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April 15, 2016

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Subject: **2015 Annual Progress Report – Former Fairchild Buildings 13, 19, and 23**
Middlefield-Ellis-Whisman ("MEW") Area
Mountain View, California

Dear Ms. Lee:

Attached please find the 2015 Annual Progress Report for Former Fairchild Buildings 13, 19, and 23, prepared by Geosyntec Consultants on behalf of Schlumberger Technology Corporation.

This annual progress report is being submitted in accordance with U.S. Environmental Protection Agency (EPA) Section XV of the Administrative Order for Remedial Design and Remedial Action (106 Order).

If you have any questions regarding this 2015 Annual Progress Report, please feel free to call me.

Very truly yours,

Virgilio Cocianni
Remediation Manager

Attachment

CC: MEW Distribution List

Prepared for

Schlumberger Technology Corporation
100 Gillingham Lane
Sugar Land, Texas 77478

2015 ANNUAL PROGRESS REPORT FORMER FAIRCHILD BUILDINGS 13, 19, AND 23

MOUNTAIN VIEW, CALIFORNIA

Prepared by

Geosyntec consultants

engineers | scientists | innovators

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Project Number: WR1133D

15 April 2016

2015 Annual Progress Report
Former Fairchild Buildings 13, 19, and 23
Middlefield-Ellis-Whisman Study Area
Mountain View, California

Prepared by

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
106 Order	Section XV of the *1990 Administrative Order for Remedial Design and Remedial Action*
bgs	below ground surface
cis-1,2-DCE	*cis*-1,2-dichloroethene
EPA	United States Environmental Protection Agency
Fairchild	Fairchild Semiconductor Corporation
ft	feet
ft/day	feet per day
ft^2/day	square feet per day
GAC	granular activated carbon
Geosyntec	Geosyntec Consultants
GETS	groundwater extraction and treatment system
gpm	gallons per minute
GSLIB	Geostatistical Software Library
HLA	Harding Lawson Associates
ISCO	*in situ* chemical oxidation
K	hydraulic conductivity
MCLs	maximum contaminant levels
MEW	Middlefield-Ellis-Whisman
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
PCE	tetrachloroethene
PLC	programmable logic controller
PRPs	potentially responsible parties

QA/QC	quality assurance/quality control
RAO	remediation action objective
RGRP	Regional Groundwater Remediation Program
ROD	Record of Decision
RRW	regional recovery extraction well
SCADA	supervisory control and data acquisition
Schlumberger	Schlumberger Technology Corporation
SCRWs	source control recovery extraction wells
Site	369/441 North Whisman Road, Mountain View, California (Buildings 13, 19 and 23)
SVE	soil vapor extraction
TCE	trichloroethene
VC	vinyl chloride
VOCs	volatile organic compounds
Water Board	California Regional Water Quality Control Board – San Francisco Bay Region
WDRs	Waste Discharge Requirements
Weiss	Weiss Associates

1. INTRODUCTION

This *2015 Annual Progress Report* was prepared by Geosyntec Consultants, Inc. (Geosyntec) with assistance from Weiss Associates (Weiss) on behalf of Schlumberger Technology Corporation (Schlumberger) for the former Fairchild Semiconductor Corporation (Fairchild) facilities historically located at 369/441 North Whisman Road (former Buildings 13, 19, and 23) in Mountain View, California (Site) (Figures 1 and 2).

This progress report contains a summary of Site activities and data from 1 January through 31 December 2015, and provides monitoring data from the past five years. The report is submitted in accordance with Section XV of the *1990 Administrative Order for Remedial Design and Remedial Action* (106 Order) issued by the United States Environmental Protection Agency (EPA) and subsequent EPA correspondence prescribing Annual Report contents (EPA, 1990a, 2005, and 2011).

1.1 Site Background

The Site lies within the Middlefield-Ellis-Whisman (MEW) study area, an approximate one-quarter square mile area bounded by Middlefield Road on the south, Ellis Street on the east, Whisman Road on the west, and California Highway 101 on the north, in Mountain View, California (Figures 1 and 2).

From 1969 to 1987 the Site operated as a facility to produce semiconductor devices. The Site was redeveloped in the 1990s and was occupied by AOL/Netscape and HP/Mercury Interactive until 2008. Google has occupied the Site buildings since 2013. The previous and current addresses of Former Fairchild Buildings 13, 19, and 23 are provided below:

Previous Address	Current Address
Former Fairchild 13, 19 and 23 369/441 North Whisman Road	369 North Whisman Road 379 North Whisman Road 389 North Whisman Road 399 North Whisman Road ("The Quad")

The primary constituents of concern at the Site are trichloroethene (TCE) and its reductive dechlorination breakdown products, *cis*-1,2-dichloroethene (*cis*-1,2-DCE),

and vinyl chloride (VC). Remedial actions for the MEW study area, including the Site, are specified in a 1989 *Record of Decision* (ROD) issued by EPA and two subsequent *Explanations of Significant Difference* (EPA, 1989, 1990b, 1996). Remedial actions within the MEW study area include facility-specific activities by the individual potentially responsible parties (PRPs) and a Regional Groundwater Remediation Program (RGRP) that addresses areas of commingled volatile organic compounds (VOCs) that have migrated beyond the facility-specific areas and cannot be attributed to a single source.

As specified in the ROD, groundwater cleanup included initial actions (completed) and the current long-term remedial phase (EPA, 1989).[1] In order to prevent migration of VOCs offsite, a groundwater extraction and treatment system was installed at the Site beginning in 1984 and a soil-bentonite slurry wall was constructed at the Site from the ground surface to the A/B Aquitard in 1985. A description of the remedy is provided in Section 1.3.

1.2 Local Hydrogeology

The MEW study area is located in the northern portion of the Santa Clara Valley Groundwater Sub-basin, the northernmost of three interconnected groundwater basins within Santa Clara County (SCVWD, 2001). The groundwater flow direction is northerly, toward the San Francisco Bay, and generally sub-parallel to the ground slope. The hydrostratigraphy in this part of the sub-basin is divided into upper and lower water-bearing zones, separated by an extensive regional aquitard (SCVWD, 1989).

The upper water-bearing zone is subdivided into two depth intervals: the A Zone (roughly between 15 and 40 feet below ground surface [bgs]) and the B Zone (roughly between 45 and 160 feet bgs), which are separated by the A/B Aquitard. The B Zone is further subdivided into three zones (B1, B2, and B3 Zones).

The lower water-bearing zone occurs below a depth of about 200 feet bgs. The lower water-bearing zone is subdivided into the C Zone (which extends to about 240 feet bgs) and the Deep Zone. The aquitard separating the upper and lower water-bearing zones is

[1] The soil cleanup goals have been met at MEW (EPA, 2004). Site soil cleanup actions were conducted from 1994 to 1997 and included soil vapor extraction (SVE) with treatment by vapor-phase granular activated carbon (GAC) and soil excavation with treatment by aeration.

represented as the B/C Aquitard and is the major confining layer beneath the MEW study area.

The water-bearing zones defined at the Site are summarized below:

Water-Bearing Zones	Approximate Depth Interval
A Zone	15 to 40 feet bgs
B1 Zone	45 to 75 feet bgs
B2 Zone	75 to105 feet bgs

The following table summarizes the estimated ranges of hydraulic conductivity (K) hydraulic gradient, and transmissivity for these Zones.[2]

Water-Bearing Zone	Estimated Hydraulic Conductivity (ft/day)		Approximate Horizontal Gradient (ft/ft)	Saturated Thickness (ft)	Transmissivity (ft^2/day)	
	Low	High			Low	High
A Zone	6	480	0.004	15	44	4,400
B1 Zone	20	260	0.003	25	150	2,600
B2 Zone	0.4	5	0.002 to 0.005	35	2	230

Groundwater flow beneath the MEW study area is generally towards the north in the A and B Zones under both non-pumping and pumping conditions. Groundwater hydraulic gradients are locally modified by the operation of groundwater recovery wells (both source control and regional recovery wells) and slurry walls, resulting in steeper gradients in the vicinity of pumping wells.

The vertical component of groundwater flow is generally upward from the B1 to the A Zone but is locally downward in some areas of the Site (Section 2.4.4). Vertical gradients below the B1 Zone are generally upward (Geosyntec et al., 2008).

[2] Estimates from pumping tests conducted at the MEW study area from 1986 through 2005 (Canonie, 1986a, 1986b, 1987, 1988; Geomatrix, 2004; HLA, 1986, 1987; Locus, 1998; PRC, 1991; Navy, 2005; and Weiss, 1995, 2005).

1.3 Description of Remedy

As specified in the ROD, the current Site remedy consists of slurry wall containment and a groundwater extraction and treatment system (GETS). The GETS is designed to protect local water supplies and to remediate or control groundwater that contains elevated concentrations of chemicals, including control of discharge of such groundwater to surface water.[3]

Groundwater cleanup goals are 5 micrograms per liter (µg/L) for TCE in shallow groundwater (A and B Zones) and 0.8 µg/L for TCE in deep groundwater (C and Deep Zones).[4] The ROD states that the chemical ratio of TCE to other chemicals found at the Site is such that achieving the cleanup goal for TCE will result in cleanup of the other Site chemicals to at least their respective federal maximum contaminant levels (MCLs).

A network of 13 extraction wells is used to remove groundwater from three water bearing zones at the Site (Table 1). Extracted groundwater is pumped through conveyance piping to a treatment facility, identified as Treatment System 19, located at 389 North Whisman Road (formerly 369 North Whisman Road). The treated water is monitored and sampled in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit, then discharged to the storm water sewer. A soil-bentonite slurry wall was constructed in the A-zone at the Site to prevent VOC migration from the source zones.

Effectiveness of the remedy is evaluated using a network of monitoring wells. Construction summaries for these wells are provided in Table 1. The wells are currently monitored according to the schedule provided in Table 2.

On 13 February 2015, Geosyntec submitted the letter titled *Request for Reduction in Groundwater Monitoring Frequency* to EPA, which presented an evaluation of historical monitoring data at the Sites and a request to reduce the groundwater monitoring frequency at the former Fairchild facilities to an annual basis (water level gauging) or biennial basis (VOC sampling) (Geosyntec, 2015a). In a letter dated 16 March 2016, EPA conditionally approved a trial reduction of groundwater monitoring

[3] The objectives of the groundwater remedy design are described in the ROD and the Feasibility Study for the MEW study area (Canonie, 1988).
[4] Groundwater cleanup goals are presented in the ROD.

and sampling frequency at the MEW study area (EPA, 2016). Accordingly, Fairchild monitoring wells were not sampled in 2015 so groundwater sampling on a biennial basis can be evaluated as part of the 2016 Annual Progress Report. The next planned groundwater sampling event will be in September 2016.

1.4 Summary of 2015 Site Activities and Deliverables

Table 2 provides the 2015 monitoring and reporting schedule for the Site Groundwater Remediation Program. Ongoing Site activities include:

- Groundwater monitoring and reporting, including annual sampling and semiannual water level gauging;
- Groundwater extraction and treatment;
- Operation and maintenance (O&M) of the GETS;
- Sampling the GETS monthly in compliance with the General Waste Discharge Requirements (WDRs) issued by the California Regional Water Quality Control Board – San Francisco Bay Region (Water Board) for discharge or reuse of extracted and treated groundwater resulting from cleanup of groundwater polluted by VOCs (NPDES Permit No. CAG912002 and Order No. R2-2012-0012 for Fairchild Treatment System 19);
- Assessment of remedial progress;
- Optimization of the groundwater remedy, as directed by EPA (Section 6); and
- Planning for future remedial activities.

Specific activities and deliverables by month in 2015 are listed below:

February 2015

- 11 February – Submitted the *Fourth Quarter and Annual 2014 System 19 NPDES Self-Monitoring Report* (Weiss, 2015a).
- 13 February – Submitted the letter *Request for Reduction in Groundwater Monitoring Frequency* to EPA, which presented an evaluation of historical monitoring data and a request to reduce the groundwater monitoring frequency at the former Fairchild facilities (Geosyntec, 2015a).

March 2015

- 19 March – Collected semiannual groundwater elevation measurements in Site monitoring and extraction wells, and collected quarterly groundwater elevation measurements in Site slurry wall well pairs.

April 2015

- 15 April – Submitted the *2014 Annual Progress Report for Former Fairchild Buildings 13, 19, and 23* to the EPA and other parties in accordance with the MEW distribution list (Geosyntec, 2015c).

May 2015

- 11 May – Submitted the *First Quarter 2015 System 19 NPDES Self-Monitoring Report* (Weiss, 2015b).
- 18 May – Collected quarterly groundwater elevation measurements in Site slurry wall well pairs.

June 2015

- 30 June – Submitted the *Pilot Study Work Plan for Enhanced Groundwater Extraction* (Geosyntec, 2015d).

August 2015

- 14 August – Submitted the *Second Quarter 2015 System 19 NPDES Self-Monitoring Report* (Weiss, 2015c).

September 2015

- 17 September – Collected semiannual groundwater elevation measurements in Site monitoring and extraction wells, and collected quarterly groundwater elevation measurements in Site slurry wall well pairs.

November 2015

- 11 November – Submitted the *Third Quarter 2015 System 19 NPDES Self-Monitoring Report* (Weiss, 2015d).
- 12 November – Collected quarterly groundwater elevation measurements in Site slurry wall well pairs.

December 2015

- 19-23 December – Completed well redevelopment at four extraction wells (71A, RW-11A, RW-12A, and RW-26A) as part of the scope of work outlined in the *Pilot Study Work Plan for Enhanced Groundwater Extraction*.[5]
- 28 December – Collected baseline groundwater samples from five extraction wells (71A, RW-11A, RW-12A, RW-24A, and RW-26A) and Treatment System 19 as part of the scope of work outlined in the *Pilot Study Work Plan for Enhanced Groundwater Extraction*.

The 2015 Annual Report Remedy Performance Checklist is provided in Appendix A.

[5] Although EPA has not formally commented on the Pilot Study Work Plan, Schlumberger has elected to proactively move forward with implementation in order to evaluate the potential for a modified groundwater extraction program to increase VOC mass removal rates at the Site.

2. GROUNDWATER EXTRACTION AND TREATMENT

2.1 Extraction, Treatment, and Containment System Description

During 2015, the Site GETS and containment system (Figure 3) included the following components:

- A slurry wall installed in the A Zone to a depth of approximately 40 feet bgs and keyed a minimum of two feet into the A/B1 Aquitard.
- Groundwater extraction from (Table 3):
  - 13 active source control recovery extraction wells (SCRWs); and,
  - One active regional recovery extraction well (RRW) located off-Site.
- Treatment System 19:
  - Receives extracted groundwater from the active SCRWs and RRW;
  - Double-contained groundwater conveyance piping and well vaults;
  - One pad sump and sump pump;
  - Two sediment filters in parallel;
  - Three 5,000-pound liquid-phase granular activated carbon (GAC) vessels in series; and,
  - Electrical distribution and control panels including:
    - A programmable logic controller (PLC),
    - A supervisory control and data acquisition (SCADA) computer; and
    - An auto-dialer.

The discharge of treated groundwater from the treatment system to the storm sewer is authorized by NPDES Permit CAG912002, Order No. R2-2012-0012.

Table 3 lists the water bearing zone, monthly average flow rates, and 2015 average flow rates for the 13 active Site SCRWs. Two other SCRWs (RW-1(B1) and RW-26A) have been shut down with EPA approval (EPA, 2006; Weiss, 2009) and were not operated in 2015.

Groundwater extracted by offsite RRW REG-4B(1) is conveyed to System 19 for treatment (Table 3). An additional six offsite RRWs (65B3, DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R) are connected to System 19 but have been shut down with EPA approval (EPA, 2006; Weiss, 2009; Geosyntec, 2010; EPA, 2012). Further discussion of these regional wells is included in the MEW RGRP *2015 Annual Progress Report* (Geosyntec, 2016a).

2.2 Extraction and Treatment System Operation and Maintenance

From 1 January through 31 December 2015, Treatment System 19 ran 96% of the time.[6] A total of approximately 48.4 million gallons of groundwater were treated and 365 pounds of VOCs were removed by Treatment System 19 during this reporting period.

As required by NPDES Permit CAG912002, Order R2-2012-0012, extraction well and treatment system flow readings are recorded weekly, and the Site treatment system is sampled monthly. Results are reported quarterly to the Water Board (e.g., Weiss, 2015b-d; Weiss, 2016).

Flow rates for each well connected to System 19 are calculated on a monthly basis.[7] Monthly and annual average flow rates and monthly extraction totals by well are provided in Tables 3 and 4, respectively. The combined average flow rates for the Fairchild wells pumping to System 19 totaled 74.6 gallons per minute (gpm) in 2015.

The analytical results for monthly groundwater samples from System 19 are summarized in Tables 5a 5b, and 5c. The laboratory analytical reports are provided in Appendix B, and the quality assurance/quality control (QA/QC) evaluation for samples collected at the Site during 2015 is provided in Appendix C. Treatment system discharges were within effluent limits established by NPDES Permits CAG912002 and Order R2-2012-0012, with the exception of a VC effluent exceedance in November

[6] Of the System 19 downtime, approximately 2% was due to planned shut downs.

[7] As part of routine system operation, target flow rates based on historical operational information and groundwater capture requirements are established for each SCRW and RRW and used to evaluate potential operational issues and well maintenance requirements by the system operators throughout the year.

2015. The effluent sample collected on 24 November 2015 contained VC at 0.68 µg/L, which exceeds the effluent limitation of 0.5 µg/L. A confirmation sample collected on 9 December 2015 from the system effluent contained VC at a concentration of 0.90 µg/L. Following confirmation of the exceedance, the system was temporarily shut down on 9 December 2015 while a carbon change out was scheduled. The carbon change out was completed on 16 December 2016 and the system was restarted on 17 December 2015. Additional details of the response to the VC exceedance are provided in the *Fourth Quarter and Annual 2015 System 19 NPDES Self-Monitoring Report* (Weiss, 2016).

Table 6 presents a VOC mass removal summary based on the quarterly NPDES *Self-Monitoring Reports* prepared by Weiss (Weiss, 2015b-d, 2016). The cumulative groundwater and VOC mass removal for System 19 since 1988 is shown in Figure 6.

A summary of non-routine maintenance or operational activities performed at the Site during 2015 is provided in Table 7. The EPA and Water Board are required to be notified of extraction well and system downtime events as follows:

1. **EPA:** The owner and/or operator of the treatment system will make a best effort to notify the EPA orally within 24 hours of a well or system shutdown that occurs for more than 72 hours.
2. **Water Board:** If the treatment system is shut down for more than 120 consecutive hours after the start-up period (maintenance, repair, violations, etc.) the reason(s) for shut down, proposed corrective action(s), and estimated start-up date shall be orally reported to the Water Board within five days of shut down and a written submission shall also be provided within 15 days of shut down.

As detailed in Table 7, the EPA and Water Board were notified as required of one unplanned manual shut down of the treatment system, and EPA was additionally notified of one well shutdown during 2015. As described above, System 19 was temporarily shut down on 9 December 2015 due to a discharge exceedance of VC. The system carbon was changed out on 16 December, and the system was restarted on 17 December 2015. Well RW-24A was temporarily shut down from 19 December through 23 December 2015 in order to redevelop the well (Section 6). No other notifications were required.

A total of 35 tons of spent carbon were generated during 2015 and classified as non-hazardous. The spent carbon was shipped to Norit America's regeneration facility in Pryor, Oklahoma for reactivation. Spent sediment filters generated during 2015 were disposed of as hazardous waste at the Clean Harbors facility in Aragonite, Utah.

2.3 Groundwater Level Monitoring

In 2015 groundwater levels were measured semiannually for the purpose of monitoring the hydraulic performance of the Site groundwater remedy. Table 1 summarizes the construction details for the Site monitoring and extraction wells. During this reporting period, groundwater levels were measured in the Site monitoring and extraction wells on 19 March and 17 September 2015. In addition, water levels were measured quarterly on 19 March, 18 May, 17 September, and 12 November 2015 in 11 slurry wall well pairs (22 wells). Water levels measured in the Site monitoring wells during 2015 are included in Table 8. Water levels measured in the Site slurry wall well pairs between January 2011 and December 2015 are included in Table 9.

Hydrographs of the Site slurry wall well pairs are provided in Figures 4 and 5. Figure 4 includes a set of hydrographs of A Zone slurry wall well pairs showing the inward and outward horizontal gradients across the slurry wall. Figure 5 includes hydrographs of slurry wall well pairs in which one well is screened inside the slurry wall in the A Zone, and the adjacent well pair is screened below the slurry wall in the B1 Zone to illustrate vertical gradients between the two zones.

Groundwater elevation contour maps for the A Zone, B1 Zone, and B2 Zone underlying the Site are provided in Figures 7a through 9b and are based on facility-specific and regional data as presented in the *2015 Annual Progress Report for Middlefield-Ellis-Whisman Study Area, Regional Groundwater Remediation Program* (Geosyntec, 2016a). The groundwater elevation contour maps were created using the geostatistical software package KT3D_H2O version 3.4 (Tonkin and Larson, 2002).[8] As opposed to most interpolation programs that require a choice between linear and logarithmic kriging, this version of KT3D allows for linear-log ordinary kriging using linear kriging in areas distant from recovery wells and point logarithmic kriging in the vicinity of

[8] The KT3D software package was developed as part of the Geostatistical Software Library (GSLIB) at Stanford University and was subsequently modified by S.S. Papadopulos and Associates, Inc. to include well drift (Deutsch and Journal, 1998, Tonkin and Larson, 2002).

recovery wells. The flow rates from the extraction wells were input to the program in order to allow for a variable radial distance of the transition from linear to logarithmic kriging. A spherical variogram was specified with grid spacing of 30 feet.

In recent years, water levels have declined in the A Zone, B1 Zone, and B2 Zone both at the Site and throughout the southern portion of the MEW study area. Figures 4 and 5 illustrate the decline in water levels that has been ongoing for the last three years, with water levels measured in 2015 approximately 4 to 5 feet lower than water levels prior to 2013. Water levels remain significantly higher than historical levels observed in the early 1990s and groundwater elevation contour maps from March and September show that while there are minor seasonal fluctuations in groundwater elevations, there is no significant seasonal change in groundwater flow or extraction well capture across the Site.

2.4 Hydraulic Control and Capture Zone Analysis

The water level monitoring described in Section 2.3 provides the basis for evaluating the hydraulic performance of the Site-specific groundwater remedies. The hydraulic capture area achieved by one or more recovery wells cannot be directly measured, but rather requires analysis and interpretation of the measured water levels and extraction rates. The following discussion summarizes the basis for estimating the capture zones.

2.4.1 Methodology

In evaluating groundwater capture for Site wells, consideration was given to the EPA guidance document *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems* (EPA, 2008). The following steps were used to perform the hydraulic evaluation of the groundwater remedy.

- The conceptual site model, remedy objectives, slurry wall locations, and target capture zones were available from previous studies and prior annual monitoring reports;
- Water level measurements from March and September 2015 were interpolated to generate groundwater elevation contour maps as described in Section 2.3 and the MEW RGRP *Annual Report* (Geosyntec, 2016a);
- Pumping rates from RRWs and SCRWs were compiled;

- Hydraulic capture from each RRW and SCRW was estimated based on graphical flow-net analysis of the contour maps, guided by backward particle tracking and analytical flow solutions (Section 2.4.2);
- A water balance calculation was used to check the total width of capture estimated from the graphical analysis;
- Water level data from well clusters were analyzed for the distribution of vertical gradients; and
- VOC time-series trends in monitoring wells were reviewed for confirming evidence of hydraulic capture (Section 2.5).

2.4.2 Estimated Extraction Well Capture

Estimated capture zones for Site A Zone, B1 Zone, and B2 Zone recovery wells in March and September 2015 are shown in Figures 7a through 9b. The capture zones were estimated by graphical flow-net analysis, using the groundwater elevation contour maps (Section 2.3). The graphical analysis was guided by backward particle tracking using the TransientTracker module in KT3D_H20 and calculated distances to the stagnation point and capture zone width based on the analytical solution of Javandel and Tsang (1986). All extraction wells pumping in the MEW study area were considered as part of the capture zone evaluation for the Site. The KT3D_H20 particle tracking method and analytical calculations assume homogeneous, two-dimensional groundwater flow with a single regional estimated value of transmissivity. These methods were used as supporting lines of evidence to evaluate capture together with the groundwater elevation contour maps. The final capture zones presented in Figures 7a through 9b are based on professional judgment in consideration of the above analyses, known Site conditions, and experience with similar sites.

2.4.3 Capture Width Based on Combined Flow Rate Analysis

The capture zone analysis described in Section 2.4.2 was developed on a well-by-well basis. However, the net result of the combined capture zones from all SCRWs is an area of hydraulic capture significantly wider than the distribution of VOCs in groundwater. An independent check of the capture zones presented in Figures 7a through 9b was developed by using the combined 2015 groundwater extraction rates for all RRWs and SCRWs located within the Site boundaries to estimate the total capture width in each zone (A, B1, B2). The estimated capture widths were then compared to the distribution

of TCE in groundwater (Section 2.5, Figures 10a, 11a, and 12a)[9] within the Site boundaries, measured in map view for each zone. The target capture width for A Zone wells inside the slurry wall was considered to be the total width of the slurry wall enclosure. The target capture width for wells outside the slurry wall was considered to be the total width of the Site. If the estimated width of capture is greater than the transgradient width of the TCE distribution in groundwater, then hydraulic containment of the plume is indicated.

The calculations of capture width for each zone based on the total extraction rate, regional hydraulic gradient, hydraulic conductivity, and zone thickness are shown in Table 10. The results indicate that the predicted capture width based on the total extraction rate is greater than the measured transgradient width of TCE in groundwater within the Site, thereby providing an additional line of evidence that hydraulic containment is achieved.

2.4.4 Horizontal and Vertical Gradients

Slurry wall well pairs are used to evaluate:

- The direction of horizontal gradient across the slurry wall by comparing water levels in wells located inside the slurry wall boundary with water levels in adjacent wells outside the slurry wall boundary; and,
- The direction of vertical gradient across the A/B aquitard by comparing water levels in wells located inside the slurry wall boundary (in the A Zone) with water levels in wells located below the slurry wall (in the B1 Zone).

Figures 4 and 5 illustrate head differences between slurry wall well pairs at the Site. Groundwater elevations were recorded quarterly in March, May, September, and November 2015 in the slurry wall well pairs listed in Table 9. The well locations are shown in Figures 3 through 5.

Results of the well pair analysis at the Building 19 slurry wall indicate the following:

[9] Because samples were not collected from Site monitoring wells in 2015, capture zones were compared to the distribution of TCE in groundwater developed when the wells were last sampled in 2014 (Geosyntec, 2015b).

- **Horizontal Gradients:** During this reporting period, inward gradients were consistently observed at well pairs 140A/101A and 142A/143A, which are located on the upgradient side of the slurry wall, and well pair 141A/139A, which is located on the eastern cross gradient side of the slurry wall. Well pair 17A/159A, which is located on the western cross gradient side of the slurry wall, had inward gradients in March, June, and September, and a slight outward gradeint in November. Outward gradients were observed at well pairs 115A/134A and 154A/155A,[10] which are located on the downgradient side of the slurry wall.
- **Vertical Gradients:** Upward and downward gradients were observed between the A and B1 aquifer. Upward gradients were observed at well pairs 101A/93B1, 134A/110B1, and 15A/98B1 throughout 2015, and at well pairs 12A/117B1 and 159A/RW-1(B1) in September 2015. Downward gradients were observed at well pairs 12A/117B1 and 159A/RW-1(B1) in March, June and November 2015.

The horizontal and vertical gradients recorded during this reporting period are generally consistent with historical observations, with a few exceptions:

- In September 2015, upward gradients were measured in well pairs 117B1/12A and RW-1(B1)/159A. This change in gradient may be related to an approximate 7-hour temporary shutdown of extraction well RW-10(B1) due to a pump fault the day before the water levels were gauged. Downward gradients were observed in these wells in December 2015, consistent with historical conditions.
- In November 2015 an outward gradient was observed for well pair 17A/159A. This change in gradient may be related to an approximate 34-hour temporary shutdown extraction well RW-12A due to a fouled flow meter two days prior the water level gauging. The gradient will continue to be monitored and evaluated in 2016.

The outward and downward gradients observed at the Site slurry wall do not impact Site cleanup objectives because water immediately downgradient of the slurry wall is

[10] An obstruction was present in well 154A during the September 2015 gauging event and a water level could not be collected. The obstruction was cleared prior to the November 2015 gauging event.

completely captured by downgradient Site A Zone extractions wells RW-24A and RW-2A and B1 Zone extraction wells RW-11(B1) and RW-2(B1).

2.5 Groundwater Quality Monitoring

Site-wide VOC monitoring data was last collected in 2014, consistent with EPA's 16 March 2016 conditional approval of a trial reduction of groundwater monitoring and sampling frequency at the MEW study area (EPA, 2016). The next groundwater sampling event will occur in fall 2016, and the effectiveness of biennial VOC monitoring will be evaluated as part of the 2016 Annual Progress Report.

Chemical analytical results for the previous five years (2011 through 2015[11]) are provided in Table 11. VOC (TCE, *cis*-1,2-DCE, and VC) versus time graphs for select monitoring wells are included in Appendix D.

2.5.1 Isoconcentration Contour Maps

Because groundwater quality sampling was not conducted in 2015, TCE, *cis*-1,2-DCE, vinyl chloride, and tetrachloroethene (PCE) isoconcentration contour maps from the most recent annual sampling event in 2014 are presented for the A Zone, B1 Zone, and B2 Zone in Figures 10a through 12d. These maps are based on isoconcentration contouring performed for the 2014 MEW RGRP Annual Progress Report (Geosyntec, 2015b) that includes all wells in the MEW study area sampled for VOCs in 2014. The 2014 contour maps were based on the previous 2013 isoconcentration contour maps (Geosyntec, 2014a) with contours modified as needed to reflect decreases or increases in TCE concentrations between 2013 and 2014.

2.5.2 Remedy Performance

In conjunction with the hydraulic analysis described in Section 2.4, VOC monitoring data provides an additional line of evidence for assessing remedy performance. Site-wide VOC monitoring data was last collected in 2014 and VOC concentration trends were evaluated as part of the *2014 Annual Progress Report for Former Buildings 13, 19, and 23* (Geosyntec, 2015c) by reviewing timeseries graphs and performing Mann-

[11] Results from wells sampled in 2015 as part of the implementation of the Pilot Study Work Plan for Enhanced Groundwater Extraction (Geosyntec, 2015d) are tabulated in Table 11 (Section 6).

Kendall statistical analysis. The 2014 evaluation of VOC concentration trends concluded the following:

- 98% of the Site wells sampled in 2014 had TCE concentrations that were within or below historical ranges.[12]
- Since 2005, TCE concentrations are decreasing, stable, or have no statistically significant trend in 90% of the Building 19 Site wells evaluated. Approximately 24% of the wells display decreasing TCE concentration trends and 66% show no trend or are stable (Table 12).

The spatial distribution of VOC monitoring data can also be used to assess remedy performance. Figures 10a, 11a, and 12a present 2014 TCE isoconcentration contour maps of the A Zone, B1 Zone, and B2 Zone, respectively, with the March 2015 hydraulic capture zones (Section 2.4) overlain on the maps.[13] These Figures illustrate complete capture of areas of high TCE concentration within the Site boundaries.

Overall, the most recent VOC monitoring data indicate that the combined MEW remedies are performing as designed to control or remediate VOCs in groundwater.

2.6 Compliance

Results from samples collected for NPDES compliance are summarized in Tables 5a through 5c. The system operated within the effluent limits established by the NPDES permits throughout 2015 (Weiss, 2016), with the exception of a VC effluent exceedance in November 2015. The effluent sample collected on 24 November 2015 contained VC at a concentration of 0.68 µg/L, which is above the effluent limitation of 0.5 µg/L. A confirmation sample collected on 9 December 2015 from the system effluent that contained VC at a concentration of 0.90 µg/L. Following confirmation of the exceedance, the Water Board was notified in accordance with permit requirements and

[12] In 2014, well 160A had a TCE concentration of 1,000 µg/L. This value was higher than TCE concentrations historically observed at the well and was attributed to increased extraction in the vicinity of the well.

[13] These figures show depictions of the capture for extraction wells within a given zone and do not depict the vertical capture across zones. As discussed in the 2008 optimization evaluation (Geosyntec et al., 2008) there is a vertical component to the groundwater flow throughout most of the MEW study area, which often results in capture that crosses between zones.

the system was temporarily shut down on 9 December 2015 while a carbon change out was scheduled. The carbon change out was completed on 16 December 2015 and the system was restarted on 17 December 2015. VC was not detected in the effluent sample collected on 17 December 2015 following system restart.

3. OTHER ACTIVITIES

3.1 Air/Vapor Intrusion

The EPA issued a ROD amendment on 16 August 2010 to address vapor intrusion. The MEW parties continued to work with EPA and local entities to implement the ROD amendment during 2015. In accordance with the Statement of Work for the Vapor Intrusion ROD Amendment, an annual report summarizing the status of the vapor intrusion remedy will be submitted under a separate cover (Geosyntec, 2016b).

4. PROBLEMS ENCOUNTERED

Table 7 provides a summary of all non-routine O&M events that occurred at System 19 or at individual extraction wells in 2015.

As described in Section 2.6 and the *Fourth Quarter and Annual 2015 System19 NPDES Self-Monitoring Report* (Weiss, 2016), the concentration of VC in the System 19 effluent exceeded the NPDES effluent limit in a sampled collected on 24 November 2015. Following collection of a confirmation sample that also exceeded the NPDES effluent limit for VC, the Water Board was notified in accordance with NPDES Permit CAG912002, Order R2-2012-0012 and the treatment system was temporarily shut down on 9 December 2015. A carbon change out was completed on 16 December 2015 and the system was restarted on 17 December 2015. VC was not detected in the effluent sample collected on 17 December 2015 following system restart.

No other problems related to the groundwater treatment or containment system at the Site were encountered (Weiss, 2016).

5. TECHNICAL ASSESSMENT

The following assessment of the groundwater remedy performance was made based on data collected through 2015.

- **The remedy is functioning as intended.** Based on 2015 data reviewed, the groundwater remedy is functioning as intended. The 2015 Annual Report Remedy Performance Checklist is included in Appendix A.
- **The capture zones are adequate.** Groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends provide converging lines of evidence that the Site extraction wells are achieving adequate horizontal and vertical capture.
- **VOC concentrations are steady to decreasing over time.** From 2005-2014, over 90% of Site wells have decreasing, stable, or no statistically significant trend in TCE concentrations over time (Geosyntec, 2015c, Table 12, Appendix D).

The remedial actions meet the remediation action objectives (RAOs) for groundwater.

6. OPTIMIZATION PROGRESS

In 2014, EPA requested that the MEW PRPs proceed with optimization of existing facility-specific and regional groundwater remedies. EPA's stated objective for remedy optimization is to increase the rate of VOC mass removal from the individual MEW sites.

In support of the planned remedy optimization, a regional groundwater flow model was developed and submitted to EPA on 2 May 2014 (Geosyntec, 2014b). A local VOC fate and transport model was developed for the Building 19 Site based on the regional groundwater flow model, and various optimization strategies were evaluated. Based on this optimization evaluation, a *Pilot Study Work Plan for Enhanced Groundwater Extractio*n (Work Plan) was submitted to EPA on 30 June 2015 (Geosyntec, 2015d).

The Work Plan presents a scope of work for a pilot study to implement a modified groundwater extraction program and assess the potential efficacy of groundwater extraction modifications to enhance VOC mass removal rates. The proposed pilot study optimization network includes SCRWs RW-11A, RW-12A, RW-26A, RW-24A, and 71A. These SCRWs were selected based on their location within areas of the A-zone with the highest VOC concentrations and their potential for operating at higher flow rates based on historical operational records.

Although the EPA has not formally approved the Work Plan, Schlumberger has elected to proactively move forward with groundwater extraction optimization work at the Site. The first phase of pilot study work was completed in December 2015 and included redevelopment of SCRWs 71A, RW-11A, RW-12A, and RW-26A between 19 and 23 December 2015, and baseline sampling of the optimization network and treatment system on 28 December 2015 (Table 11). Implementation of the pilot study scope of work will continue in 2016, including modification of the extraction rates to potentially increase VOC mass removal and monitoring of VOC concentrations at the SCRWs following flow rate modification. In accordance with the Work Plan, pilot study progress will be reported to the EPA in quarterly email updates through 2016 and summarized in the 2016 Annual Progress Report for the Site.

7. CONCLUSIONS AND RECOMMENDATIONS

Approximately 48.4 million gallons of groundwater were treated, and 365 pounds of VOCs were removed by Treatment System 19 during 2015. From 1 January through 31 December 2015, System 19 had an operational uptime of 96%.

The Site groundwater remedy is performing as intended. The estimated capture zones from March and September 2015 meet or exceed target capture areas as indicated by converging lines of evidence, including graphical flow net analysis, capture zone width calculations, and VOC concentration trends.

Optimization of the groundwater remedy at the Site will continue in 2016. Updates on the progress of optimization activities will be provided to EPA quarterly through 2016 and included in the 2016 Annual Progress Report for the Site.

The reductions in groundwater gauging and sampling frequency that were requested in February 2015 will be evaluated as part of the 2016 Annual Progress Report. Groundwater elevations measurements in 2016 will only be collected in September in order to evaluate a potential reduction in gauging from a semi-annual to annual basis. Groundwater samples will be collected in September 2016 and compared to the 2014 sampling results to evaluate a potential reduction in sampling from an annual to biennial basis. Based on the analyses previously presented in the *Request for Reduction in Groundwater Monitoring Frequency* (Geosyntec, 2015a), it is anticipated that the evaluation will conclude that monitoring at a reduced frequency is adequate to demonstrate remedy effectiveness.

8. UPCOMING WORK IN 2016 AND PLANNED FUTURE ACTIVITIES

January	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Second Pilot Study Baseline Sampling Event
February	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Submit 4th Quarter and Annual NPDES report • Begin Flow Rate Adjustments for Pilot Study[14]
March	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Slurry wall well pair groundwater level measurements
April	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Submit Annual Progress Report to EPA
May	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Semiannual system influent sampling (NPDES) • Submit 1st Quarter NPDES report • Slurry wall well pair groundwater level measurements
June	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES)
July	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES)
August	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Submit 2nd Quarter NPDES report
September	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Groundwater sampling • Groundwater level measurements
October	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Annual system effluent sampling (NPDES) • Groundwater sampling

[14] Implementation of the pilot study for enhanced groundwater extraction at the Site will be ongoing in 2016. A schedule for the pilot study was provided in the Work Plan (Geosyntec, 2015d).

November	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES) • Semiannual system influent sampling (NPDES) • Submit 3rd Quarter NPDES report • Slurry wall well pair groundwater level measurements
December	• Pump and Treat System O&M • Monthly system effluent sampling (NPDES)

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TABLES

Table 1
Extraction and Monitoring Well Construction Summary
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Well ID	Year Installed	Reference Elevation[1] (ft msl)	Diameter (inches)	Total Well Depth (ft btoc)	Top of Screened Interval (ft btoc)	Bottom of Screened Interval (ft btoc)	Top of Sand Pack (ft btoc)	Bottom of Sand Pack (ft btoc)	Well Type
A Zone									
4A	1982	54.69	2	35	20	35	15	35	Mon
6A	1982	54.74	2	39	20	39	17	39	Mon
9A	1982	55.82	2	40	15	40	10	40	Mon
12A	1982	55.11	2	35	15	35	15	35	Mon
15A	1982	54.06	2	40	15	40	15	40	Mon
16A	1982	53.30	2	32	22	32	14	32	Mon
17A	1982	53.40	2	35	20	35	15	35	Mon
22A	1982	52.87	2	30	14	30	12	30	Mon
23A	1982	50.56	2	30	14	30	14	30	Mon
71A	1984	55.15	12	36	26	31	13	37.5	Ext
101A	1986	55.14	4	36	19	34	14	36	Mon
115A	1986	53.48	4	30	20	30	18	32	Mon
134A	1986	53.44	4	30	20	30	18	32	Mon
139A	1986	53.21	4	31	16	31	11	34	Mon
140A	1986	56.99	4	33	18	33	16	35	Mon
141A	1986	53.25	4	26	16	26	11	28	Mon
142A (RGRP)	1986	57.27	4	27	22	27	20	29	Mon
143A	1986	55.72	4	27	22	27	20	29	Mon
148A	1991	53.92	4	32.5	22.5	32.5	19.5	33	Mon
149A	1991	51.90	4	32.5	12.5	32.5	11.5	35	Mon
154A	1993	53.90	4	29	19	29	15	30	Mon
155A	1993	54.17	4	29	19	29	15	30	Mon
159A	1997	54.62	4	30	20	30	17	33	Mon
160A	1997	53.89	4	33.5	18.5	33.5	15.5	35.5	Mon
161A	1997	56.15	4	30.5	20.5	30.5	17.5	33	Mon
174A	2002	53.66	4	31.5	18	28	15	30	Mon
175A	2002	53.82	4	35	19	29	16	30	Mon
RW-1A	1985	53.71	6	35	20	35	15.5	35	Ext
RW-2A	1985	49.42	6	34	19	34	15	36	Ext
RW-11A	1985	54.87	6	35	25	35	10	37	Ext
RW-12A	1985	53.96	6	35	25	35	10	37	Ext
RW-23A	1994	52.75	6	34.5	24.5	34.5	21.5	35	Ext
RW-24A	1994	50.15	6	32	22	32	19	33	Ext
RW-26A	1997	53.51	6	32	22	32	15	34	Ext
RW-29A	2002	52.04	6	35	20	35	17	35	Ext
B1 Zone									
93B1	1986	55.27	4	67	52	67	45	69	Mon
95B1	1986	56.95	4	65	50	65	46.5	67	Mon
98B1 (RGRP)	1986	54.10	4	66	57	66	46	68	Mon
101B1	1986	54.92	4	65	50	65	46	67	Mon
110B1	1986	53.68	4	59	49	59	47	61	Mon
117B1	1986	53.80	4	63	53	63	51	65	Mon
145B1	1994	54.00	6	65	53	63	50	65	Mon
156B1	2002	50.87	4	60	49	54	37	55	Mon
RW-1(B1)	1985	53.83	6	72	52	72	42	73	Ext
RW-2(B1) (RGRP)	1986	48.18	6	56	46	56	45	59	Ext
RW-10(B1)	1994	52.40	6	65	55	65	52	66	Ext
RW-11(B1)	1995	50.43	6	61	51	61	48	63	Ext
B2 Zone									
40B2	1985	54.59	4	92	87	92	83.5	93	Mon
90B2	1986	54.18	4	104	94	104	87	106	Mon
146B2	1995	53.58	6	96	85	95	82	97	Mon
RW-1(B2)	1985	53.49	6	94	87	92	84	97	Ext
RW-2(B2)	1985	48.95	6	96	76	96	72	98	Ext

Notes:

Water levels for extraction wells are taken from a 2" piezometer located next to the well.

1. Reference Elevations are in National Geodetic Vertical Datum from 1929 (NGVD 29).

ft msl = feet mean sea level

ft btoc = feet below top of casing

Ext = extraction well

Mon = monitoring well

(RGRP) = Regional Groundwater Remediation Program well. Further discussion of this well is provided in the MEW RGRP 2015 Annual Progress Report (Geosyntec, 2016a)

Table 2
Monitoring and Reporting Schedule
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Monitoring and Sampling - Wells		
Well	**Sampling Frequency[1]**	**Water Level Gauging Frequency[2]**
A Zone		
4A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
6A	Every 5 Years (Last Sampled 2012)	Semiannually (March, September)
9A	Every 5 Years (Last Sampled 2012)	Semiannually (March, September)
12A	Every 5 Years (Last Sampled 2012)	Quarterly
15A	Every 5 Years (Last Sampled 2012)	Quarterly
16A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
17A	Annually (September or October, last sampled 2014)	Quarterly
22A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
23A (RGRP)	Annually (September or October, last sampled 2014)	Semiannually (March, September)
71A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
101A	Every 5 Years (Last Sampled 2012)	Quarterly
115A	Annually (September or October, last sampled 2014)	Quarterly
134A	Annually (September or October, last sampled 2014)	Quarterly
139A	Every 5 Years (Last Sampled 2012)	Quarterly
140A		Quarterly
141A		Quarterly
142A[3] (RGRP)		Quarterly
143A	Every 5 Years (Last Sampled 2012)	Quarterly
148A	Every 5 Years (Last Sampled 2012)	Semiannually (March, September)
149A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
154A	Annually (September or October, last sampled 2014)	Quarterly
155A	Annually (September or October, last sampled 2014)	Quarterly
159A	Annually (September or October, last sampled 2014)	Quarterly
160A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
161A	Every 5 Years (Last Sampled 2012)	Semiannually (March, September)
174A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
175A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-1A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-2A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-11A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-12A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-23A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-24A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-26A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-29A	Annually (September or October, last sampled 2014)	Semiannually (March, September)
B1 Zone		
93B1[3]		Quarterly
95B1	Annually (September or October, last sampled 2014)	Semiannually (March, September)
98B1[3] (RGRP)		Quarterly
101B1	Annually (September or October, last sampled 2014)	Semiannually (March, September)
110B1	Annually (September or October, last sampled 2014)	Quarterly
117B1	Annually (September or October, last sampled 2014)	Quarterly
145B1	Annually (September or October, last sampled 2014)	Semiannually (March, September)
156B1	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-1(B1)	Annually (September or October, last sampled 2014)	Quarterly
RW-2(B1)[4]	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-10(B1)	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-11(B1)	Annually (September or October, last sampled 2014)	Semiannually (March, September)
B2 Zone		
40B2 (RGRP)	Annually (September or October, last sampled 2014)	Semiannually (March, September)
90B2	Annually (September or October, last sampled 2014)	Semiannually (March, September)
146B2	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-1(B2)	Annually (September or October, last sampled 2014)	Semiannually (March, September)
RW-2(B2)	Annually (September or October, last sampled 2014)	Semiannually (March, September)

Table 2
Monitoring and Reporting Schedule
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Monitoring and Sampling - System 19	
System Component	**Sample Frequency**
Systerm 19 Influent	Quarterly
System19 Midpoint 1	Monthly
System 19 Midpoint 2	Monthly
System 19 Effluent	Monthly
Stevens Creek[5,6]	

Reporting	
Report	**Due Date**
Quarterly NPDES	February 15, May 15, August 15, and November 15
EPA Annual Progress Report	April 15

Notes:

Wells shown in **bold** are associated with the Fairchild Operation and Maintenance Program (RMT, 2003).

1. In February 2015, Geosyntec submitted the Request for Reduction in Groundwater Monitoring Frequency (Geosyntec, 2015a). Based on verbal feedback provided by the EPA, the wells were not sampled in 2015 in order to evaluate the proposed reduction in sampling frequency to a biennial basis. The wells will be sampled in 2016 and the proposed reduction in sampling frequency will be evaluated as part of the 2016 Annual Progress Report. EPA conditionally approved this approach in a letter dated 16 March 2016 (EPA, 2016).
2. In February 2015, Geosyntec submitted the Request for Reduction in Groundwater Monitoring Frequency (Geosyntec, 2015a). Based on verbal feedback provided by the EPA, the wells will not be gauged in March 2016 in order to evaluate the proposed reduction in gauging frequency to an annual basis. The wells will be gauged in September 2016 and the proposed reduction in frequency will be evaluated as part of the 2016 Annual Progress Report. EPA conditionally approved this approach in a letter dated 16 March 2016 (EPA, 2016).
3. Regional Groundwater Remediation Program well gauged as part of a slurry wall well pair.
4. RW-2(B1) is a Fairchild extraction well that is monitored as part of the Regional Groundwater Remediation Program.
5. In cases of effluent exceedance, receiving water must be sampled upstream/downstream of treatment system within 24 hours for the exceeded compound(s) and dissolved oxygen level(Per NPDES Permit CAG912002, Order No. R2-2012-0012, effective until March, 15, 2017).
6. In cases of Cadmium, Chromium (total), Copper, Lead, Silver, or Zinc trigger exceedances, receiving water must be sampled upstream/downstream of treatment system for hardness and salinity on the same day as one of the three required resamples is taken (Per NPDES Permit CAG912002, Order No. R2-2012-0012, effective until March, 15, 2017).

EPA = United States Environmental Protection Agency
NPDES = National Pollutant Discharge Elimination System
(RGRP) = Regional Groundwater Remediation Program well. Further discussion of this well is provided in the MEW RGRP 2015 Annual Progress Report (Geosyntec, 2016a).
Slurry wall well pair water levels are measured on a quarterly basis.

Table 3
System 19 Average Recovery Well Flow Rates
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Extraction Well	2015 Average Monthly Flowrate[1] (gpm)												2015 Average Annual Flow Rate[2] (gpm)
	January	February	March	April	May	June	July	August	September	October	November	December	
A Zone													
71A	4.40	4.69	5.07	4.42	4.65	4.63	4.15	2.75	1.97	1.93	1.94	1.57	3.50
RW-1A	2.18	2.01	2.04	1.92	1.52	1.29	1.28	1.03	0.80	1.12	1.01	1.00	1.43
RW-2A	9.39	8.73	9.60	9.76	9.55	9.77	10.00	9.60	8.81	8.76	8.81	7.02	9.14
RW-11A	2.95	3.11	3.75	3.50	3.33	3.29	3.44	3.40	2.88	3.12	3.10	1.99	3.15
RW-12A	4.98	4.21	4.75	4.35	4.14	4.04	2.43	3.57	3.47	2.56	2.16	1.99	3.52
RW-23A	6.05	5.54	9.02	9.28	7.49	6.13	6.38	6.26	5.36	5.17	5.16	3.96	6.33
RW-24A	2.46	2.96	3.73	3.60	3.48	3.57	3.50	3.44	3.21	3.23	2.99	1.42	3.12
RW-26A[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-29A	7.93	7.44	8.39	8.21	8.24	5.80	6.26	5.83	5.76	6.96	6.37	4.11	6.78
B1 Zone													
REG-4B(1) (RGRP)	3.04	2.59	3.33	6.03	6.60	7.03	6.79	6.86	6.48	6.78	6.72	5.25	5.62
RW-1(B1)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-2(B1)	5.75	5.27	5.64	3.92	7.78	8.77	6.51	5.47	6.02	7.42	7.45	5.70	6.26
RW-10(B1)	13.04	11.59	12.68	12.58	12.50	12.68	12.59	11.94	8.99	13.15	13.21	10.18	12.05
RW-11(B1)	9.74	8.86	9.65	9.48	9.30	9.69	9.64	7.55	6.50	9.96	9.96	7.86	9.00
B2 Zone													
RW-1(B2)	0.27	0.25	0.28	0.27	0.26	0.26	0.25	0.25	0.23	0.25	0.25	0.20	0.25
RW-2(B2)	7.97	7.25	8.24	7.77	10.61	12.02	11.92	11.65	11.69	11.68	11.34	8.64	10.05
B3 Zone													
65B3 (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
C/Deep Zone													
DW3-219 (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
DW3-244 (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
DW3-334 (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
DW3-364 (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
DW3-505R (RGRP)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	80.14	74.52	86.15	85.11	89.43	88.97	85.16	79.60	72.17	82.09	80.49	60.89	80.20

Notes:
1. Monthly average recovery well flow rates were calculated by dividing the volume of groundwater extracted by the time (minutes) between the effluent totalizer readings (generally taken last Wednesday of each month).
2. Average 2015 flow rates were calculated by dividing the total volume of groundwater recovered by the time in minutes between the totalizer readings. System 19 totalizer readings were recorded on 30 December 2014 and 30 December 2015.
3. Well is offline with EPA approval (EPA, 2006; Weiss, 2009; Geosyntec, 2010; EPA, 2012).
-- = well was off during this period
gpm = gallons per minute
EPA = United States Environmental Protection Agency
(RGRP) = Regional Groundwater Remediation Program well connected to System 19 for treatment. Further discussion of this well is provided in the MEW RGRP 2015 Annual Progress Report (Geosyntec, 2016a)

Table 4
System 19 Monthly Extraction Totals
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Extraction Well	2015 Monthly Volume Extracted[1] (gallons)											
	January	February	March	April	May	June	July	August	September	October	November	December
A Zone												
71A	183,761	188,910	240,718	191,059	221,089	146,548	221,064	110,897	90,774	83,423	78,060	76,675
RW-1A	90,996	81,193	97,164	82,759	72,284	40,913	68,367	41,484	36,733	48,499	40,842	49,088
RW-2A	391,979	352,171	455,978	421,809	453,687	309,562	532,844	387,264	405,856	378,226	355,414	343,662
RW-11A	123,298	125,286	178,337	151,389	158,110	104,228	183,388	137,077	132,790	134,796	125,183	97,450
RW-12A	208,131	169,609	225,557	188,031	196,500	127,936	129,480	143,855	160,088	110,433	87,114	97,304
RW-23A	252,577	223,411	428,743	401,040	356,056	194,050	339,945	252,347	246,778	223,253	208,019	193,784
RW-24A	102,650	119,386	177,085	155,526	165,177	113,100	186,583	138,660	147,983	139,564	120,660	69,681
RW-26A[2]	--	--	--	--	--	--	--	--	--	--	--	--
RW-29A	331,272	300,073	398,546	354,707	391,502	183,761	333,643	235,087	265,494	300,645	256,694	201,460
B1 Zone												
REG-4B(1) (RGRP)	126,921	104,466	158,069	260,514	313,496	222,804	361,866	276,575	298,562	292,727	271,045	256,976
RW-1(B1)[2]	--	--	--	--	--	--	--	--	--	--	--	--
RW-2(B1)	240,007	212,500	268,100	169,319	369,523	277,942	346,842	220,673	277,187	320,536	300,497	279,265
RW-10(B1)	544,366	467,404	602,497	543,521	593,939	401,584	670,768	481,221	414,345	568,223	532,480	498,324
RW-11(B1)	406,770	357,398	458,396	409,626	441,788	307,119	513,537	304,330	299,432	430,374	401,581	384,822
B2 Zone												
RW-1(B2)	11,148	10,256	13,075	11,635	12,346	8,264	13,538	10,059	10,659	10,963	10,159	9,844
RW-2(B2)	332,907	292,501	391,531	335,784	504,421	380,782	635,335	469,912	538,689	504,708	457,429	422,822
B3 Zone												
65B3 (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
C/Deep Zone												
DW3-219 (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
DW3-244 (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
DW3-334 (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
DW3-364 (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
DW3-505R (RGRP)[2]	--	--	--	--	--	--	--	--	--	--	--	--
Total[3]	3,346,783	3,004,564	4,093,796	3,676,719	4,249,918	2,818,593	4,537,200	3,209,441	3,325,370	3,546,370	3,245,177	2,981,157

Notes:

1. The monthly volume of groundwater extracted is based on effluent totalizer readings at each well (generally taken last Wednesday of each month).

2. Well is offline with EPA approval (EPA, 2006; Weiss, 2009; Geosyntec, 2010; EPA, 2012).

3. The total volume extracted is calculated from the system effluent totalizer, therefore the sum of the wells may not be equal to the total volume reported. This discrepancy is attributed to inherent errors associated with comparing these two independently measured totalizer values.

-- = well was off during this period

EPA = United States Environmental Protection Agency

(RGRP) = Regional Groundwater Remediation Program well connected to System 19 for treatment. Further discussion of this well is provided in the MEW RGRP 2015 Annual Progress Report (Geosyntec, 2016a)

Table 5a

System 19 VOC Sampling Results Summary

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	1,1,1-TCA	TCE	PCE	Vinyl Chloride	1,4-Dioxane[1]
Influent	1/15/2015	<20	<10	<10	**5.0**	**210**	<10	16	<10	**500**	<10	**6.6**	NA
Influent	2/19/2015	<20	**4.2**	<10	**5.0**	**220**	**4.3**	19	**6.1**	**680**	<10	**4.7**	NA
Influent (D)	2/19/2015	<10	**4.3**	<5.0	**4.9**	**230**	**3.9**	19	**6.0**	**680**	<5.0	**4.7**	NA
Influent	3/16/2015	<20	**5.7**	<10	**6.4**	**240**	**5.7**	17	**6.6**	**590**	<10	**6.4**	NA
Influent	4/10/2015	<20	**5.1**	<10	**4.9**	**220**	**3.2**	17	**6.9**	**640**	<10	<10	NA
Influent	5/21/2015	<20	**5.2**	<10	**4.5**	**260**	**2.8**	15	**5.9**	**570**	<10	<10	NA
Influent (D)	5/21/2015	<5.0	**4.8**	<2.5	**4.7**	**250**	**3.2**	16	**5.5**	**670**	<2.5	**5.2**	NA
Influent	6/25/2015	<20	**11**	<10	**10**	**230**	**12**	16	**11**	**620**	**0.68**	**6.9**	NA
Influent	7/24/2015	<20	**3.8**	<10	**4.4**	**240**	**3.3**	12	**4.7**	**540**	<10	**4.8**	NA
Influent	8/21/2015	<20	**3.4**	<10	**4.7**	**270**	**3.8**	16	**6.0**	**770**	<10	<10	NA
Influent	9/9/2015	<10	**4.9**	<5.0	**5.0**	**270**	**3.5**	21	**7.5**	**940**	<5.0	**6.7**	NA
Influent (D)	9/9/2015	<10	**5.1**	<5.0	**4.7**	**270**	**3.5**	22	**7.5**	**930**	<5.0	**6.7**	NA
Influent	10/5/2015	<10	**3.6**	<5.0	**3.5**	**170**	**2.5**	11	**3.7**	**470**	<5.0	**4.8**	NA
Influent	11/24/2015	<10	**3.5**	<5.0	**3.1**	**170**	**2.4**	10	**3.9**	**490**	<5.0	**4.3**	NA
Influent (D)	11/24/2015	<10	**3.4**	<5.0	**3.3**	**160**	**2.4**	9.6	**3.8**	**470**	<5.0	**4.0**	NA
Influent	12/9/2015	<10	**3.8**	<5.0	**4.1**	**170**	**2.8**	15	**5.1**	**570**	<5.0	**2.5**	NA
Influent	12/17/2015	<10	**3.4**	<5.0	**4.4**	**300**	**4.0**	15	**3.5**	**690**	<5.0	**19**	NA
Influent	12/21/2015	<10	**5.1**	<5.0	**6.6**	**220**	**3.8**	34	**12**	**990**	<5.0	**11**	NA
Influent	12/28/2015	<10	**4.9**	<5.0	**6.2**	**280**	**5.6**	24	**10**	**950**	<5.0	**7.3**	NA
Midpoint 1	1/15/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 1	2/19/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**3.0**	NA
Midpoint 1	3/16/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.7**	NA
Midpoint 1	4/10/2015	<1.0	**1.3**	<0.50	<0.50	**1.3**	<0.50	<0.50	<0.50	<0.50	<0.50	**2.6**	NA
Midpoint 1	5/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.9**	NA
Midpoint 1	6/25/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.9**	NA
Midpoint 1	7/24/2015	<1.0	**2.9**	<0.50	**0.74**	**61**	**0.20**	0.98	**0.33**	<0.50	<0.50	**1.5**	NA
Midpoint 1	8/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.80**	NA
Midpoint 1	9/9/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.6**	NA
Midpoint 1	10/5/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
NPDES Trigger Levels		*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*3*
Effluent Limitations:		*5*	*5*	*0.5*	*0.11*	*5*	*5*	*5*	*5*	*5*	*1.6*	*0.5*	*NE*

Table 5a

System 19 VOC Sampling Results Summary

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	1,1,1-TCA	TCE	PCE	Vinyl Chloride	1,4-Dioxane[1]
Midpoint 1	11/24/2015	<1.0	**2.9**	<0.50	**0.96**	**76**	**0.31**	1.1	**0.42**	<0.50	<0.50	**0.88**	NA
Midpoint 1	12/9/2015	<1.0	**4.4**	<0.50	**2.3**	**160**	**1.1**	3.2	**1.3**	**3.5**	<0.50	**0.69**	NA
Midpoint 1	12/17/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.91**	NA
Midpoint 1	12/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.5**	NA
Midpoint 1	12/28/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.0**	NA
Midpoint 2	1/15/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	2/19/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.94**	NA
Midpoint 2	3/16/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	4/10/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.9**	NA
Midpoint 2	5/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.67**	NA
Midpoint 2	6/25/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.46**	<0.50	<0.50	NA
Midpoint 2	7/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.6**	NA
Midpoint 2	8/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	9/9/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.34**	NA
Midpoint 2	10/5/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	11/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.2**	NA
Midpoint 2	12/9/2015	<1.0	**0.14**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.1**	NA
Midpoint 2	12/17/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	12/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Midpoint 2	12/28/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	1/15/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	2/19/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	3/16/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	4/10/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	5/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	6/25/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	7/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	8/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	9/9/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
NPDES Trigger Levels		*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*3*
Effluent Limitations:		*5*	*5*	*0.5*	*0.11*	*5*	*5*	*5*	*5*	*5*	*1.6*	*0.5*	*NE*

Table 5a

System 19 VOC Sampling Results Summary

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	1,1,1-TCA	TCE	PCE	Vinyl Chloride	1,4-Dioxane[1]
Effluent	10/5/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Effluent	11/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.68**	NA
Effluent	12/9/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.90**	NA
Effluent	12/17/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	1/15/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	2/19/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	3/16/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	4/10/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	5/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	6/25/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	7/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	8/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	9/9/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	10/5/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	11/24/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	12/9/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	12/17/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	12/21/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
Travel Blank	12/28/2015	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA
T19-R-2	12/9/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA
T19-R-1	12/9/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA
NPDES Trigger Levels		*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*3*
Effluent Limitations:		*5*	*5*	*0.5*	*0.11*	*5*	*5*	*5*	*5*	*5*	*1.6*	*0.5*	*NE*

Table 5a

System 19 VOC Sampling Results Summary

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Notes:
All Parameters are within effluent limits specified in NPDES permit order no. R2-2012-0012, and NPDES permit no.CAG912002, with the exception of one vinyl chloride exceedance in the 24 November 2015 effluent sample and subsequent confirmation sample on 9 December 2015. The Water Board was notified, the system was temporarily shut down on 9 December 2015, and a carbon change out was completed on 16 December 2015. Vinyl chloride was not detected in the effluent sample collected on 17 December 2015 following the carbon change out.
Samples T19-R-2 and T19-R-2 on 9 December were collected at Stevens Creek, 50 ft. upstream and 50 ft. downstream of the discharge point, respectively.

(1) The NPDES permit requries semiannual sampling of 1,4-Dioxane if the chemical is known to be in the influent. In May 2011, the influent was sampled for 1,4-Dioxane. Because it was not detected, sampling the effluent for the chemical is not required. (Weiss, 2012)
In accordance with the NPDES permit, if reporting limit for 1,1-DCE is greater than the effluent limit, the permit specifies that non-detect using a 0.5 µg/L reporting limit will not be deemed to be out of compliance.
Effluent limitations are maximum daily effluent limitations on discharge to drinking water areas as specified in Order No. R2-2012-0012, and VOC General NPDES Permit No. CAG912002.

1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
trans-1,2-DCE = trans-1,2-Dichloroethene
Freon 113 = trichlorotrifluoroethane
1,1,1-TCA = 1,1,1-Trichloroethane
PCE = Tetrachloroethene
TCE = Trichloroethene

< indicates analyte not detected above the reported detection limit
NA indicates the sample was not analyzed for the given analyte
Midpoint 1 = sample collected between the primary and secondary carbon vessels
Midpoint 2 = sample collected between the secondary and tertiary carbon vessels
NE = Not Established
NPDES = National Pollutant Discharge Elimination System
µg/L = micrograms per liter
VOC = Volatile Organic Compound
(D) = Duplicate

Table 5b
System 19 Inorganic Sampling Results Summary
MEW Fairchild Building 13, 19, and 23 Groundwater Remediation Prgram
Mountain View, California

Sample Location	Sample Date	pH	Temp (^{o}C)	Conductivity (µS/cm)	Turbidity (NTU)	Rainbow Trout Acute Toxicity[1] (% survival)	
						Three sample moving median	single sample
Influent	01/15/15	7.33	18.7	594	---	---	---
Influent	02/19/15	7.37	18.7	644	---	---	---
Influent	03/16/15	6.91	19.4	936	---	---	---
Influent	04/10/15	8.14	19.3	665	---	---	---
Influent	05/21/15	7.05	19.0	819	---	---	---
Influent	06/25/15	7.24	21.3	652	---	---	---
Influent	07/24/15	7.21	18.8	561	---	---	---
Influent	08/21/15	7.09	20.3	774	---	---	---
Influent	09/09/15	7.13	23.1	786	---	---	---
Influent	10/05/15	7.12	18.5	612	---	---	---
Influent	11/24/15	7.26	18.8	754	---	---	---
Influent	12/17/15	6.97	15.4	978	---	---	---
Midpoint 1	01/15/15	7.28	19.0	595	---	---	---
Midpoint 1	02/19/15	7.39	18.5	634	---	---	---
Midpoint 1	03/16/15	6.92	19.4	935	---	---	---
Midpoint 1	04/10/15	8.04	19.4	663	---	---	---
Midpoint 1	05/21/15	7.12	19.4	822	---	---	---
Midpoint 1	06/25/15	7.26	20.7	657	---	---	---
Midpoint 1	07/24/15	7.26	18.8	562	---	---	---
Midpoint 1	08/21/15	7.11	19.7	771	---	---	---
Midpoint 1	09/09/15	7.21	21.8	783	---	---	---
Midpoint 1	10/05/15	7.09	18.7	622	---	---	---
Midpoint 1	11/24/15	7.20	19.1	761	---	---	---
Midpoint 1	12/17/15	7.55	18.4	772	---	---	---
Midpoint 2	01/15/15	7.29	18.9	601	---	---	---
Midpoint 2	02/19/15	7.46	18.5	642	---	---	---
Midpoint 2	03/16/15	6.89	19.6	934	---	---	---
Midpoint 2	04/10/15	8.02	19.4	665	---	---	---
Midpoint 2	05/21/15	7.08	19.5	819	---	---	---
Midpoint 2	06/25/15	7.25	21.1	660	---	---	---
Midpoint 2	07/24/15	7.18	18.7	562	---	---	---
Midpoint 2	08/21/15	7.15	19.7	771	---	---	---
Midpoint 2	09/09/15	7.09	21.9	786	---	---	---
Midpoint 2	10/05/15	7.15	18.7	622	---	---	---
Midpoint 2	11/24/15	7.11	18.7	768	---	---	---
Midpoint 2	12/17/15	7.68	18.1	793	---	---	---
Effluent	01/15/15	7.41	18.8	593	---	---	---
Effluent	02/19/15	7.44	18.5	685	---	---	---
Effluent	03/16/15	7.01	19.6	938	---	---	---
Effluent	04/10/15	7.75	19.6	663	---	---	---
Effluent	05/21/15	7.09	19.7	827	---	---	---
Effluent	06/25/15	7.25	22.4	704	---	---	---
Effluent	07/24/15	7.22	18.5	591	---	---	---
Effluent	08/21/15	7.13	19.8	881	---	---	---
Effluent	09/09/15	6.99	22.4	869	---	---	---
Effluent	10/05/15	7.25	18.6	639	---	---	---
Effluent	11/24/15	6.97	19.0	769	0.11	100	100
Effluent	12/17/15	8.27	16.8	829	---	---	---
NPDES Trigger Levels:		---	---	---	5	---	NE
Effluent Limitations:[2]		6.5 to 8.5	NE	NE	NE	90	70

Notes:

All parameters are within effluent limits specified in NPDES permit order no. R2-2012-0012, and NPDES permit no. CAG912002.

pH, temperature, electrical conductivity, and turbidity are required to be reported on an annual basis but pH, temperature, and conductivity readings are reported more frequently. System effluent was analyzed for turbidity in November 2015.

Sampling for hardness and salinity is required in a single annual sample in the receiving water only if trigger levels for Cadmium, Chromium (total), Copper, Lead, Nickel, Silver, or Zinc are exceeded. System samples are analyzed for these metals, mercury, and cyanide every three years. The next triennial sampling will be conducted in November 2018.

1. Rainbow trout acute toxicity, 96-hr static, percent survival. This analysis is required to be performed annually.

2. Effluent limitation in system discharge as specified in Order No. R2-2012-0012, VOC General NPDES Permit CAG912002.

--- = not applicable, not required

Temp = temperature

ºC = degrees Celsius

µS/cm = micro Siemens per centimeter

NTU = nephelometric turbidity unit

NE = not established

NPDES = National Pollutant Discharge Elimination System

Table 5c

System 19 Metals Sampling Results Summary

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L)													
		Antimony	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**	**Hexavalent Chromium**	**Low-Level Mercury**
Effluent	11/24/2015	<0.50	**0.63**	<0.20	<0.10	**1.5**	**3.9**	0.29	**1.7**	**4.9**	<0.20	<0.10	**3.0**	<0.50	**0.00034**
NPDES Trigger Levels[1]		*6*	*10*	*4*	*1.1*	*11*	*4.7*	*3.2*	*27*	*5.0*	*2.2*	*1.7*	*86*	*11*	*0.025*

Notes:

All parameters are below trigger level specified in NPDES permit order no. R2-2012-0012, NPDES permit no. CAG912002.

Sampling for hardness and salinity is required in a single annual sample in the receiving water only if trigger levels for cadmium, chromium (total), copper, lead, nickel, silver, or zinc are exceeded. System samples are analyzed for these metals, mercury and cyanide every three years and sampling was performed in November 2015. The next triennial sampling will be conducted in November 2018.

[1]There are no effluent limitations specified for metals in the NPDES permit order no. R2-2012-0012, NPDES permit no. CAG912002.

< indicates analyte not detected above the reported detection limit

NPDES = National Pollutant Discharge Elimination System

µg/L = micrograms per liter

Table 6
System 19 VOC Mass Removal Summary
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

	Total Groundwater Extracted[1] (gallons)	Influent VOC Concentration[1,2] (mg/L)	Total VOC Mass Removed[1] (pounds)
January	3,722,520	0.74	23
February	3,267,460	0.95	26
March	4,498,870	0.88	33
April	4,182,300	0.90	31
May	4,862,750	0.91	37
June	3,248,300	0.92	25
July	5,416,100	0.81	37
August	3,809,700	1.07	34
September	3,661,520	1.25	38
October	4,100,260	0.67	23
November	3,938,670	0.67	22
December	3,677,750	1.10	34
2015 Cumulative[1]	48,386,200		365

Notes:
1. Total groundwater extracted, influent VOC concentrations, total VOC mass removed, and cumulative values were obtained from the NPDES quarterly reports (Weiss, 2015b, c, d and 2016).
2. Influent samples are analyzed at least one time per quarter for System 19.
mg/L = milligrams per liter
NPDES = National Pollutant Discharge Elimination System
VOC = Volatile Organic Compound

Table 7
Summary of 2015 Non-Routine Maintenance and Operational Activities for System 19
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Date	Component	Off-line Time	Event/Alert	Diagnosis and Response	Regulatory Notification[1]
January 12	Treatment System	<1 hour	Sump high level alert	Alert was triggered during system maintenance. The alert was reset and the system was restarted.	Not Required
February 6 - 9	Treatment System	60 hours	Multiple alerts	Alerts were triggered by heavy rains in the evening of Friday, February 6. The water was pumped out, the alerts were reset, and the system was restarted in the morning of Monday, February 9.	Not Required
February 27	Treatment System, LDV-02	2 hours	Vault high level alert	Alert was triggered by irrigation water. The water was pumped out and the system was restarted.	Not Required
March 5	RW-12(B1)	<1 hour	Pump Low flow alert	Alert was triggered by a fouled flow meter. The flow meter was cleaned and the well was restarted.	Not Required
March 13	Treatment System	<1 hour	Multiple alerts	Alerts were triggered during system testing. The alerts were reset and the system was restarted.	Not Required
March 23	RW-2(B1)	17 hours	Pump Low flow alert	Alert was triggered by a fouled flow meter. The flow meter was cleaned and the well was restarted.	Not Required
April 2 - 3	RW-23A	16 hours	Pump low flow alert	Alert triggered by a failed flow meter. The flow meter was replaced and the well was restarted.	Not Required
April 11 - 30	RW-2(B1)	153 hours, non-consecutive	Pump low flow alert	Alerts were triggered during ongoing troubleshooting efforts. The alerts were reset and the well was restarted.	Not Required
April 23	Treatment System	3 hours	Planned manual shutdown	The system was shut down to perform preventative valve replacement on granular activated carbon vessels. The system was restarted.	Not Required
April 23	71A	1 hour	Pump low flow alert	Alert triggered by a fouled flow meter. The flow meter was cleaned and the well was restarted.	Not Required
April 26 - 27	RW-23A	10 hours	Pump low flow alert	Alerts triggered by a failed flow transmitter. Transmitter was replaced, and the well was restarted.	Not Required
May 4 - 5	RW-2(B1)	3 hours, non-consecutive	Pump low flow alert	Alerts triggered by declining pump performance. Pump was replaced and the well was restarted.	Not Required
May 6	Treatment System	4 hours	Planned manual shutdown	System was shut down to replace main power wiring to wells RW-1(A), RW-1(B1), and RW-1(B2). The system was restarted.	Not Required
May 21 - 22	RW-1A	30 hours	Pump cycled off	Pump cycled off without alert. Pump found to be malfunctioning and was replaced. The well was restarted.	Not Required
May 22	Treatment System, RW-1A	2 hours	Multiple alerts	Alerts were triggered during pump change. The alerts were reset and the system was restarted.	Not Required
May 28 - 29	RW-1(B2)	17 hours	Multiple alerts	Alerts were triggered by pump saver settings that needed adjustment. Pump saver was adjusted and the well was restarted.	Not Required
June 11 - 12	RW-23A	14 hours	Multiple alerts	Alerts were triggered by a fouled flow meter. The meter was repaired, and the well was restarted.	Not Required
June 15 - 17	RW-29A	50 hours	Multiple alerts	Alerts were caused by a communication problem within the 24-volt direct current system. The alert was cleared and the well was restarted.	Not Required
July 2	RW-2(B1)	7 hours	Pump low flow alert	Alert was triggered by a failed flow meter. The flow meter was replaced and the well was restarted.	Not Required
August 9 - 11	RW-11(B1)	53 hours	Pump cycled off	Alert was caused by a failed pump, the pump was replaced, and the well was restarted.	Not Required
August 16	RW-11A	21 hours	Pump low flow alert	Alert was triggered by a failed flow meter. The flow meter was replaced and the well was restarted.	Not Required
August 19	Treatment System, 65B3, DW3-244, DW3-219	<1 hour	Vault high level alert	Alerts were triggered during testing of float switch. The alerts were cleared and they system was restarted.	Not Required
August 24	71A	1 hour	Multiple alerts	Alerts were triggered while diagnosing low flow condition. The well was restarted.	Not Required
August 27 - 28	RW-1A	12 hours, non-consecutive	Multiple alerts	Pump saver settings were adjusted and the well was restarted.	Not Required
September 5 - 8	RW-1A	77 hours, non-consecutive	Multiple alerts	Flow settings were adjusted and the well was restarted.	Not Required

Table 7
Summary of 2015 Non-Routine Maintenance and Operational Activities for System 19
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Date	Component	Off-line Time	Event/Alert	Diagnosis and Response	Regulatory Notification[1]
September 11	RW-1A	7 hours	Low flow alert	Alert was reset and the well was restarted.	Not Required
September 16	RW-10(B1)	7 hours	Pump fault alert	Pump saver settings were adjusted and the well was restarted.	Not Required
September 11 - 24	RW-1A	132 hours, non-consecutive	Multiple alerts	Flow settings were adjusted and the well was restarted.	Not Required
September 25	71A	5 hours	Multiple alerts	Pump detached from the drop pipe. The pump was reattached and was restarted.	Not Required
September 25	Treatment System, REG-4B(1)	57 hours	Vault high level alert	Alert was reset and the well was restarted.	Not Required
November 8 - 9	RW-12A	34 hours	Low flow alert	Alert was triggered by a fouled flow meter. The flow meter was cleaned and the well was restarted.	Not Required
November 10 - 11	Treatment System	<1 hour	Multiple alerts	Alerts were triggered by entrapped air in sump pump discharge line. The line was cleared and the system was restarted.	Not Required
December 9 - 17	Treatment System	183 hours	Unplanned manual shutdown	System was shut down due to a discharge exceedance of vinyl chloride. The system carbon was changed and the system was restarted.	Geosyntec notified USEPA on December 11, 2015 Weiss notified RWQCB on December 10, 2015
December 19 - 20	71A	28 hours	Planned manual shutdown	Well was shut down for redevelopment. The well was redeveloped and restarted.	Not Required
December 19 - 23	RW-24A	125 hours	Planned manual shutdown	Well was shut down for planned redevelopment. The well was not redeveloped due to a logistical issue, well pump was replaced and the well was restarted.	Geosyntec notified USEPA on December 21, 2015
December 21 - 23	RW-11A	73 hours, non-consecutive	Planned manual shutdown	Well was shut down for redevelopment. The well was redeveloped, and upon reinstallation, the manifold cracked and had to be repaired. The well was restarted following manifold repairs.	Not Required
December 23 - 26	RW-12A	28 hours	Planned manual shutdown	Well was shut down for redevelopment. The well was redeveloped and restarted.	Not Required
December 23 - 26	RW-24A	68 hours, non-consecutive	Multiple alerts	Alerts were triggered while tuning pump saver after pump replacement. The alerts were reset and the system was restarted.	Not Required

Notes:
1. The EPA is required to be notified if the treatment system or an extraction well is shut down for 72 consecutive hours. The Water Board is required to be notified if the treatment system is shut down for more than 120 consecutive hours.

RWQCB = Regional Water Quality Control Board
USEPA = U.S. Environmental Protection Agency

Table 8

Groundwater Elevations, January through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Well ID	TOC Elevation (ft msl)	19 March 2015		17 September 2015	
		Depth To Water (feet BTOC)	Groundwater Elevation (ft msl)	Depth To Water (feet BTOC)	Groundwater Elevation (ft msl)
A Zone					
4A	54.69	17.34	37.35	19.38	35.31
6A	54.74	17.52	37.22	19.76	34.98
9A	55.82	19.08	36.74	20.68	35.14
12A	55.11	19.55	35.56	21.10	34.01
15A	54.06	18.37	35.69	20.00	34.06
16A	53.30	16.23	37.07	17.82	35.48
17A	53.40	17.23	36.17	19.33	34.07
22A	52.87	20.51	32.36	22.82	30.05
23A	50.56	18.20	32.36	20.57	29.99
71A	55.15	21.30	33.85	27.76	27.39
101A	55.14	16.92	38.22	19.15	35.99
115A	53.48	18.88	34.60	20.84	32.64
134A	53.44	18.24	35.20	19.99	33.45
139A	53.21	17.82	35.39	19.46	33.75
140A	56.99	15.80	41.19	17.58	39.41
141A	53.25	11.89	41.36	13.12	40.13
143A	55.72	18.95	36.77	20.71	35.01
148A	53.92	18.54	35.38	20.16	33.76
149A	51.90	19.63	32.27	21.94	29.96
154A	53.90	21.22	32.68	NM	NA
155A	54.17	18.87	35.30	20.48	33.69
159A	54.62	19.29	35.33	21.13	33.49
160A	53.89	21.43	32.46	23.66	30.23
161A	56.15	19.54	36.61	21.52	34.63
174A	53.66	18.43	35.23	20.08	33.58
175A	53.82	21.08	32.74	23.25	30.57
RW-1A	53.71	21.09	32.62	27.48	26.23
RW-2A	49.42	21.43	27.99	27.58	21.84
RW-11A	54.87	20.16	34.71	20.90	33.97
RW-12A	53.96	18.52	35.44	19.50	34.46
RW-23A	52.75	24.01	28.74	22.95	29.80
RW-24A	50.15	19.64	30.51	23.68	26.47
RW-26A	53.51	NM	NA	18.23	35.28
RW-29A	52.04	28.43	23.61	22.08	29.96
B1 Zone					
93B1	55.27	15.86	39.41	17.50	37.77
95B1	56.95	17.76	39.19	19.38	37.57
101B1	54.92	15.66	39.26	17.25	37.67
110B1	53.68	17.55	36.13	19.03	34.65
117B1	53.80	19.28	34.52	19.16	34.64
145B1	54.00	17.93	36.07	19.63	34.37
156B1	50.87	15.17	35.70	16.91	33.96
RW-1(B1)	52.40	17.20	35.20	18.80	33.60
RW-2(B1) (RGRP)	48.18	14.55	33.63	17.10	31.08
RW-10(B1)	52.40	23.45	28.95	17.00	35.40
RW-11(B1)	50.43	20.74	29.69	21.63	28.80

Table 8

Groundwater Elevations, January through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Well ID	TOC Elevation (ft msl)	19 March 2015		17 September 2015	
		Depth To Water (feet BTOC)	Groundwater Elevation (ft msl)	Depth To Water (feet BTOC)	Groundwater Elevation (ft msl)
B2 Zone					
40B2 (RGRP)	54.59	29.72	24.87	30.76	23.83
90B2	54.18	15.00	39.18	16.75	37.43
146B2	53.58	19.10	34.48	20.06	33.52
RW-1(B2)	53.49	70.73	-17.24	69.82	-16.33
RW-2(B2)	48.95	19.37	29.58	23.55	25.40

Notes:
TOC = Top of Casing
BTOC = Below Top of Casing
ft msl = Feet Mean Sea Level
NA = Not Available
NM = Not Measured
(RGRP) = Regional Groundwater Remediation Program Well associated with the Fairchild Operation and Maintenance Program (RMT, 2003)

Table 9

Groundwater Elevations, Slurry Wall Well Pairs, January 2011 through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Gradient Direction
Southern Wall - Upgradient Well Pairs						
3/24/2011	140A	45.23	101A	42.23	3.00	Inward
5/26/2011	140A	41.94	101A	30.84	11.10	Inward
9/15/2011	140A	44.40	101A	41.40	3.00	Inward
11/10/2011	140A	44.14	101A	41.01	3.13	Inward
3/15/2012	140A	43.89	101A	40.93	2.96	Inward
5/24/2012	140A	44.04	101A	40.99	3.05	Inward
9/20/2012	140A	43.38	101A	40.27	3.11	Inward
11/21/2012	140A	43.00	101A	39.90	3.10	Inward
3/21/2013	140A	43.80	101A	41.10	2.70	Inward
5/16/2013	140A	44.24	101A	41.34	2.90	Inward
9/19/2013	140A	43.34	101A	40.26	3.08	Inward
11/25/2013	140A	42.94	101A	39.58	3.36	Inward
3/20/2014	140A	42.20	101A	39.29	2.91	Inward
5/15/2014	140A	41.93	101A	38.57	3.36	Inward
9/18/2014	140A	40.77	101A	37.06	3.71	Inward
11/13/2014	140A	40.24	101A	36.81	3.43	Inward
3/19/2015	140A	41.19	101A	38.22	2.97	Inward
5/18/2015	140A	40.66	101A	37.25	3.41	Inward
9/17/2015	140A	39.41	101A	35.99	3.42	Inward
11/12/2015	140A	39.14	101A	35.92	3.22	Inward
3/24/2011	142A	45.82	143A	43.64	2.18	Inward
5/26/2011	142A	29.99	143A	36.76	-6.77	Outward
9/15/2011	142A	45.08	143A	40.66	4.42	Inward
11/10/2011	142A	44.79	143A	40.21	4.58	Inward
3/15/2012	142A	44.56	143A	39.97	4.59	Inward
5/24/2012	142A	44.67	143A	40.37	4.30	Inward
9/20/2012	142A	43.96	143A	39.25	4.71	Inward
11/21/2012	142A	43.61	143A	38.56	5.05	Inward
3/21/2013	142A	44.58	143A	39.96	4.62	Inward
5/16/2013	142A	44.83	143A	40.60	4.23	Inward
9/19/2013	142A	43.99	143A	39.11	4.88	Inward
11/25/2013	142A	43.39	143A	38.32	5.07	Inward
3/20/2014	142A	42.73	143A	37.80	4.93	Inward
5/15/2014	142A	42.36	143A	37.16	5.20	Inward
9/18/2014	142A	41.19	143A	36.04	5.15	Inward
11/13/2014	142A	40.64	143A	35.68	4.96	Inward
3/19/2015	142A	41.55	143A	36.77	4.78	Inward
5/18/2015	142A	40.96	143A	35.95	5.01	Inward
9/17/2015	142A	39.76	143A	35.01	4.75	Inward
11/12/2015	142A	39.53	143A	34.83	4.70	Inward
Western Wall - Crossgradient Well Pairs						
3/24/2011	17A	40.62	159A	41.08	-0.46	Outward
5/26/2011	17A	26.60	159A	39.60	-13.00	Outward
9/15/2011	17A	39.25	159A	39.50	-0.25	Outward
11/10/2011	17A	38.97	159A	39.04	-0.07	Outward
3/15/2012	17A	38.83	159A	38.70	0.13	Inward

Table 9

Groundwater Elevations, Slurry Wall Well Pairs, January 2011 through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Gradient Direction
5/24/2012	17A	38.85	159A	38.74	0.11	Inward
9/20/2012	17A	38.18	159A	37.91	0.27	Inward
11/21/2012	17A	37.89	159A	37.63	0.26	Inward
3/21/2013	17A	38.97	159A	38.55	0.42	Inward
5/16/2013	17A	39.15	159A	38.95	0.20	Inward
9/19/2013	17A	38.16	159A	37.76	0.40	Inward
11/25/2013	17A	37.58	159A	36.98	0.60	Inward
3/20/2014	17A	37.16	159A	36.52	0.64	Inward
5/15/2014	17A	36.56	159A	35.73	0.83	Inward
9/18/2014	17A	35.25	159A	34.82	0.43	Inward
11/13/2014	17A	34.85	159A	34.29	0.56	Inward
3/19/2015	17A	36.17	159A	35.33	0.84	Inward
5/18/2015	17A	35.32	159A	34.45	0.87	Inward
9/17/2015	17A	34.07	159A	33.49	0.58	Inward
11/12/2015	17A	33.94	159A	34.22	-0.28	Outward
Eastern Wall - Crossgradient Well Pairs						
3/24/2011	141A	44.56	139A	41.72	2.84	Inward
5/26/2011	141A	30.64	139A	40.72	-10.08	Outward
9/15/2011	141A	47.09	139A	39.46	7.63	Inward
11/10/2011	141A	43.92	139A	38.93	4.99	Inward
3/15/2012	141A	43.68	139A	38.67	5.01	Inward
5/24/2012	141A	43.80	139A	38.81	4.99	Inward
9/20/2012	141A	43.32	139A	37.98	5.34	Inward
11/21/2012	141A	43.01	139A	37.19	5.82	Inward
3/21/2013	141A	43.67	139A	38.40	5.27	Inward
5/16/2013	141A	43.83	139A	39.06	4.77	Inward
9/19/2013	141A	43.23	139A	37.82	5.41	Inward
11/25/2013	141A	42.78	139A	37.00	5.78	Inward
3/20/2014	141A	42.30	139A	36.37	5.93	Inward
5/15/2014	141A	42.06	139A	35.73	6.33	Inward
9/18/2014	141A	41.27	139A	34.78	6.49	Inward
11/13/2014	141A	40.88	139A	34.32	6.56	Inward
3/19/2015	141A	41.36	139A	35.39	5.97	Inward
5/18/2015	141A	40.91	139A	34.52	6.39	Inward
9/17/2015	141A	40.13	139A	33.75	6.38	Inward
11/12/2015	141A	39.96	139A	33.41	6.55	Inward
Northern Wall - Downgradient Well Pairs						
3/24/2011	115A	39.04	134A	41.07	-2.03	Outward
5/26/2011	115A	28.41	134A	25.31	3.10	Inward
9/15/2011	115A	37.55	134A	39.14	-1.59	Outward
11/10/2011	115A	37.27	134A	38.72	-1.45	Outward
3/15/2012	115A	37.10	134A	38.41	-1.31	Outward
5/24/2012	115A	37.12	134A	38.52	-1.40	Outward
9/20/2012	115A	36.46	134A	37.69	-1.23	Outward
11/21/2012	115A	36.17	134A	37.21	-1.04	Outward
3/21/2013	115A	37.23	134A	38.29	-1.06	Outward

Table 9

Groundwater Elevations, Slurry Wall Well Pairs, January 2011 through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Gradient Direction
5/16/2013	115A	37.43	134A	38.72	-1.29	Outward
9/19/2013	115A	36.44	134A	37.61	-1.17	Outward
11/25/2013	115A	35.98	134A	36.60	-0.62	Outward
3/20/2014	115A	35.58	134A	36.28	-0.70	Outward
5/15/2014	115A	34.87	134A	35.50	-0.63	Outward
9/18/2014	115A	33.77	134A	34.54	-0.77	Outward
11/13/2014	115A	33.38	134A	34.06	-0.68	Outward
3/19/2015	115A	34.60	134A	35.20	-0.60	Outward
5/18/2015	115A	33.71	134A	34.24	-0.53	Outward
9/17/2015	115A	32.64	134A	33.45	-0.81	Outward
11/12/2015	115A	32.38	134A	33.04	-0.66	Outward
3/24/2011	154A	36.40	155A	41.36	-4.96	Outward
5/26/2011	154A	33.77	155A	39.21	-5.44	Outward
9/15/2011	154A	34.99	155A	39.36	-4.37	Outward
11/10/2011	154A	34.65	155A	38.83	-4.18	Outward
3/15/2012	154A	34.47	155A	38.58	-4.11	Outward
5/24/2012	154A	34.60	155A	38.72	-4.12	Outward
9/20/2012	154A	33.91	155A	37.91	-4.00	Outward
11/21/2012	154A	33.65	155A	37.13	-3.48	Outward
3/21/2013	154A	34.58	155A	38.39	-3.81	Outward
5/16/2013	154A	34.72	155A	38.95	-4.23	Outward
9/19/2013	154A	33.93	155A	37.72	-3.79	Outward
11/25/2013	154A	33.50	155A	36.92	-3.42	Outward
3/20/2014	154A	33.25	155A	36.29	-3.04	Outward
5/15/2014	154A	32.76	155A	35.63	-2.87	Outward
9/18/2014	154A	31.68	155A	34.75	-3.07	Outward
11/13/2014	154A	31.33	155A	34.29	-2.96	Outward
3/19/2015	154A	32.68	155A	35.30	-2.62	Outward
5/18/2015	154A	31.79	155A	34.42	-2.63	Outward
9/17/2015	154A	NM	155A	33.69	NA	NA
11/12/2015	154A	30.23	155A	33.35	-3.12	Outward
Vertical Gradient Well Pairs						
3/24/2011	110B1	40.78	134A	41.07	-0.29	Downward
5/26/2011	110B1	30.02	134A	25.31	4.71	Upward
9/15/2011	110B1	39.32	134A	39.14	0.18	Upward
11/10/2011	110B1	38.98	134A	38.72	0.26	Upward
3/15/2012	110B1	38.80	134A	38.41	0.39	Upward
5/24/2012	110B1	38.97	134A	38.52	0.45	Upward
9/20/2012	110B1	38.03	134A	37.69	0.34	Upward
11/21/2012	110B1	37.65	134A	37.21	0.44	Upward
3/21/2013	110B1	38.97	134A	38.29	0.68	Upward
5/16/2013	110B1	39.08	134A	38.72	0.36	Upward
9/19/2013	110B1	38.06	134A	37.61	0.45	Upward
11/25/2013	110B1	37.44	134A	36.60	0.84	Upward
3/20/2014	110B1	37.08	134A	36.28	0.80	Upward
5/15/2014	110B1	36.45	134A	35.50	0.95	Upward
9/18/2014	110B1	35.26	134A	34.54	0.72	Upward

Table 9

Groundwater Elevations, Slurry Wall Well Pairs, January 2011 through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Gradient Direction
11/13/2014	110B1	34.88	134A	34.06	0.82	Upward
3/19/2015	110B1	36.13	134A	35.20	0.93	Upward
5/18/2015	110B1	35.18	134A	34.24	0.94	Upward
9/17/2015	110B1	34.65	134A	33.45	1.20	Upward
11/12/2015	110B1	34.02	134A	33.04	0.98	Upward
3/24/2011	117B1	40.72	12A	41.79	-1.07	Downward
5/26/2011	117B1	27.70	12A	28.84	-1.14	Downward
9/15/2011	117B1	39.04	12A	39.77	-0.73	Downward
11/10/2011	117B1	38.70	12A	39.33	-0.63	Downward
3/15/2012	117B1	38.45	12A	39.13	-0.68	Downward
5/24/2012	117B1	38.60	12A	39.22	-0.62	Downward
9/20/2012	117B1	36.58	12A	38.30	-1.72	Downward
11/21/2012	117B1	36.15	12A	38.68	-2.53	Downward
3/21/2013	117B1	37.50	12A	38.94	-1.44	Downward
5/16/2013	117B1	37.65	12A	39.41	-1.76	Downward
9/19/2013	117B1	36.57	12A	38.14	-1.57	Downward
11/25/2013	117B1	35.91	12A	38.30	-2.39	Downward
3/20/2014	117B1	35.53	12A	36.89	-1.36	Downward
5/15/2014	117B1	34.73	12A	36.01	-1.28	Downward
9/18/2014	117B1	33.62	12A	35.09	-1.47	Downward
11/13/2014	117B1	33.28	12A	34.59	-1.31	Downward
3/19/2015	117B1	34.52	12A	35.56	-1.04	Downward
5/18/2015	117B1	33.67	12A	34.73	-1.06	Downward
9/17/2015	117B1	34.64	12A	34.01	0.63	Upward
11/12/2015	117B1	32.43	12A	33.64	-1.21	Downward
3/24/2011	93B1	44.37	101A	42.23	2.14	Upward
5/26/2011	93B1	32.18	101A	30.84	1.34	Upward
9/15/2011	93B1	42.28	101A	41.40	0.88	Upward
11/10/2011	93B1	42.77	101A	41.01	1.76	Upward
3/15/2012	93B1	42.55	101A	40.93	1.62	Upward
5/24/2012	93B1	42.67	101A	40.99	1.68	Upward
9/20/2012	93B1	41.66	101A	40.27	1.39	Upward
11/21/2012	93B1	41.25	101A	39.90	1.35	Upward
3/21/2013	93B1	42.75	101A	41.10	1.65	Upward
5/16/2013	93B1	42.87	101A	41.34	1.53	Upward
9/19/2013	93B1	41.65	101A	40.26	1.39	Upward
11/25/2013	93B1	40.96	101A	39.58	1.38	Upward
3/20/2014	93B1	40.49	101A	39.29	1.20	Upward
5/15/2014	93B1	39.92	101A	38.57	1.35	Upward
9/18/2014	93B1	38.66	101A	37.06	1.60	Upward
11/13/2014	93B1	38.16	101A	36.81	1.35	Upward
3/19/2015	93B1	39.41	101A	38.22	1.19	Upward
5/18/2015	93B1	38.63	101A	37.25	1.38	Upward
9/17/2015	93B1	37.77	101A	35.99	1.78	Upward
11/12/2015	93B1	37.34	101A	35.92	1.42	Upward
3/24/2011	98B1	42.32	15A	41.41	0.91	Upward
5/26/2011	98B1	31.02	15A	26.83	4.19	Upward

Table 9

Groundwater Elevations, Slurry Wall Well Pairs, January 2011 through December 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Gradient Direction
9/15/2011	98B1	40.97	15A	39.64	1.33	Upward
11/10/2011	98B1	40.61	15A	39.14	1.47	Upward
3/15/2012	98B1	40.38	15A	38.91	1.47	Upward
5/24/2012	98B1	40.55	15A	39.01	1.54	Upward
9/20/2012	98B1	39.43	15A	38.20	1.23	Upward
11/21/2012	98B1	39.21	15A	37.46	1.75	Upward
3/21/2013	98B1	40.52	15A	38.72	1.80	Upward
5/16/2013	98B1	40.70	15A	39.30	1.40	Upward
9/19/2013	98B1	39.57	15A	38.06	1.51	Upward
11/25/2013	98B1	39.00	15A	37.30	1.70	Upward
3/20/2014	98B1	38.52	15A	36.62	1.90	Upward
5/15/2014	98B1	37.94	15A	36.02	1.92	Upward
9/18/2014	98B1	36.60	15A	35.07	1.53	Upward
11/13/2014	98B1	36.35	15A	34.63	1.72	Upward
3/19/2015	98B1	37.53	15A	35.69	1.84	Upward
5/18/2015	98B1	36.75	15A	34.82	1.93	Upward
9/17/2015	98B1	35.92	15A	34.06	1.86	Upward
11/12/2015	98B1	35.45	15A	33.71	1.74	Upward
3/24/2011	RW-1(B1)	41.39	159A	41.08	0.31	Upward
5/26/2011	RW-1(B1)	29.84	159A	39.60	-9.76	Downward
9/15/2011	RW-1(B1)	39.93	159A	39.50	0.43	Upward
11/10/2011	RW-1(B1)	37.99	159A	39.04	-1.05	Downward
3/15/2012	RW-1(B1)	37.89	159A	38.70	-0.81	Downward
5/24/2012	RW-1(B1)	38.05	159A	38.74	-0.69	Downward
9/20/2012	RW-1(B1)	37.15	159A	37.91	-0.76	Downward
11/21/2012	RW-1(B1)	36.74	159A	37.63	-0.89	Downward
3/21/2013	RW-1(B1)	38.13	159A	38.55	-0.42	Downward
5/16/2013	RW-1(B1)	38.16	159A	38.95	-0.79	Downward
9/19/2013	RW-1(B1)	37.20	159A	37.76	-0.56	Downward
11/25/2013	RW-1(B1)	36.55	159A	36.98	-0.43	Downward
3/20/2014	RW-1(B1)	33.84	159A	36.52	-2.68	Downward
5/15/2014	RW-1(B1)	35.52	159A	35.73	-0.21	Downward
9/18/2014	RW-1(B1)	34.33	159A	34.82	-0.49	Downward
11/13/2014	RW-1(B1)	33.92	159A	34.29	-0.37	Downward
3/19/2015	RW-1(B1)	35.20	159A	35.33	-0.13	Downward
5/18/2015	RW-1(B1)	34.28	159A	34.45	-0.17	Downward
9/17/2015	RW-1(B1)	33.60	159A	33.49	0.11	Upward
11/12/2015	RW-1(B1)	33.06	159A	34.22	-1.16	Downward

Notes:
ft msl = Feet Mean Sea Level
NA = Not Applicable
NM = Not Measured

Table 10

Calculation of Predicted Capture Widths Based on Combined Flow Rate

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program

Mountain View, California

Parameter	A Zone[1]	A Zone Slurry Wall[2]	B1 Zone[1]	B2 Zone[1]
Q = Combined pumping rate (gpm)	12.3	24.7	27.3	10.3
b = saturated aquifer thickness (ft)	15	15	25	35
i = regional hydraulic gradient (ft/ft)	0.004	0.004	0.003	0.004
K = hydraulic conductivity (ft/day)[3]	40	40	40	5
Calculated Capture Width (ft) = Q/(K x b x i)	1000	2000	1800	2800
Measured plume width at widest point (ft)[4]	662	630	662	662

Notes:

1. The combined pumping rate equals the summed average 2015 flow rates of all extraction wells located within the Fairchild Building 13, 19, and 23 Site that are outside the slurry wall
2. The combined pumping rate equals the summed average 2015 flow rates of all extraction wells located within the Fairchild Building 13, 19, and 23 Site slurry wall.
3. Hydraulic conductivity values used for each aquifer zone are from the numerical model included as Appendix B to the 2008 Optimization Report (Geosyntec et al., 2008)
4. Measured plume width at widest point is not continued past Site boundaries, Site width is approximately 662 feet

1 cubic foot = 7.48 gallons
1 day = 1440 minutes
gpm = gallons per minute; ft = feet

Assumptions:

1. Homogeneous, isotropic, confined aquifer of infinite extent
2. Uniform regional horizontal hydraulic gradient
3. No net recharge (or net recharge is accounted for in the regional hydraulic gradient)
4. Uniform aquifer thickness
5. Fully penetrating extraction well
6. Steady-state flow
7. Negligible vertical gradient

Table 11
VOC Analytical Results
Five Year Summary, January 2011 through December 2015
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
A Zone													
4A	9/28/2011	<71	**52**	<36	**100**	**660**	<36	<140	<140	<36	<36	**4000**	**46**
4A	10/23/2012	<1.0	**60**	<0.50	**91**	**1200**	**5.5**	**49**	<5.0	<0.50	**14**	**4400**	**36**
4A	9/27/2013	<1.0	**61**	<0.50	**120**	**4800**	**12**	**47**	<5.0	<0.50	**11**	**4600**	**35**
4A	9/29/2014	<25	**48**	<25	**95**	**2800**	<25	<100	<100	<25	<25	**3800**	**69**
6A	9/24/2012	<1.0	**2.5**	<0.50	**10**	**64**	**0.70**	<0.50	<5.0	<0.50	<0.50	**290**	<0.50
9A	9/21/2012	<1.0	**6.2**	<0.50	**5.0**	**310**	**1.2**	<0.50	<5.0	<0.50	<0.50	**10**	**13**
12A	10/4/2012	<1.0	**5.9**	<0.50	**5.6**	**1700**	**23**	**11**	<5.0	**1.1**	**0.81**	**2000**	**37**
15A	9/24/2012	<1.0	**2.5**	<0.50	**1.6**	**21**	**0.56**	**0.55**	<5.0	<0.50	<0.50	**71**	<0.50
16A	9/27/2011	<1.0	<0.5	<0.5	<0.5	**1.6**	<0.5	<2.0	<2.0	<0.5	<0.5	**50**	<0.5
16A	9/24/2012	<1.0	<0.50	<0.50	<0.50	**1.5**	<0.50	<0.50	<5.0	<0.50	<0.50	**43**	<0.50
16A	9/26/2013	<1.0	<0.50	<0.50	<0.50	**1.2**	<0.50	<0.50	<5.0	<0.50	<0.50	**40**	<0.50
16A	9/29/2014	<0.50	<0.50	<0.50	<0.50	**2.7**	<0.50	<2.0	<2.0	<0.50	<0.50	**59**	<0.50
17A	9/27/2011	<1.0	<0.5	<0.5	<0.5	**4.0**	<0.5	<2.0	<2.0	<0.5	<0.5	**50**	<0.5
17A	9/24/2012	<1.0	<0.50	<0.50	<0.50	**4.9**	<0.50	<0.50	<5.0	<0.50	<0.50	**76**	<0.50
17A	9/26/2013	<1.0	<0.50	<0.50	<0.50	**5.8**	<0.50	<0.50	<5.0	<0.50	<0.50	**84**	<0.50
17A	9/29/2014	<0.50	<0.50	<0.50	<0.50	**6.7**	<0.50	<2.0	<2.0	<0.50	<0.50	**120**	<0.50
22A	9/22/2011	<2.0	<1.0	<1.0	<1.0	**19**	<1.0	**47**	<4.0	<1.0	**1.0**	**97**	<1.0
22A	10/19/2012	<1.0	**1.2**	<0.50	**1.6**	**25**	**0.56**	**97**	<5.0	<0.50	**1.3**	**120**	<0.50
22A D	10/19/2012	<1.0	**1.1**	<0.50	**1.5**	**23**	**0.52**	**90**	<5.0	<0.50	**1.3**	**120**	<0.50
22A	10/23/2013	<1.0	**1.6**	<0.50	**1.9**	**34**	**0.50**	**120**	<5.0	<0.50	**1.6**	**110**	**0.56**
22A	9/26/2014	<0.50	**1.6**	<0.50	**1.4**	**43**	**0.77**	**80**	<2.0	<0.50	**1.9**	**130**	<0.50
23A	9/2/2011	<1.0	<0.5	<0.5	<0.5	**0.5**	<0.5	**2.6**	<2.0	<0.5	<0.5	**1.7**	<0.5
23A	10/19/2012	<1.0	**2.0**	<0.50	**2.4**	**50**	**0.55**	**3.0**	<5.0	<0.50	<0.50	**29**	<0.50
23A	9/27/2013	<1.0	**4.2**	<0.50	**7.4**	**140**	**0.88**	**8.6**	<5.0	<0.50	**0.63**	**94**	<0.50
23A	9/29/2014	<1.3	**6.6**	<1.3	**11**	**250**	**1.3**	**9.5**	<5.0	<1.3	<1.3	**170**	<1.3
71A	9/16/2011	<20	<10	<10	<10	**310**	<10	<40	<40	<10	<10	**1600**	**33**
71A	9/25/2012	**2.3**	**3.8**	<0.50	**11**	**340**	**12**	**32**	<5.0	<0.50	**6.0**	**1900**	**27**
71A	10/25/2013	**1.1**	**3.9**	<0.50	**12**	**280**	**7.4**	**36**	<5.0	<0.50	**7.9**	**1600**	**16**

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Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
A Zone													
71A	9/30/2014	<25	<25	<25	**27**	**580**	<25	<100	<100	<25	<25	**3200**	<25
71A	12/28/2015	**0.70**	**36**	<0.50	**74**	**2400**	**62**	**470**	<5.0	**0.89**	**190**	**13000**	**200**
101A	9/25/2012	<1.0	<0.50	<0.50	<0.50	**16**	<0.50	**0.50**	<5.0	<0.50	<0.50	**52**	<0.50
115A	9/27/2011	<4.0	**4.9**	<2.0	**3.6**	**180**	**3.7**	<8.0	<8.0	<2.0	<2.0	**5.3**	<2.0
115A	10/24/2012	<1.0	**6.7**	<0.50	**4.2**	**360**	**1.8**	**1.7**	<5.0	<0.50	<0.50	**5.1**	**1.3**
115A	10/24/2013	<1.0	**7.5**	<0.50	**7.5**	**460**	**0.86**	**2.6**	<5.0	<0.50	<0.50	**6.7**	**2.3**
115A	10/1/2014	<0.50	**5.9**	<0.50	**6.7**	**290**	**0.87**	<2.0	<2.0	<0.50	<0.50	<5.0	**2.0**
134A	9/27/2011	<1.0	**1.9**	<0.5	**2.7**	**7.8**	<0.5	**11**	<2.0	<0.5	**4.7**	**47**	<0.5
134A	10/4/2012	<1.0	**2.2**	<0.50	**2.6**	**9.8**	<0.50	**10**	<5.0	<0.50	**3.7**	**46**	<0.50
134A	10/24/2013	<1.0	**1.9**	<0.50	**2.2**	**7.8**	<0.50	**11**	<5.0	<0.50	**3.8**	**56**	<0.50
134A	10/1/2014	<0.50	**1.5**	<0.50	**1.5**	**6.8**	<0.50	**7.2**	<2.0	<0.50	**2.9**	**41**	<0.50
139A	9/21/2012	<1.0	**1.8**	<0.50	**1.3**	**11**	<0.50	**0.53**	<5.0	<0.50	<0.50	**49**	<0.50
140A	6/22/2012	**5.4**	**0.3**	<0.5	<0.5	**8.5**	<0.5	**0.4**	<2.0	**0.2**	<0.5	**78**	<0.5
140A D	6/22/2012	**5.5**	**0.4**	<0.5	<0.5	**9.1**	<0.5	**0.4**	<2.0	**0.3**	<0.5	**80**	<0.5
141A	9/21/2012	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	**0.78**	**38**	<0.50
143A	9/21/2012	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	**6.3**	<5.0	<0.50	<0.50	**4.1**	<0.50
148A	10/4/2012	<1.0	**6.4**	<0.50	**16**	**1200**	**7.9**	**34**	<5.0	**0.58**	**9.2**	**2400**	**29**
149A	9/2/2011	<2.0	<1.0	<1.0	<1.0	**6.2**	<1.0	<4.0	<4.0	<1.0	**1.0**	**99**	<1.0
149A	9/24/2012	<1.0	<0.50	<0.50	**0.71**	**4.8**	<0.50	**1.8**	<5.0	<0.50	**0.77**	**89**	<0.50
149A	9/27/2013	<1.0	<0.50	<0.50	**0.88**	**6.1**	<0.50	**2.4**	<5.0	<0.50	**0.89**	**110**	<0.50
149A	9/29/2014	<1.0	<1.0	<1.0	<1.0	**5.6**	<1.0	<4.0	<4.0	<1.0	**1.2**	**120**	<1.0
154A	9/27/2011	<5.0	**3.0**	<2.5	**4.6**	**100**	<2.5	**13**	<10	<2.5	**4.8**	**300**	<2.5
154A	10/4/2012	<1.0	**4.2**	<0.50	**5.8**	**180**	**1.7**	**15**	<5.0	<0.50	**4.8**	**340**	**3.1**
154A	10/24/2013	<1.0	**4.9**	<0.50	**6.6**	**240**	**1.8**	**24**	<5.0	**0.60**	**7.0**	**410**	**2.4**
154A	10/1/2014	<0.50	**4.5**	<0.50	**7.3**	**110**	**1.3**	**20**	<2.0	**0.85**	**7.2**	**290**	**1.1**
155A	9/27/2011	<5.0	**12**	<2.5	**9.0**	**20**	<2.5	<10	<10	<2.5	**13**	**340**	<2.5
155A	10/4/2012	<1.0	**28**	<0.50	**14**	**49**	<0.50	**21**	<5.0	**1.2**	**29**	**330**	<0.50
155A	10/24/2013	<1.0	**25**	<0.50	**17**	**55**	<0.50	**23**	<5.0	**1.9**	**20**	**460**	<0.50

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		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
A Zone													
155A	10/1/2014	<0.50	**11**	<0.50	**11**	**36**	<0.50	**11**	<2.0	**2.4**	**9.9**	**300**	<0.50
159A	9/28/2011	<8.3	<4.2	<4.2	<4.2	**9.3**	<4.2	<17	<17	<4.2	<4.2	**480**	<4.2
159A	10/4/2012	<1.0	<0.50	<0.50	**0.87**	**10**	**2.3**	**1.1**	<5.0	<0.50	<0.50	**370**	<0.50
159A	10/24/2013	<1.0	<0.50	<0.50	**1.0**	**15**	**3.8**	**1.6**	<5.0	<0.50	<0.50	**440**	<0.50
159A	10/1/2014	<0.50	<0.50	<0.50	**0.72**	**21**	**12**	<2.0	<2.0	<0.50	<0.50	**270**	<0.50
160A	10/3/2011	<13	**11**	<6.3	**11**	**330**	**9.2**	**250**	<25	<6.3	**6.6**	**520**	<6.3
160A	10/23/2012	<1.0	**11**	<0.50	**10**	**420**	**3.3**	**270**	<5.0	<0.50	**6.2**	**560**	**0.84**
160A	9/27/2013	<1.0	**11**	<0.50	**12**	**340**	**4.4**	**300**	<5.0	**0.77**	**6.3**	**630**	**0.74**
160A	9/29/2014	<5.0	**13**	<5.0	**15**	**770**	**7.5**	**110**	<20	<5.0	**14**	**1000**	<5.0
161A	9/25/2012	<1.0	**0.83**	<0.50	**16**	**8800**	**1200**	**86**	<5.0	<0.50	**1.1**	**4600**	**15**
174A	9/9/2011	<4.0	**17**	<2.0	**7.2**	**26**	<2.0	**11**	<8.0	**2.1**	**13**	**220**	<2.0
174A	10/24/2012	<1.0	**39**	<0.50	**15**	**58**	**0.78**	**26**	<5.0	**1.9**	**16**	**340**	<0.50
174A	9/27/2013	<1.0	**3.5**	<0.50	**2.7**	**17**	<0.50	**1.9**	<5.0	**1.4**	**0.99**	**140**	<0.50
174A	9/29/2014	<0.50	**2.6**	<0.50	**1.9**	**13**	<0.50	<2.0	<2.0	**0.89**	**0.57**	**80**	<0.50
175A	9/1/2011	<2.0	**7.4**	<1.0	**3.1**	**20**	<1.0	**4.9**	<4.0	<1.0	**4.0**	**100**	<1.0
175A	10/15/2012	<1.0	**3.3**	<0.50	**1.9**	**19**	<0.50	**1.5**	<5.0	<0.50	**0.83**	**87**	<0.50
175A	9/27/2013	<1.0	**2.0**	<0.50	**1.5**	**19**	<0.50	**0.84**	<5.0	<0.50	<0.50	**84**	<0.50
175A	10/1/2014	<0.50	**1.9**	<0.50	**1.3**	**18**	<0.50	<2.0	<2.0	<0.50	<0.50	**83**	<0.50
RW-1A	9/16/2011	**1.1**	<0.5	<0.5	<0.5	**5.8**	**1.0**	<2.0	<2.0	<0.5	<0.5	**87**	<0.5
RW-1A	10/4/2012	**1.0**	<0.50	<0.50	<0.50	**7.0**	**2.7**	**0.67**	<5.0	<0.50	<0.50	**110**	<0.50
RW-1A	10/24/2013	<1.0	<0.50	<0.50	<0.50	**8.4**	**3.6**	**0.70**	<5.0	<0.50	<0.50	**97**	<0.50
RW-1A	10/1/2014	<0.50	<0.50	<0.50	<0.50	**10**	**5.8**	<2.0	<2.0	<0.50	<0.50	**140**	<0.50
RW-2A D	9/2/2011	<4.0	<2.0	<2.0	**2.3**	**89**	<2.0	**8.8**	<8.0	<2.0	**2.3**	**230**	<2.0
RW-2A	9/2/2011	<5.0	<2.5	<2.5	**2.6**	**93**	<2.5	<10	<10	<2.5	<2.5	**240**	<2.5
RW-2A	9/26/2012	<1.0	**1.3**	<0.50	**2.8**	**90**	**0.82**	**8.8**	<5.0	<0.50	**2.4**	**290**	<0.50
RW-2A	10/17/2013	**1.3**	**1.6**	<0.50	**3.4**	**86**	**0.79**	**13**	<5.0	<0.50	**3.3**	**250**	<0.50
RW-2A D	10/17/2013	**1.3**	**1.6**	<0.50	**3.3**	**82**	**0.82**	**12**	<5.0	<0.50	**3.3**	**260**	<0.50
RW-2A	9/30/2014	<1.0	**1.8**	<1.0	**3.3**	**110**	**1.0**	**9.3**	<4.0	<1.0	**2.8**	**310**	<1.0
RW-11A D	9/16/2011	<25	**18**	<13	**33**	**260**	<13	**100**	<50	<13	**25**	**1600**	**14**

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		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
A Zone													
RW-11A	9/16/2011	<33	<17	<17	**29**	**260**	<17	**100**	<67	<17	**28**	**1600**	<17
RW-11A	10/5/2012	<1.0	**18**	<0.50	**34**	**320**	**1.2**	**120**	<5.0	<0.50	**32**	**1600**	**12**
RW-11A	10/24/2013	<1.0	**16**	<0.50	**27**	**240**	**1.4**	**130**	<5.0	<0.50	**17**	**1300**	**10**
RW-11A	10/1/2014	<1.3	**29**	<1.3	**48**	**4300**	**18**	**180**	<5.0	<1.3	**34**	**10000**	**320**
RW-11A	12/28/2015	<1.0	**22**	<0.50	**30**	**2800**	**27**	**93**	<5.0	**0.23**	**9.0**	**4500**	**250**
RW-11A D	12/28/2015	<1.0	**23**	<0.50	**32**	**2700**	**28**	**100**	<5.0	**0.25**	**9.6**	**4500**	**230**
RW-12A	9/16/2011	<63	<31	<31	<31	**3400**	**50**	<130	<130	<31	<31	**2800**	**150**
RW-12A	10/5/2012	<1.0	**3.9**	<0.50	**10**	**5400**	**52**	**14**	<5.0	**1.6**	**1.7**	**2800**	**390**
RW-12A	10/24/2013	<1.0	**4.1**	<0.50	**15**	**8100**	**82**	**27**	<5.0	**2.4**	**1.4**	**6000**	**400**
RW-12A	10/1/2014	<1.3	**7.4**	<1.3	**6.0**	**2400**	**31**	**14**	<5.0	**2.0**	<1.3	**710**	**90**
RW-12A	12/28/2015	<1.0	**9.4**	<0.50	**6.3**	**1800**	**37**	**15**	<5.0	**2.0**	**1.1**	**680**	**110**
RW-23A	9/16/2011	<10	**11**	<5.0	**6.8**	**90**	<5.0	<20	<20	<5.0	**6.6**	**520**	<5.0
RW-23A	10/5/2012	<1.0	**13**	<0.50	**8.1**	**100**	**1.4**	**14**	<5.0	**1.8**	**12**	**630**	<0.50
RW-23A	10/24/2013	<1.0	**14**	<0.50	**8.6**	**150**	**2.0**	**18**	<5.0	**2.2**	**11**	**650**	<0.50
RW-23A	10/1/2014	<1.3	**17**	<1.3	**8.3**	**120**	**1.5**	**18**	<5.0	**2.0**	**9.6**	**450**	<1.3
RW-24A	9/2/2011	<7.1	**4.4**	<3.6	**7.5**	**460**	**6.6**	**19**	<14	<3.6	<3.6	**350**	**5.2**
RW-24A	9/25/2012	<1.0	**4.3**	<0.50	**5.9**	**410**	**4.3**	**16**	<5.0	<0.50	**3.3**	**360**	**3.4**
RW-24A	10/17/2013	<1.0	**3.4**	<0.50	**5.0**	**320**	**3.1**	**14**	<5.0	<0.50	**3.2**	**310**	**3.4**
RW-24A	9/30/2014	<2.5	**3.6**	<2.5	**5.6**	**390**	**3.1**	**17**	<10	<2.5	**3.6**	**300**	**4.0**
RW-24A	12/28/2015	<1.0	**6.0**	<0.50	**7.7**	**540**	**4.6**	**14**	<5.0	**0.28**	**4.4**	**310**	<10
RW-26A	10/14/2011	<2.5	**3.5**	<1.3	**8.8**	**89**	**1.8**	**5.3**	<5.0	<1.3	**2.6**	**170**	<1.3
RW-26A	10/25/2012	<1.0	**5.5**	<0.50	**14**	**130**	**0.92**	**7.2**	<5.0	<0.50	**3.4**	**260**	<0.50
RW-26A	10/29/2013	<1.0	**19**	<0.50	**30**	**840**	**3.9**	**8.5**	<5.0	<0.50	**2.9**	**270**	**0.74**
RW-26A	10/6/2014	<5.0	**19**	<5.0	**27**	**650**	<5.0	<20	<20	<5.0	<5.0	**220**	<5.0
RW-26A	12/28/2015	**1.0**	**9.3**	<0.50	**17**	**310**	**2.8**	**6.8**	<5.0	<0.50	**4.1**	**240**	<5.0
RW-29A	9/16/2011	<3.3	**4.3**	<1.7	**2.3**	**9.4**	<1.7	<6.7	<6.7	<1.7	**2.8**	**180**	<1.7
RW-29A	9/24/2012	<1.0	**7.5**	<0.50	**3.3**	**14**	**1.3**	**3.9**	<5.0	**1.8**	**3.5**	**240**	<0.50
RW-29A	10/17/2013	<1.0	**5.4**	<0.50	**2.9**	**12**	**1.4**	**3.1**	<5.0	**1.6**	**2.6**	**290**	<0.50
RW-29A	9/30/2014	<1.3	**10**	<1.3	**3.9**	**21**	**1.6**	<5.0	<5.0	**2.2**	**3.2**	**240**	<1.3

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Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
B1 Zone													
95B1	9/9/2011	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<0.5	<0.5	**5.7**	<0.5
95B1	10/25/2012	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	**9.0**	<0.50
95B1	10/29/2013	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	**6.2**	<0.50
95B1	10/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<0.50	<0.50	**9.2**	<0.50
101B1	9/9/2011	<1.0	**1.1**	<0.5	**0.9**	**32**	<0.5	<2.0	<2.0	<0.5	<0.5	**37**	<0.5
101B1	10/15/2012	<1.0	**1.1**	<0.50	**0.75**	**37**	<0.50	<0.50	<5.0	<0.50	<0.50	**42**	<0.50
101B1	9/27/2013	<1.0	**1.0**	<0.50	**0.92**	**34**	<0.50	<0.50	<5.0	<0.50	<0.50	**51**	<0.50
101B1	9/29/2014	<0.50	**1.4**	<0.50	**0.80**	**44**	<0.50	<2.0	<2.0	<0.50	<0.50	**55**	<0.50
110B1	9/28/2011	<5.0	<2.5	<2.5	**3.8**	**7.2**	<2.5	**67**	<10	<2.5	**29**	**260**	<2.5
110B1	10/4/2012	<1.0	**1.5**	<0.50	**5.9**	**9.2**	<0.50	**58**	<5.0	<0.50	**22**	**300**	<0.50
110B1	10/24/2013	<1.0	**1.5**	<0.50	**4.6**	**9.1**	<0.50	**51**	<5.0	<0.50	**14**	**380**	<0.50
110B1	10/1/2014	<0.50	**1.3**	<0.50	**3.8**	**8.8**	<0.50	**31**	<2.0	<0.50	**2.8**	**290**	<0.50
117B1	9/28/2011	<7.1	<3.6	<3.6	<3.6	**430**	**11**	<14	<14	<3.6	<3.6	**200**	<3.6
117B1	10/4/2012	<1.0	**0.68**	<0.50	<0.50	**330**	**3.1**	<0.50	<5.0	<0.50	<0.50	**100**	<0.50
117B1	10/24/2013	<1.0	<0.50	<0.50	<0.50	**40**	<0.50	<0.50	<5.0	<0.50	<0.50	**120**	**4.1**
117B1	10/1/2014	<0.50	<0.50	<0.50	<0.50	**34**	<0.50	<2.0	<2.0	<0.50	<0.50	**110**	**2.6**
145B1	9/28/2011	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<0.5	<0.5	<0.5	**2.2**
145B1	9/21/2012	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	**0.71**
145B1	10/29/2013	<1.0	**0.53**	<0.50	<0.50	**35**	**1.4**	<0.50	<5.0	<0.50	<0.50	**69**	**0.89**
145B1	9/29/2014	<0.50	**0.59**	<0.50	<0.50	**44**	**1.9**	<2.0	<2.0	<0.50	<0.50	**100**	<0.50
156B1	9/1/2011	<1.0	**1.7**	<0.5	**0.8**	**25**	<0.5	<2.0	<2.0	<0.5	<0.5	**46**	<0.5
156B1	10/23/2012	<1.0	**1.9**	<0.50	**0.98**	**39**	<0.50	<0.50	<5.0	<0.50	<0.50	**48**	<0.50
156B1	9/27/2013	<1.0	**1.4**	<0.50	**1.2**	**22**	**0.61**	<0.50	<5.0	<0.50	<0.50	**48**	<0.50
156B1	9/26/2014	<0.50	**1.9**	<0.50	**1.2**	**40**	**0.52**	<2.0	<2.0	<0.50	<0.50	**75**	<0.50
156B1 D	9/26/2014	<0.50	**1.0**	<0.50	**0.71**	**23**	<0.50	<2.0	<2.0	<0.50	<0.50	**48**	<0.50
RW-1(B1)	10/14/2011	<0.50	**1.2**	<0.50	**2.2**	**6.9**	<0.50	**22**	<5.0	<0.50	**9.8**	**73**	<0.50
RW-1(B1)	10/24/2012	<5.0	<2.5	<2.5	<2.5	**15**	<2.5	<2.5	<25	<2.5	<2.5	**11**	**13**
RW-1(B1)	10/24/2013	<1.0	**0.55**	<0.50	**1.3**	**5.1**	<0.50	**11**	<5.0	<0.50	**5.1**	**52**	<0.50
RW-1(B1) D	10/24/2013	<1.0	**0.57**	<0.50	**1.3**	**5.3**	<0.50	**11**	<5.0	<0.50	**5.0**	**53**	<0.50

Table 11
VOC Analytical Results
Five Year Summary, January 2011 through December 2015
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
B1 Zone													
RW-1(B1)	10/1/2014	<0.50	**0.51**	<0.50	**0.85**	**6.3**	<0.50	**6.5**	<2.0	<0.50	**3.5**	**48**	<0.50
RW-1(B1) D	10/1/2014	<0.50	**0.53**	<0.50	**0.75**	**6.1**	<0.50	**6.0**	<2.0	<0.50	**3.3**	**45**	<0.50
RW-2(B1) (RGRP)	10/6/2011	<3.3	<1.7	<1.7	**1.9**	**21**	<1.7	**30**	<6.7	<1.7	**15**	**190**	<1.7
RW-2(B1) (RGRP)	9/18/2012	<1.0	**1.2**	<0.50	**3.2**	**26**	<0.50	**37**	<5.0	<0.50	**18**	**270**	<0.50
RW-2(B1) (RGRP)	10/25/2013	<1.0	<0.50	<0.50	**2.3**	**23**	<0.50	**25**	<5.0	<0.50	**12**	**330**	<0.50
RW-2(B1) (RGRP)	9/26/2014	<2.5	<2.5	<2.5	<2.5	**22**	<2.5	**20**	<10	<2.5	**9.3**	**240**	<2.5
RW-2(B1) (RGRP) D	9/26/2014	<2.5	<2.5	<2.5	<2.5	**20**	<2.5	**21**	<10	<2.5	**9.1**	**230**	<2.5
RW-10(B1)	9/16/2011	<10	<5.0	<5.0	<5.0	**360**	**7.9**	<20	<20	<5.0	**5.6**	**670**	<5.0
RW-10(B1)	10/5/2012	<1.0	**1.5**	<0.50	**2.3**	**430**	**5.7**	**19**	<5.0	<0.50	**11**	**710**	<0.50
RW-10(B1)	10/24/2013	<1.0	**1.0**	<0.50	**1.9**	**200**	**3.0**	**19**	<5.0	<0.50	**7.8**	**590**	<0.50
RW-10(B1)	10/1/2014	<0.50	**0.96**	<0.50	**1.7**	**100**	**1.6**	**22**	<2.0	<0.50	**10**	**500**	<0.50
RW-11(B1) D	9/2/2011	<2.0	<1.0	<1.0	<1.0	**45**	**2.0**	<4.0	<4.0	<1.0	<1.0	**96**	<1.0
RW-11(B1)	9/2/2011	<2.0	<1.0	<1.0	<1.0	**44**	**1.9**	<4.0	<4.0	<1.0	<1.0	**95**	<1.0
RW-11(B1)	9/24/2012	<1.0	**0.67**	<0.50	<0.50	**41**	**1.4**	<0.50	<5.0	<0.50	<0.50	**90**	<0.50
RW-11(B1)	10/17/2013	<1.0	**0.57**	<0.50	**0.54**	**38**	**1.4**	**0.50**	<5.0	<0.50	<0.50	**94**	<0.50
RW-11(B1)	9/30/2014	<0.50	**0.85**	<0.50	<0.50	**51**	**2.1**	<2.0	<2.0	<0.50	<0.50	**110**	<0.50
B2 Zone													
40B2 (RGRP)	9/28/2011	<1.0	<0.5	<0.5	<0.5	**9.5**	**0.7**	<2.0	<2.0	<0.5	<0.5	**2.0**	<0.5
40B2 (RGRP)	10/4/2012	<1.0	<0.50	<0.50	<0.50	**61**	<0.50	**1.7**	<5.0	<0.50	<0.50	**8.5**	<0.50
40B2 (RGRP)	10/24/2013	<1.0	<0.50	<0.50	<0.50	**47**	**0.56**	**2.0**	<5.0	<0.50	<0.50	**4.1**	<0.50
40B2 (RGRP)	10/1/2014	<0.50	<0.50	<0.50	<0.50	**4.9**	**0.52**	<2.0	<2.0	<0.50	<0.50	**1.6**	<0.50
90B2	9/28/2011	<2.5	<1.3	<1.3	<1.3	**33**	<1.3	<5.0	<5.0	<1.3	<1.3	**140**	<1.3
90B2	10/23/2012	<1.0	<0.50	<0.50	**0.76**	**56**	**0.59**	<0.50	<5.0	<0.50	<0.50	**120**	<0.50
90B2	9/27/2013	<1.0	<0.50	<0.50	**0.92**	**69**	**0.94**	<0.50	<5.0	<0.50	<0.50	**150**	<0.50
90B2	9/26/2014	<1.0	<1.0	<1.0	<1.0	**59**	<1.0	<4.0	<4.0	<1.0	<1.0	**170**	<1.0
146B2	9/28/2011	<5.0	<2.5	<2.5	<2.5	**230**	<2.5	<10	<10	<2.5	<2.5	**5.8**	<2.5
146B2	10/24/2012	<1.0	<0.50	<0.50	**0.62**	**300**	<0.50	<0.50	<5.0	<0.50	<0.50	**5.0**	<0.50
146B2 D	10/24/2012	<1.0	<0.50	<0.50	**0.57**	**300**	<0.50	<0.50	<5.0	<0.50	<0.50	**4.8**	<0.50
146B2 D	10/24/2013	<1.0	<0.50	<0.50	<0.50	**43**	<0.50	<0.50	<5.0	<0.50	<0.50	**85**	<0.50

Table 11
VOC Analytical Results
Five Year Summary, January 2011 through December 2015
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Sample Location	Sample Date	Constituent (concentration in µg/L and method is 8260B)											
		Chloroform	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride
B2 Zone													
146B2	10/24/2013	<1.0	<0.50	<0.50	<0.50	**36**	<0.50	<0.50	<5.0	<0.50	<0.50	**96**	<0.50
146B2	10/1/2014	<0.50	<0.50	<0.50	<0.50	**39**	<0.50	<2.0	<2.0	<0.50	<0.50	**120**	<0.50
RW-1(B2)	9/16/2011	<1.0	<0.5	<0.5	<0.5	**33**	<0.5	<2.0	<2.0	<0.5	<0.5	**71**	<0.5
RW-1(B2)	10/4/2012	<1.0	<0.50	<0.50	<0.50	**40**	<0.50	**1.2**	<5.0	<0.50	<0.50	**51**	<0.50
RW-1(B2)	10/24/2013	<1.0	<0.50	<0.50	<0.50	**41**	<0.50	**1.4**	<5.0	<0.50	<0.50	**54**	<0.50
RW-1(B2)	10/1/2014	<0.50	<0.50	<0.50	<0.50	**35**	<0.50	<2.0	<2.0	<0.50	<0.50	**67**	<0.50
RW-2(B2)	9/2/2011	<14	<7.1	<7.1	<7.1	**13**	<7.1	<29	<29	<7.1	<7.1	**750**	<7.1
RW-2(B2)	9/26/2012	<1.0	<0.50	<0.50	**3.0**	**11**	**1.9**	**2.4**	<5.0	<0.50	<0.50	**850**	<0.50
RW-2(B2)	10/17/2013	<1.0	<0.50	<0.50	**3.5**	**17**	**2.0**	**2.6**	<5.0	<0.50	<0.50	**870**	<0.50
RW-2(B2)	9/30/2014	<2.5	<2.5	<2.5	**3.5**	**14**	<2.5	<10	<10	<2.5	<2.5	**880**	<2.5

Notes:
1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
trans-1,2-DCE = trans-1,2-Dichloroethene
PCE = Tetrachloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene
µg/L = micrograms per liter
< indicates analyte not detected above the reported detection limit
D indicates duplicate sample
(RGRP) = Regional Groundwater Remediation Program Well associated with the fairchild Operation and Maintenance Program (RMT, 2003)

Table 12
Mann-Kendall Statistics Concentration Trends Summary
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Well Name	TCE	cis-1,2-DCE	Vinyl Chloride
A Zone			
4A	PD	NT	NT
6A	N/A	N/A	N/A
9A	N/A	N/A	N/A
12A	N/A	N/A	N/A
15A	N/A	N/A	N/A
16A	S	PD	ND
17A	NT	PI	ND
22A	S	I	S
23A	S	NT	ND
71A	I	NT	NT
101A	N/A	N/A	N/A
115A	NT	I	I
134A	PD	NT	ND
139A	N/A	N/A	N/A
140A	N/A	N/A	N/A
141A	N/A	N/A	N/A
143A	N/A	N/A	N/A
148A	N/A	N/A	N/A
149A	NT	PD	NT
154A	PI	I	S
155A	S	NT	ND
159A	NT	I	ND
160A	I	I	NT
161A	N/A	N/A	N/A
174A	S	NT	ND
175A	D	D	ND
RW-1A	NT	NT	ND
RW-2A	NT	PI	ND
RW-11A	PD	PD	D
RW-12A	NT	I	I
RW-23A	S	I	ND
RW-24A	D	PD	NT
RW-26A	I	I	NT
RW-29A	NT	I	ND
B1 Zone			
93B1	N/A	N/A	N/A
95B1	S	S	ND
101B1	D	D	ND
110B1	NT	NT	ND
117B1	NT	NT	NT
145B1	S	S	NT
156B1	S	NT	ND
RW-1(B1)	S	D	NT
RW-2(B1)	S	PD	ND
RW-10(B1)	D	S	ND
RW-11(B1)	D	PD	ND
B2 Zone			
40B2	NT	PD	ND
90B2	S	NT	ND
146B2	NT	S	ND
RW-1(B2)	D	NT	ND
RW-2(B2)	NT	NT	ND

Notes:

TCE = Trichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

PI =Probably Increasing

I =Increasing

S = Stable

PD = Probably Decreasing

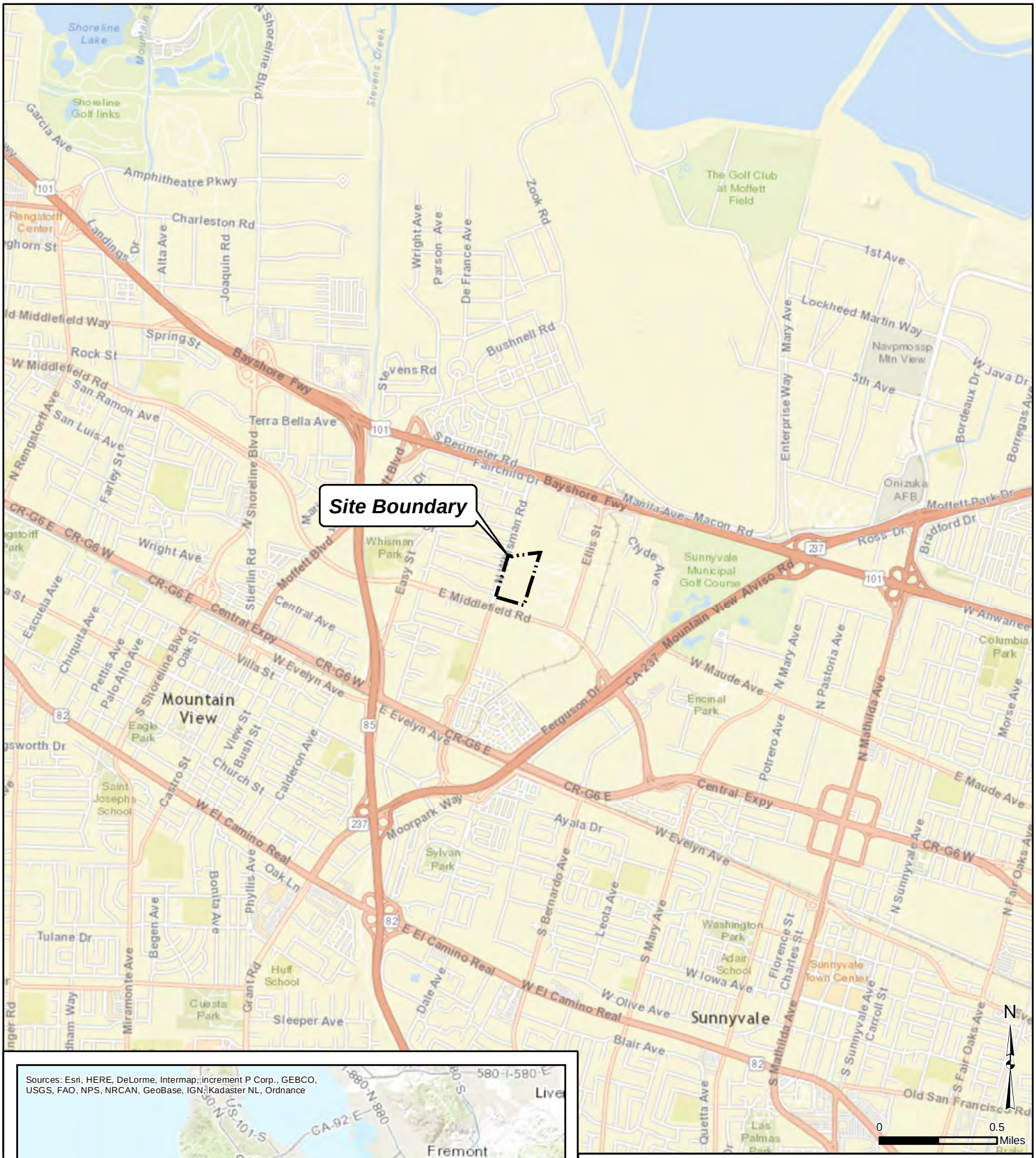
D = Decreasing

NT = No Trend

ND = Non-Detect, In circumstances where sample concentratons have not been detected in any sample from the last 10 sampling years the ND designation was used

N/A = Not applicable due to insufficient data (< 4 sampling events)
Mann-Kendall statistics are presented using data from 2005-2014.

FIGURES



Site Location Map

MEW Former Fairchild Buildings 13, 19, and 23
Mountain View, California

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Figure 1

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig01_SiteLocation_v2.mxd 3/23/2016 9:53:23 AM

Evandale Avenue

Highway 101

Murlagan Avenue

Whisman Avenue

National Avenue

Hetch Hetchy Aqueduct

Ellis Street

Middlefield Road

A

B

C

D

E

F

G

H

I

J

K

L

M

Legend

Former Fairchild Facility

- Buildings 1 - 4
- Building 18
- Building 9
- Building 20 and 20A
- Buildings 13, 19, and 23
- === Slurry Wall
- Building
- Road

FAIRCHILD BUILDINGS 1 - 4
A. 313 Fairchild Drive
B. 323 Fairchild Drive
C. 545 North Whisman Road
D. 515 North Whisman Road

FAIRCHILD BUILDING 18
E. 331 Fairchild Drive*

FAIRCHILD BUILDING 9
F. 600 National Avenue**

FAIRCHILD BUILDING 20 AND 20A
G. 468 Ellis Street
H. 466 Ellis Street
I. 464 Ellis Street

FAIRCHILD BUILDINGS 13, 19, AND 23
J. 399 North Whisman Road
K. 389 North Whisman Road
L. 369 North Whisman Road
M. 379 North Whisman Road

* Former address for Building 18 is 644 National Avenue
** Former address for Building 9 is 401 National Avenue

N

300 150 0 300 Feet

Current Building Configurations
Former Fairchild Facilities

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

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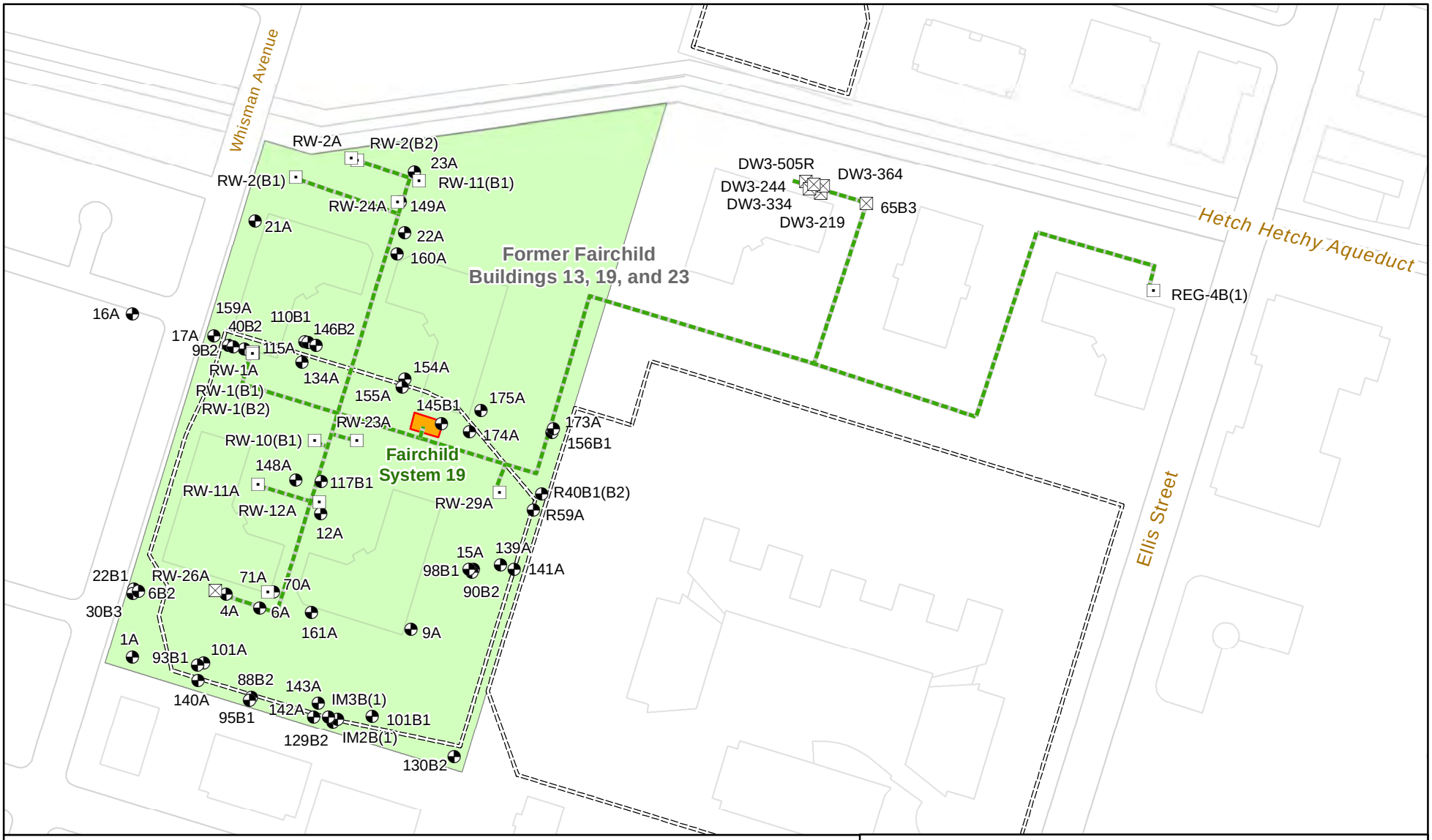
Figure **2**

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig02_FormerFacilities.mxd



Legend

Extraction and Monitoring Wells

- Monitoring Well
- Recovery Well, On
- Recovery Well, Off
- Treatment System Pipeline
- Slurry Wall
- Building
- Road
- Former Fairchild Building 13, 19 and 23 Site - 369/379/389/399/441 Whisman Road
- Fairchild Groundwater Treatment System 19

Site Map and Well Network

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

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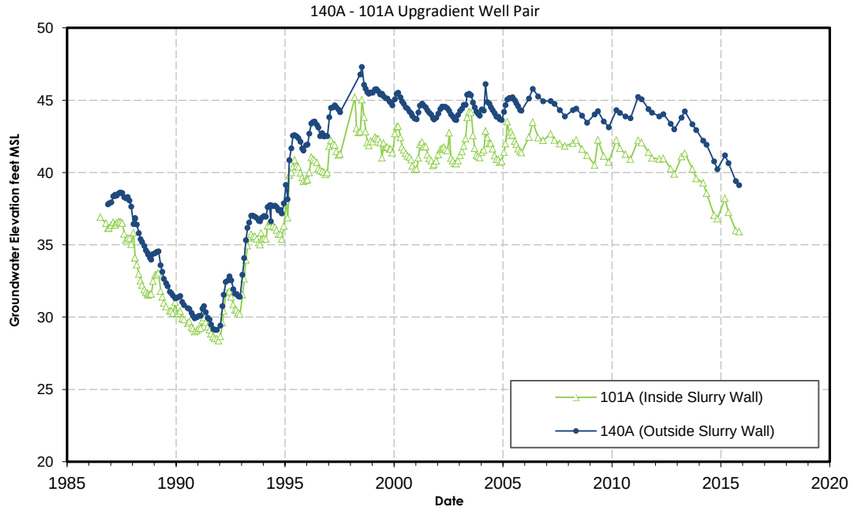
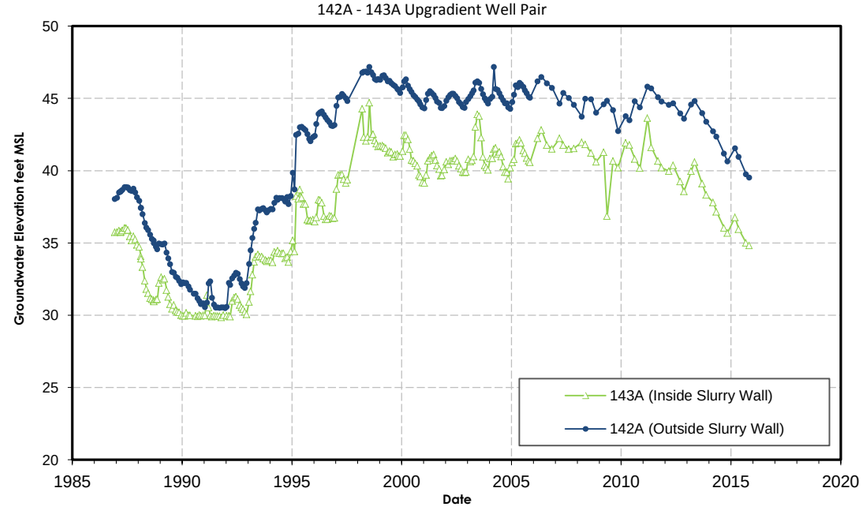
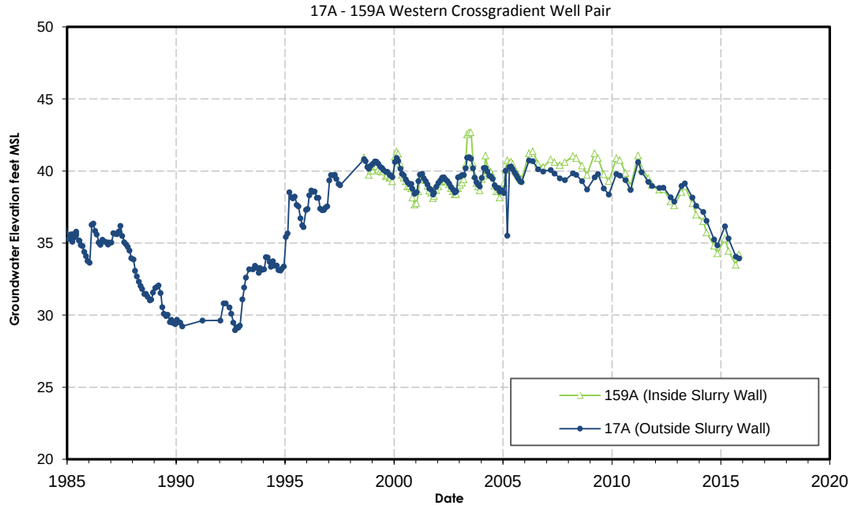
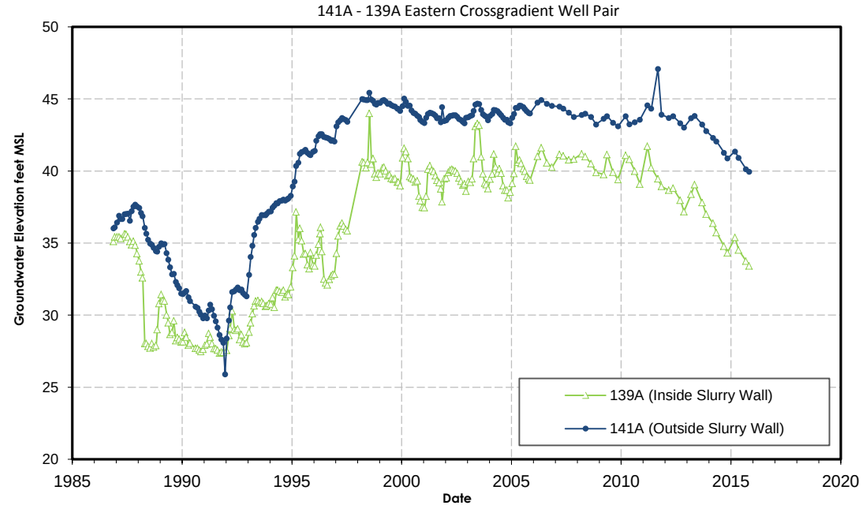
Figure 3

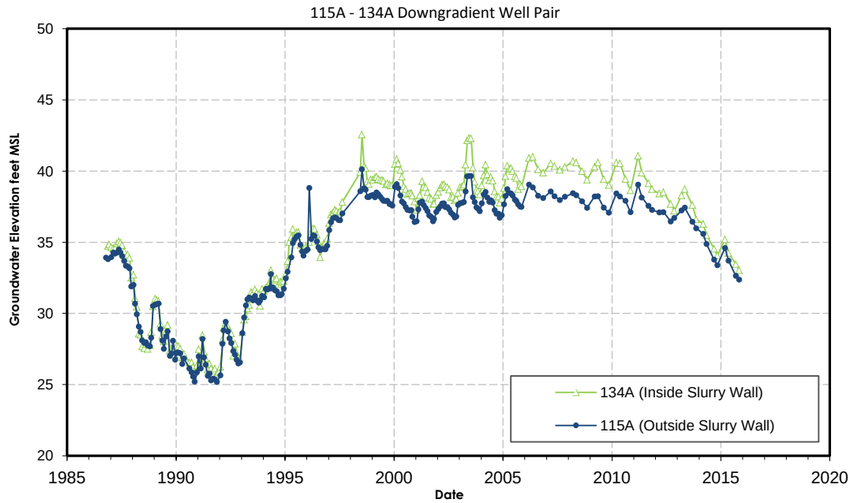
\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig03_SiteMap.mxd

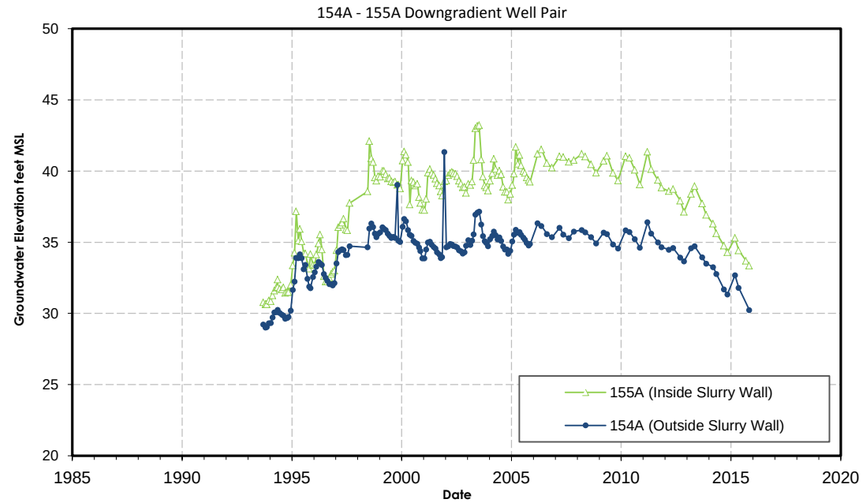


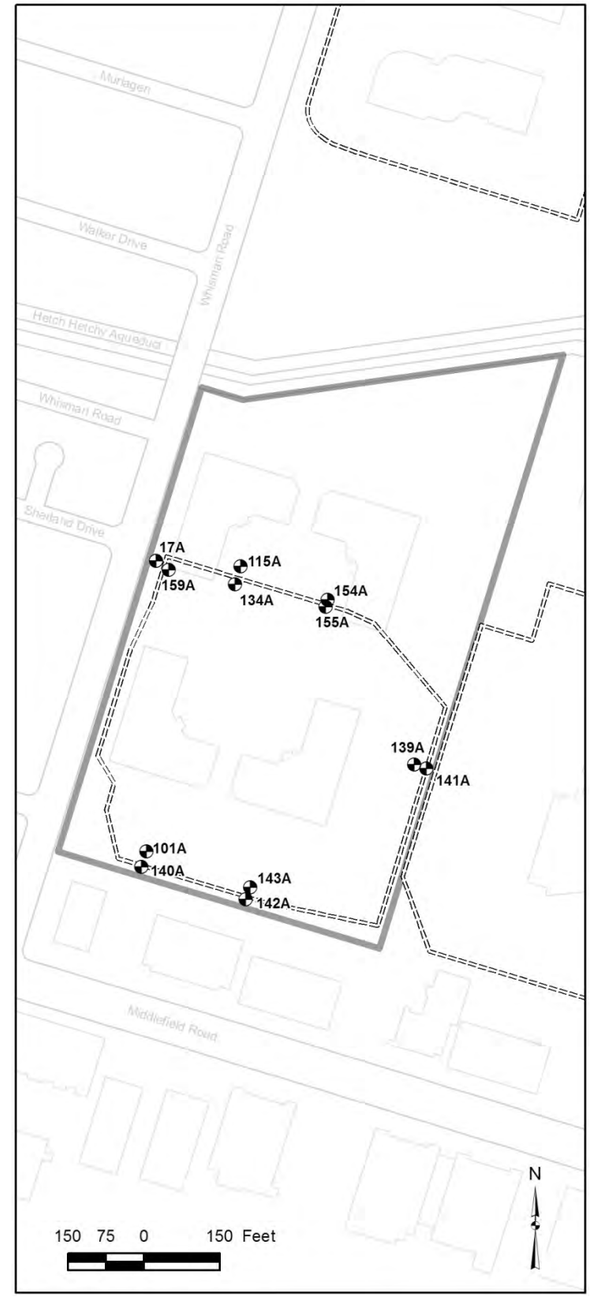












Hydrographs - Slurry Wall Well Pairs

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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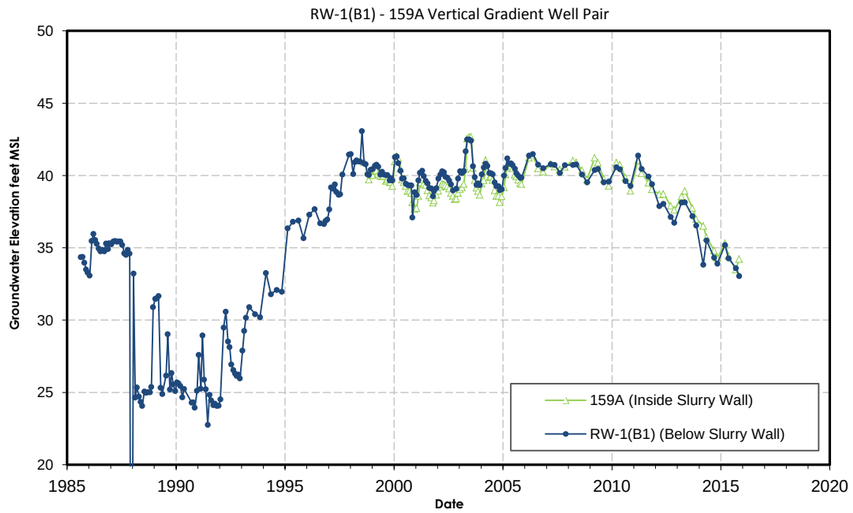
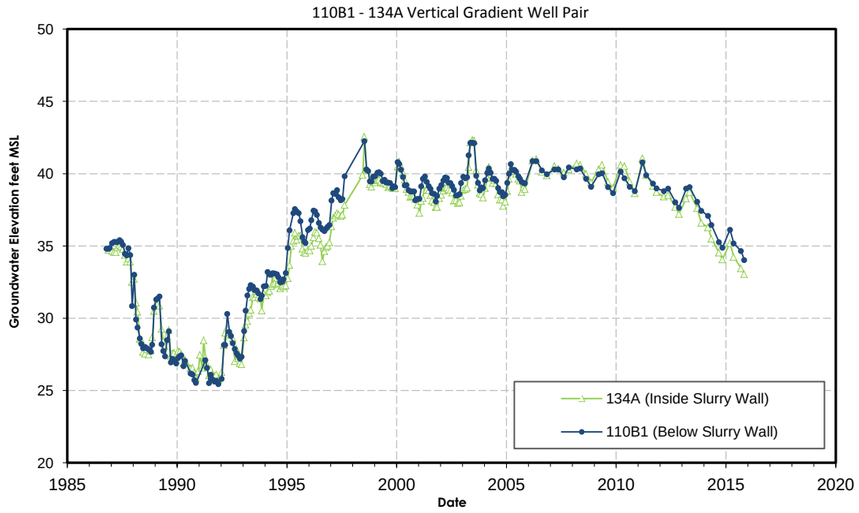
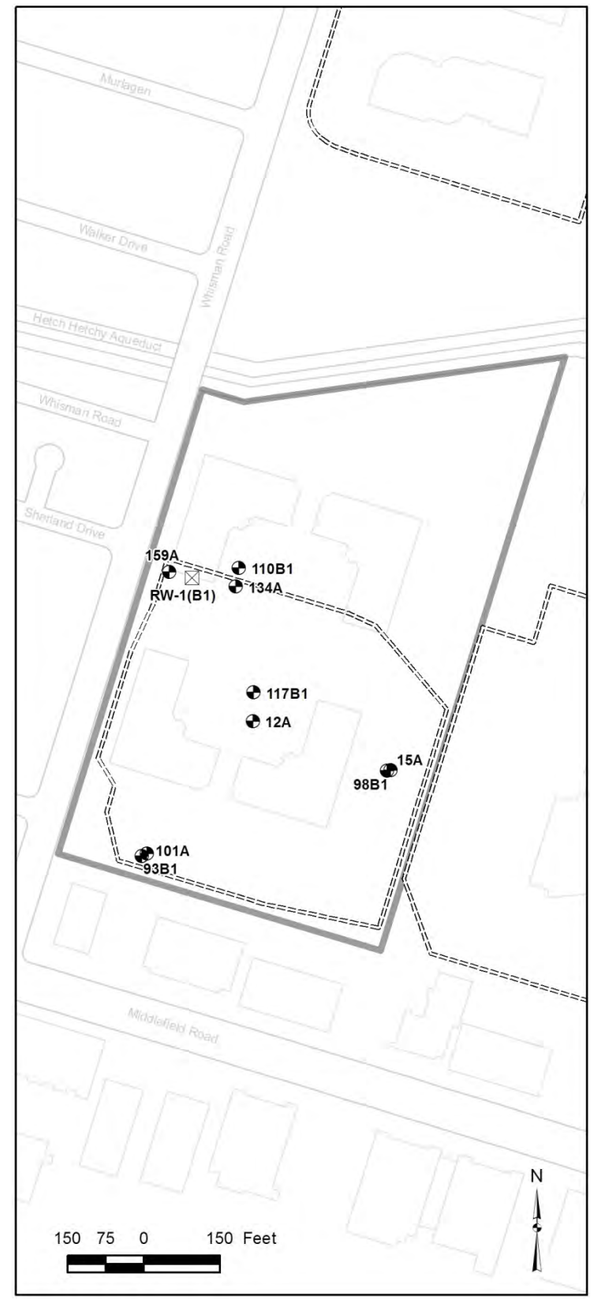
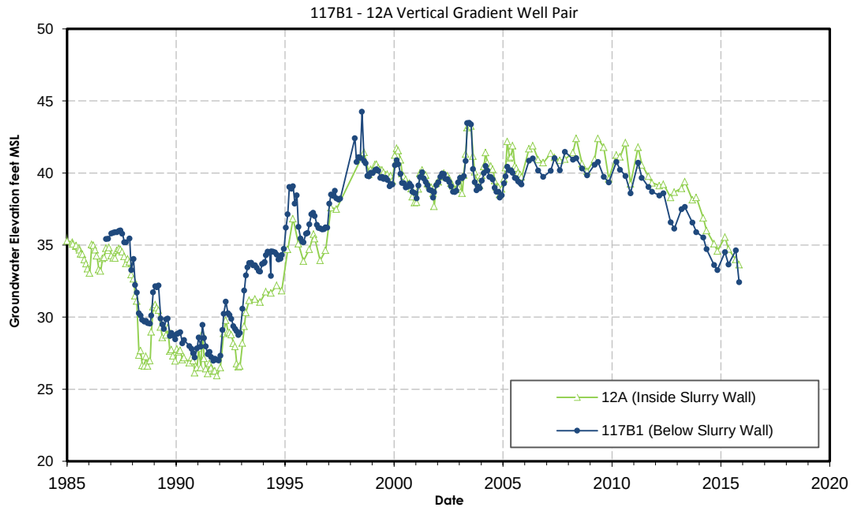
Figure 4

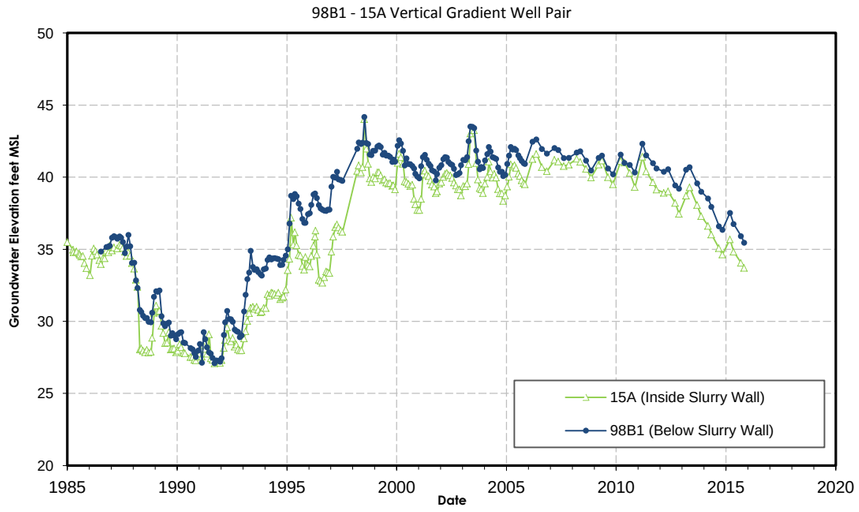
P:\GIS\MEW\Excel\Fairchild\Building19\Fig5and6_Hydrographs.xlsx

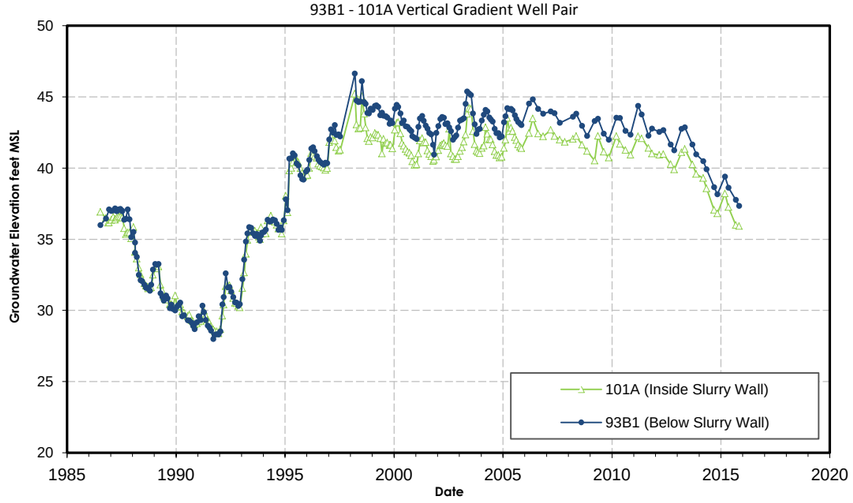












Hydrographs - Slurry Wall Well Pairs Across Water-Bearing Zones

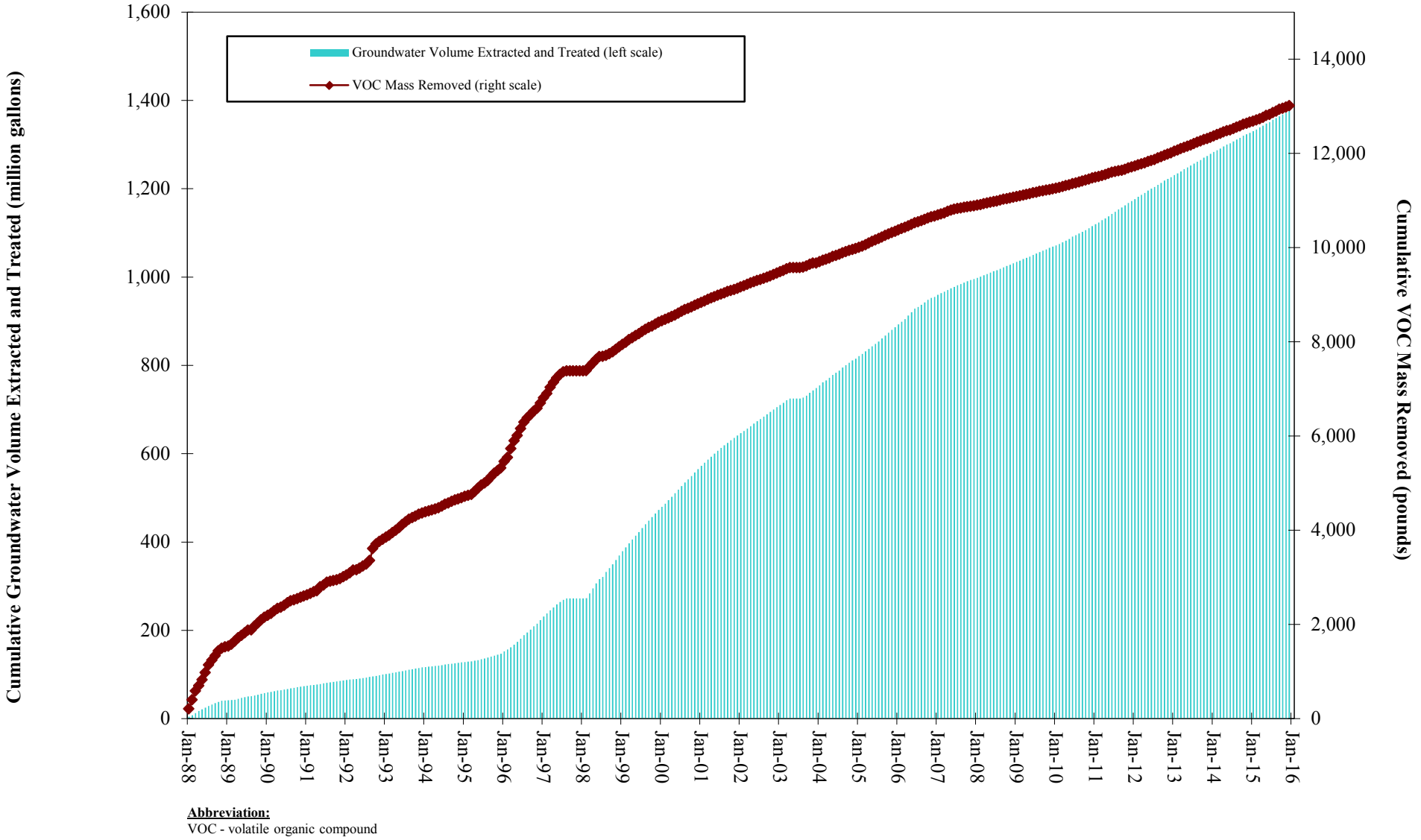
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure 5

P:\GIS\MEW\Excel\Fairchild\Building19\Fig5and6_Hydrographs.xlsx



Abbreviation:
VOC - volatile organic compound

Source: Fourth Quarter and Annual 2015 Self-Monitoring Report, Treatment System 19 (Weiss, 2016)

Cumulative Groundwater Extracted and VOC Mass Removed, System 19

MEW Former Fairchild Buildings 13,19 and 23 Groundwater Remediation Program
Mountain View, California

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Figure 6

P:\GIS\MEW\PPT\Fairchild\Building19\Figure4_System19.pptx

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road

RW-2A (9.8) 27.99
23A 32.36
RW-24A (3.8) 30.51
149A 32.27
21A 33.79
160A 32.46
22A 32.36
16A 37.07
17A 36.17
159A 35.33
115A 34.60
RW-1A (2.2) 32.62
134A 35.20
154A 32.68
155A 35.30
175A 32.74
173A 33.97
RW-23A (11) 28.74
174A 35.23
RW-11A (3.8) 34.71
148A 35.38
RW-12A (4.7) 35.44
12A 35.56
RW-29A (8.7) 23.61
R59A 41.75
15A 35.69
139A 35.39
141A 41.36
RW-26A NM
71A (4.7) 33.85*
70A 36.24
4A 37.35
6A 37.22
161A 36.61
9A 36.74
1A 40.52
101A 38.22
140A 41.19
143A 36.77
142A 41.55

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off
- Groundwater Elevation: 1 ft Contours
- Groundwater Elevation: 5 ft Contours
- Closely Spaced Groundwater Contour
- Estimated Capture Zone
- Building
- Road
- Slurry Wall
- Site Boundary

71A (4.7) Well ID (Pumping Rate)
33.85* Groundwater Elevation (feet above mean sea level)
***** Groundwater Measurement Not Used in Contouring. (Water levels measured inside the casing of an extraction well are not used in contouring.)

Note:
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

N

150 75 0 150 Feet

A Zone Groundwater Elevation Contours and Estimated Capture Zones 19 March 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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Figure **7a**

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig07a_GW_A_Mar.mxd | 4/8/2016 3:33:32 PM

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road

RW-2A (9.4)
21.84
23A
29.99
RW-24A (3.6)
26.47
149A
29.96
21A
31.65
160A
30.23
22A
30.05
16A
35.48
17A
34.07
159A
33.49
RW-1A (1.4)
26.23
115A
32.64
134A
33.45
154A
NM
155A
33.69
175A
30.57
174A
33.58
173A
32.18
RW-23A (5.6)
29.80
RW-11A (3.2)
33.97
148A
33.76
RW-12A (3.6)
34.46
12A
34.01
RW-29A (6.3)
29.96
R59A
40.38
15A
34.06
139A
33.75
141A
40.13
RW-26A
35.28
4A
35.31
71A (3.7)
27.39*
6A
34.98
70A
33.12
161A
34.63
9A
35.14
1A
38.65
101A
35.99
140A
39.41
143A
35.01
142A
39.76

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off
- Groundwater Elevation: 1 ft Contours
- Groundwater Elevation: 5 ft Contours
- Closely Spaced Groundwater Contour
- Estimated Capture Zone
- Building
- Road
- Slurry Wall
- Site Boundary

71A (3.7) Well ID (Pumping Rate)
27.39* Groundwater Elevation (feet above mean sea level)
* Groundwater Measurement Not Used in Contouring. (Water levels measured inside the casing of an extraction well are not used in contouring.)

Note:
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

N

150 75 0 150 Feet

A Zone Groundwater Elevation Contours and Estimated Capture Zones 17 September 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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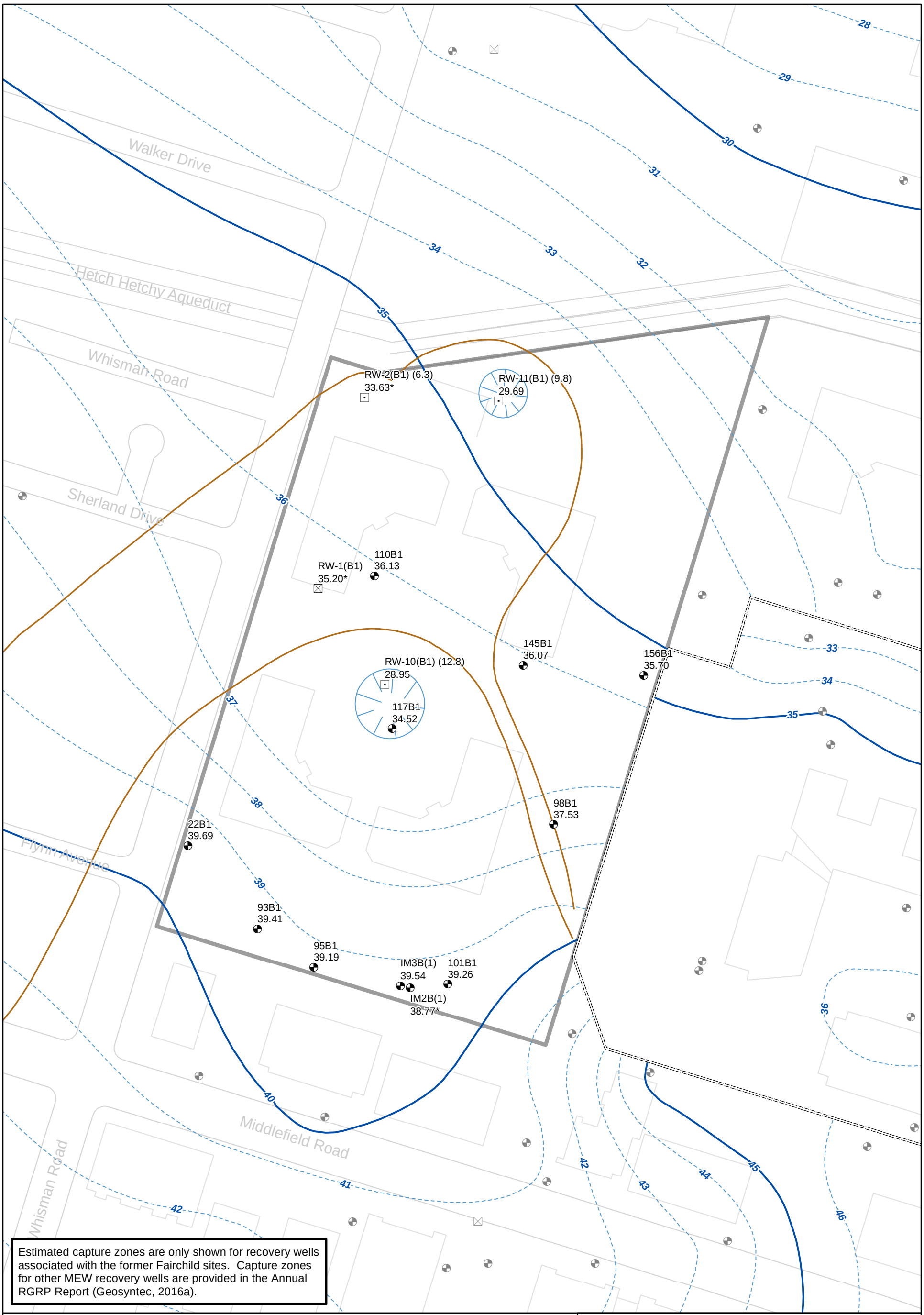
Figure 7b

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig07b_GW_A_Sept.mxd | 4/8/2016 3:32:34 PM



B1 Zone Groundwater Elevation Contours and Estimated Capture Zones 19 March 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

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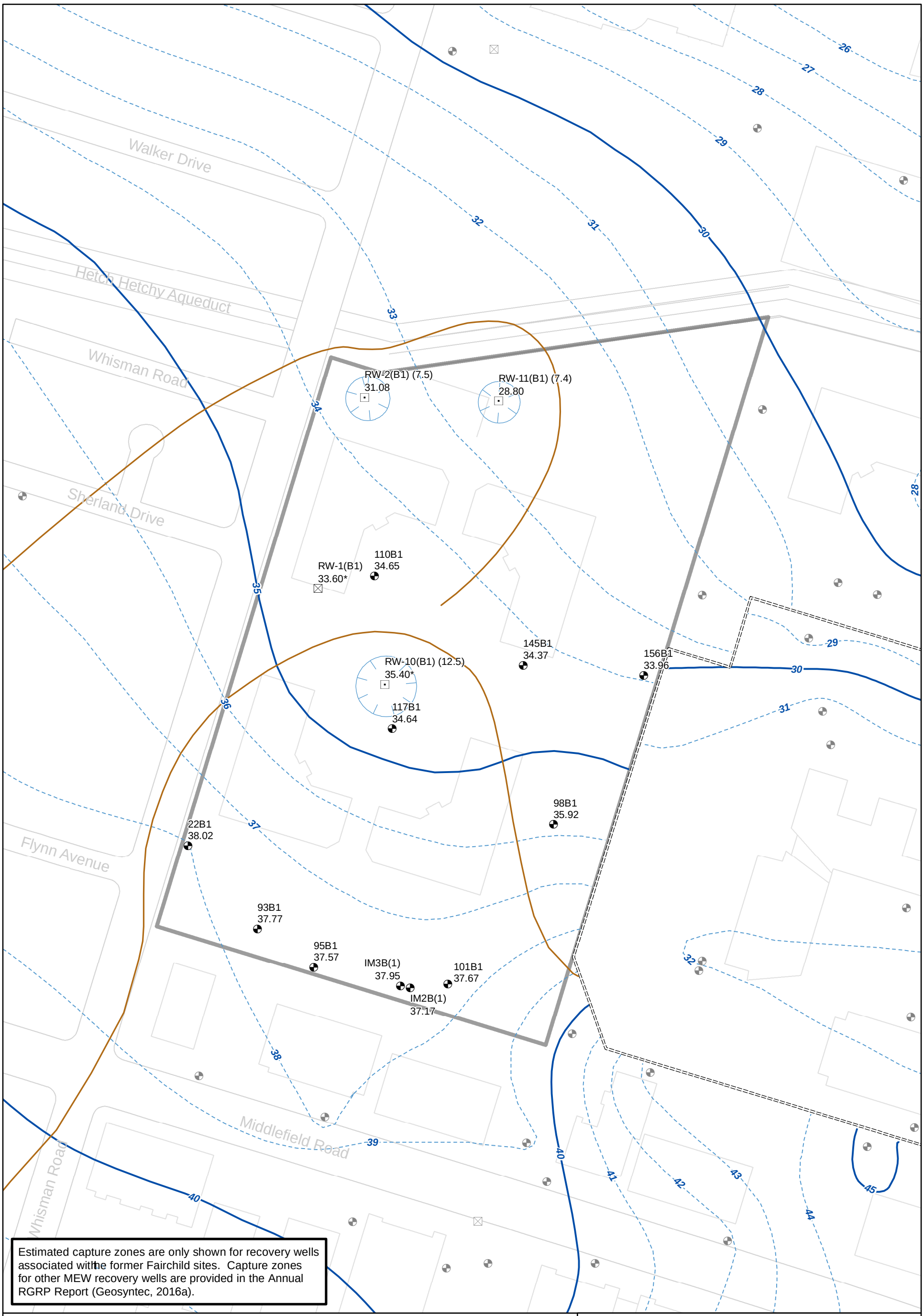
Figure 8a

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig08a_GW_B1_Mar.mxd | 4/8/2016 3:29:25 PM


Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road
RW-2(B1) (7.5)
31.08
RW-11(B1) (7.4)
28.80
RW-1(B1)
33.60*
110B1
34.65
RW-10(B1) (12.5)
35.40*
117B1
34.64
145B1
34.37
156B1
33.96
22B1
38.02
98B1
35.92
93B1
37.77
95B1
37.57
IM3B(1)
37.95
101B1
37.67
IM2B(1)
37.17
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).
Legend
Monitoring Well
Recovery Well On
Recovery Well Off
Groundwater Elevation: 1 ft Contours
Groundwater Elevation: 5 ft Contours
Closely Spaced Groundwater Contour
Estimated Capture Zone
Slurry Wall
Building
Road
Site Boundary
RW-2(B1) (7.5) Well ID (Pumping Rate)
31.08 Groundwater Elevation (feet above mean sea level)
* Groundwater Measurement Not Used in Contouring. (Water levels measured inside the casing of an extraction well are not used in contouring.)
Note:
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.
N
150 75 0 150 Feet
B1 Zone Groundwater Elevation Contours and Estimated Capture Zones
17 September 2015
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California
Geosyntec consultants
Oakland
April 2016
Figure
8b
\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig08b_GW_B1_Sept.mxd | 4/8/2016 3:30:13 PM

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road

RW-2(B2) (8.3)
29.58

9B2
34.26

146B2
34.48

40B2
24.87

RW-1(B2) (6.6)
-17.24

R40B1(B2)
36.15

90B2
39.18

6B2
40.58

88B2
43.26

129B2
NM

130B2
43.45

31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off
- Groundwater Elevation: 1 ft Contours
- Groundwater Elevation: 5 ft Contours
- Closely Spaced Groundwater Contour
- Estimated Capture Zone
- Building
- Road
- Slurry Wall
- Site Boundary

RW-1(B2) (6.6) Well ID (Pumping Rate)
-17.24 Groundwater Elevation (feet above mean sea level)
***** Groundwater Measurement Not Used in Contouring. (Water levels measured inside the casing of an extraction well are not used in contouring.)

Note:
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

N

150 75 0 150 Feet

B2 Zone Groundwater Elevation Contours and Estimated Capture Zones 19 March 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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Figure 9a

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig09a_GW_B2_Mar.mxd | 4/8/2016 3:31:01 PM

B2 Zone Groundwater Elevation Contours and Estimated Capture Zones 17 September 2015

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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Figure 9b

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\Fig09b_GW_B2_Sept.mxd | 4/8/2016 3:31:46 PM

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road

RW-2A 310
23A 170
149A 120
RW-24A 300
21A 87
22A 130
160A 1000
16A 59
17A 120
115A <5.0
RW-1A 140
159A 270
134A 41
154A 290
155A 300
175A 83
173A 37
174A 80
RW-23A 450
RW-11A 10000
RW-12A 710
RW-29A 240
R59A 96
RW-26A 220
4A 3800
71A 3200
1A 150
142A 88

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).
A number of wells within Building 19 Slurry Wall are sampled every 5 years and were last sampled in 2012. Concentration contours within the slurry wall take into consideration the most recent groundwater concentration for these wells.

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

TCE Concentration (2014)

- 5 - 100 ug/L
- 100 - 1,000 ug/L
- 1,000 - 10,000 ug/L
- Greater than 10,000 ug/L

- Estimated Capture zone (2015)
- ==== Slurry Wall
- Building
- Road
- Site Boundary

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for TCE in 2014.
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

N

150 75 0 150 Feet

2014 A Zone TCE Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

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Figure **10a**

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig10a_TCE_A_March_CZ.mxd | 4/8/2016 3:15:58 PM

2014 A Zone cDCE Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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Figure 10b

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig10b_DCE_A_March_CZ.mxd | 4/8/2016 3:16:40 PM

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road

RW-2A <1.0
23A <1.3
RW-24A 4.0
149A <1.0
21A <0.50
22A <0.50
160A <5.0
16A <0.50
17A <0.50
159A <0.50
RW-1A <0.50
115A 2.0
134A <0.50
154A 1.1
155A <0.50
175A <0.50
173A 1.0
RW-23A <1.3
174A <0.50
RW-11A 320
RW-12A 90
RW-29A <1.3
R59A <0.50
RW-26A <5.0
4A 69
71A <25
1A <2.5
142A <1.0

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).
A number of wells within Building 19 Slurry Wall are sampled every 5 years and were last sampled in 2012. Concentration contours within the slurry wall take into consideration the most recent groundwater concentration for these wells.

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

VC Concentration (2014)

- 0.5 - 5 ug/L
- 5 - 100 ug/L
- 100 - 1,000 ug/L
- 1,000 - 10,000 ug/L
- Greater than 10,000 ug/L

- Estimated Capture zone (2015)
- Slurry Wall
- Building
- Road
- Site Boundary

N

150 75 0 150 Feet

Notes:
VC = Vinyl Chloride
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for VC in 2014.
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

2014 A Zone VC Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

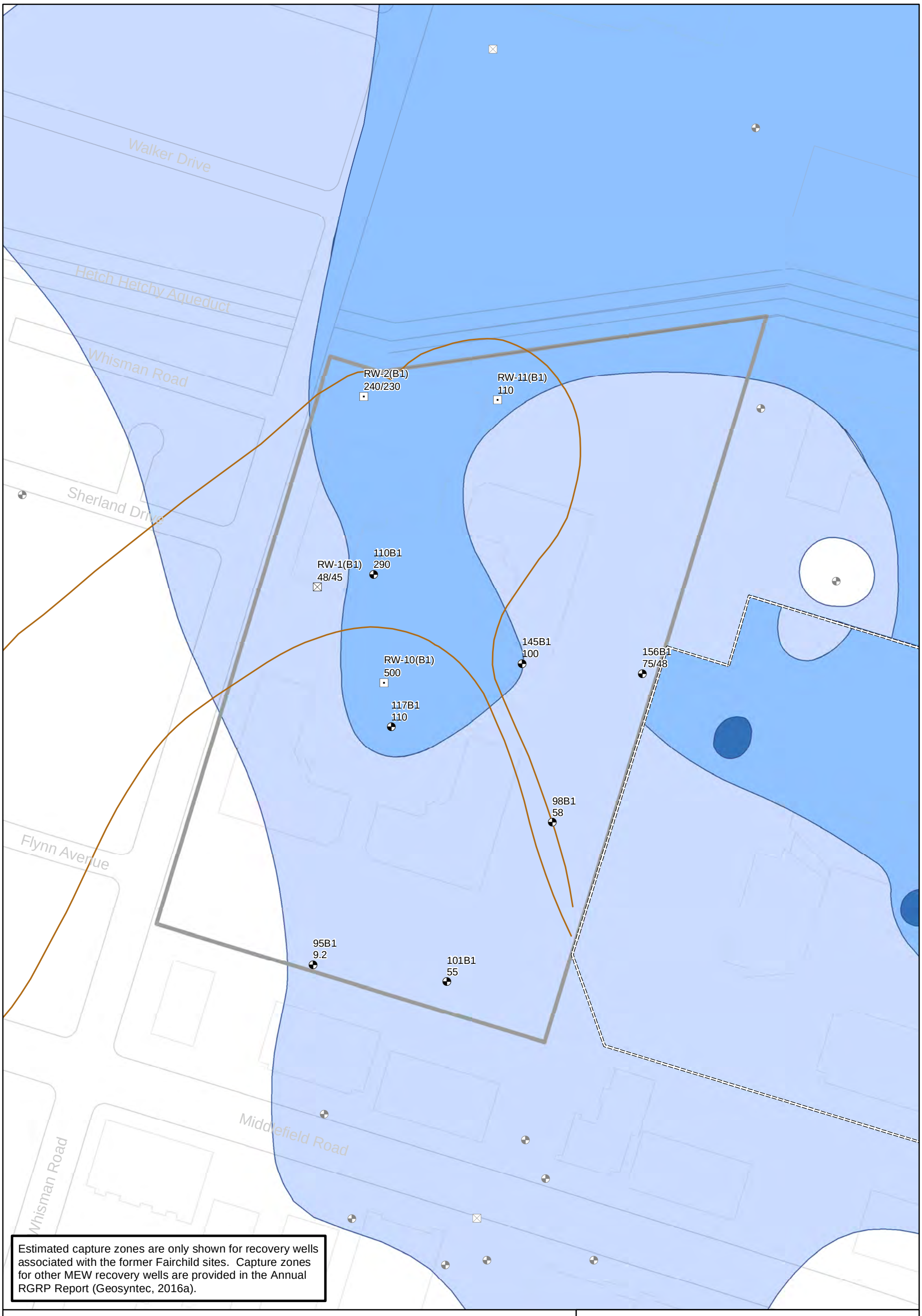
Geosyntec consultants

Oakland | April 2016

Figure 10c

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig10c_VC_A_March_CZ .mxd | 4/8/2016 3:17:22 PM


Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
RW-2A
<1.0
23A
<1.3
RW-24A
<2.5
149A
<1.0
21A
<0.50
22A
<0.50
160A
<5.0
16A
<0.50
17A
<0.50
115A
<0.50
RW-1A
<0.50
159A
<0.50
134A
<0.50
154A
0.85
155A
2.4
175A
<0.50
173A
<0.50
174A
0.89
RW-23A
2.0
RW-11A
<1.3
RW-12A
2.0
RW-29A
2.2
R59A
<0.50
RW-26A
<5.0
4A
<25
71A
<25
1A
<2.5
142A
15
Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).
A number of wells within Building 19 Slurry Wall are sampled every 5 years and were last sampled in 2012. Concentration contours within the slurry wall take into consideration the most recent groundwater concentration for these wells.
Legend
Monitoring Well
Recovery Well On
Recovery Well Off
PCE Concentration (2014)
5 - 100 ug/L
100 - 1,000 ug/L
1,000 - 10,000 ug/L
Greater than 10,000 ug/L
Estimated Capture zone (2015)
Slurry Wall
Building
Road
Site Boundary
Notes:
PCE = Tetrachloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for PCE in 2014.
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.
N
150 75 0 150 Feet
2014 A Zone PCE Concentrations and March 2015 Estimated Capture Zones
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California
Geosyntec consultants
Oakland
April 2016
Figure
10d
\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig10d_PCE_A_March_CZ.mxd | 4/8/2016 3:18:04 PM



\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig11a_TCE_B1_March_CZ.mxd | 4/8/2016 3:18:49 PM

2014 B1 Zone cDCE Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure 11b

\\oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig11b_DCE_B1_March_CZ.mxd | 4/8/2016 3:19:32 PM

2014 B1 Zone VC Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

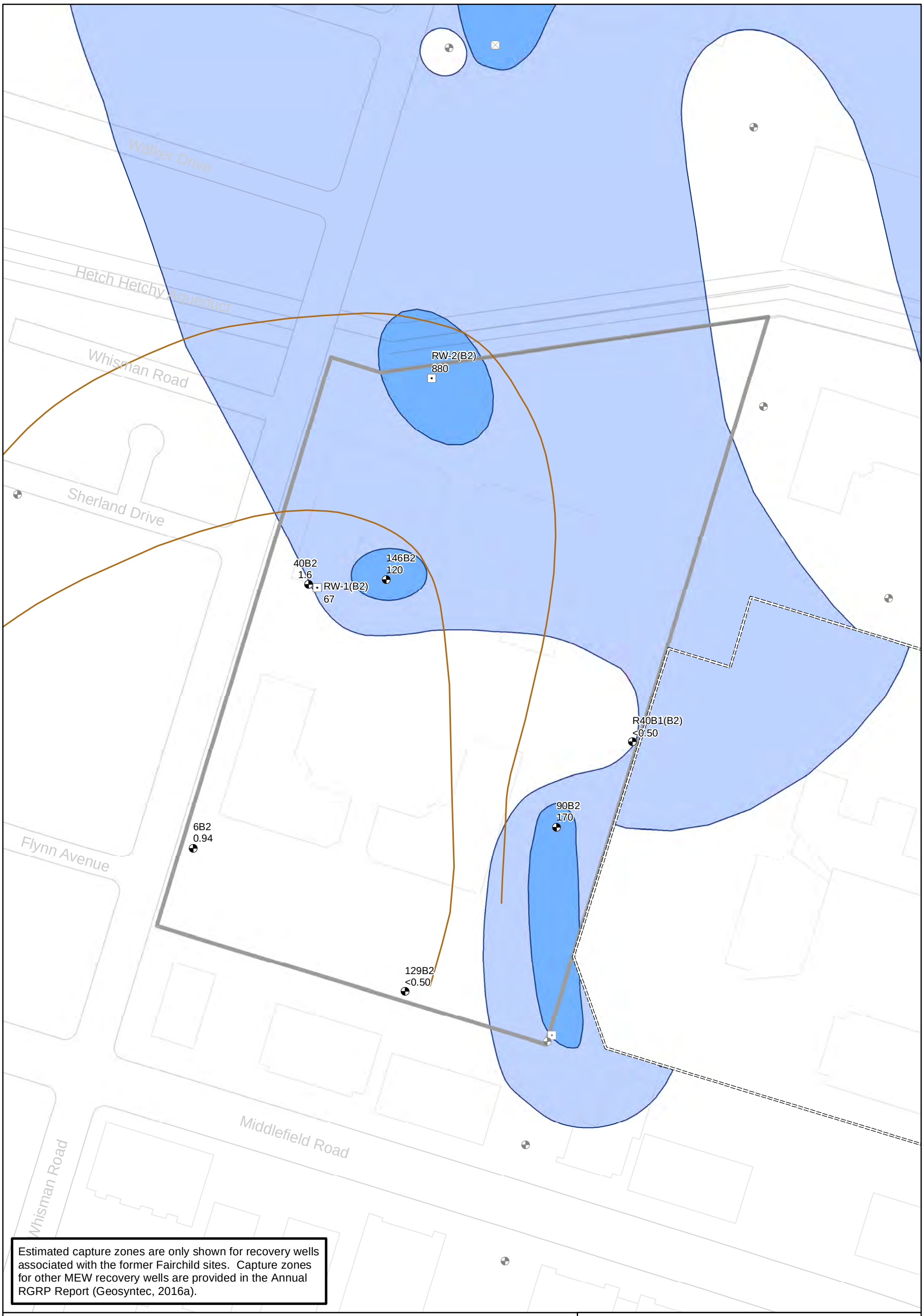
Geosyntec consultants

Oakland | April 2016

Figure 11c

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig11c_VC_B1_March_CZ.mxd | 4/8/2016 3:20:13 PM


Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road
RW-2(B1)
<2.5/<2.5
RW-11(B1)
<0.50
RW-1(B1)
<0.50/<0.50
110B1
<0.50
RW-10(B1)
<0.50
117B1
<0.50
145B1
<0.50
156B1
<0.50/<0.50
98B1
<0.50
95B1
<0.50
101B1
<0.50
Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).
Legend
Monitoring Well
Recovery Well On
Recovery Well Off
PCE Concentration (2014)
5 - 100 ug/L
100 - 1,000 ug/L
1,000 - 10,000 ug/L
Greater than 10,000 ug/L
Estimated Capture zone (2015)
Slurry Wall
Building
Road
Site Boundary
Notes:
PCE = Tetrachloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for PCE in 2014.
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.
N
150 75 0 150 Feet
2014 B1 Zone PCE Concentrations and March 2015 Estimated Capture Zones
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California
Geosyntec consultants
Oakland
April 2016
Figure
11d
\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig11d_PCE_B1_March_CZ.mxd | 4/8/2016 3:20:54 PM



2014 B2 Zone TCE Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure **12a**

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig12a_TCE_B2_March_CZ.mxd | 4/8/2016 3:21:37 PM

Walker Drive
Hetch Hetchy Aqueduct
Whisman Road
Sherland Drive
Flynn Avenue
Middlefield Road
Whisman Road
RW-2(B2)
14
40B2
4.9
RW-1(B2)
35
146B2
39
6B2
<0.50
90B2
59
R40B1(B2)
<0.50
129B2
<0.50

Estimated capture zones are only shown for recovery wells associated with the former Fairchild sites. Capture zones for other MEW recovery wells are provided in the Annual RGRP Report (Geosyntec, 2016a).

Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

cDCE Concentration (2014)

- 5 - 100 ug/L
- 100 - 1,000 ug/L
- 1,000 - 10,000 ug/L
- Greater than 10,000 ug/L

- Estimated Capture zone (2015)
- ==== Slurry Wall
- Building
- Road
- Site Boundary

N

150 75 0 150 Feet

Notes:
cDCE = cis-1,2-Dichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for cDCE in 2014.
Wells not associated with the Former Fairchild Buildings 13, 19, and 23 Site are shown in gray.

2014 B2 Zone cDCE Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure **12b**

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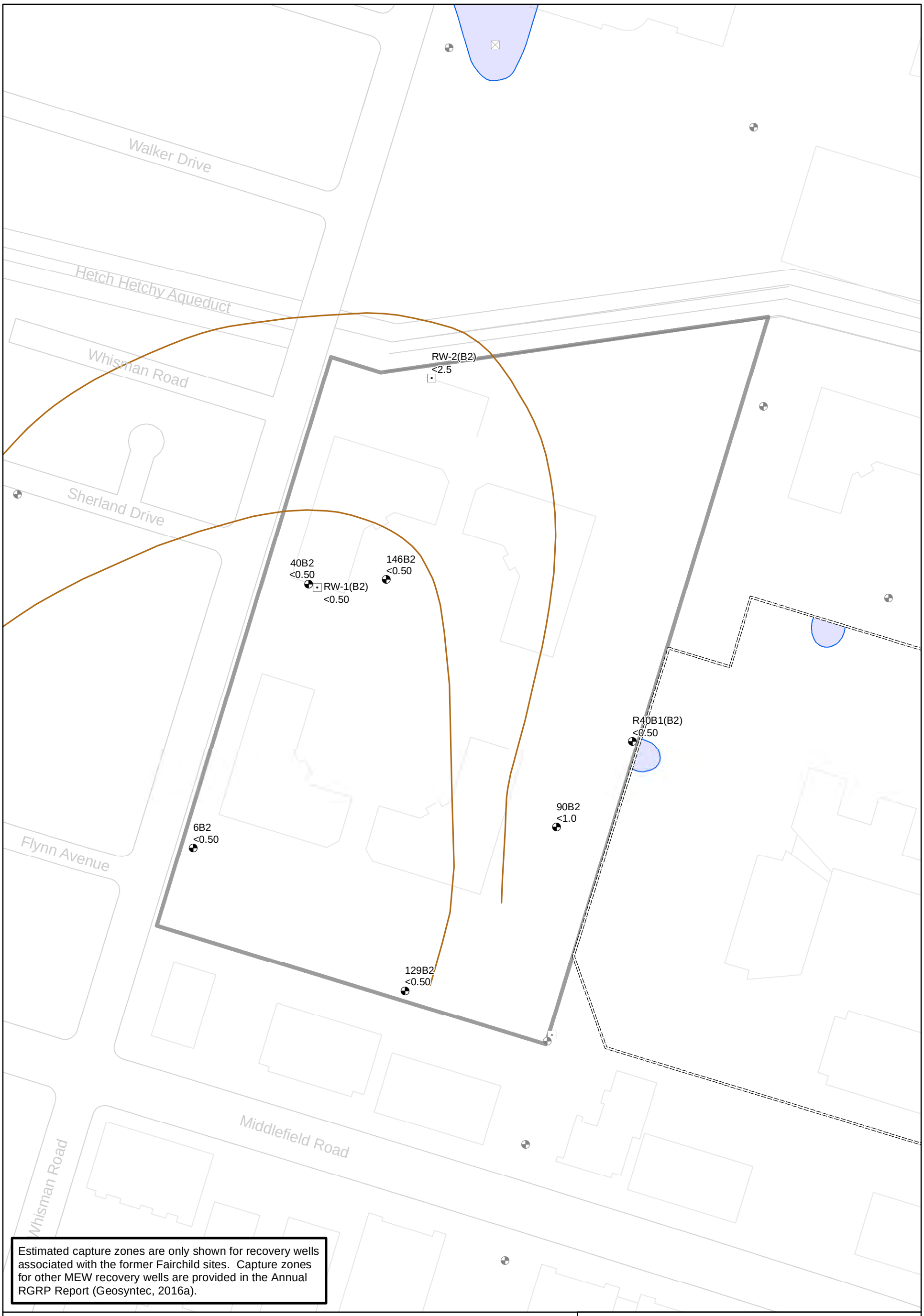

2014 B2 Zone VC Concentrations and March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

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Figure **12c**

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2014 B2 Zone PCE Concentrations
March 2015 Estimated Capture Zones

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure **12d**

\\Oakland-01\data\GIS\MEW\Project\Fairchild\2015_AR\Building19\TEMP_MARCH_CZFIGS\Fig12d_PCE_B2_March_CZ.mxd | 4/8/2016 3:23:40 PM

APPENDIX A

2015 Annual Report Remedy Performance Checklist

2015 Annual Report Remedy Performance Checklist

I. GENERAL SITE INFORMATION	
Facility Name: Former Fairchild Facilities, Middlefield-Ellis-Whisman Study Area (MEW Site)	
Facility Address, City, State: 515/545 North Whisman Road and 313 Fairchild Drive (former Bldgs. 1-4; this includes the building located at 323 Fairchild Drive) 369 and 441 North Whisman Road (former Bldgs. 13 and 19 and 23; this includes buildings located 379, 389 and 399 North Whisman Road) 600 National (former Bldg. 9, formerly 401 National). 331 Fairchild Drive (former Bldg. 18, formerly 644 National Avenue) 464 Ellis Street (former Bldg. 20 and 20A; this includes buildings located at 466 and 468 Ellis Street)	
Checklist completion date: March 2016	EPA Site ID: System-1: CAR000164285 System-3: CAD095989778 System-19: CAR000164228
Site Lead: ☐ Fund ☑ PRP ☐ State ☐ State Enforcement ☐ Federal Facility ☐ Other: EPA Region IX	

Site Remedy Components (Include Other Reference Documents for More Information, as appropriate):

1. Three slurry wall enclosures around former Buildings 1-4, Building 9, and Building 19. The slurry walls extend to a depth of about 40 feet below ground surface and are keyed a minimum of two feet into the A/B1 aquitard.
2. Extraction Systems as described below:

Buildings 1-4 – 20 recovery wells: 3 Regional Groundwater Remediation Program (RGRP) wells and 17 Source Control Recovery Wells (SCRWs).

Buildings 13, 19, 23 – 13 SCRWs and 1 RGRP well.

Building 9 – 4 SCRWs.

Building 18 – 1 SCRW and 3 RGRP wells.

3. Treatment Systems as described below:

System 1 (treats water from Buildings 1-4, Building 9, Building 18, and one RGRP well)

- Three 5,000-pound liquid phase GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances.
- On 12 November 2015, System 1 was shut down following realignment of the piping network from System 1 to allow discharge of groundwater to the RGRP South of 101 Treatment System. Discussion and additional details are provided in the 2015 Annual Progress Report for the RGRP (Geosyntec, 2016a) and the Annual Progress Report for Former Fairchild Buildings 1-4, 9 and 18 (Geosyntec, 2016b).

System 3 (treats water from Buildings 1-4)

- Three 5,000-pound liquid phase GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances.
- On 12 November 2015, System 3 was shut down following realignment of the piping network from System 3 to allow discharge of groundwater to the RGRP South of 101 Treatment System. Discussion and additional details are provided in the 2015 Annual Progress Report for the RGRP (Geosyntec, 2016a) and the Annual Progress Report for Former Fairchild Buildings 1-4, 9 and 18 (Geosyntec, 2016b).

Consolidated RGRP South of 101 Treatment System

- Three 10,000-pound liquid phase GAC vessels in series, one 4,000-gallon atmospheric tank, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances.
- On 12 November 2015, flows from System 1 and System 3 were redirected to the consolidated RGRP South of 101 Treatment System and future discharges of groundwater from those systems will be treated at the South of 101 Treatment System (Geosyntec, 2016b). Discussion and additional details are provided

in the 2015 Annual Progress Report for the RGRP (Geosyntec, 2016a) and the Annual Progress Report for Former Fairchild Buildings 1-4, 9 and 18 (Geosyntec, 2016b).

System 19 (treats water from Buildings 13, 19, and 23, and two RGRP wells)

- Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances.

II. CONTACTS

List important personnel associated with the Site: Name, title, phone number, e-mail address:

	Name/Title	Phone	E-mail
RP/Facility Representative	Virgilio Cocianni Schlumberger Technology Corporation	281/285-4747	cocianni-v@slb.com
RP Consultant	Eric Suchomel Geosyntec Consultants	510/285-2786	esuchomel@geosyntec.com
RP Consultant	Trish Eliasson Weiss Associates	510/450-6138	tae@weiss.com

III. O&M COSTS (OPTIONAL)

What is your annual O&M cost total for the reporting year?_____
Breakout your annual O&M cost total into the following categories (use either dollars or %):

- Analytical (e.g., lab costs): _____
- Labor (e.g., site maintenance, sampling): _____
- Materials (e.g., treatment chemicals): _____
- Oversight (e.g., project management): _____
- Utilities (e.g., electric, gas, phone, water): _____
- Reporting (e.g., NPDES, progress): _____
- Other (e.g., capital improvements): _____

Describe unanticipated/unusually high or low O&M costs (go to section [fill in] to recommend optimization methods):

IV. ON-SITE DOCUMENTS AND RECORDS (Check all that apply)

☑ O&M Manual ☑ O&M Maintenance Logs ☐ O&M As-built drawings ☑ O&M reports
☑ Daily access/Security logs
☑ Site-Specific Health & Safety Plan ☑ Contingency/Emergency Response Plan
☑O&M/OSHA Training Records ☑ Settlement Monument Records
☐ Gas Generation Records ☑ Groundwater monitoring records ☐ Leachate extraction records
☑ Discharge Compliance Records
☐Air discharge permit ☑ Effluent discharge permit ☐ Waste disposal, POTW Permit

Are these documents currently readily available? ☑ Yes ☐ No If no, where are records kept?

Documents and records are available at treatment systems and/or on-site office located at 453 Ravendale Drive, Suite C, Mountain View, CA.

2015 Annual Report Remedy Performance Checklist

V. INSTITUTIONAL CONTROLS (as applicable)

List institutional controls called for (and from what enforcement document): Signs and other security measures are in place at extraction and treatment points.

Status of their implementation: Posted signage (Health & Safety and emergency contact information).

- Signs and other security measures are in place at extraction and treatment points.
- Groundwater production wells within plume area are prohibited. Administered by Santa Clara Valley Water District.
- Properties formerly owned by Fairchild have deed restrictions that require notification prior to subsurface construction and provide for access for remedial actions.
- Public notifications regarding remediation activities.

Where are the ICs documented and/or reported?

ICs are being properly implemented and enforced? ☑ Yes ☐ No, elaborate below
ICs are adequate for site protection? ☑ Yes ☐ No, elaborate below

Additional remarks regarding ICs:

VI. SIGNIFICANT SITE EVENTS
Check all Significant Site events Since the Last Checklist that Affects or May Affect Remedy Performance

☐ Community Issues
☐ Vandalism
☐ Maintenance Issues
☑Other:

Please elaborate on Significant Site Events:

- Treatment System 19 had a vinyl chloride effluent exceedance in November 2015 (Weiss, 2016a). The effluent sample collected on 24 November 2015 contained vinyl chloride at a concentration of 0.68 µg/L, (effluent limitation is 0.5 µg/L), and a confirmation sample collected on 9 December 2015 contained vinyl chloride at a concentration of 0.90 µg/L. Following confirmation of the exceedance, the Water Board was notified in accordance with permit requirements and the system was temporarily shut down on 9 December 2015 while a carbon change out was scheduled. The carbon change out was completed on 16 December 2015 and the system was restarted on 17 December 2015. Vinyl chloride was not detected in the effluent sample collected on 17 December 2015 following system restart (Weiss, 2016a).
- Remedy optimization at the former Building 9 site included the implementation of an ongoing in situ chemical oxidation (ISCO) pilot study. As part of pilot study, the four SCRWs located within the Building 9 slurry wall were shut down in February 2015 with EPA approval. In 2015, two rounds of ISCO injections and associated monitoring were completed inside the Building 9 slurry wall boundary. The ISCO pilot study is being conducted in accordance with the Final Work Plan for In Situ Chemical Oxidation Pilot Study (Work Plan; Geosyntec, 2014c) and Addendum (Geosyntec, 2015a), and the Notification of Second Injection Event, In Situ Chemical Oxidation Pilot Study letter (Geosyntec, 2015e). The ongoing pilot study is evaluating the effectiveness of injecting oxidant into the subsurface to reduce the concentration of volatile organic compounds (VOCs) in groundwater. A third ISCO injection is planned for spring 2016. An implementation report summarizing the ISCO pilot study results through the third injection event and presenting recommendations for future pilot study activities will be submitted to EPA in 2016 following the third ISCO injection.
- Beginning in November 2015, groundwater extracted from the Buildings 1-4, 9, and 18 Sites is being treated at the upgraded RGRP South of 101 GETS. Electrical distribution and controls for wells associated with Systems 1 and 3 extraction networks remain at the System 1 and System 3 enclosures. Current groundwater extraction and treatment components for the consolidated RGRP South of 101 GETS are

described in the 2015 Annual Progress Report for the RGRP (Geosyntec, 2016a) and the Annual Progress Report for Former Fairchild Buildings 1-4, 9 and 18 (Geosyntec, 2016b).

VII. REDEVELOPMENT

Is redevelopment on property planned? ☑ Yes ☐ No

If yes, what is planned? Please describe below.

Is redevelopment plan complete ☐ Yes, date:_____; No ? ☑ Not Applicable

Redevelopment proposal in progress? ☑ Yes, elaborate below
☐ No; If no, is a proposal anticipated? ☐ Yes ☐ No

☑ Is the redevelopment proposal compatible with remedy performance? ☑ Yes ☐ No

Elaborate on redevelopment proposal and how it affects remedy performance:

In 2013 the 401 National Avenue property (former Fairchild Building 9) was purchased by National Avenue Partners, LLC and in May 2014 redevelopment of 401 National was approved by the City of Mountain View in conjunction with three properties to the north. Redevelopment activities include the construction of a two-story parking garage over most of the former 401 National Avenue property and construction of a four story office building to the north. The former Building 9 was demolished in November 2014 as part of redevelopment activities. Construction of the parking garage began in 2015 and is expected to be completed in 2016.

The existing treatment systems and their components (conveyance piping, extraction wells, and monitoring wells) are being maintained or modified as appropriate to accommodate redevelopment.

VIII. GROUNDWATER REMEDY (reference isoconcentration, capture zone maps, trend analysis, and other documentation to support analysis)

Groundwater Quality Data

List the types of data that are available:	What is the source report?
Potentiometric surface maps, hydrographs Capture zone maps, isoconcentration maps VOC time series plots and trend analysis Laboratory Analytical Results and Reports	2015 Annual Fairchild Building Reports (Geosyntec, 2016b, c) and the 2015 Annual Regional Report (Geosyntec, 2016a)

☑ Contaminant trend(s) tracked during O&M (i.e., temporal analysis of groundwater contaminant trends).
☑ Groundwater data tracked with software for temporal analyses.
☐ Reviewed MNA parameters to ensure health of substrate (e.g., DO, pH, temperature), if appropriate?

Groundwater Pump & Treat Extraction Well and Treatment System Data

List the types of data that are available:	What is the source report?
O&M logs System influent & effluent water samples VOC mass and groundwater removal graphs	NPDES Self-Monitoring Reports (Weiss, 2016a-c) 2015 Annual Fairchild Building Reports (Geosyntec, 2016b, c)

☑ The system is functioning adequately.
☐ The system has been shut down for significant periods of time in the past year. Please elaborate below.

Discharge Data

List the types of data that are available:	What is the source report?
System performance data such as average flow rates, totalized flow, influent/effluent chemical data, GAC removal efficiencies	NPDES Self-Monitoring Reports (Weiss, 2016a-c)

☑ The system is in compliance with discharge permits.

Slurry Wall Data

2015 Annual Report Remedy Performance Checklist

List the types of data that are available:	What is the source report?
Water level elevations in select well pairs	2015 Annual Fairchild Reports (Geosyntec, 2016b, c)
Analysis of inward and upward hydraulic gradients	

Is slurry wall operating as designed? ☑ Yes ☐ No

If not, what is being done to correct the situation?

The slurry walls are operating as designed and are effective at impeding flow and preventing VOCs inside the wall from migrating downgradient. However, the ROD specifies that the slurry walls, "maintain inward and upward gradients." Historically, this has not been observed in all well pairs, even under maximum historical pumping scenarios.

The four SCRWs located inside of the slurry wall at the Building 9 site (AE/RW-9-1, AE/RW-9-2, RW-20A, and RW-21A) were turned off in February 2015 with EPA approval as part of the ongoing ISCO pilot study These wells will remain off until the completion of the pilot study, which may change slurry wall gradients. While the ISCO pilot study is ongoing at the former Fairchild Building 9 site, hydraulic capture will be maintained through the operation of the downgradient shared source recovery wells (Shared SCRWs) (GSF-1A, GSF-1B1 and GSF-1B2) (Geosyntec, 2016b).

The chemical concentration data from 2014 and potentiometric surface contours from 2015 continue to demonstrate that the slurry walls are an effective means of impeding VOC migration outside of the slurry walls.

Elaborate on technical data and/or other comments

IX. AIR MONITORING/VAPOR INTRUSION PATHWAY EVALUATION (Include in Annual Progress Report and reference document)

The EPA issued a ROD amendment on 16 August 2010 to address vapor intrusion. The MEW parties continued to work with EPA and local entities to implement the ROD amendment during 2015. In accordance with the Statement of Work for the Vapor Intrusion ROD Amendment (VI SOW), an annual report summarizing the status of the vapor intrusion remedy will be submitted under separate cover (Geosyntec, 2016d).

Summary of Activities: Operations, maintenance, and monitoring (OM&M) activities were performed for the sub-slab depressurization (SSD) systems installed in the buildings located at the 369, 379, 389, and 399 North Whisman Road properties in accordance with the OM&M Plans (Geosyntec, 2013b and Geosyntec, 2014a). No VI investigation activities were conducted in 2015. Additional information is provided in the VI Annual Report (Geosyntec, 2016d).

Problems Encountered: The building tiering process could not be completed in 2015 due to EPA's delay in completion of its review and approval of the Revised Site-Wide Vapor Intrusion Sampling and Analysis Work Plan for Response Action Tiering, Middlefield-Ellis-Whisman Area and Moffett Field, California ([Revised Tiering Work Plan]; H&A, 2013), which was submitted to EPA on 22 March 2013. Upon approval of the Revised Tiering Work Plan by EPA, it is expected that implementation of the VI tiering will begin.

Recommendations/Next Steps: Continue ongoing operation, maintenance, and monitoring programs for SSD systems installed in the buildings located at 369, 379, 389, and 399 North Whisman Road, in accordance with the OM&M Plans (Geosyntec, 2013b and Geosyntec, 2014a). Upon receipt of EPA's approval of the Revised Tiering Work Plan (H&A, 2013), evaluate the potential for vapor intrusion in buildings where follow-up sampling is needed, and tier all former Fairchild facilities in accordance with the tiers established in the VI ROD Amendment.

Schedule: Ongoing operation, maintenance, and monitoring programs for SSD systems installed in the buildings located at 369, 379, 389, and 399 North Whisman Road will be conducted in accordance with schedules set forth in the OM&M Plans for these systems. Vapor intrusion and tiering activities will be conducted in accordance with a schedule set forth and approved by EPA in the building-specific vapor intrusion work plans and as requested by EPA. Further details are provided in the Vapor Intrusion Annual Report (Geosyntec, 2016d).

X. REMEDY PERFORMANCE ASSESSMENT

2015 Annual Report Remedy Performance Checklist

A. Groundwater Remedies

What are the remedial goals for groundwater? ☑ Plume containment (prevent plume migration); ☑ Plume restoration (attain ROD-specific cleanup levels in aquifer); ☐ Other goals, please explain:

The groundwater remedy is hydraulic remediation by extraction and treatment. The Treatment Systems are reliable and consistent in their operation and mass removal ability, with greater than 95% up-time. The capture zones from the extraction wells provide sufficient overlap to achieve hydraulic control over the plume based on flow net evaluation and converging lines of evidence, including stable lateral extent of TCE exceeding 5 µg/L. Remediation is also demonstrated because concentrations within the TCE plume have continued to decrease in all zones. Groundwater with TCE concentrations exceeding 5 µg/L does not discharge to surface water.

Have you done a trend analysis? ☑ Yes ☐ No; If Yes, what does it show?

(Is it inconclusive due to inadequate data? Are the concentrations increasing or decreasing?) Explain and provide source document reference

Site-wide VOC monitoring data was last collected in 2014, consistent with EPA's 16 March 2016 conditional approval of a trial reduction of groundwater monitoring and sampling frequency at the MEW study area (EPA, 2016). The next groundwater sampling event will occur in fall 2016, and the effectiveness of biennial VOC monitoring will be evaluated as part of the 2016 Annual Progress Report. Based on the VOC data collected in 2014, concentrations within TCE plume were evaluated using Mann-Kendall trend analysis and reviewing VOC concentrations over time. The analyses show that TCE concentrations in the majority of monitoring wells have continued to decrease, remain stable, or show no trend in all zones, while the lateral extent of TCE exceeding 5 µg/L has been stable. See Annual Reports for trends in monitoring wells (Geosyntec 2016b, c).

If plume containment is a remedial goal, check all that apply:
☑ Plume migration is under control (explain basis below)
☐ Plume migration is not under control (explain basis below)
☐ Insufficient data to determine plume stability (explain below)
(Include attachments that substantiate your answers, e.g., reference plume, trend analysis, and capture zone maps in source document)

Elaborate on basis for determining that plume containment goal is being met or not being met**:**

Plume containment goal is met, slurry walls provide physical containment of sources on 369 N. Whisman Road, the southern part of 600 National Avenue (formerly 401 National Avenue), 515/545 N. Whisman Road and 313 Fairchild Drive.

Groundwater elevation monitoring from 2015 and chemical monitoring results from 2014 demonstrate that the operating Fairchild extraction wells and Shared SCRWs continue to achieve adequate horizontal and vertical capture based on converging lines of evidence, including graphical flow net analysis and chemical concentration trends.

If plume restoration is a cleanup objective, check all that apply:
☑ Progress is being made toward reaching cleanup levels (explain basis below)
☐ Progress is not being made toward reaching cleanup levels (explain basis below)
☐ Insufficient data to determine progress toward restoration goal (explain below)

Elaborate on basis for determining progress or lack of progress toward restoration goal:

The objective is to remediate and control the plume. VOC concentrations in groundwater are well below historical maximums, and generally show long-term decreasing trends. The groundwater extraction, treatment, and containment systems are functioning as intended and meet the Remedial Action Objectives for the Site.

B. Vertical Migration

Have you done an assessment of vertical gradients? ☑ Yes ☐ No; If Yes, what does it show? (Is it inconclusive due to inadequate data?

Are the concentrations increasing or decreasing? Explain and provide source document reference

In general, vertical gradients across the B and deeper water-bearing zones are upward. Upward vertical gradients are typical from the B Zone to A Zone, but downward vertical gradients are observed at a few locations where caused by extraction in deeper zones. Gradients in 2015 across the Former building 13, 19, 23 and 1-4, 9, 18 Sites were generally consistent with historical observations, with the exception of gradients near the former Building 9 site. Gradients shifted in this area due to the shutdown of four former Building 9 extraction wells as part of ongoing ISCO pilot study activities.

Source document reference: 2015 Annual Fairchild Building Reports (Geosyntec, 2016b,c)
2015 Annual Regional Report (Geosyntec, 2016a)
2008 Optimization Evaluation (Geosyntec, 2008)

C. Source Control Remedies

What are the remedial goals for source control?

Capture of former source areas is the goal for source control. Cleanup standards are Maximum Contaminant Level (MCLs) in upper groundwater zones; the TCE MCL is 5 µg/L.

Elaborate on basis for determining progress or lack of progress toward these goals:

Capture zone analysis in the 2015 Fairchild Building and RGRP Annual Progress Reports indicate containment of target capture areas (Geosyntec, 2016a-c).

XI. PROJECTIONS

Administrative Issues
Dates of next monitoring and sampling events for next annual reporting period: September/October 2016

A. Groundwater Remedies - Projections for the upcoming year and long-term (Check all that apply)

Remedy Projections for the upcoming year (2016)
☑ No significant changes projected.
☐ Groundwater remedy will be converted to monitored natural attenuation. Target date:
☐ Groundwater Pump & Treat will be shut down. Target date:
☐ Groundwater cleanup standards to be modified. Target date:
☐ PRP will request remedy modification. Target date of request:
☐ Change in the number of monitoring wells. ☐ Increasing or ☐ decreasing? Target date:
☐ Change in the number and/or types of analytes being analyzed. ☐ Increasing or ☐ decreasing? Target date:
☐ Change in groundwater extraction system. Expansion or minimization (i.e., number of extraction wells and/or pumping rate)? Target date:
☐ Modification on groundwater treatment? Elaborate below. Target date:
☐ Change in discharge location. Target date:
☑ Other modification(s) anticipated: Groundwater Remedy Optimization Elaborate below. Target date: 2016

In 2016, monitoring wells will be gauged annually, concurrent with the September/October 2016 sampling event (EPA, 2016).

Elaborate on Remedy Projections:

EPA has requested that the MEW parties work to optimize performance of the groundwater remedy with respect to mass removal. An ISCO Pilot Study is being implemented at the former Fairchild Building 9 site to assess the ability of oxidant injections to increase the rate of VOC mass removal at that site. The Pilot Study will continue

through 2016, and a report summarizing the pilot study implementation will be submitted to EPA in 2016 following a third injection event.

A Pilot Study Work Plan for Enhanced Groundwater Extraction for former Fairchild Building 19 Site was submitted to EPA on 30 June 2015 (Geosyntec, 2015c). Although EPA has not commented on the work plan, Schlumberger has elected to proceed with work plan implementation. Optimization activities were implemented in December 2015 and will continue through 2016, with a summary of 2016 activities provided in the 2016 Annual Progress Report for the Site.

Remedy Projections for **the long-term** (Check all that apply)
☑ No significant changes projected.
☐ Groundwater remedy will be converted to monitored natural attenuation. Target date:
☐ Groundwater Pump & Treat will be shut down. Target date:
☐ Groundwater cleanup standards to be modified. Target date:
☐ PRP will request remedy modification. Target date of request:
☐ Change in the number of monitoring wells. ☐ Increasing or ☐ decreasing? Target date:
☐ Change in the number and/or types of analytes being analyzed. ☐ Increasing or ☐ decreasing? Target date:
☐ Change in groundwater extraction system. ☐ Expansion or ☐ minimization (i.e., number of extraction wells and/or pumping rate)? Target date:
☐ Modification on groundwater treatment? Elaborate below. Target date:
☐ Change in discharge location. Target date:
☑ Other modification(s) anticipated: Groundwater Remedy Optimization Elaborate below. Target date: 2016

Elaborate on Remedy Projections: EPA has requested that the MEW parties work to optimize performance of the groundwater remedy with respect to mass removal. Optimization programs for the former Fairchild Buildings 1-4, Building 18, and Building 19 sites are expected to include adjustments to the groundwater extraction remedies to increase the rate of VOC mass removal. The former Fairchild Building 19 site will be the first of the Fairchild sites evaluated for extraction well network optimization.

A Pilot Study Work Plan for Enhanced Groundwater Extraction was submitted to EPA on 30 June, 2015 (Geosyntec, 2015c) and Schlumberger has elected to proactively move forward with work plan implementation. The first phase of pilot study work was completed in December 2015 and included redevelopment of SCRWs 71A, RW-11A, RW-12A, and RW-26A between 19 and 23 December 2015, and baseline sampling of the optimization network and treatment system on 28 December 2015. Implementation of the pilot study scope of work will continue in 2016, including modification of the extraction rates to potentially increase VOC mass removal and monitoring of VOC concentrations at the SCRWs following flow rate modification. In accordance with the Work Plan, pilot study progress will be reported to the EPA in quarterly email updates through 2016 and summarized in the 2016 Annual Progress Report for the Site.

Remedy optimization at the former Building 9 site includes implementation of an ongoing ISCO pilot study. In 2015, two rounds of ISCO injections and associated monitoring were completed inside the Building 9 slurry wall boundary. The ISCO pilot study is being conducted in accordance with the Final Work Plan for In Situ Chemical Oxidation Pilot Study (Work Plan; Geosyntec, 2014c) and Addendum (Geosyntec, 2015a), and the Notification of Second Injection Event, In Situ Chemical Oxidation Pilot Study letter (Geosyntec, 2015e).[1] The ongoing pilot study is evaluating the effectiveness of injecting oxidant into the subsurface to reduce the concentration of VOCs in groundwater. A third ISCO injection is planned for spring 2016. An implementation report summarizing the ISCO pilot study results through the third injection event and presenting recommendations for future pilot study activities will be submitted to EPA in 2016 following the third ISCO injection.

[1] EPA conditionally approved the Work Plan on 2 January 2015 (EPA, 2015a). EPA approved the addendum on 30 January 2015 (EPA, 2015b). EPA concurred with the notification letter in an email dated 13 November 2015 (EPA, 2015d).

2015 Annual Report Remedy Performance Checklist

B. Projections – Slurry Walls (Check all that apply)

Remedy Projections for **the upcoming year**
☑ No significant changes projected.
☐ PRP will request remedy modification. Target date of request:
☐Change in the number of monitoring wells. ☐ Increasing or ☐ decreasing? Target date:
☐ Other modification(s) anticipated: Elaborate below. Target date:

Elaborate on Remedy Projections:

Remedy Projections for **the long-term**
☑ No significant changes projected.
☐ PRP will request remedy modification. Target date of request:
☐ Change in the number of monitoring wells. ☐ Increasing or ☐ decreasing? Target date:
☐ Other modification(s) anticipated: Elaborate below. Target date:

Elaborate on Remedy Projections:

C. Projections – Other Remedial Options Being Reviewed to Enhance Cleanup

Progress implementing recommendations from last report or Five-Year Review
Has optimization study been implemented or scheduled? ☑ Yes; No; If Yes, please elaborate.

In 2016, an ISCO pilot study will continue to be implemented at the former Fairchild Building 9 site and a pilot study for enhanced groundwater extraction will continue to be implemented at the former Fairchild Building 19 site.

XII. ADMINISTRATIVE ISSUES
Check all that apply:

☐ Explanation of Significant Differences in progress ☐ ROD Amendment in progress
☐ Site in operational and functional ("shake down") period;
☐ Notice of Intent to Delete in progress ☐ Partial site deletion in progress ☐ TI Waivers
☑ Other administrative issues:

Date of Next EPA Five-Year Review: September 2019

XIII. RECOMMENDATIONS

The reductions in groundwater gauging and sampling frequency that were requested in February 2015 will be evaluated as part of the 2016 Annual Progress Report. Groundwater elevations measurements in 2016 will only be collected in September in order to evaluate a potential reduction in gauging from a semi-annual to annual basis. Groundwater samples will be collect in September 2016 and compared to the 2014 sampling results to evaluate a potential reduction in sampling from an annual to biennial basis. Based on the analyses previously presented in the Request for Reduction in Groundwater Monitoring Frequency (Geosyntec, 2015b), it is anticipated that the evaluation will conclude that monitoring at a reduced frequency is adequate to demonstrate remedy effectiveness.

REFERENCES

EPA, 2015a. E-mail from Alana Lee/EPA, to Virgilio Cocianni/Schlumberger Technology Corporation providing Conditional approval of the Final ISCO Work Plan – 401 National Avenue, Mountain View CA, MEW Superfund Study Area. 2 January

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APPENDIX B

Laboratory Analytical Reports and Chain-of-Custody Documents, January through December 2015

(This appendix is being submitted to CD to the EPA only and is available upon request.)

APPENDIX C

QA/QC Report, Summary Tables, and Criteria

Weiss Associates

M E M O R A N D U M

TO: Eric Suchomel, PhD, PE
Geosyntec Consultants

FROM: Trish Eliasson, PE
Weiss Associates

DATE: March 29, 2016

RE: **2015 DATA QUALITY ASSURANCE/QUALITY CONTROL SUMMARY**
RGRP and Fairchild
Middlefield-Ellis-Whisman Study Area
Mountain View, California

This memorandum summarizes Weiss Associates' (Weiss) review of data quality for water samples collected in 2015 for the Regional Groundwater Remediation Program (RGRP) and former Fairchild facilities in the Middlefield-Ellis-Whisman (MEW) Study Area. Our review was conducted in general accordance with the MEW Quality Assurance Project Plan (QAPP)[1] and United States Environmental Protection Agency (USEPA) data review guidelines.[2,3] The data reviewed herein include field and laboratory data quality assurance and quality control (QA/QC) results for the following events.

- Two quarterly sampling events of six newly installed monitoring wells located North of 101 as part of the RGRP.
- Four quarterly sampling events of three newly installed monitoring wells located near Evandale Avenue as part of the RGRP.
- One semi-annual sampling event of monitoring well DW3-219 in May, 2015.
- Monthly water sampling at the RGRP North-101 (N101) and South-101 (S101) treatment systems and Fairchild treatment systems 1, 3, and 19. As required by the discharge permit, triennial metals sampling was conducted at the treatment systems in November 2015.[4]

No annual sampling was conducted for RGRP or Fairchild facility wells in 2015. In a letter dated February 13, 2015, Geosyntec requested that the USEPA reduce the frequency of groundwater gauging and monitoring to once every two years.[5] The USEPA provided written approval on

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[1] The QAPP includes the following: *Quality Assurance Project Plan, Middlefield-Ellis-Whisman Site, Mountain View, California,* prepared by Canonie Environmental Services Corporation, submitted on May 3, 1991 and approved in part by USEPA on July 22, 1991; modifications as presented in *Revision 1.0, Quality Assurance Project Plan, Middlefield-Ellis-Whisman Site, Mountain View, California,* prepared by Canonie, submitted on August 16, 1991; and the *Transmittal of Addendum to the Unified Quality Assurance Project Plan,* submitted on December 2, 1992 and approved by the USEPA on February 3, 1993.

[2] *National Functional Guidelines for Superfund Organic Methods Data Review,* prepared by the USEPA Contract Laboratory Program, OSWER 9240.1-48 USEPA-540-R-14-002, August 2014.

[3] *National Functional Guidelines for Inorganic Superfund Methods Data Review,* prepared by the USEPA Contract Laboratory Program, OSWER 9240.1-51 USEPA-540-R-13-001, August 2014.

[4] Monthly sampling at Systems 1 and 3 in November and December and triennial metals sampling at the same systems was not conducted due to consolidation of flow to S101.

[5] *Request for Reduction in Groundwater Monitoring Frequency. Middlefield-Ellis-Whisman Study Area, Mountain View, California,* letter report prepared by Geosyntec Consultants, February 13, 2015.

March 16, 2016 for trial reductions in groundwater gauging frequency from semi-annually to annually and groundwater monitoring frequency from annually to once every two years.[6]

FIELD QA/QC SAMPLE REQUIREMENTS

Per the QAPP, the following field QA/QC samples were collected:

Field duplicate – Field duplicate samples are blind duplicates that provide data to assess precision of the sampling method and contract laboratory. Field duplicates are specified to be collected at a frequency of 1 for every 20 field samples collected.

Matrix spike/Matrix spike duplicate – Matrix spike/matrix spike duplicate (MS/MSD) samples measure the accuracy and precision of the analytical methods. MS/MSD samples are specified at a frequency of 1 for every 20 field samples collected.

Rinseate blank – Rinseate blanks are collected to evaluate whether sampling equipment (e.g., bladder pumps used at monitoring wells for low-flow sampling) may be causing cross-contamination between sample locations. The blanks consist of distilled/organic-free water collected from a final rinse of sampling equipment after the decontamination procedure has been performed or before sampling equipment is deployed. Rinseate blank sampling is not necessary for locations that have dedicated sample collection, such as at groundwater extraction and treatment system (GWETS) sample ports. Rinseate samples are specified at a frequency of 1 for every 20 (5%) field samples.

Field blank – Field blanks are collected to assess if the source water used on-site for decontamination may affect the samples. The decontamination source water is distilled and organic-free. Field blanks are collected at a frequency of 5% of the samples collected.

Trip blank – Trip blanks assist in evaluating whether the exposure of a sample to site conditions, storage, and shipment may introduce volatile organic compounds (VOCs). These samples consist of volatile organic analysis vials (VOAs) filled with distilled/organic-free water and preserved with hydrochloric acid. These pre-filled VOAs are supplied by the laboratory and accompany the other samples in the field and to the laboratory. One trip blank accompanies each VOC sample shipment to the laboratory.

LABORATORY DATA QUALITY REVIEW PARAMETERS

Per the QAPP, Weiss verified that the sample results met the QAPP Level 2 requirements for completeness. A Level 2 data review includes reviewing the following parameters:

- Holding time;
- Detection and reporting limits;
- Surrogate recovery (VOC methods only);
- Laboratory control sample recovery;
- MS/MSD recovery;
- Method blank results;
- Trip blank results (VOC methods only);
- Field, rinseate and equipment blank results; and
- Field duplicate results.

[6] USEPA, 2016. *EPA Conditional Approval – Trial Reduction of Groundwater Monitoring Frequency, Middlefield-Ellis-Whisman (MEW) Superfund Area, Mountain View and Moffett Field, California.* March 16.

A Level 4 data validation review was not performed because annual sampling was not conducted in 2015 as part of the USEPA-approved trial evaluation of reduction in groundwater monitoring frequency.

REVIEW FINDINGS

Well Sampling

This section summarizes well sampling results from the quarterly and semi-annual events.

Field Sampling Data

A total of 10 groundwater monitoring and extraction wells were sampled during 2015 quarterly and semi-annual events, resulting in 25 primary samples. The total number of primary analyses and QA/QC samples for each laboratory test method are summarized in Table 1.

Weiss checked all chain-of-custody forms for completeness and accuracy before the samples were transported to the laboratory. The laboratory reported no sample quality concerns that resulted in qualified data. Temperatures in the sample coolers were acceptable for sample preservation, no significant headspace volumes were observed in the VOAs, and sample containers were properly preserved.

A total of 10 sample results were "J" qualified during the validation process. A J-qualifier, as defined by the USEPA, applies when an analyte is positively identified and the associated numerical value is qualified as an estimated concentration of the analyte in the sample. A “J” flag was applied to the 10 sample results because each result was between the method detection limit (MDL) and the reporting limit.

Field Duplicates. Field duplicates were collected for VOCs during each quarterly sampling event (Table 1). The required frequency of 1 field duplicate for every 20 field samples collected was satisfied as specified in the QAPP. Table 2 reports the relative percent difference (RPD) in concentrations for each of the duplicate sample pairs, the average RPD, the upper confidence level (UCL) as specified in the QAPP, and the precision acceptance limits for tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride. Table 2 shows that the RPDs for these analytes were within the respective precision acceptance limits.

Rinseate Blanks. Only disposable or dedicated equipment was used to sample each of the wells during the 2015 sampling period. Therefore, no rinseate blanks were collected.

Field Blanks. Only disposable or dedicated sampling equipment was used to sample each of the wells during the 2015 sampling period; therefore, no field blanks were collected.

Trip Blanks. A total of 6 trip blanks were analyzed for VOCs (Table 1). One blank was analyzed per shipping container with samples for VOC analysis. No VOCs were detected above reporting limits in any of the blanks.

Field Audit. Weiss performed an internal audit of sampling activities on November 11, 2015 as required by the QAPP. The audit consisted of observing sampling

activities conducted by two field technicians. The audit findings were that the sampling activities were in general accordance with the QAPP and Weiss standard operating procedures as appropriate.

Laboratory Data

The samples were analyzed by TestAmerica Laboratories, Inc., Pleasanton, California, which is certified by the Environmental Laboratory Accreditation Program of the California Department of Public Health for the analyses conducted.

Weiss reviewed the Level 2 QA/QC analysis results produced by the laboratory for the well sample analyses. Weiss confirmed that all samples were analyzed per the requested laboratory analyses, and all samples met the QAPP Level 2 requirements for completeness.

As part of the laboratory protocol specified in the QAPP, method blanks and laboratory control spikes (LCS) are required to be performed to verify accuracy, precision, and completeness.

Method Blanks. The required frequency for method blanks is 1 for every 20 field samples collected and the acceptance criterion is no detections above reporting limits. The required frequency and acceptance criterion were met.

Matrix Spike/Matrix Spike Duplicates. A total of 4 MS/MSD samples were analyzed for VOCs. The required frequency of 1 MS/MSD for every 20 field samples collected was met. The RPDs for all 4 MS/MSD sample pairs were below the 35% limit, and therefore met the precision goal specified in the QAPP.

Laboratory Control Spikes. As specified in the QAPP, the required frequency for LCS is 1 for every 20 field samples, and the acceptance range is 80% to 120% recovery. The required LCS frequency was met. However, the acceptance range was not met for all compounds. The acceptance criteria in the QAPP was set in 1991 and is considered out-of-date as laboratories are continually calibrating their equipment and updating their capabilities for percent recovery for each compound based on the equipment used. In accordance with the USEPA Test Method[7], it is necessary for the laboratory to develop single-laboratory performance data for accuracy and precision in the matrices of interest. The laboratory has developed their own in-house LCS recovery limits, which were used as the acceptance criteria for the 2015 data. The laboratory LCS ranges were met for all compounds.

Groundwater Extraction and Treatment System Sampling

Field Sampling Data

A total of 279 primary samples and 56 field duplicates were collected from RGRP Systems N101 and S101 and from Fairchild Systems 1, 3 and 19 throughout the year. The total number of

[7] Method 8000C, Determinative Chromatographic Separations. Revision 3. USEPA March, 2003.

primary analyses, duplicate analyses and QA/QC samples for each laboratory test method are summarized in Table 3.

The samples were collected, stored, transported, and managed according to USEPA protocols based on Weiss's review of field and laboratory documentation. The laboratories reported that sample temperature and holding times were within acceptable ranges.

No data were rejected during the validation process, and a "detected, but not quantified (DNQ)" qualification was applied to 244 sample results. DNQ qualifier applies when an analyte is detected between the MDL and the reporting limit. The DNQ naming convention is unique to the treatment system data because the National Pollutant Discharge Elimination System Permit requires this qualification code.

Field Duplicates. The required frequency of 1 field duplicate for every 20 field samples collected was satisfied as specified in the QAPP. Table 4 reports the RPD in concentrations for each of the duplicate sample pairs, average RPDs, resultant UCLs and precision acceptance limits for 1,4-dioxane, PCE, TCE, cis-1,2-DCE and vinyl chloride. Table 5 reports the RPD in concentrations for each of the duplicate sample pairs for metals and cyanide samples. Table 6 reports the RPD in concentrations for each of the duplicate sample pairs for selenium. All RPDs for analyte concentrations presented in Tables 4 through 6 were below the precision acceptance limit.

Trip Blanks. Fifty-nine trip blanks were analyzed for VOCs, meeting the QAPP requirement of one trip blank for each GWETS sample shipment to the laboratory. No VOCs were detected above method detection limits in the trip blanks.

Laboratory Data

The samples were analyzed by the following laboratories, each certified by the Environmental Laboratory Accreditation Program of the California Department of Public Health for the analyses they conducted:

- TestAmerica Laboratories, Inc., Pleasanton, California;
- Caltest Analytical Laboratory, Napa, California; and
- McCampbell Analytical, Inc., Pittsburg, California.

Per the QAPP, Weiss verified that the samples from the treatment systems met the QAPP Level 2 requirements for completeness. Our review confirmed that all samples were analyzed per the requested laboratory analyses and that all method holding times were met. No significant deviations from the required reporting limits were identified, and no data were rejected. However, as mentioned above, DNQ qualifiers were applied to 244 sample results.

As part of the laboratory protocol specified in the QAPP, method blanks and LCS are required to be performed to verify accuracy, precision, and completeness.

Method Blanks. The required frequency for method blanks is 1 for every 20 field samples collected, and the acceptance criterion is no detections above method detection limits. The required frequency was met. A trace amount of mercury was detected in one

laboratory method blank. The concentration of mercury was reported as DNQ, and was significantly less than that of the primary samples. Therefore the associated primary sample results were not qualified further or rejected.

Matrix Spike/Matrix Spike Duplicates. A total of 36 MS/MSD samples were analyzed from system samples (Table 3). The required frequency of 1 MS/MSD for every 20 field samples collected was met. The RPDs for all MS/MSD sample pairs were below the respective laboratory precision goal limits specified in the QAPP.

Laboratory Control Spikes. As specified in the QAPP, the required frequency for LCS is 1 for every 20 field samples and the acceptance range is 80% to 120% recovery. The required LCS frequency was met. However, the acceptance range was not met for all compounds. The acceptance criteria in the QAPP was set in 1991 and is considered out-of-date as laboratories are continually calibrating their equipment and updating their capabilities for percent recovery for each compound based on the equipment used. Therefore, there are several compounds where the QAPP acceptance criteria of 80% to 120% cannot be met using modern laboratory practices. The laboratory LCS ranges were not met for compounds in five data packets. The recovery for these compounds was greater than the laboratory LCS range. However, there were no detections of these analytes in the associated field samples, so there were no qualifications applied.

COMPLETENESS STATEMENT

A total of 11,266 results were generated from the well and system sampling for the RGRP and Fairchild in 2015. No laboratory results were qualified as "rejected," therefore 100% of the data in the project database for the 2015 year is valid. The QAPP requires that valid data constitute at least 90% of the total data collected. Therefore, the completeness goal for water sampling in 2015 was met.

TABLES

Table 1. Quantities of Primary Well and Associated Quality Assurance Samples Analyzed in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Analytes	Laboratory Method	Primary Samples	Field Duplicates	Field Blanks	Rinseate Blanks	Trip Blanks	Matrix Spike/ Matrix Spike Duplicates	Total
VOCs	USEPA Method 8260	25	4	0	0	6	4	**39**

Notes:

Only disposable sampling equipment was used, therefore field blanks and rinseate blanks were not collected.

Abbreviations:

RGRP – Regional Groundwater Remediation Program

USEPA – United States Environmental Protection Agency

VOCs – volatile organic compounds

Table 2. VOC Results for Groundwater Duplicate Samples Collected from Wells in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

		cis-1,2-DCE		PCE		TCE		Vinyl Chloride	
Well ID	**Sample Date**	**(µg/L)**	**RPD**	**(µg/L)**	**RPD**	**(µg/L)**	**RPD**	**(µg/L)**	**RPD**
BC-2-B1	3/16/2015	<0.50		<0.50		3.6		<0.50	
BC-2-B1 (DUP)	3/16/2015	<0.50	NC	<0.50	NC	3.3	9	<0.50	NC
BC-1-A	6/18/2015	<0.50		<0.50		<0.50		<0.50	
BC-1-A (DUP)	6/18/2015	<0.50	NC	<0.50	NC	<0.50	NC	<0.50	NC
ED-3-B1	9/22/2015	<0.50		<0.50		1.7		<0.50	
ED-3-B1 (DUP)	9/22/2015	<0.50	NC	<0.50	NC	1.7	0	<0.50	NC
ED-3-B1	12/17/2015	<0.50		<0.50		1.4		<0.50	
ED-3-B1 (DUP)	12/17/2015	<0.50	NC	<0.50	NC	1.7	19	<0.50	NC
Average RPD			---		---		9		---
UCL			---		---		24		---
Precision Acceptance Limit			---		---		33		---

Notes:

For duplicates where both results are not detected, no calculation is performed.

VOCs analyzed by USEPA Method 8260B

Per the 1991 MEW Quality Assurance Project Plan:

RPD = (X1-X2) /((X1+X2) / 2)*100, where X1 is the concentration in sample 1 and X2 is the concentration in sample 2.

UCL = 3*s, where s is the standard deviation of the RPDs for that analyte.

Precision Acceptance Limit = average RPD + UCL

Abbreviations:

--- – not applicable
cis-1,2-DCE – cis-1,2-dichloroethene
DUP – duplicate sample
MEW – Middlefield-Ellis-Whisman
NC – not calculated
PCE – tetrachloroethene
RPD – relative percent difference
TCE – trichloroethene
UCL – upper confidence level
USEPA – United States Environmental Protection Agency
VOCs – volatile organic compounds
µg/L – micrograms per liter
< # – analyte not detected above the reporting limit of "#"

Table 3. Quantities of System and Associated Quality Assurance Samples Analyzed in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Analytes	Lab Method	Primary Samples Analyzed	Field Duplicates	Trip Blanks	Matrix Spike/ Matrix Spike Duplicates	Total
Volatile organic compounds	USEPA Method 8260B	222	24	59	20	325
1,4-Dioxane	USEPA Method 8270C	27	16	0	4	47
Priority Pollutant Metals	USEPA Method 200.8	3	2	0	2	7
Zinc	USEPA Method 200.8	3	2	0	2	7
Selenium	USEPA Method 200.8	9	6	0	2	17
Low-Level Mercury	USEPA Method 1631E	3	2	0	3	8
Cyanide	Standard Method 4500-CN	3	2	0	1	6
Hexavalent Chromium	USEPA Method 7199	3	2	0	1	6
Turbidity	USEPA Method 180.1	3	0	0	1	4
96-hour Fish Bioassay	E2000 (821-R-02-012)	3	0	0	0	3
Total		**279**	**56**	**59**	**36**	**430**

Abbreviations:
RGRP - Regional Groundwater Remediation Program
USEPA - United States Environmental Protection Agency

Table 4. Summary of Results for VOCs and 1,4-Dioxane Duplicate Samples Collected during Treatment System Sampling in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Treatment System Owner	Treatment System	Sample Date	Sample Location	cis-1,2-DCE		PCE		TCE		Vinyl Chloride		1,4-Dioxane	
				(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD
RGRP	N101	1/15/2015	Influent	190		<5.0		600		<5.0		---	
RGRP	N101	1/15/2015	Influent (DUP)	190	0	<5.0	NC	620	3	<5.0	NC	---	---
RGRP	N101	2/19/2015	Influent	---		---		---		---		2.5	
RGRP	N101	2/19/2015	Influent (DUP)	---	---	---	---	---	---	---	---	2.1	17
RGRP	N101	3/16/2015	Influent	180		<5.0		530		<5.0		---	
RGRP	N101	3/16/2015	Influent (DUP)	210	15	<5.0	NC	590	11	<5.0	NC	---	---
RGRP	N101	4/10/2015	Influent	180		<5.0		640		<5.0		---	
RGRP	N101	4/10/2015	Influent (DUP)	180	0	<5.0	NC	640	0	<5.0	NC	---	---
RGRP	N101	5/27/2015	Effluent	---		---		---		---		2.0	
RGRP	N101	5/27/2015	Effluent (DUP)	---	---	---	---	---	---	---	---	1.7	16
RGRP	N101	6/25/2015	Influent	190		<5.0		580		<5.0		---	
RGRP	N101	6/25/2015	Influent (DUP)	190	0	<5.0	NC	580	0	<5.0	NC	---	---
RGRP	N101	7/23/2015	Influent	180		<5.0		430		<5.0		---	
RGRP	N101	7/23/2015	Influent (DUP)	210	15	<5.0	NC	510	17	<5.0	NC	---	---
RGRP	N101	8/19/2015	Influent	---		---		---		---		2.7	
RGRP	N101	8/19/2015	Influent (DUP)	---	---	---	---	---	---	---	---	2.5	8
RGRP	N101	9/4/2015	Influent	200		<5.0		670		<5.0		---	
RGRP	N101	9/4/2015	Influent (DUP)	200	0	<5.0	NC	630	6	<5.0	NC	---	---
RGRP	N101	10/5/2015	Influent	230		<5.0		610		<5.0		---	
RGRP	N101	10/5/2015	Influent (DUP)	230	0	<5.0	NC	620	2	<5.0	NC	---	---
RGRP	N101	11/24/2015	Effluent	---		---		---		---		1.9	
RGRP	N101	11/24/2015	Effluent (DUP)	---	---	---	---	---	---	---	---	2.1	10
RGRP	N101	12/14/2015	Influent	210		<5.0		670		<5.0		---	
RGRP	N101	12/14/2015	Influent (DUP)	210	0	<5.0	NC	670	0	<5.0	NC	---	---

Table 4. Summary of Results for VOCs and 1,4-Dioxane Duplicate Samples Collected during Treatment System Sampling in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Treatment System Owner	Treatment System	Sample Date	Sample Location	cis-1,2-DCE		PCE		TCE		Vinyl Chloride		1,4-Dioxane	
				(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD
RGRP	S101	2/19/2015	Influent	61		<10		1,200		<10		---	
RGRP	S101	2/19/2015	Influent (DUP)	60	2	<25	NC	1,100	9	<25	NC	---	---
RGRP	S101	5/21/2015	Influent	71		<10		1,300		<10		---	
RGRP	S101	5/21/2015	Influent (DUP)	56	24	<10	NC	1,100	17	<10	NC	---	---
RGRP	S101	8/17/2015	Influent	44		<5.0		830		<5.0		---	
RGRP	S101	8/17/2015	Influent (DUP)	42	5	<10	NC	740	11	<10	NC	---	---
RGRP	S101	11/24/2015	Influent	280		2.6		1,100		<5.0		1.1	
RGRP	S101	11/24/2015	Influent (DUP)	280	0	<10	NC	970	13	<10	NC	1.1	0
RGRP	S101	12/14/2015	Influent	370		2.5		1,100		<5.0		---	
RGRP	S101	12/14/2015	Influent (DUP)	360	3	<10	NC	1,000	10	<10	NC	---	---
RGRP	S101	12/14/2015	Effluent	---		---		---		---		<0.97	
RGRP	S101	12/14/2015	Effluent (DUP)	---	---	---	---	---	---	---	---	<0.97	NC
Fairchild	System 1	1/15/2015	Midpoint 2	<0.50		<0.50		<0.50		3.1		---	
Fairchild	System 1	1/15/2015	Midpoint 2 (DUP)	<0.50	NC	<0.50	NC	<0.50	NC	3.0	3	---	---
Fairchild	System 1	3/16/2015	Effluent	---		---		---		---		<1.0	
Fairchild	System 1	3/16/2015	Effluent (DUP)	---	---	---	---	---	---	---	---	<1.0	NC
Fairchild	System 1	4/10/2015	Influent	390		<10		980		<10		---	
Fairchild	System 1	4/10/2015	Influent (DUP)	420	7	<10	NC	1,000	2	<10	NC	---	---
Fairchild	System 1	6/25/2015	Midpoint 2	<0.50		<0.50		<0.50		2.2		---	
Fairchild	System 1	6/25/2015	Midpoint 2 (DUP)	<0.50	NC	<0.50	NC	<0.50	NC	2.3	4	---	---
Fairchild	System 1	7/24/2015	Influent	330		<10		770		<10		---	
Fairchild	System 1	7/24/2015	Influent (DUP)	330	0	1.7	NC	780	1	2.6	NC	---	---
Fairchild	System 1	8/21/2015	Effluent	---		---		---		---		<1.0	
Fairchild	System 1	8/21/2015	Effluent (DUP)	---	---	---	---	---	---	---	---	<1.0	NC
Fairchild	System 1	10/2/2015	Midpoint 2	<0.50		<0.50		<0.50		0.51		---	
Fairchild	System 1	10/2/2015	Midpoint 2 (DUP)	<0.50	NC	<0.50	NC	<0.50	NC	0.83	48	---	---

Table 4. Summary of Results for VOCs and 1,4-Dioxane Duplicate Samples Collected during Treatment System Sampling in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Treatment System Owner	Treatment System	Sample Date	Sample Location	cis-1,2-DCE (µg/L)	cis-1,2-DCE RPD	PCE (µg/L)	PCE RPD	TCE (µg/L)	TCE RPD	Vinyl Chloride (µg/L)	Vinyl Chloride RPD	1,4-Dioxane (µg/L)	1,4-Dioxane RPD
Fairchild	System 3	2/19/2015	Influent	---		---		---		---		2.2	
Fairchild	System 3	2/19/2015	Influent (DUP)	---	---	---	---	---	---	---	---	2.8	24
Fairchild	System 3	3/16/2015	Influent	520		7.0		870		<10		---	
Fairchild	System 3	3/16/2015	Influent (DUP)	680	27	6.9	1	1,100	23	<5.0	NC	---	---
Fairchild	System 3	5/21/2015	Influent	---		---		---		---		2.1	
Fairchild	System 3	5/21/2015	Influent (DUP)	---	---	---	---	---	---	---	---	1.9	10
Fairchild	System 3	8/21/2015	Influent	600		5.7		930		<5.0		---	
Fairchild	System 3	8/21/2015	Influent (DUP)	600	0	5.7	0	920	1	<5.0	NC	---	---
Fairchild	System 19	2/19/2015	Influent	220		<10		680		4.7		---	
Fairchild	System 19	2/19/2015	Influent (DUP)	230	4	<5.0	NC	680	0	4.7	0	---	---
Fairchild	System 19	5/21/2015	Influent	260		<10		570		<10		---	
Fairchild	System 19	5/21/2015	Influent (DUP)	250	4	<2.5	NC	670	16	5.2	NC	---	---
Fairchild	System 19	9/9/2015	Influent	270		<5.0		940		6.7		---	
Fairchild	System 19	9/9/2015	Influent (DUP)	270	0	<5.0	NC	930	1	6.7	0	---	---
Fairchild	System 19	11/24/2015	Influent	170		<5.0		490		4.3		---	
Fairchild	System 19	11/24/2015	Influent (DUP)	160	6	<5.0	NC	470	4	4.0	7	---	---
Average RPD					5		1		7		10		12
UCL					24		2		21		51		22
Precision Acceptance Limit					29		3		28		61		34

Notes:

For duplicates where both results are not detected, no calculation is performed. For duplicate pairs where the analyte was detected in one sample but not in the other and the detection limit is below the detected value, half the reporting limit was used as the concentration for the sample with no analyte detected. For duplicate pairs where the analyte was detected in one sample but not in the other sample and the detection limit is higher than the detected value, no calculation is performed.

VOCs analyzed by USEPA Method 8260B

1,4-Dioxane analyzed by USEPA Method 8270C

Per the 1991Quality Assurance Project Plan:

RPD = (X1-X2) /((X1+X2) / 2)*100, where X1 is the concentration in sample 1 and X2 is the concentration in sample 2.

UCL = 3*s, where s is the standard deviation of the RPDs for that analyte.

Precision Acceptance Limit = average RPD + UCL

Abbreviations:

cis-1,2-DCE – cis-1,2-dichloroethene

DUP – duplicate sample

NC – not calculated

PCE – tetrachloroethene

RGRP – Regional Groundwater Remediation Program

RPD – relative percent difference

TCE – trichloroethene

UCL – upper confidence level

USEPA – United States Environmental Protection Agency

VOCs – volatile organic compounds

µg/L – micrograms per liter

--- – not analyzed

< # – analyte not detected above the reporting limit of "#

Table 5. Triennial Metals and Cyanide Results for Duplicate Samples from Treatment System Sampling in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Treatment System Owner	Treatment System	Sample Date	Sample Location	Antimony		Arsenic		Beryllium		Cadmium		Chromium		Copper		Cyanide		Lead		Nickel		Silver		Thallium		Zinc		Hexavalent Chromium		Low-Level Mercury	
				(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(µg/L)	RPD	(ng/L)	RPD
RGRP	S101	11/24/2015	Effluent	<0.50		0.82		<0.20		0.066 DNQ		3.1		<0.50		<1.0		0.076 DNQ		3.3		<0.20		0.17		1		<0.50		<0.50	
RGRP	S101	11/24/2015	Effluent (DUP)	<0.50	NC	0.77	6	<0.20	NC	<0.10	NC	<0.50	170	<0.50	NC	0.76 DNQ	NC	0.057 DNQ	29	2.8	16	<0.20	NC	0.050 DNQ	109	1.1	10	<0.50	NC	<0.50	NC
RGRP	N101	11/24/2015	Effluent	0.20 DNQ		0.54		<0.20		0.081 DNQ		<0.50		4.0		1.0		0.18		1.9		0.10 DNQ		0.15		3.1		0.16 DNQ		1.1	
RGRP	N101	11/24/2015	Effluent (DUP)	<0.50	NC	0.65	18	<0.20	NC	<0.10	NC	0.38 DNQ	NC	2.3	54	0.76 DNQ	27	0.22	20	0.77	85	<0.20	NC	0.053 DNQ	96	3.3	6	0.16 DNQ	0	0.47 DNQ	80
Average RPD					---		12		---		---		---		---		---		24		51		---		102		8		---		---
UCL (three standard deviations)					---		18		---		---		---		---		---		13		102		---		20		5		---		---
Precision Acceptance Limit					---		31		---		---		---		---		---		37		153		---		123		13		---		---

Notes:

For duplicates where both results are not detected, no calculation is performed. For duplicate pairs where the analyte was detected in one sample but not in the other and the detection limit is below the detected value, half the reporting limit was used as the concentration for the sample with no analyte detected. For duplicate pairs where the analyte was detected in one sample but not in the other sample and the detection limit is higher than the detected value, no calculation is performed.

Cyanide analyzed by SM20-4500-CN

Hexavalent chromium analyzed by USEPA Method 7199

Low-level mercury analyzed by USEPA Method 1631E

Priority pollutant metals analyzed by USEPA Method 200.8

Per the 1991 MEW Quality Assurance Project Plan:

RPD = (X1-X2) /((X1+X2) / 2))*100 where X1 is the concentration in sample 1 and X2 is the concentration in sample 2.

UCL = 3*s where s is the standard deviation of the RPDs for that analyte.

Precision Acceptance Limit = average RPD + UCL

For analytes with only one calculated RPD, the average RPD, UCL, and Precision Acceptance Limit were not calculated.

Abbreviations:

--- – not applicable

DNQ – laboratory estimated value below the reporting limit but above the method detection limit

DUP – duplicate sample collected at indicated location

MEW – Middlefield-Ellis-Whisman

NC – not calculated

ng/L – nanograms per liter

RGRP – Regional Groundwater Remediation Program

RPD – relative percent difference

UCL – upper confidence level

USEPA – United States Environmental Protection Agency

µg/L – micrograms per liter

< # – analyte not detected above the reporting limit of "#"

Table 6. Selenium Results for Duplicate Samples from Treatment System Sampling in 2015, RGRP and Fairchild Sampling, Middlefield-Ellis-Whisman Study Area, Mountain View, California

Treatment System Owner	Treatment System	Sample Date	Sample Location	Selenium (µg/L)	RPD
RGRP	N101	2/19/2015	Effluent	5.9	
RGRP	N101	2/19/2015	Effluent (DUP)	6.0	2
RGRP	N101	8/19/2015	Effluent	5.8	
RGRP	N101	8/19/2015	Effluent (DUP)	5.9	2
RGRP	N101	11/24/2015	Effluent	2.9	
RGRP	N101	11/24/2015	Effluent (DUP)	5.1	55
Fairchild	System 1	2/19/2015	Effluent	10	
Fairchild	System 1	2/19/2015	Effluent (DUP)	9.6	4
Fairchild	System 1	8/21/2015	Effluent	8.1	
Fairchild	System 1	8/21/2015	Effluent (DUP)	8.4	4
Average RPD					13
UCL (three standard deviations)					63
Precision Acceptance Limit					76

Notes:

Selenium analyzed by USEPA Method 200.8.

Per the 1991 MEW Quality Assurance Project Plan:

RPD = (X1-X2) /((X1+X2) / 2))*100 where X1 is the concentration in sample 1 and X2 is the concentration in sample 2.

UCL = 3*s where s is the standard deviation of the RPDs for that analyte.

Precision Acceptance Limit = average RPD + UCL

Abbreviations:

DUP – duplicate sample collected at indicated location

MEW – Middlefield-Ellis-Whisman

RGRP – Regional Groundwater Remediation Program

RPD – relative percent difference

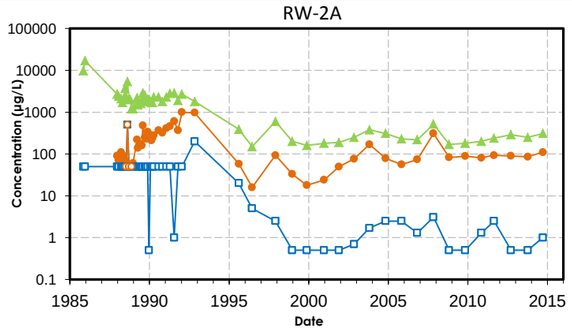
UCL – upper confidence level

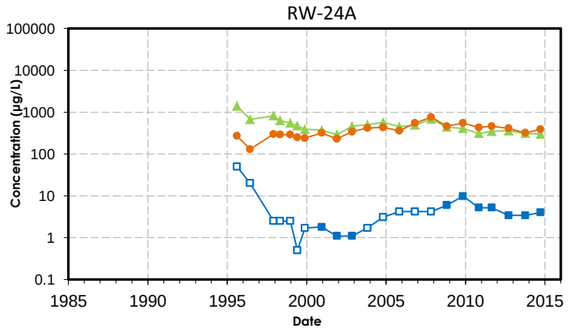
USEPA – United States Environmental Protection Agency

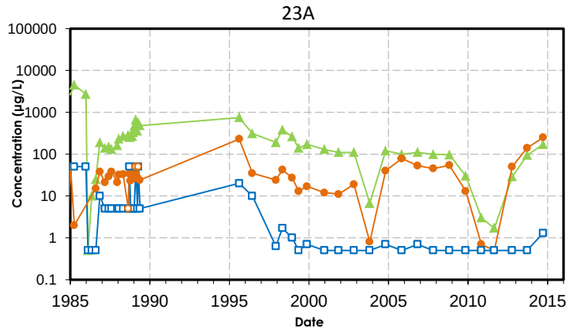
µg/L – micrograms per liter

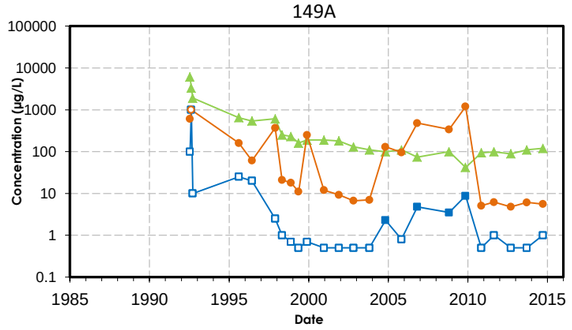
APPENDIX D

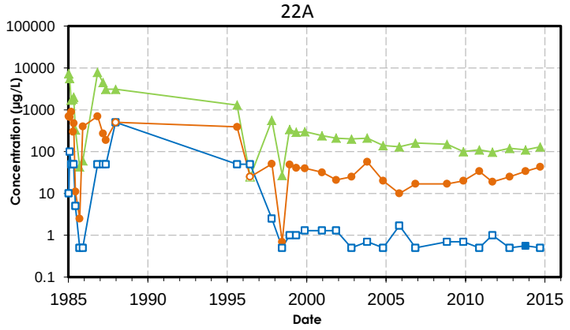
VOCs versus Time Graphs

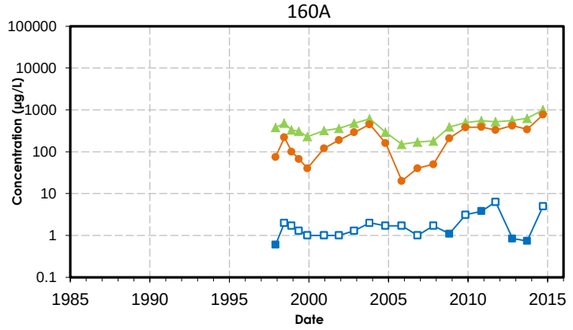


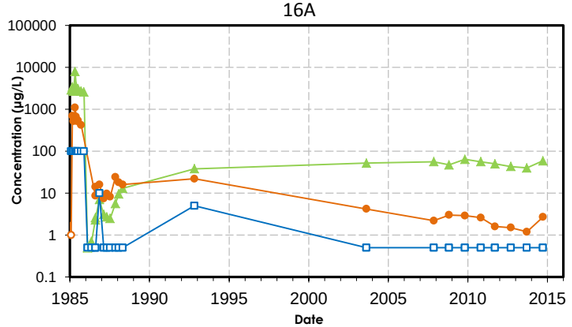


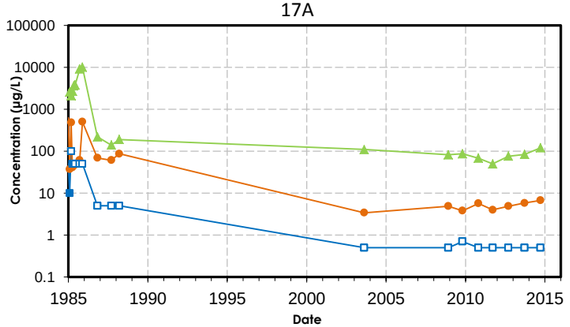


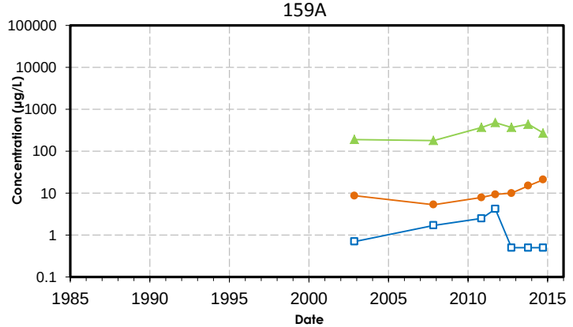


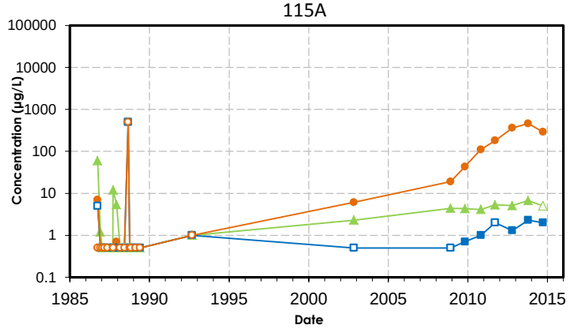


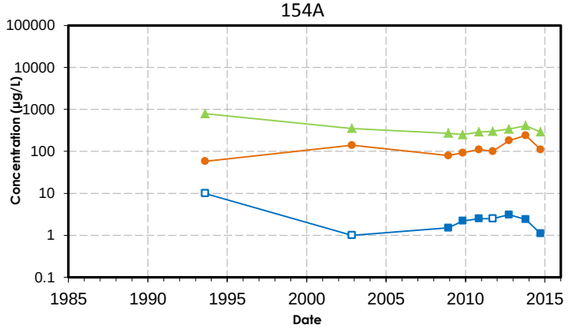


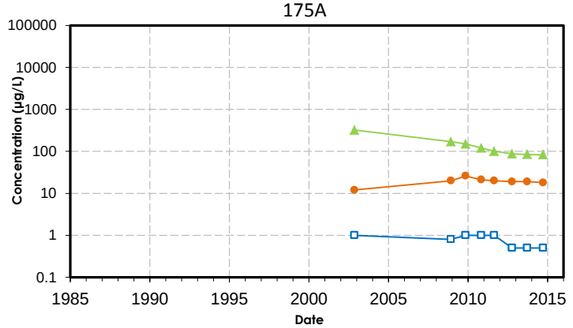






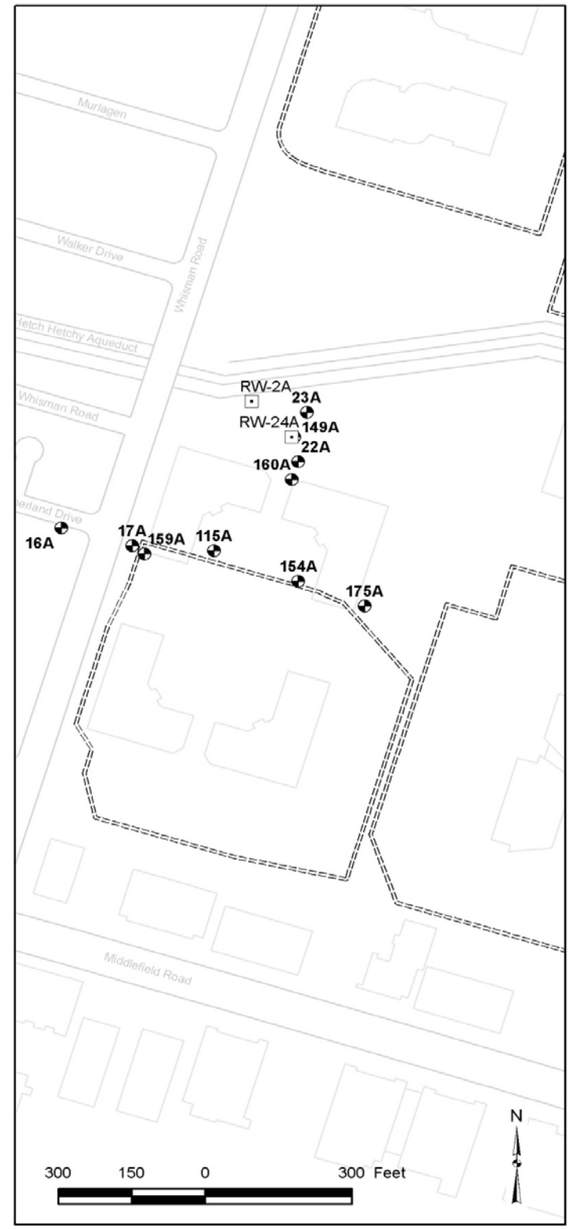






Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride

Note:
Open symbols are non-detects, presented at limit of quantification



16A Monitoring Well

RW-2A Extraction Well (On)

Chlorinated Ethenes in Groundwater
A Aquifer Wells

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure **D-1**

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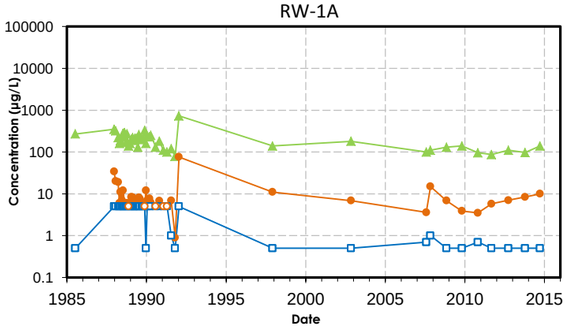
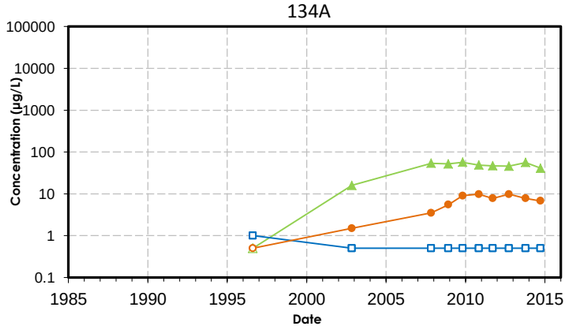
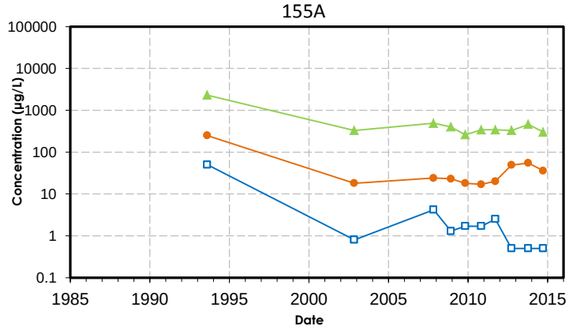
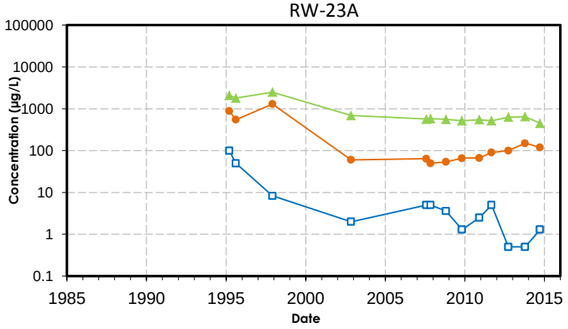
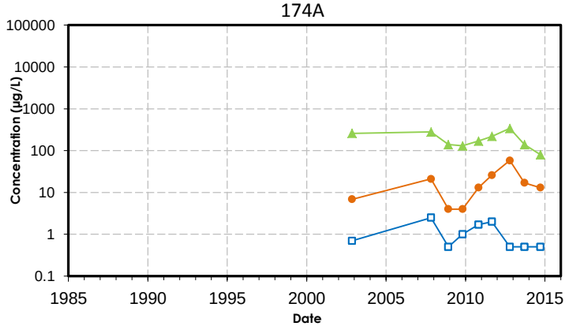
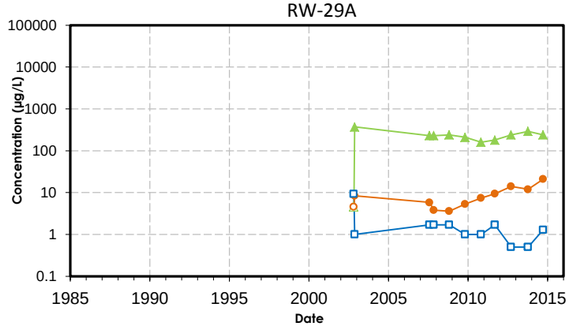


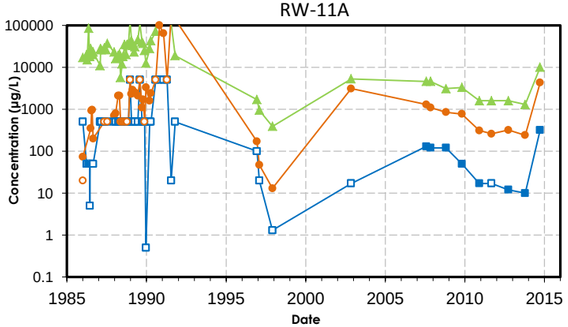


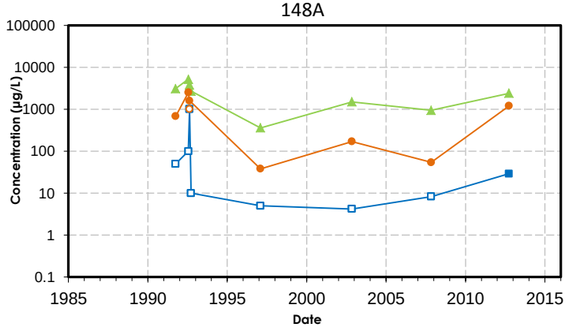


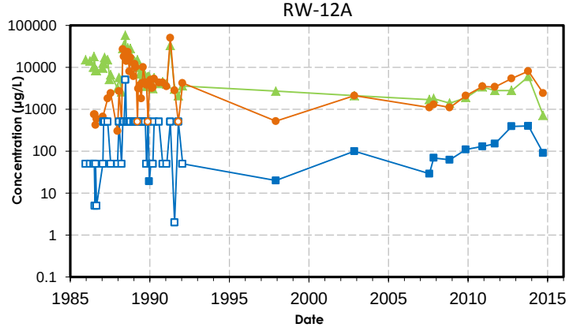


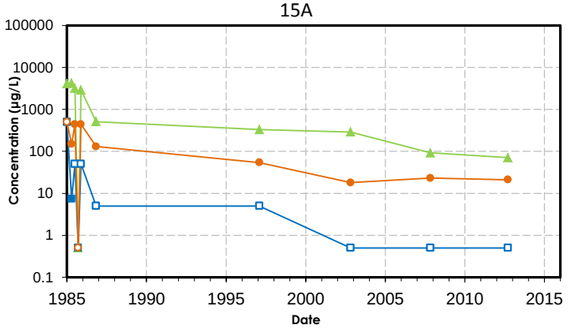


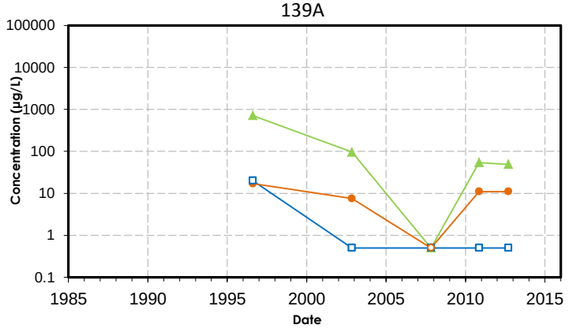


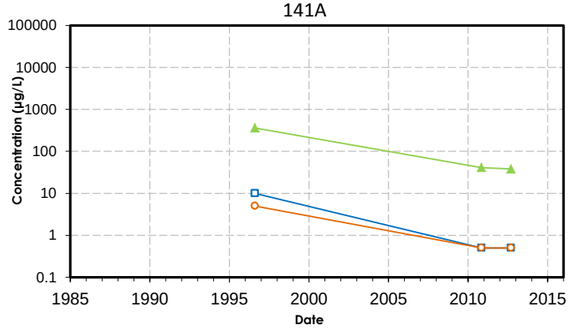






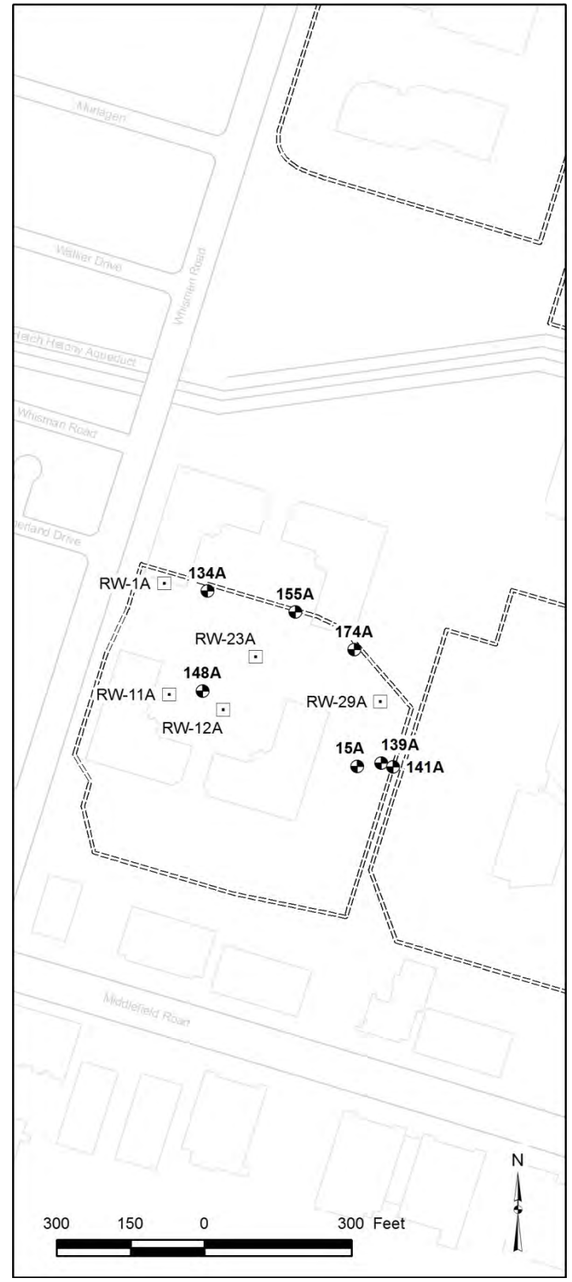






Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride

Note:
Open symbols are non-detects, presented at limit of quantification



148A Monitoring Well

RW-1A Extraction Well (On)

Chlorinated Ethenes in Groundwater
A Aquifer Wells

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2016

Figure **D-2**

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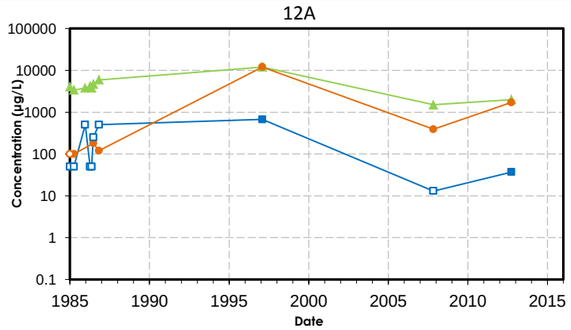
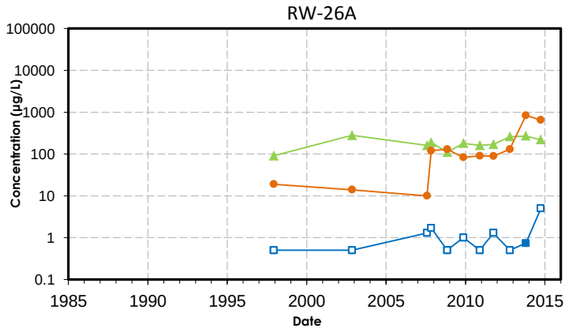
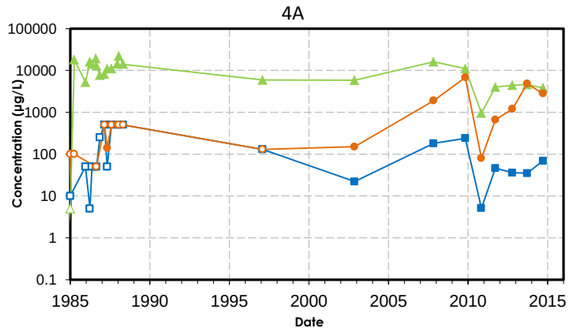
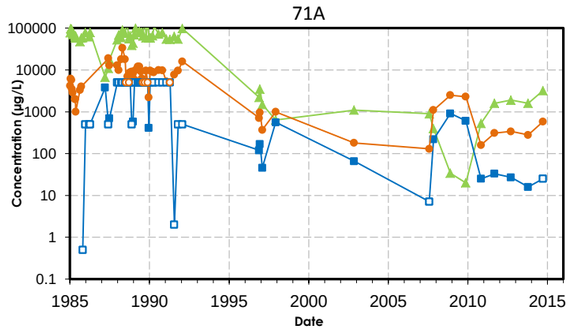
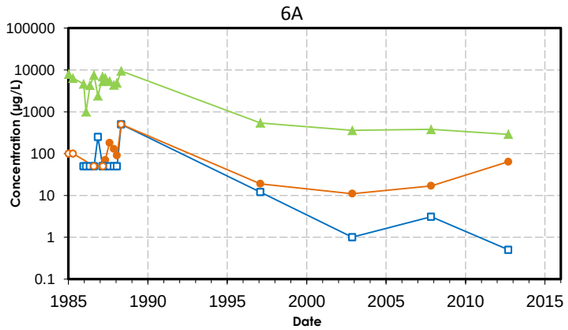
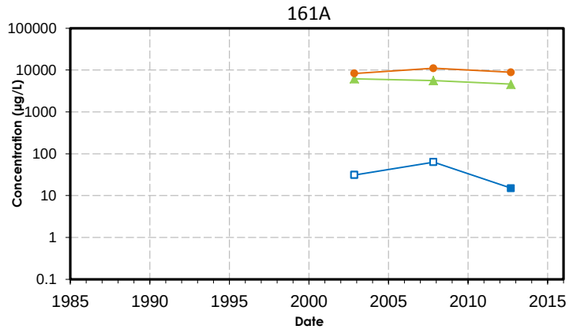


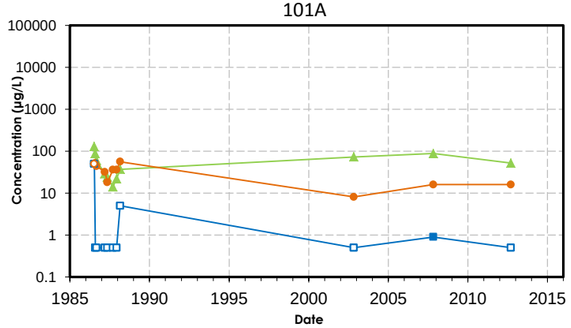


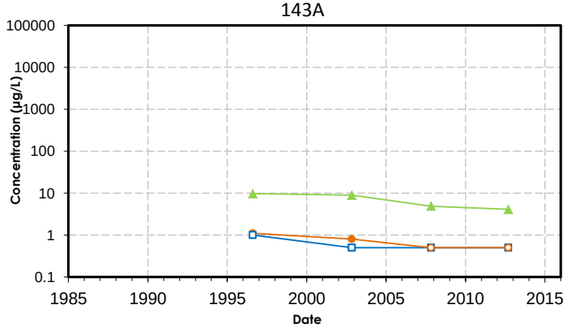


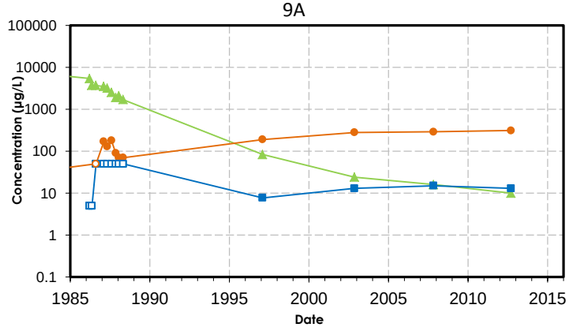


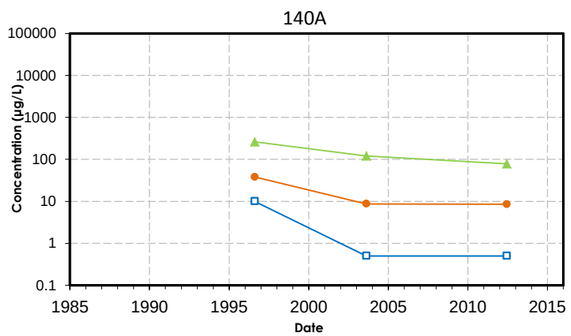












Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride

Note:
Open symbols are non-detects, presented at limit of quantification

140A Monitoring Well
71A Extraction Well (On)
RW-26A Extraction Well (Off)

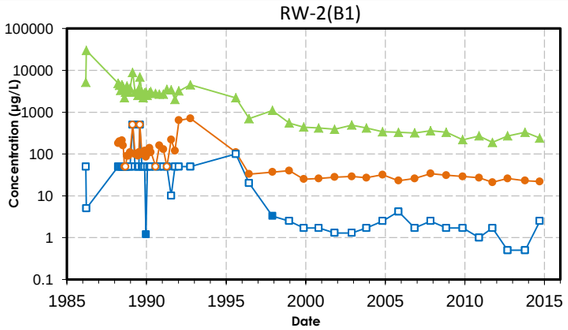
Chlorinated Ethenes in Groundwater
A Aquifer Wells
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

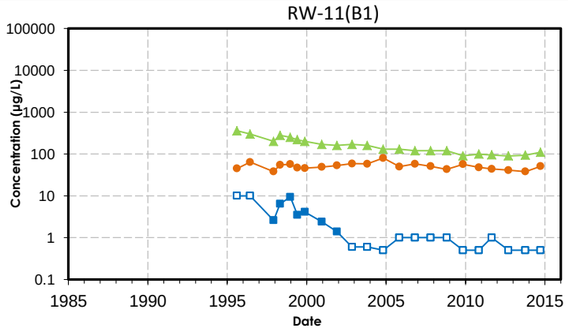
Geosyntec consultants

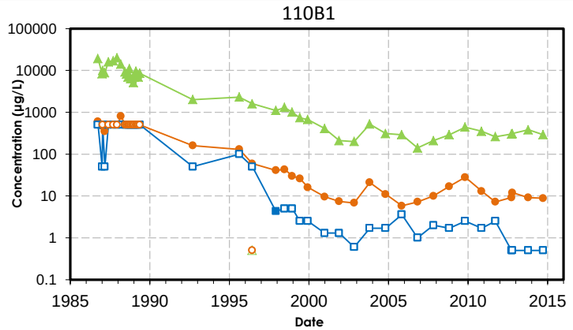
Figure **D-3**

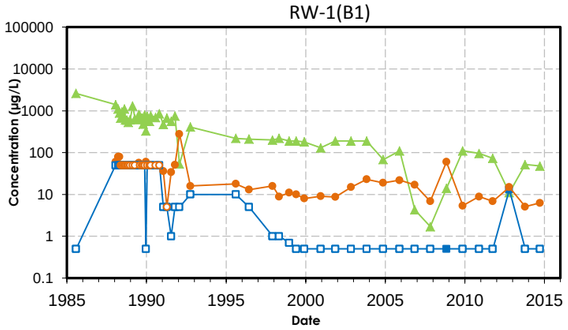
Oakland | April 2016

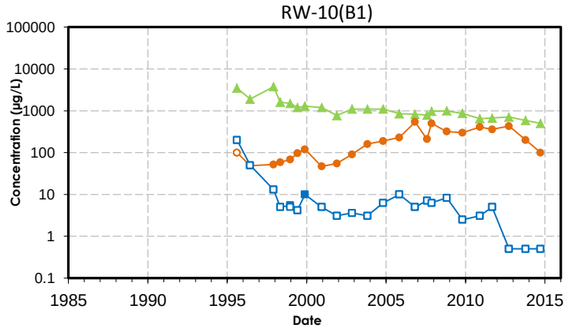
\\oakland-01\data\GIS\MEW\Excel\Fairchild\2015_AR\Building19\[FigD-3_TimeSeries.xlsx]

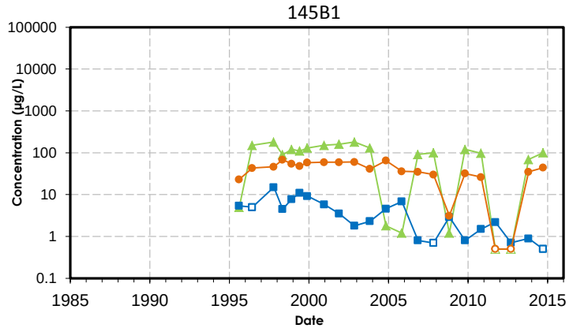


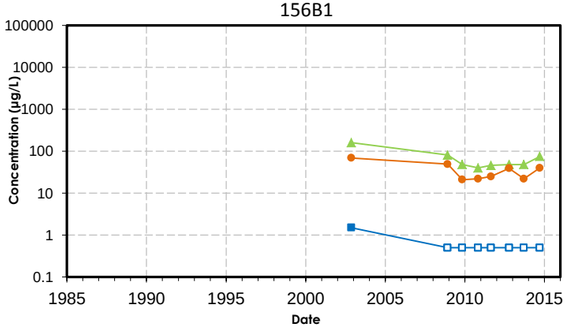


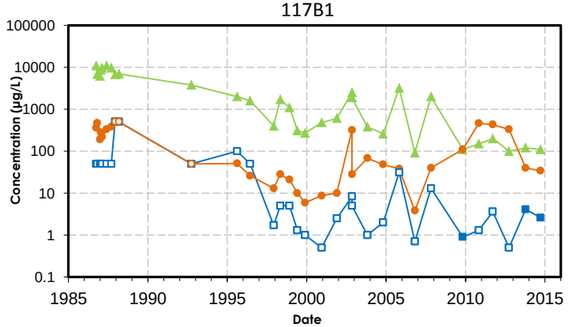


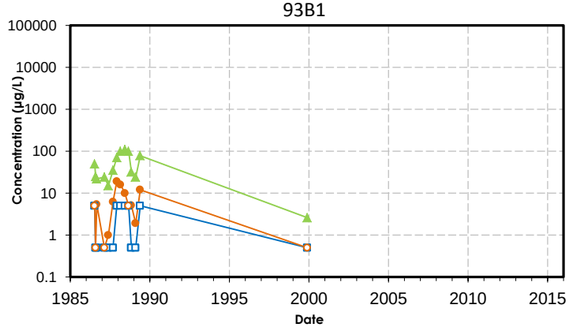


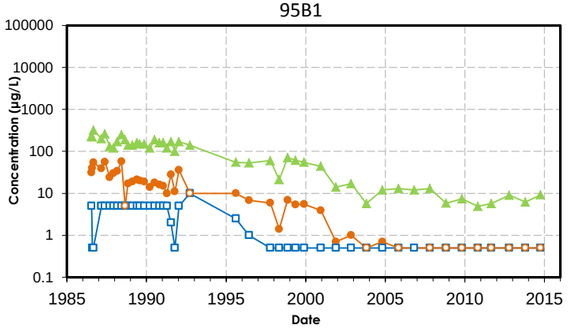


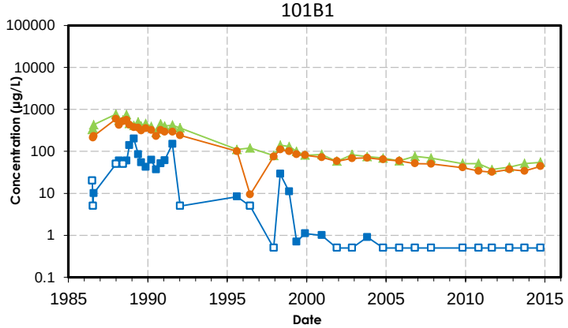






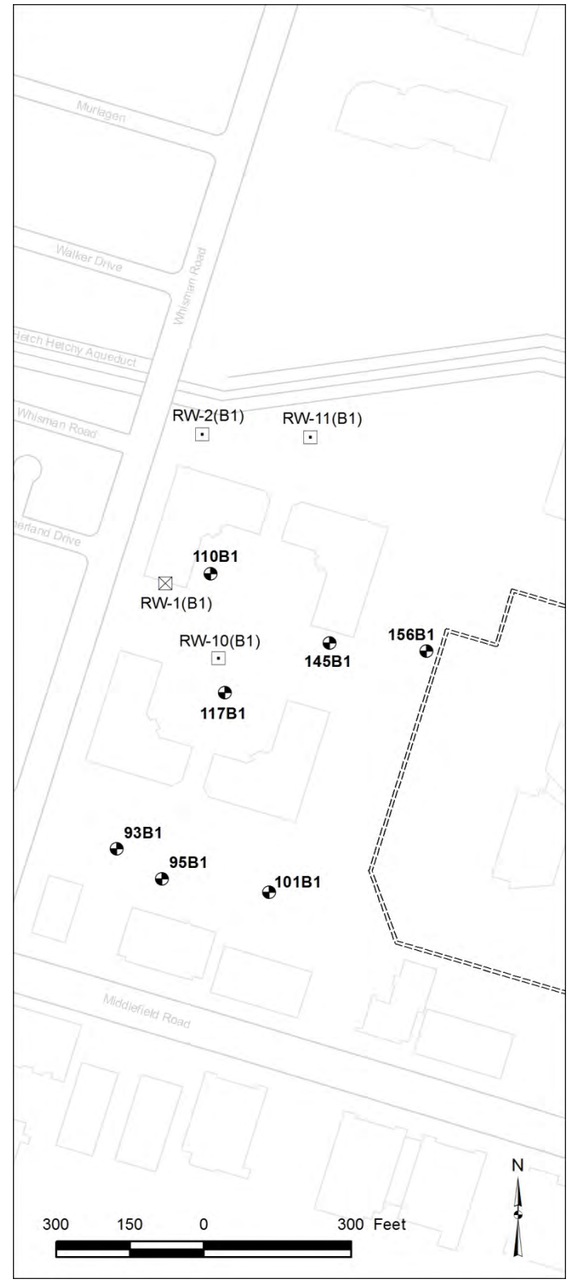






Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride

Note:
Open symbols are non-detects, presented at limit of quantification



93B1 Monitoring Well
RW-10(B1) Extraction Well (On)
RW-1(B1) Extraction Well (Off)

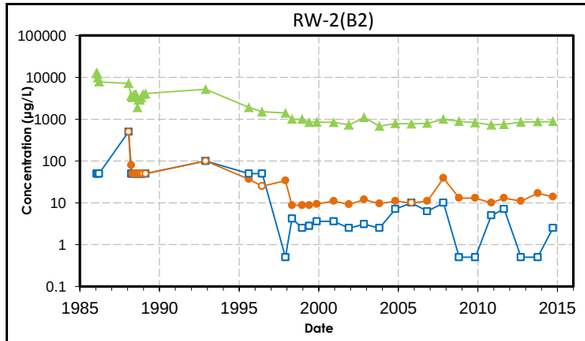
Chlorinated Ethenes in Groundwater
B1 Aquifer Wells
MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

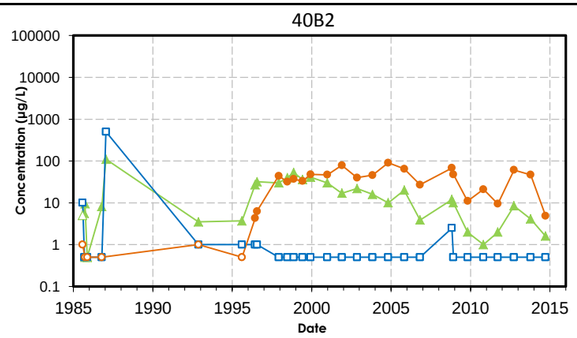
Geosyntec consultants

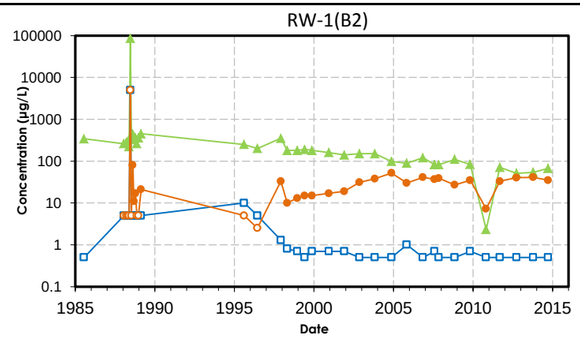
Figure **D-4**

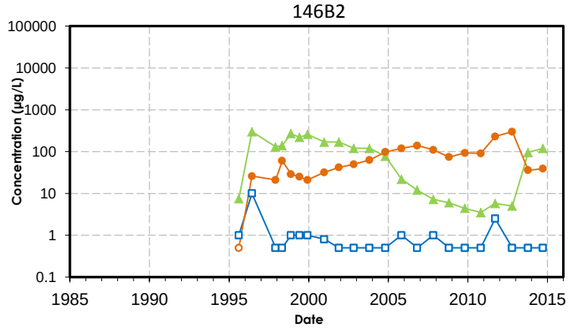
Oakland | April 2016

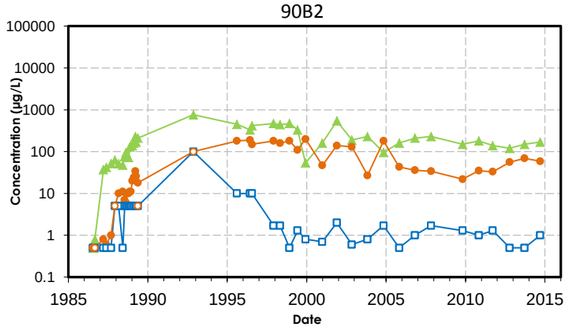
\\oakland-01\data\GIS\MEW\Excel\Fairchild\2015_AR\Building19\[FigD-4_TimeSeries.xlsx]

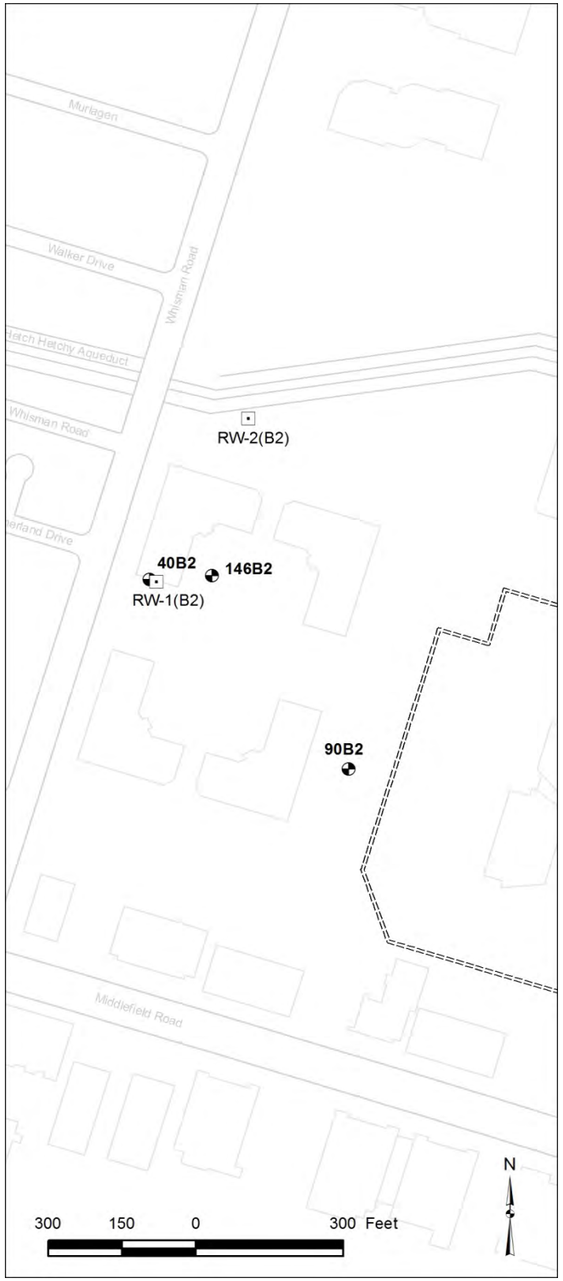












Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride

Note:
Open symbols are non-detects, presented at limit of quantification

40B2 Monitoring Well

RW-1(B2) Extraction Well (On)

Chlorinated Ethenes in Groundwater
B2 Aquifer Wells

MEW Former Fairchild Buildings 13, 19, and 23 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Figure **D-5**

Oakland | April 2016

\\oakland-01\data\GIS\MEW\Excel\Fairchild\2015_AR\Building19\[FigD-5_TimeSeries.xlsx]