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April 13, 2012

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Subject: **2011 Annual Progress Report – Former Fairchild Building 18**
Middlefield-Ellis-Whisman ("MEW") Area
Mountain View, California

Dear Ms. Reddy:

Attached please find the 2011 Annual Progress Report for Former Fairchild Building 18, 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 2011 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
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2011 ANNUAL PROGRESS REPORT FOR FORMER FAIRCHILD BUILDING 18

MOUNTAIN VIEW, CALIFORNIA

Prepared by

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engineers | scientists | innovators

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Project Number: WR1133

13 April 2012

2011 Annual Progress Report for Former Fairchild Building 18

644 National Avenue
Middlefield-Ellis-Whisman Study Area
Mountain View, California

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TABLE OF CONTENTS

1. INTRODUCTION 1
   - 1.1 Site Background 1
   - 1.2 Local Hydrogeology 2
   - 1.3 Description of the Remedy 4
   - 1.4 Summary of 2011 Site Activities and Deliverables 4

2. GROUNDWATER EXTRACTION AND TREATMENT SYSTEM 6
   - 2.1 Extraction and Treatment System Description 6
   - 2.2 Extraction and Treatment System Operation and Maintenance 6
   - 2.3 Groundwater Level Monitoring 7
   - 2.4 Hydraulic Control and Capture Zone Analysis 8
     - 2.4.1 Methodology 8
     - 2.4.2 Estimated Extraction Well Capture 9
     - 2.4.3 Comparison to Target Capture 9
     - 2.4.4 Horizontal and Vertical Gradients 10
   - 2.5 Groundwater Quality Monitoring 10
     - 2.5.1 Isoconcentration Contour Maps 10
     - 2.5.2 Remedy Performance 11

3. OTHER ACTIVITIES 12
   - 3.1 Air/Vapor Intrusion 12
   - 3.2 Soil Settlement Survey 12

4. PROBLEMS ENCOUNTERED 13

5. TECHNICAL ASSESSMENT 14

6. CONCLUSIONS AND RECOMMENDATIONS 15

7. UPCOMING WORK IN 2012 AND PLANNED FUTURE ACTIVITIES 16

8. REFERENCES 17

LIST OF TABLES

Table 1: 2011 Monitoring and Reporting Schedule

Table 2: Extraction and Monitoring Well Construction Summary

Table 3: Monthly Average Recovery Well Flow Rates

Table 4: Monthly Extraction Totals

Table 5: Groundwater Elevations, January through December 2011

Table 6: Groundwater Elevations, Vertical Gradient Well Pairs, January 2007 through December 2011

Table 7: VOC Analytical Results, Five Year Summary, January 2007 through December 2011

Table 8: Mann-Kendall Statistics Concentration Trends Summary

Table 9: Calculation of Predicted Capture Width Based on Average Flow Rate

LIST OF FIGURES

Figure 1: Site Location Map

Figure 2: Current Building Configurations, Former Fairchild Facilities

Figure 3: Former Fairchild Building 18 Site Map and Well Network

Figure 4: A/A1 Zone Groundwater Elevation Contours and Estimated/Target Capture Zones, 24 March 2011

Figure 5: A/A1 Zone Groundwater Elevation Contours and Estimated/Target Capture Zones, 15 September 2011

Figure 6: A/A1 Zone TCE Concentrations and Estimated Capture Zones – September/October 2011

Figure 7: A/A1 Zone cis-1,2-DCE Concentrations and Estimated Capture Zones – September/October 2011

Figure 8: A/A1 Zone Vinyl Chloride Concentrations and Estimated Capture Zones – September/October 2011

Figure 9: A/A1 Zone PCE Concentrations and Estimated Capture Zones – September/October 2011

LIST OF APPENDICES

Appendix A: 2012 Annual Report Remedy Performance Checklist

Appendix B: Analytic Reports and Chain-of-Custody Documents, January through December 2011

Appendix C: QA/QC Report, Summary Tables, and Criteria

Appendix D: Selected VOCs versus Time Graphs

ACRONYMS AND ABBREVIATIONS

106 Order	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
GAC	granular activated carbon
Geosyntec	Geosyntec Consultants, Inc.
GSLIB	Geostatistical Software Library
gpm	gallons per minute
K	hydraulic conductivity
µg/L	micrograms per liter
MEW	Middlefield-Ellis-Whisman
MCLs	maximum contaminant levels
NASA	National Aeronautics and Space Administration
NPDES	National Pollutant Discharge Elimination System
PCE	Tetrachloroethene
QA/QC	quality assurance and quality control
RAOs	remediation action objectives
RGRP	Regional Groundwater Remediation Program
ROD	Record of Decision
RRWs	regional recovery wells
SCRWs	source control recovery wells
Site	Former Fairchild facilities located at 644 National Avenue, Mountain View, California

STC	Schlumberger Technology Corporation
System 1	515 Whisman Road
TCE	trichloroethene
VOCs	volatile organic compounds
Water Board	California Regional Water Quality Control Board
Weiss	Weiss Associates

1. INTRODUCTION

This 2011 Annual Progress Report was prepared by Geosyntec Consultants (Geosyntec) with assistance from Weiss Associates (Weiss) on behalf of Schlumberger Technology Corporation (STC) for the former Fairchild Semiconductor Corporation (Fairchild) facilities located at 644 National Avenue (Former Fairchild Building 18) in Mountain View, California (Site) (Figures 1, 2, and 3).

This progress report contains a summary of Site activities and data from 1 January through 31 December 2011, and 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 in the Matter of the MEW Study Area (106 Order) issued by the United States Environmental Protection Agency (EPA) and the EPA's 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 quarter square-mile area bounded by Middlefield Road on the south, Ellis Street on the east, Whisman Road on the west, and Highway 101 on the north, in Mountain View California (Figure 2).

From 1966 to 1984 Former Fairchild Building 18 functioned as an electroplating facility for Fairchild Semiconductor Corporation.

The building at the 644 National Avenue property is the original Fairchild Building 18 structure. The property was purchased by Carr America National Avenue, LLC in 2007. Redevelopment plans include demolition of the existing building and construction of a parking lot for buildings on adjacent parcels. Redevelopment is scheduled to begin in 2012. There is continued coordination with the developer to maintain the basement dewatering sump, extraction wells, conveyance piping, and monitoring wells at the Site, as well as the Regional Groundwater Remediation Program (RGRP) South of 101 treatment system located on the Site.

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 Explanation of Significant Differences (EPA, 1989, 1990b, 1996). The volatile organic compounds

(VOCs) addressed in the MEW ROD are assigned to both facility-specific and regional responsibilities.

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 system was installed at the Site between 1985 and 1986. A description of the extraction system is provided in Section 2.1. The RGRP South of 101 treatment system is located at 644 National Avenue but is not part of the Building 18 remedy. The South of 101 treatment system is discussed in the Annual Report for the RGRP program (Geosyntec, 2012a).

1.2 Local Hydrogeology

The Site is located within 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 water-bearing zones: the A Zone (roughly between 20 and 45 feet below ground surface [bgs]) and the B Zone (roughly between 50 and 160 feet bgs), which are separated by the A/B Aquitard. The B Zone is 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 represented as the B/C Aquitard and is the major confining layer beneath the Site.

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

[1] The soil cleanup goals have been met at the Site (EPA, 2004). Site soil cleanup actions were completed by 1995 and included and soil excavation and treatment by aeration.

Water Bearing Zones	Approximate Depth Interval Below Ground Surface (bgs)
A[a]	0 to 45 feet
B1[b]	50 to 75 feet
B2	75 to110 feet
B3	120 to 160 feet
C	200 to 240 feet
Deep Aquifer	>240 feet

[a] Navy and National Aeronautics and Space Administration (NASA) refer to this zone as the A1 Zone north of Highway 101.

[b]Navy and NASA refer to this zone as the A2 Zone north of Highway 101.

The following table summarizes the estimated ranges of hydraulic conductivity (K) hydraulic gradient, and transmissivity for the A and B 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
B3 Zone	0.5	5	0.001 to 0.002	40	5	130

Groundwater flow beneath the Site is generally towards the north in the A and B Zones during 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 in the MEW Study Area is generally upward from the B1- to the A Zone, but is locally downward in the vicinity of the Site. Vertical gradients below the B1 Zone are generally upward (Geosyntec, 2008). Groundwater extraction has likely exerted an influence on the measured vertical gradients.

[2] Pumping tests were conducted at the MEW study area from 1986 through 1985. References are Canonie, 1986a, 1986b, 1987, and 1988; Geomatrix, 2004; HLA, 1986 & 1987; Locus, 1998; PRC, 1991; Navy, 2005; and Weiss Associates 1995 and 2005.

1.3 Description of the Remedy

As specified in the ROD, the current remedy consists of groundwater extraction and treatment. The remedy 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 trichloroethene (TCE) in shallow groundwater (A and B zones) and 0.8 µg/L for TCE in deep groundwater (C and the deep aquifer).[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).

One A Zone extraction well (RW-25A) is used to remove groundwater from the Site. Extracted groundwater is then transported through conveyance piping to a treatment facility located at 515 N. Whisman Road (System 1). Once treated, the water is monitored and sampled in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit, then discharged to a storm water sewer.

Effectiveness of the remedy is evaluated using a network of monitoring wells that are currently monitored according to the schedule provided in Table 1. A construction summary for these wells is provided in Table 2.

1.4 Summary of 2011 Site Activities and Deliverables

Table 1 provides the 2011 monitoring and reporting schedule for the Site Groundwater Remediation Program. Ongoing Site activities include:

- Groundwater extraction at RW-25A;
- Assessment of remedial progress; and,
- Planning for future remedial activities.

Specific Site activities and deliverables by month in 2011 are listed below:

---

[3] The objectives of the groundwater remedy design are described in the ROD and the Feasibility Study (Canonie, 1988).

[4] Groundwater cleanup goals are presented in the ROD.

March 2011

- 25 March – Collected semiannual groundwater elevation measurements in Site monitoring and extraction wells.

June 2011

- 15 June – Distributed the 2010 Annual Progress Report to the EPA and MEW distribution list parties.

September 2011

- 2 September to 22 September – Collected annual groundwater samples from Site wells.
- 15 September – Collected semiannual groundwater elevation measurements in Site monitoring and extraction wells.

D*ecember 2011*

- 9 December – Annual settlement monitoring.

The 2011 Annual Report Remedy Performance Checklist is provided in Appendix A.

2. GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

2.1 Extraction and Treatment System Description

Groundwater is extracted at the Site by one Source Control Recovery Well (SCRW) (RW-25A) operating in the A Zone (Figures 4 and 5). Groundwater from RW-25A is piped via double-contained piping to off-Site Fairchild Treatment System 1 consisting of three 5,000-pound granular activated carbon (GAC) vessels in series. Further discussion of System 1 is provided in the 2011 Annual Progress Report for Former Fairchild Buildings 1-4 (Geosyntec, 2012a).

Groundwater is also extracted from the Site by regional wells REG-12A, REG-1B(1) and REG1(B2), and a dewatering sump (BLDG-18) located in the basement of the building. The groundwater extracted by the regional wells is pumped to the offsite Treatment System South of 101. Further discussion of REG-12A, REG-1B(1) and REG1(B2) is provided in the MEW Regional Groundwater Remediation Program (RGRP) 2011 Annual Progress Report (Geosyntec, 2012b). The BLDG-18 dewatering sump is used to keep groundwater from infiltrating the basement of Building 18, which is constructed below ground surface. The groundwater extracted by this sump is pumped to offsite Fairchild Treatment System 1.

2.2 Extraction and Treatment System Operation and Maintenance

As required by the System 1 discharge permit, the Site extraction well flow readings are recorded weekly and are reported quarterly to the California Regional Water Quality Control Board (Water Board). Extraction well flow rates were optimized in 2010 for all Fairchild wells (Geosyntec, 2010a). The optimized target flow rate for RW-25A is 5.5 gallons per minute (gpm). The average flow rates recorded for RW-25A and BLDG-18 were 5.7 gpm and 22.3 gpm, respectively. No optimized target flow rate is established for BLDG-18. Monthly average flow rates and monthly extraction totals for the Site extraction wells are provided in Tables 3 and 4, respectively.

The EPA and Water Board are required to be notified of extraction well and system down-time events as follows (Weiss, 2012):

- EPA: The owner and/or operator of the Fairchild treatment system will make a best effort to orally notify EPA within 24 hours of a well or system shutdown that occurs for more than 72 consecutive hours.

- Water Board: If the treatment system is shut down for more than 120 consecutive hours after the startup 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.

No non-routine maintenance or repairs to RW-25A or conveyance piping occurred during 2011. The following routine and non-routine maintenance or repair items occurred during 2011 at the Building 18 basement dewatering system:

- 28 April – The pump was replaced resulting in 2 hours of offline time (no regulatory notification required); and,
- 3 May – Alerts were caused by a power service interruption resulting in 1 hour of offline time (no regulatory notification required).

As demonstrated by the downtime events listed above, no notifications of system shut downs were required during 2011.

2.3 Groundwater Level Monitoring

Groundwater levels are measured semi-annually for the purpose of monitoring the hydraulic performance of the Site groundwater remedy. During this reporting period, groundwater levels were measured in Site wells on 24 March and 15 September 2011. Table 2 summarizes the construction details for the Site monitoring and extraction wells. Water levels measured in the Site monitoring wells during 2011 are included in Table 5.

Groundwater elevation contour maps for the Site are provided in Figures 4 and 5 and are based on facility-specific and regional data as presented in the MEW RGRP Annual Report (Geosyntec, 2012a). The groundwater elevation contour maps were created using KT3D_H2O version 3.0, a geostatistical software package (Tonkin and Larson, 2002).[5] As opposed to most interpolation programs that require a choice between linear

[5] 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 (Deutsh and Journal, 1998, Tonkin and Larson, 2002).

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

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 Site conceptual model, remedy objectives, and target capture zones were available from previous studies and prior annual monitoring reports;
- Water level measurements from March and September 2011 were interpolated to generate groundwater elevation contour maps as described in Section 2.3 and the MEW RGRP Annual Report (Geosyntec, 2012b);
- Pumping rates from regional recovery wells (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 the Site recovery well in March and September 2011 are shown in Figures 4 through 9. 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 TransientTracker 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 as presented in Figures 4 through 6 are based on professional judgment in consideration of the above analyses, known Site conditions, and experience with similar sites.

The estimated capture widths shown on Figures 4 through 9 were compared to the distribution of TCE in groundwater (Section 2.5, Figure 6) within the Site boundaries, measured in map view. If the estimated width of capture is greater than the trans-gradient width of the TCE distribution in groundwater, then hydraulic containment of the plume is indicated.

2.4.3 Comparison to Target Capture

The target capture zones and estimated hydraulic capture for RW-25A are depicted in Figures 4 and 5. The target hydraulic capture area is the modeled capture zone depicted in the final remedial design document for the MEW area South of Highway 101 (Canonie, 1994; Smith, 1996). As noted in Section 2.4.2, estimated hydraulic capture zones were drawn based on multiple forms of analysis, professional judgment, and known site conditions.

The estimated capture zones in Figures 4 through 5 depict complete capture of the target capture zones.

2.4.4 Horizontal and Vertical Gradients

The horizontal component of groundwater flow at the Site is towards the north-northwest. Hydraulic gradients are affected by groundwater extraction, and locally range from approximately 0.004 to 0.01. The vertical component of groundwater flow is downward as indicated by measured groundwater elevations in well pairs 147A/143B1 and 80A/32B1 located at the Site. Both well pairs demonstrated downward gradients in March and September 2011, as shown in Table 6.

The horizontal and vertical gradients recorded during this reporting period are generally consistent with historical observations. The downward gradients observed at the Site do not impact Site cleanup objectives because decreasing to stable VOC concentration trends in wells below the A Zone provide supporting evidence for adequate plume capture (Section 2.5).

2.5 Groundwater Quality Monitoring

The 2011 Annual Groundwater Quality Sampling Event at the Site was conducted in September 2011. A total of seven Site wells and two RGRP wells were sampled for VOCs in 2011. A summary of chemical analytic results for the previous five years (2007 through 2011) is provided in Table 7 Appendix B contains the laboratory analytic reports and chain-of-custody documents for samples collected in 2011, and Appendix C contains the quality assurance/quality control (QA/QC) evaluation report, summary tables, and criteria. VOCs versus time graphs for select monitoring wells are included in Appendix D.

2.5.1 Isoconcentration Contour Maps

TCE, cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride, and Tetrachloroethene (PCE) isoconcentration contour maps were created for the 2011 annual sampling event. The 2011 TCE contour maps were based on the existing 2010 TCE contour maps (Geosyntec, 2011) with contours modified as needed to reflect decreases or increases in TCE concentrations from 2010 to 2011. Similarly, the cis-1,2-DCE and vinyl chloride contour maps were based on and modified from the regional 2009 cis-1,2-DCE and vinyl chloride contour maps (Geosyntec, 2010b). The PCE contour maps were generated by hand and based on professional judgment in consideration of known Site conditions. All wells in the MEW study area sampled for VOCs in 2011 were included in isoconcentration contouring as presented in the MEW RGRP Annual Progress Report

(Geosyntec, 2012a). The 2011 isoconcentration contour maps for the Site are presented for the A Zone in Figures 6 to 9.

2.5.2 Remedy Performance

In conjunction with the hydraulic analysis described in Section 2.4, the VOC monitoring data provides an additional line of evidence for assessing remedy performance.

Selected VOCs versus time graphs are presented in Appendix D. In addition to the creation of time series graphs a Mann-Kendall statistical analysis was performed in order to evaluate VOC concentration trends in the Site wells[6] (Table 8). Based on the Mann-Kendall statistical analysis the TCE concentrations are stable, decreasing, or have no trend in all of the Site wells. Approximately 75% of wells sampled display decreasing TCE concentration trends and 25% show no trend or are stable.

A comparison of calculated capture widths and the spatial distribution of VOCs at the Site can also be used to assess remedy performance. The calculations of capture width based on the average extraction well flow rate, regional hydraulic gradient, hydraulic conductivity, and zone thickness are shown in Table 9. The results indicate that the predicted capture width based on the average 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.

The VOC time series data and VOC monitoring data indicate that the combined MEW remedies are performing as designed to control or remediate VOCs in groundwater.

[6] A Mann-Kendall statistical analysis was performed on all Site wells using the TCE, cis-1,2-DCE and vinyl chloride concentration data from 2002 to 2011 to evaluate the concentration trends. Well with insufficient data (< 4 sampling events) were not included in the trend analysis evaluation.

3. OTHER ACTIVITIES

3.1 Air/Vapor Intrusion

The EPA issued a ROD amendment on 16 August 2010 to address vapor intrusion (EPA, 2010). The MEW parties continued to work with EPA and local entities to implement the ROD amendment during 2011. 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 separate cover (Haley and Aldrich, 2012).

3.2 Soil Settlement Survey

An annual settlement survey was performed on 9 December 2011. The purpose of these annual measurements is to evaluate any potential adverse effects on the Site facilities, and whether long-term remedial groundwater extraction could affect soil settlement in the MEW study area. A qualified Geotechnical Engineer reviewed the historical settlement and water level elevation data and concluded that the measured values of ground elevation change do not appear to be related to groundwater extraction operations. Additional information on the settlement survey can be found in the RGRP 2011 Annual Progress Report (Geosyntec, 2012b).

4. PROBLEMS ENCOUNTERED

Section 2.2 summarizes all non-routine operations and maintenance events that occurred at the Site. No other problems related to the Site were encountered.

5. TECHNICAL ASSESSMENT

The following assessment of the groundwater remedy performance was made based on data collected through 2011.

- The remedy is functioning as intended. Based on 2011 data reviewed, the groundwater remedy is generally functioning as intended. An 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. Table 8 shows that all of the Site wells with a statistically significant trend in TCE concentrations are decreasing or stable.

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

6. CONCLUSIONS AND RECOMMENDATIONS

The technical assessment concludes that the Site groundwater remedy is performing as intended. The estimated capture zones from March and September 2011 meet or exceed the target capture area as indicated by converging lines of evidence, including graphical flow net analysis, capture zone width calculations, and concentration trends.

The Fairchild wells connected to Treatment System 1 are currently addressed in three separate Annual Progress Reports for the Former Fairchild Facilities: Former Fairchild Buildings 1-4, Former Fairchild Building 18, and Former Fairchild Building 9. Given the proximity of these Sites to one another, and the fact that they share a treatment system, it is recommended that future Annual Progress Reports for Former Fairchild Buildings 9, 1-4, and 18 be combined and submitted as a single Annual Progress Report.

7. UPCOMING WORK IN 2012 AND PLANNED FUTURE ACTIVITIES

March	• Groundwater level measurements
April	• Submit Annual Progress Report to EPA
September	• Annual Groundwater sampling • Groundwater level measurements

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TABLES

Table 1
2011 Monitoring and Reporting Schedule
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, CA

Monitoring and Sampling		
Well	**Sample Frequency**	**Water Level Gauging Frequency**
A/A1 Zone		
54A	Annually (September or October)	Semiannually (March, September)
58A		Semiannually (March, September)
80A	Annually (September or October)	Semiannually (March, September)
147A	Annually (September or October)	Semiannually (March, September)
151A		Semiannually (March, September)
152A	Annually (September or October)	Semiannually (March, September)
RW-25A	Annually (September or October)	Semiannually (March, September)
B1/A2 Zone		
32B1 (RGRP)	Annually (September or October)	Semiannually (March, September)
143B1 (RGRP)	Annually (September or October)	Semiannually (March, September)

Reporting	
Report	**Due Date**
EPA Annual Progress Report	April 15

Notes:

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

(RGRP) - Regional Groundwater Remediation Program well used for monitoring of vertical gradients at the Former Fairchild Building 18 Site. Additional discussion of this well is provided in the MEW RGRP 2011 Annual Progress Report (Geosyntec, 2012)

EPA = United States Environmental Protection Agency

Table 2
Extraction and Monitoring Well Construction Summary
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, CA

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/A1 Zone									
129A	1986	40.40	4	38	26	36	12	38	Mon
147A	1988	39.13	4	30	10	30	7	31	Mon
151A	1991	40.02	4	31.5	16.5	31.5	13.5	32	Mon
152A	1991	39.53	4	34.5	14.50	34.5	12.5	34.5	Mon
54A	1982	40.17	2	40	14	40	14	40	Mon
58A	1982	38.20	4	30	10	30	10	30	Mon
80A	1985	38.09	4	33	23	31	21	33	Mon
RW-25A	1995	38.38	6	32	21	31	18	32	Ext
B1/A2 Zone									
32B1	1985	38.03	4	76	64	74	59	76	Mon
143B1	1986	38.88	4	70	60	70	56	76	Mon

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

Table 3
Monthly Average Recovery Well Flow Rates
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, CA

Extraction Well	2011 Average Monthly Flowrate[1] (gpm)											
	January	February	March	April	May	June	July	August	September	October	November	December
A/A1 Zone												
BLDG-18	24.90	25.64	36.85	28.41	23.64	23.42	16.85	22.23	16.09	16.79	15.64	17.00
RW-25A	5.29	5.18	5.17	5.05	5.72	6.30	6.00	6.11	5.33	5.87	6.37	5.64

Notes:
1. Monthly average extraction well flow rates were calculated by dividing the volume of groundwater extracted at each well by the time (minutes) between the effluent totalizer readings (generally taken last Wednesday of each month).
gpm = gallons per minute

Table 4
Monthly Extraction Totals
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, CA

Extraction Well	2011 Monthly Volume Extracted[1] (gallons)											
	January	February	March	April	May	June	July	August	September	October	November	December
A/A1 Zone												
BLDG-18 - pumped to System 1	36,290	33,635	82,836	36,169	34,125	--	18,612	--	--	22,797	--	23,148
BLDG-18 - pumped to S101	967,696	1,000,138	1,402,919	1,109,475	918,967	944,254	660,703	896,412	648,890	654,102	630,674	662,099
BLDG-18 - (total)[2]	1,003,986	1,033,773	1,485,755	1,145,644	953,092	944,254	679,315	896,412	648,890	676,899	630,674	685,247
RW-25A	213,469	208,806	260,330	203,778	230,804	317,721	242,042	307,990	215,059	236,477	320,935	227,439
Total	2,221,441	2,276,352	3,231,840	2,495,066	2,136,988	2,206,229	1,600,672	2,100,814	1,512,839	1,590,275	1,582,283	1,597,933

Notes:
1. Monthly volumes of groundwater extracted are based on effluent totalizer readings at each well (generally taken last Wednesday of each month).
2. Water extracted at Building 18 is typically plumbed to Treatment System No. 1. During carbon changes or other extended shutdowns at System 1, water is pumped to the RGRP South of 101 Treatment System.
-- = No water pumped to System 1 from Building 18

Table 5

Groundwater Elevations, January Through December 2011

MEW Former Fairchild Building 18 Groundwater Remediation Program

Mountain View, California

Well ID	TOC Elevation (ft msl)	24 March 2011		15 September 2011	
		Depth To Water (feet)	Groundwater Elevation (ft msl)	Depth To Water (feet)	Groundwater Elevation (ft msl)
A/A1Zone					
54A	40.17	11.07	29.10	12.95	27.22
58A	38.28	9.70	28.58	11.40	26.88
80A	38.09	10.15	27.94	12.00	26.09
147A	39.13	9.21	29.92	11.45	27.68
151A	40.02	11.50	28.52	13.10	26.92
152A	39.53	10.98	28.55	12.38	27.15
RW-25A	38.38	11.78	26.60	13.65	24.73
A2/B1Zone					
32B1 (RGRP)	38.03	12.26	25.77	14.45	23.58
143B1 (RGRP)	38.88	10.90	27.98	13.60	25.28

Notes:
ft msl = Feet Mean Sea Level
TOC = Top of Casing
RGRP = Regional Groundwater Remediation Program

Table 6
Calculation of Predicted Capture Width Based on Flow Rate
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, CA

Parameter	A-Zone[1]
Q = Combined pumping rate (gpm)	6
b = saturated aquifer thickness (ft)	15
i = regional hydraulic gradient (ft/ft)	0.004
K = hydraulic conductivity (ft/day)[3]	40
Calculated Capture Width (ft) = Q/(K x b x i)	500
Measured plume width at widest point (ft)[4]	315

Notes:

1. The pumping rate equals the average 2011 flow rate for extraction well RW-25A located within the Former Fairchild Building 18 Site.

2. Hydraulic conductivity values used for each aquifer zone are from the numerical model included as Appendix B to the 2008 Optimization Report (Geosyntec, 2008).

3. Measured plume width at widest point is not continued past Site boundaries, Site width is approximately 315 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 7

Groundwater Elevations, Vertical Gradient Well Pairs, January 2007 Through December 2011

MEW Former Fairchild Building 18 Groundwater Remediation Program

Mountain View, California

Date	Well ID (Outside)	Groundwater Elevation (ft msl)	Well ID (Inside)	Groundwater Elevation (ft msl)	Difference	Flow Direction
Vertical Gradient Well Pairs						
3/22/2007	32B1	29.18	80A	27.97	1.21	Upward
11/15/2007	32B1	27.00	80A	27.86	-0.86	Downward
3/27/2008	32B1	25.63	80A	27.32	-1.69	Downward
11/20/2008	32B1	24.96	80A	26.73	-1.77	Downward
3/26/2009	32B1	28.33	80A	27.42	0.91	Upward
11/19/2009	32B1	24.81	80A	26.58	-1.77	Downward
3/25/2010	32B1	25.80	80A	27.34	-1.54	Downward
11/18/2010	32B1	24.87	80A	26.53	-1.66	Downward
3/24/2011	32B1	25.77	80A	27.94	-2.17	Downward
9/15/2011	32B1	23.58	80A	26.09	-2.51	Downward
Vertical Gradient Well Pairs						
3/22/2007	143B1	29.29	147A	29.87	-0.58	Downward
11/15/2007	143B1	28.24	147A	29.62	-1.38	Downward
3/27/2008	143B1	26.80	147A	29.28	-2.48	Downward
11/20/2008	143B1	26.05	147A	28.65	-2.60	Downward
3/26/2009	143B1	28.28	147A	29.33	-1.05	Downward
11/19/2009	143B1	26.11	147A	28.41	-2.30	Downward
3/25/2010	143B1	27.12	147A	29.30	-2.18	Downward
11/18/2010	143B1	26.22	147A	28.46	-2.24	Downward
3/24/2011	143B1	27.98	147A	29.92	-1.94	Downward
9/15/2011	143B1	25.28	147A	27.68	-2.40	Downward

Notes:
ft msl = Feet Mean Sea Level

Table 8
VOC Analytical Results
Five Year Summary, January 2007 through December 2011
MEW Former Fairchild Building 18 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	1,4-Dioxane
A/A1 Zone														
54A	11/14/2007	<10	**8.5**	<5.0	**13**	**470**	**9.4**	**7.8**	<200	<5.0	<5.0	**1000**	<5.0	NA
54A	11/15/2008	<13	**8.2**	<6.3	**7.4**	**210**	**13**	**8.5**	<250	<6.3	<6.3	**830**	<6.3	NA
54A	11/16/2009	<2.0	**11**	<1.0	**9.4**	**210**	**13**	**9.7**	<40	<1.0	**4.5**	**730**	<1.0	NA
54A	11/22/2010	<10	**7.4**	<5.0	**14**	**190**	<5.0	<20	<20	<5.0	<5.0	**770**	<5.0	NA
54A	9/22/2011	<8.3	**8.1**	<4.2	**10**	**180**	<4.2	<17	<17	<4.2	<4.2	**610**	<4.2	NA
80A	11/9/2007	<4.0	**2.7**	<2.0	**3.3**	**130**	**2.4**	**2.3**	<80	<2.0	<2.0	**260**	<2.0	NA
80A	11/11/2008	<1.0	**2.1**	<0.5	**3.5**	**84**	**1.3**	**2.7**	<20	**1**	**1.7**	**230**	<0.5	NA
80A	11/4/2009	<4.0	**2.2**	<2.0	**2.8**	**96**	<2.0	<8.0	<80	<2.0	<2.0	**240**	<2.0	NA
80A	11/16/2010	<2.5	**2.0**	<1.3	**2.7**	**100**	**1.6**	<5.0	<5.0	<1.3	**1.4**	**210**	<1.3	NA
80A	9/2/2011	<4.0	<2.0	<2.0	**2.6**	**90**	<2.0	<8.0	<8.0	<2.0	<2.0	**190**	<2.0	NA
147A	11/9/2007	<2.0	<1.0	<1.0	<1.0	**10**	<1.0	<1.0	<40	<1.0	<1.0	**120**	<1.0	NA
147A	11/11/2008	<1.0	**0.6**	<0.5	**0.6**	**13**	<0.5	**1.1**	<20	**0.7**	**1.2**	**130**	<0.5	NA
147A	11/3/2009	<1.0	**0.6**	<0.5	**0.5**	**14**	<0.5	<2.0	<20	**0.7**	**1.2**	**120**	<0.5	NA
147A	11/16/2010	<1.0	<0.5	<0.5	**0.6**	**19**	<0.5	<2.0	<2.0	**0.9**	**1**	**120**	<0.5	NA
147A	9/2/2011	<2.0	<1.0	<1.0	<1.0	**13**	<1.0	<4.0	<4.0	<1.0	<1.0	**110**	<1.0	NA
152A	11/9/2007	<40	<20	<20	**20**	**2700**	**28**	<20	<800	<20	<20	**1000**	**120**	NA
152A	11/11/2008	<1.0	**3.5**	<0.5	**8.5**	**780**	**7.1**	**2.9**	<20	<0.5	**1.4**	**430**	**70**	NA
152A	11/5/2009	<14	<7.1	<7.1	<7.1	**910**	**14**	<29	<290	<7.1	<7.1	**420**	**67**	NA
152A	11/17/2010	<10	<5.0	<5.0	**11**	**880**	**7.1**	<20	<20	<5.0	<5.0	**360**	**110**	NA
152A D	9/21/2011	<10	<5.0	<5.0	**5.2**	**580**	**8.3**	<20	<20	<5.0	<5.0	**330**	**52**	NA
152A	9/21/2011	<10	<5.0	<5.0	**5.2**	**570**	**6.4**	<20	<20	<5.0	<5.0	**330**	**51**	NA
BLDG-18	11/24/2008	<7.1	<3.6	<3.6	<3.6	**300**	**12**	<3.6	<140	<3.6	<3.6	**510**	**4.8**	NA
RW-25A	11/16/2007	<33	<17	<17	**24**	**2600**	**29**	**42**	<670	<17	<17	**2200**	**91**	NA
RW-25A	11/7/2008	<25	<13	<13	**20**	**2100**	**25**	**39**	<500	<13	<13	**2100**	**55**	NA
RW-25A D	11/7/2008	<40	<20	<20	**21**	**2100**	**24**	**44**	<800	<20	<20	**2100**	**55**	NA
RW-25A	11/5/2009	<33	<17	<17	**18**	**2200**	**27**	<67	<670	<17	<17	**1900**	**46**	**3.5**
RW-25A D	11/5/2009	<1.0	**13**	<0.5	**24**	**2100**	**32**	**31**	<20	**1.7**	**6.7**	**1800**	**62**	**3.0**
RW-25A D	11/16/2010	<25	<13	<13	**22**	**1700**	**21**	<50	<50	<13	<13	**1400**	**58**	NA
RW-25A	11/16/2010	<25	<13	<13	**22**	**1700**	**22**	<50	<50	<13	<13	**1500**	**60**	NA

Table 8
VOC Analytical Results
Five Year Summary, January 2007 through December 2011
MEW Former Fairchild Building 18 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	1,4-Dioxane
A/A1 Zone														
RW-25A	9/15/2011	<13	**7.6**	<6.3	**12**	**1500**	**24**	<25	<25	<6.3	<6.3	**1200**	**35**	NA
A2/B1 Zone														
32B1 (RGRP)	11/14/2007	<25	<13	<13	<13	**32**	<13	**26**	<500	<13	<13	**1500**	<13	NA
32B1 (RGRP)	11/6/2008	<0.50	<0.50	<0.50	**1.1**	**7.1**	<0.50	**1.3**	<0.50	<0.50	<0.50	**440**	<0.50	NA
32B1 (RGRP)	11/14/2009	<1.0	<0.5	<0.5	**0.9**	**5.7**	<0.5	<2.0	<20	<0.5	<0.5	**430**	<0.5	NA
32B1 (RGRP)	11/22/2010	<1.0	<0.5	<0.5	**1.5**	**4.8**	<0.5	<2.0	<2.0	<0.5	<0.5	**370**	<0.5	NA
32B1 (RGRP)	9/26/2011	<13	<6.3	<6.3	<6.3	**150**	**13**	**38**	<25	<6.3	<6.3	**1200**	<6.3	NA
143B1 (RGRP)	11/13/2007	<40	<20	<20	<20	**120**	<20	**310**	<800	<20	<20	**2600**	<20	NA
143B1 (RGRP)	11/6/2008	<0.50	**4.4**	<0.50	**12**	**290**	**2.0**	**200**	<0.50	**2.3**	**1.7**	**5400**	<0.50	NA
143B1 (RGRP)	11/16/2009	<7.1	**5.7**	<3.6	**16**	**260**	**5.3**	**140**	<140	**4.0**	<3.6	**4000**	<3.6	NA
143B1 (RGRP)	11/22/2010	<33	<17	<17	<17	**83**	<17	<67	<67	<17	<17	**2800**	<17	NA
143B1 (RGRP)	9/23/2011	<25	<13	<13	<13	**290**	<13	**76**	<50	<13	<13	**1300**	<13	NA

Notes:
1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
1,1-DCE = 1,2-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
< indicates analyte not detected above the reported detection limit
D indicates duplicate sample
NA indicates the sample wasn't analyzed for the given analyte
RGRP = Regional Groundwater Remediation Program

Table 9

Mann-Kendall Statistics Concentration Trends Summary

MEW Former Fairchild Building 18 Groundwater Remediation Program

Mountain View, California

Well Name	TCE	cis-1,2-DCE	Vinyl Chloride
A/A1 Zone			
54A	D	D	NT
80A	D	S	NT
147A	D	I	NT
152A	D	S	PI
RW-25A	NT	I	I
B1/A2 Zone			
32B1	PD	PD	NT
143B1	D	PD	NT

Notes:

TCE = Trichloroethene

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

PI =Probably Increasing

I =Increasing

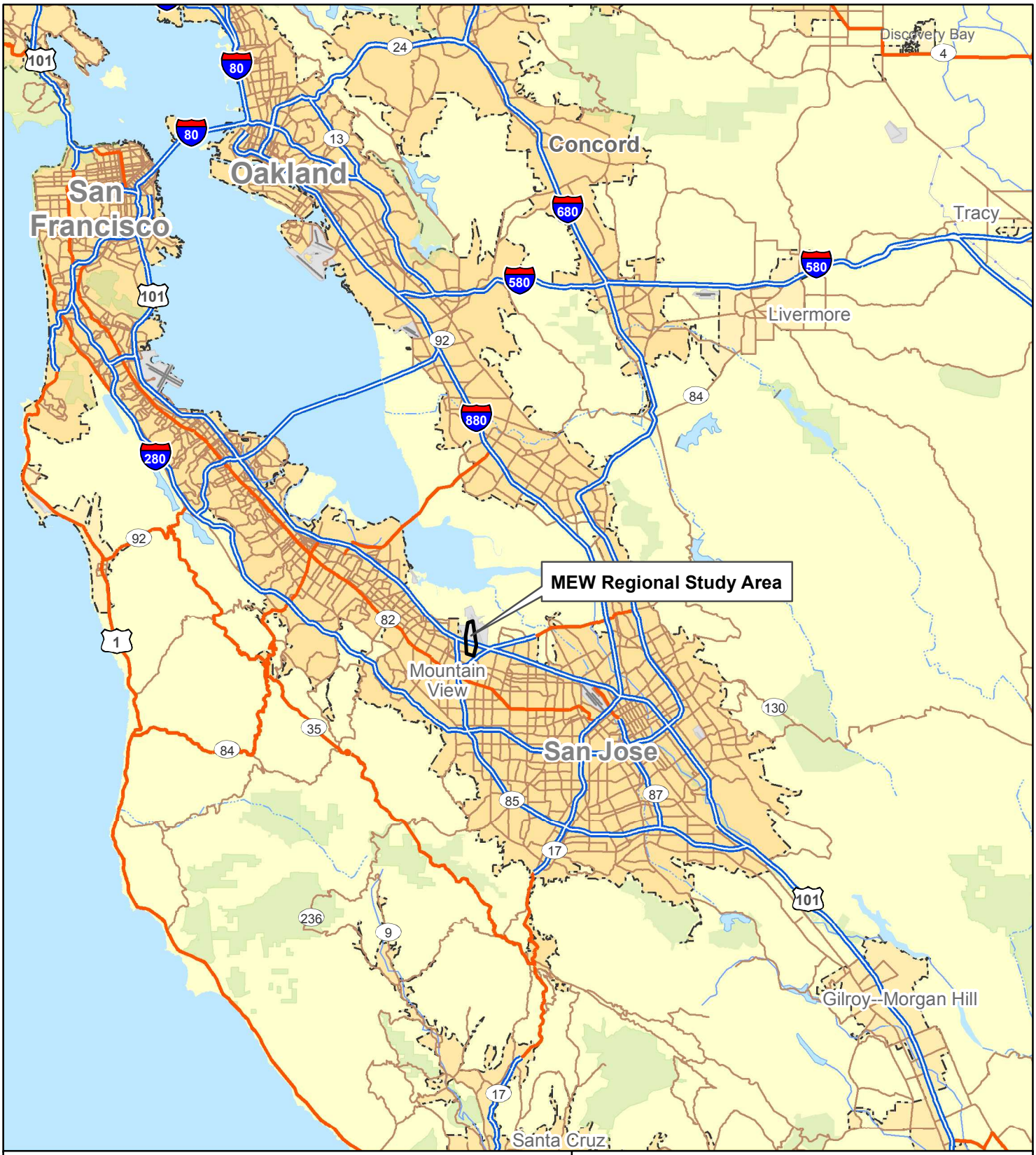
S = Stable

PD = Probably Decreasing

D = Decreasing

NT = No Trend

FIGURES



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0 10 Miles

Site Location Map

MEW Area, Mountain View, California

Geosyntec consultants

Oakland	April 2012

Figure 1

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig01_Loc_Map.mxd

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. 644 National Avenue

FAIRCHILD BUILDING 9
F. 401 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

N

300 150 0 300 Feet

Current Building Configurations
Former Fairchild Facilities
MEW Former Fairchild Building 18
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 2

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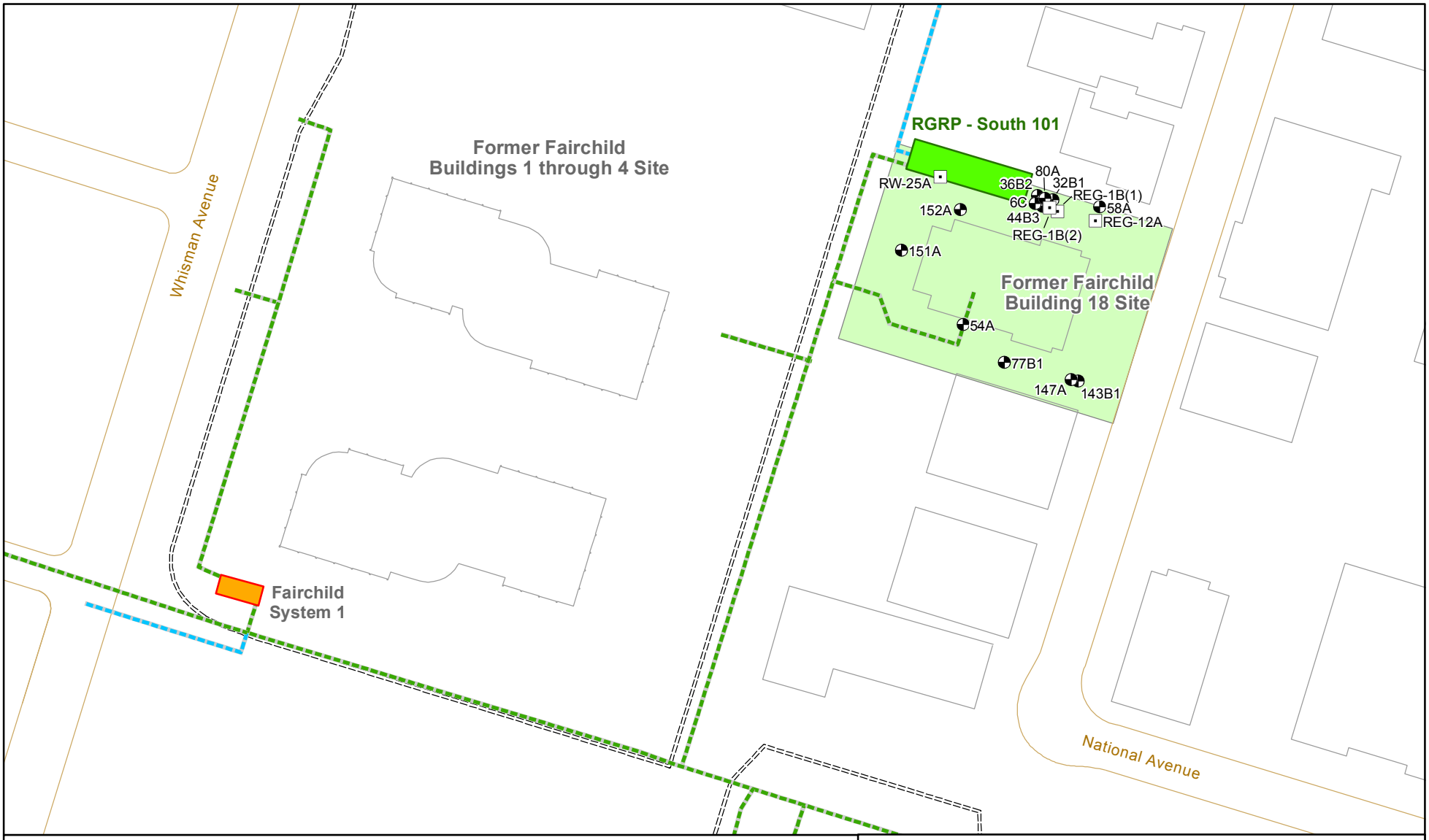


Legend

Extraction and Monitoring Wells

- Monitoring Well
- Recovery Well, On
- Recovery Well, Off

- Treatment System Pipeline
- Treatment-System Discharge Pipeline
- Slurry Wall
- Building
- Road

- Former Fairchild Building 18 Site - 644 National Avenue
- Fairchild Groundwater Treatment System 1
- RGRP - South 101

N

0 150 Feet

Site Map and Well Network

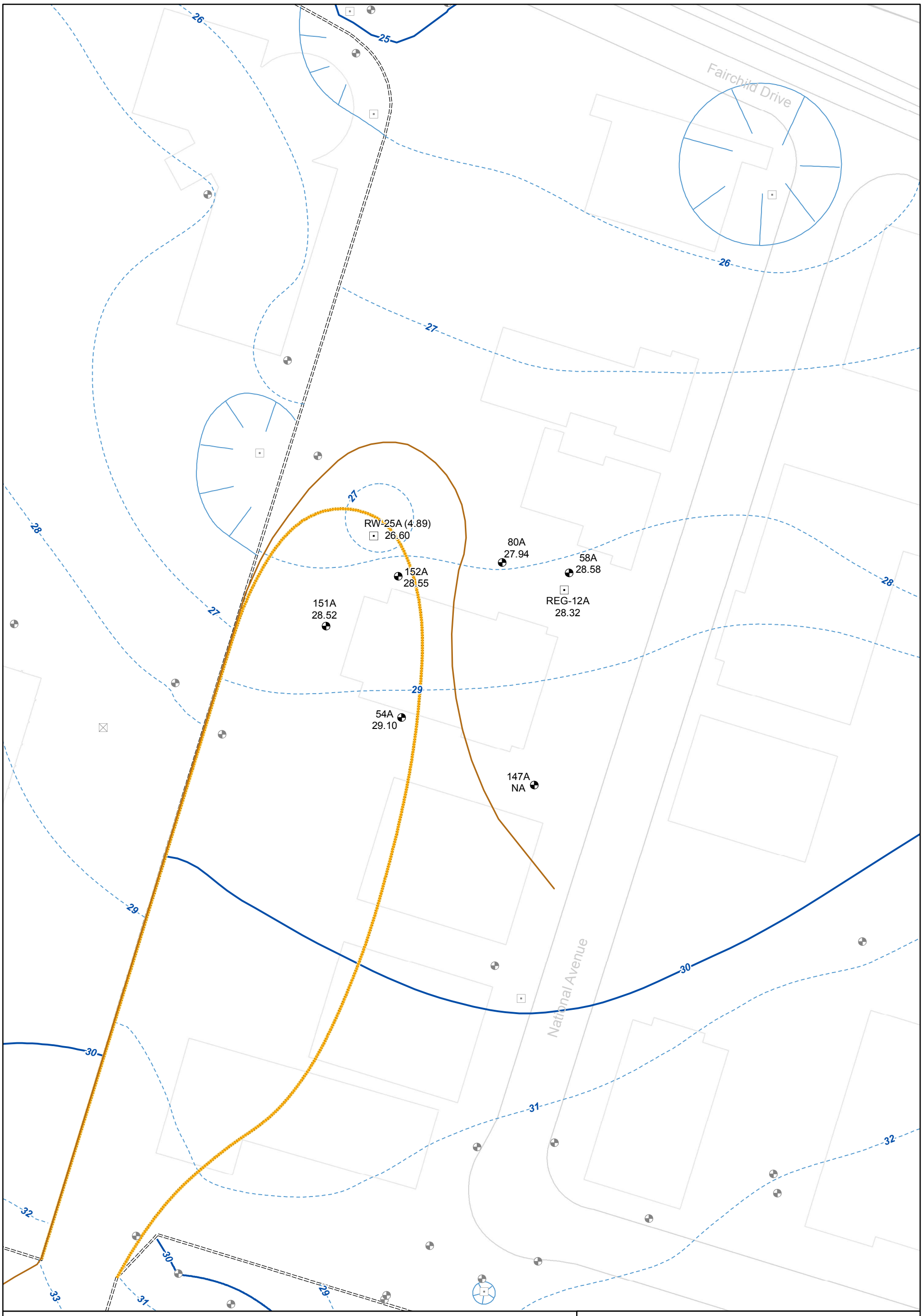
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 3

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig03_SiteMap.mxd



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
- Target Capture Zone
- Slurry Wall
- Building
- Road

RW-25A (4.89) Well ID (Flow Rate)
26.60 Groundwater Elevation (feet above mean sea level)

Note:
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

N

80 40 0 80 Feet

A/A1 Zone Groundwater Contours and Estimated Capture Zones 24 March 2011

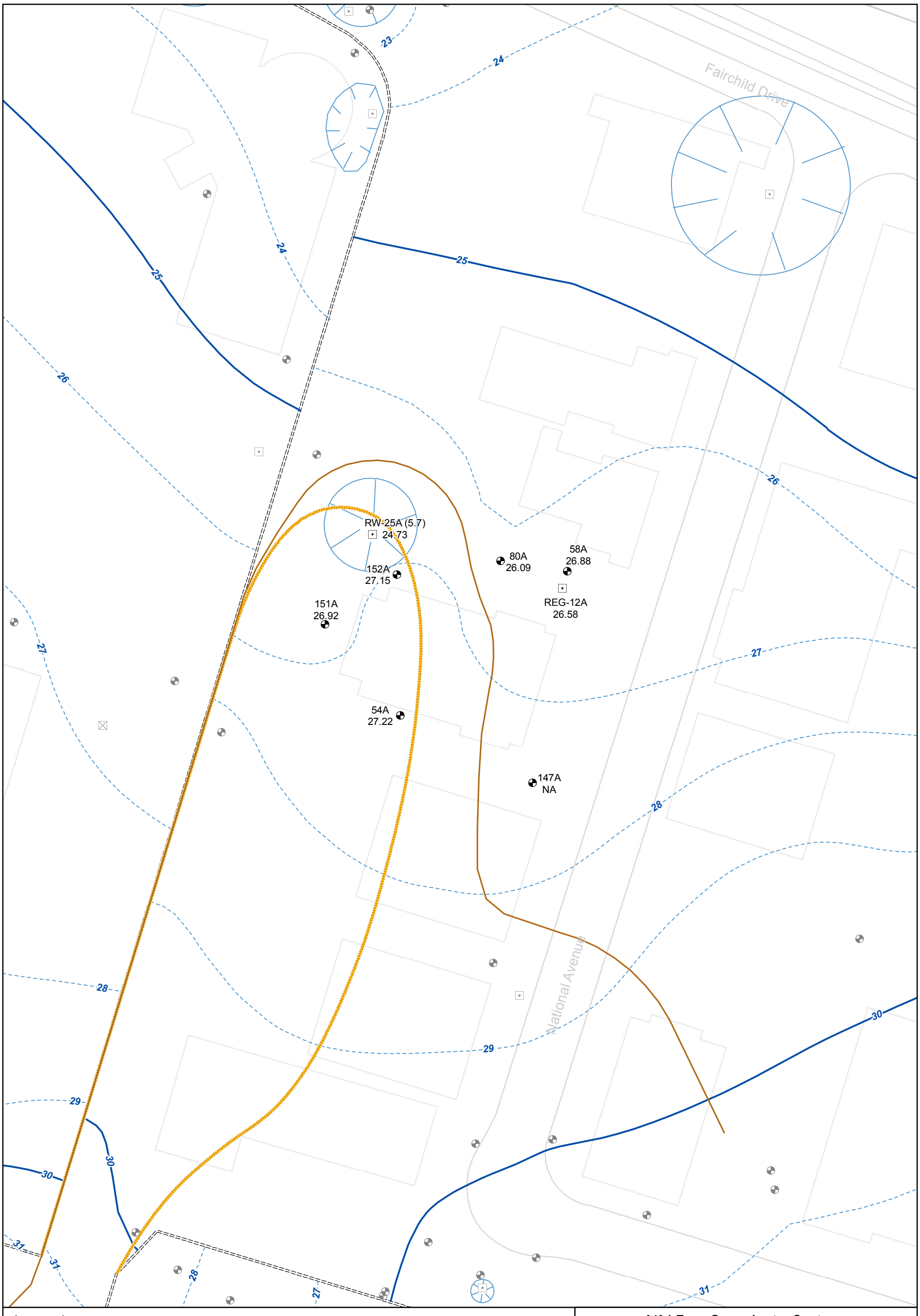
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 4

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig04_GW_AA1_Mar2011.mxd | 3/28/2012 3:27:32 PM



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
- Target Capture Zone
- Slurry Wall
- Building
- Road

RW-25A (5.7) Well ID (Flow Rate)
24.73 Groundwater Elevation (feet above mean sea level)

Note:
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

N

80 40 0 80 Feet

A/A1 Zone Groundwater Contours and Estimated Capture Zones 15 September 2011

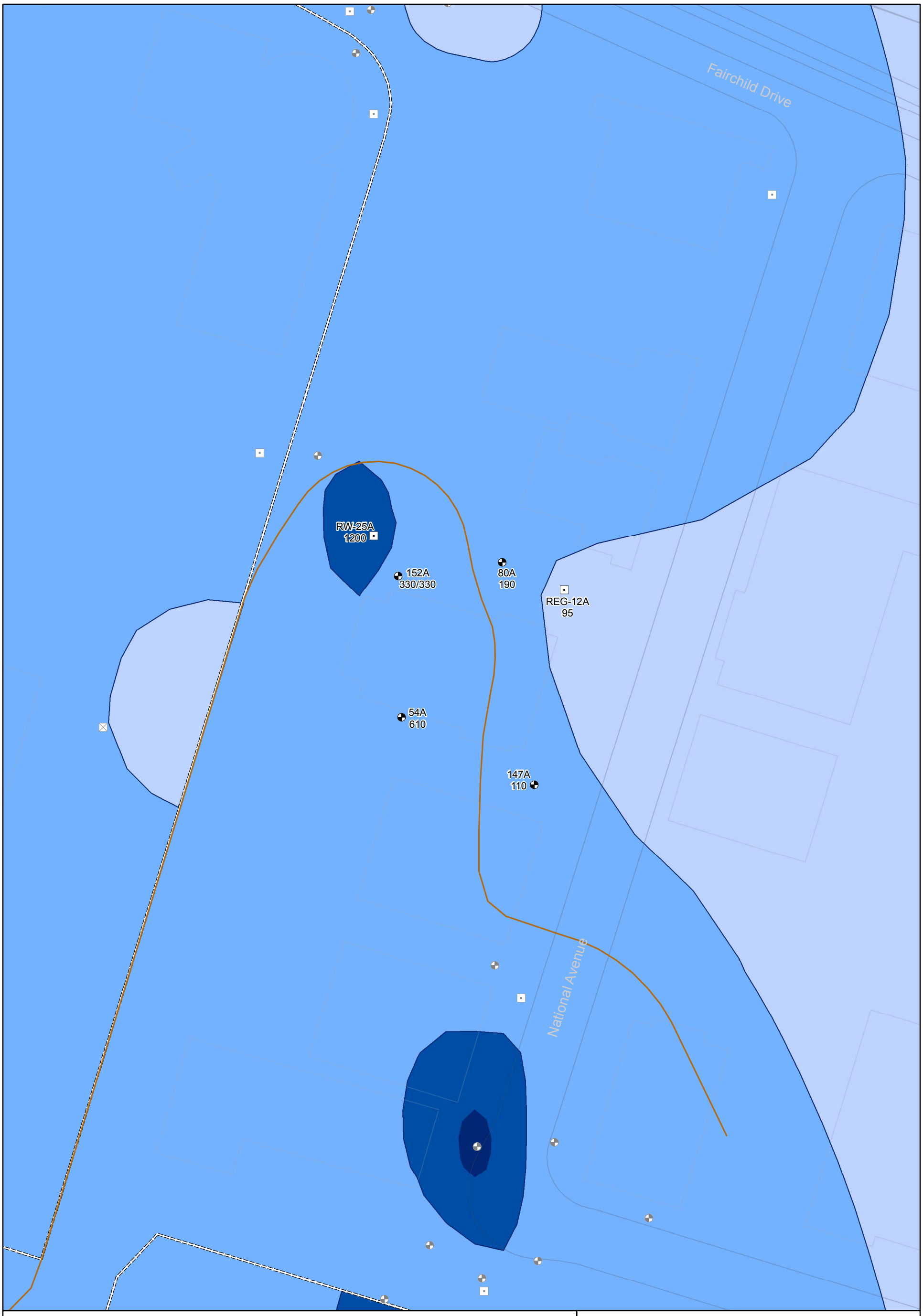
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 5

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig05_GW_AA1_Sept2011.mxd | 3/28/2012 3:28:44 PM



Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

TCE Concentration

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

- Estimated Capture Zone
- ==== Slurry Wall
- Building
- Road

N

80 40 0 80 Feet

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for TCE in 2011.
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

A/A1 Zone TCE Concentrations and Estimated Capture Zones September/October 2011

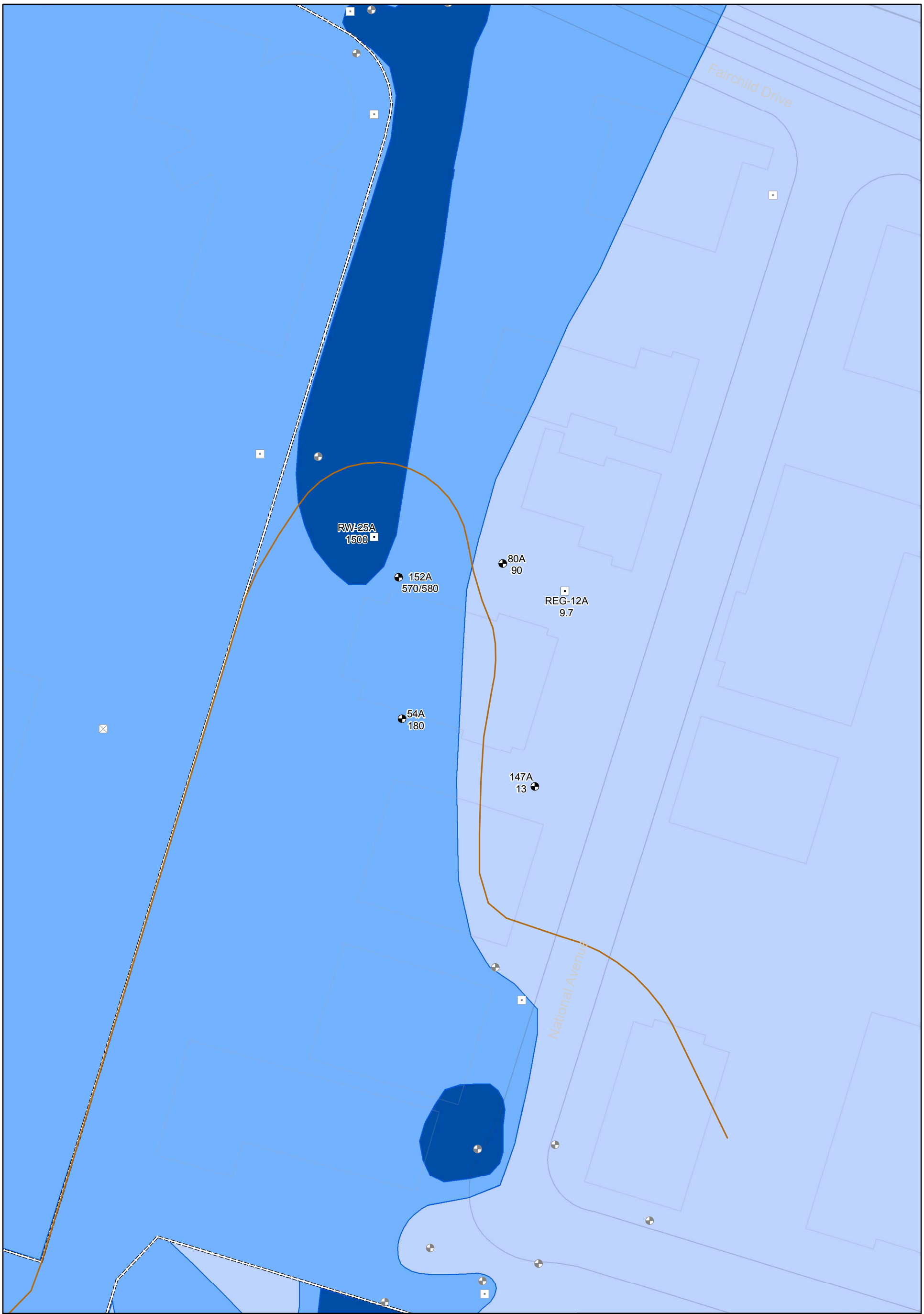
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 6

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig06_TCE_AA1_Sept2011_CZ.mxd | 3/28/2012 3:29:31 PM



Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

cDCE Concentration

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

- Estimated Capture Zone
- ==== Slurry Wall
- Building
- Road

N

80 40 0 80 Feet

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for cDCE in 2011.
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

A/A1 Zone cDCE Concentrations and Estimated Capture Zones September/October 2011

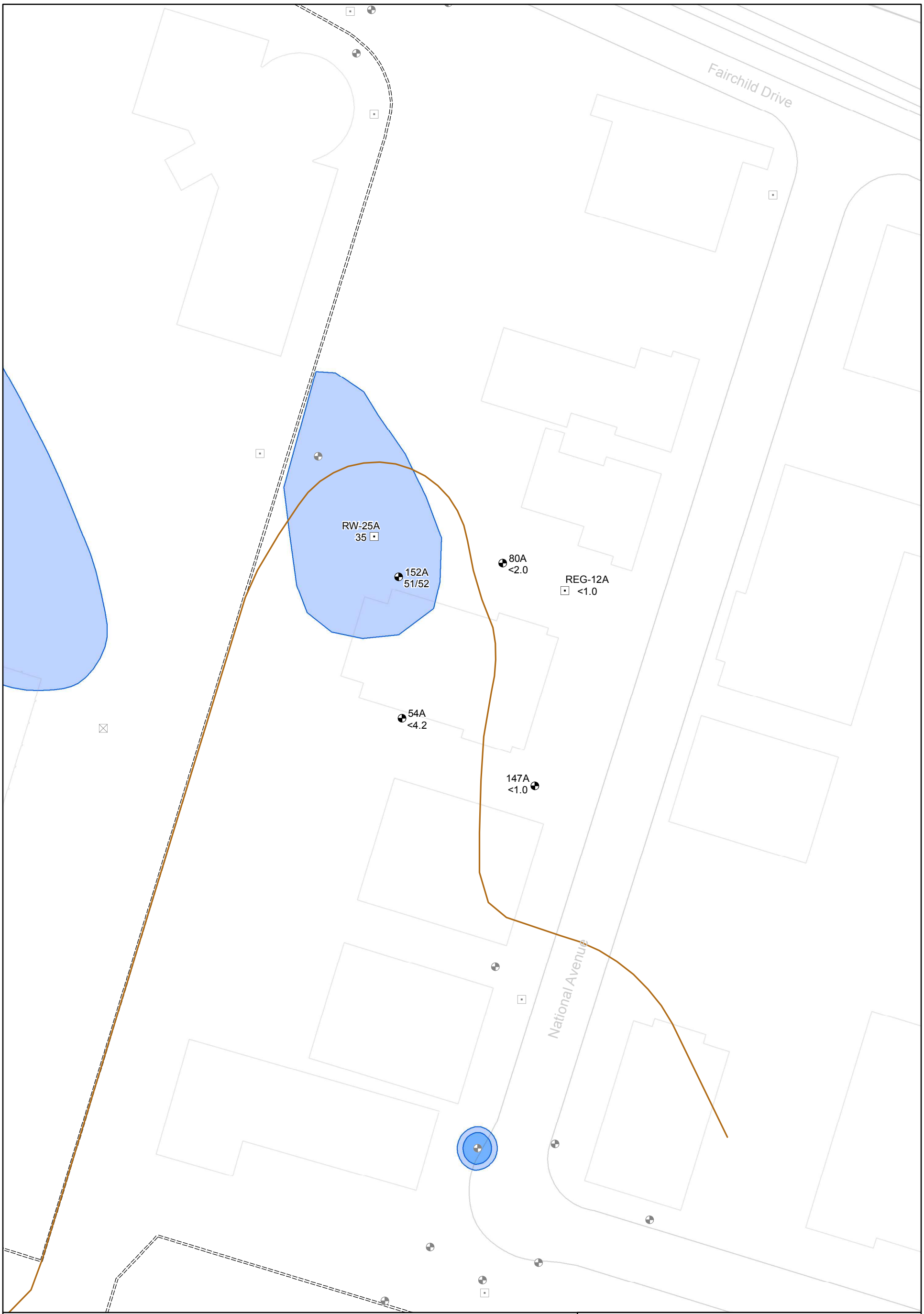
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 7

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig07_DCE_AA1_Sept2011_CZ.mxd | 3/28/2012 3:30:36 PM



Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

VC Concentration

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

- Estimated Capture Zone
- Slurry Wall
- Building
- Road

N

80 40 0 80 Feet

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for VC in 2011.
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

A/A1 Zone VC Concentrations and Estimated Capture Zones September/October 2011

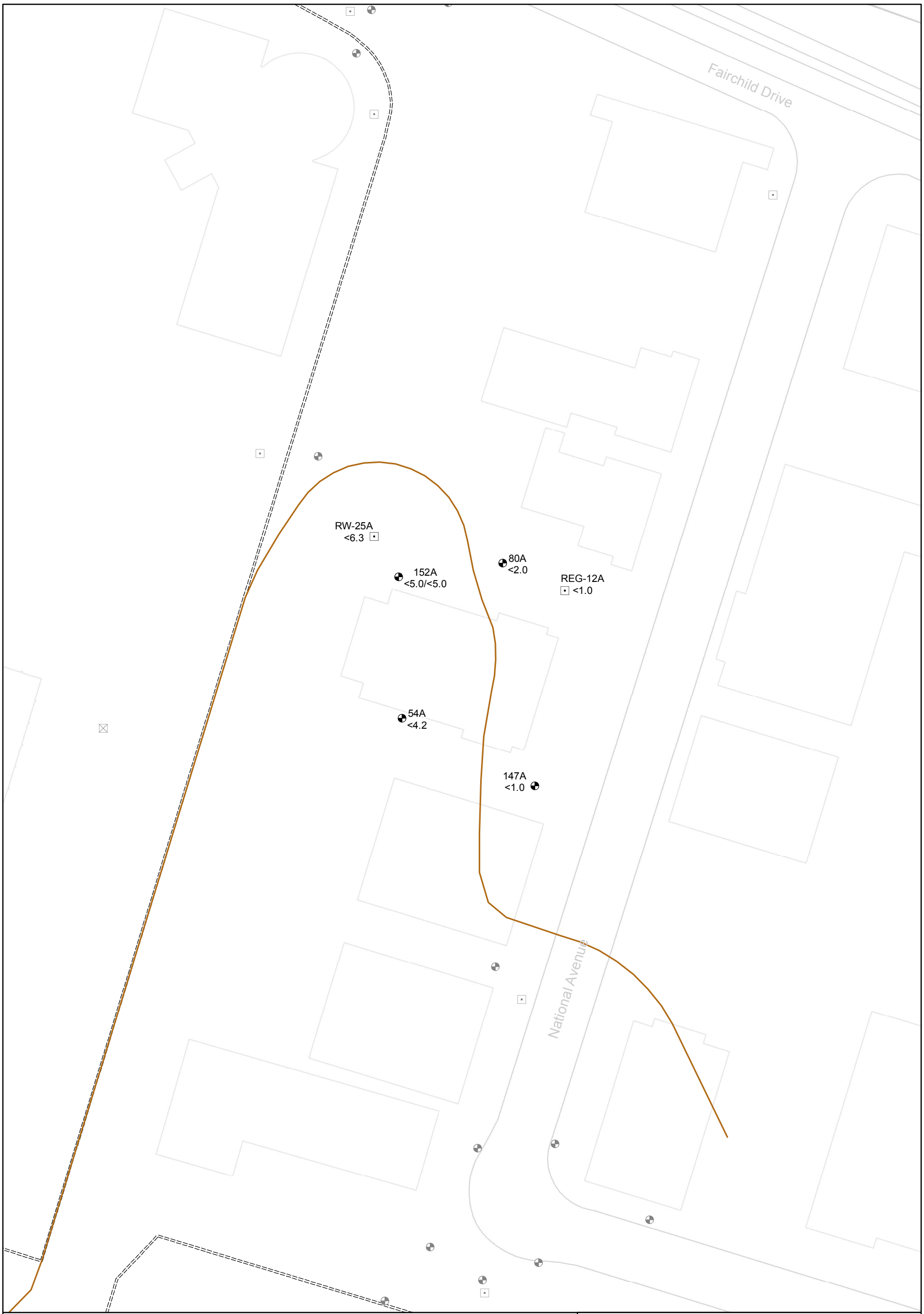
MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 8

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig08_VC_AA1_Sept2011_CZ.mxd | 3/28/2012 3:34:05 PM



Legend

- Monitoring Well
- Recovery Well On
- Recovery Well Off

PCE Concentration

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

- Estimated Capture Zone
- Slurry Wall
- Building
- Road

N

80 40 0 80 Feet

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter
Figure shows only those wells sampled and analyzed for PCE in 2011.
Wells not associated with the Former Fairchild Building 18 Site are shown in gray.

A/A1 Zone PCE Concentrations and Estimated Capture Zones September/October 2011

MEW Former Fairchild Building 18 Groundwater Remediation Program
Mountain View, California

Geosyntec consultants

Oakland | April 2012

Figure 9

P:\GIS\MEW\Project\Fairchild\Building18\2011_AR\Fig09_PCE_AA1_Sept2011_CZ.mxd | 3/28/2012 3:34:44 PM

APPENDIX A

2011 Annual Report Remedy Performance Checklist

2011 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)
369 and 441 North Whisman Road (former Bldgs. 13 and 19 and 23)
401 National Avenue (former Bldg. 9)
644 National Avenue (former Bldg. 18)
464 Ellis Street (former Bldg. 20 and 20A)

Checklist completion date: 23 march 2012

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: three Regional Groundwater Remediation Program (RGRP) wells and 17 Source Control Recovery Wells (SCRWs)

Buildings 13, 19, 23 – 15 recovery wells: one RGRP well and 14 SCRWs

Building 9 – Four SCRWs

Building 18 – One SCRW and one basement dewatering sump

3. Treatment Systems as described below:

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

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

System 3 (treats water from Buildings 1-4)

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

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

- 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	John Gallinatti Geosyntec Consultants	510-285-2750	jgallinatti@geosyntec.com
RP Consultant	Alok Kolekar Weiss Associates	650-968-7000	adk@weiss.com

2011 Annual Report Remedy Performance Checklist

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.

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:

2011 Annual Report Remedy Performance Checklist

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:

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:

644 National Avenue property (former Building 18) has been bought by Carr America National Avenue LLC. The building will be removed and replaced by a multi-parcel development. Construction is anticipated to begin May/June 2012.

369 and 441 North Whisman Road (former Bldgs. 13 and 19 and 23), owned by Keenan, Lovewell Ventures, is developing plans for additional buildings on the site.

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

2011 Annual Report Remedy Performance Checklist

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	2011 Annual Fairchild Building Reports (Geosyntec, 2012) and the 2011 Annual Regional Report (Geosyntec, 2012)

☑ 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 2011 Annual Fairchild Building Reports

☑ 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

☑ The system is in compliance with discharge permits.

Slurry Wall Data

List the types of data that are available:	What is the source report?
Water level elevations in select well pairs Analysis of inward and upward hydraulic gradients	2011 Annual Fairchild Reports (Geosyntec, 2012)

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 chemical concentration data and potentiometric surface contours from 2011 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

2011 Annual Report Remedy Performance Checklist

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

Walk-throughs/Surveys: 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 2011. 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 separate cover (Haley and Aldrich, 2012).

Summary of Results: See the Annual Vapor Intrusion Progress Report (Haley and Aldrich, 2012).

Problems Encountered: See the Annual Vapor Intrusion Progress Report (Haley and Aldrich, 2012).

Recommendations/Next Steps: See the Annual Vapor Intrusion Progress Report (Haley and Aldrich, 2012).

Schedule: See the Annual Vapor Intrusion Progress Report (Haley and Aldrich, 2012).

X. REMEDY PERFORMANCE ASSESSMENT

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 System is reliable and consistent in its 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

Concentrations within TCE plume have been evaluated using Mann-Kendall analysis and reviewing VOC concentrations over time. The analyses show that TCE concentrations 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 2012).

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, 401 National Avenue, 515/545 N. Whisman Road and 313 Fairchild Drive.

Groundwater elevation and chemical monitoring results from 2011 demonstrate that the Fairchild extraction wells 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)

2011 Annual Report Remedy Performance Checklist

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 continue to remain 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- to A-zone, but downward vertical gradients are observed at a few locations.

Source document reference: 2011 Annual Fairchild Building Reports (Geosyntec, 2012)
2011 Annual Regional Report (Geosyntec, 2012)
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 2011 Fairchild Building and RGRP Annual Progress Reports indicate containment of target capture areas.

XI. PROJECTIONS

Administrative Issues
Dates of next monitoring and sampling events for next annual reporting period: September/October 2012

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

Remedy Projections for the upcoming year (2012/2013)
☑ 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 Feasibility Study Elaborate below. Target date: 2012

Elaborate on Remedy Projections: The EPA is developing a Groundwater Feasibility Study for MEW.

2011 Annual Report Remedy Performance Checklist

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 Feasibility Study Elaborate below. Target date: 2012

Elaborate on Remedy Projections: The EPA is developing a Groundwater Feasibility Study for MEW.

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: Groundwater Feasibility Study Elaborate below. Target date: 2012

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: Groundwater Feasibility Study Elaborate below. Target date: 2012

Elaborate on Remedy Projections: The EPA is developing a Groundwater Feasibility Study for MEW.

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.

Extraction rates were modified in 2010 based on an Optimization Evaluation conducted in 2008 (Geosyntec, 2008).

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:

Site-Wide Focused Groundwater Feasibility Study for Groundwater being conducted by EPA.

Date of Next EPA Five-Year Review: September 30, 2014

XIII. RECOMMENDATIONS

APPENDIX B

Laboratory Analytic Reports and Chain-of-Custody Documents, January through December 2011

(This appendix is being submitted on 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: Carolyn Kneiblher, C.HG.
Geosyntec Consultants

FROM: Alok D. Kolekar, P.E.
Weiss Associates

RE: **2011 DATA QUALITY SUMMARY**
FORMER FAIRCHILD BUILDING 18
MIDDLEFIELD-ELLIS-WHISMAN AREA SUPERFUND SITE
MOUNTAIN VIEW, CALIFORNIA

DATE: April 6, 2012

This memorandum summarizes data quality for groundwater and treatment system water samples collected in 2011 from monitoring wells associated with former Fairchild Building 18 at the Middlefield-Ellis-Whisman (MEW) Area Superfund Site in Mountain View, California. The groundwater samples were collected during the 2011 annual groundwater sampling event in September and October. Detailed results for quality assurance/quality control (QA/QC) samples collected during the MEW annual groundwater sampling are presented in Weiss Associates' (Weiss) memorandum titled, "Data Quality Assurance/Quality Control Report, 2011 Groundwater Sampling, Middlefield-Ellis-Whisman Area Superfund Site" and dated March 9, 2012.

The analytical laboratory data and accompanying quality assurance/quality control (QA/QC) information were reviewed for precision, accuracy, reproducibility, and completeness in accordance with the approved MEW 1991 *Quality Assurance Project Plan* (QAPP).[1] In addition, the data quality review was based on Weiss Associates' Standard Operating Procedures (SOPs) for data verification, data validation, and validation procedures for metals, volatile organic chemicals (VOCs), and semivolatile organic chemicals. The SOPs functionally adhere to the most recent USEPA *Contract Laboratory Program National Functional Guidelines for Organic (October 1999) and Inorganic (February 1994) Data Review*. As specified by the QAPP and the SOPs, Weiss Associates collected field QA/QC samples and performed a laboratory data quality review.

To assess the reliability of field sampling procedures and materials, the following field QA/QC samples were collected or prepared for the annual groundwater sampling and GWETS sampling:

- Field duplicate – Field duplicate samples are blind duplicates that provide data to assess precision of the 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 – These samples consist of reagent water collected from a final rinse of sampling equipment after the decontamination procedure has been performed. The purpose of rinseate samples is to evaluate whether the sampling equipment may be causing cross-contamination of the samples. Rinseate blank

[1] 1991, *Quality Assurance Project Plan Middlefield-Ellis-Whisman Site, Mountain View, California*, prepared by Canonie Environmental, Rev. 1.0,; August 16, 1991. This document is sometimes referred to as the Unified QAPP because it is used by MEW, NASA and Navy.

sampling is not necessary for locations that have dedicated sample collection, such as at GWETS sample ports. Following equipment decontamination, deionized/organic-free water used for the final rinse is collected in appropriate bottles. Rinseate samples were specified at a frequency of 1 for every 20 field samples that are collected using reusable sample collection equipment.

- Field blank – These samples consist of source water used for decontamination of equipment. The purpose of field blanks is to evaluate whether source water is contributing to contamination of samples. Field blanks were collected at a frequency of 5% of the field samples collected.
- Trip blank – These samples consist of "clean," volatile organic analysis vials (VOAs) filled with deionized/organic-free water and preserved. These pre-filled VOAs are supplied by the laboratory and accompany other samples in the field and on their trip to the laboratory. The purpose of the trip blank is to evaluate whether exposure to sampling site conditions, storage, and shipment of samples may be causing contamination after the samples are collected. Trip blanks are collected only when samples are collected for VOC analysis. One trip blank accompanies each VOC sample shipment.

LABORATORY DATA QUALITY REVIEW PARAMETERS

For the 2011 annual groundwater sampling event, the sample results were verified for completeness using a Level 2 data review summary per the QAPP and SOPs. The following parameters were reviewed in this review:

- Holding time;
- Detection and reporting limits;
- Surrogate recovery (VOC methods only);
- Laboratory control sample recovery;
- Matrix spike and spike duplicate recovery;
- Method blank results;
- Travel blank results (VOC methods only);
- Field/rinseate blank results; and
- Field sample duplicates results.

Ten percent of the sample delivery groups underwent a Level 4 data validation as required by the QAPP. The samples intended for the Level 4 data validation were documented on separate chain-of-custody forms than the other samples. Level 4 validation procedures vary by method. In addition to the Level 2 verification parameters listed above, the Level 4 validation parameters for organic (e.g., VOC) analyses include:

- Ion abundance;
- Minimum number of initial calibration standards analyzed;
- Relative response factors in initial and continuing calibrations;
- Percent of relative standard deviations in initial calibrations;
- Percent of differences in continuing calibrations;

- Internal standard retention times;
- Internal standard area counts;
- Analytical sequence carryover;
- Dilutions performed appropriately;
- Calibration blank contamination; and
- Data package completeness for all raw data, including chromatograms and bench sheets, for calibration standards, quality control data, and samples.

The Level 4 review of inorganic (e.g., metal) data include:

- Minimum number of initial calibration standards analyzed;
- All initial calibration verification recoveries within established limits;
- Initial calibration correlation coefficients within established limits;
- Continuing calibration verification recoveries within established limits;
- Analytical sequence carryover;
- Dilutions performed appropriately;
- Laboratory duplicate results within established limits;
- Initial and continuing calibration blank contamination; and
- Data package completeness for all raw data, including bench sheets, for calibration standards, quality control data, and sample.

CONCLUSIONS

Weiss Associates' Project Chemist assigned qualifiers to data that were found outside the control limits specified by the QAPP and data evaluation SOPs. Data qualifiers defined in the USEPA *Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review* were used.

A total of 9 groundwater samples were collected from monitoring wells associated with former Fairchild Building 18 during the annual sampling. These samples were analyzed by Curtis and Tompkins, Ltd in Berkeley, California for:

- Halogenated VOCs by U.S. EPA Method 8260B (8 samples)
- Metals by U.S. EPA Method 6010B (1 sample)

The samples were collected, stored, transported, and managed according to USEPA protocols based on Weiss' review of field and laboratory documentation. The laboratories reported that sample temperature and holding times were within acceptable ranges. Custody seals were used for each set of samples as specified by the QAPP.

No data non-conformances were identified during the data verification and validation process. Thus, no data qualifiers were necessary, and the data are usable for their intended purposes. Tables 1 and 2 summarize the conformance with sampling and analytical QA/QC methods, respectively.

Table 1. Summary of Conformance with Sampling QA/QC Methods for Water Samples Collected in 2011, Former Fairchild Building 18, 644 National Avenue, Mountain View, California.

Who performed sampling (Firm name/address/contact/phone):	Weiss Associates 453 Ravendale Drive, Suite C, Mountain View, CA 94043 Alok D. Kolekar (650) 968-7000
Chain-of-custody forms completed for all samples?	YES
Field parameters stabilized prior to taking sample?	YES
Headspace in sample containers < 6mm (applicable to VOCs only)?	YES
Samples preserved according to analytical method?	YES
Required field QA/QC samples taken?	YES

Explain any "NO" answers.

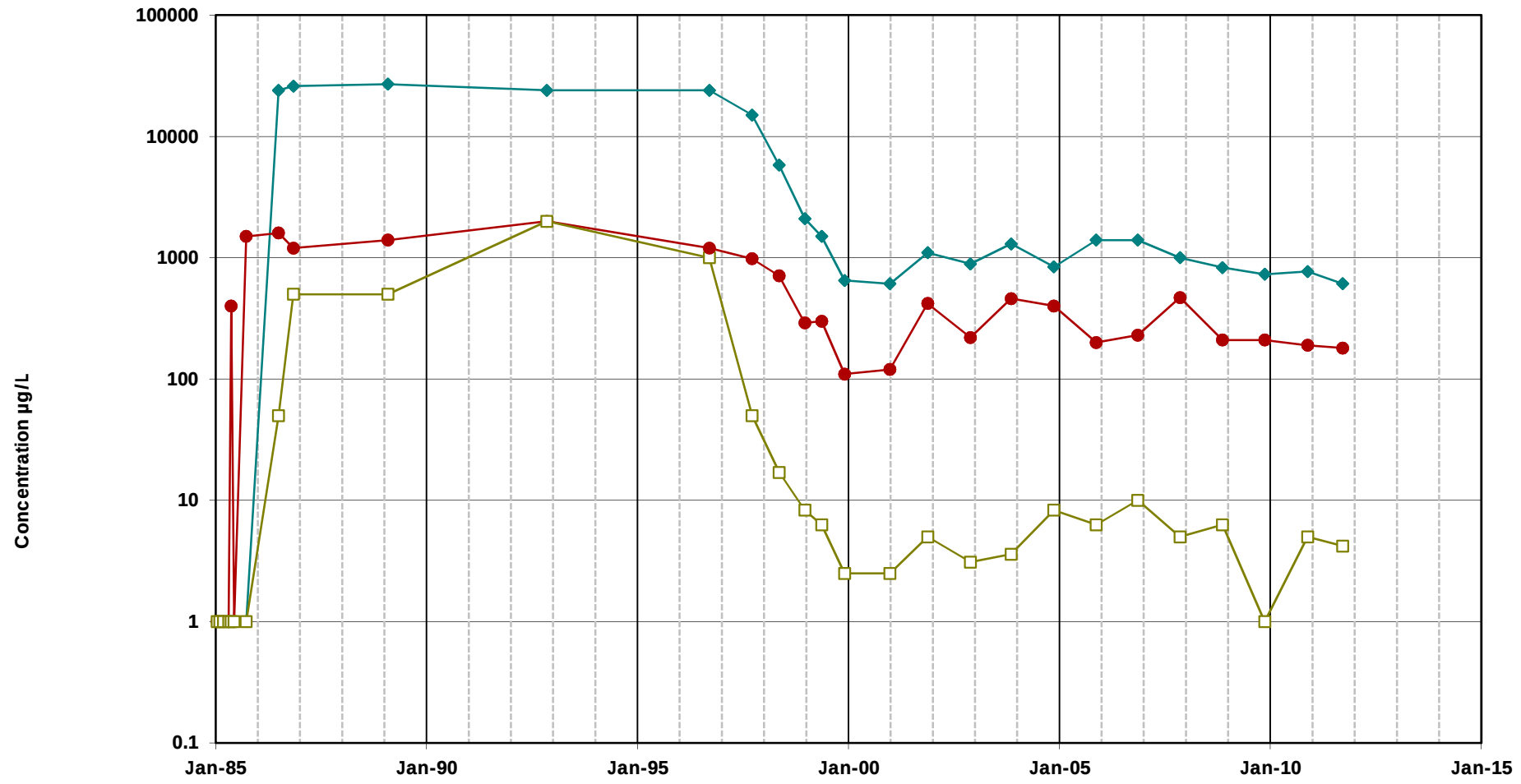
Table 2. Summary of Conformance with Analytical QA/QC Methods for Water Samples Collected in2011, Former Fairchild Building 18, 644 National Avenue, Mountain View, California.

Who performed analysis (Lab name/address/contact/phone):	Curtis and Tompkins 2323 Fifth Street Berkeley, CA 94710 Micah Smith (510) 204-2223
Are the labs state-certified for the above-noted analytical methods?	YES
Analyses performed according to standard methods?	YES
Sample holding times met?	YES
Analytical results reported for all values above MDL?	YES
QA/QC analyses run consistent with analytical methods?	YES
QA/QC results meet all acceptance criteria?	YES
QA/QC results and acceptance criteria on file?	YES

Explain any "NO" answers.

APPENDIX D

Selected VOCs versus Time Graphs



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 54A
MEW Former Fairchild Building 18

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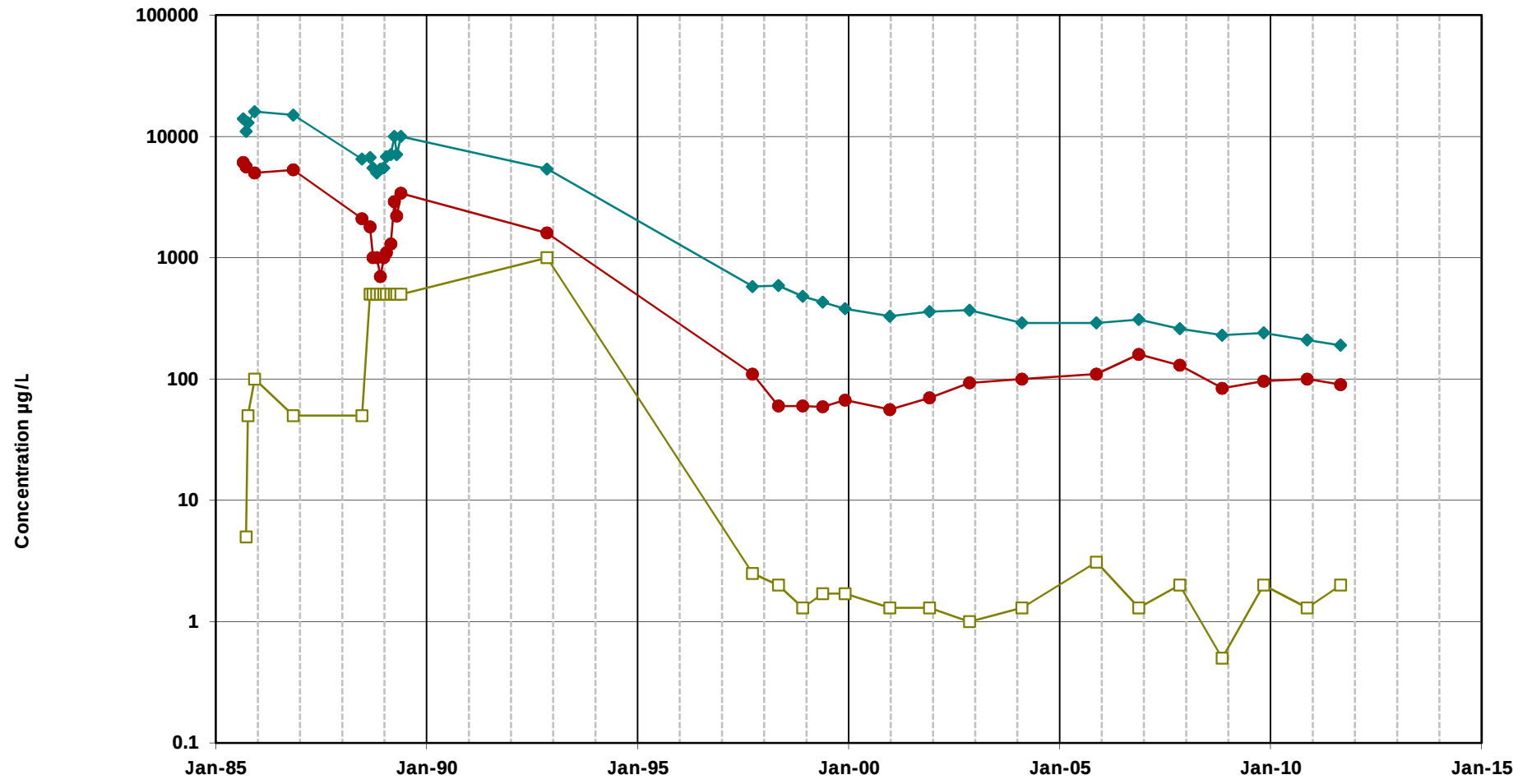
Oakland | April 2012

Figure

D-01

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[54A_VOC.xls]Plot_54A_VOC



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 80A
MEW Former Fairchild Building 18

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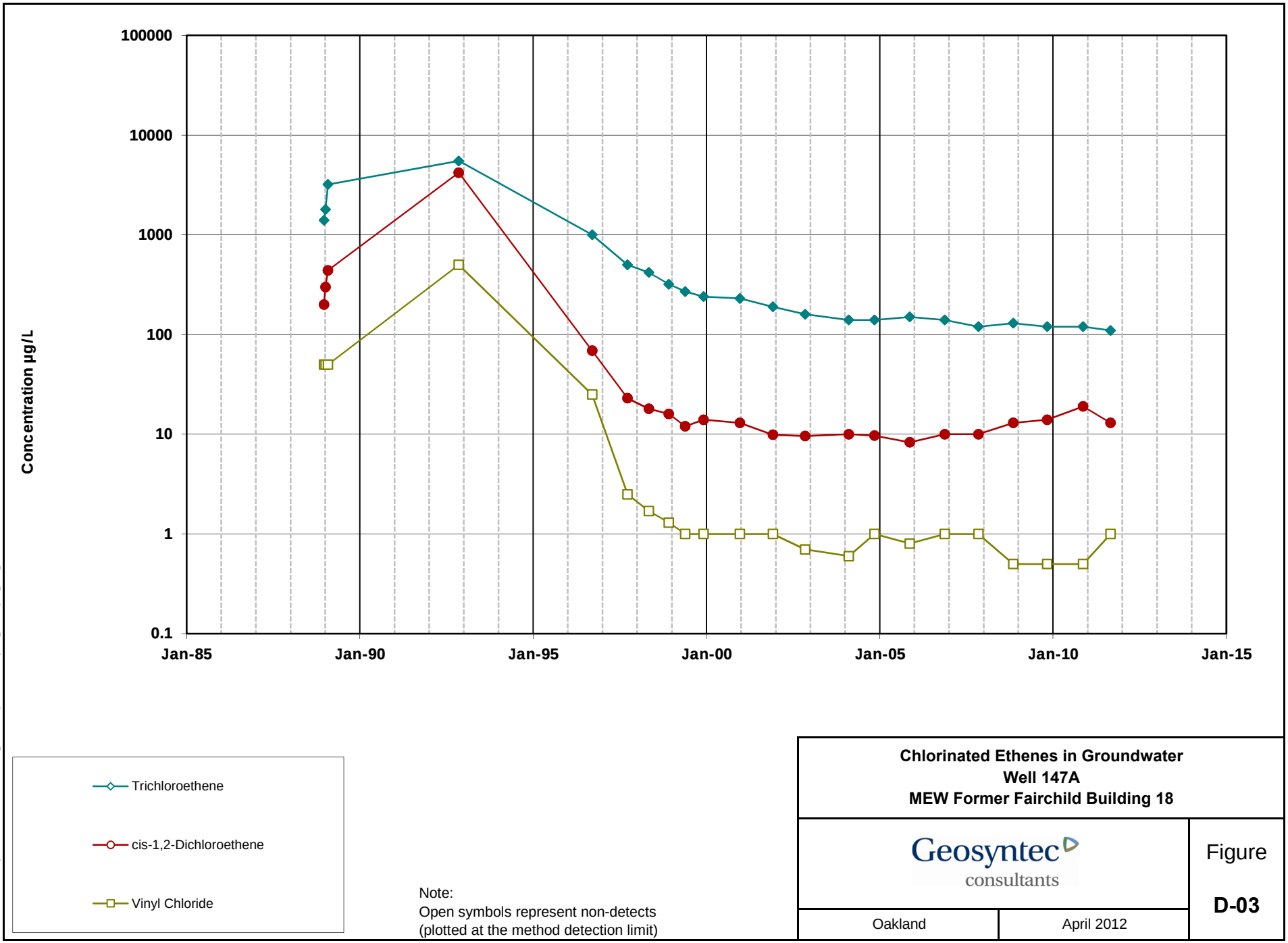
Figure

D-02

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[80A_VOC.xls]Plot_80A_VOC



Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 147A
MEW Former Fairchild Building 18

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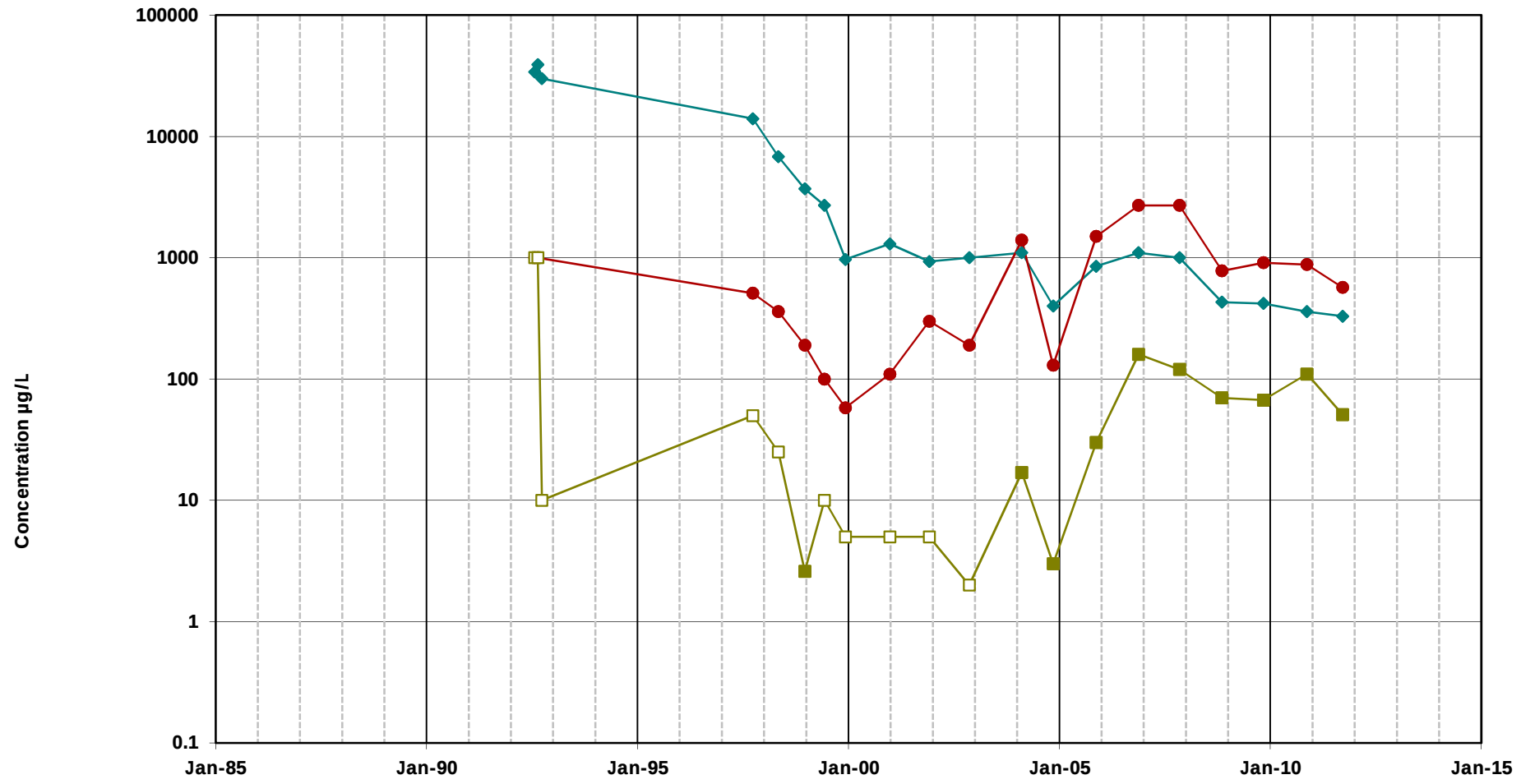
Figure **D-03**

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[147A_VOC.xls]Plot_147A_VOC



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 152A
MEW Former Fairchild Building 18

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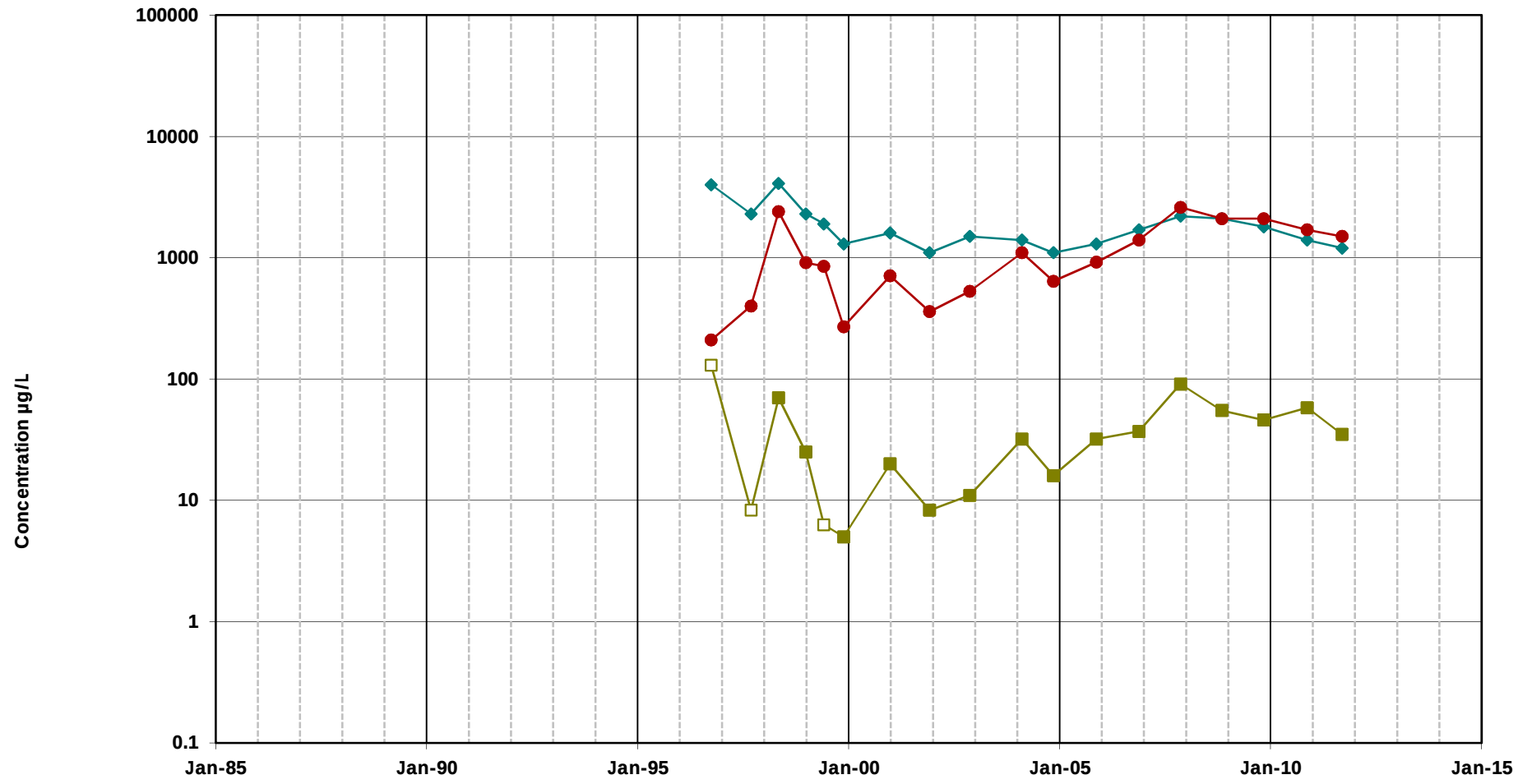
Figure

D-04

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[152A_VOC.xls]Plot_152A_VOC



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well RW-25A
MEW Former Fairchild Building 18

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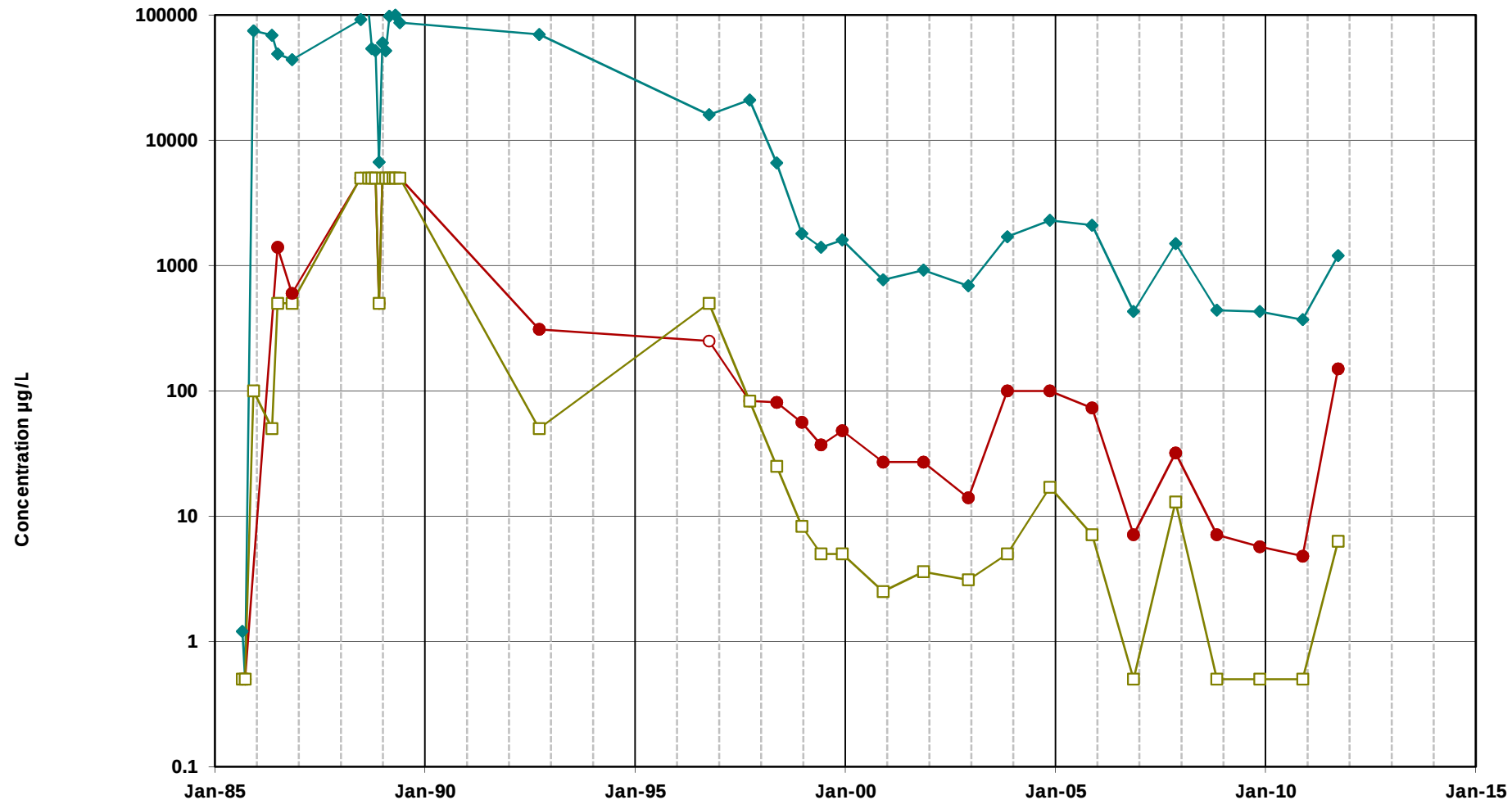
Figure

D-05

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[RW-25A_VOC.xls]Plot_RW-25A_VOC



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 32B1
MEW Former Fairchild Building 18

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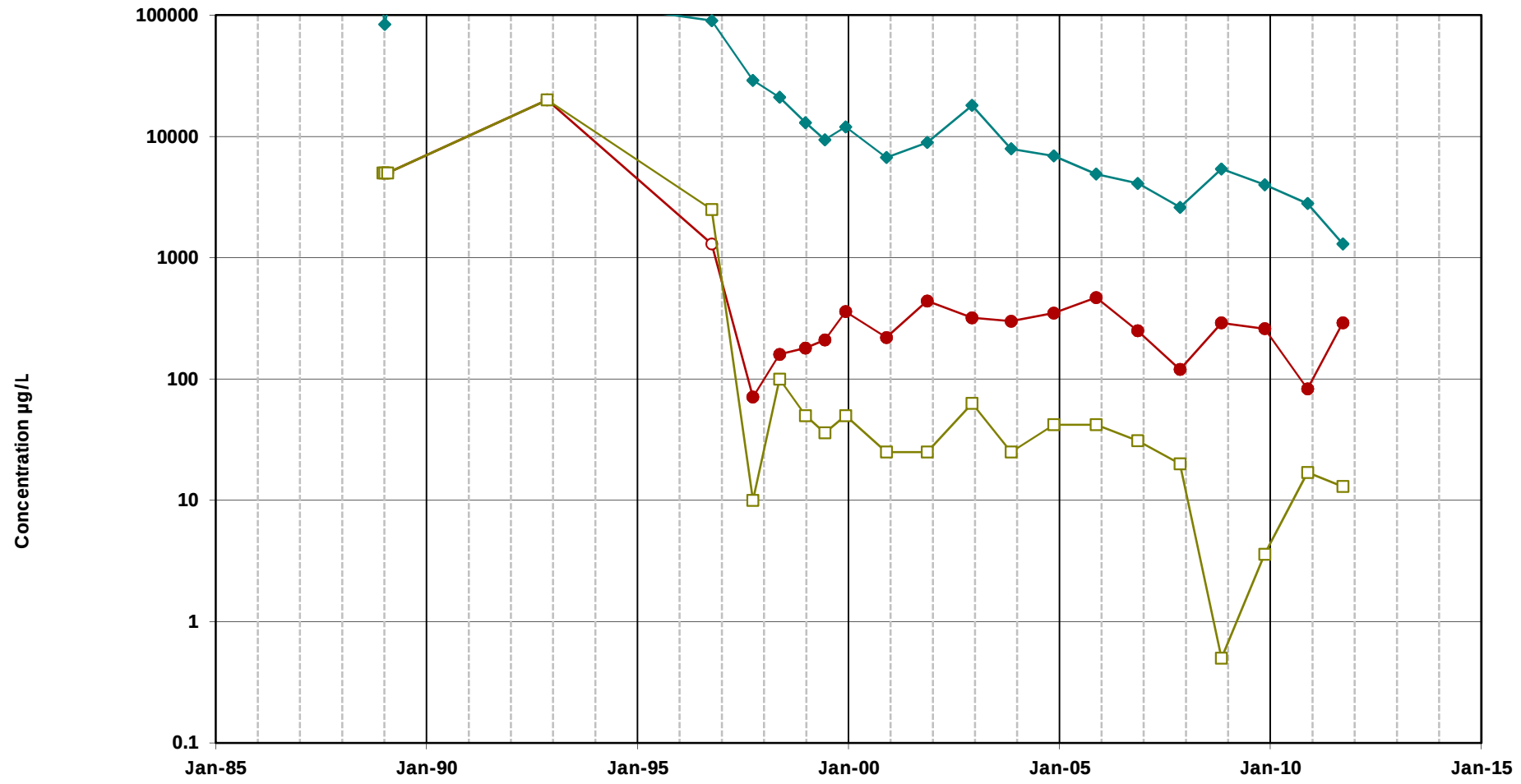
Figure

D-06

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[32B1_VOC.xls]Plot_32B1_VOC



Trichloroethene

cis-1,2-Dichloroethene

Vinyl Chloride

Note:
Open symbols represent non-detects
(plotted at the method detection limit)

Chlorinated Ethenes in Groundwater
Well 143B1
MEW Former Fairchild Building 18

Geosyntec consultants

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Figure

D-07

\\Oakland-01\data\gis\MEW\Excel\TimeSeries\2011_AR\Building 18\ExcelFiles\[143B1_VOC.xls]Plot_143B1_VOC