

Report

2015 Annual Progress Report

Former Raytheon Facilities

350 Ellis Street, Mountain View, California

CIWQS ID: 202473

**Prepared for:
Raytheon Company**

April 15, 2016

Project No. 23016-2100



Raytheon Company
Environmental, Health & Safety
2000 E. El Segundo Blvd. E07/S175
El Segundo, CA 90245
Direct Tel: 310- 647-2495
Direct Fax 310- 616-1042
e-mail : gstaylor@raytheon.com

Raytheon

15 April 2016

Ms. Alana Lee
U.S. Environmental Protection Agency Region 9
Superfund Division
75 Hawthorne Street, SFD-7-3
San Francisco, California 94105

*RE: Raytheon Site Specific 2015 Annual Progress Report
Former Raytheon Facilities
350 Ellis Street, Mountain View, California
Project Number 23016-2100*

Dear Ms. Lee:

Enclosed is the 2015 Annual Progress Report for the Raytheon site specific work performed from 1 January through 31 December 2015 at the groundwater treatment system located at 350 Ellis Street in Mountain View, California.

If you have any questions regarding this transmittal, please contact me.

Very truly yours,



Greg S. Taylor
Environmental Program Manager

GST/ Im & njl
Enclosure

DISTRIBUTION LIST

Vic Cocianni, Schlumberger Technology Corporation
Tom Boer, Hunter & Williams LLP
Thomas Fojut, Weiss Associates
Trish Eliasson, Weiss Associates
Joyce Adams, Weiss Associates
Nancy Bice, Geosyntec Consultants
John D. Gallinatti, Geosyntec Consultants
Lea Kane, Geosyntec Consultants
Maria P. Hoye, Esq., Latham & Watkins
Harold Rush, AMEC Geomatrix Consultants, Inc.
Aron Potash, Latham & Watkins
Anja Verce, Weiss Associates
Mary Stallard, Weiss Associates
Don Chuck, NASA-Ames Research Center
Kimberly Finch, NASA-Ames Research Center
Joe Lukas, NASA-Ames Research Center
Lili Pirbazari, NASA-Ames Research Center
John Weisberg, Texas Instruments, Inc.
Mansoor Bharmal, Texas Instruments, Inc.
James Sullivan, BRAC Program Management Office West
Kyle Olewnik, BRAC PMO/NAVFAC SW
John I. Jeter, Renesas Electronics America Inc.
Lisa Van Tassell, GeoSyntec Consultants
Eric Suchomel, GeoSyntec Consultants
Greg Taylor, Raytheon Company
Jim Colopy, Farella Barun & Martel LLP
Elie H. Haddad, P.E., Haley & Aldrich
Wes (John) Hawthorne, Locus Technologies
Chuck Hunnewell, SMI Holding LLC
Susan Gahry, PES Environmental, Inc.

Susan R. O'Connor, SMI Holding LLC
Jeff Homer, SUMCO Phoenix Corporation
Rafael Valazquez, SUMCO Phoenix Corporation
Dina C. Kuykendall, Baker Hughes Incorporated
Megan Conlon McCulloch, EH&S Legal
John Cermak, Baker Hostetler
Tom Gieck, The Dow Chemical Company
Alana Lee, USEPA Region IX, Superfund Division Jenny Ledesma, CH2M HILL
Laura Levine, EA Engineering Science and Technology, Inc
Jenny Ledesma, CH2M HILLc
George Cook, Santa Clara Valley Water District
Rebecca Shapiro, City of Mountain View, Community Development Department
Lenny Siegel, MEW TAG Administrator, Center for Public Environment Oversight
Peter Strauss, MEW TAG Advisor, PM Strauss & Associates
Mathew Walsh, GTE Operations Support Incorporated
Paul Paschke, Hewlett Packard
Michelle King, Eler & Kalinowski, Inc
Karen Nardi, Arnold & Porter LLP
Perry Palmer, Keenan-Lovewell
Sandi Nichols, Allen Matkins Leck Gamble Mallory & Natsis LLP
Robert Balas, Iris Environmental
Melinda Wilson, Weiss Associates

Report

2015 Annual Progress Report

Submitted to:



RAYTHEON COMPANY

Submitted by:



John W. Hawthorne
J. WESLEY HAWTHORNE

Reference:



23016-2100

Date:



April 15, 2016

Locus Technologies

299 Fairchild Drive
Mountain View, CA 94043



(650) 960-1640



locustec.com

Table of Contents

List of Tables	i
List of Figures.....	ii
List of Appendices	iii
1 Introduction	1
1.1 Site Background.....	1
1.2 Local Hydrogeology	1
1.3 Summary of Onsite Remedial Actions.....	2
1.4 Summary of 2015 Activities and Deliverables.....	3
2 Groundwater Extraction and Treatment System	5
2.1 System Description and Performance	5
2.1.1 Treatment System Sampling and Mass Removal.....	5
2.1.2 System Performance.....	6
2.2 Treatment System Operations and Maintenance	6
2.3 Hydraulic Control and Capture Zone Analysis	7
2.3.1 Methodology.....	7
2.3.2 Estimated Capture Zones.....	8

2.3.3	Horizontal (Slurry Wall) and Vertical (Aquitard) Groundwater Gradients	11
2.4	Onsite VOC Concentrations	12
2.4.1	Chemical Data Evaluation and Trend Analysis	12
2.4.2	Historical Data Summary	12
2.5	Quality Assurance/Quality Control.....	12
3	Additional Activities Conducted in 2015	13
4	Problems Encountered	14
4.1	Treatment System Operation	14
5	Technical Assessment.....	15
5.1	Is the Remedy Functioning as Intended?	15
5.2	Are Capture Zones Adequate?	15
5.3	Are Vertical Gradients Inside and Gradients Across the Slurry Walls Appropriate?	16
5.4	Are Concentrations Decreasing Over Time?.....	17
6	Conclusions and Recommendations	18
7	Activities Planned for 2016.....	19

References

Tables

Figures

Appendices

List of Tables

Table No.	Title
1	2015 Average Extraction Well Flow Rates
2	2015 Groundwater Treatment System Analytical Data
3	Cumulative VOC Mass Removal
4	2015 Groundwater Elevation Data
5	2015 Capture Zone Width Calculation
6	2015 Water Balance Results
7	Well Loss Calculations
8	2015 Differential Water Levels in Well Pairs across the Slurry Wall
9	2015 Differential Water Levels in Well Pairs across the Aquitard
10	2015 Monitoring and Reporting Schedules
11	2015 Summary of Site-Specific Monitoring Well VOC Data
12	Mann-Kendall Trichloroethene Trend Analysis

List of Figures

Figure No.	Title
1	Site Location Map
2	Base Map
3	Property Boundary
4	TCE Concentrations in Groundwater Treatment System Influent Since 2001
5	Total Influent Groundwater Concentrations
6	Cumulative VOC Mass Removal
7	Potentiometric Surface Map, "A" Aquifer, March 19, 2015
8	Potentiometric Surface Map, "B1" Aquifer, March 19, 2015
9	Potentiometric Surface Map, "A" Aquifer, September 17, 2015
10	Potentiometric Surface Map, "B1" Aquifer, September 17, 2015
11	Potentiometric Surface Map, Upper "B2" Aquifer, March 19, 2015
12	Potentiometric Surface Map, Lower "B2" Aquifer, March 19, 2015
13	Potentiometric Surface Map, "B3" Aquifer, March 19, 2015
14	Potentiometric Surface Map, Upper "B2" Aquifer, September 17, 2015
15	Potentiometric Surface Map, Lower "B2" Aquifer, September 17, 2015
16	Potentiometric Surface Map, "B3" Aquifer, September 17, 2015
17	Well Cluster and Well Pair Map
18	Water Elevation Differences Across the Slurry Wall in the "A" Aquifer

19	Water Elevation Differences Across the Slurry Wall in the "B1" Aquifer
20	Water Elevation Differences Across the "A/B1" Aquitard
21	Water Elevation Differences Across the "B1/B2" Aquitard
22	Water Elevation Differences Between the Upper and Lower "B2" Aquifers
23	2015 TCE Concentrations, "A" Aquifer
24	2015 PCE Concentrations, "A" Aquifer
25	2015 cis-1, 2-DCE Concentrations, "A" Aquifer
26	2015 Vinyl Chloride Concentrations, "A" Aquifer
27	2015 TCE Concentrations, "B1" Aquifer
28	2015 PCE Concentrations, "B1" Aquifer
29	2015 cis-1, 2-DCE Concentrations, "B1" Aquifer
30	2015 Vinyl Chloride Concentrations, "B1" Aquifer
31	2015 TCE Concentrations, Upper "B2" Aquifer
32	2015 PCE Concentrations, Upper "B2" Aquifer
33	2015 cis-1, 2-DCE Concentrations, Upper "B2" Aquifer
34	2015 Vinyl Chloride Concentrations, Upper "B2" Aquifer

List of Appendices

Appendix	Title
A	2015 Annual Report Remedy Performance Checklist
B	2015 Laboratory Analytical Reports
C	Historical Groundwater Hydrographs
D	Historical Groundwater Quality Data and Plots
E	2015 Quality Assurance/Quality Control Report

1 Introduction

This Annual Progress Report was prepared by Locus Technologies on behalf of Raytheon Company (Raytheon) for the former Raytheon facilities located at 350 Ellis Street in Mountain View, California (CIWQS Place Identification: 202473) (Figure 1). This progress report contains a summary of site activities and data from 1 January through 31 December 2015.

1.1 Site Background

The site located at 350 Ellis Street in Mountain View, California is approximately 18 acres (Figure 1). Mountain View is a town of approximately 74,000 residents, located in Santa Clara County. The former Raytheon site is part of the MEW site, where a number of companies were involved in activities requiring storage, handling, and use of chemicals. These companies are referred to as the MEW Companies in this document.

Agricultural development in this area began in the mid-1800s. Until about 1960, orchards, low crops, and greenhouse gardening dominated the area. North of U.S. Highway 101, Moffett Federal Airfield (Moffett Field) was commissioned in 1933. Ames Research Center, also north of the highway, was originally opened in 1940 adjacent to Moffett Field as a laboratory of the National Advisory Committee on Aeronautics. The facility at 350 Ellis Street was constructed around 1959 and was operated by Raytheon from 1961 to 1997 as a semiconductor manufacturing facility.

Several buildings at the MEW site have changed ownership and occupancy. For the former Raytheon site at 350 Ellis Street, the property was sold to Fairchild Semiconductor Corporation in 1997. The facility was demolished in 2000, when Veritas Software Corporation purchased the property and built an office campus consisting of five buildings (A, B, C, D and E) and a multi-level garage. Symantec acquired Veritas in 2005 and now owns the property.

1.2 Local Hydrogeology

Aquifers in the MEW area include shallow and deep aquifer systems separated by a laterally extensive aquitard approximately 40 feet thick. The shallow aquifer system is generally less than 160 feet below ground surface (bgs) south of U.S. Highway 101, and generally less than 100 feet bgs north of U.S. Highway 101. Subdivisions within the shallow aquifer have been designated the

"A", "B1", "B2", and "B3" Aquifers. The regional aquitard is designated the "B/C" Aquitard. The water-bearing zones below the "B/C" Aquitard are termed the "C" Aquifer and the Deep Aquifer.

The direction of groundwater flow at the MEW site is generally to the north. However, the presence of various groundwater extraction systems near the former Raytheon sites and the slurry walls at 350 Ellis Street and 369 North Whisman Road has altered the local direction of the groundwater gradient. At 350 Ellis Street, the groundwater in the "A" and "B1" Aquifers is contained by the slurry wall enclosure and groundwater extraction wells RAY-1A and RAY-1B1 (Figure 2).

1.3 Summary of Onsite Remedial Actions

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

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

Remediation at the former Raytheon facility location includes mitigation measures that have addressed chemicals in the groundwater, soils, and air. To address groundwater, a groundwater extraction and treatment system was installed in 1986, which currently consists of eight extraction wells and an ozone oxidation system with activated carbon. For indoor air, mitigation measures have included monitoring, conduit sealing, and installation of air purification systems.

Implementation and results of the prior mitigation measures for the site have been documented in previous reports (Golder, 1988; GT, 1995, 1996; IT, 2000; Locus, 2002, 2003a, 2003b, 2004a, 2008d; Haley & Aldrich, 2009; Locus, 2011a, Haley & Aldrich, 2015, Haley & Aldrich, 2016). The status and progress of the current remedial actions is described in Section 2. Appendix A, the annual remedy performance checklist, contains a summary of all past and current onsite remedial actions.

1.4 Summary of 2015 Activities and Deliverables

The following activities were completed at the 350 Ellis Street facility during this reporting period:

January	<ul style="list-style-type: none"> ◆ 20th - Monthly treatment system sampling.
February	<ul style="list-style-type: none"> ◆ 10th - 11th - 3,000-lb liquid-phase GAC vessel was changed out; the system was shut down for approximately 17 hours. ◆ 13th - Monthly treatment system sampling. ◆ 13th - 2014 Annual NPDES report was submitted to the RWQCB (Locus, 2015a).
March	<ul style="list-style-type: none"> ◆ 16th - Monthly treatment system sampling. ◆ 10th - Inspection of the air purification units at the property. ◆ 19th - Measured semiannual water elevations for the regional monitoring program and for well pairs at 350 Ellis Street.
April	<ul style="list-style-type: none"> ◆ 6th - 3,000-lb liquid-phase GAC vessel was changed out; the system was shut down for approximately 21 hours. ◆ 7th - System was down on April 7, 2015 for 11 hours for routine carbon hydration. ◆ 15th - 2014 Annual Report was submitted to EPA (Locus, 2015b). ◆ 16th - System was shut down for 18 hours due to failing mechanisms in the programmable logic controller (PLC), which were subsequently repaired. ◆ 20th - Monthly treatment system sampling.
May	<ul style="list-style-type: none"> ◆ 7th - System was shut down 20 hours for general operation and maintenance. ◆ 15th - Submitted first quarter 2015 NPDES report to RWQCB (Locus, 2015c). ◆ 19th - Monthly treatment system sampling.
June	<ul style="list-style-type: none"> ◆ 1st - The system was shut down for 19 hours in preparation for the replacement of the carbon filter. ◆ 9th - Inspection of the air purification units at the property. ◆ 16th - Monthly treatment system sampling. ◆ 18th - Measured quarterly water elevations at the Raytheon well pairs.
July	<ul style="list-style-type: none"> ◆ 20th - Monthly treatment system sampling.

August	<ul style="list-style-type: none"> ◆ 14th – Submitted second quarter 2015 NPDES report to RWQCB (Locus, 2015d). ◆ 17th – Monthly treatment system sampling. ◆ 21st – 3,000-lb liquid -phase GAC vessel was changed out; the system was shut down for approximately 21 hours. ◆ 22nd – The system was down on August 22, 2015 for 20 hours for routine carbon hydration.
September	<ul style="list-style-type: none"> ◆ 8th – Monthly treatment system sampling. ◆ 8th – Inspection of the air purification units at the property. ◆ 17th – Measured semi-annual water elevations per the regional monitoring program and water elevations in the site-specific well pairs at Raytheon. ◆ 21st – 3,000-lb liquid -phase GAC vessel was changed out; the system was shut down for approximately 20 hours. ◆ 29th to Oct 1st – The system was shut down for a total of 55 hours to replace key treatment system equipment including the chiller unit and programmable logic controller. EPA was notified in advance of the planned shutdown.
October	<ul style="list-style-type: none"> ◆ 16th – Monthly treatment system sampling. ◆ 22nd – Annual site-specific monitoring well sampling.
November	<ul style="list-style-type: none"> ◆ 15th – Submitted third quarter 2015 NPDES report to RWQCB (Locus, 2015e). ◆ 16th – 3,000-lb liquid-phase GAC vessel was changed out; the system was shut down for approximately 22 hours. ◆ 19th – Monthly treatment system sampling.
December	<ul style="list-style-type: none"> ◆ 8th – Inspection of the air purification units at the property. ◆ 14th – Monthly treatment system sampling. ◆ 17th – Measured quarterly water elevations at the Raytheon well pairs.

2 Groundwater Extraction and Treatment System

2.1 System Description and Performance

The groundwater treatment system consists of a hydrogen peroxide/ozone oxidation system and a liquid-phase GAC unit. The oxidation system consists of one skid-mounted high-pressure oxidation unit followed by one 3,000-lb liquid-phase GAC vessel. The hydrogen peroxide/ozone oxidation system operates by injecting 25% hydrogen peroxide and ozone generated from liquid oxygen into ten 2-inch pipeline reactors. During the oxidation process, the volatile organic compounds (VOCs) and 1,4-dioxane are oxidized. Following oxidation, the treated groundwater flows through a 3,000-lb GAC vessel for final polish. Treated effluent from the groundwater treatment system is conveyed to Stevens Creek for discharge under the NPDES permit.

The oxidation system was installed in late November 2003 and began full operation in December 2003. The current NPDES Permit No. is CAG912002, Order R2-2012-0012, which was issued on August 25, 2014.

Groundwater is extracted from eight extraction wells and treated at the groundwater treatment system. Five extraction wells are located inside, and three outside, of the slurry wall enclosure (Figures 2 and 3). In 2015, the groundwater treatment system operated at an average discharge flow rate of approximately 36 gpm. Groundwater flow rates for the extraction wells and the average monthly treatment system flow rates are presented in Table 1.

2.1.1 Treatment System Sampling and Mass Removal

Monthly treatment system samples are collected from the influent (RAYINF), effluent of the HiPOx™ system (RAYMID), and system effluent (RAYEFT). Monthly samples are analyzed for VOCs using EPA Method 8260B for the EPA 8010 analyte list. Results for the system influent and effluent sampling points are presented in Table 2.

During 2015, the groundwater treatment system treated approximately 20.1 million gallons of water, and 565 pounds of VOCs were removed by the treatment system. A total of 17,420 pounds of VOCs have been removed by the groundwater extraction system since 1986. Table 3 and Figures 5 and 6 present a summary of the VOC influent concentration and cumulative VOC mass removed for the Raytheon groundwater treatment system since 1986.

2.1.2 System Performance

In 2015, the treatment system operated approximately 95% of the time and was shut down in isolated instances for O&M activities and other unplanned incidences outlined in Chapter 1 of this report. Other than scheduled carbon change-outs, system maintenance/repairs, and the September shutdown for 55 hours for key treatment system equipment replacement, the treatment system operated continuously during 2015. No untreated groundwater was discharged during these shutdowns, and EPA was notified in advance of the equipment replacement shutdown, which lasted longer than 24 hours.

2.2 Treatment System Operations and Maintenance

Raytheon is conducting long-term monitoring and maintenance activities in accordance with the current operation and maintenance (O&M) manual (Locus, 2004b). The primary activities associated with O&M include:

- Monthly groundwater treatment system sampling, in accordance with NPDES permit requirements. Laboratory analytical reports for sampling conducted in 2015 are included in Appendix B.
- Semiannual groundwater elevation measurements of all accessible monitoring wells, and quarterly groundwater elevation measurements of slurry wall well pairs (defined as a pair of wells, one on the inside and one on the outside of the wall to monitor direction of groundwater gradient across the wall), and vertical well clusters (wells located near each other but screened in different hydraulic units to monitor the direction of the groundwater gradient between the units). Historical well hydrographs are included in Appendix C.
- Groundwater sampling of a network of monitoring wells. Laboratory analytical reports are included in Appendix B. Historical water quality concentrations from 1992 to the present are included in Appendix D for the chemicals of concern.

Also included in Appendix D are concentration trend plots for TCE, cis-1,2-DCE and vinyl chloride.

- Inspection of the conditions of the groundwater monitoring and extraction wells (Figures 2 and 3).
- Inspection and monitoring of the treatment system operation.

The primary O&M activities include monitoring the groundwater and inspecting and maintaining the groundwater treatment system.

Raytheon has historically maintained inward hydraulic gradients across the slurry wall. Since 2000, when the property was developed, an outward gradient has been observed across the northern slurry wall. Although outward gradients have been observed, the RAOs will not be impacted for the following reasons:

1. Raytheon has installed extraction wells in the "A" and "B1" Aquifers immediately downgradient of the slurry wall (RAY-1A and RAY-1B1). The capture zone analyses demonstrate that these wells provide an adequate capture of the groundwater immediately downgradient of the slurry wall.
2. The slurry wall is a low-permeability wall that results in minimal chemical migration through it even if the gradient is outward. The flux of chemicals across a low-permeability wall is small. Furthermore, groundwater and chemicals tend to migrate along easier pathways: inside the slurry wall enclosure, chemicals would preferentially move towards extraction wells RE-23A, RE-24A, RE-25A, and RE-5A rather than through the low-permeability slurry wall.

The slurry wall and the pumping activities within its enclosure and the groundwater extraction well immediately downgradient of the slurry wall physically contain chemicals.

2.3 Hydraulic Control and Capture Zone Analysis

2.3.1 Methodology

Hydraulic control and groundwater capture at 350 Ellis Street is evaluated according to EPA's 2008 guidance, *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems, Final Project Report* (EPA, 2008a). Multiple lines of evidence are used in this evaluation:

- Groundwater elevations are used to assess slurry wall gradients within the same aquifer and vertical gradients across aquitards;
- Comparison of interpreted capture zone to target capture zone using potentiometric surface maps, capture zone width calculations, and flow budget calculations; and
- Groundwater concentration trends.

2.3.2 Estimated Capture Zones

Table 4 summarizes the quarterly well pair and semi-annual site-wide groundwater level measurement data for this reporting period. Groundwater elevation contours from the March 2015 semiannual gauging event are included on Figures 7 and 8 for the "A" and "B1" Aquifers, and Figures 11 through 13 for the Upper "B2", Lower "B2", and "B3" Aquifers. Groundwater elevation contours from the September 2015 semiannual gauging event are included on Figures 9 and 10 for the "A" and "B1" Aquifers, and Figures 14 through 16 for the Upper "B2", Lower "B2", and "B3" Aquifers.

The capture zones for March and September 2015 were estimated using capture zone width calculations (and evaluation of the groundwater elevation contours) as described below.

The extent of a capture zone upgradient of an extraction well (X_0) is determined by (EPA, 2008a):

$$X_0 = \frac{-Q}{2\pi Ti};$$

Where:

Q is the well's extraction rate (gpd),

T is the transmissivity of the aquifer (gpd/ft),

i is the hydraulic gradient of the aquifer (unitless).

The distance from the well to the lateral extent of the capture zone (Y_{well}), perpendicular to the direction of groundwater flow, is determined by (EPA, 2008a):

$$Y_{well} = \frac{\pm Q}{4Ti}.$$

The width of the capture zone at the well location is $2Y_{well}$. EPA (2008a) also describes an equation to determine the maximum width of the capture zone. However, this calculation is not applicable to this site because of the presence of the slurry wall upgradient of the well. The results of the capture zone width calculations are shown in Table 5. The capture zones of wells RAY-1A and

RAY-1B1 are depicted on Figures 7 through 10. Previous reports for the MEW Site have noted variability in aquifer transmissivity of up to four orders of magnitude (Locus, 2000). Therefore, the estimated dimensions of the capture zone may be affected by uncertainty in the transmissivity value.

RAY-1A and RAY-1B1 were placed to capture groundwater along the downgradient boundary of the Raytheon slurry wall (GT, 1995). This evaluation of the capture zones indicates that these wells effectively capture the groundwater along the slurry wall boundary.

2.3.2.1 Flow Budget Calculations

Water balance calculations were performed to verify the estimated capture zones for the 350 Ellis Street site by comparing the groundwater flux flowing into the site with the volume of groundwater removed from extraction wells RAY-1A and RAY-1B1.

Theoretically, inflow to the aquifer could be caused by recharge from precipitation, recharge from surface water bodies, lateral inflow from upgradient areas, or vertical flow between aquifer zones. Outflow is the rate of groundwater flow being removed from the aquifer. Outflow of water from the aquifer system could be caused by vertical leakage between aquifers and groundwater extraction.

As demonstrated in the Feasibility Study for the MEW site (Canonie, 1988), recharge is considered to be negligible at the MEW site because most of the surface is covered by impermeable features such as paving and buildings. Infiltration is further limited by clays, which extend to a depth of approximately 10 to 15 feet at the site. With other inflow pathways being negligible, groundwater flow at the site is mostly attributed to the lateral flow from upgradient areas.

The estimated hydraulic gradients used in the water balance calculations are shown on Figures 7 through 10. The estimated groundwater flow into the aquifer and the estimated pumping required for adequate capture are calculated in Table 6. The estimated flow rate into the capture zone is calculated from (EPA, 2008a):

$$Q = K \cdot (b \cdot w) \cdot i \cdot factor .$$

The variables are defined as follows:

Q = flow rate (gpd);

K = hydraulic conductivity (gpd/ft);

b = saturated aquifer thickness (ft). Note that transmissivity $T = K \cdot b$;

w = width of capture zone (ft);

i = hydraulic gradient (unitless);

factor = 1.5 – 2 is the "rule of thumb" value used to account for other contributions to the pumping well, such as flux from a river or induced vertical flow from another groundwater unit.

Because RAY-1A and RAY-1B1 are immediately downgradient of the slurry wall, groundwater removed from these wells must originate from incoming groundwater flux around the slurry wall. Consequently, the " w " factor in the formula above is interpreted as the width of the groundwater pathway to the east and west of the slurry wall that is eventually captured by the wells.

RAY-1A: Pumping rates in March and September 2015 were 8.91 gpm and 9.38 gpm, respectively. With an estimated width of the groundwater pathway around the approximately 850-ft wide slurry wall and an assumed factor of 1.5, the interpreted capture zones correspond to estimated pumping rates of 8.93 gpm in March and 9.23 gpm in October. These values are in good agreement with actual pumping rates (Table 6).

RAY-1B1: In March and September 2015, pumping rates were 3.01 and 3.05 gpm, respectively. The interpreted capture zones correspond to estimated pumping rates of 3.06 gpm in March and 3.03 gpm in October, which is in good agreement with actual pumping rates (Table 6).

2.3.2.2 Well Loss Calculations

The two factors used to determine well loss are the extraction rate and the well loss coefficient, which is dependent on well condition. RAY-1A and RAY-1B1 were properly designed and well developed, but it is possible that mild deterioration has occurred. Given the conditions of the wells, the well loss coefficient, C , is estimated to range from 0.5 – 1 min^2/m^5 . In 2015, extraction rates ranged from 8.72 to 9.43 gpm in RAY-1A and 2.77 to 3.63 gpm in RAY-1B1. Table 7 presents potential losses in each well assuming a range of extraction rates and loss coefficients. For all cases, the well losses are not significant and adjustments to groundwater levels in the two extraction wells are not necessary.

2.3.3 Horizontal (Slurry Wall) and Vertical (Aquitard) Groundwater Gradients

In March, June, September, and December, groundwater levels were measured to monitor the direction of the groundwater gradient across the slurry wall and the aquitards. A total of 7 well pairs are used to evaluate groundwater gradient directions across the slurry wall, and 15 well pairs are used to evaluate the vertical gradient directions across the aquitards (Figure 17).

Although outward gradients have been observed, the RAOs are not impacted because Raytheon has installed extraction wells in the "A" and "B1" Aquifers immediately downgradient of the slurry wall (RAY-1A and RAY-1B1). Capture zone analyses have demonstrated that these wells provide an adequate capture of the groundwater immediately downgradient of the slurry wall. Furthermore, the slurry wall is a low-permeability wall that results in minimal chemical migration across its walls, even if the gradient is outward. The flux of chemicals across a low-permeability wall is small. Groundwater and chemicals tend to migrate along easier pathways: inside the slurry wall enclosure, chemicals preferentially move towards extraction wells RE-23A, RE-24A, RE-25A, and RE-5A rather than through the low-permeability slurry wall. The slurry wall, the pumping activities within its enclosure, and the groundwater extraction wells immediately downgradient of the slurry wall physically contain chemicals.

Slurry Wall: In 2015, the groundwater extraction system and all eight-extraction wells were operating. The quarterly water level measurements show that an inward gradient across the slurry wall has been maintained except in well pairs R-55A/RE-07A and R-05B1/RP-23B, which are located along the northern slurry wall (Table 8), where VOCs are captured by the existing extraction wells RAY-1A and RAY-1B1. Plots of the differences in hydraulic head across the slurry wall are shown on Figures 18 and 19.

Vertical Gradient Directions: The differences in water elevations between the "B1" and "A" Aquifers are shown in Table 9 and on Figure 20. In 2015, upward gradients were consistently observed in eight of the ten well pairs that are used to monitor the "A/B1" Aquitard gradient directions. The measurements show slight downward gradients in well pairs R-68B1/ R-67A, and R-67B1/RE-08A. The data will be compared to the next groundwater elevation measurement on March 2016, if needed further investigations will be done to evaluate the change. The direction of vertical gradient across the "B1/B2 aquitard" and Upper and Lower "B2" aquifer was consistently upward throughout 2015 as shown in Table 9, and on Figures 21 and 22.

2.4 Onsite VOC Concentrations

Eleven site-specific monitoring wells are sampled annually (Table 11). The annual sampling event for the Raytheon site-specific wells was conducted in October 2015. The analytical results for the 2015 annual samples are summarized in Table 11. A total of 11 site-specific wells on the monitoring plan were sampled and analyzed for VOCs using EPA Method 8260, following the QA/QC procedures specified in the 1991 Unified Quality Assurance Project Plan (UQAPP).

2.4.1 Chemical Data Evaluation and Trend Analysis

The concentrations in monitoring wells sampled in 2015 were within the range of historical concentrations. Table 11 summarizes the analytical results for the annual sampling event. TCE, PCE, cis-1,2-DCE, and vinyl chloride concentrations and contours for the "A", "B1" and "B2" Aquifers are shown on Figures 23 through 34. Appendix D shows concentration trends for TCE, cis-1,2-dichloroethene, and vinyl chloride for selected wells in each aquifer since 1992.

2.4.2 Historical Data Summary

Groundwater monitoring has been conducted at Raytheon's former facility since the early 1980s. In general, most concentrations were detected at their highest levels early in the investigation and removal period. These levels were followed by a significant drop in concentrations in the "A", "B1", and "B2" Aquifers as a result of mitigation measures that have contained and/or removed sources in the groundwater and the unsaturated soils.

Influent treatment system data indicate that TCE comprises the majority of the chemicals being treated. Historical VOC concentrations are included in Appendix D.

2.5 Quality Assurance/Quality Control

A total of 54 water samples, two field blanks, three field duplicates, and fifteen trip blanks were collected and analyzed for VOCs using EPA Methods 8260B and 8270C-SIM during this reporting period. No rinseate blanks were collected with treatment system samples because no sampling equipment other than the collection container was used to retrieve these samples. All quality assurance/quality control (QA/QC) followed the procedures specified in the 1991 UQAPP (Canonie, 1991). The quality of the entire data during this reporting period is still acceptable and valid.

3 Additional Activities Conducted in 2015

In September and October 2015, Haley & Aldrich converted the existing passive SSV system to an active sub-slab depressurization (SSD) system beneath Buildings A, B, C, D and E, as documented in the “Property-specific Vapor Intrusion Response Action Implementation Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California,” submitted to EPA on 10 March 2016.

Confirmation indoor air samples collected with the HVAC system on and off after the start-up of the SSD system showed COC concentrations below the commercial indoor air cleanup level in EPA’s 16 August 2010 “Record of Decision Amendment for the Vapor Intrusion Pathway, Middlefield–Ellis–Whisman (MEW) Superfund Study Area, Mountain View and Moffett Field, California.” The SSD system is therefore achieving the remedial action objective as stated in the ROD to “ensure that building occupants (e.g., workers and residents) are protected from Site contamination by preventing subsurface Site contaminants from migrating into indoor air or accumulating in enclosed building spaces exceed indoor air cleanup levels for long-term exposure.”

No other additional activities were completed in 2015.

4 Problems Encountered

This section documents specific issues encountered during 2015.

4.1 Treatment System Operation

As a result of scheduled carbon change, system maintenance, and unexpected shutdowns for well and/or system repairs, the treatment system operated 91% of the time. The treatment system was shut down briefly (less than 24 hr) in February, April, June, July, September, and November as part of the scheduled carbon change-outs. During the second quarter the system was shut down on April 16, 2015 for 18 hours due to failing mechanisms in the programmable logic controller (PLC), which were subsequently repaired. The treatment system was also shut down on May 7, 2015 for 20 hours for general operation and maintenance. During the third quarter the system was shut down on September 29 through October 1, 2015 for a total of 55 hours to replace key treatment system equipment including the chiller unit and programmable logic controller. Periodically throughout the year, the system had to be restarted after brief shut downs due to low O₂ flow in the system; the downtime associated with these events was less than 24 hours per event.

No untreated groundwater was discharged during these shutdowns, and EPA was notified of shutdown events lasting longer than 24 hours. Other than these events, the system was operational throughout the year.

5 Technical Assessment

5.1 Is the Remedy Functioning as Intended?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the ROD, as modified by the Explanation of Significant Differences. The Feasibility Study (Canonie, 1988) for the MEW site lists the RAOs to be:

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

Several mitigation measures have been implemented at the 350 Ellis Street property to protect potential potable water supply in the shallow aquifer zone. The SVE system installed and operated at the 350 Ellis Street property achieved soil cleanup goals by remediating chemicals present in the vadose zone soils. The installation of a slurry wall at 350 Ellis Street effectively isolated the source areas, and, combined with pumping actions, resulted in a significant decrease in concentrations in the areas within and outside the slurry walls. The slurry wall and the pumping activities inside and outside the slurry wall achieved the third RAO by controlling sources.

The ROD for the MEW site defines cleanup goals for the soils and groundwater. Soil remediation goals were achieved through the implementation of the SVE system. Groundwater remediation goals have not yet been achieved, so groundwater extraction and treatment is ongoing.

5.2 Are Capture Zones Adequate?

Comprehensive water level measurements were collected semiannually. Capture zones are determined as recommended in the 2008 EPA guidance, by calculating plume widths, evaluation of flow lines based on groundwater elevation contours, and by water-balance calculations. If a pumping well does not provide adequate capture, the pumping rate is increased. If a capture zone exceeds the design requirements, then the pumping rate may be reduced.

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

As depicted in Figures 7 through 10, and calculated in Tables 5 and 6, the overall capture of the plume at the former Raytheon facilities appears to be adequate.

5.3 Are Vertical Gradients Inside and Gradients Across the Slurry Walls Appropriate?

A total of 7 well pairs are used to evaluate groundwater gradient directions across the slurry wall, and 15 well pairs are used to evaluate the vertical gradient directions across the aquitards (Figure 17). In 2015, upward gradients were consistently observed in eight of the ten well pairs that are used to monitor the "A/B1" Aquitard gradient directions. The measurements show a slight downward gradient in well pairs R-68B1/R-67A, and R-67B1/RE-08A. The direction of vertical gradient across the "B1/B2 aquitard" and "Upper and Lower "B2" aquifer" was consistently upward throughout 2015. Onsite, the "A" Aquifer and "B1" Aquifer are entirely enclosed within the slurry wall, and the upward gradients across the "B1/B2" Aquitard (Table 9, Figure 21) and between the upper "B2" and lower "B2" Aquifers (Table 9, Figure 22) indicate that groundwater (and chemicals) will flow upward from the "B2" Aquifer into the "B1" Aquifer, where the VOCs are captured by the extraction wells.

It is generally desirable that the hydraulic gradient across slurry walls be inward. Until 2000, gradients had been mostly inward with a few exceptions that may have been due to the temporary shutdown of some extraction wells. During property redevelopment in 2000, several extraction wells were relocated. Since then, outward gradients have been observed in well pairs along the northern (downgradient) portion of the slurry wall. Although outward gradients have been observed, the RAOs will not be impacted because Raytheon has installed extraction wells in the "A" and "B1" Aquifers immediately downgradient of the slurry wall (RAY-1A and RAY-1B1). Capture zone analyses have demonstrated that these wells provide an adequate capture of the groundwater immediately downgradient of the slurry wall. Also, the slurry wall is a low-permeability wall that results in minimal chemical migration across its walls, even if the gradient is outward. The flux of chemicals across a low-permeability wall is small.

Furthermore, groundwater and chemicals tend to migrate along easier pathways: inside the slurry wall enclosure, chemicals would preferentially move towards extraction wells RE-23A, RE-24A, RE-25A, and RE-5A rather than through the low-permeability slurry wall.

The slurry wall, the pumping activities within its enclosure, and the groundwater extraction wells immediately downgradient of the slurry wall physically contain chemicals.

5.4 Are Concentrations Decreasing Over Time?

Appendix D provides concentration plots for wells on the monitoring schedule. In addition, a Mann-Kendall trend analysis on TCE concentrations was performed on the eleven site-specific monitoring wells that are sampled annually (Table 12). During the most recent 10-year period (2006–2015), TCE concentrations at all wells except wells 83A and R52A exhibited either a downward (6 wells) or a stable (3 wells) trend, including field duplicates. Although the trends for Well 83A and 52A were upward during the last 10-year period, they exhibit a stable trend over the period from 1997 through 2015, since routine annual sampling began. All eleven wells exhibit a downward or stable Mann-Kendall trend since 1997. In addition, the latest sampling results within the slurry wall show a concentration decrease of 85% in the “A” Aquifer and a decrease of 87% in the “B1” Aquifer from the initial concentrations (1986–1987).

6 Conclusions and Recommendations

The current remedial actions at Raytheon's former facilities are protective of human health and the environment. Soil remediation is complete and the ongoing groundwater remediation has removed more than 17,420 pounds of VOCs. Since 2005, the groundwater treatment system has operated approximately 91% of the time.

In summary, the VOC concentrations at the site have generally decreased, but appear to have reached asymptotic levels in many wells. The rate of removal is expected to decrease annually as mass has been removed from the source areas and rate limited mass flux becomes the dominant source of groundwater contaminants. The life-cycle assessment of the existing remedy indicates that many decades would be required to achieve the cleanup standards established in the ROD, consistent with the findings of the National Research Council of the National Academies report *Alternatives for Managing the Nation's Complex Contaminated Groundwater Sites* (NRC, 2014).

7 Activities Planned for 2016

The following site-specific activities are planned for 2016:

- Continued operation and maintenance of the groundwater treatment system.
- Continued well pair groundwater level measurements to evaluate the direction of the hydraulic gradient across the slurry wall and the aquitards.
- Collection of annual groundwater elevation measurements (in September) as part of the regional groundwater-monitoring program.
- Collection of quarterly groundwater elevation measurements from well pairs in March, June, and December.
- Collection of groundwater samples (in September/October) for the Raytheon Site-Specific program and the Regional groundwater-monitoring program.
- Quarterly inspections of the air purification units at the property.
- Collection a second round of air samples in the summer of 2016 with the HVAC system on and off.
- Continuous monitoring of the SSD system as outlined in the July 2015 OM&M manual.

References

- Canonie Environmental (1988). *Feasibility Study, Middlefield–Ellis–Whisman Area, Mountain View, California*: November.
- Canonie Environmental (1991). *Unified Quality Assurance Project Plan for the MEW Study Area, Mountain View and Moffett Field*: December.
- Golder Associates Inc. (1988). *Slurry Wall Construction Report, Volumes 1 and 2, 350 Ellis Street, Mountain View, California*: January.
- Groundwater Technology, Inc. (1995). *Revised Final Source Control Remedial Design Volumes 1 & 2, 350 Ellis Street, Mountain View, California*: February.
- Groundwater Technology, Inc. (1996). *Operation and Maintenance Plan for the Soil Vapor Extraction and Treatment System, 350 Ellis Street, Mountain View, California*: March.
- Haley & Aldrich, Inc. (2014). *Supplemental Groundwater Investigation Report Former Raytheon Facilities 250 Ellis Street Mountain View, California*: 2 April.
- Haley & Aldrich, Inc. (2014a). *Indoor Air sampling Results 401/415 Middlefield Road Mountain View, California*: 12 December.
- Haley & Aldrich, Inc. (2014b). *Revised Site–Wide Vapor Intrusion Sampling and Analysis Work Plan for Response Action Tiering, Vapor Intrusion Study Area, Middlefield–Ellis–Whisman Superfund Area, Mountain View, California*: 22 March.
- Haley & Aldrich, Inc. (2014c). *Property–specific Vapor Intrusion Control System Remedial Design, Mountain View, California*: 2 September.
- Haley & Aldrich, Inc. (2015). *Property–specific Long–Term Vapor Intrusion Operations, Maintenance, and Monitoring (OM&M) Plan, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: 21 July.
- Haley & Aldrich, Inc. (2016). *Property–specific Vapor Intrusion Response Action Implementation Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: 10 March.
- Harding Lawson Associates (1988). *Remedial Investigation Report, Remedial Investigation/Feasibility Study, Middlefield–Ellis–Whisman Area, Mountain View, California*: June.
- IT Corporation (2000). *Potassium Permanganate Pilot Test, Volumes I and II, 350 Ellis Street, Mountain View, California*: September.
- Locus Technologies (2000). *Two–Year Evaluation, Regional Groundwater Remediation Program, South of U.S. Highway 101, Middlefield–Ellis–Whisman Site, Mountain View, California*: July.
- Locus Technologies (2002). *Work Plan for Air Sampling, Middlefield–Ellis–Whisman Site, Mountain View, California*: December.
- Locus Technologies (2003a). *Revised Work Plan for Air Sampling, Middlefield–Ellis–Whisman Site, Mountain View, California*: April.

- Locus Technologies (2003b). *Results of Air Sampling, Raytheon Company Former Facilities, Middlefield–Ellis–Whisman Site, Mountain View, California*: August.
- Locus Technologies (2004a). *Results of Air Sampling, Former Raytheon Company Facilities, Middlefield–Ellis–Whisman Site, Mountain View, California*: January.
- Locus Technologies (2004b). *Operation and Maintenance Manual, Raytheon Company Treatment System, 350 Ellis Street, Mountain View, California*: January.
- Locus Technologies (2008a). *NPDES Permit No. CAG912003 2007 Annual Self–Monitoring Report, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: January 30.
- Locus Technologies (2008b). *2007 Annual Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: April 15.
- Locus Technologies (2008c). *NPDES Permit No. CAG912003 Self–Monitoring Report, First Quarter 2008, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: April 30.
- Locus Technologies (2008d). *Results of Air Sampling. Letter report to Symantec Corporation, 350 Ellis Street, Mountain View, California*, May.
- Locus Technologies (2008e). *NPDES Permit No. CAG912003 Self–Monitoring Report, Second Quarter 2008, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: July 30.
- Locus Technologies (2008f). *Remediation Process Optimization, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: August 28.
- Locus Technologies (2008g). *NPDES Permit No. CAG912003 Self–Monitoring Report, Third Quarter 2008, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: October 30.
- Locus Technologies, (2008h). *Evaluation of Remedial Alternatives and Work Plan for Pilot Test, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: December 1.
- Locus Technologies (2008i). *Investigation of the Physical and Chemical Properties of the “A” and “B1” Aquifers, Raytheon Company’s Former Facilities, 350 Ellis Street, Mountain View, California*: December 15.
- Locus Technologies (2011a). *NPDES Permit No. CAG912003 Self–Monitoring Report, 2010 Annual Self–Monitoring Report, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: February 15.
- Locus Technologies (2011b). *2011 Annual Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: April 15.
- Locus Technologies (2011c). *NPDES Permit No. CAG912003 Self–Monitoring Report, First Quarter 2011, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: May 13.



- Locus Technologies (2011d). *NPDES Permit No. CAG912003 Self-Monitoring Report, Second Quarter, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: August 15.
- Locus Technologies (2011e). *NPDES Permit No. CAG912003 Self-Monitoring Report, Third Quarter 2011, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: November 15.
- Locus Technologies (2011f). *NPDES Permit No. CAG912003 Self-Monitoring Report, Noncompliance Report 2011, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: August 5.
- Locus Technologies (2012a). *NPDES Permit No. CAG912003 Self-Monitoring Report, 2011 Annual Self-Monitoring Report, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: February 15.
- Locus Technologies (2012b). *2011 Annual Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: April 15.
- Locus Technologies (2012c). *NPDES Permit No. CAG912003 Self-Monitoring Report, First Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: May 13.
- Locus Technologies (2012d). *NPDES Permit No. CAG912003 Self-Monitoring Report, Second Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: August 15.
- Locus Technologies (2012e). *NPDES Permit No. CAG912003 Self-Monitoring Report, Third Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: November 15.
- Locus Technologies (2014a). *NPDES Permit No. CAG912003 Self-Monitoring Report, 2011 Annual Self-Monitoring Report, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: February 15.
- Locus Technologies (2014b). *2011 Annual Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: April 15.
- Locus Technologies (2014c). *NPDES Permit No. CAG912003 Self-Monitoring Report, First Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: May 13.
- Locus Technologies (2014d). *NPDES Permit No. CAG912003 Self-Monitoring Report, Second Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: August 15.
- Locus Technologies (2014e). *NPDES Permit No. CAG912003 Self-Monitoring Report, Third Quarter 2012, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: November 15.

- Locus Technologies (2015a). *NPDES Permit No. CAG912003 Self-Monitoring Report, 2014 Annual Self-Monitoring Report, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: February 13.
- Locus Technologies (2015b). *2014 Annual Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California*: April 15.
- Locus Technologies (2015c). *NPDES Permit No. CAG912003 Self-Monitoring Report, First Quarter 2015, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: May 15.
- Locus Technologies (2014d). *NPDES Permit No. CAG912003 Self-Monitoring Report, Second Quarter 2015, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: August 14.
- Locus Technologies (2014e). *NPDES Permit No. CAG912003 Self-Monitoring Report, Third Quarter 2015, Groundwater Treatment System, 350 Ellis Street, Mountain View, California*: November 13.
- National Research Council (NRC) (2014). *Alternatives for Managing the Nation's Complex Contaminated Groundwater Sites*. Washington, DC: The National Academies Press.
- Regional Water Quality Control Board, San Francisco Bay (2002). *Self-Monitoring Program for Discharges of Extracted and Treated Groundwater Resulting From the Cleanup of Groundwater Polluted by Volatile Organic Compounds, NPDES No. CAG912003, Order No. 99-051*: June 19.
- Regional Water Quality Control Board (RWQCB), 2009, *Self-Monitoring Program for Discharges of Extracted and Treated Groundwater Resulting From the Cleanup of Groundwater Polluted by Volatile Organic Compounds, NPDES No. CAG912003, Order No. R2-2009-0059*, November 17, 2009.
- United States Environmental Protection Agency (2005). *EPA Training Course for Region 9: Capture Zone Analyses for Pump-and-Treat Systems*: February 3.
- United States Environmental Protection Agency (2008a). *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems, Final Project Report*: January.
- United States Environmental Protection Agency (2008b). *EPA Comments on Partial Submittal of Draft Site-Wide Focused Feasibility Study and EPA Requirement of Remedy Optimization Evaluation for the Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Regional Groundwater Remedial Program, Mountain View and Moffett Field, California*: June 5.

Tables

TABLE 1
 2015 AVERAGE EXTRACTION WELL FLOW RATES
 RAYTHEON COMPANY – FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Extraction Wells	January	February	March	April	May	June	July	August	September	October	November	December
RAY-1A	8.98	8.92	8.86	8.72	9.29	9.43	9.40	9.41	9.38	8.97	9.23	9.01
RAY-1B1	2.98	2.77	2.94	2.99	2.93	3.00	3.00	3.02	3.06	3.50	3.63	3.62
I-1B2	1.39	1.92	2.17	2.10	1.99	1.77	2.13	2.00	2.04	2.08	1.95	1.95
R-65B2	2.31	2.40	2.67	2.53	2.60	2.14	2.74	2.63	2.69	2.62	2.81	2.61
RE-05A	5.21	5.34	5.55	5.72	6.25	5.26	4.70	5.02	5.22	5.45	5.45	4.59
RE-23A	4.28	4.47	3.99	3.13	2.54	3.55	5.25	5.07	4.81	4.64	4.79	4.69
RE-24A	9.75	10.26	10.11	9.63	9.95	10.62	9.69	8.94	8.04	7.90	6.98	6.50
RE-25A	0.34	0.33	0.31	0.33	0.28	0.23	0.24	0.22	0.20	0.19	0.18	0.17
Average GWTS Discharge Flow Rate	38.6	39.0	38.6	36.7	36.4	36.2	37.1	36.0	34.7	34.9	34.3	32.6
Total treated groundwater (gallons)	20,069,980											

Notes:

1. Flow rates are calculated averages based on the total monthly flow from each well and through the treatment system, in gallons per minute (gpm).
2. GWTS – Groundwater Treatment System

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		01/20/2015	01/20/2015	01/20/2015	02/13/2015	02/13/2015	03/16/2015	03/16/2015	04/20/2015	04/20/2015
Sample Purpose		REG	REG	FD	REG	REG	REG	REG	REG	REG
Parameter Name	Report Units	Report Result								
1,1,1,2-TETRACHLOROETHANE	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,1,2,2-TETRACHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,1,2-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,1-DICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,1-DICHLOROETHENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,1-DICHLOROPROPENE	mg/l	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE	mg/l	--	--	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE	mg/l	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE	mg/l	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE	mg/l	--	--	--	--	--	--	--	--	--
1,2-DIBROMOETHANE (EDB)	mg/l	--	--	--	--	--	--	--	--	--
1,2-DICHLOROBENZENE	mg/l	ND 0.0005	0.026	0.024	ND 0.0005	0.017	ND 0.0005	ND 0.017	ND 0.0005	0.028
1,2-DICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,2-DICHLOROPROPANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,3,5-TRIMETHYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
1,3-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
1,3-DICHLOROPROPANE	mg/l	--	--	--	--	--	--	--	--	--
1,4-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
2,2-DICHLOROPROPANE	mg/l	--	--	--	--	--	--	--	--	--
2-BUTANONE	mg/l	--	--	--	--	--	--	--	--	--
2-HEXANONE	mg/l	--	--	--	--	--	--	--	--	--
4-CHLOROTOLUENE	mg/l	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE	mg/l	--	--	--	--	--	--	--	--	--
ACETONE	mg/l	--	--	--	--	--	--	--	--	--

Notes:
 ND - denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		01/20/2015	01/20/2015	01/20/2015	02/13/2015	02/13/2015	03/16/2015	03/16/2015	04/20/2015	04/20/2015
Sample Purpose		REG	REG	FD	REG	REG	REG	REG	REG	REG
Parameter Name	Report Units	Report Result								
BENZENE	mg/l	--	--	--	--	--	--	--	--	--
BROMOBENZENE	mg/l	--	--	--	--	--	--	--	--	--
BROMOCHLOROMETHANE	mg/l	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE (Dichlorobromomethane)	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
BROMOFORM	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
BROMOMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033
CARBON DISULFIDE	mg/l	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
CHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
CHLOROETHANE	mg/l	ND 0.001	ND 0.033	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033
CHLOROFORM	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
CHLOROMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033
CIS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	0.95	0.85	ND 0.0005	0.93	ND 0.0005	0.92	ND 0.0005	0.84
CIS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
DIBROMOCHLOROMETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
DIBROMOMETHANE	mg/l	--	--	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE	mg/l	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
FREON 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	mg/l	ND 0.002	ND 0.067	ND 0.067	ND 0.002	ND 0.067	ND 0.002	ND 0.067	ND 0.002	ND 0.067
HEXACHLOROBUTADIENE	mg/l	--	--	--	--	--	--	--	--	--
ISOPROPYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
METHYL-T-BUTYL ETHER	mg/l	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	mg/l	ND 0.02	ND 0.67	ND 0.67	ND 0.02	ND 0.67	ND 0.02	ND 0.67	ND 0.02	ND 0.67
N-BUTYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--

Notes:
 ND – denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		01/20/2015	01/20/2015	01/20/2015	02/13/2015	02/13/2015	03/16/2015	03/16/2015	04/20/2015	04/20/2015
Sample Purpose		REG	REG	FD	REG	REG	REG	REG	REG	REG
Parameter Name	Report Units	Report Result								
NAPHTHALENE	mg/l	--	--	--	--	--	--	--	--	--
o-XYLENE	mg/l	--	--	--	--	--	--	--	--	--
PARA-ISOPROPYL TOLUENE	mg/l	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
STYRENE	mg/l	--	--	--	--	--	--	--	--	--
TERT- BUTYLBENZENE	mg/l	--	--	--	--	--	--	--	--	--
TETRACHLOROETHENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
TOLUENE	mg/l	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	0.065	0.061	ND 0.0005	0.073	ND 0.0005	0.062	ND 0.0005	0.061
TRANS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017	ND 0.0005	ND 0.017
TRICHLOROETHENE	mg/l	ND 0.0005	2.1	1.8	ND 0.0005	2.1	ND 0.0005	2.1	ND 0.0005	2.1
TRICHLOROFLUOROMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033	ND 0.001	ND 0.033
VINYL ACETATE	mg/l	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE	mg/l	ND 0.0005	0.041	0.03	ND 0.0005	0.022	ND 0.0005	0.019	ND 0.0005	0.021

Notes:

ND - denotes result was below the detection limits

TABLE 2
2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF
Date Sampled		05/19/2015	05/19/2015	06/16/2015	06/16/2015	07/20/2015	07/20/2015	07/20/2015	08/17/2015	08/17/2015
Sample Purpose		REG	REG	REG	REG	REG	REG	FD	REG	REG
Parameter Name	Report Units	Report Result								
1,1,1,2-TETRACHLOROETHANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,1,2,2-TETRACHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,1,2-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,1-DICHLOROETHANE	mg/l	0.0006	ND 0.017	ND 0.0005	ND 0.013	0.001	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,1-DICHLOROETHENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	0.014	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,1-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2,3-TRICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2,3-TRICHLOROPROPANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2-DIBROMO-3-CHLOROPROPANE	mg/l	ND 0.002	ND 0.067	--	--	--	--	--	--	--
1,2-DIBROMOETHANE (EDB)	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,2-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	0.028	ND 0.0005	0.013	ND 0.013	ND 0.0005	0.018
1,2-DICHLOROETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,2-DICHLOROPROPANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,3,5-TRIMETHYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,3-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
1,3-DICHLOROPROPANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
1,4-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
2,2-DICHLOROPROPANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
2-BUTANONE	mg/l	ND 0.01	ND 0.33	--	--	--	--	--	--	--
2-HEXANONE	mg/l	ND 0.01	ND 0.33	--	--	--	--	--	--	--
4-CHLOROTOLUENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE	mg/l	ND 0.01	ND 0.33	--	--	--	--	--	--	--
ACETONE	mg/l	ND 0.01	ND 0.33	--	--	--	--	--	--	--

Notes:
ND - denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF
Date Sampled		05/19/2015	05/19/2015	06/16/2015	06/16/2015	07/20/2015	07/20/2015	07/20/2015	08/17/2015	08/17/2015
Sample Purpose		REG	REG	REG	REG	REG	REG	FD	REG	REG
Parameter Name	Report Units	Report Result								
BENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
BROMOBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
BROMOCHLOROMETHANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
BROMODICHLOROMETHANE (Dichlorobromomethane)	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
BROMOFORM	mg/l	ND 0.001	ND 0.033	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
BROMOMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.025
CARBON DISULFIDE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
CARBON TETRACHLORIDE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
CHLOROENZENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
CHLOROETHANE	mg/l	ND 0.001	ND 0.033	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.025
CHLOROFORM	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
CHLOROMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.025
CIS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	0.8	ND 0.0005	1.3	ND 0.0005	0.91	0.85	ND 0.0005	0.92
CIS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
DIBROMOCHLOROMETHANE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
DIBROMOMETHANE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
DICHLORODIFLUOROMETHANE	mg/l	ND 0.001	ND 0.033	--	--	--	--	--	--	--
ETHYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
FREON 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	mg/l	ND 0.002	ND 0.067	ND 0.002	ND 0.05	ND 0.002	ND 0.05	ND 0.05	ND 0.002	ND 0.05
HEXACHLOROBUTADIENE	mg/l	ND 0.002	ND 0.067	--	--	--	--	--	--	--
ISOPROPYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
METHYL-T-BUTYL ETHER	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
METHYLENE CHLORIDE	mg/l	ND 0.01	ND 0.33	ND 0.02	ND 0.5	ND 0.02	ND 0.5	ND 0.5	ND 0.02	ND 0.5
N-BUTYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
N-PROPYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--

Notes:
 ND - denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF
Date Sampled		05/19/2015	05/19/2015	06/16/2015	06/16/2015	07/20/2015	07/20/2015	07/20/2015	08/17/2015	08/17/2015
Sample Purpose		REG	REG	REG	REG	REG	REG	FD	REG	REG
Parameter Name	Report Units	Report Result								
NAPHTHALENE	mg/l	ND 0.002	ND 0.067	--	--	--	--	--	--	--
o-XYLENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
PARA-ISOPROPYL TOLUENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
STYRENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
TERT- BUTYLBENZENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
TETRACHLOROETHENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
TOLUENE	mg/l	ND 0.0005	ND 0.017	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	0.055	ND 0.0005	0.086	ND 0.0005	0.059	0.057	ND 0.0005	0.065
TRANS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.017	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.013
TRICHLOROETHENE	mg/l	ND 0.0005	1.7	ND 0.0005	2.1	ND 0.0005	1.8	1.7	ND 0.0005	1.9
TRICHLOROFLUOROMETHANE	mg/l	ND 0.001	ND 0.033	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.025
VINYL ACETATE	mg/l	ND 0.01	ND 0.33	--	--	--	--	--	--	--
VINYL CHLORIDE	mg/l	ND 0.0005	0.02	ND 0.0005	0.052	ND 0.0005	0.025	0.023	ND 0.0005	0.02

Notes:
 ND – denotes result was below the detection limits

TABLE 2
2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		09/08/2015	09/08/2015	10/16/2015	10/16/2015	10/26/2015	11/19/2015	11/19/2015	12/14/2015	12/14/2015
Sample Purpose		REG								
Parameter Name	Report Units	Report Result								
1,1,1,2-TETRACHLOROETHANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,1,1-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,1,2,2-TETRACHLOROETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,1,2-TRICHLOROETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,1-DICHLOROETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,1-DICHLOROETHENE	mg/l	ND 0.0005	0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,1-DICHLOROPROPENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2,3-TRICHLOROBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2,3-TRICHLOROPROPANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2,4-TRICHLOROBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2,4-TRIMETHYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2-DIBROMO-3-CHLOROPROPANE	mg/l	--	--	--	--	--	ND 0.002	ND 0.1	--	--
1,2-DIBROMOETHANE (EDB)	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,2-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,2-DICHLOROETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,2-DICHLOROPROPANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,3,5-TRIMETHYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,3-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
1,3-DICHLOROPROPANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
1,4-DICHLOROBENZENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
2,2-DICHLOROPROPANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
2-BUTANONE	mg/l	--	--	--	--	--	ND 0.01	ND 0.5	--	--
2-HEXANONE	mg/l	--	--	--	--	--	ND 0.01	ND 0.5	--	--
4-CHLOROTOLUENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
4-METHYL-2-PENTANONE	mg/l	--	--	--	--	--	ND 0.01	ND 0.5	--	--
ACETONE	mg/l	--	--	--	--	--	ND 0.01	ND 0.5	--	--

Notes:
ND - denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		09/08/2015	09/08/2015	10/16/2015	10/16/2015	10/26/2015	11/19/2015	11/19/2015	12/14/2015	12/14/2015
Sample Purpose		REG								
Parameter Name	Report Units	Report Result								
BENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
BROMOBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
BROMOCHLOROMETHANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
BROMODICHLOROMETHANE (Dichlorobromomethane)	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
BROMOFORM	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.001	ND 0.05	ND 0.0005	ND 0.025
BROMOMETHANE	mg/l	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.05	ND 0.001	ND 0.05
CARBON DISULFIDE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
CARBON TETRACHLORIDE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
CHLOROENZENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
CHLOROETHANE	mg/l	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.05	ND 0.001	ND 0.05
CHLOROFORM	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
CHLOROMETHANE	mg/l	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.05	ND 0.001	ND 0.05
CIS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	1.1	ND 0.0005	1	1.2	ND 0.0005	1.5	ND 0.0005	0.94
CIS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
DIBROMOCHLOROMETHANE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
DIBROMOMETHANE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
DICHLORODIFLUOROMETHANE	mg/l	--	--	--	--	--	ND 0.001	ND 0.05	--	--
ETHYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
FREON 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	mg/l	ND 0.002	ND 0.05	ND 0.002	ND 0.05	ND 0.05	ND 0.002	ND 0.1	ND 0.002	ND 0.1
HEXACHLOROBUTADIENE	mg/l	--	--	--	--	--	ND 0.002	ND 0.1	--	--
ISOPROPYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
METHYL-T-BUTYL ETHER	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
METHYLENE CHLORIDE	mg/l	ND 0.02	ND 0.5	ND 0.02	ND 0.5	ND 0.5	ND 0.01	ND 0.5	ND 0.02	ND 1
N-BUTYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
N-PROPYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--

Notes:
 ND – denotes result was below the detection limits

TABLE 2
 2015 ANNUAL GROUNDWATER TREATMENT SYSTEM ANALYTICAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Location ID		RAYEFT	RAYINF	RAYEFT	RAYINF	RAYINF	RAYEFT	RAYINF	RAYEFT	RAYINF
Date Sampled		09/08/2015	09/08/2015	10/16/2015	10/16/2015	10/26/2015	11/19/2015	11/19/2015	12/14/2015	12/14/2015
Sample Purpose		REG								
Parameter Name	Report Units	Report Result								
NAPHTHALENE	mg/l	--	--	--	--	--	ND 0.002	ND 0.1	--	--
o-XYLENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
PARA-ISOPROPYL TOLUENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
SEC-BUTYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
STYRENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
TERT- BUTYLBENZENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
TETRACHLOROETHENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
TOLUENE	mg/l	--	--	--	--	--	ND 0.0005	ND 0.025	--	--
TRANS-1,2-DICHLOROETHENE	mg/l	ND 0.0005	0.08	ND 0.0005	0.084	0.089	ND 0.0005	0.1	ND 0.0005	0.067
TRANS-1,3-DICHLOROPROPENE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	ND 0.013	ND 0.0005	ND 0.025	ND 0.0005	ND 0.025
TRICHLOROETHENE	mg/l	ND 0.0005	2.1	0.0007	2.3	3.3	ND 0.0005	4.6	ND 0.0005	2.4
TRICHLOROFLUOROMETHANE	mg/l	ND 0.001	ND 0.025	ND 0.001	ND 0.025	ND 0.025	ND 0.001	ND 0.05	ND 0.001	ND 0.05
VINYL ACETATE	mg/l	--	--	--	--	--	ND 0.01	ND 0.5	--	--
VINYL CHLORIDE	mg/l	ND 0.0005	ND 0.013	ND 0.0005	ND 0.013	0.022	ND 0.0005	0.071	ND 0.0005	ND 0.025

Notes:
 ND - denotes result was below the detection limits

TABLE 3
 CUMULATIVE VOC REMOVAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
10/17/1986	12.37	2,473,490	0	0
10/27/1986	6.15	2,473,490	41.73	42
10/28/1986	4.59	2,473,490	3.11	45
10/29/1986	5.10	2,473,490	3.46	48
11/5/1986	5.05	3,452,400	33.46	82
11/12/1986	5.39	3,452,400	35.74	118
12/1/1986	5.00	2,787,540	72.64	190
12/29/1986	9.51	2,787,540	203.52	394
12/31/1986	6.36	2,787,540	9.72	403
1/19/1987	6.52	1,930,153	65.58	469
1/28/1987	7.16	1,930,153	34.09	503
2/23/1987	21.70	1,206,884	186.70	690
3/2/1987	13.24	3,775,862	95.95	786
3/13/1987	9.49	3,775,862	108.07	894
4/9/1987	9.25	3,078,120	210.78	1,105
4/22/1987	8.56	3,078,120	93.92	1,198
5/8/1987	4.88	1,837,494	39.34	1,238
5/28/1987	4.02	1,837,494	40.51	1,278
6/3/1987	4.19	2,527,500	17.42	1,296
6/8/1987	4.71	2,527,500	16.32	1,312
6/17/1987	5.42	2,527,500	33.80	1,346
6/25/1987	5.69	2,527,500	31.55	1,377
7/13/1987	4.16	3,866,196	79.38	1,457
7/31/1987	5.12	3,866,196	97.69	1,554
8/13/1987	3.86	3,740,305	51.46	1,606
8/27/1987	4.95	3,740,305	71.07	1,677
5/20/1988	4.10	217,000	65.13	1,742
6/7/1988	2.90	210,000	3.01	1,745
6/28/1988	2.80	210,000	3.39	1,749
10/3/1988	3.33	442,835	39.22	1,788
12/22/1988	2.80	442,835	27.20	1,815
3/28/1989	2.40	378,200	23.89	1,839
6/20/1989	2.80	474,000	30.57	1,869
9/21/1989	2.90	447,000	33.05	1,902
12/15/1989	2.00	461,900	21.53	1,924
3/30/1990	1.90	162,967	8.91	1,933
6/29/1990	1.80	438,000	19.67	1,953
9/28/1990	2.80	213,720	14.93	1,967
12/7/1990	1.05	1,116,000	22.49	1,990
3/28/1991	0.80	1,054,000	25.73	2,016
6/18/1991	0.66	733,740	10.89	2,027
9/16/1991	0.95	673,560	15.71	2,042
12/19/1991	0.63	737,862	11.98	2,054

TABLE 3
 CUMULATIVE VOC REMOVAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
3/26/1992	0.36	794,437	7.77	2,062
6/26/1992	0.48	747,060	8.97	2,071
9/24/1992	4.24	706,860	73.96	2,145
12/8/1992	8.39	846,920	146.07	2,291
2/18/1993	5.93	1,011,164	118.37	2,409
3/11/1993	5.64	1,358,947	44.13	2,454
4/14/1993	4.66	1,460,100	63.43	2,517
5/25/1993	4.55	1,154,874	59.07	2,576
6/23/1993	5.24	1,353,270	56.38	2,632
7/22/1993	5.55	1,215,572	53.64	2,686
8/24/1993	6.04	1,085,279	59.31	2,745
9/23/1993	5.69	879,840	41.18	2,787
10/28/1993	6.00	877,021	50.50	2,837
11/24/1993	6.78	772,680	38.78	2,876
12/26/1993	7.48	822,988	54.01	2,930
1/13/1994	7.61	1,020,985	38.35	2,968
2/4/1994	7.47	804,160	36.23	3,004
3/4/1994	6.82	1,099,353	57.56	3,062
4/14/1994	7.19	1,035,300	83.68	3,146
5/12/1994	7.10	942,555	51.38	3,197
6/9/1994	7.11	911,880	49.77	3,247
7/14/1994	7.08	956,877	65.01	3,312
8/11/1994	5.28	1,098,640	44.53	3,356
9/15/1994	5.59	779,940	41.84	3,398
10/12/1994	5.33	877,393	34.62	3,433
11/10/1994	3.89	706,080	21.84	3,455
12/15/1994	6.10	791,926	46.36	3,501
1/6/1995	5.35	809,007	26.11	3,527
2/9/1995	4.55	975,912	41.39	3,569
3/9/1995	5.16	1,080,226	42.79	3,611
4/6/1995	5.13	967,170	38.09	3,649
5/15/1995	4.39	997,425	46.82	3,696
6/15/1995	5.04	966,390	41.40	3,738
7/13/1995	4.79	1,130,350	41.57	3,779
8/10/1995	5.54	906,720	38.56	3,818
9/18/1995	5.08	886,970	48.18	3,866
10/12/1995	5.58	830,380	30.49	3,896
11/9/1995	4.98	796,640	30.46	3,927
12/4/1995	6.23	826,780	35.31	3,962

TABLE 3
 CUMULATIVE VOC REMOVAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/31/1996	4.72	626,360	47.01	4,009
2/29/1996	5.65	705,320	31.69	4,041
3/31/1996	5.33	721,450	32.68	4,074
4/30/1996	5.56	827,560	37.85	4,111
5/23/1996	6.49	856,930	35.07	4,147
6/14/1996	4.88	1,299,060	38.24	4,185
7/11/1996	3.98	1,577,150	46.47	4,231
8/8/1996	4.43	1,068,297	36.33	4,268
9/27/1996	8.94	1,739,434	213.18	4,481
10/17/1996	6.01	2,309,683	76.12	4,557
11/17/1996	4.92	1,976,504	82.65	4,640
12/17/1996	4.33	1,704,181	60.70	4,700
1/24/1997	4.64	1,874,988	236.15	4,793
2/13/1997	4.53	2,001,712	49.72	4,843
3/18/1997	4.76	2,428,607	104.60	4,947
4/16/1997	4.16	2,136,780	70.68	5,018
5/14/1997	4.57	2,280,782	80.02	5,098
6/19/1997	4.79	2,065,358	97.65	5,196
7/16/1997	5.21	2,294,318	88.49	5,284
8/20/1997	3.15	2,117,259	64.00	5,348
9/8/1997	7.11	2,382,011	88.23	5,436
10/2/1997	5.41	2,583,099	91.96	5,528
11/12/1997	4.91	2,059,288	113.66	5,642
12/11/1997	5.43	2,335,012	100.82	5,743
1/16/1998	4.34	2,320,835	99.42	5,842
2/25/1998	4.54	2,322,241	115.63	5,958
3/25/1998	4.38	2,322,667	78.10	6,036
4/10/1998	5.92	2,125,955	55.21	6,091
5/11/1998	6.66	2,181,943	123.51	6,215
6/8/1998	5.95	2,192,143	100.13	6,315
7/9/1998	2.96	2,187,687	55.04	6,370
8/4/1998	5.65	1,909,016	76.89	6,447
9/10/1998	6.31	1,837,103	117.60	6,564
10/30/1998	5.09	2,168,118	151.29	6,716
11/3/1998	5.23	2,050,814	11.76	6,727
12/3/1998	6.37	2,036,071	106.68	6,834

TABLE 3
CUMULATIVE VOC REMOVAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/6/1999	9.38	2,371,413	207.36	7,041
2/1/1999	8.70	1,425,421	88.40	7,130
3/3/1999	6.00	1,657,431	81.80	7,212
4/6/1999	9.90	2,160,686	199.41	7,411
5/4/1999	6.34	2,113,299	102.86	7,514
6/9/1999	4.37	2,268,609	97.85	7,612
7/6/1999	6.00	1,961,659	87.13	7,699
8/3/1999	6.00	1,934,139	89.09	7,788
9/9/1999	6.00	2,474,267	150.60	7,939
10/4/1999	6.00	1,813,012	74.56	8,013
11/2/1999	6.00	1,845,816	88.06	8,101
12/6/1999	6.00	2,262,708	126.56	8,228
1/1/2000	6.00	1,539,993	65.87	8,294
3/3/2000	1.26	1,095,810	23.42	8,317
3/8/2000	1.61	1,095,810	2.42	8,320
3/22/2000	2.56	1,095,810	10.77	8,330
3/28/2000	0.84	1,095,810	1.51	8,332
5/9/2000	1.56	1,726,160	30.93	8,363
6/5/2000	1.02	838,365	6.35	8,369
6/21/2000	1.80	838,365	6.61	8,376
8/1/2000	1.52	838,365	14.31	8,390
9/5/2000	2.82	1,619,800	43.77	8,434
10/10/2000	1.35	1,947,460	25.23	8,459
11/6/2000	8.69	1,574,200	101.24	8,560
12/1/2000	10.00	1,411,950	96.80	8,657
1/1/2001	3.80	1,080,750	34.31	8,691
2/1/2001	9.46	970,100	76.60	8,768
3/1/2001	8.01	1,182,000	79.04	8,847
4/1/2001	14.28	1,504,700	179.32	9,026
5/1/2001	9.90	937,150	77.43	9,104
6/1/2001	6.14	913,450	46.81	9,151
7/1/2001	6.80	575,185	32.64	9,183
8/1/2001	10.40	1,142,485	99.16	9,282
9/1/2001	10.00	1,107,530	92.43	9,375
10/1/2001	7.49	1,755,400	109.72	9,484
11/1/2001	7.35	1,453,700	89.17	9,574
12/1/2001	7.39	1,452,270	89.57	9,663

TABLE 3
CUMULATIVE VOC REMOVAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/1/2002	7.48	1,706,930	106.55	9,770
2/1/2002	7.88	943,350	62.04	9,832
3/1/2002	5.95	1,039,650	51.58	9,883
4/1/2002	8.10	1,030,550	69.64	9,953
5/1/2002	7.86	1,395,950	91.57	10,045
6/1/2002	8.66	1,530,800	110.68	10,155
7/1/2002	9.55	957,600	76.32	10,232
8/1/2002	5.29	1,216,500	53.71	10,285
9/1/2002	6.21	1,310,900	67.94	10,353
10/1/2002	5.75	1,157,100	55.52	10,409
11/1/2002	8.05	1,086,575	73.00	10,482
12/1/2002	10.92	1,128,975	102.89	10,585
1/1/2003	9.99	1,355,675	113.03	10,698
2/1/2003	11.67	1,288,075	125.48	10,823
3/1/2003	11.07	1,434,490	132.55	10,956
4/1/2003	11.62	1,123,510	108.91	11,065
5/1/2003	8.48	663,730	46.95	11,112
6/1/2003	11.66	1,100,130	107.06	11,219
7/1/2003	10.78	993,850	89.41	11,308
8/1/2003	10.65	782,000	69.50	11,378
9/1/2003	4.14	1,208,490	41.75	11,419
10/1/2003	5.04	817,220	34.37	11,454
11/1/2003		0	0.00	11,497
12/1/2003	7.92	514,730	34.00	11,531
1/19/2004	7.17	896,910	53.67	11,585
2/24/2004	7.69	897,850	57.62	11,642
3/15/2004	7.52	922,240	57.88	11,700
4/26/2004	6.57	1,209,520	66.32	11,766
5/17/2004	7.02	1,024,285	60.01	11,826
6/21/2004	5.91	816,920	40.32	11,867
7/19/2004	3.35	586,065	16.40	11,883
8/17/2004	6.60	1,387,020	76.43	11,960
9/21/2004	6.24	1,751,543	91.15	12,051
10/19/2004	5.89	1,662,937	81.70	12,133
11/15/2004	4.10	1,343,380	46.01	12,179
12/20/2004	3.86	1,810,315	58.24	12,237

TABLE 3
CUMULATIVE VOC REMOVAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/19/2005	5.13	1,131,215	43.96	12,281
2/23/2005	4.29	1,283,835	52.75	12,333
3/21/2005	4.99	1,593,115	60.55	12,394
4/18/2005	4.95	1,672,165	69.33	12,463
5/16/2005	4.66	1,721,575	68.65	12,532
6/20/2005	4.78	1,540,810	60.53	12,593
7/18/2005	4.53	1,480,250	57.84	12,650
8/15/2005	4.43	1,801,230	67.17	12,718
9/19/2005	4.21	1,444,838	52.27	12,770
10/19/2005	4.72	1,463,479	53.23	12,823
11/21/2005	4.19	1,603,611	60.49	12,884
12/20/2005	3.81	1,377,038	46.41	12,930
1/16/2006	3.44	1,523,394	45.77	12,976
2/7/2006	3.76	1,348,990	41.69	13,017
3/15/2006	3.49	1,074,920	32.57	13,050
4/18/2006	3.22	1,328,115	37.74	13,088
5/16/2006	5.55	1,775,355	65.85	13,154
6/27/2006	5.44	1,445,663	66.78	13,220
7/20/2006	5.35	1,806,782	66.97	13,287
8/23/2006	4.70	1,262,105	68.57	13,356
9/22/2006	5.67	1,163,583	47.35	13,403
10/19/2006	5.63	1,815,987	85.61	13,489
11/15/2006	5.82	1,617,622	77.39	13,566
12/18/2006	5.33	1,649,200	77.35	13,644
1/15/2007	4.34	1,460,498	71.85	13,715
2/21/2007	4.11	1,494,310	67.55	13,783
3/20/2007	4.11	1,650,136	69.36	13,852
4/19/2007	4.44	1,427,088	71.49	13,924
5/21/2007	4.33	1,496,597	54.85	13,979
6/21/2007	4.35	1,036,802	37.46	14,016
7/18/2007	4.04	1,166,521	41.23	14,057
8/16/2007	3.38	1,658,509	52.08	14,109
9/17/2007	4.37	1,105,795	34.99	14,144
10/15/2007	4.11	1,554,429	54.95	14,199
11/21/2007	3.99	524,276	17.95	14,217
12/26/2007	3.92	145,473	4.84	14,222

TABLE 3
CUMULATIVE VOC REMOVAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/21/2008	5.04	1,095,626	40.15	14,262
2/18/2008	4.06	991,811	39.71	14,302
3/17/2008	4.42	1,185,466	41.53	14,344
4/16/2008	4.08	1,529,220	54.31	14,398
5/20/2008	3.79	1,074,870	35.56	14,433
6/16/2008	3.64	1,185,285	32.75	14,466
7/9/2008	3.64	507,936	15.42	14,482
9/24/2008	0.59	247,343	0.19	14,482
10/15/2008	4.47	1,387,745	40.00	14,522
11/17/2008	6.13	1,086,198	49.00	14,571
12/17/2008	3.94	1,164,878	25.00	14,596
1/20/2009	4.28	1,486,450	53.04	14,649
2/18/2009	5.96	1,088,423	54.08	14,703
3/16/2009	4.69	1,074,739	42.02	14,745
4/20/2009	4.17	1,063,959	36.99	14,782
5/18/2009	2.66	1,385,381	30.72	14,813
6/15/2009	4.47	1,049,972	39.13	14,852
7/20/2009	2.38	1,226,349	24.33	14,876
8/17/2009	2.30	1,064,645	20.41	14,897
9/21/2009	2.30	1,024,120	19.64	14,916
10/19/2009	2.40	1,179,441	23.60	14,940
11/16/2009	2.20	932,094	17.10	14,957
12/21/2009	3.08	1,197,182	30.74	14,970
1/18/2010	2.48	868,448	17.96	15,006
2/15/2010	2.07	882,502	15.22	15,021
3/15/2010	3.50	658,716	19.22	15,040
4/19/2010	1.68	977,397	13.72	15,054
5/17/2010	3.68	1,044,433	32.05	15,086
6/21/2010	2.89	1,176,812	28.32	15,114
7/19/2010	2.88	856,039	20.52	15,135
8/16/2010	2.15	607,092	10.90	15,146
9/20/2010	2.15	1,211,204	21.68	15,167
10/18/2010	2.64	1,386,567	30.51	15,198
11/15/2010	2.79	812,678	18.88	15,217
12/22/2010	2.80	1,392,139	32.45	15,249

TABLE 3
CUMULATIVE VOC REMOVAL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/21/2011	2.51	812,897	17.01	15,266
2/25/2011	4.79	1,102,459	44.01	15,310
3/25/2011	2.97	1,063,813	26.36	15,336
4/29/2011	3.05	1,231,474	31.35	15,368
5/27/2011	2.67	1,036,610	23.11	15,391
6/24/2011	2.46	978,064	20.03	15,411
7/29/2011	3.34	1,173,957	32.65	15,444
8/26/2011	1.85	765,901	11.82	15,455
9/30/2011	1.90	1,262,176	19.94	15,475
10/28/2011	1.73	1,361,315	19.61	15,495
11/25/2011	1.88	1,032,800	16.18	15,511
12/30/2011	2.23	2,531,761	46.96	15,558
1/27/2012	2.20	1,607,164	29.44	15,587
2/24/2012	2.39	1,230,684	24.48	15,612
3/30/2012	2.38	1,599,189	31.69	15,644
4/27/2012	3.46	1,278,997	36.84	15,680
5/25/2012	2.33	1,334,211	25.95	15,706
6/29/2012	2.21	1,661,511	30.59	15,737
7/27/2012	2.49	1,303,197	27.06	15,764
8/31/2012	2.50	1,593,126	33.14	15,797
9/28/2012	2.14	1,379,885	24.65	15,822
10/26/2012	2.18	1,260,645	22.90	15,845
11/30/2012	2.31	1,516,420	29.25	15,874
12/29/2012	2.78	1,651,015	38.32	15,912
1/25/2013	1.76	1,122,690	16.48	15,929
2/22/2013	4.03	1,150,460	38.61	15,967
3/29/2013	3.59	1,577,390	47.22	16,015
4/26/2013	3.25	1,874,160	50.84	16,066
5/31/2013	2.81	1,888,820	44.20	16,110
6/28/2013	2.91	1,816,240	44.00	16,154
7/26/2013	2.83	1,846,630	43.51	16,197
8/30/2013	2.61	2,370,440	51.57	16,249
9/27/2013	2.95	1,783,900	43.83	16,293
10/25/2013	3.02	1,550,780	38.98	16,332
11/27/2013	2.60	1,948,870	42.28	16,374
12/27/2013	3.70	1,792,270	55.29	16,429

TABLE 3
 CUMULATIVE VOC REMOVAL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Date	VOC Concentration (mg/L)	Total Flow (gallons per month)	Mass Removed (lbs)	Cumulative Mass Removed (lbs)
1/31/2014	2.72	1,945,950	44.16	16,473
2/28/2014	2.51	1,723,890	36.05	16,509
3/28/2014	2.42	1,578,790	31.91	16,541
4/25/2014	2.26	1,571,080	29.59	16,571
5/30/2014	2.41	1,504,590	30.17	16,601
6/27/2014	2.30	1,345,660	25.84	16,627
7/25/2014	2.26	1,036,270	19.48	16,646
8/29/2014	1.85	1,492,240	22.95	16,669
9/26/2014	3.74	823,480	25.68	16,695
10/31/2014	3.00	2,007,480	50.21	16,745
11/26/2014	3.70	1,733,930	53.43	16,799
12/24/2014	3.64	1,838,410	55.79	16,854
1/20/2015	3.18	2,418,320	64.15	16,919
2/13/2015	3.14	1,728,540	45.28	16,964
3/16/2015	3.10	1,591,510	41.15	17,005
4/20/2015	3.05	1,420,630	36.12	17,041
5/19/2015	2.59	2,109,620	45.59	17,087
6/16/2015	3.57	1,691,320	50.28	17,137
7/20/2015	2.81	2,097,640	49.09	17,186
8/17/2015	2.92	1,259,120	30.68	17,217
9/8/2015	3.29	1,665,900	45.74	17,263
10/16/2015	4.67	1,206,470	47.00	17,310
11/19/2015	6.27	1,192,380	62.34	17,372
12/14/2015	3.41	1,688,530	47.96	17,420

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
I-1B2	03/19/2015	37.14	58.76	21.62	
	09/17/2015	31.50		27.26	
ME1A	03/19/2015	15.04	58	42.96	Well not accessible
	09/17/2015	-		-	
ME1B1	03/19/2015	12.53	58	45.47	
	09/17/2015	14.12		43.88	
R10A	03/19/2015	16.85	51.83	34.98	
	09/17/2015	19.23		32.60	
R13B1	03/19/2015	6.37	35	28.63	
	09/17/2015	8.01		26.99	
R13B2	03/19/2015	4.81	35	30.19	
	09/17/2015	6.47		28.53	
R14A	03/19/2015	12.79	55.41	42.62	
	09/17/2015	14.10		41.31	
R14B1	03/19/2015	18.66	62	43.34	
	09/17/2015	20.55		20.55	
R15A	03/19/2015	14.07	56.94	42.87	
	09/17/2015	15.33		41.61	
R16B1	03/19/2015	8.48	47	38.52	
	09/17/2015	10.3		36.7	
R17B2	03/19/2015	17.88	60.69	42.81	
	09/17/2015	18.33		42.36	
R18B3	03/19/2015	1.20	51.66	50.46	Artesian No longer artesian
	09/17/2015	1.21		50.45	
R1B1	03/19/2015	14.33	51.87	37.54	
	09/17/2015	16.14		35.73	
R20A	03/19/2015	14.12	57	42.88	
R21A	03/19/2015	20.74	64.15	43.41	
R21B1	03/19/2015	25.65	73	47.35	
	09/17/2015	27.60		45.40	
R22A	03/19/2015	29.52	73	43.48	
	09/17/2015	31.22		41.78	
R22B1	03/19/2015	17.26	62.73	45.47	
	09/17/2015	18.83		43.90	
R24A	03/19/2015	-	70.05	-	Well is blocked. Measured to blockage 22.2" well is blocked. Measured to blockage 22.2"
	09/17/2015	-		-	
R25A	03/19/2015	17.41	59.20	41.79	
	09/17/2015	18.69		40.51	
R27A	03/19/2015	16.15	47.70	31.55	
	09/17/2015	19.09		28.61	
R27B2	03/19/2015	8.16	51.66	43.50	
	09/17/2015	10.36		41.30	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R27B3	03/19/2015	0.62	51.37	50.75	Artesian No longer artesian
	09/17/2015	1.62		49.75	
R28B2	03/19/2015	8.03	57.57	49.54	
	09/17/2015	9.45		48.12	
R29A	03/19/2015	7.65	36	28.35	
	09/17/2015	8.87		27.13	
R2A	03/19/2015	24.06	57.85	33.79	
	09/17/2015	28.27		29.58	
R30B2	03/19/2015	17.02	63	45.98	
	09/17/2015	18.61		44.39	
R31A	03/19/2015	9.65	34	24.35	
	09/17/2015	10.85		23.15	
R32A	03/19/2015	8.83	35.65	26.82	
	09/17/2015	10.39		25.26	
R33B2	03/19/2015	11.86	56.64	44.78	
	09/17/2015	13.49		43.15	
R36A	03/19/2015	21.80	53.99	32.19	
	06/18/2015	23.29		30.70	
	09/17/2015	25.07		28.92	
	12/17/2015	26.27		27.72	
R36B1	03/19/2015	16.01	58.75	42.74	
	09/17/2015	17.66		41.09	
R37B3	03/19/2015	6.87	60.52	53.65	
	09/17/2015	9.69		50.83	
R39B2	03/19/2015	6.95	51.07	44.12	
	06/18/2015	7.71		43.36	
	09/17/2015	8.92		42.15	
	12/17/2015	9.24		41.83	
R3B1	03/19/2015	16.19	47.16	30.97	
	09/17/2015	16.18		30.98	
R3C	03/19/2015	14.92	70.1	55.18	
	09/17/2015	12.27		57.83	
R40B1(B2)	03/19/2015	17.91	54.06	36.15	
	09/17/2015	19.94		34.12	
R41A	03/19/2015	18.84	51.00	32.16	
	06/19/2015	20.48		30.52	
	09/17/2015	22.77		28.23	
	12/17/2015	23.92		27.08	
R41B2	03/19/2015	12.52	57	44.48	
	09/17/2015	14.19		42.81	
R42B1	03/19/2015	13.90	56.61	42.71	
	09/17/2015	15.21		41.40	
R43A	03/19/2015	8.44	46	37.56	
	09/17/2015	10.13		35.87	
R44A	03/19/2015	14.85	57.66	42.81	
	09/17/2015	16.12		41.54	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R45A	03/19/2015	19.17	62.00	42.83	
	09/17/2015	21.13		40.87	
R46A	03/19/2015	28.82	73	44.18	Cannot locate well. May be covered by wood chips.
	09/17/2015	-		-	
R46B1	03/19/2015	15.46	58	42.54	
	09/17/2015	17.10		40.90	
R48A	03/19/2015	23.04	66.86	43.82	
	09/17/2015	24.37		42.49	
R4C	03/19/2015	16.89	72	55.11	
	09/17/2015	15.11		56.89	
R50A	03/19/2015	18.73	60.43	41.70	
	09/17/2015	20.23		40.20	
R50B2	03/19/2015	10.73	60	49.27	
	09/17/2015	11.91		48.09	
R51A	03/19/2015	16.98	60	43.02	Hit bottom or blockage at 17.65"
	09/17/2015	-		-	
R51B3	03/19/2015	-	59.86	-	Well is obstructed.
	09/17/2015	7.67		52.19	
R52A	03/19/2015	21.42	64	42.58	
	09/17/2015	22.83		41.17	
R52B2	03/19/2015	17.90	64.24	46.34	
	09/17/2015	19.53		44.71	
R53A	03/19/2015	-	58.6	-	Well is buried.
R53B2	03/19/2015	9.92	64.09	54.17	
	09/17/2015	10.62		53.47	
R54A	03/19/2015	16.47	57.18	40.71	
	09/17/2015	15.41		41.77	
R54B3	03/19/2015	9.16	64.52	55.36	
	09/17/2015	9.82		54.70	
R55A	03/19/2015	16.50	47.76	31.26	
	06/18/2015	18.03		29.73	
	09/17/2015	19.25		28.51	
	12/17/2015	19.45		28.31	
R55B2	03/19/2015	15.54	64.21	48.67	
	09/17/2015	17.00		47.21	
R56B3	03/19/2015	10.65	64.13	53.48	
	09/17/2015	11.85		52.28	
R57A	03/19/2015	13.58	53.71	40.13	
	06/18/2015	14.38		39.33	
	09/17/2015	15.00		38.71	
	12/17/2015	14.99		38.72	
R57B3	03/19/2015	3.02	57	53.98	
	09/17/2015	3.80		53.20	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R58A	03/19/2015	18.17	53.77	35.60	
	06/18/2015	19.63		34.14	
	09/17/2015	21.24		32.53	
	12/17/2015	21.96		31.81	
R58B2	03/19/2015	10.20	50.58	40.38	
	09/17/2015	11.34		39.24	
R59A	03/19/2015	12.94	54.69	41.75	
	06/18/2015	13.76		40.93	
	09/17/2015	14.31		40.38	
	12/17/2015	14.18		40.51	
R59B2	03/19/2015	4.75	51.29	46.54	
	06/18/2015	5.57		45.72	
	09/17/2015	6.18		45.11	
	12/17/2015	6.1		45.19	
R5B1	03/19/2015	14.98	47.44	32.46	
	06/18/2015	16.37		31.07	
	09/17/2015	17.12		30.32	
	12/17/2015	17.03		30.41	
R5B2	03/19/2015	4.16	50.46	46.30	
	09/17/2015	5.40		45.06	
R5B3	03/19/2015	-0.75	50.2	50.95	Artesian
	09/17/2015	0.30		49.90	Water level stabilized. No longer artesian.
R60A	03/19/2015	21.21	56.44	35.23	
	06/18/2015	22.70		33.74	
	09/17/2015	24.96		31.48	
	12/17/2015	26.14		30.3	
R60B1	03/19/2015	11.02	58.01	46.99	
	06/18/2015	11.82		46.19	
	09/17/2015	12.54		45.47	
	12/17/2015	12.56		45.45	
R61B3	03/19/2015	4.14	58.41	54.27	Artesian
	09/17/2015	4.83		53.58	Was artesian. Today's level did not rise. No longer artesian
R62A	03/19/2015	12.65	47.59	34.94	
	09/17/2015	14.27		33.32	
R62B2	03/19/2015	7.40	56.91	49.51	
	06/18/2015	8.04		48.87	
	09/17/2015	8.81		48.10	
	12/17/2015	8.79		48.12	
R63A	03/19/2015	22.76	58.33	35.57	
	09/17/2015	25.13		33.20	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R63B1	03/19/2015	21.24	56.52	35.28	
	06/18/2015	22.70		33.82	
	09/17/2015	24.91		31.61	
	12/17/2015	25.99		30.53	
R64B1	03/19/2015	12.37	56.65	44.28	
	06/18/2015	13.31		43.34	
	09/17/2015	14.04	42.61		
	12/17/2015	14.02	56.65	42.63	
R65B1(B2)	06/19/2015	-	53	-	Cannot measure water level due to existing extraction well design
	12/17/2015	-		-	Cannot measure water level due to existing extraction well design
R66B1	03/19/2015	16.16	48.72	32.56	
	09/17/2015	19.83		28.89	
R67A	03/19/2015	21.72	57.58	35.86	
	06/18/2015	23.12		34.46	
	09/17/2015	25.29		32.29	
	12/17/2015	26.31		31.27	
R67B1	03/19/2015	16.41	49.06	32.65	
	06/18/2015	17.83		31.23	
	09/17/2015	20.07		28.99	
	12/17/2015	21.07		27.99	
R68A	03/19/2015	22.75	57.44	34.69	
	09/17/2015	26.58		30.86	
R68B1	03/19/2015	21.88	56.96	35.08	
	06/18/2015	23.31		33.65	
	09/17/2015	24.97		31.99	
	12/17/2015	-		-	
R68B2	03/19/2015	1.70	54.91	53.21	Artesian Slow to recover
	06/18/2015	1.78		53.13	Water level stabilized. No longer artesian.
	09/17/2015	1.71		53.20	
	12/17/2015	1.79		53.12	
R69A	03/19/2015	23.79	56.22	32.43	
	06/18/2015	25.16		31.06	
	09/17/2015	27.79		28.43	
	12/17/2015	29.03		27.19	
R69B1	03/19/2015	22.09	57.28	35.19	
	09/17/2015	25.79		31.49	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R69B2	03/19/2015	10.79	54.85	44.06	
	06/18/2015	11.57		43.28	
	09/17/2015	13.05		41.80	
	12/17/2015	13.48		41.37	
R6A	03/19/2015	12.51	55.64	43.13	
	06/18/2015	13.24		42.40	
	09/17/2015	13.88		41.76	
	12/17/2015	13.97		41.67	
R6B1	03/19/2015	9.51	46	36.49	
	09/17/2015	11.34		34.66	
R70A	03/19/2015	22.96	57.33	34.37	
	09/17/2015	26.88		30.45	
R70B1	03/19/2015	20.89	56.25	35.36	
	06/18/2015	22.31		33.94	
	09/17/2015	24.55		31.70	
	12/17/2015	25.57		30.68	
R70B2	03/19/2015	10.58	54.68	44.10	
	09/17/2015	12.29		42.39	
R71A	03/19/2015	20.68	54.53	33.85	
	09/17/2015	24.69		29.84	
R71B2	03/19/2015	9.69	57.45	47.76	
	09/17/2015	11.31		46.14	
R72A	03/21/2015	23.47	56.47	33.00	
	06/20/2015	25.01		31.46	
	09/19/2015	27.59		28.88	
R72B2	03/19/2015	13.42	57.11	43.69	
	06/18/2015	14.17		42.94	
	09/17/2015	15.71		41.40	
	12/17/2015	16.17		40.94	
R73A	03/21/2015	24.36	59.19	34.83	
	06/20/2015	25.98		33.21	
	09/19/2015	28.87		30.32	
R73B2	03/19/2015	12.02	57.15	45.13	
	06/18/2015	12.22		44.93	
	12/17/2015	14.34		42.81	
R74A	03/21/2015	22.95	57.84	34.89	
	09/19/2015	26.67		31.17	
R7B1	03/19/2015	21.06	56.47	35.41	
	06/18/2015	22.51		33.96	
	09/17/2015	24.73		31.74	
	12/17/2015	25.79		30.68	
R9B1	03/19/2015	22.78	69.92	47.14	
	09/17/2015	24.34		45.58	
R9B2	03/19/2015	23.67	72	48.33	
	09/17/2015	25.28		46.72	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
R9B3	03/19/2015	13.48	69.64	56.16	
	09/17/2015	14.05		55.59	
RAY-1A	03/19/2015	19.79	45.21	25.42	Pump running
	09/17/2015	24.98		20.23	
RAY-1B1	03/19/2015	14.85	45.77	30.92	Pump running
	09/17/2015	17.04		28.73	
RE10A	03/21/2015	23.78	58.65	34.87	
	09/19/2015	27.45		31.20	
RE11A	03/19/2015	18.24	48.75	30.51	
	09/17/2015	22.36		26.39	
RE12A	03/19/2015	16.59	48.64	32.05	
	09/17/2015	20.50		28.14	
RE1B2	03/19/2015	6.37	52.88	46.51	
	09/17/2015	7.77		45.11	
RE21A	03/19/2015	18.38	49.88	31.50	
	09/17/2015	22.32		27.56	
RE22A	03/19/2015	19.36	49.81	30.45	
	06/18/2015	20.90		28.91	
	09/17/2015	23.66		26.15	
	12/17/2015	24.98		24.83	
RE23A	03/19/2015	22.44	53.66	31.22	
	09/17/2015	27.33		26.33	
RE24A	03/19/2015	30.71	55.24	24.53	
	09/17/2015	36.52		18.72	
RE25A	03/19/2015	22.36	57.00	34.64	
	09/17/2015	35.97		21.03	
RE3B1	03/19/2015	16.23	48.71	32.48	
	09/17/2015	19.92		28.79	
RE5A	03/19/2015	23.82	56.85	33.03	
	09/17/2015	28.58		28.27	
RE7A	03/19/2015	17.16	48.61	31.45	
	06/18/2015	18.66		29.95	
	09/17/2015	21.11		27.50	
	12/17/2015	22.3		26.31	
RE8A	03/19/2015	17.45	51.66	34.21	
	06/18/2015	18.89		32.77	
	09/17/2015	21.13		30.53	
	12/17/2015	22.11		29.55	
RE9A	03/21/2015	23.48	58.73	35.25	
	09/19/2015	28.30		30.43	
RH1A	03/19/2015	19.60	62.39	42.79	
	09/17/2015	21.06		41.33	
RP16B	03/19/2015	13.58	58.63	45.05	
	09/17/2015	15.08		43.55	

TABLE 4
 2015 GROUNDWATER ELEVATION DATA
 FORMER RAYTHEON COMPANY FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Location ID	Date Measured	Depth to Groundwater (feet MSL)	Reference Elevation (feet MSL)	Groundwater Elevation (feet MSL)	Comments
RP19B	03/19/2015	20.78	56.47	35.69	
	06/18/2015	22.21		34.26	
	09/17/2015	24.46		32.01	
	12/17/2015	25.52		30.95	
RP21B	03/19/2015	18.12	53.34	35.22	
	06/18/2015	19.57		33.77	
	09/17/2015	21.80		31.54	
	12/17/2015	22.87		30.47	
RP22B	03/19/2015	19.78	64.07	44.29	
RP23B	03/19/2015	19.55	54.67	35.12	Well not accessible.
	06/18/2015	20.98		33.69	
	09/17/2015	23.25		31.42	
	12/17/2015	-		-	
RP24B	03/19/2015	19.88	54.99	35.11	
	09/17/2015	23.53		31.46	
RP41B	03/19/2015	21.75	57.35	35.60	
	09/17/2015	25.22		32.13	
RP42B	03/21/2015	25.21	61.70	36.49	
	06/20/2015	26.61		35.09	
	09/19/2015	28.95		32.75	
RP43B	03/21/2015	22.24	57.28	35.04	
	06/20/2015	23.71		33.57	
	09/19/2015	25.87		31.41	

Notes:

MSL: mean sea level
 - : No measurements

TABLE 5
 2015 CAPTURE ZONE WIDTH CALCULATION
 FORMER RAYTHEON COMPANY FACILITY
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Well	Extraction Rate Q (gpm)	Transmissivity ¹ (gpd/ft)	Hydraulic Gradient ²	Distance from well to Capture Zone ³ X _o (ft)	Width of Capture Zone ⁴ Y _{well} (ft)
March 20, 2015					
RAY-1A	8.91	3940	0.015	35	54
RAY-1B1	3.01	3230	0.013	16	26
September 18, 2015					
RAY-1A	9.38	3940	0.015	36	57
RAY-1B1	3.05	3230	0.012	18	28

Notes:

1. The transmissivities used in the calculations were those calculated for the MEW aquifers in the 2-year evaluation report. (Note: Transmissivity, $T=K*b$)
2. The hydraulic gradient is calculated for each groundwater level event.
3. The distance is measured from the well to the downgradient end of the capture zone along the central line of the flow direction (calculated based on January 2008 EPA guidance on capture zone analysis).
4. The calculation is based on January 2008 EPA guidance on capture zone analysis. Y_{well} is the capture zone width at the location of well from the central line of the plume.

TABLE 6
 2015 WATER BALANCE RESULTS
 RAYTHEON COMPANY – FORMER FACILITY
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Well	Upgradient Width of Incoming Groundwater Flux ¹ (ft)	Transmissivity ² (gpd/ft)	Hydraulic Gradient ³	Estimated Pumping Rate ⁴ (gpm)	Actual Pumping Rate (gpm)
March 20, 2015					
RAY-1A	145	3940	0.015	8.93	8.91
RAY-1B1	70	3230	0.013	3.06	3.01
September 18, 2015					
RAY-1A	150	3940	0.015	9.23	9.38
RAY-1B1	75	3230	0.012	3.03	3.05

Notes:

1. The width of the controlled area is determined from the most recent water level contours and capture zone maps.
2. The transmissivities used in the calculations were those calculated for the MEW aquifers in the 2-year evaluation report.(Note: (Transmissivity, $T=K*b$)
3. The hydraulic gradient is calculated for each groundwater level event.
4. The estimated flow rate is calculated based on January 2008 EPA guidance on capture zone analysis, the estimated flow rate into capture zone is calculated using the equation : $Q= K \times (b \times w) \times i \times \text{factor}$. A factor of 1.5 – 2 is the "rule of thumb" value used to account for other contributions to a pumping well such as flux from a river or induced vertical flow from another groundwater unit.

TABLE 7
WELL LOSS CALCULATIONS
FORMER RAYTHEON COMPANY FACILITY
350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Well Loss Coefficient C (min ² /m ⁵)	Well Extraction Rate Q (gpm)	Calculated Well Loss S _L = CQ ² (feet)
0.5	0.25	1.47E-06
1	0.25	2.94E-06
4	0.25	1.18E-05
0.5	0.5	5.88E-06
1	0.5	1.18E-05
4	0.5	4.70E-05
0.5	1	2.35E-05
1	1	4.70E-05
4	1	1.88E-04
0.5	1.5	5.29E-05
1	1.5	1.06E-04
4	1.5	4.23E-04
0.5	2	9.40E-05
1	2	1.88E-04
4	2	7.52E-04
0.5	2.5	1.47E-04
1	2.5	2.94E-04
4	2.5	1.18E-03
0.5	3	2.12E-04
1	3	4.23E-04
4	3	1.69E-03
0.5	4.5	4.76E-04
1	4.5	9.52E-04
4	4.5	3.81E-03
0.5	6	8.46E-04
1	6	1.69E-03
4	6	6.77E-03
0.5	7.5	1.32E-03
1	7.5	2.64E-03
4	7.5	1.06E-02
0.5	9	1.90E-03
1	9	3.81E-03
4	9	1.52E-02
0.5	10.5	2.59E-03
1	10.5	5.18E-03
4	10.5	2.07E-02
0.5	12	3.38E-03
1	12	6.77E-03
4	12	2.71E-02
0.5	13.5	4.28E-03
1	13.5	8.57E-03
4	13.5	3.43E-02

TABLE 8
2015 DIFFERENTIAL WATER LEVELS IN WELL PAIRS ACROSS THE SLURRY WALL
RAYTHEON COMPANY – FORMER FACILITIES
350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Well No.	March 19, 2015		June 18, 2015		September 17, 2015		December 17, 2015	
	Water Elevation (ft msl)	Difference (ft)						
R-6A	43.13	10.9	42.40	12	41.76	12.8	41.67	14.0
R-36A	32.19		30.70		28.92		27.72	
R-59A	41.75	6.2	40.93	7	40.38	7.9	40.51	8.7
R-58A	35.60		34.14		32.53		31.81	
R-57A	40.13	4.9	39.33	NA	38.71	NA	38.72	8.4
R-60A	35.23		33.74		31.48		30.30	
R-64B1	44.28	9.0	43.34	10	42.61	11.0	42.63	12.1
R-63B1	35.28		33.82		31.61		30.53	
R-60B1	46.99	11.6	46.19	12	45.47	13.7	45.45	14.8
R-7B1	35.41		33.96		31.74		30.68	
R-55A	31.26	-0.2	29.73	0	28.51	1.0	28.31	2.0
RE-7A	31.45		29.95		27.50		26.31	
R-5B1	32.46	-2.7	31.07	-3	30.32	-1.1	30.41	NA
RP-23B	35.12		33.69		31.42		NA	

Notes:

A positive difference indicates an inward gradient.

ft – feet

msl – above mean sea level

NA – Not Available

TABLE 9
2015 DIFFERENTIAL WATER LEVELS IN WELL PAIRS ACROSS THE AQUITARD
RAYTHEON COMPANY – FORMER FACILITIES
350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Well No	March 19, 2015		June 18, 2015		September 17, 2015		December 17, 2015	
	Water Elevation (ft msl)	Difference (ft)						
RP-21B	35.22	3.1	33.77	3.3	31.54	3.3	30.47	3.4
R-41A	32.16		30.52		28.23		27.08	
R-59B2 (l)	46.54	2.4	45.72	2.4	45.11	3.0	45.19	3.4
R-39B2 (u)	44.12		43.36		42.15		41.83	
R-65B1 B2 *	NA	NA	NA	NA	NA	NA	NA	NA
R-58A	35.60		34.14		32.53		31.81	
R-7B1	35.41	3.2	33.96	3.3	31.74	2.8	30.68	3.0
R-36A	32.19		30.70		28.92		27.72	
R-62B2 (l)	49.51	5.8	48.87	5.9	48.10	6.7	48.12	7.2
R-72B2 (u)	43.69		42.94		41.40		40.94	
R-63B1	35.28	NA	33.82	0.1	31.61	0.1	30.53	0.2
R-60A	35.23		33.74		31.48		30.30	
R-68B2 (l)	53.21	9.2	53.13	9.9	53.20	11.4	53.12	11.8
R-69B2 (u)	44.06		43.28		41.80		41.37	
R-73B2	45.13	10.1	44.93	11.3	NA	NA	42.81	NA
R-68B1	35.08		33.65		31.99		NA	
R-68B1	35.08	-0.8	33.65	-0.8	31.99	-0.3	NA	NA
R-67A	35.86		34.46		32.29		31.27	
RP-19B	35.69	NA	34.26	0.5	32.01	0.5	30.95	0.6
R-60A	35.23		33.74		31.48		30.30	
RP-42B	36.49	1.7	35.09	1.9	32.75	2.4	NA	NA
R-73A	34.83		33.21		30.32		NA	
RP-43B	35.04	2.0	33.57	2.1	31.41	2.5	NA	NA
R-72A	33.00		31.46		28.88		NA	
R-67B1	32.65	2.2	31.23	2.3	28.99	2.8	27.99	3.2
RE-22A	30.45		28.91		26.15		24.83	
R-67B1	32.65	-1.6	31.23	-1.5	28.99	-1.5	27.99	-1.6
RE-8A	34.21		32.77		30.53		29.55	
R-70B1	35.36	2.9	33.94	2.9	31.70	3.3	30.68	3.5
R-69A	32.43		31.06		28.43		27.19	

Notes:

A positive difference indicates an upward gradient.

ft – feet

msl – above mean sea level

NA – Not Available

NM = Not measured because a car was parked over the well.

* Packer is installed in R65B1 B2; water elevation cannot be measured.

TABLE 10
 2015 MONITORING AND REPORTING SCHEDULES
 RAYTHEON COMPANY – FORMER FACILITY
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Wells Monitored Annually		
"A" Aquifer	"B1" Aquifer	"B2" Aquifer
24A	007B1	I-1B2
83A	94B1	R-17B2
100A	97B1	
R-52A	RAY-1B1	
RAY-1A		

Wells Monitored Every Five Years		
"A" Aquifer	"B1" Aquifer	"B2" Aquifer
R-36A	R-7B1	R-27B2
R-41A	R-67B1	R-39B2
R-60A	RP-19B	R-65B1B2
R-72A	RP-21B	R-68B2
RE-07A	RP-23B	RE-1B2
RE-08A	RP-24B	
RE-09A	RP-41B	
RE-10A	RP-43B	
RE-23A		
RE-24A		
RE-25A		

Reporting Schedule		
Report	Agency	Frequency
NPDES	RWQCB	Quarterly (Submitted on the 15th day of February, May, August and September of each year)
Annual Progress Report	US EPA	Annually (submitted in April of each year)

TABLE 11
 2015 SUMMARY OF SITE-SPECIFIC MONITORING WELL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

	Location Id	100A	24A	24A	7B1	83A	94B1
	Sample Date	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015
	Sample Type	REG	FD	REG	REG	REG	REG
Parameter Name	Units						
1,1,1-TRICHLOROETHANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	0.0073	ND 0.0017
TRICHLOROETHENE	mg/L	0.0018	0.34	0.26	ND 0.0005	0.33	0.21
VINYL CHLORIDE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
CIS-1,2-DICHLOROETHENE	mg/L	0.080	1.8	1.7	0.0049	0.18	0.02
TRANS-1,2-DICHLOROETHENE	mg/L	0.0013	ND 0.017	ND 0.017	ND 0.0005	0.0035	ND 0.0017
1,1-DICHLOROETHANE	mg/L	0.0024	ND 0.017	ND 0.017	ND 0.0005	0.0053	ND 0.0017
1,1-DICHLOROETHENE	mg/L	0.0018	ND 0.017	ND 0.017	ND 0.0005	0.0086	0.003
1,1,2-TRICHLOROETHANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
TETRACHLOROETHENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	0.0012	ND 0.0017
METHYLENE CHLORIDE	mg/L	ND 0.020	ND 0.670	ND 0.670	ND 0.020	ND 0.020	ND 0.067
FREON 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	mg/L	ND 0.0020	ND 0.067	ND 0.067	ND 0.0020	0.028	ND 0.0067
CHLOROFORM	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
TRICHLOROFLUOROMETHANE	mg/L	ND 0.0010	ND 0.033	ND 0.033	ND 0.0010	ND 0.0010	ND 0.0033
1,1,2,2-TETRACHLOROETHANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
1,2-DICHLOROBENZENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
BROMODICHLOROMETHANE (Dichlorobromomethane)	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
BROMOFORM	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
BROMOMETHANE	mg/L	ND 0.0010	ND 0.033	ND 0.033	ND 0.0010	ND 0.0010	ND 0.0033
CARBON TETRACHLORIDE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
CHLOROBENZENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
CHLOROETHANE	mg/L	ND 0.0010	ND 0.033	ND 0.033	ND 0.0010	ND 0.0010	ND 0.0033
CHLOROMETHANE	mg/L	ND 0.0010	ND 0.033	ND 0.033	ND 0.0010	ND 0.0010	ND 0.0033

Notes:

All results are in milligrams per liter (mg/L)
 ND - denotes result was below the detection limit
 NT - sample not tested for the given parameter

TABLE 11
 2015 SUMMARY OF SITE-SPECIFIC MONITORING WELL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

	Location Id	100A	24A	24A	7B1	83A	94B1
	Sample Date	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015
	Sample Type	REG	FD	REG	REG	REG	REG
Parameter Name	Units						
DIBROMOCHLOROMETHANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
1,3-DICHLOROBENZENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
1,4-DICHLOROBENZENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
1,2-DICHLOROETHANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
1,2-DICHLOROPROPANE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
CIS-1,3-DICHLOROPROPENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017
TRANS-1,3-DICHLOROPROPENE	mg/L	ND 0.0005	ND 0.017	ND 0.017	ND 0.0005	ND 0.0005	ND 0.0017

Notes:

All results are in milligrams per liter (mg/L)
 ND - denotes result was below the detection limit
 NT - sample not tested for the given parameter

TABLE 11
 2015 SUMMARY OF SITE-SPECIFIC MONITORING WELL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

	Location Id	97B1	I-1B2	R17B2	R52A	RAY-1A	RAY-1B1
	Sample Date	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015
	Sample Type	REG	REG	REG	REG	REG	REG
Parameter Name	Units						
1,1,1-TRICHLOROETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
TRICHLOROETHENE	mg/L	0.57	0.14	0.044	1.8	0.45	0.3
VINYL CHLORIDE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
CIS-1,2-DICHLOROETHENE	mg/L	0.049	0.0016	0.19	0.092	0.13	0.045
TRANS-1,2-DICHLOROETHENE	mg/L	ND 0.0050	ND 0.0013	0.0015	ND 0.010	ND 0.0025	ND 0.0025
1,1-DICHLOROETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	0.0037	ND 0.0025
1,1-DICHLOROETHENE	mg/L	0.0058	ND 0.0013	0.0008	ND 0.010	0.0045	0.0033
1,1,2-TRICHLOROETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
TETRACHLOROETHENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
METHYLENE CHLORIDE	mg/L	ND 0.200	ND 0.050	ND 0.020	ND 0.400	ND 0.100	ND 0.100
FREON 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	mg/L	ND 0.020	ND 0.0050	ND 0.0020	ND 0.040	ND 0.010	ND 0.010
CHLOROFORM	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
TRICHLOROFLUOROMETHANE	mg/L	ND 0.010	ND 0.0025	ND 0.0010	ND 0.020	ND 0.0050	ND 0.0050
1,1,2,2-TETRACHLOROETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
1,2-DICHLOROBENZENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	0.006	ND 0.0025
BROMODICHLOROMETHANE (Dichlorobromomethane)	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
BROMOFORM	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
BROMOMETHANE	mg/L	ND 0.010	ND 0.0025	ND 0.0010	ND 0.020	ND 0.0050	ND 0.0050
CARBON TETRACHLORIDE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
CHLOROBENZENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
CHLOROETHANE	mg/L	ND 0.010	ND 0.0025	ND 0.0010	ND 0.020	ND 0.0050	ND 0.0050
CHLOROMETHANE	mg/L	ND 0.010	ND 0.0025	ND 0.0010	ND 0.020	ND 0.0050	ND 0.0050

Notes:

All results are in milligrams per liter (mg/L)
 ND - denotes result was below the detection limit
 NT - sample not tested for the given parameter

TABLE 11
 2015 SUMMARY OF SITE-SPECIFIC MONITORING WELL DATA
 RAYTHEON COMPANY FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

	Location Id	97B1	I-1B2	R17B2	R52A	RAY-1A	RAY-1B1
	Sample Date	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015	10/22/2015
	Sample Type	REG	REG	REG	REG	REG	REG
Parameter Name	Units						
DIBROMOCHLOROMETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
1,3-DICHLOROBENZENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
1,4-DICHLOROBENZENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
1,2-DICHLOROETHANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
1,2-DICHLOROPROPANE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
CIS-1,3-DICHLOROPROPENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025
TRANS-1,3-DICHLOROPROPENE	mg/L	ND 0.0050	ND 0.0013	ND 0.0005	ND 0.010	ND 0.0025	ND 0.0025

Notes:

All results are in milligrams per liter (mg/L)
 ND - denotes result was below the detection limit
 NT - sample not tested for the given parameter

TABLE 12
MANN-KENDALL TRICHLOROETHENE TREND ANALYSIS
BASED ON ANNUAL SITE SPECIFIC MONITORING WELL DATA
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

Most Recent 10-Year Period (2006 – 2015)							
Location	Number of Records	Number of Positive Differences	Number of Negative Differences	Number of Ties	Mann-Kendall Statistic (S)	Probability	Trend
100A	10	4	40	1	-36	0	Down
24A	10	25	20	0	5	0.728	None
7B1	10	7	32	6	-25	0.028	Down
83A	10	41	4	0	37	0	Up
94B1	10	1	43	1	-42	0	Down
97B1	10	14	31	0	-17	0.156	None
I-1B2	10	6	37	2	-31	0.004	Down
R17B2	11	12	43	0	-31	0.016	Down
R52A	10	35	8	2	27	0.016	Up
RAY-1A	10	29	16	0	13	0.292	None
RAY-1B1	10	3	38	4	-35	0	Down

Since the Beginning of Routine Annual Sampling (1997 – 2015)							
Location	Number of Records	Number of Positive Differences	Number of Negative Differences	Number of Ties	Mann-Kendall Statistic (S)	Probability	Trend
100A	21	7	200	3	-193	0	Down
24A	20	105	83	2	22	0.5	None
7B1	21	33	171	6	-138	0	Down
83A	21	83	120	7	-37	0.281	None
94B1	21	25	183	2	-158	0	Down
97B1	22	102	127	2	-25	0.504	None
I-1B2	22	24	204	3	-180	0	Down
R17B2	22	50	180	1	-130	0	Down
R52A	21	118	89	3	29	0.403	None
RAY-1A	21	65	142	3	-77	0.02	Down
RAY-1B1	21	39	166	5	-127	0	Down

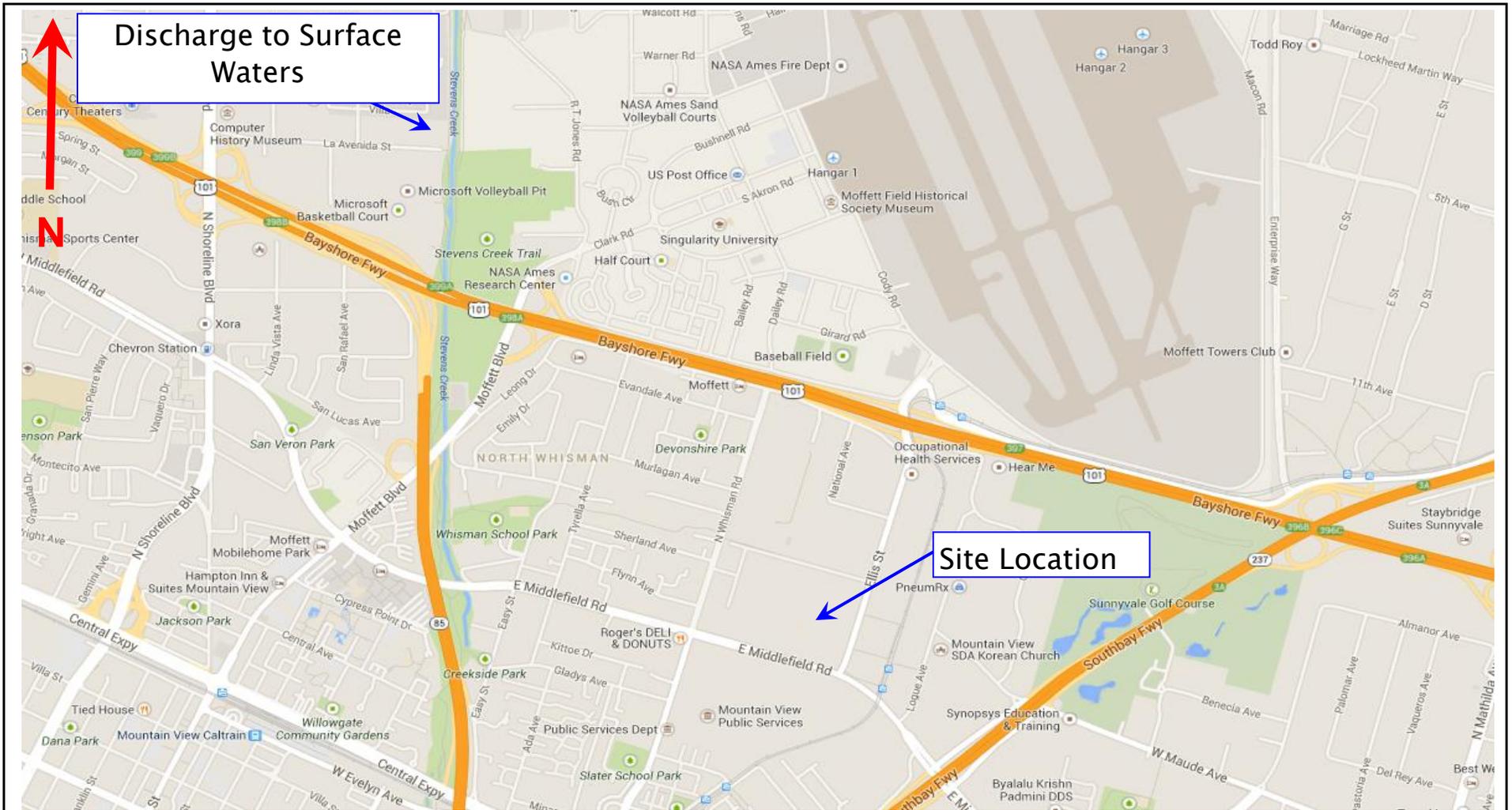
NOTES:

Field duplicates are included in the analysis by taking the average value of the regular sample and the field duplicate for a given sampling event.

A significance level of 0.05 was used.

All non-detects were set to a common value lower than any of the detected values.

Figures



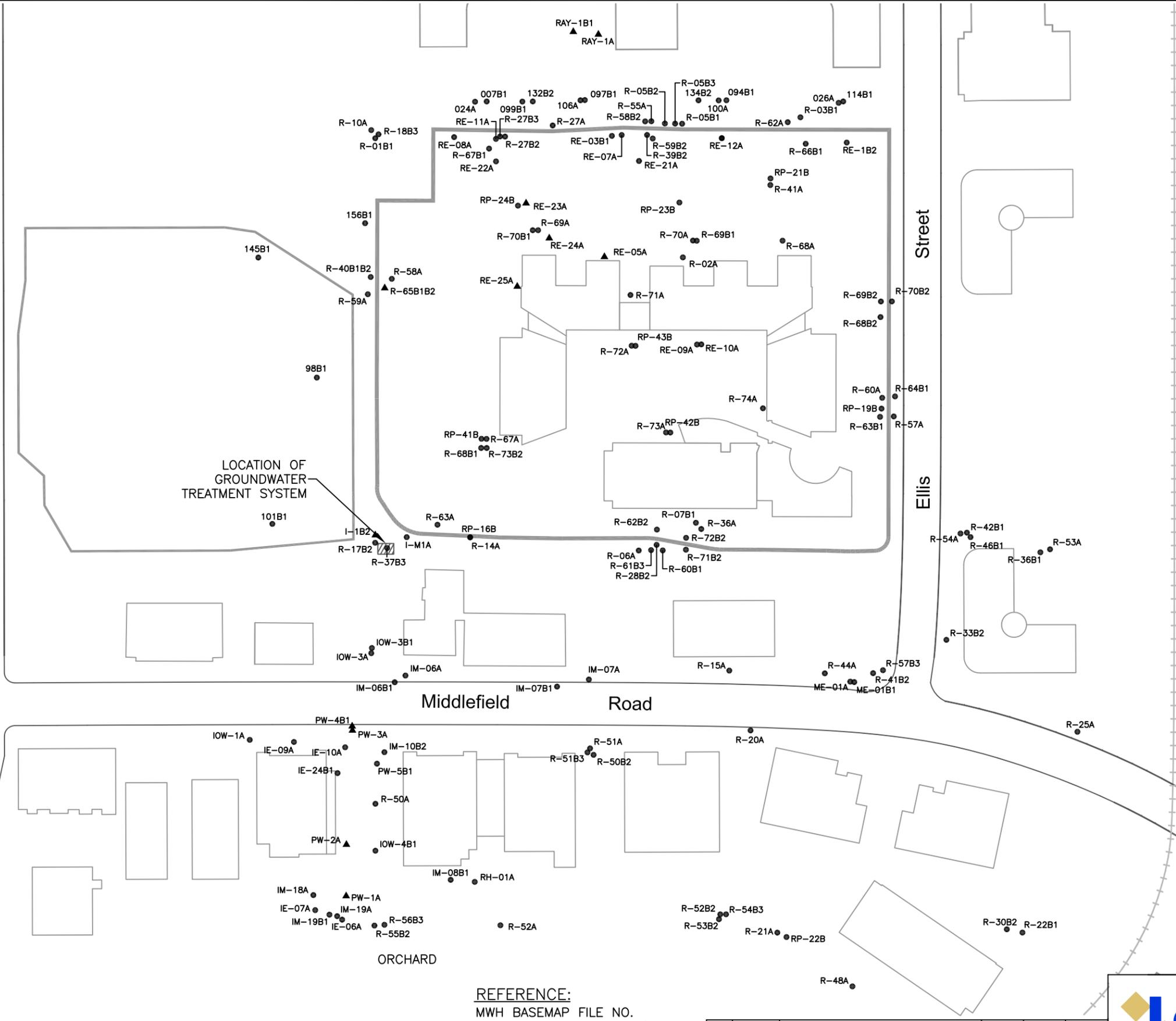
Map Data © 2014 Google

Figure 1
 Site Location Map
 350 Ellis Street
 Mountain View, California





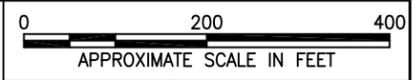
- LEGEND:**
-  SLURRY WALL
 -  GROUNDWATER EXTRACTION WELL
 -  GROUNDWATER MONITORING WELL



LOCATION OF
GROUNDWATER
TREATMENT SYSTEM

BASE MAP
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
PREPARED FOR
RAYTHEON COMPANY

REFERENCE:
MWH BASEMAP FILE NO.
USCKIS-INDSURINDUSTRIAL\
MLUBKE\RAYTHEON SM A
AQUIFER DATED: AUGUST 22, 2002



No.	DATE	ISSUE / REVISION	CWC DWN. BY	AJK CK'D BY	JAM AP'D BY
		ISSUED FOR REPORT			

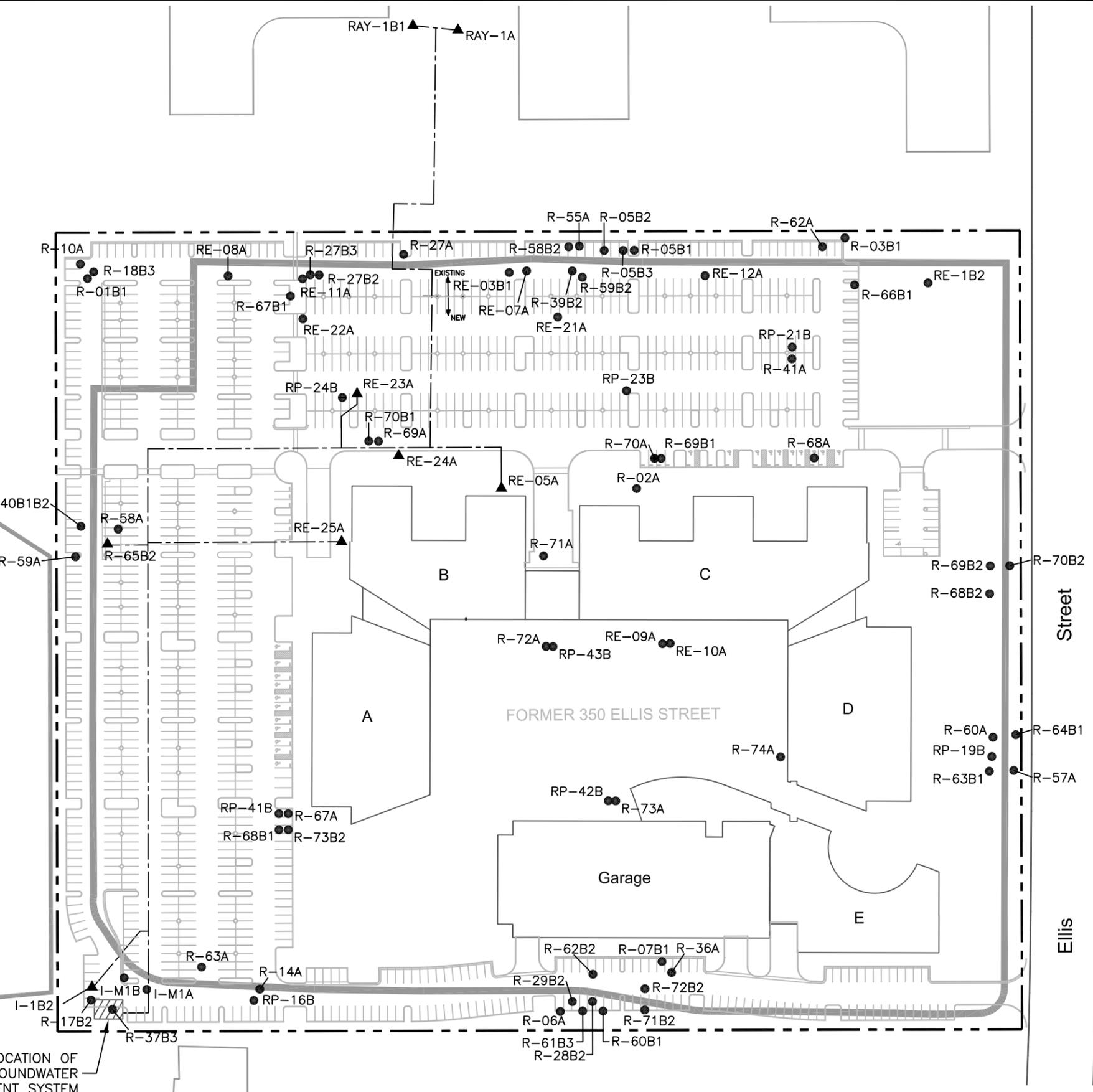
DRAWING NO.	23-016-B197
FIGURE 2	

FILE NAME: Z:\LOCUS\TEC\RAYTHEON\ELLIS MOUNTAIN VIEW\ITEMAP\2010\ITEMAP\03110\FIG2-B197-BSM.0310.DWG



- LEGEND:**
- PROPERTY BOUNDARY
 - SLURRY WALL
 - - - GROUNDWATER EXTRACTION PIPING (UNDERGROUND)
 - ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL

FILE NAME: Z:\LOCUS\TEC\RAYTHEON\ELLIS MOUNTAIN VIEW\ITEMAP\2010\ITEMAPS\0310\FIG3-B198-BSM.0310.DWG



REFERENCE:
 MWH BASE MAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM A
 AQUIFER DATED: AUGUST 22, 2002

PROPERTY BOUNDARY
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
RAYTHEON COMPANY

LOCATION OF
 GROUNDWATER
 TREATMENT SYSTEM

0 120 240
 APPROXIMATE SCALE IN FEET

DRAWING NO.	23-016-B198
FIGURE 3	

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY

FIGURE 4
TCE CONCENTRATIONS IN GROUNDWATER TREATMENT SYSTEM INFLUENT SINCE 2001
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

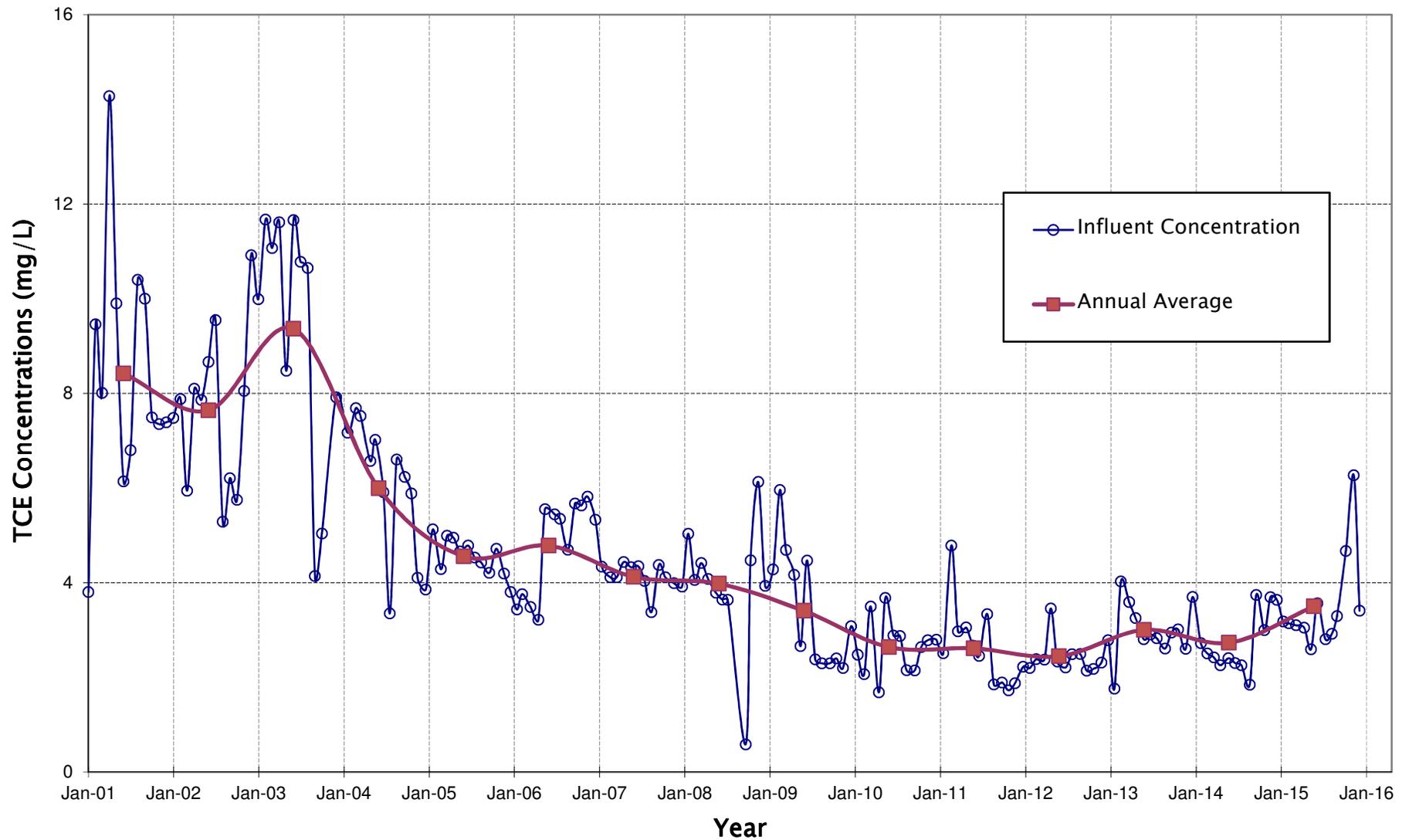


FIGURE 5
TOTAL INFLUENT GROUNDWATER CONCENTRATIONS
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA

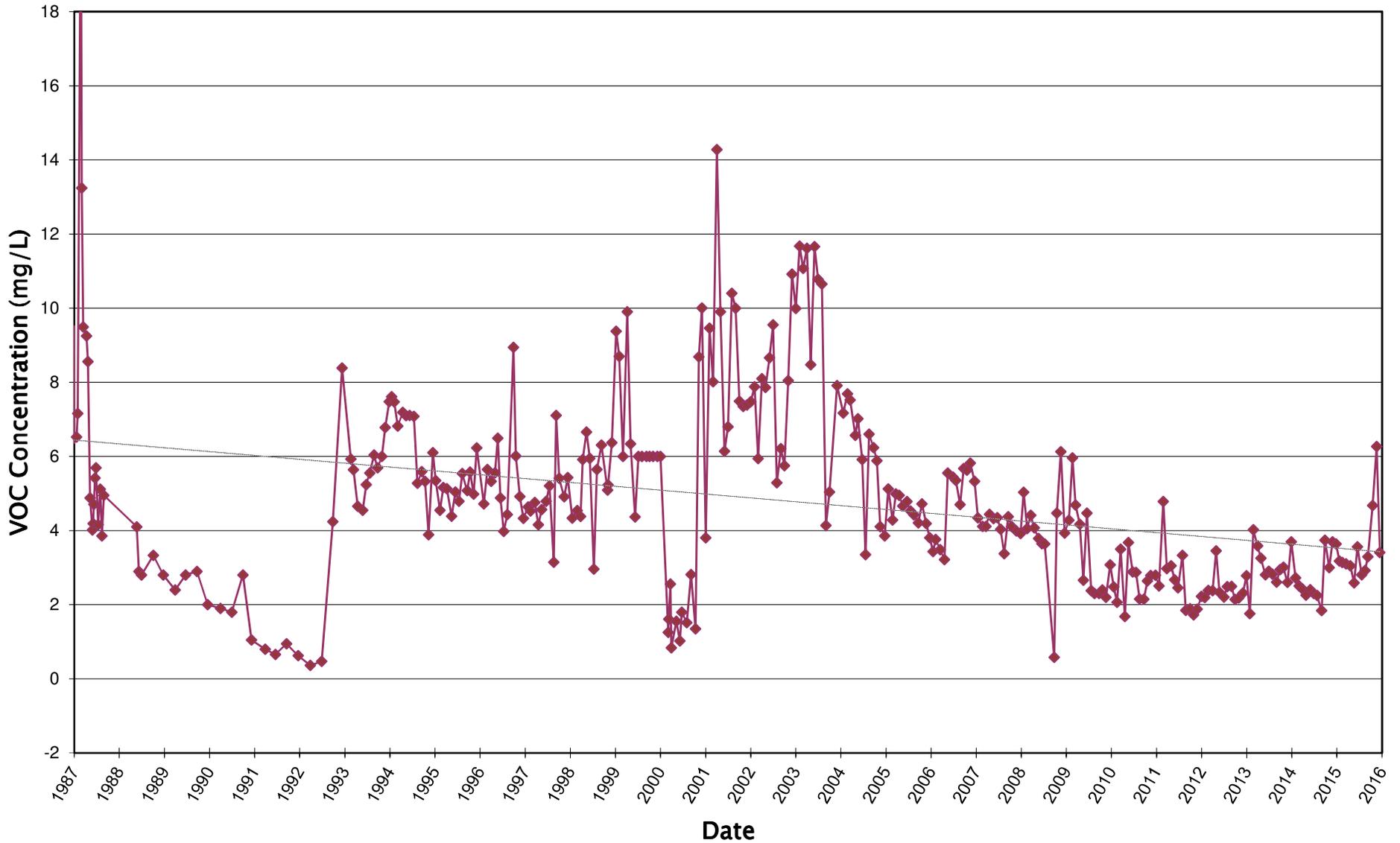
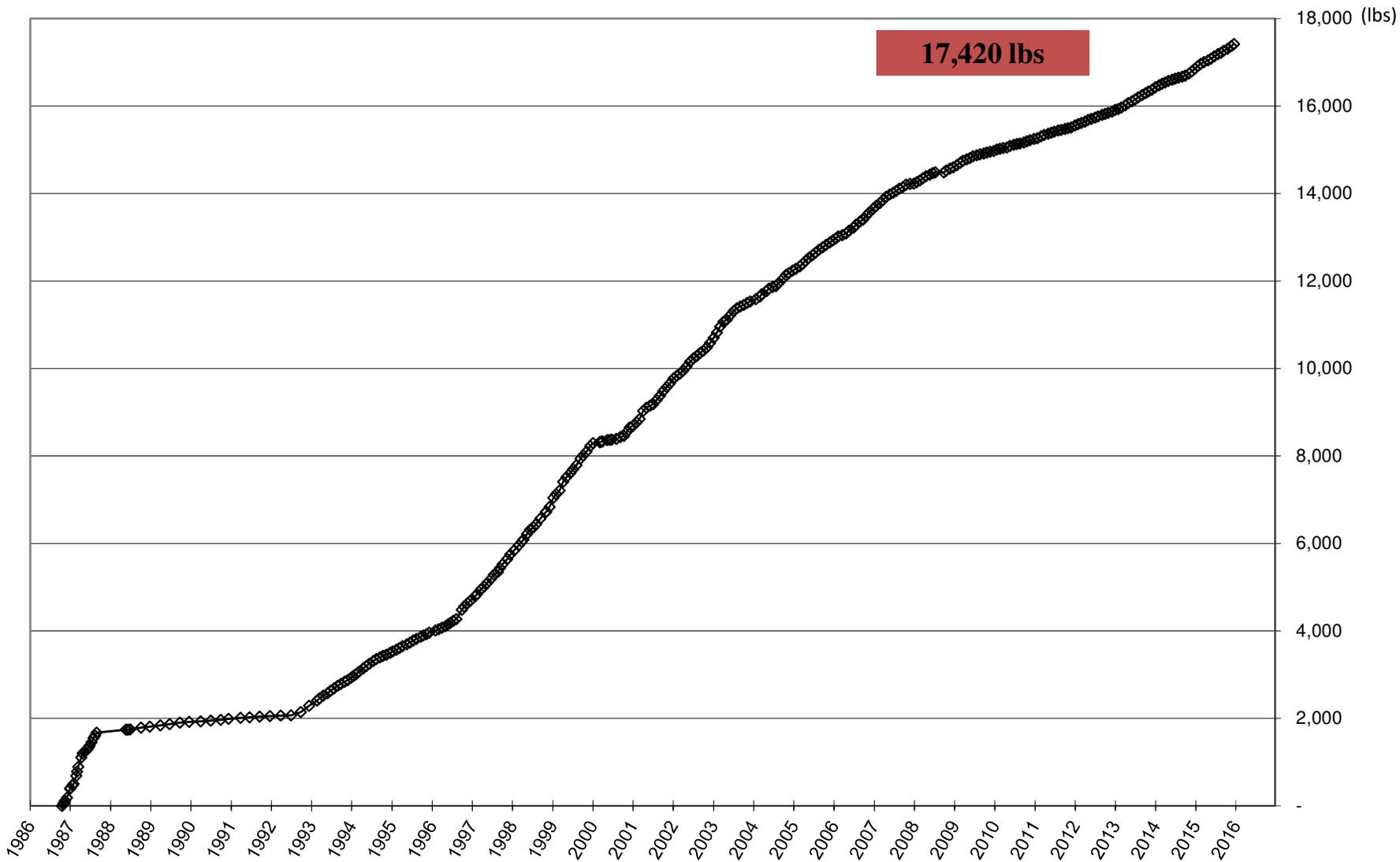
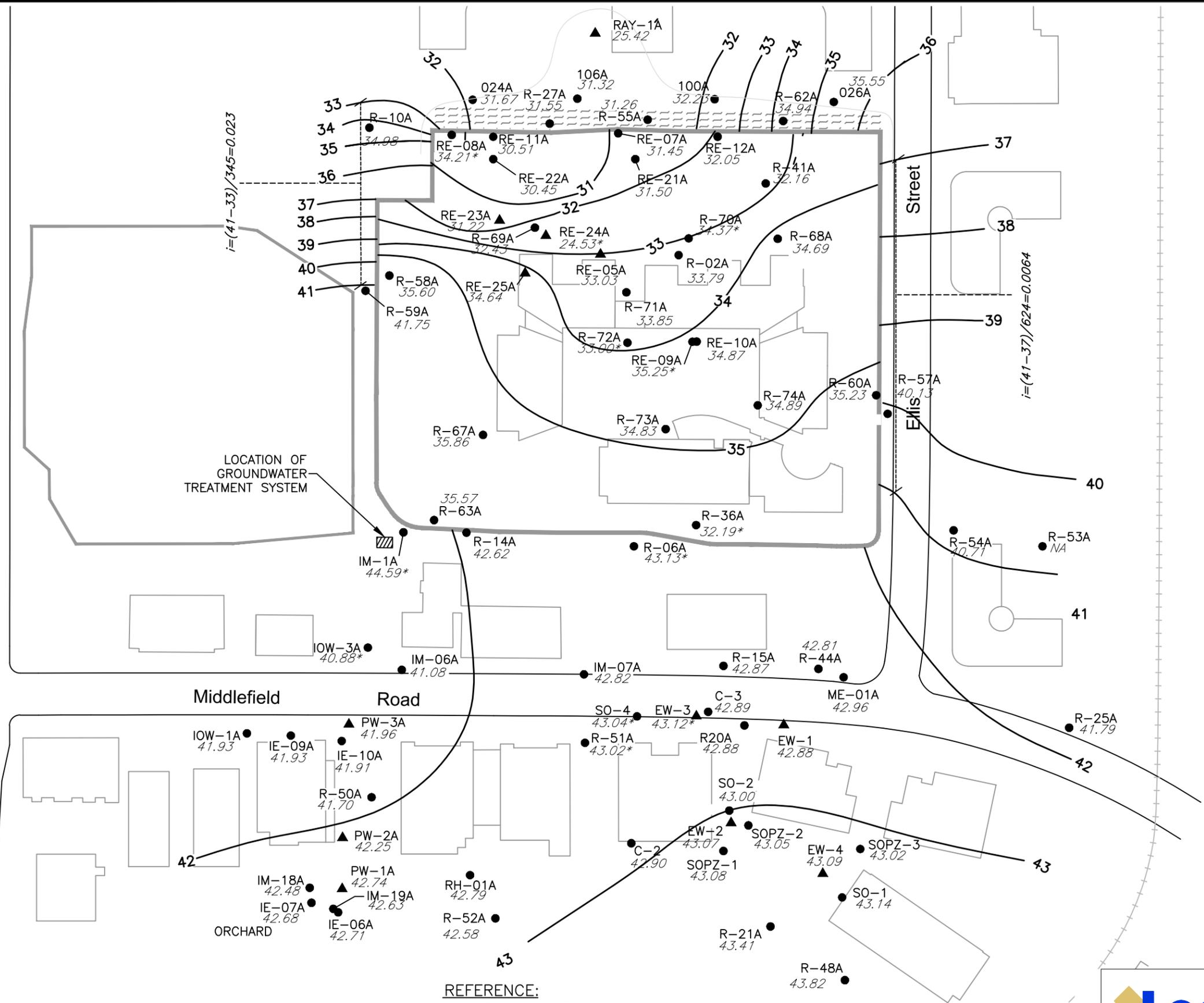


FIGURE 6
CUMULATIVE VOC MASS REMOVAL
RAYTHEON COMPANY FORMER FACILITIES
350 ELLIS STREET SITE, MOUNTAIN VIEW, CALIFORNIA



FILE NAME: I:\PROJECTS\RAYTHEON\23-016_RAYTHEON_MW\ANNUAL_RPTS\ANNUAL_2015\2015 ANNUAL REPORT FIGURES\2015 FIG 7.DWG



LOCATION OF GROUNDWATER TREATMENT SYSTEM

Middlefield Road

ORCHARD

REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM A
 AQUIFER DATED: AUGUST 22, 2002

LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 46 POTENTIOMETRIC SURFACE CONTOUR
- 46.63 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER DEPRESSION
- * NOT USED IN CONTOURING
- CAPTURE ZONE
- TARGET CAPTURE ZONE
- NA DATA NOT AVAILABLE

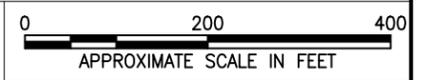
EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

RAY-1A	8.91
RE-05A	5.58
RE-23A	3.94
RE-24A	10.15
RE-25A	0.30

NOTES:

1. THE AVERAGE ONSITE HYDRAULIC GRADIENT, $i=0.015$

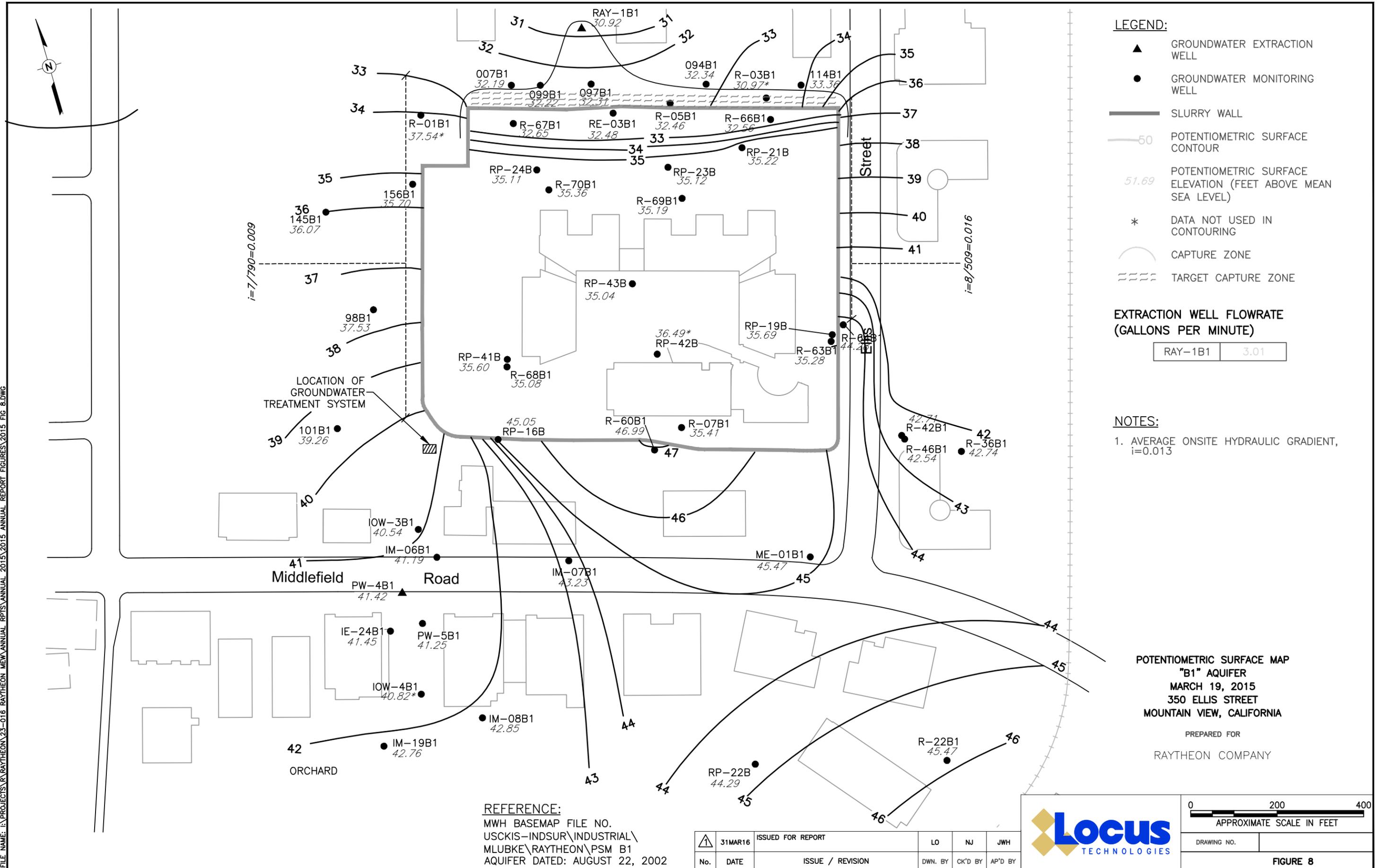
POTENTIOMETRIC SURFACE MAP
 "A" AQUIFER
 MARCH 19, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY



31MAR16	ISSUED FOR REPORT	LO	NJ	JWH	
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY

DRAWING NO.	
FIGURE 7	

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MEW\ANNUAL RPT'S\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 8.DWG



- LEGEND:**
- ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - SLURRY WALL
 - 50 POTENTIOMETRIC SURFACE CONTOUR
 - 51.69 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - * DATA NOT USED IN CONTOURING
 - CAPTURE ZONE
 - ▤▤▤▤ TARGET CAPTURE ZONE

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

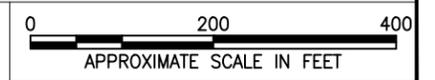
RAY-1B1	3.01
---------	------

NOTES:
 1. AVERAGE ONSITE HYDRAULIC GRADIENT, $i=0.013$

POTENTIOMETRIC SURFACE MAP
 "B1" AQUIFER
 MARCH 19, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

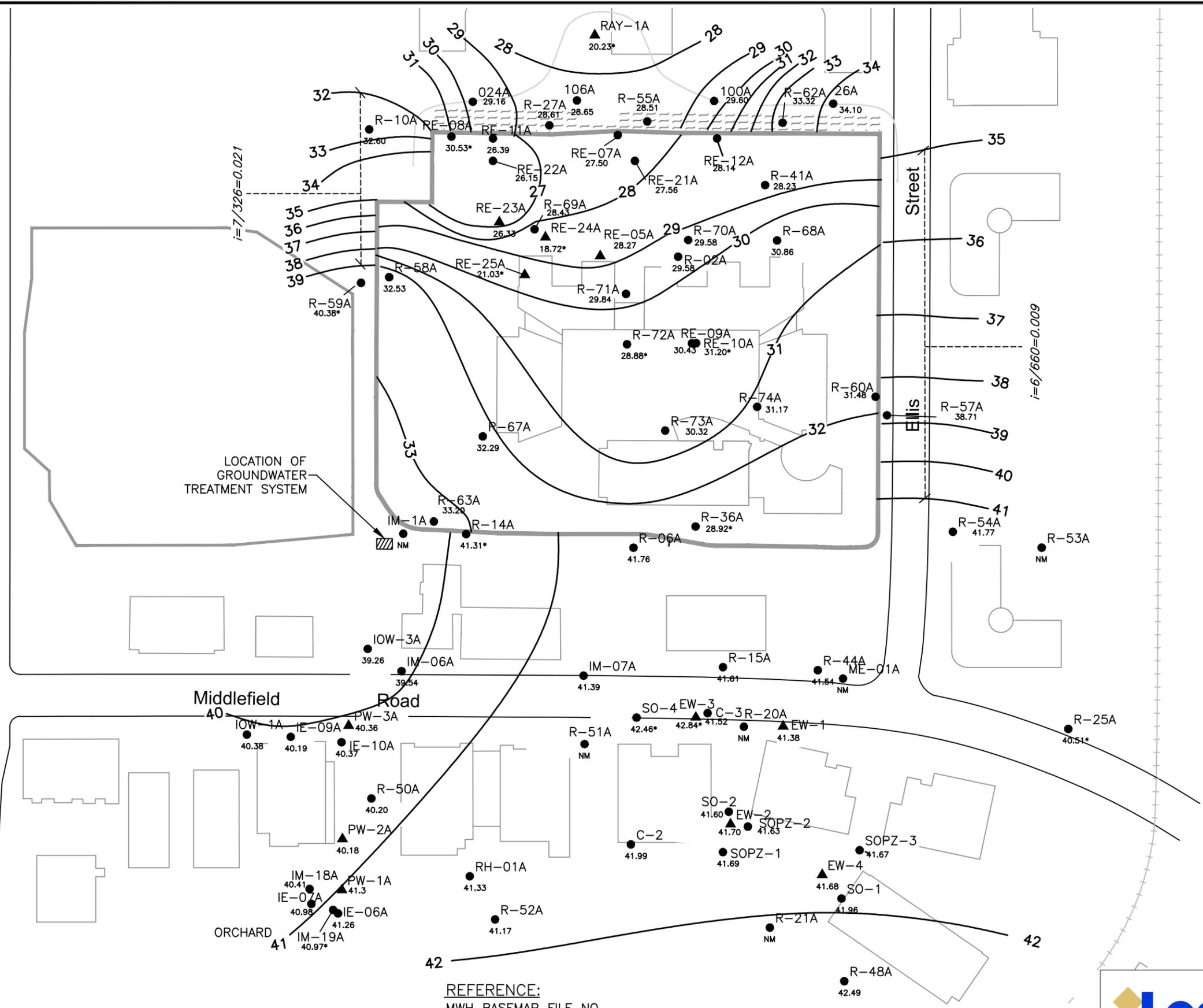
REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM B1
 AQUIFER DATED: AUGUST 22, 2002

▲	31MAR16	ISSUED FOR REPORT	LO	NJ	JWH
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 8

FILE NAME: I:\PROJECTS\RAYTHEON\23-016_RAYTHEON_MEW\ANNUAL_RPTS\ANNUAL_2015\2015 ANNUAL REPORT FIGURES\2015 FIG 9.DWG



- LEGEND:**
- ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - SLURRY WALL
 - 46 POTENTIOMETRIC SURFACE CONTOUR
 - 43.53 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - * NOT USED IN CONTOURING
 - CAPTURE ZONE
 - TARGET CAPTURE ZONE
 - NM NOT MEASURED

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

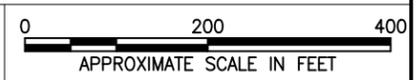
RAY-1A	9.38
RE-05A	5.16
RE-23A	4.81
RE-24A	7.97
RE-25A	0.19

- NOTES:**
1. AVERAGE ONSITE HYDRAULIC GRADIENT, $i=0.015$

POTENTIOMETRIC SURFACE MAP
 "A" AQUIFER
 SEPTEMBER 17, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

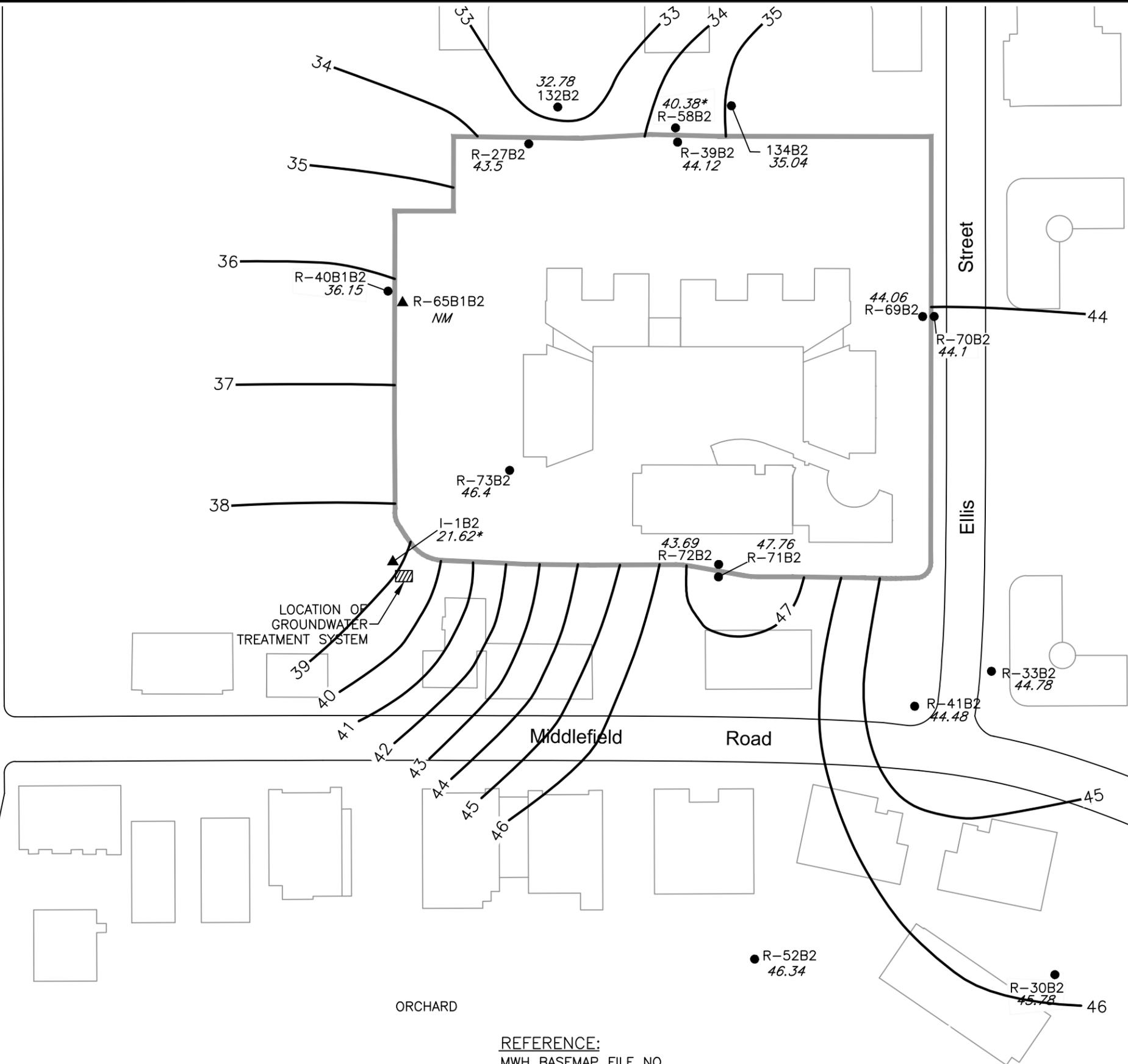
REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM A
 AQUIFER DATED: AUGUST 22, 2002

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
1	31MAR16	ISSUED FOR REPORT	LO	NJ	JWH



DRAWING NO.	
FIGURE 9	

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MHW\ANNUAL RPTS\ANNUAL REPORT FIGURES\2015 FIG 11.DWG



- LEGEND:**
- ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - SLURRY WALL
 - 44 POTENTIOMETRIC SURFACE CONTOUR
 - 49.41 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - * NOT USED IN CONTOURING
 - NM NOT MEASURED

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

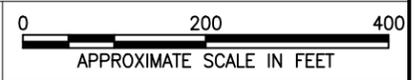
I-1B2	2.32
R-65B1B2	2.75

- NOTES:**
- R-65B1B2 IS LOCATED IN THE LOWER B2 AQUIFER.

POTENTIOMETRIC SURFACE MAP
 UPPER "B2" AQUIFER
 MARCH 19, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM UB2
 AQUIFER DATED: AUGUST 22, 2002

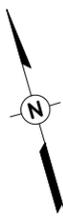
No.	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



NOTE:
 CONTOURING REPRESENTS ONE
 INTERPRETATION, OTHER
 INTERPRETATIONS ARE POSSIBLE.

DRAWING NO. _____
FIGURE 11

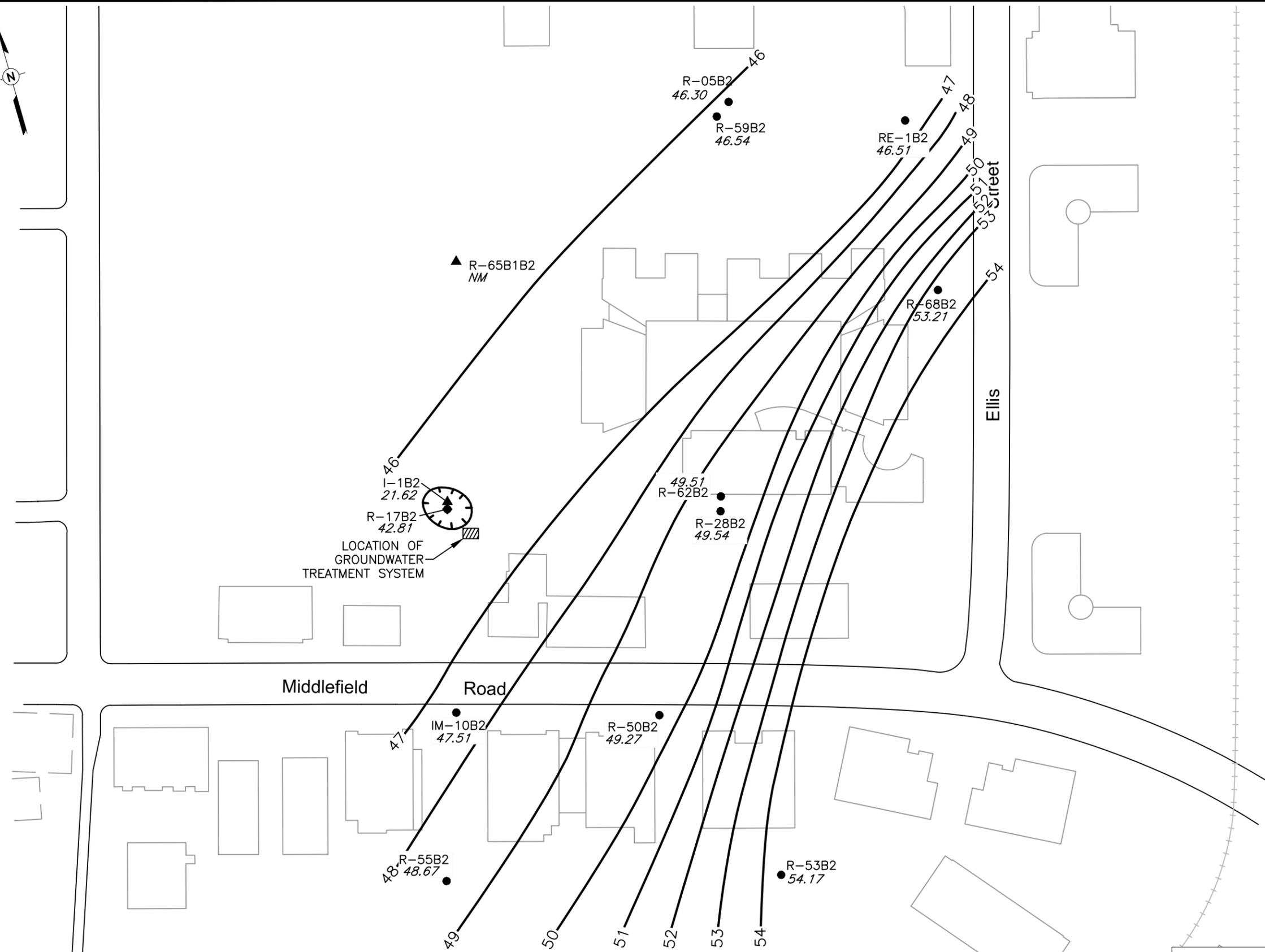
FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL REPORT FIGURES\2015 FIG 12.DWG



- LEGEND:**
- ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - ▬ SLURRY WALL
 - 54 POTENTIOMETRIC SURFACE CONTOUR
 - 63.30 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - ⊖ GROUNDWATER DEPRESSION
 - NM NOT MEASURED

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

I-1B2	2.32
R-65B1B2	2.75

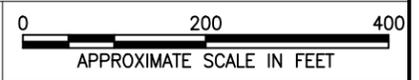


POTENTIOMETRIC SURFACE MAP
 LOWER "B2" AQUIFER
 MARCH 19, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

NOTE:
 CONTOURING REPRESENTS ONE
 INTERPRETATION, OTHER
 INTERPRETATIONS ARE POSSIBLE.

REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM LB2
 AQUIFER DATED: AUGUST 22, 2002

▲	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY

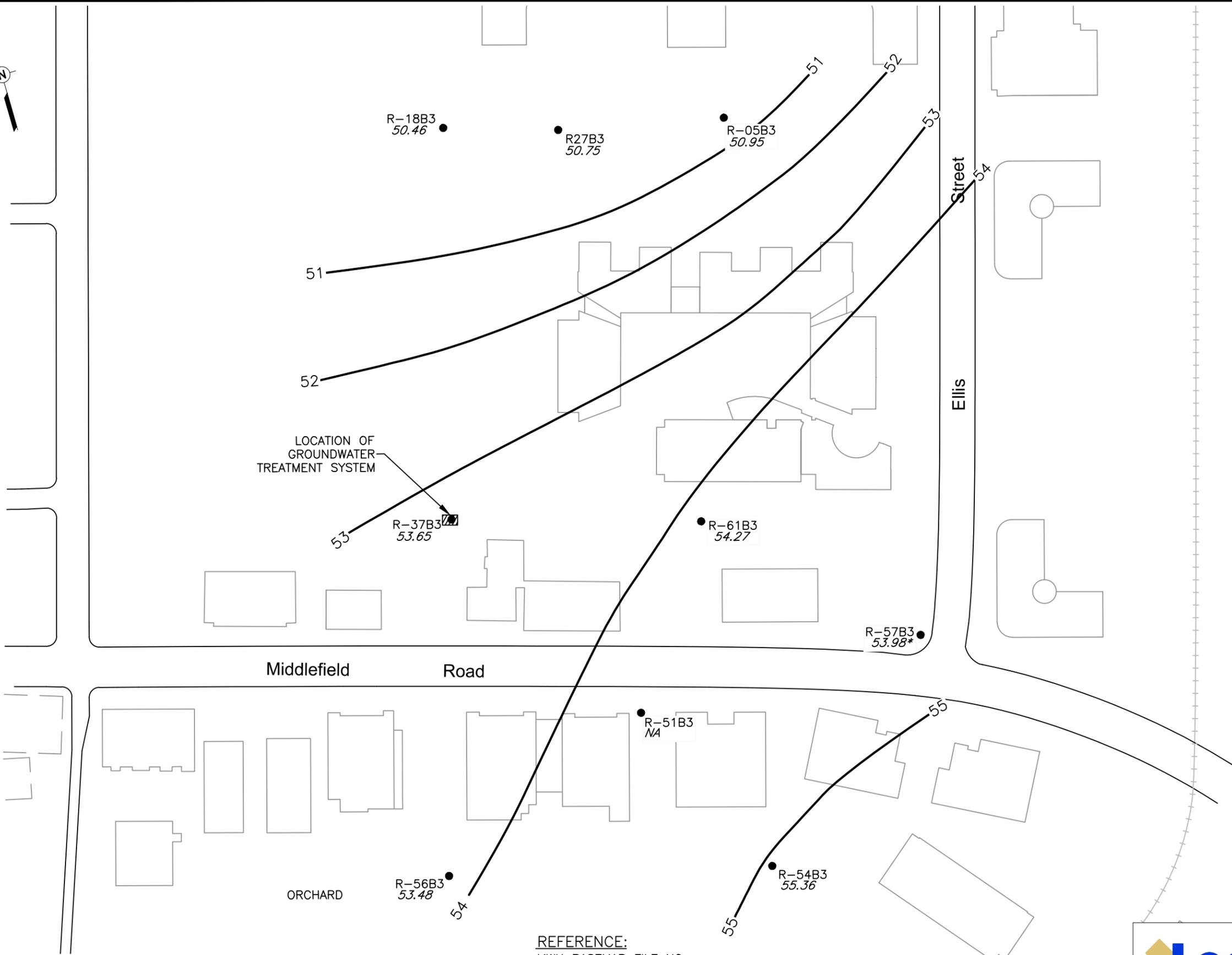


DRAWING NO.	
FIGURE 12	

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON_MW\ANNUAL_RPTS\ANNUAL_2015\2015 ANNUAL REPORT FIGURES\2015 FIG 13.DWG



- LEGEND:**
- GROUNDWATER MONITORING WELL
 - 54 POTENTIOMETRIC SURFACE CONTOUR
 - 61.53 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - NM NOT MEASURED
 - NA NOTE AVAILABLE
 - * NOT USED IN CONTOURING



LOCATION OF GROUNDWATER TREATMENT SYSTEM

Middlefield Road

Ellis Street

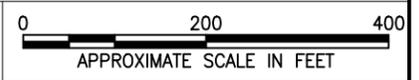
ORCHARD

POTENTIOMETRIC SURFACE MAP
 "B3" AQUIFER
 MARCH 19, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

NOTE:
 CONTOURING REPRESENTS ONE INTERPRETATION, OTHER INTERPRETATIONS ARE POSSIBLE.

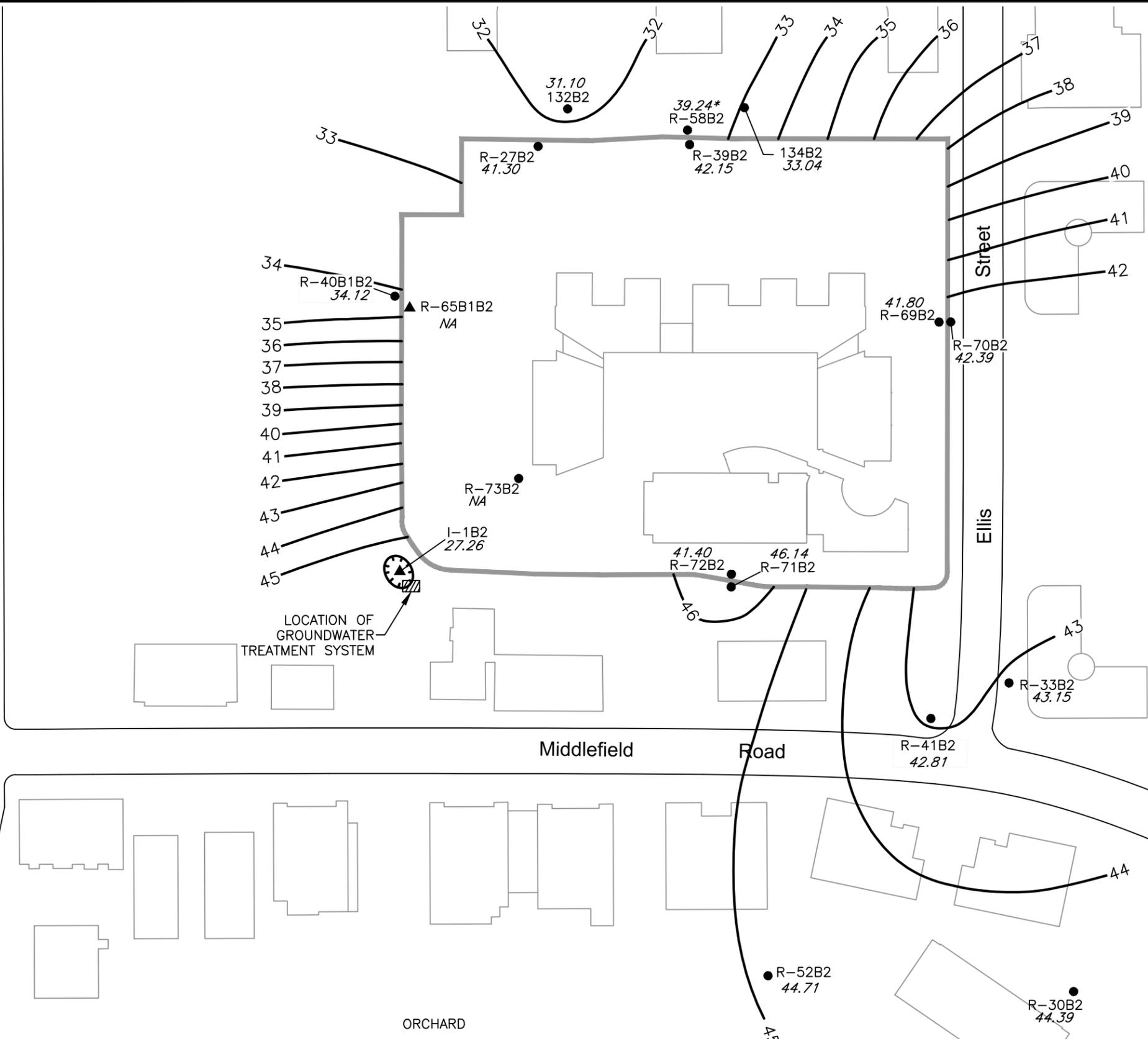
REFERENCE:
 MWH BASEMAP FILE NO. USCKIS-INDSUR\INDUSTRIAL\MLUBKE\RAYTHEON\PSM A AQUIFER DATED: AUGUST 22, 2002

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
1	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH



DRAWING NO.	
FIGURE 13	

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MFW\ANNUAL RPTS\ANNUAL REPORT FIGURES\2015 FIG 14.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 51 POTENTIOMETRIC SURFACE CONTOUR
- 49.41 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- * NOT USED IN CONTOURING
- NA DATA NOT AVAILABLE
- ⊗ GROUNDWATER DEPRESSION

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

I-1B2	2.0
R-65B1B2	2.73

NOTES:

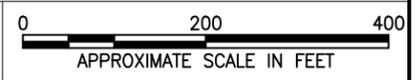
1. R-65B1B2 IS LOCATED IN THE LOWER B2 AQUIFER. PACKER INSTALLED, AND UNABLE TO TAKE GROUNDWATER MEASUREMENT.

POTENTIOMETRIC SURFACE MAP
 UPPER "B2" AQUIFER
 SEPTEMBER 17, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

REFERENCE:

MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM UB2
 AQUIFER DATED: AUGUST 22, 2002

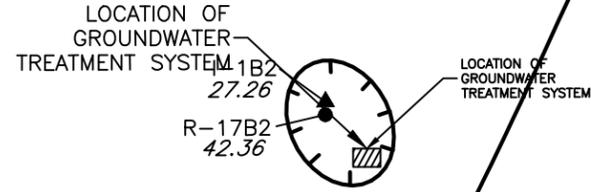
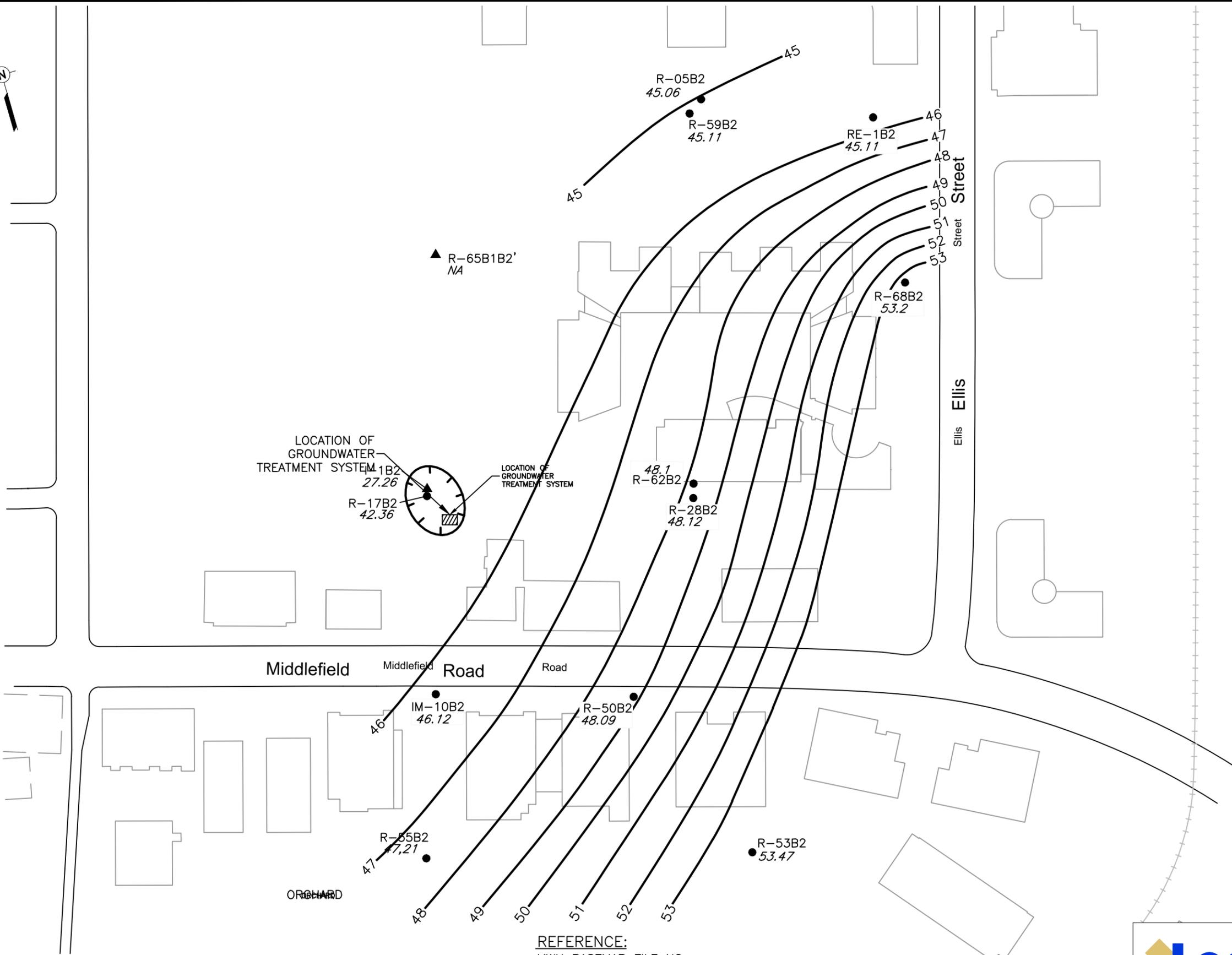
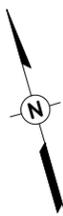
No.	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO.	
FIGURE 14	

NOTE:
 CONTOURING REPRESENTS ONE
 INTERPRETATION, OTHER
 INTERPRETATIONS ARE POSSIBLE.

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MOUNTAIN VIEW ANNUAL REPORT FIGURES\2015 FIG 15.DWG



- LEGEND:**
- ▲ GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - SLURRY WALL
 - 53 POTENTIOMETRIC SURFACE CONTOUR
 - 53.47 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - GROUNDWATER DEPRESSION
 - , R65B1(B2) UNABLE TO MEASURE. PACKER INSTALLED.
 - NM NOT MEASURED
 - * NOT USED IN CONTOURING

EXTRACTION WELL FLOWRATE (GALLONS PER MINUTE)

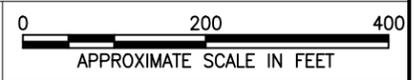
I-1B2	2.0
R-65B1B2	2.73

POTENTIOMETRIC SURFACE MAP
 LOWER "B2" AQUIFER
 SEPTEMBER 17, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

NOTE:
 CONTOURING REPRESENTS ONE
 INTERPRETATION, OTHER
 INTERPRETATIONS ARE POSSIBLE.

REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM LB2
 AQUIFER DATED: AUGUST 22, 2002

▲	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY

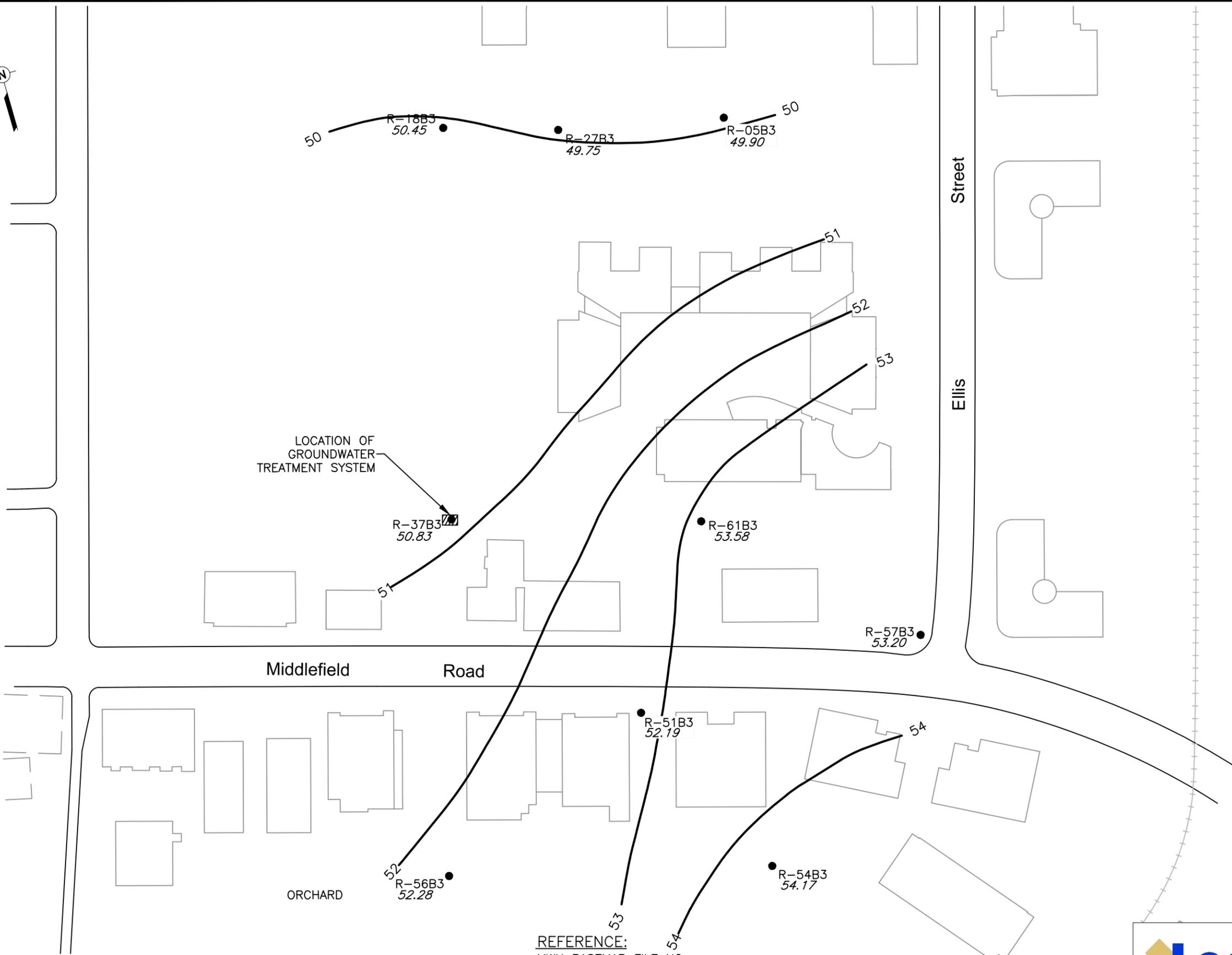


DRAWING NO.	
FIGURE 15	

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON_MW\ANNUAL_RPTS\ANNUAL_2015\2015 ANNUAL REPORT FIGURES\2015 FIG 16.DWG



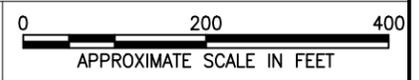
- LEGEND:**
- GROUNDWATER MONITORING WELL
 - 54 POTENTIOMETRIC SURFACE CONTOUR
 - 53.20 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MEAN SEA LEVEL)
 - * NOT USED IN CONTOURING



POTENTIOMETRIC SURFACE MAP
 "B3" AQUIFER
 SEPTEMBER 17, 2015
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

REFERENCE:
 MWH BASEMAP FILE NO.
 USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM A
 AQUIFER DATED: AUGUST 22, 2002

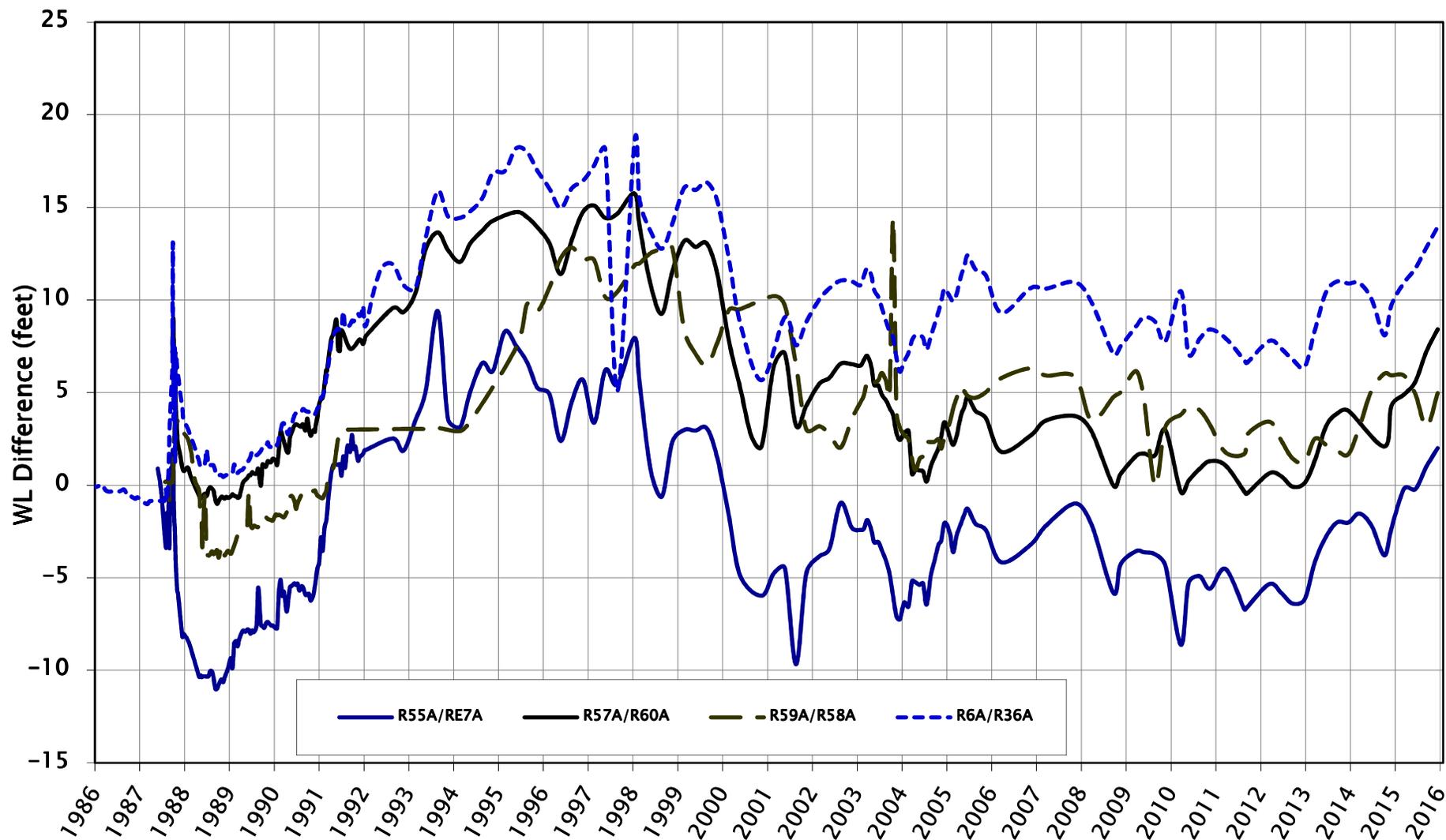
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
1	31MAR16	ISSUED FOR REPORT	AJK	NJ	JWH



NOTE:
 CONTOURING REPRESENTS ONE
 INTERPRETATION, OTHER
 INTERPRETATIONS ARE POSSIBLE.

DRAWING NO. _____
FIGURE 16

Figure 18
Water Elevation Differences Across the Slurry Wall in the "A" Aquifer
350 Ellis Street Site, Mountain View, California



Note: A positive difference indicates an inward gradient. Year

Figure 19
Water Elevation Differences Across the Slurry Wall in the "B1" Aquifer
350 Ellis Street Site, Mountain View, California

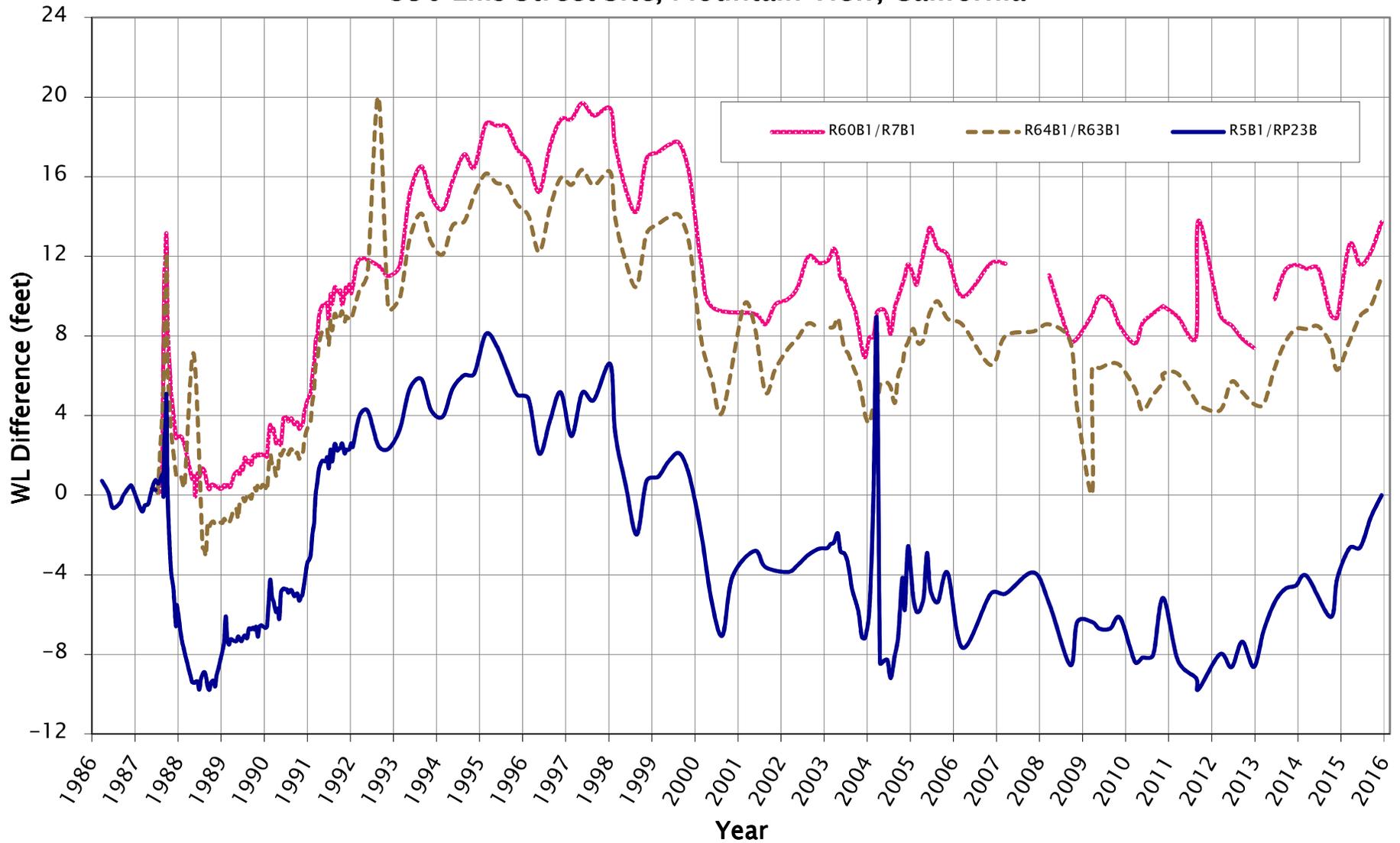
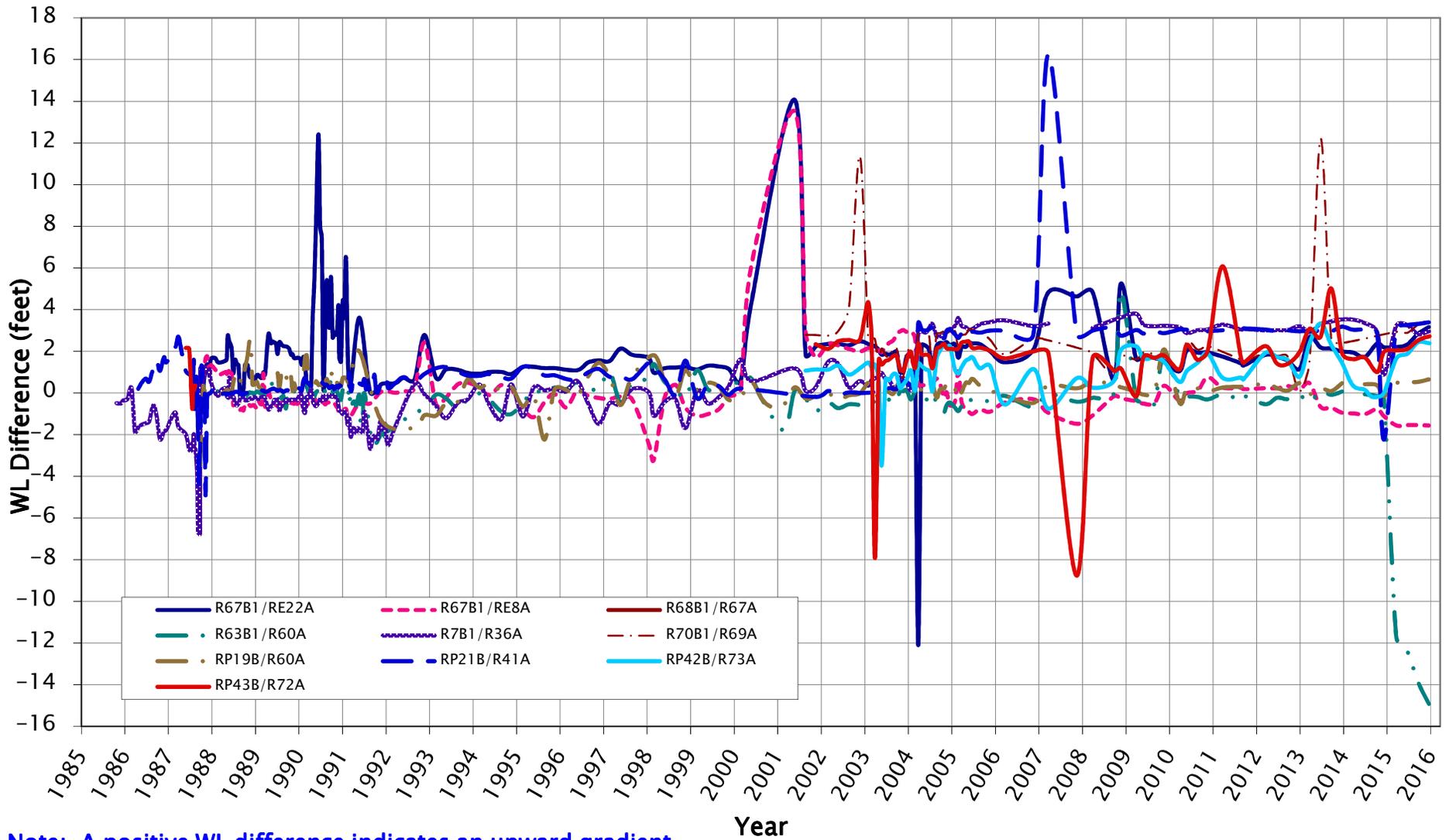
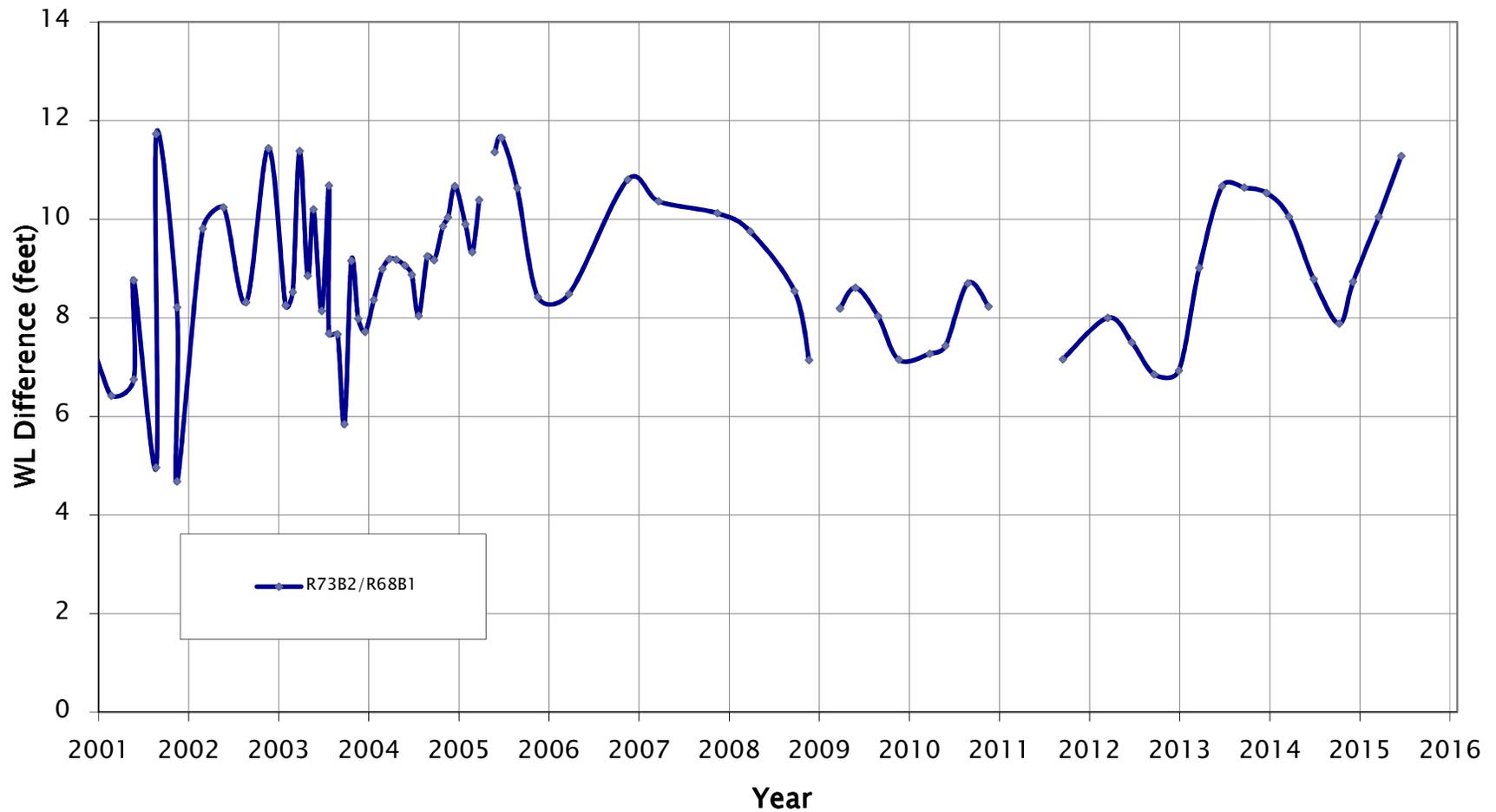


Figure 20
Water Elevation Differences Across A/B1 Aquitard
350 Ellis Street Site, Mountain View, California



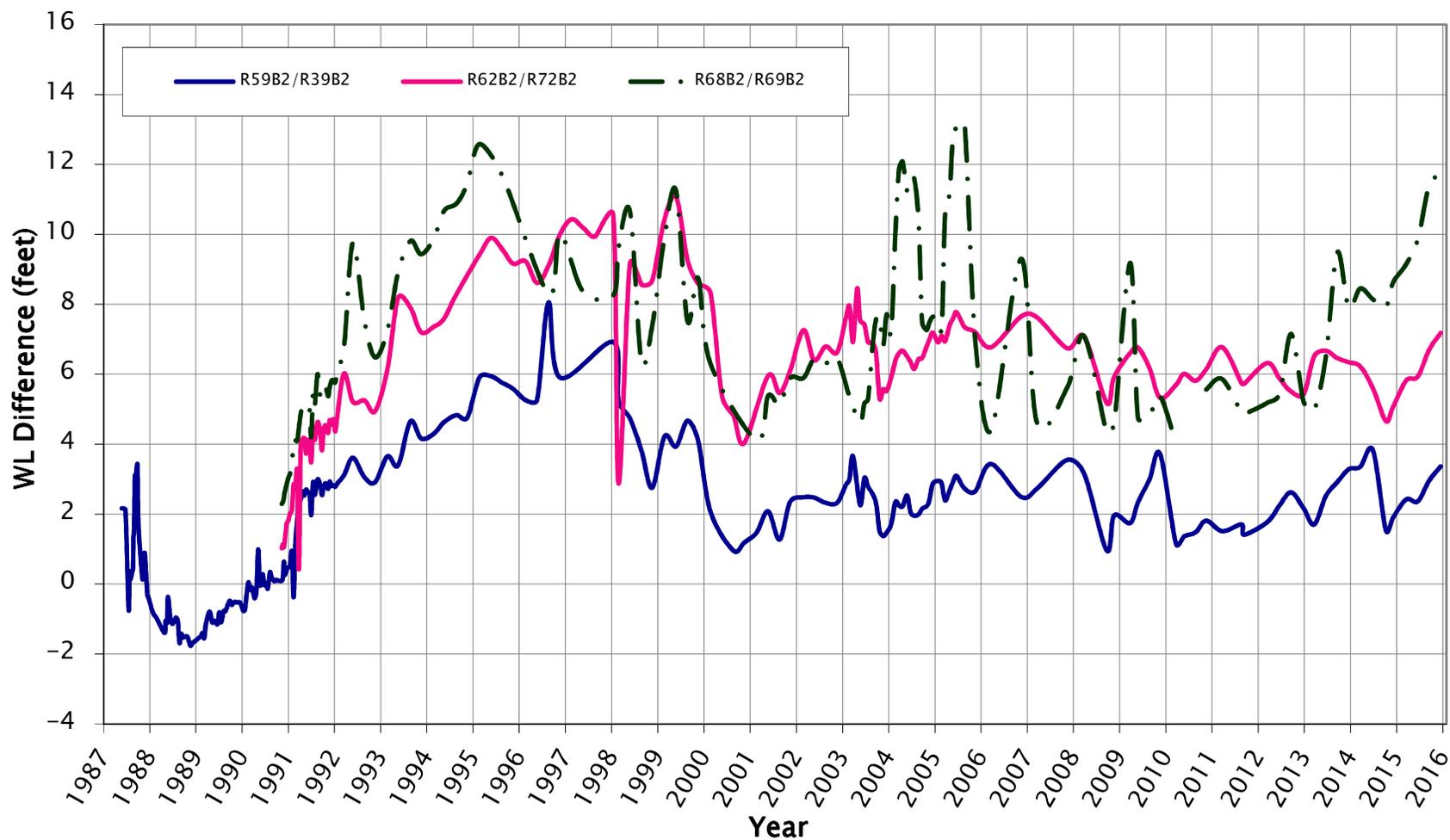
Note: A positive WL difference indicates an upward gradient.

Figure 21
Water Elevation Differences Across B1 /B2 Aquitard
350 Ellis Street Site, Mountain View, California



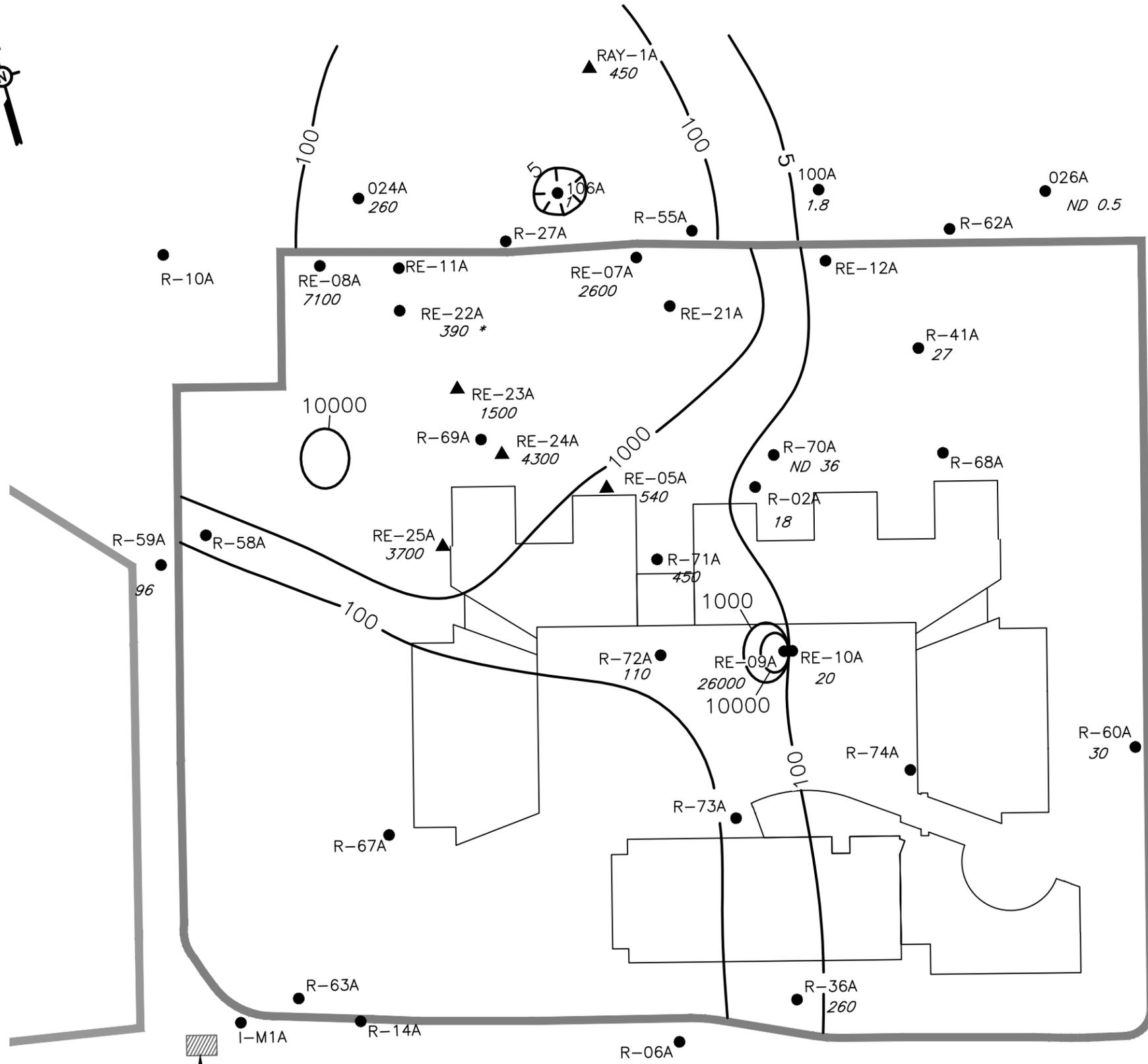
Note: A positive WL difference indicates an upward gradient.

Figure 22
Water Elevation Differences Between the Upper and Lower B2 Aquifers
350 Ellis Street Site, Mountain View, California



Note: A positive WL difference indicates an upward gradient.

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 23 - A TCE.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 TCE CONCENTRATION CONTOUR (µg/L)
- 26,000 TCE CONCENTRATION (µg/L)
- ND NOT DETECTED
- * DATA NOT USED FOR CONTOURING

NOTES:

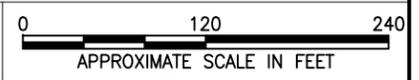
1. TCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 24A, 100A, RAY-1A

2015 TCE CONCENTRATIONS
 "A" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

LOCATION OF GROUNDWATER TREATMENT SYSTEM

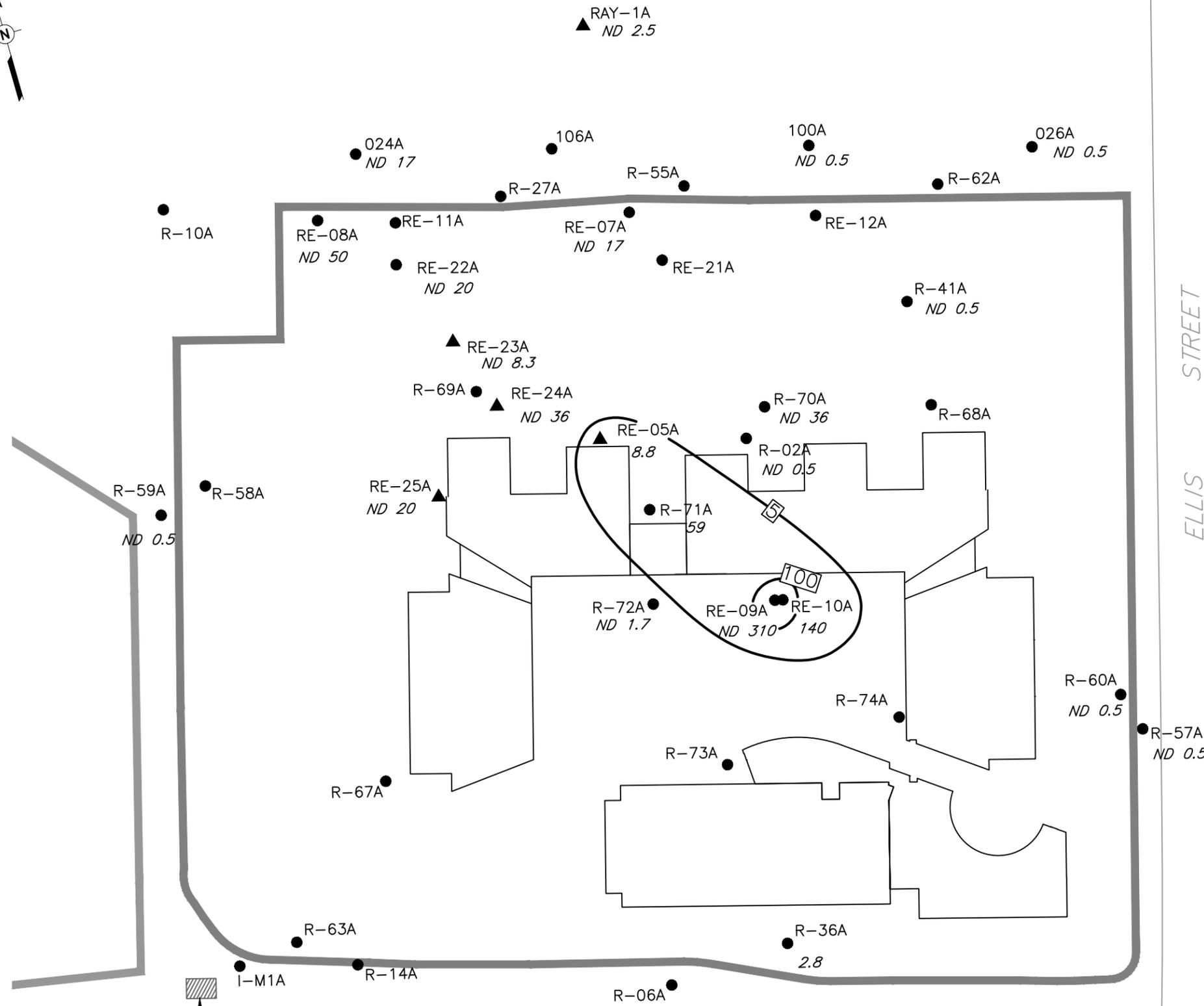
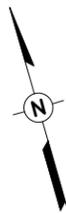
REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\MLUBKE\RAYTHEON\PSM A AQUIFER
 DATED: 22 AUGUST 2002

31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH	
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 23

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MFW\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 24 - A PCE.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 PCE CONCENTRATION CONTOUR (µg/L)
- 510 PCE CONCENTRATION (µg/L)
- ND NOT DETECTED

NOTES:

1. PCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 24A, 100A, RAY-1A

ELLIS STREET

LOCATION OF GROUNDWATER TREATMENT SYSTEM

2015 PCE CONCENTRATIONS
"A" AQUIFER
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
PREPARED FOR
RAYTHEON COMPANY

REFERENCE:

MWH BASEMAP
FILE NO. USCKIS-INDSUR\INDUSTRIAL\
MLUBKE\RAYTHEON\PSM A AQUIFER
DATED: 22 AUGUST 2002

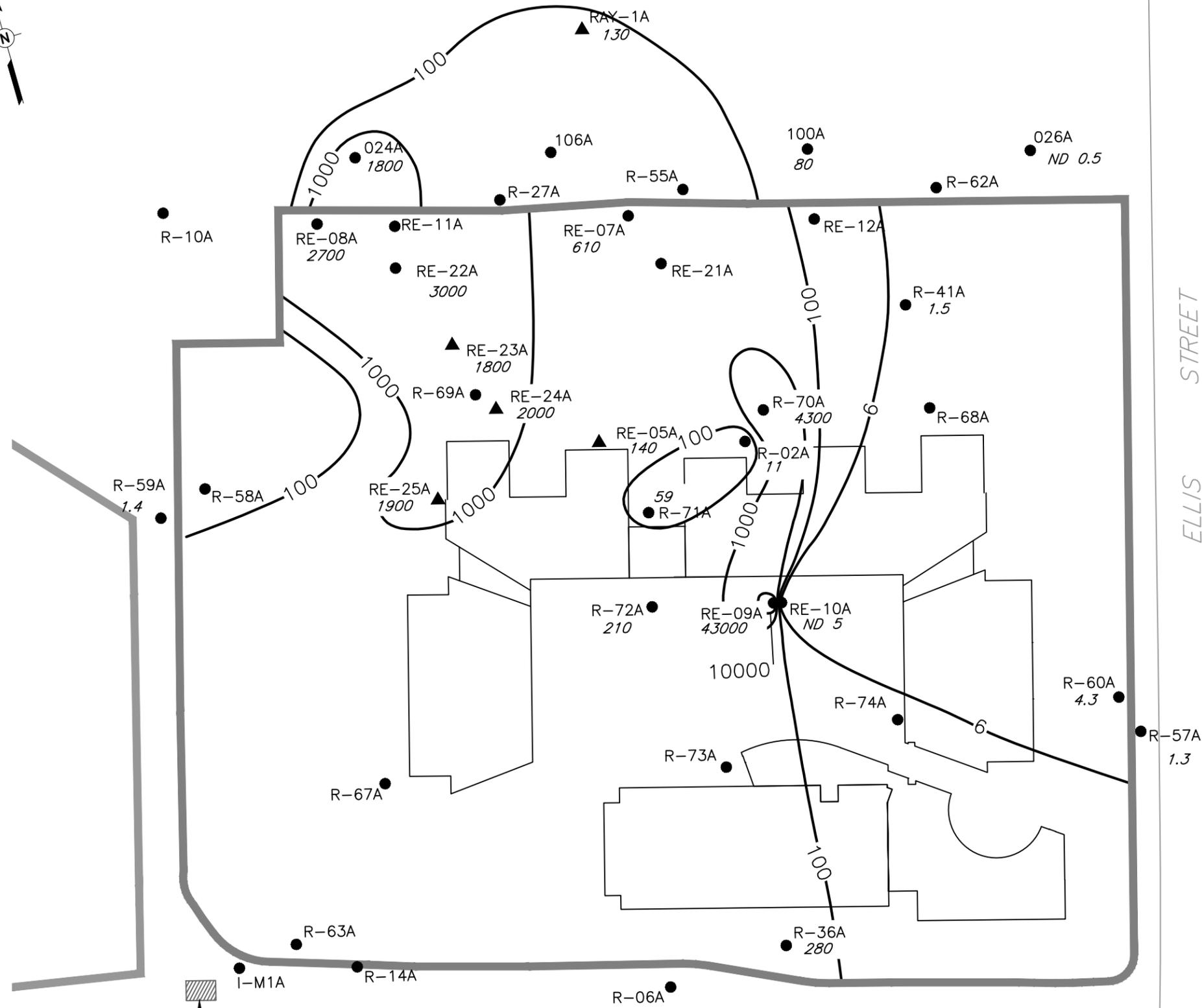
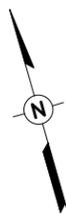
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO.

FIGURE 24

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 25 - A CIS-1,2-DCE.DWG

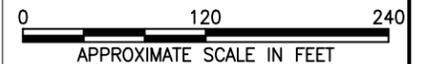


LOCATION OF
GROUNDWATER
TREATMENT SYSTEM

REFERENCE:

MWH BASEMAP
FILE NO. USCKIS-INDSUR\INDUSTRIAL\
MLUBKE\RAYTHEON\PSM A AQUIFER
DATED: 22 AUGUST 2002

No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO.

FIGURE 25

LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 cis-1,2-DCE CONCENTRATION CONTOUR(µg/L)
- 43,000 cis-1,2-DCE CONCENTRATION (µg/L)
- ND NOT DETECTED

NOTES:

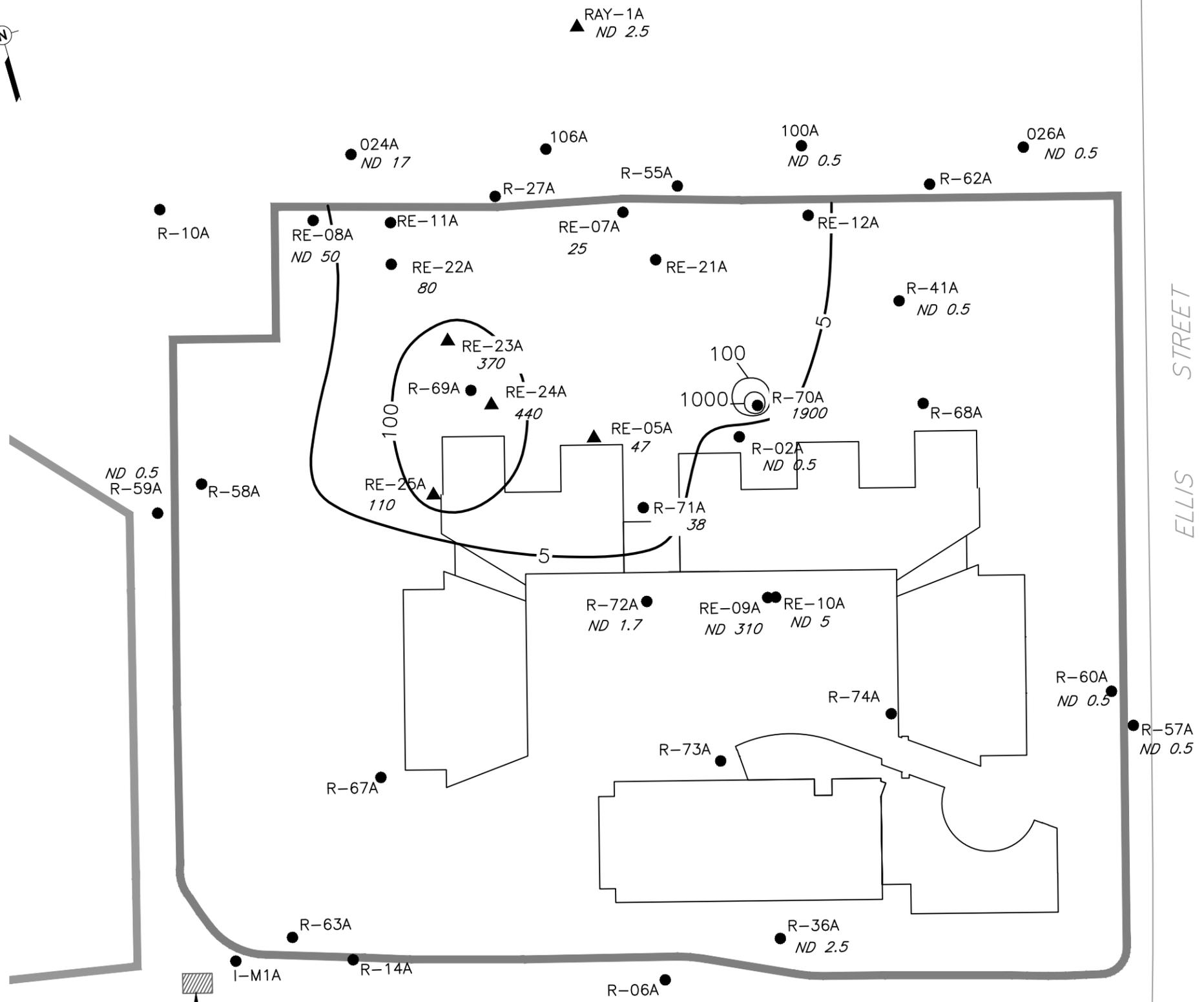
1. cis-1,2-DCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 24A, 100A, RAY-1A

2015 CIS-1,2-DCE CONCENTRATIONS
"A" AQUIFER
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
PREPARED FOR
RAYTHEON COMPANY

ELLIS STREET



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MFW\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 26 - A VC.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 VC CONCENTRATION CONTOUR (µg/L)
- 1900 VC CONCENTRATION (µg/L)
- ND NOT DETECTED

NOTES:

1. VINYL CHLORIDE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 24A, 100A, RAY-1A

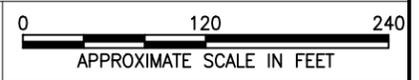
2015 VINYL CHLORIDE CONCENTRATIONS
"A" AQUIFER
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR
RAYTHEON COMPANY

LOCATION OF GROUNDWATER TREATMENT SYSTEM

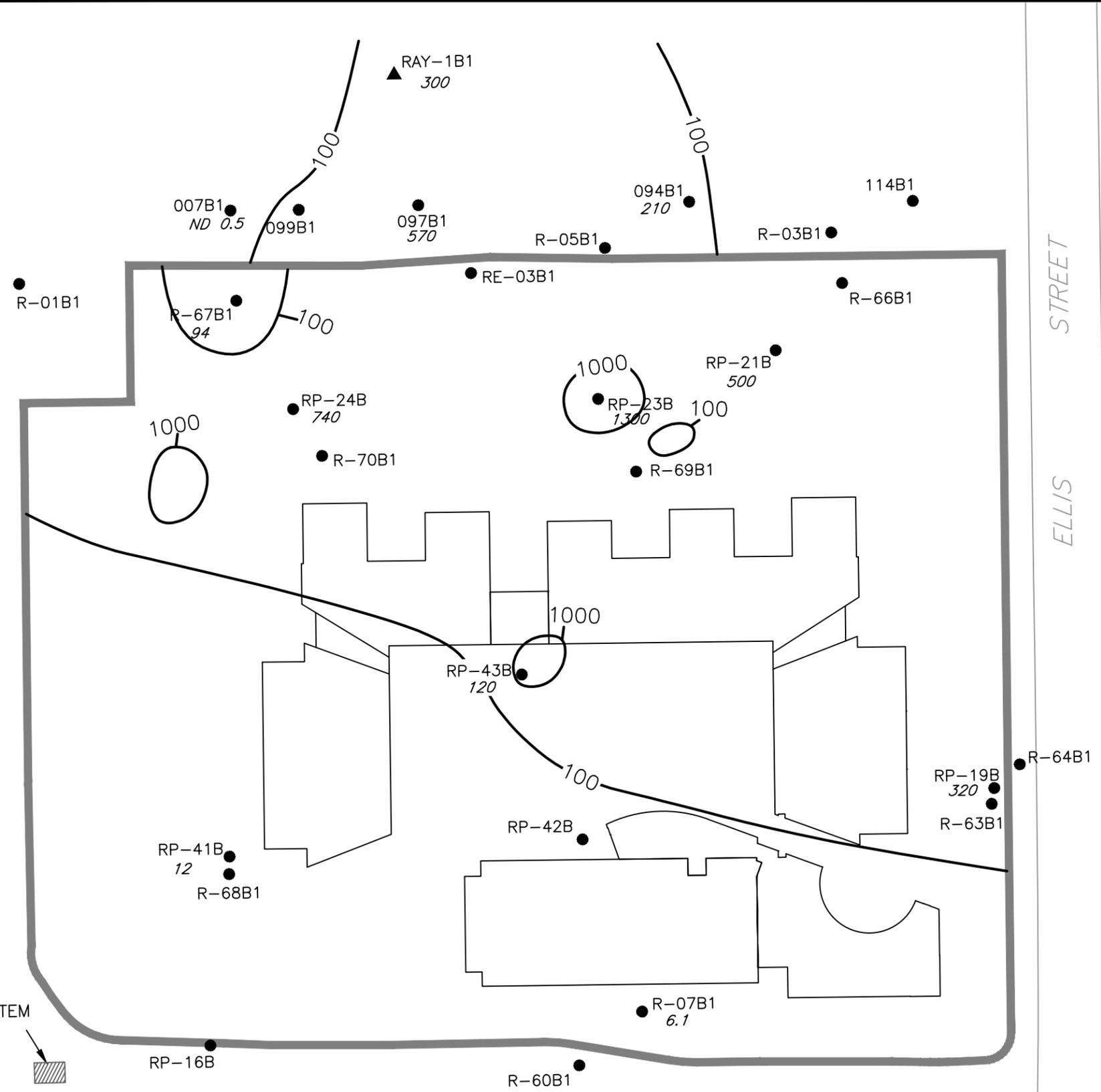
REFERENCE:
MWH BASEMAP
FILE NO. USCKIS-INDSUR\INDUSTRIAL\
MLUBKE\RAYTHEON\PSM A AQUIFER
DATED: 22 AUGUST 2002

No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 26

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 27 - B1 TCE.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 TCE CONCENTRATION CONTOUR ($\mu\text{g/L}$)
- 1300 TCE CONCENTRATION ($\mu\text{g/L}$)
- ND NOT DETECTED

NOTES:

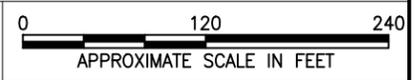
1. TCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 7B1, 94B1, 97B1, RAY-1B1

LOCATION OF GROUNDWATER TREATMENT SYSTEM

2015 TCE CONCENTRATIONS
"B1" AQUIFER
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
PREPARED FOR
RAYTHEON COMPANY

REFERENCE:
MWH BASEMAP
FILE NO. USCKIS-INDSUR\INDUSTRIAL\
MLUBKE\RAYTHEON\PSM B1 AQUIFER
DATED: 22 AUGUST 2002

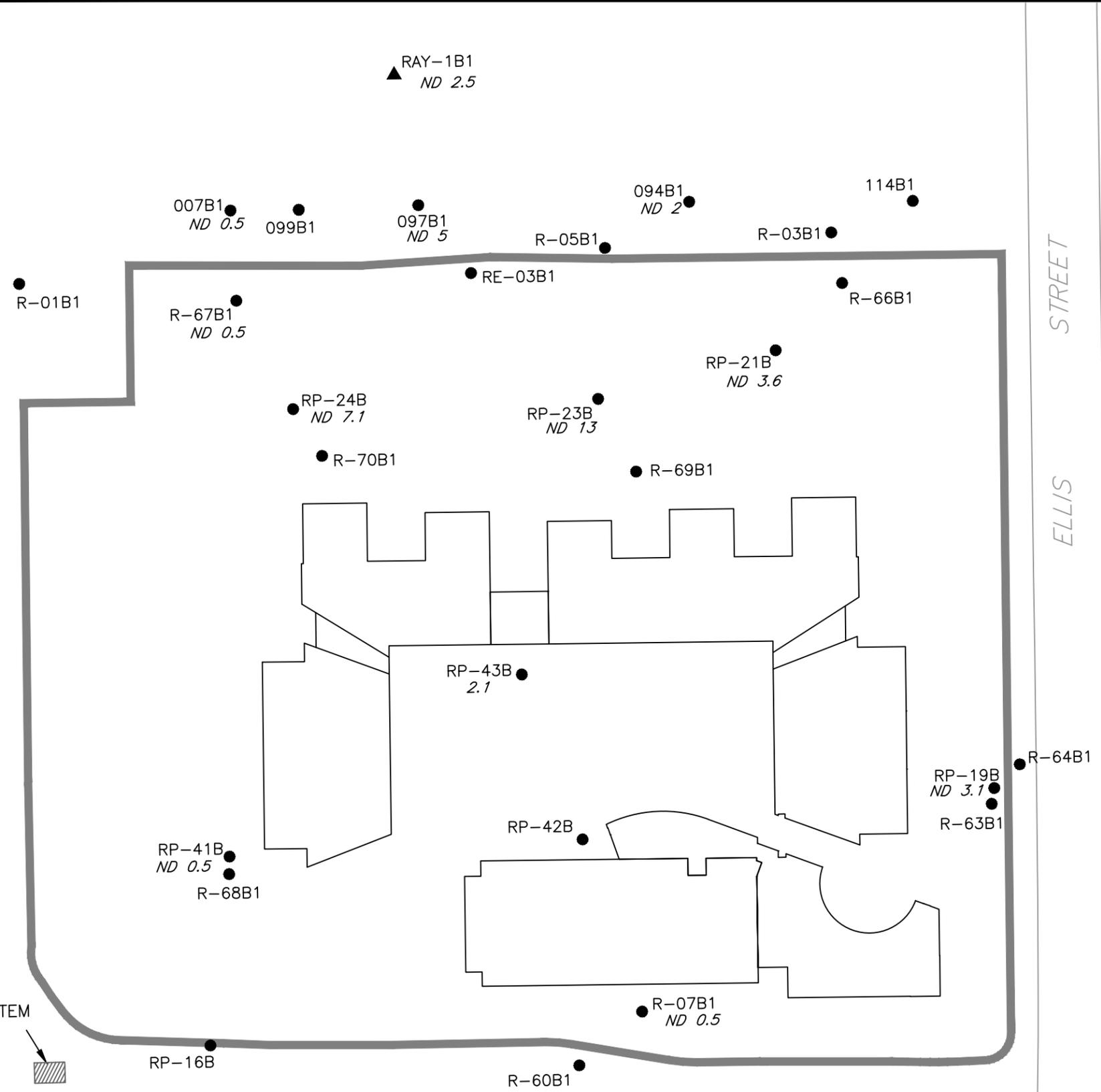
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 27



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 28 - B1_PCE.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 PCE CONCENTRATION CONTOUR ($\mu\text{g/L}$)
- 2.1 PCE CONCENTRATION ($\mu\text{g/L}$)
- ND NOT DETECTED

NOTES:

1. PCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011.
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 7B1, 94B1, 97B1, RAY-1B1

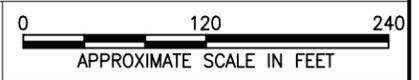
LOCATION OF GROUNDWATER TREATMENT SYSTEM

2015 PCE CONCENTRATIONS
"B1" AQUIFER
350 ELLIS STREET
MOUNTAIN VIEW, CALIFORNIA
PREPARED FOR
RAYTHEON COMPANY

REFERENCE:

MWH BASEMAP
FILE NO. USCKIS-INDSUR\INDUSTRIAL\
MLUBKE\RAYTHEON\PSM B1 AQUIFER
DATED: 22 AUGUST 2002

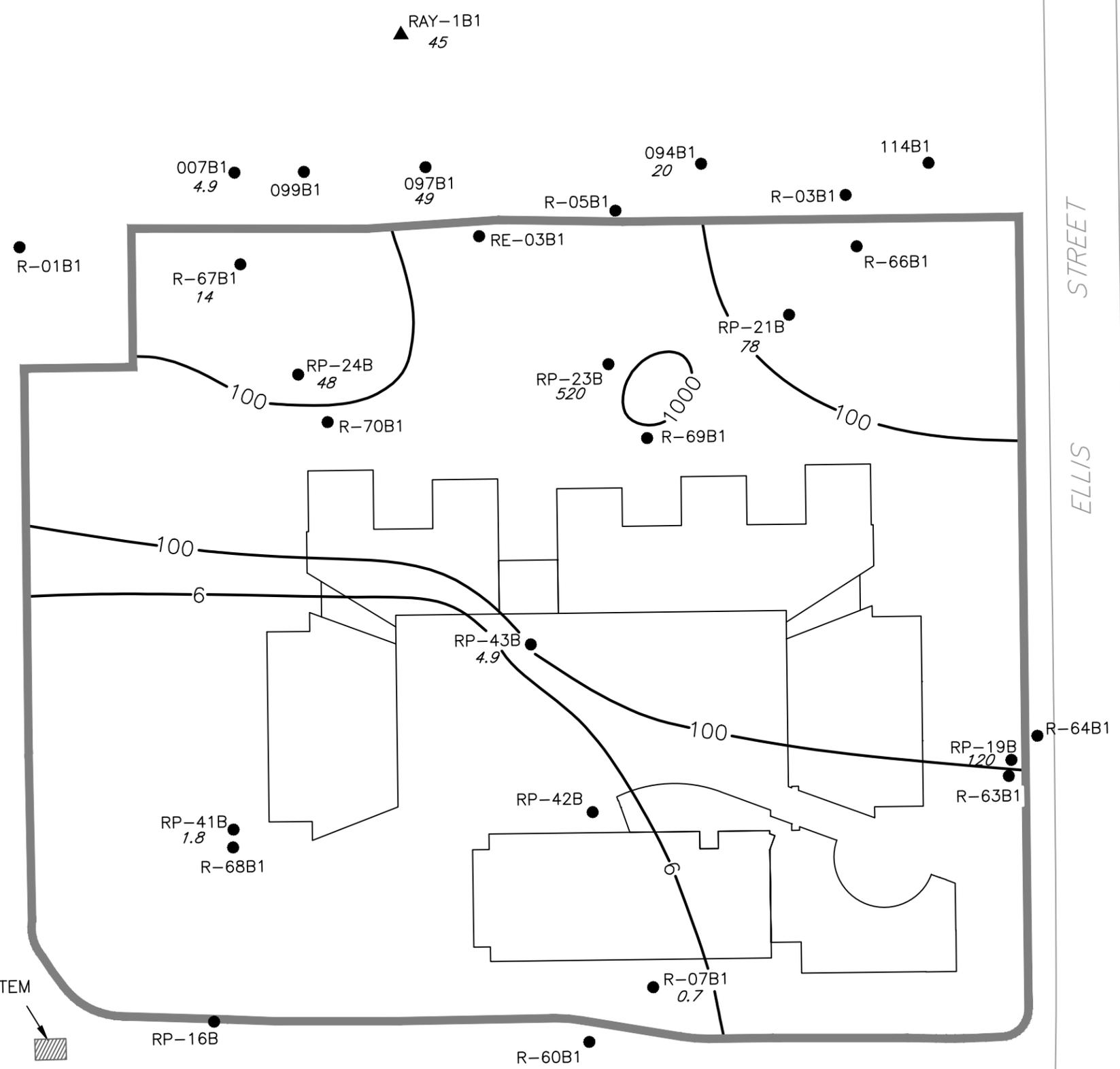
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO.	
FIGURE 28	



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWH\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 29 - B1 CIS-1,2-DCE.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 cis-1,2-DCE CONCENTRATION CONTOUR (µg/L)
- 520 cis-1,2-DCE CONCENTRATION (µg/L)
- ND NOT DETECTED

NOTES:

1. CIS-1,2-DCE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 7B1, 94B1, 97B1, RAY-1B1

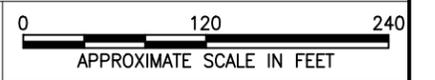
LOCATION OF GROUNDWATER TREATMENT SYSTEM



2015 CIS-1,2-DCE CONCENTRATIONS
 "B1" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\MLUBKE\RAYTHEON\PSM B1 AQUIFER
 DATED: 22 AUGUST 2002

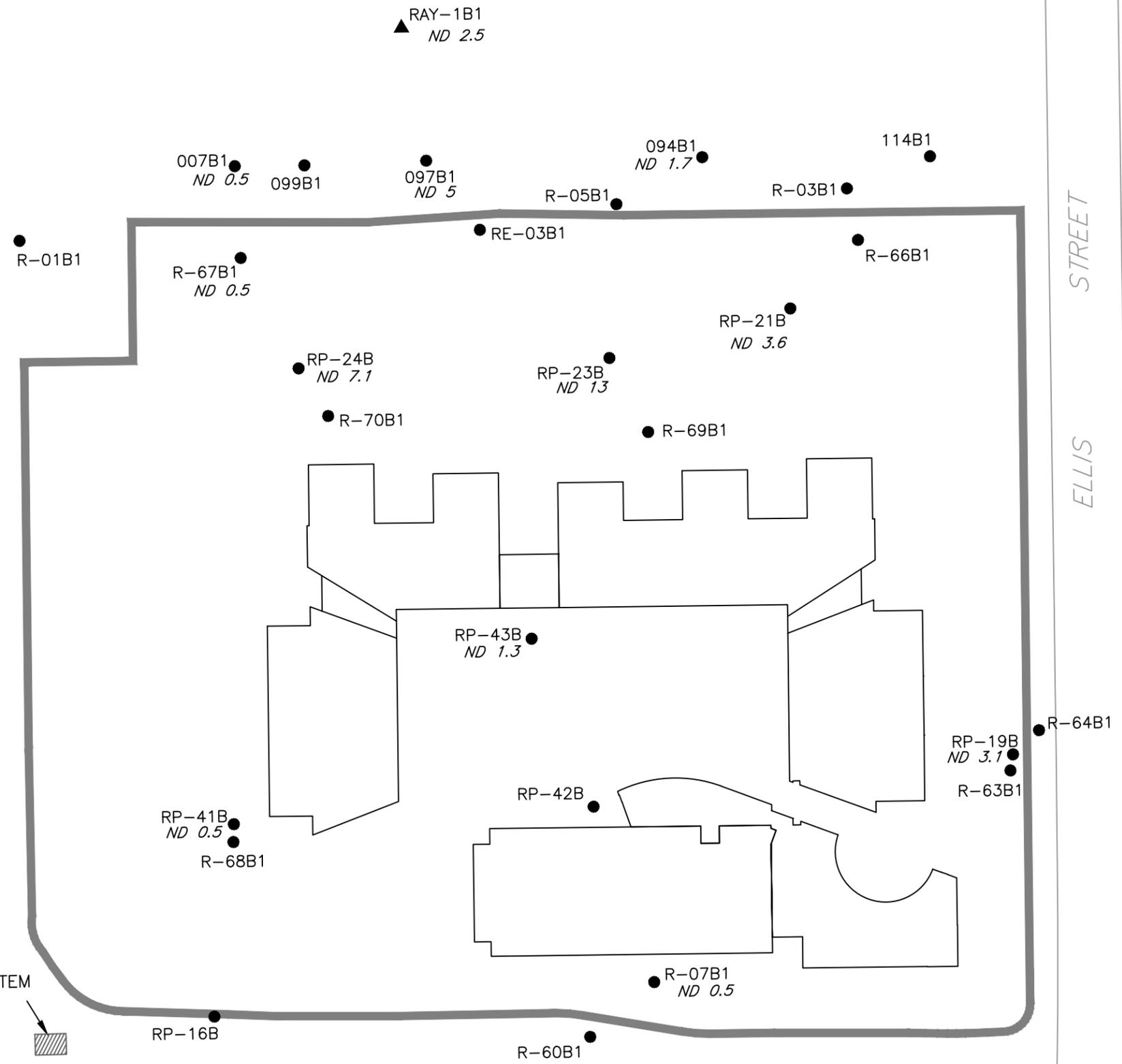
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 29



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MWA\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 30 - B1 VC.DWG



LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 100 VC CONCENTRATION CONTOUR ($\mu\text{g/L}$)
- ND13 VC CONCENTRATION ($\mu\text{g/L}$)
- ND NOT DETECTED

NOTES:

1. VINYL CHLORIDE CONCENTRATION CONTOURS WITHIN THE SLURRY WALL ARE BASED ON THE DISPLAYED GROUNDWATER CONCENTRATIONS FROM 2011 AND HPT RESULTS FROM 2013.
2. HPT = HYDRAULIC PROFILING TOOL
3. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. THE FOLLOWING WELLS ARE BASED ON 2015 DATA: 7B1, 94B1, 97B1, RAY-1B1

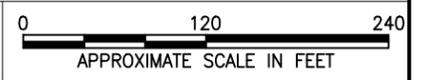
LOCATION OF GROUNDWATER TREATMENT SYSTEM

ELLIS STREET

2015 VINYL CHLORIDE CONCENTRATIONS
 "B1" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM B1 AQUIFER
 DATED: 22 AUGUST 2002

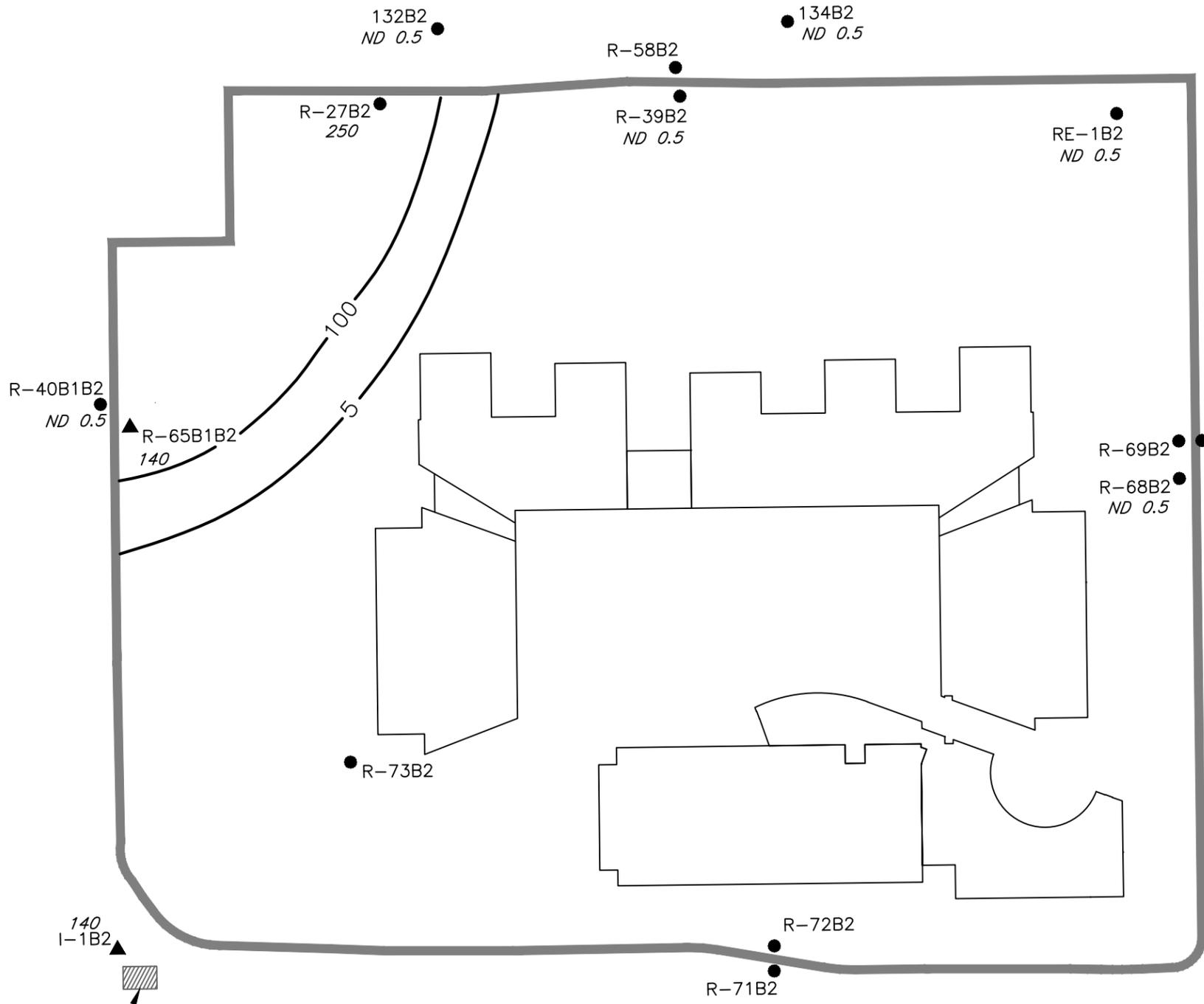
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 30



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MVA\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 31 - B2 TCE.DWG



LEGEND:

-  GROUNDWATER EXTRACTION WELL
-  GROUNDWATER MONITORING WELL
-  SLURRY WALL
- 250 TCE CONCENTRATION ($\mu\text{g/L}$)
- ND NOT DETECTED

NOTES:

1. TCE CONCENTRATION CONTOUR WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011.
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. WELL I-1B2 IS BASED ON 2015 DATA.

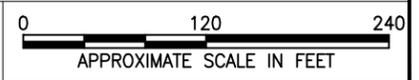
2015 TCE CONCENTRATIONS
 UPPER "B2" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

LOCATION OF
 GROUNDWATER
 TREATMENT SYSTEM



REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\
 MLJBKE\RAYTHEON\PSM UB2 AQUIFER
 DATED: 22 AUGUST 2002

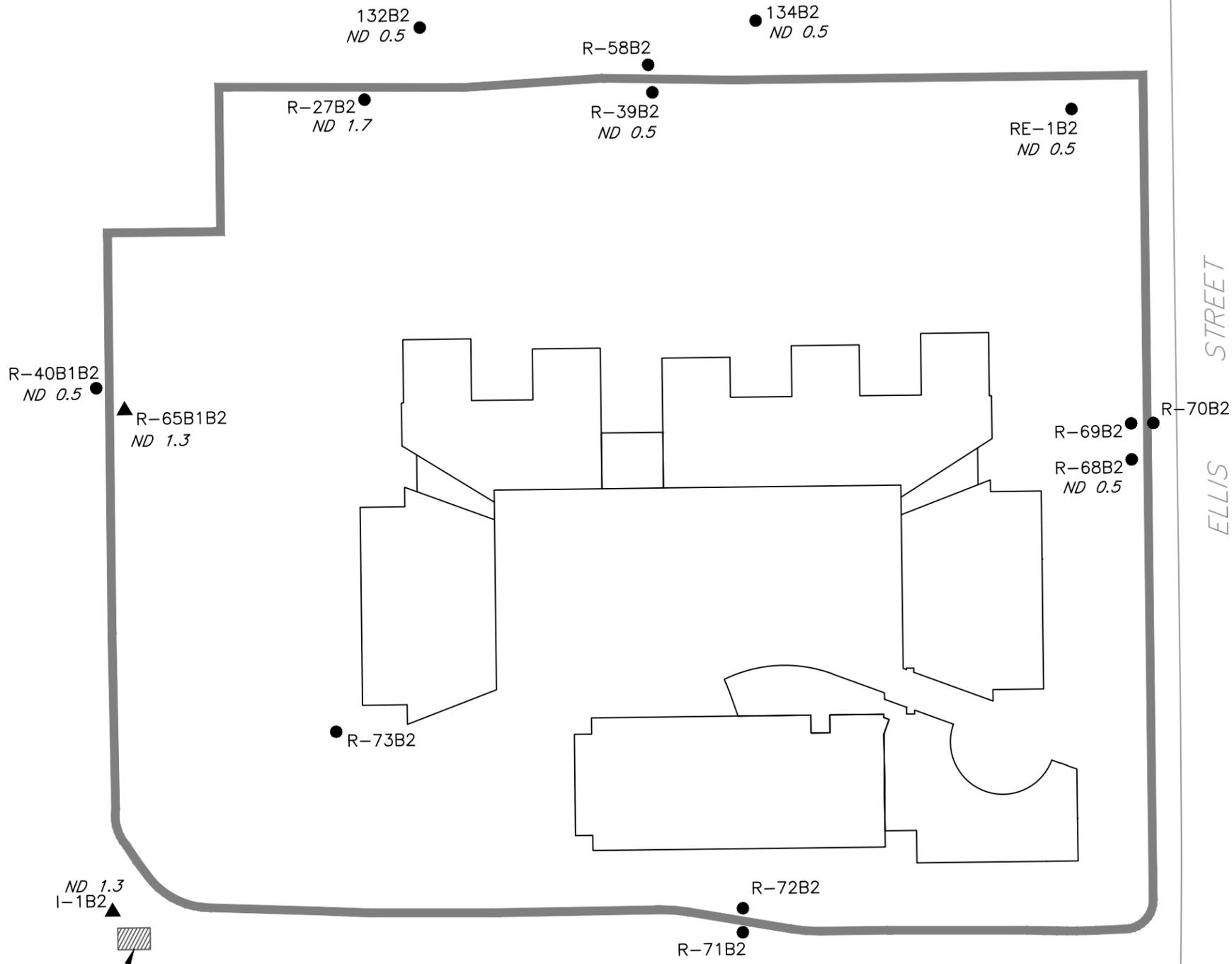
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 31



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON_MW\ANNUAL_RPTS\ANNUAL_2015\2015 ANNUAL REPORT FIGURES\2015 FIG 32 - B2_PCE.DWG



LEGEND:

- GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- ND 1.7 PCE CONCENTRATION (µg/L)
- ND NOT DETECTED

NOTES:

1. PCE CONCENTRATION CONTOUR WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011.
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. WELL I-1B2 IS BASED ON 2015 DATA.

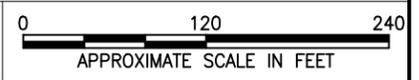
2015 PCE CONCENTRATIONS
 UPPER "B2" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR
 RAYTHEON COMPANY

LOCATION OF GROUNDWATER TREATMENT SYSTEM

REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM UB2 AQUIFER
 DATED: 22 AUGUST 2002

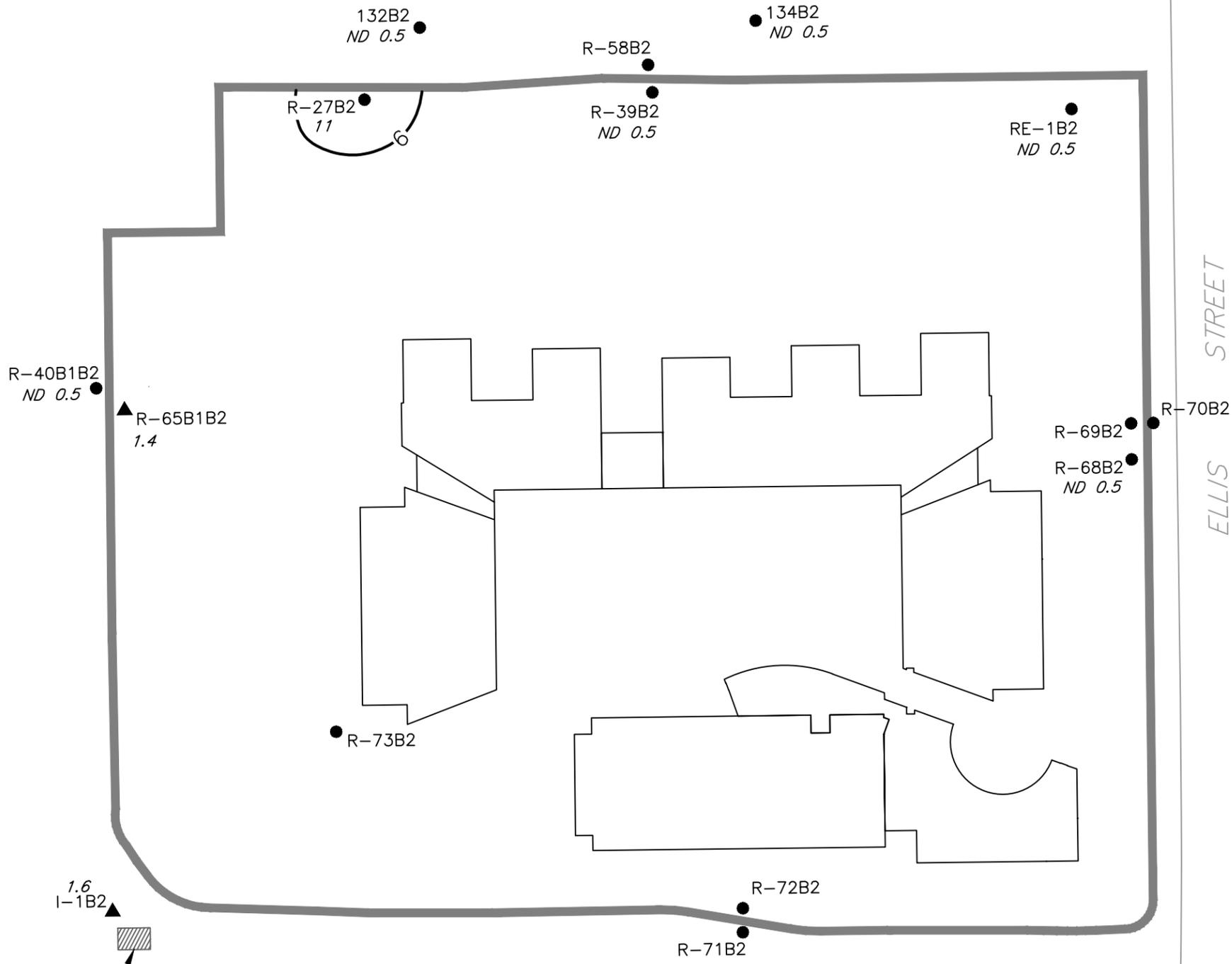
No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO.	
FIGURE 32	



FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MVA\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 33 - B2 CIS-1,2-DCE.DWG



LEGEND:

- GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- 11 cis CONCENTRATION ($\mu\text{g/L}$)
- ND NOT DETECTED

NOTES:

1. CIS-1,2-DCE CONCENTRATION CONTOUR WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011.
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. WELL I-1B2 IS BASED ON 2015 DATA.

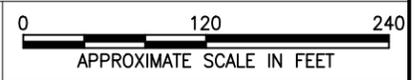
2015 CIS-1,2-DCE CONCENTRATIONS
 UPPER "B2" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA

PREPARED FOR
 RAYTHEON COMPANY

LOCATION OF GROUNDWATER TREATMENT SYSTEM

REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM UB2 AQUIFER
 DATED: 22 AUGUST 2002

	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____

FIGURE 33

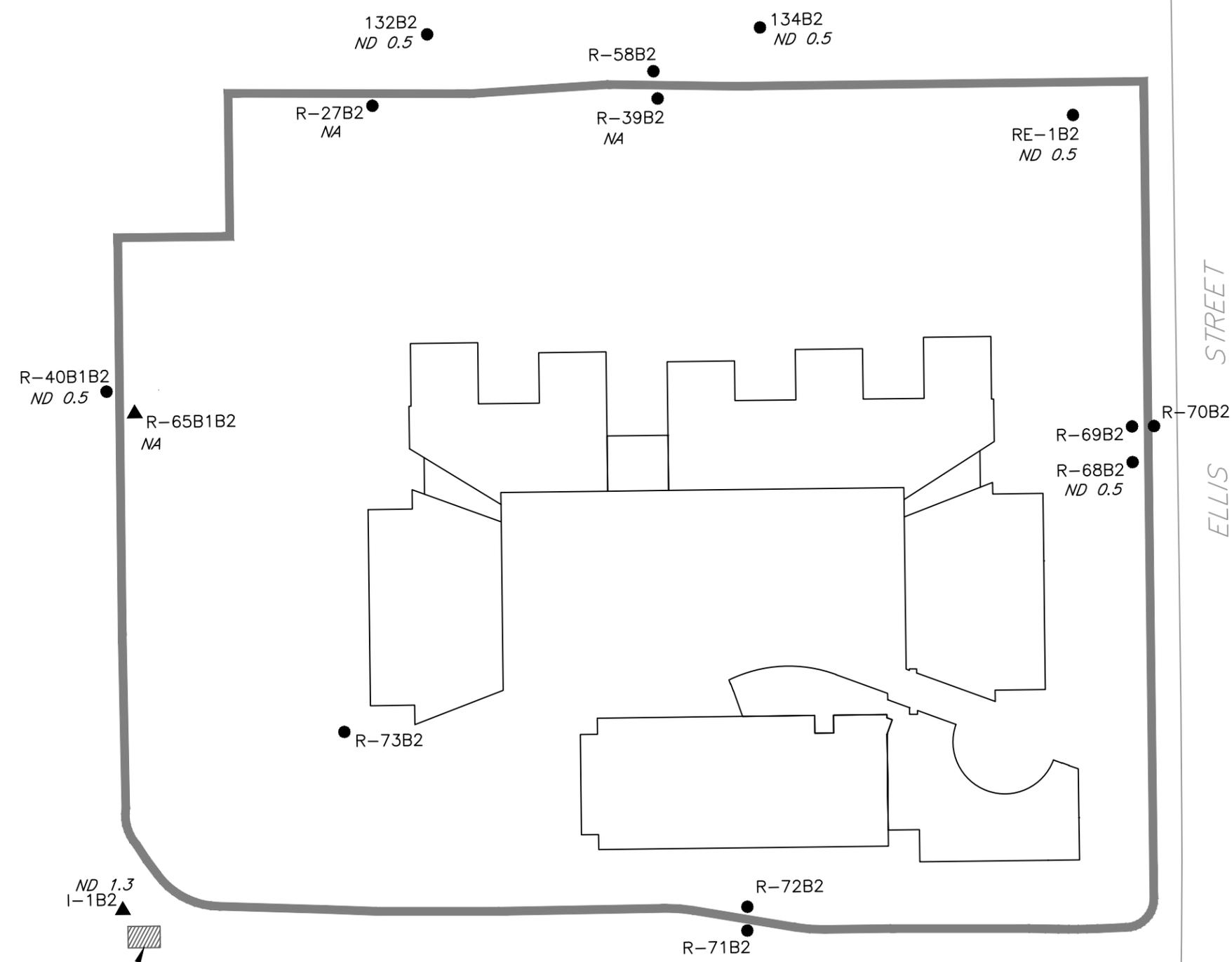


LEGEND:

- ▲ GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- SLURRY WALL
- ND 1.3 VC CONCENTRATION (µg/L)
- ND NOT DETECTED
- NA NOT AVAILABLE

NOTES:

1. VINYL CHLORIDE CONCENTRATION CONTOUR WITHIN THE SLURRY WALL ARE BASED ON THE MOST RECENT GROUNDWATER CONCENTRATIONS, 2011.
2. CONTOURS OUTSIDE THE SLURRY WALL ARE BASED ON 2014 AND 2015 DATA. WELL I-1B2 IS BASED ON 2015 DATA.



ELLIS STREET

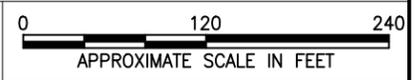
2015 VINYL CHLORIDE CONCENTRATIONS
 UPPER "B2" AQUIFER
 350 ELLIS STREET
 MOUNTAIN VIEW, CALIFORNIA
 PREPARED FOR
 RAYTHEON COMPANY

LOCATION OF
 GROUNDWATER
 TREATMENT SYSTEM

ND 1.3
 I-1B2

REFERENCE:
 MWH BASEMAP
 FILE NO. USCKIS-INDSUR\INDUSTRIAL\
 MLUBKE\RAYTHEON\PSM UB2 AQUIFER
 DATED: 22 AUGUST 2002

No.	31 MAR 16	ISSUED FOR REPORT	AJK	NJ	JWH
	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY



DRAWING NO. _____
FIGURE 34

FILE NAME: I:\PROJECTS\RAYTHEON\23-016 RAYTHEON MVA\ANNUAL RPTS\ANNUAL 2015\2015 ANNUAL REPORT FIGURES\2015 FIG 34 - B2 VC.DWG

Appendix A

2015 Annual Report Remedy Performance Checklist

2015 Annual Report Remedy Performance Checklist

I. GENERAL SITE INFORMATION	
Facility Name: <i>Raytheon Mountain View</i>	
Facility Address, City, State: 350 Ellis Street, Mountain View, California	
Checklist completion date: April 06, 2016	EPA Site ID: CAD09205097
Site Lead: <input type="checkbox"/> Fund <input type="checkbox"/> PRP <input type="checkbox"/> State <input type="checkbox"/> State Enforcement <input type="checkbox"/> Federal Facility <input checked="" type="checkbox"/> Other, specify: U.S. EPA, Region IX	
Site Remedy Components (Include Other Reference Documents for More Information, as appropriate): Groundwater pump-and-treat system; Groundwater containment; Vertical barrier walls (slurry wall is 100 feet deep and extends into the B2-aquifer)	
II. CONTACTS	
<u>List important personnel associated with the Site:</u> Name, title, phone number, e-mail address:	
PRP / Facility Representative: Gregory Taylor, Raytheon Company Environmental Manager (310) 647-2495 gstaylor@raytheon.com	
PRP Contractor/ Consultant: Elie Haddad, Haley & Aldrich Vice President (408) 453-8703 ehaddad@haleyaldrich.com	
J. Wesley Hawthorne, Locus Technologies Senior Vice President (415) 799-9937 hawthornej@locustec.com	
O&M Contractor: J. Wesley Hawthorne, Locus Technologies Senior Vice President (415) 799-9937 hawthornej@locustec.com	
Other:	

2015 Annual Report Remedy Performance Checklist

III. O&M COSTS (OPTIONAL) - CONFIDENTIAL

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

What is your annual O&M cost total for the reporting year?

Breakout your annual O&M cost total into the following categories (use either dollars or %):

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

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

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

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

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

O&M manual, Site H&S plan, discharge records and permits are kept onsite; O&M reports, maintenance logs and training records are available at Locus Technologies' office in Mountain View.

V. INSTITUTIONAL CONTROLS (as applicable)

List institutional controls called for (and from what enforcement document):

Status of their implementation:

Where are the ICs documented and/or reported?

Governmental controls (zoning, local permits, state codes);

Environmental agreements with property owner (proprietary controls);

Informational devices (fact sheets, public meetings)

ICs are being properly implemented and enforced? Yes No, elaborate below

ICs are adequate for site protection? Yes No, elaborate below

Additional remarks regarding ICs:

2015 Annual Report Remedy Performance Checklist

- The system is in compliance with discharge permits.

Slurry Wall Data

List the types of data that are available:

What is the source report?

Quarterly WL monitoring data from monitoring well pairs

Annual Report, Tables 8 and 9

Capture zone maps

Annual Report, Figures 7 – 10

Is slurry wall operating as designed? ■ Yes □ No

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

Elaborate on technical data and/or other comments

Since 2000, when the 350 Ellis Street property was developed, an outward gradient has been observed along the northern slurry wall. However, these gradients do not have a significant impact on remediation because: 1) Raytheon installed two recovery wells in the "A" and "B1" aquifers immediately downgradient of the slurry wall; the wells provide an adequate capture of the area immediately downgradient of the slurry wall, and 2) the slurry wall is a low-permeability wall that allows only minimal chemical migration across its walls, even if the gradient is outward. That combined with the fact that chemicals tend to take the easier pathway and migrate towards recovery wells within the wall enclosure, rather than across the low-permeability wall, would minimize outward chemical migration. Therefore, the slurry wall and the pumping activities within its enclosure physically contain chemicals. If a small flux of chemicals migrates through the slurry wall, it is captured immediately downgradient of the wall.

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

Walkthroughs/Surveys: Quarterly inspection was conducted for the air purification units at the property (rooms A106, A112, B104, C110, and D106). In September and October 2015, Haley & Aldrich converted the existing passive SSV system to an active sub-slab depressurization (SSD) system beneath Buildings A, B, C, D and E, as documented in the "Property-specific Vapor Intrusion Response Action Implementation Report, Former Raytheon Facilities, 350 Ellis Street, Mountain View, California," submitted to EPA on 10 March 2016

Air testing/monitoring conducted: Confirmation indoor air samples collected with the HVAC system on and off after the start-up of the SSD system showed COC concentrations below the commercial indoor air cleanup level in EPA's 16 August 2010 "Record of Decision Amendment for the Vapor Intrusion Pathway, Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Mountain View and Moffett Field, California." The SSD system is therefore achieving the remedial action objective as stated in the ROD to "ensure that building occupants (e.g., workers and residents) are protected from Site contamination by preventing subsurface Site contaminants from migrating into indoor air or accumulating in enclosed building spaces exceed indoor air cleanup levels for long-term exposure."

Summary of Results: Refer to Property-specific Vapor Intrusion Response Action Implementation Report (Haley & Aldrich, 10 March 2016).

Problems Encountered: None.

Recommendations/Next Steps: Continued operation of the SSD system as described in the Property-specific Long-Term Vapor Intrusion Operations, Maintenance, and Monitoring (OM&M) Plan (Haley & Aldrich, 21 July 2015).

2015 Annual Report Remedy Performance Checklist

Schedule: Additional air sampling events planned for summer 2016 with and without HVAC system operation.

X.

REMEDY PERFORMANCE ASSESSMENT

A. Groundwater Remedies

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

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

Table 12 of the Annual Report provides a comparison of the average TCE concentration for each aquifer at different time periods. The concentrations have decreased significantly, but are approaching asymptotic levels.

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

If plume containment is a remedial goal, check all that apply:

- Plume migration is under control (explain basis below)
- Plume migration is not under control (explain basis below)
- Insufficient data to determine plume stability (explain below)

(Include attachments that substantiate your answers, e.g., reference plume, trend analysis, and capture zone maps in source document)

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

The plume is not expanding and capture is adequate.

If plume restoration is a cleanup objective, check all that apply:

- Progress is being made toward reaching cleanup levels (explain basis below)
- Progress is not being made toward reaching cleanup levels (explain basis below)
- Insufficient data to determine progress toward restoration goal (explain below)

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

As explained above, concentrations have decreased significantly since remedial measures were begun. Concentrations are approaching asymptotic levels, indicating that using the current remedy reaching MCLs will require many decades.

B. Vertical Migration

Have you done an assessment of vertical gradients? Yes No; If Yes, what does it show? (Is it inconclusive due to inadequate data? Are the concentrations increasing or decreasing? Explain and provide source document reference.)

Fifteen well pairs are used to monitor the vertical gradient direction across the "A/B1" and "B1/B2" Aquitards, and from the lower to upper "B2" aquifer. The differences in water elevations between the "B1" and "A" Aquifers are shown in Table 8 and on Figure 20 of the Annual Report. In 2015, upward gradients were consistently observed in seven of the ten well pairs that are used to monitor the "A/B1" Aquitard gradient directions. The measurements show a slight downward gradient in well pairs R-68B1/R-67A, and R-67B1/RE-08A. The direction of vertical gradient across the "B1/B2 aquitard" and "Upper and Lower "B2" aquifer" was consistently upward throughout 2015. Onsite, the "A" Aquifer and "B1" Aquifer are entirely enclosed within the slurry wall, and the upward gradients across the "B1/B2" Aquitard (Table 9, Figure 21) and between the upper "B2" and lower "B2" Aquifers (Table 9, Figure 22) indicate that groundwater (and chemicals) will flow upward from the "B2" Aquifer into the

2015 Annual Report Remedy Performance Checklist

<p>"B1" Aquifer, where the VOCs are captured by the extraction wells. Therefore, the chemicals present in the "A" and "B1" Aquifers are contained onsite.</p>
<p>C. Source Control Remedies</p>
<p>What are the remedial goals for source control?</p> <p>Elaborate on basis for determining progress or lack of progress toward these goals:</p>
<p>XI. PROJECTIONS</p>
<p><u>Administrative Issues</u></p> <p>None.</p>
<p>A. Groundwater Remedies - Projections for the upcoming year and long-term (Check all that apply)</p>
<p><u>Remedy Projections for the upcoming year (2016)</u></p> <p><input checked="" type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> Groundwater remedy will be converted to monitored natural attenuation. Target date:</p> <p><input type="checkbox"/> Groundwater Pump & Treat will be shut down. Target date:</p> <p><input type="checkbox"/> Groundwater cleanup standards to be modified. Target date:</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in the number and/or types of analytes being analyzed. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in groundwater extraction system. Expansion or minimization (i.e., number of extraction wells and/or pumping rate)? Target date:</p> <p><input type="checkbox"/> Modification on groundwater treatment? Elaborate below. Target date:</p> <p><input type="checkbox"/> Change in discharge location. Target date:</p> <p><input type="checkbox"/> Other modification(s) anticipated: _____ Elaborate below. Target date:</p>
<p>Elaborate on Remedy Projections:</p>
<p><u>Remedy Projections for the long-term</u> (Check all that apply)</p> <p><input checked="" type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> Groundwater remedy will be converted to monitored natural attenuation. Target date:</p> <p><input type="checkbox"/> Groundwater Pump & Treat will be shut down. Target date:</p> <p><input type="checkbox"/> Groundwater cleanup standards to be modified. Target date:</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in the number and/or types of analytes being analyzed. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in groundwater extraction system. Expansion or minimization (i.e., number of extraction wells and/or pumping rate)? Target date:</p> <p><input type="checkbox"/> Modification on groundwater treatment? Elaborate below. Target date:</p> <p><input type="checkbox"/> Change in discharge location. Target date:</p> <p><input type="checkbox"/> Other modification(s) anticipated: _____ Elaborate below. Target date:</p>
<p>Elaborate on Remedy Projections:</p>

2015 Annual Report Remedy Performance Checklist

B. Projections – Slurry Walls (Check all that apply)
<u>Remedy Projections for the upcoming year</u> <input checked="" type="checkbox"/> No significant changes projected. <input type="checkbox"/> PRP will request remedy modification. Target date of request: <input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date: <input type="checkbox"/> Other modification(s) anticipated: _____ Elaborate below. Target date:
Elaborate on Remedy Projections:
<u>Remedy Projections for the long-term</u> <input checked="" type="checkbox"/> No significant changes projected. <input type="checkbox"/> PRP will request remedy modification. Target date of request: <input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date: <input type="checkbox"/> Other modification(s) anticipated: _____ Elaborate below. Target date:
Elaborate on Remedy Projections:
C. Projections – Other Remedial Options Being Reviewed to Enhance Cleanup
Progress implementing recommendations from last report or Five-Year Review Has optimization study been implemented or scheduled? <input checked="" type="checkbox"/> Yes; <input type="checkbox"/> No; If Yes, please elaborate. A work plan for additional subsurface characterization was submitted to and approved by EPA in 2013. The investigation was completed in 2013 and a report summarizing the results was submitted to EPA in April 2014. The investigation will be used to finalize a plan for optimization of the existing treatment system, but the optimization has been delayed pending property use by the owner.
XII. ADMINISTRATIVE ISSUES Check all that apply:
<input type="checkbox"/> Explanation of Significant Differences in progress <input type="checkbox"/> ROD Amendment in progress <input type="checkbox"/> Site in operational and functional ("shake down") period; <input type="checkbox"/> Notice of Intent to Delete in progress <input type="checkbox"/> Partial site deletion in progress <input type="checkbox"/> TI Waivers <input type="checkbox"/> Other administrative issues: Date of Next EPA Five-Year Review: September 30, 2019
XII. RECOMMENDATIONS No additional recommendations at this time pending update on property use by the owner.

Appendix B

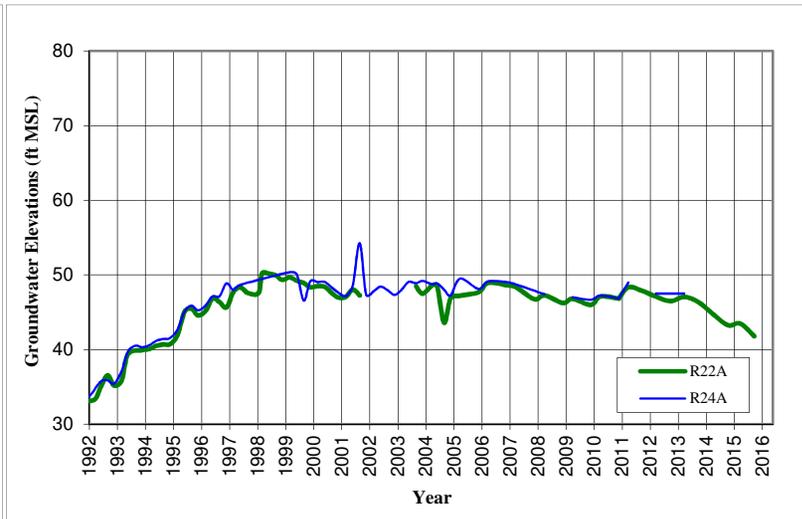
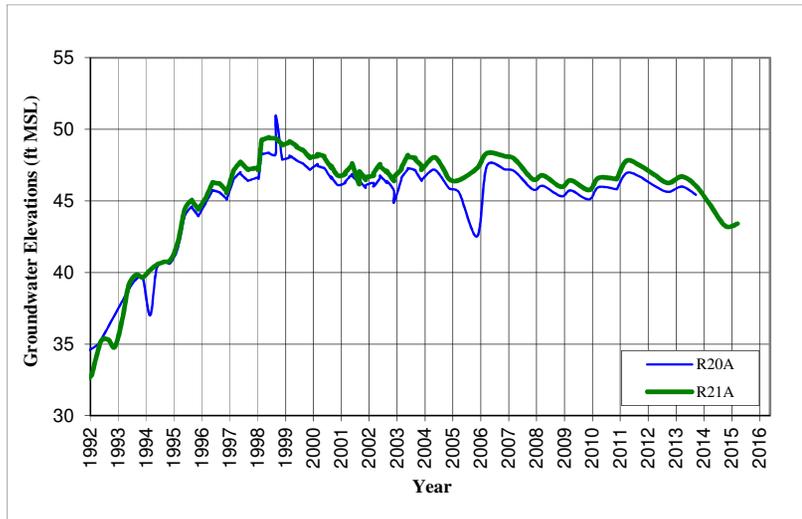
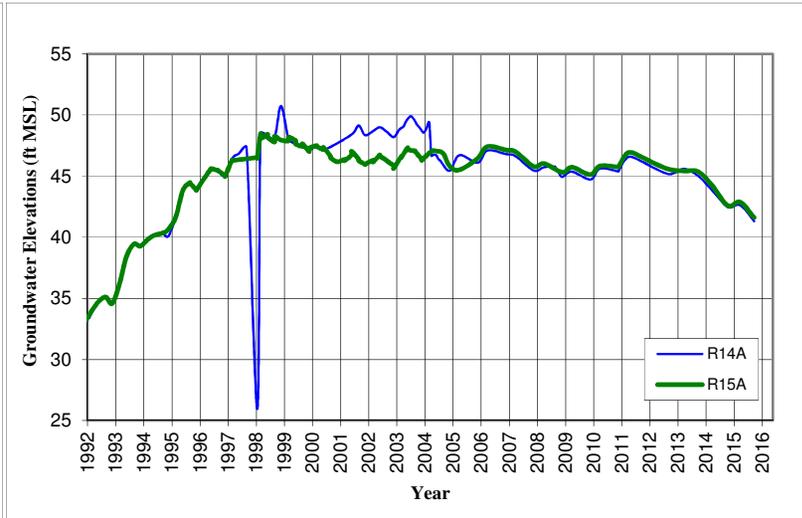
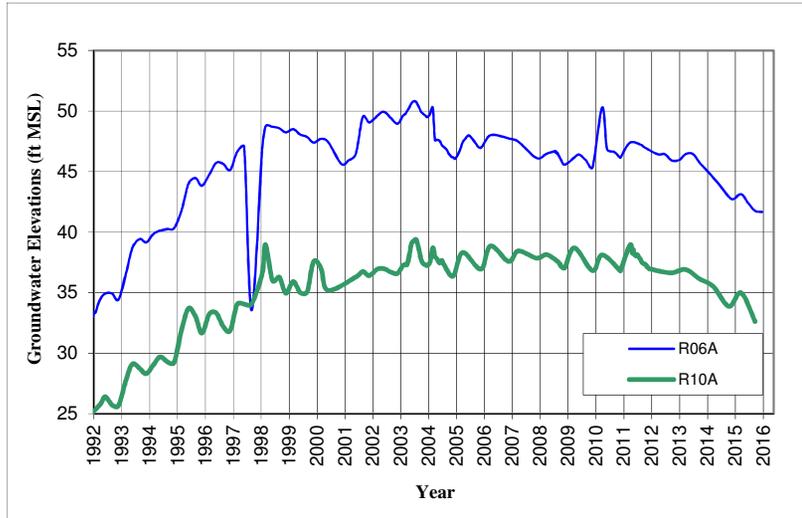
Laboratory Analytical Reports

**LABORATORY ANALYTICAL REPORTS
ARE NOT INCLUDED IN THIS
TRANSMITTAL BUT ARE AVAILABLE
UPON REQUEST.**

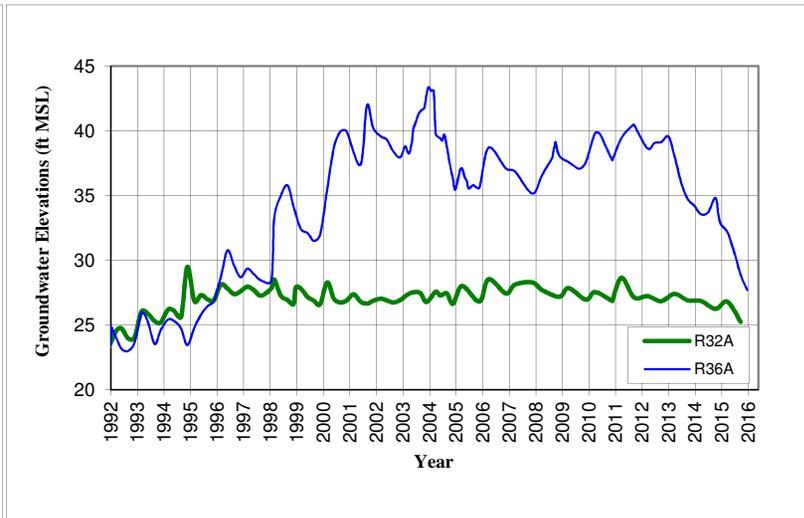
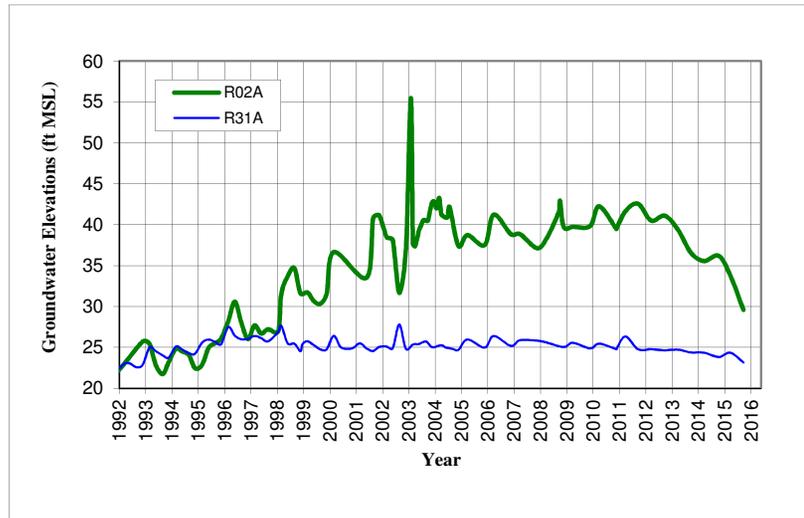
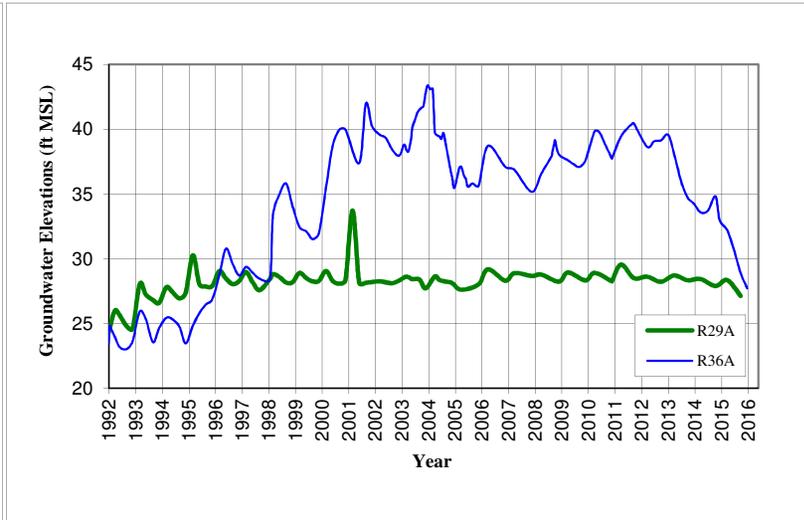
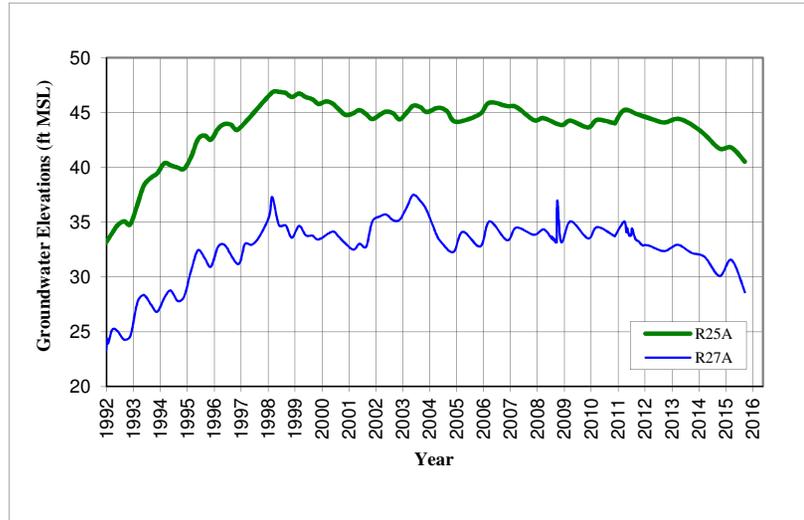
Appendix C

Groundwater Hydrographs

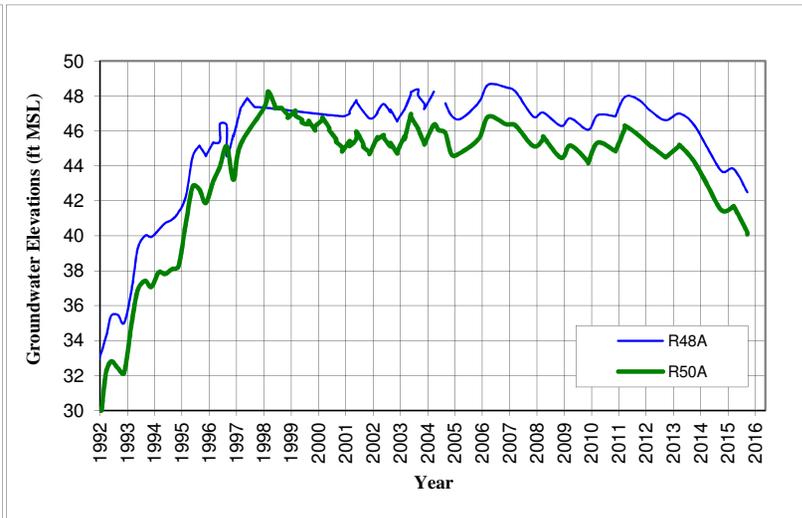
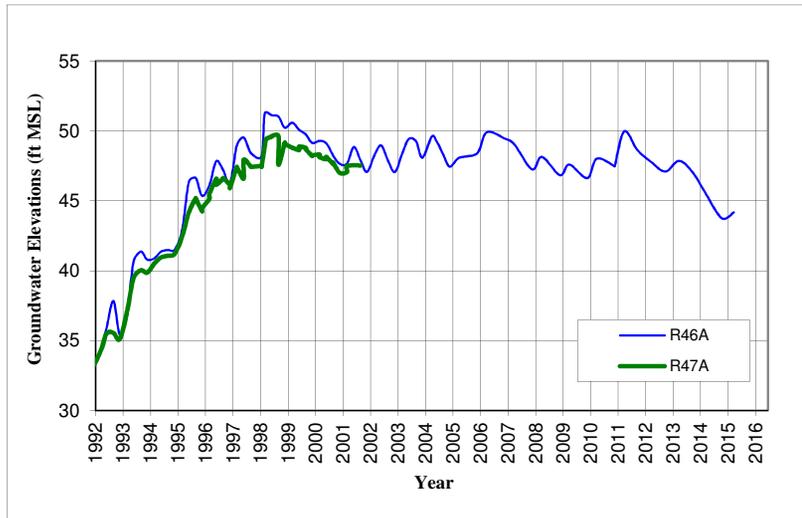
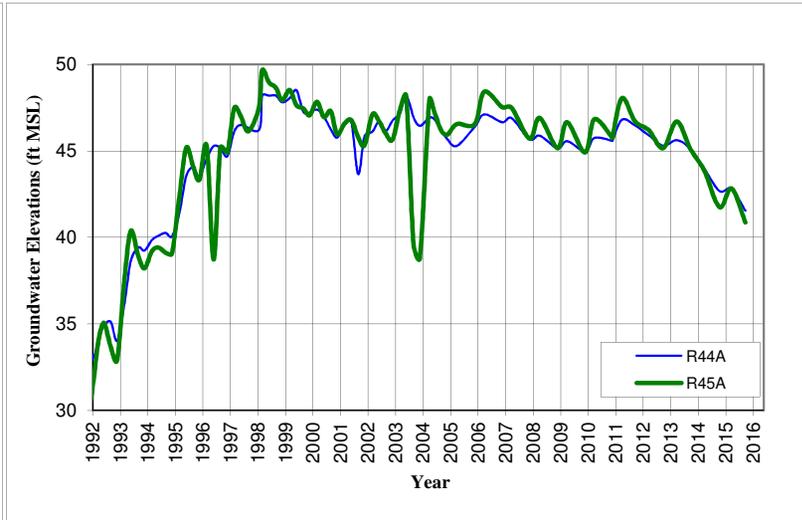
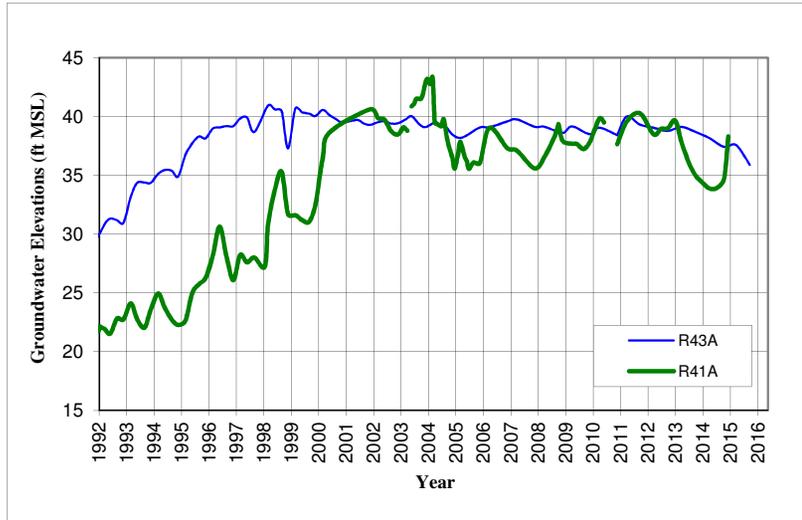
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



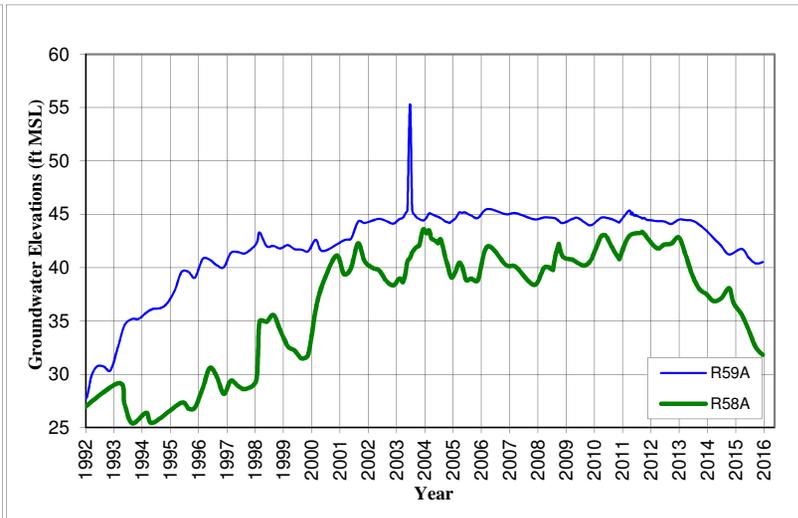
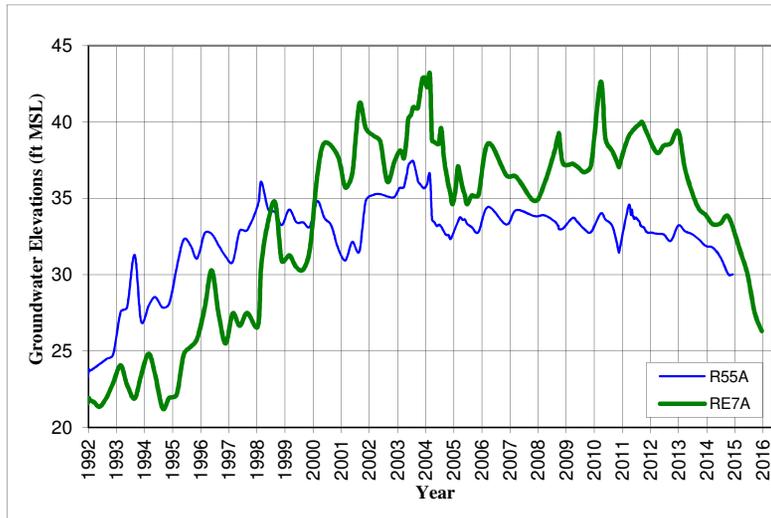
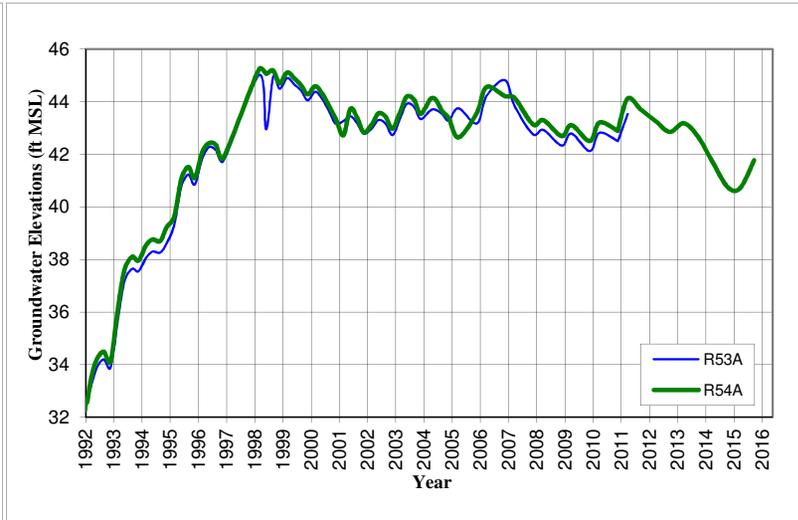
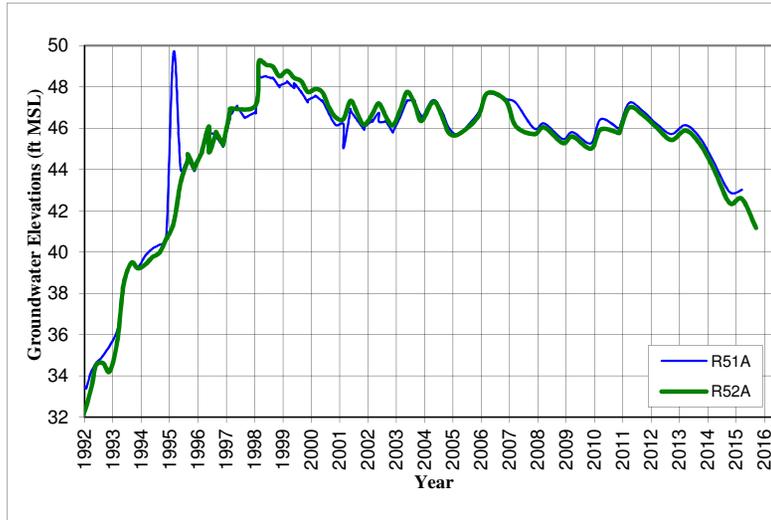
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



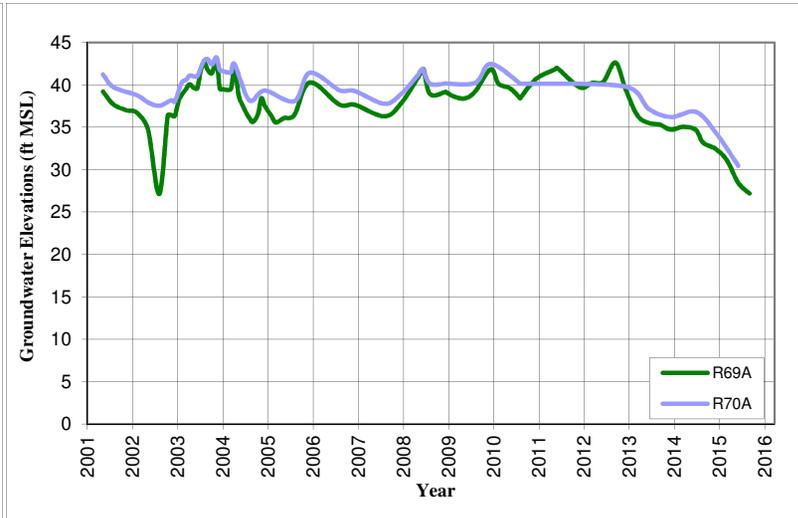
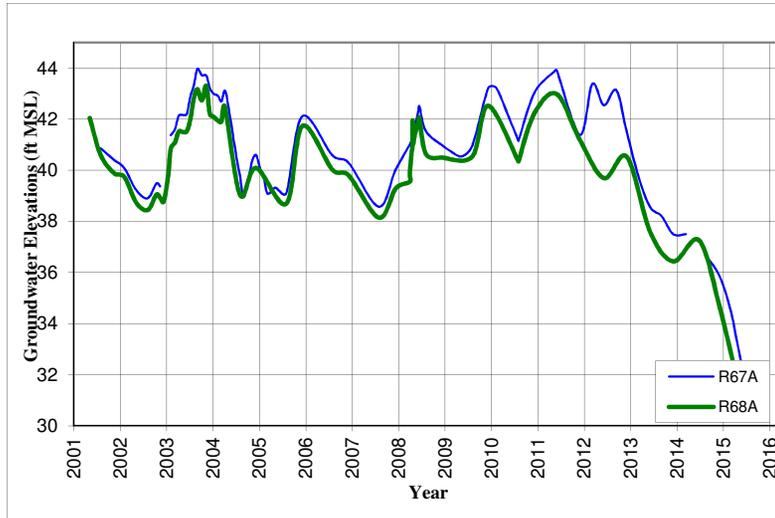
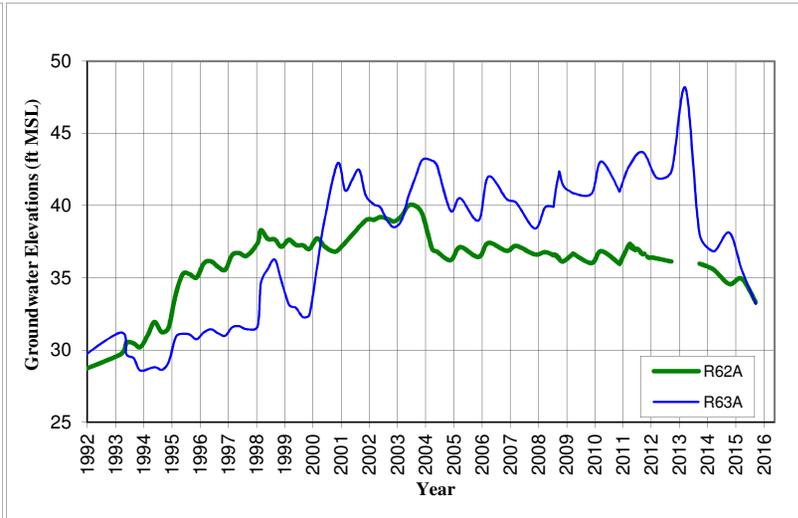
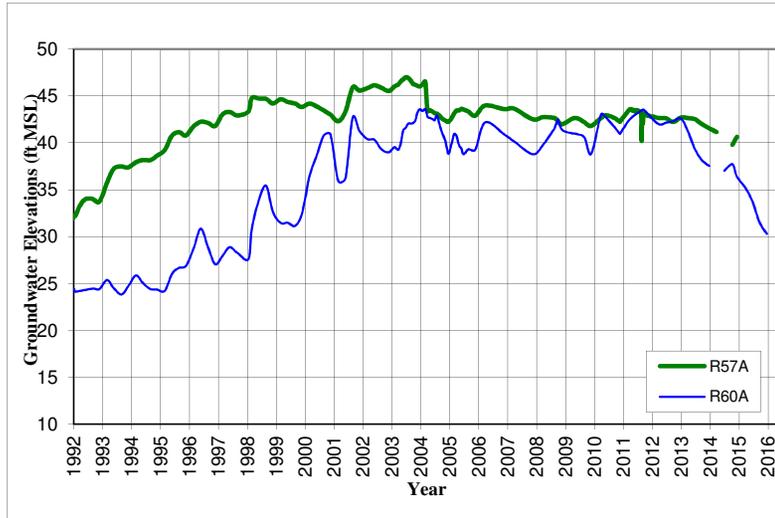
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



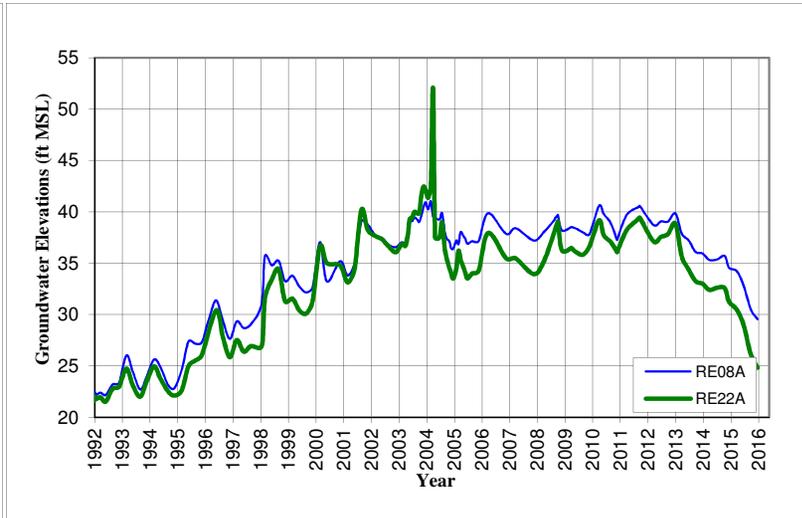
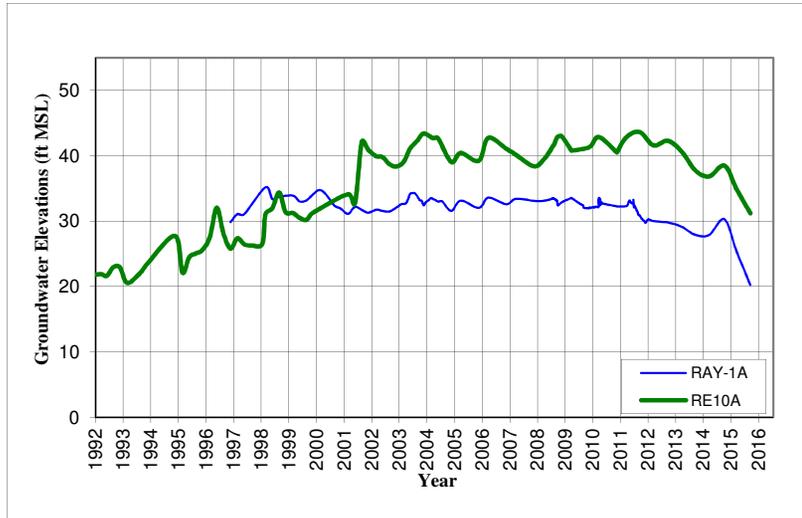
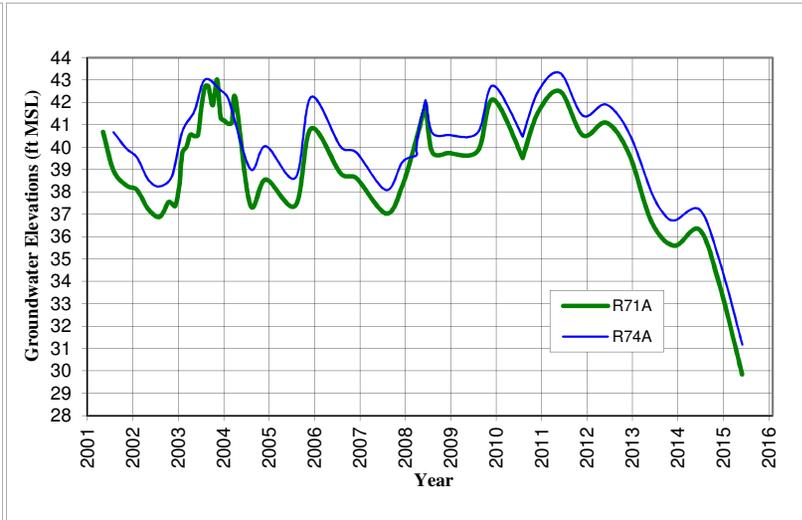
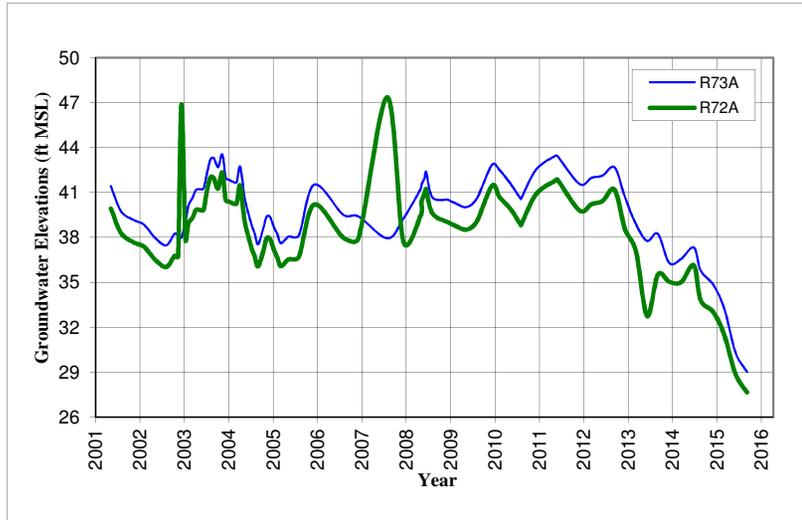
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



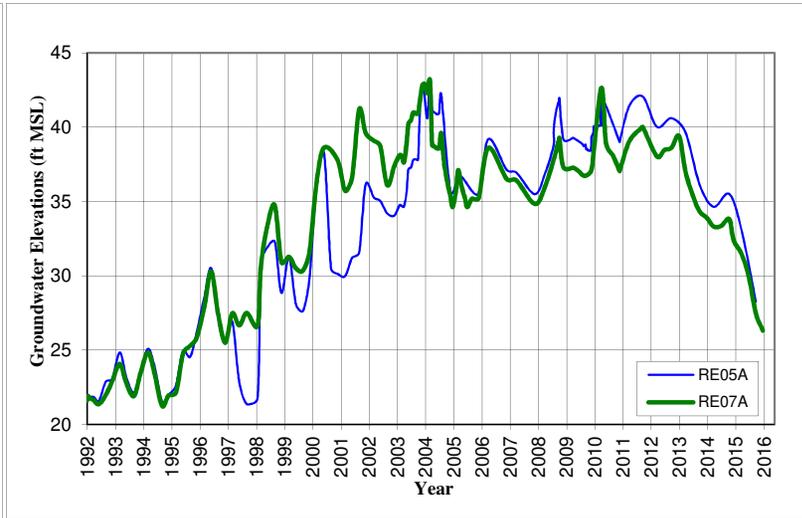
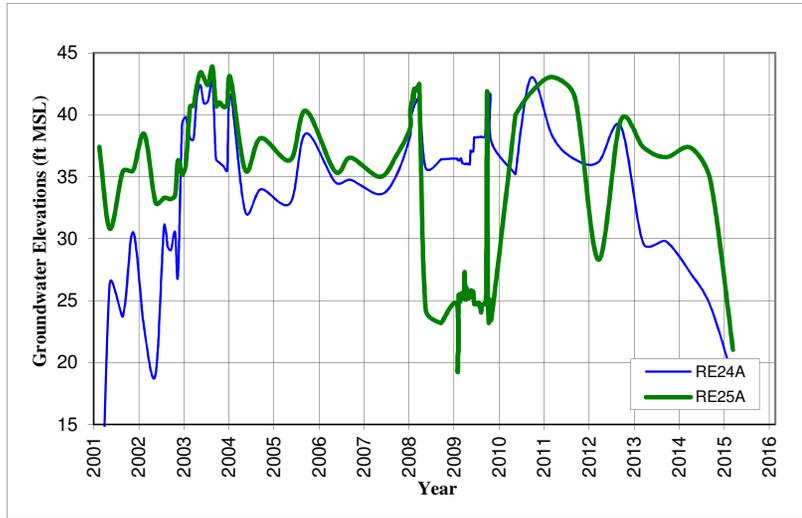
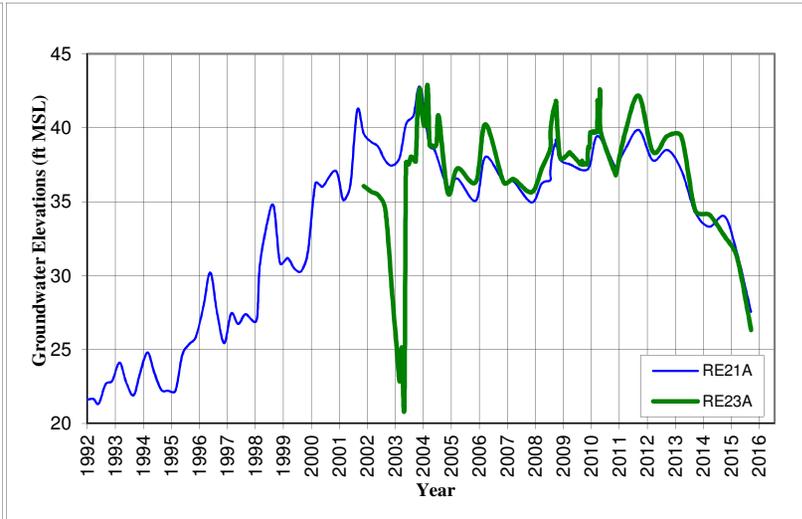
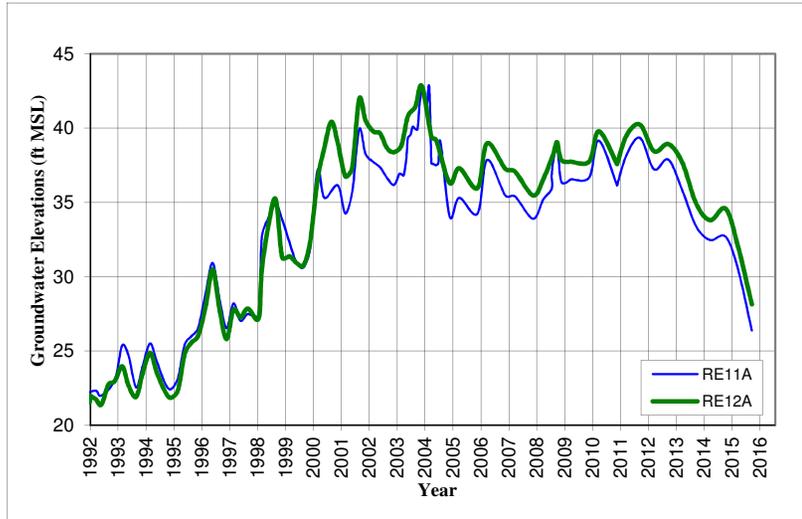
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



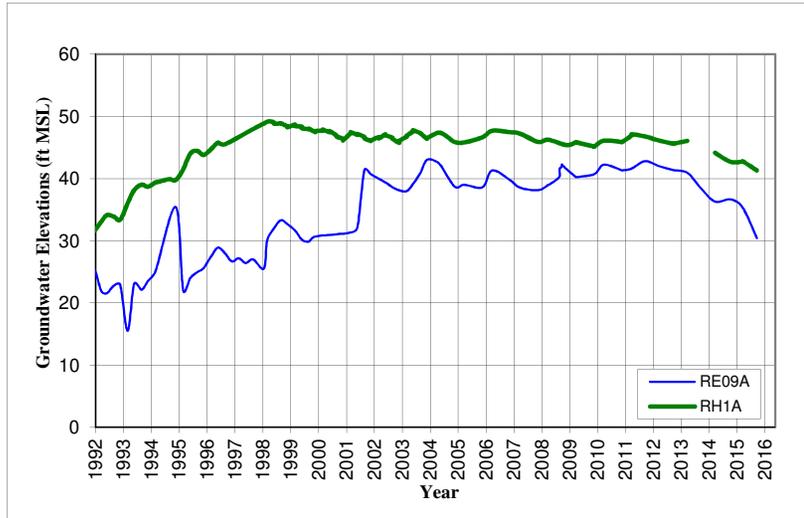
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



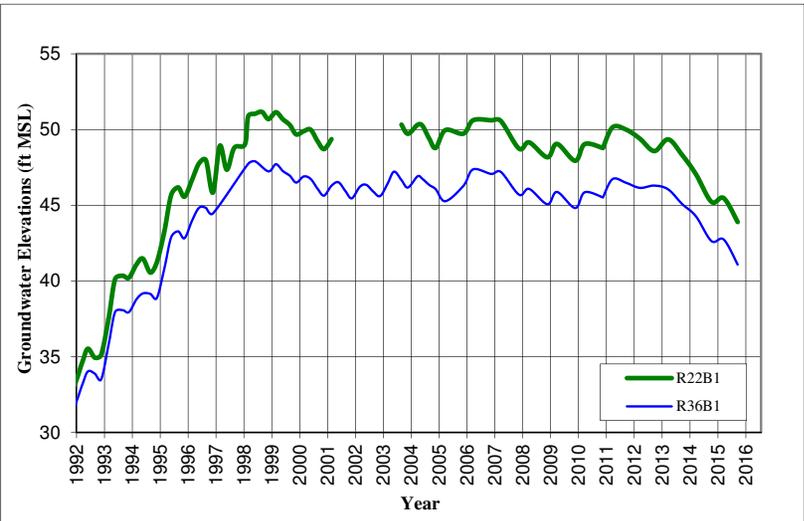
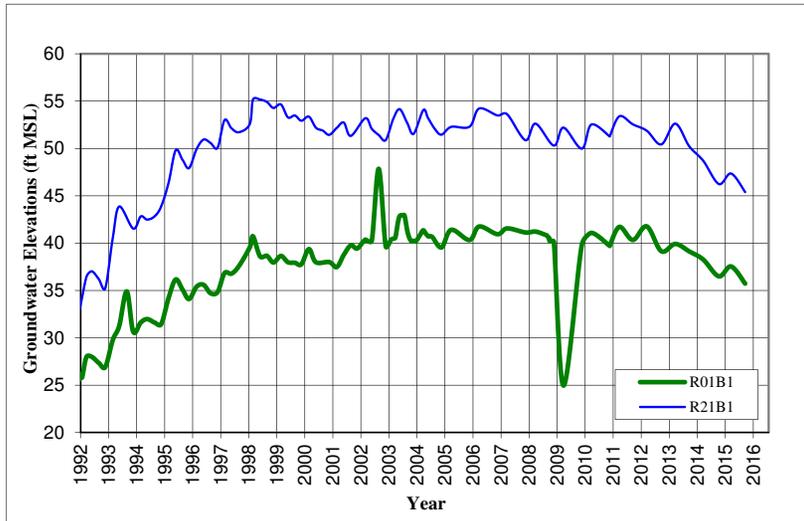
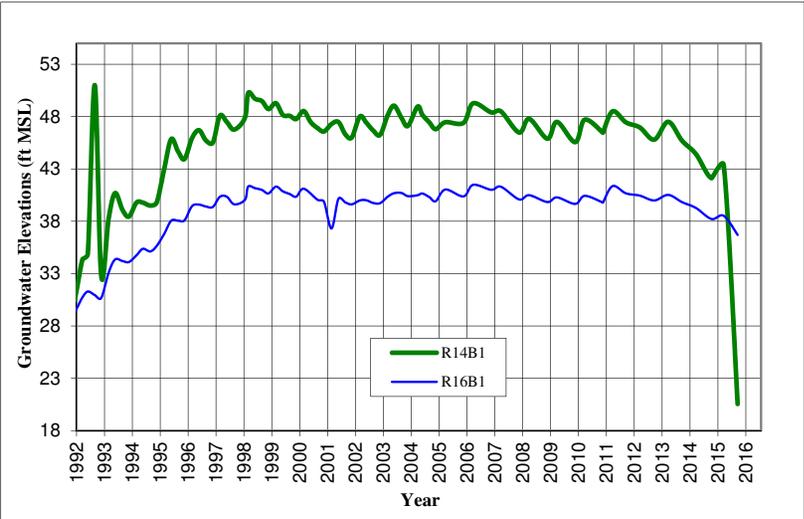
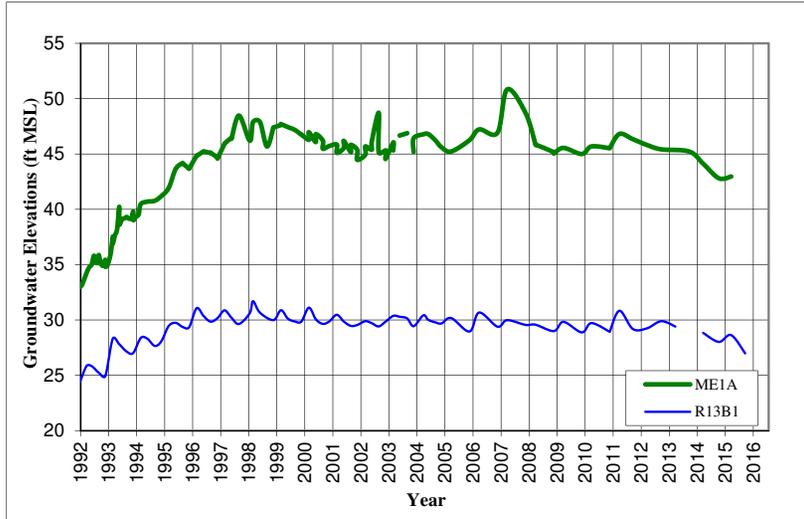
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS



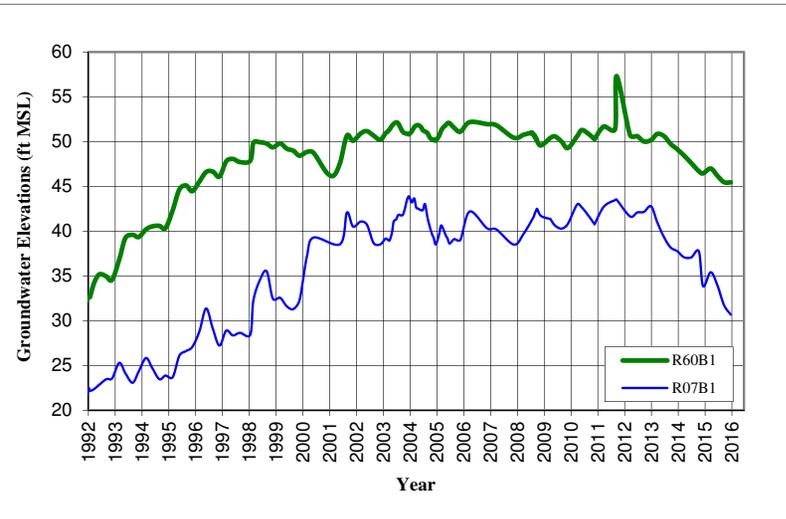
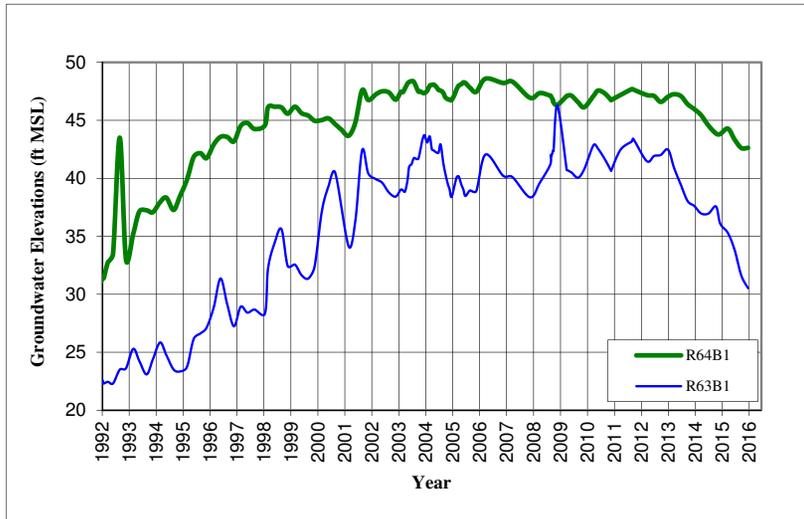
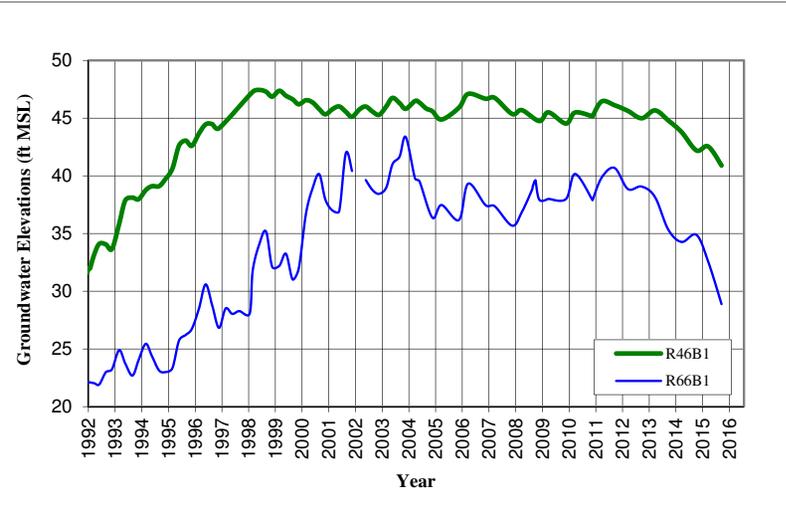
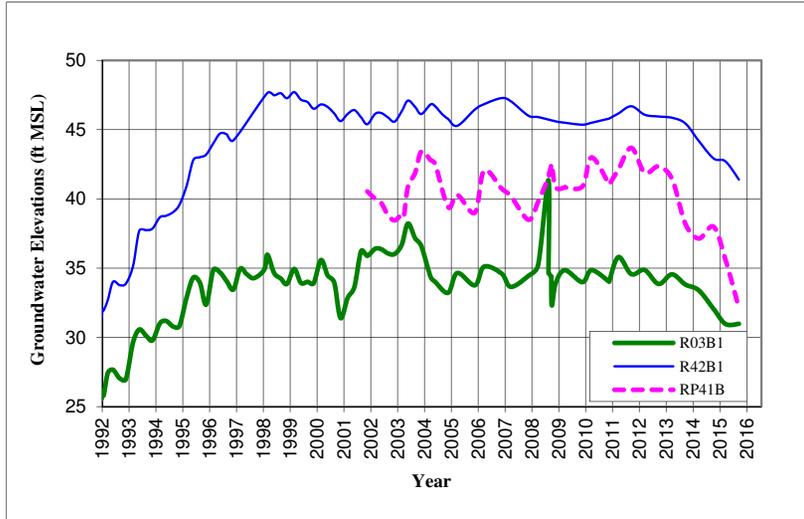
**APPENDIX C
HISTORICAL GROUNDWATER ELEVATIONS IN "A" AQUIFER WELLS**



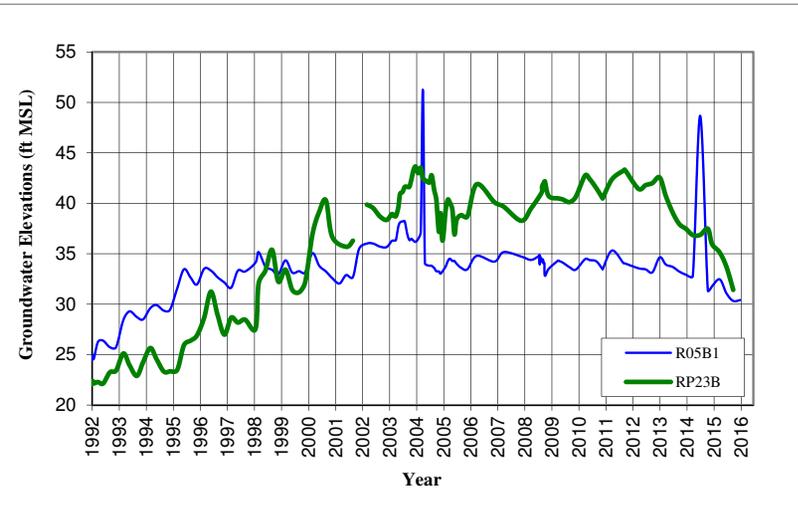
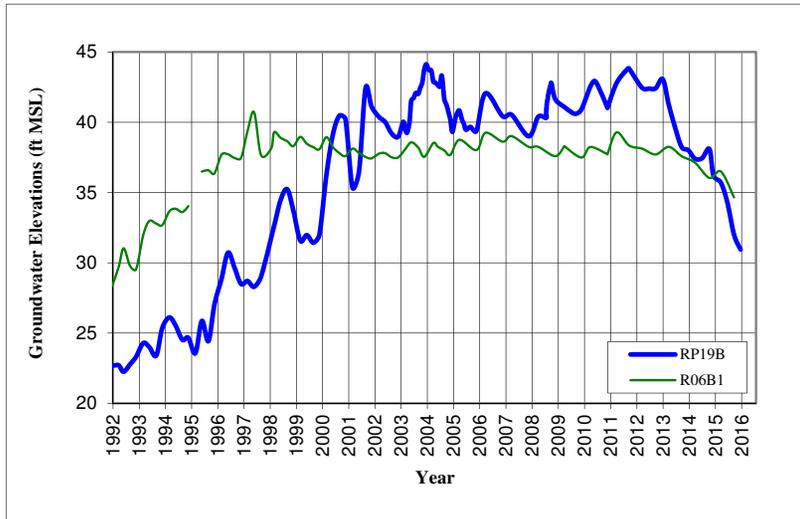
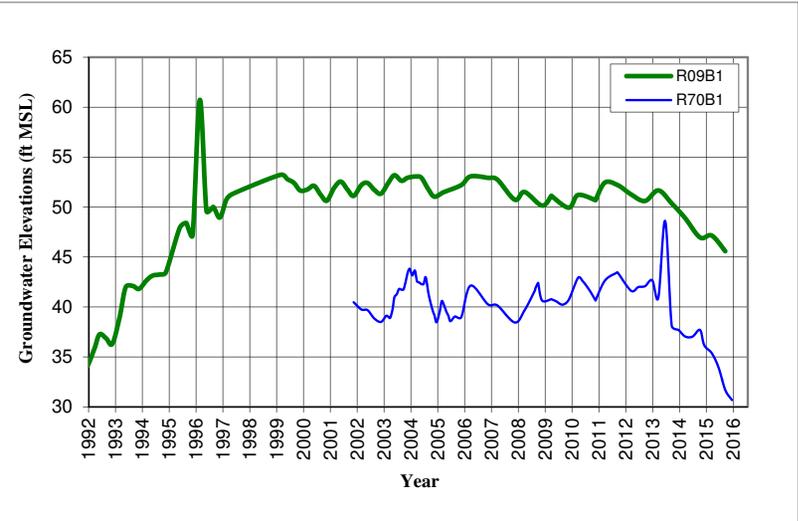
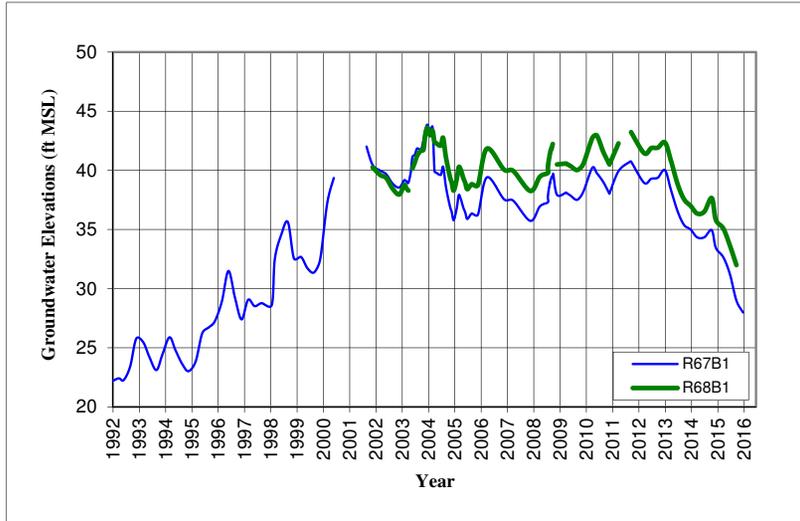
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B1" AQUIFER WELLS



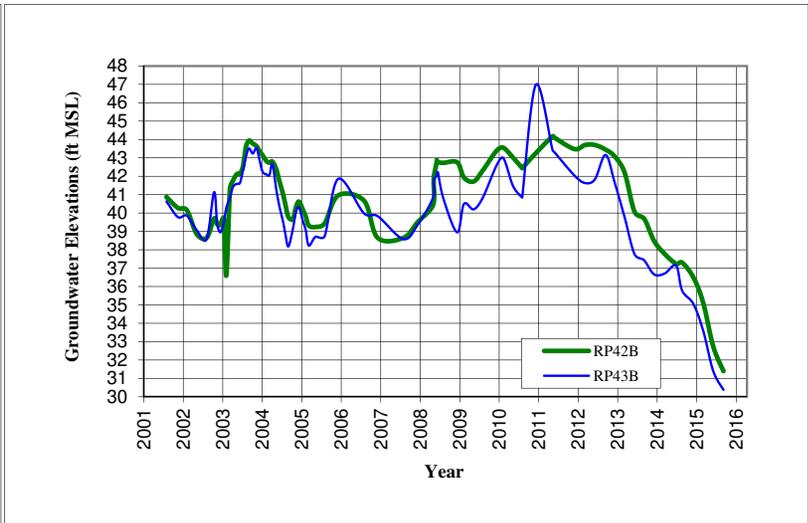
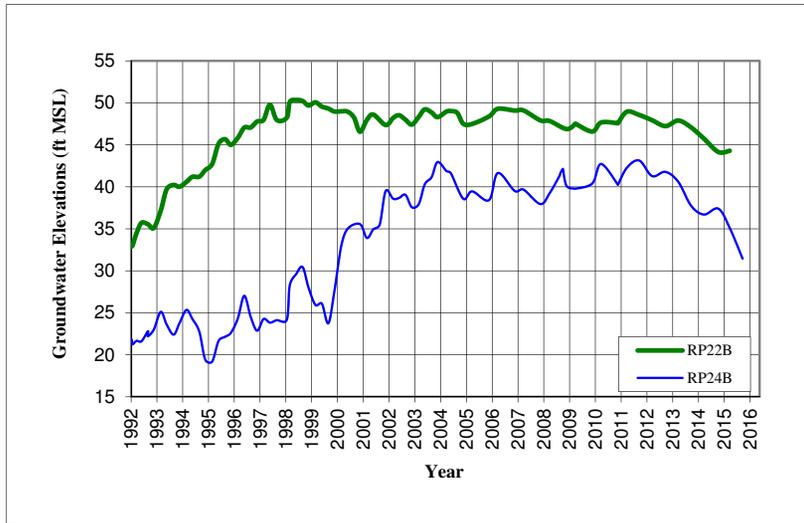
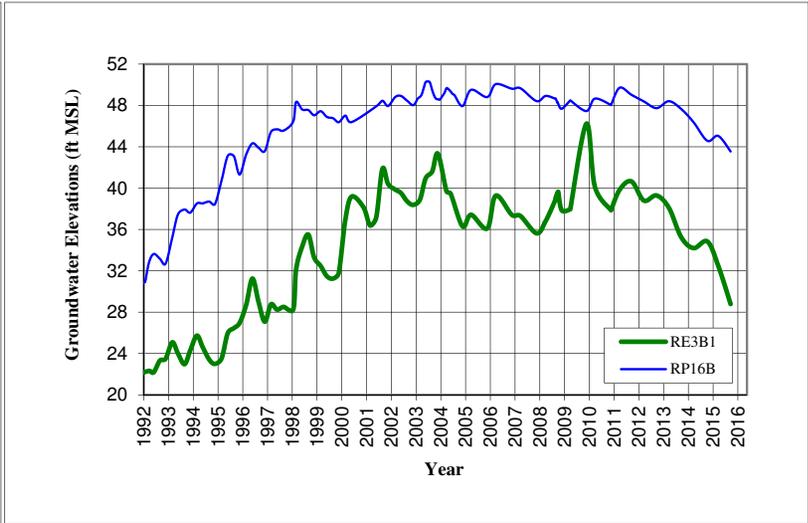
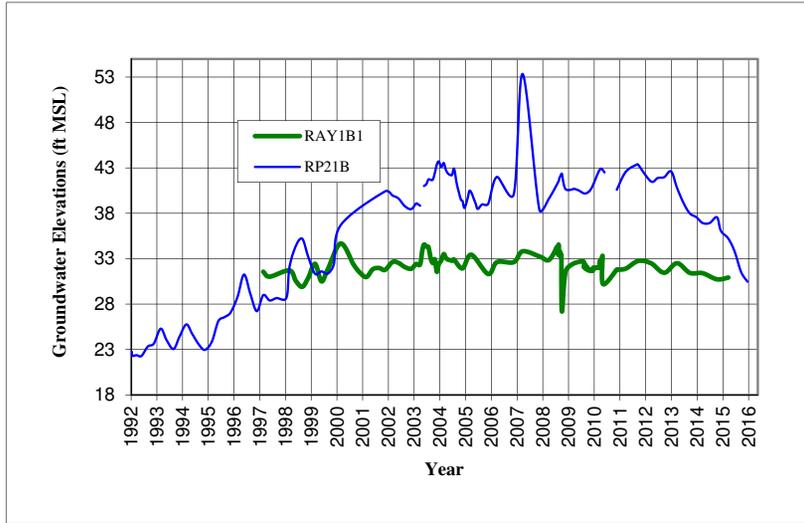
**APPENDIX C
HISTORICAL GROUNDWATER ELEVATIONS IN "B1" AQUIFER WELLS**



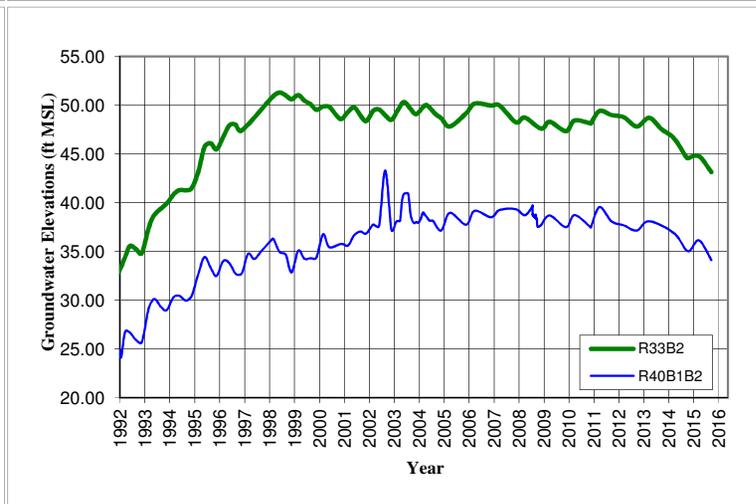
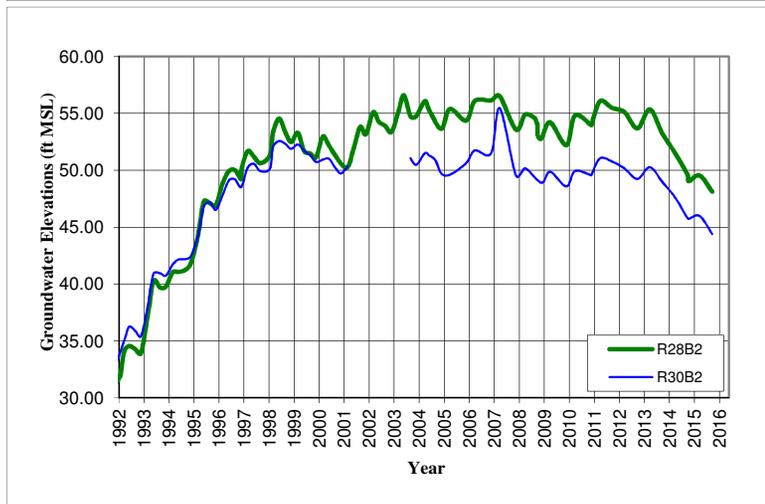
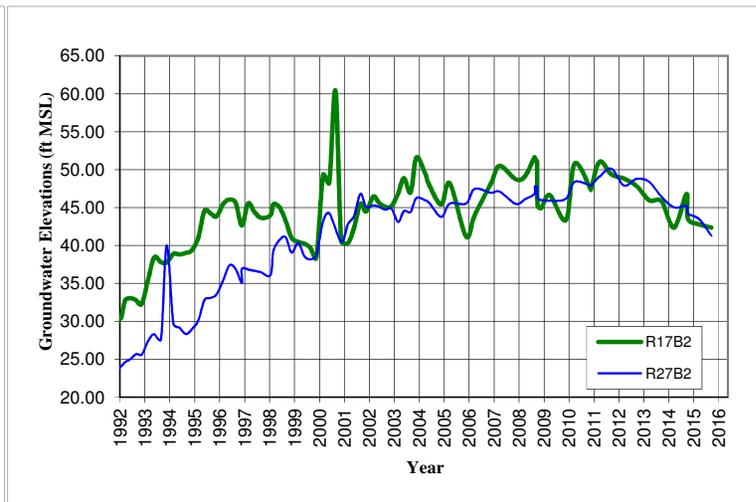
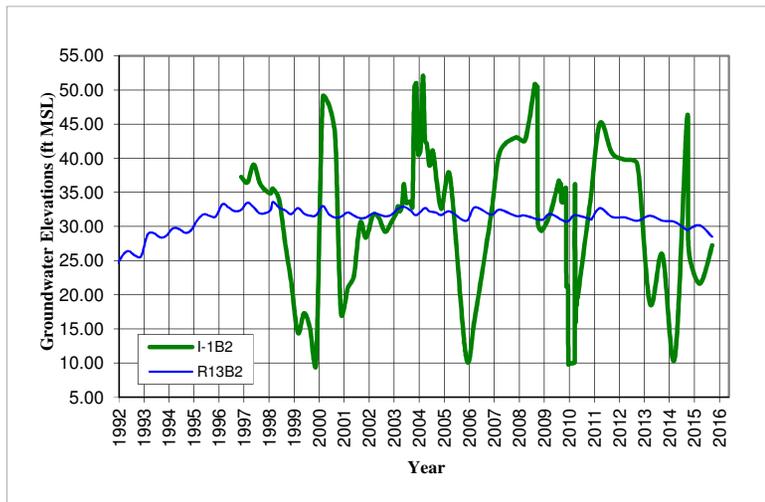
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B1" AQUIFER WELLS



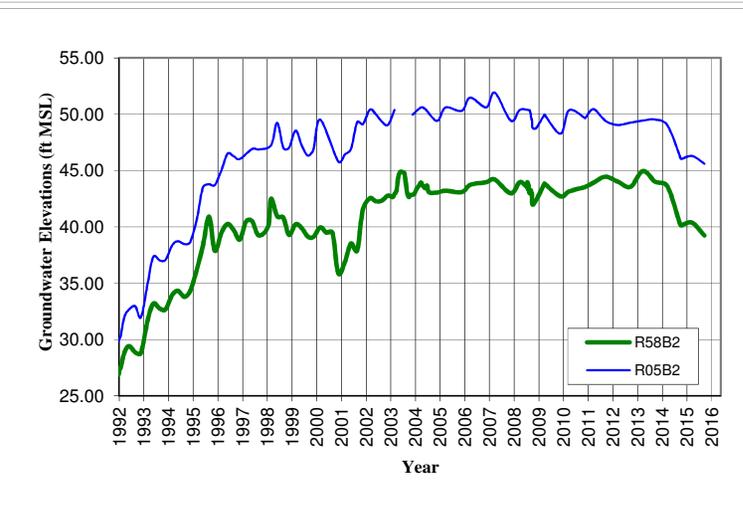
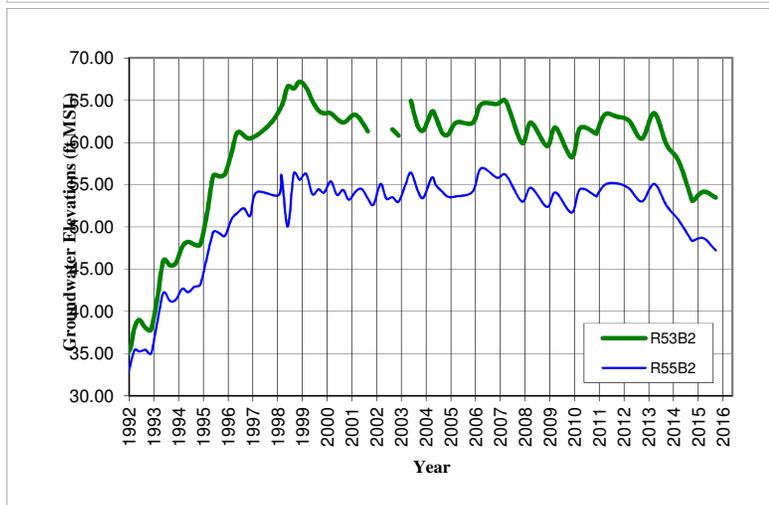
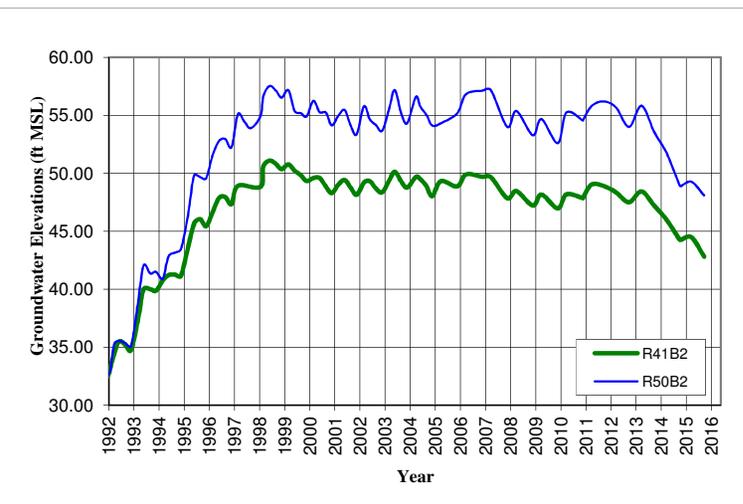
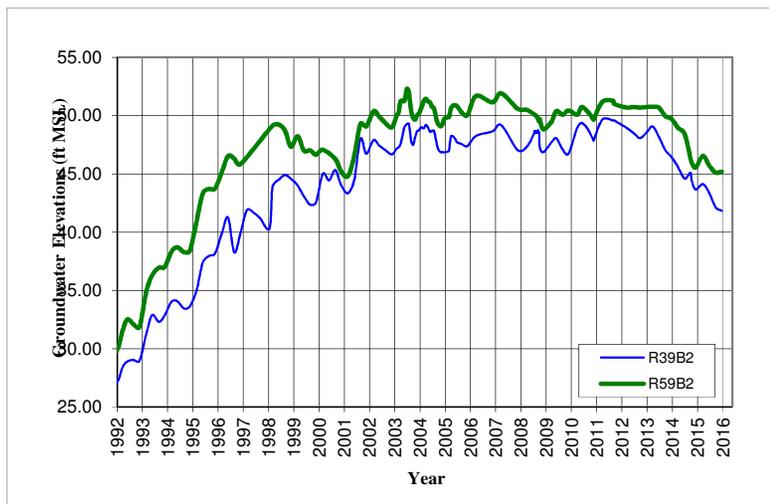
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B1" AQUIFER WELLS



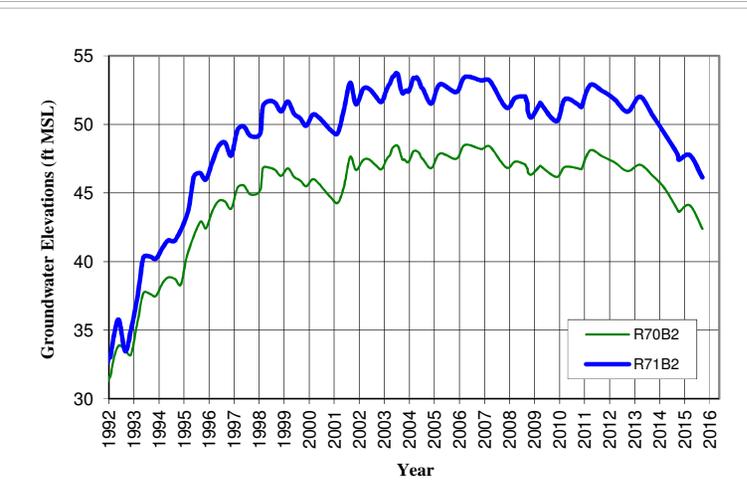
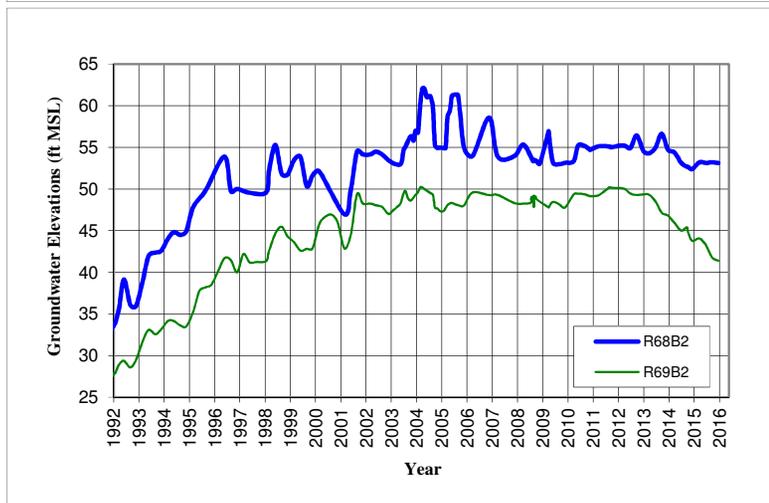
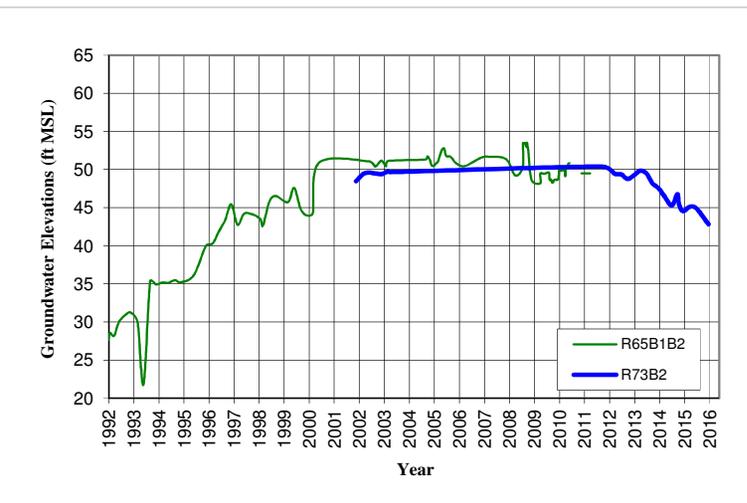
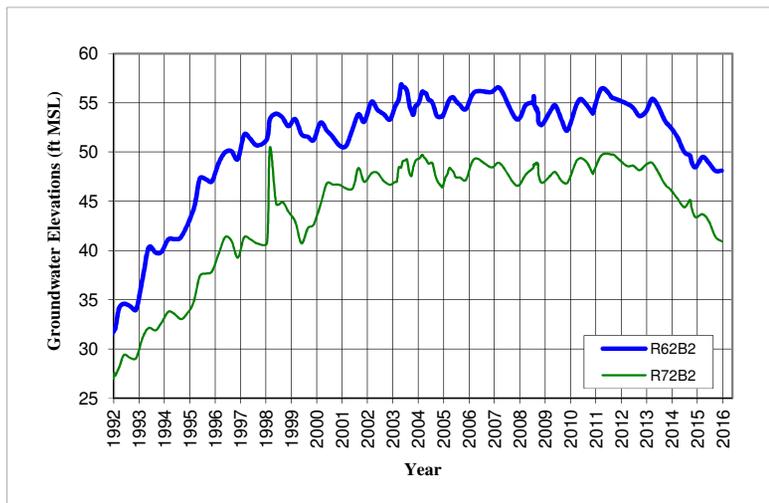
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B2" AQUIFER WELLS



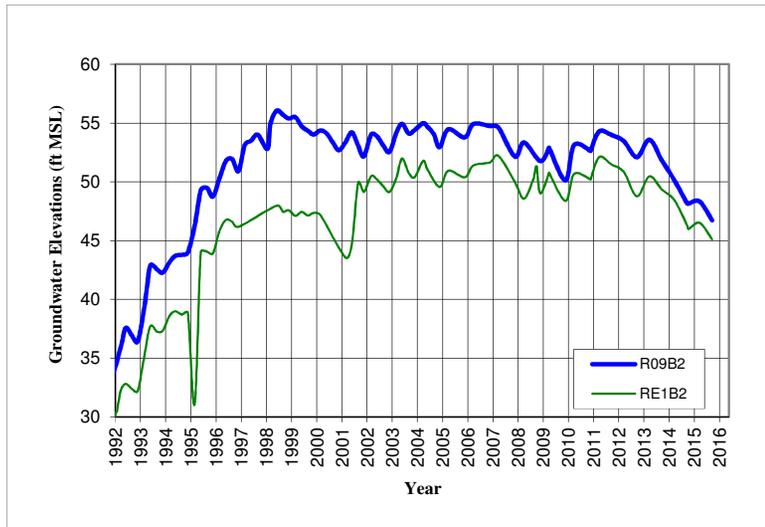
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B2" AQUIFER WELLS



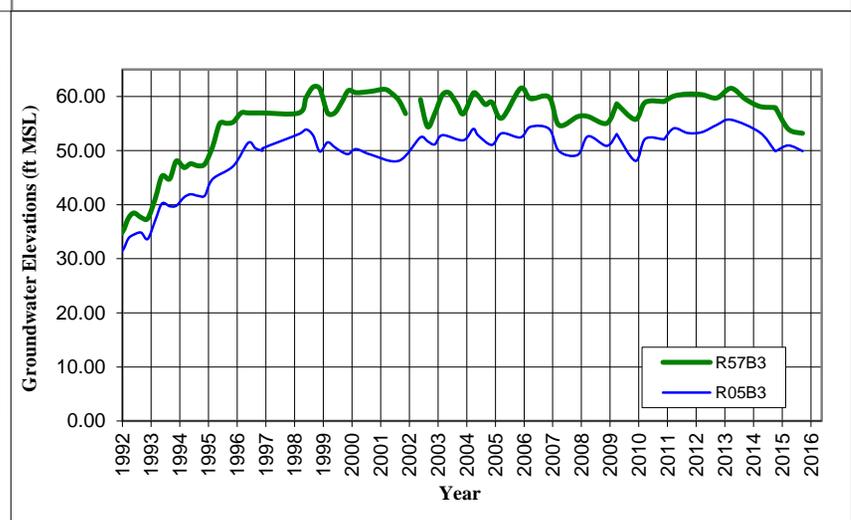
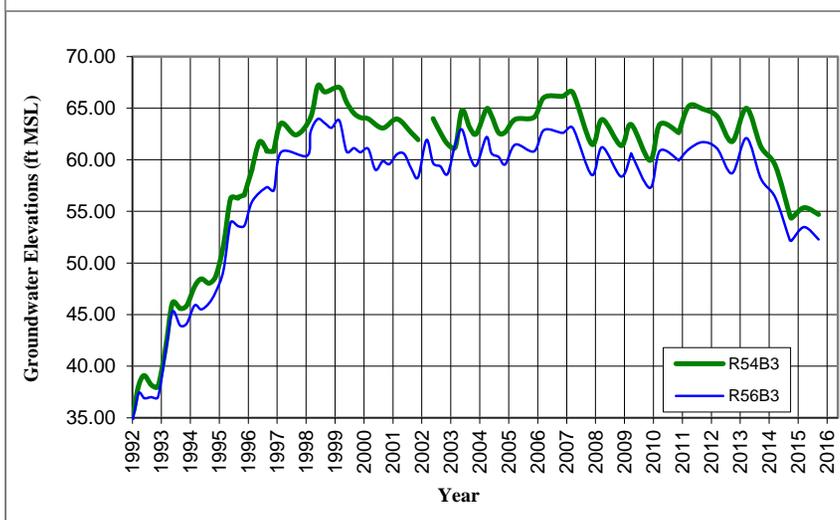
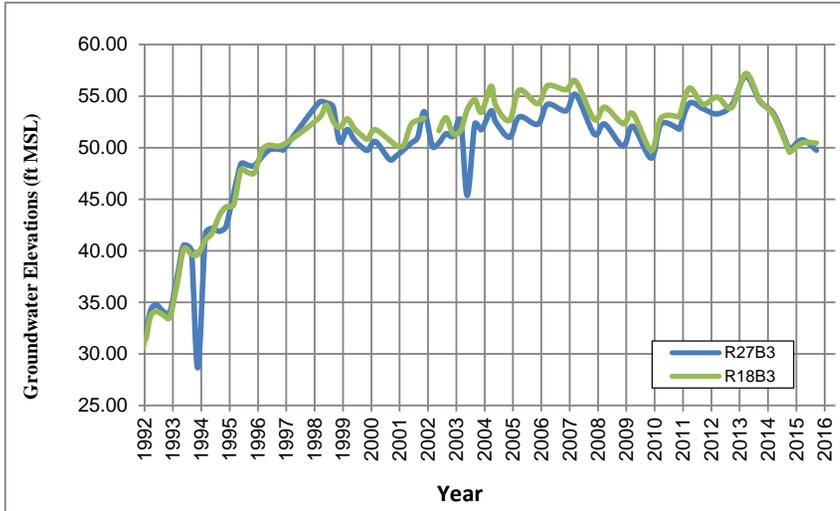
APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B2" AQUIFER WELLS



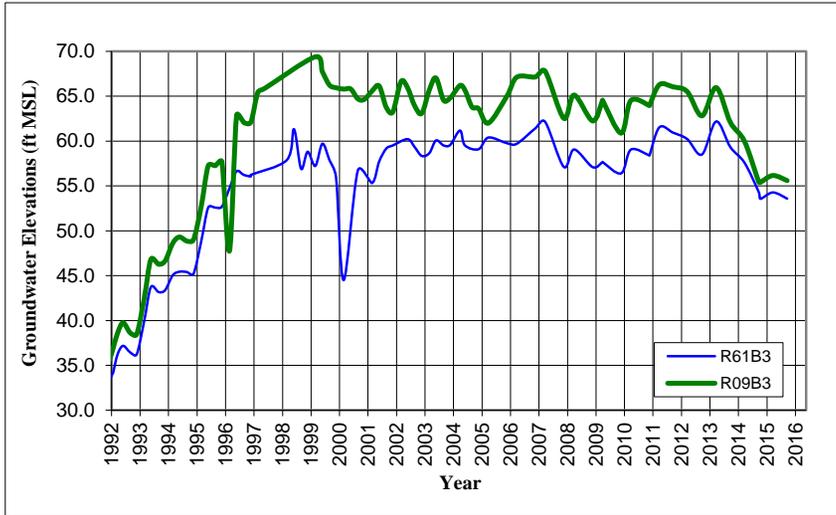
APPENDIX C
HISTORICAL GROUNDWATER ELEVATIONS IN "B2" AQUIFER WELLS



APPENDIX C HISTORICAL GROUNDWATER ELEVATIONS IN "B3" AQUIFER WELLS



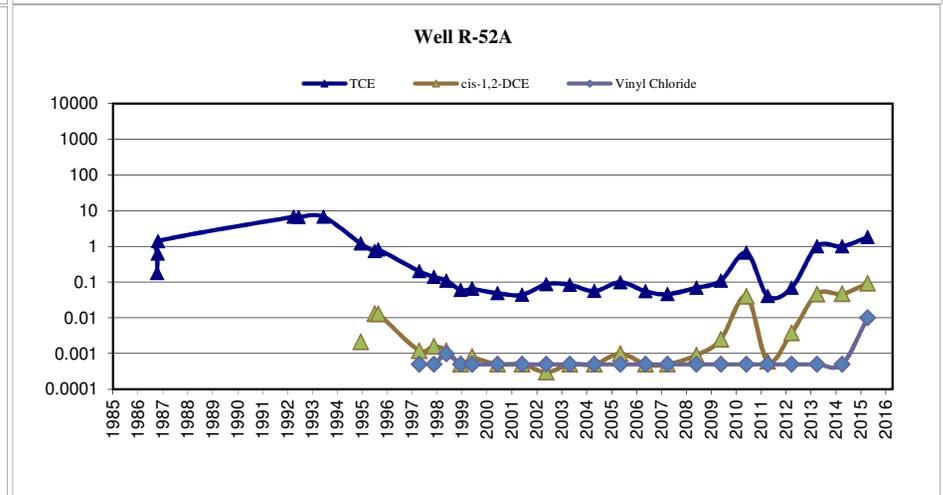
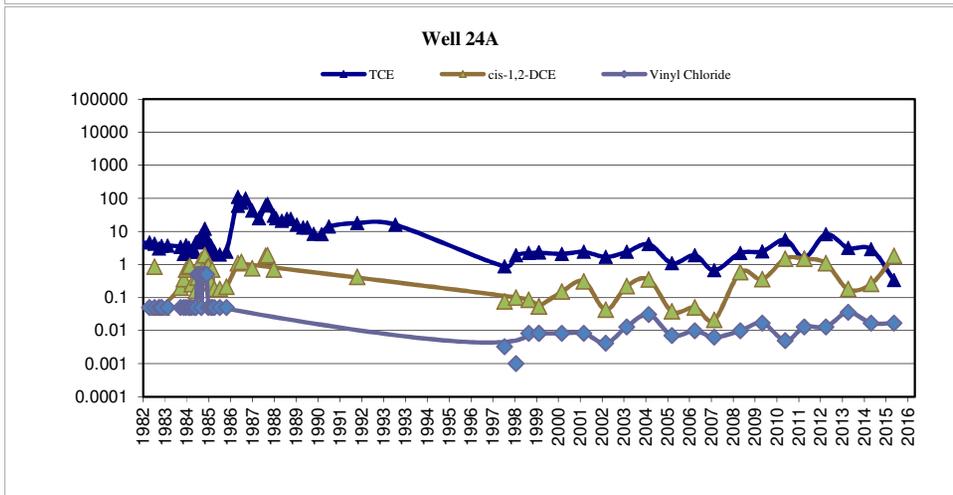
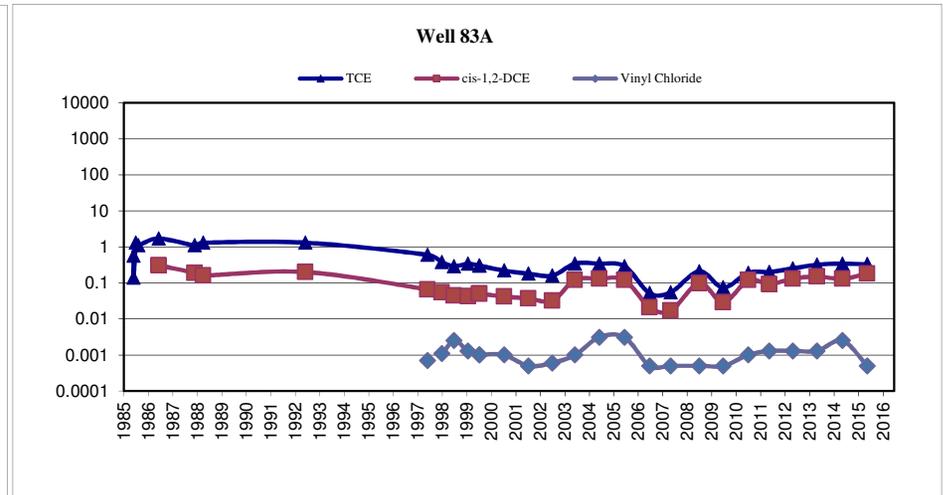
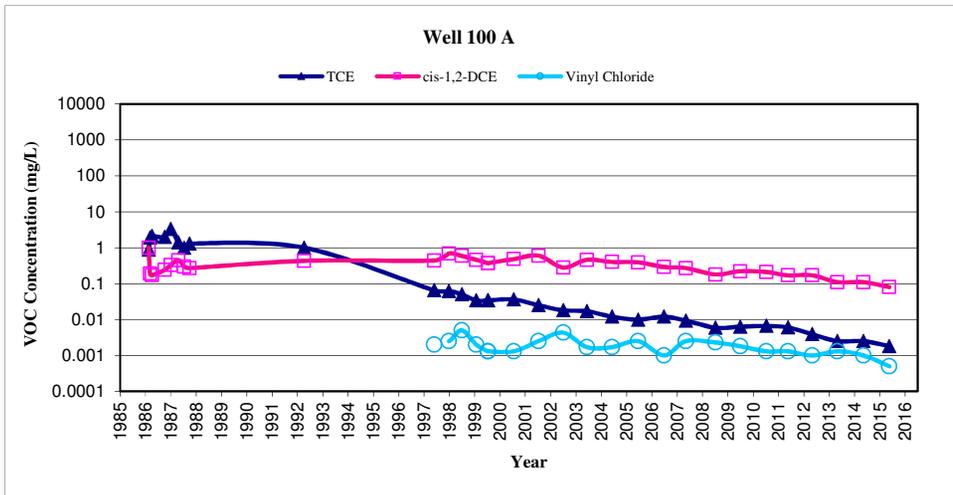
APPENDIX C
HISTORICAL GROUNDWATER ELEVATIONS IN "B3" AQUIFER WELLS



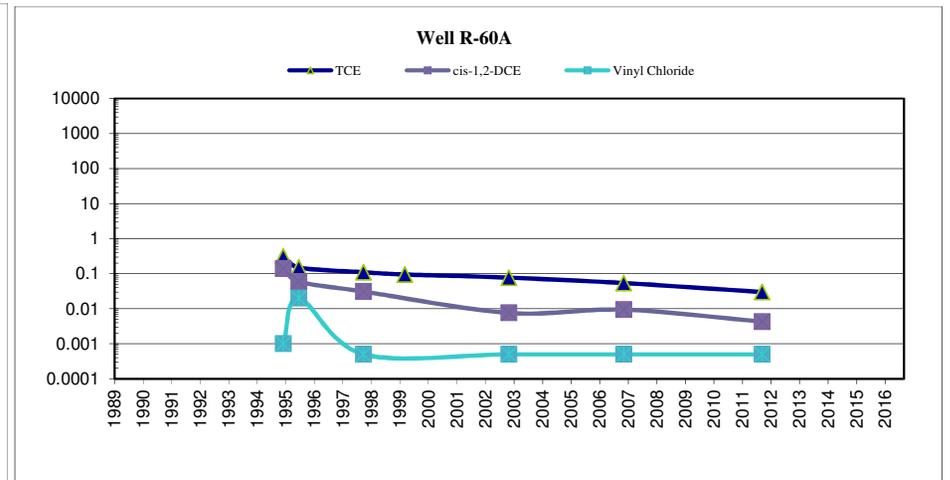
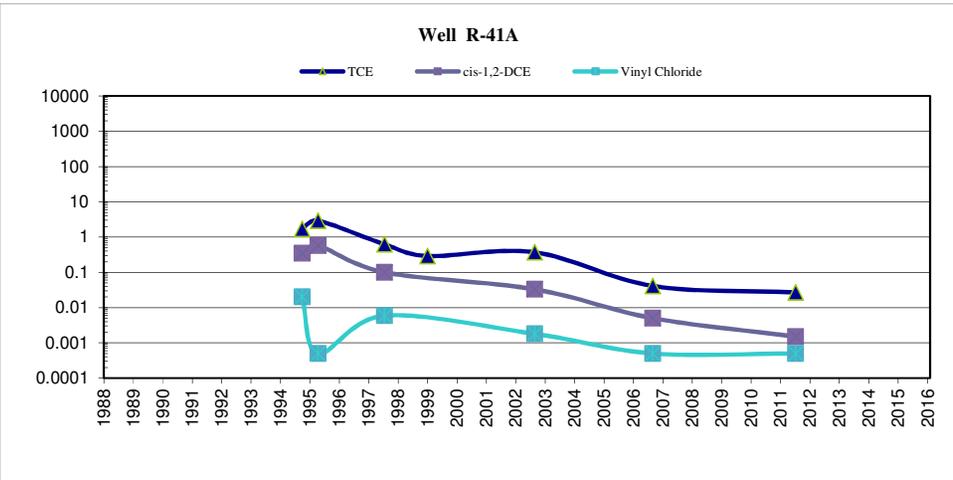
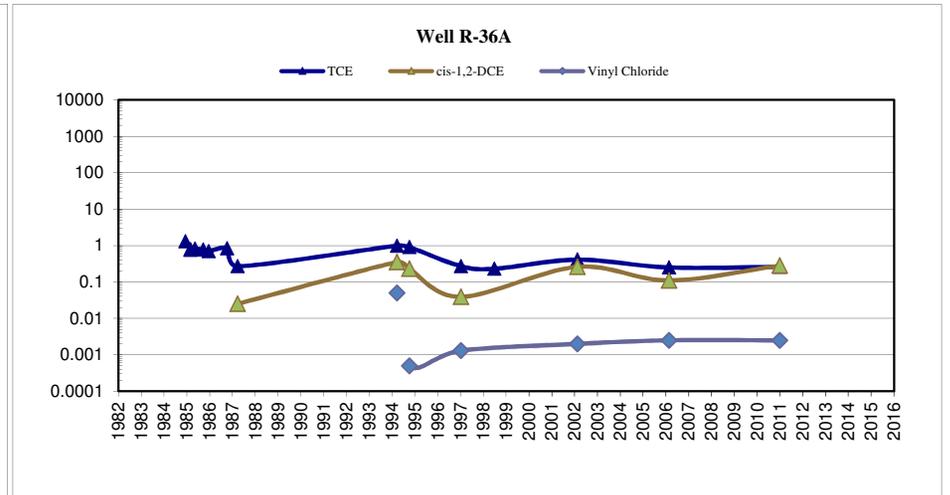
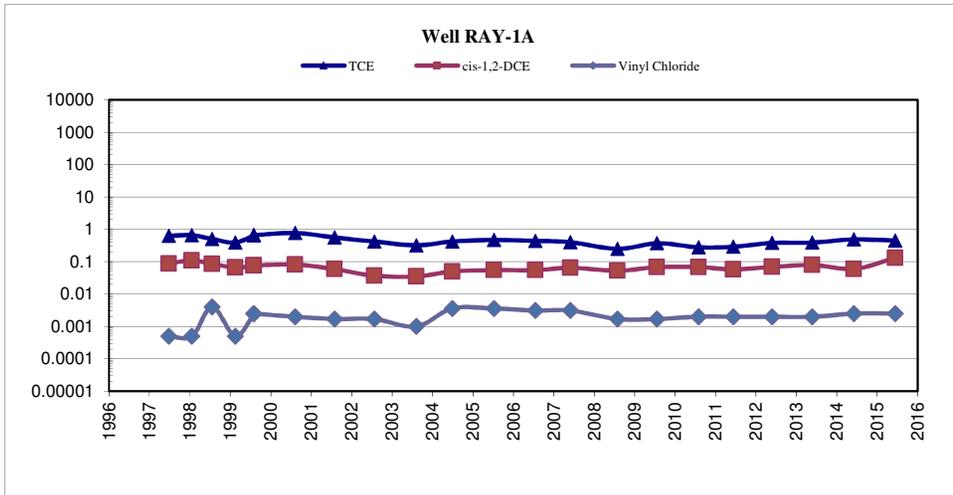
Appendix D

Historical Groundwater Quality Data And Plots

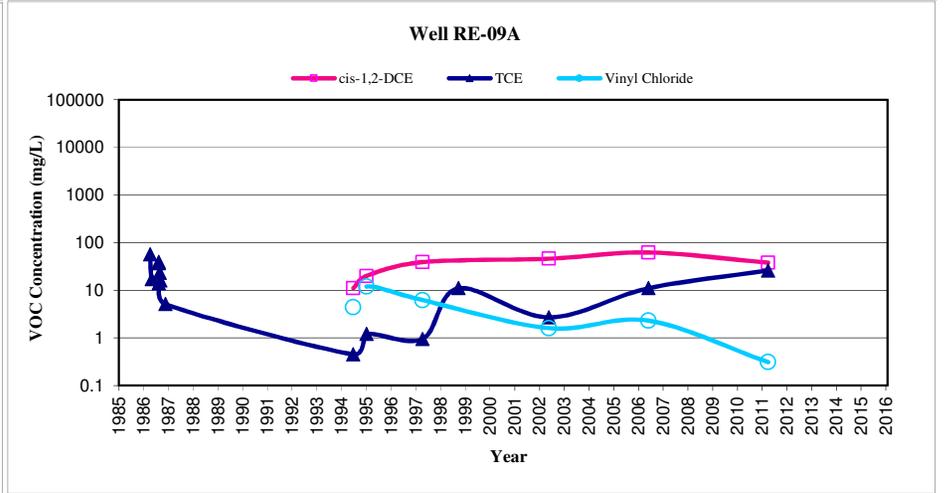
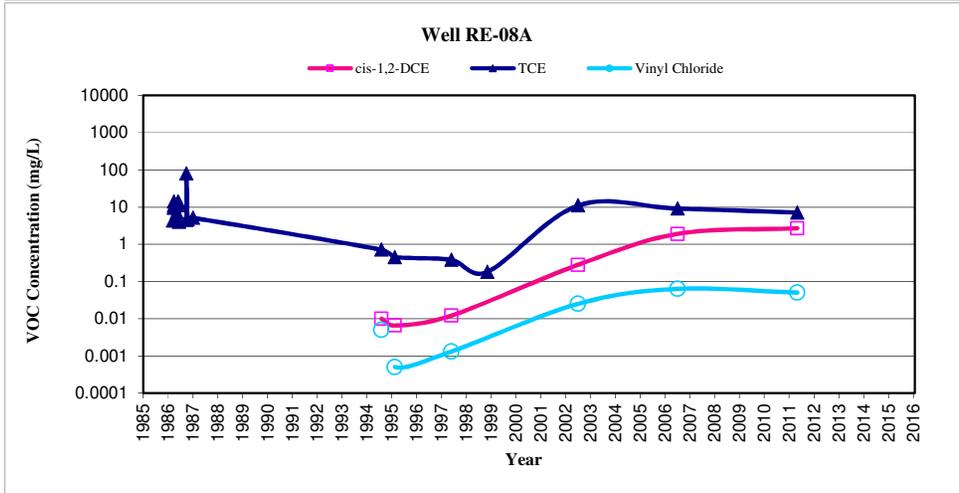
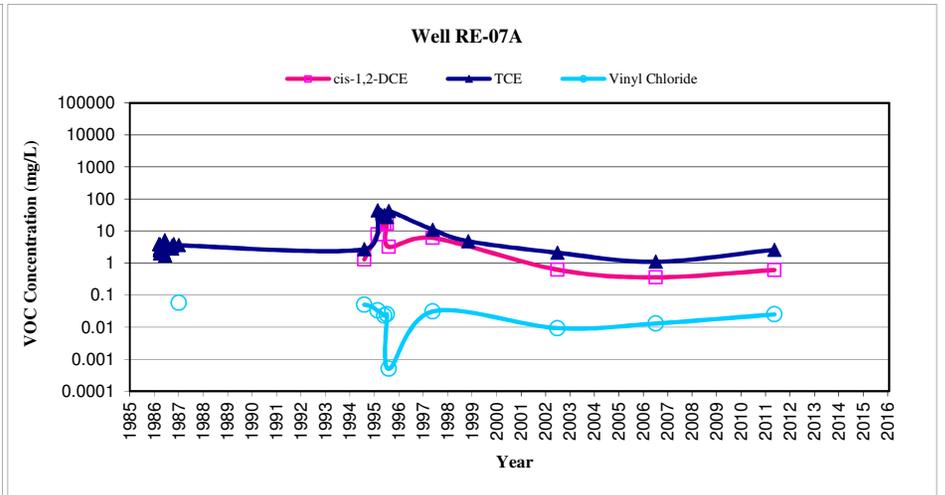
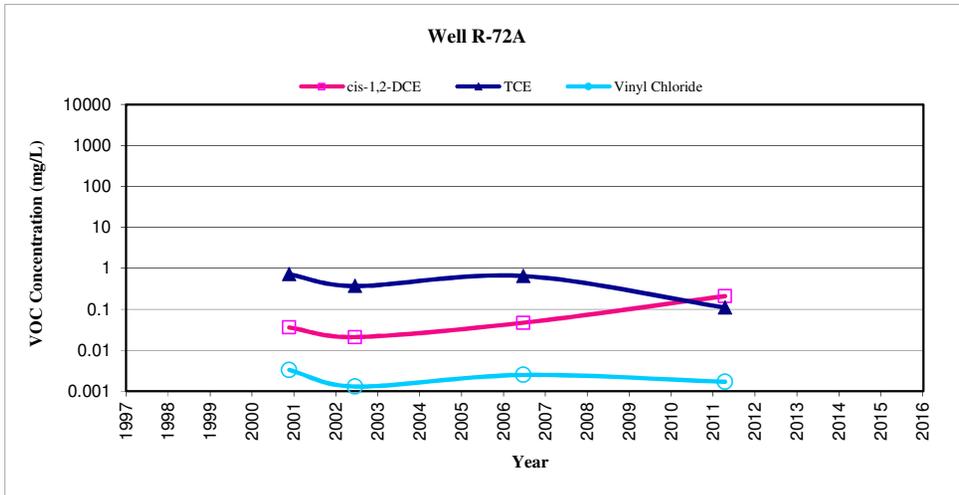
**APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "A" AQUIFER WELLS**



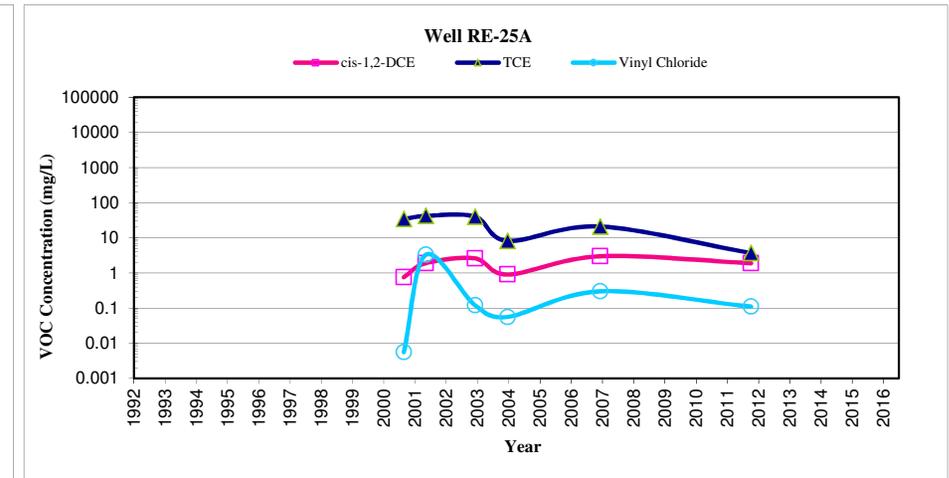
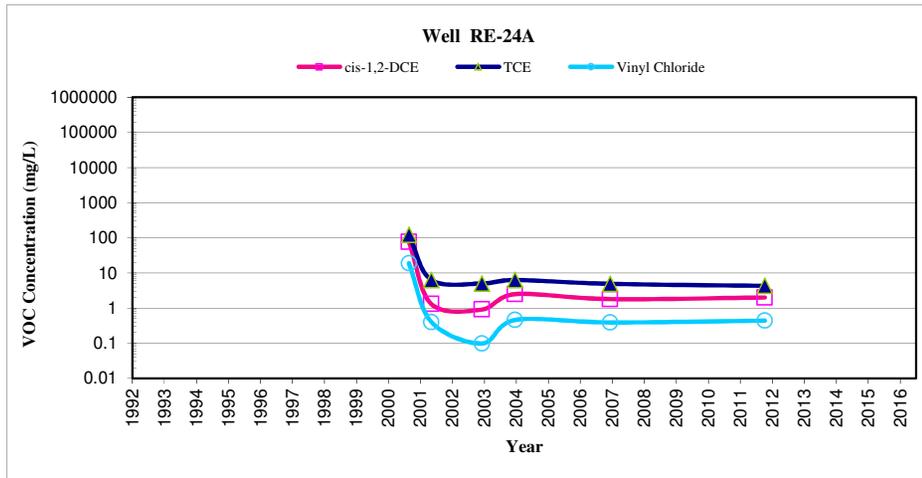
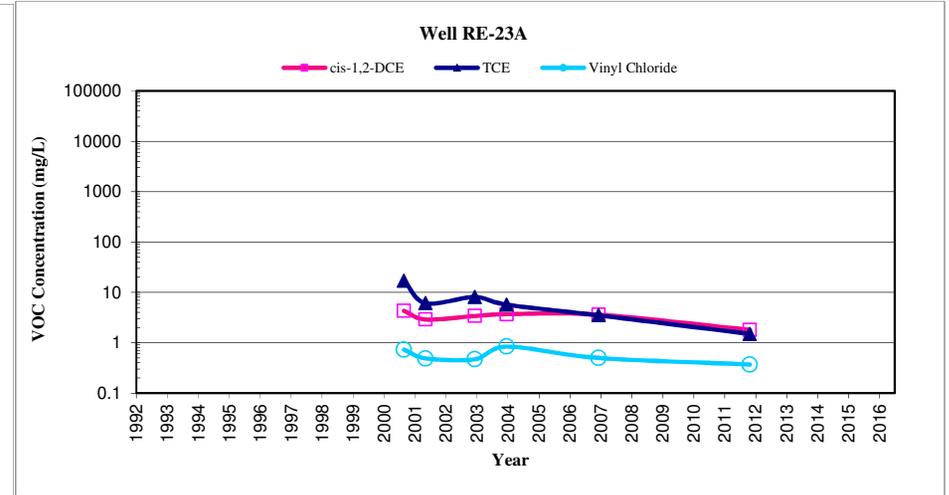
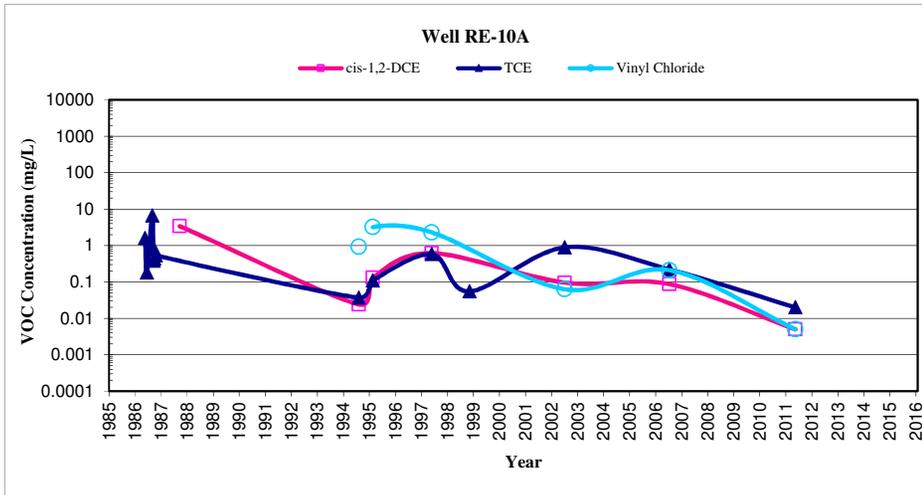
APPENDIX D AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "A" AQUIFER WELLS



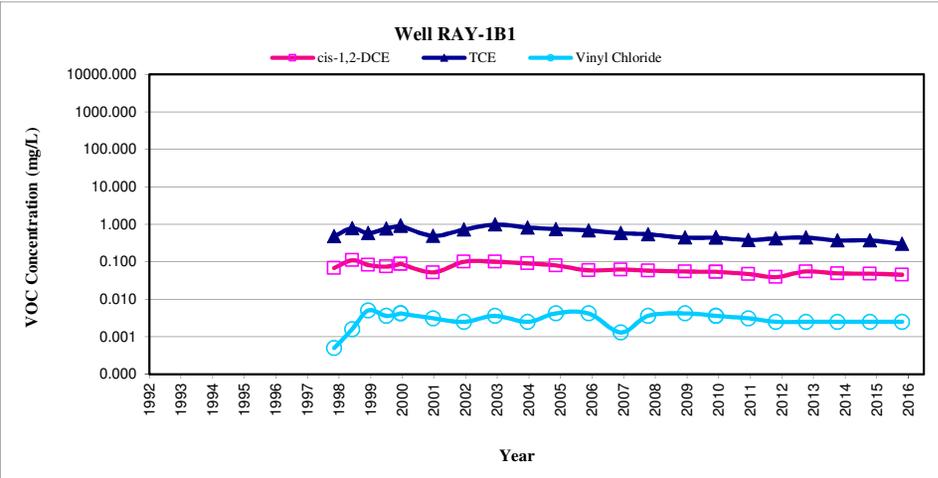
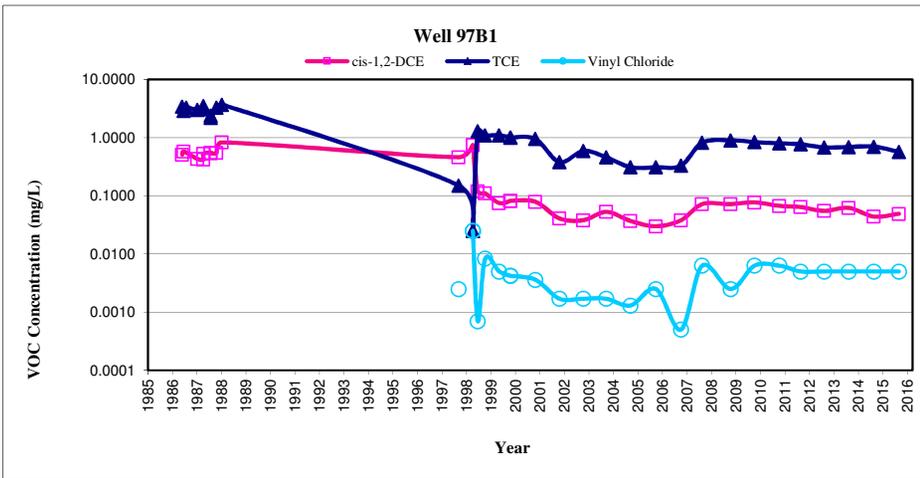
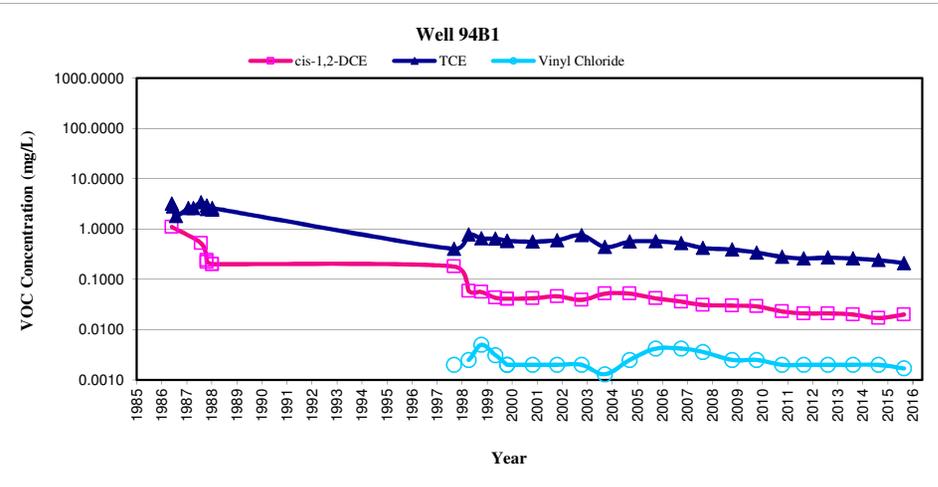
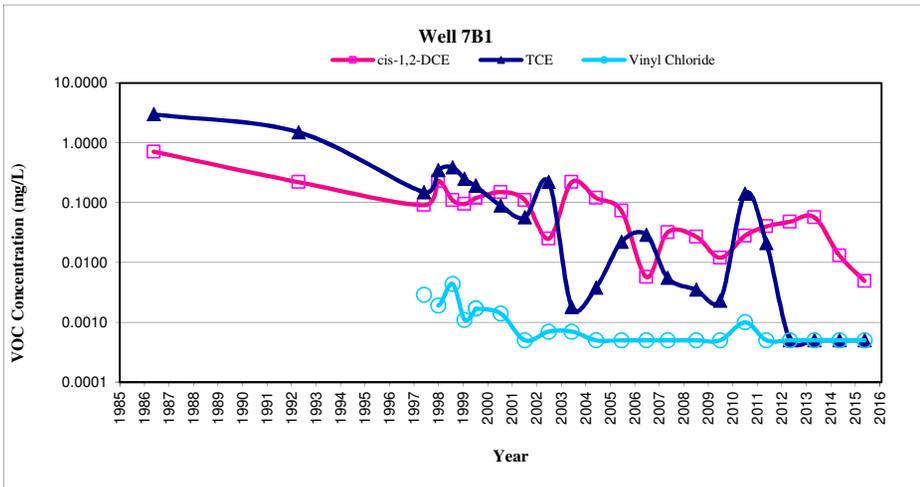
**APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "A" AQUIFER WELLS**



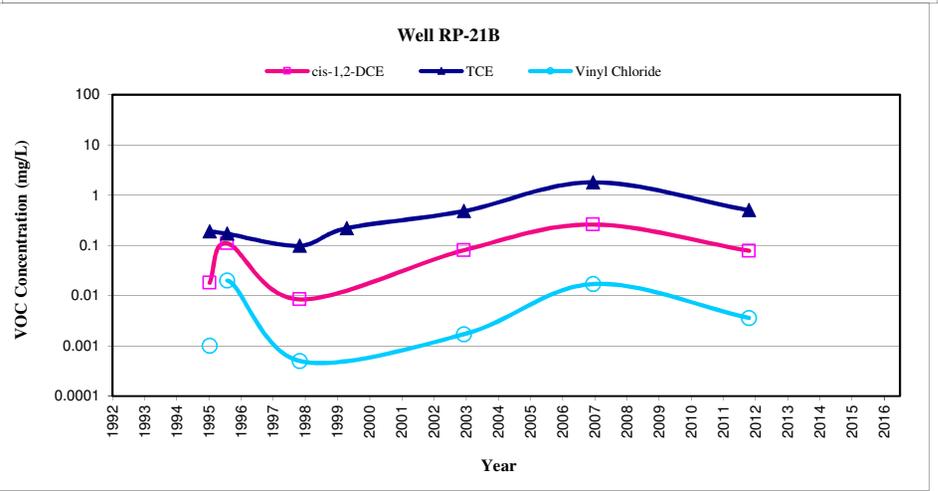
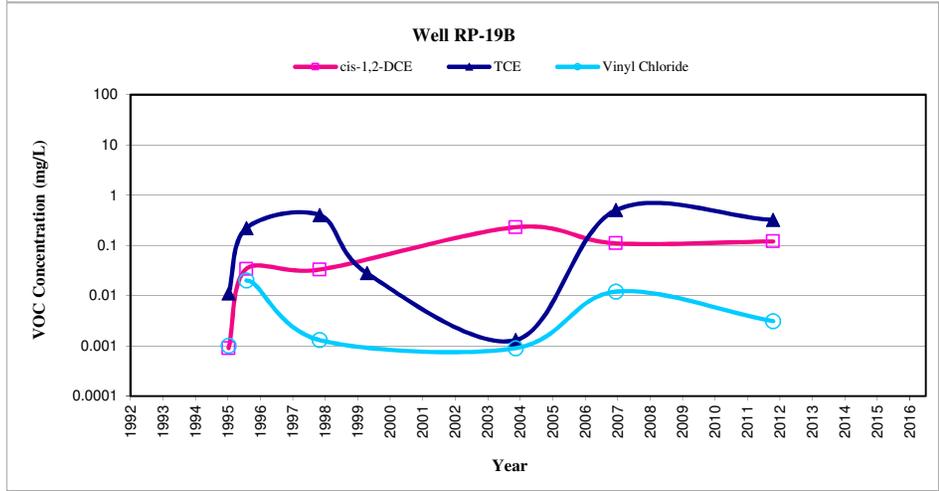
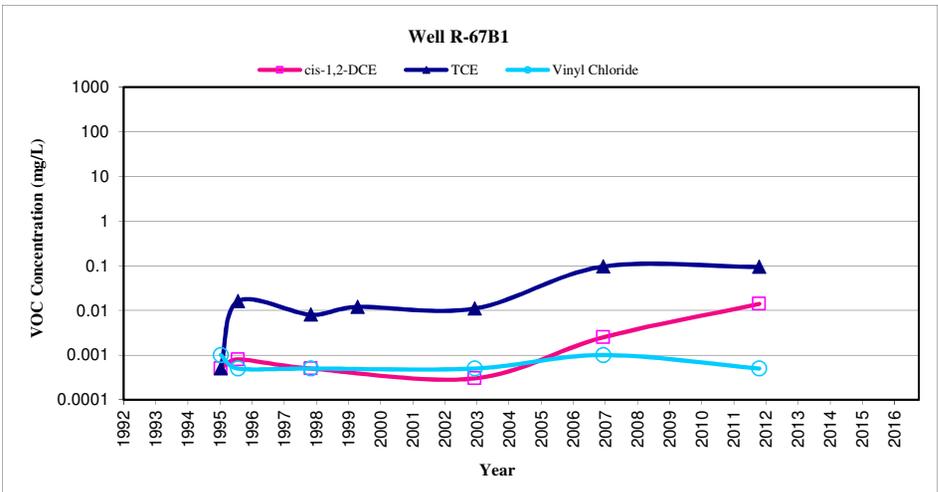
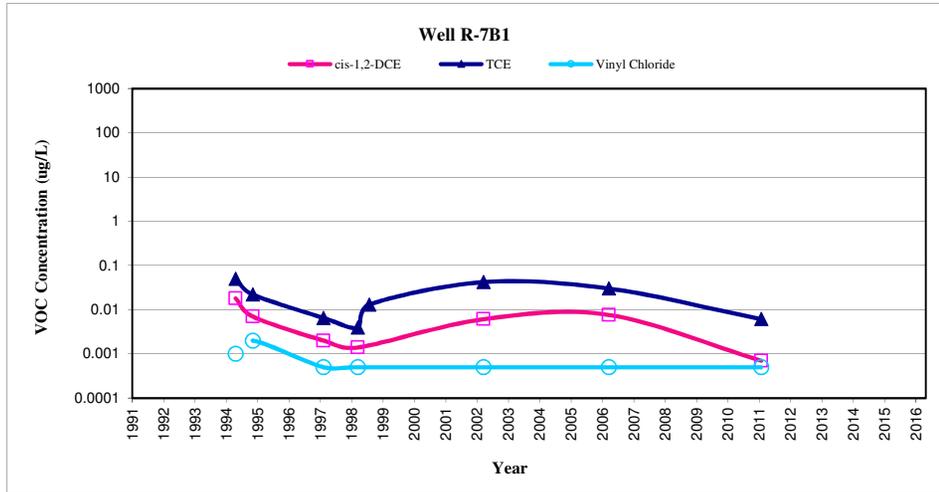
APPENDIX D AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "A" AQUIFER WELLS



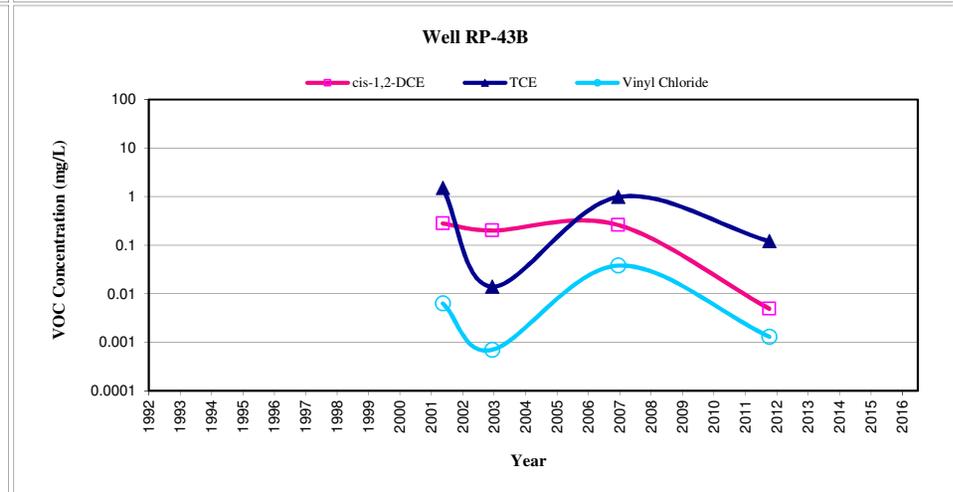
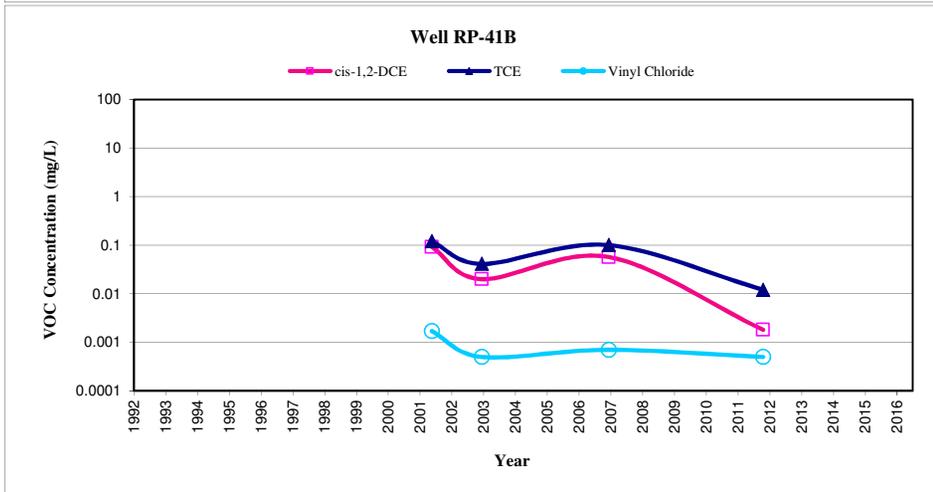
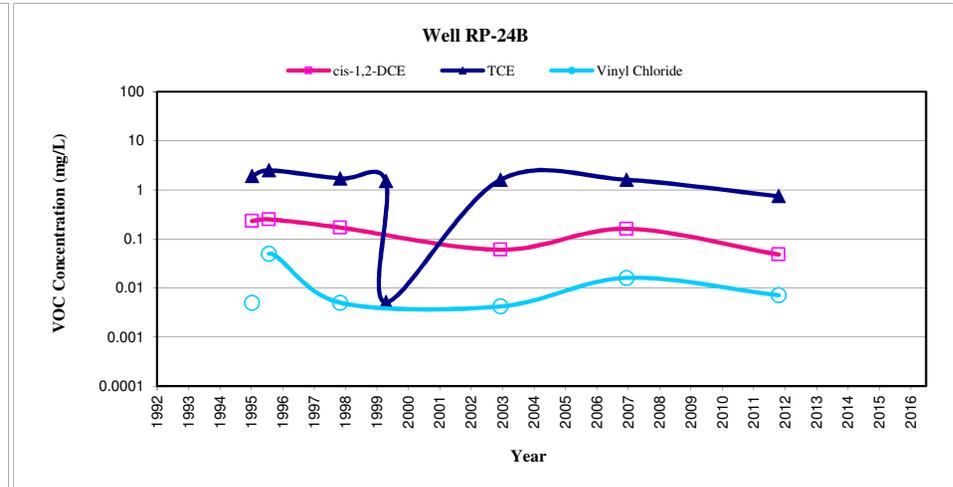
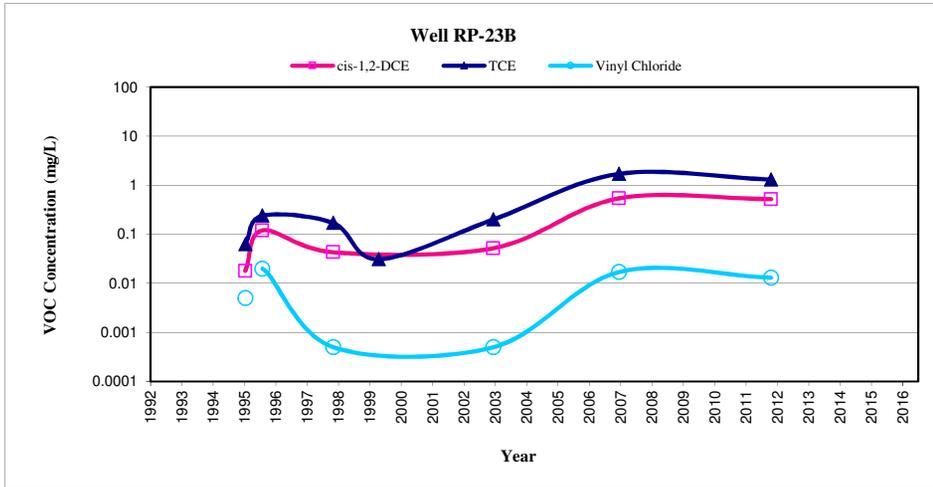
**APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "B1" AQUIFER WELLS**



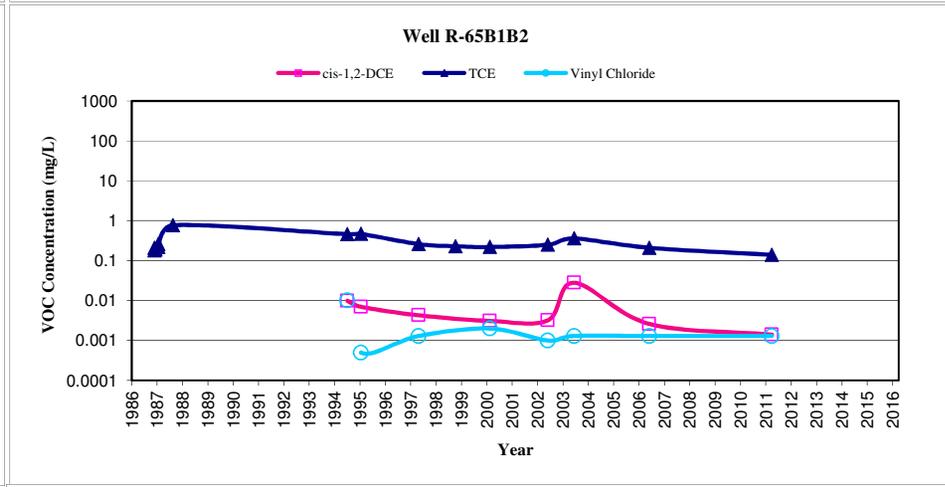
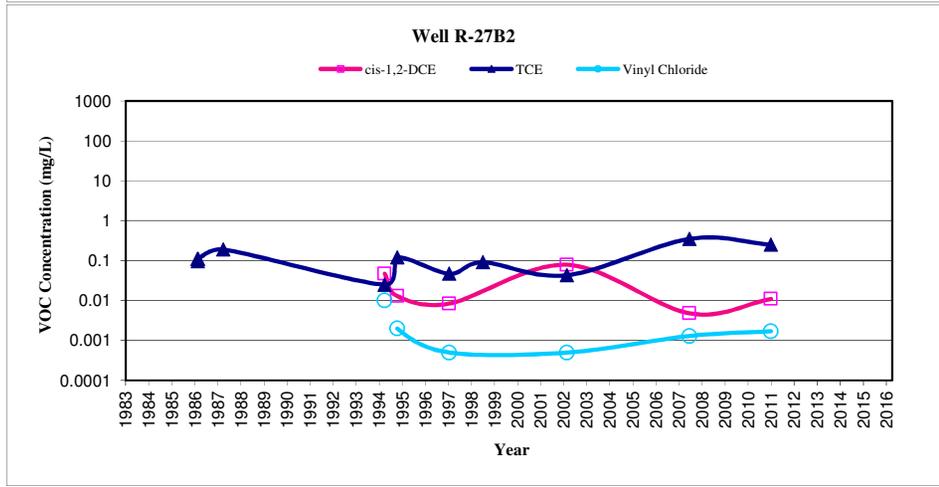
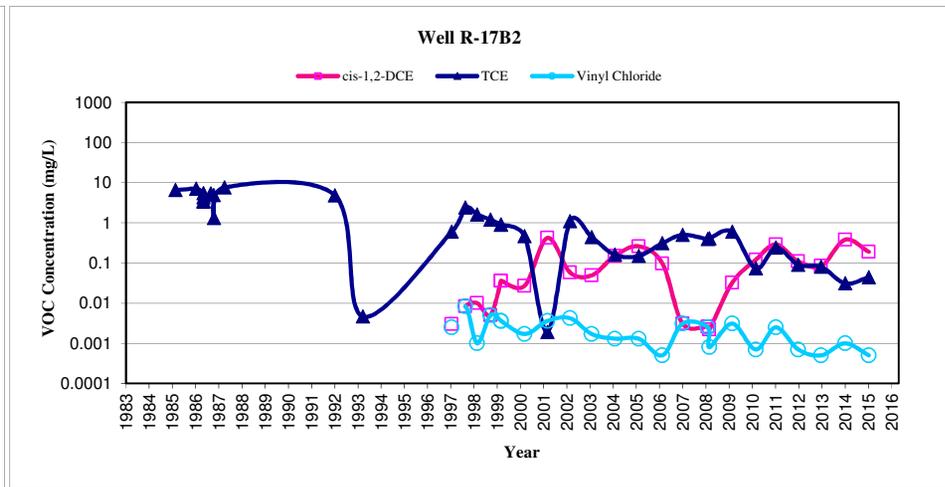
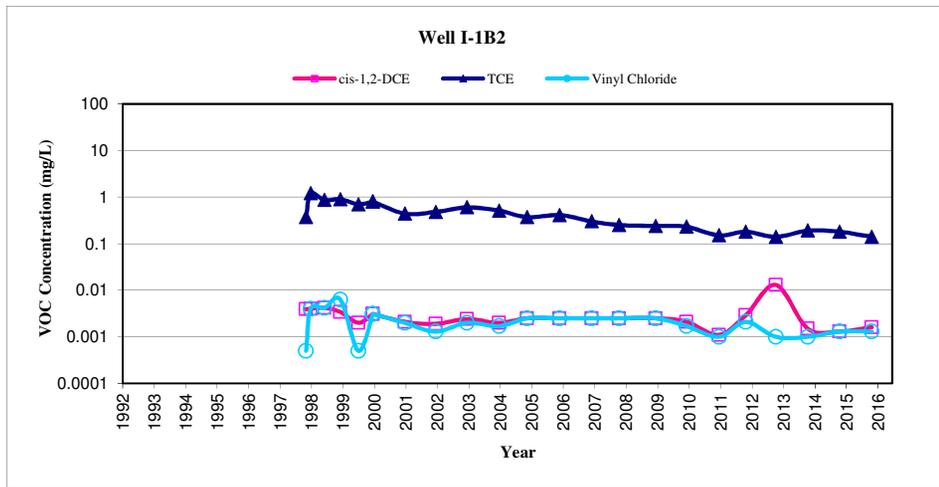
**APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "B1" AQUIFER WELLS**



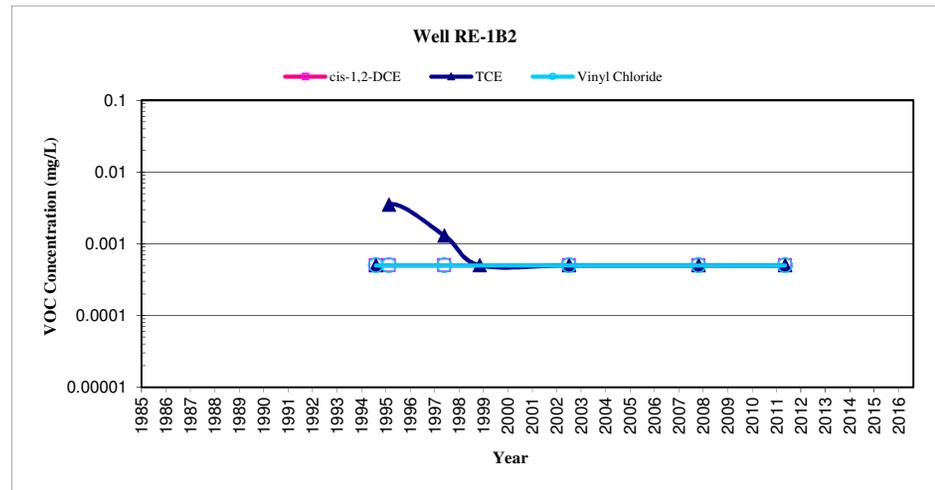
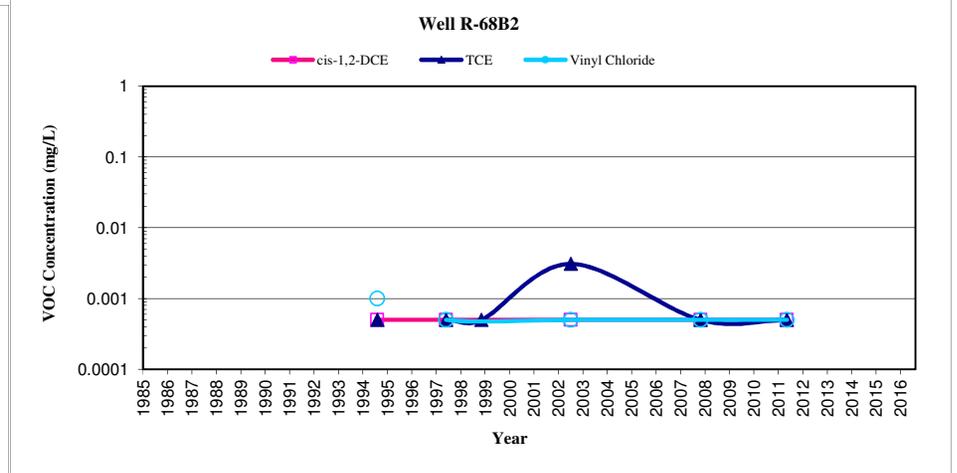
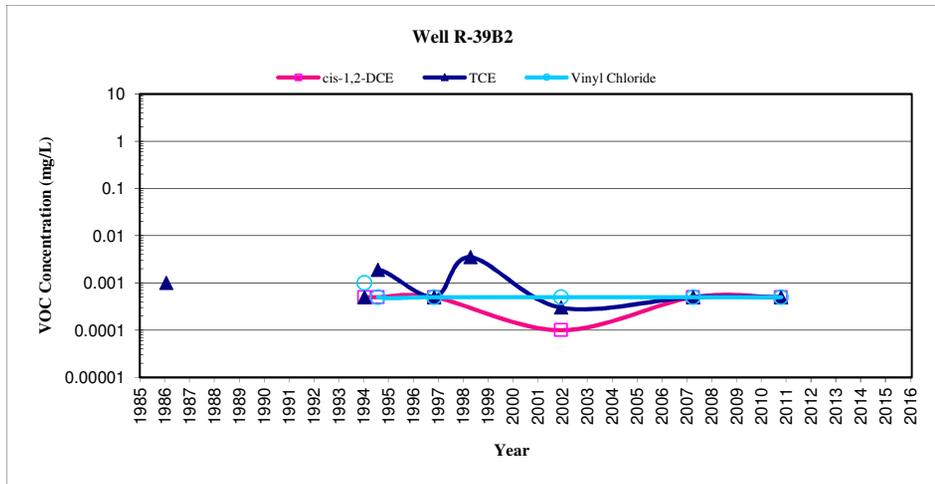
APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "B1" AQUIFER WELLS



APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "B2" AQUIFER WELLS



**APPENDIX D
AVERAGE ANNUAL VOC CONCENTRATIONS IN SITE SPECIFIC "B2" AQUIFER WELLS**



Appendix E

Quality Assurance / Quality Control Report

Appendix E
Quality Assurance/Quality Control Report
Raytheon Company – Former Facilities
350 Ellis Street Site
Mountain View, California

This Quality Assurance/Quality Control Report has been prepared by Locus Technologies (Locus) on behalf of Raytheon Company for the groundwater treatment system samples collected during this reporting period at the Raytheon's former facility located at 350 Ellis Street in Mountain View, California. This QA/QC report demonstrates that the work performed at this site complied with the standards and protocols in accordance with the 1991 Unified Quality Assurance Project Plan for the Middlefield–Ellis–Whisman site in Mountain View, California (UQAPP).

In accordance with the UQAPP, one matrix spike/matrix spike duplicate (MS/MSD) and one method blank sample are to be analyzed for every 20 samples analyzed by the laboratory. In addition, one field duplicate is to be collected for every 20 samples collected and a laboratory prepared travel blank sample accompanies every shipment of samples.

Matrix Spike/Matrix Spike Duplicate and Blank Spike/Blank Spike Duplicate (BS/BSD) Samples

The MS/MSD and BS/BSD samples are used to assess accuracy and precision of the data. MS/MSD and/or BS/BSD samples were run for each of the analyses conducted. A precision goal of 20 to 43 percent relative percent difference (RPD) was used for

VOC/SVOC analyses depending on the constituent analyzed (Table E-1). The RPD values ranged from 0 to 14 percent for BSD and MSD samples. All BSD samples are within the precision goals.

Percent recovery goals ranging from 76 to 113 percent for the volatile and semi-volatile analysis were used for the MS/MSD samples. Laboratory QC limits were used for the analyses for which the UQAPP does not specify a percent recovery goal. The surrogate recoveries for the MS/MSD samples ranged from 85 to 125 percent. For analyte recoveries for the MS/MSD samples, two were observed beyond the quality assurance goal. In terms of accuracy and precision for MS/MSD samples, the completeness is 100 percent (Table E-2).

The laboratory BS/BSD samples were analyzed using EPA Methods 8260 and 8270C-SIM. Percent recovery goals for BS/BSD samples are not specified in the UQAPP; as such, the laboratory QC limits were used as the quality assurance goals. All BS/BSD sample percent recoveries were within the quality assurance goals, and are included in Table E-2. In terms of accuracy and precision, the completeness for both BS/BSD analyte recovery and surrogate recovery is 100 percent.

Travel Blank Samples

A total of 12 travel blank samples were analyzed for this annual reporting period. The travel blank surrogate recoveries ranged from 82 to 117 percent (Table E-3). One surrogate was outside of quality assurance goals. The completeness of the travel blank data is 100 percent, and the data are valid.

Field Blank Samples

Three field blank samples were analyzed during this reporting period. The percent recoveries of the field blank surrogates ranged from 84 to 114 percent, and are

within the quality assurance goal of 75 to 139 percent (Table E-3). The completeness of the field blank data is 100 percent; the data are valid.

Method Blank Samples

The laboratory analyzed 22 method blank samples in this reporting period. The percent recoveries ranged from 61 to 135 percent for surrogates associated with EPA Methods 8260 and 8270C-SIM, and are within the quality assurance goals of 45 to 139 percent (Table E-3). The method blank data have a completeness of 98 percent; the data are valid.

Field Samples

The laboratory analyzed a total of 54 field samples during this reporting period. The percent recoveries ranged from 54 to 131 percent for EPA Methods 8260 and 8270C-SIM. The field sample data have a completeness of 100 percent and are valid.

Field Duplicate Samples

Three field duplicate samples were collected and analyzed in 2015. The percent recoveries ranged from 96 to 122 percent for surrogates associated with EPA Methods 8260 and 8270C-SIM, which are within the quality assurance goals (Table E-3). The duplicate sample data have a completeness of 100 percent and are valid.

TABLE E-1
 2015 ANNUAL PROGRESS REPORT
 QUALITY ASSURANCE REPORT
 SUMMARY OF LABORATORY PRECISION DATA
 RAYTHEON COMPANY – FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Sample Type	Constituent	Precision		Completeness	
		Relative Percent Difference (%)	Quality Assurance Goal (%) ¹	Percent (%)	Quality Assurance Goal (%)
Blank Spike Duplicate	1,1-Dichloroethene	0 - 14	24	100	90
	Trichloroethene	0 - 9	20		
	Chlorobenzene	0 - 10			
	Toluene	1 - 4	43		
	1,4-Dioxane	1 - 2			
	Benzene	1 - 4	20		
Matrix Spike Duplicate	1,1-Dichloroethene	0 - 13	25	100	90
	Trichloroethene*	0 - 10	20		
	Chlorobenzene	0 - 11	24		
	cyanide	0	37		

Notes:
¹ If QA goal is not specified in UQAPP for specified compound, or its associated analysis, the laboratory QC limit is used.

TABLE E-2
 2015 ANNUAL PROGRESS REPORT
 QUALITY ASSURANCE REPORT
 SUMMARY OF LABORATORY ACCURACY DATA
 RAYTHEON COMPANY - FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Sample Type	Constituent	Accuracy		Completeness		
		Percent Recovery (%)	Quality Assurance Goal (%)	Percent (%)	Quality Assurance Goal (%)	
Matrix Spike and Matrix Spike Duplicate ¹	Analyte	1,1-Dichloroethene	77 - 99	73 - 129	100	90-100
		Chlorobenzene	98 - 113	80 - 120		
		Trichloroethene	76 - 110	73 - 123		
	Surrogate	1,2-Dichloroethane-d4	85 - 125	75 - 139		
		Bromofluorobenzene	91 - 106	80 - 120		
		Dibromofluoromethane	93 - 110	80 - 128		
Blank Spike and Blank Spike Duplicate ²	Analyte	1,1-Dichloroethene	79 - 116	66 - 135	100	90-100
		1,4-Dioxane	62 - 99	44 - 120		
		Chlorobenzene	91 - 119	80 - 123		
		Toluene	103 - 114	80 - 121		
	Surrogate	Trichloroethene	89 - 117	80 - 123		
		1,2-Dichloroethane-d4	80 - 122	75 - 139		
		Bromofluorobenzene	89 - 112	80 - 120		
		Dibromofluoromethane	93 - 110	80 - 128		
		Toluene-d8	82 - 108	80 - 120		

Notes:

¹ The percentages shown for the quality assurance goals are actually laboratory QC limits; when the UQAPP was written, these analyses were not required for treatment system samples, as such a QA goal was not established.

² Quality assurance goals were not specified for BS/BSD samples in the UQAPP, as such the laboratory QC limits were used.

TABLE E-3
 2015 ANNUAL PROGRESS REPORT
 QUALITY ASSURANCE REPORT
 SUMMARY OF ACCURACY AND PRECISION DATA
 RAYTHEON COMPANY - FORMER FACILITIES
 350 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

Sample Type		Constituent	Accuracy		Precision		Completeness	
			Percent Recovery (%)	Quality Assurance Goal (%) ^a	Relative Percent Difference (%)	Quality Assurance Goal (%)	Percent (%)	Quality Assurance Goal (%)
Travel Blanks	Surrogate	Bromofluorobenzene	94 - 115	80 - 120	not applicable		100	90-100
		Dibromofluoromethane	95 - 117	80 - 128				
		1,2-Dichloroethane-d4	90 - 115	75 - 139				
		Toluene-d8	82 - 106	80 - 120				
Field Blanks	Surrogate	1,2-Dichloroethane-d4	105 - 113	75 - 139	not applicable		100	90-100
		Toluene-d8	84 - 101	80 - 120				
		Dibromofluoromethane	106 - 108	80 - 128				
		Bromofluorobenzene	91 - 114	80 - 120				
Method Blanks	Surrogate	Bromofluorobenzene	88 - 135	80 - 120	not applicable		98	90-100
		Dibromofluoromethane	93 - 119	80 - 128				
		1,2-Dichloroethane-d4	82 - 127	75 - 139				
		2-Fluorobiphenyl	61 - 74	46 - 120				
		Nitrobenzene-d5	64 - 78	45 - 120				
		Toluene-d8	81 - 108	80 - 120				
Field Samples	Surrogate	Bromofluorobenzene	89 - 117	80 - 120	not applicable		100	90-100
		Dibromofluoromethane	95 - 119	80 - 128				
		1,2-Dichloroethane-d4	84 - 131	75 - 139				
		2-Fluorobiphenyl	54 - 81	46 - 120				
		Nitrobenzene-d5	59 - 86	45 - 120				
		Toluene-d8	81 - 107	80 - 120				
Field Duplicates	Surrogate	Bromofluorobenzene	96 - 113	80 - 120	not applicable		100	90-100
		1,2-Dichloroethane-d4	112 - 122	75 - 139				
		Toluene-d8	100 - 103	77 - 136				
		Dibromofluoromethane	101 - 112	80 - 120				

Notes:

a. Quality assurance goals were only specified for MS/MSD laboratory samples in the UQAPP, as such laboratory QC limits are used.
 b. The quality assurance goals stated are the actual laboratory QC limits; the methods were not required on treatment system samples at the time the UQAPP was written.
 *. High surrogate recoveries were observed for bromofluorobenzene; no target analytes were detected in these samples. Therefore completeness is 98 %.