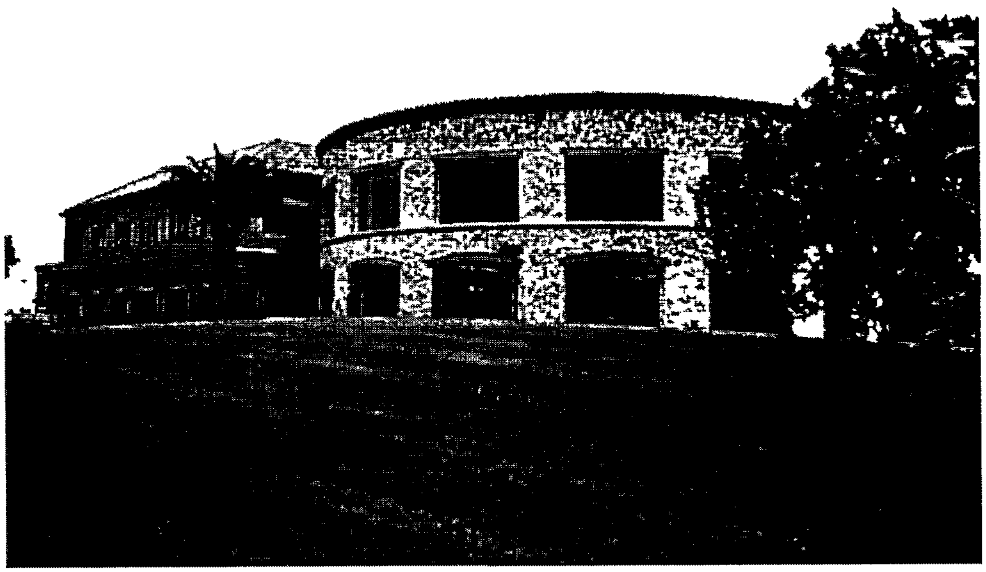
Report

Five Year Performance Review
Fairchild Semiconductor Corporation
Middlefield-Ellis-Whisman Site
Mountain View, California



Prepared for:

Fairchild Semiconductor Corporation

17 December 2003

Project No. 23007-03-2500

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17 December 2003

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RE: Response to EPA Information Request for Five-Year Review, Former Fairchild Facilities, Middlefield-Ellis-Whisman Site, Mountain View, CA
Locus Project No. 23007-03-2500

Dear Ms. Lee:

Please find enclosed our report providing the remainder of information that you requested on 10 October 2003 in support of EPA Region IX's five-year performance review for the former Fairchild Semiconductor Corporation facilities at the Middlefield-Ellis-Whisman Site in Mountain View, California. This report supplements the data submitted to you on 8 December 2003. Table 1-1 of the enclosed report provides references to where the information specified in EPA's 10 October 2003 letter can be found on the enclosed CD ROM. Because Fairchild has elected to provide the optional information and evaluation identified in the 10 October 2003 letter, we have prepared the enclosed report in the format for a five-year review specified in EPA's current five-year review guidance document.

Should you have questions, please call.

Sincerely,

Elie Haddad, P.E.
Vice President

EHH/mmm

Enclosures

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Five Year Performance Review

Fairchild Semiconductor Corporation
Middlefield-Ellis-Whisman Site
Mountain View, California

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LIST OF ACRONYMS

ACRONYM	DESCRIPTION
106 Order	EPA 106 Order (EPA Docket No. 91-4)
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCB	1,2-dichlorobenzene
1,2-DCE	1,2-dichloroethene
BAAQMD	Bay Area Air Quality Management District
bgs	below ground surface
CAG	Community Advisory Group
CD	Consent Decree (U.S. District Court Case No. C9120275JW)
Canonie	Canonie Environmental Services Corporation
cis-1,2-DCE	cis-1,2-dichloroethene
CTR	California Toxics Rule
DTSC	California Department of Toxic Substances Control
EA	Endangerment Assessment
EPA	U. S. Environmental Protection Agency
ESD	Explanation of Significant Difference
Fairchild	Fairchild Semiconductor Corporation
GAC	granular activated carbon
gpm	gallons per minute
HLA	Harding Lawson Associates
lb.	pound
Locus	Locus Technologies
MEW	Middlefield-Ellis-Whisman
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
Moffett Field	Moffett Federal Airfield

LIST OF ACRONYMS (CONT'D)

ACRONYM	DESCRIPTION
MRLs	federal minimal risk levels
NASA	National Aeronautics and Space Administration
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PCE	tetrachloroethene (perchloroethene)
PRGs	Preliminary Remediation Goals
PRP	Potentially Responsible Party
RAOs	Remedial Action Objectives
Raytheon	Raytheon Company
RGRP	Regional Groundwater Remediation Program
RRW	Regional Recovery Well
RWQCB	Regional Water Quality Control Board
SCRW	Source Control Recovery Well
SCVWD	Santa Clara Valley Water District
SIM	selective ion mode
TCA	1,1,1-trichloroethane
TCE	trichloroethene
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

INTRODUCTION:

Locus Technologies prepared this five-year performance review of the remedial actions implemented and performance of the soil and groundwater remediation program at the former Fairchild Semiconductor Corporation (Fairchild) facilities at the Middlefield-Ellis-Whisman Site (MEW Site) in Mountain View, California. The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. This is the first five-year review for the Fairchild former facilities. The triggering action for this statutory review is the initiation of the regional groundwater remediation program in 1998.

BACKGROUND:

The former Fairchild facilities are part of the MEW Site, where a number of companies were involved in activities requiring storage, handling, and use of chemicals. At several of the Fairchild former facilities, the properties were redeveloped in the late 1990s and are now currently occupied by AOL/Netscape, Nokia, and Veritas.

Groundwater aquifers within the MEW Site consist of shallow and deep aquifer systems, which are separated by a laterally extensive aquitard approximately 40 feet thick. The shallow aquifer system is generally less than 160 feet below ground surface. Subdivisions within the shallow aquifer have been designated the "A", "B1", "B2" and "B3" aquifers. The direction of the groundwater flow is generally to the north, although the slurry walls and recovery wells installed at the MEW Site have changed the direction of groundwater flow in a few locations including areas within and around the slurry walls.

In 1982, Fairchild initiated subsurface investigations at its facilities and detected volatile organic compounds (VOCs) in the groundwater and subsurface soil. Subsequently, Fairchild implemented a number of on-site source control and groundwater remediation actions including groundwater extraction and treatment, removal of waste solvent tanks, and installation of three slurry walls to control the migration of chemicals.

REMEDIAL ACTIONS:

Soil and Groundwater: Fairchild has installed a total of 35 recovery wells and operates three groundwater treatment systems at the MEW site (System 1, System 3 and System 19). To remediate soils, Fairchild excavated more than 24,000 yd3 of soils from its former facilities. In addition, Fairchild installed two soil vapor extraction systems to remediate deeper soils. The SVE systems were decommissioned in 1997 after they had removed approximately 1,210 lbs of VOCs from the soils, and after confirmation samples showed that soils had reached cleanup goals. From the groundwater, Fairchild has removed 41,550 lbs of VOCs to date.

Air: On 3 October 2002, the U.S. Environmental Protection Agency (EPA) requested a work plan "to conduct a human health risk assessment to evaluate the groundwater-to-indoor air exposure pathway by collecting indoor air, outdoor air, and soil gas samples at each Facility." In response, Fairchild has collected more than 400 air samples from 13 buildings located at the Fairchild former facilities. Sampling was conducted in spring and fall 2003. Two discreet sampling rounds were collected in each season at each of the selected locations, separated by a one-week period. Air samples were collected over a ten-hour period and were analyzed for chemicals on concern.

The results showed acceptable levels of concentrations in accordance with state and federal comparison criteria with the exception of two buildings (at 401 and 644 National Avenue) where certain indoor air samples showed TCE concentrations above EPA's draft provisional long-term values.

In the building on 401 National Avenue, Fairchild sealed cracks and penetrations in the utility room in August 2003. Following the sealing work, Fairchild conducted a test by starting the ventilation system in the office portion of the building during the morning of 2 September 2003. Because the ventilation system had not been operated at the building for a while, it created unacceptable dust and heat and was operated for only 1.5 hours. Regardless, confirmation samples were collected on 04-Sep-03. The confirmation samples showed that the mitigation measures were effective in reducing concentrations to within EPA Region IX's draft provisional goals. Consequently, Fairchild is recommending that steps be considered to improve the existing ventilation in the building.

In August 2003, Fairchild sealed the elevator shaft and openings in the basement floor in the building on 644 National Avenue. In addition, Fairchild sealed several openings in the floor between the basement and the first floor and installed two exhaust fans, each with a capacity of 6,000 cubic feet per minute. Subsequently, Fairchild conducted a test by starting the fans in the basement and the ventilation system connected to the 2nd floor, and then collecting confirmation air samples. ' The mitigation measures substantially reduced concentrations in the building. The concentrations in the 1st and 2nd floor were reduced to either non-detect levels or just above the detection level. TCE concentrations in the basement were reduced by about 20 times, and are within all acceptable criteria except only EPA Region IX's provisional goals for long-term occupancy. The basement in the building has not been occupied for several years, and remains unoccupied. Based on the results of the air samples, it is apparent that ventilation of the building will reduce concentrations to acceptable levels. To further reduce concentrations in the basement, it may be necessary to enhance the existing system.

FIVE-YEAR REVIEW PROCESS:

Groundwater monitoring has been conducted at the former Fairchild facilities since the 1980s. In general, chemicals were detected at their highest levels early in the remedial history of the site. These levels drop in concentration levels as a result of remedial activities eliminating source material. This assessment of the remedy at the site evaluates the following indicators:

Are proper capture zones obtained? The overall capture of the plume at the former Fairchild facilities is adequate.

Are the gradients across the slurry wall appropriate? Inward gradients have been observed across the slurry wall except for the northern portions of the walls at 369 N. Whisman Road and 313 Fairchild Drive. Despite the outward gradient, the chemicals are contained through the physical isolation provided by the slurry wall and the operation of several recovery wells within the slurry wall enclosure. Furthermore, recovery wells downgradient of the slurry walls provide adequate capture of the area.

The slurry walls are low-permeability walls that minimize chemical migration, even if the gradient is outward, because the flux of chemicals across a low-permeability zone is small. That, combined with the fact that chemicals tend to take the easier pathway and migrate towards recovery wells within the wall enclosure rather than across the low-permeability wall, minimize outward chemical migration.

Therefore, the slurry walls and the pumping activities within these enclosures physically contain chemicals. If a small flux of chemicals migrates through the slurry wall, it is captured by recovery wells placed downgradient of the wall.

Are vertical gradients appropriate? In general, upward gradients are observed across the "A/B1" aquitard. In a few limited areas, downward gradients are observed. However, the concentration trends in the "B1" aquifer are decreasing. Upward gradients are generally observed across the other aquitards.

Are the overall trends in concentrations decreasing? By 2002, the TCE concentrations in the "A" aquifer have decreased 99%, 99%, and 80% compared to 1986/1987, 1992, and 1997 conditions. In the areas within the three slurry walls, TCE concentrations have decreased by an average of 79% to 83%, 31% between 2002 and 1986/1987, 1992, and 1997, respectively. Although the comparisons do not use the same set of wells (because not all wells existed or were sampled at all sampling events), the calculations indicate significant decreases in TCE concentrations.

"B1" Aquifer: By 2002, the TCE concentrations in the former Fairchild facilities in the "B1" aquifer have decreased 68%, 64%, and 33% compared to 1986/1987, 1992, and 1997 conditions.

"B2" Aquifer: The concentration in one "B2" aquifer well, RW-4B2, increased between 1986 and 1997. However, by pumping groundwater from RW-4B2, the average TCE concentration decreased by 55% from 2002 to 1997.

TECHNICAL ASSESSMENT:

Is the remedy functioning as intended by the decision document? Fairchild implemented a number of remedial measures to clean up the shallow aquifer zone. The remedy is functioning as intended. The soil remedial measures included excavation and SVE and achieved soil cleanup goals by remediating chemicals in the vadose zone. The installation of three slurry walls isolated source areas, and, combined with pumping and treatment, has resulted in a significant decrease in concentrations in the groundwater.

Although the three Fairchild treatment systems were modified to result in virtually zero air emissions, the groundwater pump-and-treat remedy has functioned well as intended. 1,4-dioxane concentrations above Regional Water Quality Control Board (RWQCB) cleanup goals were identified in the effluent to System 3. However, the observed effluent concentrations are well below applicable toxicity criteria, and the available remedial technologies for 1,4-dioxane are technically impracticable. Therefore, no further action is necessary to address the issue.

Inward gradients have been observed across the slurry wall except for the northern portions of the walls at 369 N.

Whisman Road, and 313 Fairchild Drive. Despite the outward gradient, the chemicals are contained through the physical isolation provided by the slurry wall and the operation of several recovery wells within the slurry wall enclosure. Furthermore, recovery wells immediately downgradient of the 369 N. Whisman Road slurry wall (RW-2A and RW-24A) and the 313 Fairchild slurry wall (RW-9A and REG-2A) provide adequate capture of the area immediately downgradient of the slurry wall.

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid? There have been no changes in ARARs and no new standards affecting the protectiveness of the remedy.

Except for a potential change in the inhalation toxicity factor for TCE, there have been no changes in the toxicity factors for the contaminants of concern. One complicating factor for TCE is that EPA's most current cancer risk assessment for inhalation remains in draft form and does not include an inhalation-specific cancer slope factor. On 3 October 2002, EPA Region IX requested a work plan "to conduct a human health risk assessment to evaluate the groundwater-to-indoor air exposure pathway by collecting indoor air, outdoor air, and soil gas samples at each Facility." In response, Fairchild collected more than 400 air samples at its former facilities in the spring and fall 2003. The results showed acceptable levels of concentrations in accordance with state and federal comparison criteria with the exception of two buildings (at 401 and 644 National Avenue) where certain indoor air samples showed TCE concentrations above EPA Region IX's draft provisional long-term goals. Mitigation measures implemented by Fairchild substantially reduced concentrations in the two buildings to within all criteria, except for the basement of 644 National Avenue. Fairchild is recommending enhancement of ventilation at the two buildings.

Has any other information come to light that could call into question the protectiveness of the remedy? No ecological targets were identified during the endangerment assessment (EA) and none were identified during the five-year review, and therefore monitoring of ecological targets is not necessary. No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

ISSUES AND RECOMMENDATIONS

Issue: An outward gradient has been observed along the northern portion of the slurry wall at 369 North Whisman Road and 313 Fairchild Drive

Recommendation: The observed outward gradients do not have a significant impact on remedial goals. Continue to monitor water quality downgradient of slurry wall.

Issue: 1,4-dioxane was detected in System 3 effluent at levels higher than RWQCB goals.

Recommendation: The observed effluent concentrations are well below applicable toxicity criteria, and the available remedial technologies for 1,4-dioxane are technically impracticable. Therefore, no further action is necessary.

Issue: Indoor air samples in two buildings showed concentrations of TCE higher than EPA Region IX's draft provisional goals.

Recommendation: Enhance ventilation in the buildings.

PROTECTIVENESS STATEMENT

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup standards. In the interim, exposure pathways that could result in unacceptable risks are being controlled, and exposure to, or the ingestion of, groundwater is prevented. Exposure to impacted soils has been addressed by soil excavation and treatment and by installing and operating SVE systems that achieved cleanup goals.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater samples to fully evaluate the progress of remediation. Current data indicate that the concentrations have decreased significantly, and that the remedy is functioning as required.

NEXT REVIEW

The next five-year review for the Fairchild former facilities is required by August 2009, five years from the date of this review.

FIVE-YEAR PERFORMANCE REVIEW
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE
MOUNTAIN VIEW, CALIFORNIA

1. INTRODUCTION

This document presents a five-year performance review of the Fairchild Semiconductor Corporations (Fairchild) groundwater remediation program at its former facilities at the Middlefield-Ellis-Whisman Site (MEW Site) in Mountain View, California. The location of these facilities is shown on Figure 1-1. The purpose of the five-year review is to determine whether the remedy at the Fairchild former facilities is protective of human health and the environment. The methods, findings, and conclusions of the review are documented in this report. In addition, this five-year review identifies issues found during the review, if any, and recommendations to address them.

Fairchild prepared this five-year review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 provides:

> *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 5 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 judgement of the President that action is appropriate at such site in accordance with section [9604] or [9606] of this title, 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.*

This requirement is interpreted further in the NCP, 40 CFR §300.430(f)(4)(ii) as follows:

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

This is the first five-year review for the Fairchild former facilities. The triggering action for this statutory review is the initiation of the regional groundwater remediation program (RGRP) in

1998. The five-year review is required due because chemicals remain in the groundwater at the site above levels that allow for unlimited use and unrestricted exposure.

Locus Technologies (Locus) prepared this five-year evaluation report on behalf of Fairchild in accordance with the U. S. Environmental Protection Agency's (EPA's) June 2001 Comprehensive Five-Year Review Guidance (EPA, 2001). Fairchild was notified of the initiation of the five-year review on 10 October 2003 in an email from the EPA remedial project manager, Ms. Alana Lee, entitled "EPA Information Request and Notification for MEW Five-Year Review". As part of the five-year review, EPA requested site-specific information as the foundation of the technical assessment of the remedy. Table 1-1 is a reference list showing where EPA's requested items can be found in this document or the accompanying CD ROM disk.

Fairchild is one of several companies (MEW Companies) named by EPA in the 106 Order (EPA Docket no. 91-4). Other MEW Companies - SMI Holding LLC; Sumitomo Mitsubishi Silicon Corporation (formerly Siltec Corporation); and Vishay General Semiconductor, Inc. (formerly General Instrument Corporation) - were also named Respondents in the 106 Order. Intel Corporation (Intel) and Raytheon Company (Raytheon) entered into a Consent Decree with EPA for additional work at the MEW Site (U.S. District Court Case No. C9120275JW). North of U. S. Highway 101, the Department of the Navy, and National Aeronautics and Space Administration are undergoing their own cleanup activities.

2. CHRONOLOGY OF EVENTS

The following two tables list the chronology of major events regarding remedial activities at the Fairchild former facilities.

Date	Event
December 1982	Groundwater investigations initiated at MEW.
February 1982	Fairchild initiates groundwater remediation by installing pumping wells.
Spring 1984	Fairchild, Intel, Raytheon, NEC, and Siltec conduct a joint groundwater investigation program.
April 1985	RWQCB referred the Companies' investigative programs to EPA.
June 1985 - February 1986	Fairchild installed several pumping wells and three air stripping groundwater treatment systems to control chemical concentrations along Whisman Road and Fairchild Drive.
August 1985	Fairchild, Intel, and Raytheon entered into an Administrative Order on Consent to jointly perform a Remedial Investigation/Feasibility Study (RI/FS) program for EPA.
October 1986	Fairchild installed underground slurry walls around three of its former properties to physically contain on-site chemical residues in the "A" aquifer.
July 1987	The Remedial Investigation report was submitted to EPA. More than 400 monitoring wells were installed and sampled to investigate chemical concentrations in 8 aquifer zones to 550 feet below the ground surface. The RI Report was revised in 1988.
December 1988	A bioremediation System was installed at Bldg. 9 to treat acetone.
November 1988	The Feasibility Study report was submitted to EPA. Pump-and-treat was proposed as the remedial technique for the regional groundwater. Soil vapor extraction and/or soil excavation was proposed as the remedial technique for shallow soils.

Date	Event
June 1989	EPA issued the ROD. The ROD specified TCE as the indicator chemical and included cleanup levels for TCE and 10 other chemicals. Using the conclusions of the Feasibility Study, the ROD identifies pump and treat with air stripping and/or carbon adsorption as an appropriate remedial technology for groundwater. The ROD identifies soil excavation/aeration and/or soil vapor extraction as an appropriate remedial technology for vadose soils.
September 1990	EPA issued an Explanation of Significant Differences to the ROD.
November 1990	EPA issued a Section 106 Order to Fairchild, NEC, Siltec/General Instrument (now Sumco/Vishay), Sobrato (SMI Holdings), Union Carbide, National Semiconductor Corporation, and Spectrace. Facility-Specific Work requires remediation of soils and groundwater. Joint Work includes sealing potential conduit wells, plume definition, groundwater chemistry, and water reuse programs.
April 1991	EPA lodged the MEW Consent Decree (CD), which required Intel and Raytheon to design and construct the regional groundwater remediation program, and to perform Facility-Specific remedial work.
December 1991	Soil vapor extraction pilot study was started with a real field application on 369 N. Whisman Road to evaluate the feasibility of the technology.
November 1991 – April 1995	Preliminary and final design documents and drawings for source control measures (design of pump-and-treat, soil excavation, soil vapor extraction, air sparging) were developed by MEW Companies and submitted to EPA. See reference list for Fairchild's final design documents.
March 1992 – July 1994	The Potential Conduit Program was implemented, which included investigation and sealing of up to 16 old agricultural wells.
December 1992	The Plume Definition Program was completed. The program included sampling of more than 200 monitoring wells to define the vertical and horizontal extent of the plume.
November 1994	Fairchild excavated and treated 6,000 yd^3 of soils at 369 N. Whisman Road.

Date	Event
June 1995	Fairchild excavated and treated 3,000 yd^3 of soils at 401 National Avenue.
June 1995-March 1997	Fairchild installed, operated, and completed an SVE system at 369 N. Whisman Road to remediation shallow soils.
June 1996 - March 1997	Fairchild operated an SVE system for shallow soils at 401 National Avenue.
August 1996	Fairchild excavated and treated 15,000 yd^3 of soils at 515/545 N. Whisman Road.
Winter 1997-Fall 1998	MEW Companies, including Fairchild, installed and/or expanded groundwater extraction systems as source control measures.
1997-2000	Redevelopment of several Fairchild former facilities, including construction of new AOL/Netscape, Nokia, and Veritas buildings.
December 2002	Work plan for air sampling at the MEW Site was submitted to EPA.
April 2003	Revised work plan for air sampling at the MEW Site was submitted to EPA.
May and October 2003	MEW Companies implemented the air-sampling program. Fairchild collected 205 samples from 13 former Fairchild facilities.
May – August 2003	Fairchild modified treatment systems 1, 3, and 19 to replace air strippers with aqueous carbon adsorption.

3. BACKGROUND

This chapter provides background information on the former Fairchild facilities at the MEW Site including descriptions of the physical characteristics of the former facilities, land and resource use, the history of the environmental issues and remedial actions taken by Fairchild, and the basis for taking these actions.

3.1. Physical Characteristics

Fairchild formerly occupied the properties at 369, 441, 515, and 545 N. Whisman Road, 313 and 323 Fairchild Drive, 401 and 644 National Avenue, and 464 Ellis Street. These facilities are located in Mountain View, California (Figure 1-2). Mountain View is a town of approximately 70,000 residents, located in Santa Clara County. The former Fairchild facilities are part of the Middlefield-Ellis-Whisman Site, where a number of companies were involved in activities requiring storage, handling, and use of chemicals. These companies are referred to as MEW Companies in this document.

3.2. Land and Resource Use

Agricultural development in this area began in the mid 1800s. Until about 1960, orchards, low crops, and greenhouse gardening dominated the area. North of U.S. Highway 101, Moffett Federal Airfield (Moffett Field) was commissioned in 1933. The National Aeronautics and Space Administration (NASA) Ames Research Center, also north of the highway, was originally opened in 1940 adjacent to Moffett Field as a laboratory of the National Advisory Committee on Aeronautics.

Fairchild Semiconductor Corporation (Fairchild) occupied its former facilities at the MEW Site beginning in the early 1960s. Fairchild operations have included semiconductor manufacturing and use of a variety of chemicals, including solvents.

At 515/545 N. Whisman Road and 313 Fairchild Drive, Fairchild occupied four buildings (Bldgs 1 through 4). Building 1 was constructed in 1961 and occupied by Fairchild in 1962. Building 2 was constructed in 1959 and occupied by Fairchild in 1962. Fairchild constructed Buildings 3 and 4 in 1962 and occupied them in 1963. Although manufacturing operations were conducted in Buildings 1 through 3, Building 4 contained only offices and was not used for chemical operations by Fairchild. In the late 1990s, the 313 property was sold to Keenan Lovewell Ventures and redeveloped into two buildings on two parcels (313 and 323 Fairchild Drive). These two buildings were constructed in 1999 and are currently leased by Nokia. The 515/545 N. Whisman Road properties were sold to Jay Paul Company in the late 1990s, and two buildings were constructed there in 2000. One building is now leased by Nokia and the other by Veritas Software Corporation (Veritas).

The building at 401 National Avenue (former Building 9) was constructed in 1969. Fairchild used the building as a chemical receipt, mixing and delivery facility, a de-ionized water processing plant, and as a waste storage collection area. The building is currently occupied by ADEMA Technologies, Inc.

Former Fairchild Building 18, located at 644 National Avenue, was constructed in 1967 and occupied by Fairchild. Summit Corporation bought the building in 1986. It was later sold to Test Equipment Corporation, the current owner.

Former Fairchild Buildings 19, 13 and 23 occupied 369 and 441 Whisman Road. Building 19 was constructed in 1961 and was occupied by Fairchild at that time. Buildings 13 and 23 were also constructed about the same time. Fairchild purchased Building 13 in 1969. These properties were subsequently sold in the mid 1990s to Keenan Lovewell Ventures. The buildings were demolished and the properties were then divided into four parcels (369/379/389/399 N. Whisman Road) and redeveloped into four buildings (constructed in 1998) that are now leased by AOL/Netscape.

464 Ellis Street was the location of former Fairchild Building 20, which contained offices and laboratory facilities. Building 20 was constructed in 1969. Fairchild began operations there at that time. The building and the adjacent parking structure were demolished, and the property was sold in the mid 1990s to Keenan Lovewell Ventures. The property was then divided into three parcels (464/466/468 Ellis Street), three buildings were constructed on the properties in 1998, and AOL/Netscape now leases the buildings.

Previous Facility Address	**Current Address**
369/441 North Whisman Road	369/379/389/399 N. Whisman Road
515/545 N. Whisman Road	515/545 N. Whisman Road
313 Fairchild Drive	313/323 Fairchild Drive
464 Ellis Street	464/466/468 Ellis Street
401 National Avenue	401 National Avenue
644 National Avenue	644 National Avenue

Groundwater aquifers within the MEW Site consist of shallow and deep aquifer systems, which are separated by a laterally extensive aquitard approximately 40 feet thick. The shallow aquifer system is generally less than 160 feet below ground surface (bgs) south of U.S. Highway 101 and generally less than 100 feet bgs north of U.S. Highway 101. Subdivisions within the shallow aquifer have been designated the "A", "B1", "B2" and "B3" aquifers. The regional aquitard is designated the

"B/C" aquitard. The zones below the "B/C" aquitard are termed the "C" aquifer and the Deep aquifers.

The direction of groundwater flow at the MEW site is generally to the north. However, the construction of slurry walls has altered the direction locally at the Fairchild former facilities. Several pumping tests have been performed to estimate aquifer parameters such as the transmissivity and hydraulic conductivity. A summary of the results is provided in Table 3-1.

The groundwater at the MEW Site is not used for drinking water.

3.3. History of Environmental Investigation and Remediation

The area around the former Fairchild facilities, including Moffett and the NASA Ames Research Center north of Highway 101, include locations of several current and former semiconductor and other manufacturing and industrial facilities. Operations in this area have included semiconductor and electronics manufacturing, metal finishing, and other activities that used chemicals. While in operation, these facilities required the storage, handling, and use of a variety of chemicals, particularly solvents and others in manufacturing processes. Some of the chemicals leaked or were otherwise released to the ground. The released chemicals impacted the soil and the groundwater.

In 1982, Fairchild initiated the subsurface investigations, which detected volatile organic compounds (VOCs) in the groundwater and subsurface soil. Around the same time, other companies at nearby sites also conducted separate investigations, which confirmed the presence of similar VOCs in soil and groundwater. Since then, Fairchild has installed numerous monitoring wells to complete the investigation (Table 3-2). Other monitoring wells have been installed that are being monitored by the individual MEW Companies, the RGRP, the Navy, and NASA (Figures 3-1 through 3-5). Table 3-3 lists monitoring wells that have been sealed by Fairchild since the remedial investigation started. These wells were sealed because 1) they are redundant, 2) they interfered with property development, or 3) they are not needed for future monitoring. All wells were sealed with EPA's approval and following Santa Clara Valley Water District (SCVWD) procedures. The location of these wells and of other wells sealed by other MEW Companies are shown on Figures 3-6 to 3-10. The Remedial Investigation report for the MEW site includes detailed descriptions of the early investigations that Fairchild performed in the 1980s (HLA, 1988).

3.4. Initial Remedial Actions

After the discovery of chemicals in soil and groundwater, Fairchild implemented a number of on-site source control and groundwater actions. These actions include 1) closure of all waste solvent holding sumps, 2) initiation of groundwater extraction and treatment as early as 1982, 3) sealing of four private wells on 464 Ellis Street, and 4) construction of three slurry walls at the 369 N. Whisman Road, 401 National Avenue, and 515/545 &313 Fairchild Drive Properties.

3.5. Basis for Taking Action

Chemicals of concern defined in the ROD and the CD are:

- trichloroethene (TCE)
- 1,2-dichloroethene (cis and trans isomers – cis-1,2-DCE and trans-1,2-DCE)
- 1,1,1-trichloroethane (TCA)
- 1,2-dichlorobenzene (1,2-DCB)
- chloroform
- vinyl chloride
- Freon 113
- 1,1-dichloroethane (1,1-DCA)
- tetrachloroethene (PCE)
- 1,1-dichloroethene (1,1-DCE)
- phenol

In addition, the ROD and CD list four metals as chemicals of concern: antimony, arsenic, cadmium, and lead.

An endangerment assessment (EA) (ICF-Clement, 1988) of the MEW site by EPA evaluated whether or not the MEW site poses a hazard to public health, welfare, or the environment. The report concluded that there is no imminent or substantial endangerment associated with contact with surface soils. The EA identified the only potentially significant exposure pathway as that to groundwater containing chemicals. However, there were and are no water supply wells at the site.

On 3 October 2002, the EPA requested additional air sampling data to evaluate the potential migration of VOCs from the groundwater to the indoor air of commercial buildings at the MEW Companies former facilities. The 1988 EA for the MEW Site did not provide a quantitative evaluation of this groundwater-to-indoor air exposure pathway. The toxicity factors for one of the chemicals of concern (TCE) have been reassessed since the EA and the facility-specific risk assessments were conducted (Smith, 1997c; Locus, 1997b; HLA, 1999). For EPA to evaluate the protectiveness of remedial actions at the MEW Site, EPA requested a work plan to conduct a human health risk assessment to evaluate the groundwater-to-indoor air exposure pathway by collecting air samples.

4. REMEDIAL ACTIONS

The ROD for the MEW Site was issued in May 1989. Remedial Action Objectives (RAOs) were developed as a result of data collected during the Remedial Investigation (HLA, 1988) to aid in the development and screening of remedial alternatives to be considered for the ROD. The Feasibility Study (Canonie, 1988) for the MEW site lists the RAOs to be:

1. Protection of potential potable water supply;
2. Remediation or control of relatively elevated concentrations of chemicals present in localized vadose zone soils below the ground surface that could migrate into the shallow groundwater system;
3. Remediation or control of groundwater, which contains elevated concentrations of chemicals, including control of discharge of such groundwater into surface water.

For the vadose soils, the ROD selects two remedial technologies: 1) in situ soil vapor extraction (SVE) with treatment by vapor-phase granular activated carbon (GAC), and/or 2) excavation with treatment by aeration. The cleanup levels for soils containing TCE were established in the ROD to be 1 milligram per kilogram (mg/kg) for soils contained within slurry walls and 0.5 mg/kg for soils outside slurry walls.

For groundwater, the ROD specifies hydraulic remediation by groundwater extraction and treatment by air stripping or liquid-phase GAC. Air borne emissions from air stripper would be required to meet Bay Area Air Quality Management District (BAAQMD) emission standards. The cleanup level for groundwater containing TCE at the site is 0.005 milligrams per liter (mg/L) is the shallow aquifers and 0.0008 mg/L in the deep aquifers.

EPA issued an Explanation of Significant Difference (ESD) for the MEW site in September 1990. The purpose of the ESD was to clarify that the numerical standards characterized as "goals" in the ROD are final cleanup "standards".

4.1. Remedy Implementation

Fairchild has installed a total of 35 recovery wells and operates three groundwater treatment systems at the MEW site (System 1, System 3 and System 19). The location of the treatment systems, recovery wells, and associated piping is shown on Figures 4-1, 4-2, and 4-3. The treatment systems used air strippers for remediation of the extracted groundwater until April 2003, after which Fairchild voluntarily replaced the air strippers with carbon adsorption system to achieve nearly zero air emissions. Fairchild received EPA approval to replace the air strippers with aqueous carbon systems in April 2003. The three treatment systems were subsequently shut down on 22 April and were removed in May 2003. The modified groundwater treatment systems, which use granular activated carbon, were restarted in August 2003.

The air strippers had operated under BAAQMD permits. At each treatment system, extracted groundwater is now treated by three 5,000-pound GAC units, which are piped in series. Prior to treatment by GAC, sediment is removed from the groundwater by a bag filter. Two filters are used in parallel, allowing one filter to operate as primary sediment removal and the other as secondary filtration. Each treatment system pad is also equipped with a sump pump that is used to pump water that may collect on the pad. The treated groundwater continues to be discharged to the local storm drain under a National Pollutant Discharge Elimination System (NPDES) permit.

4.1.1. Pilot and Treatability Tests

Acetone Pilot Study (1989): A pilot acetone pilot study was conducted at the former Fairchild 401 National Avenue property from January 1989 to July 1989. The acetone pilot study consisted of a full-scale biological reactor using cultured bacteria to consume acetone in the groundwater. The system consisted of two 1,800-pound activated carbon units, which operated in series to remove VOCs followed by long term aeration of the groundwater with bacteria that was cultured to consume the acetone. The system operated at a flow rate of 20 gallons per minute (gpm) for six months and was able to remove acetone concentrations of up to 20 ppm from the groundwater prior to discharge to the City of Mountain View sanitary sewer system. The study was concluded after acetone levels in the groundwater diminished.

Soil Vapor Extraction Pilot Study (1991 & 1992): A pilot in-situ soil vapor extraction (SVE) system was constructed and operated on the south and east sides of the building at 369 N. Whisman Road from December 1991 to June 1992. The purpose of the pilot study was to evaluate the effectiveness of the SVE in removing VOCs from unsaturated soil and to determine design and operating parameters for a full-scale system.

The pilot study showed a vacuum response up to 8.8 inches of water column at a distance of 38 feet from the air extraction well (Canonie, 1993b). Based on the successful pilot study, two SVE systems were installed at two Fairchild former facilities (401 National Avenue and 369/441 N. Whisman Road) to remove VOCs from the unsaturated soils.

Selenium Treatment Evaluation (1997 & 1998): In 1997 and 1998, a field research study was conducted to find a suitable selenium removal technology to reduce selenium effluent concentrations found at the Fairchild groundwater treatment systems (Locus, 1998). Before 1999, the NPDES discharge permit for the systems specified a 10 μg/L limit for selenium.

A product called "Metal-X" manufactured by Solmetex Inc. was selected for this field study. This product is designed to adsorb selective multivalent anions and form a plate like crystal structure irreversibly. In the test, groundwater with selenium concentration of 40μg/L was treated with "Metal-X" over a two-week period. The results of the experiment showed that a removal rate of 37% was achieved initially, but that dropped to 7% within 32 hours. This test showed that using the "Metal-X" product would be technically impracticable.

The field research study also determined that the selenium concentrations were naturally occurring in the shallow aquifers, and toxicity tests revealed that the naturally occurring selenium in the groundwater does not pose any environmental impact. Based on this evaluation, the Regional Water Quality Control Board (RWQCB) amended the general NPDES permit limit for selenium to a mass discharge limit from an effluent concentration limit. Since this permit modification, the Fairchild treatment systems have met the permit limit for selenium.

4.1.2. 515/545 Whisman Road and 313 Fairchild Drive

This area is located southeast of the intersection of Whisman Road and Fairchild Drive. A slurry wall was installed in 1986 along the boundaries of these properties to limit migration of chemicals. This slurry wall is approximately 40 feet deep and is keyed into the "A/B" aquitard.

Soils requiring remediation [greater than 0.5 and 1 milligram per kilogram TCE outside and inside slurry wall enclosures, respectively] above six feet were excavated and aerated. On 15 September 1995, EPA approved a work plan for additional subsurface investigations in the area. The objective of the investigation was to provide data to evaluate the use of soil excavation instead of SVE at locations where previously unsaturated soils had become saturated because of the rising water table. The investigation, area-redevelopment constraints, and cost analysis revealed that soil excavation and aeration was more feasible than SVE. Subsequently, and after EPA's approval of the excavation plans, vadose zone soils below 6 feet were also excavated and aerated. More than 15,000 yd^3 were excavated and aerated at these properties. Soil cleanup standards established in the ROD have been achieved at these properties (Locus, 1997c).

Groundwater extraction was initiated in the mid-1980s to control and remediate and sources in the groundwater. The system was expanded and currently includes 12 source control recovery wells (SCRWs) both inside and outside the slurry wall. Recovery wells RW-3A, RW-5A, RW-7A, RW-16A, RW-18A, RW-27A, and RW-28A (which replaced RW-17A) are operating as SCRWs within the slurry wall enclosure. Recovery wells RW-4A, RW-4B1, RW-7B1, RW-12B1, and RW-4B2 operate as SCRWs outside the slurry wall enclosure. The RGRP operates three wells, RW-9A, RW-9B1, and RW-9B2, also outside the slurry wall enclosure

Extracted groundwater from wells RW-5A, RW-7A, RW-18A, RW-27A, RW-5B1, RW-7B1, RW-12B1, RW-5B2, and RW-7B2 is conveyed to the System 3, located at 313 Fairchild Drive, for treatment (Figure 4-2). Groundwater from wells RW-4A, RW-4B1, RW-4B2, RW-4A, RW-16A, and RW-17A is treated through System 1, located at the 515/545 N. Whisman Road property (Figure 4-1). Groundwater from both treatment systems is discharged to the storm drain under a

NPDES permit, and eventually discharges to Stevens Creek to the west, and then to San Francisco Bay.

4.1.3. 401 National Avenue

A slurry wall was installed in 1986 along the boundaries of this property and is keyed into the "A/B" aquitard at a depth of approximately 40 feet.

In the vadose zone, a total of 3,000 yd^3 of soils requiring remediation in the top six feet were excavated and aerated in 1995. The deeper soil (from six feet below ground surface to 18 inches above the groundwater table) was remediated using a SVE system. This system consisted of 29 air extraction/inlet wells and five air-inlet wells. The extracted air was treated using a vapor phase carbon adsorption system to remove the chemicals. The system was operated from February 1996 to June 1997. Soil samples collected after the system was shutdown confirmed that the soils had reached the cleanup standards defined as 0.5 and 1 mg/kg, TCE inside and outside the slurry walls, respectively (Locus, 1997a; Smith, 1997b&d).

Groundwater extraction was initiated at this property as early as 1982 with extraction from well 65A. Since then, the groundwater system has been expanded to include four SCRWs within the slurry wall enclosure (AE/RW-9-1, AE/RW-9-2, RW-20A, and RW-21A). Extracted groundwater from the wells is treated at System 1 (Figure 4-1). Three other SCRWs have also been installed north of this facility (GSF-1A, GSF-1B1, and GSF-1B2, see Figures 3-1, 3-2, and 3-3), which are the joint responsibility of Vishay General Semiconductor, Sumitomo Mitsubishi Silicon America and Fairchild.

4.1.4. 369 and 441 North Whisman Road

In 1986 Fairchild installed a slurry wall along the boundaries of the 369 N. Whisman Road property. The wall is approximately 40 feet deep and is keyed into the "A/B" aquitard.

In November 1994, the upper six feet of soil requiring remediation were excavated and stockpiled. The excavated soil was then treated by aeration. In April 1995, the soil was backfilled after sufficient testing showed that the chemical concentrations were below site cleanup standards.

For vadose soils requiring remediation more than six feet bgs, an SVE system was installed and operated. The extracted air was treated using a resin adsorption system and a vapor-phase granular activated carbon adsorption system. This system was in operation from April 1996 until February 1997, when soil chemical concentrations were observed to be below site cleanup levels (Smith, 1996 & 1997a).

Groundwater extraction was started in 1982 at this property, and has been expanded to include seven "A" aquifer SCRWs within the slurry wall enclosure (71A, RW-1A, RW-11A, RW-12A, RW-15A, RW-23A, and RW-26A); two "A" aquifer SCRWs downgradient of the slurry wall (RW-2A and RW-24A); three SCRWs in the "B1" aquifer (RW-2B1, RW-10B1 and RW-11B1); and two SCRWs in the "B2" aquifer (RW-1B2 and RW-2B2). Groundwater extracted from these wells is conveyed to System 19, located at 369 N. Whisman Road, for treatment (Figure 4-3).

4.1.5. 644 National Avenue

Shallow soils exceeding cleanup standards were found in one isolated spot northwest of this building. These soils were excavated to a depth of 13 feet and aerated. One SCRW (RW-25A) is being operated in the "A" aquifer northwest of the building. Groundwater from this recovery well is treated at System 1 (Figure 4-1).

4.1.6. 464 Ellis Street

No potential sources were found at this property. Cleanup activities included a soil vapor extraction system that was implemented by Raytheon along the southern portion of the property, and downgradient of the Raytheon slurry wall. Raytheon also installed and currently operate two SCRWs, RAY-1A and RAY-1B1, in the "A" and "B1" aquifers, respectively. Groundwater from these two wells is conveyed to the Raytheon system for treatment.

The RGRP has installed one "B1" recovery well (REG-4B1), one "B3" recovery well (65B3), and four "C" and deep aquifer recovery wells (DW3 wells). Groundwater extracted from these wells is conveyed to Fairchild treatment System 19.

4.1.7. Air

On 3 October 2002, the EPA requested a work plan "to conduct a human health risk assessment to evaluate the groundwater-to-indoor air exposure pathway by collecting indoor air, outdoor air, and soil gas samples at each Facility." In response, the MEW Companies, including Fairchild, submitted a unified work plan on 2 December 2002 (Locus, 2002), and a revision on 16 April 2003 (Locus, 2003a) responding to EPA's 17 February 2003 comments. The results of the spring sampling event were submitted to EPA on 15 August 2003 (Locus, 2003b). The results of the fall sampling event will be submitted to EPA in January 2004.

4.1.7.1 *Types of Samples*

Indoor air concentrations can be attributed to facility or occupational sources (e.g., sources attributed to building construction, operations, and occupation), indoor accumulation, potential volatilization from the groundwater into the building, and contributions from outdoor air. Accordingly, the following types of air samples were collected:

Indoor Samples, collected in areas typically occupied by workers, at breathing zone height. The results were used to estimate potential worker exposure to VOCs.

Pathway Samples, collected in areas where potential direct conduits were observed that might provide a direct route for VOC vapor migration into the building. Examples of these potential conduits are utilities, cracks in the floor, or open sumps. Results of samples in these areas represent localized preferential pathways, and are not representative of exposure point concentrations to occupants. The data collected from these samples are used to evaluate if localized mitigation is necessary.

Outdoor Samples, collected outside buildings (e.g., at HVAC unit inlets). The results from these samples can be compared to those from indoor samples to evaluate the potential contribution of VOCs from outside air to indoor air.

Background Outdoors Samples, collected outdoors at a distance of 0.25 to 1.5 miles away from the MEW Site to assess background levels of VOCs.

Quality Assurance Samples, including field duplicates, field blanks, and laboratory control samples, collected to maintain an acceptable level of quality assurance.

4.1.7.2 *Sampling Procedures*

Fairchild collected more than 400 indoor, outdoor, and pathway samples from 13 buildings located at the Fairchild former facilities at the MEW Site. Locations were finalized on the pre-sampling walk-through with EPA. Sampling was conducted in spring and fall 2003. Two discreet sampling rounds were collected in each season at each of the selected locations, separated by a one-week period. The air samples were analyzed by an accredited lab using EPA Method TO-15 selective ion mode (SIM) for TCE, cis-1,2-DCE, VC, trans-1,2-DCE, chloroform, 1,1-DCE, 1,1-DCA, PCE, Freon 113, 1,1,1-TCA and 1,2-DCB. Before sampling started, the laboratory cleaned and certified each canister, with its corresponding flow controller and filter, to SIM-level reporting limits for the chemicals listed above. Air samples were collected over a ten-hour period.

4.1.7.3 *Evaluation Methodology*

The potential public health impacts associated with measured levels of site-related chemicals in air were evaluated through comparison with three tiers of data and/or criteria:

Tier 1: Site concentrations were compared with local or regional ambient background levels. Background concentration of PCE, chloroform, Freon 113, and 1,1,1-TCA are similar to those measured in indoor air, suggesting that vapor migration of these chemicals from groundwater at these buildings is not significant. For TCE concentrations, the indoor air samples concentrations for some buildings were higher than the background samples.

Tier 2: Concentrations were compared with Tier 2 acceptable air concentrations proposed for interim risk management. These values are based on effects other than cancer and are available for both short- and long-term exposure durations. The proposed Tier 2 values include available occupational limits; federal minimal risk levels (MRLs); OEHHA REL levels, and risk-based concentrations (RBCs) for occupational settings derived using federal EPA reference concentrations (RfCs) and these values were applied in that hierarchy. The results showed that indoor air concentrations pose insignificant short- and long-term non-cancer risks.

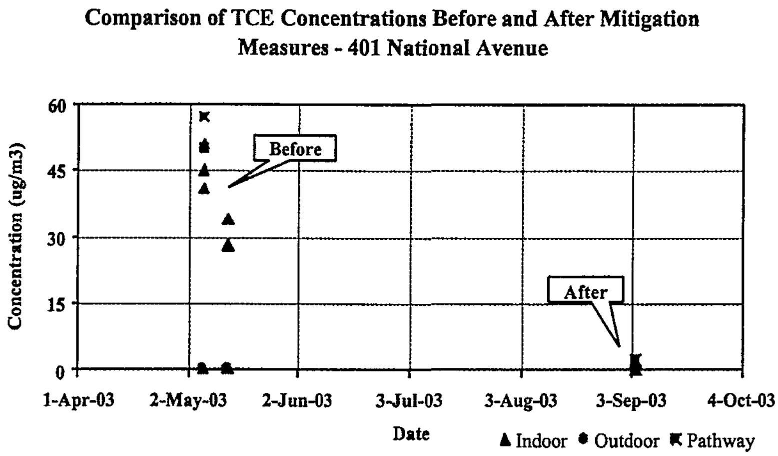
Tier 3: Carcinogenic chemicals were evaluated using risk-specific air concentrations for occupational settings based on theoretical cancer risks to assess potential alternative mitigation measures. One complicating factor for TCE is that EPA's most current cancer risk assessment remains in draft form and does not recommend an inhalation-specific cancer slope factor. The EPA's Science Advisory Board review of the draft TCE reassessment has identified several shortcomings to be addressed, including a number of uncertainties regarding the weight of evidence in data used to derive the proposed slope factors. In addition, the California Department of Toxic Substances Control (DTSC) and the RWQCB for the San Francisco Bay Region provided directives in February and March 2003 indicating that the current inhalation carcinogenic slope factor of 0.007 $(mg/kg\text{-}day)^{-1}$ will be retained for use in deriving risk based concentrations for use in assessments conducted in their jurisdictions.

Given the controversy, a panel of toxicologists retained by the MEW Companies used the most technically supportable available data sets to derive Tier 3, long-term exposure criteria for TCE. These are referred to as the "MEW criteria". In addition, the concentrations were compared to the DTSC/RWQCB criteria, as well as to EPA's current and the draft provisional criteria.

4.1.7.4 Sampling Results

The results showed acceptable levels of concentrations in accordance with state and federal comparison criteria with the exception of two buildings (at 401 and 644 National Avenue) where certain indoor air samples showed TCE concentrations above EPA Region IX's draft provisional long-term goals, which remain under evaluation by EPA and other agencies and are subject to change.

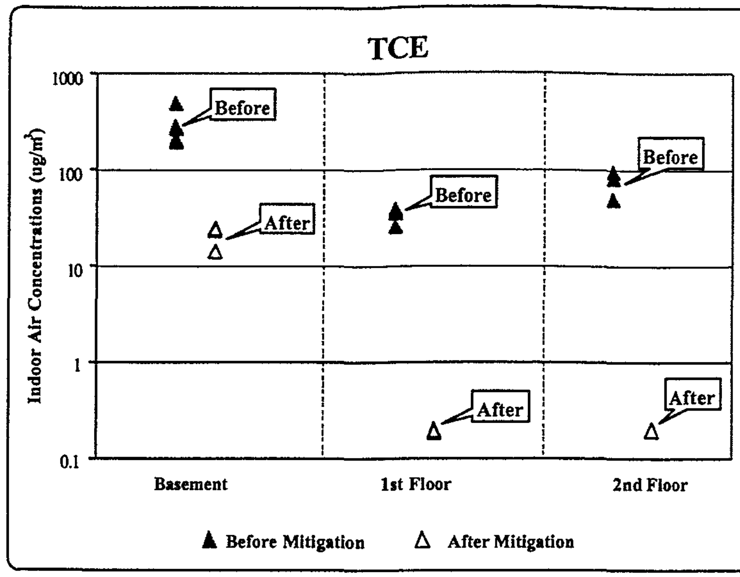
401 National Avenue: Fairchild sealed cracks and penetrations in the utility room in August 2003. Following the sealing work, Fairchild conducted a test by starting the ventilation system in office portion of the building the morning of 2 September 2003. Because the ventilation system had not been operated at the building for a while, it created unacceptable dust and heat and was operated for only 1.5 hours. Regardless, confirmation samples were collected on 04-Sep-03. The confirmation samples showed that the mitigation measures were effective in reducing concentrations to within EPA Region IX's provisional goals. For example, the highest pre-mitigation concentration of TCE was measured in the utility room (74 μg/m^3). The highest concentration after mitigation was 32 times lower - 2.3 μg/m^3, which is now within even EPA's draft provisional range. Consequently, Fairchild is recommending that steps be considered to improve the existing ventilation in the building.



644 National Avenue: In August 2003, Fairchild sealed the elevator shaft and openings in the basement floor. In addition, Fairchild sealed several openings in the floor between the basement and the first floor and installed two exhaust fans, each with a capacity of 6,000 cubic feet per minute.

Following the sealing work, Fairchild conducted a test by starting the fans in the basement and the ventilation system connected to the 2nd floor, and then collecting confirmation air samples on 13 November 2003 after the openings had been sealed, after the basement had been ventilated for one week, and after the ventilation system in the top floor had been operated for three days. The mitigation measures substantially reduced concentrations in the building. The concentrations in the 1st and 2nd floor were reduced to non-detect levels. TCE concentrations in the basement were reduced by about 20 times, and are within all acceptable criteria except only EPA Region IX's draft provisional values for the long term. The basement in the building has not been occupied for several years, and remains unoccupied.

Based on the results of the air samples, it is apparent that ventilation of the building will reduce concentrations to acceptable levels. To further reduce concentrations in the basement, it may be necessary to enhance the existing system.



4.2. System Operation/ Operation & Maintenance

Fairchild is conducting long-term monitoring and maintenance activities according to the operation and maintenance (O&M) plan (RMT, 2003). The primary activities associated with O&M are the following:

1. Quarterly groundwater elevation measurements of all accessible monitoring wells, and monthly groundwater elevation measurements of slurry wall well pairs - one on the inside and one on the outside of the wall - to monitor direction of groundwater gradient across the wall, and "A/B1" aquitard well pairs – one well in the "A" aquifer and another adjacent well in the "B1" well – to monitor the direction of the vertical gradient within the slurry wall area. Historical water level measurements and hydrographs are included in Appendix A.

2. Groundwater sampling of a network of monitoring wells. Historical water quality concentrations for chemicals of concern from 1986 to the present are included in Appendix B. Data prior to 1986 can be found in the RI Report (HLA, 1988).

3. Inspection of the conditions of groundwater monitoring and recovery wells. Locations of monitoring and recovery wells are shown on Figures 3-1 through 3-5.

4. Inspection and monitoring of the treatment system (a summary of the operations of the treatment system is found in Table 4-3).

Soil cleanup has been achieved by excavating shallow soils and by implementing two SVE programs. The SVE systems met the cleanup objective and were decommissioned in 1997. Therefore, there are no ongoing O&M activities for the soil cleanup actions. The only remaining component of the cleanup is groundwater extraction and treatment as chemicals still remain in the groundwater at the site. Therefore, as indicated above, the primary O&M activities are geared towards monitoring groundwater and inspection and maintenance of the treatment system. Several O&M plans have been submitted for the construction of remedies and for monitoring of the cleanup activities (Canonie, 1994c & 1995a,b; Smith, 1995a,b,c,d). These plans have been updated by a more recent O&M plan submitted after Fairchild modified the three treatment systems to replace the air stripping systems with carbon adsorption unites (RMT, 2003).

4.2.1. System 1 (515 & 545 N. Whisman Road)

System 1 treats extracted groundwater from 12 SCRWs and 1 regional recovery well (RRW), 38B2. The SCRWs include AE/RW-9-1, AE/RW-9-2, RW-3A, RW-3B1, RW-4A, RW-4B1, RW-4B2, RW-16A, RW-20A, RW-21A, RW-25A, and RW-28A. System 1 also treats water from two basement dewatering sumps at 644 National Avenue. Pumping rates are included in Table 4-7.

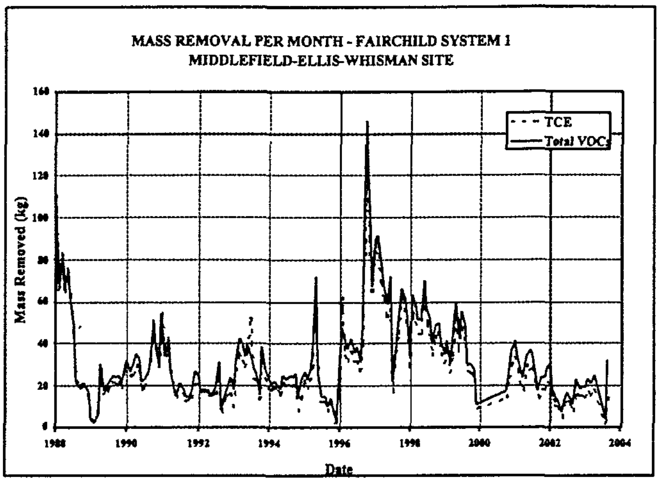
Effluent from System 1 is discharged to the storm drain in accordance with a NPDES permit issued by the RWQCB. The maximum flow rate for System 1 specified in the NPDES permit is 120 gpm, and the treated effluent water quality and sampling requirement must comply with the discharge limits specified in the Self-Monitoring Program established by RWQCB Order No. 99-051, Permit No. CAG912003.

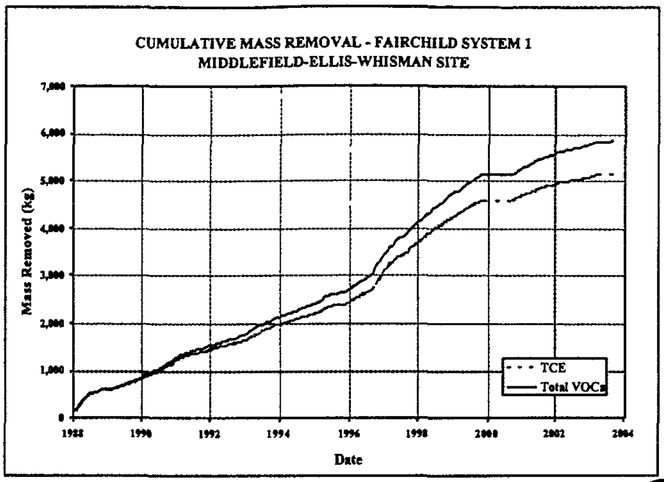
The treatment system has automated components that can be controlled both manually and remotely through computers with dial-up access. The control system consists of a main control panel (MCP), pump control panel (PCP), operator interface (site control computer), alarm dialer, and field instrumentation. This control equipment makes remote monitoring, programming, and data downloading possible through a modem connection.

The effluent of the first GAC vessel is collected and analyzed monthly using EPA Method 8260M to monitor VOC breakthrough. Once breakthrough has occurred, the carbon in the first vessel is replaced with fresh carbon and placed in the tertiary position. The spent and new carbon is slurried in and out from separate truck compartments. Once the carbon change has been completed, the new carbon is soaked for 24 hours in clean water. Municipal water is obtained from the fire hydrant located on Whisman Road and connected with a temporary meter from the City of Mountain View. Since the fresh carbon typically has a pH higher than the limit specified in the discharge permit, the carbon is pre-washed with a 36% sulfuric acid solution to lower the pH prior to restarting the treatment system. The acid solution is injected into the carbon in a closed-loop system and the effluent is monitored until the pH is lowered to an acceptable level. After the acid wash is completed, the system is restarted.

The sediment filter is changed when the differential pressure reaches 10 psi. During the filter change, the system is shut down. The filter's inlet and outlet valves are closed and the drain valve is opened. The filter lid is then opened and the filter cartridge is replaced. The filters are checked for leaks by closing the outlet valve slowly until the differential pressure reaches 14 psi or a leak develops. If a leak develops, the wing nuts on the lid are tightened until the leak stops. The system is then restarted. The spent filter is stored in a 55-gallon drum and profiled to determine the proper disposal method.

The sump pump is checked monthly and cycled and tested quarterly to maintain its proper function. Debris is removed monthly from the sump to prevent pump wear and blockage. The submersible pumps in the recovery wells require no regular maintenance.





System 1 has removed approximately 5,880 kg (12,930 lbs) of VOCs from the groundwater through September 2003, of which approximately 5,160 kg (11,345 lbs) is TCE. Because of diminishing concentrations in the groundwater, the monthly removal rate has been decreasing, and now averages approximately 19 kg/month (42 lbs/month). Table 4-4 provides month-to-month and cumulative calculations of the mass removal rates.

4.2.2. System 3 (313 Fairchild Drive)

System 3 treats extracted groundwater from 7 SCRWs and 3 RRWs. The SCRWs include RW-5A, RW-5B1, RW-7A, RW-7B1, RW-12B1, RW-18A, and RW-27A. The RRWs include RW-9A, RW-9B1, and RW-9B2. Pumping rates are included in Tables 4-8.

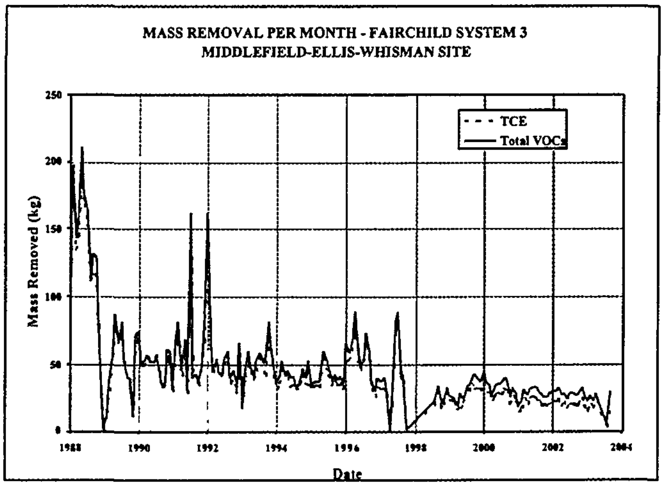
Effluent from System 3 is discharged to the storm drain in accordance with a NPDES permit issued by the RWQCB. The maximum flow rate for System 3 specified in discharge permit is 50 gpm, and the treated effluent water quality and sampling requirement must comply with the discharge limits specified in the Self-Monitoring Program established by RWQCB Order No. 99-051, Permit No. CAG912003.

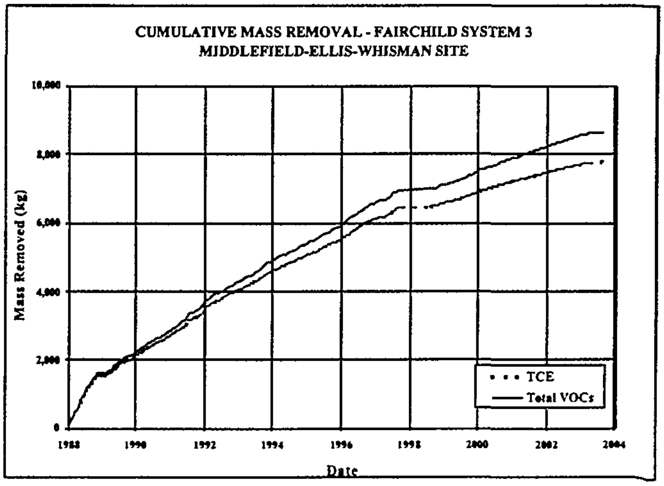
The treatment system has automated components that can be controlled both manually and remotely through computers with dial-up access. The control system consists of a main control panel (MCP), pump control panel (PCP), operator interface (site control computer), alarm dialer, and field instrumentation. This control equipment makes remote monitoring, programming, and data downloading possible through a modem connection.

The effluent of the first GAC vessel is collected and analyzed regularly using EPA Method 8260M to monitor VOC breakthrough. Once breakthrough has occurred, the carbon in the first vessel is replaced with fresh carbon and placed in the tertiary position. The spent and new carbon is slurried in and out from separate truck compartments. Once the carbon change has been completed, the new carbon is soaked for 24 hours in clean water. Municipal water is obtained from the fire hydrant located on Whisman Road and connected with a temporary meter from the City of Mountain View. Since the fresh carbon typically has a pH higher than the limit specified in the discharge permit, the carbon is prewashed with a 36% sulfuric acid solution to lower the pH prior to restarting the treatment system. The acid solution is injected into the carbon in a closed-loop system and the effluent is monitored until the pH is lowered to an acceptable level. After the acid wash is completed, the system is restarted.

The sediment filter is changed when the differential pressure reaches 15 psi. During the filter change, the system is shut down. The filter's inlet and outlet valves are closed and the drain valve is opened. The filter lid is then opened and the filter cartridge is replaced. The filters are checked for leaks by closing the outlet valve slowly until the differential pressure reaches 14 psi or a leak develops. If a leak develops, the wing nuts on the lid are tightened until the leak stops. The system is then restarted. The spent filter is stored in a 55-gallon drum and profiled to determine the proper disposal method.

The sump pump is checked monthly and cycled and tested quarterly to maintain its proper function. Debris is removed monthly from the sump to prevent pump wear and blockage. The submersible pumps in the recovery wells require no regular maintenance.





System 3 has removed approximately 8,660 kg (19,060 lbs) of VOCs from the groundwater through September 2003, of which 7,800 kg (17,160 lbs) is TCE. Because of diminishing concentrations, the monthly removal rate has been decreasing, and now averages approximately 27 kg/month (60 lbs/month). Table 4-5 provides month-to-month and cumulative calculations of the mass removal rates.

1,4-dioxane was detected at concentrations in the effluent to System 3 that exceeded NPDES criteria for further evaluation. Based on the median concentration observed in the effluent of System 3 from November 2002 through March 2003, the mass discharge of 1,4-dioxane from System 3 was approximately 1.7 grams per day. An analysis of treatment technologies to reduce the effluent concentrations of 1,4–dioxane was performed (Weiss, 2003). Because the observed effluent concentrations are well below applicable toxicity criteria, and because the available remedial technologies for 1,4-dioxane are technically impracticable, no further action to address the issue is warranted.

4.2.3. System 19 (369 N. Whisman Road)

System 19 treats extracted groundwater from 14 SCRWs and 5 RRWs. The SCRWs include 71A, RW-1A, RW-1B2, RW-2A, RW-2B1, RW-2B2, RW-10B1, RW-11A, RW-11B1, RW-12A, RW-23A, RW-24A, RW-26A, and RW-29A. The RRWs include 65B3, DW3-244, DW3-334, DW3-364, and REG-4B1. Pumping rates are included in Table 4-9.

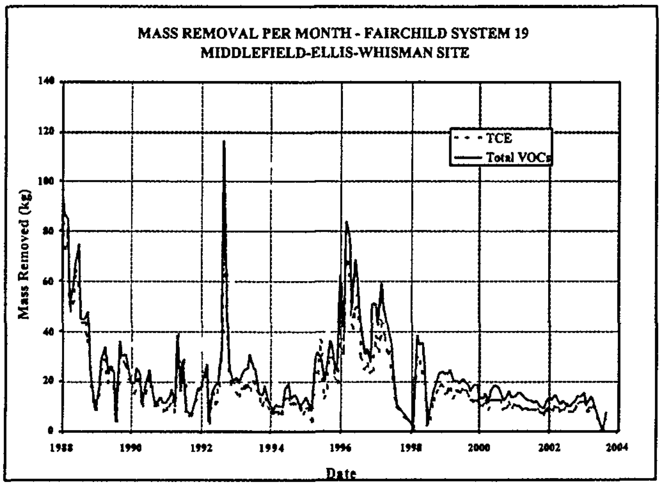
Effluent from System 19 is discharged to the storm drain in accordance with a NPDES permit issued by the RWQCB. The maximum flow rate for System 19 specified in the NPDES permit is 225 gpm, and the treated effluent water quality and sampling requirement must comply with the discharge limits specified in the Self-Monitoring Program established by RWQCB Order No. 99-051, Permit No. CAG912003.

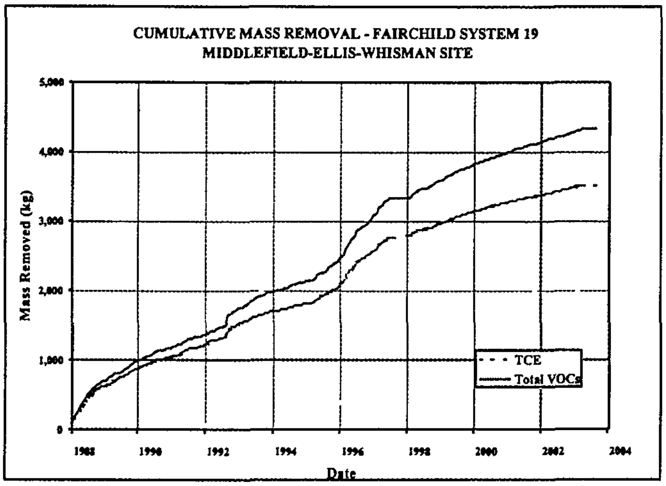
The treatment system has automated components that can be controlled both manually and remotely through computers with dial-up access. The control system consists of a main control panel (MCP), pump control panel (PCP), operator interface (site control computer), alarm dialer, and field instrumentation. This control equipment makes remote monitoring, programming, and data downloading possible through a modem connection.

The effluent of the first GAC vessel is collected and analyzed monthly using EPA Method 8260M to monitor VOC breakthrough. Once breakthrough has occurred, the carbon in the first vessel is replaced with fresh carbon and placed in the tertiary position. The spent and new carbon is slurried in and out from separate truck compartments. Once the carbon change has been completed, the new carbon is soaked for 24 hours in clean water. Municipal water is obtained from the fire hydrant located on Whisman Road and connected with a temporary meter from the City of Mountain View. Since the fresh carbon typically has a pH higher than the limit specified in the discharge permit, the carbon is pre-washed with a 36% sulfuric acid solution to lower the pH prior to restarting the treatment system. The acid solution is injected into the carbon in a closed-loop system and the effluent is monitored until the pH is lowered to an acceptable level. After the acid wash is completed, the system is restarted.

The sediment filter is changed when the differential pressure reaches 10 psi. During the filter change, the system is shut down. The filter's inlet and outlet valves are closed and the drain valve is opened. The filter lid is then opened and the filter cartridge is replaced. The filters are checked for leaks by closing the outlet valve slowly until the differential pressure reaches 14 psi or a leak develops. If a leak develops, the wing nuts on the lid are tightened until the leak stops. The system is then restarted. The spent filter is stored in a 55-gallon drum and profiled to determine the proper disposal method.

The sump pump is checked monthly and cycled and tested twice quarterly to maintain its proper function. Debris is removed monthly from the sump to prevent pump wear and blockage. The submersible pumps in the recovery wells require no regular maintenance.





System 19 has removed approximately 4,345 kg (9,560 lbs) of VOCs from the groundwater through September 2003, of which 3,533 kg (7,775 lbs) is TCE. Because of diminishing concentrations, the monthly removal rate has been decreasing, and now averages approximately 12 kg/month (26 lbs/month). Table 4-6 provides month-to-month and cumulative calculations of the mass removal rates.

4.2.4. O&M Costs

O&M costs include 1) report preparation for agencies (BAAQMD, RWQCB, EPA), 2) sampling, analysis, and data review (water level monitoring, water quality sampling), 3) groundwater treatment system O&M (routine tasks for operations and maintenance of the treatment system), and 4) utilities & fees.

5. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review of the site.

6. FIVE-YEAR REVIEW PROCESS

Fairchild was notified of the initiation of the five-year review on 10 October 2003 in an email from the EPA remedial project manager, Ms. Alana Lee, entitled "EPA Information Request and Notification for MEW Five-Year Review". In that email, EPA stated that the purpose of the five-year review is to evaluate the implementation and performance of the remedy to determine whether the remedy as currently being implemented is or will be protective of human health and the environment. As part of the five-year review, EPA requested site-specific information as foundation of the technical assessment of the remedy (Table 1-1). EPA also noted that requests for site inspections and interviews will be conducted separately as part of the five-year review.

This five-year report was prepared by Locus on behalf of Fairchild.

6.1. Community Involvement

Activities to involve the community in the five-year review were initiated by EPA in a meeting in January 2003 between EPA, the MEW Companies, and the public. A notice for the meeting was sent to newspapers and to about 10,000 addresses in Mountain View. The outcome of the January 2003 meeting was the creation of a Community Advisory Group (CAG), which has met since January on a monthly schedule.

During the public meetings, representatives of the CAG and local residents expressed concerns about air strippers that are used at the MEW site to remediate groundwater. To be responsive to the community's concerns, Fairchild modified its three treatment systems starting in April 2003 to replace the air stripper components with aqueous carbon units. The modified systems started operations in August 2003.

Similar actions were taken by other companies at the MEW site to remove and replace air strippers with alternative technologies.

6.2. Document Review

This five-year review has included a review of relevant documents (see References) and O&M records and monitoring data. Applicable groundwater cleanup standards, as listed in the 1989 Record of Decision also were reviewed.

6.3. Data Review

Groundwater monitoring has been conducted at the Fairchild former facilities since the early 1980s. In general, chemicals were detected at their highest concentrations early in the remedial history. These concentrations have dropped significantly since then because remedial activities have eliminated source material. The evaluation of the remedy at the site was achieved by analyzing the following indicators:

- Are proper capture zones obtained?
- Are the gradients across the slurry wall appropriate?
- Are vertical gradients appropriate?
- Are the overall trends in concentrations decreasing?

The answers to each of these questions are provided in the following subsections.

6.3.1. Are Proper Capture Zones Obtained?

Comprehensive water level measurements have been collected quarterly, which has allowed the generation of water elevation maps on a semiannual basis [in the first year after the startup of the RGRP system in 1998, maps were generated more frequently as shown in Appendix C]. Capture zones were interpolated from water elevation contours by projecting flow lines perpendicular to water elevation contours. After startup of pumping, some flow rates were adjusted to obtain proper capture zones based on the observations from the capture zone maps. The process is iterative. The interpolated capture zones are evaluated. If a pumping well does not provide proper capture, then the pumping rate is increased. If a capture zone exceeds the design requirements, then the pumping rate may be reduced. The objective is to optimize the groundwater extraction system to effectively remediate the groundwater.

Field measurements of water elevations from monitoring wells reflect the site conditions. These data would translate the actual conditions of the aquifer into water elevation data from which water elevation contours and capture zones are estimated. These estimates are dynamic in that they reflect hydrological changes in the aquifer (such as seasonal changes in water elevations and flow direction, and changes to pumping rates in regional and source control recovery wells).

The discussion below provides a description of capture zones estimated from 1998 to 2002 (see Appendix C).

15 January 1998: Because of redevelopment activities, the following Fairchild recovery wells were not operated:

"A" Aquifer:	Wells RW-1A, RW-11A, RW-12A, RW-23A, RW-15A, RW-13A, RW-17A, RW-26A, RW-2A, RW-24A, RW-18A, RW-7A, and RW-5A
"B1" Aquifer:	Wells RW-10B1, RW-11B1, RW-2B1, and RW-7B1
"B2" Aquifer:	Wells RW-1B2 and RW-2B2

Accordingly, the capture zones for Fairchild SCRWs at the former Fairchild facilities at 313/323 Fairchild Drive and 369/441 N. Whisman Road (Bldgs. 3, 4, 13, and 19 areas) are not shown because the wells were not operating due to property redevelopment activities. Capture zones in the other facilities are adequate.

26 February 1998: The following recovery wells were not operated because of property redevelopment activities:

"A" Aquifer:	Wells RW-5A, RW-7A, RW-18A, and RW-27A
"B1" Aquifer:	Well RW-7B1

Accordingly, the capture zones for Fairchild SCRWs at the former Fairchild facilities at 313/323 Fairchild Drive are not shown because the wells were not operating due to property redevelopment activities. Capture zones in the other facilities are adequate.

28 May 1998: The following recovery wells were not operated because of property redevelopment activities:

"A" Aquifer:	Wells RW-5A, RW-7A, RW-18A, and RW-27A
"B1" Aquifer:	Well RW-7B1

Accordingly, the capture zones for Fairchild SCRWs at the former Fairchild facilities at 313/323 Fairchild Drive are not shown because the wells were not operating due to property redevelopment activities. Capture zones in the other facilities are adequate.

27 August 1998: As compared to 28 May 1998, the capture zones have been enhanced after Fairchild's System 3 returned to operation in August 1998, when redevelopment activities were completed. The capture zones are adequate.

19 November 1998: The capture zones at the former Fairchild facilities are adequate.

25 February 1999: The capture zones at the former Fairchild facilities are adequate.

27 May 1999: The capture zones at the former Fairchild facilities are adequate.

18 November 1999: RW-1B2 was not pumping due to redevelopment activities in the area. The capture zones at the former Fairchild facilities are adequate.

25 May 2000: Because of redevelopment activities at 515/545 N. Whisman Road, treatment System 1 and its associated wells (AE-RW-9-1, AE-RW-9-2, RW-3A, RW-4A, RW-16A, RW-20A, RW-21A, RW-25A, RW-3B1, RW-4B1, RW-3B2, RW-4B2) were off during this period. Accordingly, capture zones are not depicted for these wells. Capture zones for the other former Fairchild facilities are adequate.

16 November 2000: The capture zones at the former Fairchild facilities are adequate.

24 May 2001: The capture zones at the former Fairchild facilities are adequate.

15 November 2001: The capture zones at the former Fairchild facilities are adequate.

23 May 2002: The capture zones at the former Fairchild facilities are adequate.

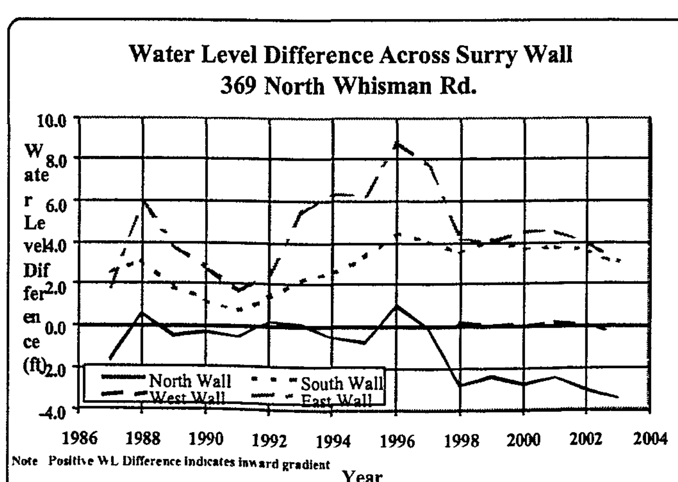
21 November 2002: The capture zones at the former Fairchild facilities are adequate.

Summary: In summary, an examination of estimated capture zones shows that the capture zones are fairly uniform. Fairchild's recovery wells adequately capture the groundwater except in isolated instances when the wells were temporarily off as necessitated by property redevelopment activities.

6.3.2. Are the gradients across the slurry wall appropriate?

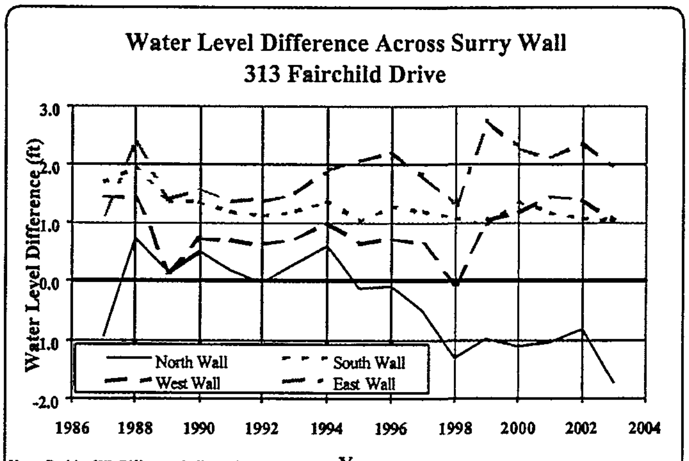
The direction of the hydraulic gradients across the three slurry walls at the Fairchild former facilities can be calculated for each date on which water level measurements were taken (Appendix D). The direction can be determined from water elevations in pairs of nearby wells that are in the same aquifer, but on different sides of the wall.

It is generally desirable that the hydraulic gradient across the slurry walls be inward. This is normally achieved by lowering the water elevations inside the slurry wall using recovery wells. Most outward gradients are expected to occur on the downgradient side of the slurry wall, where water elevations outside the slurry wall are lowest.



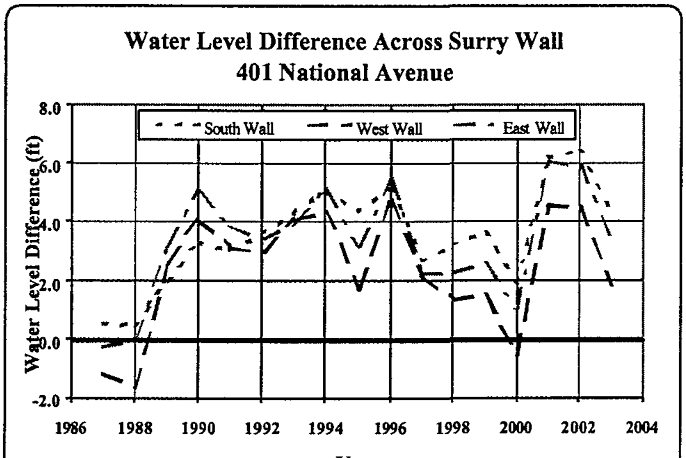
Inward gradients have been observed across the slurry walls except for the northern portions of the walls at 369 N. Whisman Road, and 313 Fairchild Drive (Appendix D). At 369 N. Whisman Road, Fairchild installed recovery well RW-23A in May

1995 in the downgradient portion of the slurry wall enclosure in an attempt to reverse the hydraulic gradient across the northern wall. Although the well is capable of relatively high pumping rates as compared to other "A" aquifer wells, its operation did not reverse the gradient.



Note: Positive WL Difference indicates inward gradient.

Fairchild planned to install a recovery well in the northern area of the slurry wall enclosure. However, the formation in that area would not yield sufficient water because the subsurface in the "A" aquifer is mainly clays and silts. Therefore the plans to install the well were abandoned.



Note: Positive WL Difference indicates inward gradient.

Because slurry walls provide a barrier against chemical migration, slight outward gradients will not result in significant chemical migration out of the enclosed area, especially because the data show that the groundwater concentrations on the outside and inside faces of the wall are comparable. In other words, given the concentrations in groundwater just outside the slurry wall, outward gradients will not result in significant changes to the concentration downgradient of the wall.

In the first few years of groundwater remediation, the concentrations inside and outside the slurry walls are likely to be similar. Because of similar concentrations, outward gradients would not adversely impact the groundwater quality outside the slurry wall enclosure. To expedite the remediation, it is generally beneficial to prioritize mass removal in the first years of operations. Eventually, when concentration differences inside and outside the slurry wall enclosures are significant, then the gradient direction would be of more importance.

Despite the outward gradient, the chemicals are hydraulically contained through the physical isolation provided by the slurry wall and the operation of several recovery wells within the slurry wall enclosure. Furthermore, recovery wells immediately downgradient of the 369 N. Whisman Road slurry wall (RW-2A and RW-24A) and the 313 Fairchild slurry wall (RW-9A and REG-2A) provide adequate capture of the area immediately downgradient of the slurry wall.

6.3.3. *Are Vertical Gradients Appropriate?*

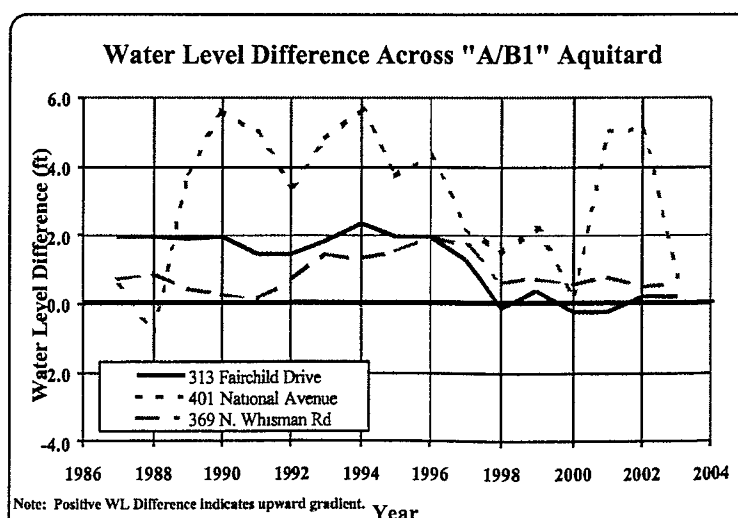
The direction of the vertical gradient across "A/B1" aquitard where the slurry walls are keyed can be determined for each date on which water level measurements were taken. For each aquitard, nearby pairs of wells were identified - one well in the aquifer above the aquitard and one in the aquifer below the aquitard. The difference in the water elevations in these two wells can be used to determine the direction of the vertical gradient across the aquitard. Ideally, upward gradients across the aquitards are desired in a groundwater extraction program. However, in several locations, the concentrations in the lower aquifer are higher than the concentrations in the upper aquifer, maintaining upward gradients is not critical in these areas. This is especially the case between in the "A" and the "B1" aquifers.

To evaluate if the flow direction across aquitards is appropriate, it is necessary to answer the following questions:

- If an undesired vertical gradient is observed, do the historical concentrations in the downgradient point (e.g., the lower aquifer for a downward gradient) show an increasing trend?

- If an undesired vertical gradient is observed, are there existing remedial actions operating to remedy the situation? For example, if a downward gradient is observed from the "A" to the "B1" aquifer at a location, are remedial actions in place in the "B1" aquifer near that location?

Appendix E includes data on the difference in water elevations between the "B1" and "A" aquifers at the Fairchild slurry walls. In general, upward gradients are observed. In some years, downward gradients are observed because wells were shut down for redevelopment activities. Concentration trends in the "B1" aquifer are decreasing though (see following section), and Fairchild operates recovery wells in the "B1" aquifer.



The RGRP five-year performance review, which is submitted concurrently with this document, includes further evaluation of vertical gradients across the other aquitards. The evaluation concluded that upward gradients are generally maintained.

6.3.4. *Are the Overall Trends in Concentrations Decreasing?*

A concentration trend analysis was performed for TCE. Influent data from treatment systems indicate that TCE comprises the majority of the chemical mass being treated (Tables 4-4, 4-5, and 4-6; and Locus 2000c). Therefore, because TCE remains the indicator compound for the MEW site, a trend analysis for TCE provides a good indication of the performance of the remedial actions.

Appendix B contains a listing of the concentrations of the 15 chemicals of concern identified in the CD. The results of the Plume Definition Program (Canonie, 1993a) confirmed that 10 organic chemicals are the only chemicals that require routine monitoring. The eleventh organic chemical, phenol, was not detected above the 0.3 mg/L criterion for phenol specified in the Plume Definition Program in any of the samples tested for that compound. Appendix F shows a series of TCE concentration maps for the MEW site (including Fairchild's former facilities) for shallow and deep aquifers.

A trend in TCE concentrations was estimated using the following process:

1. Identify wells in each aquifer
2. Calculate the annual average of the TCE concentration for each well in each aquifer
3. From the average of each well, calculate the annual average for each aquifer.

Appendix B lists individual well concentrations. A regular sampling network was not established until 1997. Therefore, not all wells have been sampled at each event. Table 6-1 provides a comparison of the average for each aquifer for wells sampled by Fairchild based on available data.

Groundwater monitoring has been conducted at the Fairchild's former facilities since the early 1980s. In general, most concentrations were detected at their highest levels early in the investigation and remedial period. These levels have reduced significantly in the "A", "B1", and "B2" aquifers by the remedial measures that have contained and/or removed sources in the groundwater and have cleaned up the unsaturated soils.

The average concentrations in 2002 were compared to RI/FS conditions (1986/1987) and to 1992 conditions when data were available. The average 2002 concentrations were also compared to conditions just before the RGRP started south of the highway (1997 concentrations). In 1997, Fairchild also expanded its groundwater remediation system to install additional recovery wells per the Fairchild source control design documents (Canonie, 1994a,b,d & 1995c). The comparison was performed for wells where data were available.

"A" Aquifer: By 2002, the TCE concentrations in the "A" aquifer have decreased 99%, 99%, and 80% compared to 1986/1987, 1992, and 1997 conditions. In the areas within the three slurry walls, TCE concentrations have decreased by an average of 79%, 83% and 31% between 2002 and 1986/1987, 1992, and 1997, respectively. Although the comparisons do not use the same set of wells (because not all wells were sampled or existed at all sampling events), the calculations indicate significant decreases in TCE concentrations.

"B1" Aquifer: By 2002, the TCE concentrations in the former Fairchild facilities in the "B1" aquifer have decreased 68%, 64, and 33% compared to 1986/1987, 1992, and 1997 conditions.

Area	2002/86&87	2002/1992	2002/1997
"A" Aquifer Outside Slurry Wall	-99%	-99%	-80%
"B1" Aquifer	-68%	-64%	-33%
"B2" Aquifer	42%	336%	-55%
Area within 313 Slurry Wall	-69%	-71%	-53%
Area within 369 Slurry Wall	-94%	-95%	-22%
Area within 401 Slurry Wall	-75%	-83%	-18%

"B2" Aquifer: Concentration in the "B2" aquifer increased in one well, RW-4B2 between 1986 and 1997. However, by pumping groundwater from the RW-4B2, the average TCE concentration decreased by 55% from 1997 to 2002.

No potentially toxic or mobile transformation products have been identified during sampling events that were not already present at the time of the ROD. Therefore the cleanup goals specified in the ROD remain the same.

6.3.5. Interviews

It is our understanding that EPA will be conducting interviews of interested parties in connection with this five-year review. The following persons can be contacted by EPA to answer questions that EPA may have regarding the five-year review or the operations of the Fairchild treatment systems.

Name	Company	Phone
Mr. Cliff Kirchof	Schlumberger (for Fairchild)	281-258-8298
Mr. Elie Haddad	Locus Technologies	650-960-1640
Mr. Fred Banker	RMT, Inc.	650-926-9832
Ms. Maile Smith	Weiss Associates	650-968-7000

7. TECHNICAL ASSESSMENT

This chapter assesses the effectiveness of the implemented remedies. In accordance with the EPA guidance for preparing five-year reviews (EPA, 2001), this chapter answers three questions:

A. Is the remedy functioning as intended by the decision document?
B. Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?
C. Has any other information come to light that could call into question the protectiveness of the remedy?

7.1. Question A: Is the Remedy Functioning as Intended by the Decision Document?

The Feasibility Study (Canonie, 1988) for the MEW site lists the RAOs to be:

1. Protection of potential potable water supplies;
2. Remediation or control of relatively elevated concentrations of chemicals present in localized vadose zone soils below the ground surface that could migrate into the shallow groundwater system;
3. Remediation or control of groundwater containing elevated concentrations of chemicals, including control of discharge of such groundwater into surface water.

Extensive remedial measures have been implemented by Fairchild to clean up the shallow aquifer zone. The review of documents, ARARs, risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the ROD, as modified by the ESD. The SVE systems installed and operated at 369/441 North Whisman Road, and 401 National Avenue, and the soil excavations at the former Fairchild facilities resulted in soil concentrations lower than soil cleanup goals. The installation of three slurry walls effectively isolated the source areas, and, combined with groundwater extraction and treatment, resulted in a significant decrease in concentrations in the areas within and outside the slurry walls. The slurry walls and the pumping activities inside and outside the slurry walls achieved the third RAO by controlling sources and remediating the groundwater.

Although the three Fairchild treatment systems were modified to result in virtually zero air emissions, the groundwater pump-and-treat remedy has functioned well as intended. Recently, 1,4-dioxane concentrations above RWQCB cleanup goals were identified in the effluent to System 3. However, the observed effluent concentrations are well below applicable toxicity criteria, and the available remedial technologies for 1,4-dioxane are technically impracticable. Therefore, no further action is necessary to address the issue.

Inward gradients have been observed across the slurry wall except for the northern portions of the walls at 369 N. Whisman Road and 313 Fairchild Drive (Appendix D). Despite the outward gradient, the chemicals are contained through the physical isolation provided by the slurry wall and the operation of several recovery wells within the slurry wall enclosures. Furthermore, recovery wells immediately downgradient of the 369 N. Whisman Road slurry wall (RW-2A and RW-24A) and the 313 Fairchild slurry wall (RW-9A and REG-2A) provide adequate capture of the area immediately downgradient of the slurry wall.

The slurry wall is a low-permeability wall that results in minimal chemical migration across its walls, even if the gradient is outward. In other words, the flux of chemicals across a low-permeability zone is small. That, combined with the fact that chemicals would tend to take the easier pathway and migrate towards recovery wells within the wall enclosure rather than across the low-permeability wall, would minimize outward chemical migration.

Therefore, the slurry wall and the pumping activities within its enclosure physically contain chemicals. If a small flux of chemicals migrates through the slurry wall, it is captured by recovery wells placed downgradient of the wall.

In the first few years of groundwater remediation, the concentrations inside and outside the slurry walls are likely to be similar. Because of similar concentrations, outward gradients do not adversely impact groundwater quality outside the slurry wall enclosure. To expedite the remediation, it would be beneficial to prioritize mass removal in the first years of operations. Eventually, when concentration differences inside and outside the slurry wall enclosures are significant, then the gradient direction would be of more importance.

There were no opportunities for system optimization during this review. The monitoring well network provides sufficient data to assess the progress of the remediation.

The ROD for the MEW site defines cleanup goals for the soils and groundwater. Table 7-1 presents a summary of the status of these goals at the Fairchild former facilities.

7.2. Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of Remedy Selection Still Valid?

This section discusses changes in standards to be considered, and changes in exposure pathways, toxicity, and other chemical characteristics.

7.2.1. Changes in Standards and To Be Considered

As the remedial work progressed, the ARARs for soils Specified in the ROD have been met. ARARs that still must be met at this time and that have been evaluated include: the Safe Drinking Water Act (40 CFR 141.11-141.16) from which many of the groundwater cleanup levels were derived. A list of ARARs is included in Appendix G. There have been no changes in these ARARs in a manner that affects operations of Fairchild's groundwater extraction and treatment systems and no new standards or "To Be Considered" (TBCs) affecting the protectiveness of the remedy.

In 2000, EPA promulgated the California Toxics Rule (CTR), which updates and adds standards for discharges to surface waters. The CTR standards for VOCs are not lower than those in the NPDES permit for the Fairchild system. Therefore, these new standards do not affect the NPDES discharge standards for Fairchild's treated effluent, and do not affect the protectiveness of the remedy.

7.2.2. Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

Except for a potential change in the inhalation toxicity factor for TCE, there have been no changes in the toxicity factors for the contaminants of concern that were used in the endangerment assessment for the MEW site (ICF-Clement, 1988), or in the risk assessments developed for redevelopment activities (Locus, 1997b; Smith, 1997c). The assumptions considered in the risk assessments are conservative and reasonable in evaluating risk. No change to these assumptions, or the cleanup levels for groundwater or soil is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

One complicating factor for TCE is that EPA's most current cancer risk assessment for inhalation remains in draft form and does not recommend an inhalation-specific cancer slope factor. The EPA's Science Advisory Board review of the draft TCE reassessment has identified several shortcomings to be addressed, including a number of uncertainties regarding the weight of evidence in data used to derive the proposed slope factors. In addition, DTSC and the RWQCB for the San Francisco Bay Region provided directives in February and March 2003 indicating that the current inhalation carcinogenic slope factor of 0.007 $(mg/kg\text{-}day)^{-1}$ will be retained for use in deriving risk based concentrations for use in assessments conducted in their jurisdictions.

On 3 October 2002, the EPA requested a work plan "to conduct a human health risk assessment to evaluate the groundwater-to-indoor air exposure pathway by collecting indoor air, outdoor air, and soil gas samples at each Facility." In response, Fairchild collected more than 400 air samples at its former facilities in the spring and fall 2003. The results showed acceptable levels of concentrations in accordance with state and federal comparison criteria with the exception of two buildings (at 401 and 644 National Avenue) where certain indoor air samples showed TCE concentrations above EPA Region IX's draft provisional long-term values.

In the building on 401 National Avenue, Fairchild sealed cracks and penetrations in the utility room in August 2003. Following the sealing work, Fairchild conducted a test by starting the ventilation system in office portion of the building the morning of 2 September 2003. Because the ventilation system had not been operated at the building for a while, it created dust and could only be operated for 1.5 hours. Regardless, confirmation samples were collected on 04-Sep-03. The confirmation samples showed that the mitigation measures were effective in reducing concentrations to within EPA Region IX's draft provisional values. Consequently, Fairchild is recommending that steps be considered to improve the existing ventilation in the building.

In August 2003, Fairchild sealed the elevator shaft and openings in the basement floor in the building on 644 National Avenue. In addition, Fairchild sealed several openings in the floor between the basement and the first floor and installed two exhaust fans, each with a capacity of 6,000 cubic feet per minute. Subsequently, Fairchild conducted a test by starting the fans in the basement and the ventilation system connected to the 2nd floor, and then collecting confirmation air samples. The mitigation measures substantially reduced concentrations in the building. The concentrations in the 1st and 2nd floor were reduced to non-detect levels. TCE concentrations in the basement were reduced by about 20 times, and are within all acceptable criteria except only EPA Region IX's provisional values for the long term. The basement in the building has not been occupied for several years, and remains unoccupied. Based on the results of the air samples, it is apparent that ventilation of the building will reduce concentrations to acceptable levels. To further reduce concentrations in the basement, it may be necessary to enhance the existing system.

7.3. Question C: Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No ecological targets were identified during the endangerment assessment (ICF-Clement, 1988) and none were identified during the five-year review. Therefore monitoring of ecological targets is not necessary. No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

7.4. Summary of Technical Assessment

According to the data reviewed, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs for soil contamination specified in the ROD have been met.

Other than the draft provisional values for TCE, there have been no changes in the toxicity factors for the contaminants of concern that were used in the EA. There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

8. ISSUES

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
An outward gradient has been observed along the northern portion of the slurry wall at 369 North Whisman Road and 313 Fairchild Drive	N	N
1,4-dioxane was detected in System 3 effluent at levels higher than RWQCB goals	N	N
Indoor air samples in two buildings showed concentrations of TCE higher than EPA Region IX draft provisional values	N	Y

9. RECOMMENDATIONS AND FOLLOW UP ACTIONS

Issue	Recommendation And Follow up Action	Party Respon-sible	Over-sight Agency	Date	Affects Protectiveness (Y/N)	
					Current	Future
An outward gradient has been observed along the northern portion of the slurry wall at 369 North Whisman Road and 313 Fairchild Drive	Outward gradient does not have a significant impact on remedial goals. Continue to monitor water quality downgradient of slurry wall.	Fairchild	EPA	On-going	N	N
1,4-dioxane was detected in System 3 effluent at levels higher than RWQCB goals	The observed effluent concentrations are well below applicable toxicity criteria, and the available remedial technologies for 1,4-dioxane are technically impracticable. Therefore, no further action is necessary.	Fairchild	RWQCB	-	N	N
Indoor air samples in two buildings showed concentrations of TCE higher than EPA Region IX draft provisional values	Enhance ventilation in the buildings.	Fairchild, property owner & tenant	EPA	2004	N	Y

10. PROTECTIVENESS STATEMENT

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup standards. In the interim, exposure pathways that could result in unacceptable risks are being controlled, and exposure to, or the ingestion of, groundwater is prevented. Exposure to impacted soils has been addressed by installing and operating an SVE system that achieved cleanup goals.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater samples to fully evaluate the progress of remediation. Current data indicate that the concentrations have decreased significantly, and that the remedy is functioning as required to achieve groundwater cleanup standards.

11. NEXT REVIEW

The next five-year review for the former Fairchild facilities at the MEW Site is required by August 2009, five years after EPA finalizes its five-year review.

12. REFERENCES

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Canonie Environmental Services Corp. 1995a, *Revised Construction Operation and Maintenance Plan, Fairchild Semiconductor Corporation, 644 National Avenue, Building 18, Middlefield-Ellis-Whisman Site, Mountain View, California,* prepared for Fairchild Semiconductor Corporation, January.

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Locus Technologies, 1997b, *Health Risk Assessment, 313 Fairchild Drive, Mountain View, California*, prepared for Keenan-Lovewell Ventures and Fairchild Semiconductor Corporation, 27 August.

Locus Technologies, 1997c, *Confirmatory Sample Report, 515/545 N. Whisman Road and 313 Fairchild Drive, Buildings 1, 2, 3, and 4, Mountain View, California,* prepared for Fairchild Semiconductor Corporation, 30 September.

Locus Technologies, 1998, *NPDES Permit No. CAG91203, Selenium Discharge Report, Ground Water Treatment System, Tower 1,* prepared for Fairchild Semiconductor Corporation, 30 July.

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Locus Technologies, 2002, *Work Plan for Air Sampling, Middlefield-Ellis-Whisman Site, Mountain View, California*, December.

Locus Technologies, 2003a, *Revised Work Plan for Air Sampling, Middlefield-Ellis-Whisman Site, Mountain View, California*, April.

Locus Technologies, 2003b, *Results of Air Sampling, Former Fairchild Semiconductor Corporation Facilities, Middlefield-Ellis-Whisman Site, Mountain View, California,* prepared for Fairchild Semiconductor Corporation and Schlumberger Technology Corporation, 15 August.

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TABLE 1-1
CHECK LIST FOR EPA'S REQUEST FOR INFORMATION – FIVE YEAR REPORT
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

GENERAL REQUESTS

Request	File Name	Comments
1. Site Vicinity Map - Format: PDF	Report: Figure 1-1	Submitted to EPA on 8-Dec-03
~~2. MEW Regional Site Map with All Facilities – former building locations and addresses -Format: PDF~~	N/A	Not applicable for Fairchild. Included in the RGRP submittal package.
~~3. MEW Regional Site Map with All Facilities – current building locations and addresses -Format: PDF~~	N/A	Not applicable for Fairchild. Included in the RGRP submittal package.
~~4. MEW Regional Site Map with current treatment system locations – Format: PDF~~	N/A	Not applicable for Fairchild. Included in the RGRP submittal package.
~~5. MEW Regional Site Map with Areas of Soil Cleanup – Format: PDF~~	N/A	Not applicable for Fairchild. Included in the RGRP submittal package.
6. Site Location Maps - By facility - Format: PDF	Report: Figure 1-2	Submitted to EPA on 8-Dec-03
7. Brief Site Description and Background	Report: Chapter 3	Also see Word version of the report.
8. Description of remedial actions for groundwater [and soil, if applicable], including all components of the remedy, and current status of each of the components. Include descriptions of old and new treatment facilities, specify changes, reason for change, and year implemented.	Report: Chapter 4	Also see Word version of the report.
9. Tables and text summarizing that remedial actions achieved the ROD objectives (including soil excavation and SVE remedies). Format: Excel and Word or WordPerfect.	Report: Table 7-1 CD ROM: Table 7-1 ROD Objectives.xls	
~~10. Table and text summarizing compliance with ROD requirements to seal potential conduits, agricultural wells and any other abandoned wells. Also, provide a figure with location(s) of abandoned wells, if possible. Format: Excel, Word or WordPerfect and PDF.~~	N/A	Not applicable for Fairchild. Included in the RGRP submittal package.
11. Table summarizing chronology of site events and milestone dates for implementation of the response actions. Format: Word or WordPerfect.	Report: Chapter 2	Also see Word version of the report.
12. Text summarizing treatability studies, results, and conclusions/recommendations, if applicable. Format: Word or WordPerfect.	Report: Section 4.1.1	Also see Word version of the report.

TABLE 1-1
CHECK LIST FOR EPA'S REQUEST FOR INFORMATION – FIVE YEAR REPORT
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

GROUNDWATER WELLS

Request	File Name	Comments
1. Table summarizing all wells installed post Remedial Investigation (1987) for purposes of remedy implementation. Please include well identifier, units screened, year constructed and purpose. Format: Excel.	Report: Table 3-2	Submitted to EPA on 8-Dec-03
2. Separate tables summarizing new and abandoned wells. These tables should specify year of construction or abandonment and aquifer screened. Also, provide a figure with abandoned well locations. If it was necessary to replace monitoring wells for building construction, please provide. Format: Excel and PDF.	Report: Table 3-3 and Figures 3-6 to 3-10	Submitted to EPA on 8-Dec-03
3. Base maps of all wells on facility and nearby properties	Report: Figures 3-1 to 3-5	Submitted to EPA on 8-Dec-03

CHEMICAL DATA

Request	File Name	Comments
1. Tables summarizing all MEW chemicals of concern for all wells since inception of groundwater sampling. Format: Excel or Access.	Report: Appendix B	Submitted to EPA on 8-Dec-03
2. TCE concentration contour figures from 1988 to January 2003, and other VOCs, if available. Format: PDF and Hard Copy	Report: Appendix F	Submitted to EPA on 8-Dec-03

GROUNDWATER ELEVATIONS, CAPTURE ZONES, GRADIENTS

Request	File Name	Comments
1. Tables summarizing groundwater level elevation data for each well since inception of data collection through September 2003. Format: Excel Table or Access Database.	Report: Appendix A	Submitted to EPA on 8-Dec-03
2. Groundwater hydrographs (groundwater elevation versus time) and any available graphs of TCE concentration versus time. Format: Excel or PDF.	Report: Appendix A	Submitted to EPA on 8-Dec-03. TCE concentrations versus time graphs are not available.
3. Piezometric surface maps for all aquifers: quarterly postings maps (or contour maps) and semi-annual contour maps from 1988 through September 2003. Format: PDF and Hard Copies	Report: Appendix C	Submitted to EPA on 8-Dec-03
4. Capture Zones Maps for all aquifers (from start of pumping through September 2003). Format: PDF	Report: Appendix C	Submitted to EPA on 8-Dec-03
5. Since aquifer test results are often embedded in other documents, please provide a table summarizing aquifer test results and a list of documents where these results can be found. Format: Excel and Word or WordPerfect.	Report: Table 3-1	Submitted to EPA on 8-Dec-03
6. Tables summarizing vertical hydraulic gradient data from before remediation began through September 2003. This information should be provided by aquifer and well pair. Format: Excel.	Report: Appendix E	Submitted to EPA on 8-Dec-03
7. Tables summarizing horizontal gradients since inception of the groundwater monitoring network (Raytheon and Fairchild/Schlumberger) across slurry wells (through Septe[illegible] 2003).Format: Excel	Report: Appendix D	Submitted to EPA on 8-Dec-03

TABLE 1-1
CHECK LIST FOR EPA'S REQUEST FOR INFORMATION – FIVE YEAR REPORT
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

SYSTEMS OPERATIONS, PERFORMANCE AND O&M

Request	File Name	Comments
1. Base map of locations of all extraction wells and piping to treatment systems	Report: Figures 4-1, 4-2, and 4-3	Submitted to EPA on 8-Dec-03
2. Briefly describe operating procedures and any issues or problems	Report: Section 4.2	Also see Word version of the report.
3. Table summarizing operation of treatment systems including down-times since inception of groundwater extraction and treatment through September 2003. Format: Excel.	Report: Table 4-3 CD ROM: Table 4-3 Operations Summary.xls	
4. Description of system operations/O&M requirements, estimated costs, and reasons for unanticipated or unusually high O&M costs [table of annual O&M costs, optional]	Report: Section 4.2	Also see Word version of the report.
~~5. Table summarizing estimates of TCE and VOC mass in groundwater from before groundwater extraction began to September 2003. Format Excel.~~	N/A	Summary of mass calculations of the regional plume are included in the RGRP submittal package.
6. Table summarizing mass removal (TCE and VOCs) by month from inception of groundwater extraction to September 2003. These tables should include monthly groundwater extraction rates and volumes. Format: Excel.	Report: Tables 4-4, 4-5, and 4-6	Submitted to EPA on 8-Dec-03
7. Graph of cumulative mass removal graphs for TCE and VOCs with mass removal by year (or month) Format: Excel.	Report: Section 4.2	Submitted to EPA on 8-Dec-03
8. Discussion (and figures as needed) demonstrating progress made in removing TCE and VOCs from the aquifer. Format: Word or WordPerfect text and graphs in Excel.	Report: Sections 4.2 and 6.3.4.	Also see Word version of the report.
9. Table summarizing treatment plant operation including influent and effluent flow rates and contaminant concentrations from the inception of treatment to September 2003. Format: Excel or WordPerfect.	Report: Tables 4-4, 4-5, and 4-6	Submitted to EPA on 8-Dec-03
10. Table(s) summarizing extraction well performance including pumping rates (designed and actual) and well rehabilitation (all years through September 2003). Note any exceedances, duration, and corrective actions. Format: Excel, Word or WordPerfect.	Report: Tables 4-7, 4-8, and 4-9	Submitted to EPA on 8-Dec-03
11. Table summarizing BAAQMD permit and air emissions compliance (through September 2003). Format: Excel, Word or WordPerfect.	Report: Table 4-2 CD ROM: Table4-1&4-2 Comliance.xls	
12. Table summarizing NPDES permit compliance (through September 2003). Note any exceedances, duration, and corrective actions. Format: Excel, Word or WordPerfect.	Report: Table 4-1 CD ROM: Table4-1&4-2 Comliance.xls	
13. List of interview candidates with phone numbers with knowledge of groundwater extraction network and/or groundwater treatment plant operation. Format: Excel or WordPerfect.	Report: Section 6.3.5	Also see Word version of the report.

TABLE 1-1
CHECK LIST FOR EPA'S REQUEST FOR INFORMATION – FIVE YEAR REPORT
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

OTHER REQUESTS

Request	File Name	Comments
Opportunities for Optimization: Briefly summarize recommendations for remedy optimization, whether opportunities exist to improve the performance and/or reduce the costs of monitoring, sampling, and treatment systems operations.	Report: Chapter 7	Also see Word version of the report.
Indicators of Potential Issues: Discuss any issues or problems, actions taken, and/or any recommendations for improvement or follow-up actions.	Report: Chapters 7, 8 and 9	Also see Word version of the report.
Successes/Problems/Lessons Learned - Optional ▫ Achievements, Progress, Effectiveness, Improvements ▫ Implementation of access and institutional controls ▫ Construction of the Remedy ▫ System Operations ▫ Unusual situations or problems at the site.	Report: Chapters 6 and 7	Also see Word version of the report.
Reference Documents: Please list reference documents - Format: Word or WordPerfect	Report: Chapter 12	Submitted to EPA on 8-Dec-03. See Word version for an updated list.

TABLE 3-1
AQUIFER TEST RESULTS - FAIRCHILD
MIDDLEFIELD-ELLIS-WHISMAN SITE
MOUNTAIN VIEW, CALIFORNIA

Aquifer	Pumped Well	Observation Wells	Average Transmissivity (gpd/ft)
A/A1	69A	69A, 42A, 41A, 39A, 44A	625
A/A1	RW1A	18A, 17A	1701
A/A1	83A	87A	27008
B1/A2	3B1	3B1, 60B1, RW9B1, 13B1	1152
B1/A2	85B1	106B1	119
B2	RW1B2	40B2, 9B2	13

Reference:
Harding Lawson Associates, 1987, Remedial Investigation Report, Remedial Investigation/Feasibility Study, Middlefield-Ellis-Whisman Area, Mountain View, California, prepared for Fairchild Semiconductor Corporation, Intel Corporation, and Raytheon Company, June.

TABLE 3-2
MONITORING WELL DETAILS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	North	East	Aquifer	Purpose	Construction year
100A	4	17	37	39	331144.5	1548934.8	A	Monitoring	1986
101A	4	19	34	36	330710.2	1547579.8	A	Monitoring	1986
102A Sealed	4	24	34	36	330643	1547669.8	A	Monitoring	1986
103A Sealed	4	18	28	30	330713.7	1548083.9	A	Monitoring	1986
104A Sealed	4	20	25	27	330623.8	1547866.2	A	Monitoring	1986
105A	4	21	36	38	331254.2	1548576.7	A	Monitoring	1986
106A	4	22	37	39	331222.1	1548687.4	A	Monitoring	1986
107A	4	23	48	50	331635.9	1546463.9	A	Monitoring	1986
108A	4	11	36	38	332077.9	1548878.7	A	Monitoring	1986
10A Sealed	2	23	35	35	331042.7	1547522.2	A	Monitoring	1982
110A	4	33	43	45	332033.9	1549073.2	A	Monitoring	1986
111A Sealed	4	22	37	39.5	331236.6	1548634.1	A	Monitoring	1986
112A Sealed	4	25	40	41	331195.4	1548777.4	A	Monitoring	1986
113A Sealed	4	17	22	26.5	338751.6	1548339.5	A	Monitoring	1986
114A Sealed	4	15	25	26	331575.3	1548568.3	A	Monitoring	1986
115A	4	20	30	32	331281	1547766.1	A	Monitoring	1986
116A	4	19	39	41	332074	1548811.3	A	Monitoring	1987
117A Sealed	4	13	28	29	331106.6	1549050.5	A	Monitoring	1986
118A	4	10.5	20.5	21	333028.1	1548705.6	A	Monitoring	1986
119A	4	19	29	31.5	331451.7	1549180.5	A	Monitoring	1986
11A Sealed	2	19	39	39	330994.9	1547675.4	A	Monitoring	1982
120A Sealed	4	19	24	26	336371.9	1547741.5	A	Monitoring	1986
121A	4	26	36	38	332478.8	1548548.1	A	Monitoring	1986
122A	4	28	38	39	331779.2	1548589	A	Monitoring	1986
123A	4	28	38	39	331752.6	1548582.7	A	Monitoring	1[illegible]
124A	4	14	24	26	332760.1	1548646	A	Monitoring	1[illegible]
125A	4	22	32	34	332896.3	1547009.5	A	Monitoring	1986
126A	4	23	38	40	331996.4	1548513.9	A	Monitoring	1986
127A	4	15	20	22	332145.6	1547886.8	A	Monitoring	1986
128A	4	18	28	30	332089.2	1548032.3	A	Monitoring	1986
129A	4	26	36	38	332434.1	1548588.9	A	Monitoring	1986
12A	2	15	35	35	330975.6	1547788.5	A	Monitoring	1982
130A	4	14	29	31	333040.9	1548143	A	Monitoring	1986
131A Sealed	4	17	27	29	331112.6	1548106.4	A	Monitoring	1986
132A Sealed	4	17	27	29	331090.7	1548082.1	A	Monitoring	1986
133A	4	15	30	32	332018.3	1548369.1	A	Monitoring	1986
134A	4	20	30	32	331245.1	1547755.2	A	Monitoring	1986
135A Sealed	4	22	32	34	331268.2715	1547618.365	A	Monitoring	1986
136A	4	25	30	32	331986.9	1548360.6	A	Monitoring	1986
137A	4	34	36	38	331822.2	1548741.6	A	Monitoring	1986
138A	4	34	37	38	331813.6	1548769.8	A	Monitoring	1986
139A	4	16	31	34	330884.4	1548108.3	A	Monitoring	1986
13A Sealed	2	15	40	40	330976.4	1547856.3	A	Monitoring	1982
140A	4	18	33	35	330679	1547570	A	Monitoring	1986
141A	4	16	26	28	330876.4	1548132.8	A	Monitoring	1986
143A	4	22	27	29	330638.8	1547784.5	A	Monitoring	1986
145A	4	15	30	32	332399	1547119.4	A	Monitoring	1987
146A	4	35	55	56	332068.8	1547043.2	A	Monitoring	1988
147A	4	10	30	31	332389.9	1548861	A	Monitoring	1988
148A	4	22.5	32.5	33	331035.6	1547744.3	A	Monitoring	1991
149A	4	12.5	32.5	35	331529.9	1547929.7	A	Monitoring	1991
14A Sealed	2	18	38	40	330933.5	1548024.4	A	Monitoring	1982
150A Sealed	4	14.5	34.5	35	331452.658	1547940.945	A	Monitoring	199[illegible]
151A	4	16.5	31.5	35	332528.4	1548679.4	A	Monitoring	1[illegible]
152A	4	14.5	34.5	35	332572	1548742.5	A	Monitoring	1991
154A	4	19	29	30	331214.6	1547938.2	A	Monitoring	1993

TABLE 3-2
MONITORING WELL DETAILS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	North	East	Aquifer	Purpose	Construction year
155A	4	19	29	30	331200 97	1547933.8	A	Monitoring	1993
156A	4	19.5	29.5	30	333227.8	1548367.9	A	Monitoring	1993
157A	4	19 5	29.5	30	333208.3	1548361.4	A	Monitoring	1993
158A	4	20	30	31.5	331169.08	1549278.54	A	Monitoring	1997
159A	4	20	30	33	331274.46	1547623.91	A	Monitoring	1997
15A	2	15	40	40	330877.3	1548060.1	A	Monitoring	1982
160A	4	18.5	33.5	35 5	331437.21	1547924.32	A	Monitoring	1997
161A	4	20.5	30.5	33	330800.03	1547771.87	A	Monitoring	1997
163A	2	10	25	27	333575.54	1548787.78	A	Monitoring	2001
164A	2	13	28	30.5	334698 4	1548819.79	A	Monitoring	2001
165A	2	13	28	30 5	334675 56	1548945.19	A	Monitoring	2001
166A	2	16	31	33	334872 88	1548422.1	A	Monitoring	2001
167A	2	14	29	30 5	334168.49	1548517.3	A	Monitoring	2001
168A	2	14	29	30 5	334136.73	1548631.81	A	Monitoring	2001
169A	2	21	31	34	334441.04	1547740.68	A	Monitoring	2001
16A	2	22	32	32	331330.8	1547453.8	A	Monitoring	1982
170A	2	21	31	34	334426.43	1547831.07	A	Monitoring	2001
171A	2	17	27	28 5	335145.24	1547438.38	A	Monitoring	2001
172A	2	17	27	28 5	335174.36	1547526.59	A	Monitoring	2001
173A	4	19	29	30			A	Monitoring	2002
174A	4	18	28	30			A	Monitoring	2002
175A	4	19	29	30			A	Monitoring	2002
17A	2	20	35	35	331292.7	1547598 5	A	Monitoring	1982
18A Sealed	2	15	40	40	331262	1547646.3	A	Monitoring	1982
19A Sealed	2	18	33	33	331108.7	1548166.1	A	Monitoring	1982
23A	2	14	30	30	331584	1547955.5	A	Monitoring	1982
24A	2	16	30	30	331277.9	1548497 2	A	Monitoring	1982
25A Sealed	2	15	30	30	331167.8	1548850 1	A	Monitoring	1982
27A Sealed	2	14	32	32	331275 8	1549273	A	Monitoring	1982
28A	2	14	30	30	331538.9	1548949.4	A	Monitoring	1982
2A Sealed	2	22	35	35	330618 8	1547781.7	A	Monitoring	1982
30A Sealed	2	15	30	30	331785 9	1548503.8	A	Monitoring	1982
31A	2	14.5	27	27	331770 4	1548756.3	A	Monitoring	1982
32A	2	13	26 5	26 5	331535 6	1549318.5	A	Monitoring	1982
33A	2	14	34	34	332159.5	1547916.1	A	Monitoring	1982
34A Sealed	1			20	331992.5	1548520.8	A	Monitoring	1983
35A	2	12	37	37	331963.7	1548550.6	A	Monitoring	1982
36A	2	35	40	40	331936.9	1548596 6	A	Monitoring	1982
37A	2	15	30	30	331924.5	1548636.2	A	Monitoring	1982
39A	2	15	35	35	331885 5	1548769	A	Monitoring	1982
3A Sealed	2	20	37	37	330567 8	1547953.7	A	Monitoring	1982
40A	2	11.5	27	27	331865 9	1548787.8	A	Monitoring	1982
41A	2	13	25	25	331941	1548730.4	A	Monitoring	1982
43A	2	15	27	27	331914.9	1548804	A	Monitoring	1982
44A	2	13.5	28	28	331959.2	1548815.5	A	Monitoring	1982
46A	2	14	34	34	332576.5	1547870.4	A	Monitoring	1982
47A Sealed	2	14	34	34	332424 4	1547966 1	A	Monitoring	1982
48A Sealed	2	15	35	35	332479	1547975.3	A	Monitoring	1982
49A Sealed	2	15	30	30	332258 1	1548329 8	A	Monitoring	1982
4A	2	20	35	35	330832 8	1547620	A	Monitoring	1982
50A	2	12	26 5	26 5	332050 5	1549069 6	A	Monitoring	1982
51A	2	14	34	34	332530 3	1548407 4	A	Monitoring	1982
52A Sealed	2				332448 7	1548650 2	A	Monitoring	1982
53A Sealed	1				332475 5	1548681	A	Monitoring	1983
55A Sealed	2				332405 6	1548904.9	A	Monitoring	1982
56A	2	10	25	25	332253.2	1549147.1	A	Monitoring	1982

TABLE 3-2
MONITORING WELL DETAILS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	North	East	Aquifer	Purpose	Construction year
57A	2	15	35	35	332801 8	1548210	A	Monitoring	1982
58A	2	10	30	30	332574 8	1548891 5	A	Monitoring	1982
59A	2	15	30	30	333029 1	1548184 8	A	Monitoring	1982
5A Sealed	2	15	35	35	330868	1547637	A	Monitoring	1982
60A Sealed	2	15	35	35	332936 5	1548499 2	A	Monitoring	1982
61A	2	16	31	31	333312 9	1547992	A	Monitoring	1982
63A	2	7	33	33	333517 2	1548683 8	A	Monitoring	1982
64A	2	8 5	25	25	333300 3	1549209 3	A	Monitoring	1982
66A	4	10	20	20	335190 6	1548957 7	A	Monitoring	1982
67A	4	21	31	31	332905 1	1548576 3	A	Monitoring	1982
68A	4	21	31	31	332446 1	1547993 4	A	Monitoring	1982
69A	4	21	31	31	331944 7	1548732 3	A	Monitoring	1982
6A	2	20	39	39	330807 5	1547679 9	A	Monitoring	1982
70A	4	25	35	35	330836 2	1547704 3	A	Monitoring	1982
71A	12	26	31	37 5	330836 6	1547694 2	A	Extraction	1987
76A	4	10	20	22	333066 1	1548718 7	A	Monitoring	1985
7A Sealed	2	23	35	35	330831	1547754 5	A	Monitoring	1982
80A	4	23	31	33	332583 8	1548833 1	A	Monitoring	1985
83A	4	15	33	35	331535 7	1548751 3	A	Monitoring	1985
84A	4	18	28	30	332110 6	1548012 1	A	Monitoring	1985
85A	4	15	30	33	334685 2	1548324 3	A	Monitoring	1986
86A	4	15	25	27	335163 5	1549520 7	A	Monitoring	1986
87A Sealed	4	15	33	35	331546 4	1548754 3	A	Monitoring	1986
8A Sealed	2	20	35	35	330792 2015	1547773 251	A	Monitoring	1982
90A	4	15	30	32	336647 9	1548475 2	A	Monitoring	1[illegible]
91A	4	11	26	28	337146 8	1549712 6	A	Monitoring	19[illegible]
94A	4	33	38	40	338557 1	1547201	A	Monitoring	1986
96A	4	32	37	39	338402 5	1546394 5	A	Monitoring	1986
97A	4	10	20	22	335373	1546366 2	A	Monitoring	1986
98A Sealed	4	13	28	30	331309 7	1548394 6	A	Monitoring	1986
9A	2	15	40	40	330769 8	1547949	A	Monitoring	1982
AE/RW-13-1 Sealed	6	8	29	30	331499 61	1547947 21	A	Extraction	1995
AE/RW-19-1 Sealed	6	8	29	30	330875 41	1547703 2	A	Extraction	1994
AE/RW-19-2 Sealed	6	8	29	30	330887 78	1548047 25	A	Extraction	1994
AE/RW-9-1	6	8	33	36	331891 05	1548561 14	A	Extraction	1996
AE/RW-9-2	6	8	37	38	331877 31	1548709 6	A	Extraction	1996
AE/RW-9-3 Sealed	6	8	36	37	331990 31	1548779 88	A	Extraction	1996
AE/RW-9-4 Sealed	6	8	35	36	331765 87	1548746 19	A	Extraction	1996
RW-10A Sealed	6	18	38	40	331929 71	1548636 34	A	Extraction	1985
RW-11A	6	25	35	37	331027 9	1547676 4	A	Extraction	1985
RW-12A	6	25	35	37	330996 4	1547786 3	A	Extraction	1985
RW-13A Sealed	8	29 5	39 5	40 5	330786 8	1547866 1	A	Extraction	1988
RW-14A Sealed	6	18	28	29	330759 2	1548027 8	A	Extraction	1988
RW-15A Sealed	2	20	35	36	331024 6	1548104 9	A	Extraction	1988
RW-16A	8	22	32	33	332102 3	1548307 8	A	Extraction	1988
RW-17A Sealed	6	15	25	26	332445 9	1548438	A	Extraction	1988
RW-18A	6	25	35	36	332679 3	1548621 7	A	Extraction	1988
RW-19A Sealed	6	12	22	23	332981	1548692 8	A	Extraction	1988
RW-1A	6	20	35	35	331261	1547666 8	A	Extraction	1985
RW-20A	8	26 5	36 5	37 5	331760 1	1548663 5	A	Extraction	1988
RW-21A	6	21	36	37	331830 4	1548518 1	A	Extraction	1988
RW-22A Sealed	6	28	33	34	330841 8448	1547606 007	A	Extraction	1988
RW 23A	6	24 5	34 5	35	331106 78	1547852 96	A	Extraction	199[illegible]
RW-24A	2	22	32	33	331530 46	1547924 98	A	Extraction	19[illegible]
RW-25A	6	52	60	32	332607 01	1548721 1	A	Extraction	1995
RW-26A	6	22	32	34	330838 8657	1547600 546	A	Extraction	1997

TABLE 3-2
MONITORING WELL DETAILS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	North	East	Aquifer	Purpose	Construction year
RW-27A	6	15	25	27.5	332975.087	1548721.144	A	Extraction	1997
RW-28A	6	18	28	31	332440	1548485	A	Extraction	2000
RW-29A	6	20	35	17			A	Extraction	2002
RW-2A	2	19	34	36	331608.6	1547842.8	A	Extraction	1985
RW-3A	6	19 6	29.6	32	332181 9	1547927.1	A	Extraction	1985
RW-4A	6	18	28	32	332668.9	1548032.3	A	Extraction	1986
RW-5A	6	19.5	29.5	32	332836 4	1548213.7	A	Extraction	1985
RW-7A	6	15	35	37	333128 3	1548562.8	A	Extraction	1986
100B1 Sealed	4	49	54	56	330724	1548087	B1	Monitoring	1986
101B1	4	50	65	67	330615.5	1547880.2	B1	Monitoring	1986
104B1	4	57	72	74	332083.2	1548880	B1	Monitoring	1986
106B1 Sealed	4	42	47	49	338761.9	1548352.6	B1	Monitoring	1986
109B1	4	54.5	69.5	71	332086.2	1548819.9	B1	Monitoring	1986
110B1	4	49	59	61	331282 5	1547760.4	B1	Monitoring	1986
111B1	4	39	49	52	335926.3	1547050.7	B1	Monitoring	1986
114B1	4	68	73	75	331073.7	1549157.7	B1	Monitoring	1986
115B1	4	59	64	65	332757.3	1548651	B1	Monitoring	1986
117B1	4	53	63	65	331033.2	1547789.5	B1	Monitoring	1986
120B1	4	49	59	61	331039.4	1546738 8	B1	Monitoring	1986
126B1 Sealed	4	45	50	51	331261.7	1548549	B1	Monitoring	1987
135B1 Sealed	4	55	70	74	331191	1548792	B1	Monitoring	1987
137B1 Sealed	4	56	76	78	331230 6	1548651.4	B1	Monitoring	1987
138B1	4	55.5	58.5	58 5	338393.6	1546392.9	B1	Monitoring	1988
144B1	6	67	77	77	331682.1	1546302.1	B1	Monitoring	1994
145B1	6	53	63	65	331136.83	1548003.23	B1	Monitoring	1994
147B1	6	50	60	62	333120.3	1548172 01	B1	Monitoring	1995
148B1	2	49	59	60.5	334878.36	1548421.03	B1	Monitoring	2001
149B1	2	48	58	60	334704 65	1548991.86	B1	Monitoring	2001
150B1	2	48	58	60	334697.36	1549058.26	B1	Monitoring	2001
151B1	2	34	54	56	335625 17	1547964 01	B1	Monitoring	2001
152B1	2	34	54	56	335685 25	1548118.1	B1	Monitoring	2001
153B1	2	32	42	44	337119.35	1548397.26	B1	Monitoring	2001
154B1	2	32	42	44	337194 85	1548565.54	B1	Monitoring	2001
155B1	2	32	52	54	336029.48	1547104 82	B1	Monitoring	2001
156B1	4	49	54	55			B1	Monitoring	2002
19B1 Sealed	4	67	72	73	331292	1547643 4	B1	Monitoring	1985
1B1 Sealed	4	72	85	85	331276.6	1547776 4	B1	Monitoring	1982
20B1	4	57	67	68	332139.9	1547887.7	B1	Monitoring	1985
21B1	4	59	63	64	333292.5	1548237.8	B1	Monitoring	1985
22B1	4	61	71	72	330841.8	1547455.9	B1	Monitoring	1985
25B1	4	64	74	76	331531.2	1548749.4	B1	Monitoring	1985
2B1	4	47	59	60	332306 2	1548456.3	B1	Monitoring	1982
35B1 Sealed	4	67	72	73	331271.1	1547640.1	B1	Monitoring	1985
3B1	4	60	72	78	333074.8	1548702.4	B1	Monitoring	1982
4B1	4	54	64	64	334393.9	1548699.4	B1	Monitoring	1982
5B1 Sealed	4	54.5	64 5	64 5	332559.3	1548012 6	B1	Monitoring	1982
60B1	4	63	73	75	333013.9	1548718.5	B1	Monitoring	1985
67B1	4	56	62	67	333814 6	1546559 7	B1	Monitoring	1985
69B1	4	54	59	61	331928 8	1548625 1	B1	Monitoring	1986
73B1 Sealed	4	50	60	62 5	335159 8	1549490 7	B1	Monitoring	1986
7B1	4	68	78	78	331271 6	1548517 8	B1	Monitoring	1982
80B1	4	40	55	57	336651	1548480 6	B1	Monitoring	1986
84B1	4	47	52	54	338548 8	1547198 3	B1	Monitoring	1986
85B1	4	42	47	49	338752 4	1548349 6	B1	Monitoring	1986
86B1	4	42	52	54	337183.7	1545732 8	B1	Monitoring	1987
93B1	4	52	67	69	330705 9	1547569.3	B1	Monitoring	1986

TABLE 3-2
MONITORING WELL DETAILS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	North	East	Aquifer	Purpose	Construction year
94B1	4	58	73	75	331140 7	1548949	B1	Monitoring	1986
95B1	4	50	65	67	330643 7	1547661 4	B1	Monitoring	1986
96B1 Sealed	4	38	53	55	331099 7	1548168	B1	Monitoring	1986
97B1	4	57	67	69	331220	1548694 5	B1	Monitoring	1986
99B1	4	61	76	78	331251 7	1548582	B1	Monitoring	1986
RW-10(B1)	2	55	65	66	331105 41	1547777 21	B1	Extraction	1994
RW-11(B1)	2	51	61	63	331568 23	1547963 63	B1	Extraction	1995
RW-12(B1)	6	52	62	68	332642 13	1548447 42	B1	Extraction	1995
RW-3(B1)	6	46	56	59	332142 6	1547956	B1	Extraction	1985
RW-4(B1)	6	50	60	63	332523 9	1548031 4	B1	Extraction	1986
RW-5(B1)	6	43	58	62	332869 9	1548152 4	B1	Extraction	1985
RW-7(B1)	6	55	65	67	333137 5	1548562 8	B1	Extraction	1986
RW-9(B1)	6	59	69	76	333063 8	1548702 9	B1	Extraction	1985
107B2	4	81 5	86 5	88 5	332080 5	1548814 9	B2	Monitoring	1986
108B2	4	77	82	84	332072 8	1548877 7	B2	Monitoring	1986
116B2	4	85	95	97	332893 1	1547019 9	B2	Monitoring	1986
118B2	4	84	89	91	332015 1	1548379 8	B2	Monitoring	1986
11B2	2	87	92	92	333300 4	1548227 2	B2	Monitoring	1985
121B2 Sealed	4	81	86	88	335939 8	1547048 1	B2	Monitoring	1986
127B2 Sealed	4	80	90	92	330892	1546958 6	B2	Monitoring	1987
130B2	4	102	112	114	330543 8	1548026 2	B2	Monitoring	1987
131B2 Sealed	4	80	90	92	331306 1	1548405 1	B2	Monitoring	1987
136B2 Sealed	4	80	90	96	331215 6	1548709 1	B2	Monitoring	1987
141B2	4	95	100	101	332066 7	1547050 1	B2	Monitoring	1988
146B2	6	85	95	97	331275 99	1547780 01	B2	Monitoring	199[illegible]
148B2	6	75	85	87	333112 22	1548169 54	B2	Monitoring	199[illegible]
18B2 Sealed	4	94	99	101	330026 5	1548860 7	B2	Monitoring	1985
23B2	4	82	85	86	332487 7	1548005 7	B2	Monitoring	1985
24B2	4	79 5	87	90	333075 3	1548695 2	B2	Monitoring	1985
34B2 Sealed	4	82	85	86 5	333658 8	1547093 6	B2	Monitoring	1985
40B2	4	87	92	93	331268 1	1547653	B2	Monitoring	1985
42B2	4	87	97	99	331532 2	1548761 2	B2	Monitoring	1985
45B2	4	101	111	113	334683 7	1548303 9	B2	Monitoring	1985
52B2 Sealed	4	93	98	100	335163 6	1549499 7	B2	Monitoring	1985
53B2	4	97	102	104	334258 5	1549519 5	B2	Monitoring	1985
61B2 Sealed	4	76	86	87	333025 3	1548695 3	B2	Monitoring	1985
64B2(R)	4	79	84	85	332696 8	1549518 4	B2	Monitoring	1985
71B2 Sealed	4	88	93	95	334362 5	1548666 4	B2	Monitoring	1986
88B2	4	95	105	107	330649 2	1547665	B2	Monitoring	1986
90B2	4	94	104	106	330871 5	1548058	B2	Monitoring	1986
9B2	2	87	97	98	331272 5	1547632 5	B2	Monitoring	1985
RW-1(B2)	2	87	92	97	331262 9	1547666 7	B2	Extraction	1985
RW-2(B2)	2	76	96	98	331605	1547853 8	B2	Extraction	1985
RW-3(B2)	6	76	91	94	332149 6	1547957 9	B2	Extraction	1985
RW-4(B2)	6	74 5	89 5	93	332485 1	1547967 1	B2	Extraction	1986

TABLE 3-3
ABANDONED WELLS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	Year Abandoned	Replacement Well
100B1 Sealed	4	49	54	56	1996	
102A Sealed	4	24	34	36	1996	
103A Sealed	4	18	28	30	1996	
104A Sealed	4	20	25	27	1996	
10A Sealed	2	23	35	35	1986	
111A Sealed	4	22	37	39.5	1996	
112A Sealed	4	25	40		1996	
114A Sealed	4	15	25	26	1996	
117A Sealed	4	13	28	29	1996	
11A Sealed	2	19	39	39	1989	
121B2 Sealed	4	81	86	88	1996	
126B1 Sealed	4	45	50	51	1996	
127B2 Sealed	4	80	90	92	1996	
131A Sealed	4	17	27	29	2001	175A
131B2 Sealed	4	80	90	92	1996	
132A Sealed	4	17	27	29	2001	174A
135A Sealed	4	22	32	34	1997	
135B1 Sealed	4	55	70	74	1996	
136B2 Sealed	4	80	90	96	1996	
137B1 Sealed	4	56	76	78	1996	
13A Sealed	2	15	40	40	1997	
14A Sealed	2	18	38	40	1996	
150A Sealed	4	14.5	34.5	35	1997	160A
18A Sealed	2	15	40	40	1986	
18B2 Sealed	4	94	99	101	1996	
19A Sealed	2	18	33	33	2001	
19B1 Sealed	4	67	72	73	1986	
1B1 Sealed	4	72	85	85	1987	
25A Sealed	2	15	30	30	1996	
27A Sealed	2	14	32	32	1996	158A
2A Sealed	2	22	35	35	1986	
30A Sealed	2	15	30	30	1986	
34A Sealed	1			20	1986	
34B2 Sealed	4	82	85	86.5	1996	
35B1 Sealed	4	67	72	73	1996	
3A Sealed	2	20	37	37	1996	
3A Sealed	2	20	37	37	1996	
47A Sealed	2	14	34	34	1986	
48A Sealed	2	15	35	35	1986	
49A Sealed	2	15	30	30	1996	
52A Sealed	2				1987	
52B2 Sealed	4	93	98	100	1996	
53A Sealed	1				1986	
55A Sealed	2				1987	
5A Sealed	2	15	35	35	1996	
5B1 Sealed	4	54.5	64.5	64.5	1986	
60A Sealed	2	15	35	35	1997	
7A Sealed	2	23	35	35	1996	161A
7C Sealed	4	193	218	220	1997	

TABLE 3-3
ABANDONED WELLS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Well ID	Casing Diam	Top of Screen	Bottom of Screen	Total Depth	Year Abandoned	Replacement Well
87A Sealed	4	15	33	35	1995	
8A Sealed	2	20	35	35	1997	
96B1 Sealed	4	38	53	55	2001	156B1
98A Sealed	4	13	28	30	1996	
AE/RW-13-1 Sealed	6	8	29	30	1997	
AE/RW-19-1 Sealed	6	8	29	30	1997	
AE/RW-19-2 Sealed	6	8	29	30	1997	
AE/RW-9-3 Sealed	6	8	36	37	1998	
AE/RW-9-4 Sealed	6	8	35	36	1998	
RW-10A Sealed	6	18	38	40	1998	
RW-13A Sealed	8	29.5	39.5	40.5	1996	
RW-14A Sealed	6	18	28	29	1996	
RW-15A Sealed	2	20	35	36	2001	RW-29A
RW-17A Sealed	6	15	25	26	1999	RW-28A
RW-19A Sealed	6	12	22	23	1997	RW-27A
RW-22A Sealed	6	28	33	34	1997	

TABLE 4-1
NPDES PERMIT COMPLIANCE, ORDER NO. 99-051, PERMIT NO. CAG912003
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

SYSTEM 1		
Date	**Description, Exceedance, and Duration**	**Corrective Actions**
Late 1996 - Early 1997	Selenium detected in effluent above permit limits.	Engineering controls implemented to reduce flows from recovery wells with elevated selenium concentrations.
1998	An evaluation of selenium treatment technologies was performed.	A temporary exemption from effluent requirements for selenium was requested. RWQCB changed the effluent limits of selenium from concentration-based to mass-based. Effluent meets the mass-based limits.
29-Oct-99	NPDES permit CAG912003 was issued for the system. The new permit limit for selenium is based on mass discharge instead of concentration. Since this revision, no exceedances have occurred.	N/A

SYSTEM 3		
Date	**Description, Exceedance, and Duration**	**Corrective Actions**
29-Oct-99	NPDES permit CAG912003 was issued for the system.	N/A
Nov-02	1,4-dioxane detected in system effluent. An analysis of treatment technologies was performed. The analysis showed that the available technologies are technically impracticible, and that the effluent concentration of 1,4-dioxane is well below applicable toxicity criteria.	N/A

SYSTEM 3		
Date	**Description, Exceedance, and Duration**	**Corrective Actions**
29-Oct-99	NPDES permit CAG912003 was issued for the system.	N/A

TABLE 4-2
BAAQMD PERMIT COMPLIANCE
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

ALL SYSTEMS		
Date	**Description, Exceedance, and Duration**	**Corrective Actions**
22-Jan-87	Authority to construct was issued.	N/A
27-Sep-88	Permit to Operate was issued for the treatment systems.	N/A
1988-2003	No violations were recorded	N/A
September 2003	The treatment systems were shut off, demolished, and replaced with liquid phase GAC system.	N/A

TABLE 4-3
FAIRCHILD TREATMENT SYSTEM OPERATION SUMMARY
MIDDLEFIELD-ELLIS-WHISMAN SITE
MOUNTAIN VIEW, CALIFORNIA

System 1 **515 and 545 N. Whisman Road**	
Jan 88 - Dec 99	The groundwater treatment system began operation in Jan 88 and was operational through Dec 99. Major components of the treatment system included one packed-tower air stripper, anti-scalant chemical, two filter units, and a transfer pump. The system treated extracted groundwater from "A", "B1", and "B2" aquifers source control recovery and regional recovery wells. The air stripper was operated under the BAAQMD permit.
Jan 00 - Oct 00	The treatment system was off during this period due to the ongoing land development at the site.
Oct 00 - Apr 03	The treatment system was operational during this time.
22 Apr - 18 Aug 03	The treatment system was shut off, demolished, and replaced with liquid phase GAC system.
18 Aug 03 - Sept 03	The new liquid phase GAC system began operation and has been operational since then.

System 3 **313 Fairchild Drive**	
Jan 88 - Oct 97	The groundwater treatment system began operation in Jan 88 and was operational through Oct 97. Major components of the treatment system included one packed-tower air stripper, anti-scalant chemical, two filter units, and a transfer pump. The system treated extracted groundwater from "A", "B1", and "B2" aquifers source control recovery and regional recovery wells. The air stripper was operated under the BAAQMD permit.
Oct 97 - Aug 98	The treatment system was off during this period due to the ongoing land development at the site.
Aug 98 - Apr 03	The treatment system was operational during this time.
22 Apr - 18 Aug 03	The treatment system was shut off, demolished, and replaced with liquid phase GAC system.
18 Aug 03 - Sept 03	The new liquid phase GAC system began operation and has been operational since then.

System 19 **369 N. Whisman Road**	
Jan 88 - Aug 97	The groundwater treatment system began operation in Jan 88 and was operation through Aug 97. Major components of the treatment system included one packed-tower air stripper, anti-scalant chemical, two filter units, and a transfer pump. The system treated extracted groundwater from "A", "B1", "B2" and deep aquifers source control recovery and regional recovery wells. The air stripper was operated under the BAAQMD permit.
Aug 97 - Feb 98	Thetreatment system was off during this period due to the ongoing land development at the site.
Feb 98 - Apr 03	The treatment system was operational during this time.
22 Apr - 18 Aug 03	The treatment system was shut off, demolished, and replaced with liquid phase GAC system.
18 Aug 03 - Sept 03	The new liquid phase GAC system began operation and has been operational since then.

Note:
Other minor down times less than 24 hours may have occurred during the following events: extraction well development/redevelopment and regular treatment system maintenance.

TABLE 4-4
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 1
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Jan-88	9.6	10.0	68.33	3,050,251	3576	110.9	111	3725	115.5	115
Feb-88	9.2	9.2	46.91	1,891,411	2,353	65.9	177	2,353	65.9	181
Mar-88	8.4	8.4	58.28	2,601,619	2,669	82.7	259	2,669	82.7	264
Apr-88	7.8	7.9	50.8	2,194,560	2,160	64.8	324	2,177	65.3	329
May-88	6.9	6.9	64.74	2,889,994	2,436	75.5	400	2,436	75.5	405
Jun-88	6.7	6.7	57.04	2,464,128	2,084	62.5	462	2,084	62.5	467
Jul-88	5.9	6.3	45.96	2,051,654	1,478	45.8	508	1,576	48.9	516
Aug-88	3.7	3.7	35.4	1,580,256	714	22.1	530	714	22.1	538
Sep-88	2.8	2.9	40.38	1,744,416	616	18.5	549	641	19.2	558
Oct-88	3.2	3.3	36.8	1,642,752	642	19.9	569	664	20.6	578
Nov-88	4.0	4.2	29.8	1,287,360	650	19.5	588	676	20.3	599
Dec-88	3.8	4.0	24.14	1,077,610	500	15.5	604	521	16.2	615
Jan-89	3.1	3.2	6.39	285,250	108	3.3	607	111	3.4	618
Feb-89	2.2	2.2	6.87	276,998	82	2.3	609	82	2.3	620
Mar-89	3.8	4.0	9.83	438,811	204	6.3	616	212	6.6	627
Apr-89	4.7	5.2	35.59	1,537,488	912	27.4	643	1,013	30.4	657
May-89	3.4	3.8	27.41	1,223,582	508	15.8	659	565	17.5	675
Jun-89	3.9	4.3	27.69	1,186,112	589	17.5	676	652	19.4	694
Jul-89	5.0	5.8	22.69	1,011,189	619	19.1	695	711	22.0	716
Aug-89	4.2	4.8	30.76	1,363,892	704	21.7	717	808	24.9	741
Sep-89	4.1	4.7	31.81	1,345,100	711	20.9	738	806	23.7	765
Oct-89	4.3	5.1	48.4	1,281,576	1,135	20.9	759	1,337	24.6	789
Nov-89	4.2	4.5	30.03	1,191,809	688	19.0	778	735	20.3	810
Dec-89	4.6	5.0	35.01	1,482,117	878	25.8	804	963	28.3	838
Jan-90	4.7	5.1	32.94	1,689,501	844	30.1	834	914	32.5	871
Feb-90	4.4	4.9	35.95	1,449,515	862	24.1	858	955	26.7	897
Mar-90	4.4	5.3	35.15	1,518,722	843	25.3	883	1,023	30.7	928
Apr-90	4.7	5.5	37.37	1,668,143	958	29.7	913	1,114	34.5	963
May-90	4.3	5.3	36.46	1,627,566	855	26.5	939	1,051	32.6	995
Jun-90	3.2	3.9	35.94	1,500,994	627	18.2	958	756	21.9	1,017
Jul-90	3.2	3.7	34.93	1,614,476	609	19.6	977	708	22.7	1,040
Aug-90	4.3	4.6	34.36	1,534,111	806	25.0	1,002	856	26.5	1,066
Sep-90	6.3	6.3	32.78	1,321,737	1,126	31.5	1,034	1,126	31.5	1,098
Oct-90	8.6	8.6	32.64	1,551,232	1,530	50.5	1,084	1,530	50.5	1,148
Nov-90	8.0	8.0	28.57	1,234,546	1,246	37.4	1,121	1,246	37.4	1,186
Dec-90	6.0	6.0	27.99	1,249,441	916	28.4	1,150	916	28.4	1,214
Jan-91	11.3	11.3	19.7	1,270,774	1,217	54.5	1,204	1,217	54.5	1,269
Feb-91	7.2	7.2	30.77	1,240,901	1,208	33.8	1,238	1,208	33.8	1,303
Mar-91	7.6	8.4	32.72	1,354,172	1,347	38.7	1,277	1,497	43.0	1,346
Apr-91	4.7	4.7	33.08	1,524,245	839	26.8	1,304	839	26.8	1,372
May-91	3.1	3.1	33.71	1,504,778	561	17.4	1,321	561	17.4	1,390
Jun-91	3.4	3.4	24.79	1,106,789	460	14.2	1,335	460	14.2	1,404
Jul-91	3.7	3.8	31.94	1,458,942	636	20.2	1,356	658	20.9	1,425
Aug-91	3.2	3.6	30.83	1,331,670	538	16.1	1,372	612	18.4	1,443
Sep-91	2.4	2.8	28.45	1,355,672	372	12.3	1,384	441	14.6	1,458
Oct-91	2.6	3.0	29.18	1,336,216	414	13.2	1,397	469	14.9	1,473
Nov-91	3.7	4.3	18.45	1,018,081	372	14.3	1,411	433	16.6	1,489
Dec-91	4.4	5.7	18.54	1,252,067	440	20.6	1,432	572	26.8	1,516
Jan-92	3.9	4.8	29.65	1,365,184	634	20.3	1,452	770	24.6	1,541
Feb-92	3.3	3.3	31.85	1,325,204	577	16.7	1,469	577	16.7	1,557
Mar-92	2.9	3.2	31.1	1,494,416	495	16.5	1,485	541	18.0	1,575
Apr-92	3.0	3.0	35.55	1,535,791	572	17.2	1,503	572	17.2	1,593
May-92	2.7	2.8	35.13	1,467,023	509	14.8	1,517	532	15.4	1,608
Jun-92	2.7	2.7	33.14	1 479 423	488	15.1	1,533	488	15.1	1 623
Jul-92	3.3	3.9	36.72	1,296,036	651	15.9	1,548	791	19.4	1,643
Aug-92	6.1	7.2	25.24	1,126,820	841	26.1	1,575	992	30.8	1,673
Sep-92	3.5	4.2	21.94	537,145	419	7.1	1,582	498	8.5	1,682
Oct-92	2.8	3.3	26.31	1,221,885	402	13.0	1,595	476	15.4	1,697
Nov-92	3.0	3.5	30.68	1,369,480	493	15.3	1,610	584	18.1	1,715

TABLE 4-4

TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL

FAIRCHILD SYSTEM 1

MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Dec-92	2.3	3.3	41.35	1,846,073	510	15.8	1,626	754	23.4	1,739
Jan-93	2.1	3.9	28.554861	1,192,458	330	9.6	1,635	612	17.7	1,756
Feb-93	3.6	4.2	48.850694	1,969,672	969	27.1	1,662	1,108	31.0	1,787
Mar-93	3.5	4.2	56.392361	2,679,755	1,077	35.6	1,698	1,291	42.6	1,830
Apr-93	3.9	5.1	49.3	2,129,646	1,038	31.1	1,729	1,371	41.1	1,871
May-93	4.0	4.6	47.5	1,915,389	1,031	28.9	1,758	1,191	33.4	1,904
Jun-93	3.7	4.1	55.3	2,625,567	1,116	36.8	1,795	1,233	40.7	1,945
Jul-93	5.3	3.6	60.2	2,600,386	1,736	52.1	1,847	1,172	35.1	1,980
Aug-93	2.8	3.3	61.1	2,186,200	923	22.9	1,870	1,113	27.6	2,008
Sep-93	2.3	2.6	61.5	2,656,135	754	22.6	1,892	855	25.6	2,034
Oct-93	1.3	1.5	63.3	2,643,170	452	13.1	1,906	528	15.3	2,049
Nov-93	3.0	3.3	66.4	3,059,482	1,075	34.4	1,940	1,191	38.1	2,087
Dec-93	2.3	2.8	60.7	2,620,983	768	23.0	1,963	927	27.8	2,115
Jan-94	2.2	2.8	47.3	2,177,331	573	18.3	1,981	720	23.0	2,138
Feb-94	2.6	3.1	45.2	1,821,996	646	18.1	1,999	764	21.4	2,159
Mar-94	2.5	2.9	45.2	2,019,766	616	19.1	2,018	717	22.3	2,181
Apr-94	2.5	2.9	43.1	1,799,170	587	17.0	2,035	686	19.9	2,201
May-94	2.2	2.6	41.1	1,892,971	484	15.5	2,051	583	18.6	2,220
Jun-94	2.4	2.9	53.4	2,307,078	707	21.2	2,072	836	25.1	2,245
Jul-94	2.2	2.6	55.6	2,320,351	679	19.7	2,092	788	22.8	2,268
Aug-94	2.0	2.4	58.6	2,699,704	649	20.8	2,113	760	24.3	2,292
Sep-94	2.1	2.6	56.8	2,452,959	647	19.4	2,132	799	24.0	2,316
Oct-94	2.2	2.7	55.7	2,485,544	665	20.6	2,153	814	25.2	2,341
Nov-94	1.4	2.5	33.7	1,457,966	255	7.7	2,160	467	14.0	2,355
Dec-94	1.8	2.9	46.6	2,080,441	455	14.1	2,174	739	22.9	2,378
Jan-95	2.3	2.8	54.7	2,518,878	698	22.3	2,197	843	26.9	2,405
Feb-95	2.2	2.7	56	2,256,795	656	18.4	2,215	815	22.8	2,428
Mar-95	2.3	2.9	57.6	2,573,152	713	22.1	2,237	895	27.8	2,456
Apr-95	2.3	2.8	81.7	3,292,505	1,020	28.5	2,266	1,261	35.3	2,491
May-95	2.3	2.8	143.2	6,807,061	1,772	58.5	2,324	2,163	71.4	2,563
Jun-95	2.2	2.4	64.5	2,784,372	756	22.7	2,347	851	25.5	2,588
Jul-95	2.0	2.3	37.7	1,684,292	401	12.4	2,359	471	14.6	2,603
Aug-95	1.5	1.8	46.9	2,094,063	391	12.1	2,371	455	14.1	2,617
Sep-95	1.4	1.8	32.5	1,402,458	255	7.6	2,379	326	9.8	2,627
Oct-95	1.6	2.0	39.3	1,812,034	347	11.1	2,390	422	13.5	2,640
Nov-95	1.3	1.5	35.8	1,546,903	260	7.8	2,398	291	8.7	2,649
Dec-95	1.2	1.5	33.5	530,066	225	2.5	2,400	268	3.0	2,652
Jan-96	5.4	10.7	61.1	791,375	1,796	16.2	2,417	3,564	32.1	2,684
Feb-96	4.3	3.4	90.2	3,766,032	2,129	61.7	2,478	1,652	47.9	2,732
Mar-96	2.3	2.8	91.6	3,826,755	1,169	33.9	2,512	1,378	40.0	2,772
Apr-96	2.0	2.4	91.4	4,209,626	982	31.4	2,544	1,176	37.6	2,809
May-96	2.1	2.5	101	4,508,500	1,162	36.0	2,580	1,366	42.3	2,852
Jun-96	2.2	2.4	96.5	3,890,544	1,142	32.0	2,612	1,268	35.5	2,887
Jul-96	1.8	2.3	101.2	4,518,076	1,010	31.3	2,643	1,252	38.8	2,926
Aug-96	1.8	2.1	88.3	3,939,555	862	26.7	2,670	997	30.9	2,957
Sep-96	2.7	3.1	94.7	4,090,989	1,368	41.0	2,711	1,580	47.4	3,004
Oct-96	9.7	11.1	77.5	3,460,251	4,086	126.7	2,837	4,703	145.8	3,150
Nov-96	8.2	9.2	73.6	2,861,638	3,299	89.1	2,926	3,685	99.5	3,250
Dec-96	4.8	4.9	72.6	3,555,468	1,900	64.6	2,991	1,955	66.5	3,316
Jan-97	6.1	6.5	81.4	3,635,766	2,689	83.4	3,075	2,894	89.8	3,406
Feb-97	6.5	7.2	83	3,346,147	2,919	81.7	3,156	3,258	91.2	3,497
Mar-97	5.3	6.0	76.6	3,418,815	2,213	68.6	3,225	2,493	77.3	3,574
Apr-97	5.1	5.7	70.5	3,145,428	1,953	60.5	3,285	2,187	67.8	3,642
May-97	4.6	5.1	68.5	3,059,344	1,703	52.8	3,338	1,905	59.1	3,701
Jun-97	5.2	5.9	73.8	3,186,424	2,080	62.4	3,401	2,382	71.4	3,773
Jul-97	4.7	6.0	67.5	971,979	1,719	17.2	3,418	2,193	21.9	3,794
Aug-97	4.9	5.3	55.2	1,909,000	1,481	35.6	3,453	1,583	38.0	3,833
Sep-97	4.0	4.3	69.1	2,986,000	1,496	44.9	3,498	1,631	49.0	3,881
Oct-97	4.8	5.1	76.5	3,414,960	2,002	62.1	3,560	2,127	65.9	3,947

TABLE 4-4
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 1
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Nov-97	4.3	4.7	80.4	3,473,280	1,885	56.5	3,617	2,056	61.7	4,009
Dec-97	3.3	3.7	85.3	3,807,792	1,535	47.6	3,664	1,739	53.9	4,063
Jan-98	4.2	4.9	41.7	1,801,000	959	28.8	3,693	1,103	33.1	4,096
Feb-98	4.1	4.7	91.0	3,539,000	2,034	54.9	3,748	2,342	63.2	4,159
Mar-98	3.5	4.0	84.7	3,780,000	1,616	50.1	3,798	1,861	57.7	4,217
Apr-98	3.7	4.1	87.4	3,250,000	1,739	44.9	3,843	1,973	50.9	4,268
May-98	3.5	4.0	86.7	3,383,000	1,654	44.8	3,888	1,881	51.0	4,319
Jun-98	5.3	6.0	91.4	3,082,000	2,651	62.1	3,950	2,995	70.1	4,389
Jul-98	4.4	5.1	65.9	2,944,000	1,581	49.0	3,999	1,818	56.4	4,445
Aug-98	3.9	4.6	66.6	2,972,000	1,416	43.9	4,043	1,663	51.5	4,497
Sep-98	3.2	3.8	64.8	2,798,000	1,145	34.3	4,077	1,339	40.2	4,537
Oct-98	3.4	3.8	74.7	3,333,000	1,364	42.3	4,120	1,556	48.2	4,585
Nov-98	3.7	4.1	74.5	3,219,000	1,515	45.5	4,165	1,661	49.8	4,635
Dec-98	3.3	3.8	62.9	2,810,000	1,132	35.1	4,200	1,310	40.6	4,676
Jan-99	2.9	3.3	62.8	2,803,000	993	30.8	4,231	1,130	35.0	4,711
Feb-99	3.6	4.1	66.2	2,672,128	1,299	36.4	4,267	1,480	41.5	4,752
Mar-99	2.3	2.7	66.2	2,952,872	830	25.7	4,293	975	30.2	4,783
Apr-99	3.1	3.6	68.1	2,942,000	1,151	34.5	4,328	1,337	40.1	4,823
May-99	4.6	5.3	66.4	2,965,000	1,665	51.6	4,379	1,919	59.5	4,882
Jun-99	3.4	3.9	65.3	2,824,000	1,210	36.4	4,416	1,389	41.7	4,924
Jul-99	4.4	5.1	63.8	2,849,000	1,531	47.5	4,463	1,774	55.0	4,979
Aug-99	3.8	4.4	65.9	2,940,000	1,365	42.3	4,505	1,581	49.0	5,028
Sep-99	2.6	2.9	63.0	2,720,000	893	26.8	4,532	996	29.9	5,058
Oct-99	2.5	2.9	61.7	2,753,000	841	26.1	4,558	976	30.2	5,088
Nov-99	2.6	2.9	58.4	2,530,000	828	24.9	4,583	923	27.8	5,116
Dec-99	1.9	2.3	27.4	1,220,000	284	8.8	4,592	344	10.6	5,126
Jan-00 to Sep-00	System was off because of property redevelopment activities.				-	-	4,592	-	-	5,126
Oct-00	2.3	2.9	35.9	1,609,000	451	14.0	4,606	564	17.5	5,144
Nov-00	1.8	2.3	79.0	3,414,556	776	23.3	4,629	989	29.7	5,174
Dec-00	2.3	2.9	75.9	3,386,944	951	29.5	4,659	1,188	36.8	5,210
Jan-01	2.6	3.2	75.5	3,368,500	1,070	33.2	4,692	1,314	40.7	5,251
Feb-01	2.3	2.9	76.6	3,089,000	961	26.9	4,719	1,221	34.2	5,285
Mar-01	1.5	2.0	81.0	3,618,061	663	20.5	4,739	864	26.8	5,312
Apr-01	1.3	1.8	81.6	3,526,839	579	17.4	4,757	805	24.1	5,336
May-01	2.2	2.5	79.5	3,549,100	954	29.6	4,786	1,083	33.6	5,370
Jun-01	2.1	2.8	79.1	3,423,103	906	27.2	4,813	1,214	36.5	5,406
Jul-01	2.2	2.8	75.8	3,382,391	909	28.2	4,842	1,157	35.9	5,442
Aug-01	1.5	1.9	75.8	3,383,500	620	19.2	4,861	785	24.3	5,466
Sep-01	1.1	1.4	76.7	3,262,103	460	13.6	4,874	585	17.3	5,484
Oct-01	1.4	1.9	74.6	3,327,897	573	17.7	4,892	771	23.9	5,508
Nov-01	1.4	1.9	74.6	3,327,897	573	17.7	4,910	771	23.9	5,532
Dec-01	1.7	2.2	75.3	3,361,625	686	21.3	4,931	907	28.1	5,560
Jan-02	1.7	2.3	78.3	3,456,746	713	21.9	4,953	978	30.0	5,590
Feb-02	1.1	1.6	74.2	2,991,629	461	12.9	4,966	635	17.8	5,607
Mar-02	0.8	1.1	75.6	3,373,333	330	10.2	4,976	453	14.0	5,621
Apr-02	0.8	1.0	76.1	3,289,576	319	9.6	4,986	427	12.8	5,634
May-02	0.3	0.6	75.3	3,362,734	140	4.3	4,990	234	7.3	5,642
Jun-02	0.8	1.0	84.1	3,631,155	376	11.3	5,001	477	14.3	5,656
Jul-02	1.0	1.3	75.6	3,376,270	396	12.3	5,014	536	16.6	5,672
Aug-02	0.8	1.0	75.1	3,353,037	328	10.2	5,024	409	12.7	5,685
Sep-02	0.7	0.9	72.6	3,136,172	257	7.7	5,031	352	10.6	5,696
Oct-02	1.3	1.9	70.7	3,154,442	501	15.5	5,047	732	22.7	5,718
Nov-02	1.2	1.5	74.9	3,238,079	490	14.7	5,062	613	18.4	5,737
Dec-02	1.2	1.5	75.0	3,343,464	491	15.2	5,077	613	19.0	5,756
Jan-03	1.1	1.5	75.7	3,378,122	454	14.1	5,091	621	19.3	5,775
Feb-03	1.5	2.1	71.5	2,882,395	585	16.4	5,107	808	22.6	5,798
Mar-03	1.3	1.9	67.4	3,010,300	478	14.8	5,122	687	21.3	5,819
Apr-03	1.4	2.0	75.5	3,260,090	576	17.3	5,139	814	24.4	5,843

TABLE 4-4

TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL

FAIRCHILD SYSTEM 1

MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
May-03 to Jul-03	System was off to replace air stripper unit with granular carbon vessel.				-	-	5,139	-	-	5,843
Aug-03	1.0	2.0	10.0	444,610	54	1.7	5,141	107	3.3	5,847
Sep-03	1.0	2.0	99.2	4,286,800	541	16.2	5,157	1,068	32.0	5,879

Notes:

No influent samples were collected in September 2003. The August 2003 influent sample is used to calculate the mass removal for September 2003.

TABLE 4-5
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 3
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Jan-88	8 7	8 7	73 2	3,265,416	3,470	107 6	108	3,470	107 6	108
Feb-88	17 0	17 0	75 9	3,060,691	7,036	197 0	305	7,036	197 0	305
Mar-88	7 8	8 3	102 5	4,573,368	4,357	135 1	440	4,636	143 7	448
Apr-88	11 0	11 7	80 6	3,481,920	4,834	145 0	585	5,142	154 2	603
May-88	12 0	13 3	94 0	4,197,053	6,151	190 7	775	6,818	211 4	814
Jun-88	11 0	11 5	93 9	4,057,776	5,633	169 0	944	5,889	176 7	991
Jul-88	11 0	11 8	82 1	3,664,944	4,924	152 6	1,097	5,282	163 7	1,154
Aug-88	8 5	8 5	78 3	3,495,312	3,629	112 5	1,209	3,629	112 5	1,267
Sep-88	8 5	9 5	84 5	3,649,968	3,916	117 5	1,327	4,376	131 3	1,398
Oct-88	8 6	9 5	80 1	3,574,771	3,755	116 4	1,443	4,148	128 6	1,527
Nov-88	7 3	7 9	65 4	2,824,416	2,602	78 1	1,521	2,816	84 5	1,611
Dec-88	6 0	6 0	26 3	1,173,139	860	26 7	1,548	860	26 7	1,638
Jan-89	7 7	8 1	0 3	11,160	10	0 3	1,548	11	0 3	1,638
Feb-89	5 0	5 2	18 0	726,970	492	13 8	1,562	508	14 2	1,652
Mar-89	6 4	7 6	28 4	1,265,544	989	30 7	1,593	1,175	36 4	1,689
Apr-89	6 9	6 9	49 4	2,134,944	1,859	55 8	1,649	1,859	55 8	1,745
May-89	9 2	9 8	52 7	2,351,635	2,642	81 9	1,730	2,800	86 8	1,831
Jun-89	7 5	7 5	54 4	2,344,681	2,224	66 6	1,797	2,224	66 6	1,898
Jul-89	8 2	9 5	50 8	2,274,283	2,270	70 6	1,868	2,622	81 5	1,979
Aug-89	7 0	7 0	44 1	1,955,776	1,682	51 8	1,920	1,682	51 8	2,031
Sep-89	7 6	7 6	33 4	1,386,770	1,384	39 9	1,959	1,384	39 9	2,071
Oct-89	6 7	6 7	32 2	1,545,045	1,175	39 2	1,999	1,175	39 2	2,110
Nov-89	6 3	6 3	10 6	469,656	365	11 2	2,010	365	11 2	2,122
Dec-89	9 2	9 9	46 0	1,923,349	2,306	67 0	2,077	2,470	71 8	2,193
Jan-90	7 6	8 1	47 4	2,424,456	1,963	69 8	2,147	2,096	74 5	2,268
Feb-90	6 8	6 8	47 7	1,921,222	1,767	49 5	2,196	1,767	49 5	2,317
Mar-90	6 5	7 0	45 7	1,976,251	1,621	48 6	2,245	1,748	52 5	2,370
Apr-90	7 0	7 0	47 7	2,131,007	1,822	56 5	2,301	1,822	56 5	2,426
May-90	6 5	6 5	47 3	2,111,280	1,676	52 0	2,353	1,676	52 0	2,478
Jun-90	7 4	7 4	47 3	1,834,041	1,910	51 4	2,405	1,910	51 4	2,530
Jul-90	7 1	7 1	46 0	2,117,808	1,781	56 9	2,461	1,781	56 9	2,587
Aug-90	7 4	7 4	36 7	1,636,944	1,479	45 9	2,507	1,479	45 9	2,632
Sep-90	6 8	7 5	31 6	1,274,379	1,172	32 8	2,540	1,286	36 0	2,668
Oct-90	4 4	4 5	43 0	2,042,997	1,031	34 0	2,574	1,045	34 5	2,703
Nov-90	8 2	8 9	42 0	1,815,551	1,879	56 4	2,631	2,044	61 3	2,764
Dec-90	8 6	9 7	35 6	1,588,446	1,667	51 7	2,682	1,880	58 3	2,823
Jan-91	4 4	4 5	27 8	1,812,556	667	30 2	2,712	676	30 6	2,853
Feb-91	10 0	10 8	42 2	1,702,935	2,302	64 5	2,777	2,477	69 4	2,922
Mar-91	10 0	10 8	47 7	1,981,340	2,601	75 0	2,852	2,815	81 2	3,004
Apr-91	5 1	5 5	47 4	2,185,213	1,319	42 2	2,894	1,427	45 7	3,049
May-91	9 2	9 2	44 0	1,963,965	2,195	68 0	2,962	2,195	68 0	3,117
Jun-91	7 8	8 3	21 5	961,794	916	28 4	2,991	977	30 3	3,148
Jul-91	24 0	24 8	38 1	1,735,397	4,980	157 7	3,148	5,138	162 7	3,310
Aug-91	6 5	6 5	38 1	1,644,246	1,349	40 5	3,189	1,349	40 5	3,351
Sep-91	6 7	6 7	34 9	1,671,577	1,264	42 1	3,231	1,264	42 1	3,393
Oct-91	5 8	5 8	35 0	1,606,105	1,097	35 0	3,266	1,097	35 0	3,428
Nov-91	8 8	9 4	25 7	1,418,174	1,232	47 3	3,313	1,316	50 5	3,478
Dec-91	9 8	10 5	36 8	1,802,911	1,967	66 9	3,380	2,111	71 8	3,550
Jan-92	21 0	24 4	39 4	1,758,924	4,511	139 9	3,520	5,242	162 5	3,713
Feb-92	9 5	9 5	44 2	1,782,989	2,290	64 1	3,584	2,290	64 1	3,777
Mar-92	6 0	6 1	42 8	1,973,839	1,401	44 8	3,629	1,419	45 4	3,822
Apr-92	7 4	7 5	43 5	1,881,253	1,757	52 7	3,681	1,783	53 5	3,876
May-92	6 8	6 8	40 4	1,687,425	1,498	43 4	3,725	1,498	43 4	3,919
Jun 92	6 5	6 5	37 6	1,730,358	1,321	42 3	3 767	1,321	42 3	3,961
Jul-92	8 1	8 8	36 7	1,639,043	1,622	50 3	3,817	1,752	54 3	4,016
Aug-92	8 9	9 3	37 6	1,678,139	1,824	56 5	3,874	1,908	59 2	4,075
Sep-92	9 8	10 9	22 4	958,437	1,197	35 6	3,910	1,332	39 6	4,114
Oct-92	7 0	7 5	26 4	1,636,856	1,008	43 4	3,953	1,072	46 2	4,161
Nov-92	5 7	6 2	30 4	1,356,838	945	29 3	3,982	1,032	32 0	4,193

TABLE 4-5
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 3
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Dec-92	10.0	11.3	34.5	1,539,001	1,880	58.3	4,040	2,128	66.0	4,259
Jan-93	8.2	9.7	13.6	567,315	607	17.6	4,058	721	20.9	4,279
Feb-93	7.7	7.9	35.1	1,416,762	1,468	41.1	4,099	1,515	42.4	4,322
Mar-93	7.1	8.9	37.9	1,802,153	1,465	48.4	4,148	1,834	60.5	4,382
Apr-93	7.5	8.1	36.6	1,579,911	1,491	44.7	4,192	1,620	48.6	4,431
May-93	7.2	7.3	35.7	1,439,765	1,401	39.2	4,231	1,413	39.6	4,471
Jun-93	7.2	8.4	35.0	1,661,020	1,374	45.3	4,277	1,611	53.1	4,524
Jul-93	8.2	8.7	40.9	1,768,416	1,835	55.1	4,332	1,933	58.1	4,582
Aug-93	7.3	7.6	42.0	1,934,362	1,679	53.7	4,386	1,731	55.4	4,637
Sep-93	5.5	6.9	45.6	1,970,486	1,377	41.3	4,427	1,711	51.3	4,688
Oct-93	8.6	10.4	49.5	2,067,443	2,318	67.2	4,494	2,818	81.7	4,770
Nov-93	7.3	7.6	47.3	2,177,648	1,875	59.9	4,554	1,950	62.3	4,832
Dec-93	5.4	6.1	45.2	1,952,859	1,336	40.1	4,594	1,491	44.7	4,877
Jan-94	4.6	4.9	40.8	1,881,907	1,012	32.4	4,627	1,083	34.7	4,912
Feb-94	5.7	6.4	41.8	1,684,383	1,290	36.1	4,663	1,456	40.8	4,953
Mar-94	6.6	7.3	42.9	1,913,397	1,537	47.6	4,710	1,698	52.6	5,005
Apr-94	6.7	6.4	40.5	1,691,933	1,484	43.0	4,753	1,404	40.7	5,046
May-94	5.5	6.2	41.9	1,930,100	1,256	40.2	4,794	1,414	45.2	5,091
Jun-94	5.2	6.0	40.1	1,731,170	1,128	33.8	4,827	1,314	39.4	5,131
Jul-94	5.6	6.7	39.1	1,633,480	1,196	34.7	4,862	1,433	41.6	5,172
Aug-94	4.8	4.7	38.4	1,767,874	1,001	32.0	4,894	976	31.2	5,203
Sep-94	5.2	5.8	41.9	1,809,726	1,179	35.4	4,929	1,325	39.7	5,243
Oct-94	6.0	6.7	41.7	1,862,770	1,353	42.0	4,971	1,523	47.3	5,290
Nov-94	5.2	5.8	41.9	1,808,096	1,190	35.7	5,007	1,325	39.7	5,330
Dec-94	4.9	7.4	41.9	1,872,100	1,119	34.7	5,042	1,695	52.6	5,383
Jan-95	6.2	6.3	30.3	1,395,268	1,023	32.7	5,074	1,041	33.3	5,416
Feb-95	5.3	5.7	41.9	1,691,336	1,206	33.8	5,108	1,294	36.3	5,452
Mar-95	4.9	5.2	42.3	1,887,850	1,119	34.7	5,143	1,197	37.1	5,489
Apr-95	4.8	5.4	44.2	1,780,985	1,164	32.6	5,175	1,299	36.3	5,526
May-95	6.8	7.4	45.3	2,154,496	1,667	55.1	5,231	1,830	60.4	5,586
Jun-95	6.1	6.9	46.8	2,022,902	1,559	46.8	5,277	1,756	52.7	5,639
Jul-95	5.7	6.4	43.2	1,927,648	1,350	41.8	5,319	1,500	46.5	5,685
Aug-95	5.3	5.7	38.5	1,716,997	1,113	34.5	5,354	1,203	37.3	5,723
Sep-95	5.7	6.5	39.4	1,703,956	1,231	37.0	5,391	1,396	41.9	5,764
Oct-95	4.7	5.3	41.8	1,926,500	1,067	34.1	5,425	1,215	38.9	5,803
Nov-95	5.5	6.4	39.3	1,697,570	1,185	35.5	5,460	1,376	41.3	5,845
Dec-95	4.2	4.3	47.6	1,988,846	1,085	31.5	5,492	1,119	32.5	5,877
Jan-96	4.4	5.5	66.0	3,136,399	1,587	52.4	5,544	1,983	65.4	5,942
Feb-96	5.4	5.9	62.1	2,592,747	1,818	52.7	5,597	2,008	58.2	6,001
Mar-96	5.5	6.4	69.5	2,902,223	2,088	60.5	5,657	2,414	70.0	6,071
Apr-96	6.1	6.7	75.8	3,493,536	2,500	80.0	5,737	2,785	89.2	6,160
May-96	7.3	8.2	42.3	1,889,888	1,677	52.0	5,789	1,898	58.9	6,219
Jun-96	7.3	7.4	40.2	1,680,753	1,600	46.5	5,836	1,626	47.2	6,266
Jul-96	6.2	6.6	46.6	2,216,115	1,574	52.0	5,888	1,677	55.4	6,321
Aug-96	7.5	8.5	52.7	2,275,457	2,155	64.6	5,952	2,428	72.8	6,394
Sep-96	7.3	7.8	46.2	1,997,549	1,837	55.2	6,008	1,967	59.1	6,453
Oct-96	5.6	6.1	34.2	1,527,644	1,039	32.2	6,040	1,130	35.1	6,488
Nov-96	5.3	5.9	33.5	1,302,902	959	25.9	6,066	1,078	29.1	6,517
Dec-96	4.7	5.7	37.2	1,821,960	959	32.6	6,098	1,154	39.3	6,557
Jan-97	5.0	5.7	38.2	1,704,543	1,048	32.5	6,131	1,187	36.8	6,593
Feb-97	5.0	6.5	39.8	1,604,889	1,094	30.6	6,161	1,402	39.3	6,633
Mar-97	4.6	5.1	42.8	1,600,971	1,066	27.7	6,189	1,183	30.7	6,663
Apr-97	-	-	-	-	-	-	6,189	-	-	6,663
May-97	3.1	3.5	40.1	1,790,000	667	20.7	6,210	772	23.9	6,687
Jun-97	5.5	6.1	83.3	3,599,000	2,489	74.7	6,285	2,752	82.6	6,770
Jul-97	5.2	5.7	92.5	4,131,000	2,612	81.0	6,366	2,860	88.7	6,859
Aug-97	4.6	5.1	51.7	2,306,000	1,299	40.3	6,406	1,432	44.4	6,903
Sep-97	4.0	4.5	56.1	2,424,000	1,233	37.0	6,443	1,389	41.7	6,945
Oct-97	3.9	4.0	34.0	97,920	723	1.4	6,444	743	1.5	6,946

TABLE 4-5
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 3
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Nov-97 to Jul-98	~~System was off because of property redevelopment activities~~				-	-	6,444	-	-	6,946
Aug-98	4 3	4 9	27 6	1,233,000	648	20 1	6,464	738	22 9	6,969
Sep-98	3 9	4 5	46 3	2,001,000	992	29 8	6,494	1,141	34 2	7,003
Oct-98	2 5	3 0	40 5	1,809,000	557	17 3	6,511	658	20 4	7,024
Nov-98	3 4	3 8	36 0	1,556,000	668	20 0	6,531	736	22 1	7,046
Dec-98	3 9	4 4	44 4	1,980,000	950	29 5	6,561	1,059	32 8	7,079
Jan-99	3 3	3 7	42 3	1,889,000	761	23 6	6,584	854	26 5	7,105
Feb-99	3 6	3 9	41 4	1,668,495	812	22 7	6,607	880	24 6	7,130
Mar-99	3 4	3 8	37 2	1,662,505	690	21 4	6,629	772	23 9	7,154
Apr-99	2 5	2 8	39 6	1,709,000	539	16 2	6,645	604	18 1	7,172
May-99	2 5	3 9	41 9	1,870,000	571	17 7	6,662	891	27 6	7,199
Jun-99	3 1	3 4	43 4	1,875,000	734	22 0	6,684	805	24 1	7,223
Jul-99	4 1	4 5	44 0	1,962,000	982	30 5	6,715	1,078	33 4	7,257
Aug-99	3 9	4 4	45 8	2,046,000	975	30 2	6,745	1,100	34 1	7,291
Sep-99	4 2	5 0	50 9	2,198,000	1,165	35 0	6,780	1,387	41 6	7,333
Oct-99	3 7	4 9	51 9	2,316,000	1,047	32 4	6,813	1,386	43 0	7,376
Nov-99	3 9	4 7	50 2	2,169,000	1,068	32 0	6,845	1,287	38 6	7,414
Dec-99	3 1	3 8	57 1	2,551,000	966	29 9	6,875	1,184	36 7	7,451
Jan-00	3 2	4 0	66 2	2,957,000	1,156	35 8	6,910	1,445	44 8	7,496
Feb-00	3 4	4 2	55 0	2,290,009	1,020	29 5	6,940	1,260	36 4	7,532
Mar-00	3 2	3 9	54 4	2,332,730	950	28 3	6,968	1,158	34 4	7,566
Apr-00	2 5	2 8	56 0	2,419,189	763	22 9	6,991	855	25 6	7,592
May-00	2 7	3 5	58 8	2,574,811	866	26 3	7,017	1,123	34 1	7,626
Jun-00	2 9	3 5	60 9	2,628,000	962	28 9	7,046	1,161	34 8	7,661
Jul-00	2 8	3 5	58 8	2,626,000	898	27 8	7,074	1,122	34 8	7,696
Aug-00	3 2	4 0	60 4	2,613,000	1,054	31 7	7,106	1,307	39 2	7,735
Sep-00	2 9	3 7	64 7	2,737,074	1,023	30 1	7,136	1,301	38 2	7,773
Oct-00	2 6	3 3	47 0	2,096,926	666	20 6	7,156	841	26 1	7,799
Nov-00	2 9	3 6	53 9	2,326,889	852	25 5	7,182	1,064	31 9	7,831
Dec-00	2 6	3 3	51 8	2,193,360	735	21 6	7,203	942	27 7	7,859
Jan-01	3 0	3 7	27 7	1,237,930	454	14 1	7,218	563	17 4	7,876
Feb-01	2 7	3 5	41 6	1,678,400	613	17 2	7,235	783	21 9	7,898
Mar-01	2 7	3 5	52 3	2,332,730	769	23 8	7,259	991	30 7	7,929
Apr-01	2 5	3 3	48 4	2,088,774	659	19 8	7,278	875	26 3	7,955
May-01	2 6	3 3	56 5	2,520,100	800	24 8	7,303	1,022	31 7	7,987
Jun-01	2 7	3 4	60 0	2,592,414	883	26 5	7,330	1,104	33 1	8,020
Jul-01	2 5	3 3	58 4	2,608,844	796	24 7	7,354	1,051	32 6	8,053
Aug-01	2 4	3 2	54 8	2,446,000	717	22 2	7,377	956	29 6	8,082
Sep-01	2 3	3 1	53 0	2,252,353	665	19 6	7,396	896	26 4	8,109
Oct-01	2 2	3 0	51 8	2,312,647	630	19 5	7,416	842	26 1	8,135
Nov-01	2 3	3 0	51 2	2,211,000	631	18 9	7,435	843	25 3	8,160
Dec-01	2 4	3 2	50 9	2,274,000	666	20 7	7,455	888	27 6	8,188
Jan-02	2 3	3 0	59 9	2,635,171	745	22 7	7,478	976	29 8	8,218
Feb-02	2 2	3 0	63 3	2,553,257	759	21 3	7,499	1,035	29 0	8,247
Mar-02	2 3	3 1	61 5	2,747,405	765	23 7	7,523	1,046	32 5	8,279
Apr-02	2 0	2 7	59 0	2,548,773	627	18 8	7,542	875	26 2	8,305
May-02	2 1	2 9	57 8	2,578,644	671	20 8	7,563	901	27 9	8,333
Jun-02	2 3	3 1	47 4	2,046,465	594	17 8	7,580	788	23 6	8,357
Jul-02	2 1	2 9	56 3	2,511,571	645	20 0	7,600	890	27 6	8,384
Aug-02	2 1	3 0	56 6	2,527,463	648	20 1	7,621	926	28 7	8,413
Sep-02	2 1	2 9	56 0	2,418,508	641	19 2	7,640	898	26 9	8,440
Oct-02	2 1	3 0	55 5	2,476,391	635	19 7	7,659	908	28 1	8,468
Nov 02	2 7	3 5	56 0	2 422 995	824	24 8	7 684	1,069	32 1	8,500
Dec-02	2 0	2 8	55 3	2,468,768	603	18 7	7,703	844	26 2	8,526
Jan 03	2 0	3 0	45 0	2,008,800	491	15 2	7,718	740	22 9	8 549
Feb-03	2 4	3 2	54 1	2,179,597	707	19 8	7,738	953	26 7	8,576
Mar-03	2 1	2 9	47 5	2,122,500	544	16 9	7,755	748	23 2	8,599
Apr-03	2 5	3 3	52 7	2,275,130	718	21 5	7,776	950	28 5	8,628

TABLE 4-5
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 3
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
May-03 to Jul-03	System was off to replace air stripper unit with granular carbon vessel.				-	-	7,776	-	-	8,628
Aug-03	2.3	3.4	8.3	370,340	104	3.2	7,780	155	4.8	8,633
Sep-03	2.3	3.4	53.6	2,313,830	672	20.1	7,800	999	30.0	8,663

Notes:
No influent samples were collected in September 2003. The August 2003 influent sample is used to calculate the mass removal for September 2003.

TABLE 4-6
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 19
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Jan-88	5 5	5 8	95 4	4,259,995	2,862	88 7	89	3,028	93 9	94
Feb-88	5 5	6 6	86 5	3,487,680	2,594	72 6	161	3,099	86 8	181
Mar-88	4 5	4 8	105 4	4,705,949	2,586	80 2	242	2,736	84 8	265
Apr-88	2 7	2 8	108 8	4,700,160	1,602	48 0	290	1,685	50 5	316
May-88	3 2	3 7	94 1	4,202,410	1,642	50 9	340	1,894	58 7	375
Jun-88	4 5	4 7	87 2	3,765,744	2,139	64 2	405	2,248	67 4	442
Jul-88	4 2	5 3	82 6	3,688,157	1,892	58 6	463	2,401	74 4	517
Aug-88	3 7	3 8	70 0	3,124,800	1,412	43 8	507	1,435	44 5	561
Sep-88	3 8	3 9	70 0	3,024,000	1,450	43 5	551	1,475	44 2	605
Oct-88	3 2	4 2	67 1	2,994,005	1,170	36 3	587	1,532	47 5	653
Nov-88	2 5	2 6	57 6	2,489,616	786	23 6	610	808	24 2	677
Dec-88	4 9	5 3	14 3	637,013	381	11 8	622	412	12 8	690
Jan-89	5 2	5 2	9 8	437,472	278	8 6	631	278	8 6	698
Feb-89	7 3	9 4	12 4	498,758	492	13 8	645	637	17 8	716
Mar-89	12 0	12 0	14 2	634,334	930	28 8	673	930	28 8	745
Apr-89	3 6	4 2	49 2	2,123,280	965	28 9	702	1,117	33 5	779
May-89	2 4	2 8	48 1	2,147,630	630	19 5	722	732	22 7	801
Jun-89	3 3	3 4	47 0	2,026,707	845	25 3	747	876	26 2	827
Jul-89	3 2	4 1	32 9	1,492,718	573	18 1	765	736	23 2	851
Aug-89	5 7	5 7	5 0	175,745	155	3 8	769	155	3 8	855
Sep-89	4 4	5 2	43 2	1,816,748	1,037	30 3	799	1,233	36 0	890
Oct-89	3 9	4 3	39 9	1,851,754	848	27 3	827	930	30 0	920
Nov-89	3 7	4 4	41 9	1,859,101	845	26 0	853	1,008	31 0	952
Dec-89	3 6	4 1	36 6	1,535,560	718	20 9	874	808	23 6	975
Jan-90	2 9	3 0	33 3	1,695,230	527	18 6	892	545	19 3	994
Feb-90	3 1	3 8	32 0	1,290,276	541	15 1	907	670	18 8	1,013
Mar-90	3 9	4 8	31 7	1,409,030	674	20 8	928	832	25 7	1,039
Apr-90	3 3	4 0	33 1	1,477,000	595	18 5	947	727	22 5	1,061
May-90	2 7	2 8	43 0	988,433	633	10 1	957	661	10 6	1,072
Jun-90	3 0	3 7	31 9	1,330,696	521	15 1	972	645	18 7	1,091
Jul-90	4 5	4 6	30 1	1,403,336	739	23 9	996	755	24 4	1,115
Aug-90	3 3	3 4	31 5	1,403,773	566	17 5	1,013	583	18 1	1,133
Sep-90	2 3	2 3	29 4	1,186,474	369	10 3	1,024	369	10 3	1,143
Oct-90	2 1	2 3	27 7	1,314,958	317	10 5	1,034	353	11 6	1,155
Nov-90	2 8	2 9	28 9	1,249,974	442	13 3	1,047	453	13 6	1,169
Dec-90	1 8	2 6	27 8	1,194,165	272	8 1	1,056	391	11 7	1,180
Jan-91	2 7	3 5	18 7	833,779	275	8 5	1,064	361	11 2	1,192
Feb-91	2 6	3 4	25 9	1,044,075	367	10 3	1,074	484	13 6	1,205
Mar-91	4 5	6 0	17 2	716,751	421	12 2	1,087	561	16 3	1,221
Apr-91	2 0	2 5	22 1	1,017,369	241	7 7	1,094	296	9 5	1,231
May-91	7 6	7 6	29 9	1,335,664	1,240	38 4	1,133	1,240	38 4	1,269
Jun-91	3 1	3 1	33 8	1,361,691	571	16 0	1,149	571	16 0	1,285
Jul-91	5 8	5 8	27 3	1,297,222	863	28 5	1,177	863	28 5	1,314
Aug-91	1 9	2 0	26 0	1,121,117	269	8 1	1,185	282	8 5	1,322
Sep-91	1 7	1 8	22 1	987,057	205	6 4	1,192	212	6 6	1,329
Oct-91	1 8	2 1	20 7	924,990	203	6 3	1,198	236	7 3	1,336
Nov-91	3 2	3 4	25 1	975,417	438	11 8	1,210	465	12 6	1,349
Dec-91	3 5	3 6	24 9	1,219,312	475	16 2	1,226	483	16 4	1,365
Jan-92	4 0	4 0	25 5	1,139,042	557	17 3	1,243	557	17 3	1,382
Feb-92	6 2	6 2	22 7	916,748	769	21 5	1,265	769	21 5	1,404
Mar-92	12 0	12 6	12 6	560,793	822	25 5	1,290	860	26 7	1,431
Apr-92	2 0	2 1	10 3	444,902	112	3 4	1,294	115	3 5	1 434
May-92	3 6	3 6	27 7	1,157,200	544	15 8	1,309	544	15 8	1,450
Jun 92	2 2	3 9	28 1	1,295 524	337	10 8	1 320	598	19 1	1 469
Jul-92	3 9	4 0	26 9	1,233,832	573	18 2	1,338	589	18 7	1,488
Aug-92	6 1	7 0	28 5	1,273,833	949	29 4	1,368	1,095	34 0	1,522
Sep-92	19 0	26 9	26 5	1,145,522	2,747	82 4	1,450	3,892	116 8	1,638
Oct-92	6 9	8 6	30 7	1,326,495	1,162	34 9	1,485	1,447	43 4	1,682
Nov-92	3 6	4 8	30 6	1,366,265	601	18 6	1,504	808	25 0	1,707

TABLE 4-6
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 19
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Dec-92	3.7	3.7	31.9	1,424,919	644	20.0	1,524	644	20.0	1,727
Jan-93	3.2	4.4	30.4	1,269,007	532	15.4	1,539	732	21.2	1,748
Feb-93	3.1	4.3	29.4	1,186,560	497	13.9	1,553	685	19.2	1,767
Mar-93	3.3	4.5	28.6	1,358,377	511	16.9	1,570	701	23.1	1,790
Apr-93	3.4	4.7	31.7	1,369,138	583	17.5	1,587	805	24.2	1,814
May-93	3.8	5.2	31.9	1,285,546	667	18.7	1,606	904	25.3	1,840
Jun-93	2.8	5.3	32.2	1,529,696	484	16.0	1,622	937	30.9	1,871
Jul-93	3.7	4.7	33.0	1,426,872	661	19.8	1,642	846	25.4	1,896
Aug-93	2.7	4.2	33.3	1,536,701	496	15.9	1,658	764	24.4	1,921
Sep-93	2.4	2.9	32.2	1,392,569	423	12.7	1,670	506	15.2	1,936
Oct-93	2.0	2.7	33.3	1,388,531	364	10.6	1,681	491	14.2	1,950
Nov-93	2.6	3.6	29.6	1,364,584	413	13.2	1,694	576	18.4	1,968
Dec-93	2.3	2.9	25.7	1,107,919	316	9.5	1,704	411	12.3	1,981
Jan-94	2.4	3.4	18.5	851,603	242	7.7	1,711	338	10.8	1,992
Feb-94	2.5	3.0	18.5	747,527	249	7.0	1,718	302	8.5	2,000
Mar-94	2.4	3.2	19.3	859,814	254	7.9	1,726	339	10.5	2,011
Apr-94	2.5	3.3	18.3	765,586	254	7.4	1,734	326	9.4	2,020
May-94	2.3	3.1	18.2	840,113	229	7.3	1,741	308	9.9	2,030
Jun-94	2.7	3.4	30.0	1,297,241	445	13.4	1,754	550	16.5	2,046
Jul-94	2.8	4.0	29.7	1,241,026	452	13.1	1,767	647	18.7	2,065
Aug-94	2.7	3.2	22.6	1,039,715	335	10.7	1,778	397	12.7	2,078
Sep-94	3.1	3.8	22.5	971,473	380	11.4	1,789	468	14.1	2,092
Oct-94	3.0	3.7	21.9	977,007	358	11.1	1,801	445	13.8	2,106
Nov-94	2.5	2.6	22.2	960,670	308	9.2	1,810	315	9.5	2,115
Dec-94	2.1	3.6	20.4	880,645	233	7.0	1,817	399	12.0	2,127
Jan-95	2.8	3.8	19.9	916,561	300	9.6	1,826	417	13.3	2,140
Feb-95	3.4	3.5	18.1	731,034	336	9.4	1,836	346	9.7	2,150
Mar-95	1.8	3.7	13.6	608,045	133	4.1	1,840	275	8.5	2,159
Apr-95	4.1	5.1	38.3	1,545,258	859	24.0	1,864	1,061	29.7	2,188
May-95	4.8	6.6	26.2	1,246,583	692	22.8	1,887	948	31.3	2,220
Jun-95	4.6	3.7	48.4	2,089,245	1,208	36.2	1,923	981	29.4	2,249
Jul-95	2.3	3.5	34.1	1,522,357	420	13.0	1,936	647	20.1	2,269
Aug-95	2.2	3.1	47.0	2,098,080	559	17.3	1,953	800	24.8	2,294
Sep-95	3.6	4.4	50.0	2,158,743	986	29.6	1,983	1,210	36.3	2,330
Oct-95	3.2	3.9	51.8	2,388,037	915	29.3	2,012	1,091	34.9	2,365
Nov-95	2.8	3.2	46.9	2,026,351	706	21.2	2,033	816	24.5	2,390
Dec-95	2.2	2.9	46.1	2,286,210	558	19.2	2,053	739	25.4	2,415
Jan-96	2.7	3.1	110.0	5,228,381	1,626	53.6	2,106	1,884	62.2	2,477
Feb-96	1.9	2.3	106.3	4,438,839	1,078	31.3	2,138	1,339	38.8	2,516
Mar-96	3.5	4.3	119.4	5,156,180	2,258	67.7	2,205	2,811	84.3	2,600
Apr-96	3.1	3.5	130.4	5,819,171	2,182	67.6	2,273	2,495	77.3	2,678
May-96	1.7	2.0	145.0	6,470,727	1,320	40.9	2,314	1,565	48.5	2,726
Jun-96	1.9	2.7	166.1	6,698,593	1,748	48.9	2,363	2,446	68.5	2,795
Jul-96	1.8	2.0	182.8	8,160,167	1,794	55.6	2,418	2,003	62.1	2,857
Aug-96	1.3	1.8	134.9	6,023,226	956	29.6	2,448	1,302	40.4	2,897
Sep-96	1.0	1.3	149.1	6,441,962	829	24.9	2,473	1,033	31.0	2,928
Oct-96	1.0	1.2	165.7	7,398,187	867	26.9	2,500	1,075	33.3	2,961
Nov-96	1.0	1.1	165.8	6,444,549	868	23.4	2,523	1,021	27.6	2,989
Dec-96	0.8	1.6	166.0	8,125,390	715	24.3	2,548	1,484	50.5	3,039
Jan-97	1.3	1.7	173.6	7,748,070	1,221	37.8	2,585	1,631	50.6	3,090
Feb-97	1.2	1.6	173.5	6,997,200	1,135	31.8	2,617	1,504	42.1	3,132
Mar-97	1.7	2.2	157.2	7,017,020	1,431	44.4	2,662	1,903	59.0	3,191
Apr-97	1.5	1.9	158.1	6,831,270	1,250	37.5	2,699	1,638	49.1	3,240
May-97	1.3	1.7	148.1	6,612,051	1.018	31.5	2,731	1,341	41.6	3,282
Jun-97	1.3	1.7	125.8	5,435,467	878	26.3	2,757	1,146	34.4	3,316
Jul-97	1.0	1.2	112.7	5,028,974	584	18.1	2,775	762	23.6	3,340
Aug-97	0.7	0.8	75.5	3,368,231	284	8.8	2,784	346	10.7	3,351
Sep-97 to Jan-98	System was off because of property redevelopment activities.				0	0.0	2,788	0	0.0	3,349

TABLE 4-6
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 19
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Feb-98	0.8	1.1	10.6	427,000	47	1.3	2,789	61	1.7	3,350
Mar-98	0.8	1.0	235.8	10,524,000	977	30.3	2,820	1,247	38.7	3,389
Apr-98	0.6	0.8	265.7	11,477,000	927	27.8	2,847	1,159	34.8	3,424
May-98	0.6	0.8	250.5	11,183,000	765	23.7	2,871	1,134	35.1	3,459
Jun-98	0.5	0.7	230.1	9,940,000	615	18.4	2,890	903	27.1	3,486
Jul-98	0.1	0.2	115.7	5,163,000	76	2.3	2,892	95	2.9	3,489
Aug-98	0.1	0.2	253.3	11,308,000	152	4.7	2,897	235	7.3	3,496
Sep-98	0.4	0.5	201.1	8,688,000	406	12.2	2,909	537	16.1	3,512
Oct-98	0.5	0.6	193.5	8,638,000	506	15.7	2,924	654	20.3	3,533
Nov-98	0.5	0.6	224.9	9,714,000	588	17.7	2,942	760	22.8	3,555
Dec-98	0.5	0.6	221.7	9,897,000	604	18.7	2,961	774	24.0	3,579
Jan-99	0.4	0.6	222.0	9,912,000	484	15.0	2,976	726	22.5	3,602
Feb-99	0.5	0.7	210.4	8,482,119	573	16.1	2,992	803	22.5	3,624
Mar-99	0.5	0.7	205.2	9,158,881	559	17.3	3,009	783	24.3	3,649
Apr-99	0.4	0.6	200.3	8,651,000	437	13.1	3,022	655	19.7	3,668
May-99	0.5	0.6	195.2	8,712,000	532	16.5	3,039	638	19.8	3,688
Jun-99	0.5	0.6	193.1	8,341,000	526	15.8	3,055	632	18.9	3,707
Jul-99	0.5	0.6	200.1	8,933,000	546	16.9	3,072	655	20.3	3,727
Aug-99	0.5	0.6	192.7	8,602,000	525	16.3	3,088	630	19.5	3,747
Sep-99	0.5	0.6	183.3	7,918,000	500	15.0	3,103	600	18.0	3,765
Oct-99	0.4	0.5	187.2	8,355,000	408	12.7	3,116	510	15.8	3,781
Nov-99	0.4	0.6	183.1	7,909,000	399	12.0	3,127	599	18.0	3,799
Dec-99	0.4	0.6	183.2	8,177,000	399	12.4	3,140	599	18.6	3,817
Jan-00	0.4	0.5	163.5	7,300,000	357	11.1	3,151	446	13.8	3,831
Feb-00	0.4	0.5	162.9	6,798,000	355	10.3	3,161	444	12.9	3,844
Mar-00	0.4	0.5	177.8	7,937,000	388	12.0	3,173	485	15.0	3,859
Apr-00	0.3	0.4	177.7	7,675,000	291	8.7	3,182	387	11.6	3,871
May-00	0.4	0.5	188.9	8,414,000	412	12.7	3,195	515	15.9	3,886
Jun-00	0.4	0.6	186.3	8,042,000	406	12.2	3,207	609	18.3	3,905
Jul-00	0.4	0.6	182.2	8,124,000	397	12.3	3,219	552	17.1	3,922
Aug-00	0.4	0.5	183.9	8,208,000	391	12.1	3,231	515	16.0	3,938
Sep-00	0.4	0.5	155.0	6,697,829	296	8.9	3,240	407	12.2	3,950
Oct-00	0.3	0.4	176.6	7,883,000	298	9.3	3,249	418	12.9	3,963
Nov-00	0.4	0.6	175.9	7,600,267	374	11.2	3,261	529	15.9	3,979
Dec-00	0.3	0.5	176.1	7,859,833	307	9.5	3,270	449	13.9	3,993
Jan-01	0.4	0.5	168.8	7,536,500	350	10.8	3,281	430	13.3	4,006
Feb-01	0.4	0.6	166.9	6,729,000	355	9.9	3,291	528	14.8	4,021
Mar-01	0.4	0.6	159.6	7,126,161	322	10.0	3,301	490	15.2	4,036
Apr-01	0.4	0.5	155.7	6,724,839	297	8.9	3,310	450	13.5	4,050
May-01	0.4	0.5	155.0	6,918,000	296	9.2	3,319	421	13.0	4,063
Jun-01	0.4	0.5	150.9	6,519,766	288	8.6	3,328	393	11.8	4,074
Jul-01	0.4	0.5	139.1	6,208,234	281	8.7	3,336	394	12.2	4,087
Aug-01	0.4	0.5	135.4	6,042,000	288	8.9	3,345	369	11.4	4,098
Sep-01	0.4	0.5	136.2	5,791,434	294	8.7	3,354	408	12.0	4,110
Oct-01	0.3	0.5	130.7	5,834,566	240	7.4	3,361	324	10.0	4,120
Nov-01	0.3	0.5	118.5	5,120,000	226	6.8	3,368	306	9.2	4,129
Dec-01	0.4	0.5	121.2	5,411,750	264	8.2	3,376	358	11.1	4,140
Jan-02	0.5	0.7	122.6	5,418,164	301	9.2	3,386	434	13.3	4,154
Feb-02	0.4	0.6	124.0	4,998,657	297	8.3	3,394	433	12.1	4,166
Mar-02	0.5	0.7	125.1	5,583,262	334	10.4	3,404	457	14.2	4,180
Apr-02	0.4	0.6	125.8	5,434,500	307	9.2	3,413	427	12.8	4,193
May-02	0.4	0.5	125.6	5,607,917	260	8.1	3,422	345	10.7	4,203
Jun-02	0.5	0.6	121.9	5,267,595	299	9.0	3,431	391	11.7	4,215
Jul-02	0.5	0.5	119.7	5,344,571	352	10.9	3,441	333	10 3	4,226
Aug-02	0.4	0.5	119.7	5,343,370	255	7.9	3,449	326	10.1	4,236
Sep-02	0.4	0.6	118.5	5,118,806	258	7.8	3,457	362	10.9	4,247
Oct-02	0.5	0.6	117.5	5,246,651	288	8.9	3,466	378	11.7	4,258
Nov-02	0.5	0.6	137.1	5,925,458	374	11.2	3,477	448	13.5	4,272
Dec-02	0.6	0.7	117.7	5,252,357	385	11.9	3,489	449	13.9	4,286

TABLE 4-6
TRICHLOROETHENE (TCE) AND VOLATILE ORGANIC COMPOUND (VOC) MASS REMOVAL
FAIRCHILD SYSTEM 19
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month	Average Influent TCE Concentration (mg/L)	Average Influent VOC Concentration (mg/L)	Average Flow Rate (gpm)	Total Monthly Flow (gal/month)	TCE Mass Removed per Day (gram/day)	Total TCE Mass Removed (kg/month)	Cumulative TCE Removed (kg)	VOC Mass Removed per Day (gram/day)	Total VOC Mass Removed (kg/month)	Cumulative VOCs Removed (kg)
Jan-03	0.5	0.7	125.0	5,580,000	368	11.4	3,501	489	15.2	4,301
Feb-03	0.4	0.6	112.4	4,533,655	270	7.6	3,508	370	10.4	4,311
Mar-03	0.5	0.7	108.1	4,824,950	301	9.3	3,517	417	12.9	4,324
Apr-03	0.5	0.7	117.2	5,064,400	326	9.8	3,527	452	13.6	4,338
May-03 to Jul-03	System was off to replace air stripper unit with granular carbon vessel.				-	-	3,527	-	-	4,338
Aug-03	0.6	0.7	0.1	2,720	0	0.0	3,527	0	0.0	4,338
Sep-03	0.6	0.7	67.3	2,906,530	205	6.2	3,533	248	7.4	4,345

Notes:

The analytical results for the influent sample on April 2003 are not constistent with other samples for this system. The March 2003 influent sample is used to calculate the mass removal for April.

No influent samples were collected in September 2003. The August 2003 influent sample is used to calculate the mass removal for September 2003.

TABLE 4-7
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 1 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	38B2	AE/RW-9-1	AE/RW-9-2	BLDG18	RW16A	RW17A	RW20A	RW21A	RW25A	RW28A	RW3A	RW3B1	RW3B2	RW4A	RW4B1	RW4B2	Total
July 1998	5.47	0.68	0.72	20.57	0.68	0.00	1.88	4.98	3.06	NA	1.29	7.08	6.98	0.00	5.70	1.69	60.78
August 1998	4.98	0.61	0.71	19.65	0.00	0.00	1.67	5.91	2.90	NA	3.65	6.61	7.28	0.00	5.43	1.62	61.03
September 1998	5.06	0.61	0.49	19.28	0.00	0.00	1.67	6.09	2.87	NA	7.18	4.55	4.90	0.00	5.80	1.75	60.25
October 1998	5.88	0.74	0.55	13.81	1.31	0.00	1.92	7.31	3.47	NA	8.67	0.00	20.35	1.20	6.94	1.96	74.11
November 1998	4.37	0.57	0.38	11.21	0.84	0.00	1.42	5.39	2.67	NA	6.48	0.00	23.40	0.84	5.27	0.91	63.75
December 1998	5.85	0.71	0.48	19.55	1.14	1.45	1.86	7.01	3.45	NA	8.72	0.12	0.10	1.21	6.86	1.01	59.52
January 1999	5.18	0.82	0.30	19.05	0.96	2.95	1.92	5.96	2.87	NA	7.39	0.00	0.00	0.23	5.73	1.83	55.20
February 1999	5.28	0.78	0.00	9.42	1.08	3.39	1.99	6.08	2.94	NA	7.50	0.00	3.23	0.75	8.57	1.91	52.90
March 1999	4.73	0.65	0.00	13.35	0.95	2.64	1.75	5.52	2.75	NA	6.82	0.00	5.55	0.00	7.84	1.16	53.70
April 1999	6.03	0.77	0.00	16.63	1.14	3.65	2.12	7.14	3.59	NA	8.81	0.00	7.15	1.52	10.20	1.85	70.60
May 1999	4.58	0.77	0.00	10.95	0.81	2.56	1.52	5.47	2.88	NA	6.82	0.00	5.58	1.41	7.91	1.59	52.84
June 1999	4.41	0.86	0.00	9.36	0.77	2.44	1.55	5.48	2.89	NA	6.87	0.01	5.63	1.34	8.01	1.60	51.25
July 1999	5.50	1.06	1.17	12.40	0.92	3.04	1.89	6.70	3.61	NA	5.11	0.00	6.86	1.56	9.88	2.04	61.73
August 1999	4.37	0.81	0.70	10.59	0.73	2.30	1.50	5.39	2.84	NA	7.18	0.00	5.53	1.19	7.96	1.50	52.59
September 1999	5.57	1.02	0.62	14.80	0.90	2.70	1.87	6.75	3.57	NA	9.06	0.00	6.82	1.46	10.07	1.91	67.12
October 1999	4.42	0.79	0.50	12.07	0.29	0.85	1.36	5.21	2.80	NA	7.07	0.00	5.56	0.42	7.92	1.40	50.66
November 1999	4.05	0.76	0.48	10.25		sealed	1.26	4.70	2.56	NA	6.87	0.02	5.25	0.38	7.55	0.81	44.93
December 1999	5.39	0.86	0.73	15.36		sealed	1.60	6.03	3.05	NA	0.00	0.00	7.10	0.12	0.00	0.25	40.50
January 2000	0.55	0.00	0.14	3.40		sealed	0.16	0.66	0.00	NA	0.00	0.00	0.79	0.00	0.00	0.00	5.71
February 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
August 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
September 2000	0.00	0.00	0.00	0.00	0.00	sealed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
October 2000	6.23	2.10	8.48	7.99	5.51	sealed	10.67	7.62	4.60	6.73	7.92	7.92	0.00	8.80	1.70	4.00	90.25
November 2000	6.39	1.84	13.97	8.03	5.57	sealed	10.63	7.65	4.67	6.78	8.03	8.03	0.00	8.80	1.47	3.86	95.71
December 2000	6.93	1.64	12.80	8.22	5.87	sealed	10.68	7.74	4.87	6.84	8.45	8.45	0.00	8.46	1.57	3.35	95.88
January 2001	8.07	4.96	1.42	12.54	3.34	sealed	5.89	10.54	7.61	6.67	8.60	6.56	0.00	2.20	8.21	1.50	88.12
February 2001	8.18	5.06	1.97	14.29	3.82	sealed	6.04	10.71	7.74	6.49	8.87	6.58	0.00	2.28	8.29	1.36	91.69
March 2001	8.22	5.04	1.98	16.99	4.25	sealed	5.78	10.70	7.78	6.70	9.15	6.62	0.00	2.36	8.55	1.09	95.23
April 2001	8.26	5.09	1.62	16.26	4.10	sealed	6.21	10.78	7.93	6.91	9.55	7.00	0.00	2.45	8.61	1.01	95.78
May 2001	8.23	5.04	0.84	15.88	3.74	sealed	6.12	10.74	7.92	7.01	9.92	8.01	0.00	2.55	8.66	0.91	95.58
June 2001	8.23	5.09	1.14	14.54	3.40	sealed	6.27	10.75	7.94	7.10	10.31	8.04	0.00	2.62	8.52	0.74	94.68
July 2001	8.17	5.11	1.00	10.14	3.15	sealed	5.72	10.64	7.91	7.06	10.31	7.75	0.00	2.66	8.26	0.96	88.84
August 2001	8.19	5.25	0.91	7.59	3.10	sealed	5.58	10.70	7.99	6.73	10.63	8.74	0.00	2.59	8.10	0.89	86.98
September 2001	8.21	5.33	0.87	13.51	3.04	sealed	5.78	10.65	8.02	6.93	10.91	8.54	0.00	2.59	8.06	0.89	93.33
October 2001	8.20	5.37	0.71	13.40	2.76	sealed	5.87	10.62	7.99	7.22	10.61	8.12	0.00	2.63	7.96	1.10	92.57
November 2001	8.20	5.43	0.65	13.84	2.74	sealed	5.84	10.57	7.96	7.00	10.93	7.55	0.00	2.58	7.26	0.90	91.45
December 2001	8.17	5.46	0.98	17.02	3.55	sealed	6.35	10.58	7.84	7.27	7.84	7.99	0.00	2.55	6.87	0.78	93.26
January 2002	8.19	5.41	1.00	17.76	3.63	sealed	6.72	10.63	8.70	7.21	8.52	8.60	0.00	2.65	6.83	0.79	96.62
February 2002	8.18	5.45	1.03	16.79	3.12	sealed	6.62	10.60	8.77	6.87	4.26	8.71	0.00	2.77	6.84	0.80	90.81
March 2002	8.19	5.59	2.08	16.51	4.53	sealed	6.73	10.61	8.82	7.10	4.38	9.07	0.00	4.88	7.49	0.80	96.77
April 2002	8.18	5.56	1.78	16.33	4.96	sealed	6.75	10.61	8.89	7.01	4.82	8.96	0.00	4.97	7.85	0.80	97.48
May 2002	8.18	5.50	1.56	16.29	4.90	sealed	6.80	10.61	8.71	7.06	4.93	9.12	0.00	4.98	7.64	0.81	97.09
June 2002	8.17	5.49	1.22	15.89	4.95	sealed	6.89	10.61	8.70	7.28	5.30	8.81	0.00	4.98	8.33	0.86	97.46
July 2002	8.17	5.49	1.08	15.17	4.96	sealed	7.00	10.59	8.65	7.39	5.72	9.05	0.00	4.99	8.55	0.82	97.63
August 2002	8.16	5.40	0.84	15.12	2.43	sealed	7.12	10.49	8.46	7.07	5.72	8.84	0.00	4.98	8.12	0.82	93.57
September 2002	8.14	5.42	0.95	15.42	5.08	sealed	7.18	10.43	8.22	6.83	5.38	8.79	0.00	5.00	8.03	0.81	95.67
October 2002	8.15	6.17	1.15	14.94	4.98	sealed	5.67	10.48	8.30	6.82	5.70	8.45	0.00	4.97	7.02	0.86	93.65
November 2002	8.13	8.14	1.02	16.54	5.14	sealed	5.24	10.31	8.54	6.86	5.78	8.69	0.00	4.96	6.75	0.89	97.02
December 2002	8.11	8.09	1.81	19.92	5.20	sealed	5.45	10.30	8.58	6.94	6.12	8.52	0.00	4.98	6.28	0.90	101.21
January 2003	8.20	8.30	5.00	23.28	0.00	sealed	6.00	10.30	8.70	7.00	6.50	9.00	0.00	5.00	6.80	1.30	105.38
February 2003	8.16	8.26	0.72	NA	3.76	sealed	6.07	10.28	8.58	7.08	6.57	9.93	0.00	5.00	6.59	1.42	82.40

TABLE 4-7
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 1 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	38B2	AE/RW-9-1	AE/RW-9-2	BLDG18	RW16A	RW17A	RW20A	RW21A	RW25A	RW28A	RW3A	RW3B1	RW3B2	RW4A	RW4B1	RW4B2	Total
March 2003	8 15	7 95	0 99	NA	4 05	sealed	6 23	10 30	8 50	7 23	5 18	10 13	0 00	5 00	6 70	1 30	81 69
April 2003	8 12	7 72	1 38	23 81	3 68	sealed	6 40	10 00	8 60	7 24	6 76	10 06	0 00	5 02*	6 72	1 14	106 65
May 2003	0 00	0 00	0 00	27 80	0 00	sealed	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	27 80
June 2003	0 00	0 00	0 00	28 82	0 00	sealed	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	28 82
July 2003	0 00	0 00	0 00	31 57	0 00	sealed	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	31 57
August 2003	7 93	7 73	4 43	30 33	6 60	sealed	5 87	9 53	8 40	4 03	6 40	9 93	0 00	4 87	7 23	2 03	115 33
September 2003	7 77	8 07	2 55	NA	4 92	sealed	5 83	9 07	8 35	9 90	6 28	8 90	0 00	4 75	6 87	0 82	84 07
Design Flow Rates	NA	NA	NA	NA	0 04	2 19	5 00	5 00	7 00	NA	2 74	NA	NA	2 00	8 00	5 00	36 97

TABLE 4-8
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 3 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	RW5A	RW5B1	RW5B2	RW7A	RW7B1	RW7B2	RW9A	RW9B1	RW9B2	RW18A	RW27A	RW12B1	Total
August 1998	0.25	0.00	0.03	1.29	1.37	0.03	0.76	1.25	1.93	1.16	1.29	1.95	11.31
September 1998	1.21	0.00	0.00	5.59	5.85	0.00	3.32	5.61	8.60	4.77	5.15	7.94	48.05
October 1998	0.93	0.00	0.00	4.09	4.40	0.00	2.49	3.53	6.48	0.56	3.74	6.13	32.34
November 1998	0.68	0.00	0.19	3.89	4.06	0.00	2.59	2.37	6.23	0.98	3.42	5.61	30.03
December 1998	0.80	0.04	1.31	5.23	5.50	0.00	3.86	2.25	8.39	5.57	4.54	7.28	44.77
January 1999	0.91	0.00	0.00	4.30	4.35	0.00	3.05	1.60	6.68	0.43	3.33	4.14	28.79
February 1999	0.99	0.00	0.00	4.89	4.83	0.16	4.71	2.33	8.91	5.03	3.82	4.04	39.70
March 1999	0.81	0.00	0.00	4.01	4.25	0.00	3.57	1.17	8.57	2.87	3.07	3.35	31.68
April 1999	0.66	0.00	0.00	4.46	4.35	0.00	3.89	1.30	10.30	2.65	3.60	3.39	34.62
May 1999	0.70	0.00	0.00	4.36	4.32	0.00	3.69	1.55	14.67	3.89	3.24	3.47	39.87
June 1999	1.03	0.00	0.00	5.56	5.44	0.00	4.59	3.24	18.10	5.53	4.10	4.31	51.89
July 1999	0.75	0.06	0.04	4.09	4.00	0.03	3.45	3.95	4.87	3.68	3.04	3.09	31.05
August 1999	0.71	6.31	0.00	4.10	4.14	0.00	3.55	4.49	3.73	2.85	3.21	2.80	35.90
September 1999	0.63	11.03	0.00	5.11	5.20	0.00	4.42	5.39	4.60	3.76	3.92	3.26	47.32
October 1999	0.69	6.87	0.00	3.22	3.15	0.00	2.60	3.22	2.85	2.35	2.43	2.39	29.77
November 1999	1.27	11.87	0.00	5.40	5.18	0.00	4.25	5.42	4.75	4.29	4.06	3.79	50.27
December 1999	2.11	10.93	0.21	6.45	4.83	1.18	3.91	5.30	4.45	4.29	4.64	5.27	53.56
January 2000	3.70	10.19	0.00	7.90	4.46	0.86	3.62	5.12	4.24	5.02	6.64	5.55	57.30
February 2000	3.62	10.12	0.00	7.58	4.70	0.01	3.70	5.34	4.31	10.83	11.19	5.70	67.09
March 2000	3.60	10.18	0.00	7.22	4.68	0.00	3.62	5.21	4.27	7.82	13.00	5.35	64.95
April 2000	3.85	11.16	0.00	7.27	4.68	0.00	3.90	5.63	3.06	5.50	7.53	5.06	57.65
May 2000	4.28	13.40	0.00	7.84	4.68	0.00	4.22	6.05	4.16	6.21	8.10	5.43	64.36
June 2000	4.22	12.98	0.00	7.67	4.59	0.00	3.98	6.02	4.15	6.14	7.63	5.28	62.67
July 2000	4.30	12.50	0.00	7.34	4.53	0.00	3.87	6.02	4.16	5.97	6.17	4.91	59.78
August 2000	4.27	12.33	0.00	7.11	4.40	0.00	3.89	6.00	4.14	5.35	5.58	4.68	57.77
September 2000	4.23	12.37	0.00	6.94	4.39	0.00	3.38	5.89	4.14	3.76	6.35	4.43	55.89
October 2000	4.09	12.48	0.00	6.88	4.37	0.00	3.30	5.84	4.16	2.71	5.41	4.33	53.55
November 2000	3.99	12.39	0.00	7.10	4.32	0.00	3.45	5.82	4.20	2.81	3.97	4.62	52.67
December 2000	3.92	12.39	0.00	7.02	4.21	0.00	3.28	5.72	4.19	2.22	4.04	4.81	51.82
January 2001	3.83	11.65	0.00	7.02	4.17	0.00	3.22	5.70	4.14	1.61	3.36	4.78	49.48
February 2001	3.87	11.33	0.00	7.11	4.11	0.00	3.40	5.81	4.17	1.66	3.03	5.02	49.51
March 2001	3.92	10.45	0.00	7.33	4.09	0.00	3.38	5.74	4.12	1.76	2.82	5.05	48.67
April 2001	3.89	11.00	0.00	7.39	4.18	0.00	3.31	5.73	4.09	1.49	2.66	4.76	48.50
May 2001	4.04	11.33	0.00	7.52	4.03	0.00	3.10	5.74	4.10	3.71	4.88	4.75	53.19

TABLE 4-8
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 3 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	RW5A	RW5B1	RW5B2	RW7A	RW7B1	RW7B2	RW9A	RW9B1	RW9B2	RW18A	RW27A	RW12B1	Total
June 2001	4.04	11.34	0.00	7.59	3.94	0.00	3.17	5.78	4.10	4.74	5.19	4.78	54.67
July 2001	3.94	11.25	0.00	7.51	3.83	0.00	3.09	5.70	4.04	4.50	4.06	4.59	52.51
August 2001	4.01	11.28	0.00	7.61	3.80	0.00	3.20	5.79	4.09	4.04	3.88	4.36	52.05
September 2001	3.97	11.32	0.00	7.58	3.72	0.00	2.90	5.78	4.03	3.35	3.84	4.44	50.92
October 2001	3.89	10.83	0.00	7.43	3.73	0.00	2.36	5.78	3.98	1.11	3.91	4.46	47.49
November 2001	3.87	10.18	0.00	7.35	3.67	0.00	2.28	5.84	3.97	0.51	4.61	4.56	46.86
December 2001	3.70	9.50	0.00	7.31	3.77	0.00	3.93	6.83	3.91	0.00	3.34	3.87	46.16
January 2002	3.68	9.41	0.00	7.66	3.90	0.00	4.26	7.42	3.86	5.56	5.19	3.60	54.54
February 2002	3.65	8.77	0.00	7.64	3.87	0.00	4.59	7.82	3.80	7.10	9.05	4.76	61.04
March 2002	3.64	8.56	0.00	7.67	4.11	0.00	4.97	7.13	3.78	5.76	9.24	4.66	59.52
April 2002	3.53	8.24	0.00	7.69	4.08	0.00	6.07	8.36	3.49	5.75	8.98	4.25	60.46
May 2002	3.57	7.99	0.00	7.63	4.03	0.00	6.86	5.94	3.19	5.91	8.50	4.12	57.77
June 2002	3.59	7.72	0.00	7.56	3.75	0.00	7.05	5.57	2.96	6.08	8.44	4.09	56.81
July 2002	3.60	7.49	0.00	7.61	3.80	0.00	7.31	5.52	2.70	6.12	8.64	4.06	56.84
August 2002	3.54	6.89	0.00	7.68	3.82	0.00	7.33	5.54	2.82	6.02	8.67	4.42	56.73
September 2002	3.52	6.44	0.00	7.65	3.73	0.00	7.29	5.62	2.97	5.61	7.61	4.60	55.04
October 2002	3.50	6.29	0.00	7.50	3.70	0.00	7.10	5.67	2.80	5.63	7.52	4.45	54.17
November 2002	3.42	8.33	0.00	7.60	3.57	0.00	7.12	6.76	2.37	5.63	6.78	4.50	56.07
December 2002	3.38	7.60	0.00	7.64	3.45	0.00	7.60	7.09	1.61	5.77	6.73	4.34	55.22
January 2003	3.20	7.20	0.00	7.80	4.50	0.00	7.50	6.20	4.00	6.00	6.70	4.10	57.20
February 2003	3.16	7.50	0.00	7.78	3.36	0.00	7.59	6.11	3.55	6.11	6.48	4.15	55.79
March 2003	3.30	7.03	0.00	7.70	3.08	0.00	7.63	6.10	3.20	6.03	6.25	3.88	54.18
April 2003	3.26	7.06	0.00	6.16	1.52	0.00	7.58	6.10	3.26	6.00	5.54	2.34	48.82
May 2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June 2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July 2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
August 2003	3.30	7.03	0.00	7.45	3.45	0.00	8.05	5.93	4.38	6.35	5.33	3.65	54.90
September 2003	3.48	7.33	0.00	7.63	1.53	0.00	8.25	6.07	4.32	7.05	2.65	4.42	52.73
Design Flow	1.00	NA	NA	5.00	1.00	NA	3.00	5.00	4.00	5.00	NA	15.00	39.00

TABLE 4-9
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 3 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	71A	RW-1A	RW-1B1	RW-1B2	RW-2A	RW-2B1	RW-2B2	RW-10B1	RW-11A	RW-11B1	RW-12A	RW-15A	RW-23A	RW-24A	RW-26A	RW-29A	DW3-219	DW3-244	DW3-334	DW3-364	DW3-505R	65B3	REG-4B1	Total
March 1998	1.76	2.14	0.00	0.42	3.31	6.80	3.37	4.98	2.25	4.30	0.00	6.38	4.17	4.12	2.16	NA	14.54	6.22	7.70	4.50	0.04	1.06	2.05	82.27
April 1998	4.70	6.32	0.00	1.02	8.94	17.68	8.83	12.99	6.11	11.95	0.00	16.14	10.12	10.90	5.85	NA	38.61	16.57	20.65	11.55	0.13	2.79	6.54	218.39
May 1998	3.16	4.40	0.01	0.59	5.98	12.05	5.69	6.49	4.17	8.35	0.00	11.36	7.76	7.98	3.90	NA	14.28	16.30	19.17	14.65	0.08	1.88	4.44	152.71
June 1998	3.74	5.39	0.00	0.76	6.78	14.12	4.83	7.35	4.78	10.30	0.00	11.15	8.98	8.50	3.95	NA	12.69	14.57	29.41	20.15	0.14	2.25	5.23	175.07
July 1998	0.90	1.32	0.00	0.18	1.56	3.50	1.09	2.05	1.25	2.26	0.00	3.06	2.20	2.19	0.39	NA	3.15	17.42	35.89	24.52	0.16	0.58	1.17	104.82
August 1998	3.49	5.12	3.98	0.71	7.40	14.00	6.22	8.60	5.40	8.99	0.00	12.47	8.19	8.61	4.22	NA	12.59	14.50	28.23	19.11	1.33	2.50	4.28	179.96
September 1998	4.17	6.65	12.30	0.90	9.81	18.24	8.74	11.60	7.25	9.98	0.09	16.07	10.48	11.01	4.53	NA	16.43	14.52	27.91	25.33	0.16	3.22	5.11	224.49
October 1998	3.61	5.15	0.00	0.73	7.67	13.99	6.67	9.59	5.49	9.27	4.64	12.06	7.77	8.14	4.25	NA	10.15	17.89	20.82	6.18	0.16	2.67	3.79	160.69
November 1998	3.68	5.13	0.00	0.73	7.96	14.61	6.93	10.06	5.53	9.59	4.81	12.95	8.06	8.41	4.44	NA	15.65	19.33	29.15	18.66	0.16	3.80	4.11	193.75
December 1998	4.23	6.29	0.04	0.83	9.73	17.52	8.46	12.16	5.69	11.48	5.97	15.65	9.38	9.92	5.37	NA	18.19	22.34	34.87	21.98	0.18	5.70	5.07	231.03
January 1999	3.21	5.24	0.00	0.68	7.63	14.05	6.87	9.23	5.16	9.04	4.56	12.61	6.89	7.46	4.28	NA	14.49	17.67	28.05	17.48	0.16	4.86	4.09	183.70
February 1999	3.36	5.75	0.00	0.68	8.61	15.37	7.49	10.90	5.98	8.65	4.82	13.86	7.75	8.90	4.91	NA	15.66	19.19	23.01	18.84	0.17	5.51	4.39	193.81
March 1999	4.87	6.66	0.00	0.69	10.60	18.18	8.63	13.07	7.23	7.11	5.25	16.44	11.78	11.17	6.14	NA	16.35	22.53	23.03	21.94	0.20	6.47	6.82	225.16
April 1999	3.61	5.30	0.00	0.72	8.86	14.79	6.88	10.42	5.55	5.22	3.81	13.44	9.58	8.78	4.99	NA	11.61	18.12	18.58	17.56	0.18	5.27	5.61	178.87
May 1999	3.44	5.15	0.00	0.67	8.84	14.45	6.89	10.08	5.01	4.91	3.84	13.46	9.55	3.69	4.90	NA	11.46	17.55	17.87	16.93	0.16	5.15	5.49	169.49
June 1999	4.18	6.89	0.03	0.87	10.32	18.30	8.77	12.85	3.98	6.57	4.39	17.62	11.92	6.87	6.14	NA	14.69	21.93	22.30	21.00	0.20	6.58	6.77	213.18
July 1999	2.90	2.88	0.01	0.59	7.81	14.47	6.92	10.04	4.98	5.47	2.95	13.99	9.39	9.95	4.81	NA	11.78	17.13	17.25	16.18	0.17	5.21	5.42	170.30
August 1999	1.80	0.39	0.02	0.39	5.63	9.70	4.64	6.62	3.20	3.64	1.62	9.41	6.26	6.16	3.16	NA	7.81	11.38	11.41	10.70	0.10	3.50	3.56	111.11
September 1999	2.79	5.32	0.00	0.47	3.77	19.87	9.39	13.27	6.29	7.36	5.90	16.79	12.74	11.43	6.56	NA	16.44	22.94	22.97	21.57	0.17	7.25	7.14	220.43
October 1999	3.13	2.96	0.00	0.67	9.62	13.30	5.66	10.11	4.51	5.38	3.85	12.25	9.23	7.38	3.53	NA	12.39	16.41	16.61	15.46	0.09	5.30	4.87	162.73
November 1999	2.98	3.88	0.00	0.44	12.35	15.02	2.38	10.54	4.40	5.38	2.04	12.84	9.58	6.43	4.09	NA	12.97	16.83	17.17	15.73	0.11	5.51	5.00	165.66
December 1999	3.24	4.75	0.02	0.82	14.87	18.18	4.84	11.97	4.31	6.33	3.72	14.96	11.39	7.82	5.78	NA	15.52	19.75	20.27	18.45	0.14	6.67	6.26	200.06
January 2000	2.54	3.29	0.08	1.13	11.02	12.77	3.07	8.84	2.92	2.17	2.79	10.45	8.60	6.20	4.21	NA	12.75	15.61	14.25	14.49	0.10	5.20	4.99	147.44
January 2000	2.83	3.52	0.09	0.66	12.14	11.93	3.23	9.35	3.25	2.82	2.98	10.71	9.49	5.91	4.82	NA	14.12	17.19	15.53	15.93	0.12	5.75	5.65	158.02
February 2000	2.23	1.85	1.97	0.67	13.20	14.38	2.97	9.07	3.61	9.09	2.69	6.18	10.21	5.69	5.88	NA	14.68	17.24	12.52	15.91	0.16	5.81	6.45	162.46
March 2000	2.09	3.71	0.00	0.69	13.54	16.12	4.16	8.67	3.64	9.38	2.50	7.30	10.49	6.03	5.66	NA	15.43	17.42	18.20	16.11	0.14	5.97	6.68	173.94
April 2000	2.17	4.24	0.00	0.65	12.80	16.06	4.33	11.00	3.15	9.39	1.72	4.95	10.47	7.97	6.15	NA	15.71	17.34	18.22	15.89	0.17	5.99	6.85	175.22
May 2000	2.26	4.44	1.47	0.62	12.64	15.85	4.29	10.92	2.90	9.23	4.60	12.01	10.09	8.31	6.66	NA	15.79	16.94	17.94	15.44	0.13	5.95	6.79	185.26
June 2000	2.13	4.53	0.00	0.67	12.80	16.21	3.51	11.09	4.96	9.41	4.93	10.90	10.47	5.99	6.29	NA	16.28	17.06	18.05	15.30	0.15	6.05	6.96	183.74
July 2000	1.95	4.41	0.00	0.65	12.94	15.59	5.45	10.43	4.46	9.10	4.79	8.68	10.19	7.29	6.44	NA	15.86	16.63	17.14	14.36	0.14	5.88	6.77	179.14
August 2000	3.09	4.82	0.00	0.64	13.31	16.01	5.91	10.35	4.41	9.41	5.13	7.39	10.50	7.61	5.64	NA	16.55	17.06	17.86	13.96	0.14	6.05	6.94	182.79
September 2000	3.89	4.66	0.00	0.65	13.39	15.27	6.05	9.29	3.99	9.37	5.08	6.06	10.46	7.54	6.31	NA	16.61	16.96	17.86	13.30	0.10	6.02	6.83	179.69
October 2000	3.46	4.37	0.00	0.62	12.70	14.17	5.96	7.39	3.15	8.81	4.81	8.32	9.91	7.18	7.38	NA	15.92	16.06	16.89	12.09	0.19	5.79	6.48	171.66
November 2000	3.49	4.91	3.35	0.64	13.30	7.82	6.59	7.35	2.87	9.25	4.68	11.65	10.42	7.62	8.77	NA	16.87	16.86	17.85	12.14	0.16	6.10	6.76	179.45
December 2000	3.26	4.71	4.19	0.62	13.37	6.85	7.01	7.58	2.41	9.33	4.48	11.38	10.48	7.55	9.00	NA	17.14	16.90	18.04	11.66	0.14	6.11	6.78	179.01
January 2001	2.89	4.60	0.58	0.63	12.38	6.73	6.09	9.17	2.27	9.30	4.20	11.19	10.42	6.98	9.18	NA	17.29	16.58	18.05	10.85	0.12	6.07	6.84	172.41
February 2001	2.46	5.16	0.70	0.72	12.19	6.46	4.70	9.09	2.76	8.38	3.62	10.92	10.42	7.79	9.42	NA	17.58	16.61	18.09	9.50	0.18	6.05	6.95	169.75
March 2001	1.65	5.39	0.00	0.68	13.48	6.40	3.35	9.07	3.42	9.24	4.79	1.47	10.38	9.00	9.65	NA	17.89	16.54	18.05	7.75	0.16	6.07	7.09	161.51
April 2001	4.30	5.43	0.00	0.70	13.70	6.41	2.65	8.69	4.11	9.28	4.92	0.00	10.48	8.84	9.60	NA	17.95	16.55	18.15	4.61	0.19	5.85	7.14	159.54
May 2001	4.56	5.46	0.00	0.68	13.59	6.29	1.97	9.01	4.44	9.21	4.45	0.00	10.41	9.98	9.18	NA	18.09	16.37	17.95	3.05	0.15	6.55	7.11	158.49
June 2001	4.58	5.23	0.00	0.61	12.97	6.02	7.00	8.58	3.77	8.81	4.57	0.00	10.00	8.70	7.05	NA	10.65	15.53	17.13	2.96	0.09	6.13	6.75	147.12
July 2001	4.71	5.32	0.00	0.52	13.51	5.96	7.80	8.85	4.55	8.42	5.01	0.00	10.33	10.84	9.45	NA	0.42	15.92	17.54	1.51	0.00	6.59	6.94	144.18
August 2001	5.09	5.57	0.00	0.68	13.78	5.97	9.11	8.97	4.43	9.06	4.80	0.00	10.51	11.29	7.06	NA	0.00	15.88	17.67	0.61	0.00	6.68	7.00	144.16
September 2001	6.18	5.39	0.00	0.66	13.84	5.94	9.06	8.99	4.35	9.22	4.55	0.00	10.45	9.95	5.83	NA	0.00	15.78	17.63	0.61	0.00	6.08	6.97	141.49
October 2001	5.18	5.19	0.00	0.66	13.61	5.81	8.95	8.26	3.42	9.21	4.25	0.00	10.35	13.20	4.97	NA	0.00	15.69	17.64	0.62	0.00	5.44	6.63	139.08
November 2001	5.77	5.08	0.00	0.63	8.42	3.84	8.87	8.30	2.88	5.89	3.94	0.00	10.15	13.34	3.53	NA	0.00	14.04	17.62	0.67	0.00	5.43	6.49	124.89
December 2001	5.46	5.32	0.00	0.58	10.91	6.01	8.88	8.40	2.67	9.06	3.66	0.00	8.40	13.24	8.41	NA	0.00	13.80	17.73	0.66	0.00	3.36	6.45	132.99
January 2002	5.00	5.36	0.00	0.58	6.02	5.99	8.94	8.42	5.71	9.09	3.12	0.00	10.40	4.74	8.68	NA	0.00	13.63	17.78	0.67	0.00	4.63	6.75	125.50
February 2002	4.27	5.61	0.00	0.53	10.17	5.73	8.89	8.31	5.91	9.01	3.93	0.00	10.30	7.59	4.10	NA	0.00	14.04	17.64	0.62	0.00	6.57	6.61	129.83
March 2002	4.03	5.85	0.00	4.26	10.22	5.59	9.15	8.47	5.57	9.10	4.92	0.00	10.43	8.62	8.86	NA	0.00	14.07	17.59	6.89	0.00	6.70	6.74	147.08
April 2002	3.29	6.00	0.00	3.81	9.94	5.70	9.23	8.61	4.36	9.10	5.01	0.00	10.44	8.32	9.11	NA	0.00	13.67	17.68	7.11	0.00	6.72	6.79	144.88
May 2002	5.12	6.12	0.00	4.26	9.50	5.64	10.03	8.66	4.11	9.09	5.12	0.00	10.40	5.55	9.12	NA	0.00	13.02	17.42	7.00	0.00	6.70	6.78	143.62
June 2002	4.63	6.09	0.00	4.54	8.88	5.58	10.06	8.78	4.16	8.83	5.13	0.00	10.37	5.04	9.11	NA	0.00	12.19	17.14	7.10	0.00	6.70	6.77	141.13
July 2002	3.86	6.06	0.00	4.57	8.91	5.42	10.10	8.80	4.40	8.83	5.72	0.00	10.37	5.01	8.37	NA	0.00	11.85	16.96	6.80	0.00	6.71	6.61	139.33
August 2002	3.23	6.04	0.00	4.61	8.56	5.10	10.04	8.82	4.32	8.83	5.51	0.00	10.43	6.23	7.30	NA	0.00	10.85	16.85	6.73	0.00	6.67	6.54	136.64
September 2002	2.49	5.81	0.00	4.53	8.67	5.23	10.04	8.82	3.98	8.85	5.23	0.00	10.47	5.55	6.49	NA	0.00	11.54	16.66	6.81	0.00	6.59	6.70	134.46

TABLE 4-9
MONTHLY AVERAGE PUMPING RATES (gallons per minute)
SYSTEM 3 - FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Month/Year	71A	RW-1A	RW-1B1	RW-1B2	RW-2A	RW-2B1	RW-2B2	RW-10B1	RW-11A	RW-11B1	RW-12A	RW-15A	RW-23A	RW-24A	RW-26A	RW-29A	DW3-219	DW3-244	DW3-334	DW3-364	DW3-505R	65B3	REG-4B1	Total
October 2002	1 82	5 35	0 00	4 58	8 99	5 68	10 04	8 82	3 80	8 86	5 20	0 00	10 43	5 33	5 56	NA	0 00	11 25	16 60	6 95	0 00	6 55	6 70	132 50
November 2002	3 79	5 48	0 00	4 57	8 63	5 63	10 06	8 83	3 50	8 84	5 02	0 00	10 42	5 26	5 39	NA	0 00	10 73	16 44	6 97	0 00	6 51	6 44	132 50
December 2002	5 38	5 97	0 00	4 33	8 69	5 88	10 06	8 85	4 81	9 16	4 76	0 00	10 44	4 54	6 11	NA	0 00	10 25	16 31	6 70	0 00	6 51	6 46	135 21
January 2003	5 70	6 50	0 00	0 00	9 20	6 10	10 00	9 70	3 90	9 30	4 50	0 00	10 50	4 50	6 60	10 40	0 00	5 30	16 30	0 00	0 00	6 50	6 70	131 70
February 2003	5 68	6 50	0 00	0 51	9 19	5 97	10 01	9 78	4 17	9 41	3 91	0 00	9 74	11 59	6 47	10 47	0 00	5 36	16 44	0 94	0 00	6 51	6 62	139 27
March 2003	5 63	6 60	0 00	1 18	9 30	5 93	10 00	9 80	3 83	9 43	3 80	0 00	10 48	4 85	6 88	10 53	0 00	5 48	16 50	1 93	0 00	6 58	6 65	135 33
April 2003	5 54	6 68	0 00	0 11	9 27	5 94	10 02	9 87	0 00	9 45	2 45	0 00	10 46	5 25	6 98	10 58	0 00	4 61	16 55	0 14	0 00	6 58	6 70	127 17
May 2003	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
June 2003	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
July 2003	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
August 2003	5 40	6 37	0 00	3 20	9 00	3 00	8 73	9 60	1 27	8 97	1 37	0 00	10 10	4 37	7 80	11 10	0 00	1 13	15 37	2 13	0 00	6 40	6 93	122 23
September 2003	5 42	6 54	0 00	0 00	9 50	4 00	8 92	10 84	3 78	9 10	3 96	0 00	10 12	4 46	7 40	11 18	0 00	2 14	14 00	1 40	0 00	6 38	7 22	126 36
Design Flow	0 15	0 02	NA	5 00	NA	NA	6 00	13 44	0 00	13 65	0 00	6 14	7 00	8 00	NA	6 14	NA	NA	NA	NA	NA	NA	5 00	70 54

TABLE 6-1
TCE CONCENTRATION TRENDS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

TCE Trends "A" Aquifer Outside the Slurry Wall (mg/L)

Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
127A		0.2200	0.0380	0.0665	0.0645	0.0380	0.0220	0.0200
130A		0.8400	0.4000	0.3700	0.2900	0.2000	0.0900	0.0960
147A		5.5000	0.5000	0.3700	0.2550	0.2300	0.1900	0.1600
149A		3.7667	0.6100	0.2400	0.1750	0.1900	0.1800	0.1300
152A		34.3333	14.0000	5.2500	1.8350	1.3000	0.9300	1.0000
156A			3.9000	3.1500	1.2500		0.1950	0.2800
160A			0.3800	0.4050	0.2700	0.3200	0.3600	0.4800
22A	4.7000		0.5600	0.1835	0.2950	0.2400	0.2100	0.2000
23A	0.0992		0.1900	0.3200	0.1550	0.1300	0.1100	0.1100
40A	278.7500		2.3000	1.3000	4.5000	1.8000	0.8100	1.4000
42A	45.1667	9.0000	1.0000	0.7800	0.6500	0.5700	0.5200	0.6200
43A	6.7000	205.0000	0.3400	0.4400	0.4900	0.4100	0.4300	0.4200
44A	4.9500		0.7000	0.6000	0.5300	0.4500	0.3700	0.3700
54A	28.3333	24.0000	15.5000	3.9500	1.0750	0.6100	1.1000	0.8900
80A	15.0000	5.4000	0.5800	0.5350	0.4050	0.3300	0.3600	0.3700
RW-24A			0.8200	0.5900	0.4300	0.3700	0.2900	0.4600
RW-25A			2.3000	3.2000	1.6000	1.6000	1.1000	1.5000
RW-2A	2.7000	2.2500	0.6000	0.2000	0.1600	0.1800	0.1900	0.2500
RW-4A	0.2533		0.1900		0.1900	0.1400	0.1400	0.1800
No. of Samples	10	10	19	18	19	18	19	19
Average All Wells	38.6653	29.0310	2.3636	1.2194	0.7694	0.5060	0.3998	0.4703
Average 86/87 Wells	38.6653		2.1960	0.9232	0.8450	0.4860	0.4240	0.4810
Average 1992 Wells		29.0310	3.3568	1.2202	0.5400	0.4058	0.4012	0.3956

TCE Trends "B1" Aquifer (mg/L)

Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
101B1	0.3700	0.3600	0.0790	0.1350	0.0905	0.0840	0.0580	0.0830
110B1	10.9083	2.0000	1.1000	1.1500	0.7050		0.3100	0.2000
115B1	19.2667	8.8000	5.6000	14.5000	11.6667	13.0000	9.5000	9.9500
117B1	7.2993	3.8000	0.4000	1.4000	0.2900	0.4800	0.6100	1.9000
145B1			0.1800	0.1045	0.1200	0.1500	0.1600	0.1800
147B1			3.5000	3.2500	2.5000	0.5900	0.0130	1.9000
2B1	4.7000		0.5100	0.7400	0.7450	0.5600	0.5500	0.6400
60B1			16.0000	18.0000	10.6000		2.5500	5.1000
95B1	0.2028	0.1550	0.0600	0.0460	0.0580	0.0440	0.0140	0.0170
RW-1(B1)		0.2320	0.2000	0.2050	0.1850	0.1300	0.1900	0.1900
RW-10(B1)			3.8000	1.5500	1.2500	1.2000	0.7700	1.1000
RW-11(B1)			0.2000	0.2650	0.2100	0.1700	0.1600	0.1700
RW-12(B1)			3.2000	1.8000	1.8667	1.2000	0.8700	1.0000
RW-3(B1)	2.6333	1.5000	0.4700	0.4750	0.4600	0.3800	0.2900	0.3900
RW-4(B1)	4.4000	11.1500	4.9000	4.1500	4.1500	3.2000	2.3000	3.4000
RW-5(B1)	9.1250	5.6500	3.5000	4.8250	5.3667	2.4000	1.9000	2.4000
RW-7(B1)	16.6667	30.0000	16.0000	7.9000	9.3000	6.2000	4.8000	5.9000
Number of Samples	10	10	17	17	17	15	17	17
Average All Wells	7.7793	6.6952	4.2611	4.3053	3.6980	2.7993	2.3358	2.8622
Average 86/87 Wells	7.7793	7.0461	3.2619	3.5321	3.2832	2.9276	2.0332	2.4880
Average 1992 Wells		6.6952	3.2309	3.4786	3.2272	2.8798	1.9972	2.4430

TABLE 6-1
TCE CONCENTRATION TRENDS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

TCE Trends "B2" Aquifer (mg/L)

Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
10B2	0.0044	0.0007	4.7000	2.4667	10.8000	11.7500	0.3210	0.7800
118B2	0.0152	0.4000	0.0005	0.4300	0.2530	0.2200	0.3100	0.4600
11B2	0.0005	0.0018	0.0120	0.0005	0.0005		0.0008	0.0005
146B2			0.1300	0.2050	0.2400		0.1700	0.1200
148B2			0.0009	0.0021	0.0014	0.0010	0.0008	0.0008
40B2	0.0591	0.0032	0.0300	0.0465	0.0385		0.0235	0.0220
90B2	0.0246	0.7600	0.4700	0.4550	0.1920		0.3500	0.1900
RW-1(B2)			0.3500	0.1800	0.1850	0.1600	0.1400	0.1500
RW-2(B2)	10.5333	5.2000	1.4000	1.0000	0.8450	0.8400	0.7300	1.1000
RW-3(B2)	5.7000		6.2000	4.3333	3.7000	4.4000	3.4000	4.9000
RW-4(B2)	8.9500	0.7500	67.0000	51.2500	55.7500	43.5000	24.0000	28.5000
Number of Samples	8	7	11	11	11	7	11	11
Average All Wells	3.1609	1.0165	7.2994	5.4881	6.5459	8.6959	2.6769	3.2930
Average 86/87 Wells	3.1609	1.0165	9.9766	7.4978	8.9474	12.1420	3.6419	4.4941
Average 1992 Wells		1.0165	10.5161	7.9498	9.6970	14.0775	3.6765	4.4361

TCE Trends Within 313 Fairchild Drive Slurry Wall Enclosure (mg/L)

Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
118A								2.5000
121A								0.6100
124A	1.6725					0.8200		1.1000
133A								0.0230
157A			11.0000					4.7500
33A	1.1213							0.0380
51A	2.8725							3.3000
57A	8.4167							0.0240
59A	0.1052							0.1100
67A	7.5000							0.1600
68A	2.3583							0.3300
84A	0.0008							0.0018
RW-16A	1.1800		0.5700					0.7200
RW-18A		11.0000	4.8000					2.3000
RW-27A			6.7000					2.2000
RW-28A								1.0000
RW-3A		0.7100	0.0820					0.0520
RW-5A	3.0800	3.0000	2.2000					2.4000
RW-7A	5.5000	8.1000	5.2000					1.9000
Number of Samples	8.5	4	7	0	0	1	0	19
Average All Wells	2.9631	5.7025	4.3646			0.8200		1.2378
Average 86/87 Wells	2.9631							0.9167
Average 1992 Wells		5.7025						1.6630
Average 1997 Wells			4.3646					2.0460

TABLE 6-1
TCE CONCENTRATION TRENDS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

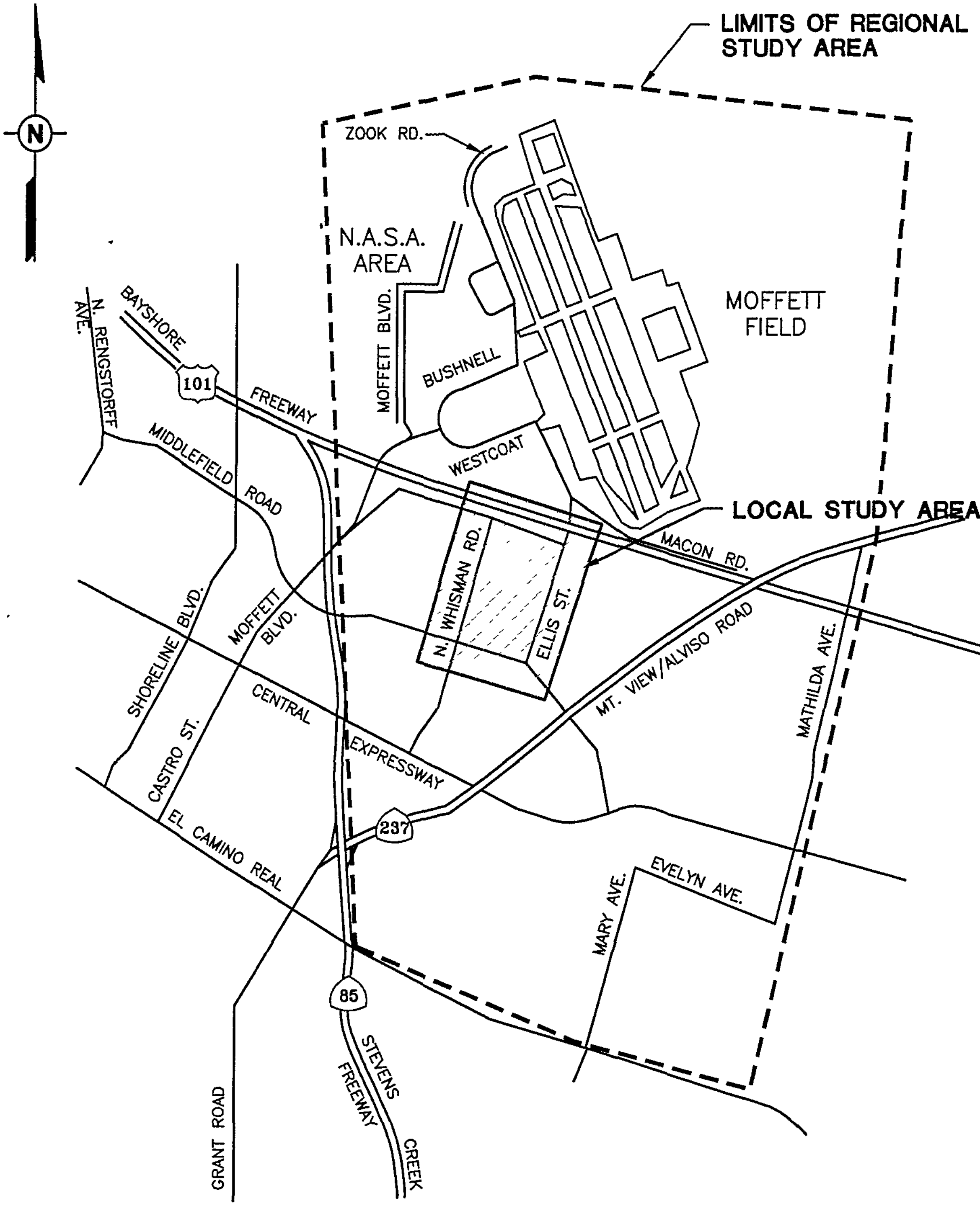
TCE Trends Within 369 N. Whisman Road Slurry Wall Enclosure (mg/L)								
Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
101A	0.0575							0.0730
12A	4.5286		12.0000					
134A								0.0160
139A								0.0960
143A								0.0089
148A		3.7500	0.3600					1.5000
155A								0.3300
159A								0.1900
15A	0.5100		0.3300					0.2900
161A								6.2000
174A								0.2600
4A	12.1982		5.9000					5.8000
6A	4.7500		0.5400					0.3600
70A	189.8000		0.2000					
71A	46.3375	98.0000	1.0700					1.1000
9A	3.5208		0.0830					0.0240
RW-11A	24.5687		0.6700					5.3000
RW-12A	10.2000	3.6000	2.7000					2.1000
RW-1A	0.3500	0.7300	0.1400					0.1800
RW-23A			2.5000					0.6900
RW-26A			0.0910					0.2800
RW-29A								0.3700
Number of Samples	11	4	13	0	0	0	0	20
Average All Wells	26.9838	26.5200	2.0449					1.2584
Average 86/87 Wells	26.9838							1.6919
Average 1992 Wells		26.5200						1.2200
Average 1997 Wells			2.0449					1.6022

TCE Trends Within 401 National Avenue Slurry Wall Enclosure (mg/L)								
Well Name	1986/1987	1992	1997	1998	1999	2000	2001	2002
122A	10.0000							0.4600
137A	4.1000							4.5000
35A	1.1323							0.3800
36A	7.6100							0.3300
37A	3.3167							0.7550
AE/RW-9-1			2.2000					1.2000
AE/RW-9-2			30.0000					25.0000
RW-20A	4.3500	8.0000	2.0000					1.1000
RW-21A		2.5000	0.1500					0.7100
Number of Samples	6	2	4	0	0	0	0	9
Average All Wells	5.0848	5.2500	8.5875					3.8261
Average 86/87 Wells	5.0848							1.2542
Average 1992 Wells		5.2500						0.9050
Average 1997 Wells			8.5875					7.0025

TABLE 7-1
STATUS OF ROD CLEANUP GOALS
FAIRCHILD SEMICONDUCTOR CORPORATION
MIDDLEFIELD-ELLIS-WHISMAN SITE, MOUNTAIN VIEW, CALIFORNIA

Property	Remedial Action	Soil Cleanup Goals Achieved?	Groundwater MCLs Achieved?	Comments
369/441 N. Whisman Road	GW Extraction, Soil Vapor Extraction, Soil Excavation, Slurry Wall	YES	In progress	Soil remediation goal has been achieved by excavating shallow soils above 6 feet, and by implementing an SVE system. Groundwater remediation goals have not been achieved although groundwater extraction and treatment system is in operation. Groundwater concentrations have decreased significantly.
515/545 N. Whisman Road and 313 Fairchild Drive	GW Extraction, Soil Excavation, Slurry Wall	YES	In progress	Soil remediation goal has been achieved by excavating vadose soils to a depth of approximately 15 feet. Groundwater remediation goals have not been achieved although groundwater extraction and treatment system is in operation. Groundwater concentrations have decreased significantly.
644 National Avenue	GW Extraction, Soil Excavation	YES	In progress	Soil remediation goal has been achieved by excavating vadose soils. Groundwater remediation goals have not been achieved although groundwater extraction and treatment system is in operation. Groundwater concentrations have decreased significantly.
401 National Avenue	GW Extraction, Soil Vapor Extraction, Soil Excavation, Slurry Wall	YES	In progress	Soil remediation goal has been achieved by excavating shallow soils above 6 feet, and by implementing an SVE system. Groundwater remediation goals have not been achieved although groundwater extraction and treatment system is in operation. Groundwater concentrations have decreased significantly.
464 Ellis Street	Remedial actions were implemented by Raytheon and by the RGRP. They include GW Extraction and SVE.	YES	In progress	Soil remediation goal has been achieved by implementing an SVE system. Groundwater remediation goals have been achieved in two deep aquifers by the RGRP. Groundwater extraction and treatment system is in operation. Groundwater concentrations have decreased significantly.

FIGURES



SITE LOCATION MAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

FAIRCHILD SEMICONDUCTOR CORP.

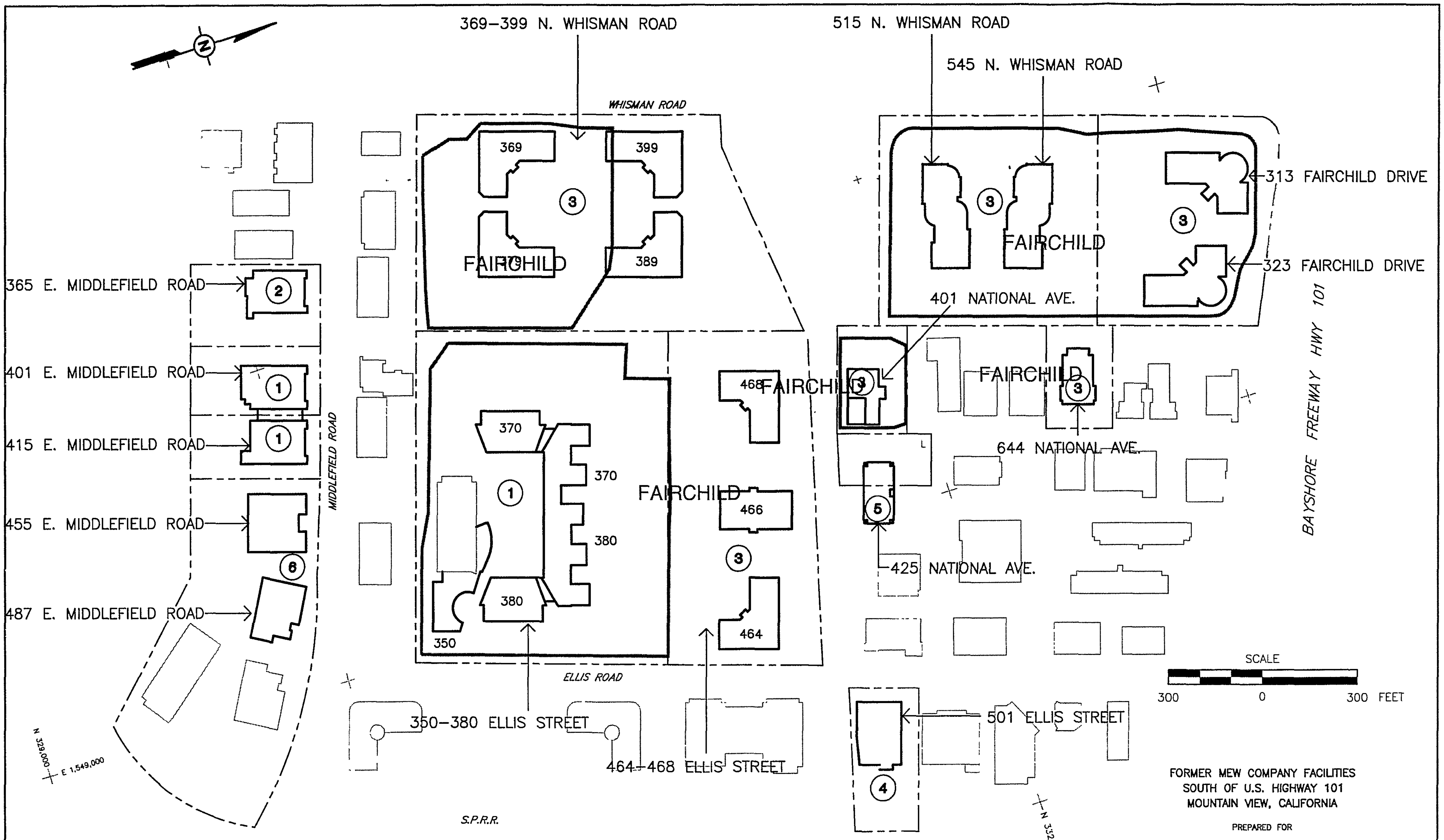
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
1	2 APR 03	ISSUED FOR REPORT	VZC		

Locus TECHNOLOGIES

N.T.S.

DRAWING NO. 97-023-A45

FIGURE 1-1



FORMER MEW COMPANY FACILITIES
SOUTH OF U.S. HIGHWAY 101
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

MEW COMPANIES

LEGEND:

1. RAYTHEON COMPANY
2. INTEL CORPORATION
3. FAIRCHILD SEMICONDUCTOR CORPORATION
4. NEC ELECTRONICS, INC.
5. SUMITOMO MITSUBISHI SILICON CORPORATION/ VISHAY GENERAL SEMICONDUCTOR, INC.
6. SMI HOLDING LLC

- - - - PROPERTY BOUNDARIES
——— SLURRY WALL

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△	12 DEC 03	ISSUED FOR REPORT	VZC	WH	

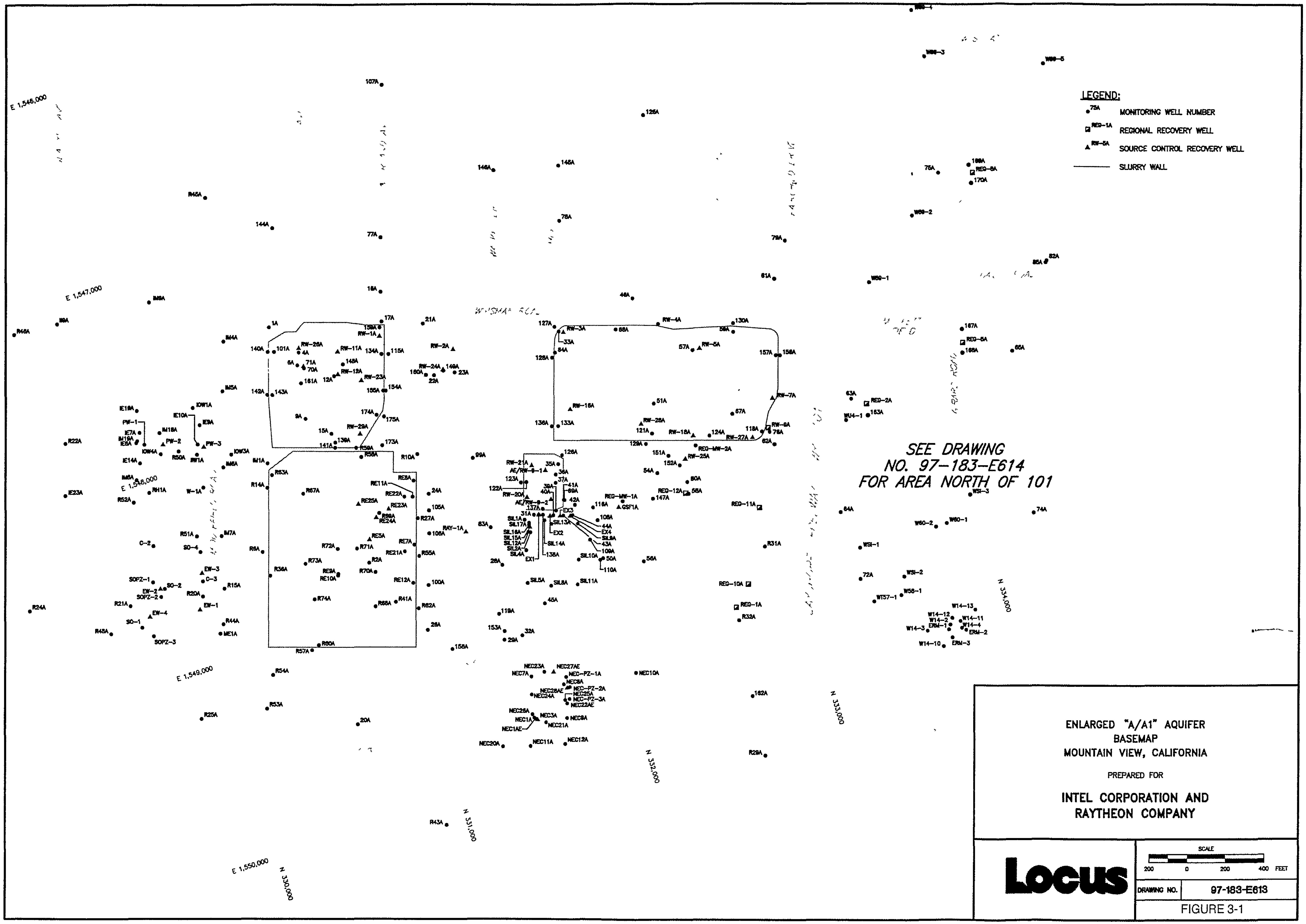
Locus TECHNOLOGIES

SCALE: AS SHOWN

DRAWING NO. 23-007-B47

FIGURE 1-2

K:\23-007\B47.DWG 12 DEC 03



ENLARGED "A/A1" AQUIFER BASEMAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

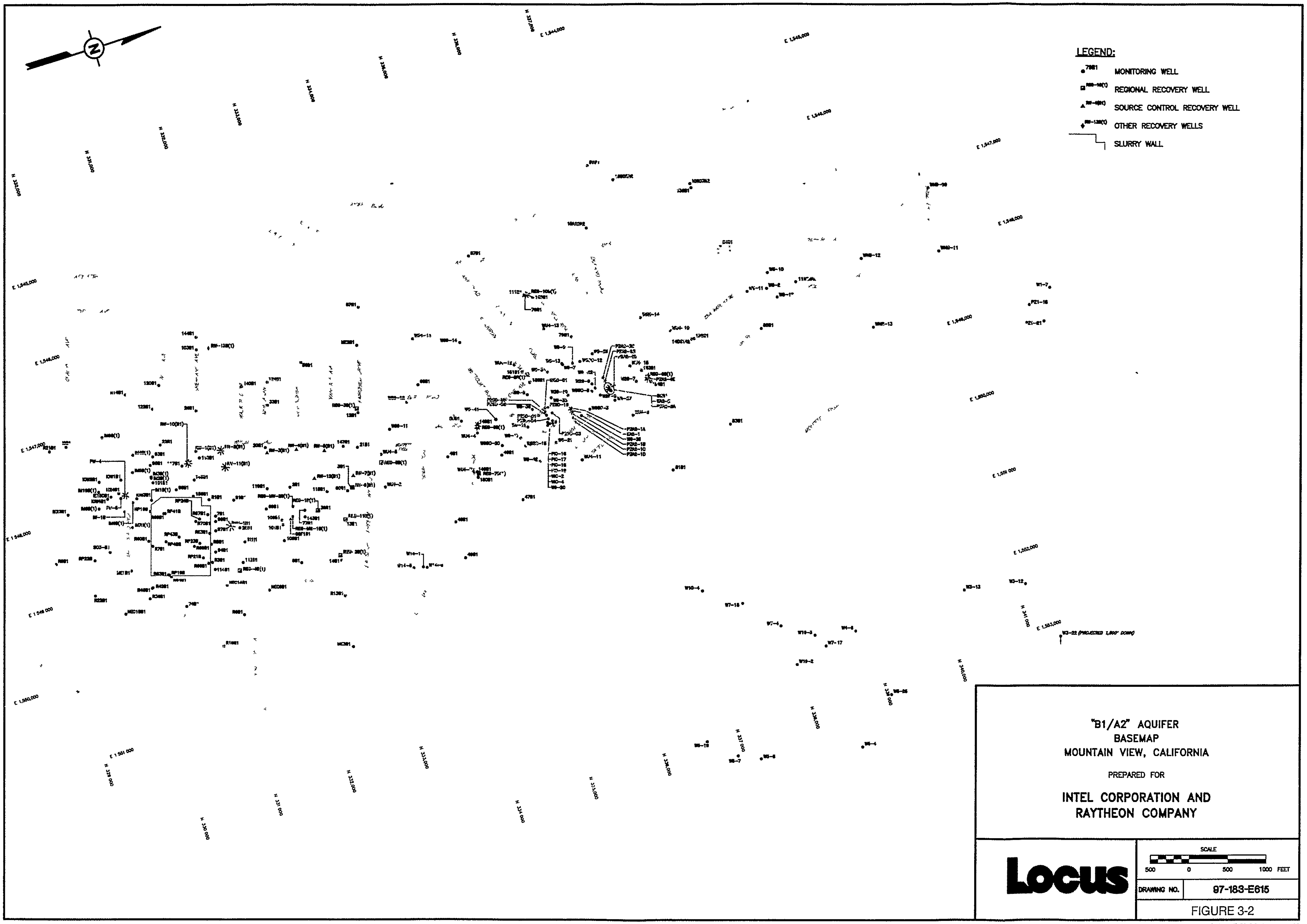
INTEL CORPORATION AND RAYTHEON COMPANY

Locus

DRAWING NO. 97-183-E613

FIGURE 3-1

K\97-183\E613.DWG 4 NOV 03



"B1/A2" AQUIFER
BASEMAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND
RAYTHEON COMPANY

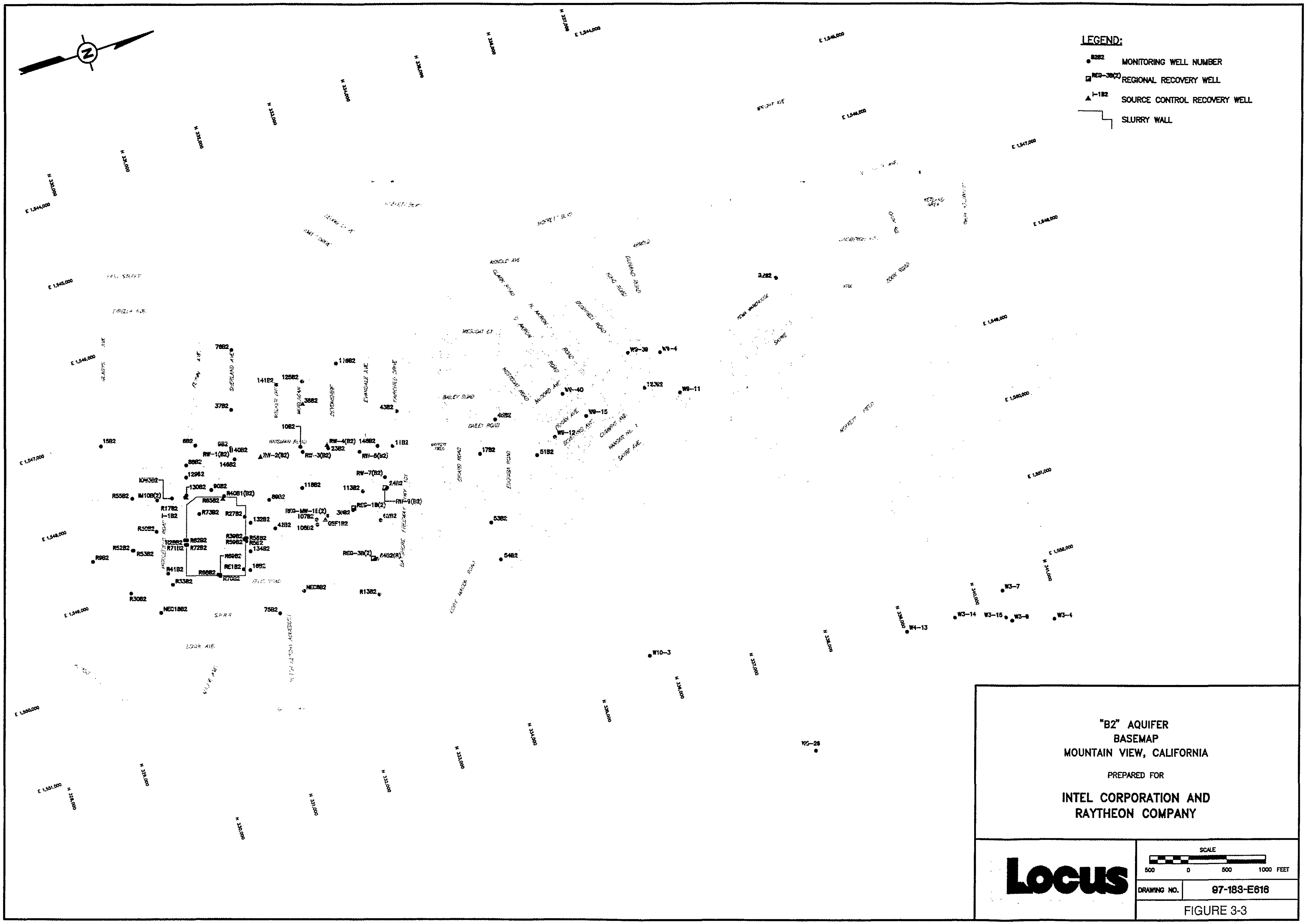
Locus

SCALE
500 0 500 1000 FEET

DRAWING NO. 97-183-E615

FIGURE 3-2

K:\97-183\E615.DWG 4 NOV 03



"B2" AQUIFER
BASEMAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND
RAYTHEON COMPANY

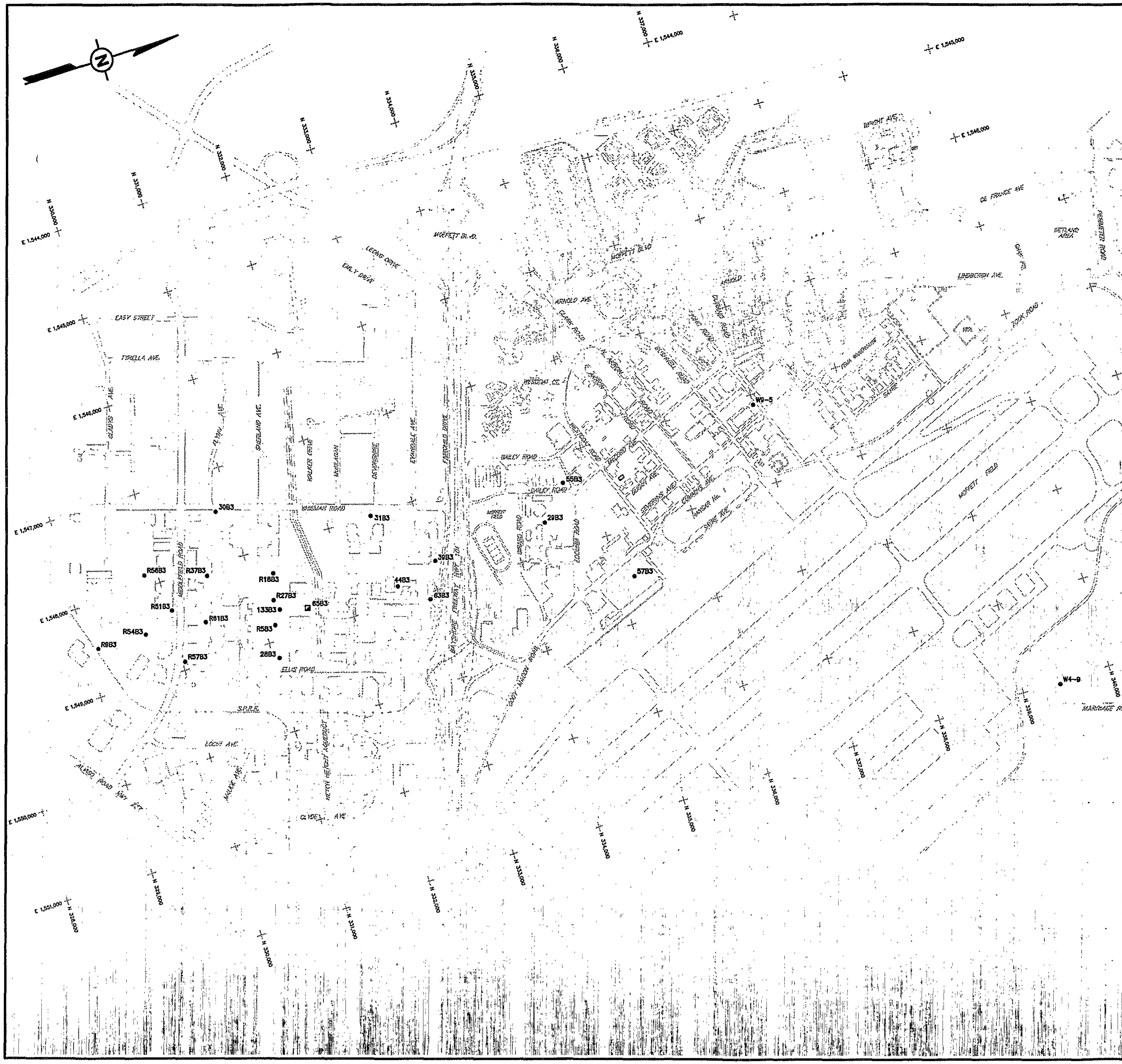
Locus

SCALE
500 0 500 1000 FEET

DRAWING NO. 97-183-E616

FIGURE 3-3

K:\97-183\E616.DWG 4 NOV 03



LEGEND:

W9-5 MONITORING WELL NUMBER

65B3 REGIONAL RECOVERY WELL

"B3" AQUIFER
BASEMAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND RAYTHEON COMPANY

Locus TECHNOLOGIES

SCALE

500 0 500 1000 FEET

DRAWING NO.	97-183-E617
	FIGURE 3-4

K:\97-183\E617.DWG 4 NOV 03

"C" AND DEEP AQUIFER MONITORING WELLS
BASEMAP
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND RAYTHEON COMPANY

LOCUS TECHNOLOGIES

SCALE: 200 0 200 400 FEET

DRAWING NO. 97-183-E618

FIGURE 3-5

K:\97-183\E618.DWG 4 NOV 03

LEGEND:

• 60A ABANDONED OR SEALED WELLS

NOTES:

1. WELL LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE, AND ARE INTENDED FOR ILLUSTRATIVE PURPOSES ONLY.

ENLARGED "A/A1" AQUIFER ABANDONED WELLS MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND RAYTHEON COMPANY

Locus TECHNOLOGIES

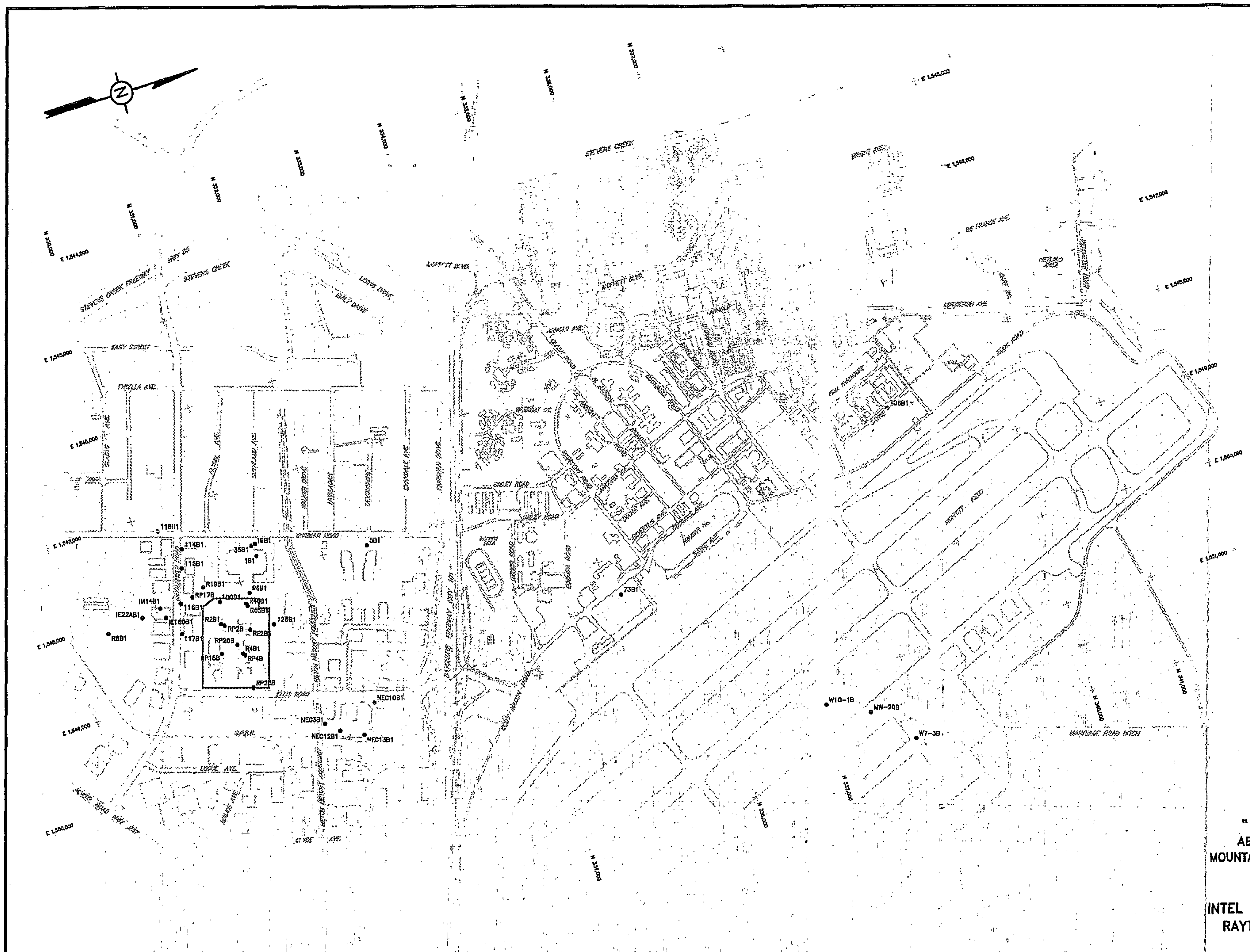
SCALE

200 0 200 400 FEET

DRAWING NO. 23-007-E50

FIGURE 3-6

K:\23-007\E50.DWG 24 NOV 03



LEGEND:

• 10581 ABANDONED OR SEALED WELLS

SLURRY WALL

NOTES:

1. WELL LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE, AND ARE INTENDED FOR ILLUSTRATIVE PURPOSES ONLY.

"B1" AQUIFER
ABANDONED WELLS
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND
RAYTHEON COMPANY

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△		ISSUED FOR REPORT	VZC		

Locus TECHNOLOGIES

SCALE: 500 0 500 1000 FEET

DRAWING NO. 23-007-E51

FIGURE 3-7

K:\23-007\E51.DWG 24 NOV 03

LEGEND:

•52B2 ABANDONED OR SEALED WELLS

SLURRY WALL

NOTES:

1. WELL LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE, AND ARE INTENDED FOR ILLUSTRATIVE PURPOSES ONLY.

"B2" AQUIFER
ABANDONED WELLS
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND
RAYTHEON COMPANY

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△		ISSUED FOR REPORT	VZC		

Locus
TECHNOLOGIES

SCALE
500 0 500 1000 FEET

DRAWING NO. 23-007-E53

FIGURE 3-8

K:\23-007\E53.DWG 24 NOV 03

LEGEND:

• 58B3 ABANDONED OR SEALED WELLS

NOTES:

1. WELL LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE, AND ARE INTENDED FOR ILLUSTRATIVE PURPOSES ONLY.

"B3" AQUIFER
ABANDONED WELLS
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND
RAYTHEON COMPANY

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△		ISSUED FOR REPORT	VZC		

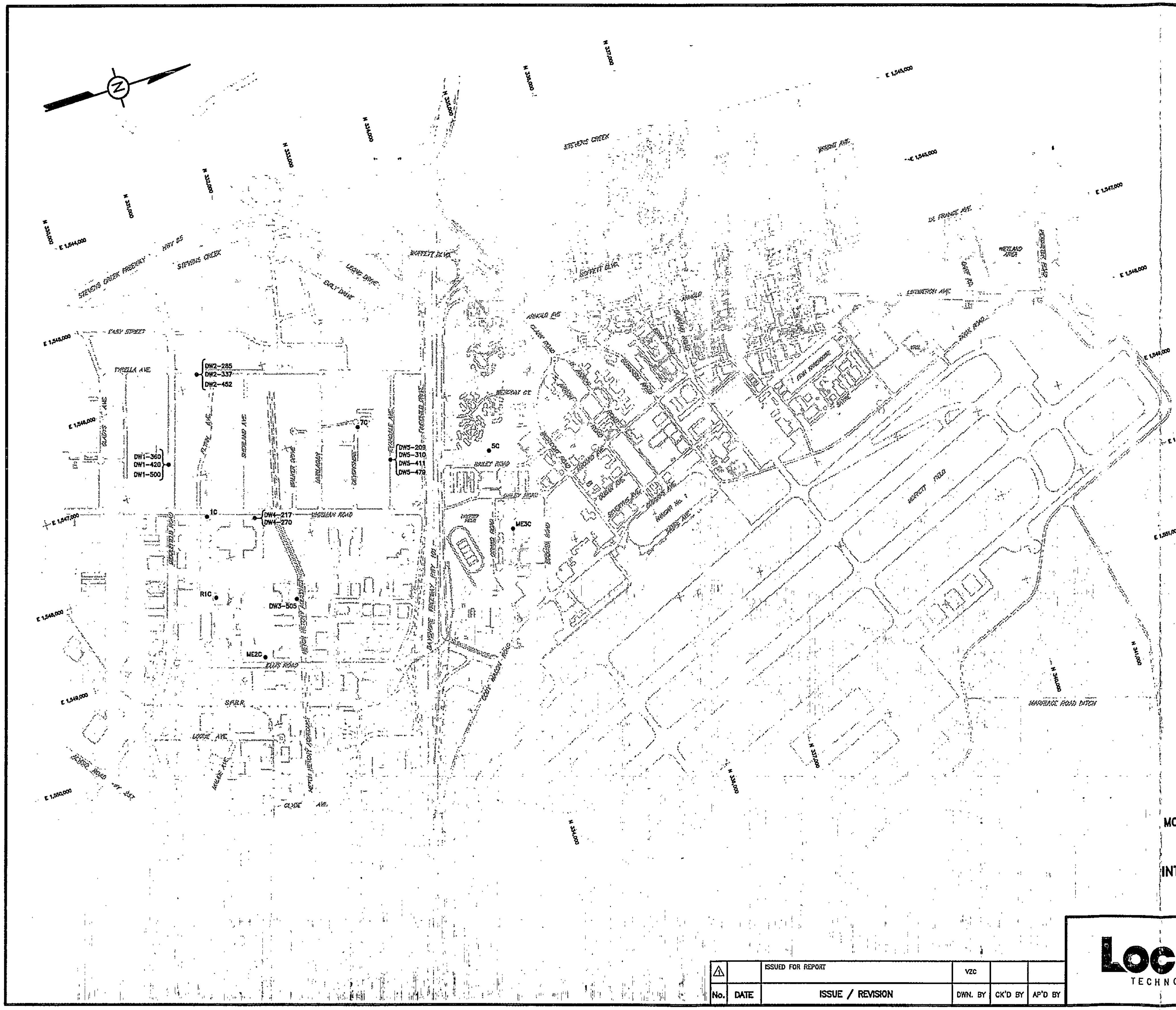
Locus TECHNOLOGIES

SCALE: 500 0 500 1000 FEET

DRAWING NO. 23-007-E54

FIGURE 3-9

K:\23-007\E54.DWG 24 NOV 03



LEGEND:

•5C ABANDONED OR SEALED WELLS

NOTES:

1. WELL LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE, AND ARE INTENDED FOR ILLUSTRATIVE PURPOSES ONLY.

"C" AQUIFER ABANDONED WELLS MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

INTEL CORPORATION AND RAYTHEON COMPANY

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△		ISSUED FOR REPORT	VZC		

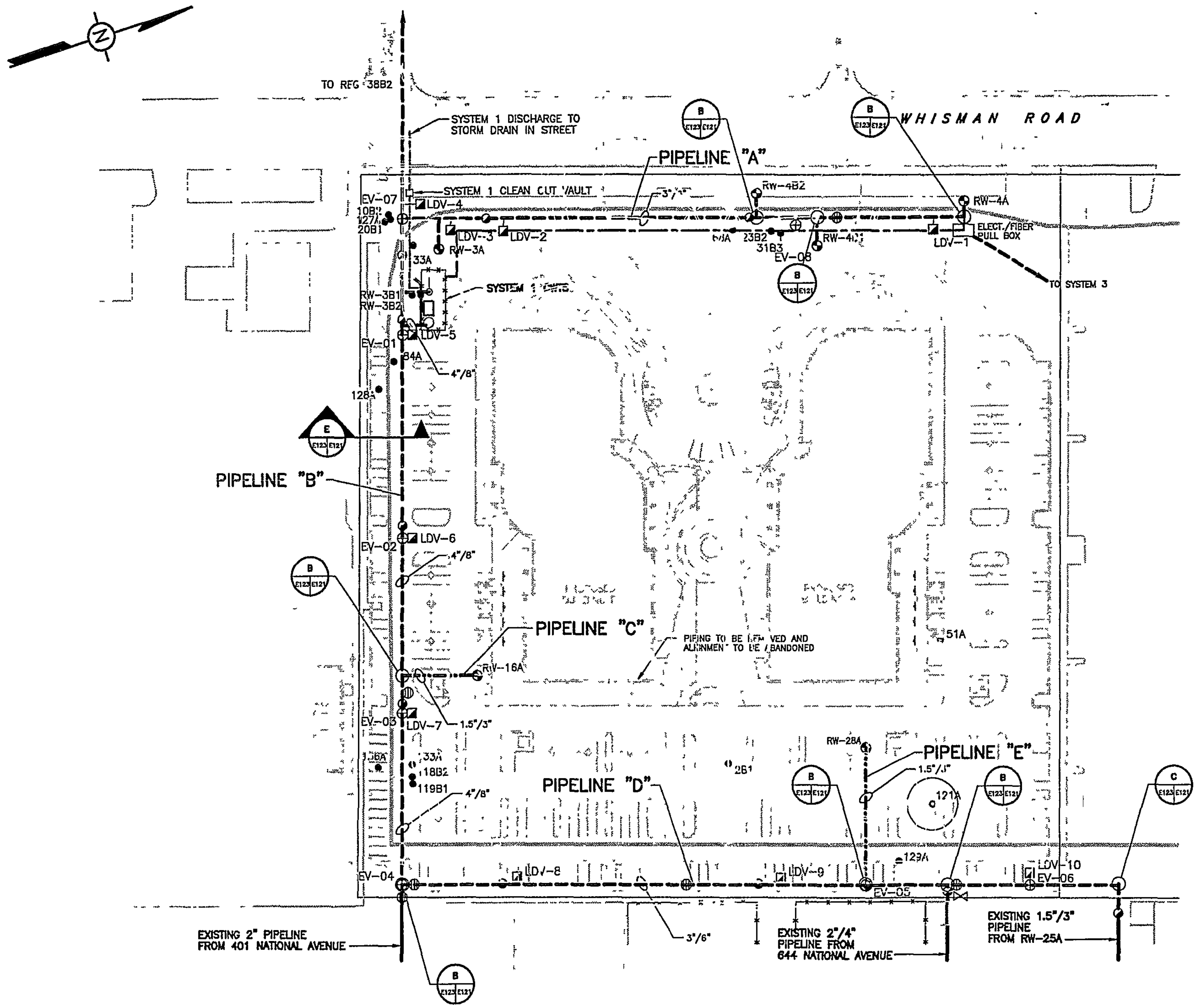
Locus TECHNOLOGIES

SCALE 500 0 500 1000 FEET

DRAWING NO. 23-007-E55

FIGURE 3-10

K:\23-007\E55.DWG 24 NOV 03



LEGEND:

- EXTRACTION WELL
- MONITORING WELL
- LEAK DETECTION VAULT
- CONTAINMENT PIPE ANNULUS SEAL
- ELECTRICAL VAULT
- CLEANOUT
- WATER VALVE
- EXISTING PIPELINE
- FIBER OPTIC COMMUNICATION CABLE AND POWER SERVICE TO SYSTEM 3
- NEW PIPING TO BE INSTALLED IN EXISTING TRENCH ALIGNMENT
- NEW PIPING TO BE INSTALLED
- SYSTEM 1 DISCHARGE LINE
- SLURRY WALL
- PROPERTY LINE
- 3"/6" INDICATES DOUBLE CONTAINED PIPING
  - SIZE OF CONTAINMENT PIPE, IN INCHES
  - SIZE OF CARRIER PIPE, IN INCHES

NOTES:

1. ALL CARRIER AND CONVEYANCE PIPELINES TO BE SCHEDULE 40 PVC.
2. FINAL LOCATIONS OF HIGH POINT AND LEAK DETECTION VAULTS WILL BE DETERMINED BY ENGINEER IN THE FIELD.

AS-BUILT
GROUNDWATER CONVEYANCE PIPING ALIGNMENT
SYSTEM 1 REDEVELOPMENT
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

FAIRCHILD SEMICONDUCTOR CORP.

No.	DATE	ISSUE / REVISION	DWN BY	CK'D BY	AP'D BY
△		AS BUILT	VZC		

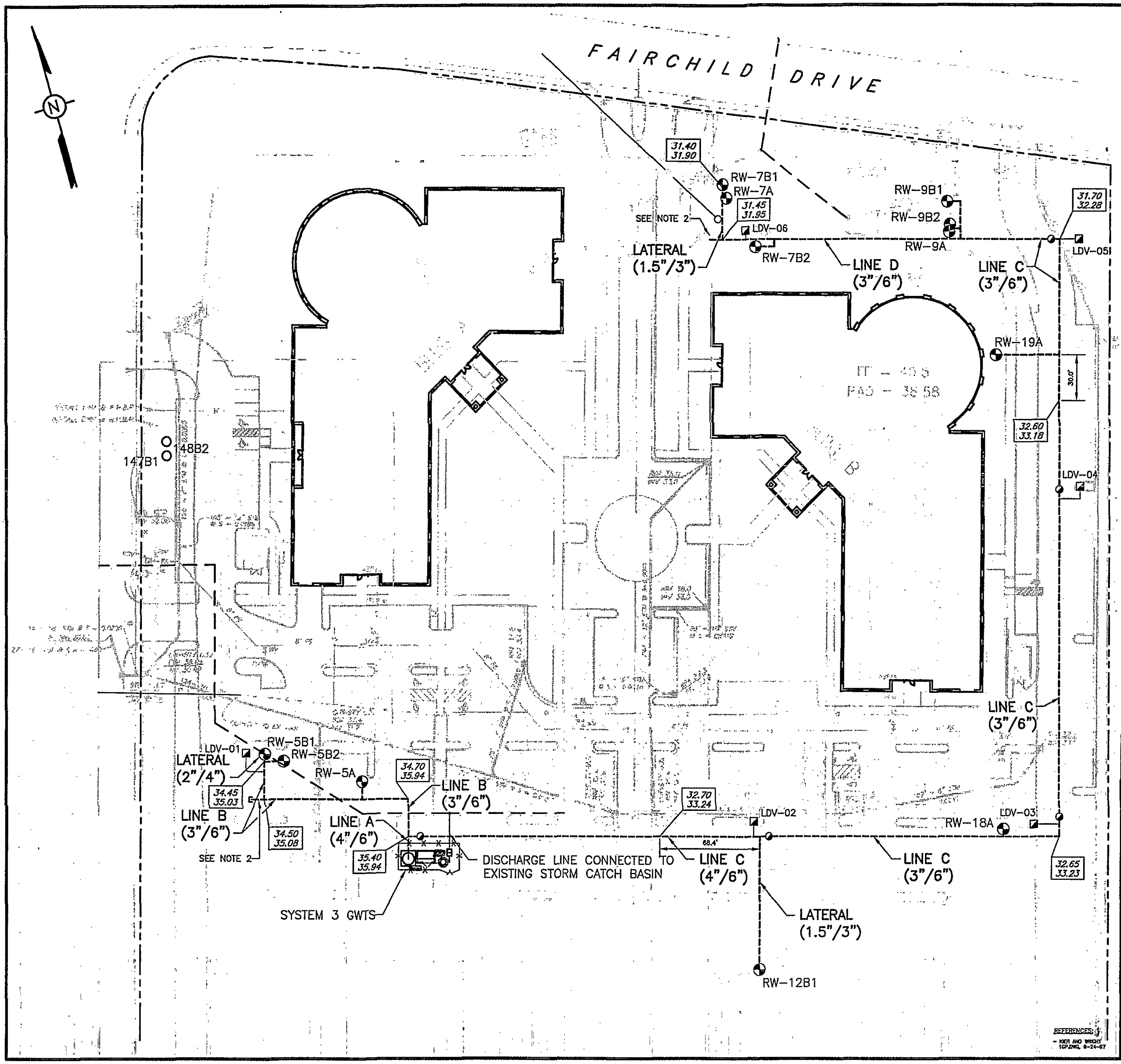
Locus TECHNOLOGIES

SCALE 50 0 50 100 FEET

DRAWING NO. 97-023-E199

FIGURE 4-1

K:\97-023\E199 27 JUN 01



LEGEND:

- CONVEYANCE PIPELINE
- EXISTING STORM SEWER
- LEAK DETECTION VAULT
- CONTAINMENT PIPE ANNULUS SEAL
- EXTRACTION WELL
- 31.70 EXCAVATION ELEVATION
- 32.28 CONTAINMENT PIPE INVERT ELEVATION

NOTES:

1. ALL CONVEYANCE PIPELINE LATERALS ARE 1.5"/3" UNLESS OTHERWISE NOTED.
2. PROVIDE 2' STUB OF PIPE OFF TEE FOR FUTURE WELLS. CAP ENDS.

△	10-10-97	ISSUED FOR CONSTRUCTION	VZC	DPD	CY
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY

GROUNDWATER CONVEYANCE PIPELINE
PLAN VIEW
SYSTEM 3 GROUND WATER TREATMENT SYSTEM
SITE IMPROVEMENTS
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

FAIRCHILD
SEMICONDUCTOR CORP.

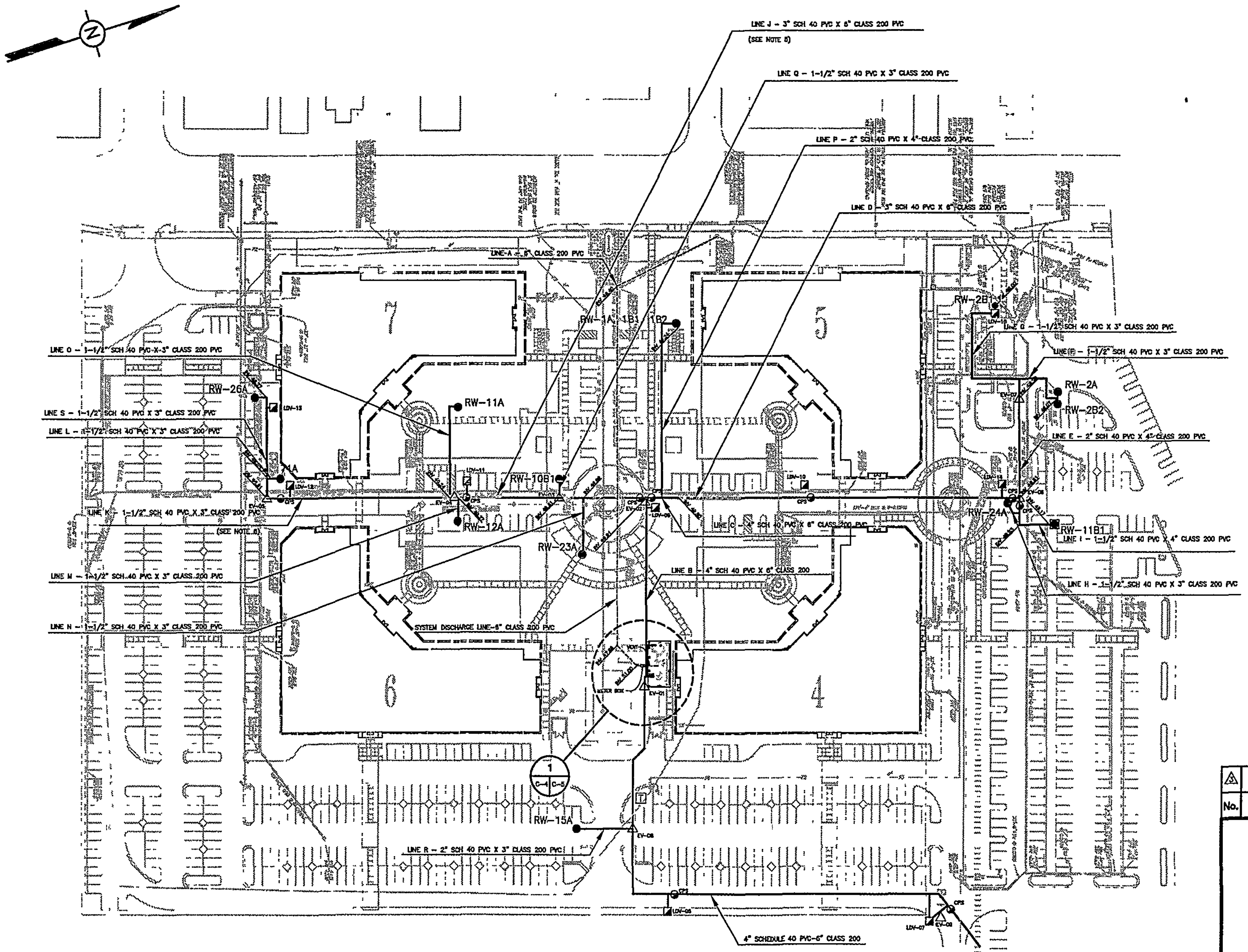
Locus
TECHNOLOGIES

SCALE
30 0 30 60 FEET

DRAWING NO. 97-954-E14

FIGURE 4-2

MV K:\97-954\E14.DWG 10-3-97



LEGEND:

- DOUBLE CONTAINED PIPE
- DISCHARGE PIPE
- RW-2A EXTRACTION WELL
- 65B3 EXTRACTION WELL\LEAK DETECTION VAULT
- CONTAINMENT PIPE ANNULUS SEAL
- ELECTRICAL PULL PORT
- LEAK DETECTION VAULT

NOTES:

1. SEE SHEET M-1 AND C-5 FOR PIPING DETAILS AROUND TREATMENT PAD.
2. SEE SHEET M-6 FOR LEAK DETECTION VAULT PIPING DETAILS.
3. FIELD VERIFY INVERT ELEVATIONS IN THE FIELD. MAINTAIN POSITIVE SLOPE FROM WELL FIELD TO TREATMENT PAD.
4. SEE SHEET M-2 FOR WELL VAULT DETAIL.
5. LINE J RUNS FROM LINE B TO LINE O. JNE O TO LINE L.

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
3		REVISED PIPELINE ALIGNMENT	VZC		

CONVEYANCE PIPING PLAN
SYSTEM 19
GROUND WATER TREATMENT SYSTEM
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR

FAIRCHILD
SEMICONDUCTOR CORP.

Locus TECHNOLOGIES

SCALE: 50 0 50 100 FEET

DRAWING NO. 97-954-E7

FIGURE 4-3

K:\97-954\E7.DWG 2-25-98

APPENDIX A
HYDROGRAPHS AND HISTORICAL WATER ELEVATION MEASUREMENTS

PROVIDED IN ELECTRONIC FORMAT

APPENDIX B
HISTORICAL WATER QUALITY MEASUREMENTS

PROVIDED IN ELECTRONIC FORMAT

APPENDIX C
HISTORICAL WATER ELEVATION AND CAPTURE ZONE MAPS

PROVIDED IN ELECTRONIC FORMAT

APPENDIX D
DIRECTION OF GRADIENTS ACROSS SLURRY WALL

PROVIDED IN ELECTRONIC FORMAT

APPENDIX E
DIRECTION OF VERTICAL GRADIENTS ACROSS AQUITARDS

PROVIDED IN ELECTRONIC FORMAT

APPENDIX F
HISTORICAL TCE CONTOUR MAPS

PROVIDED IN ELECTRONIC FORMAT

APPENDIX G
LIST OF ARARS

APPENDIX G

ATTAINMENT OF ARARS AND PERMITTING REQUIREMENTS

Section XVI of the CD requires that:

> All actions required to be taken pursuant to this Consent Decree shall be undertaken in accordance with the requirements of all applicable federal, state and local laws, regulations, appendices to this Consent Decree, and permitting required by CERCLA and the CD.

ARARs associated with the MEW Site have been categorized into three types:

- Ambient or chemical-specific
- Performance, design, or action-specific
- Location-specific

Ambient or chemical-specific requirements set health or risk-based concentration limits for particular chemicals. Performance, design, or action-specific requirements govern particular activities, such as the Clean Water Act pretreatment standards for discharges to publicly owned treatment works. Location-specific requirements refer to facility citing restrictions.

Section VI.G of the CD states that:

> Pursuant to CERCLA Section 121(e), 42 U.S.C §9621(e), no federal, state, or local permit shall be necessary for the portion of the Work conducted entirely on site where such Work is carried out in compliance with said Section.

Not withstanding this provision, however, the Companies intend to apply and obtain all permits that would otherwise be required. The following sections describe the ARARs of local, state, and federal regulatory agencies that the remedial work will be designed to achieve.

1 CHEMICAL-SPECIFIC ARARS AND CLEAN-UP STANDARDS

Chemical-specific ARARs for the MEW Site include federal and State of California drinking water standards. The ROD includes federal MCLs, as defined under the Safe Drinking Water, as ARARs for ground water at the MEW Site. Ground water clean-up standards are defined in the CD as 0.005 mg/l TCE for the shallow aquifers and 0.0008 mg/l TCE for the deep aquifers. The CD also provides that the clean-up of the other 10 organic chemicals based on clean-up of TCE will meet ARARs and will not exceed maximum cumulative risk levels for the ground water.

2 ACTION-SPECIFIC ARARS

Action-specific ARARs for the MEW Site depend on the type of remedial alternative chosen to obtain prescribed clean-up goals. As specified in the MEW ROD, soil remediation can be achieved by means of partial excavation and/or in-situ vapor extraction and ground water remediation can be accomplished through ground water extraction and treatment. The ROD also specified that treatment of extracted ground water and soil vapor be performed by the removal of VOCs from either matrix by air stripping and/or GAC adsorption. The use of either air stripping or GAC adsorption triggers ARARs for VOC emissions, carbon regeneration or disposal, and discharge or reinjection of treated effluent.

2.1 Air Emission Standards

The MEW ROD states that, although on-site facilities are exempted by CERCLA from the BAAQMD administrative requirement to obtain a permit, emission limits and monitoring requirements imposed by the BAAQMD must be met. These emission limits apply to the discharge of air from treatment systems (i.e., air stripping towers) or of GAC-treated soil vapor from an in-situ aeration system.

Three ground water treatment systems are currently in place and operate at Fairchild's facilities in Mountain View, California, each of which will become part of the RGRP treatment system. Each system includes a ground water extraction system, a surge tank, and a treatment system. The extraction system consists of a recovery well network. The treatment system consists of a sophisticated control system; an influent feed pump, and three 5,000-pound aqueous carbon adsorbers.

The three ground water treatment systems do not have any air emissions and therefore do not require a BAAQMD Permit.

The following subsections discuss subparts from the Code of Federal Regulations, Title 40, Part 61 that were included in the evaluation of the design process.

2.1.1 National Emission Standards for Mercury

The Code of Federal Regulations, Title 40, Part 61, Subpart E (40 CFR 61.E) specifies the national emission standards for mercury that "are applicable to stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge." The remedial actions implemented at the Fairchild facilities do not involve any of the process discussed above and therefore, this subpart is not applicable.

2.1.2 National Emission Standards for Benzene

The Code of Federal Regulations, Title 40, Part 61, Subpart FF (40 CFR 61.FF) specifies the national emission standards for benzene waste operations that "apply to owners and operators of chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries. The provisions of the subpart also apply to hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by any facility discussed above. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any facility discussed above."

However, Subpart FF also identifies the following waste that is exempt from its requirements, such as "(1) waste in the form of gases or vapors that is emitted from process fluids, (2) waste that is contained in a segregated storm water sewer system, and (3) waste that is not discharged from the process unit which generates the waste stream and, instead, is returned directly to the process."

The remedial actions implemented at the Fairchild facilities do not involve any of the process discussed above and therefore, this subpart is not applicable.

2.1.3 National Emission Standards for Vinyl Chloride

The Code of Federal Regulations, Title 40, Part 61, Subpart F (40 CFR 61.F) specifies the national emission standards for plants that produce vinyl chloride by any process. Although the provisions of this subpart pertain to system processes more sophisticated than the Fairchild ground water treatment systems. The remedial actions implemented at the Fairchild facilities do not involve any of the process discussed above and therefore, this subpart is not applicable.

2.2 Carbon Adsorption

GAC adsorption is used for treatment of extracted ground water from the Fairchild ground water treatment systems. All spent carbon is subject to ARARs applicable to its disposal or regeneration. Under current regulations, spent carbon generated from the treatment of a hazardous waste or that meets the criteria for a hazardous waste is considered to be a hazardous waste under the Resource Conservation and Recovery Act (RCRA) and is required to be handled as a hazardous waste.

Spent carbon generated from the Fairchild treatment systems at the MEW Site are regenerated off-site at a licensed facility. Therefore, management of the spent carbon must comply with certain requirements under RCRA and California hazardous waste regulations for transportation, storage, and generation of hazardous waste for recycling. If the spent carbon were to be disposed off-site as a hazardous waste, it would need to be treated to meet Best Demonstrated Available

Technology treatment standards and would be subject to RCRA's Subtitle C off-site land disposal restrictions.

There were no requirements identified from the local municipal and county hazardous materials ordinances for the storage or monitoring of spent carbon on-site. Once the carbon is determined to be spent through sampling, it will be removed and transported off-site for regeneration.

2.3 Design and Operational Standards for Tank Systems

The California Code of Regulations, Title 22, Division 4.5, Chapter 14, Article 10 (22 CCR 4.5,14,10), specifies standards and establishes design and operational requirements for storing, treating, and transferring hazardous waste using tank systems. The design and operational standards and requirements are regulated by the California Department of Health Services (DHS). The use of GAC contained in closed tanks for the treatment of VOCs requires tanks to have sufficient shell strength and pressure controls (e.g., vents) to prevent potential rupture or collapse. Minimum shell thickness is required to be maintained at all times to ensure sufficient shell strength. Factors to be considered in establishing minimum shell thickness include the width, height and materials of tank construction, and the specific gravity of tank contents.

Secondary containment required for tank systems storing, treating, and transferring hazardous waste to prevent its release or its constituents into the environment. Secondary containment for tanks shall include one or more of the following devices:

- A liner (external to the tank)
- A vault
- A double-walled tank
- An equivalent device as approved by the DHS

Secondary containment systems shall be designed or operated to contain precipitation from a 24-hour, 25-year storm event plus the greater of 10 percent of the aggregate volume of all tanks or 100 percent of the capacity of the largest tank within its boundary, whichever is greater.

2.4 Standards for Thermal Treatment of Hazardous Waste

The California Code of Regulations, Title 22, Division 4.5, Chapter 14, Article 15 (22 CCR 4.5,14,15), specifies standards for the thermal treatment of hazardous waste that could be applicable if thermal treatment is utilized for pre-treatment in the remedial design. Because thermal treatment is not employed in the Fairchild remedial design, these standards are not applicable.

2.5 Discharge to Surface Waters

The following sections describe the requirements that apply to the discharge of treated effluent into surface waters or storm drains.

2.5.1 Water Quality Control Plan

The Water Quality Control Plan, San Francisco Bay Basin (Basin Plan) provides future direction of water quality control management for protection of California's waters. The Basin Plan consists of a definitive program of actions designed to preserve and enhance water quality, and to protect beneficial uses for water basins. The Basin Plan establishes the necessary elements of a water quality control plan, including identified beneficial water uses, water quality objectives, implementation program for meeting these objectives, and a surveillance program to monitor the effectiveness of the plan.

Treated water from the Fairchild treatment systems are discharged into the local storm sewer system along Whisman Road. Because the chosen remedial alternative requires discharge to surface water, effluent limitations and monitoring requirements apply for this point source discharge. The RWQCB has established the effluent discharge limitations and permit requirements for the Fairchild ground water treatment system under an NPDES permit.

2.5.2 State Board Resolution 68-16

RWQCB Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," requires the continued maintenance of existing water quality unless it is demonstrated that a change will benefit the people of the state, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other water quality control plans or policies.

Discharges to surface water under the Clean Water Act must, at a minimum, meet BACT requirements for toxic pollutants and Best Conventional Control Technology for conventional pollutants. As discussed above, treated water from the Fairchild treatment systems discharge into the local storm sewer system located at Whisman Road under an NPDES permit. The RWQCB has established the effluent discharge limitations and permit requirements for the Fairchild ground water treatment systems using either water quality standards prescribed in the Basin Plan or best available technology standards.

2.5.3 National Pollutant Discharge Elimination System Program

Effluent limitations and monitoring requirements apply to the discharge of treated effluent into surface waters or storm drains. The NPDES program, under the Clean Water Act, requires a permit before discharge of treated effluent from point sources to surface waters. The NPDES permit specifies restrictions on quantities, discharge rates, and concentrations of pollutants discharged (i.e., effluent discharge limitations) and specifies sampling, monitoring, and reporting requirements for a particular point source.

Currently, ground water treated at the three Fairchild treatment systems are discharged through the City of Mountain View storm drain system to Stevens Creek under NPDES Permit No. CAG 912003 issued by the RWQCB on October 1999. Fairchild's treatment systems 1 and 19 are permitted to discharge up to 250 gpm of treated effluent. Fairchild's treatment systems 3 is are permitted to discharge up to 180 gpm of treated effluent.

Treated water from the Fairchild treatment systems discharge into the local storm sewer system at Whisman Road under the NPDES permit.

2.6 Discharge to the Sanitary Sewers

A permit to discharge ground water into the local sanitary sewer system may be obtained from the City's Environmental Safety Division under various conditions. All treated groundwater from the Fairchild treatment facilities discharge to the City of Mountain View storm drain system and therefore discharge to the City of Mountain View sanitary sewer system was not required.

2.7 Trench Excavation, Potential Soil Treatment by Aeration and Disposal

Trench excavation to install the ground water conveyance piping requires a permit from the Industrial Relations Division of the California Occupational Safety and Health Administration (Cal-OSHA). An Annual Trench and Excavation Permit from Cal-OSHA is required. Additionally the permit requires notification of Cal-OSHA's local district office at 10-days prior to any scheduled excavation or trenching work.

Planned trenching activity that may uncover soils containing VOCs requires written notification of the BAAQMD at least 5 days prior to the commencement of such excavation. The written notification shall include the following:

- Names and addresses of persons performing and responsible for excavation
- Location of site where excavation will occur
- Scheduled starting date of excavation
- Procedures to be employed for the excavation and soil aeration
- Name, title, and authority of the state or local government representative who has ordered the excavation

If excavated soil or drill cuttings were to be treated on-site by aeration, substantive provisions of BAAQMD regulations may apply. Under the BAAQMD's Regulation 8, Organic Compounds, Rule 40, Aeration of Contaminated Soil and Removal of Underground Storage Tanks, the aeration of material containing a volatile organic content of 50 mg/kg or greater is subject to regulation by the BAAQMD. Prior to the treatment of soil by aeration, the level of contamination of the material will be determined by obtaining soil samples for laboratory analysis. If the soil is determined to contain VOCs at concentrations greater than or equal to 50 mg/kg, requirements specified under Regulation 8, Rule 40 of the BAAQMD will be observed. The BAAQMD also requires written notification no less than 24 hours prior to the aeration of soils containing VOCs. The written notice shall include the following:

- Estimated total quantity of soil to be aerated
- Estimated quantity of soil to be aerated per day
- Estimated average degree of contamination, or total organic content of soil
- Chemical composition of organic compounds (i.e., TCE, etc.)
- A description of the basis on which these estimates were derived (soil analysis test reports, etc.)

Although it is not expected the BAAQMD limit of 50 mg/kg will be exceeded, written notifications for soil and trench excavation, and soil aeration will be submitted to the BAAQMD five days prior to such work. The soil and trench excavation, and soil aeration will be monitored and sampled. Excavated material will be stockpiled and treated by aeration, if necessary.

The treatment of excavated soil determined to contain VOC concentrations above the soil clean-up standards specified in the ROD and CD will be the responsibility of the property owner where the contaminated soil was excavated. The responsibility for soil treatment will be determined by the location of the soils containing VOCs through the soil monitoring program.

In accordance with RCRA Subtitle C, soil containing listed hazardous wastes is considered to constitute hazardous waste. Soil containing detectable amounts of TCE is considered a listed waste and is governed by RCRA land disposal restrictions. RCRA land disposal requirements would apply to soil or drill cuttings containing detectable concentrations of VOCs to be disposed off-site. U.S. Department of Transportation requirements would also apply. However, it is not anticipated that any hazardous solid waste will be generated from the proposed remedial activities because soils which contain chemicals will be treated on-site by aeration and will be used as backfill material, as appropriate.

2.8 Health and Safety Plan

A Site Safety Plan will be prepared prior to and for all remedial fieldwork to be performed at the MEW Site. The Site Safety Plan will be prepared in accordance with the July 1988 U.S. Occupational Safety and Health Administration's (OSHA's) 29 CFR 1910 and 1926, the U.S. Department of Health and Human Services "Occupational Safety and Health Guidance for Hazardous Waste Site Activities (October 1985); and EPA's "Standard Operating Safety Guides." The Site Safety Plan will establish guidelines to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes that may be encountered during the performance of field remedial work at the MEW Site. The Site Safety Plan will be included as part of the Construction O&M Plan, and the O&M Plan.

3 Location-Specific ARARs

3.1 Fault Zone

The MEW Site is not located within 200 feet of a geological fault. Therefore, the fault zone requirement of 40 CFR 264 is satisfied.

3.2 Floodplain

A hazardous waste treatment facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood. The MEW Site is not located in a floodplain so these requirements are not ARARs.

4 Miscellaneous ARARs

4.1 Construction of Ground Water Extraction Wells

The ROD does not specifically identify ARARs for the installation of ground water extraction wells. The SCVWD standards for well installation and destruction will be followed.

4.2 Proposition 65

The notice requirement specified in California's Proposition 65 may also apply to the performance of remedial activities. If listed chemicals are released in concentrations that would present a significant risk, Proposition 65 requires that clear and reasonable warning be given to anyone who may be exposed to the chemicals.

4.3 Building Permits

The City's Public Works and Building Departments will be notified of construction work that will be performed within the City's jurisdiction, after EPA approval of the Final Design, and prior to the start of work. The construction of all temporary or permanent structures (e.g., treatment system) will comply with all applicable building codes and requirements of the City. In addition, the City's Planning Division has requirements regarding architectural aesthetics and visibility limitations that may apply to treatment equipment and its enclosures.

The City has requirements for the installation of utilities in their right-of-way. These utilities include monitoring and extraction wells, ground water conveyance piping, electrical power lines and meters, ground water discharge lines, and connections to the sanitary and storm sewer systems. The following describes the permits generally required by the City for the installation of utilities and identify the various departments that will be involved in the review and issuance of permits.

An Excavation Permit must be obtained from the City's Public Works Department for the installation of utilities within the City's right-of-way specific to each (general street) location where work is to be performed.

An Encroachment Agreement will also be obtained from the City's Public Works Department. The encroachment permit is valid for a period of five years. At or just before the end of this five-year period, an extension may be requested and the City may re-evaluate the permit conditions.

Completed permit application packages for obtaining an excavation, well installation, and encroachment permits will be submitted to the City's Public Works Department after the Final Design has been approved by EPA.

4.4 Utility Services

Appropriate agencies or companies will be contacted before installation of a particular utility required for the remedial work. Permits and service contracts will be obtained in this process, as necessary. Notifications will be provided as necessary.

4.5 Access and Easements

Property access and easements have been obtained from private property owners and from the City of Mountain View as necessary to construct and maintain the Fairchild systems.