California Regional Water Quality Control Board
San Francisco Bay Region

Third Five-Year Review

Advanced Micro Devices Site
901/902 Thompson Place
Sunnyvale, Santa Clara County, California

September 2009

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9/30/09
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List of Acronyms

AMD	Advanced Micro Devices, Inc.
ARAR	Applicable or Relevant and Appropriate Requirements
bgs	Below Ground Surface
BPHE	Baseline Public Health Evaluation
cDCE	cis-1, 2-dichloroethene
ESL	Environmental Screening Levels
GAC	Granular Activated Carbon
GWR	Groundwater Recirculation
GWETS	Groundwater Extraction and Treatment System
HVAC	Heating Ventilation and Air Conditioning
ISB	In-situ Bioremediation
MCL	Maximum Contaminant Level
ug/L	Micrograms Per Liter
ug/m^3	Micrograms Per Cubic Meter
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
PCE	tetrachloroethene
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
Regional Water Board	California Regional Water Quality Control Board
SCR	Site Cleanup Requirements
SVET	Soil Vapor Extraction and Treatment
TCA	1,1,1-trichloroethane
TCE	Trichloroethene
TRW	TRW Corporation
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC	Volatile Organic Compound

Executive Summary

The remedy for groundwater contamination at the Advanced Micro Devices, Inc. (AMD) Superfund site at 901/902 Thompson Place in Sunnyvale, California, has included soil excavation, operation of a groundwater extraction and treatment system (GWETS), groundwater monitoring, in-situ bio-remediation (ISB), and institutional controls. This is the third five-year review for the AMD 901/902 site, and it covers remedial activities conducted between January 2001 and September 2009.

Groundwater extraction began in 1983 and continued through 2002. During that time, groundwater concentrations declined across the site. AMD completed a pilot scale test of in-situ bioremediation (ISB) at the 901 Thompson Place facility in September 2004 and implemented a full-scale test of ISB treatment in December 2005. The results demonstrate that ISB is effectively removing the remaining volatile organic compounds (VOC) mass from groundwater. In 2008, the Regional Water Board issued a No Further Action (NFA) letter for soil cleanup at the Site.

The remedy at the Advanced Micro Devices, Inc. (AMD) Superfund site at 901/902 Thompson Place in Sunnyvale, California is currently protective of human health and the environment. Although the GWETS has been turned off, the ISB groundwater program, currently in passive mode, is continuing to make progress towards groundwater restoration. In the meantime, institutional controls are in place to prevent exposure to contaminated groundwater. There is no exposure risk from vapor intrusion. To be protective in the long-term, a strategy should be developed to assess the risk of future vapor intrusion if site occupancy changes. Additionally, the Record of Decision and final Site Cleanup Requirements will need to be amended to reflect the groundwater remedy change.

Five-Year Review Summary Form		
SITE IDENTIFICATION		
Site Name (from WasteLAN): Advanced Micro Devices, Inc.		
EPA ID (from WasteLAN): CAD048634059		
Region: 9	**State:** CA	**City/County:** Sunnyvale/Santa Clara
SITE STATUS		
NPL status: Final		
Remediation Status: Operating		
Multiple OUs? No	**Construction completion date:** 1984	
Has site been put into reuse? The site is now a self-storage warehouse.		
REVIEW STATUS		
Lead agency: State of California		
Author Name: Max Shahbazian		
Author title: Engineering Geologist	**Author affiliation:** CA Regional Water Quality Control Board (Lead Agency)	
Review period: October 2008 to September 2009		
Date(s) of site inspection: 3/24/09		
Type of Review: (in bold) _Post-Sara _Pre-Sara _NPL-Removal only _Non-NPL Remedial Action Site x **NPL State/Tribe-lead** _Regional Discretion		
Review number: (in bold) _1 (first) _2 (second) X**3 (third)** Other (specify)		
Triggering action: (in bold) _Actual RA Onsite Construction at OU#__ _Actual RA Start at OU#__ _Construction Completion x **Previous Five-Year Review Report** _Other (specify)		
Triggering action date 9/30/2004		
Due Date: 9/30/2009		

Five-Year Review Summary Form, continued

VIII. Issues

The three issues identified during the review are:

1. In-situ bioremediation has shown greater potential towards achieving site cleanup standards in a reasonable time frame than the GWETS;
2. If use at the building changes, or a new building is constructed, then there may be a potential for vapor instruction until the groundwater remedy is successful; and,
3. The existing restrictive covenant is not consistent with current state law (California Civil Code section 1471) which establishes the framework for environmental covenants in California.

IX. Recommendations and Follow-up Actions

The issues, recommendations, follow-up actions, and milestone dates are summarized in Table 9.

1. AMD should continue to evaluate the progress of groundwater treatment and the ISB Program. The ROD and final SCR will need to be amended to reflect the remedy change from groundwater extraction to ISB.
2. AMD will be required to conduct soil gas sampling to further assess the potential vapor intrusion pathway. If the soil gas sampling results indicate a potential vapor intrusion concern (i.e., soil gas concentrations greater than soil gas ESLs), AMD will be required to conduct indoor air sampling.
3. A restrictive covenant should be recorded for the Site that is consistent with current California law.

Protectiveness Statement:

The remedy at the Advanced Micro Devices, Inc. (AMD) Superfund site at 901/902 Thompson Place in Sunnyvale, California, is currently protective of human health and the environment as institutional controls are in place to prevent exposure to contaminated groundwater and there is no current exposure from vapor intrusion. To be protective in the long-term, a strategy should be developed to assess and address potential, future vapor intrusion risk if on-site building use changes, or if new buildings are constructed, and a new restrictive covenant should be recorded. Additionally, the ROD and final SCR will need to be amended to reflect the remedy change.

California Regional Water Quality Control Board
San Francisco Bay Region

Third Five-Year Review

Advanced Micro Devices, Inc.
901/902 Thompson Place
Sunnyvale, California

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to 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.

The Agency 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.

The California Regional Water Quality Control Board, San Francisco Bay Region, conducted the five-year review of the remedy implemented at the AMD 901/902 Thompson Place Superfund Site (Site) in Sunnyvale, Santa Clara County, California. This is the third five-year review for the Site. The triggering action for this policy review is the completion of the second five-year review on September 30, 2004. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Activity	Date
AMD began semiconductor assembly at 901 Thompson Place	1969
AMD began semiconductor assembly at 902 Thompson Place	1972
AMD discovered soil and groundwater contamination at the site	1982
AMD removed acid neutralization systems and associated contaminated soils from both buildings	1983 – 1984
AMD began groundwater extraction and treatment. NPDES permit issued for discharge of treated effluent.	1983
Regional Water Board issued Waste Discharge Requirements Order	Sept 1985
USEPA added Site to the National Priorities List (NPL)	June1986
Regional Water Board adopted Site Cleanup Requirements order	Dec 1987
Baseline Public Health Evaluation completed for site	1990
Regional Water Board and USEPA approved Final RI/FS Report and Final Remedial Action Plan (FRAP) for AMD and adjacent TRW and Philips sites	June 1991
Regional Water Board adopted Order No. 91-102, the Final Site Cleanup Requirements for the site.	June 1991
USEPA issued Record of Decision (ROD)	Sept 1991
AMD stopped industrial operations at the site	1992
RWQCB and EPA complete first Five-Year Review	Sept 1999
AMD submitted second Five-Year Review Report to Regional Water Board	Sept 2001
AMD initiated in-situ bioremediation pilot project in former VOC source area at 901 Thompson Place	Dec 2002
ISB pilot test ended and AMD proposed in-situ bioremediation as final remedy for AMD 901 Thompson Place	Sept 2004
RWQCB and EPA complete second Five-Year Review	Sept 2004
AMD conducted additional subsurface investigation	April 2005
AMD began full-scale ISB Program	Dec 2005
AMD sells the Site property	2005
Onsite structures are demolished by new owner.	2006
A single large building is constructed for use as a Self-Storage Facility. The address is changed to 875 East Arques Avenue.	2007
Vapor Intrusion Report prepared	April 2007
Regional Water Board approved soil remediation and granted a "No Further Action" letter for soil remediation	May 2008
AMD converted the full-scale ISB Program from an active to a passive program, where ongoing intrinsic bioremediation is monitored on a quarterly basis.	May 2008

III. Background

Physical Characteristics

The AMD 901/902 Thompson Place site (Site) is located south of Highway 101 in Sunnyvale (see attached map). The Site is located in a light industrial and commercial area dominated by the electronics industry that is known as the Silicon Valley, which is a portion of the larger Santa Clara Valley. Sunnyvale has a population of approximately 100,000, and is part of the San Francisco Bay Metropolitan Region, which has a total population of about six million. Most buildings in the vicinity of the Site are low-rise building developments containing office space and research and development facilities.

Historically, two large, low-rise industrial buildings occupied the Site. These buildings were vacated by AMD in 1992. AMD sold the Site to Westcore Thompson II, LLC in 2005, and the Site was later transferred to Summit Commercial Properties, Inc. Summit demolished the buildings and built a self-storage warehouse on the Site in 2007.

This five-year review covers only remedial activities conducted at the AMD 901/902 Thompson Place Site. Separate Five-Year Reviews will be prepared and issued for the two adjacent Superfund sites: TRW Microwave, Inc., 825 Stewart Drive, and the AMD site at 915 DeGuigne Drive. The nearby Philips site at 811 East Arques Avenue is a RCRA site, and submits annual groundwater monitoring and cleanup progress reports to the Regional Water Board.

Site Operational History

Industrial operations began at the Site in 1969, when AMD began manufacturing printed circuit boards and semiconductors at 901 Thompson Place. AMD began operations at 902 Thompson Place in 1972. AMD operated the facility until 1992. Operations were continuous with no significant process changes between 1969 and 1992. During this time, TCE and other industrial solvents were used for cleaning and degreasing, although TCE use reportedly ceased in approximately 1979. Acids were used for etching and caustics were used for acid neutralization. Acid neutralization systems (ANS), including in-ground sumps, were used at both AMD buildings between 1969 and 1984. Hazardous wastes generated from these various operations were stored on-site.

Hydrogeology

The Site is located in the Santa Clara Valley, within a structural groundwater basin containing coarse and fined grained marine and alluvial sediment deposits. The coarser sediment deposits are probably the result of fluvial deposition in or near stream channels that drain the highlands that surround the basin. Finer-grained sediment deposits likely developed under a variety of conditions, but resulted in a heterogeneous sequence of interbedded sands, silts, and clays. The natural groundwater flow direction beneath the Site is to the north towards San Francisco Bay. An extensive, deep, regional, confined aquifer that is used for municipal water production generally lies greater than 200 to 300 feet below ground surface (bgs) in the Sunnyvale area. A thick, relatively impermeable aquitard separates this deep aquifer from a complex series of

laterally discontinuous aquifers and aquitards that can extend up to within a few feet of the ground surface.

Four distinct water-bearing units have been characterized in the upper 100 feet bgs at this Site. These coarse-grained, transmissive units are generally composed of sand or sandy gravel. The first encountered water-bearing unit, called the A-zone, is found from about 5 to 25 feet bgs. The next encountered water-bearing unit is called the B1-zone and is found from about 30 to 45 feet bgs. The B2-zone is typically found between 45 and 70 feet bgs. The B3- zone is generally found between 70 and 90 feet bgs. Groundwater contamination extends down to about 65 feet bgs, and appears to have migrated to off-site down-gradient areas. The upper zones are separated by variable thicknesses of clay to silty sand; however, there is some degree of hydraulic connection between the zones due to the discontinuous nature of the sediment types. The highest concentrations of contaminants exist in the A-zone and B1-zone. VOCs are also present in elevated concentrations in the B2-zone. However, chemicals from this Site have not impacted deeper, active, drinking water source aquifers.

History of Contamination

Early studies of groundwater contamination at this Site reported that groundwater was impacted by chlorinated volatile organic compounds (VOCs), consisting primarily of trichloroethylene (TCE) and its biodegradation product, cis-1,2-dichlorethylene (cDCE), and appeared to commingle with similar discharges from three nearby sites. These other sites include: the TRW Microwave site at 825 Stewart Drive, which is located to the north; the Philips Semiconductors site at 811 East Arques Avenue site, which is located to the west; and another AMD facility at 915 DeGuigne Drive, which is located north of TRW. At the time of these early studies in the 1980's it was difficult to distinguish the origin of VOCs because of similar chemical use among various facilities and a relatively sparse groundwater monitoring well network. Both of the AMD sites and the TRW Microwave site are Superfund sites, whereas the Philips site is regulated under the RCRA program.

Because of the difficulty of identifying discrete sources of VOCs in groundwater down-gradient of these three sites, a relatively large area down-gradient of these sites, referred to as "The Companies' Offsite Operable Unit", was mapped in the 1980s as a single commingled VOC plume composed chiefly of TCE. The commingled groundwater VOC plume from the Philips, AMD, and TRW sites in the A- and B1-zones is approximately 4,000 feet long and extends northward to Highway 101. Philips is operating a GWETS on-site to address the Companies Offsite plume.

Site remedial investigations began in 1982 with the discovery of leakage from an acid neutralization sump at 901 Thompson Place. The main contaminants of concern at the Site are TCE and cDCE. The sources of the contamination were determined to be leaking ANS sumps at each building. Additional remedial investigations determined the extent of contamination. VOCs in groundwater are limited to water-bearing units in the upper 65 feet that are not used for public water supply.

Initial Response

Remedial action at the Site began in 1983 with the removal of the ANS systems and 257 cubic yards of contaminated soils from 901 and 902 Thompson Place buildings. Operation of the groundwater extraction and treatment system (GWETS), including excavation dewatering, began in 1983.

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 1.5 million residents of the Santa Clara Valley. The AMD Site was made a Superfund site primarily because of its potential threat to this valuable resource.

IV. Remedial Actions

Remedy Selection

A Baseline Public Health Evaluation (BPHE) was submitted in 1990. The Remedial Investigation/Feasibility Study (RI/FS) was approved by USEPA and the Regional Water Board in June 1991. These documents form the basis of the remedial action plan. The Regional Water Board adopted Final Site Cleanup Requirements (SCR) Order No. 91-102 in June 1991. The Final SCR contains the approved remedy for cleanup at the Site. A Record of Decision (ROD) was issued by USEPA in September 1991. The remedy selected in the SCR and the ROD consisted of the following elements:

1) Groundwater extraction;
2) Treatment of extracted groundwater by air stripping or ozone oxidation;
3) Discharge of treated water under NPDES permit; and
4) Placement of a restrictive covenant prohibiting the use of shallow groundwater for drinking water.

The groundwater cleanup standards were set at California proposed or adopted Maximum Contaminant Levels (MCLs), USEPA MCLs, California Action Levels, or levels based on a risk assessment. The groundwater cleanup standards are listed in Table 1 below.

Table 1 Site Groundwater Cleanup Standards

Chemical	Cleanup Standard (ug/L)
1,1-dichloroethane (1,1-DCA)	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

Chemical	Cleanup Standard (ug/L)
vinyl chloride	0.5
Tetrachloroethene (PCE)	5
1,2-dichlorobenzene (1,2-DCB)	600
1,1,1-trichloroethane (1,1,1-TCA)	200
trichloroethene (TCE)	5

Remedy Implementation

Groundwater Extraction and Treatment

The groundwater extraction and treatment system (GWETS) and groundwater-monitoring program were fully implemented at the time the final SCR and ROD were adopted in 1991.

The GWETS at the Site began operation in 1984 and continued operating through 2002, when it was discontinued in advance of the ISB pilot test. The GWETS was comprised of eight extraction wells (DW-1 through DW-8) which pumped water from the A-, B1-, and B2-zones to an on-site treatment system, where VOCs were removed from the extracted water by air-stripping prior to permitted discharge to the storm sewer or onsite re-use. Treated groundwater was discharged to an on-site storm sewer under Waste Discharge Requirements (Regional Water Board Order No. 94-087, and NPDES Permit No. CAG912003) issued in December 1994. The storm sewer discharges into Calabazas Creek at Highway 101. The GWETS was integrated into the ISB in December 2005 and is used for groundwater recirculation (extraction and re-injection).

Between December 2002 and September 2004, AMD conducted a pilot study to test the feasibility of using ISB to expedite Site cleanup. The Site GWETS was shutdown in December 2002 in order to conduct the pilot study.

The primary findings and conclusions from the pilot study follow:

- Tracer test results indicted that a groundwater circulation system would be effective in distributing carbohydrate throughout the treatment zone.

- Carbohydrate was rapidly utilized by bacteria in the treatment zone and required a relatively frequent or continuous carbohydrate injection stream in order to maintain the amount of carbohydrate necessary to promote the treatment of VOCs.

- TCE and cDCE were effectively reduced to their common, environmentally benign products (e.g., ethene and chloride) when carbohydrate was present in sufficient quantities and duration. Results indicated that TCE, cDCE, and vinyl chloride concentrations were reduced in pilot test wells by over 90% within 6 months.

- ISB was documented to be a viable treatment technology for expediting the groundwater cleanup at the site.

Based on the results of the ISB pilot study, AMD recommended expanding the ISB Program as an alternative to the existing GWETS and as the final cleanup remedy for the Site.

Systems Operation & Maintenance

AMD submits groundwater monitoring reports to the Water Board annually. The main costs associated with the operation and maintenance of the GWETS and ISB Program are sampling, analytical laboratory fees, carbohydrate amendment, electricity, parts, and consulting fees. Costs associated with operation and maintenance of the GWETS, ISB Program and associated reporting are summarized in Table 2 below.

Table 2 - GWETS and ISB Program Operation Costs

From	To	Total Cost
1996	2000	$726,700
2001	2004	$859,000
2004	2008	$655,530

V. Progress Since Last Review

The 2nd Five Year Review, completed in 2004, concluded that:

> *"Remedial actions conducted at the site are achieving success. In situ bioremediation appears to have the potential to accelerate site cleanup. The remedy is currently protective of human health and the environment in terms of limiting ingestion of contaminated water through the use of institutional controls prohibiting the use of shallow groundwater.*
>
> *The existing soil and groundwater remedy does not address risks from long-term exposure through the vapor intrusion pathway. Since the issuance of the ROD, new information has been developed concerning the toxicity of TCE and potential vapor intrusion into buildings overlying shallow groundwater contamination. This information, and other recent changes in the methodology of assessing risk from VOCs, requires a reevaluation of the protectiveness of the remedy in terms of its ability to limit exposure to VOC vapors in indoor air. Indoor air has not been sampled at the AMD 901/902 Thompson Place site. While the available data suggest human health risks should be minimal, RWQCB and USEPA are deferring making a protectiveness statement until an analysis of the risks at this site from the vapor intrusion pathway has been completed."*

The issue identified and the actions taken since the last five-year review are summarized below in Table 3.

Table 3 - Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations Follow-up Actions	Action Taken and Outcome
Mass removal efficiency of GWETS is declining over time, and may not be capable of achieving cleanup standards in a reasonable time frame.	Evaluate in-situ bioremediation (ISB) as an alternate remedial technology.	Designed and implemented full scale ISB treatment as alternative remedial technology.
Possible off-site migration of VOCs onto adjacent sites	Evaluate and reduce off-site migration of VOCs onto adjacent sites	Evaluated off-site migration of VOCs onto adjacent and down-gradient sites. The implemented remedy is reducing but not eliminating off-site migration.
The vapor intrusion pathway has not been assessed at this Site	Assess potential VOC vapor intrusion risks into indoor air through soil gas and possibly indoor air sampling	Screening level assessment conducted indicates VOCs concentrations in groundwater are above Regional Water Board ESLs for potential vapor intrusion. However, the new building is a self-storage facility and has a 15-inch thick concrete slab and is ventilated by an HVAC system.

AMD also prepared a new environmental restrictive covenant for the property and recorded it with the Santa Clara County Records Office on May 20, 2005, Recorders' No. 18382725. A title search was conducted in September 2008 and reflected that the covenant appears in the title record. The covenant prohibits the use of groundwater from the shallow aquifer (i.e., A- and B-zone aquifers as described above) as a source of drinking water. However, the covenant does not identify a convenatee that is benefited by the restrictions contrary to the requirements of California Civil Code Section 1471.

VI. Five-Year Review Process

Community Notification

The Regional Water Board published a public notice in the local newspaper regarding this third five-year review of cleanup actions undertaken at the Site. A copy of the public notice, published on July 8, 2009, in the Sunnyvale Sun, is attached.

Document Review

This five-year review consisted of a review of relevant documents including AMD's Third Five-Year status report (submitted to the Regional Water Board on December 31, 2008), annual groundwater monitoring reports, subsurface investigation reports, and periodic ISB progress reports. There have been no changes in the cleanup standards contained in the Final SCR.

Data Review

Soil

Shallow soil investigation and remediation at the Site is complete, as confirmed in the Regional Water Board's No Further Action letter (Water Board, 2008). The soil excavations in 1983, 1984, and 1992 successfully removed a significant mass of collocated VOCs and shallow soil is no longer a source for groundwater contamination.

Groundwater

Groundwater monitoring data collected from October 2004 through October 2008 were reviewed to evaluate progress in remediating the groundwater beneath the Site.

Remedial efforts have reduced VOC concentrations in source areas and across the dissolved plume; however, VOC concentrations in groundwater remain above cleanup standards due to the complexity of site hydrogeology and the technical limitations of the remedial methods. Since contamination was first measured in August 1983, up until October 2008, total, maximum VOC concentrations in on-site groundwater have been reduced by almost two orders of magnitude from 110,000 ug/L to 6,658 ug/L . The total, current, maximum VOC concentrations (6,658 ug/L) remain in the former source area at 901 Thompson Place, in the vicinity of monitoring well PMW-2-1. Well DW-1 was used as an extraction well before January 23, 2008, and as an injection well from January 28, 2008, to May 2, 2008. Total VOC concentrations in well DW-1 have decreased from 32,100 ug/L on May 3, 2006, to 47 ug/L on October 7, 2008.
The results indicate TCE concentrations in groundwater, for the most part, have decreased or have reached asymptotic levels. TCE concentrations detected in on-site wells from October 2000 through October 2008 are summarized in Table 4, below.

Concentrations of VOCs in wells located near the down-gradient property boundary have decreased since the GWETS was shut down, indicating that cessation of groundwater extraction has not resulted in higher groundwater concentrations in samples collected from off-site monitoring wells.

On the basis of decreasing concentrations in the B2-zone aquifer, and an absence of detectable VOC concentrations in the B3-zone, AMD believes there is no evidence that groundwater contamination has migrated vertically since groundwater extraction began.

The GWETS began operating in 1983 and continued through 2002. During this period, the GWETS removed approximately 231 million gallons of water and approximately 809 pounds of VOCs. Between 1984 and 1995, the GWETS removed VOCs at a rate of approximately 4.4 pounds of VOCs per million gallons of groundwater extracted (lb/MG). This efficiency decreased to an average of 2.4 lb/MG between 1996 and 2002.

Between December 2002 and September 2004, AMD conducted a pilot study to test the feasibility of using ISB to expedite cleanup. The full-scale ISB Program operation started in December 2005 and operated until May 2008.

Following a subsurface investigation in 2005, AMD designed and installed a full-scale ISB system to expedite groundwater cleanup in the vicinity of the former 901 Thompson Place ANS. The work included the installation of 13 injection, extraction, and monitoring wells as part of the ISB system. The ISB system extracted groundwater from down-gradient extraction wells, treated it with granular activated carbon (GAC), and amended it with carbohydrate prior to injecting it into up-gradient injection wells. The system operated from December 2005 until February 2006, when Site redevelopment activities and power supply problems interrupted normal operations. Between March 2006 and June 2006, the ISB system operated intermittently; in May 2006, the ISB injection wells (located within the footprint of the building) were destroyed to accommodate Site redevelopment. Other wells, such as former extraction wells DW-1 and DW-2 (located outside the building footprint) were used as temporary, substitute injection wells. A continuing reduction of chlorinated VOCs in the treatment zone during periods in which the ISB system was not operating was accomplished by providing an excess of carbohydrate prior to system shut-down.

Normal ISB operations, including carbohydrate addition, resumed in July 2006. Due to the presence of excess carbohydrate (high TOC) and high methane concentrations in the A-Zone wells, carbohydrate amendment was stopped in August 2006. Again, it should be noted that ISB continued to reduce VOCs after the shutdown because of the excess carbohydrate in the A-Zone. Carbohydrate injection continued, for the B1-Zone only, in October 2006. The system was shut down again in December 2006 in preparation for the installation of new, dedicated injection wells and system modifications.

AMD conducted another subsurface investigation in January 2007 to assess lithologic and groundwater conditions in the vicinity of the former source area. The investigation consisted of three borings for lithology, and the collection of depth-discrete groundwater samples. The intent of the investigation was to assess whether ISB processes had sufficiently reduced VOC concentrations in groundwater beneath the vicinity of the former source area after operation of the original injection wells (that were removed in May 2006). The results indicated that the original seven injection wells had initiated the ISB process, but because these wells had to be decommissioned earlier than intended to allow for the demolition of an existing building and construction of a new building, additional injection should occur in this area to promote additional ISB treatment and complete dechlorination of target VOCs.

Using the information collected in the January 2007 subsurface investigation, AMD installed five injection wells in February and March 2007; including an angled injection well to target a zone of higher VOC concentrations underneath the new building. These wells were integrated into the ISB system and used to introduce carbohydrate to the treatment zone up-gradient of the previous system, and directly target the former 901 Thompson Place ANS. The new configuration was designed such that groundwater would be extracted from one or two of the former injection wells at a time, treated and amended with carbohydrate, and injected into one new injection well at a time, so that treatment would occur throughout an area up-gradient from the former treatment zone.

The ISB system was returned to its 2006 configuration in January 2008, and operated with DW-1 and DW-2 acting as injection wells. The addition of carbohydrate continued until April 2008, at

which time it was discontinued due to excess carbohydrate in the subsurface; however, the groundwater circulation system continued to run until May 2, 2008, to promote continued carbohydrate mixing with subsurface microbes. The ISB Program is currently in passive mode (no groundwater recirculation) and AMD will continue to monitor the progress of ISB treatment on a quarterly basis.

Performance monitoring was conducted regularly during the ISB Program. The results of the ISB performance monitoring from December 2005 through December 2006 are reported in the *In-Situ* Bioremediation Program Implementation Report (Geomatrix, 2006a) and in quarterly monitoring reports (Geomatrix, 2006b, 2006c, and 2007a). Preliminary results indicated that *in-situ* reduction of TCE, cDCE, and vinyl chloride is occurring in the treatment zone groundwater. Cumulative TCE, cDCE, and vinyl chloride concentrations have greatly decreased at most monitoring locations (greater than 90% at some locations). Complete transformation of TCE, cDCE, and vinyl chloride to ethene is occurring throughout the A-Zone and in most B1-Zone wells.

As part of the full-scale ISB Program, VOCs were removed from groundwater *ex-situ* using GAC prior to being amended with carbohydrate in advance of re-injection. While the volume of groundwater circulated (approximately 1 million gallons between 2006 and 2008), and the mass of VOCs removed *ex-situ* (approximately 10 pounds), is less than when the GWETS was in operation, the majority of the VOC removal by the ISB system has likely occurred *in-situ*, from carbohydrate injection. This statement is supported by the measured increase of ethene concentrations found in collected samples; ethene is an end-product of TCE reduction, and cDCE, and vinyl chloride are intermediate products of the same reduction process. Therefore, one molecule of ethene forms for every molecule of TCE that is sequentially reduced to cDCE, to vinyl chloride, and finally to ethene, assuming the ethene is itself not consumed. Because ethene itself is biodegradable in the subsurface, it is difficult to accurately track VOC mass removal *in-situ*. Nonetheless, the *ex-situ* mass removal has been tracked during the ISB system operation, to further assess in-situ treatment processes. The efficiency of the ISB *ex-situ* component is much greater than the GWETS, removing VOCs at an average rate of 11.3 lb of VOCs/MG (compared to 2.4 lb/MG for the GWETS). However, *ex-situ* removal rates have declined as *in-situ* treatment has substantially decreased the availability of mobile VOCs in the subsurface beneath the Site.

The full-scale ISB Program has removed much of the remaining VOC mass in the area near the former 901 Thompson Place source area through *in-situ* reductive dechlorination and *ex-situ* treatment with carbon filtration. The ISB treatment has resulted in decreases in concentrations of TCE and cDCE by greater than 90% in a majority of ISB monitoring wells during the treatment period. Decreases in chemical concentrations have also been observed based on measurements of concentrations in samples collected from Site monitoring wells located hydraulically down-gradient of the treatment area.

Passive ISB treatment will continue to occur in the subsurface in the future due to an excess of carbohydrate. The progress of ISB will continue to be monitored on a quarterly basis in 2009.

Table 4 - TCE Concentrations in Extraction and Monitoring Wells

Well ID	Oct-00	Oct-01	Oct/Nov-02	Oct-03	Oct-04	Oct-05	Oct-06	Oct-07	Oct-08
Extraction Wells									
DW-1	1,100	1,400	730	13,000	16,000	18,000	NS	NS	2.5
DW-2	12	12	Extraction well not operating						
DW-3	NS								
DW-4	280	250	250	29	50	NS			
DW-5	110	100	110	61	8.6	NS			
DW-6	190	240	240	210	1.2	NS			
DW-7	210	250	210	250	230	NS	1.6	NS	17
DW-8	210	250	270	270	250	NS	11	NS	
A-Zone Wells									
14-S	ND	ND	ND	ND	ND	ND	ND	ND	NS
15-S	NS							30	15
16-S	33	25	43	8.9	5.1	3	1	0.9	ND
17-S	14	22	38	41	40	42	58	72	NS
21-S	NS								
22-S	27	26	33	71	130	190	2.3	6.5	7.8
23-S	6.3	3.1	9.4	17	25	33	29	52	29
25-S	110	62	84	2.7	67	86	NS		
26-S	NS								
27-S	620	680	910	960	520	480	340	130	280
28-S	370	270	330	71	NS	41	1.2	ND	1.6
29-S	52	30	25	49	84	20	32	16	25
36-S	83	140	140	100	91	91	98	70	98
37-S	200	150	170	160	110	91	83	81	81
38-S	NS								
54-S	NS								
B1-Zone Wells									
16-D	31	82	130	95	300	110	1.5	1.7	1.7
23-D	170	180	200	220	250	110	3.1	210	300
25-D	NS								
27-D	190	140	190	63	25	36	58	120	130
28-D	360	470	290	250	11	160	1.3	ND	0.9
29-D	160	160	58	0.6	1.1	1.3	3.6	53	49
36-D	110	67	150	110	85	4.6	92	17	27
52-D	4.2	5.4	24	13	ND	29	32	37	33
53-D	3.8	4.1	5.6	3.3	1.8	1.2	1.3	5.0	6.9
B2-Zone Wells									
22-DD	NS		120	180	9	2.8	1.1	3.7	140
27-DD	200	300	320	220	190	110	93	79	94
30-DD	NS								
36-DD	6.4	11	8.1	1.2	0.5	ND	0.8	1.5	1.6
B3-Zone Wells									
35-DDD	1	1	0.6	ND	ND	ND	0.5	ND	ND

Notes:
ND = Not detected
NS = Not sampled
Concentrations are in micrograms per liter (ug/L)

Soil Gas/Vapor Intrusion

The previous five-year review completed in 2004 reevaluated the exposure pathways and found that the understanding of vapor intrusion had changed since 1990 when the BPHE was completed. Initially, AMD did not conduct soil gas and indoor air sampling due to the building demolition and redevelopment activities at the Site during this review period. However, in 2007 AMD assessed the vapor intrusion pathway from the groundwater plume into the overlying buildings at the Site by a screening level assessment (Vapor Intrusion Study, 901/902 Thompson Place; Geomatrix; April 18, 2007). The assessment looked at existing shallow groundwater concentrations and compared these to the Water Board's Environmental Screening Levels (ESLs). Table 5 summarizes the findings.

Table 5 -
Comparison of Maximum Groundwater Shallow Concentrations and ESLs

Compound	Maximum Shallow Groundwater Concentrations (ug/l) (April 2007)	ESLs (ug/l)
1,1-Dichloroethane (1,1-DCA)	0.5	3400
1,1,1-Trichloroethane (1,1,1-TCA)	1.1	360000
Freon 113	1.3J	N/A
1,1-Dichloroethylene	1.7	1800
Cis-1,2-Dichloroethylene	67	17000
Trans-1,2-Dichloroethylene	25	19000
Trichloroethene (TCE)	340J	1800
Tetrachloroethene (PCE)	20	420
Vinyl Chloride	**14**	**13**
1,2-Dichlorobenzene (1,2-DCB)	15	160000
1,3-Dichlorobenzene (1,3-DCB)	.7	N/A
1,4-Dichlorobenzene (1,4-DCB)	2.8	1100
Chlorobenzene	130	37000
Chloroethane	3.3	2700

The conclusions in the report were that maximum concentrations in the uppermost shallow zone are below the respective ESLs; therefore, there was no potential for vapor intrusion risk with the exception of one area near the former source area. The concentration of vinyl chloride slightly exceeded the respective ESL for this location. The building at this location was demolished and new self-storage facility was constructed with 15-inch slab-on grade foundation in 2007. The former source area was under remediation in 2007. The latest groundwater concentration for vinyl chloride sampled in October 2008 and at this location was 23 ug/l.

EPA has also developed screening levels in various media to address the potential for vapor intrusion. Both agencies use similar conceptual models that incorporate important variables such as depth to the source and physical properties of the chemicals of concern. It is important that the specific site conditions are consistent with assumptions incorporated within the conceptual model used. The Water Board's ESLs are derived using generalized soil physical properties that may be applicable for the San Francisco Bay area. EPA's screening values are derived from empirical data collected in the process of numerous vapor intrusion investigations done nationally. EPA's screening values are lower but exceeding these levels would require a more site- specific investigation to verify actual site conditions, especially soil physical properties. Table 6 shows a comparison of the different screening levels.

Table 6 -
Comparison of Maximum Groundwater Shallow Concentrations, ESLs and EPA Vapor Intrusion Screening Levels.

Compound	Maximum Shallow Groundwater Concentrations (ug/l) (April 2007)	ESLs (ug/l)	EPA Vapor Intrusion industrial Screening Levels (ug/l)	EPA Vapor Intrusion residential Screening Levels (ug/l)
1,1-Dichloroethane (1,1-DCA)	0.5	3400	33	6.5
1,1,1-Trichloroethane (1,1,1-TCA)	1.1	360000	31400	7429
Freon 113	1.3J	N/A	5910	1410
1,1-Dichloroethylene	1.7	1800	800	191
Cis-1,2-Dichloroethylene	67	17000		
Trans-1,2-Dichloroethylene	25	19000	684	166
Trichloroethene (TCE)	**340J**	**1800**	**15**	**3**
Tetrachloroethene (PCE)	**20**	**420**	**3**	**0.57**
Vinyl Chloride	14	13	3	0.15
1,2-Dichlorobenzene (1,2-DCB)	15	160000	11282	2690
1,3-Dichlorobenzene (1,3-DCB)	0.7	N/A	N/A	N/A
1,4-Dichlorobenzene (1,4-DCB)	2.8	1100	11	2.2
Chlorobenzene	130	37000	1690	400
Chloroethane	3.3	2700	97800	22000

Although the most current maximum groundwater monitoring levels found at the site exceed the screening levels for potential vapor intrusion, conditions suggest a newly constructed slab of 15-inch thickness is expected to significantly retard vapor intrusion. In addition, any potential for vapor migration into the building would be mitigated by the extensive HVAC system installed and operated on all floors. The facility is currently used as a self-storage facility.

Based on our review of the 2007 Vapor Intrusion Assessment (Geomatrix Consultants, 2007), the EPA vapor screening levels, and verification of current on-site conditions, we conclude that there is no current exposure via the vapor intrusion pathway. However, the Regional Board and EPA recommend that additional sampling be collected and evaluated if the use of the building changes.

Mass Removal

VOC mass removal methods, volumes and efficiency are summarized in Table 7 below.

Table 7 VOC Mass Removal Methods, Volumes and Efficiency

Method	Volume Extracted[1] (gallons)	Average Influent VOCs (ug/L)	Estimated Total VOCs Removed (pounds)	Extraction System Efficiency (lb/MG)
1983/1984 Excavations	NA	NA	10	NA
1992 Excavation	NA	NA	0.3	NA
Groundwater Extraction				
1984 through 1995[2,3]	126,940,000	529	559	4.4
Groundwater Extraction				
1996	16,140,000	283	38	2.4
1997	15,817,920	339	45	2.8
1998	16,636,170	277	38	2.3
1999	16,170,000	251	33	2.0
2000	12,291,830	262	27	2.2
2001	13,032,970	281	29	2.2
2002	13,495,145	363	40	2.9
SUBTOTALS[3]	**103,584,035**	**294**	**250**	**2.4**
ISB Groundwater Extraction				
2006	586,929	1,287	5.9	10.0
2007	154,649	2,653	3.0	19.5
2008	261,553	505	1.3	4.4
SUBTOTALS[3]	**1,003,131**	**1,482**	**10.2**	**11.3**
TOTAL[3]	**231,527,166**	-	**829**	**3.6**

Notes
1. The extraction volumes (and associated VOCs removed estimate) are based upon meter readings for individual extraction wells.
2. Estimated values.
3. Mass removed values rounded to nearest pound.
ug/L = micrograms per liter.
Lb/MG = pounds VOCs removed per million gallons of extracted water.
NA = not available.

Site Inspection

A Site inspection was conducted on March 24, 2009, by Regional Water Board and USEPA staff. AMD sold the Site to Westcore Thompson II, LLC in 2005, which sold the Site to Summit Commercial Properties (Summit). Summit demolished the Site buildings in 2006 and constructed a new self-storage building at the Site in 2007.

Staff reviewed construction drawings and verified that the new storage facility constructed in mid-2007 was constructed on a 15-inch thick concrete slab and visually inspected the mechanical ventilation (HVAC) system installed and functioning throughout the office building and including all storage areas.

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.

VII. Technical Assessment

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

No. The remedy is no longer functioning as intended by the decision documents. The remedy selected in the Final Remedial Action Plan (i.e., GWETS and institutional controls) was implemented as planned and achieved some success by removing VOC mass from soil and groundwater, maintaining plume control, and reducing VOC concentrations in groundwater. Contamination remains confined to the shallow and intermediate water bearing zones, which extend down to about 65 feet bgs. VOC concentrations declined while the GWETS was operating, but remained above cleanup standards. Mass removal efficiency also declined while the GWETS was operating and it is not clear if GWETS can achieve site cleanup standards in a reasonable time frame.

Because of declining effectiveness of the selected GWETS groundwater remedy, AMD conducted an *in-situ* bioremediation (ISB) pilot test. AMD determined that the ISB pilot test demonstrated that TCE can be successfully biodegraded to ethene at the Site, and that ISB has the potential to accelerate Site cleanup. In December 2005, AMD implemented full-scale ISB treatment for the Site. GWETS was integrated into the ISB for groundwater recirculation (extraction and re-injection). The ISB system was in operation until May 2008 and ISB was successful in removing much of the remaining VOC mass beneath the Site and reducing off-site groundwater contaminant migration. The ISB program is currently in passive mode (no groundwater recirculation) and AMD will continue to monitor the progress of ISB on a quarterly basis. The current groundwater-monitoring program is sufficient to track the plume at and

beyond its current boundary. The plume is not captured at the Site boundary but approximately 2000 feet down gradient of the Site by the AMD 915 GWETS (see Attachment B).

The institutional controls in place include prohibitions on the use of groundwater until cleanup standards are achieved. No activities were observed that would have violated the institutional controls. The existing restrictive covenant is not consistent with current state law (California Civil Code section 1471), which establishes the framework for environmental covenants in California.

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

Summit demolished the Site buildings in 2006 and constructed a new self-storage building at the Site in 2007. There have been no significant changes to the physical conditions of the Site that would affect the protectiveness of the remedy. Land use at the Site and surrounding area remains commercial, light industrial, and office space.

Changes in Cleanup Levels

There have not been any changes to Applicable, Relevant, and Appropriate Requirements (ARARs) or any new standards that would affect the protectiveness of the Site groundwater remedy. TCE and cis-1,2-DCE are the primary chemicals still found at concentrations above the cleanup standards. Groundwater cleanup standards have not been changed since the ROD was issued.

Changes in Exposure Assumptions

The exposure assumptions used to develop the Baseline Public Health Evaluations (BPHE) in 1991 included exposure to untreated groundwater used as drinking water and on-site residential development. These assumptions are considered to be conservative in evaluating risk and in developing the risk-based cleanup levels. Institutional controls prohibit the use of groundwater and groundwater is not currently used at the Site. The land use of the Site is primarily commercial/industrial.

In 2007, AMD assessed the vapor intrusion pathway for groundwater contaminant plume vapor migration into the overlying buildings at the Site. The primary conclusions from that assessment were that VOC concentrations in groundwater beneath a small area near the former source zone are above the Regional Water Board ESLs for potential vapor intrusion into indoor air. The new building at the Site is a self-storage facility and was constructed on a 15-inch thick concrete slab on grade. The office space of this new building is the only occupied portion of the building and is located approximately 600 feet up-gradient of the former source area and the entire building is ventilated by an HVAC system. Therefore VOC concentrations in groundwater above ESLs should not cause an unacceptable risk to occupants of the onsite building.

Changes in Toxicity

There have been a number of changes to the toxicity values for the specific constituents of concern since the BPHA was completed. Four contaminants have had their toxicity values lowered (i.e., are considered more toxic) since the 1991 BPHA; these contaminants include: PCE, TCE, Vinyl Chloride and 1,2-DCA. Appendix C provides a direct comparison between the 1988 toxicity values and current U.S. Environmental Protection Agency (EPA) Regional Screening Levels.

Although there have been changes to the toxicity values, the changes do not increase the site risk to unacceptable levels and the clean-up levels chosen in the Record of Decision are still protective of human health and the environment.

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

There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

There have been no significant changes in the physical condition or land use at the Site that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. Issues

The three issues identified during the review are:

1. In-situ bioremediation has shown greater potential towards achieving site cleanup standards in a reasonable time frame than GWETS; and,
2. If use at the building changes, or a new building is constructed, then there may be a potential for vapor instruction until the groundwater remedy is successful; and,
3. The existing restrictive covenant is not consistent with current state law (California Civil Code section 1471) which establishes the framework for environmental covenants in California.

IX. Recommendations and Follow-up Actions

The issues, recommendations, follow-up actions and milestone dates are summarized in Table 9 below.

1. AMD should continue to evaluate the progress of groundwater treatment and the ISB Program. The ROD and final SCR will need to be amended to reflect the remedy change.

2. A new restrictive covenant must be recorded for the Site that is consistent with current California law.
3. AMD will be required to conduct soil gas sampling to further assess the potential vapor intrusion pathway. If the soil gas sampling results indicate a potential vapor intrusion concern (i.e., soil gas concentrations greater than soil gas ESLs), AMD will be required to conduct indoor air sampling.

X. Protectiveness Statement

The remedy at the Advanced Micro Devices, Inc. (AMD) Superfund site at 901/902 Thompson Place in Sunnyvale, California is protective of human health and the environment. The ISB groundwater program is making progress towards groundwater restoration. In the meantime, institutional controls are in place to prevent exposure. There is no current exposure risk from vapor intrusion. The ROD and final SCR need to be amended to change the remedy.

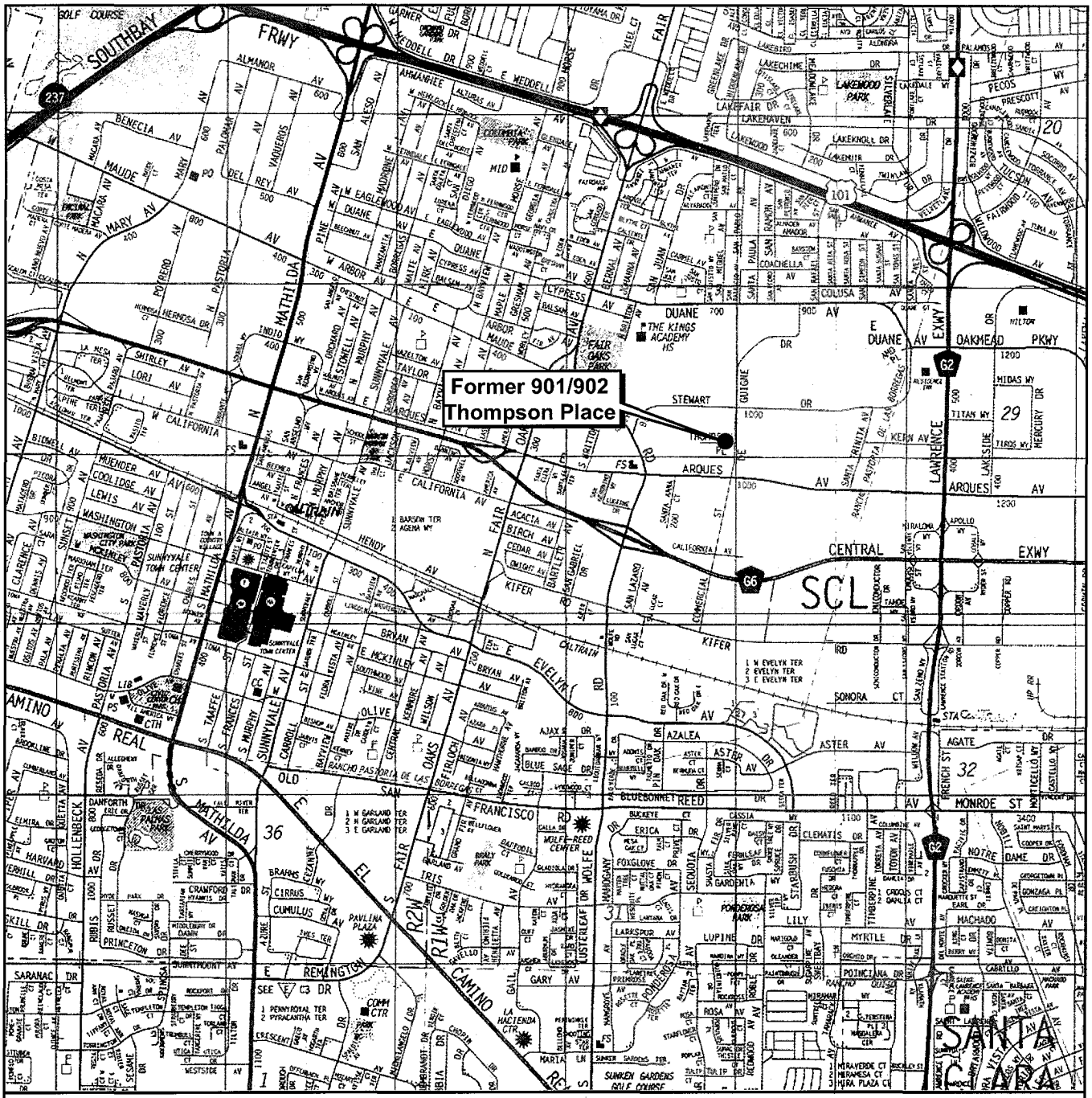
XI. Next Review

The next five-year review for the Site is required by September 30, 2014. In order to re-synchronize the five-year reporting schedule between Regional Water Board and USEPA, AMD should submit its next Five-Year Summary Report to Regional Water Board by December 31, 2013.

Table 9 - Issues, Recommendations and Milestone Dates

Issue	Recommendation and Follow-up Action	Responsible Party	Oversight Agency	Date	Affects Protectiveness (Yes/No)
In-situ bioremediation (ISB) has shown greater potential towards achieving site cleanup standards in a reasonable time frame than GWETS.	AMD should continue to evaluate the progress of groundwater treatment and the ISB Program. The ROD and final SCR will need to be amended to reflect the remedy change from groundwater extraction to ISB.	AMD	Regional Water Board	2012	Short term: No Long term: Yes
If use at the building changes, or a new building is constructed, then there may be a potential for vapor instruction until the groundwater remedy is successful	AMD will be required to conduct soil gas sampling to further assess the potential vapor intrusion pathway. If the soil gas sampling results indicate a potential vapor intrusion concern (i.e., soil gas concentrations greater than soil gas ESLs), AMD will be required to conduct indoor air sampling	AMD	Regional Water Board	2012	Short term: No Long term: Yes
The existing restrictive covenant is not consistent with current state law (California Civil Code section 1471) which establishes the framework for environmental covenants in California.	A new restrictive covenant should be recorded for the Site that is consistent with current California law.	AMD	Regional Water Board	2011	Short term: No Long term: Yes

Appendix A – Site Map



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N

0 2000 Feet

SITE LOCATION MAP
Former Advanced Micro Devices, Inc.
901/902 Thompson Place
Sunnyvale, California

By: MC	Date: 12/15/2008	Project No. 8219.009
AMEC Geomatrix		Figure 1

SS:\8200\8219\8219.009\task_01\08_1203_5yr_thompl_fig_01(01).ai

Appendix B – Site Location relative to Companies Operable Unit

NORTH

0 5,000
FEET

Site Location Map
Sunnyvale, California

Appendix C – Change in Toxicity Values for Groundwater

Change in Toxicity Values for Groundwater

Compound	Toxicity Value in 1991 BHPA (ppb)	Source	Current RSL for tap water (2009) (ug/l)	Maximum Groundwater Contamination (Fall 2008)
Dichloromethane	5	CREG	4.8	Not Reported
Chloroform[1]	6	CREG	0.19	Not Reported
1,1-Dichloroethane (1,1-DCA)	**5**	**CA MCL**	**2.4**	1.2
1,1,1-Trichloroethane (1,1,1-TCA)	200	US MCL	9100	1.2
Freon 113	1200	CREG	59000	2.9
1,1-Dichloroethylene	0.6	CREG	340	1.8
1,2-Dichloroethylene	6	CA MCL		
Cis-1,2-Dichloroethylene			370	130
Trans-1,2-Dichloroethylene			110	17
Trichloroethene (TCE)	**3**	**CREG**	**1.7**	300
Tetrachloroethene (PCE)	**0.7**	**CREG**	**0.11**	17
Vinyl Chloride	**0.2**	**EMEG**	**.016**	23
1,2-Dichlorobenzene (1,2-DCB)	900	RMEG	370	20

CREG – ATSDR Cancer Risk Evaluation Guide
CA MCL – California MCL
EMEG - ASTDREnvironmental Media Evaluation Goal
RMEG – ATSDR Reference Dose Evaluation Guide
US MCL – Federal MCL

[1] Dichloromethane and Chloroform were evaluated in the BPHA but were not included in the final list of the Site's COCs.

Appendix D – Site Documents – State Clearinghouse Link

http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL720041205

The State Water Resources Control Board maintains the Geotracker website as a repository of environmental data for regulated facilities in California. You can use the following link(s) to find the covenant(s) that have been recorded for the Site property or properties. In addition, the environmental title search reports will shortly be available at the same link.