California Regional Water Quality Control Board
San Francisco Bay Region

Third Five-Year Review

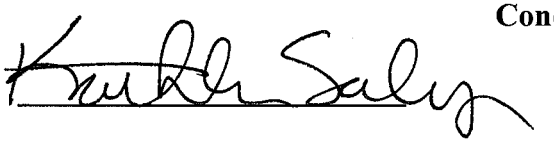
Monolithic Memories (Advanced Micro Devices–Arques)
Sunnyvale, Santa Clara County, California

September 2009

Approved By:

Stephen A. Hill
Chief, Toxics Cleanup Division

Concurred By:



Kathleen Salyer
Assistant Director
Superfund Division
U.S. EPA Region IX

9/30/09

Date

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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
cis-1,2-DCE	cis-1,2-Dichloroethene
ESL	Environmental Screening Levels
FRAP	Final Remedial Action Plan
GWET	Groundwater extraction and treatment
MCL	Maximum Contaminant Level
ug/L	Micrograms per liter
MMI	Monolithic Memories, Inc.
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSC	National Semiconductor Corporation
OU 1	Operable Unit 1
PCE	Tetrachloroethene
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
Regional Water Board	Regional Water Quality Control Board
SCR	Site Cleanup Requirements
SVET	Soil Vapor Extraction and Treatment
TCA	1,1,1-trichloroethane
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC	Volatile Organic Compound

Executive Summary

The remedy for groundwater contamination at the Monolithic Memories Superfund Site in Sunnyvale, California, hereinafter MMI or the Site, has included soil excavation, groundwater extraction and treatment (GWET), soil vapor extraction and treatment (SVET), groundwater monitoring, and institutional controls. This is the third five-year review for MMI and it covers remedial activities conducted between September 2004 and September 2009.

A protectiveness determination of the remedy at Monolithic Memories, Inc (Advanced Micro Devices - Arques) cannot be made at this time until further information is obtained concerning the potential for vapor intrusion. Further information will be obtained from collecting and analyzing soil gas and possibly indoor air samples at 1160 Kern Avenue building and the need for a further restrictive covenant at that property will be assessed. The historical data from bi-annual vapor sampling data from the 1155 East Arques Avenue location (KinderCare) will be analyzed to verify protectiveness. It is expected that these actions will take approximately one year to complete.

Although the historical groundwater plume was reduced and contained, current information indicates that the selected remedy may not be able to restore the groundwater to its beneficial use as a potential drinking water supply. The recent PCE spill has increased concentrations on property and has not been fully assessed. Currently, the institutional controls are preventing exposure to, and the ingestion of, contaminated groundwater. The feasibility of alternative remedies or improvements to the existing system need to be evaluated to insure the long term remedial objectives are achieved.

Five-Year Review Summary Form		
SITE IDENTIFICATION		
Site name (from WasteLAN): Monolithic Memories (Advanced Micro Devices–Arques)		
EPA ID (from WasteLAN): CAD049236201		
Region: 9	**State:** CA	**City/County:** Sunnyvale/Santa Clara
SITE STATUS		
NPL status: Final		
Remediation status: Not Operating		
Multiple OUs? No	**Construction completion date:** 1988	
Has Site been put into reuse? Yes. The buildings located at 1165 and 1175 E. Arques Avenue, respectively, were demolished in 2005. The building at 1160 Kern Avenue was redeveloped in 2007.		
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: 3/24/2009		
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) **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: (from WasteLAN)**:** 9/30/2004		
Due Date: 9/30/2009		

Five-Year Review Summary Form-Continued

Issues

The following issues were identified during this review:

1) Mass removal efficiency of the GWET system has declined over time and the system was shut down in 2005;
2) The impact of a 2005 spill of PCE has not been fully assessed; and
3) The vapor intrusion pathway at the Site has not been assessed at 1160 Kern Avenue (Building 3), a property which is not covered by a restricted covenant. Additionally, further evaluation needs to be completed of the historic VOC concentrations in the bi-annual indoor air sampling program at 1155 East Arques Avenue (KinderCare).

Recommendations and Follow-up Actions

The following are recommendations and follow-up actions:

1) An evaluation of alternatives for achieving groundwater cleanup standards needs to be completed. The ROD and final SCR will need to be amended to reflect the change in remedy.
2) An investigation should be completed to assess the impact of the 2005 PCE spill and the possible need for further action. Additionally, the ROD and final SCR will need to be amended to incorporate the implementation of remedial treatments and treatment systems related to the 2005 PCE spill.
3) Soil gas and possibly indoor air samples should be collected at 1160 Kern Avenue building to further assess the potential for a vapor intrusion pathway. The necessity of a further restrictive covenant for that property will be determined after the vapor intrusion assessment is completed. A statistical analysis of the historic indoor air data from Kindercare needs to be completed to verify that the clean-up activities from the 2005 PCE spill is protective of the KinderCare facility.

Protectiveness Statement

A protectiveness determination of the remedy at Monolithic Memories, Inc (Advanced Micro Devices-Arques) cannot be made at this time until further information is obtained concerning the potential for vapor intrusion. Further information will be obtained from collecting and analyzing soil gas and possibly indoor air samples at 1160 Kern Avenue building. The historical data from bi-annual vapor sampling data from the 1155 East Arques Avenue location (KinderCare) will be analyzed to verify protectiveness. It is expected that these actions will take approximately one year to complete.

Although the historical groundwater plume was reduced and contained, current information indicates that the selected remedy may not be able to restore the groundwater to its beneficial use as a potential drinking water supply. The recent PCE spill has increased concentrations on property and has not been fully assessed. Currently, the institutional controls are preventing exposure to, and the ingestion of, contaminated groundwater. The feasibility of alternative remedies or improvements to the existing system need to be evaluated to insure the long term remedial objectives are achieved.

California Regional Water Quality Control Board
San Francisco Bay Region

Third Five-Year Review

Monolithic Memories (MMI)
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 (Regional Water Board), conducted the five-year review of the remedy implemented at the Monolithic Memories Superfund Site (MMI or 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
Monolithic Memories (MMI) begins semiconductor manufacturing at 1165 East Arques Avenue	1970
Initial investigations and removal of leaking USTs and associated piping; soil and groundwater contamination discovered at the Site	1982
MMI removes Building 1 acid neutralization system (ANS), waste stripper tank and Building 2 ANS waste reclaim tank. MMI installed new ANS and waste collection system in Building 2	1984
MMI begins groundwater extraction from A-zone aquifer	1986
Regional Water Board issues Waste Discharge Requirements Order.	Aug 1986
Applied Micro devices (AMD) acquires MMI and assumes Site cleanup responsibility	1987
The MMI and National Semiconductor Corporation (NSC) Sites added to the National Priorities List	July 1987
Groundwater extraction begins from the B-zone aquifer.	1988
Regional Water Board adopts Site Cleanup Requirements	April 1989
AMD stops its industrial operations	1989
AMD vacates the Site	1991
AMD completes Baseline Public Health Evaluation for Site	April 1991
Regional Water Board and USEPA approved Final RI/FS work plans for MMI and NSC Sites	Sept 1991
Regional Water Board adopted Orders No. 91-137, 91-139, and 91-140, the Final Site Cleanup Requirements for Subunits 1, 2, and 3 of Operable Unit 1	Sept 1991
USEPA issues Record of Decision (ROD) for MMI and NSC	Sept 1991
AMD installs two A-zone extraction wells (E42A and E43A) and performs soil investigation at Source Area 3.	1992
AMD installs and operates soil vapor extraction (SVE) system in Source Area 1	1993
AMD conducts Source Area 1 soil boring confirmation sampling	1995
The first Five-Year Review Report is signed	Sept 1999
NSC takes over operations of the Operable Unit 1 groundwater extraction, treatment and monitoring program	Jan 2002
The second Five-Year Review Report is signed	Sept 2004
NSC shuts down extraction wells ME19B2, ME20B2, ME25A, ME27A, ME28A, ME39A, ME42A, and ME43A	Feb 2005
AMD records an environmental restriction covenant for the 1165 East Arques Avenue property. TWC Storage LLC (TWC) purchases the property.	April 2005
AMD shuts down the on-site treatment system and decommissions 10 monitoring wells, all 7 SVE wells, 5 groundwater extraction wells (ME25A, ME26A, ME27A, ME28A, an ME20B2), and the treatment system to accommodate property redevelopment. AMD installs replacement extraction wells E44A and E45A	May 2005
TWC begins demolition of buildings and facilities located at 1165 and	June 2005

Activity	Date
1175 E. Arques Avenue	
TWC damages an electrical transformer at the 1165/1175 E. Arques property during building demolition activities and 250 gallons of PCE leak into Site soils and shallow groundwater.	July 2005
TWC removes approximately 2,000 cubic yards (3,100 tons) of PCE-impacted soil within two excavation areas in the northwest corner of the property. TWC places Hydrogen Release Compound (HRC) in the bottom of each excavation prior to backfilling to accelerate the bioremediation (breakdown) of residual PCE in soil and shallow groundwater	Oct 2005
TWC conducts soil and groundwater investigations in northwest corner of the Site	Nov 2005
NSC conducted soil gas and indoor air sampling at 1155 E. Arques Avenue (Prodigy daycare center)	Sept-Oct 2005
TWC conducts its second round biannual indoor air sampling at the daycare center (KinderCare)	Dec 2005
The Regional Water Board requires TWC to conduct semiannual soil gas and indoor air sampling at the daycare center	Feb 2006
TWC installs seven SVE wells in the northwest corner of the Site and conducts SVE feasibility test	Feb 2006
AMD removes below-surface grade wastewater conveyance lines and overburden from 1160 Kern property	March 2006
AMD conducts soil excavation activities in Areas 1 and 2 (historical), Area 3 (discovered in March 2005), Area 4 (discovered in July 2005), and 1160 Kern Areas 1 and 2 (identified in March 2006)	Nov 2006
AMD conducts two soil sampling programs to establish the extent of Area 2	Nov-Dec 2006
TWC installs a GWET system and begins groundwater extraction from well MM17A to capture and treat contaminated groundwater related to the 2005 PCE spill	July 2007
TWC installs four groundwater monitoring wells and nine multi-phase extraction (MPE) wells	Sept 2007
TWC installs a MPE system and combined it with the GWET system. The combined treatment systems began operation.	Jan 2008
TWC records a new environmental restriction covenant for the 1165 East Arques Avenue property.	July 2008
AMD completes soil excavation and backfill of contaminated soil in Area 2	Sept 2008
TWC injects 10,000 gallons of HRC to remediate PCE-impacted soil and shallow groundwater in the PCE spill area	June 2009

III. Background

Physical Characteristics

The Monolithic Memories Site (MMI or Site) is located south of Highway 101 in Sunnyvale (see attached map, Appendix A). 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 developments containing office space and research and development facilities.

The Site lies to the north of another federal Superfund Site, the National Semiconductor Corporation (NSC) Site at 2900 Semiconductor Drive in Santa Clara. A joint Record of Decision for both sites (OU 1) was issued on September 11, 1991, for the commingled plume of groundwater contamination from both sites. The MMI Site is designated Subunit 2 of OU1 and includes two properties: 1165/1175 East Arques Avenue and 1160 Kern Avenue.

Historically, groundwater contamination at MMI has commingled with groundwater contamination from NSC into a commingled plume. For regulatory oversight purposes, the areas overlying the commingled groundwater plume, called Operable Unit 1 (OU 1), are subdivided into three subunits: The National Semiconductor site (Subunit 1); the MMI Site (Subunit 2) and the area overlying the down-gradient, commingled portion of the plume (Subunit 3) – See Map in Appendix B.

Site Operational History

In 1970, two buildings, Building 1, at 1165 East Arques Avenue and Building 2, at 1175 East Arques Avenue, were constructed and used for semiconductor fabrication until 1989. Chemicals used in semiconductor manufacturing included organic solvent mixtures, acids, caustics, and other chemicals. Hazardous wastes, generated as part of fabrication activities, were stored, and treated in underground storage tanks (USTs). The USTs leaked and caused groundwater contamination. MMI occupied the Site from 1970 until Advanced Micro Devices (AMD) acquired the property from MMI in 1987.

In April 2005, AMD donated the 1165/1175 E. Arques Avenue property to a local charity, which immediately sold the property to TWC Storage, LLC (TWC). TWC purchased the property intending to redevelop it for use as a self-storage facility. Property redevelopment began in the spring and summer of 2005. However, on July 15, 2005, a tetrachloroethene (PCE) filled transformer located on a pad in the northwest corner of the Site was damaged by TWC's contractors, which released approximately 250 gallons of PCE into Site soils and groundwater.

Hydrogeology

The Site shown in Appendix A is located in the Santa Clara Valley, a low-lying area extending about 25 miles southeast from San Francisco Bay bounded by the Diablo Range on the east and by the Santa Cruz Ranges on the west. The Site lies within the Santa Clara Valley groundwater basin; the basin is bounded by the San Andreas and Hayward fault systems on the west and east, respectively, and consists of coarse and fine-grained alluvial sediment deposits extending more than 1,500 feet below ground surface (bgs).

The Site hydrostratigraphy includes four water-bearing zones: the A zone (from approximately at 5 to 25 feet bgs), the B1 zone (from approximately 30 to 45 feet bgs), the B2 zone (from approximately 50 to 65 feet bgs), and the C-zone (from approximately 70 to 100 feet bgs). Groundwater flow occurs primarily through the sandy, coarse-grained deposits within each of these zones, which are separated by two, approximately 30-foot-thick aquitards: the A-B aquitard (20 to 50 feet bgs) and the B-C aquitard (50 to 80 feet bgs). Groundwater in the A- and B-zones generally flows to the north/northeast.

Due to the heterogeneous nature of the alluvial sediments beneath the Site, large variations in hydraulic conductivity have been measured. The coarse-grained sediments of the A-zone, generally 2.5 to 22 feet in thickness, have hydraulic conductivity values ranging from 1 to 60 feet per day; the B-zone sediments, with a saturated thickness of 4 – 25 feet, have hydraulic conductivity values ranging from 1 – 80 ft/d. Hydraulic conductivities of the separating aquitards are several orders of magnitude lower.

History of Contamination

Site remedial investigations were initiated in 1982 for areas in and around Buildings 1 and 2. Soil and groundwater contamination was found to have originated from an on-site waste stripper tank, an acid neutralization system and wastewater collection system, and a waste solvent reclamation tank. Groundwater contamination at MMI has commingled with groundwater contamination from NSC into a commingled plume.

The most significant Site contamination was located on the north side of Building 2 (1175 East Arques Avenue). Additional remedial investigations between 1984 and 1991 confirmed the sources and extent of contamination. The main contaminants of concern identified during Site investigations include: trichloroethylene (TCE), PCE, chlorobenzene, 1,2-dichlorobenzene (1,2-DCB), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), ethylbenzene, xylenes, and polynuclear aromatic hydrocarbons, as the indicator chemicals associated with releases at the Site associated with former MMI operations.

On July 15, 2005, during building demolition activities by TWC, the subsequent property owner to AMD, a transformer located on a pad in the northwest corner of the 1165 Arques was damaged by TWC's contractors, spilling approximately 250 gallons of PCE to the ground, which subsequently migrated into underlying soils and groundwater.

Initial Response

Remedial actions at the Site began in 1982 with the removal of the leaking tanks and conveyance systems and contaminated soils. In 1986, a groundwater extraction and treatment system (GWET) was designed and begin operation; GWET operations were discontinued in 2005.

In response to the July 15, 2005, transformer PCE spill, TWC removed the damaged transformer, and excavated and disposed offsite approximately 2,300 cubic yards of PCE-contaminated soil. TWC, the current site owner, is conducting cleanup activities associated with this release.

Summary of Basis for Taking Action

The Site lies within 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. MMI became listed as a Superfund site primarily because its potential threat to this valuable resource from its past chemical releases.

IV. Remedial Actions

Remedy Selection

A Baseline Public Health Evaluation (BPHE) for the Site was completed in April 1991. USEPA and the Regional Water Board approved the Remedial Investigation/Feasibility Study (RI/FS) and the Regional Water Board adopted Final Site Cleanup Requirements (SCR) Order No. 91-139 for the Site in September 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 and contained the following remedy components: groundwater extraction; treatment of extracted groundwater by air stripping or ozone oxidation and discharge of treated water under NPDES permit; soil vapor extraction or excavation; and a deed restriction prohibiting the use of shallow groundwater for drinking water.

The ROD set groundwater cleanup standards 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 set in the 1991 ROD are summarized below in Table 1- Site Groundwater Cleanup Standards.

Table 1 - Site Groundwater Cleanup Standards

Chemical	Cleanup Standard (ug/L)
chlorobenzene	30
1,2-dichlorobenzene	60
1,1-dichloroethane (1,1-DCA)	5
1,1-dichloroethene (1,1-DCE)	6
cis-1,2-dichloroethene (cis-1,2-DCE)	6
trans-1,2-dichloroethene (trans-1,2-DCE)	10
ethylbenzene	68
Freon 113	1,200
tetrachloroethene (PCE)	5
1,1,1-trichloroethane (1,1,1-TCA)	200
trichloroethene (TCE)	5
vinyl chloride	0.5
xylenes (total)	175

Remedy Implementation

The GWET system and groundwater monitoring program were fully implemented at the time the final SCR was adopted in 1991. The following year, a restrictive covenant was recorded with the Santa Clara County Records Office. On April 29, 2005, AMD recorded a new restrictive covenant for 1165 East Arques Avenue, and, on July 24, 2008, TWC recorded another environmental restriction covenant for the property. The most recent covenant is consistent with current state law (California Civil Code section 1471), which established the framework for environmental covenants in California. There is no evidence in the administrative record, however, that a restrictive covenant was recorded for the 1160 Kern Avenue property. The title search prepared in September 2008 pulled up all three restrictive covenants recorded since 1992.

The 2008 restrictive covenant includes prohibitions on the use of groundwater from the shallow aquifer (i.e., A- and B-zone aquifers as described above) as a source of drinking water until cleanup standards are achieved. Remedial activities conducted by the Site property owners (AMD, NSC and TWC) are summarized below.

Groundwater Extraction and Treatment

NSC and AMD reached a settlement concerning the groundwater cleanup. Beginning on January 31, 2002, NSC took the lead on groundwater remediation in all of the groundwater including the MMI Site and the off-site plume. Treated groundwater was discharged to an on-site storm sewer into Calabazas Creek at Highway 101, under Waste Discharge Requirements (Regional Water Board Order No. 94-087, NPDES Permit No. CAG912003).

The GWET system was operated until April 2005, when it was shut down and a portion of the extraction system and the on-Site treatment system were decommissioned to accommodate development of the property by TWC. Due to changes in Site use, low groundwater extraction rates, seven extraction wells (ME20B2, ME25A, ME26A, ME27A, ME28A, ME38A and ME42A) located at the Site, along with the on-site treatment system, were decommissioned with Regional Water Board approval in 2005 and 2006. Two replacement extraction wells, E44A and E45A, were installed at the Site in May 2005, but have not been used because of the subsequent PCE spill in July 2005.

Following the July 2005 PCE spill, groundwater remediation activities required under the Order have not resumed. With the exception of TCE and cis-1, 2-DCE, groundwater concentrations related to historical sources were approaching cleanup standards. However, the most recent groundwater analytical data indicate concentrations of PCE (from the July 15, 2005 PCE spill), TCE, and cis-1, 2-DCE remain well above cleanup standards.

Residual PCE in soil from the July 15, 2005 PCE spill is being addressed by cleanup activities conducted by TWC, and TWC continues to implement PCE-cleanup for the affected A-zone groundwater beneath the western portion of the Site.

Soil Vapor Extraction

AMD installed and operated a soil vapor extraction (SVE) system north of Building 2 in 1993 to treat vadose-zone soil contamination. The system operated until 1996 when AMD demonstrated to the Regional Water Board that soil cleanup standards had been achieved. The SVE system was removed in 2000, and seven SVE wells were decommissioned in 2005.

Soil Excavation and Disposal

Redevelopment of the Site and demolition of Buildings 1 and 2 by TWC in 2006 and 2007 allowed the access and removal of approximately 160 cubic yards of soils contaminated with VOCs and SVOCs. Additionally, AMD terminated its lease for the 1160 Kern Avenue property at the end of the 2006 calendar year. To satisfy the conditions of the lease agreement, a soil investigation was completed concurrent with the removal of a wastewater conveyance line in March 2006. Based on the results of the investigation, two areas where PCE was detected above ESLs on the 1160 Kern property were identified for soil removal. Excavation, confirmation sampling, and backfilling of these areas were completed in November 2006, as documented in the excavation completion report. Approximately 90 $yards^3$ of soil were removed from 1160 Kern Area 1 and approximately 13 $yards^3$ of soil were removed from 1160 Kern Area 2.

Soil Excavation – PCE Spill

TWC conducted soil excavation and cleanup activities primarily on the northwest corner of the Site associated with the July 15, 2005, PCE spill. These activities included removing approximately 2,300 cubic yards of contaminated soil, and the application of 2,430 pounds of Hydrogen Release Compound (HRC) prior to backfilling the excavation.

In-Situ Chemical Oxidation

In February and March 2006, TWC conducted two in-situ chemical oxidation injection events using RegenOx™. The injection points were generally located west of Excavation Area B, except for three points within the excavated area. The injection intervals were approximately between 8 and 16 feet bgs. The first event (February 18 and 19, 2006) was between the SVE feasibility test period (the test was suspended during the injection event), and consisted of mixing 390 pounds (lbs) of oxidizer powder and 390 lbs of liquid activator into 8,000 gallons of water, and injecting the mixture into the ground via 26 injection points on 10 foot spacing. The second event on March 25 and 26, 2006,consisted of the injection of 480 lbs of oxidizer powder and 480 lbs of liquid activator mixed with 6,300 gallons of water, into 27 injection locations spaced approximately 10 feet apart.

Soil Vapor Extraction

TWC conducted a soil vapor extraction (SVE) feasibility test in response to elevated PCE vapors detected in soil following the PCE spill on July 15, 2005. TWC operated the SVE system in February 2006. On June 30, 2007, TWC installed an interim groundwater extraction and treatment system at the Site to extract and treat PCE-impacted groundwater using an existing monitoring well MM17A. In September 2007, TWC installed nine multi-phase extraction (MPE) wells (EX-1, EX-2, and EX-4 through EX-10) and four groundwater-monitoring wells (MW-1 through MW-4). The wells were screened in the shallow water-bearing zone to total depths ranging from 15.5 to 18 feet bgs. The MPE system, which incorporated the interim GWET system, began continuous operation on January 7, 2008, and was subsequently shut down on November 10, 2008.

In-Situ Bioremediation

In June 2009, TWC injected 10,000 gallons of 3DMe emulsion into the subsurface in the PCE spill area of the Site to accelerate the cleanup of PCE-impacted soil and shallow groundwater through enhanced reductive dechlorination treatment method.

GWET Systems Operation and Maintenance

NSC operated the GWET system on behalf of AMD until 2005. NSC submits an annual groundwater monitoring report for the entire OU 1, including the MMI Site. TWC submits monitoring and cleanup progress reports for the July 15, 2005, PCE spill to the Regional Water Board.

Costs associated with operation and maintenance of the GWET system (discontinued in 2005) and associated reporting are summarized in Table 2 below.

Table 2 - GWET System Operation Costs

From	To	Total Cost
1996	2004	$1,034,000
2004	2005	$120,110

V. Progress Since Last Five-Year Review

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

"Remedial actions conducted at the Site are achieving success. 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 re-evaluation 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 1165 East Arques Avenue Site. While the available data suggest human health risks should be minimal, Regional Water Board 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 issues 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
Migration of VOCs onto the AMD Site from up-gradient sources at NSC limits the effectiveness of the groundwater extraction and treatment remedy. Until this is resolved, groundwater extraction may not be capable of achieving groundwater cleanup standards	AMD and NSC should assess the performance of the groundwater extraction system at both sites, and evaluate the feasibility of alternative remedies	AMD evaluated the effectiveness of GWET system and in-situ bio-remediation as an alternate remedial technology. AMD excavated AMD-related impacted soils. AMD concluded that additional groundwater remediation would not expedite the timeframe to reach groundwater cleanup standards due to the impact from up-gradient off-

Issues from Previous Review	Recommendations Follow-up Actions	Action Taken and Outcome
	such as in situ bioremediation for the AMD Site.	site sources and the July 2005 PCE spill.
The vapor intrusion pathway has not been assessed at this Site	AMD may be required to assess vapor intrusion (soil-gas and/or indoor air monitoring) at the Site	There are no buildings at 1165 and 1175 East Arques Avenue parcels. However, AMD should conduct soil gas and possibly indoor air sampling at 1160 Kern Avenue building.

No new potentially toxic or mobile transformation products have been identified during recent monitoring that were not already present at the time of the ROD,

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 was published on August 19, 2009 in the Sunnyvale Sun.

Document Review
This five-year review consisted of a site visit, review of relevant documents including AMD's Five-Year status report (submitted to the Regional Water Board on February 2, 2009) and annual groundwater monitoring reports.

Data Review

Groundwater monitoring data

Groundwater monitoring data collected from 2000 to 2009 were reviewed to evaluate progress in remediation of the groundwater pollutant plume. GWET was successful in controlling migration of the plume, in removing VOC mass from saturated soil, and reducing concentrations of VOCs in groundwater.

Remedial efforts have reduced VOC concentrations in Site soils and groundwater; however, VOC concentrations in groundwater remain above cleanup standards due to the complexity of Site hydrogeology, migration of VOCs onto the property from the up-gradient NSC site, and the technical limitations of the remedial methods. Maximum VOC concentrations in on-site groundwater have been reduced from over 14,000 ug/L total VOCs when contamination was first measured in 1982 to 388 ug/L (total VOCs) in October 2008 (excluding monitoring wells impacted by the July 15, 2005 PCE spill). PCE, TCE and cis-1,2-DCE concentrations in groundwater beneath the Site are summarized below in Table 4.

Table 4 - PCE, TCE and cis-1,2-DCE Concentrations in Groundwater

Well ID	Sample Date	PCE	TCE	cis-1,2-DCE
ME19B2	10/12/2004	< 0.5	71	76
ME19B2	10/12/2004	< 0.5	94	81
ME19B2	10/10/2007	< 0.5	24	5.6
ME19B2	10/8/2008	< 0.5	18	5
ME20B2	10/20/2004	< 0.5	19	21
ME26A	10/13/2004	7.6	160	290
ME27A	10/11/2000	2	13	150
ME27A	10/13/2004	< 1.7	14	190
ME28A	10/12/2000	3.7	210	340
ME28A	10/13/2004	5	200	260
ME38A	10/12/2004	8.5	330	270
ME38A	10/12/2005	10	430	310
ME43A	10/10/2007	16	60	150
ME43A	10/8/2008	0	36	91
ME07B1	10/12/2004	< 0.5	100	92
ME07B1	10/12/2004	< 0.5	100	96
ME07B1	10/9/2008	<0.5	50	16
MM14B1	10/12/2004	0.6	6.4	17
MM14B1	10/14/2005	< 0.5	32	92
MM14B1	10/14/2005	< 0.5	31	88
MM14B1	10/11/2006	< 0.5	13	46
MM14B1	10/11/2007	< 0.5	13	40
MM14B1	10/8/2008	< 0.5	11	28
MM14B3	10/12/2004	< 0.5	< 0.5	< 0.5
MM14B3	10/12/2005	< 0.5	< 0.5	< 0.5
MM14B3	10/11/2006	< 0.5	< 0.5	< 0.5
MM14B3	10/11/2007	< 0.5	< 0.5	< 0.5
MM14B3	10/9/2008	< 0.5	< 0.5	< 0.5
MM17A	10/13/2005	12,000*	180	110
MM18A	10/12/2004	34	220	190
MM18A	10/12/2005	20	110	63
MM01B2	10/13/2004	1.1	2.9	0.8
MM31A	10/13/2004	11	250	140
MM31A	10/14/2005	12	210	92
MM31A	10/13/2006	6.5	120	74
MM31A	10/10/2007	10	180	170
MM31A	10/9/2008	12	200	170
MM33A	10/13/2004	< 0.5	6.1	23
MM33A	10/14/2005	< 0.5	7.7	26
MM33A	10/11/2006	< 0.5	8.3	40
MM33A	10/10/2007	< 0.5	6.7	40
MM33A	10/10/2008	< 0.5	5.1	27
MM33B2	10/13/2004	< 0.5	22	9

Well ID	Sample Date	PCE	TCE	cis-1,2-DCE
MM33B2	10/14/2005	< 0.5	140	52
MM33B2	10/14/2005	< 1.3	130	47
MM33B2	10/12/2006	< 0.7	77	27
MM33B2	10/12/2006	< 0.5	94	30
MM33B2	10/11/2007	< 0.5	21	6.9
MM33B2	10/11/2007	< 0.5	20	6.7
MM33B2	10/8/2008	< 0.5	18	5
MM33B2	10/9/2008	< 0.5	46	14
MM34A	10/12/2004	< 1.3	54	140
MM34A	10/12/2004	< 1.3	45	150
MM34A	10/14/2005	< 1	42	110
MM34A	10/11/2006	2.1	79	120
MM34A	10/10/2007	0.9	39	62
MM34A	10/7/2008	1.1	48	84
MM37A	10/13/2004	< 1.7	200	210
MM37A	10/12/2005	< 1.3	190	130
MM37A	10/10/2006	< 0.5	240	150
MM37A	10/11/2007	< 2.5	250	120
MM37A	10/8/2008	< 2.5	290	98
MM40A	10/12/2004	< 1.7	74	200
MM40A	10/14/2005	< 1.3	83	170
MM40A	10/11/2006	2.3	110	180
MM40A	10/10/2007	0.7	39	74
MM40A	10/7/2008	< 0.5	24	62
MM06B1	10/13/2004	< 0.5	< 0.5	< 0.5
MM07A	10/11/2006	9.4	75	330
MM07A	10/11/2007	9.2	91	470
MM07A	10/7/2008	10 J+	69	310
MW18AR	10/11/2007	21	200	130
MW18AR	10/8/2008	28	230	110
100B1	10/8/2008	2.6	230	170
101A	10/8/2008	3.1	300	220
98A/B1	10/8/2008	<2	160	190

Concentrations are in micrograms per liter (ug/L)
ND= Not Detected
NS= Not Sampled
<= less than
J= estimated value
*this value is related to the July 15, 2005 PCE release and is not related to historical MMI operations or regional VOC contamination. This well was sampled prior to July 15, 2005 (on October 12, 2000) where a PCE concentration of 24 g/L was reported in the groundwater sample.

VOC Mass Removal Data

In the approximately two years that the GWET system operated during the review period, approximately 12.4 million gallons (MG) of water were extracted and treated. VOC mass removal and efficiency of the GWET system are summarized in Table 5 below.

Table 5 - GWET System VOC Mass Removal and Efficiency

Year	Rate of Water Extracted	Volume of Water Extracted	Average Influent VOC Concentration	VOC Mass Removed	VOC Removal Efficiency
	(MG/yr)	(MG)	(ug/L)	(lbs)	(lbs/MG)
2004	11.1	9	340	20	1.80
2005	1.3	1	351	2	1.54

Table Notes:
MG = million gallons
yr = year
lbs = pounds
ug/L = micrograms per liter
VOC = volatile organic compound

In addition, TWC removed PCE-impacted soil and groundwater that resulted from the 250 gallons (i.e. 3,300 lbs) PCE spill. VOC mass removed by TWC is summarized below in Table 6 – Estimated VOC Mass Removal by TWC.

Table 6 – Estimated VOC Mass Removal by TWC

Cleanup Method	Start Date	End Date	Volume Treated	VOC Mass Removed (lbs)
Emergency clean-up by absorbing spilled PCE liquid	07/05	07/05	100 gallons (estimated)	1,320 (estimated)
Soil excavation and disposal	07/05	10/05	3,100 tons	800 (estimated)
Placement of 2,430 lbs of HRC in excavations	07/05	10/05	Unknown	Unknown
Soil vapor extraction feasibility test	02/06	02/06	242,400 cf	34
Injection of 1,740 lbs of oxidizer RegenOX	02/06	03/06	Unknown	Unknown
Groundwater extraction and treatment by MPE system	07/07	11/08	734,035 gallons	3.5
MPE system (vapor phase)	07/07	11/08	45,600,000 cf	43
Injection of 10,000 gallons of 3DMe emulsion (enhanced reductive dechlorination)	06/09	06/09	Unknown	Unknown
Total mass removed *				**2,200**

Table Notes:
cf = cubic feet
HRC = hydrogen release compound
lbs = pounds
MPE = multi-phase extraction system
VOC = volatile organic compound
Unknown = Mass removal data is normally unknown for in-situ treatment methods.
* The total does not include the amount of mass removed by in-situ treatment methods.

Vapor Intrusion Data

Currently, there is only one building remaining on the property. The 1160 Kern building primarily functions as a warehouse; there are between 4-5 employees during the week sorting materials and operating the warehouse. There has been no soil gas or indoor air samples collected at this location.

Immediately next door is the KinderCare site, a childcare facility, located at 1155 East Arques Avenue. After the PCE spill in 2005, soil gas samples were collected at the KinderCare site. The soil gas sampling found that some COCs were present in soil gas above the RWQCB ESLs for shallow soil gas indicating the need for additional investigation.

Indoor and outdoor air sampling was subsequently conducted at the KinderCare site on October 23, 2005, December 17, 2005, and March 18, 2006, to evaluate whether contaminants detected in soil gas samples were present in the building. Freon 113 and PCE were detected in the indoor and outdoor air samples. The maximum PCE concentration in the indoor air was 2.3 µg/m3. The outdoor air samples collected at the same time showed an ambient air concentration of PCE ranged from 0.52 µg/m3 to 1.3 µg/m3. The PCE ESL for residential indoor air is 0.41 $\mu g/m^3$. The concentrations of Freon 113 in indoor air samples were nearly the same as the concentrations detected in outdoor air samples and below the ESL for residential indoor air of 146 µg/m3.

Subsequently, the RWQCB approved the Indoor Air and Soil Gas sampling Work Plan, which called for semiannual indoor air sampling at the KinderCare Site. The latest sampling round was conducted in December 2008. The indoor air, outdoor air and soil gas results show PCE concentrations have declined significantly. All indoor air samples collected in December 2008 were below the ESLs, except one location that had a PCE concentration of 0.43 µg/L (ESL for PCE is 0.41 µg/l). TCE has subsequently been intermittently detected at levels below its residential ESL of 1.2 $\mu g/m^3$. It is anticipated that levels will continue to decrease as the PCE groundwater contamination associated with the 2005 spill is remediated.

Site Inspection

A Site inspection was conducted on March 24, 2009, by Regional Water Board and US EPA staff. The 1165 and 1175 properties are empty lots with the exception of the PCE dual-phase extraction system. The former Building 3 at 1160 Kern is a warehouse. 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. Vapor

intrusion from the groundwater plume into the overlying 1160 Kern Avenue building has not been assessed.

VII. Technical Assessment

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

No, the remedy selected in the Record of Decision is no longer in operation at the Site. The remedy selected in the Final Remedial Action Plan 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. The current groundwater monitoring program is sufficient to track the plume and detect any migration beyond the current plume boundaries, as well as track the effectiveness of clean up actions related to the 2005 PCE spill. VOC concentrations are declining, but remain above cleanup levels in part due to regional VOC contamination and a recent release of PCE that occurred in July 2005. The GWET system was shut down in 2005 for redevelopment of the Site just prior to the July 15, 2005, PCE release.

The institutional controls, in the form of an environmental restriction covenant, include prohibitions that prevent the use of groundwater until cleanup levels are achieved. No activities were observed that would have violated the institutional controls. The 2008 restrictive covenant was recorded in accordance with California Civil Code section 1471, which establishes the framework for environmental covenants in California. The covenant, however, does not restrict activities at 1160 Kern Avenue and, therefore; a further covenant may be necessary to achieve protectiveness, if the assessment of vapor intrusion pathway indicates a need to restrict use. Any new development at the Site properties will need to adhere to the restrictions as set forth in the 2008 covenant.

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

Changes in Site Conditions

The 1165 and 1175 East Arques Avenue buildings have been vacant since 1989. These buildings were demolished by TWC in 2005 to redevelop the Site into a self-storage facility. The building at 1160 Kern Avenue is occupied by RAFT, a non-profit organization for teachers, which operates a warehouse on the property. The use of the area adjacent to the Site remains commercial, light industrial, and office space. There is a day care center located adjacent to the Site at 1155 E. Arques. There is some residential development near Highway 101, more than 2,000 feet north of the Site. Institutional controls prohibit the use of groundwater and groundwater is not currently used at the Site.

Changes in Cleanup Levels

There have been no changes to Applicable, Relevant, and Appropriate Requirements (ARARs) for the Site and no new standards that would affect the protectiveness of the remedy. TCE, PCE and cis-1, 2-DCE are the primary chemicals whose concentrations still routinely exceed the

cleanup standards. Groundwater cleanup standards for these chemicals have not changed since the ROD was issued.

There have been several changes in the established Maximum Contaminant Levels (MCLs) since the Final Site Cleanup Requirements were issued in 1991 and used as cleanup standards for the Site; however, the current levels are higher and therefore more protective than would be required under current ARARs.

Changes in Toxicity

There have been a number of changes to the toxicity values for specific constituents of concern since the Record of Decision was completed in 1991.

The majority of the chemical contaminants currently have toxicity values that are higher than in 1990 and, therefore, the original risk assessment for those chemicals are more conservative than originally calculated. Four other chemical contaminants, PCE, TCE, Vinyl Chloride and 1,1-DCA, have had their toxicity values lowered since the 1991 Record of Decision. Although there have been changes to the toxicity values, these changes do not increase the Site risk to unacceptable levels.

Changes in Exposure Assumptions

The exposure assumptions used to develop the Baseline Public Health Evaluations (BPHE) in 1991 were for potential future exposure if untreated groundwater were used for drinking water and if residential development were to occur on the Site. The BPHE discuses the potential for vapor intrusion, but determined that since no residences exist over the plume then that pathway was not complete.

The 2004 FYR recommended that the potential for vapor intrusion be assessed. AMD will conduct soil gas sampling prior to construction of new buildings at the Site. TWC monitors the vapor intrusion pathway from the groundwater plume into the overlying daycare building located west of the Site (1155 E. Arques Ave) on a bi-annual basis. The primary conclusions from the most recent indoor air sampling at the daycare is that current VOC concentrations in indoor air are at or below the Regional Water Board residential ESLs for vapor intrusion into indoor air and expected to continue to decrease as the groundwater is remediated. It is recommended that the data from these sampling events e evaluated and semi-annual indoor air sampling program continue at the daycare until the groundwater is remediated. Neither indoor air nor soil gas samples have been collected at the 1160 Kern Avenue building. Therefore, it is recommended that soil gas samples and indoor air samples be collected at 1160 Kern Avenue building to assess the potential for vapor intrusion.

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

During demolition activities on July 15, 2005, a transformer located on a pad in the northwest corner of the Site was damaged by TWC's contractors, spilling approximately 250 gallons of

tetrachloroethene (PCE) to the ground surface and into Site soils and groundwater. Property development activities have been suspended since the PCE release while soil and groundwater cleanup operations have been implemented by TWC.

Technical Assessment Summary

According to the data reviewed and the Site inspection, groundwater extraction has resulted in a decrease in VOC concentrations; however, additional groundwater extraction is not expected to expedite the timeframe to reach cleanup standards. Therefore, the remedy may not achieve restoration of groundwater to its beneficial use as a potential drinking water supply source in a reasonable timeframe. There have no been changes in the physical condition or land use at the Site that would affect the protectiveness of the remedy. AMD will be required to conduct soil gas and possibly indoor air sampling to assess the potential vapor intrusion pathway.

VIII. Issues

The following issues were identified during this review:

1) Mass removal efficiency of the GWET system has declined over time and the system was shut down in 2005;

2) The impact of a 2005 spill of PCE has not been fully assessed; and

3) The vapor intrusion pathway at the Site has not been assessed at 1160 Kern Avenue (Building 3), a property which is not covered by a restricted covenant. Additionally, further evaluation needs to be completed of the historic VOC concentrations in the bi-annual indoor air sampling program at 1155 East Arques Avenue (KinderCare).

IX. Recommendations and Follow-up Actions

The following are recommendations and follow-up actions:

1) An evaluation of alternatives for achieving groundwater cleanup standards needs to be completed. The ROD and final SCR will need to be amended to reflect the change in remedy.

2) An investigation should be completed to assess the impact of the 2005 PCE spill and the possible need for further action. Additionally, the ROD and final SCR will need to be amended to incorporate the implementation of remedial treatments and treatment systems related to the 2005 PCE spill.

3) Soil gas and possibly indoor air samples should be collected at 1160 Kern Avenue building to further assess the potential for vapor intrusion pathway. The necessity of a

further restrictive covenant for property will be determined after the vapor intrusion assessment is completed. A statistical analysis of the historic indoor air data from Kindercare needs to be completed to verify that the clean-up activities from the 2005 PCE spill is protective of the KinderCare facility.

Issues, recommendations, follow-up actions and milestone dates are summarized in Table 7 below.

X. Protectiveness Statement

A protectiveness determination of the remedy at Monolithic Memories, Inc (Advanced Micro Devices - Arques) cannot be made at this time until further information is obtained concerning the potential for vapor intrusion. Further information will be obtained from collecting and analyzing soil gas and possibly indoor air samples at 1160 Kern Avenue building and the need for a further restrictive covenant at that property will be assessed. The historical data from bi-annual vapor sampling data from the 1155 East Arques Avenue location (KinderCare) will be analyzed to verify protectiveness. It is expected that these actions will take approximately one year to complete.

Although the historical groundwater plume has been reduced and contained, current information indicates that the selective remedy may not be able to restore the groundwater to its beneficial use as a potential drinking water supply. The recent PCE spill has increased concentrations on property and has not been fully assessed. Currently, the institutional controls are preventing exposure to, and the ingestion of contaminated groundwater. The feasibility of alternative remedies or improvements to the existing system need to be evaluated to insure the long term remedial objectives are achieved.

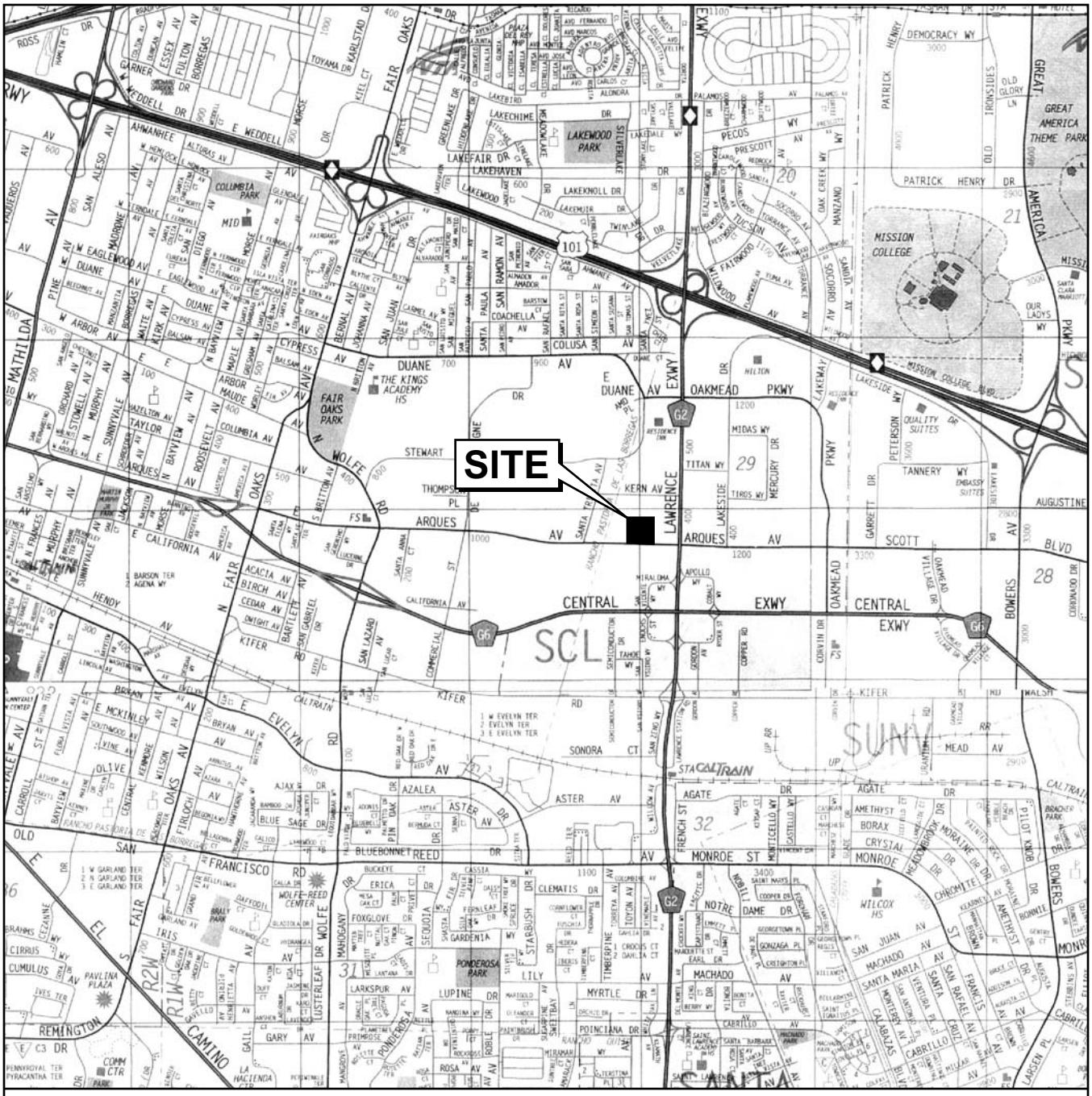
XI. Next Review

In order to make a protectiveness determination a Five Year Review Addendum must be completed by September 2011. 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 7 Issues, Recommendations, Follow-up Actions and Milestone Dates

Issue	Recommendation and Follow-up Action	Responsible Party	Oversight Agency	Date	Affects Protectiveness (Yes/No)
Mass removal efficiency of the GWET system has declined over time and may not be capable of achieving groundwater cleanup standards and the system was shut down in 2005.	AMD and NSC should evaluate other remedial alternatives for achieving groundwater cleanup standards. The ROD will need to be amended.	AMD, NSC and TWC	Regional Water Board	2012	Short term: No Long term: Yes
The impact of a 2005 spill of PCE, has not been fully assessed.	AMD, NSC, and TWC should conduct a focused investigation to assess the impact of the recent PCE spill and the possible need for further action.	AMD, NSC, and TWC	Regional Water Board	2011	Yes
The vapor intrusion pathway at the Site has not been fully assessed.	AMD should collect soil gas and possibly indoor air samples at 1160 Kern Avenue building to further assess the potential for a vapor intrusion pathway. The historical indoor air data should be analyzed and the possible need for a new restrictive covenant determined.	AMD, NSC and TWC	Regional Water Board	2010	Yes

APPENDIX A – SITE LOCATION MAP



0 2400

Scale in feet

SITE LOCATION MAP
11165/1175 E. Arques Avenue
Sunnyvale, California

By: DG	Date: 01/22/2009	Project No. 8219.006
AMEC Geomatrix		Figure **1**

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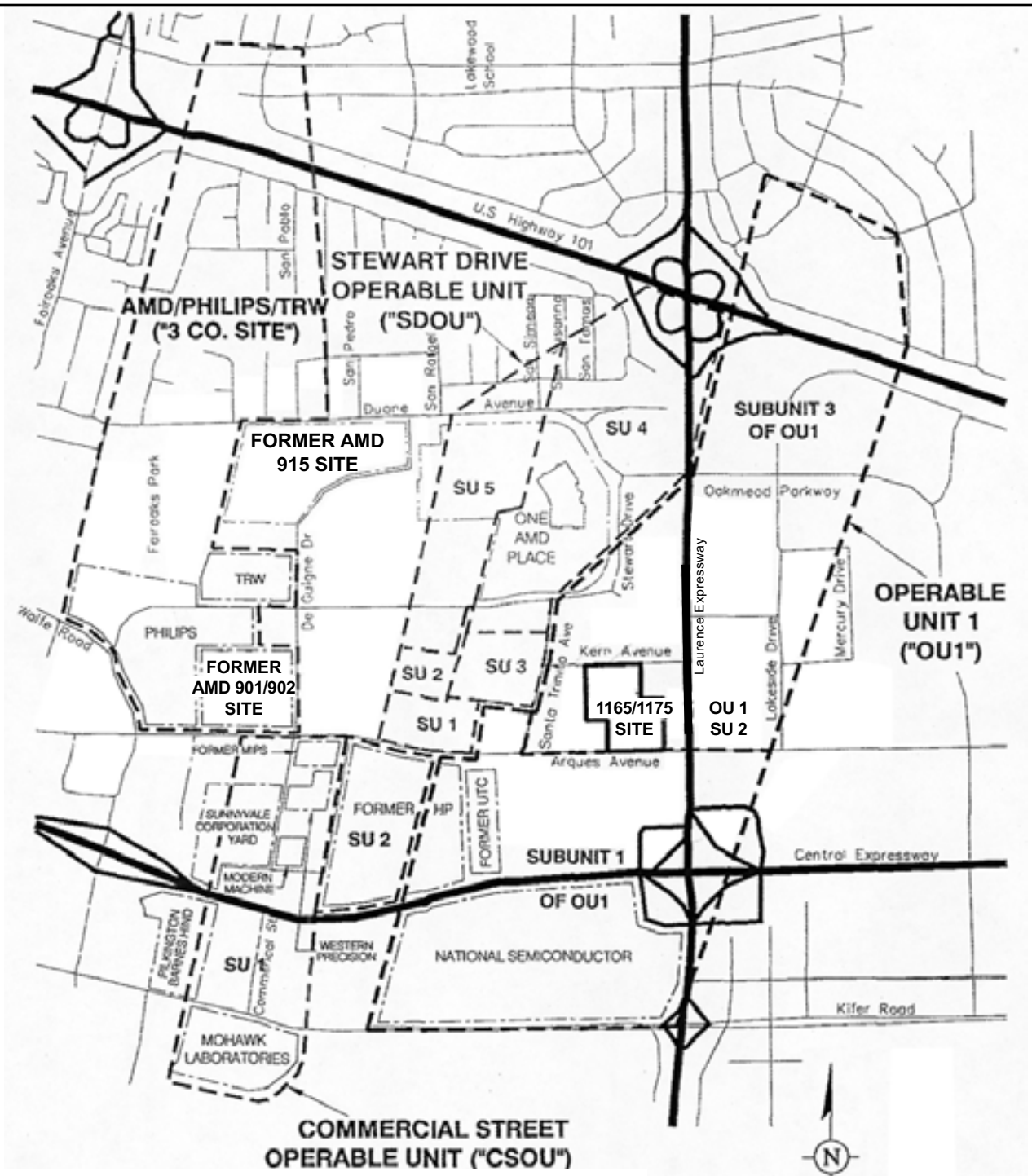
APPENDIX B – EASTERN SUNNYVALE SITES



EXPLANATION

- Operable unit boundaries
- Property lines

All locations are approximate.

Source: Advanced Micro Devices

EASTERN SUNNYVALE STUDY AREA
11165/1175 E. Arques Avenue
Sunnyvale, California

By: DG	Date: 01/22/2009	Project No. 8219.006
AMEC Geomatrix		Figure **2**

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APPENDIX C – SITE MAP

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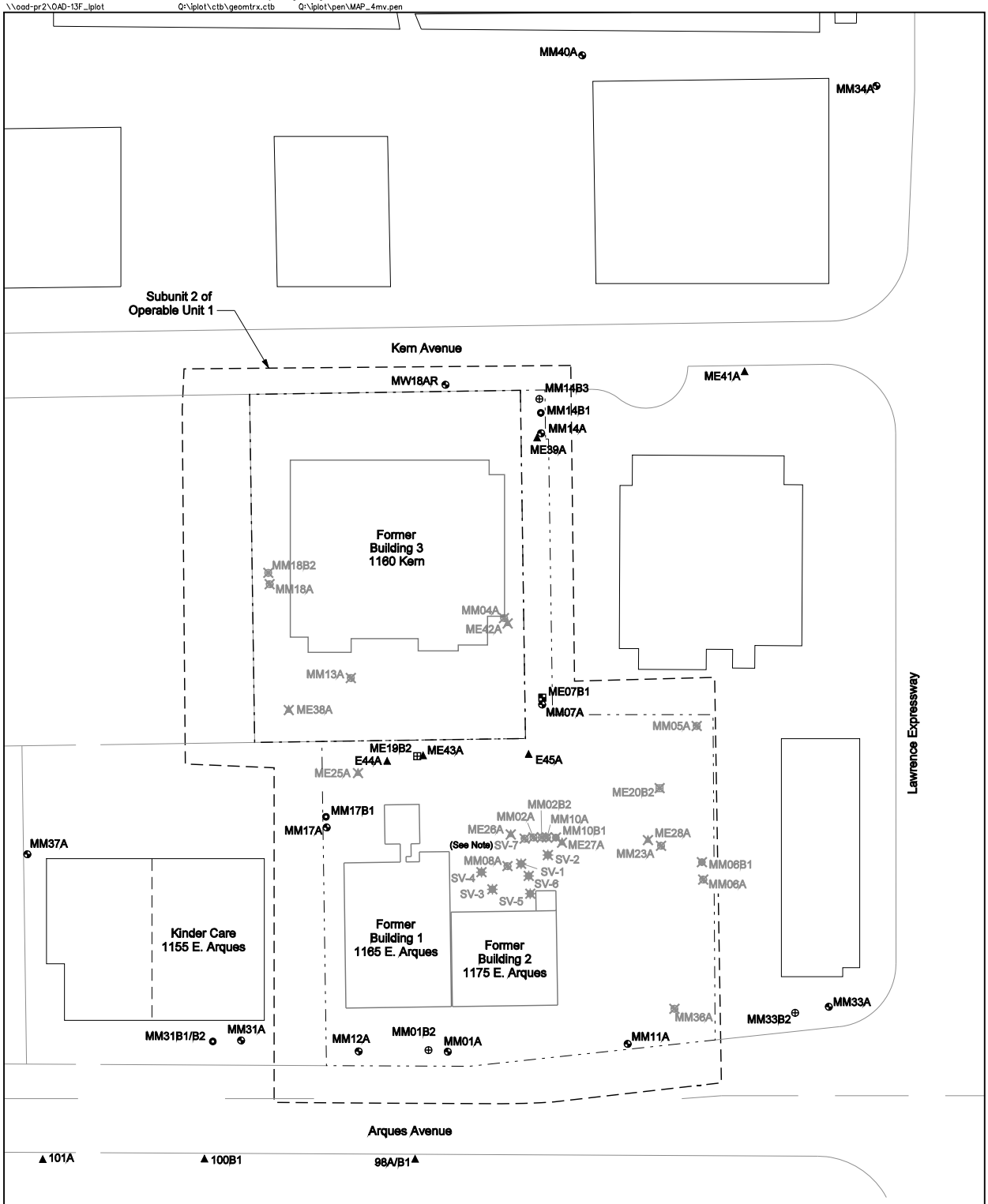

EXPLANATION

- Existing building boundaries
- A-aquifer monitoring well
- A-aquifer extraction well
- B1-aquifer monitoring well
- B1-aquifer extraction well
- Operable unit boundary
- 1165/1175 E. Arques Avenue property boundary
- 1160 Kern property boundary
- B2- or B3- aquifer monitoring well
- B2- or B3- aquifer extraction well
- Former soil vapor extraction well
- Destroyed wells

Note:
Monitoring well MM24A was converted to soil vapor well SV-7.

N

0 100
Scale in Feet

SITE PLAN
Subunit 2 of Operable Unit 1
Sunnyvale, California

By: DG	Date: 1/27/2009	Project No. 8219.006
AMEC Geomatrix		Figure 3

APPENDIX D – SITE DOCUMENTS – STATE CLEARINGHOUSE LINK

Monolithic Memories (AMD Arques)
http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL720801215

TWC Storage
http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0608512762

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.