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January 30, 2015

Mr. Roger Papler
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Ste 1500
Oakland, CA 94612

Reference: Five-Year Remedial Action Status and Effectiveness Evaluation Report for the California-Olive-Emerson (COE) Study Area and Perimeter Area, Palo Alto, California

Dear Mr. Papler:

On behalf of Hewlett-Packard Company (HP) and Varian Medical Systems, Inc. (Varian), Stantec Consulting Services, Inc. (Stantec) is pleased to submit the enclosed Five-Year Remedial Action Status and Effectiveness Evaluation Report (Five-Year Report) for the California-Olive-Emerson (COE) Study Area and Perimeter Area in Palo Alto, California. This document is submitted in accordance with Provision 7(a) of Revised Site Cleanup Requirements Order 94-130 dated September 31, 1994, issued by the San Francisco Bay Regional Water Quality Control Board.

If you have any questions regarding this Five-Year Report, please contact Mr. Paul Paschke of HP at (970) 898-8197 and Mr. John Buchanan of Varian at (650)424-6103.

Regards,

STANTEC CONSULTING SERVICES INC.

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Five-Year Remedial Action Status and Effectiveness Evaluation Report California-Olive-Emerson (COE) Study Area and Perimeter Area, Palo Alto California

Stantec PN: 185702915

Prepared for:
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January 30, 2015

Limitations and Certifications

This report was prepared in accordance with the scope of work outlined in Stantec's contract and with generally accepted professional engineering and environmental consulting practices existing at the time this report was prepared and applicable to the location of the site. It was prepared for the exclusive use of Hewlett-Packard Company and Varian Medical Systems, Inc. Any re-use of this report for a different purpose or by others not identified above shall be at the user's sole risk without liability to Stantec. To the extent that this report is based on information provided to Stantec by third parties, Stantec may have made efforts to verify this third party information, but Stantec cannot guarantee the completeness or accuracy of this information. The opinions expressed and data collected are based on the conditions of the site existing at the time of the field investigation. No other warranties, expressed or implied are made by Stantec.

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Information, conclusions, and recommendations provided by Stantec in this document have been prepared under the supervision of and reviewed by the licensed professional whose signature appears below.

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Principal Geologist

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Abbreviations and Acronyms

bgs	below ground surface
CF	confidence factor
COE	California-Olive-Emerson
COV	coefficient of variation
CSM	Conceptual Site Model
DCA	dichloroethane
DCE	dichloroethene
DPE	dual-phase extraction
e.g.,	exempli gratia, meaning "for example" (Latin)
EISB	enhanced *in situ* bioremediation
EPA	Environmental Protection Agency
FS	feasibility study
GAC	granular activated carbon
GWET	groundwater extraction and treatment
HP	Hewlett-Packard Company
i.e.,	id est, meaning "that is" (Latin)
IRM	interim remedial measure
ISCO	*in situ* chemical oxidation
lbs/yr	pounds per year
MCL	maximum contaminant level
NPDES	National Pollution Discharge Elimination System
OEU	Oregon Expressway Underpass
PCE	tetrachloroethene
POTW	publicly-owned treatment works
RDG	Recorded Document Guarantee
RMP	Risk Management Plan
RWQCB	Regional Water Quality Control Board
SMP	self-monitoring program
Stantec	Stantec Consulting Services Inc.
SVE	soil vapor extraction
SVET	soil vapor extraction and treatment
TCA	trichloroethane
TCE	trichloroethene
µg/L	micrograms per liter
Varian	Varian Medical Systems, Inc.
VC	vinyl chloride
VFD	variable frequency drive
VOC	volatile organic compound

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this Five-Year Remedial Action Status and Effectiveness Evaluation Report (Five-Year Report) for the California-Olive-Emerson (COE) Study Area and Perimeter Area on behalf of Hewlett-Packard Company (HP) and Varian Medical Systems, Inc. (Varian). The COE Study Area and Perimeter Area are located in Palo Alto, California, and generally centered on the intersection of Page Mill Road and El Camino Real. The subject area for this Five-Year Report includes the following:

- HP 640 Page Mill Road Site, Palo Alto, California (the "640 PMR Site");
- HP 395 Page Mill Road Site, Palo Alto, California (the "395 PMR Site");
- Varian 601 California Avenue Site, Palo Alto, California (the "601 CA Site"); and
- Off-Site Area.

The 640 PMR Site, 395 PMR Site and 601 CA Site are collectively referred to as "the Sites." The Off-Site Area consists of the "COE Study Area" and the "Perimeter Area." Figure 1 shows the location of the Sites and the Off-Site Area. The Sites and Off-Site Area are collectively referred to hereafter in this report as the "Study Area." Chlorinated volatile organic compounds (VOCs) were identified in groundwater within the Study Area in the 1980s. VOC occurrence in groundwater resulted from historical chemical releases at the Sites as well as the adjoining Varian 611 Hansen Way Site and other potential sources within and up gradient of the Study Area. Remediation measures have been undertaken by HP and Varian to clean up VOC-impacted groundwater and are the focus of this Five-Year Report.

This Five-Year Report is submitted in accordance with Provision C.7(a) of the *Revised Site Cleanup Requirements, Order No. 94-130* (the "Order"), issued on September 21, 1994, by the California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB). This is the Fourth Five-Year Report submitted by HP and Varian for the Study Area. This Five-Year Report covers the period January 1, 2010 through December 31, 2014 (the "Reporting Period").

The remaining portions of this Five-Year Report are organized as follows:

- Section 2.0 presents background information, including the physical setting, chemicals of concern and cleanup standards, local hydrogeology, and a brief project chronology.

- Section 3.0 describes the remedial measures implemented to date (both interim and final), the groundwater self-monitoring program (SMP) and institutional controls established to protect human health.

- Section 4.0 describes the status of recommendations included in the 2010 Third Five-Year Report and actions taken by HP and Varian in response to subsequently issued agency requirements.

- Section 5.0 details the specific investigation and remedial actions taken during the current Reporting Period.
- Section 6.0 discusses the effectiveness of groundwater cleanup remedies and institutional controls.
- Section 7.0 provides information regarding projected costs to achieve cleanup objectives.
- Section 8.0 summarizes the conclusions and recommendations.

2.0 BACKGROUND

2.1 PHYSICAL SITE SETTING

The Study Area is located in Palo Alto, California and includes the former Varian Site at 601 CA and former HP Sites at 640 PMR and 395 PMR and the Off-Site Area. The COE Study Area is generally bounded by California Avenue to the northwest, Olive Avenue to the southeast, and Emerson Avenue to the northeast. The southwest boundary of the COE Study Area extends northwest and southeast from the southwest limit of the 640 PMR Site, as shown on Figure 1. Figure 1 depicts the Perimeter Area that adjoins the COE Study Area to the southeast. The Perimeter Area is bounded to the south by the Varian 611 Hansen Way Site General Study Area boundary. Emerson Street defines limits of the Perimeter Area to the northeast, and Fernando, Margarita, and El Carmelo Avenues define the southeastern extent of the Perimeter Area.

Investigation and clean up within the Study Area is being conducted by HP and Varian under RWQCB oversight. The 640 PMR Site is a federal Superfund site for which the RWQCB is the lead agency and the United States Environmental Protection Agency (EPA) is the support agency. The Sites have been treated separately for source area characterization and remediation. HP and Varian have worked cooperatively to investigate and remediate VOC-impacted groundwater in the Off-Site Area. The dewatering system associated with the Oregon Expressway Underpass (OEU) in the northern portion of the Study Area is an important physical feature influencing groundwater flow patterns and chemical migration. The OEU location is shown on Figure 1. The OEU dewatering system influence on ground water flow is discussed in more detail in subsequent sections of this report.

2.2 CHEMICALS OF CONCERN AND CLEANUP STANDARDS

The principal chemicals of concern in soil and groundwater underlying the Sites and groundwater underlying the Off-Site Area are chlorinated VOCs, including trichloroethene (TCE); 1,1,1-trichloroethane (1,1,1-TCA); 1,1- dichloroethene (1,1-DCE); 1,2-dichloroethene (1,2-DCE); 1,1-dichloroethane (1,1-DCA); and tetrachloroethene (PCE). TCE is the VOC most widely distributed and detected at highest concentrations in groundwater. The primary VOC originating at the 395 PMR Site, however, is PCE.

Finding 18 of the Order stipulates the cleanup standards for VOCs in soil and groundwater. For unsaturated zone soil, the cleanup standard is one (1) milligram per kilogram total VOCs. This standard is based on groundwater protection. Groundwater cleanup standards established pursuant to the Order are EPA maximum contaminant levels (MCLs), California Department of Environmental Protection MCLs, or for acetone, a target level based on toxicity characteristics published by EPA. The chemical-specific groundwater cleanup standards are listed in Table 1.

2.3 HYDROGEOLOGY

The local hydrogeology has been studied extensively and a detailed description can be found in the 1993 *Remedial Investigation Report (Revised, California-Olive-Emerson (COE) Study Area and Perimeter Area, Palo Alto, CA* (Study Area RI Report) prepared by Environ on behalf of HP and Varian. Figure 2 shows the locations of wells installed within the Study Area. The local stratigraphy and hydrogeologic conditions are summarized below.

The Study Area is underlain by alluvial fan deposits associated with the San Francisquito Creek to the west and Matadero Creek to the east. Predominant directions of deposition were identified based on the occurrence and distribution of the alluvial fan deposits. The predominant depositional directions correspond generally with current ground surface topography at the Sites and within the Off-Site Area, which indicates they are situated along the transition zone between the San Francisquito Creek alluvial fan to the west and the Matadero Creek fan to the east. As a result, the predominant depositional orientation of channels developed is easterly in the general area west of Page Mill Road, becoming northerly in the vicinity of Matadero Creek, particularly southeast of the Off-Site Area. Local variations in the distribution of coarse and fine-grained deposits appear to cause localized refraction of ground water flow, which affects the distribution and migration paths of chemicals in ground water.

Groundwater is first-encountered between depths of 15 and 30 feet below ground surface (bgs). Two primary water-bearing aquifers have been identified within the younger valley alluvium, the A Aquifer and the B Aquifer. The A Aquifer extends between approximate depths of 15 to 55 feet bgs and the B Aquifer is encountered at depths of 60 to 120 feet bgs. Three major sand units have been identified within the A Aquifer: 1) the shallow Al Upper (A1U) Zone, 2) the intermediate A1 Zone, and 3) the basal A2 Zone. The aquifer zones are separated by fine-grained silt and clay aquitards. The thicknesses of both the aquifer and aquitard units vary across the Study Area. Groundwater in the A1U Zone generally occurs above a depth of 30 feet under unconfined to semi-confined conditions, with a saturated thickness typically ranging from 1 to 10 feet. In the southwest portion of the Study Area the A1U Zone sand is unsaturated and first-encountered groundwater occurs in the underlying A1 Zone sand. The A1 Zone is a semi-confined aquifer that typically occurs between approximate depths of 30 and 40 feet bgs, but may be as deep as 45 feet. The A2 Zone is a confined aquifer that typically occurs between depths of 40 and 50 feet bgs, but may be as deep as 55 feet. Where an aquitard between the Al and A2 Zones is not present west of Page Mill Road, the A1 and A2 sands form a single hydraulic unit designated the Al/A2 Zone. The deeper B Aquifer is encountered between depths of approximately 60 to 120 feet bgs.

The regional direction of groundwater flow is northeasterly, from the hills toward San Francisco Bay. Groundwater flow in the A Aquifer is generally from south to north toward the OEU. The groundwater flow direction in the deeper B Aquifer is to the north and northeast. Groundwater elevation contour maps prepared using water level data obtained in June 2014 for First-

Encountered Groundwater (A1U Zone where saturated and A1 Zone elsewhere), A1 Zone, A2 Zone, and the B Zone are presented in Figures 3 through 6, respectively.

As further described in Section 3.4, the OEU has an active dewatering system to prevent groundwater (and surface runoff) from flooding the underpass. Both horizontal and vertical groundwater gradients in the A Aquifer are affected by pumping from the OEU dewatering system, which draws groundwater toward the subdrain collection system. Hydraulic evaluations indicate that the capture area created by the dewatering system is effective in capturing chemicals in the A aquifer, particularly in the northern portion of the COE Study Area and portions of the Perimeter Area.

2.4 PROJECT CHRONOLOGY

HP and Varian began conducting soil and groundwater investigations at their respective Sites in the early 1980s. Source area investigation and soil remediation was addressed separately at each Site under RWQCB oversight. HP and Varian worked cooperatively under RWQCB oversight to investigate and remediate groundwater impacts in the Off-Site Area. Investigation findings were presented in the Study Area RI Report. Interim remedial measures (IRMs) implemented are described in Section 3.0.

HP and Varian commissioned a Study Area-wide feasibility study (FS) to evaluate remedial options for VOC-impacted groundwater across the entire Study Area. The findings of the Study Area-wide FS were presented in the May 16, 1994, *Feasibility Study Report (Revised) California-Olive-Emerson (COE) Study Area and Perimeter Area, Palo Alto, CA* (Study Area FS Report) prepared by Environ on behalf of HP and Varian. The Study Area FS Report recommended using a network of existing IRM and new extraction wells and the OEU dewatering system to extract and treat VOC-impacted groundwater in the A Aquifer. Remediation of the deeper B Zone Aquifer was not recommended, as VOC-impacts above the cleanup standards were limited to the A Aquifer. The Study Area-wide groundwater remedy was implemented beginning in 1995.

As described in Section 3.0, a number of extraction wells have been taken out of service and in some cases decommissioned since 1995. At the 640 PMR Site, two additional extraction wells were installed in 2013. Innovative *in situ* remediation technologies, including *in situ* chemical oxidation (ISCO) and enhanced *in situ* bioremediation (EISB) have been implemented at two of the three Sites (601 CA Site and 395 PMR Site) and in a portion of the COE Study Area that was redeveloped as an outdoor soccer complex in 2005.

3.0 REMEDIAL ACTIONS AND MONITORING PROGRAM

The following sections describe the remedial measures implemented to address VOC-impacted soil and groundwater within the Study Area. For the purposes of this Five-Year Report, the remedial measures discussion is organized as follows:

- 640 PMR Site;
- 395 PMR Site;
- 601 CA Site;
- OEU Dewatering System; and
- Perimeter Area.

Descriptions of the current SMP and institutional controls established for the Sites are also included in this section.

3.1 640 PAGE MILL ROAD SITE

3.1.1 Soil Remediation

Pre-1994 remedial actions primarily involved removal of tanks, piping, and other facilities associated with past site activities, and excavation of impacted soils with off-site treatment or disposal. During April 1994 through August 1997, soil vapor extraction and treatment (SVET) was used to remove residual VOCs from soil at the 640 PMR Site. The SVET system includes 28 soil vapor extraction (SVE) wells screened in an upper coarse-grained unit (16 to 21 feet bgs), a lower coarse-grained unit (26 to 38 feet bgs), or an intermediate fine-grained unit located between the upper and lower. VOCs were removed from extracted soil vapors using granular activated carbon (GAC).

An effectiveness evaluation of the SVET system was submitted per requirements of the Order in a July 1995 report to the RWQCB, and was subsequently approved. Conclusions presented in the 1995 effectiveness evaluation were:

- The influent VOC concentration to the SVET system had decreased by approximately 99 percent, and the remediation goals for VOCs and acetone had likely been achieved in the upper zone soils; and

- Groundwater levels had risen since installation of the SVE wells, partially or completely re-saturating the gravel packed intervals for most of the lower zone SVE wells.

The SVET system has not operated for any significant time since August 1997 and did not operate during the Reporting Period.

3.1.2 Groundwater Remediation

Groundwater extraction and treatment (GWET) was implemented as an IRM at the 640 PMR Site from 1982 through December 1993. Groundwater extraction was performed from wells O1A, O47A, OB5-2, and OB5-5, which were constructed in the A1 and/or A2 Zones.

An expanded GWET system that replaced the IRM began full-time operation in 1994, and originally included three on-site and six off-site extraction wells.

<u>On-Site Extraction Wells</u>

EW-4 – screened in the A1 and A2 Zones
EW-5 – screened in the A1 and A2 Zones
EW-7 – screened in the A1 Zone

<u>Off-Site Extraction Wells Located in COE Study Area</u>

EW-1 – screened in A1U Zone on the former Mayfield School property
EW-2 – screened in the A1U Zone on the former Mayfield School property
EW-6 – Screened in the A1/A2 Zone on the former Mayfield School property
EW-8 – Screened in the A1 Zone on the Palo Alto Square property
EW-9 – Screened in the A1U Zone northeast of the Palo Alto Square property
EW-10 – Screened in the A1 Zone northeast of the Palo Alto Square property

Extraction wells were connected via buried double-contained conveyance piping to a central groundwater treatment plant located in the west corner of the 640 PMR Site. Groundwater has historically been treated using an air stripper and GAC, or just GAC. More recently, extracted groundwater treatment has included oxidation (ozone) or advanced oxidation (ozone and peroxide) pre-treatment, followed by GAC. Treated groundwater is then discharged to Matadero Creek pursuant to the requirements of the National Pollution Discharge Elimination System (NPDES), VOC General Permit. Treated groundwater has also been discharged to the City of Palo Alto sanitary sewer system (*i.e.,* publicly-owned treatment works or POTW) in accordance with a POTW discharge permit.

Per RWQCB approval, groundwater extraction from the following extraction wells has been curtailed: EW-1, EW-2, EW-6, and EW-9. Wells EW-1, EW-2, and EW-6 were decommissioned in 2005 in association with redevelopment of the Former Mayfield School Site northeast of the 640 PMR Site as a soccer complex by Stanford University (Stanford, the property owner). ISCO injections were completed in the vicinity of extraction well EW-6 prior to decommissioning.

Extraction from wells EW-4, EW-5, and EW-10 was curtailed on a trial basis with RWQCB concurrence in January 2008. Extraction well EW-10, located in the off-site COE Study Area was subsequently re-started in June 2010. Groundwater extraction from on-site well EW-7 continued

until October 2013, when it was replaced by a new A1 Zone extraction well. Extraction from off-site well EW-8 continued during the Reporting Period.

As further detailed in Section 5.3, the GWET system was shut down in October 2013 to implement several retrofits and improvements. The GWET system was restarted on January 6, 2014, extracting groundwater from new on-site wells TW-1 and TW-2 and off-site wells EW-8, and EW-10.

3.2 395 PAGE MILL ROAD SITE

3.2.1 Soil Remediation

With the exception of the east corner of the property, known as Area X (ten), soil remediation throughout the 395 PMR Site was completed with RWQCB oversight and approval during 1980s through the late 1990s, when the Site was redeveloped. Construction of the Area X remedial system was completed in July 1996 to address soil and groundwater impacted by VOCs. The Area X soil remediation system consisted of the following:

- Dual-phase extraction (DPE) of soil vapor and groundwater from six A1U Zone extraction wells (RW-1 through RW-6);
- SVE from seven vertical and one shallow horizontal vadose zone wells extending to less than 10 feet bgs; and
- Soil vapor treatment using GAC.

Full-time operation of the DPE system began in September 1996. Vapor extraction from the SVE wells was conducted for a period during 1997 and then permanently curtailed with approval from the RWQCB. The DPE system was operated until June 7, 2001, when it was shut down as part of a RWQCB approved trial curtailment.

In 2007, vadose zone soil sampling and analysis was conducted demonstrating that final cleanup standards had been achieved in Area X. Sampling results were submitted to the RWQCB in a report dated December 12, 2007, and the RWQCB concurred, in a letter to HP dated January 30, 2008.

3.2.2 Groundwater Remediation

Area X is the only portion of the 395 PMR Site where active groundwater remediation was necessary. Groundwater remediation in Area X began in 1996 with the DPE system and groundwater extraction from well EW-11R. DPE wells RW-1 through RW-6 began operating in September 1996. Well RW-3 was decommissioned and well RW-5 was taken out of service in May 1998, per RWQCB approval. Groundwater extraction from well EW-11R began in 1996.

Extracted groundwater from the DPE system and well EW-11R was discharged to the sanitary sewer system under a discharge permit from the City of Palo POTW.

The DPE system was shut down on a trial basis on June 7, 2001, per RWQCB approval. Permanent shutdown of the DPE system and extraction well EW-11R was recommended in a report submitted to the RWQCB on September 27, 2002. Extraction well EW-11R was shut down on June 14, 2003, per verbal authorization from the RWQCB. On January 17, 2007, RWQCB staff conveyed to HP their concurrence with permanent curtailment of the DPE system and extraction well EW-11R for the purpose of groundwater remediation.

In October 2007, ISCO injections were conducted in the vicinity of A1U Zone well RW-5 to address localized elevated PCE concentrations. A report describing the ISCO treatment and post-treatment monitoring results was submitted to the RWQCB in July 2008. Post-treatment monitoring results revealed that ISCO provided some VOC concentration reduction in the A1U Zone near well RW-5; but VOC concentrations in wells RW-5 and OB11-2 ultimately rebounded.

As further detailed in Section 5.4, HP implemented an RWQCB-approved EISB treatment program in Area X beginning in 2013. Based on favorable performance monitoring results, a second round of EISB injections was performed in August 2014. EISB performance monitoring is ongoing.

3.3 601 CALIFORNIA AVENUE SITE

3.3.1 Soil Remediation

Remedial measures for soil began as an SVET IRM in 1991. The SVET system was expanded in 1992 as the final remedial measure and implemented in four Site areas: Areas A, B, C, and D. The SVET system consisted of 18 extraction points and a central blower/treatment compound. The SVET system was shut down and the extraction points for Areas A, B, and C were decommissioned, per RWQCB approval, in February 1996 prior to site redevelopment. The remaining Area D SVE extraction wells were subsequently decommissioned after the RWQCB approved completion of soil cleanup in August 1996.

3.3.2 Groundwater Remediation

Remedial measures for groundwater began in 1987 with extraction from a single on-site well V8-2X screened in the combined A1/A2 Zone. Extracted groundwater from V8-2X was treated by GAC and discharged to the sanitary sewer system under a discharge permit from the City of Palo Alto POTW. In 1992, the groundwater IRM was expanded and modified to include three on-site extraction wells (V8-2X, V8-8X, and V8-14X) screened in the combined A1/A2 Zone and one off-site extraction well (V-9X) screened in the combined A1/A2 Zone. The groundwater treatment system was modified for treatment with a low-profile air stripper. To facilitate Site

redevelopment, the groundwater extraction and treatment system was relocated and temporarily shut down between March and July 1996 and extraction well V8-14 was decommissioned with RWQCB approval in February 1996. Following Site redevelopment, groundwater extraction from wells V8-2X, V8-8X, and V8-9X continued until July 2003.

The groundwater extraction and treatment system was shut down in July 2003 with RWQCB approval to facilitate ISCO implementation. An ISCO pilot study was conducted in November 2001 to evaluate the potential for ISCO to expedite groundwater cleanup. Permanganate injections were conducted in the courtyard area. Pilot study findings indicated that ISCO was a viable treatment technology. Twenty (20) wells with the dual purpose of facilitating ISCO treatment and further defining VOC distribution in the courtyard and west parking lot were subsequently installed. Full-scale ISCO treatments (permanganate injections) were completed in January 2004, July 2005, and September 2006. ISCO treatment was deemed successful at reducing the overall size of the VOC-impacted area although elevated VOC concentrations in the center of the courtyard persisted following ISCO treatment.

In July 2008, Varian proposed a change from ISCO to EISB to treat the VOC-impacts in the courtyard area and control off-site plume migration. The change was proposed due to the anticipated limited effectiveness of ISCO to treat residual VOC mass found underlying the courtyard area.

As further detailed in Section 5.5, Varian completed an EISB bench scale study in 2010 which demonstrated that addition of microbes and carbon substrate could achieve complete reductive dechlorination of the contaminants of concern. Varian subsequently implemented RWQCB-approved EISB pilot studies in two phases between 2012 and 2014. EISB performance monitoring is ongoing.

3.4 OEU DEWATERING SYSTEM

The OEU serves as a subsurface roadway (*i.e.,* underpass) beneath the Southern Pacific Railroad tracks, Alma Street, and Park Boulevard. The underpass, built in 1958, extends approximately 24 feet bgs. A dewatering system was constructed to control (prevent) flooding of the underpass from groundwater seepage and storm water accumulation. The dewatering system consists of a network of subsurface perforated piping, along with surface water drains, that convey collected water to a subgrade sump within the OEU pump station. The pump station is located at the corner of the transition road from eastbound Oregon Expressway to southbound Alma Street and is identified on Figure 1.

The dewatering system has a substantial impact on groundwater flow in the Off-Site Area. The OEU dewatering system effectively captures groundwater from surrounding areas and acts to limit VOC plume migration beyond the OEU subdrain.

Historically, VOC-impacted water collected in the OEU pump station sump was discharged to the sanitary sewer system under a permit from the City of Palo Alto POTW. Periodically, during times of high surface water inflow, water was pumped into a box culvert approximately 25 feet above the OEU, which discharges to Matadero Creek approximately 2,200 feet downstream (southeast) of the OEU pump station.

In August 2000, an NPDES Permit was issued to the County of Santa Clara Roads and Airports Division (the County) by the RWQCB, allowing further discharge of water from the OEU pump station to Matadero Creek. The permit required the installation of a VOC removal system, on or in the box culvert that transports groundwater and surface water from the pump station to Matadero Creek.

A VOC treatment system was subsequently designed and constructed in 2002. The treatment system consists of two sequential operations: the first being removal of VOCs by pumping water through a vacuum air stripping unit that discharges under gravity into the box culvert. The second operation is passive air stripping as water flows approximately 2,200 feet in the box culvert toward Matadero Creek. Water from the OEU dewatering system is also periodically discharged to the sanitary sewer system under a discharge permit from the City of Palo Alto POTW.

3.5 PERIMETER AREA

Groundwater remedial measures in the Perimeter Area began in March 1993 with the installation of IRM extraction well EW-13 (A1 Zone) near the intersection of Lambert and Ash Avenues. Four additional wells were proposed as part of the final groundwater remedy. Extraction well EW-12 (A1U Zone) was installed in August 1996 near the intersection of Lambert and Ash Avenues. Extraction well EW-14 (A1 Zone) was installed in October 1995 near the intersection of Portage Avenue and Ash Street. Both wells began full-time operation in November 1996. Wells EW-12, EW-13, and EW-14 were connected to the Varian 611 Hansen Way treatment system. Per RWQCB authorization, these three extraction wells have not operated since the first quarter of 2006. The RWQCB approved permanent shutdown of extraction well EW-14 and that well was decommissioned in July 2006 following a one-time ISCO treatment. Approval for permanent shutdown of extraction well EW-12 and trial shutdown of extraction well EW-13 was issued by the RWQCB in February 2007.

Extraction wells EW-15 (A1U Zone) and EW-16 (A1 Zone) were installed in October 1995 near the intersection of Park Boulevard and Portage Avenue and began full-time operation in June 1996. Extracted groundwater from these two wells was discharged directly to the sanitary sewer under a discharge permit from the City of Palo Alto POTW. As further detailed in Section 5.7, extraction wells EW-15 and EW-16 operated until November 2013 when they were shut down on a trial basis pursuant to a RWQCB-approved work plan.

3.6 GROUNDWATER MONITORING PROGRAM

Revised Site Cleanup Requirements, Order 94-130, was adopted by the RWQCB on September 21, 1994. A groundwater SMP was also adopted on this date. The SMP specified that ground water elevations would be measured quarterly and provided a schedule for groundwater sampling and analysis. In response to requests from Hewlett-Packard and Varian, a revised SMP was approved on December 18, 1997. The revisions included discontinuing sampling from selected wells, reducing the sampling frequency in selected wells, and changing the analytical methods used.

The RWQCB approved a modified SMP in a letter to HP, Varian, and Stanford Management Company dated May 4, 2001. The SMP consists of the following elements:

- Annual groundwater level measurements from 176 wells in June of each year;
- Annual groundwater sample collection and analysis from 26 wells for chlorinated VOCs including Freon 113 by EPA Method 8260B in June of each year;
- Biennial groundwater sample collection and analysis from 102 wells and the OEU Manhole for chlorinated VOCs including Freon 113 by EPA Method 8260B in June of each year; and
- Annual groundwater self-monitoring reports submitted to the RWQCB by September 30 of each year.

The following wells are listed in the May 2001 SMP, but have since been approved by RWQCB for destruction, and thus, are no longer sampled: W9A1U (destroyed 1998); BW-4 (destroyed March 2002); EW-1, EW-2, EW-6, F23A, F43A1U, F44A and F45A1U (destroyed July 2005); EW-14 (destroyed July 2006); and EW-9 (not yet destroyed).

During the June 2014 annual monitoring event, a total of 94 wells were sampled in support of the Five-Year Review. This included the 26 wells scheduled per the May 2001 SMP and 68 wells sampled on a self-directed basis.

3.7 INSTITUTIONAL CONTROLS

Pursuant to Provisions C.3(c), C.4(c), and C.5(b) of the Order, each of the Sites has had a Covenant and Environmental Restriction of Property Covenant recorded with the Santa Clara County Recorder. Covenants were recorded for the 640 PMR and 601 CA Sites in 2003, and for the 395 PMR Site in 2006. Each of the restrictions enumerated in the covenants "run with the land" and is enforceable by the RWQCB. Restrictions on development and use specified in each covenant include the following:

- The integrity of remedial measures, equipment, and groundwater monitoring systems must be preserved; and
- Owners and occupants of the Site shall not extract contaminated groundwater for any use unless expressly permitted in writing by the RWQCB.

An additional restriction is included in the 395 PMR Site covenant: "No residential buildings shall be constructed over the area of RW-5 and OB11-2, located in the east corner of the site, without further evaluation of potential vapor intrusion."

4.0 Status of Recommendations from the Third Five-Year Review

This section describes the status of recommendations included in the 2010 Third Five-Year Report and actions taken by HP and Varian in response to agency requirements issued since the Third Five-Year Report.

4.1 640 PAGE MILL ROAD

Recommendation – Continue to operate A1 Zone extraction well EW-7 to reduce on-site VOC concentrations and mitigate off-site migration of VOC-impacted groundwater.

Status – Extraction well EW-7 was operated continuously until October 2013 when, based on investigation findings and RWQCB-approved recommendations, operation of well EW-7 was temporarily curtailed and work to connect A1 Zone extraction well TW-1 to the GWET system was initiated. Full-time operation of extraction well TW-1 began in January 2014. As further discussed in Section 5.3, extraction well TW-1 meets the operational objectives of extraction well EW-7, and is intended to operate on an interim basis pending implementation of an EISB pilot test.

Recommendation – Continue to operate off-site extraction well EW-8 to address the portion of the A1 Zone plume that extends off-site northeast of the 640 PMR Site.

Status – Extraction well EW-8 was operated continuously during the Reporting Period, except for periodic maintenance.

Recommendation – Conduct the investigations recommended in the January 19, 2010, *Updated Conceptual Site Model - A1 Zone near Well O119A1 and A2 Zone near Well O67A* (CSM).

Status – A work plan to address the CSM recommendations was submitted to and approved by the RWQCB. The work plan was implemented and results reported to the RWQCB as further discussed in Section 5.3.

Recommendation – Modifications (increases) to groundwater monitoring frequency for certain wells were recommended.

Status – The recommended modifications to groundwater monitoring frequency were implemented a self-directed basis.

RWQCB requirement – A work plan for detailed evaluation of options for direct remediation of the A2 Zone near well O67A2 was required in the RWQCB in the November 18, 2010, Third Five-Year Report approval letter.

Status – HP submitted the required work plan, it was approved by the RWQCB, and subsequently implemented. Based on the evaluation findings, A1 Zone and A2 Zone extraction wells TW-1 and TW-2 were installed in 2012 in accordance with an RWQCB-approved work plan. Extraction well TW-2 provides direct on-site remediation of the A2 Zone and mitigates off-site migration of A2 Zone VOC-impacted groundwater.

RWQCB requirement – The Third Five-Year Report approval letter required submittal of a report verifying the destruction of long-screened wells MON-1 and AEC-1 through AEC-8.

Status – HP submitted a *Monitoring Well Destruction Documentation Report* to the RWQCB on December 23, 2010, which provided the required documentation.

4.2 395 PAGE MILL ROAD SITE

Recommendation – Decommission the Area X DPE system.

Status – The RWQCB has not yet approved decommissioning of the DPE system, though as discussed below, there is now a RWQCB-approved Risk Management Plan (RMP) for Area X. As discussed in Section 5.4, HP has implemented an EISB remediation program to address residual VOCs in the groundwater of Area X.

RWQCB Requirement – In an April 25, 2011 letter, the RWQCB approved a January 13, 2010, report entitled, "*Results of October 2009 Soil Gas Sampling to Assess Potential for Vapor Intrusion,*" and required HP to submit a RMP to addresses the potential presence of uncharacterized VOCs in soil gas in the area of well OB11-2 (Area X) in the eastern portion of the 395 PMR Site.

Status – A RMP (Revised) was submitted to the RWQCB on June 30, 2011, and approved by the RWQCB in a letter dated November 1, 2011.

4.3 601 CALIFORNIA AVENUE SITE

Recommendation – Continue the 601 CA Site GWET system shutdown and implement the RWQCB-approved May 29, 2009 *Site Investigation and Bench Scale Study Work Plan*.

Status – Varian implemented the work plan and submitted a report documenting the investigation and EISB bench scale results on November 4, 2010.

RWQCB Requirement – A June 6, 2013, RWQCB letter required Varian to submit a work plan to install a groundwater monitoring well to better define the northwest boundary of the COE VOC-impacted groundwater plume.

Status – Varian submitted a monitoring well installation work plan on July 26, 2013. As described in Section 5.5, the work plan was subsequently approved by the RWQCB and implemented by Varian. A report documenting the well installation and initial sampling was submitted to the RWQCB in September 2013.

4.4 OFF-SITE AREA

Recommendation – Continued operation of the OEU dewatering and treatment system with no significant modifications.

Status – The OEU dewatering and treatment system was operated continuously during the Reporting Period, with the exception of periodic maintenance.

Recommendation – Permanent shutdown of well EW-13 with annual groundwater monitoring.

Status – The RWQCB approved the Third Five-Year Report which contained this recommendation. Well EW-13 remained shut down throughout the Reporting Period and was periodically monitored as recommended.

Recommendation – Trial shutdown of A1U Zone extraction well EW-15 and A1-Zone extraction well EW-16.

Status – The RWQCB approved the Third Five-Year Report which contained this recommendation. A *Trial Shutdown Proposal* was submitted on September 20, 2013, and approved by the RWQCB on October 8, 2013. As further described in Section 5.7, extraction wells EW-15 and EW-16 were shut down on November 11, 2013, and periodic groundwater monitoring of the extraction wells and a set of nearby wells was conducted over a one-year period. A report documenting the results of the trial shutdown and recommending continued trial shutdown was submitted to the RWQCB on December 18, 2014.

RWQCB Requirement The Third Five-Year Report approval letter required submittal of work plan to provide enough data to fully define the TCE-impacted groundwater plume in the A1U, A1, and A2 Zones.

Status – A work plan was submitted and comments from the RWQCB addressed in an updated work plan and an addendum (collectively, the "Plume Definition Work Plan") which was conditionally approved by the RWQCB. Reports documenting implementation of the Plume Definition Work Plan were submitted on October 14, 2011, August 16, 2012, and November 30,

2012. A summary of the work that was complete and the associated findings is presented in Section 5.1.

RWQCB Requirement – The Third Five-Year Report approval letter required submittal of a work plan to provide A1 Zone data between wells EW-7 and EW-10 to re-evaluate hydraulic capture of the off-property A1 Zone TCE plume, especially the northeast portion of the A1 Zone plume that underlies existing commercial buildings.

Status – This requirement was fully addressed by Varian and HP. An A1 Zone plume capture evaluation work plan was submitted and comments from the RWQCB addressed in an updated work plan that the agency conditionally approved. An A1 Zone plume capture evaluation report, documenting the implementation of the RWQCB-approved work plan, was submitted on May 11, 2012.

RWQCB Requirement – The RWQCB conditioned its approval of the A1 Zone plume capture evaluation report upon HP and Varian submitting a work plan to reconstruct well F42A1 in a manner that would further minimize the potential for cross-contamination between the A1U and A1 Zones.

Status – A work plan to reconstruct well F42A was submitted and then approved by the RWQCB. Implementation of the work plan was documented in a report dated May 23, 2013.

RWQCB Requirement – The June 1, 2011, RWQCB approval letter for the Plume Definition Work Plan required HP and Varian to submit a work plan for conducting indoor air testing in residential buildings where groundwater TCE concentrations exceed 50 micrograms per liter (µg/L) and commercial/industrial buildings where groundwater TCE concentrations exceed 100 µg/L.

Status – An indoor air testing work plan was submitted and RWQCB and EPA comments and additional requirements addressed in a revised work plan and work plan addendum, which were approved by the RWQCB. Implementation of the revised work plan and addendum is documented in a report that was submitted to the RWQCB on September 19, 2014, and summarized in Section 5.2. The RWQCB approved the report in a letter dated January 8, 2015. Additional work will be completed during 2015.

5.0 Actions Taken During Fourth Five-Year Review

This section summarizes key actions taken by HP and Varian during the current Reporting Period.

5.1 VOC PLUME DELINEATION

Approval of the Plume Delineation Work Plan – which is comprised of the January 31, 2011 *Work Plan for A1U and A1, A2 Groundwater Zone Plume Definition*, March 21, 2011 *Updated Work Plans*, and May 11, 2011 *Addendum to March 21, 2011 updated Work Plans Document* – was issued by the RWQCB in correspondence dated June 1, 2011. A total of 17 new groundwater monitoring wells were installed, developed, surveyed, and sampled during 2011 and 2012 in accordance with the approved work plan. Thirteen new monitoring wells were installed in the A1U Zone, two were installed in the A1 Zone, and two were installed in the A2 Zone. Additionally, two wells on the former Stanford Cleaners property were destroyed and replaced (F87A2R and F127A1R). Data from sampling and analysis of the new wells, along with the existing Study Area wells were used to further refine the VOC-impacted groundwater plume.

Methodology and results of the Plume Delineation Work Plan implementation were presented to the RWQCB in the October 14, 2011, report entitled, "*Further Refinement of Volatile Organic Compounds in Groundwater*, the August 16, 2012 *Well Destruction and Replacement Report,*" and the November 30, 2012, report entitled, "*Well F168A1U and F169A2 Construction Report*." Results of the further refinement of the first-encountered groundwater TCE plume were used in developing the work plan for indoor air testing discussed in Section 5.2.

5.2 VAPOR INTRUSION ASSESSMENT

Indoor air testing and related studies were conducted during 2012, 2013, and 2014 to assess the potential for vapor intrusion to residential and commercial buildings in the Study Area overlying the TCE-impacted groundwater plume. Based on the results to date, no evidence of vapor intrusion that could cause unacceptable health risks has been found.

A June 1, 2011, letter issued by the RWQCB required HP and Varian to conduct indoor air testing in the COE Study Area to evaluate potential vapor intrusion into properties that overlie first-encountered groundwater containing TCE concentrations that exceed 50 µg/L for residential properties and 100 µg/L for commercial use properties. In response to this requirement, a work plan was submitted on September 30, 2011, and a *Revised Work Plan for Indoor Air Testing, COE Study Area, Palo Alto, California* (the "IA Testing Work Plan"), which addressed agency comments to the initial work plan, was submitted on February 17, 2012. The IA Testing Work Plan was approved by the RWQCB with certain conditions in letters dated March 12, 2012, and December 4, 2012. An *Addendum to the February 17, 2012 Revised Work Plan for Indoor Air Testing, COE Study Area, Palo Alto, California* ("Addendum") was submitted on January 13, 2014,

in response to discussions between Varian, HP, and EPA representatives in which the EPA communicated new requirements to be integrated into the COE Study Area vapor intrusion investigation. The Addendum was approved by the RWQCB on January 23, 2014.

A total of 82 breathing zone samples from 16 residential buildings and a total of 66 breathing zone samples from eight commercial buildings were collected and submitted for laboratory analysis. Twenty-one crawlspace samples were collected from residential buildings concurrent with indoor breathing zone samples. Outdoor air samples and potential pathway samples (from areas that are not routinely occupied) were also collected. Laboratory analytical results for breathing zone samples were compared to the conservative health-risk based long- and short-term screening values in the RWQCB-approved IA Testing Work Plan and Addendum.

None of the breathing zone air samples contained chemicals of concern attributable to vapor intrusion at levels that exceeded corresponding long- or short-term screening levels or response action levels. Based on these findings, it was concluded that that there is no unacceptable short- or long-term health risk to residential and commercial building occupants in properties in this area from the vapor intrusion pathway. Breathing zone sample results from those buildings with pathway sample detections were either non-detect or detected concentrations were below corresponding screening levels.

A report documenting implementation of the IA Testing Work Plan and Addendum, and associated results and conclusions (*Indoor Air Testing and Supplemental Vapor Intrusion Assessment Report*) was submitted to the RWQCB on September 19, 2014. Approval of the report ("IA Testing Report Approval") was issued by the RWQCB on January 8, 2015, concurring that there was no evidence of vapor intrusion at unacceptable levels in any of the continuously occupied living or work spaces tested to date.

5.3 640 PAGE MILL ROAD SITE

The 640 PMR Site GWET system was operated continuously during the Reporting Period, except for periodic maintenance, and from October 14, 2013 to January 6, 2014, during which time the system was retrofitted to improve treatment capacity, efficiency, and reliability. Retrofit work included installing a new control system, higher capacity ozone generation system, a hydrogen peroxide injection system, and larger capacity transfer pump. During the retrofit, work wells TW-1 and TW-2 were converted to extraction wells. Containment vaults, pumps, conveyance piping, and control equipment were installed, and the piping and controls tied into the exiting GWET system. Per RWQCB approval, A1 Zone extraction well EW-7 was shut down when wells TW-1 and TW-2 were tied into the GWET system and brought on-line.

A *Work Plan for Implementing Conceptual Site Model Recommendations* (CSM Recommendations Work Plan) was submitted to the RWQCB on January 31, 2011. The CSM Recommendations Work Plan, as modified by a subsequently submitted update (March 31,

2011) and an addendum (May 11, 2011) was approved by the RWQCB in correspondence dated August 10, 2011. Key elements included in the approved work plan are:

- Perform periodic monitoring at select 640 PMR Site wells to evaluate hydraulic response to increased pumping rates for extraction on-site well EW-7 and off-site well EW-8;
- Conduct a short-term pumping test in the area of well O67A2; and
- Submit a report documenting an evaluation of the potential for off-site extraction well EW-10 to improve hydraulic capture in the area of wells F127A1 and F129A1.

A report documenting the hydraulic capture potential for well EW-10 was submitted to the RWQCB on May 17, 2011. The report recommended continued operation of extraction well EW-10. Hydraulic testing using well O67A2 was conducted in July 2011, and the results were communicated to the RWQCB in the remedial options evaluation report discussed below. Results of additional periodic groundwater monitoring were utilized in the evaluation of plume capture in the area of extraction well EW-8, also discussed below.

A remedial options evaluation report was submitted to the RWQCB on November 7, 2011. The following three options were evaluated:

- Option 1 – Continued GWET operations as currently being implemented;
- Option 2 – Enhanced GWET using existing and additional extraction wells in the A1 and/or A2 Zone; and
- Option 3 – Enhanced GWET and EISB remediation.

The report concluded that Options 2 and 3 would best address residual VOCs in the vicinity of wells O119A1 and O67A2, with Option 3 having the greater potential to accelerate the remedial timeframe. The report recommended conducting pilot tests (pumping tests and direct injection of EISB agents).

A *Work Plan for EISB Pilot Test Study* was submitted to the RWQCB on February 3, 2012, and addendum to that work plan was issued on May 4, 2012. The work plan and addendum were approved by the RWQCB in a letter dated May 15, 2012.

A *Work Plan for A1/A2 Zone Extraction Well Installation and Hydraulic Testing* and an addendum to that work plan were submitted to the RWQCB on February 9, 2012 and May 4 2012, respectively. The work plan and addendum were subsequently approved by the RWQCB in a letter dated May 15, 2012. A report documenting the implementation of the work plan and addendum was submitted to the RWQCB on October 25, 2012. Wells TW-1 and TW-2 were installed in the A1 and A2 Zones, respectively in June 2012. Hydraulic testing was conducted between June and August 2012. Hydraulic testing results indicated that the zone of influence

created from operating wells TW-1 and TW-2 encompassed wells O119A1 and O67A2, and that effective hydraulic capture in the vicinity of extraction well EW-5 could also be achieved. It was recommended that wells TW-1 and TW-2 be operated as extraction wells on an interim basis (likely up to three years). Extraction wells TW-1 and TW-2 began full-time operation in January 2014. EISB pilot testing cannot be conducted concurrent with full-time operation of extraction wells TW-1 and TW-2. Therefore, it was recommended that the EISB pilot test be delayed while wells TW-1 and TW-2 are operated on a fulltime basis. The RWQCB approved this approach in its November 8, 2012, letter approving the October 2012 *Report of A1 and A2 Zone Hydraulic Testing Activities*.

Results of additional periodic groundwater monitoring were used to evaluate VOC plume capture in the vicinity of extraction well EW-8. Results of the plume capture evaluation were presented to the RWQCB in a report dated May 11, 2012. The plume capture evaluation report concluded that pumping from extraction wells EW-8 and EW-10 captures VOC-impacted groundwater in the vicinity of monitoring well F127A1, and that the VOC plume in the immediate vicinity of extraction well EW-8 is adequately controlled. No additional hydraulic control measures or assessment in that area were recommended.

5.4 395 PAGE MILL ROAD SITE

In March 2013, HP submitted an *EISB Work Plan for Area X*. The Work Plan was subsequently approved by the RWQCB in a letter dated March 12, 2014. An initial round of EISB injections was completed in May 2013 followed by one year of performance monitoring. A report describing the EISB treatment results was submitted to the RWQCB in July 2014. Based on favorable performance monitoring results, a second round of carbon substrate injections at Area X was performed in August 2014 and performance monitoring is ongoing. EISB effectiveness at the 395 PMR Site is discussed in Section 6.3.

5.5 601 CALIFORNIA AVENUE SITE

Varian completed an EISB bench scale study in 2010 which demonstrated that addition of microbes and carbon substrate could achieve complete reductive dechlorination of the contaminants of concern. Varian subsequently conducted an initial EISB pilot study (Phase I), pursuant to a RWQCB-approved work plan in August 2012. The Phase I EISB pilot study was implemented as a "bio-barrier" treatment array on the down gradient (north) side of the on-site building. The bio-barrier was designed to create a flow through reactive treatment zone to treat the TCE plume originating in the courtyard area (source area), and thus, mitigate further plume migration into the off-site down gradient area. The bio-barrier consists of a linear array of 14 injection wells aligned perpendicular to groundwater flow in the combined A1/A2 Zone. An initial round of carbon substrate and microbe injections was performed in August 2012. Based on favorable performance monitoring results, additional EISB injections into the bio-barrier were performed in October 2013 and October 2014.

In late 2014, Varian initiated a second EISB pilot study (Phase II) in the courtyard area, pursuant to a RWQCB-approved work plan. The Phase II EISB pilot study was designed to treat contaminants directly underlying the courtyard area. The Phase II EISB pilot study involved installation of ten injection wells within the courtyard. An initial round of carbon substrate and microbe injections was completed in December 2014. An initial performance monitoring event was conducted in mid-December 2014 and additional performance monitoring is planned in 2015. EISB effectiveness at the 601 CA Site is discussed in Section 6.4.

In June 2013, the RWQCB requested Varian to install a monitoring well to further delineate the northwestern boundary of the TCE plume on the 601 CA Site. In August 2013, an additional on-site monitoring well (V8-34) was installed approximately 50 feet south/southwest of Yale Street along California Avenue. Well V8-34 was subsequently sampled in September and October 2013, and January, June and July 2014. Well installation and initial sampling results were reported to the RWQCB in September 2013. The 2014 sampling results for well V8-34 were provided to the RWQCB in emails and the *2014 Annual COE Groundwater Self-Monitoring Report* submitted to the RWQCB on September 30, 2014.

5.6 OEU DEWATERING SYSTEM

The OEU dewatering system operated continuously during the current Reporting Period. Routine maintenance of the air stripper, variable frequency drive-controlled pumps (VFD pumps), and controls was performed. Additionally, the base elbows for both VFD pumps were replaced, and the two level switch-controlled storm pumps were replaced.

5.7 PERIMETER AREA

In September 2013, HP and Varian submitted a *Trial Shutdown Proposal for Perimeter Area Extraction Wells EW-15 and EW-16* to the RWQCB. Wells EW-15 and EW-16 capture groundwater on a Perimeter Area property that contains a VOC plume that is separate and distinct from the VOC plumes originating on Sites that are the subject of the Order. The RWQCB approved the trial shut down proposal in a letter dated October 8, 2013, and the wells were shut off on November 11, 2013. Prior to shutdown, groundwater levels and water quality samples were collected from wells EW-15 and EW-16 and six down gradient and cross gradient monitoring wells. A 12-month post-shutdown monitoring period followed that included quarterly sounding and groundwater sample collection and analysis for VOCs from eight wells (4 A1U zone wells and 4 A1 zone wells).

In December 2014, HP and Varian submitted a *Trial Shutdown Evaluation Report for COE Perimeter Area Groundwater Extraction Wells EW-15 and EW-16*. The report recommended that trial shutdown of wells EW-15 and EW-16 continue and that the associated groundwater monitoring program continue on a semi-annual basis during 2015. As of the date of this Five-Year Report, the RWQCB has not responded to report. The trial shut down monitoring results are discussed in Section 6.6.

6.0 EFFECTIVENESS EVALUATION

Groundwater remediation and institutional control effectiveness is discussed in this section. During the Reporting Period, active groundwater remediation measures included groundwater extraction and treatment at the 640 PMR Site and Off-Site Area and EISB at the 395 PMR Site and 601 CA Site. Groundwater extraction and treatment effectiveness is discussed in terms of operational performance (*e.g.,* uptime and contaminant mass removal), hydraulic plume containment, and progress towards achieving the cleanup goals. EISB effectiveness is discussed in terms of treatment efficacy, plume migration control, and progress towards achieving the cleanup goals.

Chemical concentration trends are a key indicator for evaluating groundwater remedy effectiveness. Chemical concentration data from wells located throughout the Study Area were evaluated to quantitatively assess concentration trends for key chemicals of concern. The trend analysis methodology and Study Area-wide findings are discussed in Section 6.1. Area-specific concentration trends are described in their respective sections.

Table 2 provides a data summary for VOCs detected in Study Area wells during the Reporting Period (2010 to 2014). Table 3 provides a summary of VOC mass removed, groundwater volumes extracted, and VOC mass removal efficiencies for the extraction and treatment systems operating during the Reporting Period.

Figures 7 through 9 present time-series isoconcentration maps for the two primary chemicals of concern in groundwater (PCE and TCE) for the first-encountered groundwater, A1 Zone and A2 Zone. Figures 10 through 12 provide a graphical depiction of PCE and TCE concentration trend results (*e.g.,* increasing, decreasing, and stable or no statistically significant trend). Figures 13 through 15 graphically depict groundwater extraction volumes and VOC mass removal estimates for the active treatment systems.

A data table containing historical VOC results is provided in Appendix A.

6.1 MANN-KENDALL TREND ANALYSIS

6.1.1 Methodology Description

A statistical trend analysis was performed on datasets from Study Area monitoring and extraction wells to objectively evaluate concentration trends. Stantec utilized the GSI Mann-Kendall Toolkit, which is a Microsoft Excel® spreadsheet system designed to analyze time series groundwater monitoring data to quantitatively assess if measured concentrations indicate an increasing, decreasing, stable, or no statistically significant trend over time.

Statistical trend analysis was performed for TCE and PCE using water quality data from the time period 2006 to 2014. This time period was selected to provide an adequate number of data points for the Mann-Kendall test (minimum of 4 data points) for all wells evaluated. A mean TCE and PCE concentration value was calculated for each year (2006-2014) using individual sample results obtained within the calendar year. Sample results reported below the laboratory reporting limit were included by assigning a value of half the reporting limit. Statistical trend analysis was not performed on datasets with less than four sample results or wells where a chemical constituent was not detected or infrequently detected at low (less than MCL) concentration.

The Mann-Kendall test for trend analysis, as coded in the GSI Toolkit, relies on three statistical metrics, as described below.

- ***The 'S' Statistic:*** Indicates whether concentration trend versus time is generally decreasing (negative *S* value) or increasing (positive *S* value).

- ***The Confidence Factor (CF):*** The CF value modifies the *S* Statistic calculation to indicate the degree of confidence in the trend result. Additionally, if the CF is below 90 percent, due either to considerable variability in concentrations versus time or little change in concentrations versus time, the CF is used to apply a preliminary "*No Trend*" classification, pending consideration of the coefficient of variation (COV).

- ***The Coefficient of Variation (COV):*** The COV is used to distinguish between a "*No Trend*" result (significant scatter in concentration trend versus time) and a "*Stable*" result (limited variability in concentration versus time) for datasets with no significant increasing or decreasing trend (*e.g.,* low CF).

6.1.2 MK Trend Analysis Results

Trend analysis results are summarized on Table 4 and presented graphically on Figures 10 through 12. Trend analysis results are organized on Table 4 by area (640 PMR Site, 395 PMR Site, 601 CA Site, COE Study Area, and Perimeter Area), flow zone (A1U, A1, A1/A2, A2, and B), well ID, and chemical of concern (PCE and TCE). GSI Mann-Kendall Toolkit output datasheets are provided in Appendix B. Study Area-wide results are described below by groundwater zone. Area-specific trend results are also discussed in the effectiveness evaluation sections (Sections 6.2 through 6.6).

First-Encountered Groundwater (Figure 10) – Mann-Kendall trend analysis was performed on 60 Study Area wells screened across first-encountered groundwater. This total includes 32 A1U Zone wells and 28 A1 Zone or combined A1/A2 Zone wells in areas where the A1U Zone is unsaturated. PCE and TCE trends in most all wells evaluated are declining, stable, or show no statistically significant trend. Of the 26 wells evaluated for PCE trends, 25 wells were either declining, stable,

or show no statistically significant trend. A single well (F106A1) showed a statistically significant increasing trend for PCE during the period 2006 to 2014. In the case of well F106A1, PCE values remain relatively low ranging from 11 µg/L to 20 µg/L.

Of the 60 first-encountered groundwater wells evaluated for TCE trends, 58 wells were either declining, stable, or had no statistically significant trend. Two wells (EW-4 and V8-2) showed a statistically significant increasing trend for TCE during the period 2006 to 2014. These two wells are A1 Zone well EW-4 at the 640 PMR Site and combined A1/A2 Zone well V8-2 at the 601 CA Site. In the case of well EW-4, TCE values remain relatively low ranging from 13 to 30 µg/L. In the case of well V8-2, the increasing trend (85 µg/L in 2006 to 8,200 µg/L in 2014) is attributed ISCO. Following ISCO, the TCE concentration in well V8-2 rapidly declined and then subsequently rebounded over time. EISB implementation at the 601 CA Site is expected to reduce source area concentrations and control the flux of dissolved contaminants to the off-site down gradient areas.

A1 Zone Groundwater (Figure 11) – Mann-Kendall trend analysis was performed on 58 Study Area wells screened across the A1 or combined A1/A2 Zone. Of the 17 wells evaluated for PCE trends, 16 wells were either declining, stable, or show no statistically significant trend. A single well (F106A1) showed a statistically significant increasing trend for PCE during the period 2006 to 2014 (see discussion above for F106A1).

Of the 58 wells evaluated for TCE trends, 52 wells were either declining, stable, or had no statistically significant trend. Six wells (V8-2, V-9, F97A, F41A1, EW-4, and F74A) showed a statistically significant increasing trend for TCE during the period 2006 to 2014. TCE increases observed in the four wells at and down gradient from the 601 CA Site source area (V8-2, V-9, F97A, and F41A1) are attributed to rebound following ISCO treatment and plume migration from the 601 PMR Site source area. EISB implementation at the 601 CA Site is expected to reduce source area concentrations and control the flux of dissolved contaminants to the off-site down gradient areas. As noted above, TCE concentrations in 640 PMR Site well EW-4 remain relatively low (13 to 30 µg/L). In the case of well F74A, the TCE concentration increased from 2.7 µg/L in 2007 to a mean of 36 µg/L in 2014. TCE in wells located further down gradient from well F74A remain not detected.

A2 Zone Groundwater (Figure 12) – Mann-Kendall trend analysis was performed on 40 Study Area wells screened across the A2 or combined A1/A2 Zone. Of the 5 wells evaluated for PCE trends, all five wells were either declining, stable, or show no statistically significant trend during the period 2006 to 2014. Of the 40 wells evaluated for TCE trends, 35 wells were either declining, stable, or had no statistically significant trend. Five wells (V8-2, V-9, F97A, F124A2, and F74A) showed a statistically significant increasing trend for TCE during the period 2006 to 2014. As noted above, TCE increases observed in the wells at and down gradient from the 601 CA Site source area (V8-2, V-9, and F97A) are attributed to rebound following ISCO treatment and plume migration from the 601 CA Site source area. EISB implementation at the 601 CA Site is

expected to reduce source area concentrations and control the flux of dissolved contaminants to the off-site down gradient areas.

In the case of well F124A2, located down gradient from the 640 PMR Site, the TCE concentration increased from a mean of 41 µg/L in 2007 to 450 µg/L in 2014. Recent results suggest that the TCE concentration in well F124A2 is stabilizing. TCE concentrations in this well are expected to decline with continued extraction from the A2 Zone at the 640 PMR Site. Trends for well F74A were discussed above.

6.2 640 PAGE MILL ROAD SITE

The primary chemical of concern at the 640 PMR Site and the off-site down gradient area is TCE. Groundwater remediation on the 640 PMR Site currently consists of groundwater extraction and treatment. As noted in Section 5.3, two new extraction wells (TW-1 and TW-2) were constructed in 2012 and connected to the GWET system in 2013 to improve VOC mass removal and on-site hydraulic containment in the A1 and A2 Zones.

The combined hydraulic influence from pumping wells TW-1 and TW-2 effectively creates a large capture area in both flow zones. The estimated horizontal capture limits induced by pumping from wells TW-1 and TW-2 are depicted on Figures 4 and 5, respectively. The capture limit for well TW-1 encompasses much of the site and extends off-site beyond the eastern property boundary across Page Mill Road to monitoring well F123A1. The capture limit from well TW-2 also encompasses much of the site and extends to the northern property boundary near monitoring well P2-A2 and northeast across Page Mill Road to monitoring well F124A2. The hydraulic conditions created by the new on-site pumping wells are an improvement compared to conditions prior to their operation. The newly configured on-site extraction well network (TW-1 and TW-2) which began operation in early 2014 has significantly improved capture and VOC removal in the A1 and A2 Zones underlying the 640 PMR Site and is effectively mitigating plume migration beyond the property boundary.

Historically, VOCs migrated in groundwater off-site from the 640 PMR Site in the A1 Zone across Page Mill Road to the northeast. Groundwater remediation beyond the 640 PMR Site boundary in the COE Study Area is affected by groundwater extraction from extraction wells (EW-8 and EW-10) completed in the A1 Zone. The estimated horizontal capture limit created by extraction from wells EW-8 and EW-10 is depicted on Figure 4. The capture limit encompasses the width of the TCE plume originating from the 640 PMR Site and extends approximately 150 feet northeast (down gradient) from well EW-10. Pumping from wells EW-8 and EW-10 is effectively capturing and containing VOCs in the COE Study Area down gradient from the 640 PMR Site. Furthermore, on-site extraction from well TW-1 is expected to cut off the movement of VOC-impacted groundwater from beneath 640 PMR Site into the down gradient COE Study Area and thus reduce VOC concentrations.

The VOC mass removal rate slowly declined between 2010 to 2013, as VOC concentrations declined in on-site well EW-7 and off-site extraction wells EW-8 and EW-10. A significant increase in the VOC removal rate began after bringing the two on-site replacement extraction wells TW-1 and TW-2 on line in early 2014 (see Table 3 and Figure 13). Wells TW-1 and TW-2 extract directly from the on-site area containing the highest VOC concentrations. Between 2013 and 2014, the VOC mass removal rate increased by more than 300 percent, increasing from 213 lbs/yr in 2013 to 718 lbs/yr in 2014. The total VOC mass removed during the reporting period is estimated at 1,116 lbs.

In response to the substantial increase in VOC mass removal, VOC concentrations have declined in both the A1 and A2 Zones. As shown on Table 4 and Figures 10 to 12, Mann-Kendall trend analysis was conducted for the 13 A1 Zone and 16 A2 Zone on-site wells. TCE exhibits an increasing concentration trend in one well on the 640 PMR Site (EW-4). The TCE concentration in well EW-4 remains relatively low, with concentrations ranging from 13 to 30 µg/L. The remaining wells exhibit stable, decreasing, or no significant trends for TCE and/or PCE. Eleven of the 29 on-site wells (38 percent) exhibit statistically significant decreasing trends for one or both chemicals.

The improved VOC mass removal rate and hydraulic control affected by on-site wells TW-1 and TW-2 has reduced the flux of dissolved VOCs into the off-site COE Study Area. Additionally, pumping at off-site wells EW-8 and EW-10 continues to remove VOC mass from these areas and has induced a capture area that encompasses the width of the TCE plume originating from the 640 PMR Site. As shown on Table 4 and illustrated on Figures 10 to 12, Mann-Kendall trend analysis was conducted on A1 and A2 Zone wells located in the COE Study Area down gradient (northeast) from the 640 PMR Site. No A1 Zone wells in this area exhibit an increasing trend for either TCE or PCE. Key off-site A1 Zone monitoring wells F42A1-R, F123A1, F125A1, and F137A1 each exhibit statistically significant decreasing trends. Well F124A2 in the A2 zone exhibits an increasing statistical trend; however, this trend is expected to become stable and then decrease with continued pumping at well TW-2. The remaining A1 and A2 zone wells exhibit stable or decreasing trends or no statistically significant trend.

In summary, changes to GWET operations have substantially increased mass removal rates and improved on- and off-site hydraulic control. VOC concentrations in both on- and off-site monitoring wells have responded favorably to these actions, with decreasing concentrations noted in many wells.

6.3 395 PAGE MILL ROAD SITE

The primary chemical of concern at the 395 PMR Site is PCE. Historical remediation measures at the 395 PMR Site included soil vapor/groundwater extraction and treatment and ISCO in Area X. SVE was effective in achieving soil cleanup goals in the unsaturated zone. Groundwater extraction did effectively reduce overall VOC concentrations, but ultimately extraction reached its effectiveness limit and was replaced with ISCO. ISCO provided some VOC concentration reductions, but VOC concentrations ultimately rebounded and remained elevated.

Beginning in 2013, EISB was employed in Area X to address residual VOC impacts in the source area. A figure showing the EISB treatment area at the 395 PMR Site is included as Figure 16. EISB injections conducted in Area X established geochemical and microbial conditions favorable to reductive dechlorination within both the A1U and A1 treatment zones. Reductive dechlorination of PCE to non-toxic ethene is occurring within the treatment zones as evidenced by PCE concentration declines and the occurrence of sequential daughter products (TCE, *cis*-1,2-DCE, and vinyl chloride [VC] and ethene). Concentration trend plots for A1U Zone and A1 Zone EISB treatment area wells depicting PCE, TCE, *cis*-1,2-DCE, VC, and ethene concentrations over the initial 12-month monitoring period are presented as Figures 17 and 18, respectively.

Following substrate introduction, PCE concentrations in all A1U Zone and A1 Zone wells, including down gradient A1U Zone wells RW-2 and RW-6, decreased. At well RW-5, the PCE concentration initially increased above its baseline concentration and then declined to below the reporting limit in subsequent monitoring events. After 12 months, PCE concentrations in all treatment area wells, except OB11-2 and EW-11R had declined to below the reporting limit. Concurrent concentration increases in daughter products (*cis*-1,2-DCE, VC, and ethene) indicate reductive dechlorination was enhanced by carbon substrate introduction and bioaugmentation. PCE and TCE concentrations in two A1U Zone wells located down gradient wells from the treatment zone (RW-2 and RW-6) declined significantly during the 12-month monitoring period. Additional EISB performance monitoring is planned for February and August 2015.

ISCO and EISB has been effective in reducing VOC concentrations within the 395 PMR Site source area (Area X) as well reducing the flux of dissolved contaminants to down gradient plume areas. As depicted on Figures 10 and 11, PCE and TCE concentrations in off-site A1U and A1 Zone wells down gradient from Area X are decreasing or stable.

Mann-Kendall trend analysis performed on datasets from 15 wells located on the 395 PMR Site reveals that PCE and TCE concentrations in most wells are declining or stable over the period 2006 to 2014 (see Table 4). PCE concentration trends are either decreasing or stable in 8 of 11 wells evaluated, with the remaining three wells showing no statistically significant trend. TCE concentration trends are either decreasing or stable in 13 of 15 wells evaluated, with the remaining two wells showing no statistically significant trend. No 395 PMR Site wells exhibited statistically significant increasing trends for either PCE or TCE.

6.4 601 CALIFORNIA AVENUE SITE

The primary chemical of concern at the 601 CA Site is TCE. Historical remediation measures at the 601 CA Site included soil vapor/groundwater extraction and treatment and ISCO. SVE was effective in achieving soil cleanup goals in the unsaturated zone. Groundwater extraction did effectively reduce overall VOC concentrations, but ultimately extraction reached its effectiveness limit and was replaced with ISCO. ISCO was effective at temporarily reducing dissolved phase VOC concentrations within and down gradient from the source area, but the

discovery of separate phase TCE in the courtyard area prompted a change in the remedial approach from ISCO to EISB.

Beginning in 2012, EISB was first employed down gradient from the source area to treat the TCE plume originating at the 601 CA Site and reduce plume migration into the off-site down gradient area. In late 2014, EISB treatment was initiated within the courtyard (source area) at the 601 CA Site. A figure showing the two EISB treatment areas at the 601 CA Site is included as Figure 19.

EISB treatment has established a reactive treatment zone down gradient from the courtyard source area where geochemical and microbial conditions are favorable to reductive dechlorination. Reductive dechlorination of TCE to ethene is occurring as the dissolved phase TCE plume moves through the treatment zone. Treatment effectiveness is evidenced by TCE concentration declines and the occurrence of sequential daughter products (*cis*-1,2-DCE, and VC and ethene) in monitoring wells located within the treatment zone. Concentration trend plots for monitoring wells P-27, P-28, and P-29 located within the treatment zone are presented as Figure 20. These graphs depict VOC concentration trends since beginning Phase I EISB treatment in 2012. Following the initial EISB injections in August 2012, TCE concentrations in all three monitoring wells decreased while *cis*-1,2-DCE temporarily increased along with VC and ethene. TCE concentrations in wells P-27 and P-28 rebounded within six months after the initial injections in, but decreased after the second injection event in October 2013. The TCE concentration in monitoring well V8-7, located immediately down gradient but outside the treatment zone, declined from 1,000 µg/L in June 2012 to 160 µg/L in June 2014. Ongoing EISB treatment using the bio-barrier array coupled with source area treatment beginning in late 2014 is expected to further reduce VOC mass within the 601 CA Site source area and mitigate migration of contaminants into the off-site down gradient area.

Mann-Kendall trend analysis performed on datasets from 11 wells located on the 601 CA Site reveals that TCE concentrations in most wells are stable or show no statistically significant trend over the period 2006 to 2014 (see Table 4). TCE trends are stable or show no statistically significant trend in 9 of the 11 wells evaluated. Two on-site wells (V8-2 and V8-13B) show increasing TCE trends. An increasing trend in source area well V8-2 is a result of TCE concentration rebound after ISCO treatment. TCE was first detected in B Zone well V8-13B at 0.9 µg/L in August 2011 and subsequently increased to 2 µg/L in June 2014.

Two wells located in the Off-Site Area down gradient from the 601 CA Site boundary exhibit increasing TCE trends. These two wells are A1/A2 Zone wells V-9 and F97A. TCE concentrations in these down gradient wells are expected to stabilize and decrease now that EISB has been fully implemented at the 601 CA Site.

6.5 OEU DEWATERING SYSTEM

The OEU dewatering system continued to operate throughout the current Reporting Period. Operation of the OEU dewatering system continues to effectively limit migration of the VOC-impacted groundwater plumes in the Off-Site Area. During the Reporting Period, about 800 million gallons of water was pumped from the OEU dewatering system and 415 lbs of VOCs were removed (see Table 3 and Figure 14).

As depicted on Figures 3 and 4, well-developed horizontal capture zones are induced by the OEU dewatering system within both the A1U and A1 Zones. The OEU dewatering system also locally captures groundwater from the deeper A2 Zone via induced upward movement. The capture areas created by the OEU dewatering system extend laterally to intercept the VOC plumes originating from the HP and Varian Sites. As depicted on Figures 7 and 8, the down gradient extent of the VOC plumes has remained stable, with concentrations in the furthest down gradient wells remaining not detected during the Reporting Period. As shown on Figure 9, VOC-impacted A2 Zone groundwater plumes from the HP and Varian Sites do not extend to the OEU.

Mann-Kendall trend analysis performed on datasets from two Perimeter Area wells and seven COE Study Area wells located near the estimated OEU dewatering system capture limit boundary reveals that PCE and TCE concentrations are either stable, decreasing, or show no statistically significant trend over the period 2006 to 2014 in all wells except 1 (see Table 4). The single well with an increasing TCE trend over this time period is well F74A. The TCE concentration in well F74A increased from 2.7 µg/L in 2007 to a mean value of 36 µg/L in 2014; however, TCE in wells located further down gradient from well F74A remain not detected. TCE detected in well F74A is not believed to be associated with VOC sources on the HP or Varian Sites.

6.6 PERIMETER AREA

Ongoing operation of Perimeter Area extraction wells EW-15 and EW-16 continued during most of the Reporting Period. Combined, these two wells extracted approximately 23 million gallons of groundwater and removed an estimated 34 lbs of VOCs (see Table 3 and Figure 15). Following RWQCB approval, extraction from wells EW-15 and EW-16 was curtailed on a trial basis beginning in November 2013. Post-shutdown monitoring data show that the OEU dewatering system will capture VOC-impacted groundwater in the vicinity of wells EW-15 and EW-16. VOC concentrations in monitoring wells down gradient and cross gradient from wells EW-15 and EW-16 show little change since beginning the trial shutdown, indicating significant plume expansion is not occurring in the absence of pumping from wells EW-15 and EW-16.

Mann-Kendall trend analysis performed on datasets from eight Perimeter Area wells reveals that PCE and TCE concentrations in all wells are either stable, decreasing, or show no statistically significant trend over the period 2006 to 2014 (see Table 4). PCE concentration trends are stable

in two of four wells evaluated, with the remaining two wells showing no statistically significant trend. TCE concentration trends are either decreasing or stable in three of nine wells evaluated, with the remaining six wells showing no statistically significant trend. No Perimeter Area wells exhibited statistically significant increasing trends for either PCE or TCE over the period 2006 to 2014.

6.7 INSTITUTIONAL CONTORLS

Stantec retained Old Republic National Title Insurance Company (Old Republic) to provide Recorded Document Guarantee (RDG) reports, similar to property transaction Title Searches, for the 640 PMR Site, 395 PMR Site and 601 CA Site. The RDG reports were obtained to assess whether the institutional controls (land use restrictions) specified in the Order were recorded. The RDG reports identify the Covenant and Land Use Restriction recorded for each of the Sites. Copies of the RDG reports are provided in Appendix C.

7.0 PROJECTED COSTS

Costs incurred to date and projected future costs are on the order of those projected in the RI/FS.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Remedial measures implemented at the Sites and Off-Site Area generally have performed as intended and are deemed protective of human health and the environment. Remediation measures to date have significantly reduced VOC concentrations in groundwater underlying the Study Area and successfully prevented plume expansion. Actions taken by Varian and HP since 2008 in response to localized VOC concentration increases and plume migration observed in the vicinity of the 601 CA and 640 PMR Sites have successfully increased contaminant mass removal rates, stabilized and/or are reduced concentrations, and mitigated further plume migration.

VOCs remain in groundwater at concentrations above the cleanup goals after more than 20 years of remediation. As observed at many other VOC-impacted sites, groundwater remediation using pump-and-treat technology is generally effective at removing dissolved chemicals and controlling plume migration, but requires very long periods of time to achieve groundwater cleanup objectives. This effectiveness limitation is the primary reason why groundwater extraction and treatment was curtailed at the 601 CA Site and 395 PMR Site and replaced with innovative *in situ* technologies (ISCO and EISB).

At the 601 CA and 395 PMR Sites, EISB is currently being employed to remediate VOCs in groundwater. Bench scale and pilot study data collected during the past five years show that EISB is effective in treating VOCs in-place and controlling plume migration. Continued EISB is expected to further reduce contaminant mass and concentrations in groundwater at and down gradient from the EISB treatment areas. At the 640 PMR Site and down gradient COE Study Area, recent modifications to the GWET system have improved hydraulic plume control, contaminant mass removal rate, and are effectively mitigating further off-site plume migration. As planned, the GWET system at and down gradient from the 640 PMR Site will continue to operate on an interim basis until the timetable for an EISB pilot study is proposed.

The OEU dewatering system continues to effectively capture and control plume migration in the down gradient Off-Site Area. Curtailment of groundwater extraction in the Perimeter Area has not resulted in contaminant concentration increases or plume expansion and VOC-impacted groundwater underlying a large portion of the Perimeter Area is within the capture area created by the OEU dewatering system.

Indoor air testing and related studies were conducted during 2012, 2013, and 2014 to assess the potential for vapor intrusion to adversely affect occupants of residential and commercial buildings in the Study Area overlying the TCE-impacted groundwater plume. Based on the results to date, no evidence of vapor intrusion that could cause unacceptable health risks has been found.

Per applicable provisions of the Order, a *Covenant and Environmental Restriction of Property* has been recorded with the Santa Clara County Recorder for each of the Sites. RDG reports by Old Republic identify the recorded Covenant and Land Use Restriction for each of the Sites.

Specific recommendations are presented in the following subsections.

8.1 640 PAGE MILL ROAD SITE

Continue to operate the GWET system as currently configured using on-site extraction wells TW-1 and TW-2 and off-site extraction wells EW-8 and EW-10. Concentration trends in extraction wells and nearby monitoring wells will continue to be monitored, and a timetable for EISB pilot testing at the 640 PMR Site is expected to be developed during the next five-year review period.

8.2 395 PAGE MILL ROAD SITE

Continue to implement the RWQCB-approved EISB treatment program in Area X. Decommissioning of the remedial systems at the 395 PMR Site was recommended in the Second and Third Five Year Reports. The RWQCB concurred that soil cleanup standard have been achieved in Area X, but did not approve remedial system decommissioning, pending completion of a vapor intrusion assessment and ISCO treatment monitoring. Given the favorable vapor intrusion assessment and EISB treatment results obtained during this Reporting Period, decommissioning of the former remedial system is recommended.

8.3 601 CALIFORNIA AVENUE SITE

Continue to implement the RWQCB-approved EISB treatment program in both the courtyard area and the bio-barrier down gradient from the source area.

8.4 OEU DEWATERING SYSTEM

Continue to operate the OEU dewatering and treatment system with no significant modifications.

8.5 PERIMETER AREA

Continue the RWQCB-approved trial shutdown of wells EW-15 and EW-16 and perform groundwater monitoring associated with the trial shutdown on a semi-annual basis during 2015.

8.6 VAPOR INTRUSION ASSESSMENT

Vapor intrusion assessment activities are expected to be completed during 2015.

TABLES

TABLE 1
Groundwater Cleanup Standards
COE Study Area and Perimeter Area
Palo Alto, California

CHEMICAL	CLEANUP STANDARD (µg/L)
Acetone	3,500
Benzene	1
1,1-Dichloroethane (1,1-DCA)	5
1,2-Dichloroethane (1,2-DCA)	0.5
1,1-Dichloroethene (1,1-DCE)	6
cis-1,2-Dichloroethene (c-1,2-DCE)	6
trans-1,2-Dichloroethene (t-1,2-DCE)	10
Methylene Chloride	5
Tetrachloroethene (PCE)	5
1,1,1-Trichloroethane (1,1,1-TCA)	200
1,1,2-Trichloroethane (1,1,2-TCA)	3
Trichloroethene (TCE)	5
Freon 113	1,200
1,2-Dichlorobenzene (1,2-DCB)	600
1,2,4-Trichlorobenzene (1,2,4-TCB) (1)	5

Notes and Abbreviations:
Source: Table 1, Revised Site Cleanup Requirements, Order No. 94-130 issued on September 21, 1994, by the California Regional Water Quality Control Board, San Francisco Bay Region.
(1) The cleanup standard (MCL) for 1,2,4-TCB was changed on June 12, 2003 from 70 µg/L to 5 µg/L.
µg/L - micrograms per liter

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
EW-4		6/14/11	20	26	3.2	5.9	39	ND (<0.50)	ND (<0.50)	9.4	ND (<0.50)	1.9	1.1	
EW-4		6/14/13	20	30	2.3	5.9	50	ND (<0.50)	ND (<0.50)	9.1	ND (<0.50)	1.4	0.62	
EW-5		6/14/11	2.4	35	13	4.4	12	ND (<0.50)	12	7.1	ND (<0.50)	7.6	ND (<0.50)	1,2,4-TCB = 7.3; CHLFM = 1.1; Freon 11 = 4.2
EW-5		6/18/13	1.8	22	9.2	3.2	7.1	ND (<0.50)	7.9	1.7	ND (<0.50)	3.8	ND (<0.50)	1,2,4-TCB = 4.1; Freon 11 = 3.5
EW-7		4/5/10	64	1,400	870	37	87	ND (<25)	110	370	ND (<25)	900	ND (<25)	
EW-7		6/9/10	56	1,300	610	26	77	ND (<25)	87	250	ND (<25)	760	ND (<25)	
EW-7		6/14/11	70	1,100	690	39	62	ND (<25)	100	330	ND (<25)	900	ND (<25)	
EW-7		8/26/11	16	290	44	6.1	18	ND (<0.50)	31	27	ND (<0.50)	110	ND (<0.50)	1,2,4-TCB = 3.3
EW-7		9/29/11	46	810	230	17	31	ND (<10)	76	170	ND (<10)	370	ND (<10)	
EW-7		10/17/11	41	750	220	15	30	ND (<10)	74	170	ND (<10)	390	ND (<10)	
EW-7		3/5/12	33	600	89	12	32	ND (<10)	70	100	ND (<10)	280	ND (<10)	
EW-7		6/13/12	32	580	110	16	23	ND (<10)	74	180	ND (<10)	240	ND (<10)	
EW-7	Dup	6/13/12	28	580	130	17	21	ND (<0.50)	72	190	ND (<0.50)	240	0.54	1,2,4-TCB = 6.8; 1,4-DCB = 0.91; Freon 11 = 1.4
EW-7		6/20/13	31	570	230	22	30	ND (<10)	63	250	ND (<10)	320	ND (<10)	
EW-7		6/16/14	56	920	600	57	62	ND (<10)	120	530	ND (<10)	780	ND (<10)	
EW-8		4/5/10	ND (<25)	930	530	ND (<25)	83	ND (<25)	ND (<25)	110	ND (<25)	420	ND (<25)	
EW-8		6/9/10	ND (<10)	1,100	510	ND (<10)	99	ND (<10)	ND (<10)	90	ND (<10)	490	ND (<10)	
EW-8		6/15/11	7.4	730	240	11	38	ND (<5.0)	ND (<5.0)	52	ND (<5.0)	390	ND (<5.0)	
EW-8		8/26/11	8.5	710	230	14	40	ND (<5.0)	ND (<5.0)	69	ND (<5.0)	390	ND (<5.0)	
EW-8		9/29/11	9.0	740	270	16	46	ND (<5.0)	ND (<5.0)	95	ND (<5.0)	410	ND (<5.0)	
EW-8		10/17/11	10	820	340	17	53	ND (<5.0)	ND (<5.0)	120	ND (<5.0)	390	ND (<5.0)	
EW-8	Dup	10/17/11	8.2	720	310	15	45	ND (<5.0)	ND (<5.0)	98	ND (<5.0)	360	ND (<5.0)	
EW-8		3/5/12	7.9	620	330	17	64	ND (<5.0)	ND (<5.0)	110	ND (<5.0)	350	ND (<5.0)	
EW-8		6/13/12	6.6	540	350	20	41	ND (<5.0)	ND (<5.0)	140	ND (<5.0)	290	ND (<5.0)	
EW-8		6/20/13	17	920	870	36	79	ND (<5.0)	ND (<5.0)	360	ND (<5.0)	660	ND (<5.0)	
EW-8		1/16/14	29	1,500	1,700	69	170	ND (<5.0)	ND (<5.0)	740	ND (<5.0)	1,400	ND (<5.0)	
EW-8		6/10/14	20	950	660	36	68	ND (<10)	ND (<10)	350	ND (<10)	810	ND (<10)	
EW-10		6/16/11	ND (<0.50)	19	11	1.3	4.5	ND (<0.50)	ND (<0.50)	5.0	ND (<0.50)	5.8	ND (<0.50)	
EW-10		3/5/12	ND (<0.50)	16	6.6	0.99	4.3	ND (<0.50)	ND (<0.50)	4.0	ND (<0.50)	4.3	ND (<0.50)	
EW-10		6/20/13	ND (<0.50)	22	8.8	1.2	4.6	ND (<0.50)	ND (<0.50)	6.7	ND (<0.50)	5.4	ND (<0.50)	
EW-10		1/16/14	ND (<0.50)	18	6.5	0.96	3.4	ND (<0.50)	ND (<0.50)	4.5	ND (<0.50)	4.4	ND (<0.50)	
EW-10		6/11/14	ND (<0.50)	26	8.6	1.4	5.0	ND (<0.50)	ND (<0.50)	6.7	ND (<0.50)	6.8	ND (<0.50)	
EW-11R		6/8/10	500	170	13	ND (<5.0)	17	ND (<5.0)	ND (<5.0)	7.7	ND (<5.0)	ND (<5.0)	ND (<5.0)	
EW-11R		6/14/11	470	150	12	ND (<5.0)	19	ND (<5.0)	ND (<5.0)	8.8	ND (<5.0)	ND (<5.0)	ND (<5.0)	
EW-11R		6/12/12	480	150	12	ND (<5.0)	12	ND (<5.0)	ND (<5.0)	13	ND (<5.0)	ND (<5.0)	ND (<5.0)	
EW-11R		4/4/13	450	120	8.4	2.5	11	ND (<0.50)	ND (<0.50)	12	ND (<0.50)	1.2	ND (<0.50)	
EW-11R		6/18/13	250	80	5.6	8.0	14	ND (<5.0)	ND (<5.0)	840	ND (<5.0)	ND (<5.0)	ND (<5.0)	
EW-11R		8/23/13	55	19	3.5	5.8	11	ND (<2.5)	ND (<2.5)	1,700	7.2	ND (<2.5)	170	
EW-11R	Dup	8/23/13	27	12	2.7	5.1	7.9	ND (<2.5)	ND (<2.5)	1,600	5.5	ND (<2.5)	140	
EW-11R		11/22/13	42	13	ND (<2.5)	3.9	3.1	ND (<2.5)	ND (<2.5)	280	5.3	ND (<2.5)	200	
EW-11R		5/22/14	46	22	2.6	3.0	ND (<2.5)	ND (<2.5)	ND (<2.5)	110	ND (<2.5)	ND (<2.5)	130	
EW-11R	Dup	5/22/14	48	23	2.6	3.1	2.6	ND (<2.5)	ND (<2.5)	110	ND (<2.5)	ND (<2.5)	140	
EW-11R		6/11/14	51	28	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	170	ND (<5.0)	ND (<5.0)	200	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
EW-12		6/9/10	ND (<0.50)	**5.9**	ND (<0.50)	ND (<0.50)	**0.87**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-12		6/16/11	ND (<0.50)	**7.1**	**0.51**	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-12		6/14/12	ND (<0.50)	**12**	**0.54**	**0.77**	**1.5**	ND (<0.50)	ND (<0.50)	**0.52**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-12		6/20/13	ND (<0.50)	**5.4**	ND (<0.50)	ND (<0.50)	**0.56**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-12	Dup	6/20/13	ND (<0.50)	**4.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-12		6/11/14	ND (<0.50)	**5.0**	ND (<0.50)	ND (<0.50)	**0.51**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13		6/9/10	ND (<0.50)	**0.53**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13	Dup	6/9/10	ND (<0.50)	**0.59**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13		6/16/11	ND (<0.50)	**0.69**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13	Dup	6/16/11	ND (<0.50)	**0.67**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13		6/14/12	ND (<0.50)	**24**	**1.1**	**4.4**	**7.2**	ND (<0.50)	ND (<0.50)	**4.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13		6/20/13	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-13		6/11/14	ND (<0.50)	**29**	**1.3**	**4.8**	**10**	ND (<0.50)	ND (<0.50)	**4.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
EW-15		6/15/11	**73**	**12**	**0.93**	**0.73**	**2.1**	ND (<0.50)	ND (<0.50)	**9.2**	**1.2**	ND (<0.50)	ND (<0.50)	
EW-15		6/18/13	**100**	**8.5**	**0.63**	**0.54**	**1.6**	ND (<0.50)	ND (<0.50)	**9.5**	**0.61**	ND (<0.50)	ND (<0.50)	
EW-15		11/13/13	**230**	**18**	**2.8**	**1.0**	**5.4**	ND (<0.50)	ND (<0.50)	**9.4**	**1.1**	ND (<0.50)	ND (<0.50)	
EW-15		2/25/14	**15**	**17**	ND (<0.50)	**0.81**	**1.2**	ND (<0.50)	ND (<0.50)	**75**	**5.3**	ND (<0.50)	**0.62**	
EW-15		5/13/14	**12**	**29**	ND (<0.50)	**1.2**	**1.2**	ND (<0.50)	ND (<0.50)	**11**	**4.4**	ND (<0.50)	**0.98**	
EW-15		8/13/14	**13**	**31**	ND (<0.50)	**1.3**	**1.9**	ND (<0.50)	ND (<0.50)	**16**	**3.5**	ND (<0.50)	**1.7**	
EW-15		11/12/14	**20**	**22**	ND (<0.50)	**2.0**	**2.0**	ND (<0.50)	ND (<0.50)	**29**	**3.5**	ND (<0.50)	**2.8**	
EW-16		6/15/11	**140**	**45**	**1.5**	**1.8**	**5.2**	ND (<0.50)	ND (<0.50)	**14**	**2.0**	ND (<0.50)	ND (<0.50)	
EW-16	Dup	6/15/11	**120**	**44**	**1.5**	**1.9**	**4.9**	ND (<0.50)	ND (<0.50)	**14**	**2.0**	ND (<0.50)	ND (<0.50)	
EW-16		6/18/13	**170**	**45**	**1.4**	**1.7**	**3.6**	ND (<0.50)	ND (<0.50)	**10**	**1.2**	ND (<0.50)	ND (<0.50)	
EW-16		11/13/13	**270**	**56**	**2.2**	**2.2**	**5.5**	ND (<0.50)	ND (<0.50)	**10**	**1.2**	ND (<0.50)	ND (<0.50)	
EW-16	Dup	11/13/13	**180**	**46**	**1.7**	**1.8**	**3.8**	ND (<0.50)	ND (<0.50)	**9.5**	**1.1**	ND (<0.50)	ND (<0.50)	
EW-16		2/25/14	**130**	**40**	**1.6**	**1.6**	**3.4**	ND (<0.50)	ND (<0.50)	**34**	**2.1**	ND (<0.50)	ND (<0.50)	
EW-16		5/13/14	**28**	**9.6**	**0.50**	**1.1**	**1.9**	ND (<0.50)	ND (<0.50)	**190**	**1.9**	ND (<0.50)	ND (<0.50)	
EW-16		8/13/14	**22**	**9.0**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**200**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
EW-16		11/12/14	**14**	**9.9**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**200**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F21A1U		6/9/10	ND (<0.50)	**81**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.6**	**0.53**	ND (<0.50)	ND (<0.50)	
F21A1U		6/15/11	ND (<0.50)	**77**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**4.1**	**0.66**	ND (<0.50)	ND (<0.50)	
F21A1U		6/13/12	ND (<0.50)	**74**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**4.1**	**0.65**	ND (<0.50)	ND (<0.50)	
F21A1U		6/19/13	ND (<0.50)	**79**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**4.1**	**0.82**	ND (<0.50)	ND (<0.50)	
F21A1U	Dup	6/19/13	ND (<0.50)	**69**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**3.6**	**0.60**	ND (<0.50)	ND (<0.50)	
F21A1U		6/11/14	ND (<0.50)	**69**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**6.7**	**0.81**	ND (<0.50)	ND (<0.50)	
F22A1U		6/9/10	ND (<2.5)	**210**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**6.6**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F22A1U		6/15/11	ND (<2.5)	**180**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.3**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F22A1U		6/13/12	ND (<2.5)	**160**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.6**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F22A1U		6/18/13	ND (<2.5)	**120**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.2**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F22A1U		6/11/14	ND (<5.0)	**240**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	**24**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
F22A1U	Dup	6/11/14	ND (<0.50)	**230**	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**27**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

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Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F29A1U		6/9/10	ND (<0.50)	**17**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F29A1U		6/16/11	ND (<0.50)	**21**	**0.51**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F29A1U		6/13/12	ND (<0.50)	**18**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F29A1U	Dup	6/13/12	ND (<0.50)	**17**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F29A1U		6/20/13	ND (<0.50)	**25**	**0.53**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F29A1U		6/11/14	ND (<0.50)	**30**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F30A1U		6/16/11	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F32A		6/15/11	ND (<0.50)	**7.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.83**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F32A		8/26/11	ND (<0.50)	**83**	**3.4**	**1.8**	**2.7**	ND (<0.50)	ND (<0.50)	**6.9**	ND (<0.50)	**0.73**	ND (<0.50)	
F32A		6/19/13	ND (<0.50)	**3.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F33B		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F33B		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F34A		6/15/10	ND (<0.50)	**49**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F34A		6/15/11	ND (<0.50)	**49**	ND (<0.50)	**0.67**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F34A		6/17/13	ND (<0.50)	**41**	ND (<0.50)	**0.95**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F34A		6/10/14	ND (<0.50)	**50**	ND (<0.50)	**0.92**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F34A	Dup	6/10/14	ND (<0.50)	**39**	ND (<0.50)	**0.69**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F36A		6/16/11	ND (<0.50)	**5.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F36A		6/20/13	ND (<0.50)	**7.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F36A		6/11/14	ND (<0.50)	**7.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F38A		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F38A		6/16/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F38A		6/13/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F38A		6/17/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F38A		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A		6/8/10	ND (<0.50)	**0.94**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A		6/16/11	ND (<0.50)	**21**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.58**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A	Dup	6/16/11	ND (<0.50)	**21**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.70**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A		6/13/12	ND (<0.50)	**45**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A		6/20/13	ND (<0.50)	**14**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F40A		6/11/14	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F41A1		1/17/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F41A1		6/16/11	ND (<0.50)	**0.72**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F41A1		6/13/12	ND (<0.50)	**0.81**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F41A1		6/19/13	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**4.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F41A1		6/11/14	ND (<0.50)	**2.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**6.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

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F42A1		6/9/10	ND (<25)	**1,300**	**670**	ND (<25)	**110**	ND (<25)	ND (<25)	**93**	ND (<25)	**750**	ND (<25)	
F42A1		6/15/11	**6.8**	**790**	**340**	**9.2**	**58**	ND (<5.0)	ND (<5.0)	**74**	ND (<5.0)	**530**	ND (<5.0)	
F42A1		8/26/11	**6.6**	**690**	**280**	**8.9**	**59**	ND (<5.0)	ND (<5.0)	**73**	ND (<5.0)	**490**	ND (<5.0)	
F42A1		9/29/11	**6.3**	**670**	**260**	**9.4**	**55**	ND (<5.0)	ND (<5.0)	**80**	ND (<5.0)	**430**	ND (<5.0)	
F42A1		10/17/11	**6.1**	**750**	**300**	**11**	**63**	ND (<5.0)	ND (<5.0)	**94**	ND (<5.0)	**420**	ND (<5.0)	
F42A1		3/5/12	**8.2**	**610**	**170**	**8.2**	**55**	ND (<5.0)	ND (<5.0)	**66**	ND (<5.0)	**390**	ND (<5.0)	
F42A1		6/13/12	**6.4**	**600**	**190**	**8.7**	**43**	ND (<5.0)	ND (<5.0)	**74**	ND (<5.0)	**330**	ND (<5.0)	
F42A1		3/12/13	**9.4**	**530**	**250**	**29**	**52**	ND (<5.0)	ND (<5.0)	**190**	ND (<5.0)	**290**	ND (<5.0)	
F42A1R		6/19/13	**14**	**650**	**430**	**30**	**51**	ND (<5.0)	ND (<5.0)	**210**	ND (<5.0)	**350**	ND (<5.0)	
F42A1R	Dup	6/19/13	**16**	**630**	**390**	**32**	**56**	ND (<0.50)	ND (<0.50)	**210**	**0.92**	**330**	**1.1**	Freon 11 = 1.2
F42A1R		6/10/14	**19**	**780**	**800**	**23**	**58**	ND (<10)	ND (<10)	**260**	ND (<10)	**650**	ND (<10)	
F46A1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F46A1		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1	Dup	6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F49A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F53A1U		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F53A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F53A1U		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F53A1U		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F53A1U		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F54A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F54A1U		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F55A1U		8/26/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	1,2,4-TCB = 1.7
F57A1U		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.60**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F57A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.60**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F57A1U		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.67**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F57A1U		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.68**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F57A1U	Dup	6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.60**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F57A1U		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.50**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F58A		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F58A		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F58A		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F58A		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F58A		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F59A1U		7/11/11	**140**	**60**	**4.4**	ND (<2.5)	**3.0**	ND (<2.5)	ND (<2.5)	**3.9**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F59A1U		7/25/13	**130**	**54**	**1.9**	ND (<1.0)	**1.3**	ND (<1.0)	ND (<1.0)	**2.7**	**1.4**	ND (<1.0)	ND (<1.0)	
F59A1U		6/10/14	**120**	**51**	**1.2**	ND (<1.0)	**1.2**	ND (<1.0)	ND (<1.0)	**6.4**	**1.1**	ND (<1.0)	ND (<1.0)	
F59A1U	Dup	6/10/14	**110**	**44**	**1.2**	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	**6.0**	**0.96**	ND (<0.50)	**0.74**	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F61A1U		7/11/11	ND (<0.50)	**80**	**0.82**	**1.5**	**0.74**	ND (<0.50)	ND (<0.50)	**2.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F61A1U		6/17/13	ND (<0.50)	**84**	**0.96**	**2.9**	**0.82**	ND (<0.50)	ND (<0.50)	**2.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F62A1		6/9/10	ND (<0.50)	**77**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.91**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F62A1		7/11/11	ND (<0.50)	**57**	ND (<0.50)	**0.81**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.99**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F62A1		6/11/12	ND (<0.50)	**59**	ND (<0.50)	**1.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.86**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F62A1		6/17/13	ND (<0.50)	**54**	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.89**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F62A1		6/10/14	ND (<0.50)	**51**	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.87**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F63A1U/A1		6/15/11	ND (<0.50)	**19**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F63A1U/A1		6/20/13	ND (<0.50)	**15**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F64A1		6/15/11	**0.82**	**29**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**3.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F64A1		6/20/13	**0.84**	**25**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F64A1	Dup	6/20/13	**1.1**	**28**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F65A1U		12/14/10	**50**	**3.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.94**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F65A1U		6/15/11	**60**	**3.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F73A1		6/16/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.83**	ND (<0.50)	**2.3**	
F73A1		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.6**	**0.95**	ND (<0.50)	**6.1**	
F73A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**3.7**	ND (<0.50)	ND (<0.50)	**1.5**	
F74A		6/9/10	ND (<0.50)	**30**	ND (<0.50)	**1.2**	**2.5**	ND (<0.50)	ND (<0.50)	**0.78**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		6/15/11	ND (<0.50)	**35**	ND (<0.50)	**1.3**	**2.8**	ND (<0.50)	ND (<0.50)	**0.83**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		6/14/12	ND (<0.50)	**33**	ND (<0.50)	**1.4**	**2.6**	ND (<0.50)	ND (<0.50)	**0.91**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		6/19/13	ND (<0.50)	**40**	**0.50**	**1.7**	**3.5**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		11/13/13	ND (<0.50)	**35**	ND (<0.50)	**1.4**	**2.6**	ND (<0.50)	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		2/25/14	ND (<0.50)	**42**	ND (<0.50)	**1.5**	**3.4**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		5/13/14	ND (<0.50)	**33**	ND (<0.50)	**1.3**	**3.1**	ND (<0.50)	ND (<0.50)	**0.93**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		6/10/14	ND (<0.50)	**33**	ND (<0.50)	**1.4**	**2.8**	ND (<0.50)	ND (<0.50)	**0.90**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		8/13/14	ND (<0.50)	**36**	ND (<0.50)	**1.4**	**3.3**	ND (<0.50)	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F74A		11/12/14	ND (<0.50)	**36**	ND (<0.50)	**1.4**	**2.8**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F75A1U		6/15/11	ND (<0.50)	**0.77**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F75A1U		6/19/13	ND (<0.50)	**0.76**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F77A1U		6/15/11	ND (<0.50)	**31**	**0.56**	ND (<0.50)	**0.76**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F77A1U		6/18/13	ND (<0.50)	**25**	ND (<0.50)	ND (<0.50)	**0.62**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F64A1	Dup	6/18/13	ND (<0.50)	**25**	ND (<0.50)	ND (<0.50)	**0.66**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F78A1		6/15/11	ND (<0.50)	**1.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F78A1		6/19/13	ND (<0.50)	**0.89**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F83A1U		6/15/11	ND (<0.50)	**68**	**2.8**	**0.76**	**2.5**	ND (<0.50)	ND (<0.50)	**4.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F83A1U		6/11/14	ND (<0.50)	**66**	**1.7**	**0.83**	**2.4**	ND (<0.50)	ND (<0.50)	**8.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F85A1		6/15/11	ND (<0.50)	**2.8**	ND (<0.50)	ND (<0.50)	**0.84**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F85A1		6/20/13	ND (<0.50)	**5.8**	ND (<0.50)	ND (<0.50)	**0.82**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	

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COE Study Area and Perimeter Area
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Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F87A2		6/29/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2		9/30/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2		12/21/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2		2/1/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2R	Dup	2/1/12	ND (<0.50)	**2.4**	**0.69**	**1.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.81**	ND (<0.50)	
F87A2R		2/1/12	ND (<0.50)	**2.4**	**0.68**	**1.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.86**	ND (<0.50)	
F87A2R		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2R		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F87A2R		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F88A1U		7/11/11	**140**	**18**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**2.9**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F88A1U		9/11/13	**290**	**38**	**6.1**	**1.2**	**6.0**	ND (<0.50)	ND (<0.50)	**11**	**0.79**	ND (<0.50)	ND (<0.50)	
F88A1U		11/13/13	**200**	**38**	**2.7**	ND (<2.5)	**3.5**	ND (<2.5)	ND (<2.5)	**13**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
F88A1U		2/25/14	**270**	**50**	**6.7**	**1.6**	**8.9**	ND (<0.50)	ND (<0.50)	**15**	**0.95**	ND (<0.50)	ND (<0.50)	
F88A1U		6/10/14	**70**	**18**	**1.0**	**0.51**	**1.5**	ND (<0.50)	ND (<0.50)	**7.4**	**0.73**	ND (<0.50)	ND (<0.50)	
F88A1U		8/13/14	**72**	**21**	**1.1**	**0.66**	**1.9**	ND (<0.50)	ND (<0.50)	**11**	**0.93**	ND (<0.50)	ND (<0.50)	
F88A1U		11/12/14	**100**	**36**	**1.9**	**1.0**	**4.7**	ND (<0.50)	ND (<0.50)	**35**	**1.4**	ND (<0.50)	ND (<0.50)	
F89A		11/13/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F89A		2/25/14	ND (<0.50)	**0.56**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F89A		6/10/14	ND (<0.50)	**14**	**0.91**	**0.57**	**2.1**	ND (<0.50)	ND (<0.50)	**4.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F89A		8/13/14	ND (<0.50)	**12**	**0.71**	ND (<0.50)	**1.9**	ND (<0.50)	ND (<0.50)	**3.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F89A		11/12/14	ND (<0.50)	**14**	**0.95**	**0.57**	**1.7**	ND (<0.50)	ND (<0.50)	**4.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F90A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F92A2		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F92A2		7/11/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F92A2		6/11/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F92A2		6/17/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F92A2		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F95A		6/16/11	ND (<0.50)	**0.63**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F95A		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F97A		6/9/10	ND (<0.50)	**40**	**44**	**10**	**23**	ND (<0.50)	ND (<0.50)	**57**	**0.75**	**66**	ND (<0.50)	
F97A		6/15/11	ND (<0.50)	**97**	**37**	**13**	**26**	ND (<0.50)	ND (<0.50)	**59**	**0.90**	**88**	ND (<0.50)	
F97A		6/13/12	ND (<0.50)	**200**	**35**	**16**	**21**	ND (<0.50)	ND (<0.50)	**62**	**0.65**	**79**	ND (<0.50)	
F97A		6/19/13	ND (<0.50)	**360**	**23**	**16**	**18**	ND (<0.50)	ND (<0.50)	**53**	**0.63**	**60**	ND (<0.50)	
F97A		6/11/14	ND (<0.50)	**310**	**25**	**18**	**22**	ND (<0.50)	ND (<0.50)	**56**	**0.72**	**64**	**1.8**	
F98A		6/9/10	ND (<10)	**1000**	**14**	**12**	**12**	ND (<10)	ND (<10)	**39**	ND (<10)	**33**	ND (<10)	
F98A		6/15/11	ND (<5.0)	**1,200**	**12**	**15**	**13**	ND (<5.0)	ND (<5.0)	**39**	ND (<5.0)	**33**	ND (<5.0)	
F98A		6/13/12	ND (<5.0)	**1,200**	**8.3**	**16**	**10**	ND (<5.0)	ND (<5.0)	**38**	ND (<5.0)	**20**	ND (<5.0)	
F98A		6/18/13	ND (<5.0)	**990**	**6.2**	**15**	**9.3**	ND (<5.0)	ND (<5.0)	**36**	ND (<5.0)	**12**	ND (<5.0)	
F98A		6/11/14	ND (<5.0)	**800**	**5.5**	**14**	**8.6**	ND (<5.0)	ND (<5.0)	**250**	ND (<5.0)	**13**	**21**	
F106A1		6/14/11	**18**	**23**	**1.6**	**3.2**	**21**	ND (<0.50)	ND (<0.50)	**5.9**	ND (<0.50)	**1.4**	**0.85**	
F106A1		6/19/13	**20**	**23**	**1.3**	**4.0**	**31**	ND (<0.50)	ND (<0.50)	**10**	ND (<0.50)	**0.82**	**1.0**	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F107A2		6/14/11	ND (<0.50)	1.1	6.3	7.6	11	ND (<0.50)	ND (<0.50)	2.3	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F107A2		6/19/13	ND (<0.50)	ND (<0.50)	4.0	6.6	7.8	ND (<0.50)	ND (<0.50)	2.0	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F107A2	Dup	6/19/13	ND (<0.50)	0.59	5.5	7.5	9.8	ND (<0.50)	ND (<0.50)	2.3	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F123A1		6/15/11	5.6	180	31	ND (<5.0)	7.2	ND (<5.0)	ND (<5.0)	7.5	ND (<5.0)	100	ND (<5.0)	
F123A1		8/26/11	4.4	170	27	ND (<1.0)	4.3	ND (<1.0)	ND (<1.0)	6.3	ND (<1.0)	85	ND (<1.0)	
F123A1	Dup	8/26/11	4.9	170	28	1.1	4.5	ND (<0.50)	ND (<0.50)	7.1	ND (<0.50)	86	ND (<0.50)	
F123A1		9/29/11	3.6	120	20	1.1	4.0	ND (<0.50)	ND (<0.50)	5.8	ND (<0.50)	57	ND (<0.50)	
F123A1		10/17/11	2.7	130	22	1.2	4.3	ND (<0.50)	ND (<0.50)	6.4	ND (<0.50)	49	ND (<0.50)	
F123A1		3/5/12	3.2	76	12	1.4	5.0	ND (<0.50)	ND (<0.50)	6.0	ND (<0.50)	37	ND (<0.50)	
F123A1		6/20/13	3.4	95	94	3.8	9.7	ND (<0.50)	ND (<0.50)	29	ND (<0.50)	50	ND (<0.50)	Freon 11 = 1.0
F123A1		6/10/14	3.6	67	26	1.2	5.1	ND (<0.50)	ND (<0.50)	8.5	ND (<0.50)	39	ND (<0.50)	
F124A2		6/15/11	ND (<0.50)	200	16	190	26	ND (<0.50)	ND (<0.50)	25	1.6	1.5	0.62	1,1,2-TCA = 0.53
F124A2		8/26/11	ND (<5.0)	330	21	270	41	ND (<5.0)	ND (<5.0)	34	ND (<5.0)	ND (<5.0)	ND (<5.0)	
F124A2		9/29/11	ND (<5.0)	330	25	270	46	ND (<5.0)	ND (<5.0)	36	ND (<5.0)	6.9	ND (<5.0)	
F124A2	Dup	9/29/11	ND (<0.50)	340	20	270	35	ND (<0.50)	ND (<0.50)	32	2.1	2.2	0.73	1,1,2-TCA = 0.52
F124A2		10/17/11	ND (<5.0)	390	27	330	49	ND (<5.0)	ND (<5.0)	44	ND (<5.0)	ND (<5.0)	ND (<5.0)	
F124A2		6/19/13	ND (<5.0)	360	24	300	47	ND (<5.0)	ND (<5.0)	62	ND (<5.0)	ND (<5.0)	ND (<5.0)	
F124A2		6/10/14	ND (<5.0)	470	85	67	72	ND (<5.0)	ND (<5.0)	89	ND (<5.0)	25	ND (<5.0)	
F124A2	Dup	6/10/14	ND (<0.50)	430	78	56	55	ND (<0.50)	ND (<0.50)	79	1.8	20	ND (<0.50)	1,1,2-TCA = 0.59
F125A1		6/15/11	7.6	20	12	0.55	1.6	ND (<0.50)	ND (<0.50)	1.0	ND (<0.50)	2.5	ND (<0.50)	
F125A1		8/26/11	7.9	20	8.6	0.58	1.6	ND (<0.50)	ND (<0.50)	0.73	ND (<0.50)	2.2	ND (<0.50)	
F125A1		9/29/11	7.0	20	9.7	0.65	1.4	ND (<0.50)	ND (<0.50)	0.84	ND (<0.50)	2.5	ND (<0.50)	
F125A1		10/17/11	5.6	19	9.4	0.55	1.5	ND (<0.50)	ND (<0.50)	0.76	ND (<0.50)	2.2	ND (<0.50)	
F125A1	Dup	10/17/11	5.0	17	8.1	ND (<0.50)	1.3	ND (<0.50)	ND (<0.50)	0.70	ND (<0.50)	1.9	ND (<0.50)	
F125A1		6/19/13	5.0	10	2.6	ND (<0.50)	0.73	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	0.86	ND (<0.50)	
F126A2		6/15/11	ND (<0.50)	0.71	ND (<0.50)	7.2	1.0	ND (<0.50)	ND (<0.50)	1.2	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F126A2		6/13/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	11	2.4	ND (<0.50)	ND (<0.50)	4.6	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F126A2		6/20/13	ND (<0.50)	ND (<0.50)	0.52	10	5.1	ND (<0.50)	ND (<0.50)	9.3	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F126A2		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	3.1	1.3	ND (<0.50)	ND (<0.50)	2.5	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F127A1		6/8/10	ND (<25)	2,300	950	ND (<25)	190	ND (<25)	ND (<25)	160	ND (<25)	770	ND (<25)	
F127A1		6/15/11	ND (<5.0)	1,800	710	16	100	ND (<5.0)	ND (<5.0)	120	ND (<5.0)	660	ND (<5.0)	
F127A1		8/26/11	ND (<5.0)	1,800	720	10	80	ND (<5.0)	ND (<5.0)	100	ND (<5.0)	750	ND (<5.0)	
F127A1		9/29/11	ND (<5.0)	1,700	610	9.9	79	ND (<5.0)	ND (<5.0)	88	ND (<5.0)	620	ND (<5.0)	
F127A1		10/17/11	ND (<0.50)	1,600	620	8.3	75	ND (<0.50)	ND (<0.50)	88	0.67	550	ND (<0.50)	
F127A1		3/5/12	ND (<10)	1,300	380	ND (<10)	81	ND (<10)	ND (<10)	61	ND (<10)	550	ND (<10)	
F127A1	Dup	3/5/12	ND (<0.50)	1,500	430	5.7	60	ND (<0.50)	ND (<0.50)	57	0.57	590	ND (<0.50)	
F127A1		6/14/12	ND (<10)	1,400	390	ND (<10)	47	ND (<10)	ND (<10)	58	ND (<10)	510	ND (<10)	
F127A1R		3/5/12	ND (<0.50)	360	110	30	81	0.50	ND (<0.50)	130	1.2	46	ND (<0.50)	
F127A1R	Dup	3/5/12	ND (<0.50)	350	110	27	71	0.50	ND (<0.50)	110	1.3	48	ND (<0.50)	
F127A1R		6/14/12	ND (<5.0)	340	140	32	82	ND (<5.0)	ND (<5.0)	140	ND (<5.0)	56	ND (<5.0)	
F127A1R	Dup	6/14/12	0.54	360	130	32	75	0.71	ND (<0.50)	140	1.1	47	ND (<0.50)	CHLFM = 1.1
F127A1R		6/20/13	3.2	670	160	31	86	0.64	ND (<0.50)	150	1.2	61	0.50	CHLFM = 1.1
F127A1R		6/11/14	ND (<5.0)	350	100	26	71	ND (<5.0)	ND (<5.0)	120	ND (<5.0)	66	ND (<5.0)	
F127A1R	Dup	6/11/14	2.5	330	100	25	66	ND (<0.50)	ND (<0.50)	120	1.2	64	ND (<0.50)	CHLFM = 1.0

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VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
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COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F128A		9/28/11	ND (<0.50)	**67**	**2.5**	**0.91**	**1.5**	ND (<0.50)	ND (<0.50)	**5.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	CHLFM = 1.4
F129A1		6/15/11	ND (<0.50)	**1.1**	**16**	**28**	**36**	**0.68**	ND (<0.50)	**110**	**3.6**	**0.53**	**1.2**	
F129A1		8/26/11	ND (<0.50)	ND (<0.50)	**16**	**30**	**40**	**0.63**	ND (<0.50)	**110**	**5.1**	ND (<0.50)	**3.8**	
F129A1		9/29/11	ND (<0.50)	**0.82**	**19**	**26**	**37**	**0.62**	ND (<0.50)	**100**	**4.7**	ND (<0.50)	**3.5**	
F129A1		10/17/11	ND (<0.50)	ND (<0.50)	**20**	**26**	**34**	**0.67**	ND (<0.50)	**110**	**4.9**	ND (<0.50)	**3.0**	
F129A1		3/5/12	ND (<0.50)	ND (<0.50)	**22**	**26**	**40**	**0.50**	ND (<0.50)	**110**	**4.8**	ND (<0.50)	**0.96**	
F129A1		6/20/13	ND (<1.0)	ND (<1.0)	**28**	**28**	**36**	ND (<1.0)	ND (<1.0)	**97**	**4.4**	ND (<1.0)	**1.3**	
F129A1		6/11/14	ND (<0.50)	ND (<0.50)	**37**	**29**	**32**	**0.50**	ND (<0.50)	**91**	**3.9**	ND (<0.50)	**2.1**	
F130A1U		6/15/11	ND (<0.50)	**30**	**1.7**	**0.89**	**3.0**	ND (<0.50)	ND (<0.50)	**5.0**	ND (<0.50)	**3.2**	ND (<0.50)	
F130A1U		6/20/13	ND (<0.50)	**13**	**0.86**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.93**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F130A1U		6/11/14	ND (<0.50)	**15**	**0.83**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.56**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F131A1		6/15/11	ND (<0.50)	**13**	**1.6**	**0.97**	**3.0**	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	**1.8**	**0.55**	
F131A1		6/20/13	ND (<0.50)	**10**	**0.88**	ND (<0.50)	**1.5**	ND (<0.50)	ND (<0.50)	**0.78**	ND (<0.50)	**1.2**	ND (<0.50)	
F133B		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F133B		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F135A1		6/15/11	ND (<0.50)	**70**	**1.6**	**0.98**	**2.8**	ND (<0.50)	ND (<0.50)	**2.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F135A1		6/20/13	ND (<0.50)	**69**	**1.6**	**0.76**	**2.2**	ND (<0.50)	ND (<0.50)	**3.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F136A1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F136A1		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F137A1		6/15/11	**6.3**	**43**	**36**	**5.2**	**7.2**	ND (<0.50)	ND (<0.50)	**8.9**	ND (<0.50)	**29**	ND (<0.50)	
F137A1		3/5/12	**4.9**	**36**	**21**	**1.4**	**5.3**	ND (<0.50)	ND (<0.50)	**5.6**	ND (<0.50)	**19**	ND (<0.50)	
F137A1		6/13/12	**5.4**	**42**	**26**	**1.4**	**4.1**	ND (<0.50)	ND (<0.50)	**6.5**	ND (<0.50)	**19**	ND (<0.50)	
F137A1		6/20/13	**3.1**	**22**	**11**	**5.8**	**7.0**	ND (<0.50)	ND (<0.50)	**13**	ND (<0.50)	**7.6**	ND (<0.50)	
F137A1		6/11/14	**4.5**	**23**	**9.6**	**1.3**	**2.6**	ND (<0.50)	ND (<0.50)	**3.9**	ND (<0.50)	**6.5**	ND (<0.50)	
F138A1U		6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.65**	**1.2**	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F138A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.9**	**1.4**	ND (<0.50)	ND (<0.50)	**2.9**	ND (<0.50)	ND (<0.50)	**2.3**	
F138A1U		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.6**	**2.5**	ND (<0.50)	ND (<0.50)	**5.5**	ND (<0.50)	ND (<0.50)	**1.7**	
F138A1U		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.9**	**1.6**	ND (<0.50)	ND (<0.50)	**4.3**	ND (<0.50)	ND (<0.50)	**4.0**	
F138A1U		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.9**	**1.9**	ND (<0.50)	ND (<0.50)	**6.4**	ND (<0.50)	ND (<0.50)	**2.8**	
F139A1		6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F139A1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F139A1	Dup	6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F139A1		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	CHLFM = 4.9
F139A1		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F139A1		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F140A1		6/15/11	ND (<0.50)	**3.4**	**1.0**	**3.5**	**0.89**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F140A1		6/20/13	ND (<0.50)	**2.3**	ND (<0.50)	**3.6**	**0.66**	ND (<0.50)	ND (<0.50)	**0.94**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F141A1U		6/9/10	ND (<0.50)	**0.69**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		6/15/11	ND (<0.50)	**0.77**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		6/14/12	ND (<0.50)	**0.75**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		6/19/13	ND (<0.50)	**0.72**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		11/13/13	ND (<0.50)	**1.1**	ND (<0.50)	**0.55**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		2/25/14	ND (<0.50)	**1.2**	ND (<0.50)	**0.57**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U	Dup	2/25/14	ND (<0.50)	**1.2**	ND (<0.50)	**0.59**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		5/13/14	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		6/10/14	ND (<0.50)	**0.82**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		8/13/14	ND (<0.50)	**0.98**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U		11/12/14	ND (<0.50)	**1.1**	ND (<0.50)	**0.56**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F141A1U	Dup	11/12/14	ND (<0.50)	**1.0**	ND (<0.50)	**0.57**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1	Dup	6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1	Dup	6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		11/13/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		2/25/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		5/13/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		8/13/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F142A1		11/12/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F143A1U		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F143A1U		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F143A1U	Dup	6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F145A1		7/11/11	**5.7**	**25**	**1.0**	**1.0**	**0.95**	ND (<0.50)	ND (<0.50)	**4.4**	**2.8**	ND (<0.50)	ND (<0.50)	
F145A1		6/17/13	**5.3**	**27**	**0.92**	**1.1**	**0.99**	ND (<0.50)	ND (<0.50)	**5.6**	**2.6**	ND (<0.50)	ND (<0.50)	
F145A1		6/10/14	**3.1**	**68**	**7.0**	**2.3**	**5.2**	ND (<0.50)	ND (<0.50)	**16**	**0.63**	**0.90**	ND (<0.50)	
F151B		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F151B		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F155A1U		8/16/11	**4.3**	**54**	**11**	**3.1**	**2.8**	ND (<0.50)	ND (<0.50)	**12**	ND (<0.50)	**2.7**	ND (<0.50)	
F155A1U	Dup	8/16/11	**4.8**	**53**	**11**	**2.8**	**2.7**	ND (<0.50)	ND (<0.50)	**12**	ND (<0.50)	**2.9**	ND (<0.50)	
F155A1U		9/30/11	**4.9**	**48**	**11**	**2.5**	**2.5**	ND (<0.50)	ND (<0.50)	**11**	ND (<0.50)	**2.6**	ND (<0.50)	
F155A1U		6/14/12	**3.4**	**41**	**7.2**	**1.8**	**1.4**	ND (<0.50)	ND (<0.50)	**8.7**	ND (<0.50)	**2.2**	ND (<0.50)	
F155A1U		6/21/13	**5.1**	**51**	**5.5**	**2.0**	**2.0**	ND (<0.50)	ND (<0.50)	**9.3**	ND (<0.50)	**2.2**	ND (<0.50)	
F155A1U		6/11/14	**3.4**	**38**	**3.8**	**0.62**	**0.74**	ND (<0.50)	ND (<0.50)	**4.8**	ND (<0.50)	**1.3**	ND (<0.50)	
F156A1U		8/26/11	ND (<0.50)	**130**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**13**	**0.70**	ND (<0.50)	ND (<0.50)	
F156A1U		9/29/11	ND (<0.50)	**93**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**10**	**0.53**	ND (<0.50)	ND (<0.50)	
F156A1U	Dup	9/29/11	ND (<0.50)	**110**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**11**	**0.65**	ND (<0.50)	ND (<0.50)	
F156A1U		6/13/12	ND (<0.50)	**91**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**8.5**	**0.50**	ND (<0.50)	ND (<0.50)	
F156A1U		6/18/13	ND (<0.50)	**79**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**7.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F156A1U		6/11/14	ND (<0.50)	**59**	**0.53**	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**8.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
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Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F159A1U		8/16/11	ND (<0.50)	**11**	ND (<0.50)	**0.66**	**0.71**	ND (<0.50)	ND (<0.50)	**39**	**2.5**	ND (<0.50)	ND (<0.50)	
F159A1U	Dup	8/16/11	ND (<0.50)	**11**	ND (<0.50)	**0.63**	**0.69**	ND (<0.50)	ND (<0.50)	**35**	**2.4**	ND (<0.50)	ND (<0.50)	
F159A1U		9/30/11	ND (<0.50)	**15**	ND (<0.50)	**0.55**	**0.62**	ND (<0.50)	ND (<0.50)	**33**	**2.4**	ND (<0.50)	ND (<0.50)	
F159A1U		6/12/12	ND (<0.50)	**8.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**21**	**1.8**	ND (<0.50)	ND (<0.50)	
F159A1U	Dup	6/12/12	ND (<0.50)	**7.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**21**	**1.7**	ND (<0.50)	ND (<0.50)	
F159A1U		6/20/13	ND (<0.50)	**9.2**	ND (<0.50)	**0.55**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**31**	**2.2**	ND (<0.50)	ND (<0.50)	
F159A1U		6/11/14	ND (<0.50)	**7.6**	ND (<0.50)	**0.61**	**0.57**	ND (<0.50)	ND (<0.50)	**33**	**2.6**	ND (<0.50)	ND (<0.50)	
F160A1U		8/17/11	**28**	**17**	**1.0**	**0.73**	**2.1**	ND (<0.50)	ND (<0.50)	**2.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F160A1U		9/30/11	**37**	**24**	**1.5**	**0.81**	**2.7**	ND (<0.50)	ND (<0.50)	**3.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F160A1U		6/14/12	**37**	**20**	**1.1**	**0.72**	**2.1**	ND (<0.50)	ND (<0.50)	**3.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F160A1U		6/18/13	**36**	**20**	**1.1**	**0.71**	**2.2**	ND (<0.50)	ND (<0.50)	**2.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F160A1U		6/11/14	**60**	**21**	**1.5**	**0.84**	**2.8**	ND (<0.50)	ND (<0.50)	**2.8**	**0.51**	ND (<0.50)	ND (<0.50)	
F161A1U		8/17/11	**0.62**	**12**	**0.79**	**0.62**	**1.3**	ND (<0.50)	ND (<0.50)	**0.61**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		9/30/11	**0.99**	**9.3**	ND (<0.50)	ND (<0.50)	**0.80**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		6/14/12	ND (<0.50)	**10**	ND (<0.50)	**0.64**	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		6/18/13	ND (<0.50)	**12**	ND (<0.50)	**0.67**	**1.2**	ND (<0.50)	ND (<0.50)	**0.67**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		11/13/13	**0.88**	**14**	**0.50**	**0.91**	**1.8**	ND (<0.50)	ND (<0.50)	**0.95**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		2/25/14	**0.74**	**21**	**0.71**	**1.2**	**2.6**	ND (<0.50)	ND (<0.50)	**1.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		5/13/14	ND (<0.50)	**14**	**0.50**	**0.85**	**2.0**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U	Dup	5/13/14	**0.59**	**17**	**0.68**	**1.1**	**2.0**	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		6/11/14	**0.86**	**20**	**0.68**	**1.1**	**2.3**	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		8/13/14	ND (<0.50)	**15**	ND (<0.50)	**0.87**	**2.2**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U	Dup	8/13/14	ND (<0.50)	**16**	ND (<0.50)	**0.88**	**2.2**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F161A1U		11/12/14	ND (<0.50)	**19**	**0.53**	**0.86**	**1.7**	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F163A1		8/17/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F163A1		9/30/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F163A1		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F163A1		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F163A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F164A1		8/17/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F164A1		9/30/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F164A1		6/14/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F164A1		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F164A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1		8/26/11	**1.3**	**12**	ND (<0.50)	**0.55**	ND (<0.50)	ND (<0.50)	**2.6**	**1.7**	ND (<0.50)	**4.1**	ND (<0.50)	1,2,4-TCB = 25
F165A1		9/29/11	ND (<0.50)	**6.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1	Dup	9/29/11	ND (<0.50)	**6.9**	ND (<0.50)	**0.51**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1		3/5/12	ND (<0.50)	**0.80**	ND (<0.50)	**0.94**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1		6/13/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F165A1	Dup	6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
F166A1		2/1/12	ND (<0.50)	**100**	**9.5**	**5.4**	**8.1**	ND (<0.50)	ND (<0.50)	**12**	ND (<0.50)	**15**	ND (<0.50)	
F166A1		3/5/12	ND (<0.50)	**120**	**9.1**	**5.2**	**8.2**	ND (<0.50)	ND (<0.50)	**10**	ND (<0.50)	**16**	ND (<0.50)	
F166A1		6/13/12	ND (<0.50)	**80**	**7.0**	**5.3**	**3.5**	ND (<0.50)	ND (<0.50)	**8.9**	ND (<0.50)	**6.1**	ND (<0.50)	
F166A1		6/18/13	ND (<0.50)	**140**	**11**	**5.4**	**7.0**	ND (<0.50)	ND (<0.50)	**11**	ND (<0.50)	**13**	ND (<0.50)	
F166A1		6/11/14	ND (<0.50)	**120**	**11**	**5.8**	**8.0**	ND (<0.50)	ND (<0.50)	**11**	ND (<0.50)	**16**	ND (<0.50)	
F167A1U		8/16/11	ND (<0.50)	**190**	**93**	**8.2**	**27**	ND (<0.50)	ND (<0.50)	**49**	**0.54**	**50**	ND (<0.50)	CHLFM = 1.1
F167A1U		9/30/11	ND (<2.5)	**230**	**94**	**9.8**	**27**	ND (<2.5)	ND (<2.5)	**46**	ND (<2.5)	**56**	ND (<2.5)	
F167A1U		6/14/12	ND (<2.5)	**180**	**59**	**7.7**	**19**	ND (<2.5)	ND (<2.5)	**36**	ND (<2.5)	**33**	ND (<2.5)	
F167A1U		6/18/13	ND (<2.5)	**170**	**52**	**8.6**	**20**	ND (<2.5)	ND (<2.5)	**40**	ND (<2.5)	**26**	ND (<2.5)	
F167A1U		6/11/14	ND (<1.0)	**240**	**55**	**9.4**	**26**	ND (<1.0)	ND (<1.0)	**38**	ND (<1.0)	**44**	ND (<1.0)	
F169A2		3/29/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F169A2	Dup	3/29/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F169A2		6/13/12	ND (<0.50)	**0.66**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F169A2		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
F169A2		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
H1		6/15/11	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	
H1	Dup	6/15/11	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	
O17B		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O17B		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O27A1		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O28A1		6/14/11	ND (<0.50)	**27**	**1.2**	**2.2**	**2.2**	ND (<0.50)	ND (<0.50)	**2.4**	ND (<0.50)	**1.4**	ND (<0.50)	
O28A1		6/20/13	ND (<0.50)	**67**	**1.9**	**3.0**	**3.1**	ND (<0.50)	ND (<0.50)	**4.9**	ND (<0.50)	**3.6**	ND (<0.50)	
O52A2		6/9/10	ND (<10)	**500**	**100**	**13**	**55**	ND (<10)	ND (<10)	**66**	ND (<10)	**71**	ND (<10)	
O52A2	Dup	6/9/10	ND (<10)	**500**	**100**	**14**	**54**	ND (<10)	ND (<10)	**66**	ND (<10)	**72**	ND (<10)	
O52A2		6/14/11	ND (<10)	**550**	**90**	**17**	**47**	ND (<10)	ND (<10)	**70**	ND (<10)	**89**	ND (<10)	
O52A2		8/26/11	ND (<0.50)	**440**	**76**	**14**	**39**	ND (<0.50)	**0.69**	**62**	**1.0**	**74**	ND (<0.50)	
O52A2		9/29/11	ND (<10)	**510**	**93**	**15**	**38**	ND (<10)	ND (<10)	**63**	ND (<10)	**84**	ND (<10)	
O52A2		10/17/11	ND (<10)	**460**	**76**	**13**	**36**	ND (<10)	ND (<10)	**54**	ND (<10)	**67**	ND (<10)	
O52A2		6/13/12	ND (<10)	**490**	**64**	**14**	**31**	ND (<10)	ND (<10)	**54**	ND (<10)	**82**	ND (<10)	
O52A2		6/20/13	ND (<5.0)	**410**	**45**	**12**	**24**	ND (<5.0)	ND (<5.0)	**44**	ND (<5.0)	**66**	ND (<5.0)	
O52A2		6/11/14	ND (<5.0)	**340**	**51**	**12**	**24**	ND (<5.0)	ND (<5.0)	**44**	ND (<5.0)	**80**	ND (<5.0)	
O67A2		6/9/10	**620**	**23,000**	ND (<500)	ND (<500)	ND (<500)	ND (<500)	**1000**	**2,100**	ND (<500)	**3,200**	ND (<500)	
O67A2		6/14/11	**410**	**5,800**	**240**	ND (<100)	ND (<100)	ND (<100)	**1,100**	**1,200**	ND (<100)	**1,800**	ND (<100)	1,2,4-TCB = 1,300
O67A2		8/16/11	**12**	**540**	**130**	**8.3**	**14**	ND (<0.50)	**36**	**6.7**	ND (<0.50)	**68**	ND (<0.50)	1,2,4-TCB = 31; 1,4-DCB = 0.69; CHLFM = 1.1; Freon 11 = 8.6
O67A2		9/14/11	**500**	**4,100**	**290**	ND (<100)	ND (<100)	ND (<100)	**930**	**2,000**	ND (<100)	**1,900**	ND (<100)	1,2,4-TCB = 1,300
O67A2		9/29/11	**240**	**3,100**	**260**	ND (<25)	ND (<25)	ND (<25)	**520**	**1,700**	ND (<25)	**1,200**	ND (<25)	1,2,4-TCB = 250
O67A2		10/17/11	**220**	**2,400**	**220**	ND (<25)	ND (<25)	ND (<25)	**600**	**1,500**	ND (<25)	**1,200**	ND (<25)	1,2,4-TCB = 410
O67A2		6/13/12	**55**	**1,200**	**370**	ND (<25)	**25**	ND (<25)	**950**	**5,100**	**34**	**1,200**	ND (<25)	1,2,4-TCB = 2,000
O67A2		6/20/13	**380**	**7,300**	**410**	**25**	ND (<25)	ND (<25)	**1,500**	**2,000**	ND (<25)	**1,700**	ND (<25)	1,2,4-TCB = 4,500; 1,4-DCB = 33
O67A2		6/11/14	**78**	**400**	ND (<50)	ND (<50)	ND (<50)	ND (<50)	**300**	**2,400**	ND (<50)	**440**	ND (<50)	1,2,4-TCB = 1,500
O67A2	Dup	6/11/14	**74**	**410**	ND (<5.0)	**10**	ND (<5.0)	ND (<5.0)	**310**	**2,300**	**16**	**430**	ND (<5.0)	1,2,4-TCB = 1,500; 1,3-DCB = 5.3; 1,4-DCB = 7.3

TABLE 2
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COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
O68A1		6/9/10	**24**	**470**	**760**	**28**	**73**	ND (<5.0)	ND (<5.0)	**180**	ND (<5.0)	**470**	ND (<5.0)	
O68A1		6/14/11	**11**	**230**	**210**	**8.6**	**12**	ND (<5.0)	ND (<5.0)	**60**	ND (<5.0)	**210**	ND (<5.0)	
O68A1		6/13/12	**25**	**420**	**380**	**15**	**17**	ND (<5.0)	**30**	**200**	ND (<5.0)	**320**	ND (<5.0)	
O68A1		6/20/13	**200**	**2,600**	**1,800**	**210**	**120**	ND (<5.0)	**23**	**1,300**	ND (<5.0)	**2,000**	ND (<5.0)	1,2,4-TCB = 23
O68A1		6/11/14	**92**	**470**	**1,100**	**83**	**120**	ND (<25)	**140**	**760**	ND (<25)	**2,600**	ND (<25)	1,2,4-TCB = 52
O69A2D		6/9/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O69A2D		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O69A2D	Dup	6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O69A2D		6/13/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O69A2D		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O69A2D		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O70A1		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O70A1		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O100B		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O100B		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O104A1		6/14/11	ND (<0.50)	**1.3**	**4.1**	**1.6**	**6.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	Freon 11 = 1.1
O104A1		6/17/13	ND (<0.50)	**0.56**	**2.7**	**0.92**	**3.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O105A2		6/14/11	ND (<0.50)	ND (<0.50)	**4.8**	**1.3**	**4.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	Freon 11 = 1.3
O105A2		6/17/13	ND (<0.50)	ND (<0.50)	**2.7**	**0.89**	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O108A1		6/14/11	ND (<0.50)	**12**	**1.4**	**1.7**	**2.2**	ND (<0.50)	ND (<0.50)	**2.6**	ND (<0.50)	**3.2**	ND (<0.50)	
O108A1	Dup	6/14/11	ND (<0.50)	**11**	**1.3**	**1.6**	**2.2**	ND (<0.50)	ND (<0.50)	**2.4**	ND (<0.50)	**2.6**	ND (<0.50)	
O108A1		6/19/13	ND (<0.50)	**4.6**	ND (<0.50)	ND (<0.50)	**0.72**	ND (<0.50)	ND (<0.50)	**0.91**	ND (<0.50)	**1.8**	ND (<0.50)	
O109A2		6/14/11	ND (<0.50)	**28**	**42**	**13**	**18**	ND (<0.50)	ND (<0.50)	**55**	**1.4**	**51**	ND (<0.50)	
O109A2		6/19/13	ND (<0.50)	**29**	**32**	**13**	**17**	ND (<0.50)	ND (<0.50)	**49**	**1.2**	**44**	ND (<0.50)	
O110A1		6/14/11	ND (<5.0)	**390**	ND (<5.0)	**6.6**	**7.8**	ND (<5.0)	ND (<5.0)	**10**	ND (<5.0)	**9.5**	ND (<5.0)	
O110A1		6/19/13	ND (<0.50)	**170**	**2.8**	**5.1**	**6.0**	ND (<0.50)	ND (<0.50)	**7.3**	ND (<0.50)	**5.9**	ND (<0.50)	
O110A1		6/10/14	ND (<0.50)	**150**	**2.4**	**4.5**	**5.2**	ND (<0.50)	ND (<0.50)	**7.1**	ND (<0.50)	**4.5**	ND (<0.50)	
O111A2		6/14/11	ND (<5.0)	**330**	**150**	**15**	**54**	ND (<5.0)	ND (<5.0)	**100**	ND (<5.0)	**120**	ND (<5.0)	
O111A2		6/19/13	ND (<5.0)	**230**	**95**	**19**	**44**	ND (<5.0)	ND (<5.0)	**92**	ND (<5.0)	**85**	ND (<5.0)	
O111A2		6/10/14	ND (<2.5)	**160**	**71**	**11**	**25**	ND (<2.5)	ND (<2.5)	**55**	ND (<2.5)	**59**	ND (<2.5)	
O112A1		6/14/11	ND (<5.0)	**880**	**6.2**	**6.0**	**8.9**	ND (<5.0)	ND (<5.0)	**14**	ND (<5.0)	**17**	ND (<5.0)	
O112A1		6/19/13	ND (<5.0)	**650**	**8.0**	**9.9**	ND (<5.0)	ND (<5.0)	**13**	ND (<5.0)	**9.0**	ND (<5.0)		
O112A1		6/10/14	ND (<5.0)	**390**	ND (<5.0)	ND (<5.0)	**5.2**	ND (<5.0)	ND (<5.0)	**7.7**	ND (<5.0)	**7.2**	ND (<5.0)	
O113A2		6/14/11	ND (<2.5)	**270**	**55**	**10**	**22**	ND (<2.5)	ND (<2.5)	**39**	ND (<2.5)	**95**	ND (<2.5)	
O113A2		6/19/13	ND (<2.5)	**350**	**62**	**14**	**27**	ND (<2.5)	ND (<2.5)	**48**	ND (<2.5)	**120**	ND (<2.5)	

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Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
O114A2		6/9/10	ND (<10)	**570**	**53**	ND (<10)	**28**	ND (<10)	ND (<10)	**34**	ND (<10)	**110**	ND (<10)	
O114A2		6/14/11	ND (<2.5)	**560**	**47**	**12**	**27**	ND (<2.5)	ND (<2.5)	**41**	ND (<2.5)	**88**	ND (<2.5)	
O114A2		6/12/12	ND (<2.5)	**280**	**17**	**6.3**	**11**	ND (<2.5)	ND (<2.5)	**22**	ND (<2.5)	**47**	ND (<2.5)	
O114A2		6/20/13	ND (<2.5)	**340**	**24**	**8.7**	**15**	ND (<2.5)	ND (<2.5)	**24**	ND (<2.5)	**93**	ND (<2.5)	
O114A2		6/11/14	ND (<2.5)	**230**	**15**	**6.1**	**11**	ND (<2.5)	ND (<2.5)	**19**	ND (<2.5)	**49**	ND (<2.5)	
O115A1		6/14/11	ND (<0.50)	**4.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O115A1		6/19/13	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O116A1		6/14/11	**1.7**	**13**	**3.7**	**1.7**	**4.6**	ND (<0.50)	**5.6**	**1.6**	ND (<0.50)	**5.1**	ND (<0.50)	; 1,2,4-TCB = 15; Freon 11 = 1.2
O116A1		6/18/13	**0.70**	**8.0**	**2.2**	**1.2**	**3.0**	ND (<0.50)	**2.0**	**0.71**	ND (<0.50)	**1.6**	ND (<0.50)	; 1,2,4-TCB = 5.4
O117A2		6/14/11	**0.51**	**29**	**8.1**	**10**	**15**	ND (<0.50)	**0.75**	**3.1**	ND (<0.50)	**7.6**	ND (<0.50)	; 1,2,4-TCB = 2.2; CHLFM = 1.2; Freon 11 = 7.9
O117A2		6/18/13	**0.57**	**39**	**5.8**	**2.6**	**6.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**3.3**	ND (<0.50)	; 1,2,4-TCB = 2.1; CHLFM = 1.0; Freon 11 = 6.1
O118B		6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B	Dup	6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B	Dup	6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B		6/12/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O118B		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O119A1		6/9/10	**520**	**10,000**	**9,600**	ND (<250)	**810**	ND (<250)	**1,500**	**2,800**	ND (<250)	**6,700**	ND (<250)	1,2,4-TCB = 750
O119A1		6/14/11	**380**	**6,300**	**7,500**	**92**	**300**	ND (<50)	**1,300**	**3,100**	ND (<50)	**5,800**	ND (<50)	1,2,4-TCB = 1000
O119A1		8/26/11	**330**	**4,800**	**6,300**	**81**	ND (<250)	ND (<0.50)	**1,100**	**3,000**	**3.8**	**5,700**	**7.9**	1,1,2-TCA = 1.0; 1,2,4-TCB = 720; 1,3-DCB = 2.1; 1,4-DCB = 16; CHLBZ = 2.9; Freon 11 = 1.1
O119A1		9/29/11	**180**	**1,400**	**3,000**	**54**	**91**	ND (<50)	**780**	**2,400**	ND (<50)	**2,700**	ND (<50)	1,2,4-TCB = 360
O119A1		10/17/11	**120**	**1000**	**2,700**	ND (<50)	**140**	ND (<50)	**610**	**2,300**	ND (<50)	**2,300**	ND (<50)	1,2,4-TCB = 200
O119A1		6/12/12	**150**	**3,500**	**6,300**	**100**	**270**	ND (<50)	**940**	**4,500**	ND (<50)	**4,400**	ND (<50)	1,2,4-TCB = 910
O119A1		6/20/13	**670**	**12,000**	**10,000**	**150**	**420**	ND (<50)	**1,400**	**3,200**	ND (<50)	**9,400**	ND (<50)	1,2,4-TCB = 1,700
O119A1		6/11/14	**63**	**20**	**170**	**19**	**17**	ND (<5.0)	**830**	**390**	ND (<5.0)	**1000**	ND (<5.0)	1,2,4-TCB = 870; 1,4-DCB = 13
O120A2		6/9/10	**16**	**640**	**130**	**8.4**	**24**	ND (<5.0)	**45**	ND (<5.0)	ND (<5.0)	**71**	ND (<5.0)	1,2,4-TCB = 50; Freon 11 = 13
O120A2		6/14/11	**13**	**520**	**120**	**9.8**	**18**	ND (<5.0)	**39**	**6.3**	ND (<5.0)	**62**	ND (<5.0)	1,2,4-TCB = 57
O120A2		6/12/12	**9.7**	**460**	**97**	**7.8**	**12**	ND (<5.0)	**32**	ND (<5.0)	ND (<5.0)	**50**	ND (<5.0)	1,2,4-TCB = 50
O120A2		6/20/13	**11**	**500**	**94**	**6.7**	**13**	ND (<5.0)	**8.3**	**7.4**	ND (<5.0)	**51**	ND (<5.0)	1,2,4-TCB = 21
O120A2		6/11/14	**13**	**130**	**100**	**21**	**16**	ND (<5.0)	**16**	**110**	ND (<5.0)	**110**	ND (<5.0)	1,2,4-TCB = 41
O121A2		6/14/11	ND (<0.50)	**23**	**16**	**5.5**	**17**	ND (<0.50)	ND (<0.50)	**0.53**	ND (<0.50)	**3.0**	ND (<0.50)	CHLFM = 1.8; Freon 11 = 7.7
O121A2		6/18/13	ND (<0.50)	**21**	**13**	**4.2**	**12**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.0**	ND (<0.50)	CHLFM = 1.4; Freon 11 = 6.6
O121A2	Dup	6/18/13	ND (<0.50)	**21**	**13**	**4.2**	**13**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.0**	ND (<0.50)	CHLFM = 1.4; Freon 11 = 6.7
O121A2		6/10/14	ND (<0.50)	**25**	**12**	**3.5**	**11**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	CHLFM = 1.2; Freon 11 = 5.9
O122A2		6/14/11	**8.4**	**21**	**4.5**	**2.4**	**3.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.83**	ND (<0.50)	Freon 11 = 2.7
O122A2		6/18/13	**8.0**	**17**	**4.4**	**2.8**	**3.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	Freon 11 = 2.2

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
O152B		6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B	Dup	6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B		6/12/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B		6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B	Dup	6/20/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O152B		6/11/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
O162A2		8/16/11	**33**	**39**	**2.1**	**1.3**	**3.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.4**	ND (<0.50)	Freon 11 = 3.0
O162A2		9/30/11	**28**	**36**	**2.4**	**1.1**	**2.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.5**	ND (<0.50)	Freon 11 = 2.6
O162A2		6/13/12	**49**	**46**	**2.2**	**1.4**	**3.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.8**	ND (<0.50)	Freon 11 = 2.6
O162A2	Dup	6/13/12	**46**	**45**	**2.3**	**1.3**	**3.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.6**	ND (<0.50)	Freon 11 = 2.8
O162A2		6/18/13	**45**	**42**	**2.0**	**1.2**	**2.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	Freon 11 = 2.2
O162A2		6/11/14	**42**	**39**	**1.9**	**0.71**	**2.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	Freon 11 = 1.8
OB11-2		6/8/10	**360**	**61**	**60**	ND (<5.0)	**5.6**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	
OB11-2		11/4/10	**180**	**66**	**34**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	**7.9**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
OB11-2		6/14/11	**270**	**69**	**39**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	**26**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
OB11-2		6/12/12	**630**	**74**	**110**	ND (<5.0)	**6.7**	ND (<5.0)	ND (<5.0)	**38**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
OB11-2		4/4/13	**670**	**68**	**100**	**1.1**	**8.9**	ND (<0.50)	ND (<0.50)	**23**	ND (<0.50)	ND (<0.50)	ND (<0.50)	1,1,1,2-TCA = 2.6; CHLFM = 1.6; CT = 0.75
OB11-2		6/17/13	**390**	**6.0**	**110**	**5.1**	**7.5**	ND (<5.0)	ND (<5.0)	**590**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
OB11-2		8/23/13	**320**	ND (<5.0)	**68**	**13**	ND (<5.0)	ND (<5.0)	ND (<5.0)	**54**	**7.8**	ND (<5.0)	**95**	
OB11-2		11/22/13	**150**	**2.3**	**28**	**12**	**1.9**	ND (<1.0)	ND (<1.0)	**7.3**	**4.9**	ND (<1.0)	**12**	
OB11-2		5/22/14	**1,100**	**3.5**	**99**	**8.6**	**7.0**	ND (<1.0)	ND (<1.0)	**69**	**2.0**	ND (<1.0)	**52**	1,1,1,2-TCA = 1.8
OB11-2		6/11/14	**53**	**6.0**	**18**	**4.5**	**0.75**	ND (<0.50)	ND (<0.50)	**52**	**1.2**	ND (<0.50)	**20**	
OB11-3		10/16/12	**57**	**29**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.77**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
OB11-3	Dup	10/16/12	**89**	**30**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.85**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
OB11-4		10/16/12	**32**	**120**	**16**	**5.8**	**11**	ND (<0.50)	ND (<0.50)	**31**	ND (<0.50)	**2.6**	ND (<0.50)	
OB11-5		10/16/12	**290**	**94**	**10**	**4.8**	**9.3**	ND (<0.50)	ND (<0.50)	**17**	ND (<0.50)	**1.4**	ND (<0.50)	
OEU manhole		7/11/11	**23**	**61**	**2.2**	**1.6**	**1.8**	ND (<0.50)	ND (<0.50)	**7.8**	**0.52**	ND (<0.50)	ND (<0.50)	
OEU manhole		6/19/13	**40**	**100**	**5.9**	**2.8**	**3.3**	ND (<0.50)	ND (<0.50)	**14**	**0.78**	**0.72**	ND (<0.50)	
P1-A1		6/8/10	ND (<0.50)	**7.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A1		6/14/11	ND (<0.50)	**6.5**	ND (<0.50)	**0.85**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A1	Dup	6/14/11	ND (<0.50)	**6.2**	ND (<0.50)	**0.91**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A1		6/12/12	ND (<0.50)	**5.7**	ND (<0.50)	**0.87**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A1		6/19/13	ND (<0.50)	**4.2**	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A1		6/11/14	ND (<0.50)	**3.9**	ND (<0.50)	**0.86**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P1-A2		6/8/10	ND (<0.50)	**41**	**53**	**9.9**	**26**	ND (<0.50)	ND (<0.50)	**41**	ND (<0.50)	**6.0**	ND (<0.50)	
P1-A2		6/14/11	ND (<0.50)	**72**	**84**	**16**	**37**	ND (<0.50)	ND (<0.50)	**65**	**1.1**	**13**	ND (<0.50)	
P1-A2		6/12/12	ND (<0.50)	**7.0**	**1.7**	ND (<0.50)	**1.4**	ND (<0.50)	ND (<0.50)	**3.6**	ND (<0.50)	**1.3**	ND (<0.50)	
P1-A2		6/19/13	ND (<0.50)	**12**	**2.3**	**0.54**	**1.8**	ND (<0.50)	ND (<0.50)	**3.9**	ND (<0.50)	**1.7**	ND (<0.50)	
P1-A2		6/11/14	ND (<0.50)	**17**	**4.2**	**1.6**	**2.3**	ND (<0.50)	ND (<0.50)	**5.9**	ND (<0.50)	**2.7**	ND (<0.50)	

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VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
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COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
P2-A2		6/8/10	ND (<0.50)	**6.2**	**14**	**5.8**	**7.1**	ND (<0.50)	ND (<0.50)	**16**	ND (<0.50)	**0.53**	ND (<0.50)	
P2-A2		6/14/11	ND (<0.50)	**5.7**	**6.8**	**4.6**	**3.4**	ND (<0.50)	ND (<0.50)	**11**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P2-A2		6/12/12	ND (<0.50)	**3.8**	**3.1**	**4.3**	**1.8**	ND (<0.50)	ND (<0.50)	**7.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P2-A2		6/19/13	ND (<0.50)	**3.0**	**1.3**	**3.4**	**1.1**	ND (<0.50)	ND (<0.50)	**3.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P2-A2		6/11/14	ND (<0.50)	**4.1**	**2.2**	**5.4**	**2.1**	ND (<0.50)	ND (<0.50)	**4.8**	ND (<0.50)	**0.77**	ND (<0.50)	
P3		3/5/12	ND (<0.50)	**55**	ND (<0.50)	**3.0**	**3.6**	ND (<0.50)	ND (<0.50)	**35**	**2.7**	ND (<0.50)	ND (<0.50)	
P3-1		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
P3-A2		6/8/10	ND (<1.0)	**150**	**88**	**14**	**42**	ND (<1.0)	ND (<1.0)	**59**	ND (<1.0)	**19**	ND (<1.0)	
P3-A2		6/14/11	ND (<1.0)	**120**	**75**	**14**	**29**	ND (<1.0)	ND (<1.0)	**54**	**1.0**	**15**	ND (<1.0)	
P3-A2		6/12/12	ND (<1.0)	**200**	**55**	**14**	**26**	ND (<1.0)	ND (<1.0)	**50**	ND (<1.0)	**72**	ND (<1.0)	
P3-A2		6/19/13	ND (<1.0)	**160**	**35**	**11**	**18**	ND (<1.0)	ND (<1.0)	**33**	ND (<1.0)	**50**	ND (<1.0)	
P3-A2		6/11/14	ND (<1.0)	**150**	**29**	**11**	**16**	ND (<1.0)	ND (<1.0)	**32**	ND (<1.0)	**62**	ND (<1.0)	
P4		3/5/12	ND (<0.50)	**160**	ND (<0.50)	ND (<0.50)	**0.65**	ND (<0.50)	ND (<0.50)	**16**	**1.1**	ND (<0.50)	ND (<0.50)	
P4-A2		6/8/10	ND (<2.5)	**160**	**14**	**5.5**	**6.3**	ND (<2.5)	ND (<2.5)	**24**	ND (<2.5)	**5.6**	ND (<2.5)	
P4-A2		6/14/11	ND (<0.50)	**48**	**5.0**	**2.4**	**3.0**	ND (<0.50)	ND (<0.50)	**9.4**	ND (<0.50)	**5.3**	ND (<0.50)	
P4-A2		6/12/12	ND (<0.50)	**200**	**42**	**15**	**21**	ND (<0.50)	ND (<0.50)	**44**	**0.57**	**87**	ND (<0.50)	
P4-A2		6/19/13	ND (<0.50)	**39**	**4.1**	**2.4**	**2.4**	ND (<0.50)	ND (<0.50)	**7.5**	ND (<0.50)	**6.7**	ND (<0.50)	
P4-A2		6/11/14	ND (<0.50)	**29**	**1.3**	**1.1**	**1.0**	ND (<0.50)	ND (<0.50)	**4.2**	ND (<0.50)	**1.2**	ND (<0.50)	
P5-A2		6/8/10	ND (<2.5)	**210**	**55**	**12**	**26**	ND (<2.5)	ND (<2.5)	**36**	ND (<2.5)	**32**	ND (<2.5)	
P5-A2		6/14/11	ND (<2.5)	**150**	**42**	**11**	**17**	ND (<2.5)	ND (<2.5)	**31**	ND (<2.5)	**16**	ND (<2.5)	
P5-A2		6/12/12	ND (<2.5)	**150**	**26**	**11**	**14**	ND (<2.5)	ND (<2.5)	**32**	ND (<2.5)	**56**	ND (<2.5)	
P5-A2		6/19/13	ND (<2.5)	**130**	**22**	**10**	**14**	ND (<2.5)	ND (<2.5)	**25**	ND (<2.5)	**53**	ND (<2.5)	
P5-A2		6/11/14	ND (<0.50)	**110**	**19**	**10**	**12**	ND (<0.50)	ND (<0.50)	**26**	**0.56**	**46**	ND (<0.50)	
P27		1/19/14	ND (<0.5)	**12**	ND (<0.5)	**7.9**	**0.5**	**0.6**	ND (<0.5)	**51**	**7.5**	ND (<2.0)	**47**	CARBD = 11; CHLEA = 6.5; MEK = 21
P28		1/19/14	ND (<5.0)	**470**	ND (<5.0)	**16**	**7.9**	ND (<5.0)	ND (<5.0)	**370**	**8.7**	ND (<20)	**70**	
P29		1/19/14	ND (<0.5)	**19**	ND (<0.5)	**11**	ND (<0.5)	ND (<0.5)	ND (<0.5)	**18**	**3.8**	ND (<2.0)	**21**	CARBD = 2.6; CHLEA = 4.8
RW-1		6/15/11	**170**	**30**	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	
RW-1		10/16/12	**1,300**	**58**	**0.85**	ND (<0.50)	**0.78**	ND (<0.50)	ND (<0.50)	**3.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-1		4/4/13	**250**	**27**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.89**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-1		6/19/13	**6.1**	ND (<1.0)	ND (<1.0)	ND (<1.0)	**1.3**	ND (<1.0)	ND (<1.0)	**810**	ND (<1.0)	ND (<1.0)	**3.5**	
RW-1	Dup	6/19/13	**7.2**	**0.95**	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	**820**	ND (<0.50)	ND (<0.50)	**2.9**	
RW-1		8/23/13	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**12**	ND (<2.5)	ND (<2.5)	**150**	
RW-1		11/22/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.76**	**7.9**	ND (<0.50)	**1.2**	
RW-1		5/22/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**29**	**2.7**	ND (<0.50)	**28**	
RW-2		6/14/11	**130**	**27**	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	
RW-2		4/4/13	**120**	**21**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-2		6/18/13	**4.4**	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	**280**	ND (<1.0)	ND (<1.0)	ND (<1.0)	
RW-2		11/22/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**87**	**3.6**	ND (<0.50)	**82**	
RW-2		5/22/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.7**	**1.6**	ND (<0.50)	**7.5**	Toluene = 0.76

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
RW-4		6/15/11	12	44	0.53	ND (<0.50)	0.90	ND (<0.50)	ND (<0.50)	0.65	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-4		6/18/13	10	38	ND (<0.50)	ND (<0.50)	0.61	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5		6/8/10	1000	29	600	ND (<5.0)	57	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	CT = 18
RW-5		11/4/10	9.0	45	2.2	ND (<0.50)	1.0	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5	22'	11/4/10	580	51	170	ND (<5.0)	17	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	CT = 5.6
RW-5	14'	3/28/11	24	33	2.2	ND (<0.50)	0.59	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5	18'	3/28/11	21	31	3.5	ND (<0.50)	0.83	ND (<0.50)	ND (<0.50)	1.1	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5	22'	3/28/11	24	33	3.5	ND (<0.50)	0.91	ND (<0.50)	ND (<0.50)	1.1	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5	3V-C	3/28/11	660	33	95	0.57	5.0	ND (<0.50)	ND (<0.50)	1.6	ND (<0.50)	ND (<0.50)	ND (<0.50)	CHLFM = 1.2; CT = 4.8
RW-5		6/15/11	560	42	290	1.6	22	ND (<0.50)	ND (<0.50)	10	ND (<0.50)	ND (<0.50)	ND (<0.50)	CHLFM = 4.2; CT = 7.4
RW-5		6/12/12	3,900	54	190	ND (<2.5)	27	ND (<2.5)	ND (<2.5)	16	ND (<2.5)	ND (<2.5)	ND (<2.5)	CT = 3.5
RW-5		7/9/12	2,900	53	200	2.3	30	ND (<.50)	ND (<.50)	16	ND (<.50)	ND (<.50)	ND (<.50)	
RW-5	3V-C	7/9/12	23	39	1.8	ND (<.50)	0.84	ND (<.50)	ND (<.50)	0.90	ND (<.50)	ND (<.50)	ND (<.50)	
RW-5		4/4/13	31	31	1.7	ND (<0.50)	0.95	ND (<0.50)	ND (<0.50)	1.4	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-5		6/17/13	370	84	8.7	12	8.7	ND (<2.5)	ND (<2.5)	6,400	13	ND (<2.5)	5.6	
RW-5		8/23/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	4.1	ND (<0.50)	ND (<0.50)	ND (<0.50)	2.8	7.8	ND (<0.50)	41	CHLEA = 3.8
RW-5		11/22/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	4.2	ND (<0.50)	ND (<0.50)	ND (<0.50)	3.2	4.1	ND (<0.50)	6.0	CHLEA = 1.7
RW-5		5/22/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	2.3	ND (<0.50)	ND (<0.50)	ND (<0.50)	5.4	0.60	ND (<0.50)	18	
RW-6		6/15/11	110	33	9.5	ND (<0.50)	2.3	ND (<0.50)	ND (<0.50)	2.2	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-6		4/4/13	98	31	5.3	ND (<0.50)	2.2	ND (<0.50)	ND (<0.50)	2.1	ND (<0.50)	ND (<0.50)	ND (<0.50)	
RW-6		6/18/13	5.9	1.3	3.7	9.7	2.0	ND (<0.50)	ND (<0.50)	890	7.8	ND (<0.50)	ND (<0.50)	1,1,2-TCA = 0.59
RW-6		11/22/13	0.82	1.4	3.4	18	0.71	ND (<0.50)	ND (<0.50)	49	22	ND (<0.50)	160	CHLEA = 1.4
RW-6		5/22/14	ND (<0.50)	4.5	2.9	14	1.7	ND (<0.50)	ND (<0.50)	85	4.8	ND (<0.50)	160	CHLEA = 1.3
SC-1		11/4/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
SH1		6/15/11	ND (<0.50)	17	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
SH1		6/20/13	ND (<0.50)	15	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
SH2		6/15/11	24	2.6	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
T1A		6/9/10	ND (<2.5)	260	ND (<2.5)	19	11	ND (<2.5)	ND (<2.5)	24	3.0	ND (<2.5)	ND (<2.5)	
T1A		6/14/11	ND (<0.50)	62	1.5	21	17	ND (<0.50)	ND (<0.50)	25	1.9	ND (<0.50)	ND (<0.50)	
T1A		6/13/12	ND (<0.50)	32	4.8	27	25	ND (<0.50)	ND (<0.50)	42	2.0	ND (<0.50)	ND (<0.50)	
T1A		6/19/13	ND (<0.50)	21	7.5	23	25	ND (<0.50)	ND (<0.50)	39	2.2	ND (<0.50)	ND (<0.50)	
T1A		6/11/14	ND (<0.50)	250	1.5	19	23	ND (<0.50)	ND (<0.50)	160	8.4	ND (<0.50)	ND (<0.50)	
T1A	Dup	6/11/14	ND (<2.5)	240	ND (<2.5)	17	17	ND (<2.5)	ND (<2.5)	150	6.3	ND (<2.5)	ND (<2.5)	1,2,4-TCB = 20
TW-1		8/5/12	94	480	41	5.8	12	ND (<5.0)	110	37	ND (<5.0)	240	ND (<5.0)	1,2,4-TCB = 12
TW-1		8/5/12	110	640	46	6.5	13	ND (<5.0)	120	28	ND (<5.0)	270	ND (<5.0)	1,2,4-TCB = 12
TW-1		8/5/12	97	550	45	6.3	13	ND (<5.0)	120	34	ND (<5.0)	260	ND (<5.0)	1,2,4-TCB = 13
TW-1		1/16/14	42	74	76	11	12	ND (<1.0)	100	130	ND (<1.0)	95	ND (<1.0)	1,2,3-TCB = 2.3; 1,2,4-TCB = 18; 1,4-DCB = 1.4
TW-1		6/11/14	65	560	610	24	41	ND (<5.0)	170	340	ND (<5.0)	880	ND (<5.0)	1,2,4-TCB = 92
TW-2		8/5/12	ND (<100)	16,000	800	220	110	ND (<100)	ND (<100)	130	ND (<100)	2,500	ND (<100)	
TW-2		8/5/12	ND (<100)	12,000	510	130	ND (<100)	ND (<100)	ND (<100)	ND (<100)	ND (<100)	1,400	ND (<100)	
TW-2		8/5/12	ND (<100)	11,000	450	130	ND (<100)	ND (<100)	ND (<100)	ND (<100)	ND (<100)	1000	ND (<100)	
TW-2		1/16/14	81	3,300	160	ND (<50)	ND (<50)	ND (<50)	ND (<50)	130	ND (<50)	670	ND (<50)	
TW-2		6/11/14	70	1,700	570	40	38	ND (<5.0)	93	310	ND (<5.0)	730	ND (<5.0)	

TABLE 2
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V8-1		6/8/10	ND (<50)	**3,700**	ND (<50)	ND (<50)	ND (<50)	ND (<50)	ND (<50)	ND (<50)	ND (<50)	ND (<50)	ND (<50)	
V8-1	Dup	6/8/10	ND (<10)	**3,700**	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**49**	ND (<10)	ND (<10)	ND (<10)	
V8-1		7/11/11	ND (<2.5)	**190**	ND (<2.5)	**4.4**	**2.6**	ND (<2.5)	ND (<2.5)	**25**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-1		6/12/12	ND (<2.5)	**210**	ND (<2.5)	**3.1**	ND (<2.5)	ND (<2.5)	ND (<2.5)	**22**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-1		6/18/13	ND (<2.5)	**160**	ND (<2.5)	**2.8**	ND (<2.5)	ND (<2.5)	ND (<2.5)	**18**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-1		6/11/14	**0.52**	**100**	ND (<0.50)	**6.4**	**2.9**	ND (<0.50)	ND (<0.50)	**16**	**1.0**	ND (<0.50)	ND (<0.50)	
V8-2		6/14/11	ND (<5.0)	**1,400**	ND (<5.0)	**14**	**7.4**	ND (<5.0)	ND (<5.0)	**7.1**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
V8-2		6/18/13	ND (<5.0)	**1,300**	ND (<5.0)	**9.1**	**5.5**	ND (<5.0)	ND (<5.0)	**6.3**	ND (<5.0)	ND (<5.0)	ND (<5.0)	
V8-2		6/11/14	ND (<10)	**8,200**	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**26**	ND (<10)	ND (<10)	ND (<10)	
V8-2X		6/14/11	ND (<5.0)	**420**	ND (<5.0)	**10**	**6.5**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	
V8-2X		7/25/13	ND (<5.0)	**350**	ND (<5.0)	**12**	**8.9**	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	
V8-3		6/14/11	ND (<2.5)	**130**	**5.6**	**17**	**8.8**	ND (<2.5)	ND (<2.5)	**20**	ND (<2.5)	**3.8**	ND (<2.5)	
V8-3		6/18/13	ND (<2.5)	**210**	**3.1**	**12**	**7.0**	ND (<2.5)	ND (<2.5)	**13**	ND (<2.5)	**2.7**	ND (<2.5)	
V8-3		6/10/14	ND (<2.5)	**200**	**2.9**	**12**	**7.7**	ND (<2.5)	ND (<2.5)	**15**	ND (<2.5)	**2.6**	ND (<2.5)	
V8-4		6/14/11	ND (<0.50)	**79**	**10**	**14**	**9.5**	ND (<0.50)	ND (<0.50)	**18**	ND (<0.50)	**11**	ND (<0.50)	
V8-4		6/18/13	ND (<0.50)	**42**	**7.1**	**12**	**9.5**	ND (<0.50)	ND (<0.50)	**14**	ND (<0.50)	**8.0**	ND (<0.50)	
V8-5		6/8/10	ND (<0.50)	**4.1**	ND (<0.50)	**9.5**	**8.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-5		6/14/11	ND (<0.50)	**3.3**	**0.77**	**11**	**8.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-5		6/12/12	ND (<0.50)	**3.8**	ND (<0.50)	**11**	**9.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-5		6/18/13	ND (<0.50)	**3.4**	ND (<0.50)	**12**	**9.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-5		6/11/14	ND (<0.50)	**4.1**	**0.52**	**18**	**14**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-6		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-6		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-7		6/8/10	ND (<10)	**1,100**	ND (<10)	**13**	ND (<10)	ND (<10)	ND (<10)	**21**	ND (<10)	ND (<10)	ND (<10)	
V8-7		6/14/11	ND (<10)	**1,300**	**11**	**14**	ND (<10)	ND (<10)	ND (<10)	**20**	ND (<10)	ND (<10)	ND (<10)	
V8-7		6/12/12	ND (<10)	**1000**	ND (<10)	**12**	ND (<10)	ND (<10)	ND (<10)	**15**	ND (<10)	ND (<10)	ND (<10)	
V8-7		6/18/13	ND (<2.5)	**48**	**7.0**	**15**	**3.7**	ND (<2.5)	ND (<2.5)	**260**	ND (<2.5)	**3.1**	**34**	
V8-7		6/11/14	ND (<2.5)	**160**	ND (<2.5)	**8.1**	ND (<2.5)	ND (<2.5)	ND (<2.5)	**280**	ND (<2.5)	**7.0**	**34**	
V8-8		6/8/10	ND (<2.5)	**140**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.7**	**3.9**	ND (<2.5)	ND (<2.5)	
V8-8		6/14/11	ND (<2.5)	**130**	ND (<2.5)	**3.8**	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.8**	**2.7**	ND (<2.5)	ND (<2.5)	
V8-8		6/12/12	ND (<2.5)	**140**	ND (<2.5)	**3.4**	ND (<2.5)	ND (<2.5)	ND (<2.5)	**3.4**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-8		6/18/13	ND (<2.5)	**130**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**4.5**	**3.1**	ND (<2.5)	ND (<2.5)	
V8-8		6/11/14	ND (<2.5)	**270**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**9.3**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-8	Dup	6/11/14	ND (<2.5)	**260**	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	ND (<2.5)	**9.1**	ND (<2.5)	ND (<2.5)	ND (<2.5)	
V8-8X		6/14/11	**0.77**	**85**	ND (<0.50)	**2.1**	**1.4**	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-8X	Dup	6/14/11	ND (<0.50)	**69**	ND (<0.50)	**1.9**	**1.1**	ND (<0.50)	ND (<0.50)	**1.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-8X		6/18/13	ND (<0.50)	**180**	ND (<0.50)	**5.1**	**2.7**	ND (<0.50)	ND (<0.50)	**3.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-13B		8/30/11	ND (<0.50)	**0.90**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-13B		6/18/13	ND (<0.50)	**1.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-13B		6/11/14	ND (<0.50)	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	

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Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
V8-22		6/14/11	ND (<0.50)	**13**	**5.9**	**16**	**10**	ND (<0.50)	ND (<0.50)	**12**	ND (<0.50)	**3.0**	ND (<0.50)	
V8-22		6/18/13	ND (<0.50)	**16**	**3.9**	**12**	**9.0**	ND (<0.50)	ND (<0.50)	**8.1**	ND (<0.50)	**2.4**	ND (<0.50)	
V8-34		10/12/13	ND (<0.50)	**13**	ND (<0.50)	**18**	**21**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-34		1/19/14	ND (<0.5)	**20**	ND (<0.5)	**21**	**21**	ND (<0.5)	ND (<0.5)	**0.6**	ND (<0.5)	ND (<2.0)	ND (<0.5)	
V8-34		6/11/14	ND (<0.50)	**50**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V8-34		7/1/14	ND (<0.5)	**22**	ND (<0.5)	**18**	**21**	ND (<0.5)	ND (<0.5)	**0.6**	ND (<0.5)	ND (<2.0)	ND (<0.5)	
V8-34		7/1/14	ND (<0.5)	**16**	ND (<0.5)	**19**	**22**	ND (<0.5)	ND (<0.5)	**0.6**	ND (<0.5)	ND (<2.0)	ND (<0.5)	
V-9		6/15/11	ND (<10)	**2,000**	ND (<10)	**15**	**11**	ND (<10)	ND (<10)	**27**	ND (<10)	**12**	ND (<10)	
V-9		6/18/13	ND (<10)	**880**	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**31**	ND (<10)	ND (<10)	ND (<10)	
V-9		6/11/14	ND (<10)	**2,000**	ND (<10)	**13**	**10**	ND (<10)	ND (<10)	**470**	ND (<10)	ND (<10)	**65**	
V-9X		6/15/11	ND (<1.0)	**2,000**	**5.5**	**14**	**9.0**	ND (<1.0)	ND (<1.0)	**30**	ND (<1.0)	**5.5**	ND (<1.0)	
V-9X		6/18/13	ND (<10)	**2,800**	ND (<10)	**12**	ND (<10)	ND (<10)	ND (<10)	**910**	ND (<10)	ND (<10)	**120**	
V-9X		6/11/14	ND (<10)	**1,700**	ND (<10)	**12**	**14**	ND (<10)	ND (<10)	**400**	ND (<10)	ND (<10)	**72**	
V-10		6/16/11	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-10		6/18/13	ND (<0.50)	**0.81**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-16A1U		6/16/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-16A1U		6/19/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-23		6/15/11	ND (<0.50)	**0.90**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-23		6/18/13	ND (<0.50)	**0.57**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-23	Dup	6/18/13	ND (<0.50)	**0.58**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-33A2D		6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
V-33A2D		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
VB-1		6/16/11	**2.5**	**56**	**2.1**	**1.1**	**1.8**	ND (<0.50)	ND (<0.50)	**6.4**	ND (<0.50)	**0.57**	ND (<0.50)	
VB-1	Dup	6/16/11	**2.4**	**56**	**2.1**	**1.1**	**1.8**	ND (<0.50)	ND (<0.50)	**6.3**	ND (<0.50)	**0.52**	ND (<0.50)	
VB-1		6/20/13	**1.0**	**19**	**0.69**	ND (<0.50)	**0.68**	ND (<0.50)	ND (<0.50)	**2.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-3A1U		6/8/10	ND (<1.0)	**96**	**2.6**	ND (<1.0)	**3.6**	ND (<1.0)	ND (<1.0)	**2.2**	ND (<1.0)	ND (<1.0)	ND (<1.0)	
W-3A1U		6/14/11	**0.96**	**74**	**2.2**	**0.65**	**2.2**	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-3A1U		6/12/12	ND (<0.50)	**79**	**2.1**	**0.68**	**2.3**	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-3A1U		6/18/13	ND (<0.50)	**73**	**2.1**	**0.74**	**2.4**	ND (<0.50)	ND (<0.50)	**2.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-3A1U		6/10/14	ND (<0.50)	**66**	**1.6**	**0.60**	**1.8**	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-3A1U	Dup	6/10/14	ND (<0.50)	**62**	**1.5**	**0.57**	**1.7**	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-7A1U		6/14/11	**0.58**	**54**	**3.3**	**0.71**	**2.1**	ND (<0.50)	ND (<0.50)	**2.4**	ND (<0.50)	**1.3**	ND (<0.50)	
W-7A1U		6/18/13	ND (<0.50)	**48**	**2.2**	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	**2.1**	ND (<0.50)	**0.72**	ND (<0.50)	
W-7A1U		6/11/14	**0.80**	**40**	**1.5**	ND (<0.50)	**1.2**	ND (<0.50)	ND (<0.50)	**2.5**	ND (<0.50)	**0.62**	ND (<0.50)	
W-10A1U		6/14/11	**1.4**	**50**	**1.4**	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	**2.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-10A1U		6/18/13	**1.1**	**34**	**0.75**	ND (<0.50)	**0.80**	ND (<0.50)	ND (<0.50)	**1.6**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-11A1U		6/14/11	ND (<0.50)	**48**	**0.85**	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	**0.94**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-11A1U		6/18/13	ND (<0.50)	**45**	**0.76**	ND (<0.50)	**0.88**	ND (<0.50)	ND (<0.50)	**0.95**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

TABLE 2
VOC RESULTS FOR GROUNDWATER MONITORING AND EXTRACTION WELLS
(2010 to 2014)
COE Study Area and Perimeter Area
Palo Alto, California

Location	Type	Date	PCE	TCE	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	1,2-DCB	cis-1,2-DCE	trans-1,2-DCE	Freon 113	VC	Other Constituents
W-12A1U-R		6/14/11	**6.1**	**46**	**0.65**	ND (<0.50)	**0.92**	ND (<0.50)	ND (<0.50)	**0.55**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-12A1U-R		6/18/13	**4.2**	**37**	ND (<0.50)	ND (<0.50)	**0.61**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-13A2		6/8/10	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.85**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-13A2		6/14/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.1**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.76**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-13A2		6/12/12	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.3**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**0.86**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-13A2		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-13A2		6/10/14	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.5**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-16A1		6/14/11	**730**	**47**	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	
W-16A1		4/4/13	**510**	**33**	**0.62**	ND (<0.50)	**0.67**	ND (<0.50)	ND (<0.50)	**1.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-16A1		6/18/13	**25**	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**1,700**	ND (<10)	ND (<10)	ND (<10)	
W-16A1		8/23/13	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	**2,600**	**15**	ND (<5.0)	**180**	
W-16A1		11/22/13	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**590**	**13**	ND (<10)	**270**	
W-16A1		5/22/14	ND (<0.50)	**0.87**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**93**	**3.3**	ND (<0.50)	**67**	
W-17A2		6/15/11	**0.52**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-17A2	Dup	6/15/11	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-17A2		6/18/13	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2		6/8/10	ND (<0.50)	**2.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2	Dup	6/8/10	ND (<0.50)	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**1.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2		6/14/11	ND (<0.50)	**2.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2		6/12/12	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.4**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2		6/17/13	ND (<0.50)	**1.8**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**2.9**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W-19A2		6/10/14	ND (<0.50)	**1.7**	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	ND (<0.50)	**3.0**	ND (<0.50)	ND (<0.50)	ND (<0.50)	
W157A1U		8/16/11	**3.2**	**36**	**3.1**	**0.85**	**1.5**	ND (<0.50)	ND (<0.50)	**4.6**	ND (<0.50)	**1.2**	ND (<0.50)	
W157A1U		9/30/11	**5.4**	**47**	**5.3**	**0.87**	**1.6**	ND (<0.50)	ND (<0.50)	**5.6**	ND (<0.50)	**1.8**	ND (<0.50)	
W157A1U		6/19/13	**3.8**	**37**	**2.5**	**0.87**	**1.1**	ND (<0.50)	ND (<0.50)	**4.9**	ND (<0.50)	**0.95**	ND (<0.50)	
W158A1U		8/16/11	ND (<0.50)	**38**	**0.65**	**0.59**	**1.2**	ND (<0.50)	ND (<0.50)	**2.3**	**0.71**	ND (<0.50)	ND (<0.50)	
W158A1U		9/30/11	**4.7**	**44**	**5.2**	**0.87**	**1.8**	ND (<0.50)	ND (<0.50)	**5.0**	ND (<0.50)	**1.9**	ND (<0.50)	
W158A1U		6/12/12	ND (<0.50)	**36**	**0.67**	**0.52**	**1.1**	ND (<0.50)	ND (<0.50)	**1.2**	**0.73**	ND (<0.50)	ND (<0.50)	
W158A1U		6/19/13	ND (<0.50)	**38**	**0.75**	**0.55**	**1.3**	ND (<0.50)	ND (<0.50)	**1.7**	**0.51**	ND (<0.50)	ND (<0.50)	
W158A1U		6/11/14	ND (<0.50)	**26**	**0.53**	ND (<0.50)	**0.77**	ND (<0.50)	ND (<0.50)	**1.2**	ND (<0.50)	ND (<0.50)	ND (<0.50)	

Notes:
Analyzed using EPA Method 8260B for the EPA Method 8010 list of halogenated VOCs, including Freon 113. EPA Method 8260B superseded EPA Method 8010, which is the analytical method specified in the
All data reported in µg/L unless otherwise noted.
Dup = Field Duplicate
3V-C = Three Volume Conventional Purge

Abbreviations:

PCE = Perchloroethene (Tetrachloroethene)
TCE = Trichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
1,2-DCA = 1,2-Dichloroethane
1,2-DCB = 1,2-Dichlorobenzene
cis-1,2-DCE = cis-1,2-Dichloroethene
trans-1,2-DCE = trans-1,2-Dichloroethene
Freon 113 = 1,1,2-Trichloro-1,2,2-Trifluoroethane
VC = Vinyl Chloride
1,1,1,2-TCA = 1,1,1,2-Tetrachloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,2,3-TCB = 1,2,3-Trichlorobenzene
1,2,4-TCB = 1,2,4-Trichlorobenzene
1,3-DCB = 1,3-Dichlorobenzene
1,4-DCB = 1,4-Dichlorobenzene
CARBD = Carbon Disulfide
CHLBZ = Chlorobenzene
CHLEA = Chloroethane
CHLFM = Chloroform
CT = Carbon Tetrachloride
Freon = Trichlorofluoromethane
MEK = Methyl Ethyl Ketone

TABLE 3
Groundwater Extraction Volume and VOC Mass Removal
COE Study Area and Perimeter Area
Palo Alto, California

		Pre - 1995	1995-1999	2000-2004	2005-2009	2010	2011	2012	2013	2014	2010-2014	Totals
640 Page Mill Road [1]	VOC Mass (pounds) [2]	1,106	1,132	607	1,158	380	346	184	213	718	1,116	5,119
	Volume (gallons)	13,331,390	120,281,091	108,770,515	71,723,810	22,126,260	24,661,500	17,003,800	16,780,470	26,723,490	46,136,654	360,243,460
	Average Annual Flow Rate (gpd)	--	65,907	59,600	39,301	60,620	67,566	46,586	45,974	73,215	126,402	72,803
395 Page Mill Road	VOC Mass (pounds) [2]	--	337	130	0	0	0	0	0	0	0	467
	Volume (gallons)	--	36,839,200	29,219,900	0	0	0	0	0	0	0	66,059,100
	Average Annual Flow Rate (gpd)	--	25,232	17,624	0	0	0	0	0	0	0	21,428
601 California Avenue	VOC Mass (pounds) [2]	1,086	411	296	0	0	0	0	0	0	0	1,793
	Volume (gallons)	79,058,540	60,875,640	46,985,211	0	0	0	0	0	0	0	186,919,391
	Average Annual Flow Rate (gpd)	--	33,357	28,966	0	0	0	0	0	0	0	31,161
Perimeter Area [3]	VOC Mass (pounds) [4]	--	159	117	52	9	6	10	9	0	34	327
	Volume (gallons)	--	107,471,212	130,484,332	47,202,357	6,801,706	5,290,806	5,799,200	5,289,209	83	23,181,004	285,157,901
	Average Annual Flow Rate (gpd)	--	58,888	71,498	38,850	27,991	21,773	23,865	21,766	0	19,079	56,412
OEU Dewatering System	VOC Mass (pounds) [5]	1,247	2,100	477	508	95	101	81	85	53	415	4,746
	Volume (gallons)	235,423,590	620,191,862	751,333,418	812,613,120	172,606,305	176,194,537	157,326,572	154,541,748	140,615,782	801,284,944	3,220,846,934
	Average Annual Flow Rate (gpd)	--	339,831	411,690	668,817	710,314	725,080	647,434	635,974	578,666	3,297,469	1,179,452
Totals	VOC Mass (pounds)	3,439	4,138	1,627	1,717	484	453	276	308	771	2,290	10,921
	Volume (gallons)	327,813,520	945,659,005	1,066,793,376	931,539,287	201,534,271	206,146,843	180,129,572	176,611,427	167,339,355	870,602,602	3,271,805,188
	Average Annual Flow Rate (gpd)	--	523,216	589,378	746,968	798,924	814,419	717,885	703,714	651,881	3,442,950	619,854

Notes and Abbreviations:
1) Includes onsite and offsite wells (EW-1, EW-2, EW-4, EW-5, EW-6, EW-7, EW-8, EW-9, EW-10, TW-1 and TW-2)
2) VOC mass for the 395, 601, and 640 Page Mill Road Sites is calculated by taking the VOC concentration for the individual wells multiplied by the annual flow volume.
3) Includes wells EW-12, EW13-, EW-14, EW-15, and EW-16
4) VOC mass for the Perimeter Area is calculated by taking the period flow volume multiplied by the period sanitary sewer discharge VOC results for EW-15 and EW-16. EW-12, EW-13 and EW-14 VOC mass was calculated by concentration for the individual wells multiplied by the annual flow volume.
5) VOC mass for the OEU Dewatering System is calculated by taking the period total influent VOC concentration multiplied by the period storm drain and sanitary sewer flow volume.
gpd = gallons per day
lbs = pounds

TABLE 4
Mann-Kendall Trend Analysis Results
COE Study Area and Perimeter Area
Palo Alto, California

Area	Flow Zone	Well	COC	Period	Number of Samples	Mann-Kendall S Statistic	Confidence Factor (CF)	Coefficient of Variation (COV)	Trend [1]
640 Page Mill Road	A1	EW-4	TCE	2007-2013	4	6	95.8%	0.32	Increasing
			PCE	2007-2013	4	5	89.6%	0.39	No Trend
		EW-5	TCE	2007-2013	5	-4	75.8%	0.35	Stable
			PCE	2007-2013	5	-8	95.8%	0.37	Decreasing
		EW-7	TCE	2006-2014	9	-2	54.0%	0.52	Stable
			PCE	2007-2014	8	1	50.0%	0.45	No Trend
		O28A1	TCE	2007-2013	5	4	75.8%	0.79	No Trend
		O68A1	TCE	2006-2014	9	-10	82.1%	0.70	Stable
			PCE	2007-2014	8	4	64.0%	1.07	No Trend
		O104A1	TCE	2007-2013	4	-5	89.6%	0.78	Stable
		O108A1	TCE	2007-2013	4	-2	62.5%	0.47	Stable
		O110A1	TCE	2007-2014	5	-8	95.8%	0.61	Decreasing
		O112A1	TCE	2007-2014	5	2	59.2%	0.66	No Trend
		O115A1	TCE	2007-2013	4	-2	62.5%	0.34	Stable
		O119A1	TCE	2006-2014	9	-14	91.0%	0.88	Decreasing
			PCE	2006-2014	9	-16	94.0%	0.64	Decreasing
		P1-A1	TCE	2007-2014	8	-6	72.6%	0.25	Stable
		T1A	TCE	2006-2014	8	0	45.2%	0.83	Stable
	A2	O52A2	TCE	2006-2014	9	-27	99.8%	0.28	Decreasing
		O67A2	TCE	2006-2014	9	-28	99.9%	1.14	Decreasing
			PCE	2006-2014	9	-28	99.9%	0.86	Decreasing
		O109A2	TCE	2007-2013	4	3	72.9%	0.20	No Trend
		O111A2	TCE	2007-2014	5	-10	99.2%	0.40	Decreasing
		O113A2	TCE	2007-2013	5	0	40.8%	0.18	Stable
		O114A2	TCE	2006-2014	9	-30	100.0%	0.61	Decreasing
		O117A2	TCE	2006-2013	6	-3	64.0%	0.37	Stable
			PCE	2006-2013	6	-2	57.0%	0.78	Stable
		O120A2	TCE	2006-2014	9	-32	>99.9%	0.45	Decreasing
			PCE	2006-2014	9	-26	99.7%	0.66	Decreasing
		O121A2	TCE	2007-2014	5	6	88.3%	0.30	No Trend
		O122A2	TCE	2007-2013	4	-4	83.3%	0.20	Stable
			PCE	2007-2013	4	2	62.5%	0.08	No Trend
		O162A2	TCE	2011-2014	4	0	37.5%	0.11	Stable
			PCE	2011-2014	4	0	37.5%	0.18	Stable
		P1-A2	TCE	2007-2014	8	-5	68.3%	0.74	Stable
		P2-A2	TCE	2007-2014	8	-20	99.3%	1.42	Decreasing
		P3-A2	TCE	2007-2014	8	7	76.4%	0.24	No Trend
		P4-A2	TCE	2007-2014	8	-21	99.6%	0.67	Decreasing
		P5-A2	TCE	2007-2014	8	-27	>99.9%	0.39	Decreasing

TABLE 4
Mann-Kendall Trend Analysis Results
COE Study Area and Perimeter Area
Palo Alto, California

Area	Flow Zone	Well	COC	Period	Number of Samples	Mann-Kendall S Statistic	Confidence Factor (CF)	Coefficient of Variation (COV)	Trend [1]
395 Page Mill Road	A1U	OB11-2	TCE	2007-2014	8	-6	72.6%	1.71	No Trend
			PCE	2007-2014	8	-3	59.4%	2.75	No Trend
		RW-1	TCE	2007-2014	6	-7	86.4%	0.80	Stable
			PCE	2007-2014	6	-3	64.0%	1.64	No Trend
		RW-2	TCE	2007-2014	5	-8	95.8%	0.89	Decreasing
			PCE	2007-2014	5	-8	95.8%	0.76	Decreasing
		RW-4	TCE	2007-2013	4	-1	50.0%	0.08	Stable
			PCE	2007-2013	4	-3	72.9%	0.20	Stable
		RW-5	TCE	2007-2014	8	-8	80.1%	0.51	Stable
			PCE	2007-2014	8	-2	54.8%	1.67	No Trend
		RW-6	TCE	2007-2014	5	-10	99.2%	0.70	Decreasing
			PCE	2007-2014	5	-10	99.2%	0.86	Decreasing
		W3A1U	TCE	2006-2014	9	-26	99.7%	0.33	Decreasing
		W7A1U	TCE	2007-2014	5	-6	88.3%	0.15	Stable
			PCE	2007-2014	5	-4	75.8%	0.90	Stable
		W10A1U	TCE	2007-2013	4	-2	62.5%	0.22	Stable
			PCE	2007-2013	4	-1	50.0%	0.21	Stable
		W11A1U	TCE	2007-2013	4	1	50.0%	0.03	No Trend
		W12A1U - R	TCE	2007-2013	4	-4	83.3%	0.18	Stable
			PCE	2007-2013	4	-6	95.8%	0.40	Decreasing
		W158A1U	TCE	2011-2014	4	-4	83.3%	0.18	Stable
	A1	W16A1	TCE	2007-2014	5	-10	99.2%	0.79	Decreasing
			PCE	2007-2014	5	-8	95.8%	0.80	Decreasing
		EW-11R	TCE	2006-2014	9	-14	91.0%	0.41	Decreasing
			PCE	2006-2014	9	-3	58.0%	0.44	Stable
	A2	W19A2	TCE	2006-2014	9	-33	>99.9%	0.60	Decreasing
601 California	A1/A2	V8-1	TCE	2006-2014	9	-12	87.0%	1.51	No Trend
		V8-2	TCE	2006-2014	6	10	95.2%	1.39	Increasing
		V8-2X	TCE	2007-2013	4	0	37.5%	1.62	No Trend
		V8-3	TCE	2007-2014	5	-6	88.3%	0.34	Stable
		V8-4	TCE	2007-2013	4	2	62.5%	0.87	No Trend
		V8-5	TCE	2006-2014	9	-7	72.8%	0.20	Stable
		V8-7	TCE	2006-2014	9	-2	54.0%	0.89	Stable
		V8-8	TCE	2006-2014	9	-2	54.0%	0.29	Stable
		V8-8X	TCE	2007-2013	4	4	83.3%	0.72	No Trend
		V8-22	TCE	2007-2013	4	-2	62.5%	0.64	Stable
	B	V8-13B	TCE	2006-2014	7	15	98.5%	0.96	Increasing
Perimeter Area	A1U	EW-12	TCE	2006-2014	9	7	72.8%	0.53	No Trend
		EW-15	TCE	2007-2014	5	0	40.8%	0.46	Stable
			PCE	2007-2014	5	5	59.2%	0.88	No Trend
		F88A1U	TCE	2007-2014	5	4	75.8%	0.35	No Trend
			PCE	2007-2014	5	0	40.8%	0.60	Stable
		F141A1U	TCE	2006-2014	9	5	65.7%	0.35	No Trend
	A1	EW-13	TCE	2007-2014	7	6	76.4%	0.90	No Trend
		EW-16	TCE	2007-2014	5	0	40.8%	0.31	Stable
			PCE	2007-2014	5	2	59.2%	0.45	No Trend
		F135A1	TCE	2007-2013	4	-6	95.8%	0.16	Decreasing
		F140A1	TCE	2007-2013	4	-2	62.5%	0.17	Stable

TABLE 4
Mann-Kendall Trend Analysis Results
COE Study Area and Perimeter Area
Palo Alto, California

Area	Flow Zone	Well	COC	Period	Number of Samples	Mann-Kendall S Statistic	Confidence Factor (CF)	Coefficient of Variation (COV)	Trend [1]
COE Study Area	A1U	F77A1U	TCE	2007-2013	4	-6	95.8%	0.24	Decreasing
		F21A1U	TCE	2007-2014	8	-3	59.4%	0.28	Stable
		F22A1U	TCE	2007-2014	8	-19	98.9%	0.25	Decreasing
		F29A1U	TCE	2007-2014	8	2	54.8%	0.21	No Trend
		F59A1U	TCE	2006-2014	6	-11	97.2%	0.29	Decreasing
			PCE	2007-2014	5	-10	99.2%	0.35	Decreasing
		F61A1U	TCE	2007-2013	5	-4	75.8%	0.10	Stable
		F63A1U	TCE	2007-2013	4	-6	95.8%	0.37	Decreasing
		F75A1U	TCE	2007-2013	4	0	37.5%	0.12	Stable
		F130A1U	TCE	2007-2014	5	-4	75.8%	0.34	Stable
		F155A1U	TCE	2011-2014	4	-4	83.3%	0.15	Stable
			PCE	2011-2014	4	-1	50.0%	0.21	Stable
		F156A1U	TCE	2011-2014	4	-6	95.8%	0.26	Decreasing
		F159A1U	TCE	2011-2014	4	-4	83.3%	0.22	Stable
		F160A1U	TCE	2011-2014	4	1	50.0%	0.02	No Trend
			PCE	2011-2014	4	4	83.3%	0.30	No Trend
		F167A1U	TCE	2011-2014	4	0	37.5%	0.16	Stable
		SH-1	TCE	2007-2013	4	-1	50.0%	0.06	Stable
		VB-1	TCE	2007-2013	4	-4	83.3%	0.54	Stable
			PCE	2007-2013	4	-6	95.8%	0.79	Decreasing
	A1	EW-8	TCE	2007-2014	8	-16	96.9%	0.61	Decreasing
			PCE	2007-2014	8	-4	64.0%	0.48	Stable
		EW-10	TCE	2007-2014	7	-8	84.5%	0.82	Stable
		F41A1	TCE	2011-2014	4	6	95.8%	0.64	Increasing
		F42A1 - R	TCE	2007-2014	8	-21	99.6%	0.62	Decreasing
			PCE	2007-2014	8	3	59.4%	0.49	No Trend
		F62A1	TCE	2006-2014	9	-20	97.8%	0.35	Decreasing
		F64A1	TCE	2007-2013	4	-6	95.8%	0.13	Decreasing
			PCE	2007-2013	4	-4	83.8%	0.16	Stable
		F78A1	TCE	2007-2013	4	-6	95.8%	0.32	Decreasing
			PCE	2007-2013	4	-5	89.6%	0.49	Stable
		F106A1	TCE	2007-2013	4	5	89.6%	0.31	No Trend
			PCE	2007-2013	4	6	95.8%	0.24	Increasing
		F123A1	TCE	2007-2014	7	-19	99.9%	1.48	Decreasing
			PCE	2007-2014	7	-15	98.5%	0.94	Decreasing
		F125A1	TCE	2007-2013	5	-10	99.2%	0.36	Decreasing
			PCE	2007-2013	5	-10	99.2%	0.39	Decreasing
		F127A1 -R	TCE	2006-2014	9	-9	79.2%	0.63	Stable
		F129A1	TCE	2007-2014	7	-6	76.4%	0.31	Stable
		F131A1	TCE	2007-2013	5	-2	59.2%	0.24	Stable
		F137A1	TCE	2008-2014	7	-17	99.5%	0.96	Decreasing
			PCE	2008-2014	6	-5	76.5%	0.22	Stable
		F145A1	TCE	2007-2014	5	-2	59.2%	0.23	Stable
			PCE	2007-2014	5	-2	59.2%	0.23	Stable
		F161A1U	TCE	2011-2014	4	4	83.3%	0.26	No Trend
			PCE	2011-2014	4	-2	62.5%	0.44	Stable
		F165A1	TCE	2011-2014	4	-5	89.6%	1.72	No Trend
	A1/A2	F32A	TCE	2007-2013	4	-4	83.3%	1.03	No Trend
		F34A	TCE	2007-2014	7	-7	80.9%	0.09	Stable
		F36A	TCE	2007-2014	5	6	88.3%	0.56	No Trend
		F38A	TCE	2006-2014	9	-19	97.0%	1.86	Decreasing
		F40A	TCE	2006-2014	9	4	61.9%	1.26	No Trend
		F74A	TCE	2007-2014	8	20	99.3%	0.40	Increasing
		F95A	TCE	2007-2013	4	0	37.5%	0.34	Stable
		F97A	TCE	2007-2014	7	19	99.9%	0.93	Increasing
		F98A	TCE	2007-2014	7	4	66.7%	0.33	No Trend
		V-9	TCE	2007-2014	5	7	92.1%	0.69	Increasing
		V-9X	TCE	2007-2014	5	2	59.2%	0.59	No Trend
		V-10	TCE	2007-2013	4	-4	83.3%	0.41	Stable
		V-23	TCE	2007-2013	4	-6	95.8%	0.45	Decreasing
	A2	F107A2	TCE	2007-2013	4	2	62.5%	0.64	No Trend
		F124A2	TCE	2007-2014	6	15	99.9%	0.86	Increasing

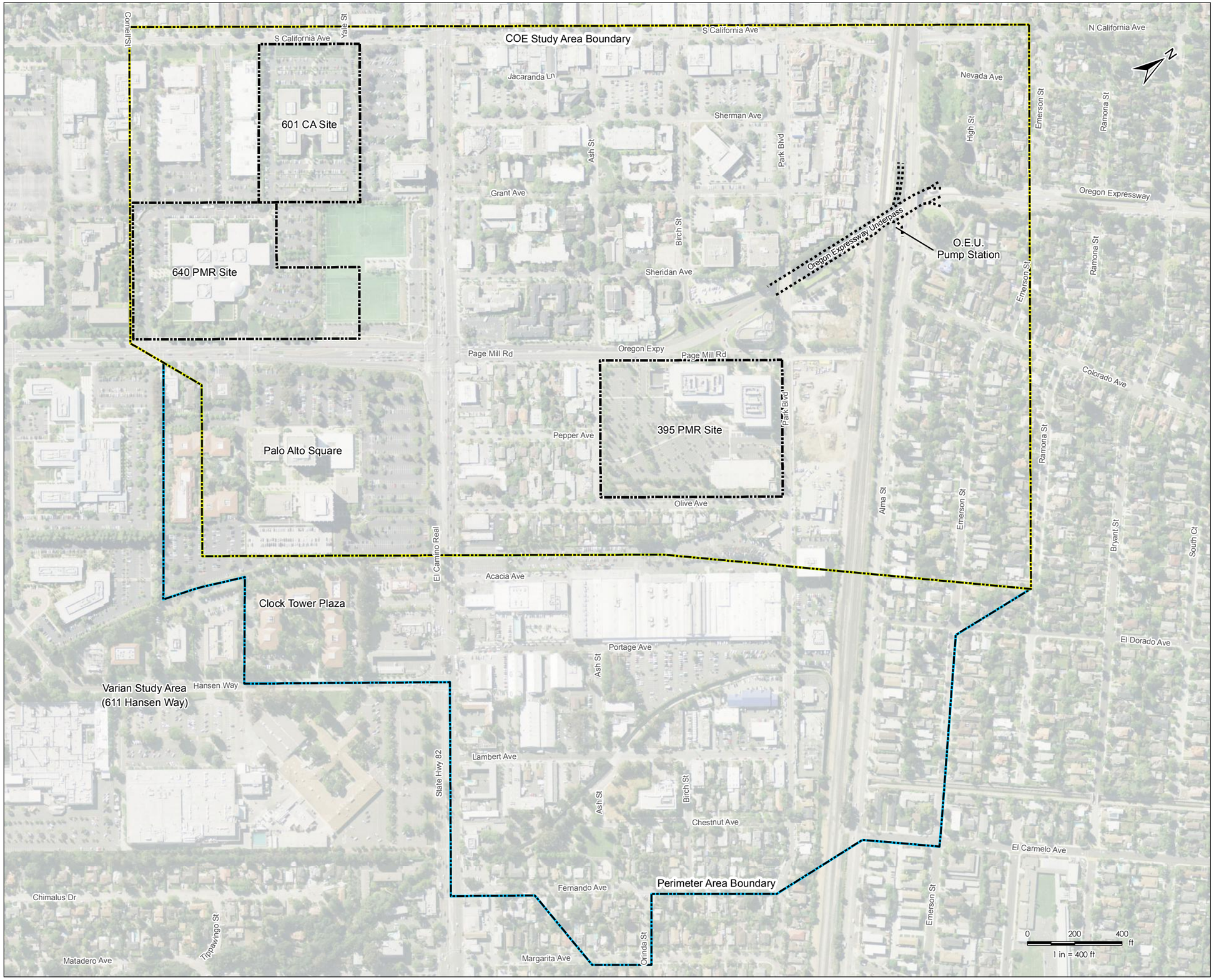
TABLE 4
Mann-Kendall Trend Analysis Results
COE Study Area and Perimeter Area
Palo Alto, California

Area	Flow Zone	Well	COC	Period	Number of Samples	Mann-Kendall S Statistic	Confidence Factor (CF)	Coefficient of Variation (COV)	Trend (1)

Notes and Abbreviations:
A1U = A1 Upper Zone
A1 = A1 Zone
A1/A2 = Combined A1/A2 Zone
A2 = A2 Zone
B = B Zone
TCE = Trichloroethene
PCE = Tetrachloroethene
COC = Chemical of Concern

(1) = Stable = S <0 and CF <90% and COV <1
No Trend = S >0 and CF <90% or S<0 and CF <90% and COV >1
Increasing = S >0 and CF >95%
Decreasing = S <0 and CF >95%

FIGURES



Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary

Notes

1. Coordinate System:
   NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Global, 2010.

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Client/Project

Hewlett-Packard Company and Varian Medical Systems, Inc.
COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

Figure No.

1

Title

Site Location Map

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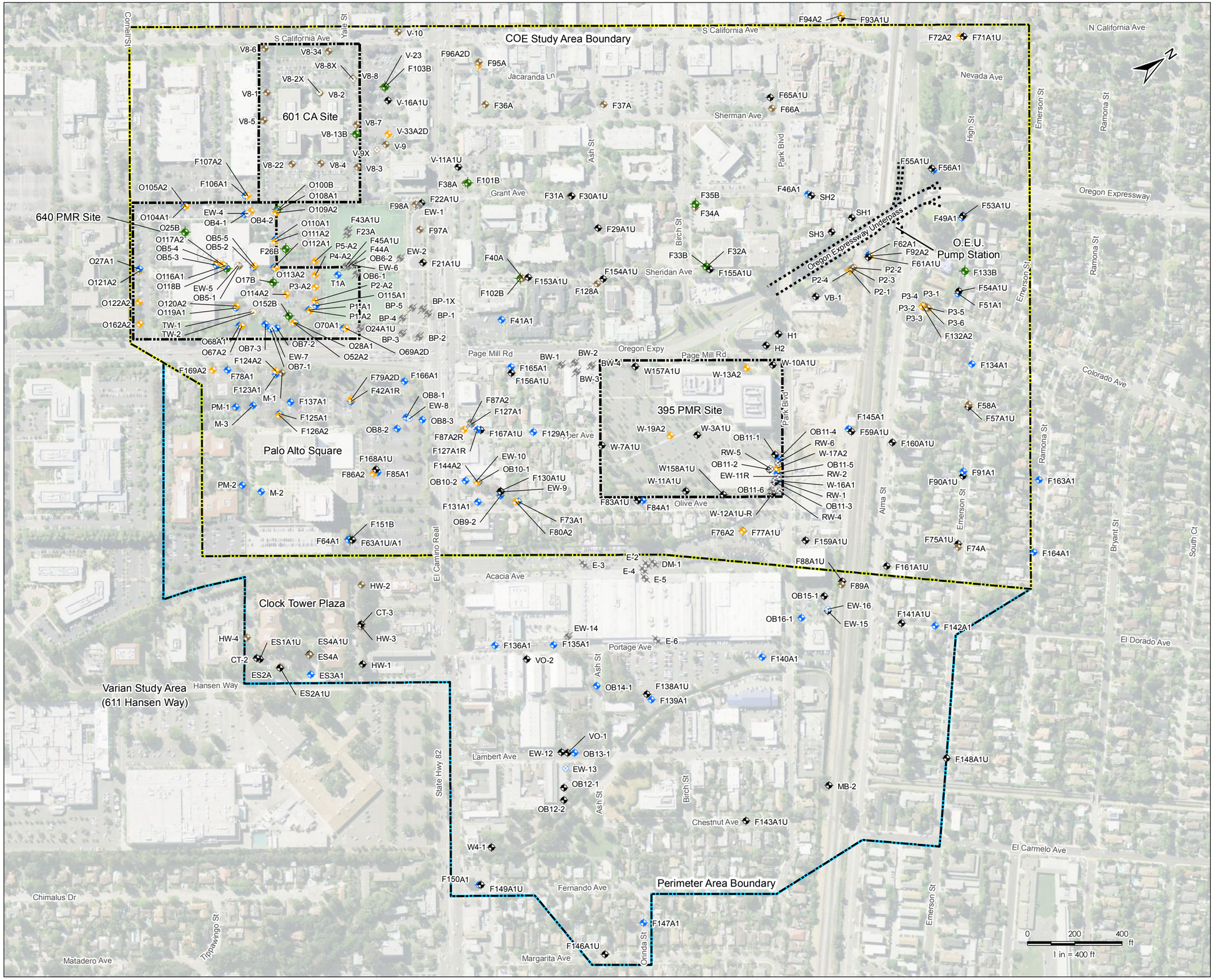
Revised: 2015-01-21 By: mkirkpatrick



Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1U Zone Monitoring Well
- A1U Zone Extraction Well
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- A2 Zone Monitoring Well
- A2 Zone Extraction Well
- B Zone Monitoring Well
- Decommissioned Monitoring or Extraction Well
- Destroyed Monitoring Well

Notes

1. Coordinate System:
   NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.

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Hewlett-Packard Company and Varian Medical Systems, Inc.
COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

Figure No.

2

Title

Well Location Map

\\cd1004-f01\Work_group\01221\active\122140012_data_base_mgmt\Databases\185702367\Drawing\MXD\COE\FiveYearReview2014\185702915_FiveYearReview2014_Fig02_WellLocMap.mxd
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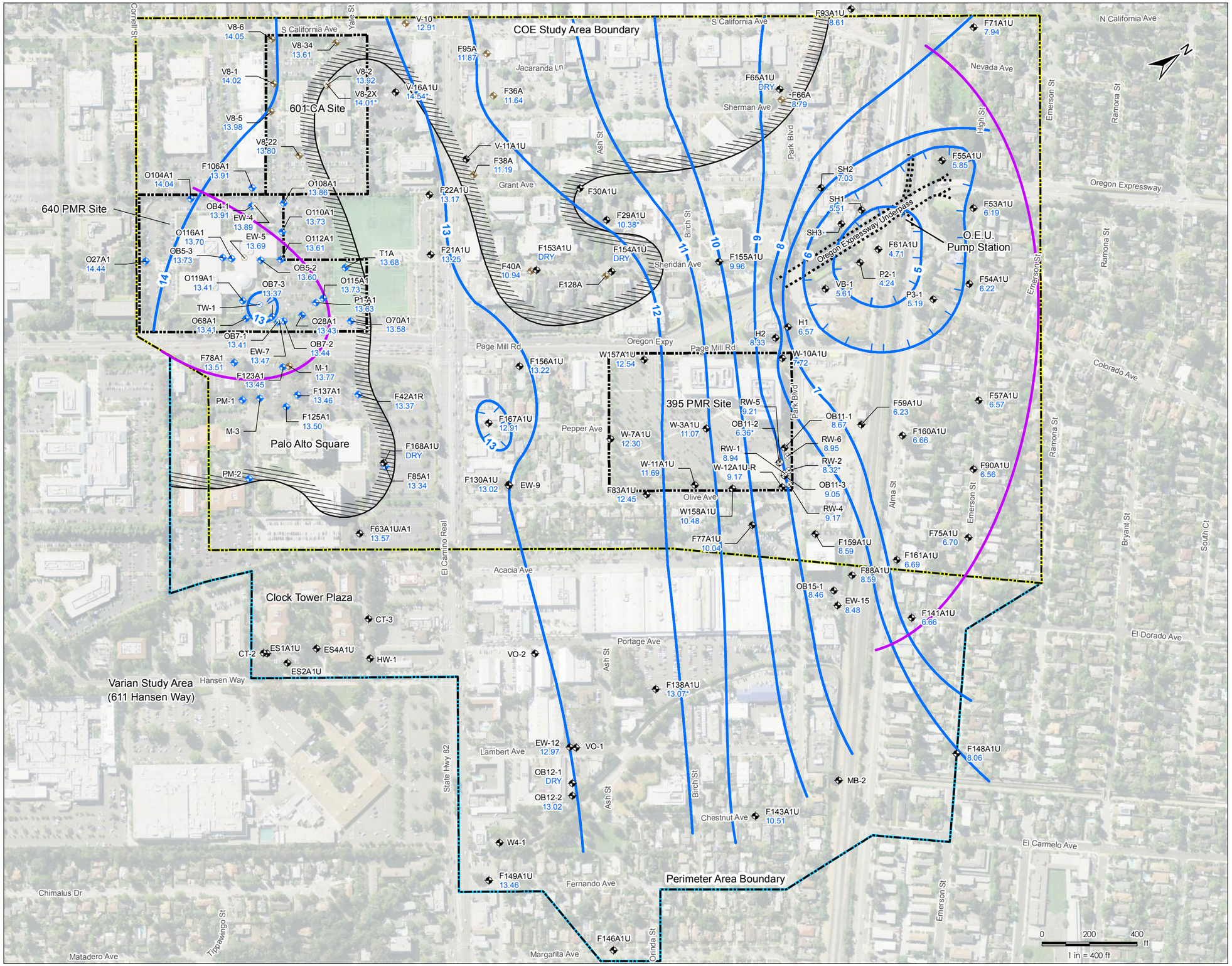

Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1U Zone Monitoring Well
- A1U Zone Extraction Well
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Approximate Extent of Unsaturated A1 Upper Zone
- Groundwater Elevation Contour (Feet MSL)
- Estimated Capture Area
- 13.22 Groundwater Elevation (Feet MSL)
- NM Not Measured
- DRY Well Dry When Monitored
- * Data Not Used in Contouring

Notes

1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screed in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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Hewlett-Packard Company and Varian Medical Systems, Inc.
COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

Figure No.

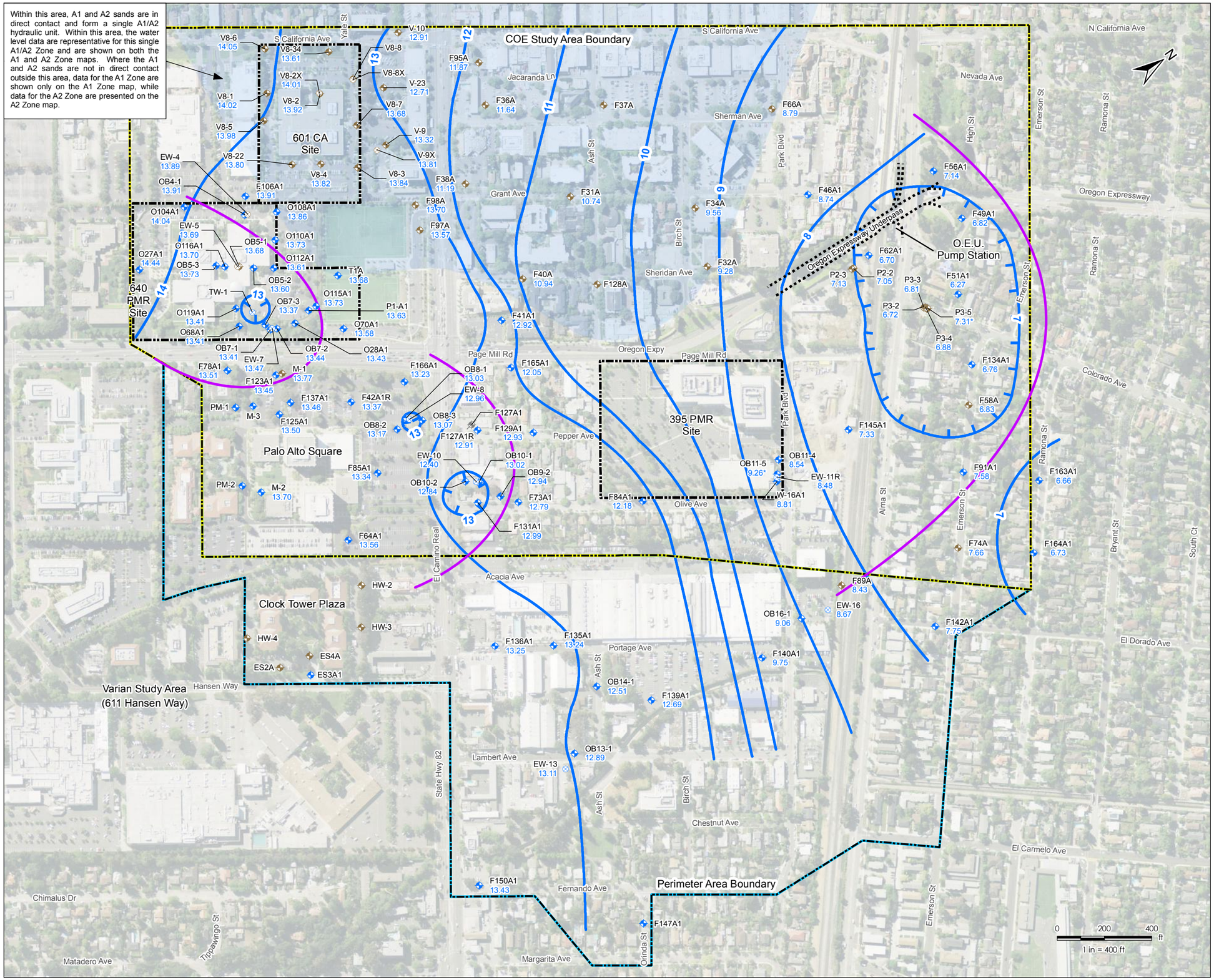
3

Title

Groundwater Elevation Contours First-Encountered Groundwater – June 10, 2014

\\cd1004-f01\Work_group\01221\active\122140012_data_base_mgmt\Databases\185702367\Drawing\MXD\COE\FiveYearReview2014\185702915_FiveYearReview2014_Fig03_GrdwElevs.mxd
Revised: 2015-01-21 By: mkirkpatrick

Within this area, A1 and A2 sands are in direct contact and form a single A1/A2 hydraulic unit. Within this area, the water level data are representative for this single A1/A2 Zone and are shown on both the A1 and A2 Zone maps. Where the A1 and A2 sands are not in direct contact outside this area, data for the A1 Zone are shown only on the A1 Zone map, while data for the A2 Zone are presented on the A2 Zone map.



Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Decommissioned Monitoring or Extraction Well
- 8 Groundwater Elevation Contour (Feet MSL)
- Estimated Capture Area
- Groundwater Depression
- 9.09 Groundwater Elevation (Feet MSL)
- NM Not Measured
- * Not Used in Contouring

Notes

1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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Hewlett-Packard Company and Varian Medical Systems, Inc.
COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

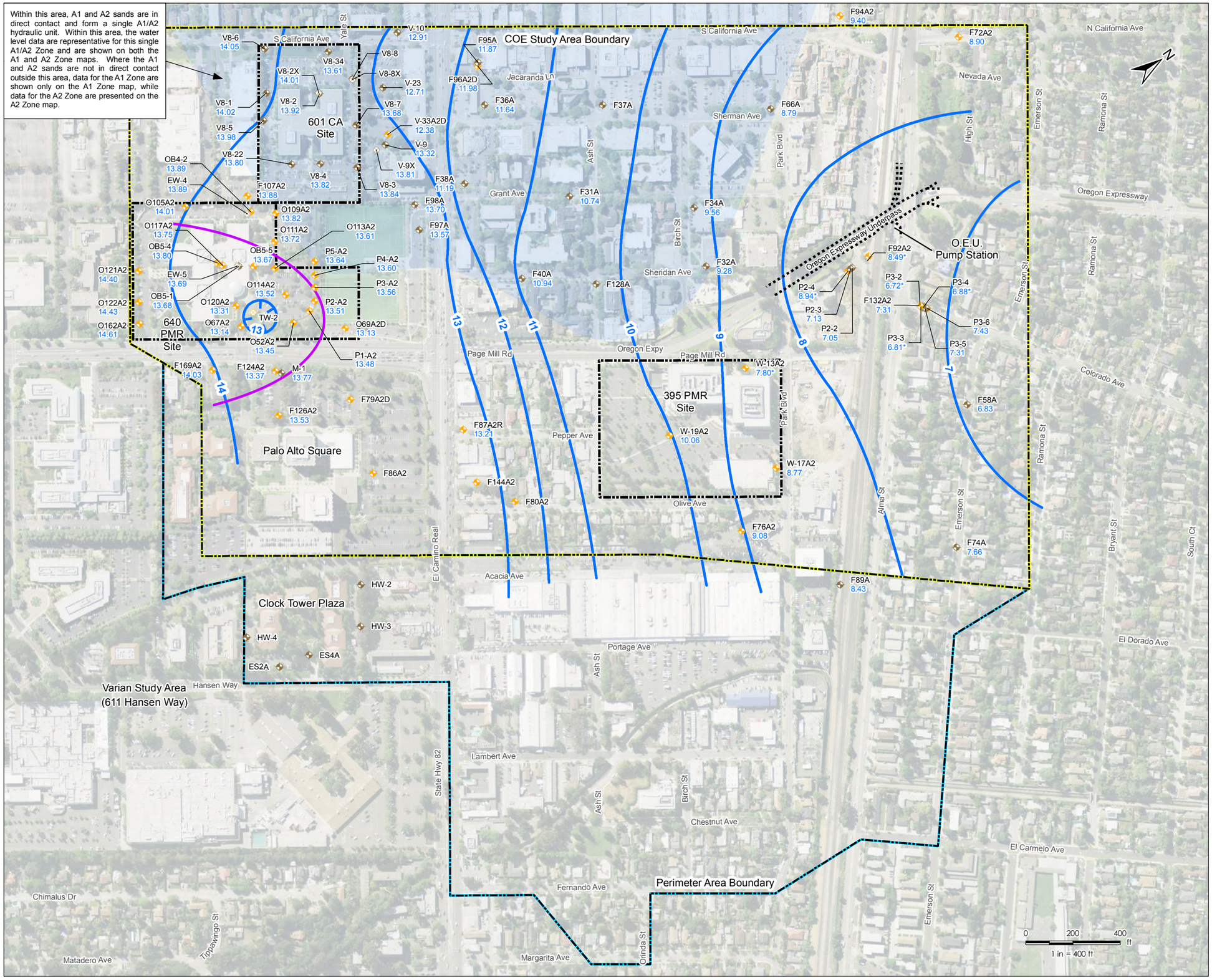
Figure No.

4

Title

Groundwater Elevation Contours A1 Zone - June 10, 2014

\\cd1004-01\Work_group\01221\active\122140012_data_base_mgmt\Databases\185702367\Drawing\MXD\COE\FiveYearReview2014\185702915_FiveYearReview2014_Fig04_GWElev_A1Zone.mxd
Revised: 2015-01-21 By: mkirkpatrick



Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A Zone Monitoring Well
- A Zone Extraction Well
- A2 Zone Monitoring Well
- A2 Zone Extraction Well
- 8 Groundwater Elevation Contour (Feet MSL)
- Estimated Capture Area
- Groundwater Depression
- 9.09 Groundwater Elevation (Feet MSL)
- NM Not Measured
- * Not Used in Contouring

Notes

1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

Figure No.

5

Title

Groundwater Elevation Contours A2 Zone - June 10, 2014

\\ccd1004-f01\Work_group\01221\active\122140012_data_base_mgmt\Databases\185702367\Drawing\MXD\COE\FiveYearReview2014\185702915_FiveYearReview2014_Fig05_GWElev_A2Zone.mxd
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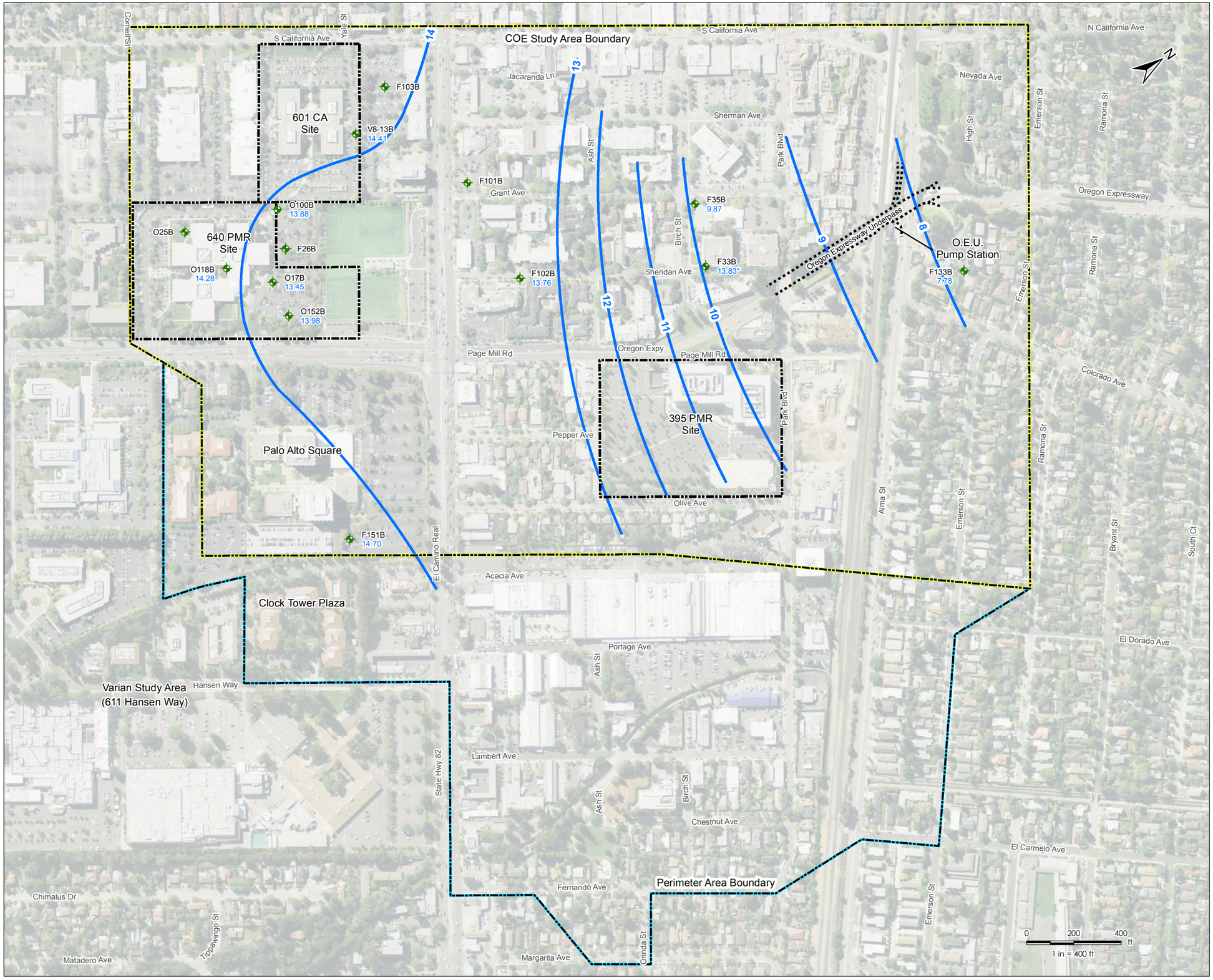

Stantec

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- B Zone Monitoring Well
- 8 Groundwater Elevation Contour (Feet MSL)
- 9.09 Groundwater Elevation (Feet MSL)
- NM Not Measured
- * Not Used in Contouring

Notes

1. Coordinate System:
   NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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COE Study Area and Perimeter Area
Palo Alto, Santa Clara County, California

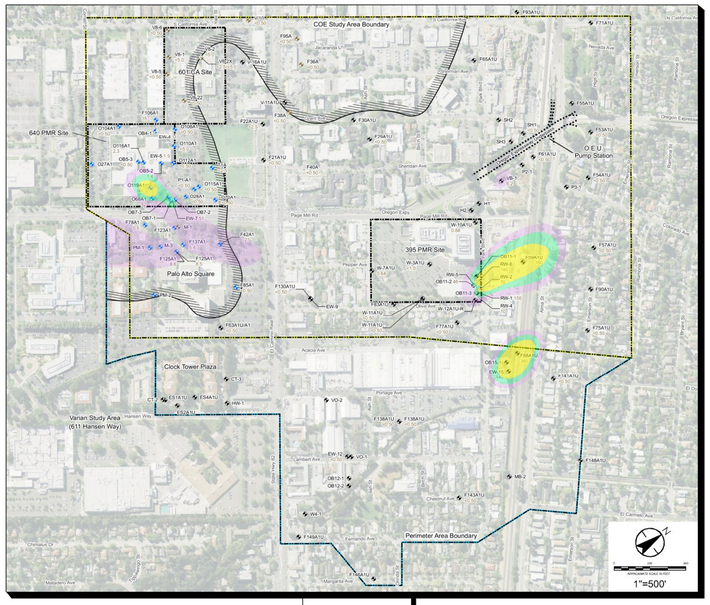
Figure No.

6

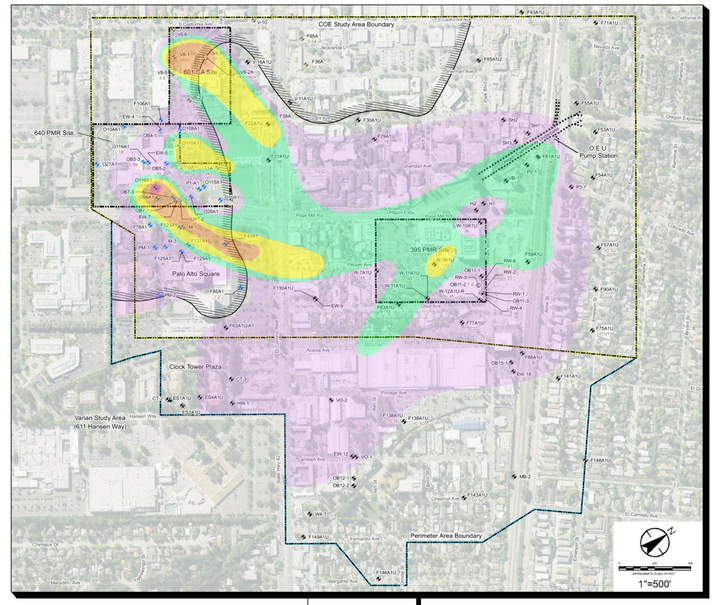
Title

Groundwater Elevation Contours B Zone - June 10, 2014

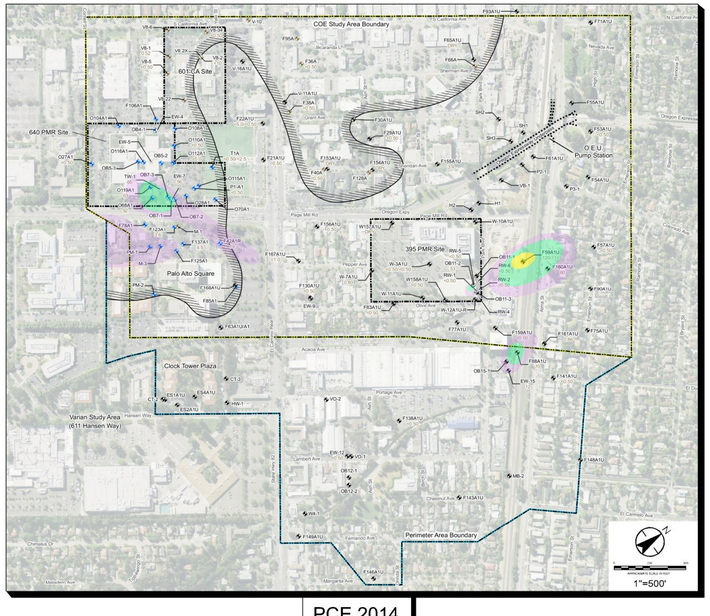
\\ca1004-f01\Work_group\01221\active\122140012_data_base_mgmt\Databases\185702367\Drawing\MXD\COE\FiveYearReview2014\185702915_FiveYearReview2014_Fig06_GWElev_BZone.mxd
Revised: 2015-01-21 By: mkirkpatrick



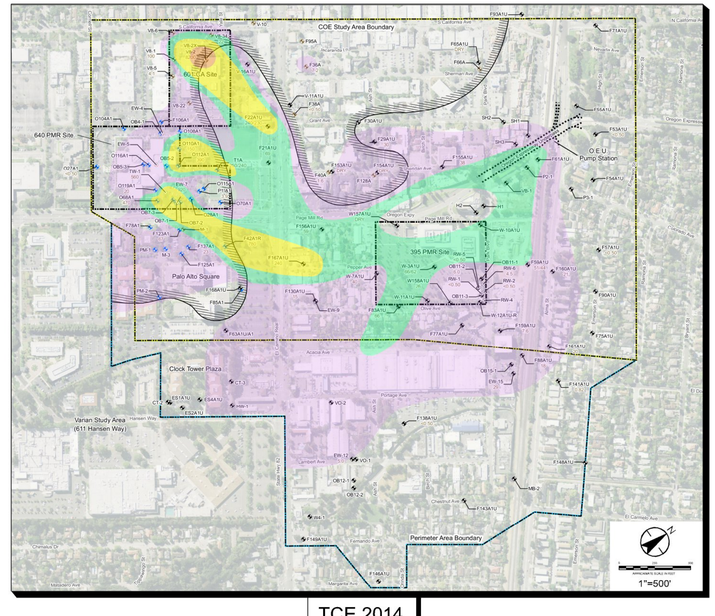
PCE 2009



TCE 2009



PCE 2014



TCE 2014

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1U Zone Monitoring Well
- A1U Zone Extraction Well
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Approximate Extent of Unsaturated A1 Upper Zone
- 25 PCE /TCE Concentration (µg/L)
- DRY Well Dry or Insufficient Water to Sample

EXPLANATION OF TCE OR PCE ISOCONCENTRATION VALUES

- <5 µg/L (BLANK/NO COLOR)
- 5 - 49 µg/L
- 50 - 99 µg/L
- 100 - 999 µg/L
- 1,000 - 9,999 µg/L
- ≥10,000 µg/L

Notes

1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screed in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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AND VARIAN MEDICAL SYSTEMS, INC.
COE STUDY AREA AND PERIMETER AREA
PALO ALTO, SANTA CLARA COUNTY, CA

TIME-SERIES ISOCONCENTRATION MAPS FOR FIRST-ENCOUNTERED GROUNDWATER

FIGURE: **7**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14

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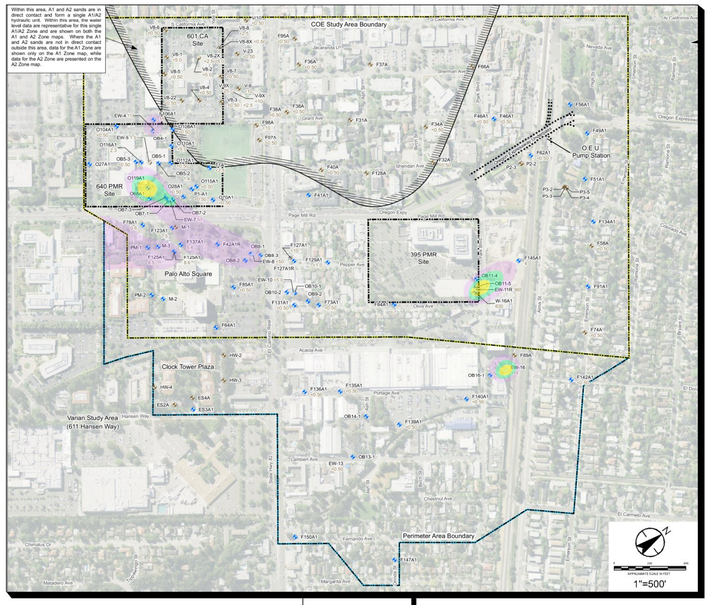
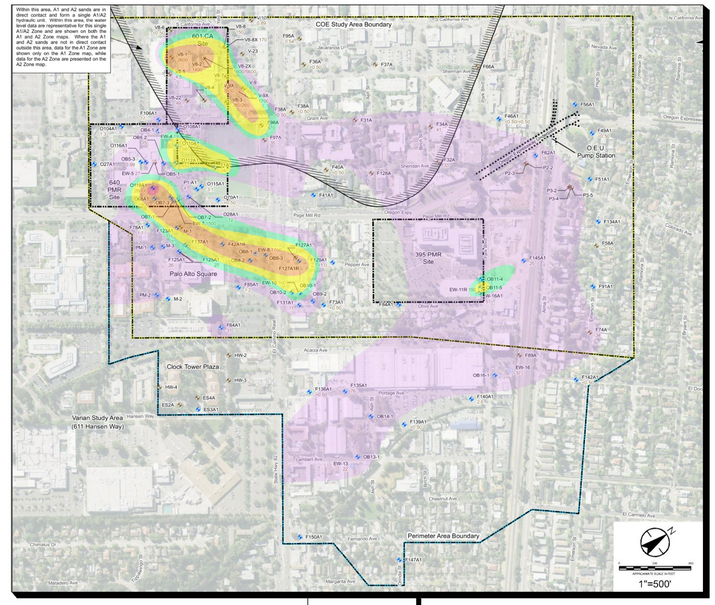
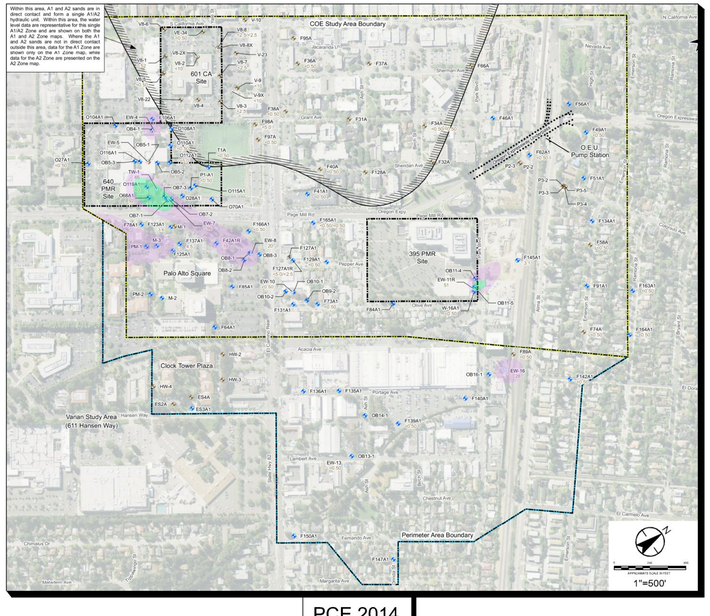


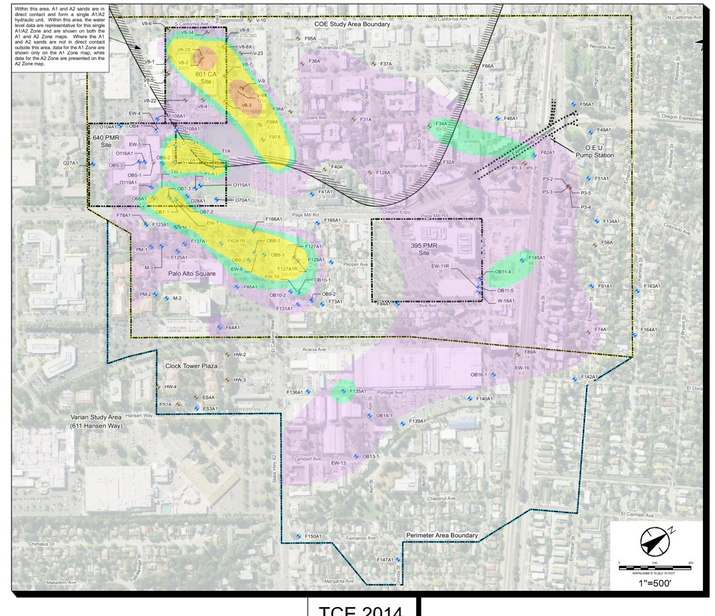
PCE 2009



TCE 2009



PCE 2014



TCE 2014

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Decommissioned Monitoring or Extraction Well
- 9.09 PCE /TCE Concentration (µg/L)
- <0.50 Not Detected Above Specified Reporting Limit

EXPLANATION OF TCE OR PCE ISOCONCENTRATION VALUES

- <5 µg/L (BLANK/NO COLOR)
- 5 - 49 µg/L
- 50 - 99 µg/L
- 100 - 999 µg/L
- 1,000 - 9,999 µg/L
- ≥10,000 µg/L

Notes

1. Coordinate System:
   NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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COE STUDY AREA AND PERIMETER AREA
PALO ALTO, SANTA CLARA COUNTY, CA

TIME-SERIES ISOCONCENTRATION MAPS FOR A1 ZONE

FIGURE: **8**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14

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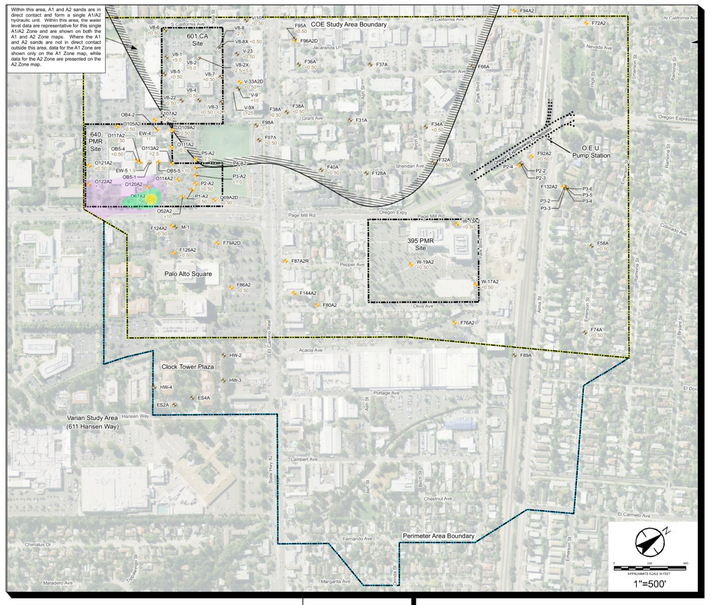
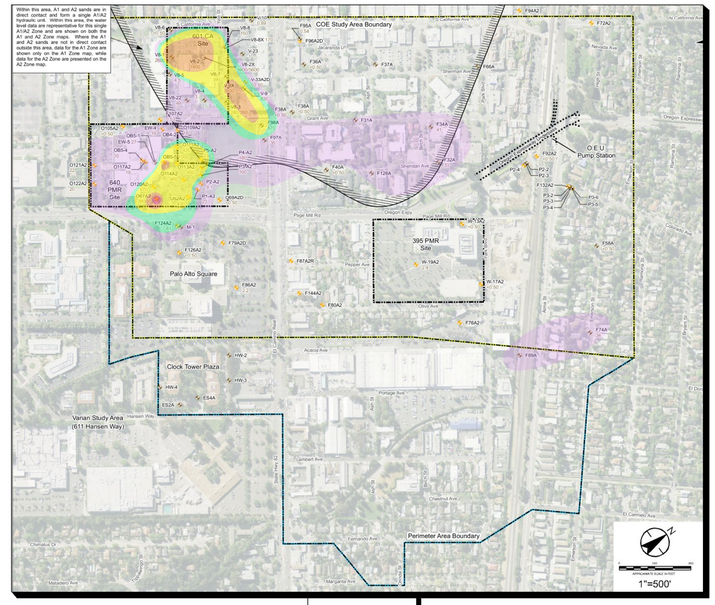
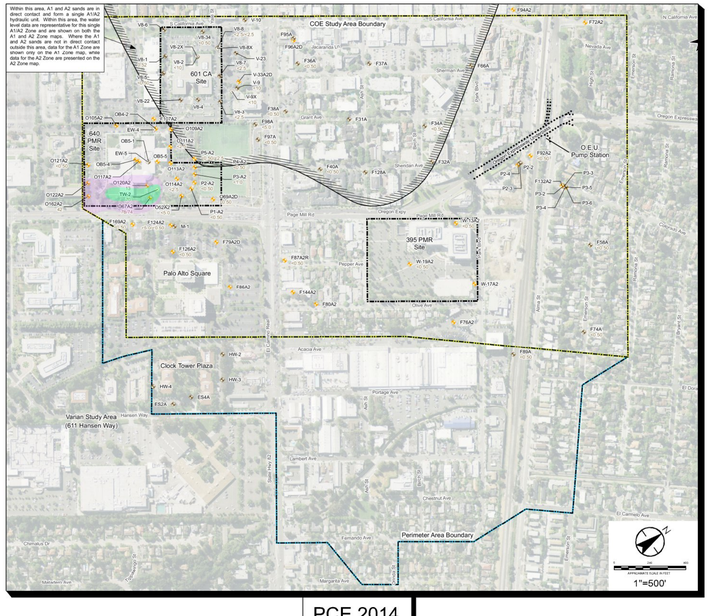


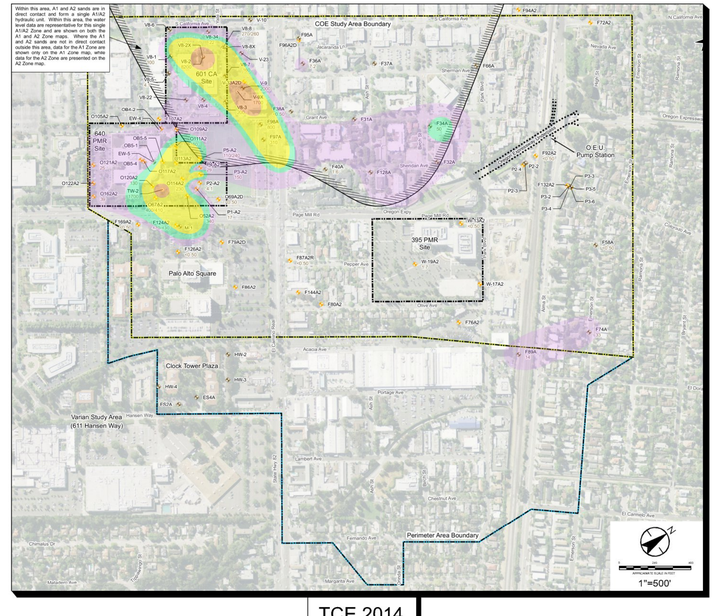
PCE 2009



TCE 2009



PCE 2014



TCE 2014

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A Zone Monitoring Well
- A Zone Extraction Well
- A2 Zone Monitoring Well
- A2 Zone Extraction Well
- 9.09 PCE /TCE Concentration (µg/L)
- <0.50 Not Detected Above Specified Reporting Limit

EXPLANATION OF TCE OR PCE ISOCONCENTRATION VALUES

- <5 µg/L (BLANK/NO COLOR)
- 5 - 49 µg/L
- 50 - 99 µg/L
- 100 - 999 µg/L
- 1,000 - 9,999 µg/L
- ≥10,000 µg/L

Notes

1. Coordinate System:
   NAD 1983 StatePlane California III FIPS 0403 Feet.
2. Aerial imagery provided by Digital Globe, 2010.
3. "D" suffix indicates well screened in deep subunit.
4. "OB" prefixes indicates observation well for extraction pumping.
5. "P" prefix indicates observation well for Oregon Expressway Subdrain Pumping.
6. Wells without data were not scheduled to be sampled during this event.

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PALO ALTO, SANTA CLARA COUNTY, CA

TIME-SERIES ISOCONCENTRATION MAPS FOR A2 ZONE

FIGURE: **9**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14

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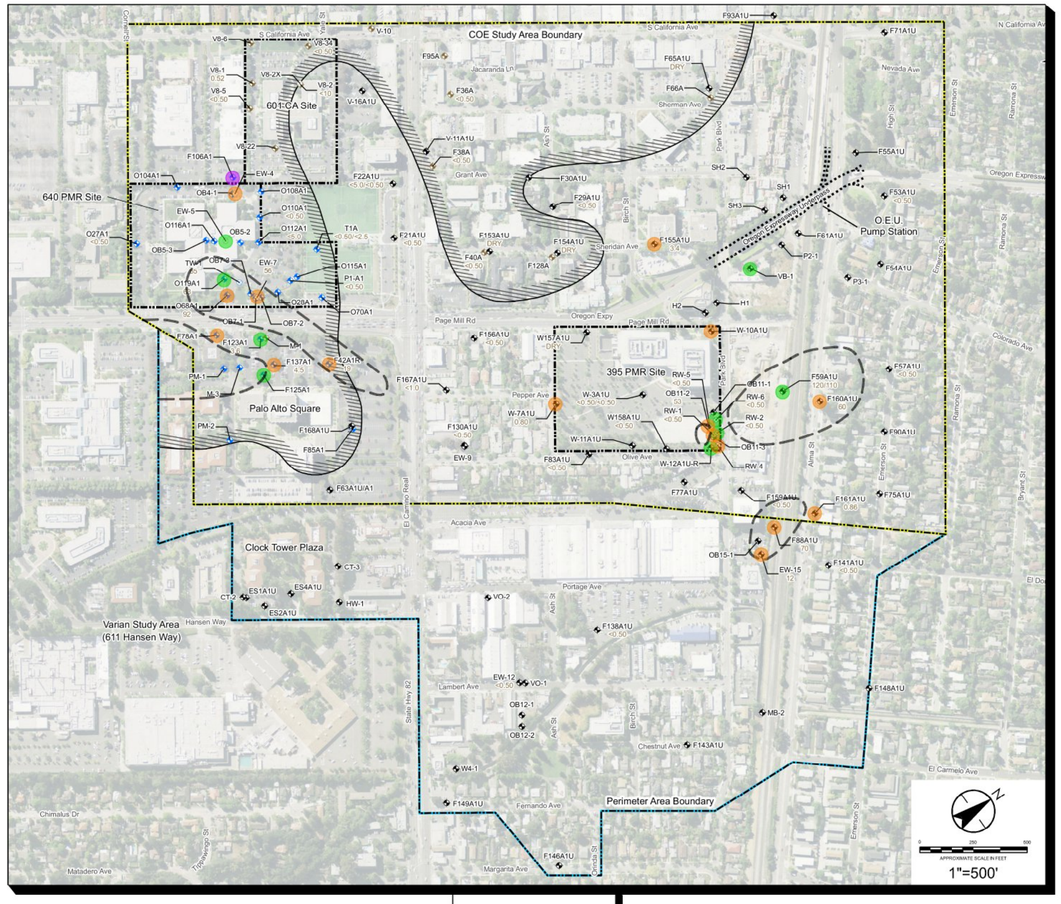
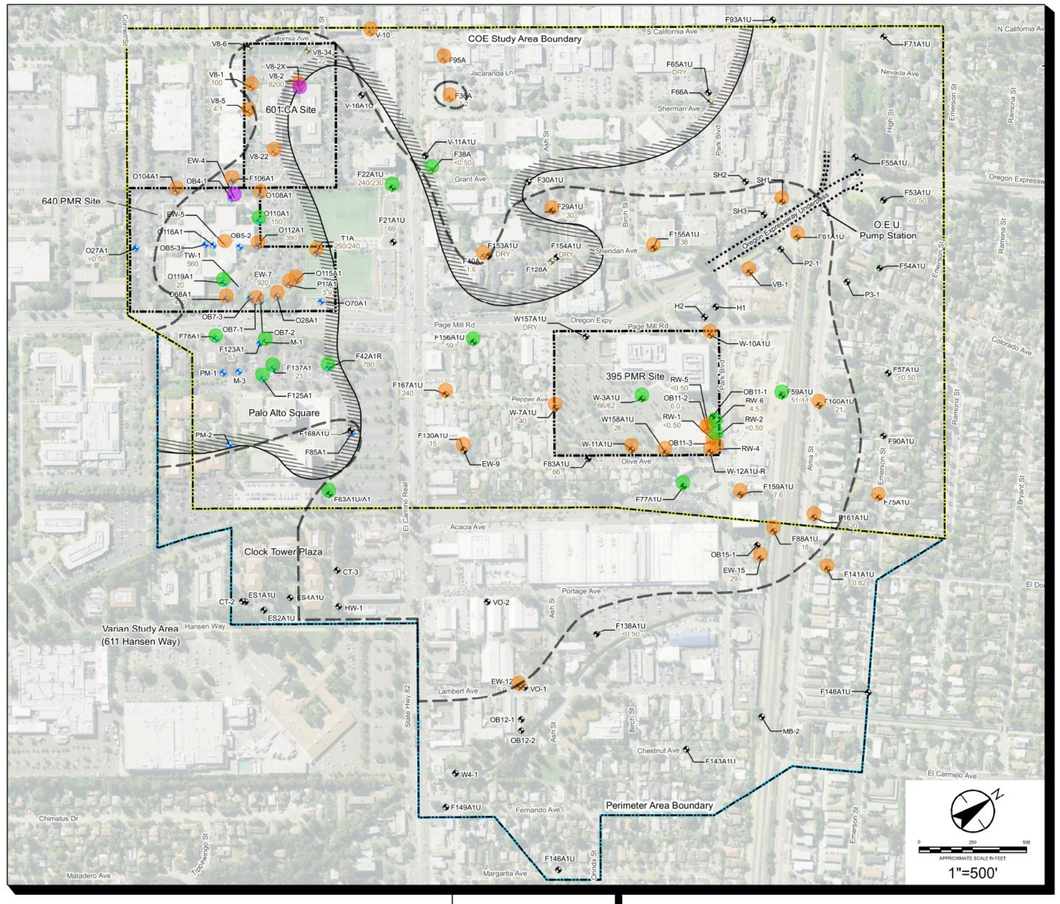


PCE



TCE

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1U Zone Monitoring Well
- A1U Zone Extraction Well
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Approximate Extent of Unsaturated A1 Upper Zone
- 25 PCE /TCE Concentration in 2014 (µg/L)
- DRY Well Dry or Insufficient Water to Sample
- Estimated Extent of TCE or PCE Plume (>5 µg/L)

EXPLANATION OF TCE OR PCE TREND VALUES

- DECREASING TREND
- STABLE OR NO TREND
- INCREASING TREND

Notes

1. Trends shown illustrate Mann-Kendall trend analysis results for the time period 2006-2014.
2. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
3. Aerial imagery provided by Digital Globe, 2010.
4. "D" suffix indicates well screened in deep subunit.
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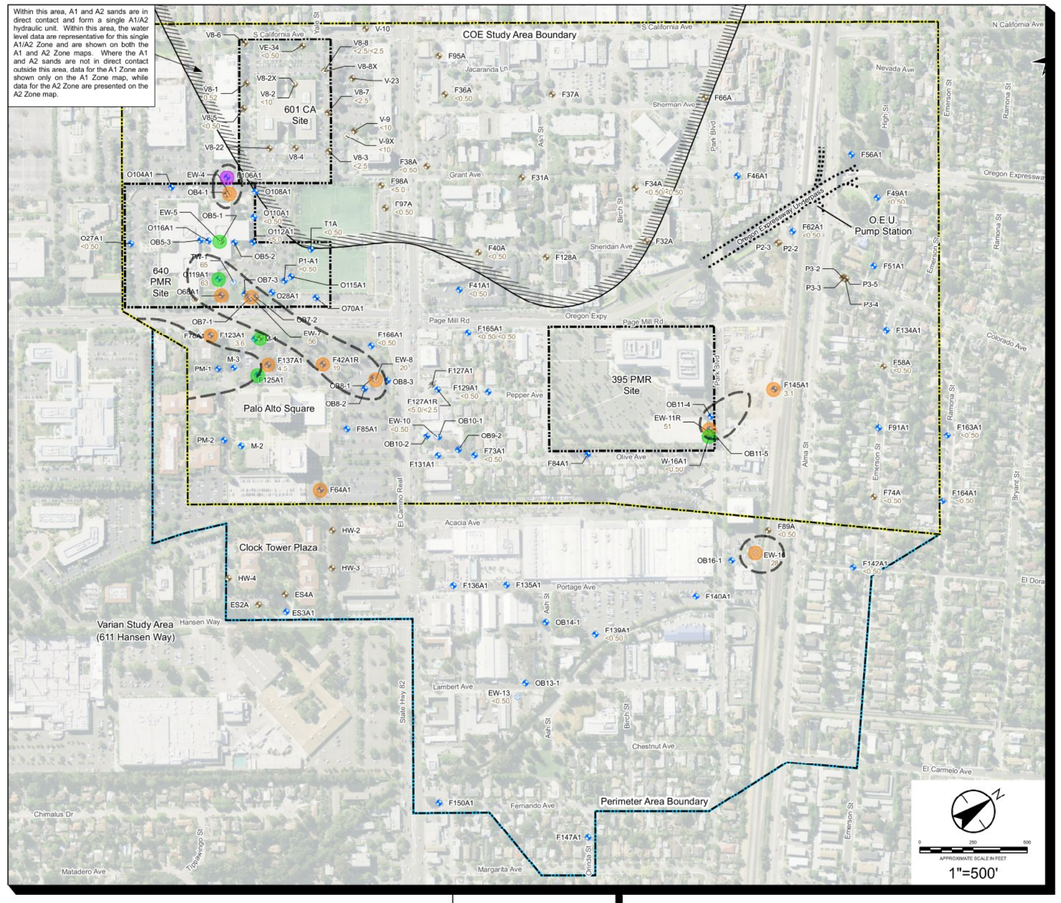
PALO ALTO, SANTA CLARA COUNTY, CA

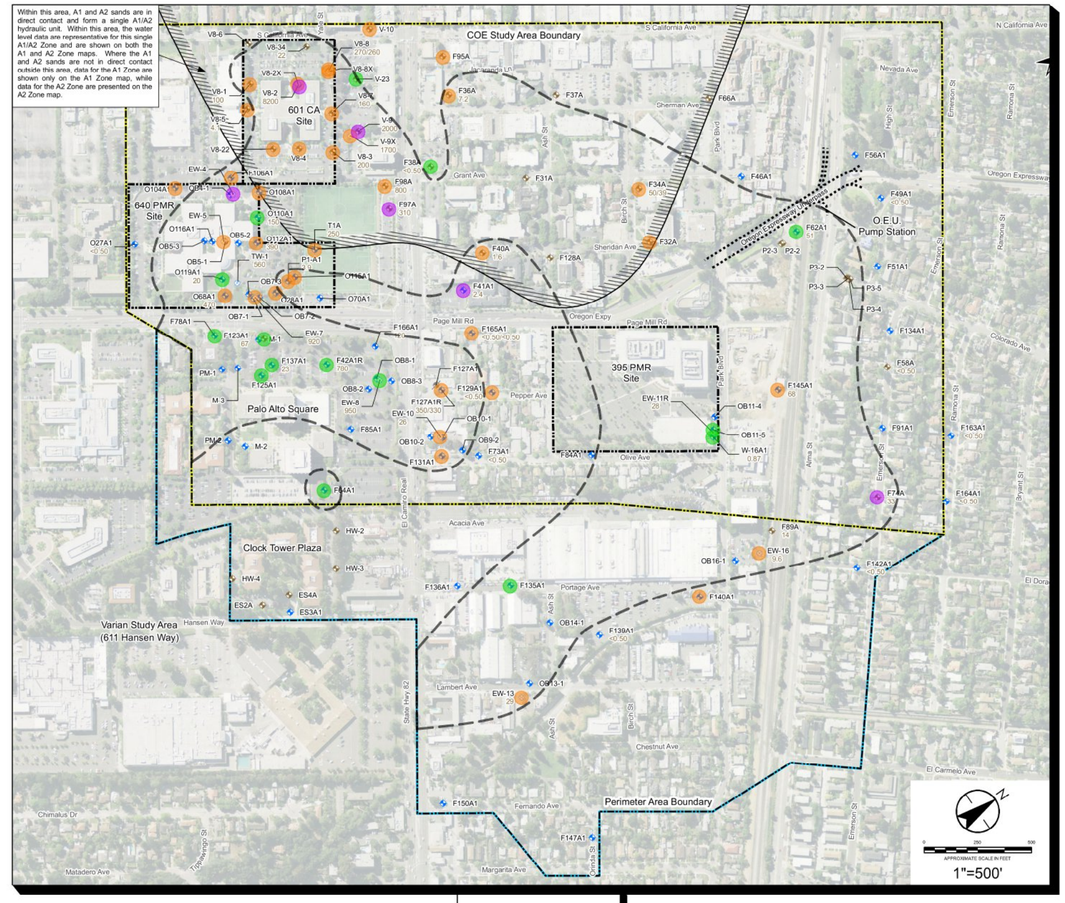
PCE AND TCE CONCENTRATION TRENDS IN FIRST-ENCOUNTERED GROUNDWATER

FIGURE: **10**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14



PCE



TCE

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A1 Zone Monitoring Well
- A1 Zone Extraction Well
- A Zone Monitoring Well
- A Zone Extraction Well
- Decommissioned Monitoring or Extraction Well
- 9.09 PCE /TCE Concentration in 2014 (µg/L)
- <0.50 Not Detected Above Specified Reporting Limit
- Estimated Extent of TCE or PCE Plume (>5 µg/L)

EXPLANATION OF TCE OR PCE TREND VALUES

- DECREASING TREND
- STABLE OR NO TREND
- INCREASING TREND

Notes

1. Trends shown illustrate Mann-Kendall trend analysis results for the time period 2006-2014.
2. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
3. Aerial imagery provided by Digital Globe, 2010.
4. "D" suffix indicates well screened in deep subunit.
5. "OB" prefixes indicates observation well for extraction pumping.
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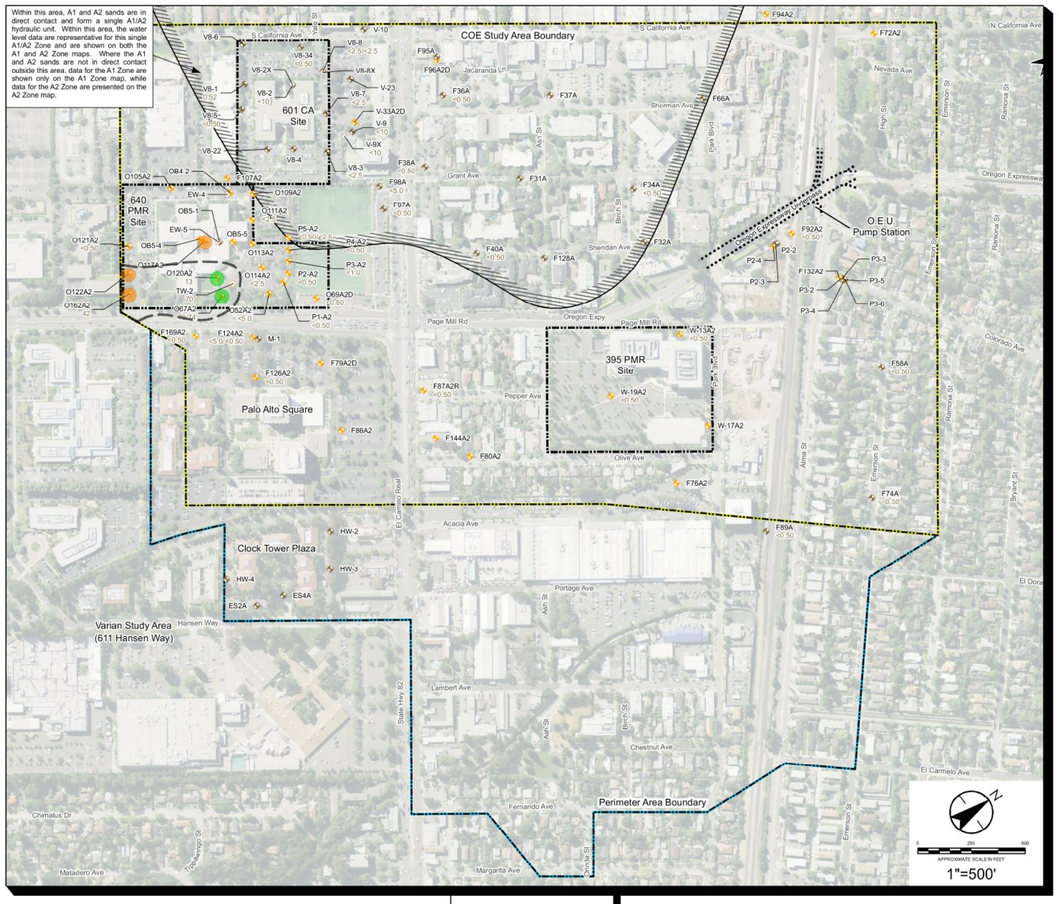
PALO ALTO, SANTA CLARA COUNTY, CA

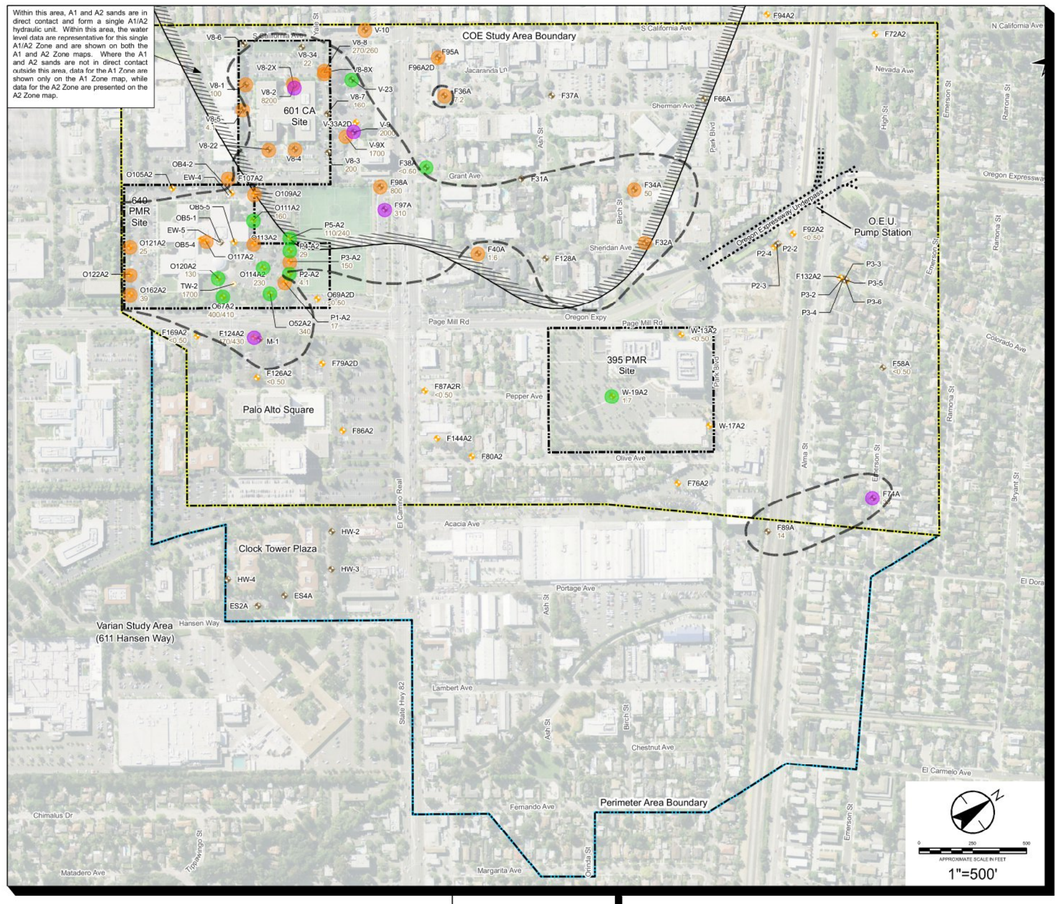
PCE AND TCE CONCENTRATION TRENDS IN A1 ZONE

FIGURE: **11**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14



PCE



TCE

Legend

- Site Boundary
- COE Study Area Boundary
- Perimeter Area Boundary
- A Zone Monitoring Well
- A Zone Extraction Well
- A2 Zone Monitoring Well
- A2 Zone Extraction Well
- 9.09 PCE /TCE Concentration in 2014 (µg/L)
- <0.50 Not Detected Above Specified Reporting Limit
- Estimated Extent of TCE or PCE Plume (>5 µg/L)

EXPLANATION OF TCE OR PCE TREND VALUES

- DECREASING TREND
- STABLE OR NO TREND
- INCREASING TREND

Notes

1. Trends shown illustrate Mann-Kendall trend analysis results for the time period 2006-2014.
2. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet.
3. Aerial imagery provided by Digital Globe, 2010.
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AND VARIAN MEDICAL SYSTEMS, INC.
COE STUDY AREA AND PERIMETER AREA
PALO ALTO, SANTA CLARA COUNTY, CA

PCE AND TCE CONCENTRATION TRENDS IN A2 ZONE

FIGURE: **12**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR	BES	BES	11/13/14

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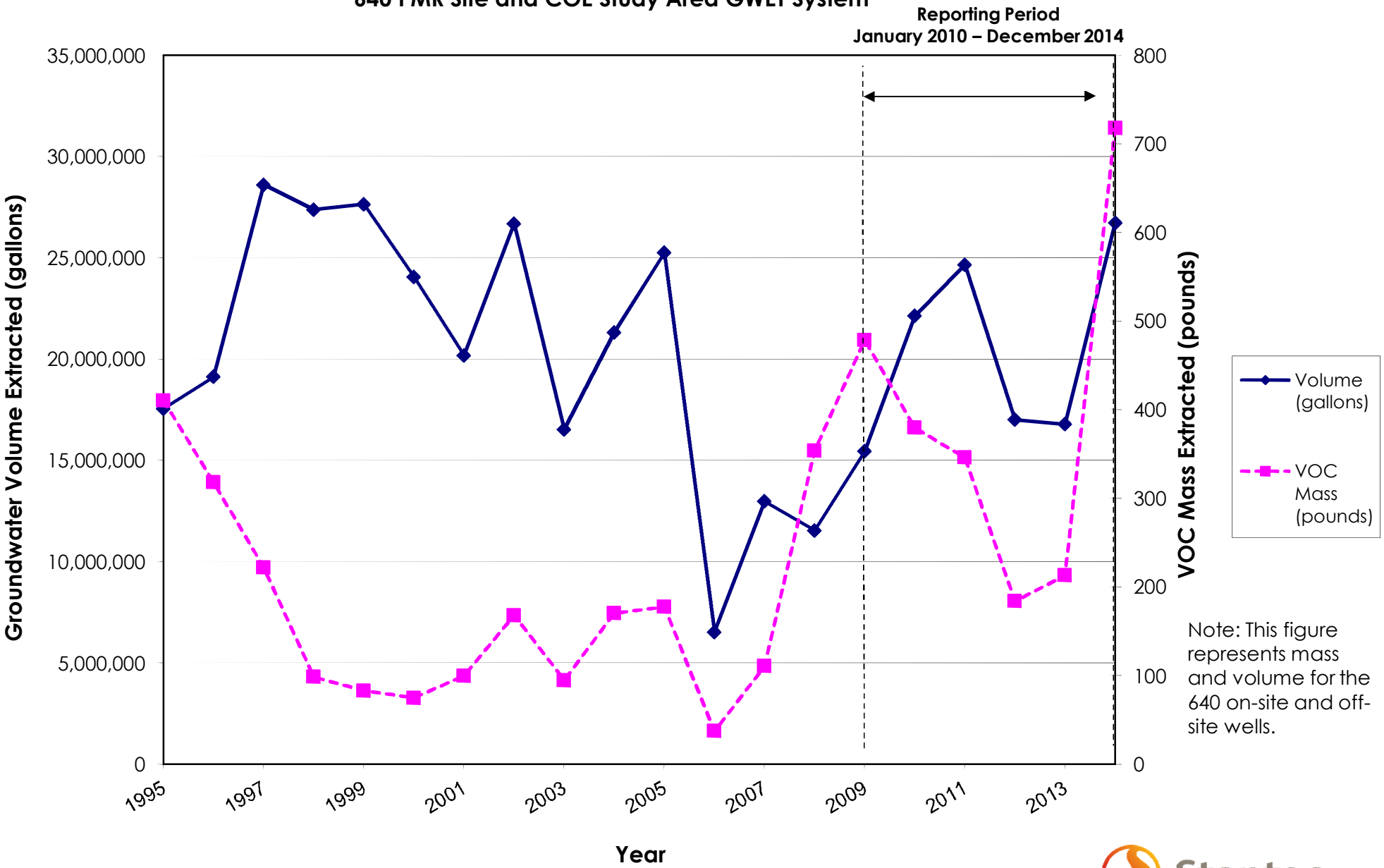
FIGURE 13
Groundwater Extraction Volume and VOC Mass Removal Trends
640 PMR Site and COE Study Area GWET System



Note: This figure represents mass and volume for the 640 on-site and off-site wells.

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FIGURE 14
Groundwater Extraction Volume and VOC Mass Removal Trends
OEU Dewatering System

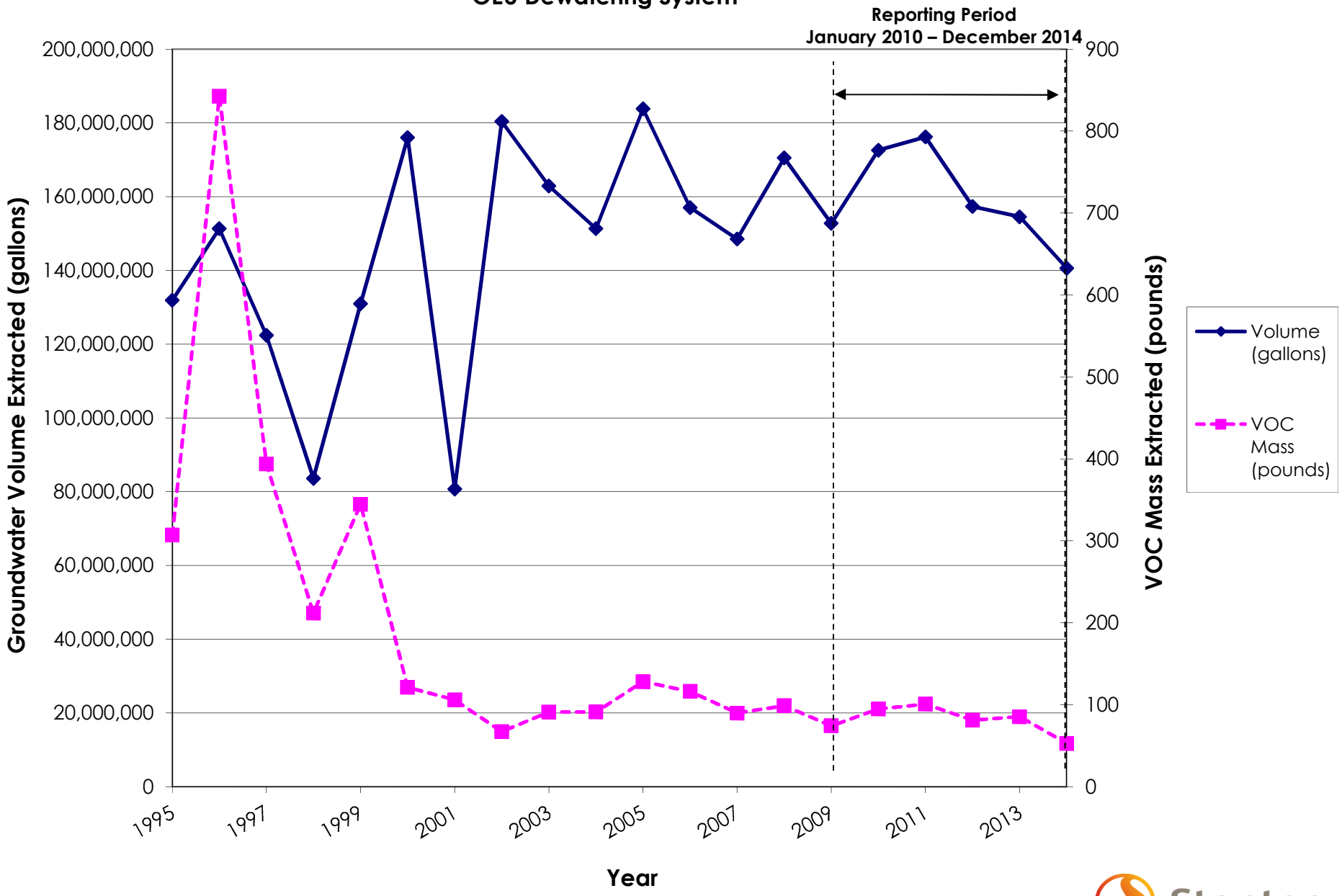

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FIGURE 15
Groundwater Extraction Volume and VOC Mass Removal Trends
Perimeter Area GWET System

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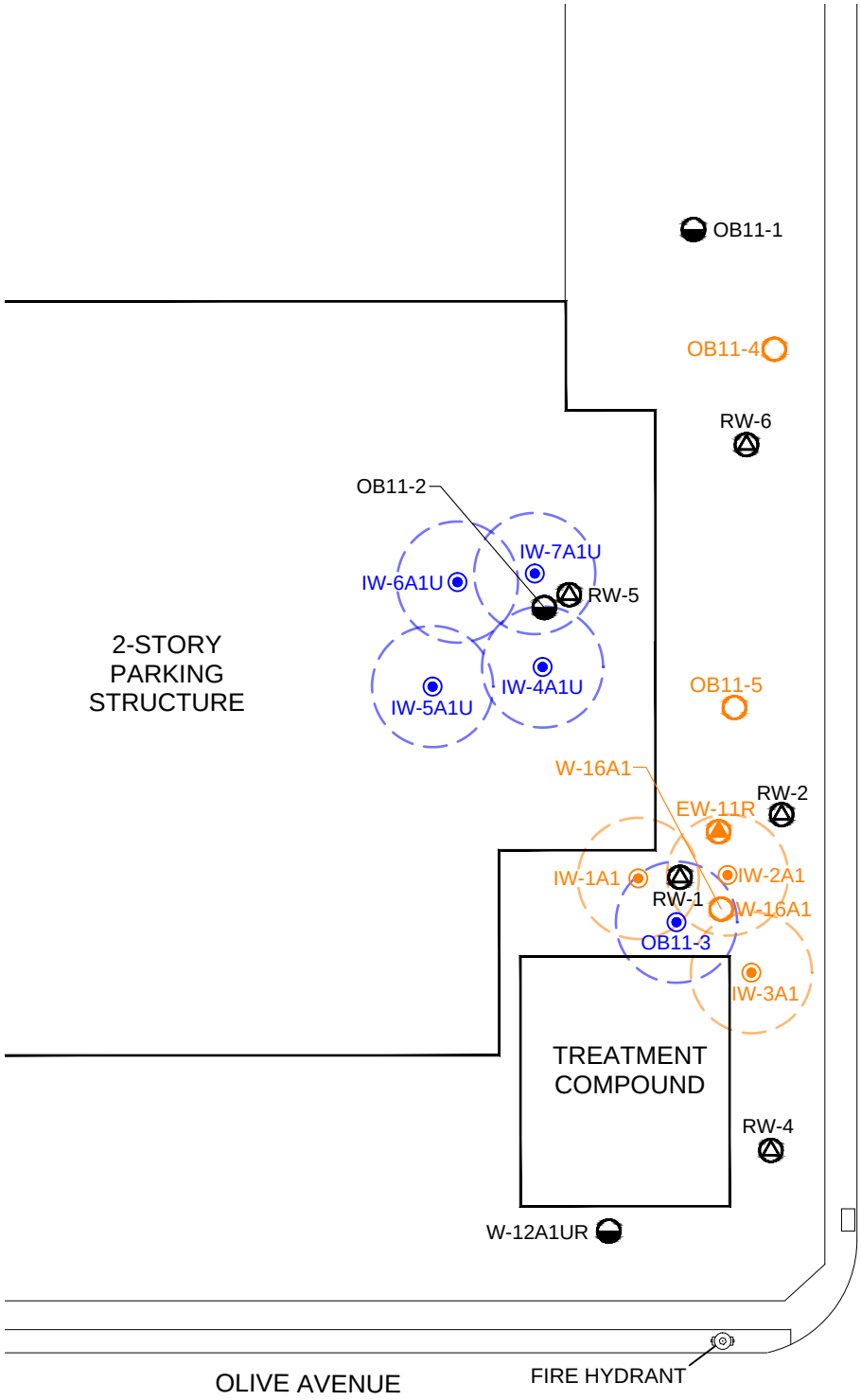

LEGEND:

RW-6 FORMER A1 UPPER ZONE EXTRACTION WELL

OB11-1 A1 UPPER ZONE MONITORING WELL

EW-11R FORMER GROUNDWATER EXTRACTION WELL IN A1 ZONE

OB11-4 A1 ZONE MONITORING WELL

A1 UPPER ZONE - EISB INJECTION WELL

A1 ZONE - EISB INJECTION WELL

NOTES:

A1 UPPER ZONE INJECTION INTERVAL 22-27 FEET bgs.

A1 ZONE INJECTION INTERVAL 35-40 FEET bgs.

ABBREVIATIONS:

bgs = BELOW GROUND SURFACE

0 30 60

APPROXIMATE SCALE IN FEET

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FOR:
HEWLETT-PACKARD COMPANY AND
VARIAN MEDICAL SYSTEMS, INC.
COE STUDY AREA
AND PERIMETER AREA
PALO ALTO, SANTA CLARA CO. CA

EISB TREATMENT AREAS
395 PMR SITE - AREA X

FIGURE: 16

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185702915.200.0001	RRR/STA	EH/BES	BES	01/08/15

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FIGURE 17

VOC Concentration Trends in A1U Zone EISB Treatment Area Wells
395 PMR Site

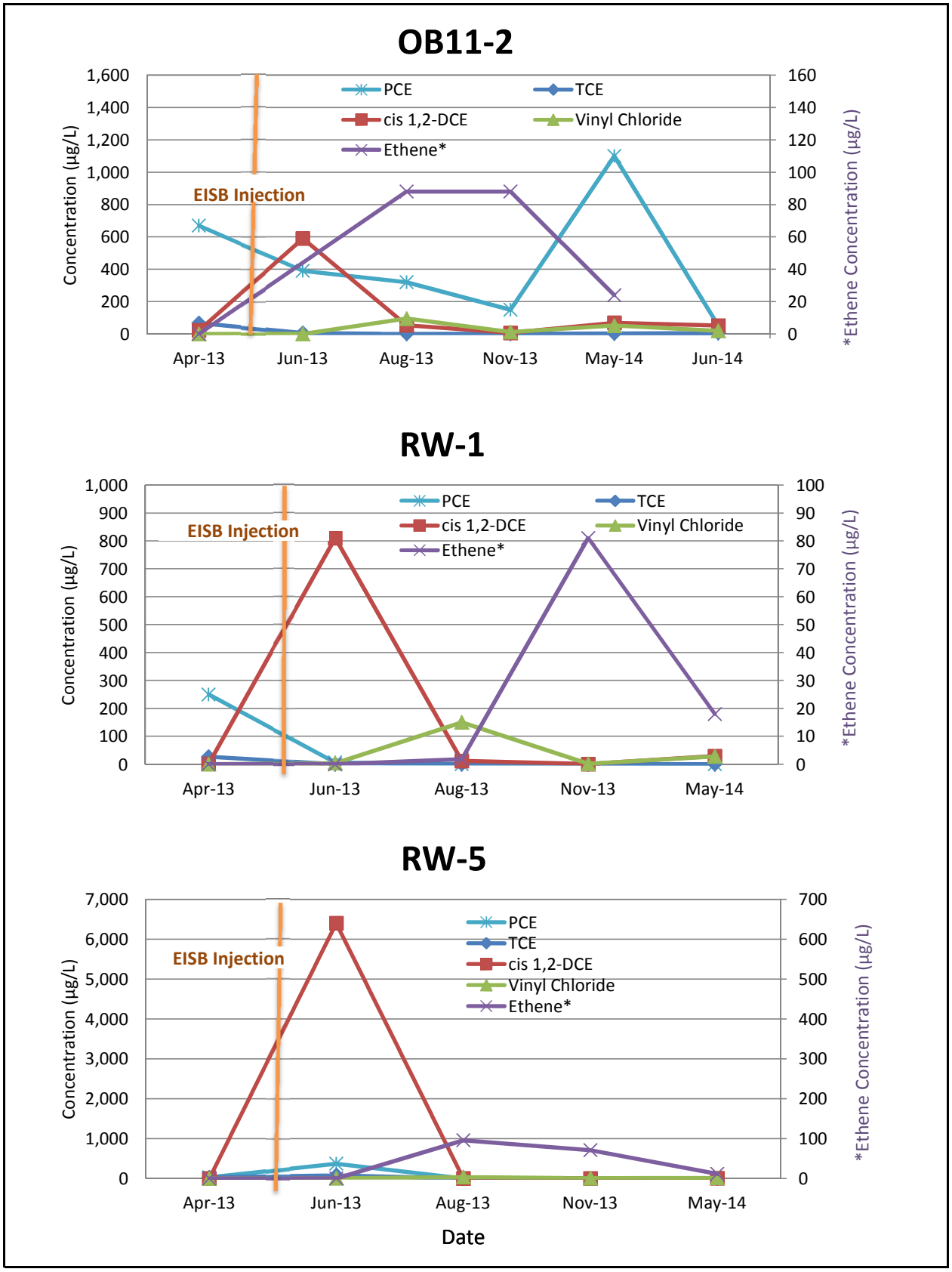
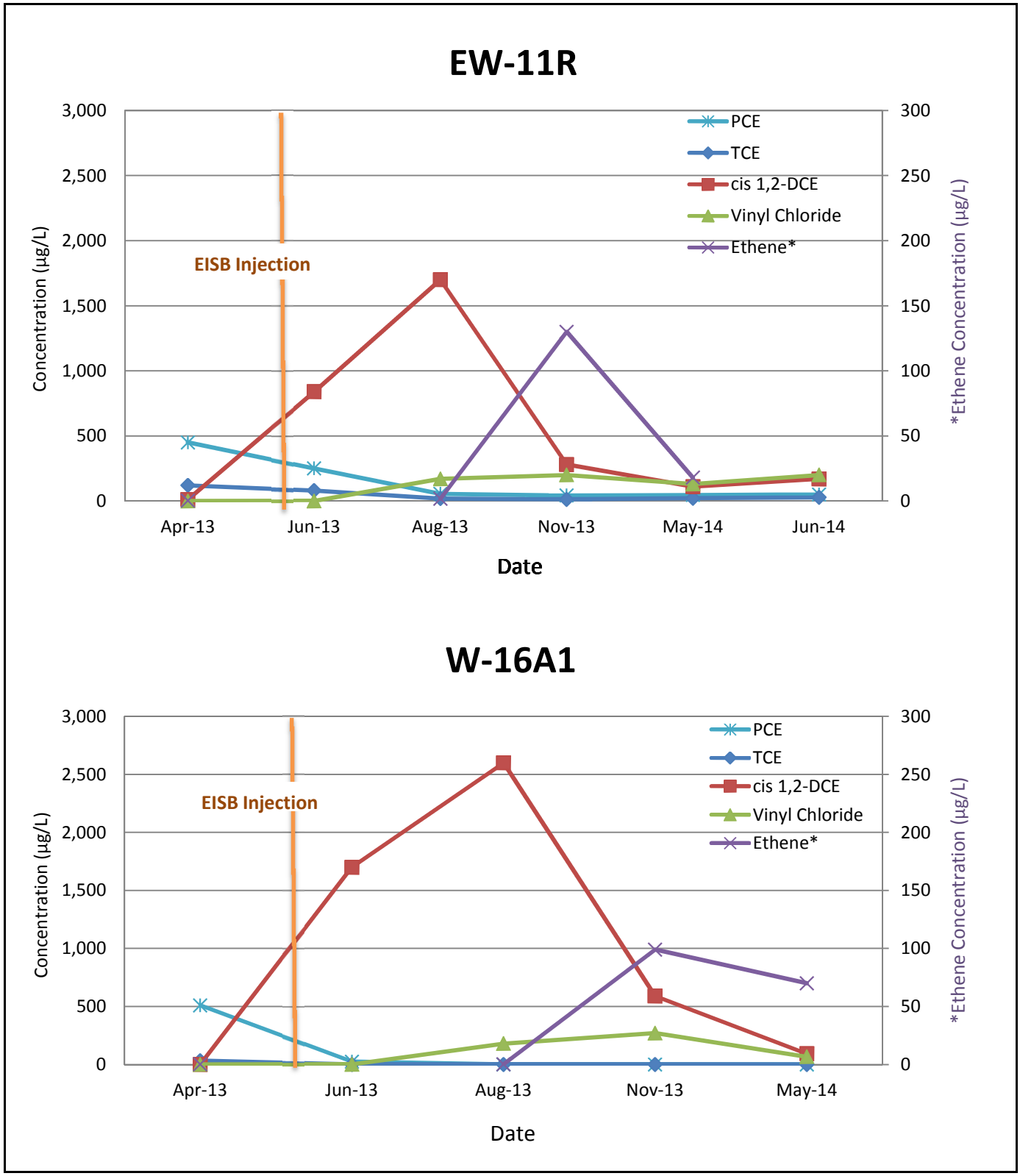
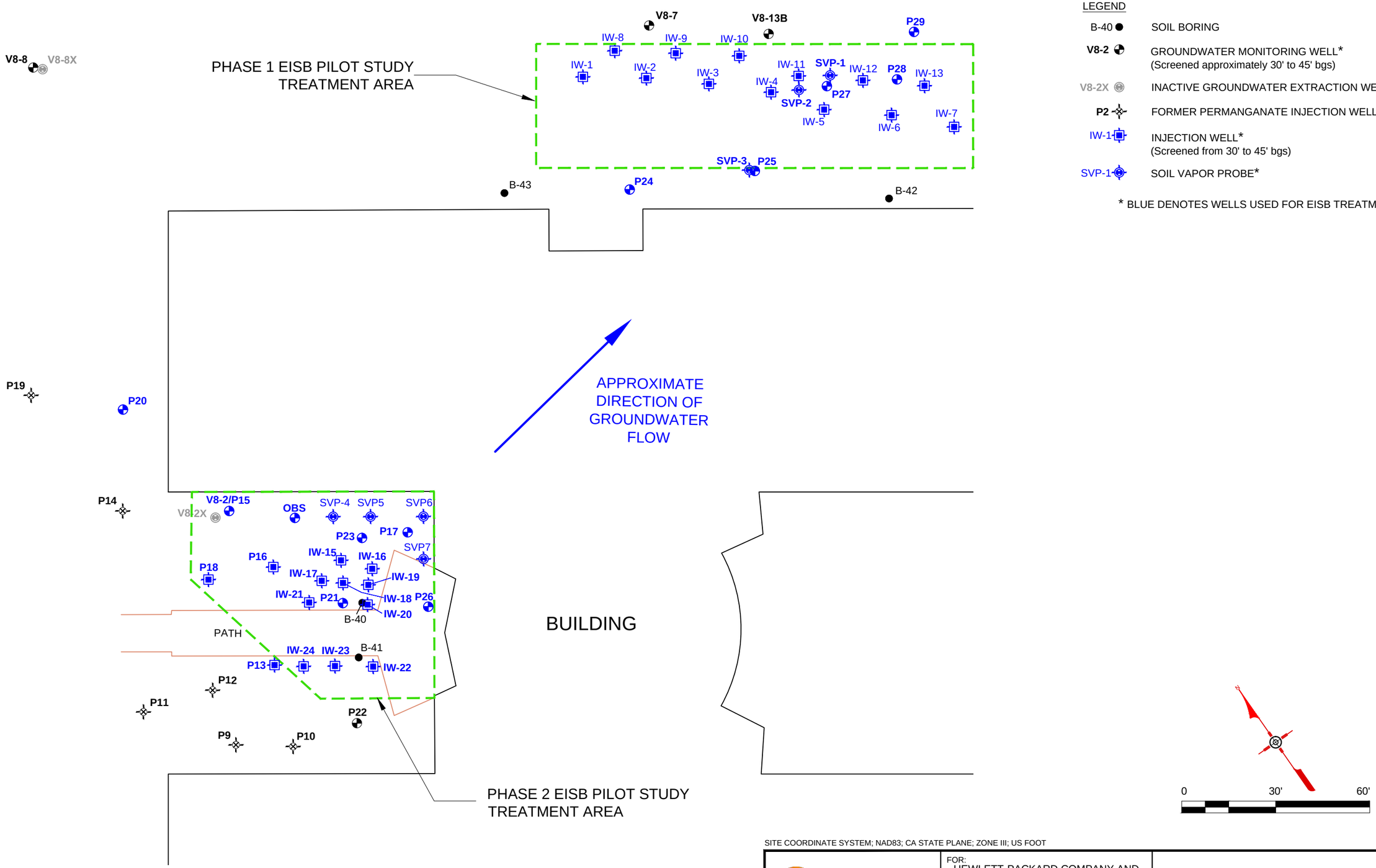


FIGURE 18

VOC Concentration Trends in A1 Zone EISB Treatment Area Wells
395 PMR Site





SITE COORDINATE SYSTEM; NAD83; CA STATE PLANE; ZONE III; US FOOT

Stantec 1340 Treat Boulevard, Suite 300 Walnut Creek, CA 94597 PHONE:(925) 941-1400 FAX:(925) 941-1401	FOR: HEWLETT-PACKARD COMPANY AND VARIAN MEDICAL SYSTEMS, INC. COE STUDY AREA AND PERIMETER AREA PALO ALTO, SANTA CLARA CO. CA	EISB TREATMENT AREAS 601 CA SITE		FIGURE: 19
	JOB NUMBER: 185702915.200.0001	DRAWN BY: RRR	CHECKED BY: BES	APPROVED BY: AM	DATE: 01/08/15

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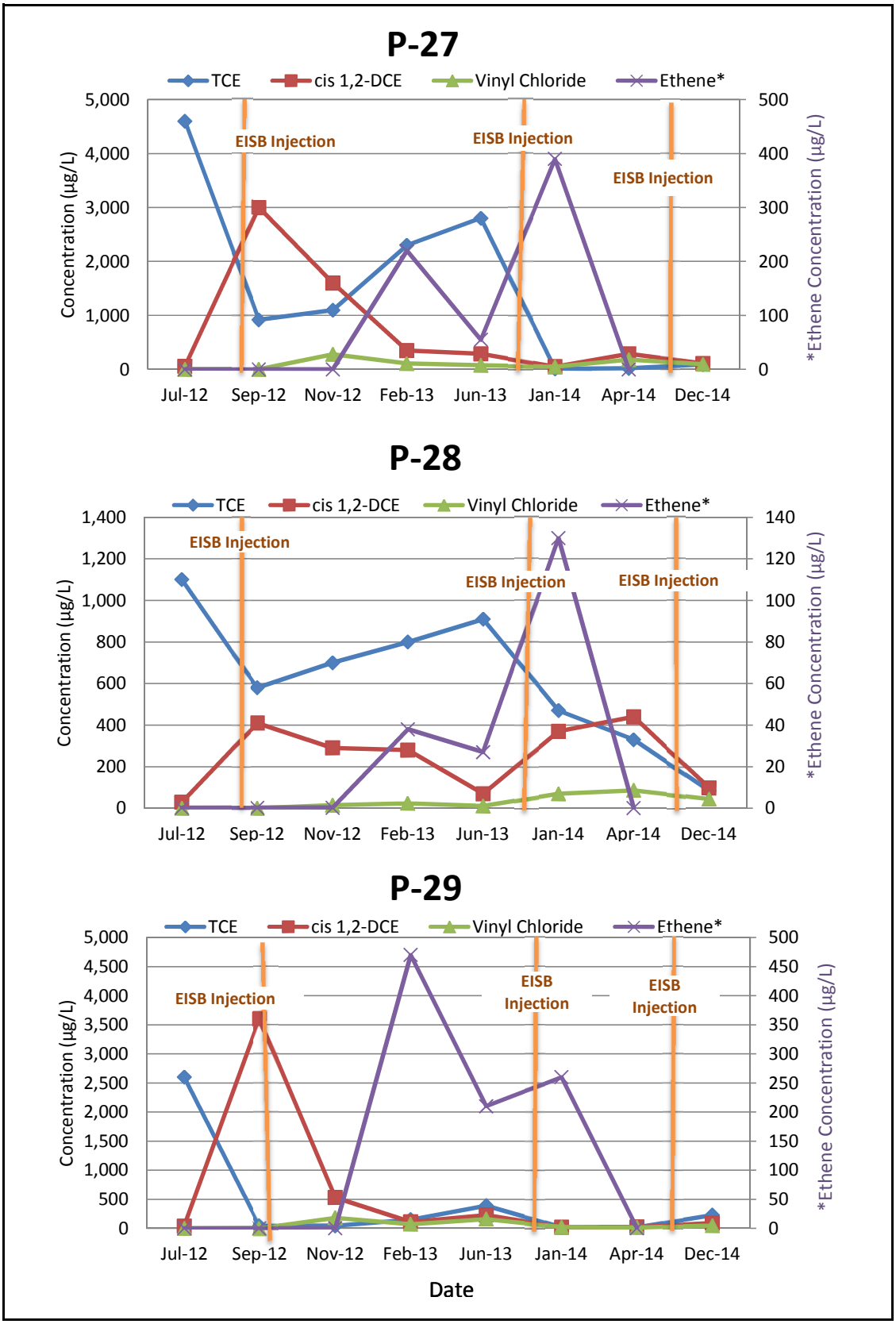
FIGURE 20

VOC Concentration Trends
Phase 1 EISB Treatment Area Wells
601 CA Site



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