Ventura County
Watershed Protection District
Water & Environmental Resources Division

2011 Groundwater Section
Annual Report

Ventura County
Watershed Protection District
Water & Environmental Resources Division

MISSION:

"Protect, sustain, and enhance
Ventura County watersheds now
and into the future for the benefit of
all by applying sound science,
technology, and policy."

2011 Groundwater Section
Annual Report

Cover Photo: Agricultural well along Calleguas Creek in the Oxnard Pressure Plain Groundwater Basin.

Ventura County Watershed Protection District
Water & Environmental Resources Division
Groundwater Section

2011 GROUNDWATER SECTION ANNUAL REPORT

Director, Watershed Protection District
Norma Camacho

Deputy Director, Watershed Protection District
Water & Environmental Resources Division
Gerhardt Hubner, P.G.

Groundwater Section Manager
Rick Viergutz, C.E.G.

Report prepared by
Jeff Dorrington, Water Resources Specialist
Barbara Council, Water Resources Specialist
Dana Files, P.G., Groundwater Specialist

County Government Center
Administration Building
800 South Victoria Avenue
Ventura, CA 93009
(805) 654-2088 (phone)
(805) 677-8762 (fax)
http://www.vcwatershed.org

Contents

Sections

Contents

Sections (con't.) **Page**

Contents

Contents

Contents

Section 1.0
Introduction

The 2011 Groundwater Section Annual Report is a summary of this year's accomplishments, while also providing an overview of the groundwater conditions for the County for the past calendar year. For more thorough background information and an explanation of the day-to-day operations of the Groundwater Section, see the Groundwater Section 2005 & 2006 Annual Report.

1.1 – Summary of Accomplishments

Over the last 12 months the Groundwater Section:

- Reviewed and approved 50 land development project applications.
- Issued 140 various types of well permits, including 40 for new water supply wells, 15 water supply well destructions and 4 for water supply well repairs or modifications. There were 59 inspections performed by Groundwater Staff of sealing and perforation work.
- Sampled 199 wells as part of the annual groundwater sampling program. Analytical results are included in Section 3 and Appendix D.
- Measured the water level, quarterly, in approximately 200 wells countywide. Approximately 50% of the groundwater levels measured during spring 2011 were higher than the 2010 Spring measurement and approximately 50% of the groundwater levels had declined from the Spring 2010 measurement levels.
- Completed potentiometric surface maps for the Santa Clara River Valley, Upper Aquifer System and Lower Aquifer System for 2011
- Created numerous new maps and map layers using ArcView GIS.
- Assisted the Fox Canyon Groundwater Management Agency (FCGMA) and other departments and Agencies with groundwater and mapping needs.
- Completed and published the 2010 Groundwater Section Annual Report.

1.2 - General County Information

The following sections contain a general overview regarding climate, population, surface water and changes in groundwater conditions in Ventura County for 2011.

1.2.1 - Population and Climate

On July 1, 2011, the California State Department of Finance estimated Ventura County's population to be 830,215, an increase of 0.59 percent over the revised 2010 population estimate of 825,378. The City of Port Hueneme had the largest estimated percentage increase in population (2.1 percent) over the previous year. The mean annual daily air temperature at the National Weather Service Oxnard area office was 60.9[1] degrees Fahrenheit, with an average daily high of 71.4[1] degrees Fahrenheit and an average low of 50.5[1] degrees Fahrenheit. The average annual rainfall, countywide (based on all active rain gages), was approximately 24.5 inches for the 2010/2011[2] water year. Throughout the County, precipitation for the 2010/2011 water year[2] was between 104 and 165 percent of normal, with the Sea Cliff area receiving 104% of normal, while the Camarillo area received 165% of the normal rainfall total. Figure 1-1 below shows various rain gage/area rainfall totals comparing water year 2010/2011 to normal precipitation totals for that gage/area. Normals are determined from the 1957-1992 base period (i.e. the most recent 35 year period that represents average rainfall from gages with 80-120 years of record).

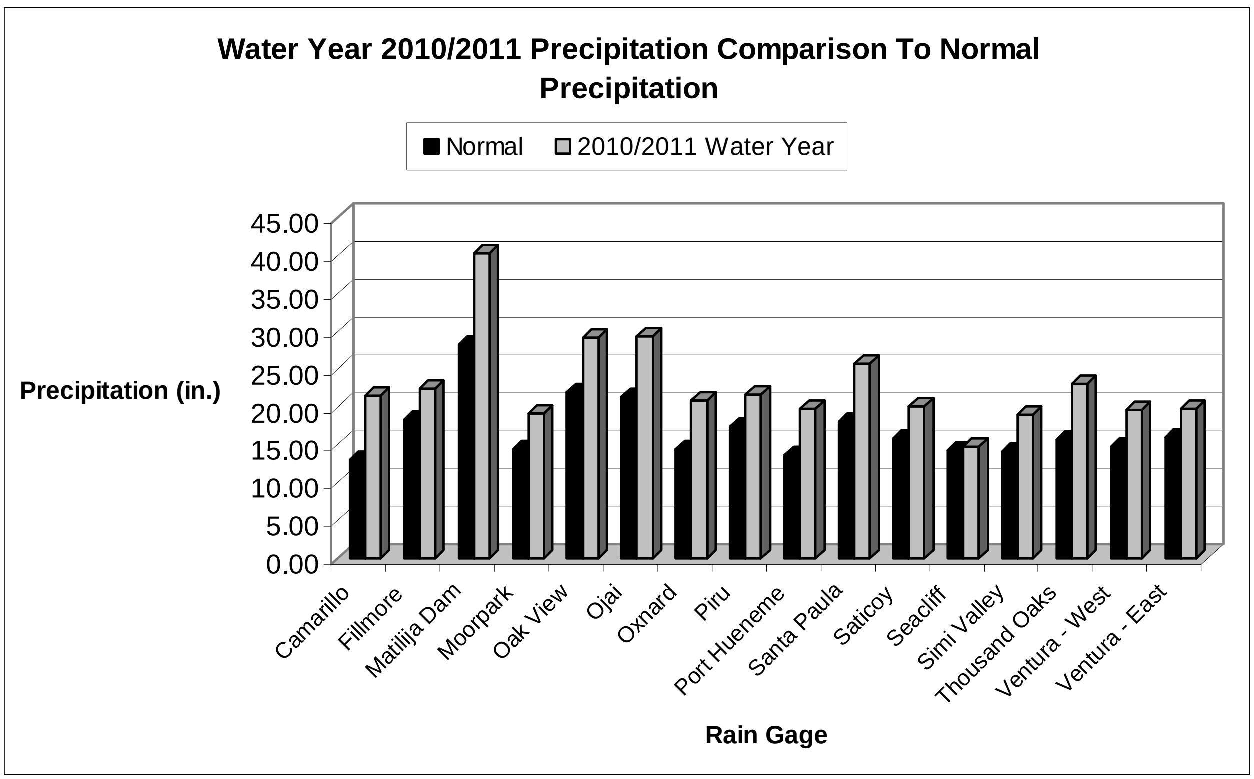


Figure 1-1: Chart comparing 2010/2011 rainfall totals to normal rainfall totals for the same area.

[1] Based on preliminary data from the National Climatic Data Center http://www.ncdc.noaa.gov.
[2] Water Year defined as: October 1 to September 30 of the following year. VCWPD precipitation data.

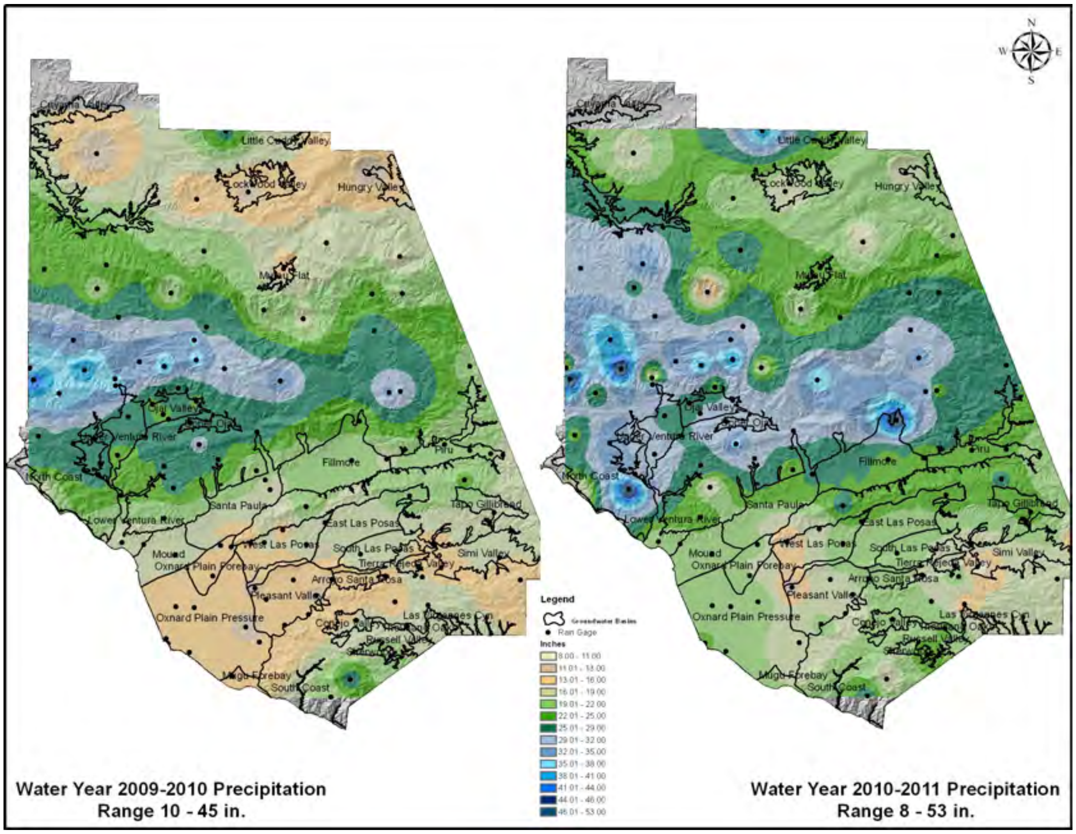


Figure 1-2: Generalized map[3] comparing precipitation between water years 2009/2010 and 2010/2011.

The map above (Figure 1-2) shows a generalized (map represents a 2D surface) distribution of rainfall across the county for water years 2009/2010 and 2010/2011. The chart below (Figures 1-3) depicts average rainfall for the period 1995/1996 to 2010/2011 for all of Ventura County (VCWPD, 2012).

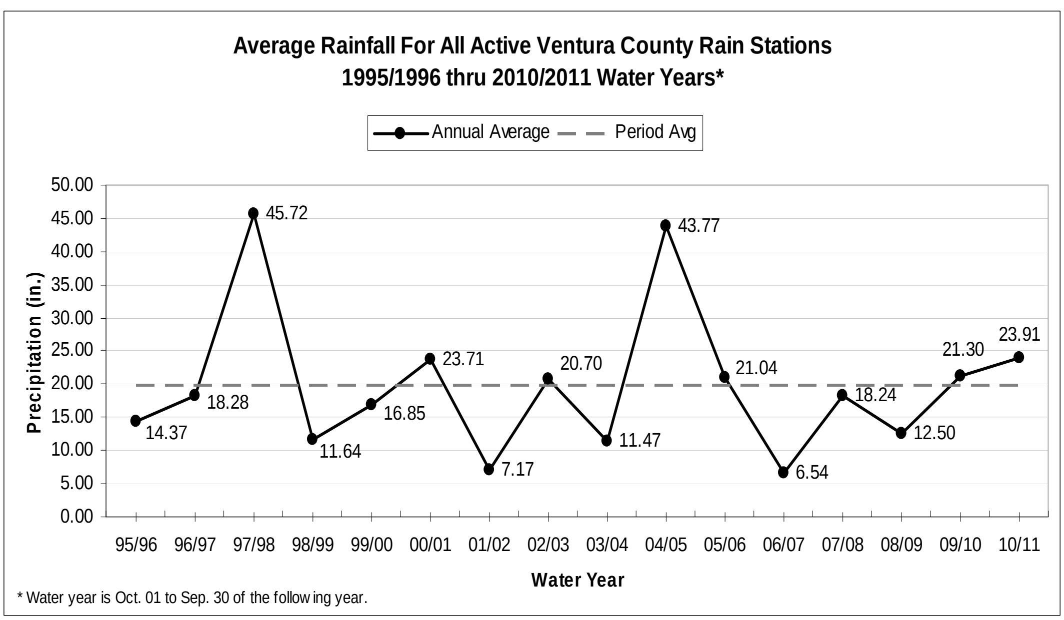


Figure 1-3: Chart comparing the average annual rainfall for Ventura County.

[3] Based on data from all active Ventura County rain gages.

1.2.2 – Surface Water

In calendar year 2011 United Water Conservation District (UWCD) released 36,046 acre feet (AF) (UWCD, 2012) of water from Lake Piru, which includes a fish passage requirement of 5 cubic feet per second (cfs) per day. UWCD diverted 70,959 AF from the Santa Clara River at the Freeman Diversion Dam with 23,435 AF sent to the Saticoy Spreading Grounds, 37,845 AF sent to the El Rio Spreading Grounds and 10,679 AF sent to the Noble pit, with some surface water also going to agricultural customers through the Pumping Trough Pipeline (PTP) and the Pleasant Valley Pipeline (PVP) (UWCD, 2012). At the end of 2011 there was 49,602 AF (UWCD, 2012) of water in storage in Lake Piru, 205,482 AF (Casitas, 2012) in Lake Casitas and 9,600 AF (Calleguas, 2012) in Lake Bard. Casitas Water District releases 3,200 AF per year from Lake Casitas for the Robles Diversion Fish Passage.

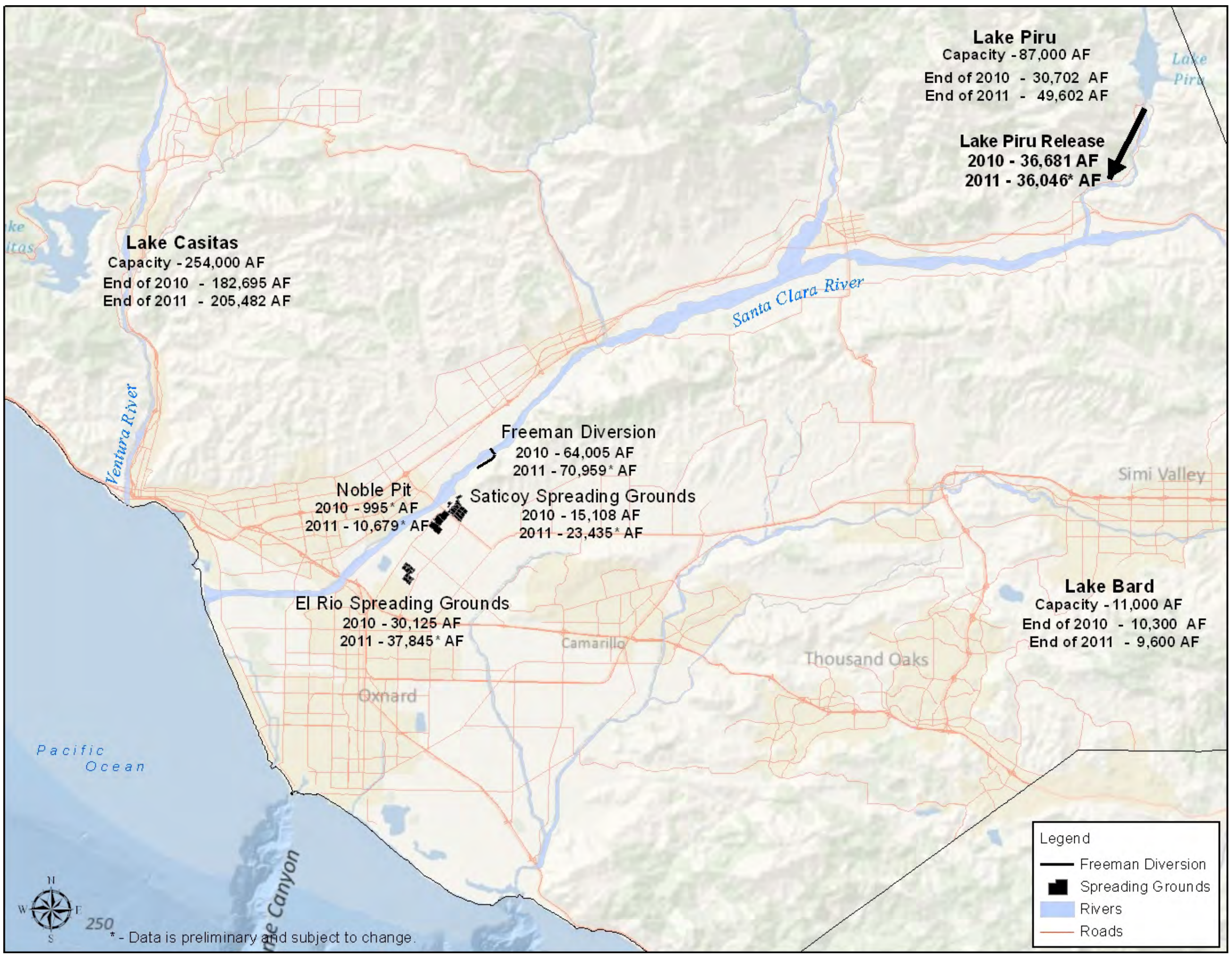


Figure 1-4: Map showing lake storage at the end of 2011 and Santa Clara River diversions.

1.2.3 – Groundwater

The majority of accessible groundwater is found in 32 groundwater basins within Ventura County. The groups of basins that make up the Santa Clara-Calleguas hydrologic unit contain the largest groundwater reserves in the County. The Groundwater Section of the Ventura County Watershed Protection District, the United Water Conservation District, dozens of individual water purveyors, and to a lesser extent the United States Geological Survey, all collect data to provide information concerning the status of groundwater in the County. Recharge of groundwater occurs naturally from rainfall, river/streamflow infiltration and percolation, artificially through injection of imported water (Calleguas Municipal Water District) and spreading of diverted river water (United Water Conservation District).

Figure 1-5: Map showing groundwater basins in Ventura County.

Section 2.0
Duties and Responsibilities

2.1 – Well Ordinance
2.1.1 – Permits

The Groundwater Section issues permits for wells and engineering test holes throughout the County, except within the City of Oxnard. The Groundwater Section conditioned and issued 140 permits for wells and engineering test holes during calendar year 2011. Table 2-1 below shows the total number of permits issued for the year by type of permit. Figure 2-1 below shows the total number of permits issued per year for the period 2001 to 2011.

Table 2-1: Permits issued by type for calendar year 2011.

Type of Work	Engineering Test Hole	Monitoring Well – Destruction	Monitoring Well – New	Water Supply Well – New	Water Supply Well – Destruction	Water Supply Well - Repair	Cathodic Protection Well	TOTAL
Number 2011	30	20	31	40	15	4	0	140

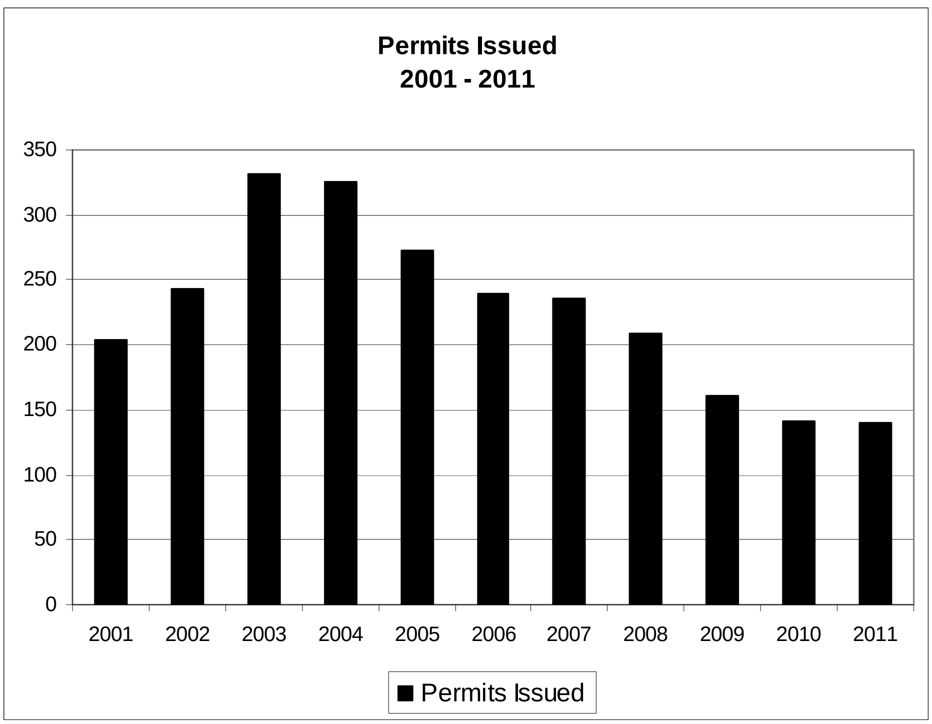


Figure 2-1: Permits issued for the period 2001 to 2011.

2.1.2 – Inspections

Groundwater Section staff perform inspections on all well perforation and sealing work required by specific permit conditions for each new water supply well, well destruction, new cathodic protection well or destruction, and major modifications or repairs to existing water supply wells per the County's Well Ordinance. In 2011, staff performed 59 inspections throughout the County. Figure 2-2 on the following page shows the distribution of new well and well destruction locations inspected by Groundwater staff in the County during 2011.

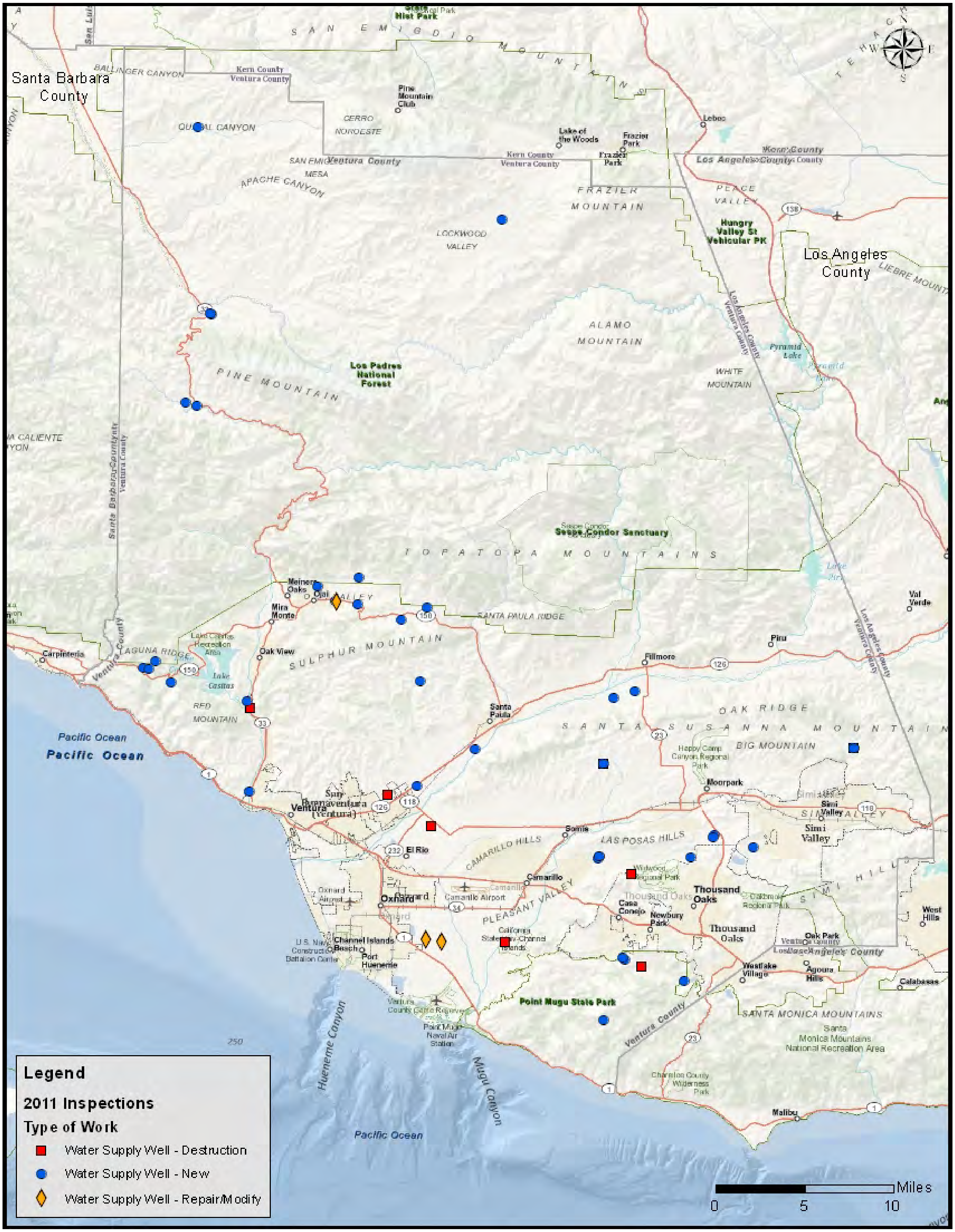


Figure 2-2: Location of well inspections in 2011.

2.2 – Project Reviews

The Groundwater Section reviews and conditions land development projects that may have potential impacts to groundwater quantity and quality, surface water quantity, and water supply. Reviews include proposed lot splits, lot legalizations, conditional use permits and other types of applications and plans requiring review and conditioning as required by the California Environmental Quality Act (CEQA). The type and number of proposed development projects reviewed by the Groundwater Section during Calendar Year 2011 is shown in the table below (Table 2-2). Staff reviewed and conditioned 50 projects during 2011.

Table 2-2: Development project reviews by type for 2011.

Type of Project	Administrative (AD)	Land Use (LU)	Sub-Division (SD)	RMA	FC (District Project)
Number 2011	2	35	1	11	1

2.3 – Inventory & Status of Wells

The Groundwater Section maintains an inventory in the Section's Water Resources Information database (WRIS) that includes the status of all wells within Ventura County. The database contains details for wells of all types including water supply wells, long-term monitoring wells, cathodic protection wells, and also springs that were given a state well number. At the end of 2011 there were 8,798 well records in the database in the following categories.

2011 Status	Number
Active	3,800
Abandoned	432
Can't Locate	1,810
Non Compliant	98
Non Compliant Abandoned	170
Destroyed	2,476
Exempt	12

Active wells are those wells that meet or exceed the minimum requirement of 8 hours pumping per calendar year as described in the County of Ventura Well Ordinance No. 4184. Abandoned wells are those wells that do not meet the 8 hour minimum usage requirement or are in a condition that no longer allows the well to be used. There are several reasons why a well may be listed as "Can't Locate". Generally, though, "Can't Locate" wells are old rural wells for which the Groundwater Section has historic well location data but the locations are now in areas that have subsequently been urbanized. The current owner of the property where the historical well is supposed to be located may be unaware of the existence of a well on his/her property, or an approved search has been conducted and no well has been found. Non Compliant wells are generally active wells where the owner of the well has failed to respond to written communication from the Groundwater Section. Non Complaint Abandoned wells are those wells where the owner of an abandoned well has failed to respond to written communication from the Groundwater Section to take action on an inactive well. The County's Well Ordinance prohibits anyone from owning an abandoned well (County of Ventura BOS,1999). Abandoned wells pose a safety risk and may also act as a potential pathway for contaminants to reach groundwater. Destroyed wells are wells that have been verified to no longer be in existence or wells that have been properly destroyed under permit. Exempt wells are wells that have been found to be in good enough condition to remain inactive for a period of 5 years before being re-activated or re-inspected. To be listed as exempt a well inspection report, from a registered geologist or civil engineer, and application fee must be submitted by the well owner to the Groundwater Section for review and approval.

Section 3.0
Groundwater Quality

3.1 – Water Quality Sampling

The Groundwater Section collects data and performs studies as needed for purposes of groundwater resource assessment and management. In 2011, Groundwater staff sampled a total of 199 wells throughout the county. All samples were analyzed for general minerals under the Irrigation Suitability suite (see Appendix Laboratory methods). Analyses were conducted by Fruit Growers Laboratory in Santa Paula. Title 22 metals were also analyzed on select samples under the Inorganic Chemical Suite and four samples were analyzed for Gross Alpha particles. Analytical results were entered into the Section's database and used to describe the current chemistry of groundwater in the basins sampled. Complete results are listed in Appendix D, and interpretations are detailed in the following sub-sections. Wells sampled in the south half of the County are shown below in Figure 3-1. Wells sampled in the north half of the County are shown on the following page in Figure 3-2.

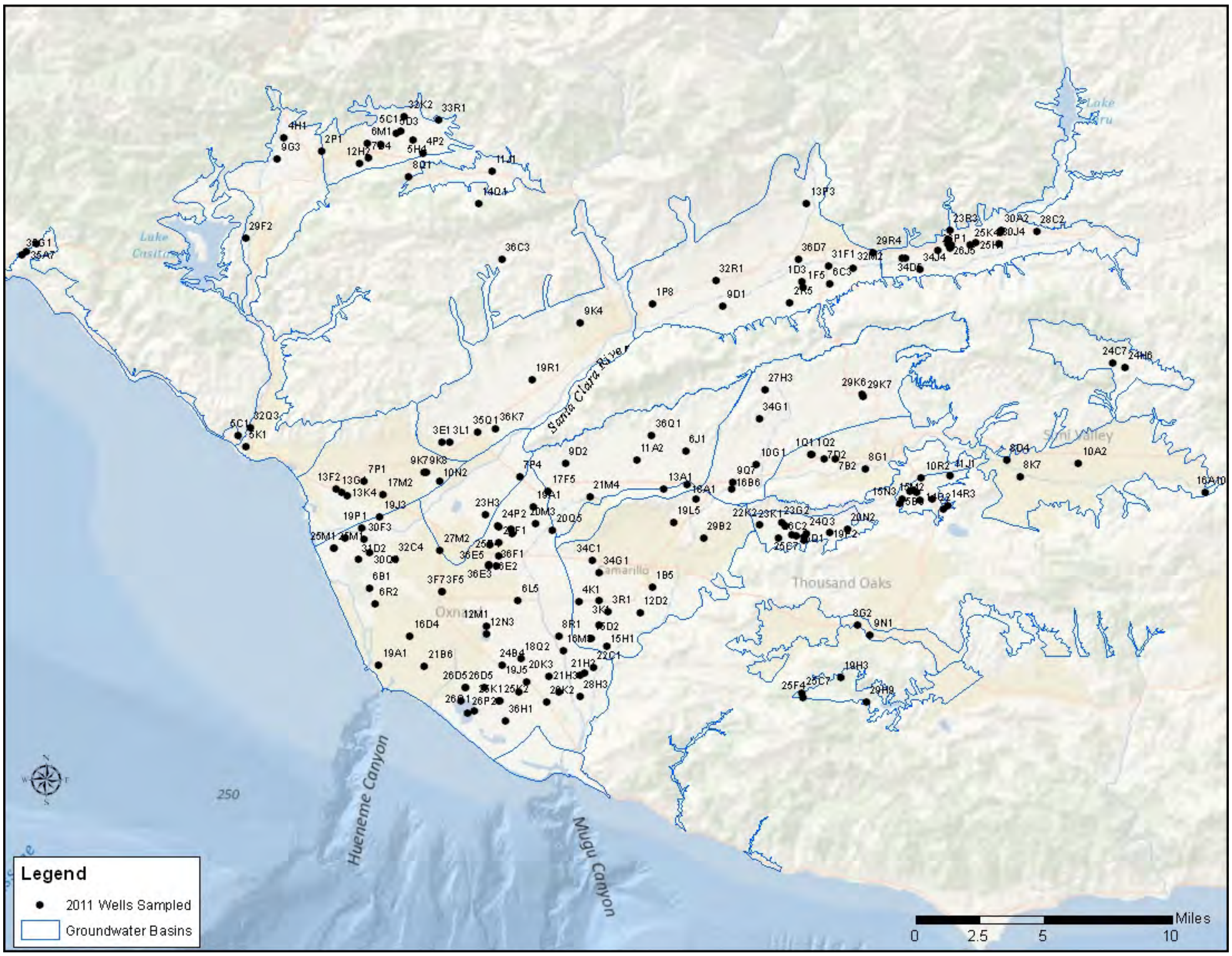


Figure 3-1: Map depicting sample locations for the south half of the County.

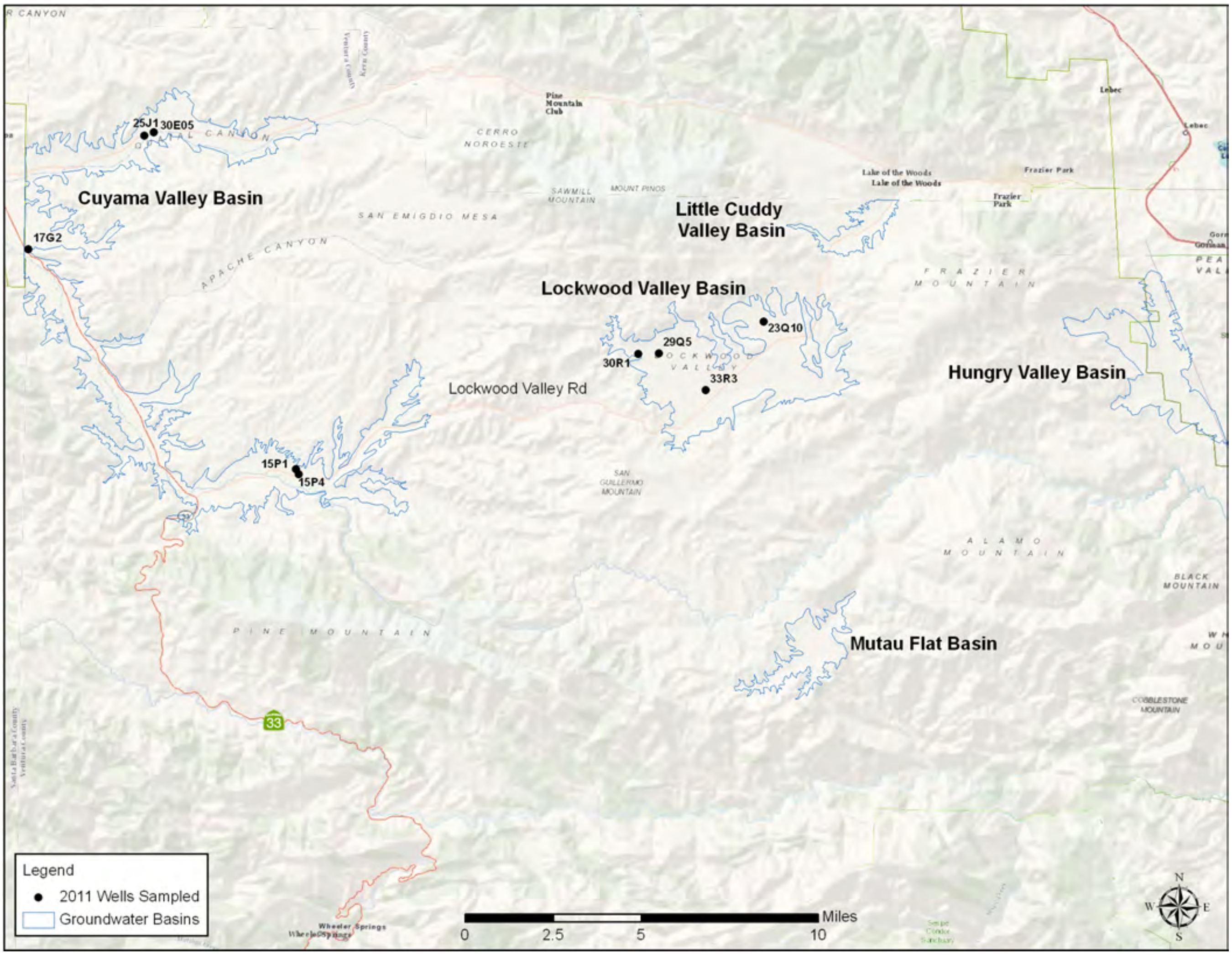


Figure 3-2: Map depicting sample locations for the northern half of the County.

3.2 – Current Conditions

A summary of the groundwater quality results for each groundwater basin sampled this year is included in this section. Basin summaries are presented in order from largest to smallest by total available storage capacity as reported in California Department of Water Resources Bulletin No. 118. Ventura County groundwater, in general, has slightly high TDS. Several areas are nitrate impacted (meaning Basin Management Objectives for nitrate are exceeded) and some areas have high concentrations of sulfate and total dissolved solids.

The Groundwater Section has adopted the United States Environmental Protection Agency (EPA) National Drinking Water Regulations and California Code of Regulations (CCR) Title 22, Section 64431 (Table 3-1 below) for describing groundwater quality in Ventura County relative to maximum contaminant levels (MCL). National Primary Drinking Water Regulations, or primary standards, are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Maximum contaminant level or MCL is the highest level of a contaminant allowed in drinking water by the United States Environmental Protection Agency. MCLs are set as close as feasible to the level that below which there is no known or expected health risk. National Secondary Drinking Water Regulations, or secondary standards, are guidelines for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The EPA recommends secondary standards to water systems but does not require systems to comply with the secondary standards. However, states may choose to adopt the secondary standards as enforceable standards. CCR, Title 22, Section 64431 lists MCLs for inorganic chemicals adopted by the State of California. In order to be certified as a permanent domestic or municipal water supply, water from wells located in the County of Ventura must meet these standards.

Table 3-1: U.S. Environmental Protection Agency Primary and Secondary Standards and California Code of Regulations, Title 22 Maximum Contaminant Levels (February 2012).

Primary Contaminants	Chemical Formula	EPA MCL (mg/l)	CCR, Title 22 MCL (mg/l)
Antimony	Sb	0.006	0.006
Arsenic	As	0	0.01
Asbestos		7 MFL[1]	7 MFL[1]
Barium	Ba	2	1
Beryllium	Be	0.004	0.004
Cadmium	Cd	0.005	0.005
Chromium	Cr	0.1	0.05
Copper	Cu	1.3	
Cyanide		0.2	0.15
Fluoride	F^-	4	2
Lead	Pb	0	
Mercury	Hg	0.002	0.002
Nitrate (as Nitrogen)	N	10	10
Nitrate[2]	NO_3^-		45
Nitrite (as Nitrogen)	N	1	1
Selenium	Se	0.05	0.05
Thallium	Tl	0.0005	0.002
Secondary Contaminants			
Aluminum[3]	Al	0.5 to 0.2	
Chloride	Cl^-	250	
Iron	Fe	0.3	
Manganese	Mn	0.05	
pH		6.5-8.5	
Silver	Ag	0.1	
Sulfate	SO_4^{2-}	250	
Total Dissolved Solids	TDS	500	
Zinc	Zn	5	

[1] MFL = Million fibers per liter longer than 10 um

[2] CCR, Title 22 standard for Nitrate reported as NO_3

[3] CCR, Title 22 lists Aluminum as a primary contaminant

The piper diagram, shown by basin in Appendix D, is used here to graphically present various types of water and is drawn based on chemical composition of water. A piper diagram shows the percentage composition of six ions. Cations (calcium, sodium and magnesium) are plotted on one triangle and anions (chloride, sulfate and bicarbonate) on another with the apex representing 100 percent concentration of one of the three constituents. The diamond-shaped field between the two triangles represents the composition of the water with respect to both cations and anions. A second method to present results is a Stiff diagram. Ions are plotted on either side of a vertical axis in milliequivalents per liter, cations on the left of the axis and anions on the right. The polygonal shape created is useful in making a visual comparison between water from different sources. Piper and Stiff diagrams for wells sampled this year are included in Appendix D by basin.

3.2.1 - Oxnard Plain Pressure Basin

The Oxnard Plain Pressure Basin is the largest and most complicated, hydraulically and hydrologically of the groundwater basins in Ventura County. The Oxnard Plain Pressure Basin consists of two major aquifer systems. The Upper Aquifer System (UAS) consists of the Perched, Semi Perched, Oxnard, and Mugu aquifers. Of the UAS aquifers, only the Oxnard and Mugu aquifers are sampled for water quality by the County. The Lower Aquifer System (LAS) consists of the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are no wells perforated solely in the Grimes Canyon aquifer so it is not sampled. Figure 3-3 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for the wells sampled in the Upper Aquifer System of the Oxnard Plain Pressure Basin. Figure 3-4 shows the same information for wells sampled in the Lower Aquifer System.

3.2.1.1 - Oxnard Aquifer (UAS)

The Oxnard aquifer is the shallowest of the confined aquifers. Average depth to the main water bearing material is 80 feet. The piper diagram Appendix D, Figure D-1 shows bicarbonate (HCO_3^-) is the major anion, and calcium (Ca^+) is the major cation. Groundwater samples were collected from ten wells in the Oxnard Aquifer. A comparison of the stiff diagrams with those from the 2010 report shows no significant change in water quality.

Water from one of the wells has a concentration of iron (Fe) above the maximum contaminant level (MCL) for drinking water. Samples from all sixteen of the wells have sulfate (SO_4^{2-}) above the MCL for drinking water with an average value of 707 mg/L. Both of these constituents are secondary standards. Total dissolved solids (TDS) ranged from 948 to 2820 mg/l with an average value of 1528 mg/l. Water from one of the wells sampled had a nitrate (NO_3^-) concentration above the MCL for drinking water. Samples from four wells were analyzed for inorganic chemicals (Title 22 metals). One well has selenium above the MCL for drinking water but all remaining inorganic constituents were below the MCL.

Groundwater plumes with elevated nitrate concentrations are common in the northern portion of the basin. Sources of nitrate are septic systems and nitrogen based fertilizers in agricultural areas.

3.2.1.2 - Mugu Aquifer (UAS)

The Mugu aquifer is the lowest layer of the UAS and has similar physical and chemical characteristics to the Oxnard Aquifer, but has slightly better water quality, in part, because with increasing depth contaminants are generally less likely to infiltrate. This is shown graphically in the piper and stiff diagrams, Figures D-1 and D-2. Average depth to the main water bearing material is 200 ft. Five wells that are perforated only in the Mugu aquifer were sampled. TDS ranges from 943 to 1220 mg/l with an average of 1023 mg/l. All five wells sampled have sulfate concentrations above the MCL, two wells have iron concentrations above the MCL and no samples have nitrate above the MCL for drinking water. One sample was analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were below the MCL.

OXNARD PLAIN PRESSURE BASIN
Upper Aquifer System

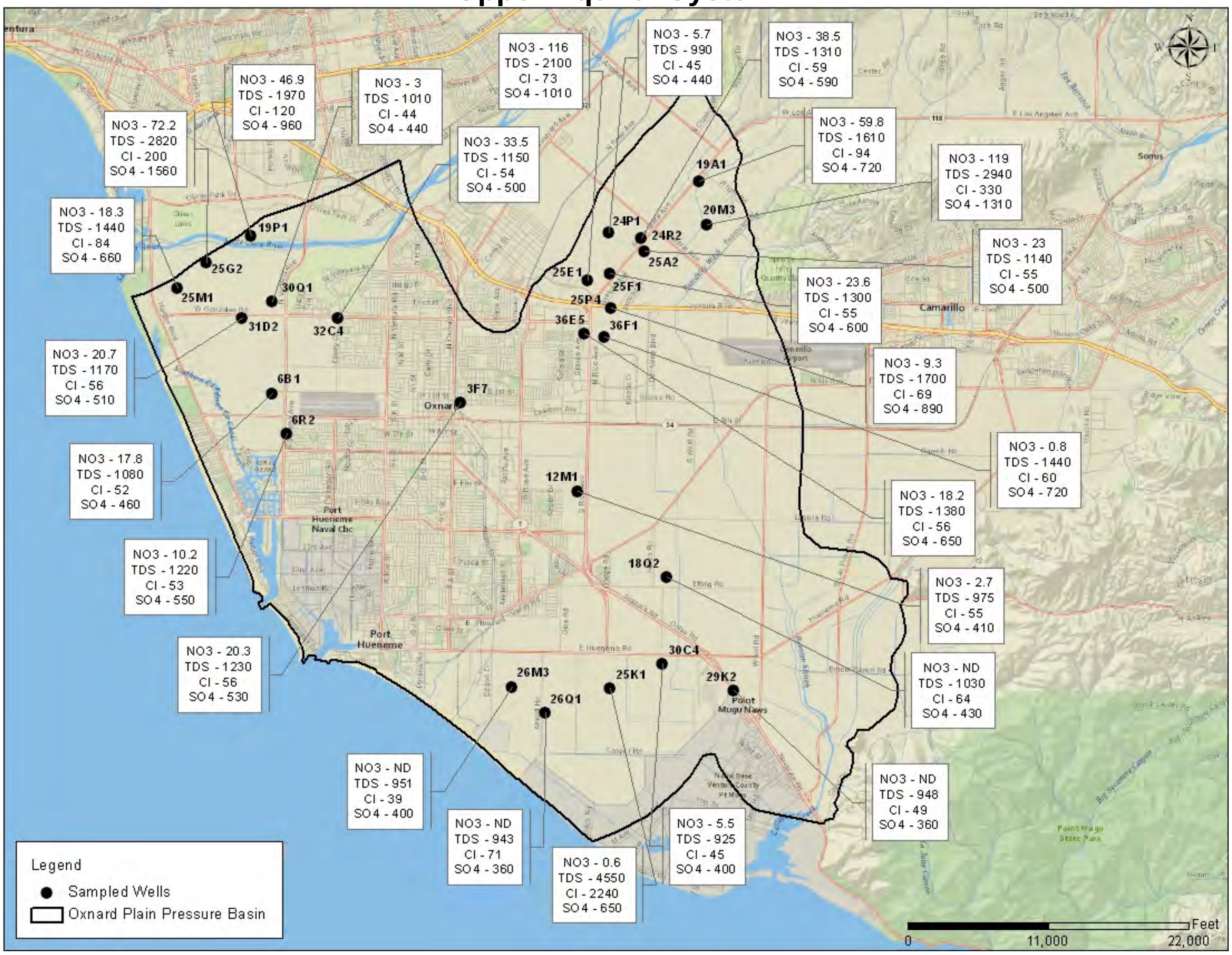


Figure 3-3: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.1.3 - Hueneme Aquifer (LAS)

The Hueneme aquifer is the shallowest of the Lower Aquifer System aquifers with depth to the main water bearing material approximately 375 feet. Very few wells are perforated exclusively in the Hueneme aquifer, making an accurate determination of water quality for the entire aquifer difficult. The historical average TDS concentration is 1180 mg/l. Two wells screened solely in the Hueneme were sampled this year. Both have elevated TDS and sulfate concentrations compared to the MCL for drinking water. Overall, water quality has not changed significantly since the previous round of sampling.

3.2.1.4 - Fox Canyon Aquifer (LAS)

The Fox Canyon aquifer is the second most developed production zone in the Oxnard Plain Pressure Basin. The Oxnard aquifer is the most developed production zone. Depth to the main water bearing material is approximately 580 feet. The Fox Canyon aquifer generally has excellent water quality and high yield rates, but is subject to seawater intrusion near Point Mugu and the Hueneme Submarine Canyon. Extractions are monitored and allocated by the Fox Canyon Groundwater Management Agency in order to mitigate aquifer overdraft and reduce the intrusion of seawater. Of the wells sampled this year, TDS concentrations varied from 575 mg/l to 1060 mg/l with an average TDS of 867 mg/l and five water samples have a manganese concentration above the MCL. Four samples were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the MCL for drinking water.

Twelve of the Oxnard Plain Pressure Basin wells that were sampled this year are perforated in both the Hueneme aquifer and the Fox Canyon aquifer and will be referred to as the LAS wells. Results for those wells are included in Appendix D, Figure D-5, and shown on the map of the Lower Aquifer System (LAS). The TDS concentration of water from these wells varies between 846 mg/l and 1160 mg/l with an average of 999 mg/l for wells sampled this season. Samples from six LAS wells have iron concentrations above the MCL, four have manganese above the MCL, and ten have sulfate above the MCL. Water samples from four of these wells were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the MCL for drinking water. Piper diagrams for Hueneme aquifer, Fox Canyon aquifer, and the LAS, show all three have the same water chemistry as would be expected if there are cross-screened wells that allow communication between the aquifers. The samples from the wells perforated solely in the Hueneme aquifer do not show a significant chemical difference from the Fox Canyon Aquifer. Stiff diagrams show that the water chemistry of the Fox Canyon Aquifer has more variation between wells, but overall the chemistry of water samples from the cross-screened wells is very similar to water samples from the wells screened in the individual aquifers. Four samples were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the MCL for drinking water. Five samples were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the MCL for drinking water.

OXNARD PLAIN PRESSURE BASIN
Lower Aquifer System

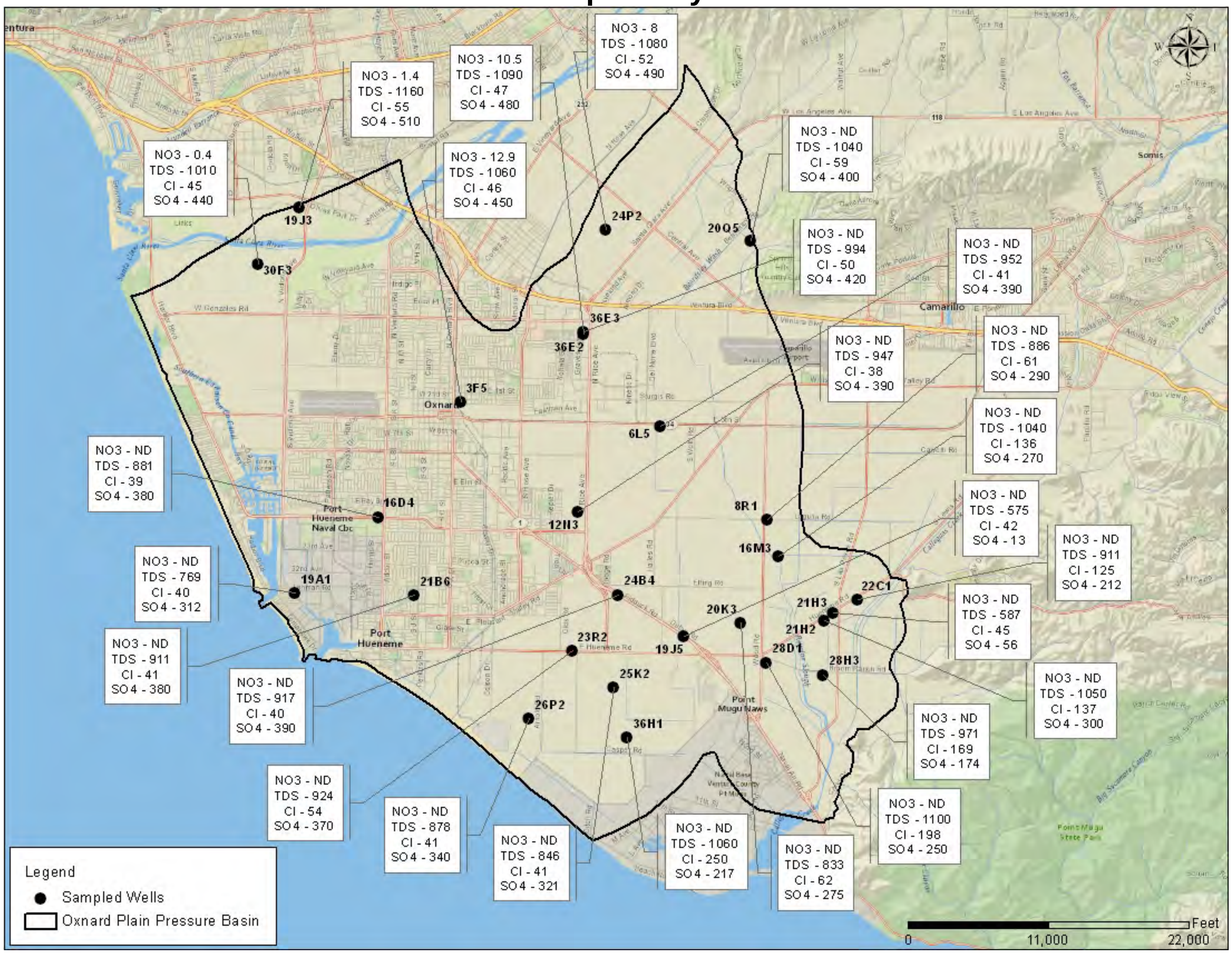
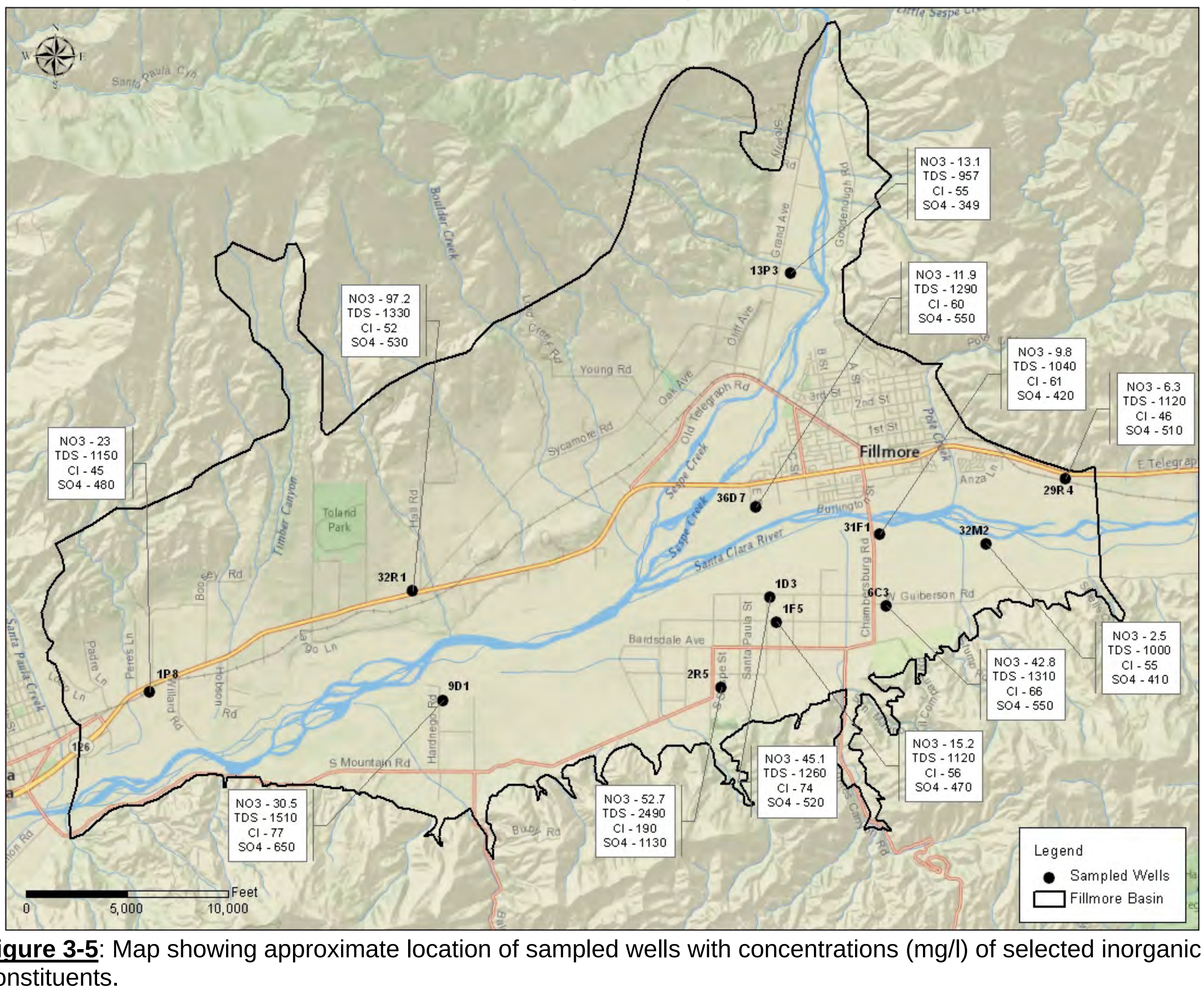


Figure 3-4: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.2 - Fillmore Basin

The Fillmore Basin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in some places. Therefore, water quality can vary greatly depending on depth of the well. Shallow groundwater is generally younger and recharged by river flows with varying chemistry. Deeper groundwater is older and has acquired its chemistry through dissolution of constituents from the surrounding sediments. Historically, nitrate (NO_3^-) concentrations have been elevated because of extensive use of fertilizers and septic system discharges, but of the twelve wells sampled this year only two showed elevated NO_3^- concentration relative to the MCL for drinking water. Groundwater samples from all twelve wells are above the secondary MCL for sulfate (SO_4^{2-}). Average TDS for the wells sampled this year is 1298 mg/l with one sample at 2490 mg/l, well above the MCL for drinking water. Water samples from nine wells were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents are below the MCL for drinking water. Water quality tends to degrade to the south east portion of the basin in the vicinity of the Oak Ridge fault. Figure 3-5 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}).

FILLMORE BASIN



<u>**Figure 3-5**</u>: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.3 - Santa Paula Basin

The Santa Paula Basin is a court adjudicated groundwater basin. In an effort to prevent overdraft, a June 1991 judgment ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Basin. The judgment stipulated an allotment of 27,000 acre-feet per year could be pumped from the basin. Water quality in the basin has not changed substantially since 2007. The depth to the water bearing material is 65 to 160 feet. TDS concentrations for water in the six wells sampled vary from 1100 to 2760 mg/l, with an average value of 1930 mg/l for wells sampled this season; all above the current secondary MCL. Water samples from all the wells have concentrations above the secondary MCL for sulfate and manganese and four have concentrations above the secondary MCL for iron. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). One sample from an agricultural well has a selenium concentration above the MCL for drinking water. The concentrations of all remaining inorganic chemicals were below the MCL. Figure 3-7 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells in the Santa Paula Basin.

SANTA PAULA BASIN

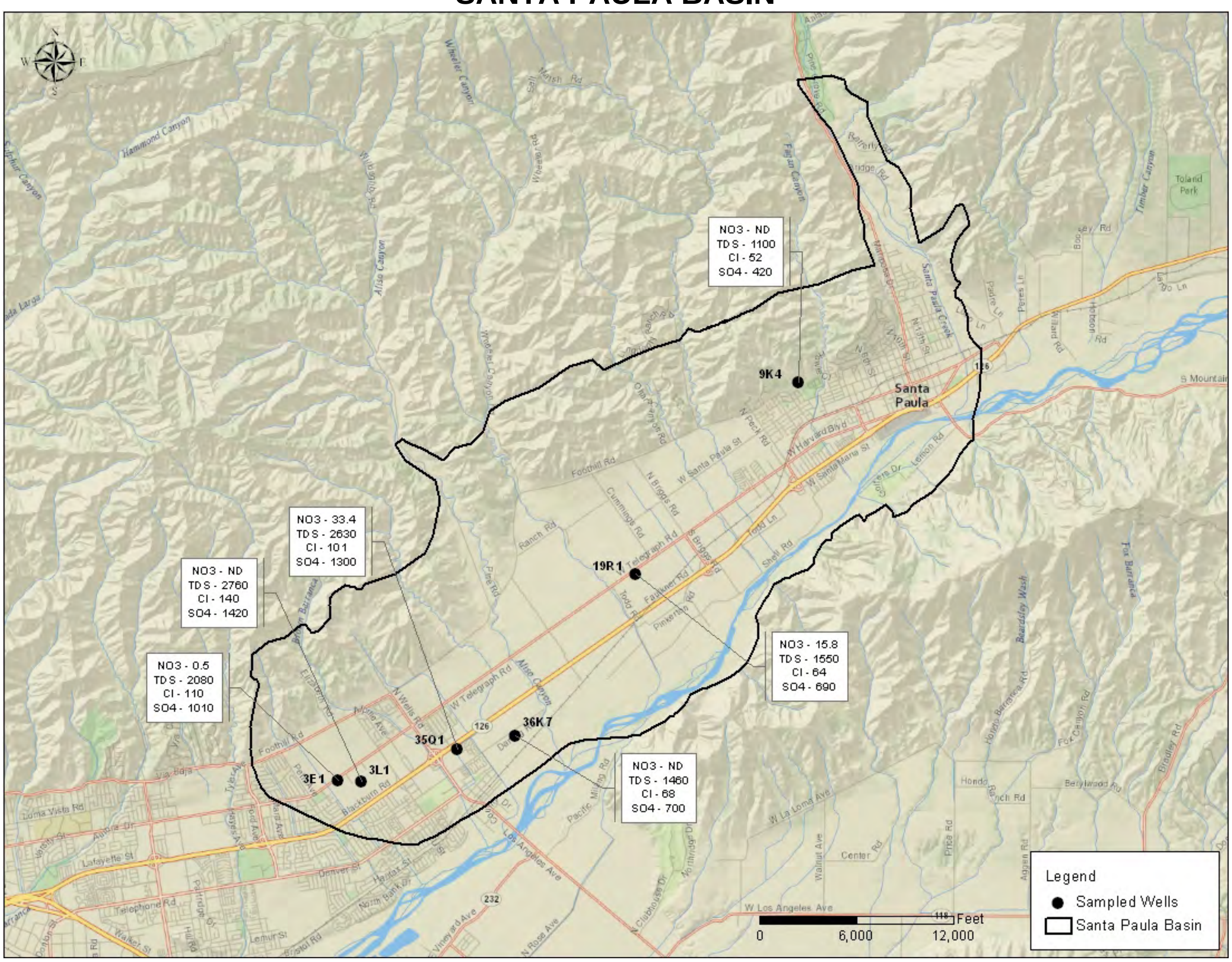


Figure 3-6: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.4 – Piru Basin

The Piru Basin groundwater recharge is principally from precipitation, releases of water by United Water Conservation District from Lake Piru, and the Santa Clara River. Flow from the Santa Clara River enters the basin from the east and carries discharges from wastewater treatment plants and urban and stormwater runoff from Los Angeles County. Depth to the main water bearing material is approximately 30 to 90 feet. The Los Angeles Regional Water Quality Control Board (LARWQCB) has adopted a Basin Plan Amendment that includes a Total Maximum Daily Load (TMDL) of 117 mg/l for chloride (Cl^-) in surface water and 150 mg/l in groundwater for the stretch of the Santa Clara River in Ventura County east of Piru Creek.

Because there have been concerns that concentrations of chloride, selenium, and radionuclides in the Piru Basin might be elevated, fourteen wells were sampled in 2011 in order to provide a more complete representative sample. None of the groundwater sampled has a Cl^- concentration above the chloride TMDL. The average TDS concentration of the water sampled this season is 1450 mg/l with three wells having concentrations significantly above 2000 mg/l. Water samples from all fourteen wells have sulfate (SO_4^{-2}) concentrations greater than the secondary MCL for drinking water and three have Mn concentrations greater than the secondary MCL. Figure 3-8 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}). Radiochemistry analyses were completed on water from two of the wells, staff did not sample others since gross alpha has not been detected in the past. Neither was above the MCL for drinking water.

Water samples from all fourteen wells were analyzed for inorganic chemicals (Title 22 metals). Three wells in the Piru Basin located south of Highway 126 have consistently been found to have selenium levels that exceed the MCL of 0.05 mg/l (also known as 50 µg/l). Two of those three wells were sampled this year (the third was not available). They continue to have the highest concentrations of SO_4^{2-} and TDS of all wells sampled in the basin. Elevated selenium concentrations occur in those wells perforated in the interval between approximately 125 to 250 feet below ground surface. A well located north of Highway 126 and perforated at a similar elevation does not have high selenium. Further testing of groundwater, surface water and cuttings obtained from future drilling is planned by staff in order to determine a possible source of selenium. Owners of the wells have been notified by Ventura County Environmental Health Department about possible adverse health effects from ingestion of water containing selenium.

PIRU BASIN

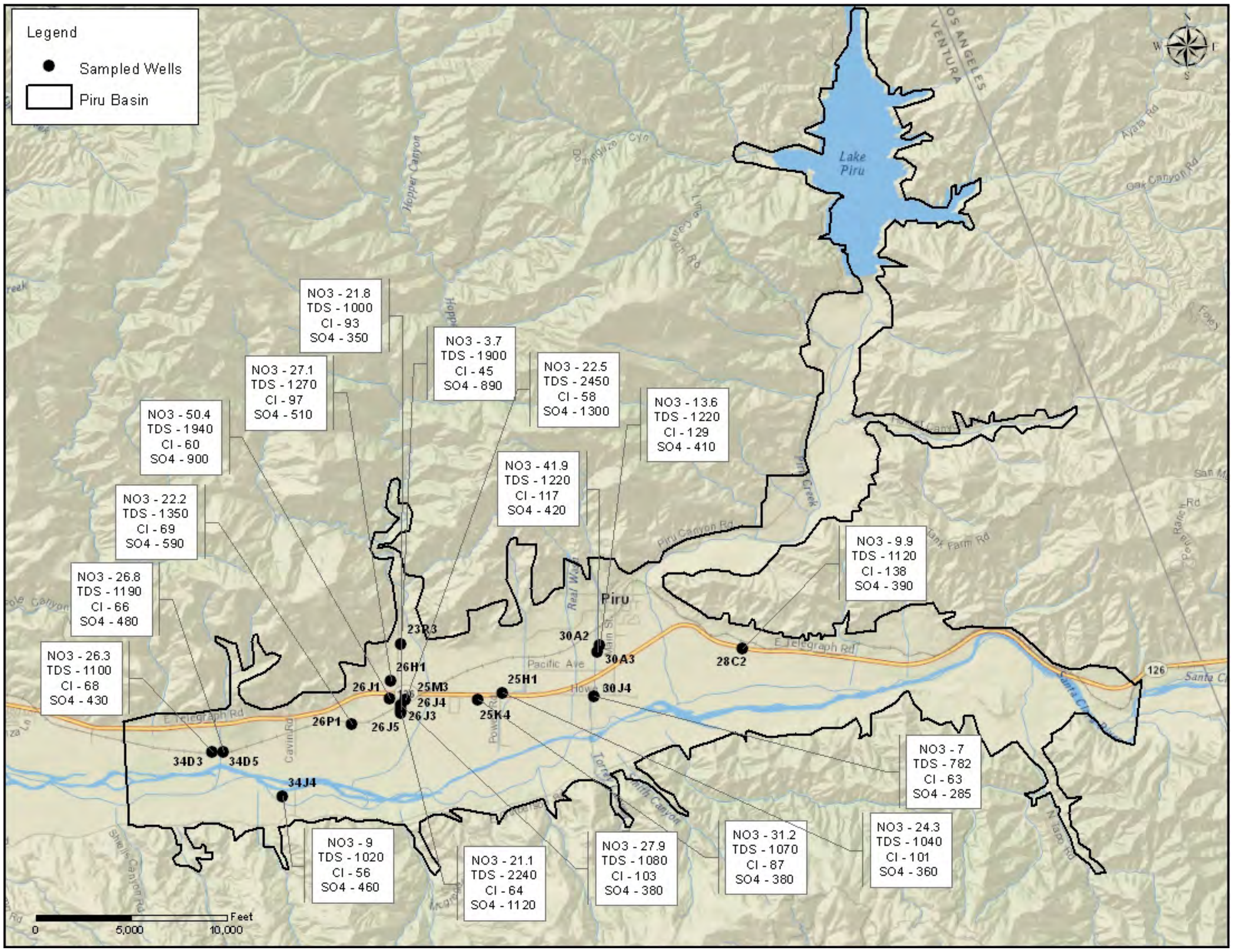


Figure 3-7: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.5 - Pleasant Valley Basin

In the Pleasant Valley Basin groundwater quality can vary greatly throughout the basin. Depth to the main water bearing unit is approximately 400 to 500 feet. The shallower groundwater bearing unit at 35 to 60 feet is not used because the water quality is very poor. Thirteen wells were sampled during this round of sampling. TDS concentrations vary from 652 to 4950 mg/l with an average of 1631 mg/l. Sulfate (SO_4^{2-}) ranges from 55 to 2410 mg/l with ten of the wells having concentrations above the secondary MCL with an average of 616 mg/l. Four water samples have iron concentrations above the MCL and seven have manganese concentrations above the MCL. Chloride (Cl^-) concentrations are above 117 mg/l in water samples from all except one well with an average value of 238 mg/l. Samples from four wells have Cl^- concentrations above the primary MCL for drinking water, but the LARWQCB Basin Plan indicates that agricultural beneficial uses are impaired when the concentration is above 117 mg/l. Comparison of Piper and Stiff diagrams with 2010 values shows no significant change. Water samples from six wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL. Figure 3-10 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}).

PLEASANT VALLEY BASIN

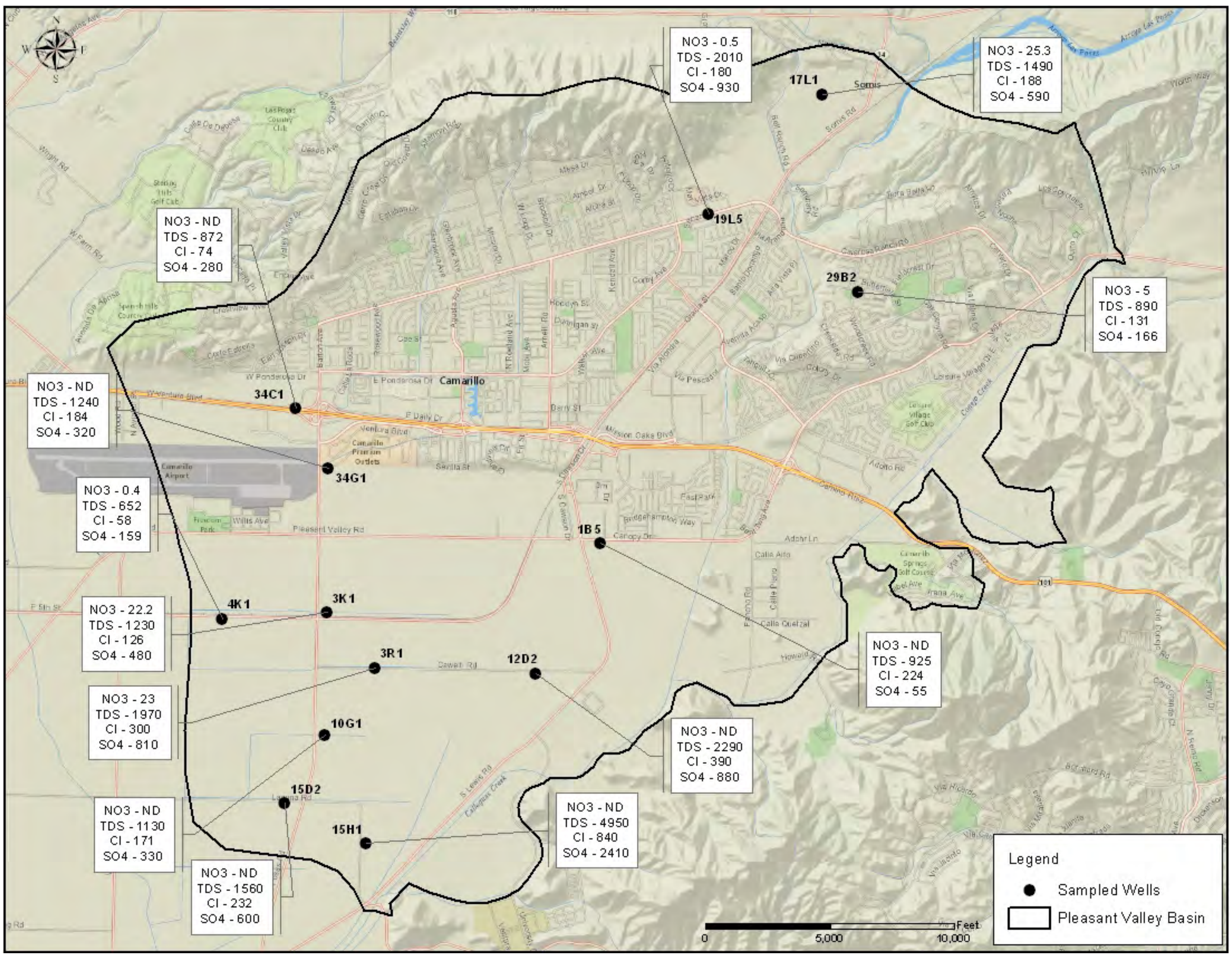


Figure 3-8: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.6 - Mound Basin

The Mound Basin water bearing units are alluvium and the San Pedro Formation. The alluvium consists of silts and clays with lenses of sand and gravel and reaches a maximum thickness of about 500 feet. The San Pedro Formation consists dominantly of fine sands and gravels and extends as deep as 4,000 feet. Groundwater is generally unconfined in the alluvium and confined in the San Pedro Formation. Based on the data collected this year and historic water quality data for the basin, water quality is generally better in the lower zone. The average TDS concentration for the seven wells sampled this year is 1538 mg/l; all above the MCL for drinking water. Sulfate and manganese are greater than the MCL in seven of the eight wells sampled and iron is above the MCL in four wells. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). One sample had a selenium concentration slightly above the MCL; all other inorganic constituents were below the MCL. Figure 3-11 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}).

MOUND BASIN

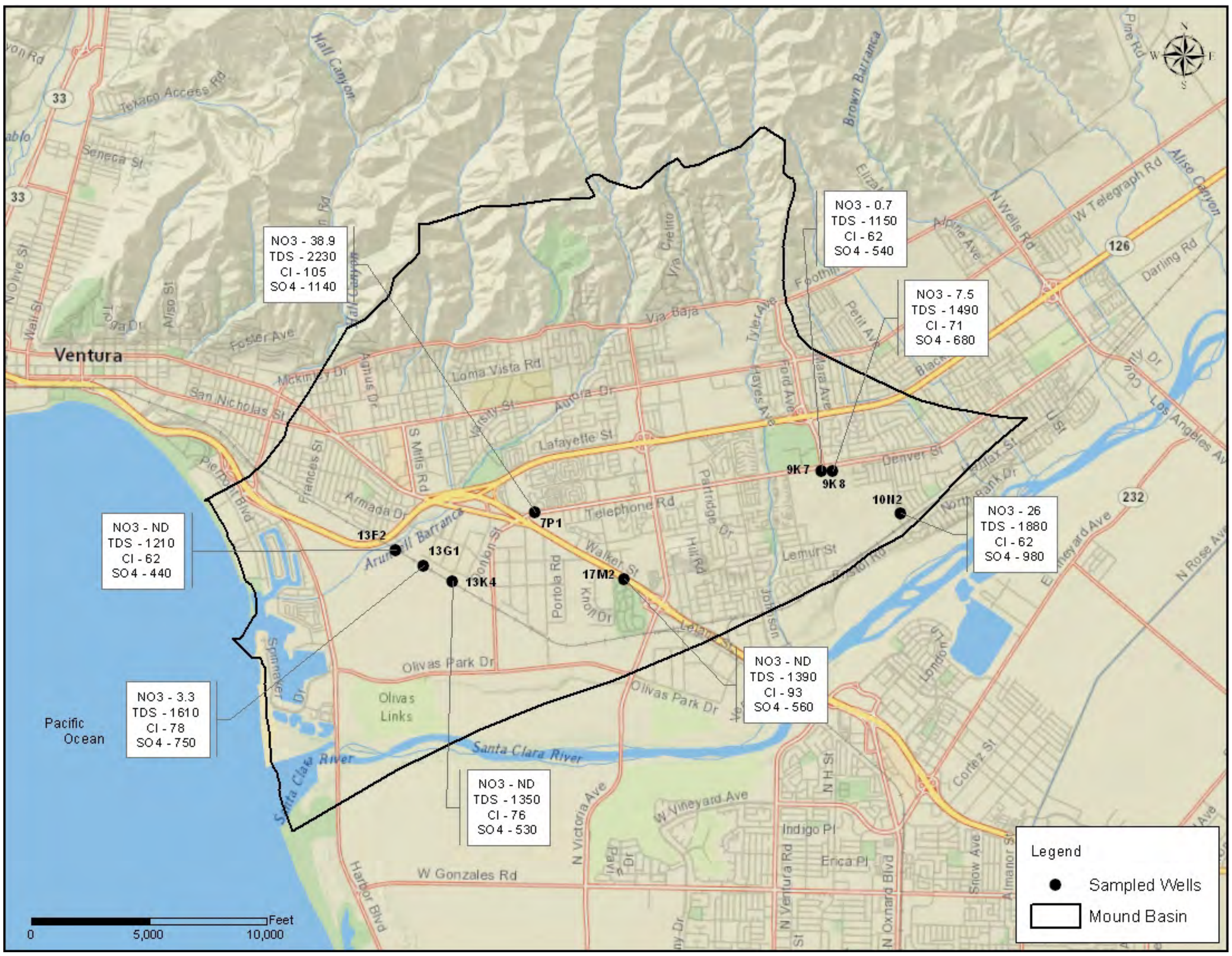


Figure 3-9: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.7 - East Las Posas Basin

Of the seven wells sampled in the East Las Posas Basin, the three wells located in the southwest portion of the basin near the Arroyo Las Posas, have very different water chemistry. The dominant cations in the southwestern wells are sodium, calcium and magnesium and the dominant anions are bicarbonate, sulfate and chloride. TDS, sulfate and manganese are above the MCL for drinking water in all three wells. The remainder of the wells sampled have good water quality with an average TDS of 486 mg/l. The dominant cations are sodium and calcium and bicarbonate is the dominant anion. Water from three wells was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the MCL. Depth to the upper water bearing unit is approximately 120 to 150 feet and to the lower unit is approximately 530 to 580 feet. Figure 3-12 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}).

EAST LAS POSAS BASIN

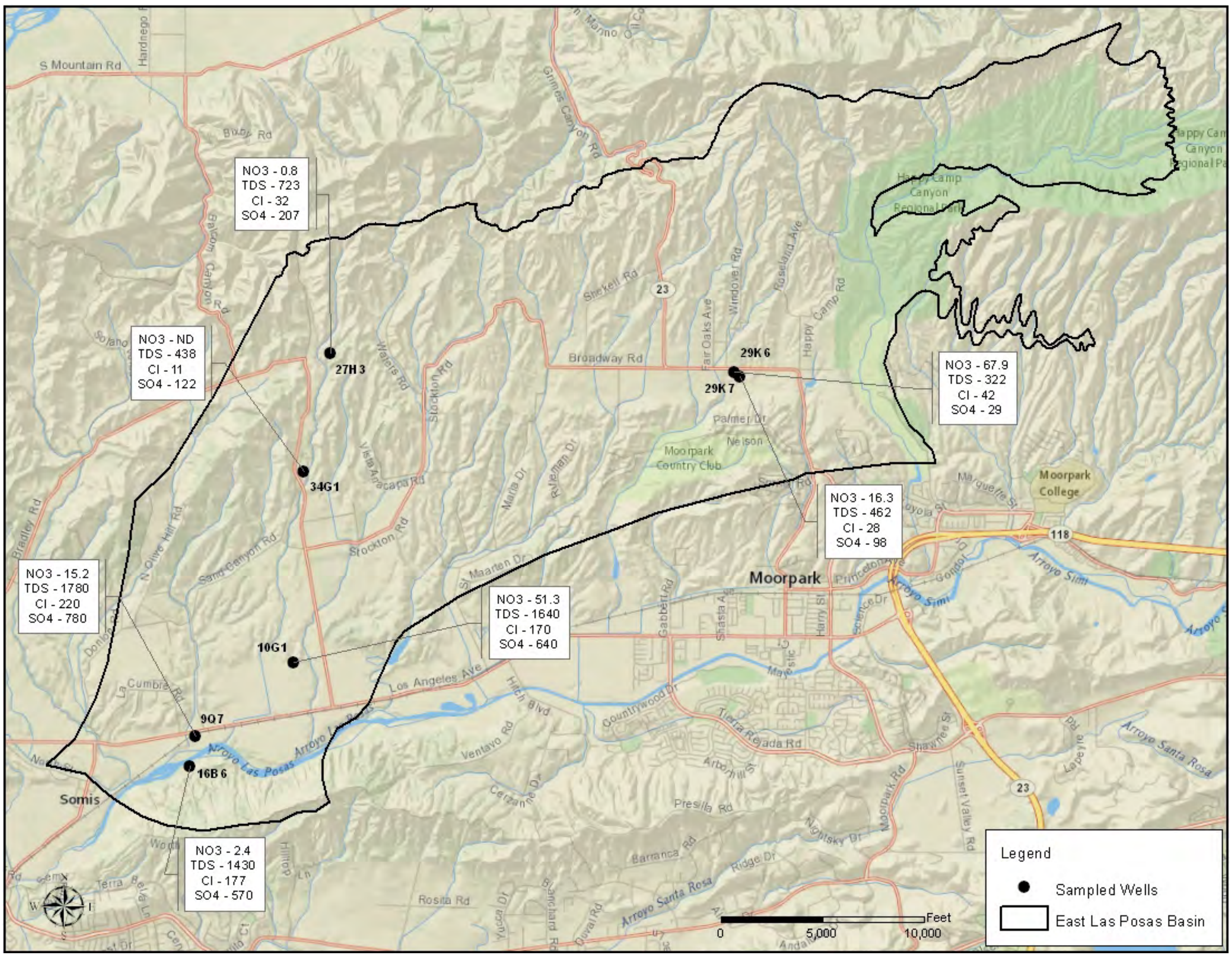


Figure 3-10: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.8 - West Las Posas Basin

All six wells sampled in the West Las Posas Basin this year have TDS above the MCL for drinking water with an average of 996 mg/L. Two wells have nitrate concentrations above the MCL for drinking water but one of those results is considered questionable because it was likely contaminated by fertilizer. The sample was obtained from the same port that is used to add fertilizer to the irrigation line. Three wells have sulfate (SO_4^{2-}) above the MCL. Figure 3-13 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for the wells sampled in the West Las Posas Basin.

WEST LAS POSAS BASIN

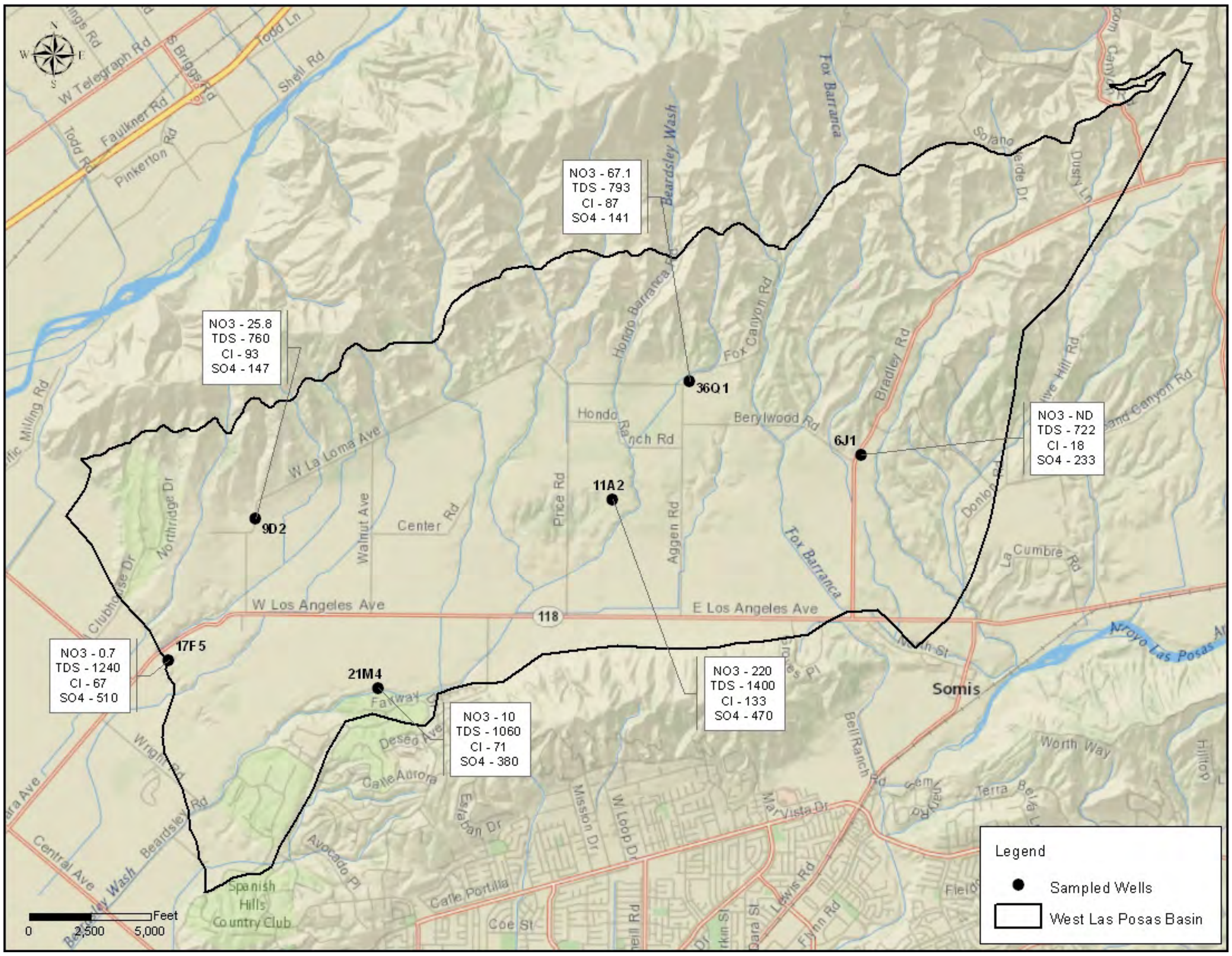


Figure 3-11: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.9 – Oxnard Forebay Basin

The Oxnard Forebay Basin is the principal recharge area for the Upper and Lower Aquifer Systems of the Oxnard Plain Pressure Basin. Approximate depth to the water bearing unit is 25 to 50 feet. The Oxnard Forebay generally has acceptable water quality except for the southern portion where high nitrate concentrations are common. The area to the north is predominantly agricultural with a few residential areas that still rely on individual septic systems. All three wells sampled have TDS and sulfate concentrations above the MCL for drinking water. A water sample from one well was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the MCL for drinking water. Figure 3-14 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Oxnard Forebay Basin.

OXNARD FOREBAY BASIN

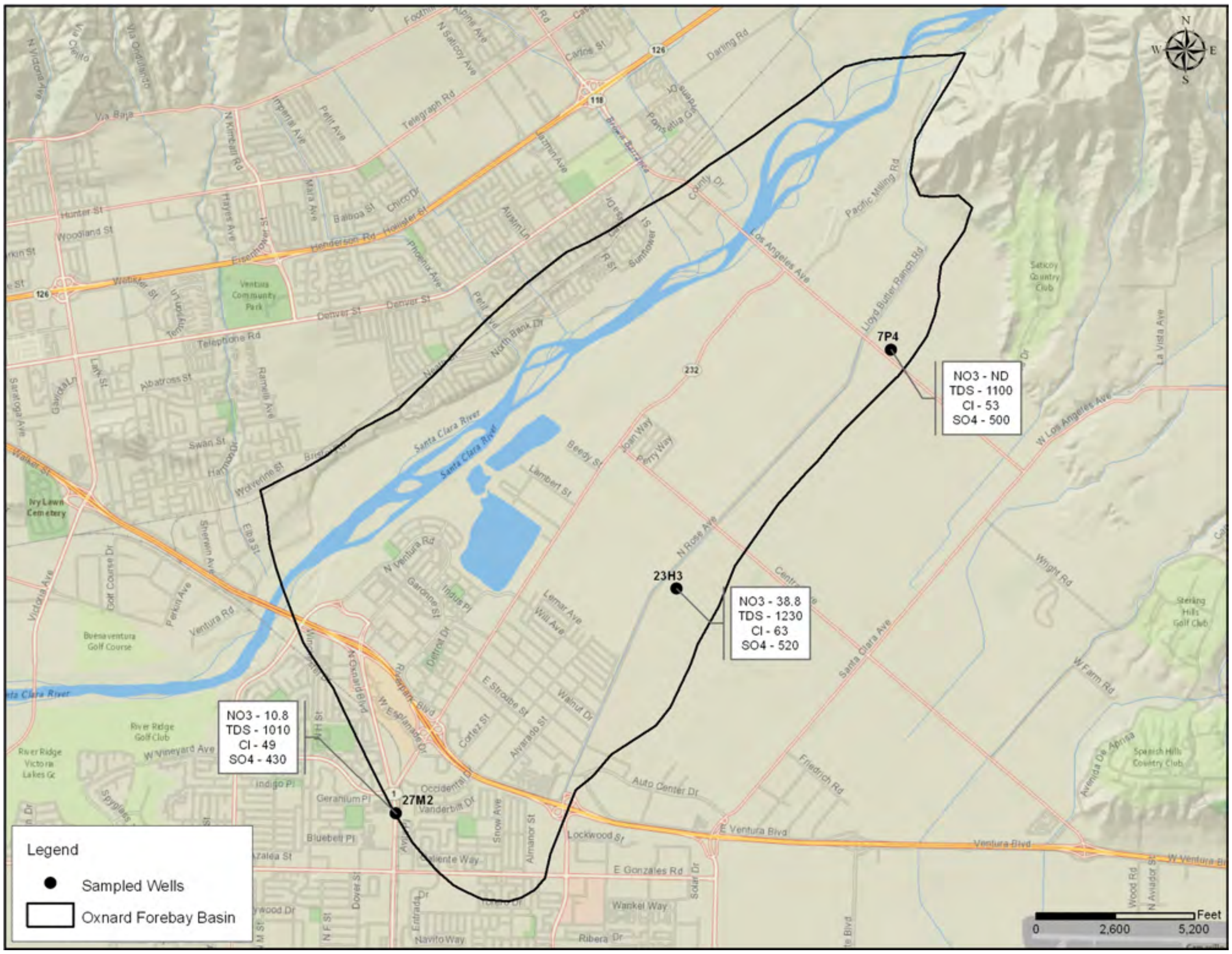


Figure 3-12: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.10 - South Las Posas Basin

The South Las Posas Basin has had no significant change in water quality over the past year. The upper water bearing unit is approximately 25 to 50 feet below ground surface and the lower is at approximately 350 to 500 feet deep. Generally, deeper wells perforated in the Fox Canyon aquifer tend to have better water quality, but that difference is not shown in these samples. Well 07B02 is perforated much deeper than the other two wells sampled but the chemistry is similar. Water from all five wells sampled has TDS and SO_4^{2-} concentrations above the MCL for drinking water and slightly elevated chloride; not above the MCL for drinking water (but high enough to be detrimental for some agricultural uses). Water from one well has NO_3^- above the MCL for drinking water. A water sample from one well was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the MCL. Figure 3-15 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the South Las Posas Basin.

SOUTH LAS POSAS BASIN

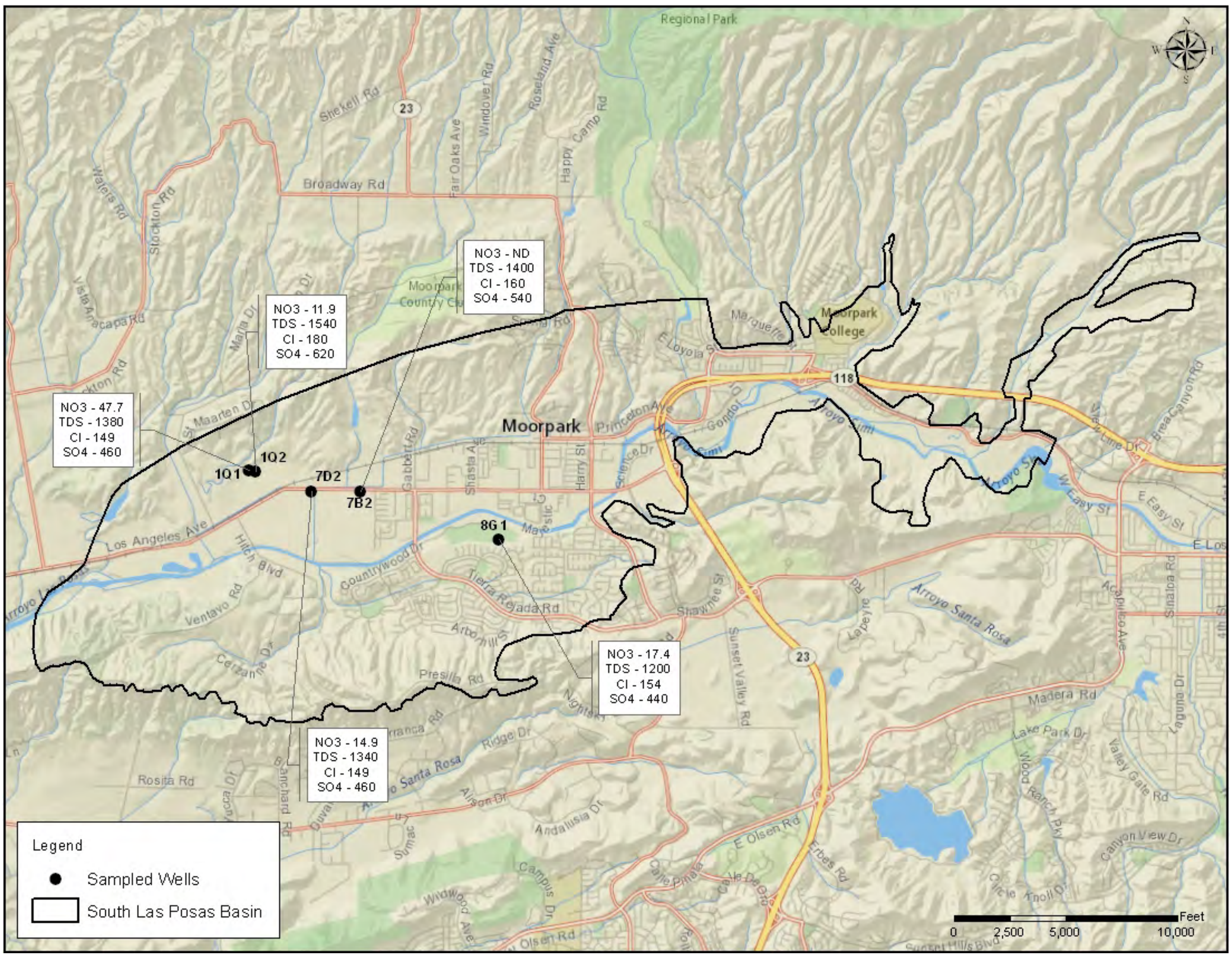


Figure 3-13: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.11 - Lower Ventura River Basin

The Lower Ventura River Basin has few remaining active water wells available for sampling. Depth to the water bearing unit is 3 to 13 feet in the floodplain and deeper as the ground surface elevation increases towards the edge of the basin. The two wells sampled this year are located in river alluvium near the coast. Total dissolved solids, sulfate, and manganese concentrations are above the MCL, otherwise, both have relatively good water quality. Water samples from both wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the MCL. Figure 3-14 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Lower Ventura River basin.

LOWER VENTURA RIVER BASIN

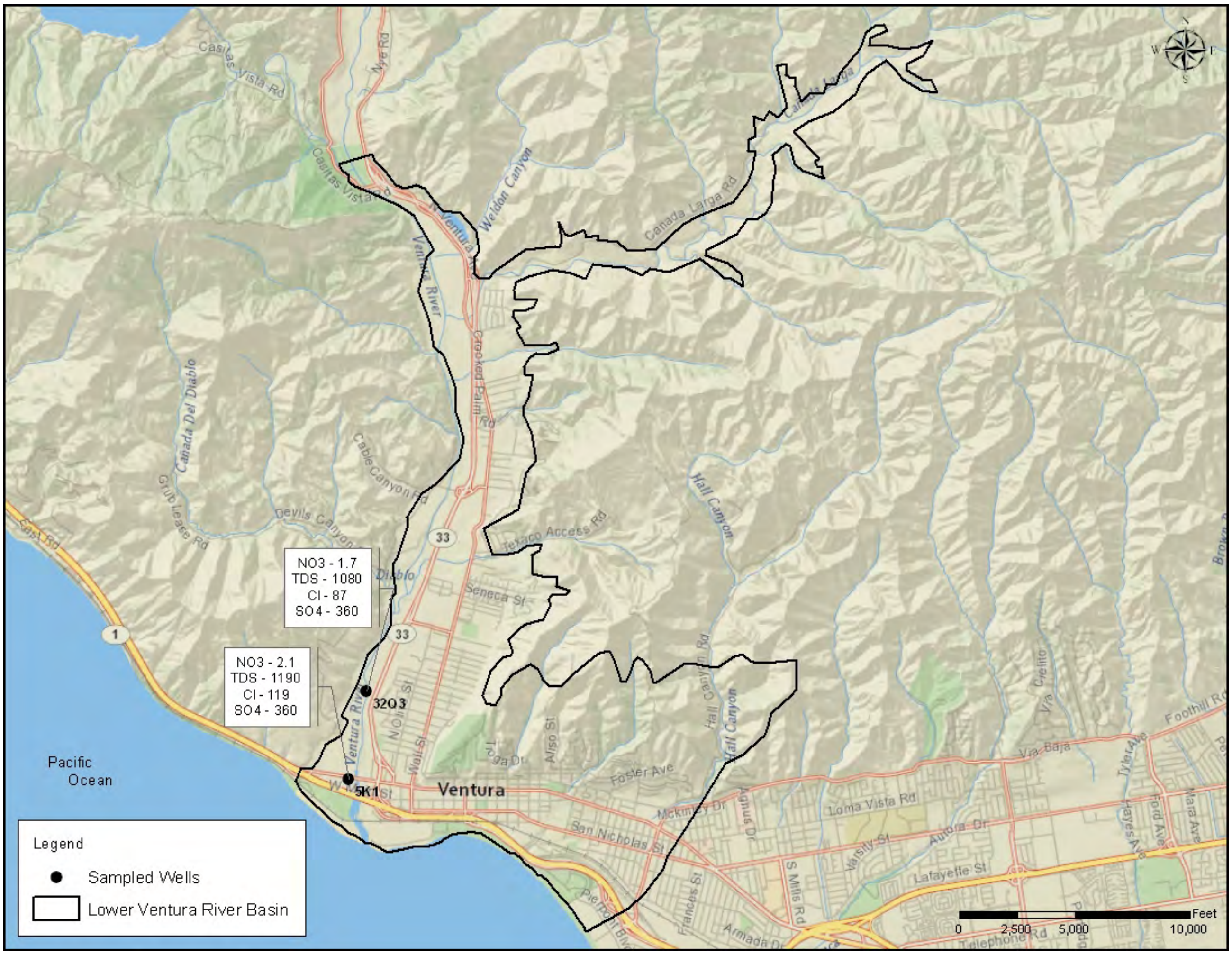


Figure 3-14: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.12 - Cuyama Valley Basin

The Cuyama Basin is in a remote area in northwestern Ventura County. All five wells sampled this year have TDS above the MCL for drinking water; four have elevated Fe; and two have elevated SO_4^{2-}. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the MCL. Groundwater Bulletin No. 118 indicates groundwater quality has been deteriorating in some areas because of the constant cycling and evaporation of irrigation water. Depth to the main water bearing unit varies between 40 to 170 feet. Figure 3-17 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Cuyama Valley basin.

CUYAMA VALLEY BASIN

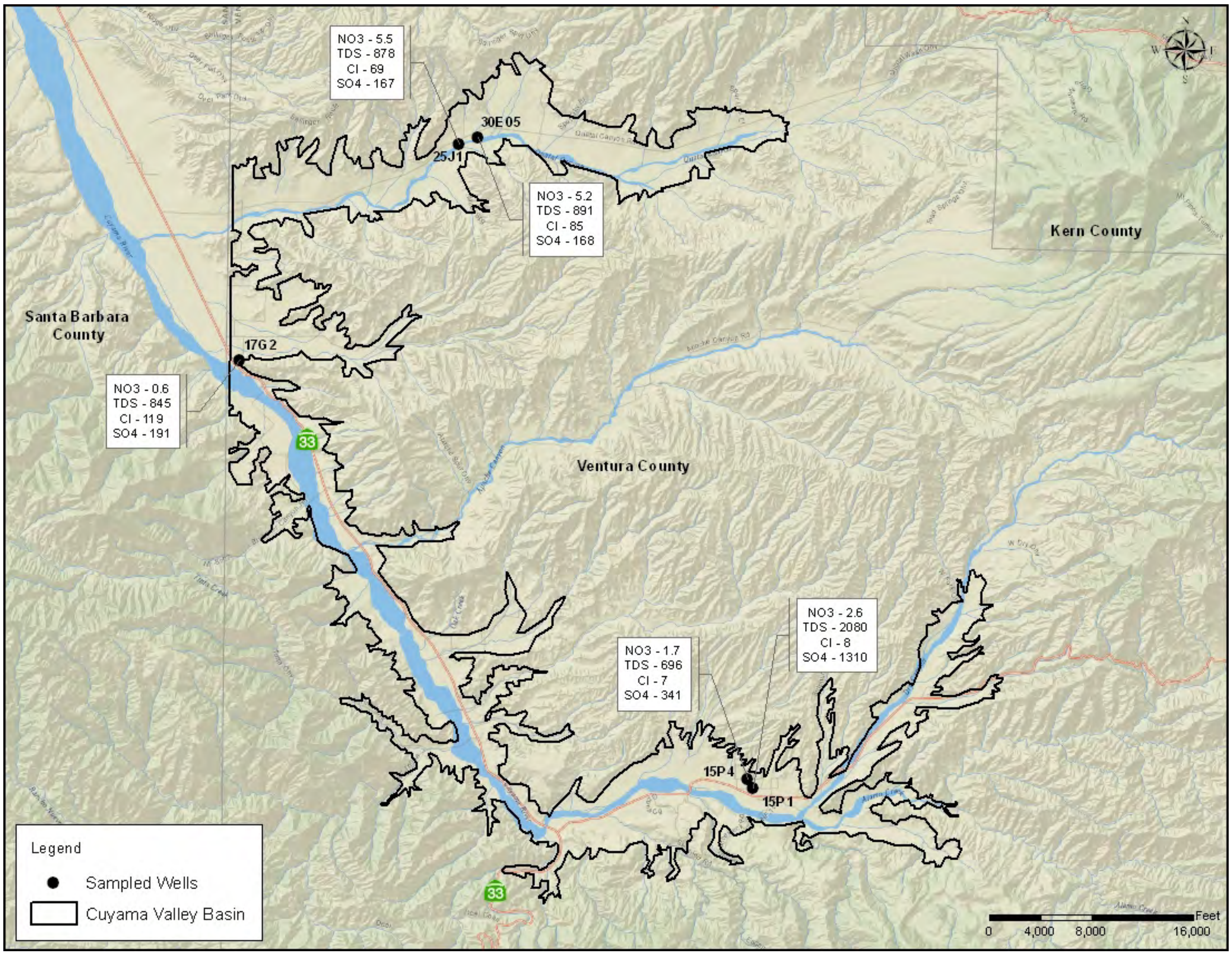


Figure 3-15: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.13 - Simi Valley Basin

The Simi Valley Basin drains to the west and historically, water quality gets worse farther west in the basin. Depth to water bearing material is approximately 5 to 25 feet below ground surface. The City of Simi Valley has a high water table at the west end of the valley and several extraction wells have been installed to remediate the problem when groundwater gets too high. Data from the wells sampled this year support the trend of worsening water quality to the west. The well located at the east end of the valley has the best water quality with no constituents, except TDS, above the MCL for drinking water. Water samples from the remaining three wells, located in the western half of the basin, have concentrations above the MCL for SO_4^{2-}, and TDS and two have elevated NO_3^-. All three samples also have concentrations of boron and chloride that cause agricultural beneficial uses for sensitive plants to be impaired, but neither contaminant is above the MCL for drinking water. Two samples were analyzed for inorganic chemicals (Title 22 metals). One sample has Se above the MCL for drinking water, but none of the remaining inorganic chemicals was above the MCL. Figure 3-18 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Simi Valley basin.

SIMI VALLEY BASIN

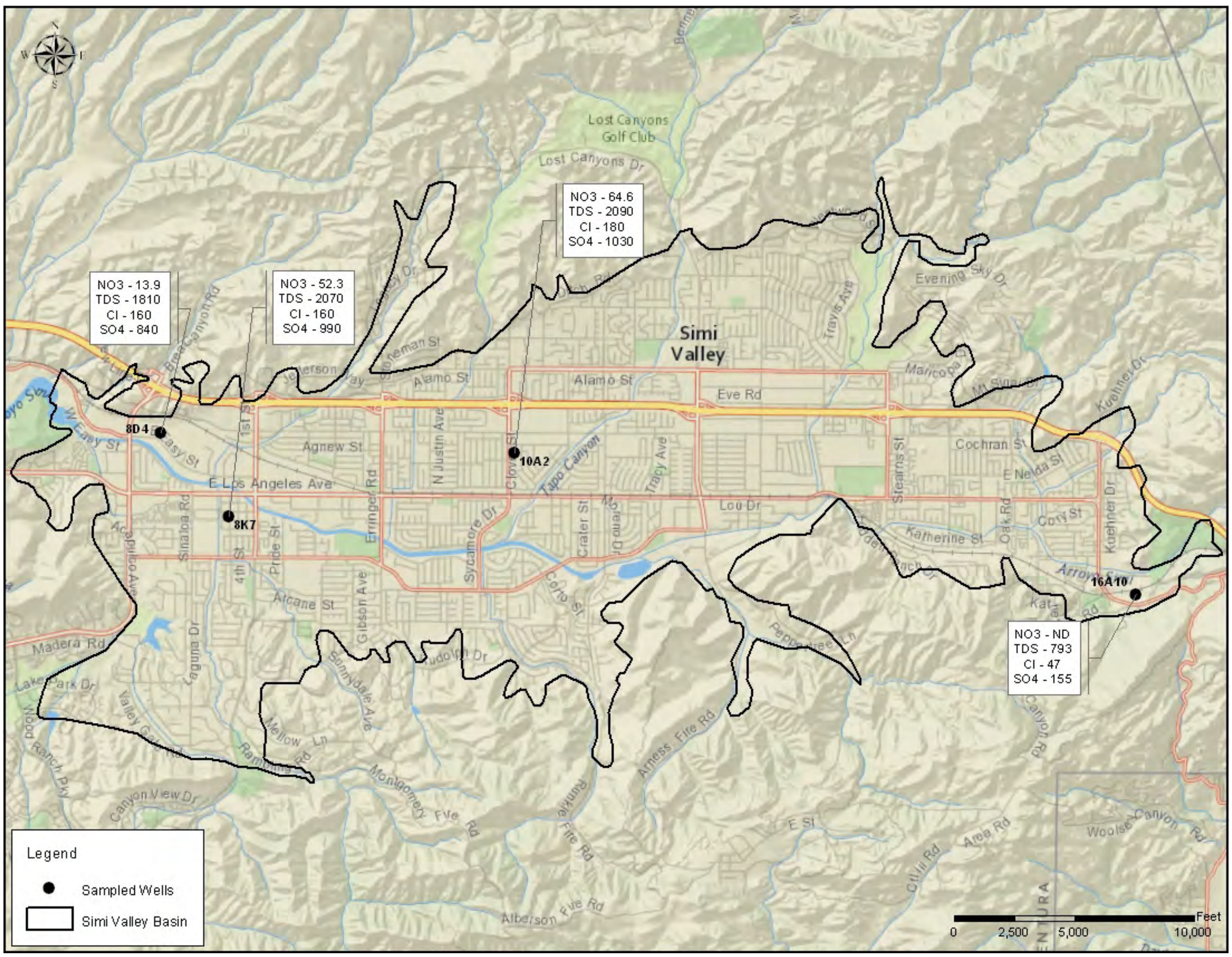


Figure 3-16: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.14 - Thousand Oaks Basin

The Thousand Oaks Basin has very few active water wells available for sampling. Two wells were sampled in the basin this year. Concentrations of iron, manganese, sulfate and TDS are above the MCL. One water sample was analyzed for inorganic chemicals (Title 22 metals). None of the inorganic chemicals was above the MCL for drinking water. The depth to the water bearing unit is approximately 25 to 30 feet. Figure 3-19 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in Thousand Oaks basin.

THOUSAND OAKS BASIN

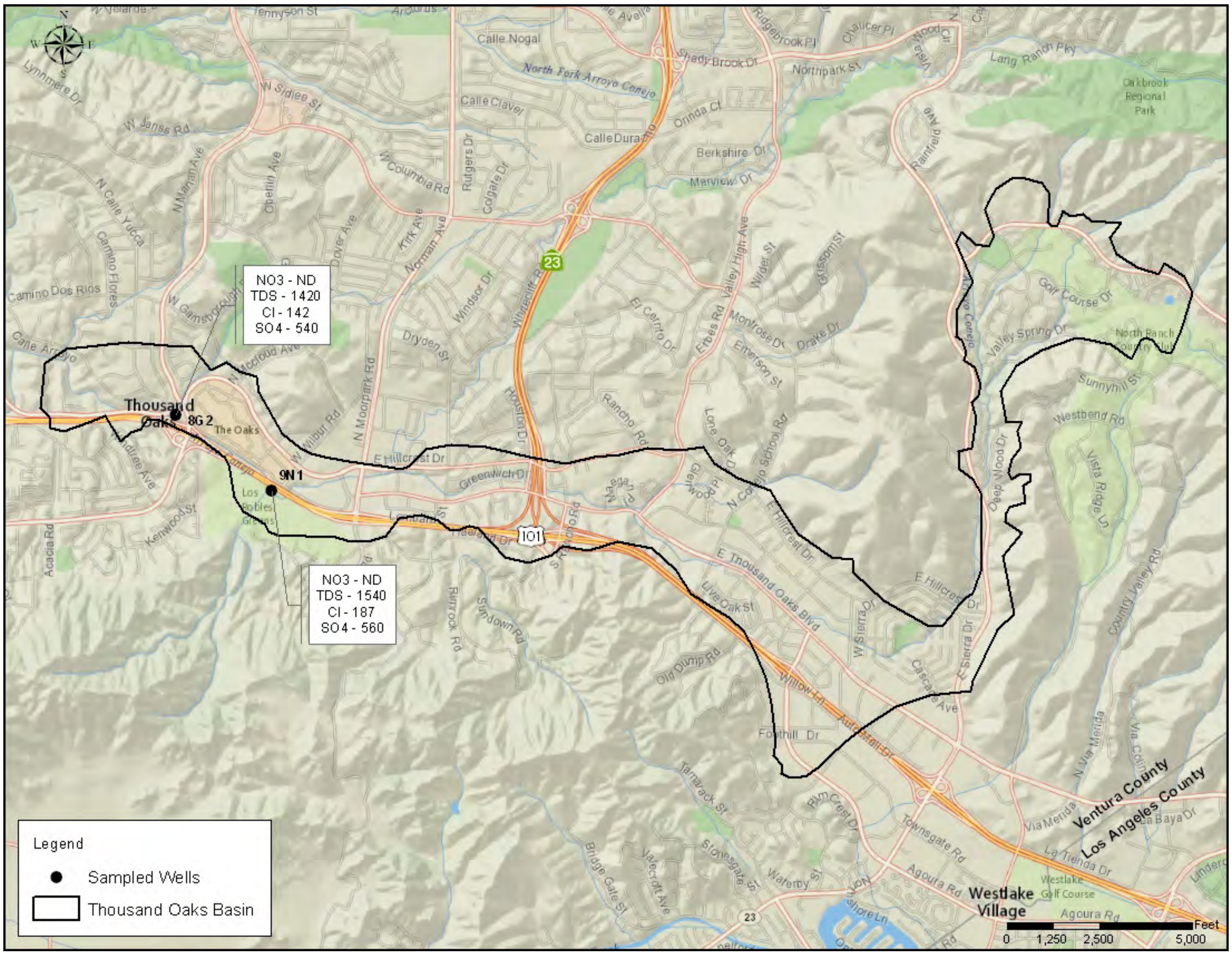


Figure 3-17: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.15 - Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley and has very good groundwater quality. The City of Simi Valley operates several wells in the basin as a backup water supply. Two wells were sampled this year. TDS concentrations are above the MCL for both samples; one has elevated SO_4^{2-} and one has elevated iron (Fe). One water sample was also analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL for drinking water. Depth to the water bearing material is approximately 125 to 150 feet. Figure 3-20 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in Tapo/Gillibrand basin.

TAPO/GILLIBRAND BASIN

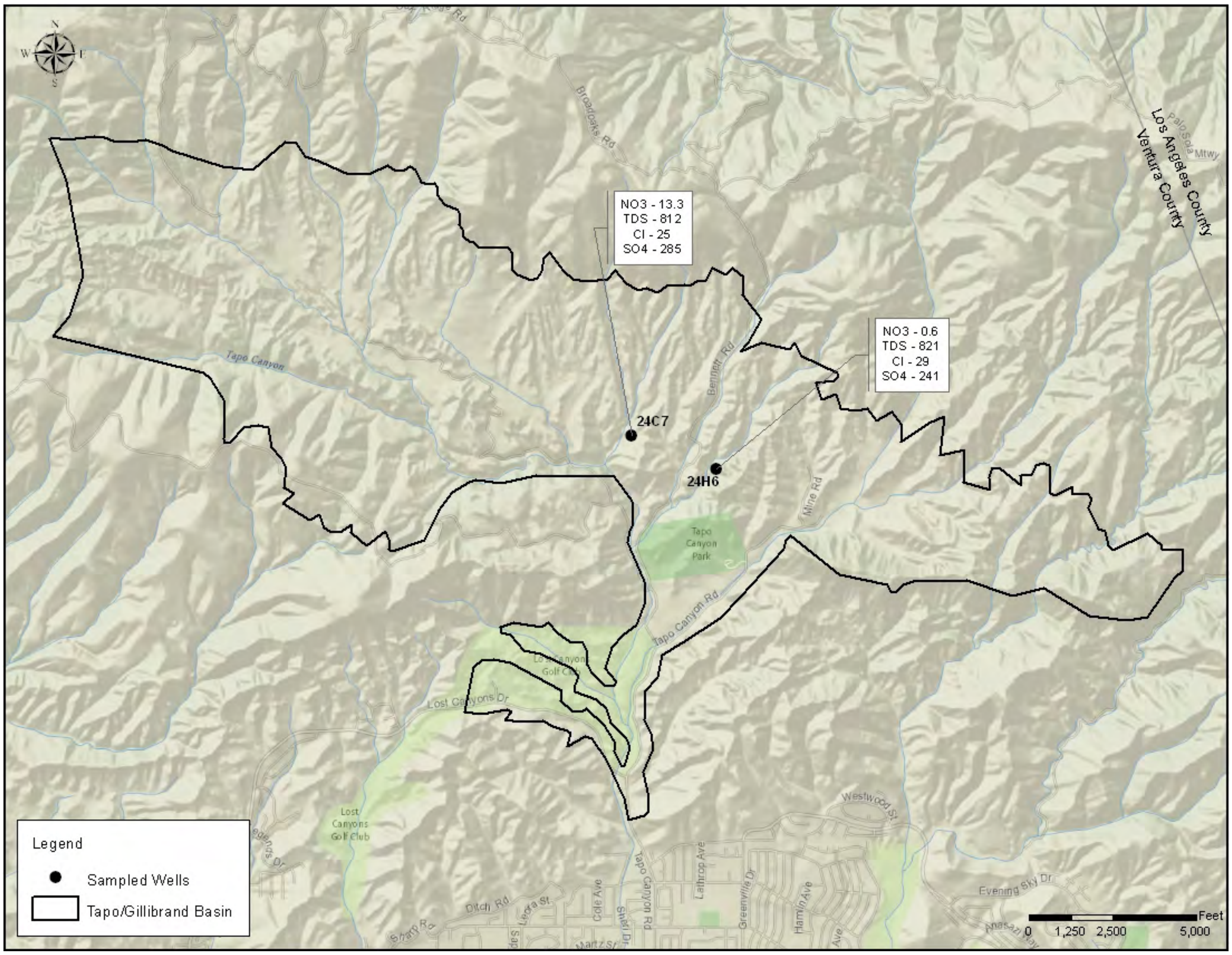


Figure 3-18: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.16 - Arroyo Santa Rosa Basin

The Arroyo Santa Rosa Basin has a large area dedicated to agricultural use and a high number of individual septic systems. A large portion of recharge to the basin is discharge from the Thousand Oaks Hill Canyon Wastewater Treatment Plant. Water from seven of the eleven wells sampled during 2011 contains nitrate (NO_3^-) concentrations higher than the MCL for drinking water. All eleven wells have TDS concentrations above the MCL with an average of 958 mg/l. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL for drinking water. Depth to water bearing material is approximately 50 feet. Figure 3-19 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Arroyo Santa Rosa basin.

ARROYO SANTA ROSA BASIN

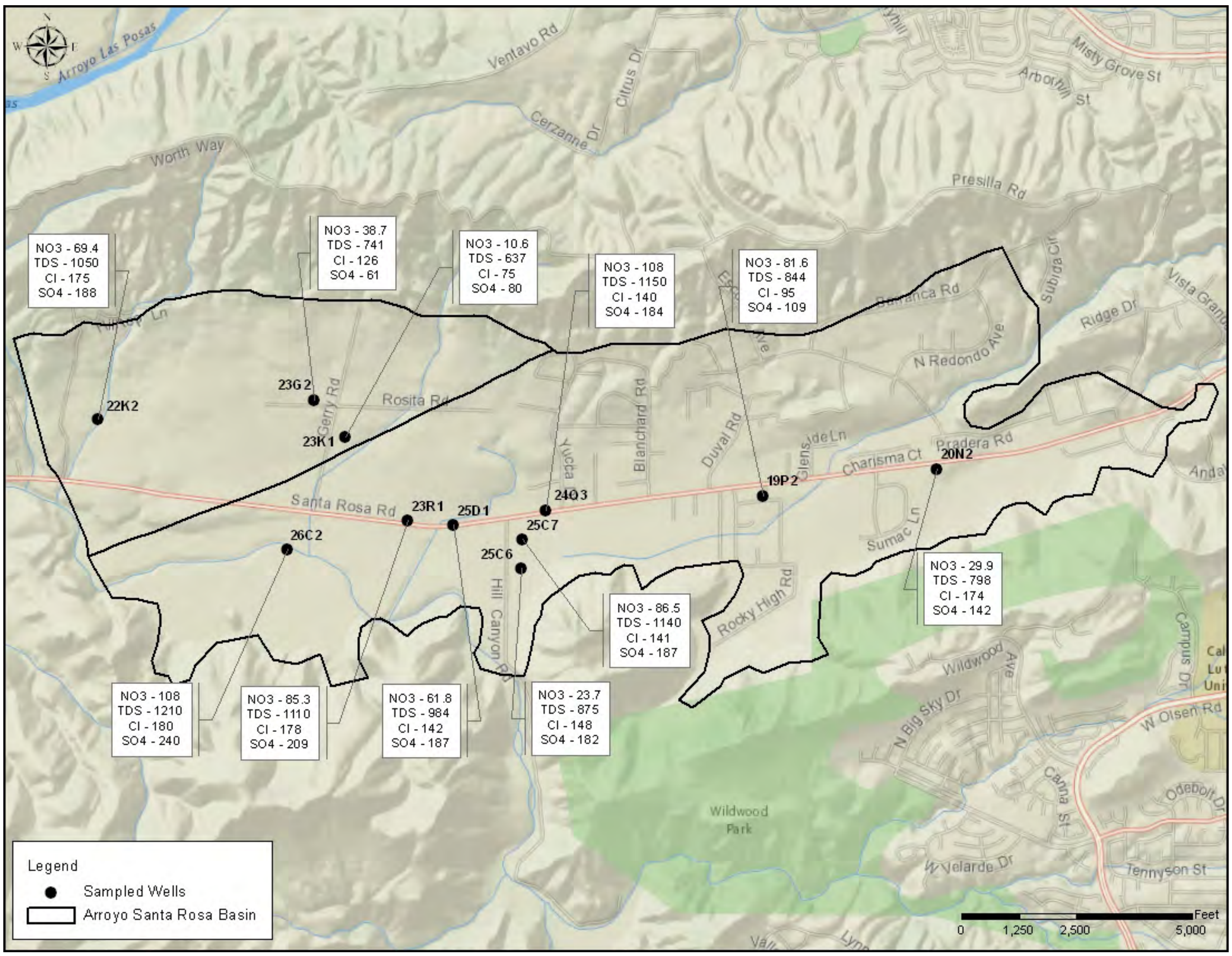


Figure 3-19: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

Figure 3-20 shows the geographic distribution of the wells sampled, with graduated symbols representing nitrate concentration for 2011. Figure 3-21 shows nitrate results for all wells sampled from 1998 through 2011 in the same manner as Figure 3-20. The Groundwater Section has used three or more wells with nitrate concentrations above the state MCL in a given year as the criteria to classify the basin as nitrate-impacted. Comparison of the two shows that the Arroyo Santa Rosa Basin has remained nitrate impacted for approximately 13 years. Management practices now in place include limiting the number of large animals, limiting the size of new construction, and limiting septic systems to lots greater than 2.875 acres.

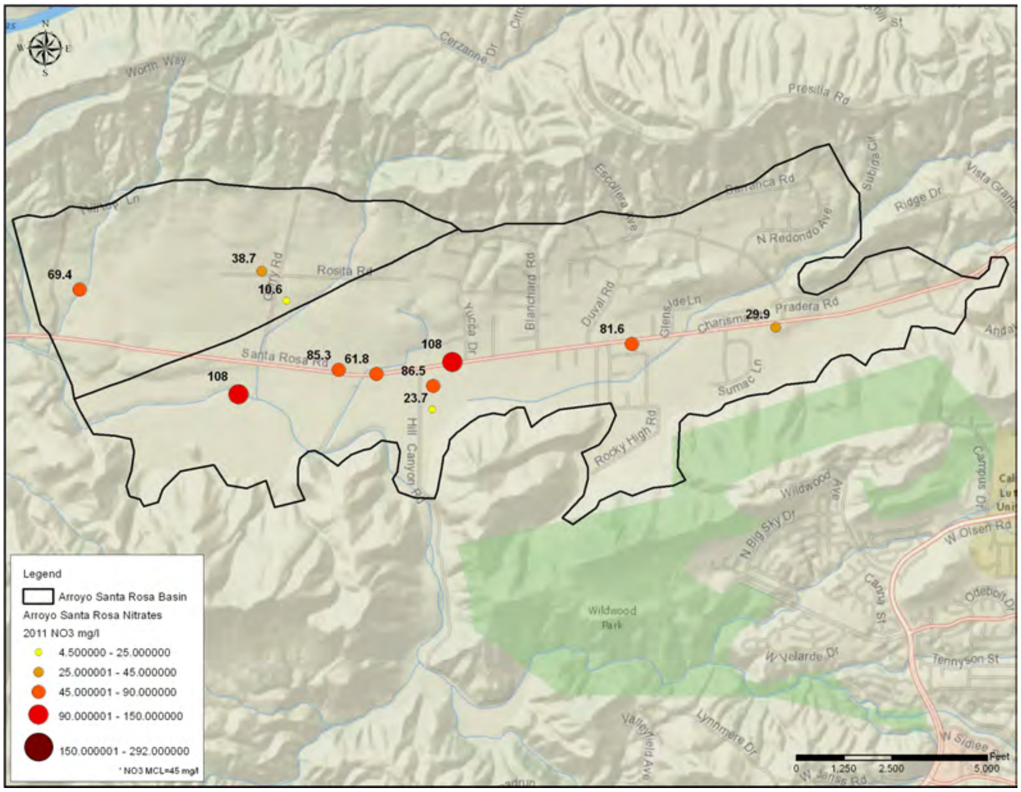


Figure 3-20: Map showing Nitrate results in mg/l for the year 2011.

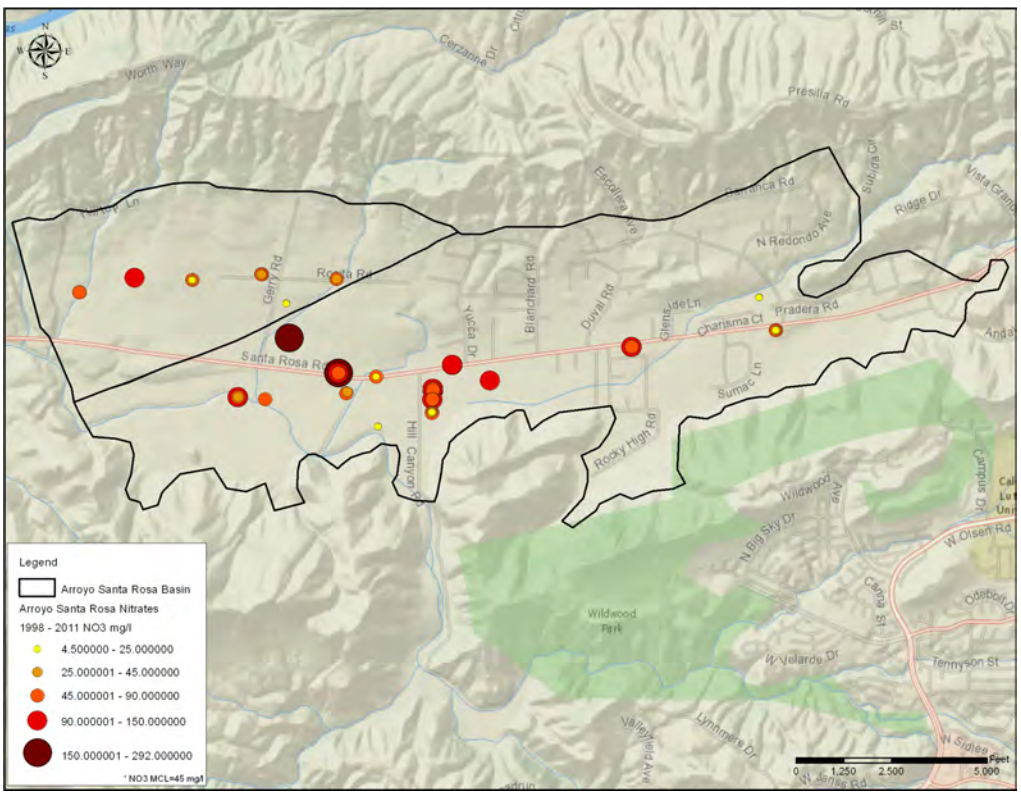


Figure 3-21: Map showing each nitrate result for each year 1998 to 2011.

3.2.17 - Ojai Valley Basin

The Ojai Valley Basin water quality is considered good. Average TDS is 935 mg/l and ranges from 706 to 1520 mg/l. One well has consistently had an extremely high chloride concentration; two to three times the MCL. Water samples from seven wells were analyzed for inorganic chemicals. No constituent was above the MCL. Depth to water bearing material is generally between 25 to 30 feet below ground surface. Figure 3-24 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Ojai Valley basin.

OJAI VALLEY BASIN

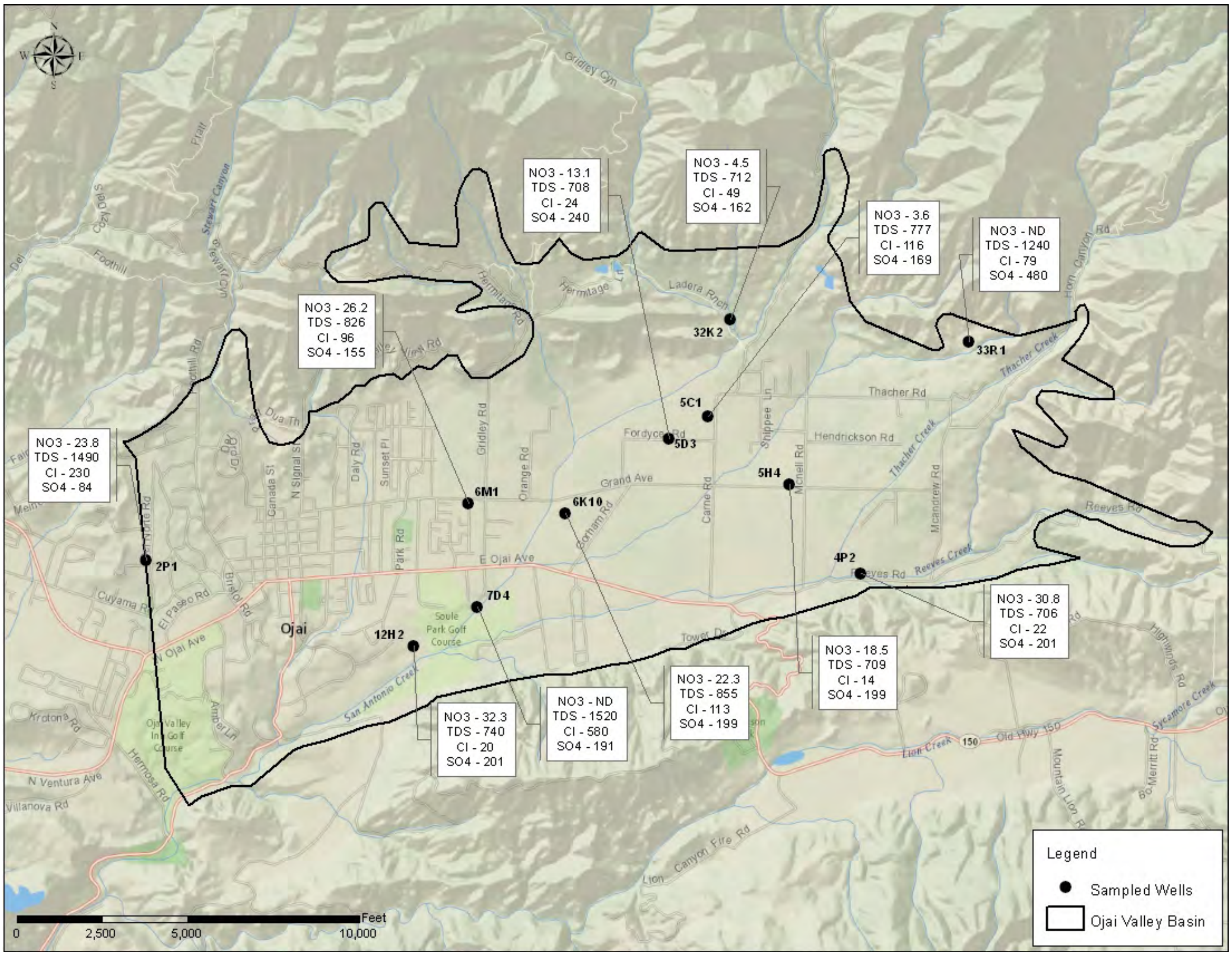


Figure 3-22: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.18 - Lockwood Valley Basin

The Lockwood Valley Basin groundwater quality ranges from good to unhealthful. The basin covers a large geographic area, approximately 34.1 square miles, and water bearing units vary. Depth to water bearing material is approximately 55 to 60 feet. Piper and Stiff diagrams in Appendix D, Figure D-21 show a variation in groundwater quality. Four wells were sampled this year and of those, all have TDS concentrations above the MCL for drinking water and two have sulfate (SO_4^{2-}) above the MCL. Samples from all four wells were also analyzed for inorganic chemicals. One well had an arsenic concentration above the MCL for drinking water but the remaining constituents were below the MCL. The area near the west end of Boy Scout Camp Road and an area around Chico Larson Rd have been reported to have high gross alpha. Water from one well in each area was tested for radionuclides. The result for gross alpha on one sample was above 5 pCi/L requiring the sample to be analyzed for uranium. In 2004, the Drinking Water Branch of the California Department of Public Health issued an Initial Monitoring and MCL Compliance Determination flow chart. The flow chart is used to determine the source of gross alpha for determining compliance in community water systems. Based on the flow chart, naturally occurring uranium was determined to be the source of the gross alpha in these samples. Following the additional testing, radionuclides were determined to be below the MCL for drinking water. Water quality is best in wells perforated to a depth of less than 250 feet. Figure 3-25 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Lockwood Valley basin.

LOCKWOOD VALLEY BASIN

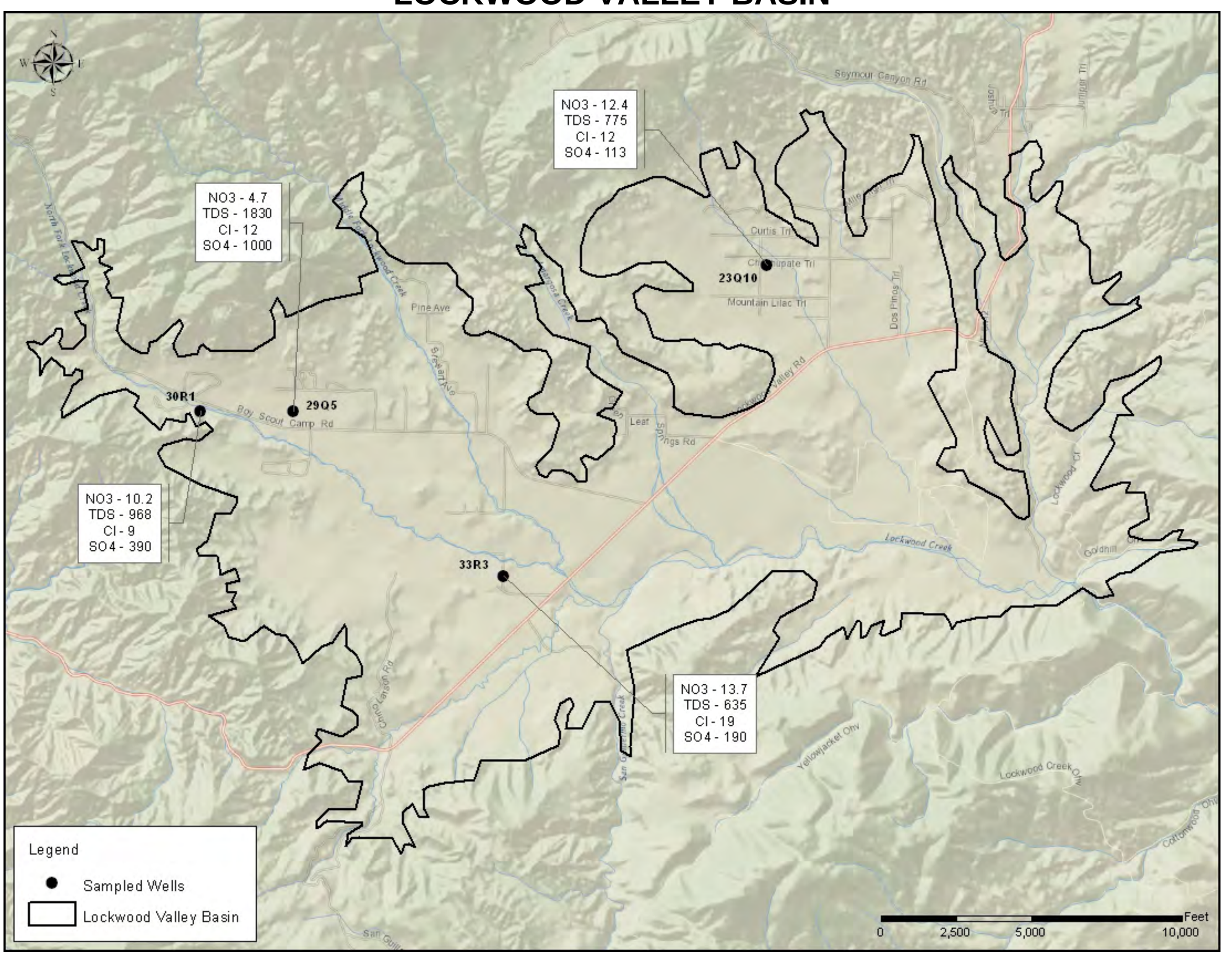


Figure 3-23: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.19 - Tierra Rejada Basin

In the past, the Tierra Rejada Basin groundwater quality has generally been considered to be good. Eleven wells were sampled this year. All eleven have concentrations above the MCL for TDS with an average of 806 mg/l. Nitrate concentrations in water samples from four of the wells is above the primary MCL with an average of 37.6 mg/l. For the third year in a row this basin has had more than three wells with high nitrate. As with the Lockwood Valley Basin, Piper and Stiff diagrams show quite a bit of variation in water quality with well location. The major cations for the majority of the wells are calcium and magnesium and the major anions are sulfate and chloride. Two wells at the south east edge of the basin yield water that has considerably different chemistry. The major cations for those two wells are sodium and magnesium and the major anion is bicarbonate. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical concentration was above the MCL for drinking water. Depth to water bearing materials varies between 20 to 80 feet. Figure 3-26 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Tierra Rejada basin.

TIERRA REJADA BASIN

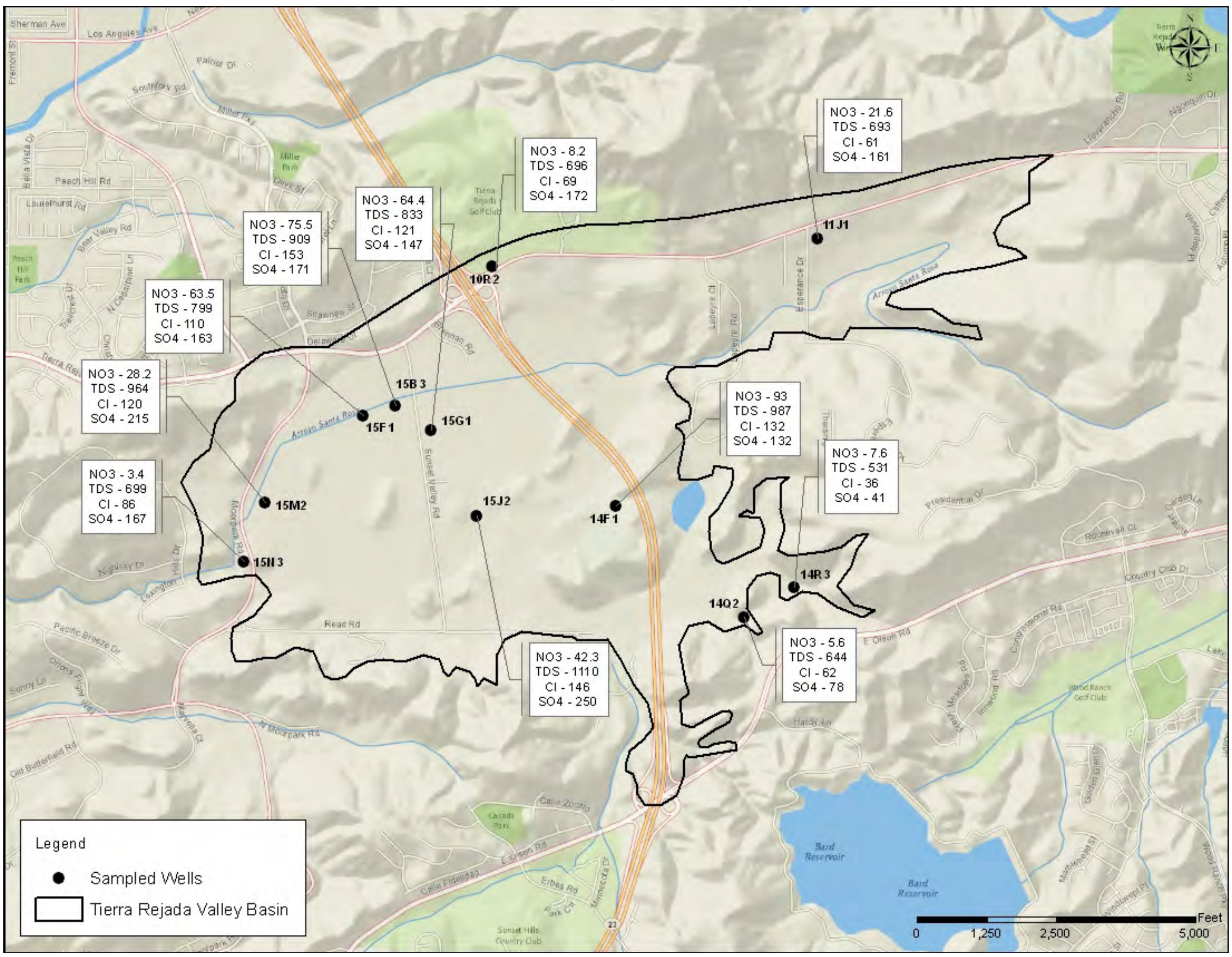


Figure 3-24: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

Figure 3-25 on the following page shows nitrate concentrations for wells sampled in Tierra Rejada Basin in 2011. Groundwater from four of the wells sampled this year has a high nitrate concentration, thus, based on the criteria used by the Groundwater Section (See discussion in Arroyo Santa Rosa Basin section) for the third year in a row, the Tierra Rejada Basin should be considered nitrate impacted.

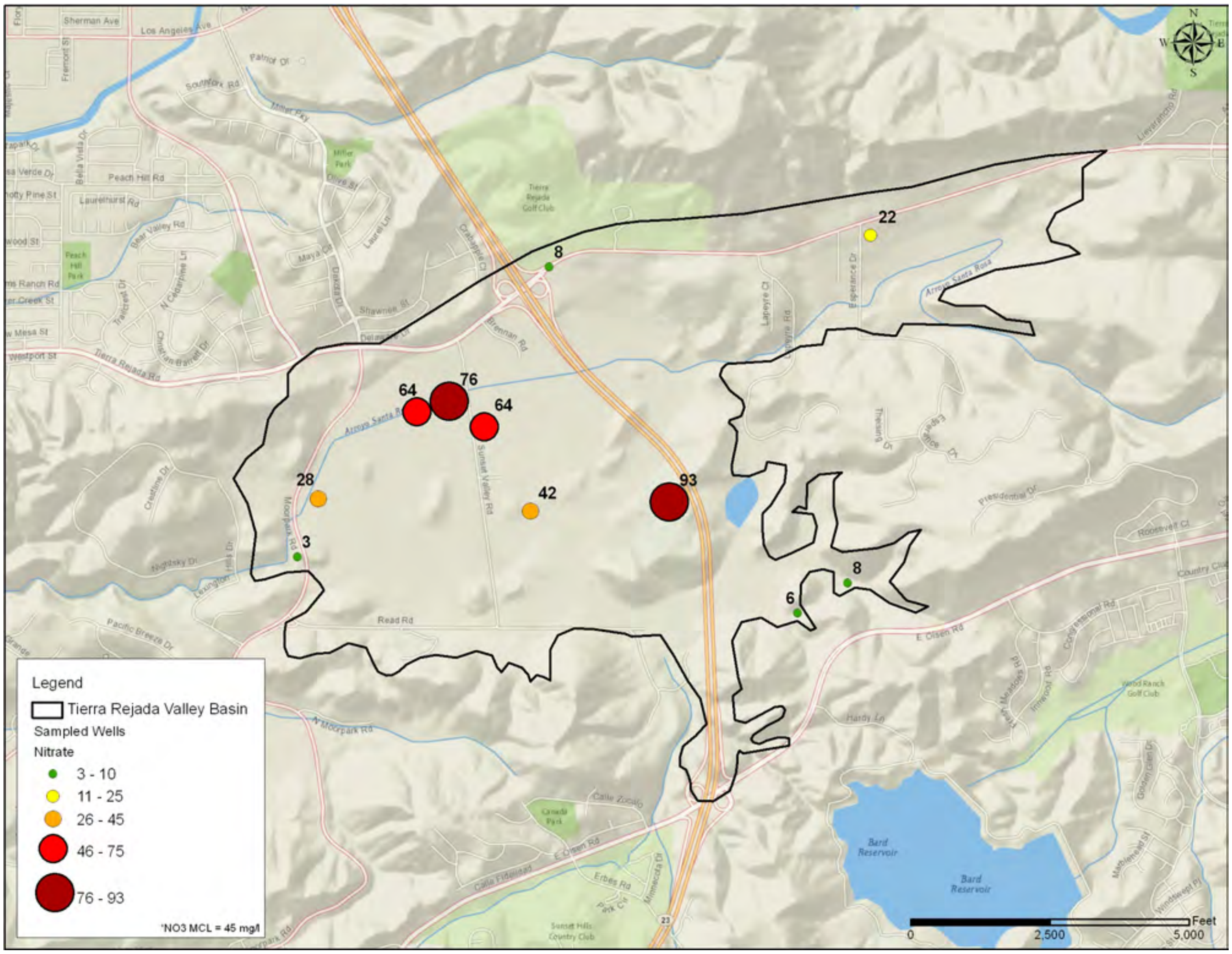


Figure 3-25: Map showing nitrate concentrations (mg/l). Four of the thirteen wells sampled this year have a nitrate concentration above the MCL for drinking water.

3.2.20 - Upper Ventura River Basin

The Upper Ventura River Basin is mainly composed of thin alluvial deposits. The wells sampled are all less than 125 feet deep, and all have good water quality. The only constituent that exceeds the MCL for drinking water is TDS, a secondary MCL, with an average concentration of 714 mg/l. Groundwater from the three wells was also analyzed for inorganic chemicals and none of the constituents was above the MCL.

Figure 3-28 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Upper Ventura River basin.

Upper Ventura River Basin

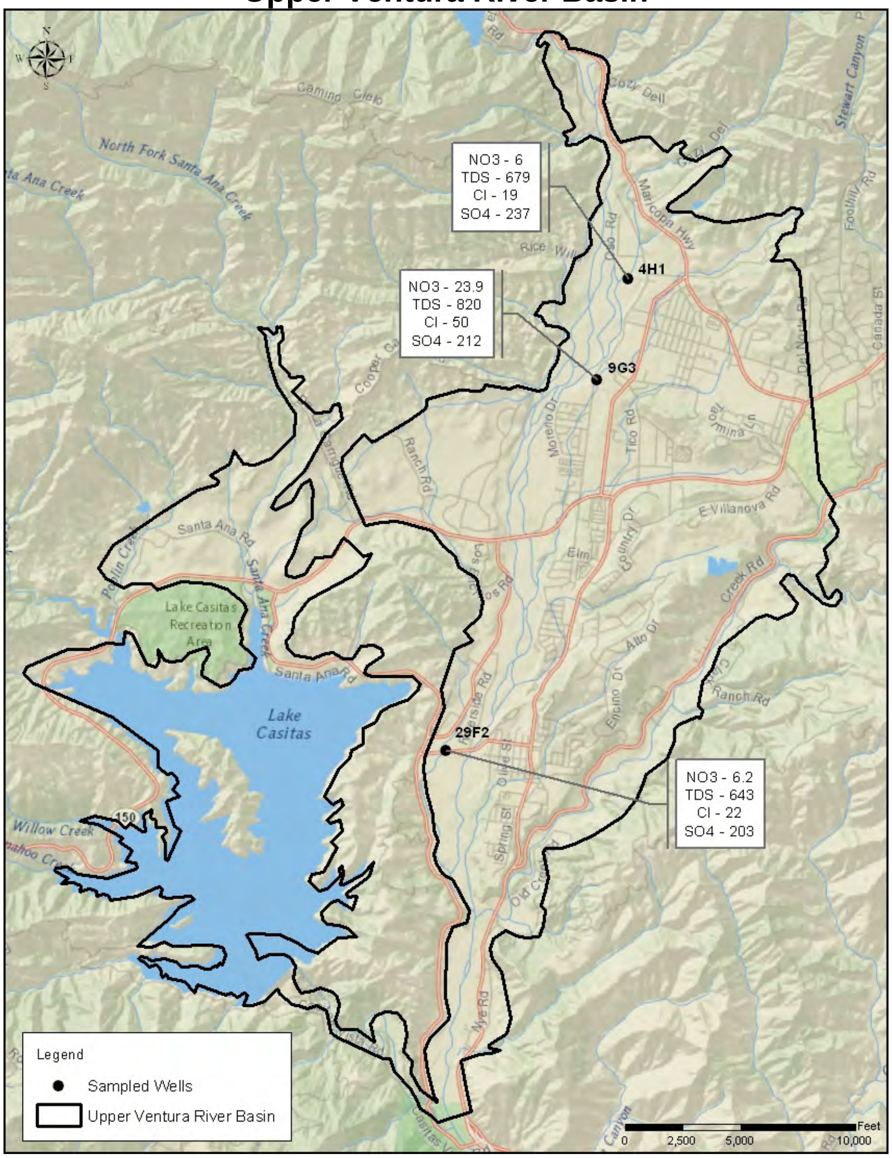


Figure 3-26: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.21 - North Coast Basin

The North Coast Basin does not fit the definition of a basin based solely on the Glossary of Geology definition as being an aquifer or aquifer system having well defined boundaries and more or less definite areas of recharge and discharge. The North Coast Basin consists of narrow, thin strips of permeable sediments and marine terrace deposits along the coastline from Rincon Creek to just north west of the Ventura River. There are only 14 active wells in the North Coast Basin with the majority in the northwest portion along Rincon Creek. Water samples were collected from three wells at the northwest end and one at the southwest end of the basin. Water from two wells has iron concentrations above the MCL; all samples have TDS above the MCL, and three have sulfate concentrations above the MCL. Water samples from one well was analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL for drinking water. Figure 3-29 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) in the North Coast basin.

NORTH COAST BASIN

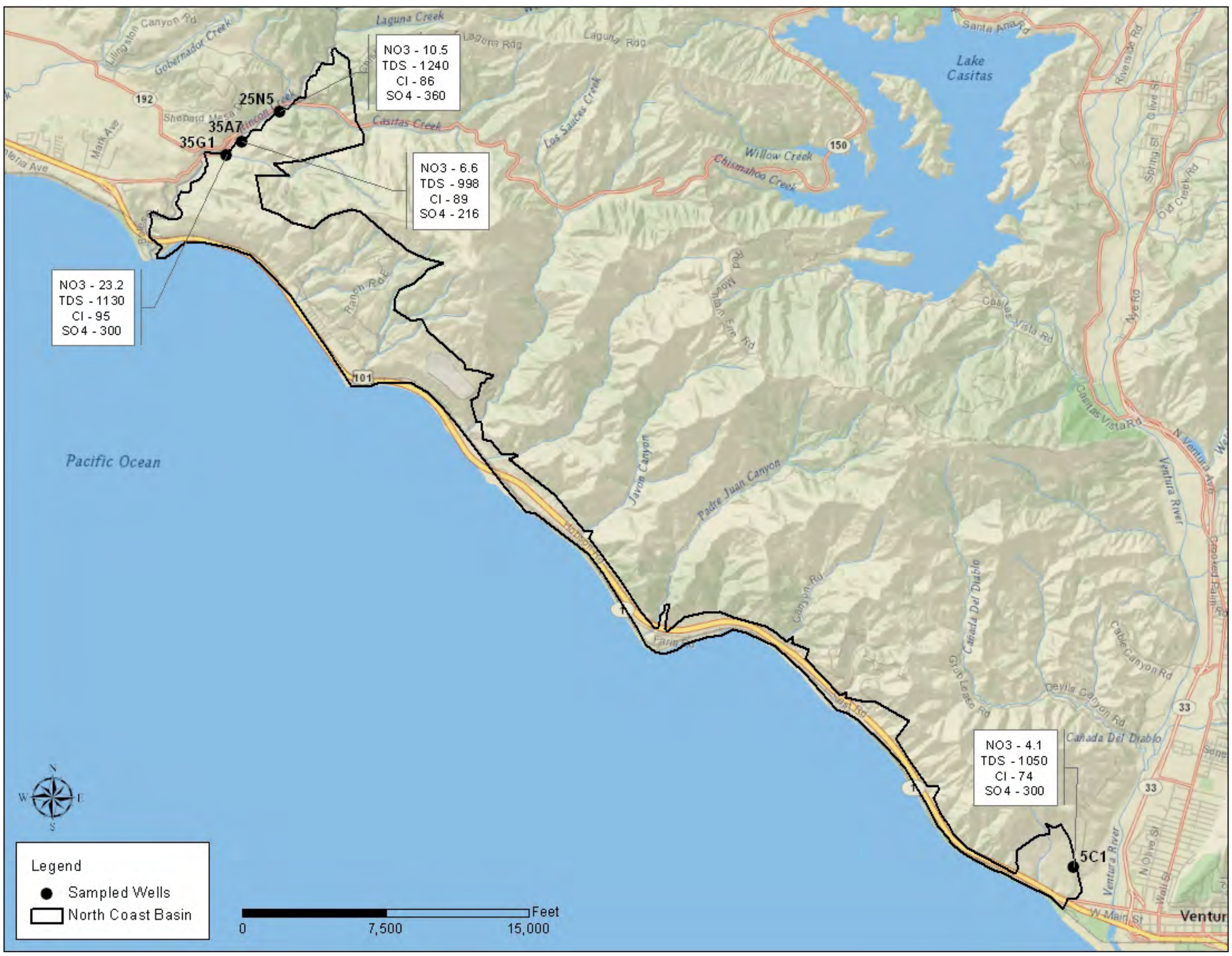


Figure 3-27: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.22 - Upper Ojai Basin

The Upper Ojai Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. Groundwater quality is considered good, but varies seasonally, usually better during winter months. Historic average TDS is 549 mg/l. Groundwater from the wells sampled this year has an average TDS concentration of 595, a little higher than the historical average. No other constituents were above the MCL for drinking water. Water samples from two wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL for drinking water. The average thickness of water bearing deposits is approximately 60 feet and is encountered approximately 45 to 60 feet below ground surface. Figure 3-30 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}).

UPPER OJAI BASIN

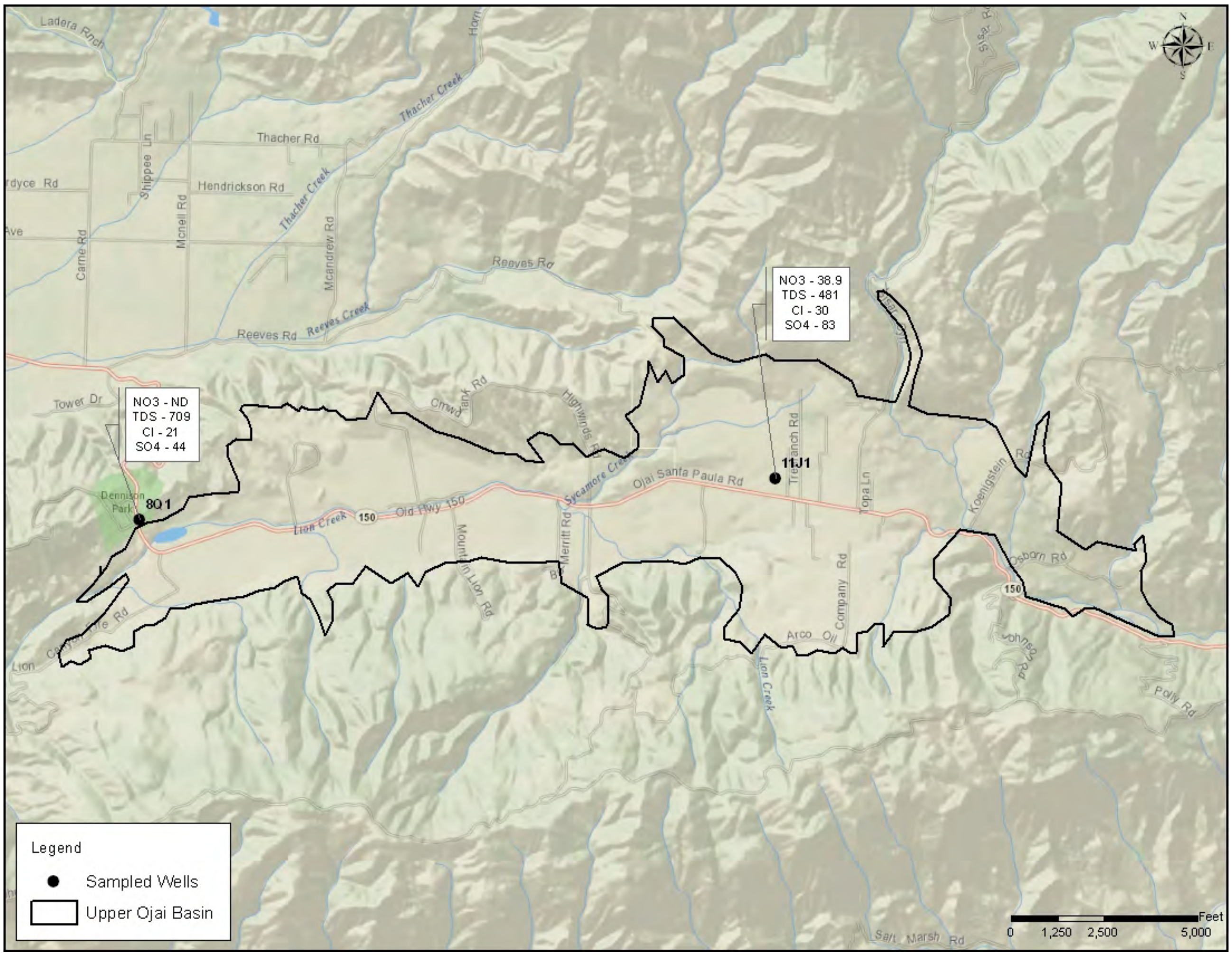


Figure 3-28: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.23 - Sherwood Basin

The Sherwood Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply and quality. Four wells were sampled and analyzed this year. Manganese is above the MCL in three wells; iron is above the MCL in all four wells and TDS is above the MCL in three wells. TDS concentrations range from 452 to 1160 mg/l with an average of 788 mg/l for wells sampled this season. Water from two wells was analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the MCL for drinking water. Figure 3-31 shows approximate well locations and concentrations of total dissolved solids (TDS), chloride (Cl^-), nitrate (NO_3^-), and sulfate (SO_4^{2-}) for wells sampled in the Sherwood basin.

SHERWOOD BASIN

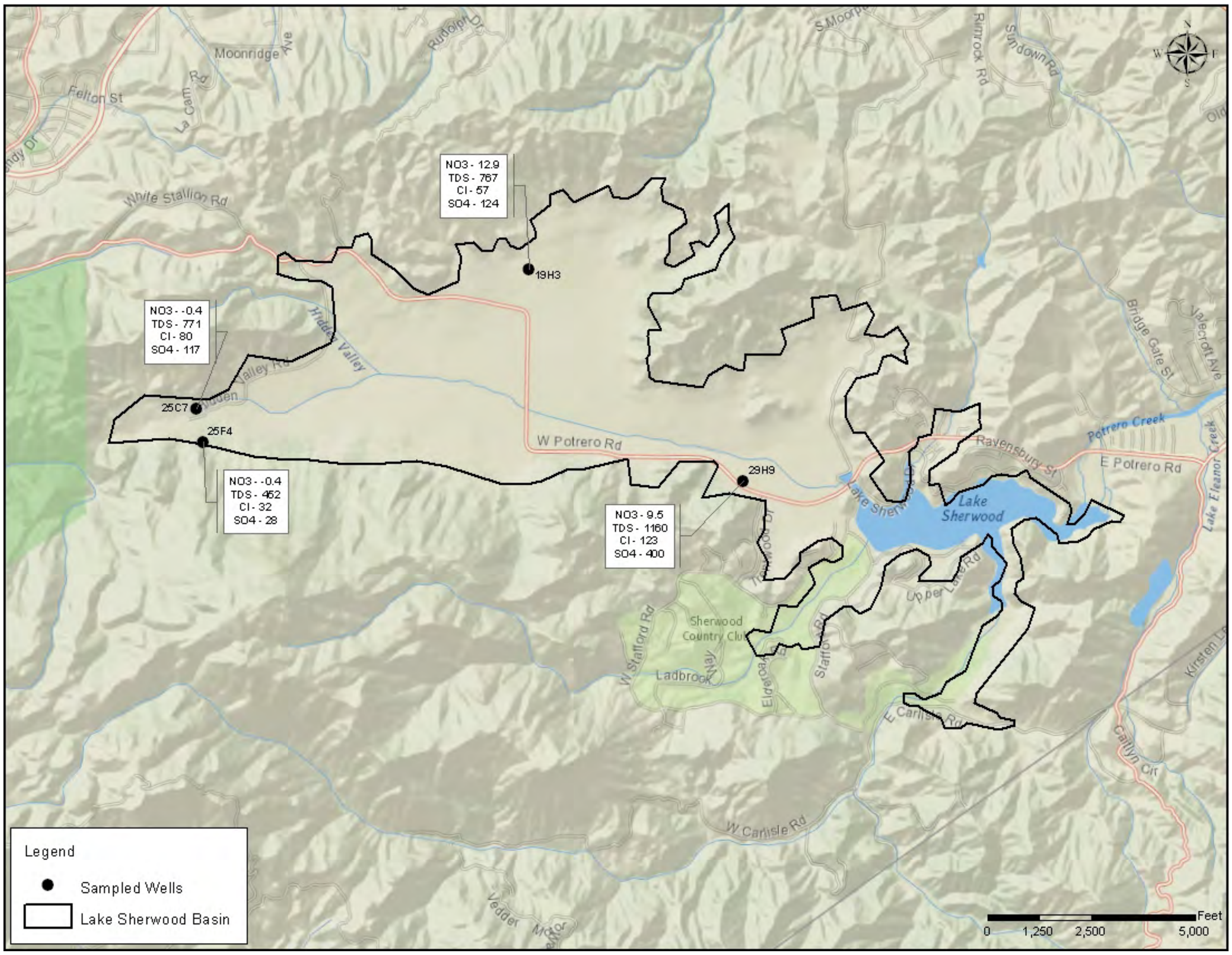


Figure 3-29: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

Section 4.0
Water Quantity

4.1 – Groundwater

The following sub-sections describe the Groundwater Section's annual groundwater level monitoring program, as well as, a general overview of water use in the County for 2011.

4.1.1 – Water Level Measurements

Groundwater Section staff, and several water districts and purveyors measure water levels in production and monitoring wells throughout the County. Changes in water levels are tracked and help determine change in storage, and to track trends in groundwater extraction and recharge. Last year, water levels were measured quarterly in approximately 200 wells throughout the County. In the southern half of the County, water levels were measured four times, while in the more remote northern half, wells are monitored twice each year. "Key" wells for seventeen of the largest groundwater basins in the County have been established. A key well is a well selected as one giving the most representational data for the basin, or for a specific aquifer in a basin. Key wells are chosen based on their location in the basin, and availability of construction information and historical water level data.

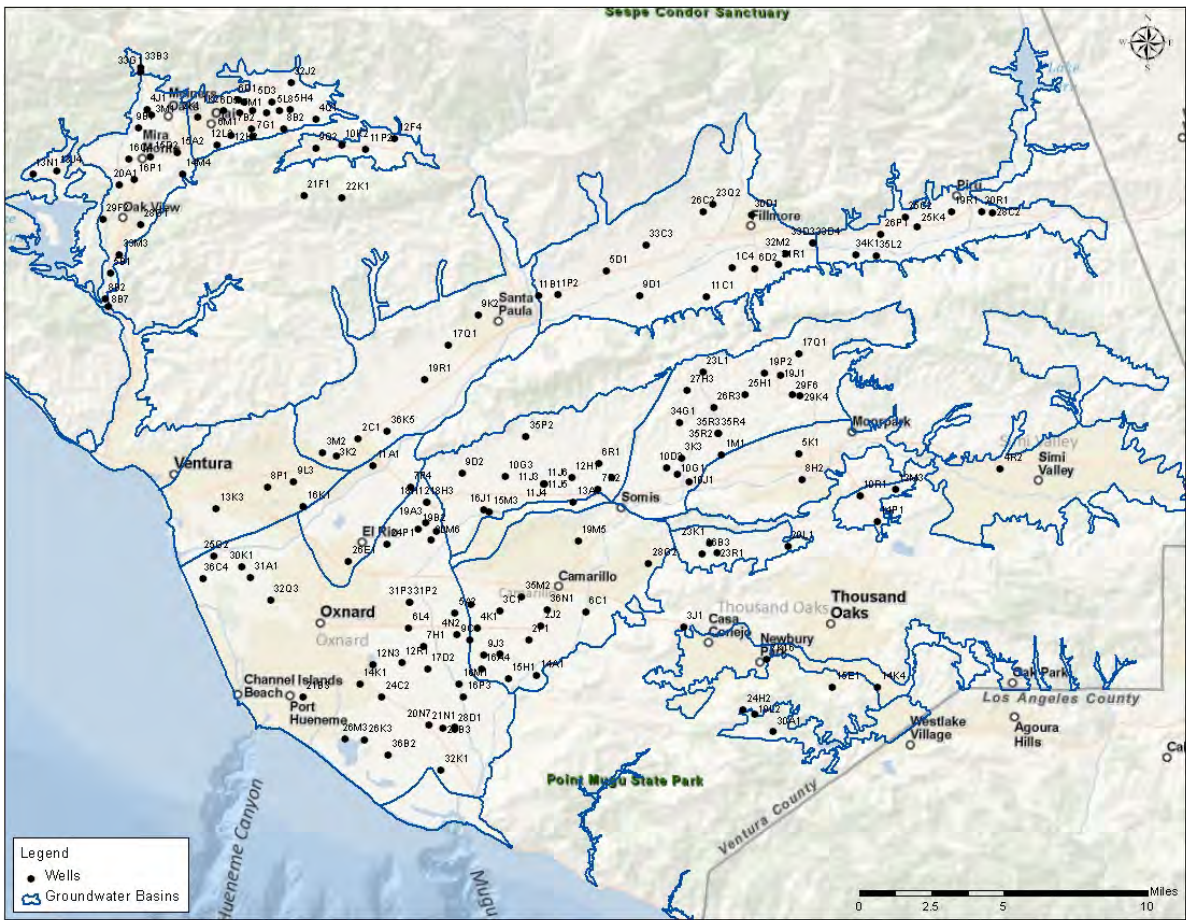


Figure 4-1: Water level wells measured in the southern half of the County.

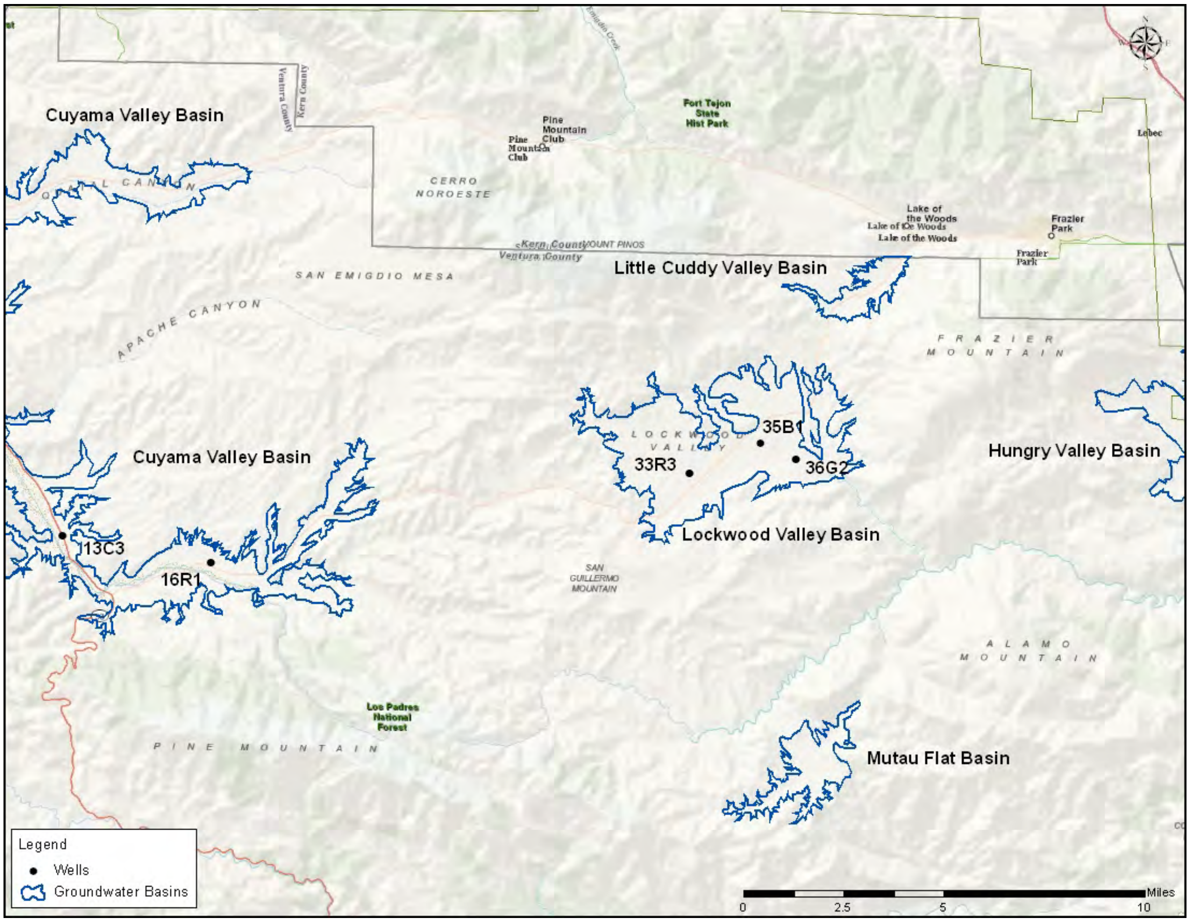


Figure 4-2: Water level wells measured in the northern half of the County.

4.1.2 – Water Level Hydrographs

The Groundwater Section maintains a database containing current and historical water levels for wells throughout the County. The database produces hydrographs for measured wells and can be used to show fluctuations in groundwater levels on a yearly basis or track long-term trends in a basin over decades. This data along with climate, stream flow, groundwater recharge, quality and pumping data can be used to determine groundwater conditions in the County. Hydrographs for all "key" water level wells are shown in Appendix B. An example hydrograph for Well No. 01N21W02J02S is shown on the following page (Figure 4-3).

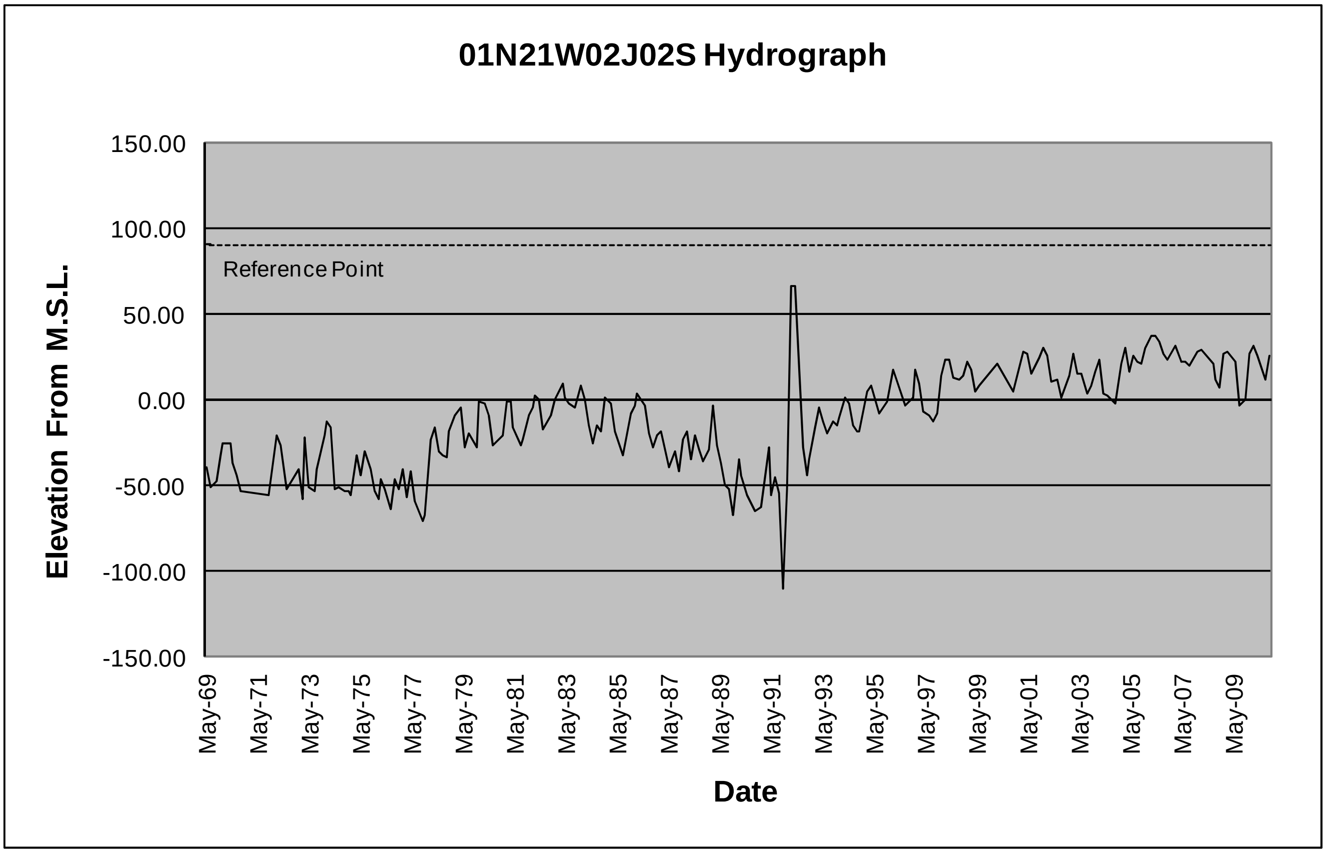


Figure 4-3: Water level hydrograph for Well No. 01N21W02J02S located in the Pleasant Valley basin. *reference point (RP) – the elevation of the measuring point of the well.

4.1.3 – Summary of Changes to Spring Depth to Groundwater in Key Wells

The following summary is based on information gathered from key wells from major groundwater basins as shown in Table B-2 in Appendix B. The increase or decrease in water level for the year and the water level data referred to is the spring measurement or the first measurement of the year for those wells measured twice each year compared to the previous spring measurement.

The Forebay area of the Oxnard Plain, responds quickly to seasonal and annual changes in precipitation and recharge. The water elevation in key Well No. 02N22W12R01S (UWCD) was up 20.1 feet from the 2010 measurement. The water elevation in the Oxnard aquifer key Well No. 01N21W07H01S was up 9.5 feet. The water elevation in the Oxnard Plain Fox Canyon aquifer key Well No. 01N21W32K01S was down 1 foot from the 2010 measurement.

In the Pleasant Valley Fox Canyon aquifer the water level elevation in key Well No. 01N21W03C01S was down 4.9 feet from the 2010 measurement.

In the Las Posas valley, the water level elevation in the West Las Posas basin key Well No. 02N21W12H01S was down 1 foot from the 2010 spring measurement. In the East Las Posas basin the water level elevation in key Well No. 03N20W26R03S was down 2.7 feet continuing the decline of the last three spring measurements. The water level in this well had been declining slightly each year over the previous ten year period, with the exception of 2003 and 2007. The water level elevation in the South Las Posas key Well No. 02N19W05K01S was down 2.3 feet in 2011 compared to the 2010 measurement. The depth to water in this well has risen from 136 feet to 27 feet below ground surface since 1975. This trend is attributed to groundwater recharge from treated effluent from upstream waste water treatment plants and groundwater discharge to surface from the Simi Valley basin.

In the Santa Rosa Valley the water level elevation in key Well No. 02N20W26B03S was up an additional 1.6 feet in 2011 after being up 7.1 feet in 2010. The water level elevation in the Simi Valley Basin key Well No. 02N18W10A02S was up 1.3 feet after being down 1.7 feet in 2010. This well has seen only slight changes in depth to water over the past eight years (less than plus or minus 10 feet).

In the Ojai Valley, the water level elevation in key Well No. 04N22W05L08S rose another 27.3 feet up from the 2010 level rise of 13.0 feet rise after being down 31.1 feet in 2009. The Ojai Valley basin responds quickly to rainfall or the lack of rainfall, and it is not uncommon to see large drops in water level during dry periods and recovery to at or above normal levels during wet periods (see Hydrograph in Appendix B). In the northern end of the Upper Ventura River Basin, the water level elevation in key Well No. 04N23W16C04S was down 0.9 feet after being up 3.2 feet in 2010.

The basins that underlie the Santa Clara River valley are other areas that respond quickly to fluctuations in annual rainfall. The water level elevation in the Piru basin key well was up 4.6 feet from the slight rise of 0.7 feet in 2010, the water level elevation in the Fillmore basin key well was up 8.7 feet after being down 4.1 feet, and in the Santa Paula basin the water level elevation in the key well was up 6.1 feet over the 2010 level after a slight drop of 0.6 feet from the 2009 measurement. In the Mound basin the water level elevation in key Well No. 02N22W07M02S was up slightly 0.3 feet after being down 3.5 feet in 2010.

In the north half of the County the Lockwood Valley basin key Well No. 08N21W35B01S was down 27.5 feet after being up 24.6 feet in 2010. The trend for this well had been a slight increase in water level elevation. In the Cuyama Valley basin key Well No. 07N23W16R01S was up 5.7 feet from the 2010 measurement.

The above paragraphs describe changes in spring water levels from the previous year's spring water level. We also computed the 2001-2010 average water level for each well (ten year trailing average). A comparison of the average 2011 water level in each well to the ten year trailing average for each key well is shown on Table B-1 on page 64.

4.1.4 – Groundwater Extractions

Groundwater is extracted and used for domestic, municipal and industrial uses, the majority of groundwater extracted (≈ 60%) in the County is used for agricultural irrigation purposes. The FCGMA reports that approximately 60% of groundwater is extracted for agricultural purposes with the remaining 40% for municipal, industrial and domestic uses. The owners and operators of wells within the boundaries of any of the three Groundwater Management Agencies, Fox Canyon Groundwater Management Agency, Ojai Basin Groundwater Management Agency and United Water Conservation District, are required to report their groundwater extractions twice each year to the respective agency. Approximately 2,000 of the 3,500 plus active wells in the County are within one or more of these agency boundaries. Owners of wells located outside of these agencies are not required to report their extractions but are asked to report the status of their well to the County each year. The table at the top of the following page compares extractions reported to the three agencies for the years 2005 to 2011. Note: the boundaries of the FCGMA and UWCD overlap.

Table 4-1: Groundwater extractions within reporting agencies 2005-2011.

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2005-1	58,045.00	41,811.56	1,748.07
2005-2	95,174.00	64,578.80	2,880.39
Annual Total 2005	**153,219.00**	**106,390.35**	**4,628.46**
2006-1	65,469.00	43,697.47	1,722.17
2006-2	101,684.00	69,827.60	2,234.77
Annual Total 2006	**167,153.00**	**113,525.07**	**3,956.94**
2007-1	90,701.00	59,449.79	2,708.68
2007-2	108,289.70	77,642.73	2,759.06
Annual Total 2007	**198,990.70**	**137,092.52**	**5,467.74**
2008-1	90,997.65	63,821.98	2,650.38
2008-2	102106.68	75,467.27	2,590.30
Annual Total 2008	**193,104.33**	**139,289.25**	**5,240.68**
2009-1	82,505.37	62,497.79	2,553.48
2009-2	104,049.64	81,274.51	2,871.94
Annual Total 2009	**186,555.01**	**143,772.30**	**5,425.42**
2010-1	69,541.85	52,696.43	2,004.86
2010-2	89,558.90	68,875.72	3,001.11
Annual Total 2010	**159,100.75**	**121,572.15**	**5,005.97**
2011-1	72,940.07	52,658.67	2,050.00
2011-2	**Not Yet Reported**		
Annual Total 2011	**72,940.07**	**52,658.67**	**2,050.00**

4.2 – Surface and Imported Water

The following subsections focus on water supplied and imported by the three wholesale water districts in the County: United Water Conservation District (UWCD), Casitas Municipal Water District (Casitas) and Calleguas Municipal Water District (Calleguas).

Figure 4-4: Map of the boundaries of the three wholesale water districts within the County.

4.2.1 – Surface & Imported Water Background

Of the ten incorporated cities within Ventura County only two, Santa Paula and Fillmore do not rely on water supplied by one of the three major wholesale districts (Casitas Municipal Water District, Calleguas Municipal Water District and United Water Conservation District).

Two cities (Ventura and Oxnard) use a blend of imported water, groundwater and treated surface water to meet demands. The City of Ventura's water supply comes from treated water diverted from the Ventura River, groundwater extracted from City wells, and from Lake Casitas delivered by Casitas MWD. The City of Oxnard receives water from UWCD, imported water from Calleguas and groundwater from City well fields.

In the south half of the County, the cities of Simi Valley, Moorpark and Thousand Oaks as well as the Communities of Bell Canyon, Newbury Park, Hidden Valley, Lake Sherwood, Oak Park and part of Westlake Village rely mainly on water imported from Calleguas.

The City of Simi Valley (Ventura County Water Works District 8 (VCWWD8)) extracts groundwater, currently used for agricultural purposes, from three wells in the Tapo Canyon area. Also, groundwater is extracted from several wells at the west end of the city for de-watering purposes. The water from these wells is discharged to the Arroyo Simi. The City is currently nearing completion of the Tapo Canyon Water Treatment Plant, a 1 MGD treatment plant, which will utilize the three Tapo Canyon wells to provide water to approximately 500 homes. Golden State Water Company (GSWC) in Simi Valley extracts groundwater from two wells and blends it with imported water from Calleguas (10% groundwater, 90% imported water) (Golden State Water Co., 2010). VCWWD8 serves 68% of demand or over 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF (Ventura County Waterworks District No. 8, 2010). In 2011 Calleguas delivered 20,334.8 AF to VCWWD8 and 5,954.5 AF to GSWC (Calleguas, 2012).

The City of Moorpark residents receive water from Ventura County Water Works District 1 (VCWWD1). Approximately 75-80% of VCWWD1's water is imported from Calleguas. In 2011 Calleguas delivered 7,982.1 AF to VCWWD1 (Calleguas, 2012). The City also extracts groundwater from two wells used for park irrigation.

The City of Thousand Oaks extracts groundwater using it for median irrigation on Hillcrest Ave and golf course irrigation at the Los Robles Golf Course. California Water Service and California American Water along with the City of Thousand Oaks Water Department provide water imported from Calleguas in the Thousand Oaks, Newbury Park and Westlake Village area. According to the City of Thousand Oaks 2010 Urban Water Management Plan, the City supplies water to approximately 36% of water users, California American Water 48%, and California Water Service Company 16%. In 2011 these three water purveyors received 34,704.1 AF (Calleguas, 2012) of water from Calleguas.

The City of Camarillo relies on groundwater and imported water from Calleguas. The city extracts groundwater from four wells, supplying approximately 40-50% of the city's water demand with the remaining demand supplied by imported water. The city must keep its groundwater extraction volume below the groundwater extraction allocation from the Fox Canyon Groundwater Management Agency. In 2011 Calleguas delivered 5056.7 AF (Calleguas, 2012) of water to the City of Camarillo. Water for some residents is supplied by Pleasant Valley Mutual (groundwater and imported water), Crestview Mutual (groundwater and imported water), California American Water Co. (imported water), and Camrosa Water District (groundwater and imported water).

The Port Hueneme Water Agency receives and treats water from UWCD and blends it with water from Calleguas for the City of Port Hueneme, Channel Islands Beach Services Community District and Naval Base Ventura County.

In the Ojai Valley the City of Ojai and the communities of Casitas Springs, Meiners Oaks and Oak View rely on a mixture of groundwater extracted by local purveyors, and wholesale water from Lake Casitas delivered by the Casitas Municipal Water District to local water purveyors.

In the Santa Clara River Valley area, the City of Santa Paula relies on local groundwater (approximately 5,000 to 7,000 AF/yr based on reporting to UWCD). In addition, some surface water is diverted from Santa Paula Creek (approximately 500 AF/yr) (City of Santa Paula, 2010) and is sent to Farmers Irrigation Company in exchange for extraction credits for the Santa Paula Basin. The City of Fillmore relies solely on groundwater extracted from City water wells (approximately 2,600 to 2,800 AF/yr based on reporting to UWCD). The community of Piru relies on groundwater delivered by local water purveyors.

Residents of the Lockwood Valley area and the Santa Monica Mountains area, as well as residents living in areas not served by a water company rely on private domestic water wells. Water is extracted from the 32 groundwater basins, or from fractured volcanic rock and bedrock in areas outside of groundwater basins.

4.2.2 – Wholesale Districts

Of the three water wholesalers in the County, Calleguas delivers the largest volume of water to retailers. Approximately 75% of the population in the County receives water imported by Calleguas. Calleguas, a member agency of the Metropolitan Water District (MWD), imports State Water Project (SWP) water from northern California. Calleguas delivered 97,218 AF of water to retailers in 2011 compared to 94,864 AF in 2010 and 125,368 AF in 2009. The Calleguas Municipal Water District imported a total of 96,604.61 AF of treated SWP water in 2011. Production from the District's ASR wellfield was 1,133.69 AF in 2011. 764.5 AF of water was injected in 2011 in the ASR wellfield. Up to 11,000 AF of water can be stored by Calleguas in Lake Bard and can supply all of the District's needs for short periods of time. The end of year volume of water in storage in Lake Bard was 9,600 AF. Some imported water is also injected in the East Las Posas groundwater basin through the Las Posas Aquifer Storage and Recovery (ASR) Project. The Las Posas Basin currently has 18 wells, operated by Calleguas. The wells are 800 to 1,200 feet deep and perforate the Fox Canyon Aquifer (Calleguas, 2007; Calleguas, 2012).

UWCD delivered 31,868 AF of water to retailers and end-users in 2011 down from 34,076 AF in 2010. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2011 there was 49,602 AF of water in storage in Lake Piru. UWCD released 36,046 *(preliminary data)* AF of water from the lake in 2011. UWCD imported 2,520 AF of State Project water into Ventura County from Lake Pyramid in 2011 (UWCD, 2012). Water released from Lake Piru flows down Piru Creek to the Santa Clara River where it is ultimately diverted downstream at the Freeman Diversion Dam. UWCD operates spreading basins in the Oxnard Forebay Groundwater Basin for the purpose of groundwater recharge. Some of the water diverted from the Santa Clara River at the Freeman diversion is sent to the spreading basins in Saticoy and El Rio, the remainder is sent through the Pleasant Valley Pipeline (PVP) and the Pumping Trough Pipeline (PTP). Table 4-2 and Figure 4-3 on the following page compare the volume of water diverted and sent to spreading grounds by UWCD versus annual precipitation for the period of 1995 to 2011.

Table 4-2: Comparison of precipitation versus recharge water volume for UWCD. (UWCD, 2012)

Year	Precipitation El Rio Spreading Grounds Gage 239(in.)	Saticoy Recharge (AF)	El Rio Recharge (AF)	Noble Pit (AF)
1995	27.27	35419.44	52876.00	10657.00
1996	20.25	25608.38	24633.00	3806.00
1997	13.3	22323.03	25271.00	4412.00
1998	30.88	56934.95	43027.00	18710.00
1999	9.39	16538.51	17992.00	1285.00
2000	15.59	28620.11	23173.00	0.00
2001	22.4	26918.00	39434.00	8824.00
2002	8.97	5291.00	14886.00	32.00
2003	14.79	7158.00	26909.00	44.00
2004	16.13	8105.00	15061.00	0.00
2005	24.43	46872.00	52267.00	19490.00
2006	15.29	29005.00	40840.00	10709.00
2007	7.77	11404.00	18200.00	99.00
2008	14.07	28,631.00	19,631.00	8,562.00
2009	10.86	9,215	13,223	0.00
2010	22.07	15,108	30,125	995.00
2011	10.95	23,435.00	37,845.00	10,679.00

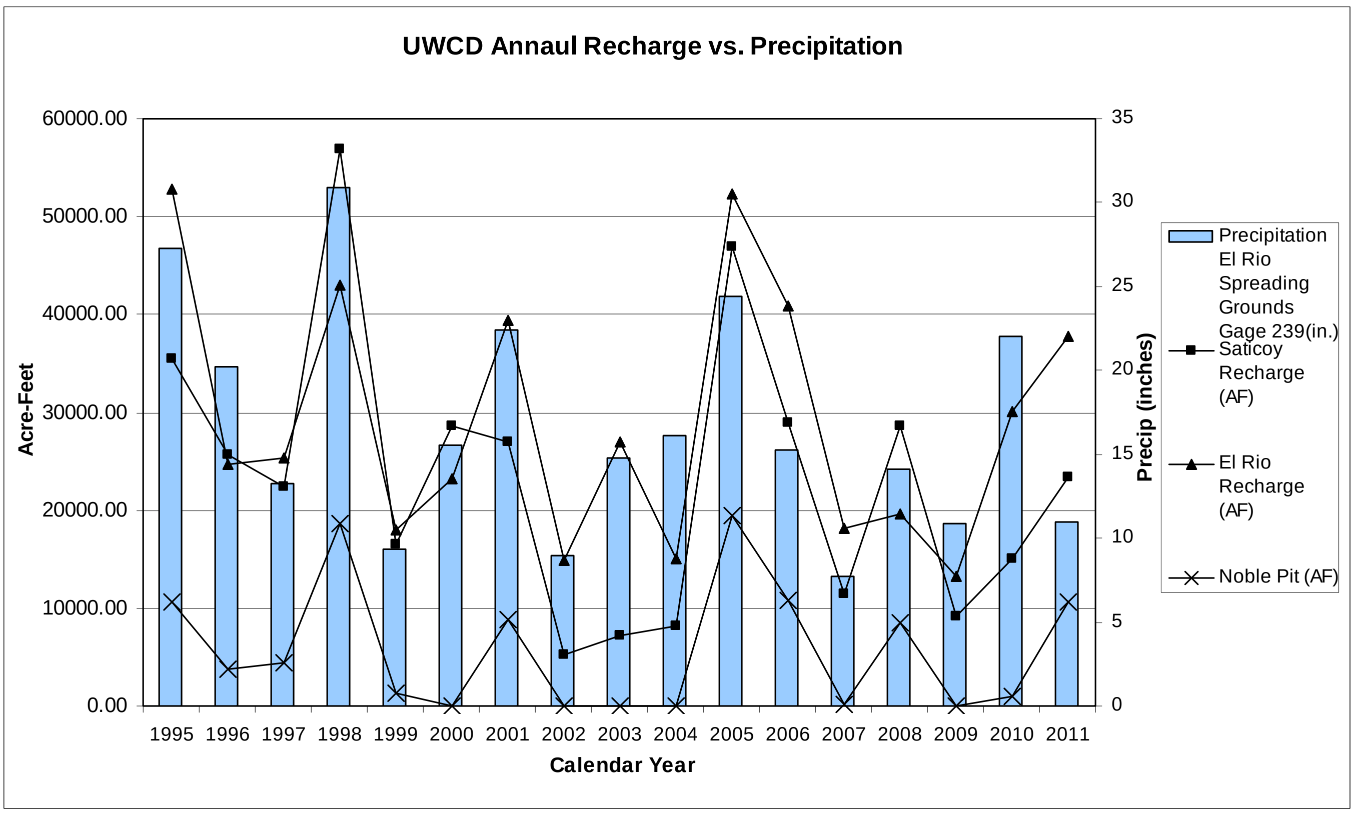


Figure 4-5: Graph depicting precipitation versus recharge for UWCD.

The Casitas Municipal Water District delivered a total of 13,439 AF in 2011, with 6,260 AF sold to retail water purveyors (Casitas, 2012). The district provides water to residential and agricultural customers, and some of the 23 water purveyors located within the district's boundaries. Annual water deliveries can vary from 13,000 to 23,000 AF. Casitas provides a blend of groundwater and surface water to its customers. Surface water is stored in Lake Casitas which has an overall capacity of 254,000 AF. At the end of 2011 there was 205,842 AF (Casitas, 2012) of water stored in the lake. Water from the Ventura River is diverted at the Robles Diversion facility. The facility diverts high flows from rainstorms and operates on average only 53 days[5] per year. Casitas diverts, on average 31% of the Ventura River flow, with 10% of that volume being redirected downstream through the Robles Diversion Fish Passage for the endangered steelhead trout and to enhance recovery of the Ventura River habitat.

Table 4-3 below compares the volume of water delivered by the three major water districts in the County for the period of 2005 to 2011.

Table 4-3: Comparison of Wholesale District water deliveries 2005-2011.

	Water Deliveries in Acre Feet (AF)			
Year	**Casitas MWD**	**Calleguas MWD**	**United WCD**	**Annual Total**
2005	16,526.50	116,431.80	30,271.46	163,229.76
2006	15,873.80	120,736.30	30,627.87	167,237.97
2007	20,080.90	131,206.10	41,387.64	192,674.64
2008	16,497.70	125,367.50	39,903.80	181,769.00
2009	15,736.10	108,726.00	41,478.00	165,940.10
2010	13,497.48	94,863.70	34,075.80	142,436.98
2011	13,439.25	84,575.80	31,868.00	129,883.05
Period Total	**111,651.73**	**781,907.20**	**249,612.57**	**1,143,171.50**

Section 5.0
Groundwater Potentiometric Surface Maps

5.1 – Mapping

Contour maps are a useful way to visualize spatial distribution of data values. ESRI's ArcMap GIS software was used to generate the contours in the report. Because the contour lines are the end result of a series of code based mathematical calculations the resulting lines should be considered only as an interpretation of the conditions in the area mapped.

5.1.1 –Maps

The following pages contain potentiometric surface maps created from 2011 groundwater level data for the Santa Clara River Valley, the upper aquifer system of the Oxnard Plain, and the lower aquifer system of the Oxnard Plain, Pleasant Valley, and Las Posas Valley Basins. Figures 5-1 thru 5-2 on pages 51-52 are potentiometric surface maps for 2011 for the Santa Clara River Valley area encompassing the Mound, Santa Paula, Fillmore, and Piru groundwater basins. It was decided that because the basins in this area are essentially hydrologically connected, creating contours for the river valley as a whole would produce a good interpretation of the groundwater surface elevations for the area. The contours were created using data collected by County staff, United Water Conservation District staff, and the staff of other agencies, cities and water companies. For this exercise the basin area was truncated to include only the extent of the alluvial area of the valley, instead of using the full area of the basin as depicted by the dashed lines on the maps.

Figures 5-3 thru 5-4 on pages 53-54 are 2011 groundwater potentiometric surface maps for the upper aquifer system of the Oxnard Plain and Pleasant Valley area. The contours were created using data collected by County staff, United Water Conservation District staff, and the staff of other agencies, cities and water companies. Note, the Forebay area has no confining clay cap as there is overlying the Oxnard Plain Pressure Basin, therefore the Oxnard aquifer is not recognized as being present here. In the Pleasant Valley area the upper aquifer system is not typically present, but there are areas of shallow alluvial sediments similar to Oxnard and Mugu aquifer units from which wells are extracting groundwater. No well data from the perched or semi-perched zone of the Oxnard Plain was used to generate these contours.

Figures 5-5 thru 5-6 on pages 55-56 are` 2011 groundwater potentiometric surface maps for the lower aquifer system of the Oxnard Plain and Las Posas Valley area. Data points for wells perforated in the shallow sand and gravel zones of the Las Posas Valley were not used to generate these contours since they are not believed to be in contact with the lower aquifers.

The Groundwater Section welcomes comments and suggestions concerning the potentiometric surface maps presented on the following pages.

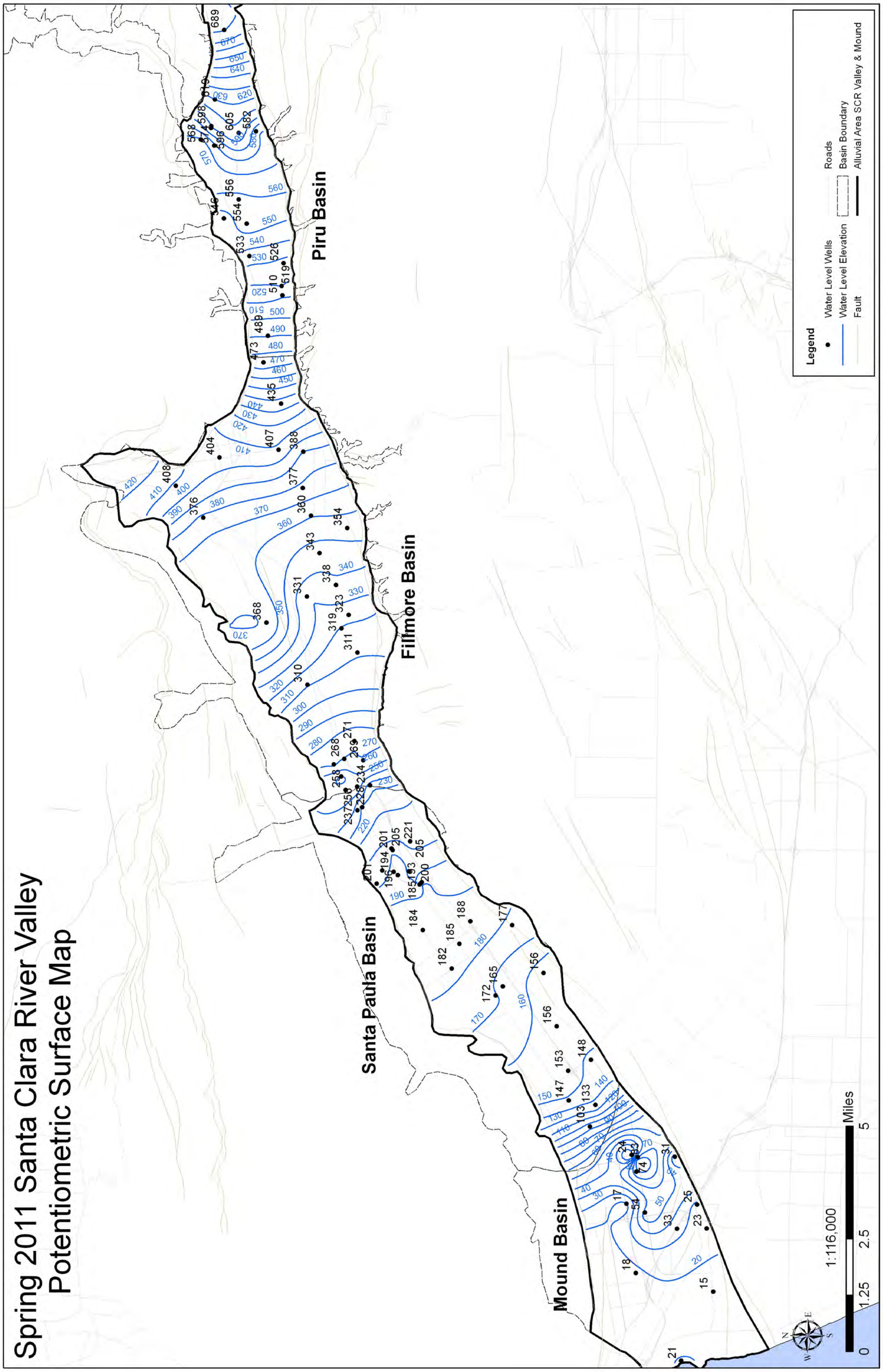


Figure 5-1: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for Spring 2011.

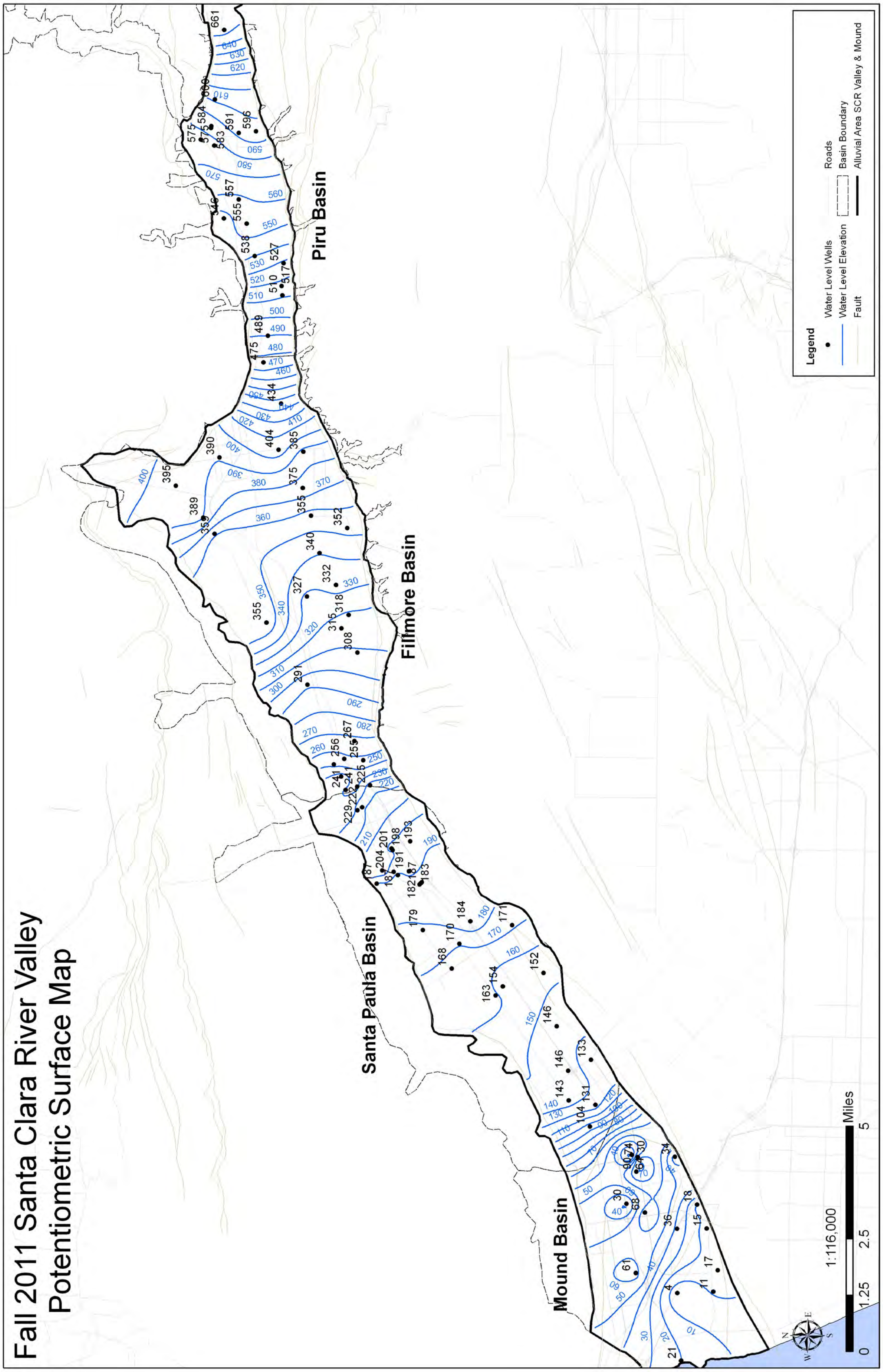


Figure 5-2: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for Fall 2011.

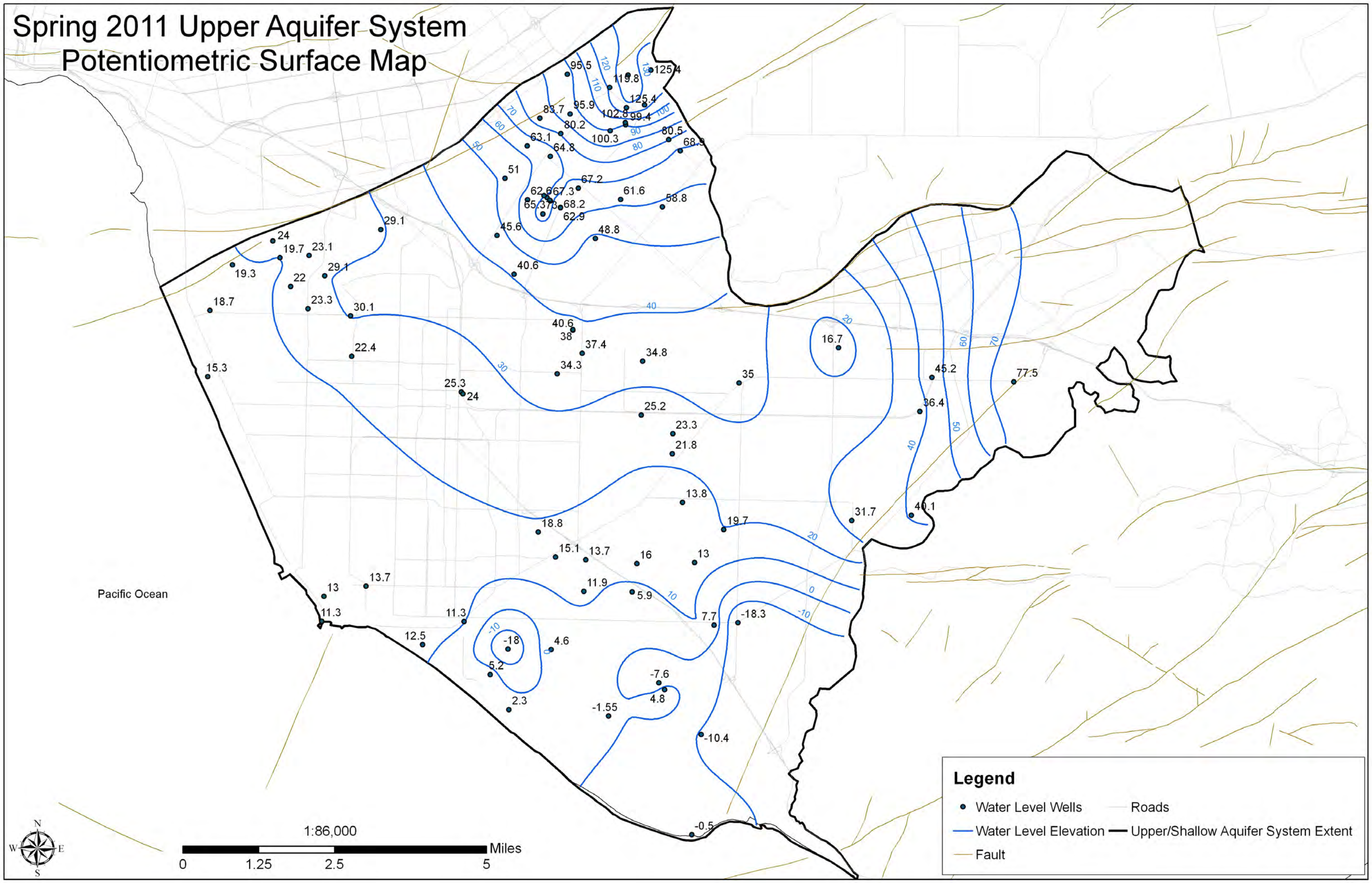


Figure 5-3: The map above depicts water level surface elevation contours for the Upper Aquifer System for Spring 2011.

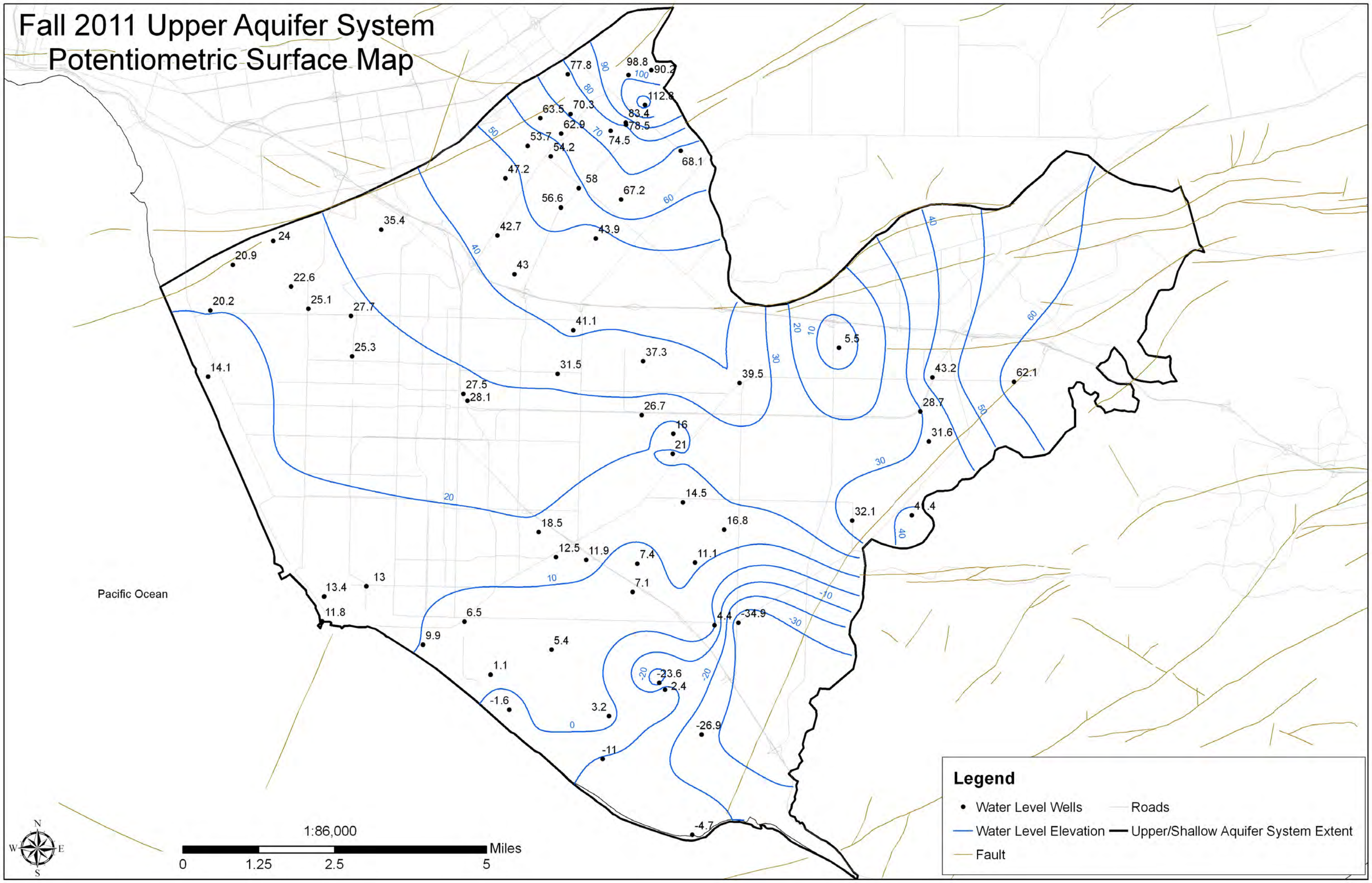


Figure 5-4: The map above depicts water level surface elevation contours for the Upper Aquifer System for Fall 2011.

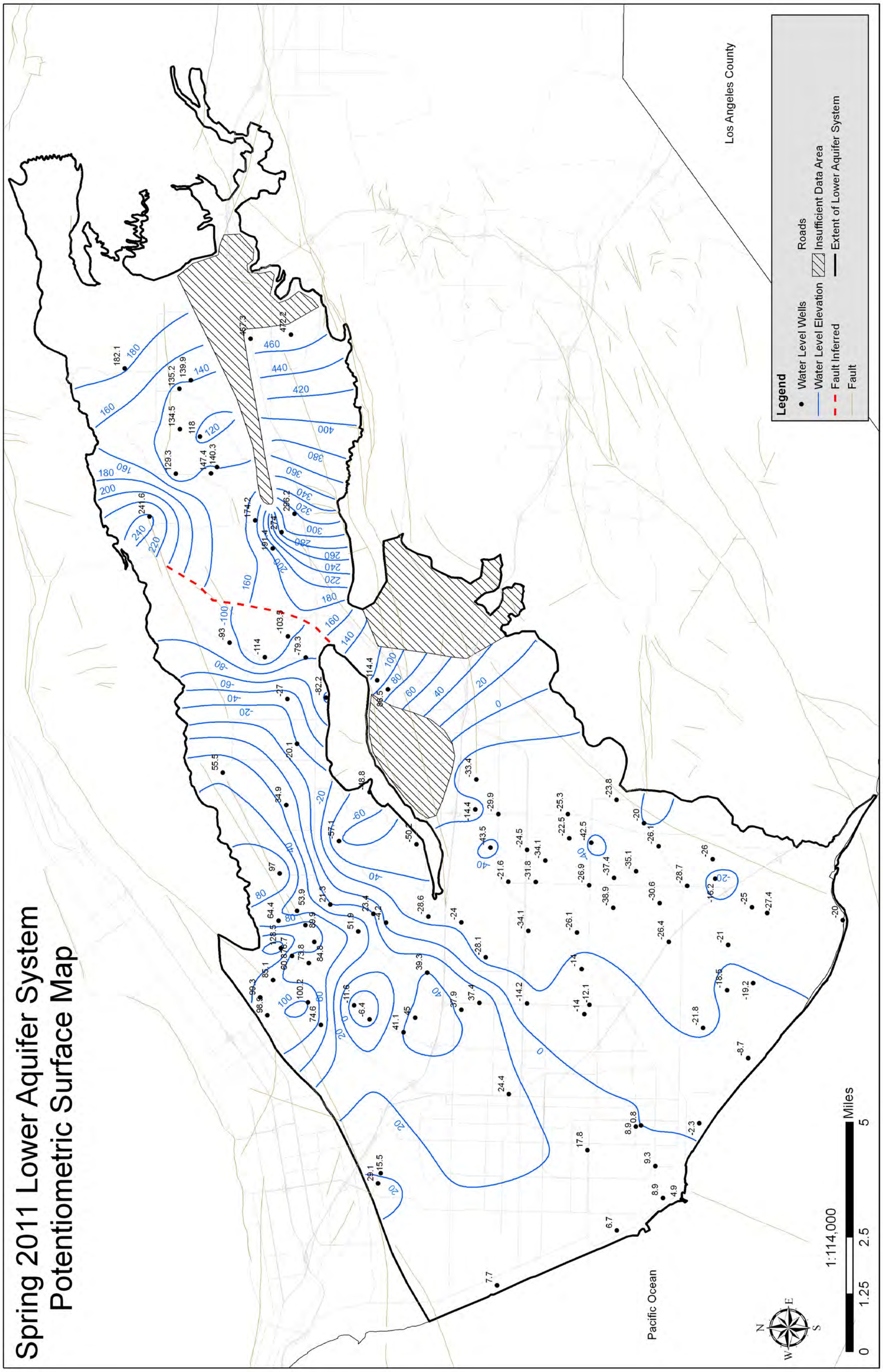


Figure 5-5: The map above depicts water level surface elevation contours for the Lower Aquifer System for Spring 2011.

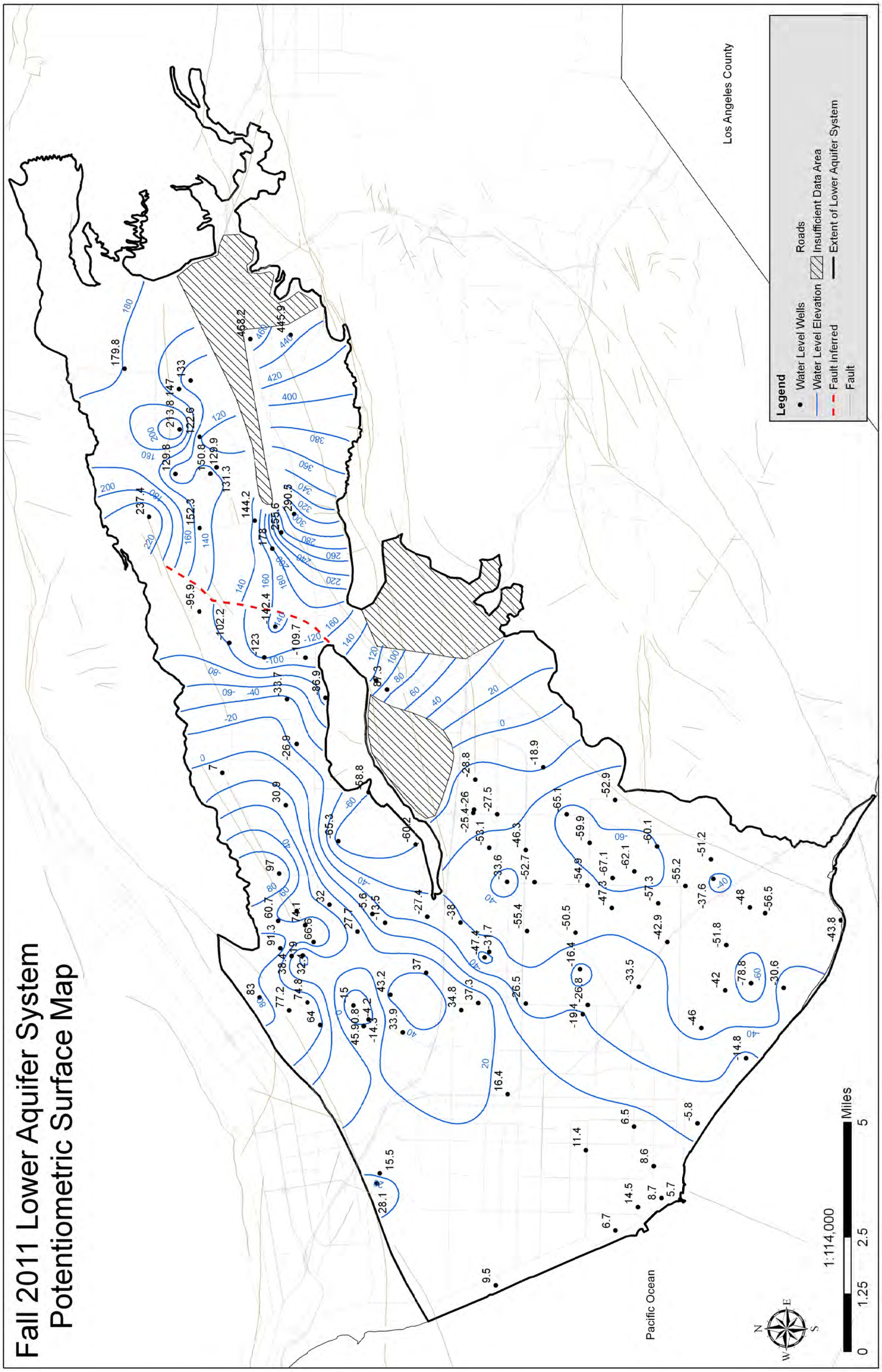


Figure 5-6: The map above depicts water level surface elevation contours for the Lower Aquifer System area for Fall 2010.

References

Calleguas Municipal Water District, Imported Water Volume & Delivery Data, Tony Goff - Personal Communication, February 2012.

Calleguas Municipal Water District, Las Posas Basin Aquifer Storage and Recovery Project, http://www.calleguas.com/projects/lpbroc.pdf, 2007

Casitas Municipal Water District, Production & Delivery Data, Chelbi Kelley - Personal Communication, February 2012.

City of Santa Paula 2010 Urban Water Management Plan Update, Ventura County, California, June 2011, Miller-Villa Consulting

City of Thousand Oaks 2010 Urban Water Management Plan, Ventura County, California, June 2011, RBF Consulting

County of Ventura Board of Supervisors (BOS), May 18, 1999, County of Ventura Ordinance 4184, An ordinance of the County of Ventura repealing and reenacting Ventura County Ordinance Code Section 4811 et seq. relating to groundwater conservation.

Fox Canyon Groundwater Management Agency, Groundwater Extraction Data, Sheila Lopez - Personal Communication, February 2012.

Golden State Water Company, 2010 Urban Water Management Plan – Simi Valley, Ventura County, California, August 2011, Kennedy/Jenks Consultants.

Ojai Basin Groundwater Management Agency (OBGMA), Groundwater Extraction Data, Cece Van Der Meer - Personal Communication, February 2012.

United Water Conservation District (UWCD), Santa Paula Basin 2005 Annual Report, Ventura County, California, November 2007.

United Water Conservation District (UWCD), Water Extraction, Production & Delivery Data, Dan Detmer; Pet Dal Pozzo - Personal Communication, January 2012.

Ventura County Watershed Protection District (VCWPD), Hydrology Section, Historic Rainfall & Hydrologic Data, http://www.vcwatershed.org/hydrodata/htdocs/static/, 2012

Ventura County Waterworks District No. 8, City of Simi Valley, 2010 Urban Water Management Plan, Ventura County, California, June 2011, RBF Consulting

Appendix A – Glossary of Groundwater Terms

Aquifer: A geologic formation or structure that yields water in sufficient quantities to supply pumping wells or springs.

Abandoned Well: Means any of the following:

(1) A water well used less than 8 hours in any twelve-month period. Failure to submit reports of well usage will result in a well being classified as abandoned.
(2) A monitoring well from which no monitoring data has been taken for a period of two years.
(3) A well which is in such a state of disrepair that it cannot be made functional for its original use or any other use.
(4) An open engineering test hole after 24 hours has elapsed after construction and testing work has been completed on the site.
(5) A cathodic protection well which is no longer used for its intended purpose.

Confined Aquifer: An aquifer separated from the surface by an aquiclude or an aquitard to the extent that pressure can be created in the lower reaches of the aquifer.

Contamination: Alteration of waters by waste, salt-water intrusion or other materials to a degree which creates a hazard to the public health through actual or potential poisoning or through actual or potential spreading of disease.

Department of Water Resources: (DWR) operates and maintains the State Water Project, including the California Aqueduct. The department also provides dam safety and flood control services, assists local water districts in water management and conservation activities, promotes recreational opportunities, and plans for future statewide water needs.

Fox Canyon Groundwater Management Agency (FCGMA): The Agency created when the California State Legislature enacted and passed State Assembly Bill No. 2995 on Sept. 13, 1982 creating the *Fox Canyon Groundwater Management Agency (GMA)*. This law, also referred to as AB2995, granted jurisdiction over all lands overlying the Fox Canyon aquifer zone to control seawater intrusion, protect water quality, and manage water resources.

Groundwater: Water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water.

Groundwater Basin: A geologically and hydrologically defined area containing one or more aquifers, which store and transmit water yielding significant quantities of water to extraction facilities.

Lower Aquifer System (LAS): The area underlying the Oxnard Pressure Basin, which contains the Hueneme aquifer, the Fox Canyon Aquifer and the Grimes Canyon aquifer. The LAS is recharged from the Fox Canyon and Grimes Canyon Outcrops, the areas where the aquifers come to the surface exposing the permeable sands and gravels to recharge from rainfall and surface runoff.

Overdraft: The condition of a groundwater basin or aquifer where the average annual amount of water extracted exceeds the average annual supply of water to a basin or aquifer.

Perched or Semi-Perched Aquifer: The water bearing area that is located between the earth's surface and clay deposits that exist above an Aquifer.

Receiving Waters: All waters that are "Waters of the State" within the scope of the State Water Code, including but not limited to, natural streams, creeks, rivers, reservoirs, lakes, ponds, water in vernal pools, lagoons, estuaries, bays, the Pacific Ocean, and ground water.

Appendix A – Glossary of Groundwater Terms

Seawater Intrusion: The overdrafting of aquifers, which results in, the depletion of water supplies, lowering of water levels and degradation from seawater intrusion. Seawater intrusion results from the reversal of hydrostatic pressure allowing water flow to be onshore rather than offshore.

Total Dissolved Solids: (TDS) is a term that represents the amount of all of our natural minerals that is dissolved in water.

Total Maximum Daily Load (TMDL) is a number that represents the assimilative capacity of a receiving water to absorb a pollutant. The TMDL is the sum of the individual waste-load allocations for point sources, load allocations for nonpoint sources plus an allotment for natural background loading, and a margin of safety. TMDL's can be expressed in terms of mass per time (the traditional approach) or in other ways such as toxicity or a percentage reduction or other appropriate measure relating to a state water quality objective. A TMDL is implemented by reallocating the total allowable pollution among the different pollutant sources (through the permitting process or other regulatory means) to ensure that the water quality objectives are achieved.

United Water Conservation District (UWCD): The District administers a "basin management" program for the Santa Clara Valley and Oxnard Plain, utilizing the surface flow of the Santa Clara River and its tributaries for replenishment of groundwater. Originally established as the Santa Clara River Water Conservation District in 1927.

Upper Aquifer System (UAS): The area underlying the Oxnard Pressure Basin, which contains the perched and semi-perched zones, the Oxnard aquifer zone, and the Mugu aquifer. The UAS is recharged via the twenty-three square mile unconfined Oxnard Forebay Basin near El Rio.

Water Quality Standards: Defined as the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.) of water and the water quality objectives adopted by the State or the United States Environmental Protection Agency to protect those uses.

Water Well Ordinance No. 4184: The Ventura County Groundwater Conservation Ordinance which was originally adopted by the Board of Supervisors in October 1970 and revised in 1979, 1984, 1985, 1987, 1991 and most recently in May 1999. The purpose of the ordinance is to ensure that all new or modified water wells, cathodic protection wells and monitoring wells are drilled by licensed water well contractors and are properly sealed so that they cannot serve as conduits for the movement of poor quality or polluted waters into useable aquifers or be hazardous to people or animals.

Well Destruction: To fill a well (including both interior and annular spaces if the well is cased) completely in such a manner that it will not produce water or act as a conduit for the transmission of water between any water-bearing formations penetrated.

Well Owner: The owner of the land on which a well is located.

Appendix B – Key Water Level Wells

FIGURES Page

Tables Page

Appendix B – Key Water Level Wells

Key water levels for the most significant groundwater basins are depicted in chart or graph form on the following pages to provide visual representations of groundwater conditions as they existed during and at the date or time of measurement.

Note that the time durations of the graphs may cover varying lengths of time, however the main goal is to provide a quick reference view of water levels and/or changes for specific aquifers or groundwater basins for the longest or best available time interval.

Each of the following pages is organized to describe the set of key water level wells measured by staff every other month. Each well listed includes a line graph (hydrograph) of groundwater levels measured periodically in relation to the ground surface or some specific reference point (RP) which is usually the top of the well casing or the concrete slab at the wellhead (RP may be above or below the existing ground surface). The hydrographs are accompanied by an up-down graph to track trends in well levels.

The following summary sheet for 2011 is used by Groundwater Section Staff to track long-term trends and to monitor the average groundwater supplies (volume) in storage. Spring season measurements are used for comparison since this time period is typically at the end of the seasonal and annual rainfall year when groundwater basins should be at their fullest. Resource management strategies are judged and adjusted based on groundwater basin levels measured at these key wells, so they have value both for planning and evaluation in water supply and demand decisions. A quick glance at the 2011 key well table list shows that many of the historical high groundwater levels occurred in the wet (high rainfall) years of 1983, 1993 or 1998. Historical low water levels were mainly reflected in dry (low rainfall) years of 1990-1991 most recently, however the drought records from the early 1960's remain unbroken when groundwater levels were at their lowest.

Key wells were/are selected as representative data points based on a centralized location within any particular groundwater basin, a sufficient penetration (depth) or perforation interval within the target aquifer, proper structural or sanitary seals, adequate well construction and site access, and potential for long-term use (measurement).

These data are static water level measurements.

Appendix B – Key Water Level Wells

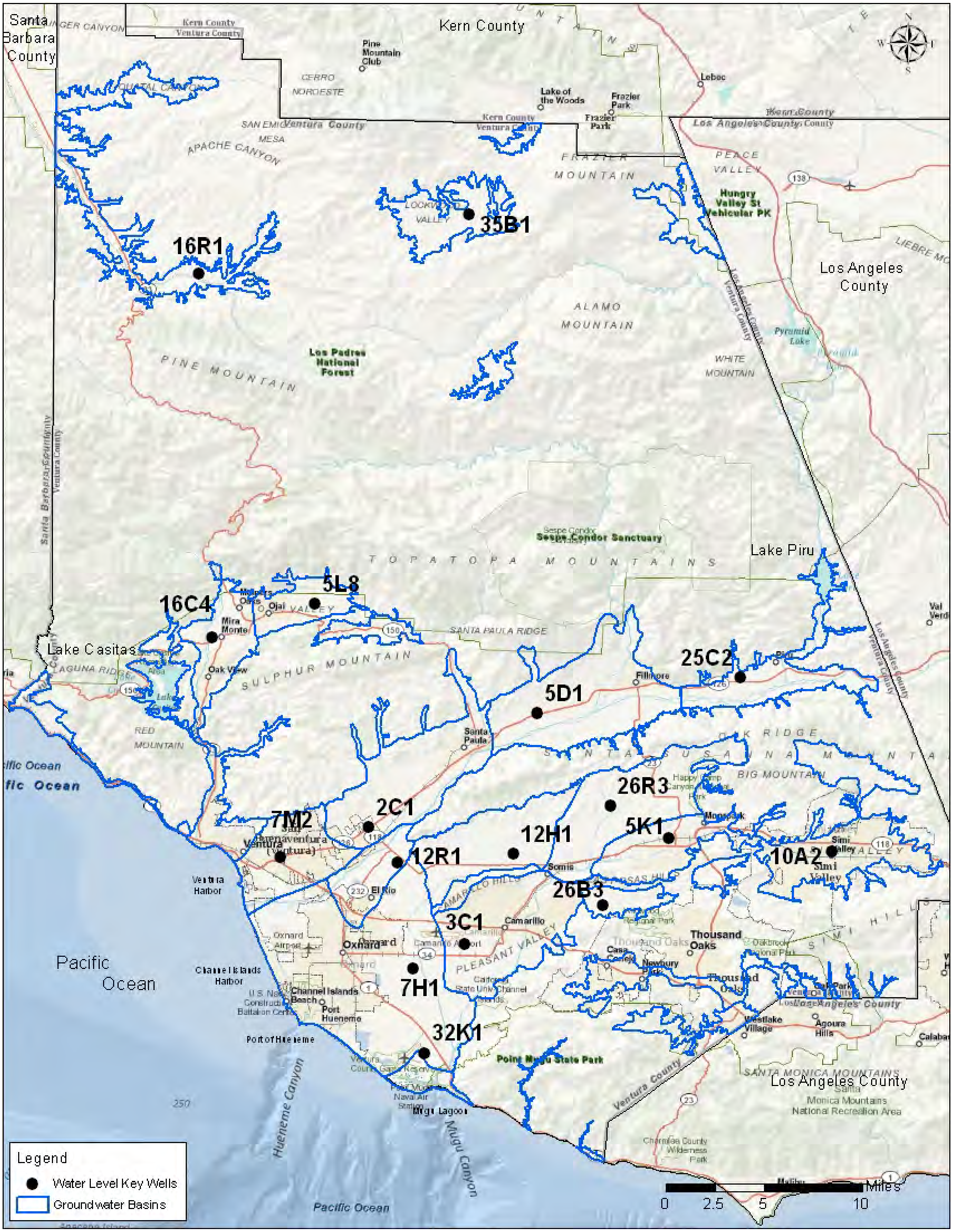


Figure B-1: Map showing key water level wells in Ventura County.

Appendix B– Key Water Level Wells

DEPTH TO GROUND WATER LEVEL CHANGES
AT KEY WELLS IN VENTURA COUNTY

		HISTORIC		SPRING				ANNUAL		
BASIN	WELL NUMBER	RECORD HIGH	RECORD LOW	WATER LEVEL	WATER LEVEL	WATER LEVEL	Change From Previous Year	10 Year Average Annual Water Level	2011 Average Annual Water Level	2011 Change From Previous 10 Year Annual Average
	(RECORD)	(DATE)	(DATE)	(YEAR 2009)	(YEAR 2010)	(YEAR 2011)	(UP/DOWN)	2001-2010	2011	(UP/DOWN)
OXNARD PLAIN										
Oxnard Aquifer	01N21W07H01S	3.4 ft.	88.4 ft.	22.7 ft.	28.6 ft.	19.1 ft.	UP 9.5 ft.	22.4 ft.	17.9 ft.	UP 4.5 ft.
	(1/31-present)	(3/99)	(9/64)	(3/20)	(3/29)	(3/14)				
Forebay Area	02N22W12R01S	14.6 ft.	136.8 ft.	63.7 ft.	56.4 ft.	36.3 ft.	UP 20.1 ft.	59.9 ft.	45.6 ft.	UP 14.2 ft.
(UWCD)	(5/31-present)	(6/98)	(2/91)	(2/25)	(3/2)	(4/5)				
Fox Canyon	01N21W32K01S	18.0 ft.	129.0 ft.	36.0 ft.	34.0 ft.	35.0 ft.	DOWN 1.0 ft.	56.5 ft.	45.5 ft.	UP 11.0 ft.
Aquifer	(12/72-present)	(4/83)	(12/90)	(3/23)	(3/29)	(3/21)				
PLEASANT VALLEY										
Fox Canyon	01N21W03C01S	87.5 ft.	253.9 ft.	96.1 ft.	97.3 ft.	102.2 ft.	DOWN 4.9 ft.	119.8 ft.	99.6 ft.	UP 20.2 ft.
Aquifer	(2/73-present)	(8/95)	(11/91)	(3/18)	(3/26)	(3/14)				
WEST LAS POSAS	02N21W12H01S	422.2 ft.	501.8 ft.	452.0 ft.	444 ft.	445.0	DOWN 1.0 ft.	459.3 ft.	449.0 ft.	UP 10.3 ft.
	(10/72-present)	(3/75)	(12/91)	(2/10)	(4/9)	(3/7)				
EAST LAS POSAS	03N20W26R03S	503.0 ft.	562.0 ft.	574.6 ft.	585.8 ft.	588.5 ft.	DOWN 2.7 ft.	551.2 ft.	588.3 ft.	DOWN 37.1 ft.
	(1985-present)	(4/86)	(9/02)	(3/18)	(3/26)	(3/7)				
SOUTH LAS POSAS	02N19W05K01S	27.5 ft.	136.2 ft.	28.0	28.3 ft.	30.6 ft.	DOWN 2.3 ft.	31.6 ft.	29.8 ft.	UP 1.8 ft.
	(6/75-present)	(7/06)	(6/75)	(3/17)	(3/24)	(3/7)				
SANTA ROSA	02N20W26B03S	13.2 ft.	60.3 ft.	37.7 ft.	30.6 ft.	29.0 ft.	UP 1.6 ft.	37.6 ft.	30.3 ft.	UP 7.3 ft.
VALLEY	(10/72-present)	(4/79)	(11/04)	(3/17)	(3/26)	(3/11)				
SIMI VALLEY	02N18W10A02S	45.0 ft.	92.0 ft.	75.2 ft.	76.9 ft.	75.6 ft.	UP 1.3 ft.	77.86 ft.	77.72 ft.	UP 0.14 ft.
	(12/84-present)	(2/98)	(6/92)	(3/17)	(3/26)	(3/11)				
VENTURA RIVER	04N23W16C04S	3.9 ft.	101.0 ft.	25.3 ft.	22.1 ft.	23.0 ft.	DOWN 0.9 ft.	44.3 ft.	33.0 ft.	UP 11.3 ft.
	(7/49-present)	(3/83)	(2/91)	(3/26)	(4/2)	(3/8)				
OJAI VALLEY	04N22W05L08S	38.2 ft.	312.0 ft.	134.6 ft.	121.6 ft.	94.3 ft.	UP 27.3 ft.	138.0 ft.	107.0 ft.	UP 31.1 ft.
	(10/49-present)	(4/78)	(9/51)	(3/27)	(4/6)	(6/23)				
MOUND	02N22W07M02S	126.6 ft.	176.2 ft.	145.1 ft.	148.6 ft.	148.3 ft.	UP 0.3 ft.	152.2 ft.	146.8 ft.	UP 5.4 ft.
	(4/96-present)	(4/98)	(4/96)	(3/31)	(4/6)	(4/6)				
SANTA PAULA	02N22W02C01S	20.7 ft.	51.9 ft.	33.2 ft.	33.8 ft.	27.7 ft.	UP 6.1 ft.	36.5 ft.	32.8 ft.	UP 3.7 ft.
	(10/72-present)	(4/83)	(12/91)	(3/23)	(3/31)	(3/29)				
FILLMORE	03N20W05D01S	107.8 ft.	163.7 ft.	132.1 ft.	136.2 ft.	127.5 ft.	UP 8.7 ft.	134.1 ft.	132.8 ft	UP 1.3 ft.
	(10/72-present)	(2/79)	(12/77)	(3/24)	(3/31)	(3/9)				
PIRU	04N19W25C02S	43.1 ft.	183.2 ft.	70.2 ft.	69.5 ft.	64.9 ft.	UP 4.6 ft.	69.1 ft.	62.2 ft.	UP 6.9 ft.
	(9/61-present)	(3/93)	(10/65)	(4/1)	(4/7)	(3/9)				
LOCKWOOD VALLEY	08N21W35B01S	19.3 ft.	52.9 ft.	43.9 ft.	19.3 ft.	46.8 ft.	DOWN 27.5 ft.	36.5 ft.	46.8 ft.	DOWN 10.3 ft.
	(6/56-present)	(05/10)	(10/91)	(6/5)	(5/18)	(6/23)				
CUYAMA VALLEY	07N23W16R01S	15.0 ft.	47.5 ft.	35.9 ft.	34.6 ft.	28.9 ft.	UP 5.7 ft.	30.9 ft.	28.9 ft.	UP 2.0 ft.
	(3/72-present)	(4/93)	(9/90)	(6/5)	(5/18)	(6/23)				
Data prepared: 12/29/2011										

Table B-1: Key Well Water Level Changes for 2011.

Appendix B – Key Water Level Wells

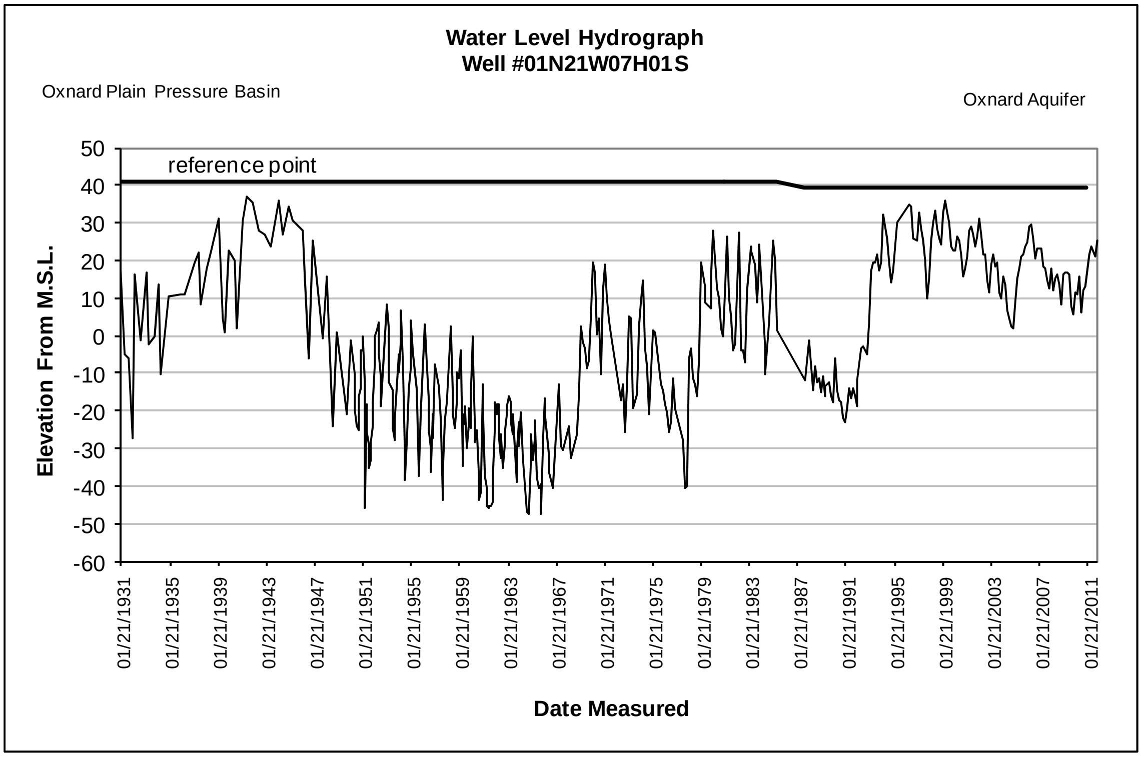


Figure B-2: Oxnard Plain Pressure Basin Oxnard aquifer key well Hydrograph.

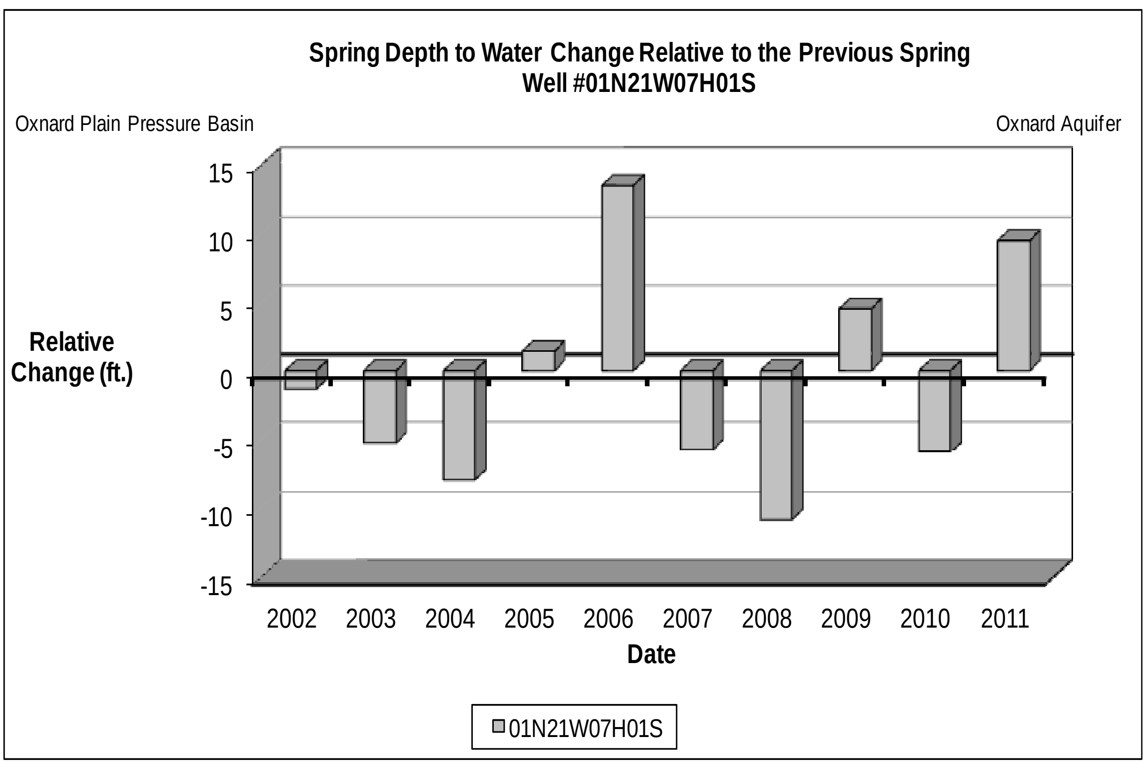


Figure B-3: Oxnard Plain Pressure Basin Oxnard aquifer spring depth to water change relative to previous spring.

Appendix B– Key Water Level Wells

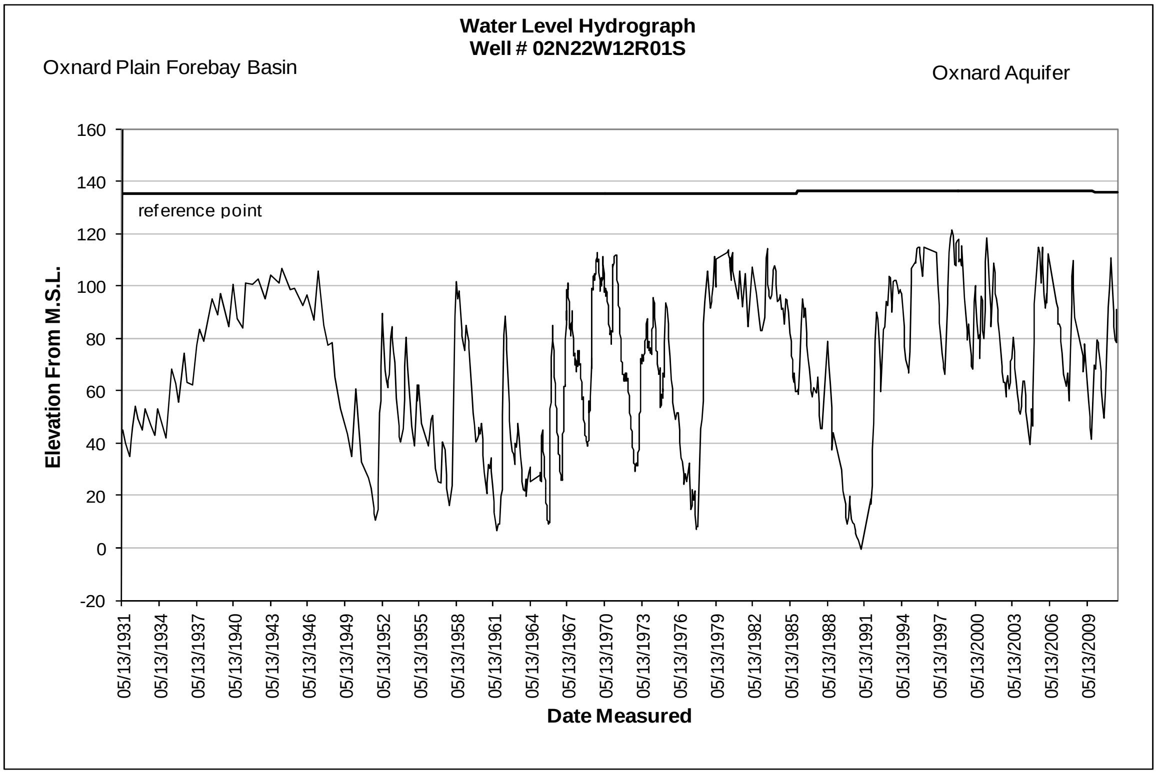


Figure B-4: Oxnard Plain Forebay Basin Oxnard Aquifer key well Hydrograph.

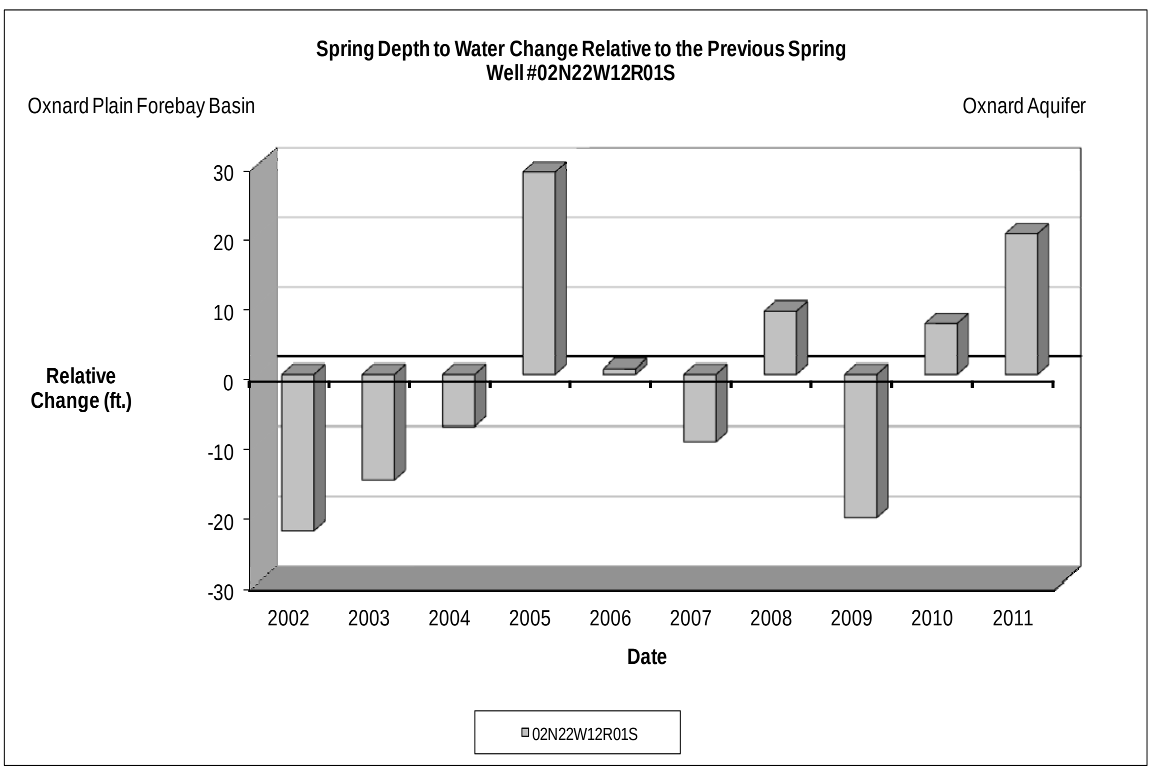


Figure B-5: Oxnard Plain Forebay Basin Oxnard Aquifer spring depth to water change relative to previous spring.

Appendix B– Key Water Level Wells

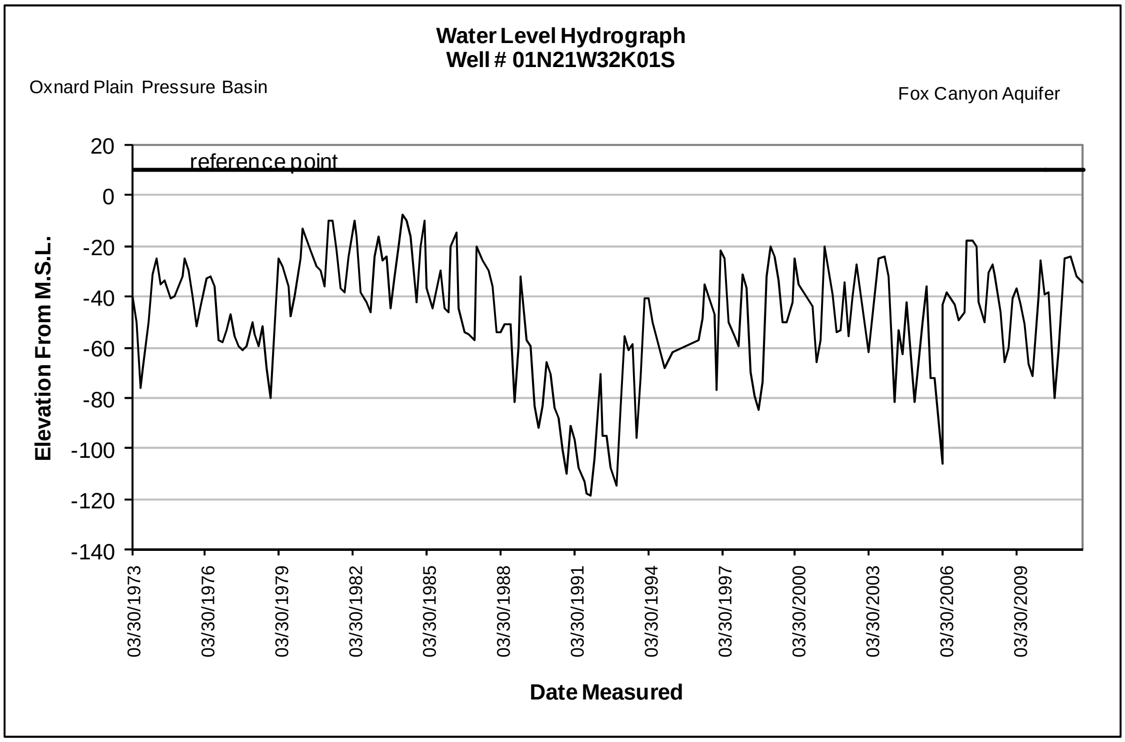


Figure B-6: Oxnard Plain Pressure Basin Fox Canyon Aquifer Key Well Hydrograph.

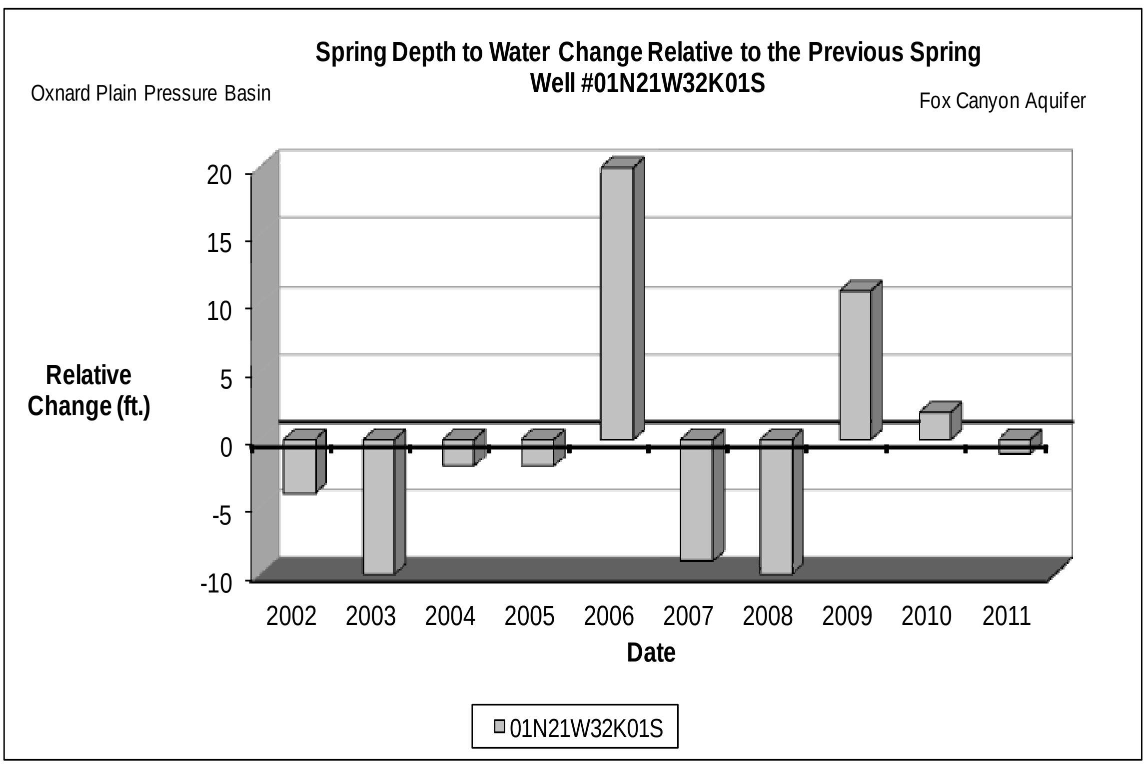


Figure B-7: Oxnard Plain Pressure Basin Fox Canyon Aquifer spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

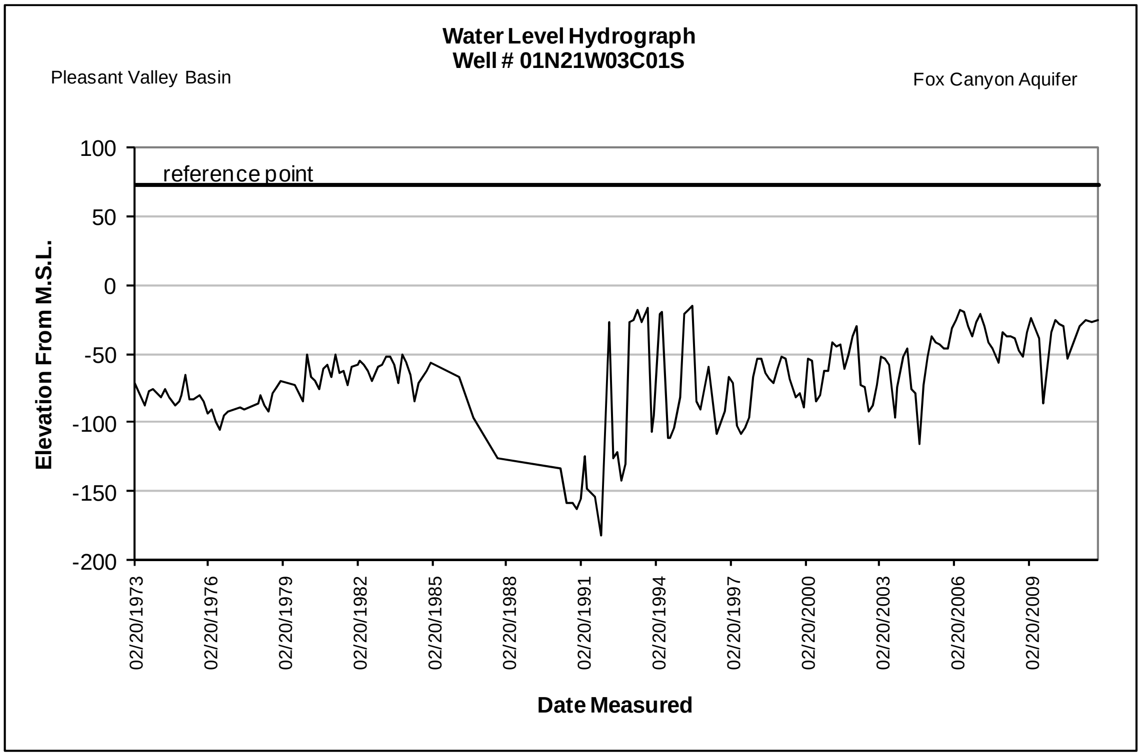


Figure B-8: Pleasant Valley Basin Fox Canyon Aquifer Key Well Hydrograph.

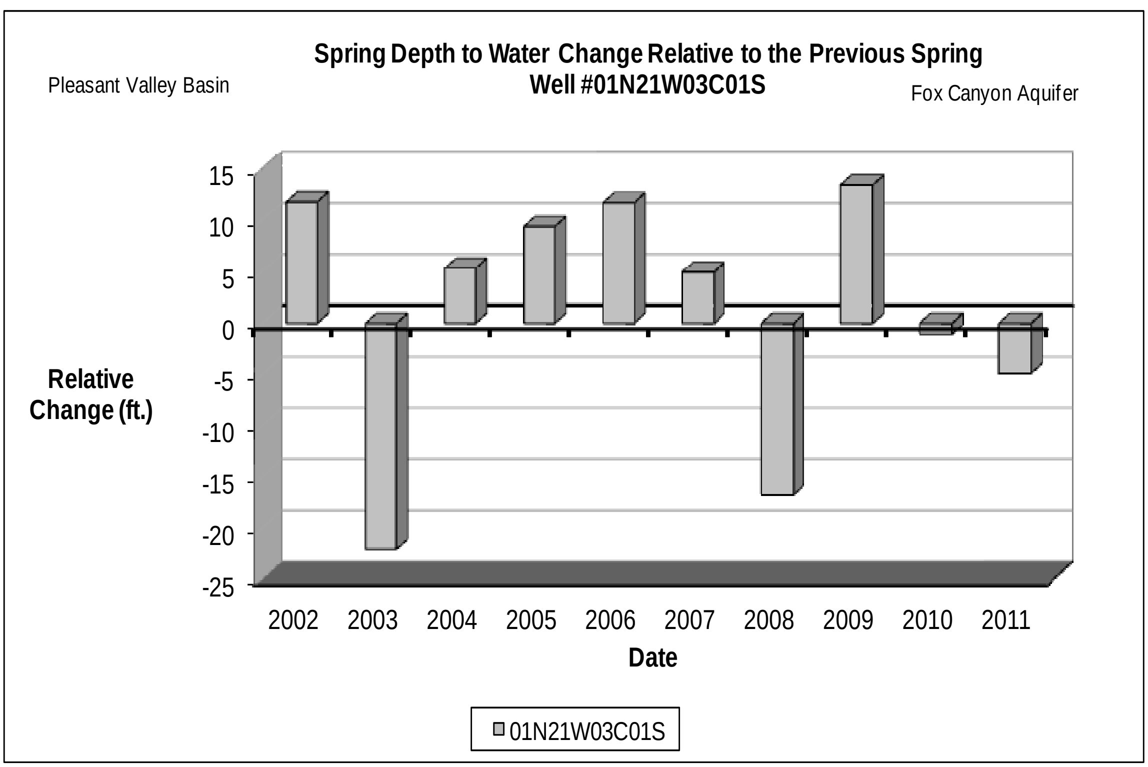


Figure B-9: Pleasant Valley Basin Fox Canyon Aquifer spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

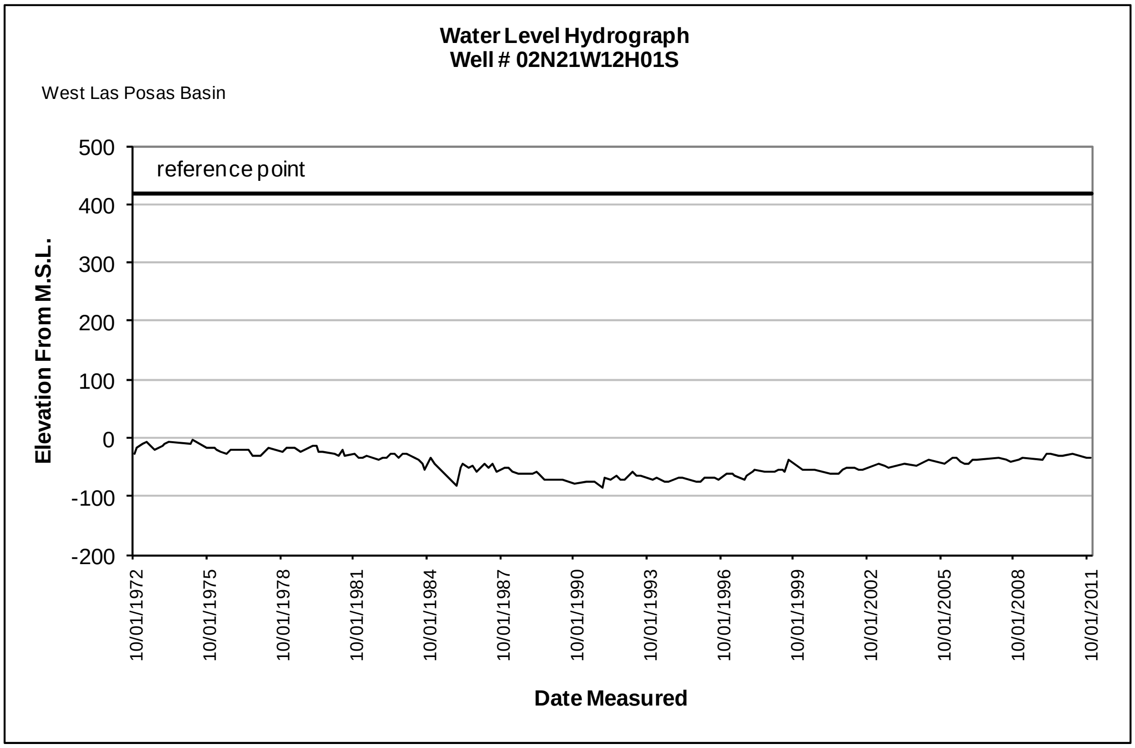


Figure B-10: West Las Posas Basin Key Well Hydrograph.

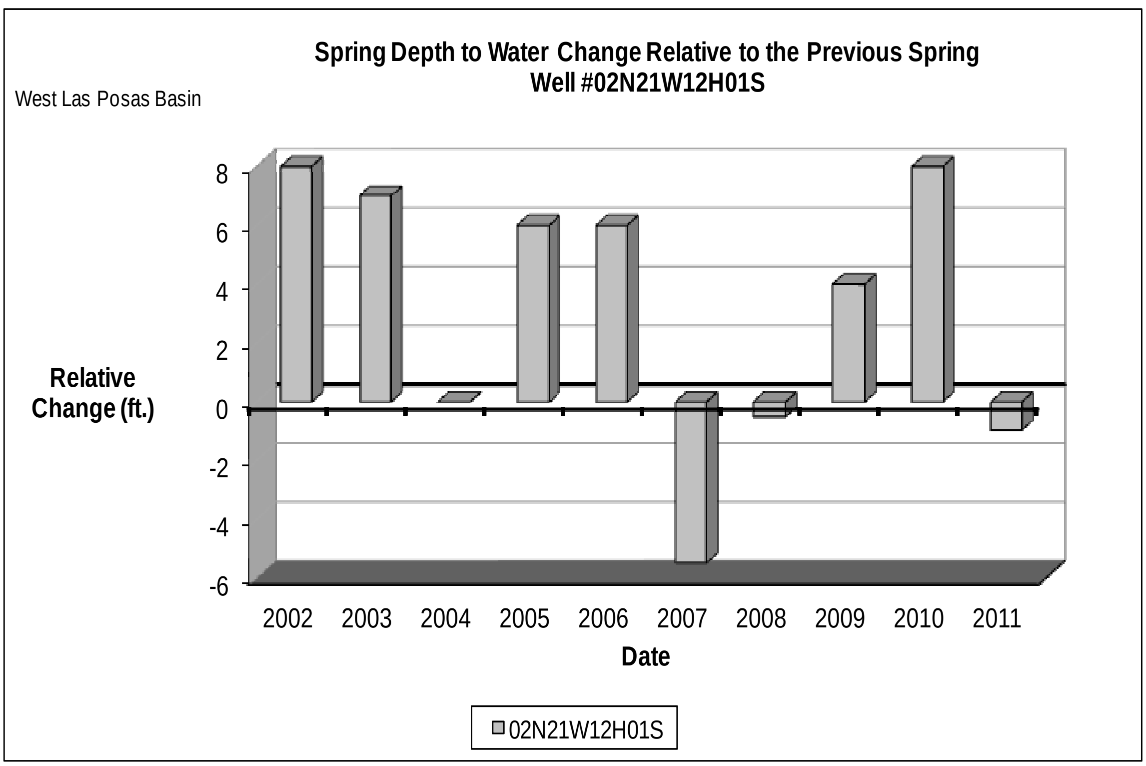


Figure B-11: West Las Posas Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

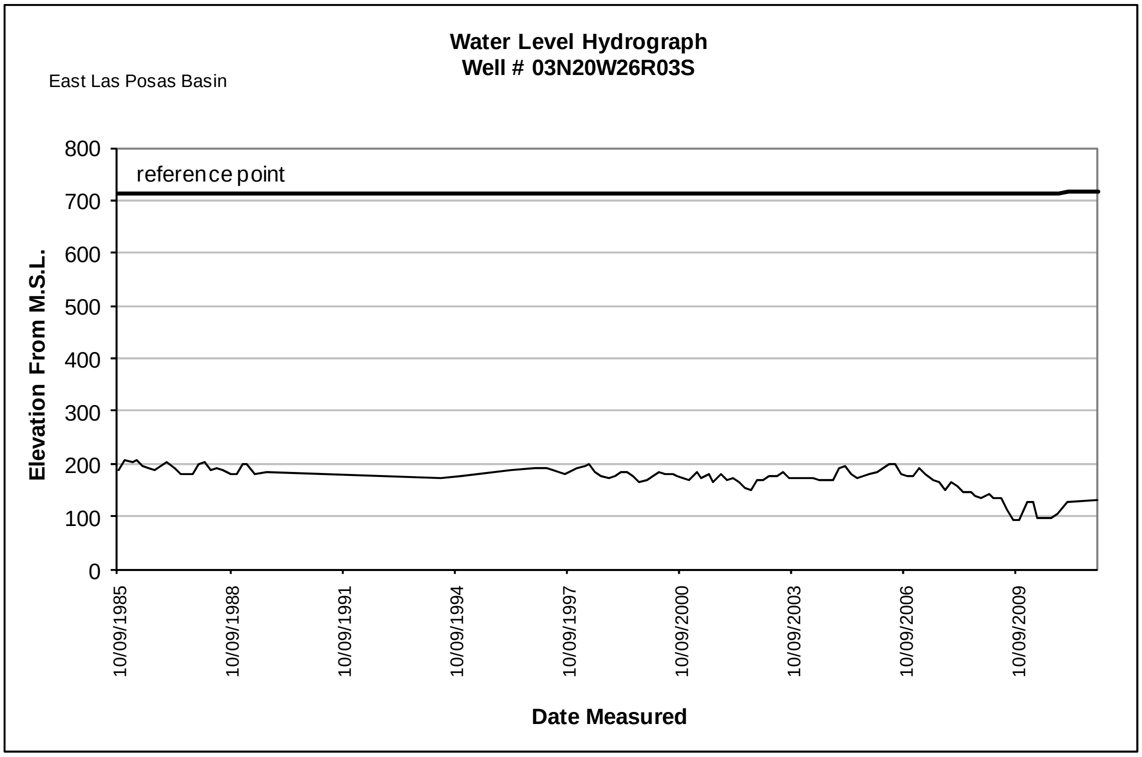


Figure B-12: East Las Posas Basin Key Well Hydrograph.

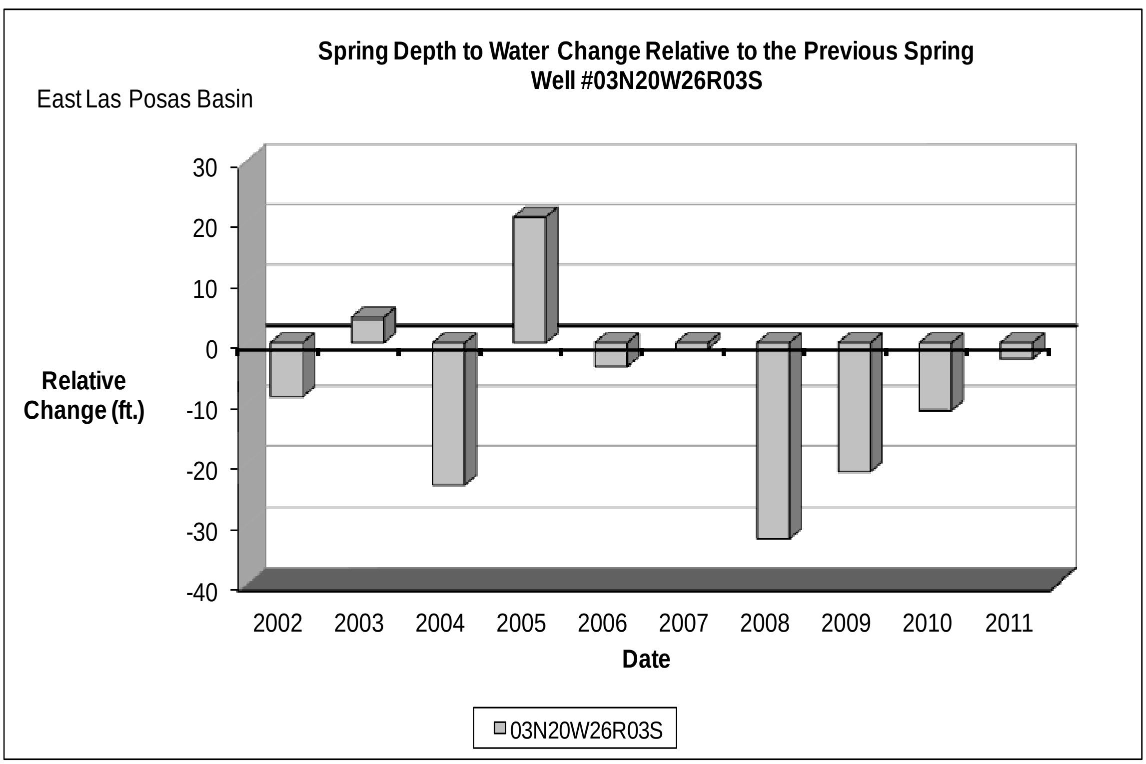


Figure B-13: East Las Posas Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

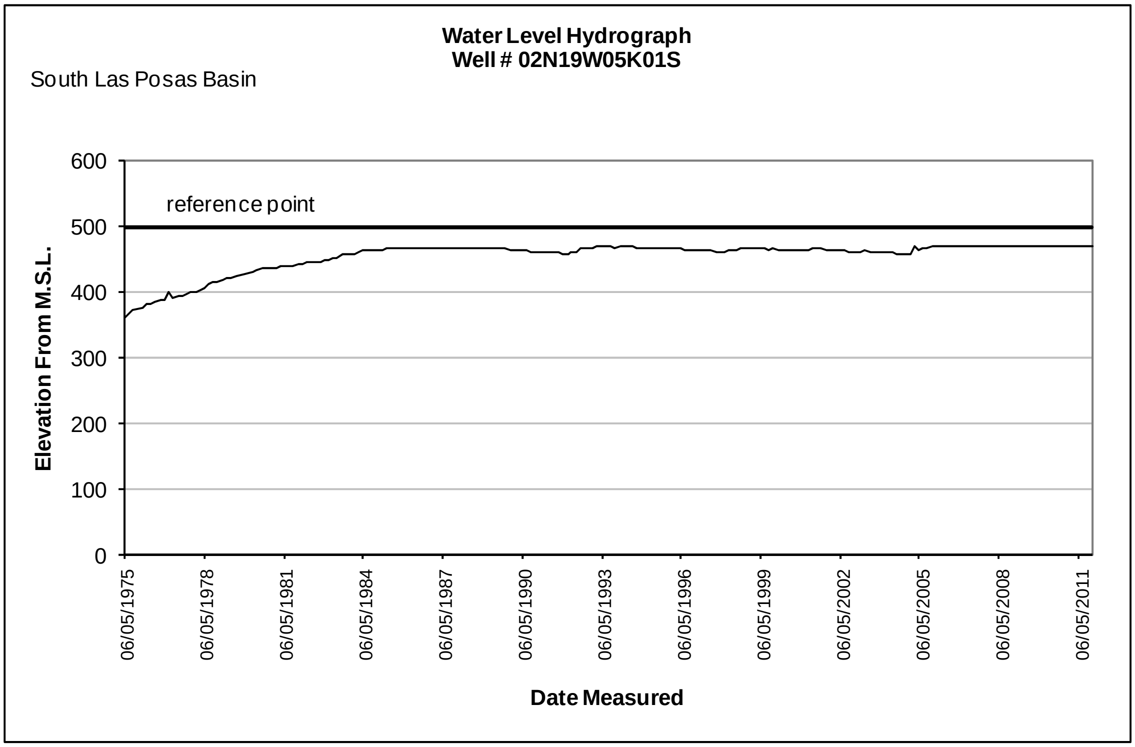


Figure B-14: South Las Posas Basin Key Well Hydrograph.

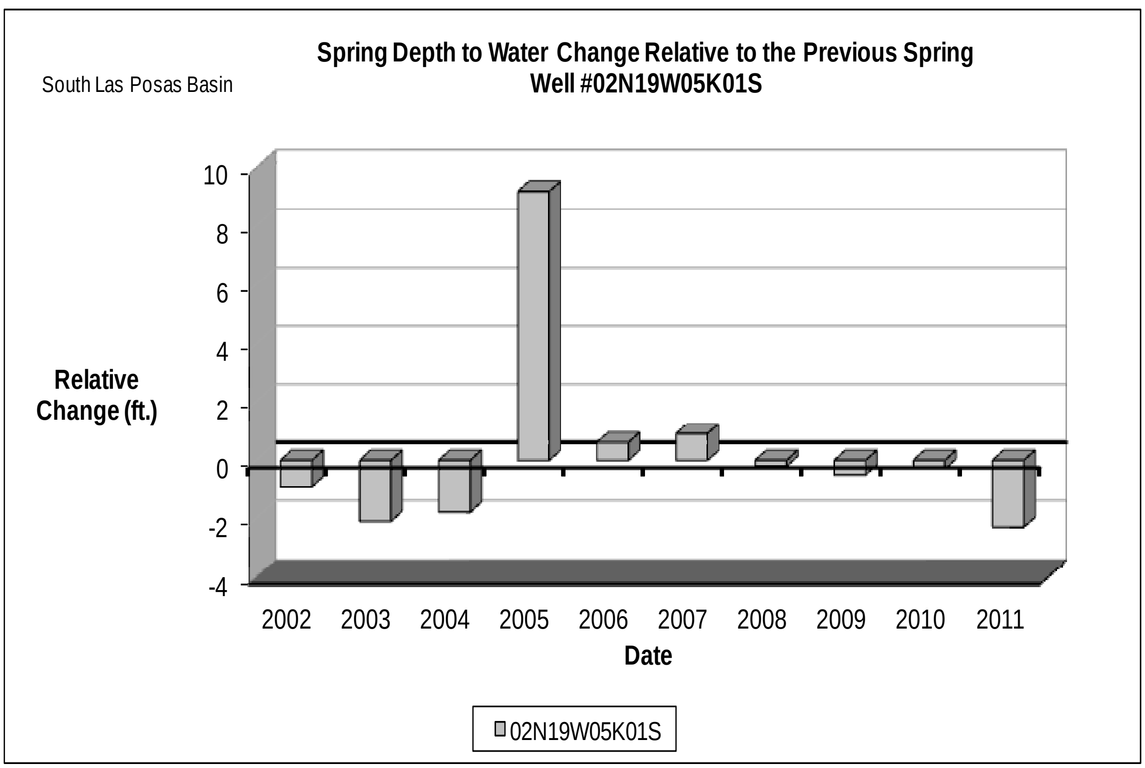


Figure B-15: South Las Posas Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

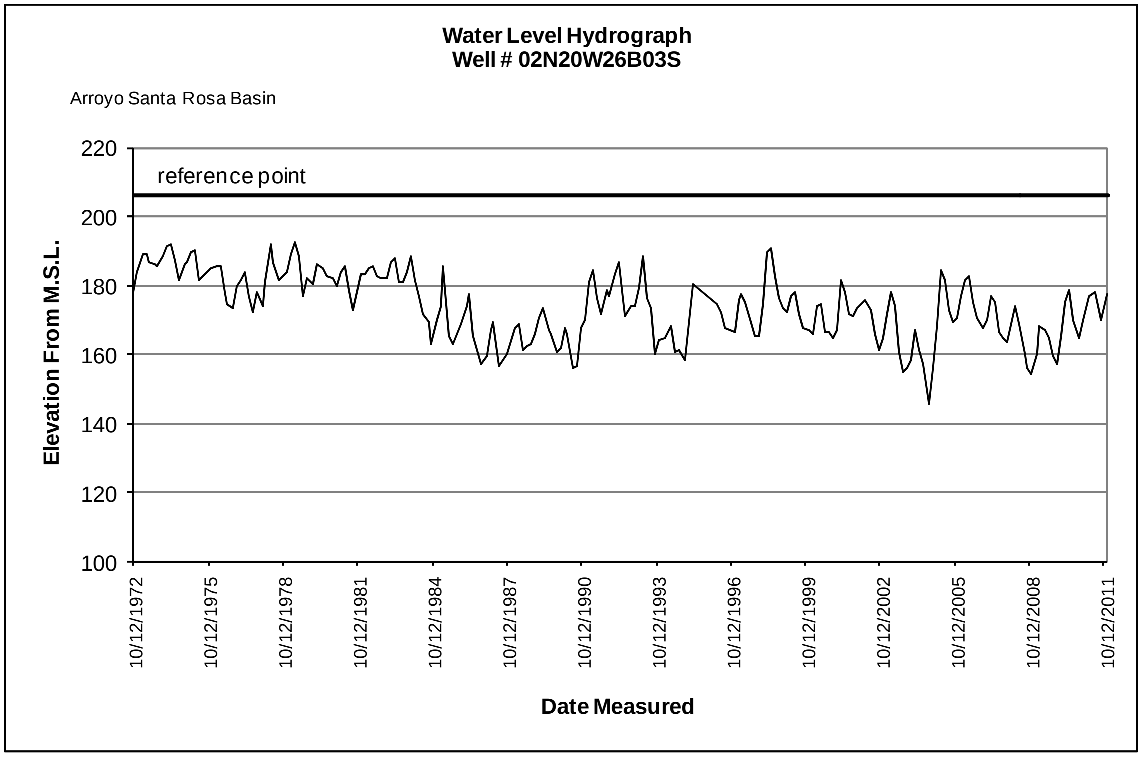


Figure B-16: Arroyo Santa Rosa Basin Key Well Hydrograph.

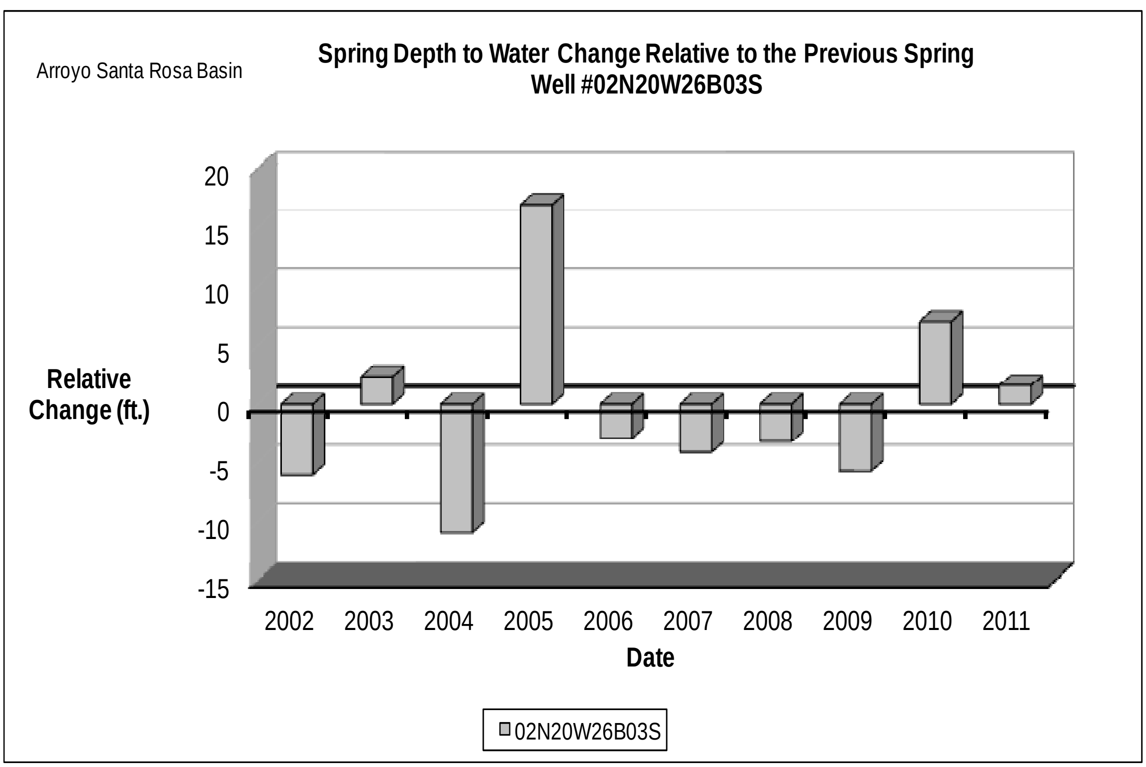


Figure B-17: Arroyo Santa Rosa Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

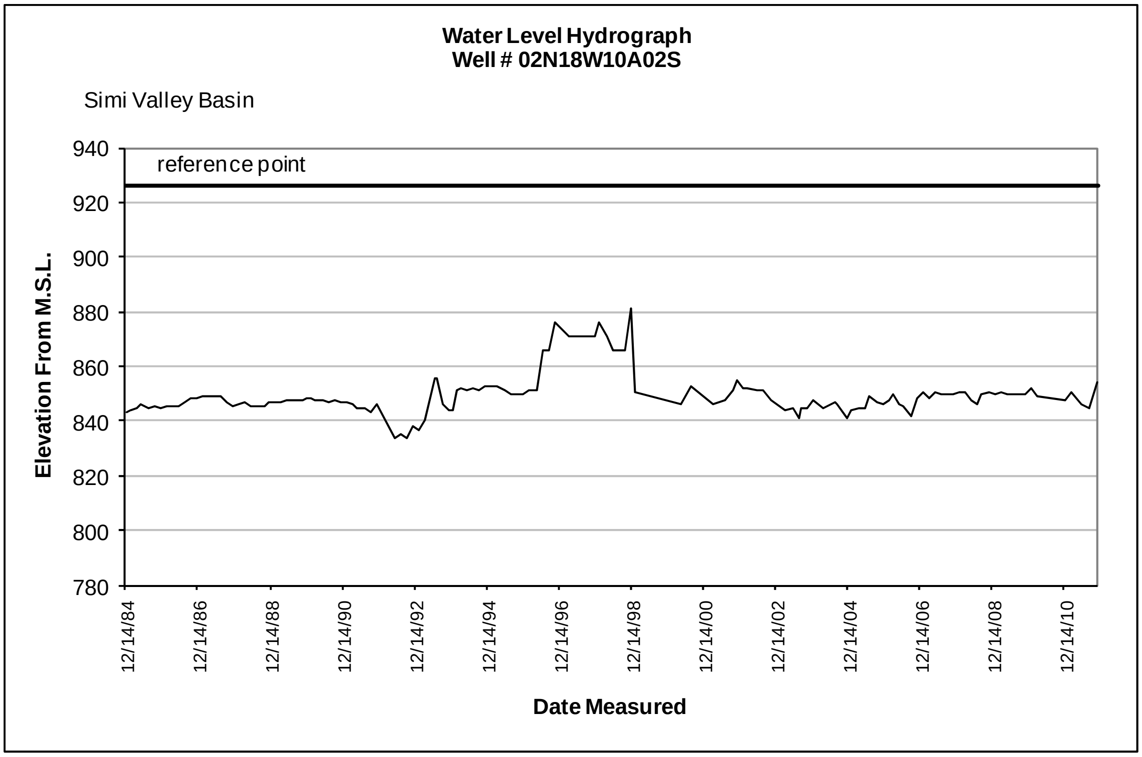


Figure B-18: Simi Valley Basin Key Well Hydrograph.

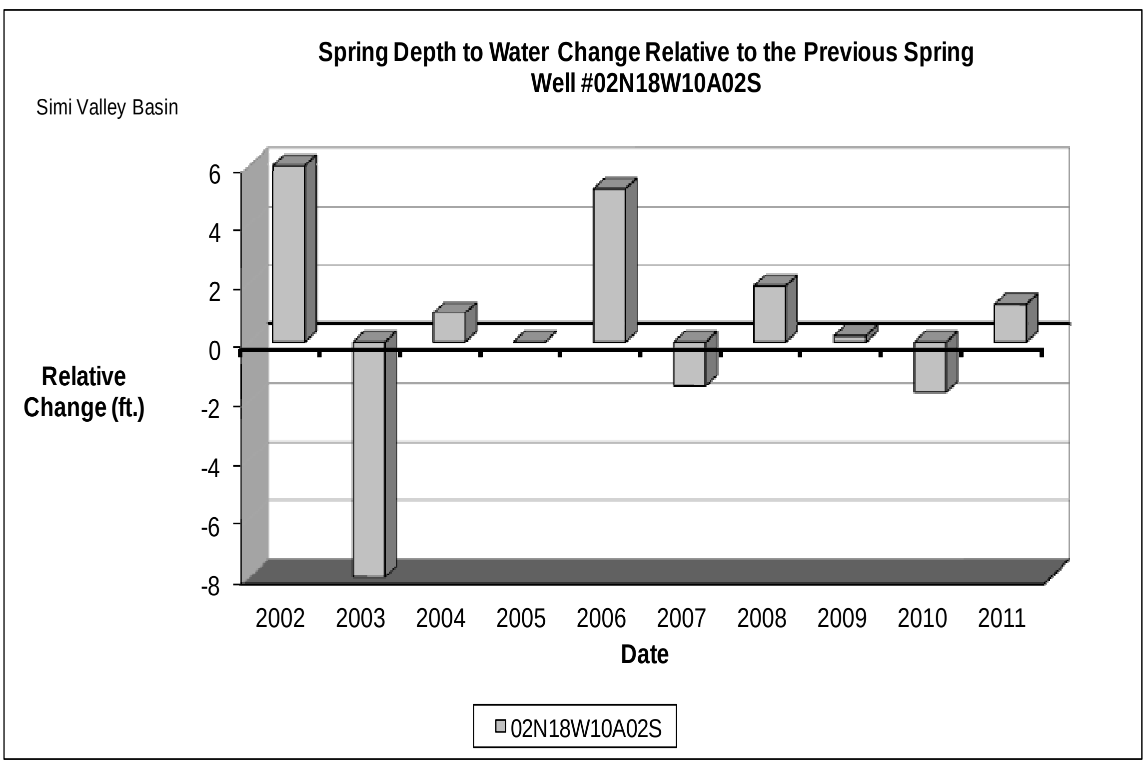


Figure B-19: Simi Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

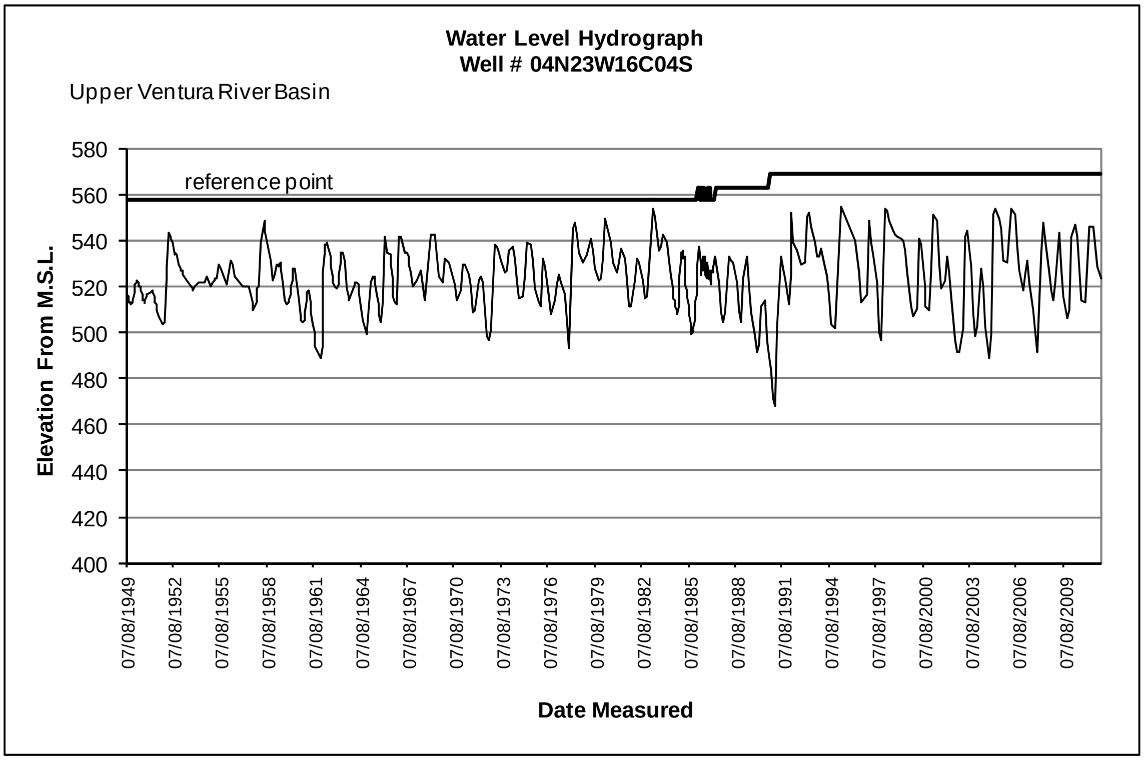


Figure B-20: Upper Ventura River Basin Key Well Hydrograph.

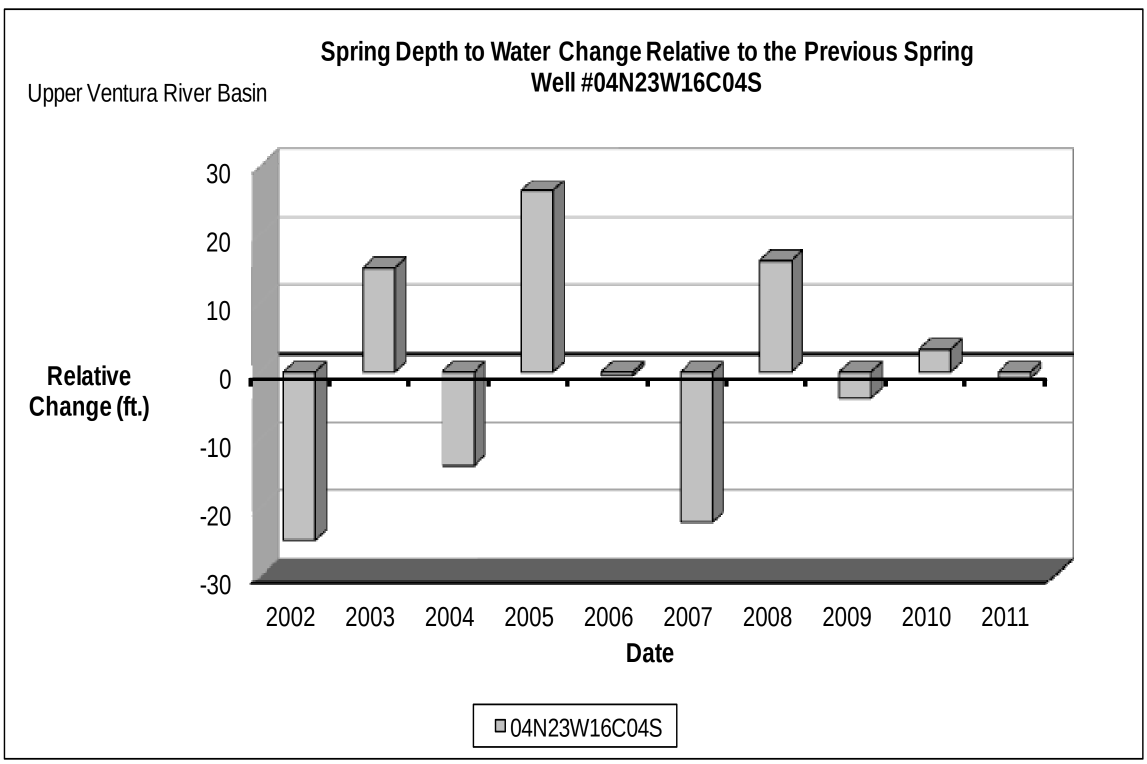


Figure B-21: Upper Ventura River Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

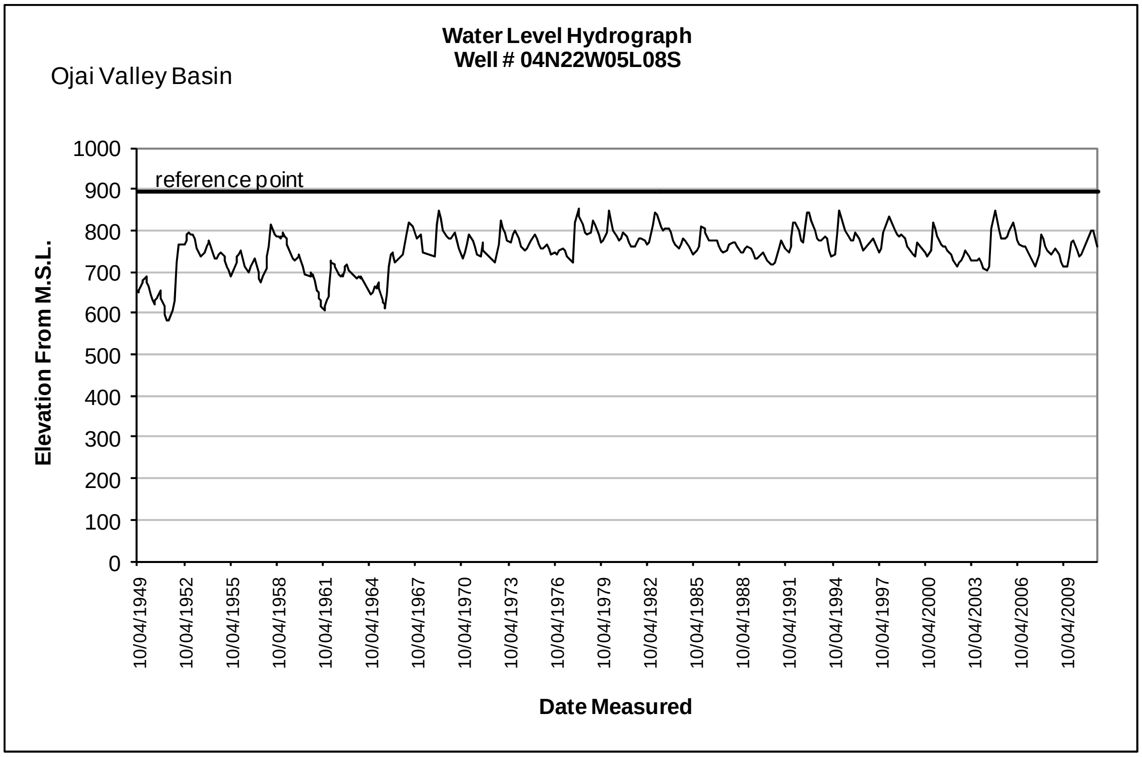


Figure B-22: Ojai Valley Basin Key Well Hydrograph.

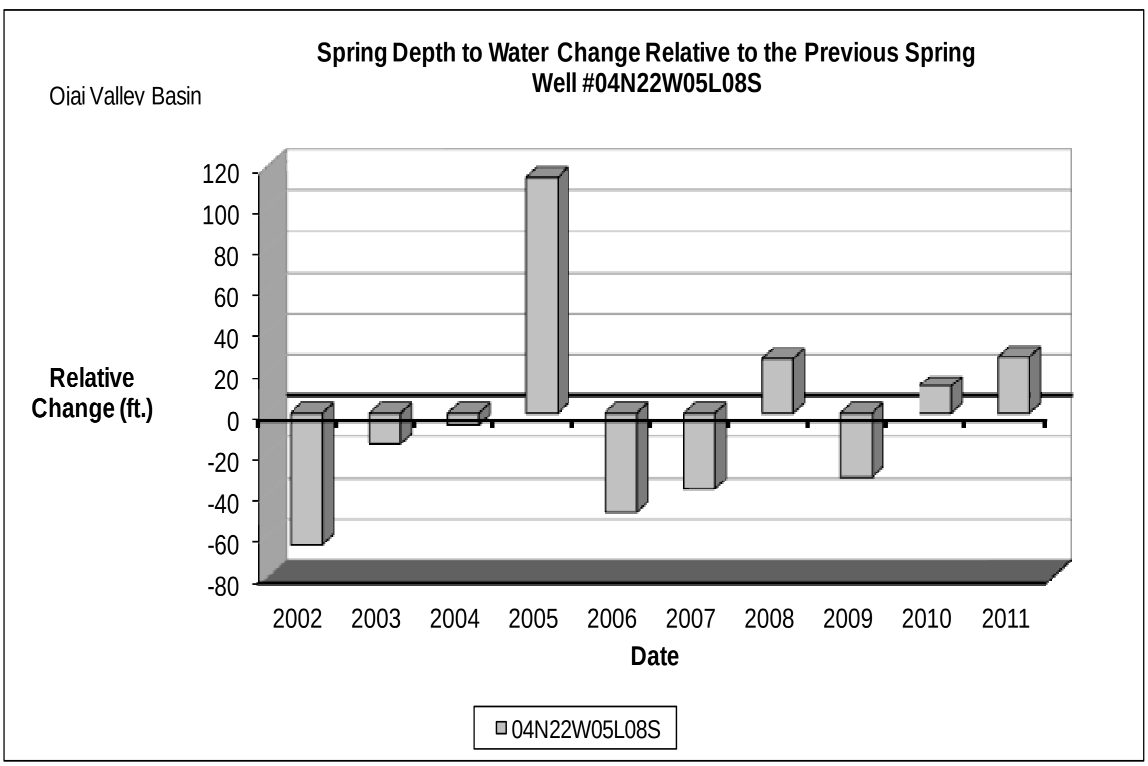


Figure B-23: Ojai Valley Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

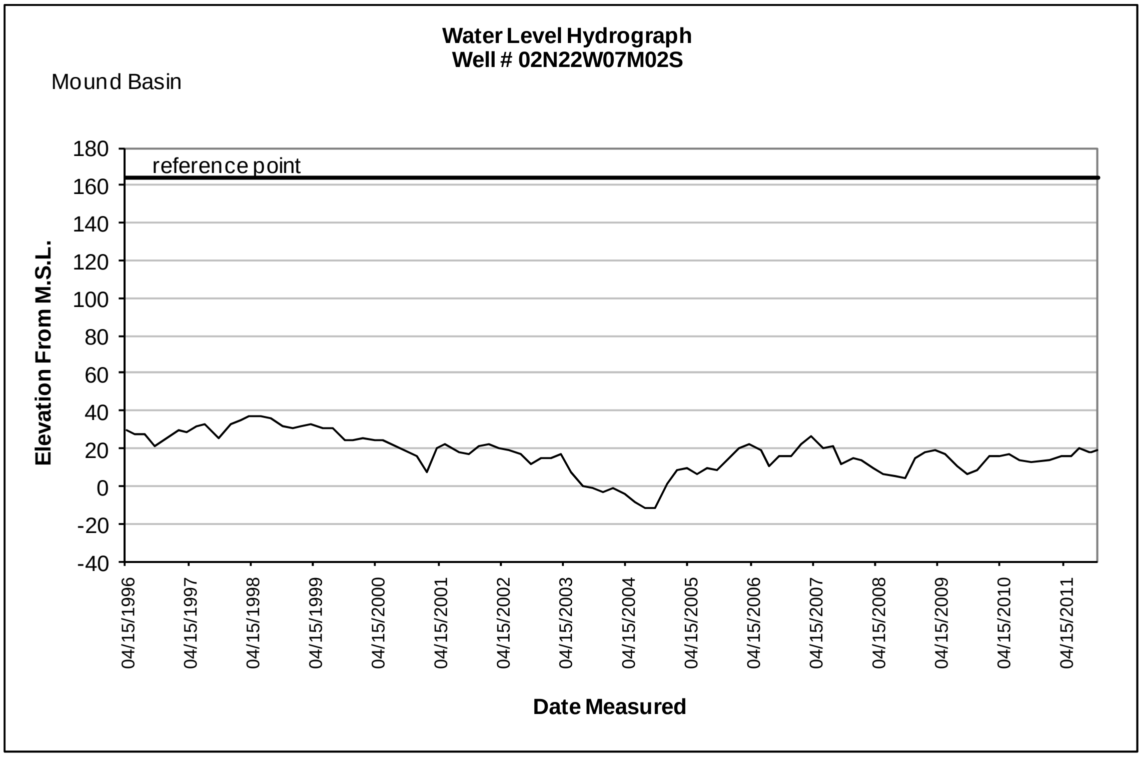


Figure B-24: Mound Basin Key Well Hydrograph.

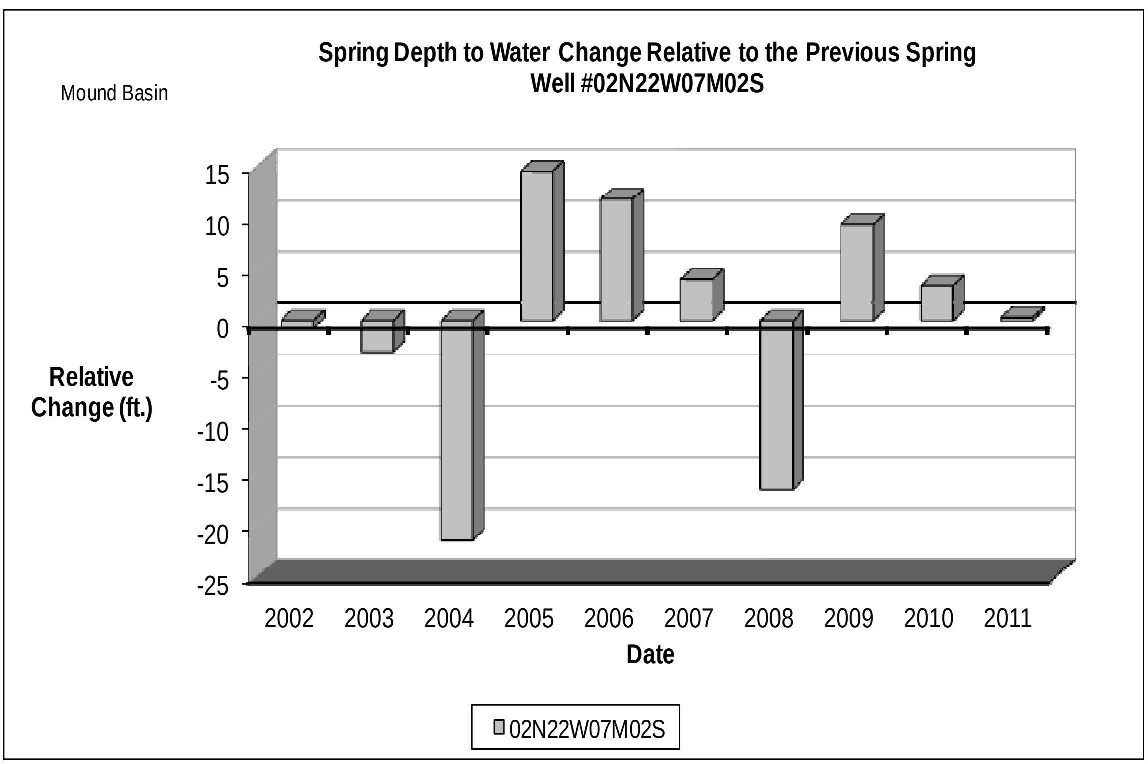


Figure B-25: Mound Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

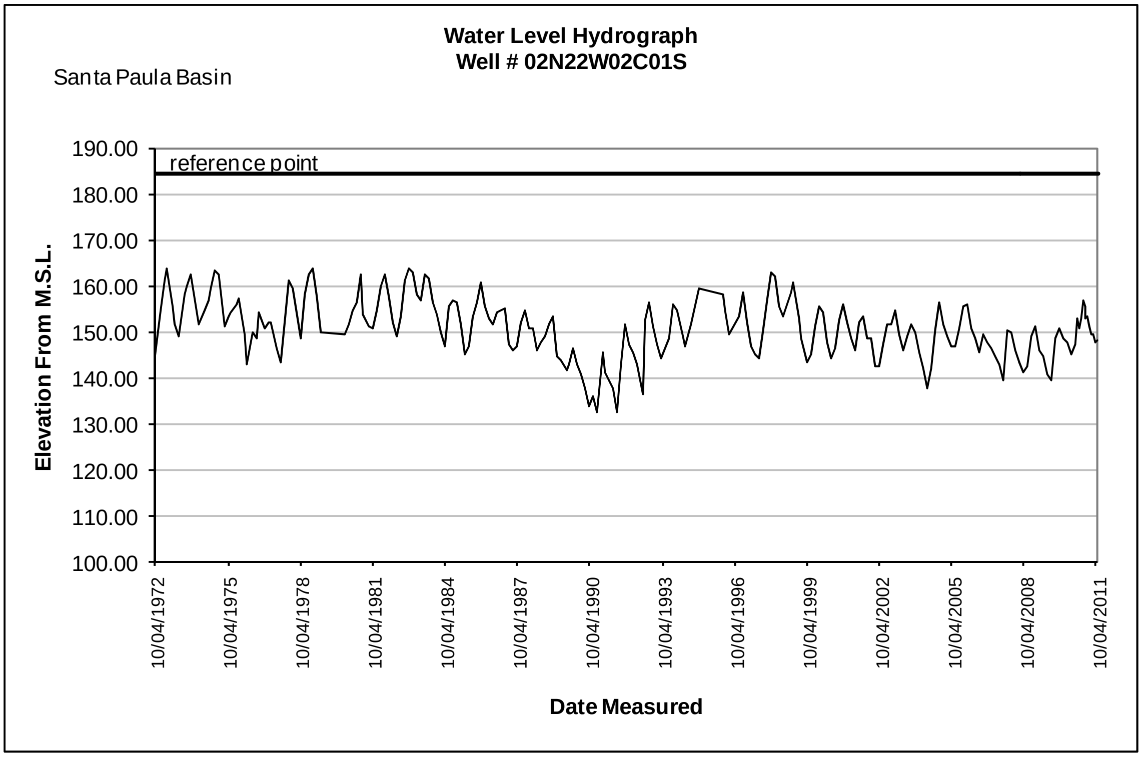


Figure B-26: Santa Paula Basin Key Well Hydrograph.

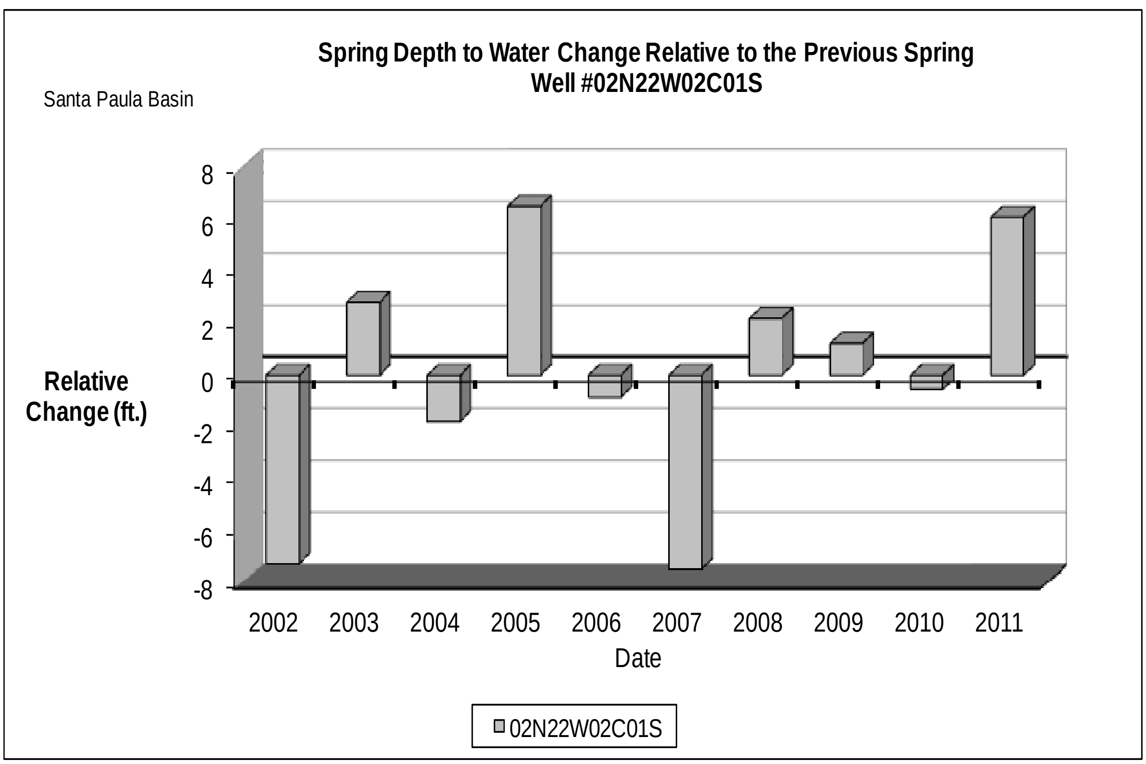


Figure B-27: Santa Paula Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

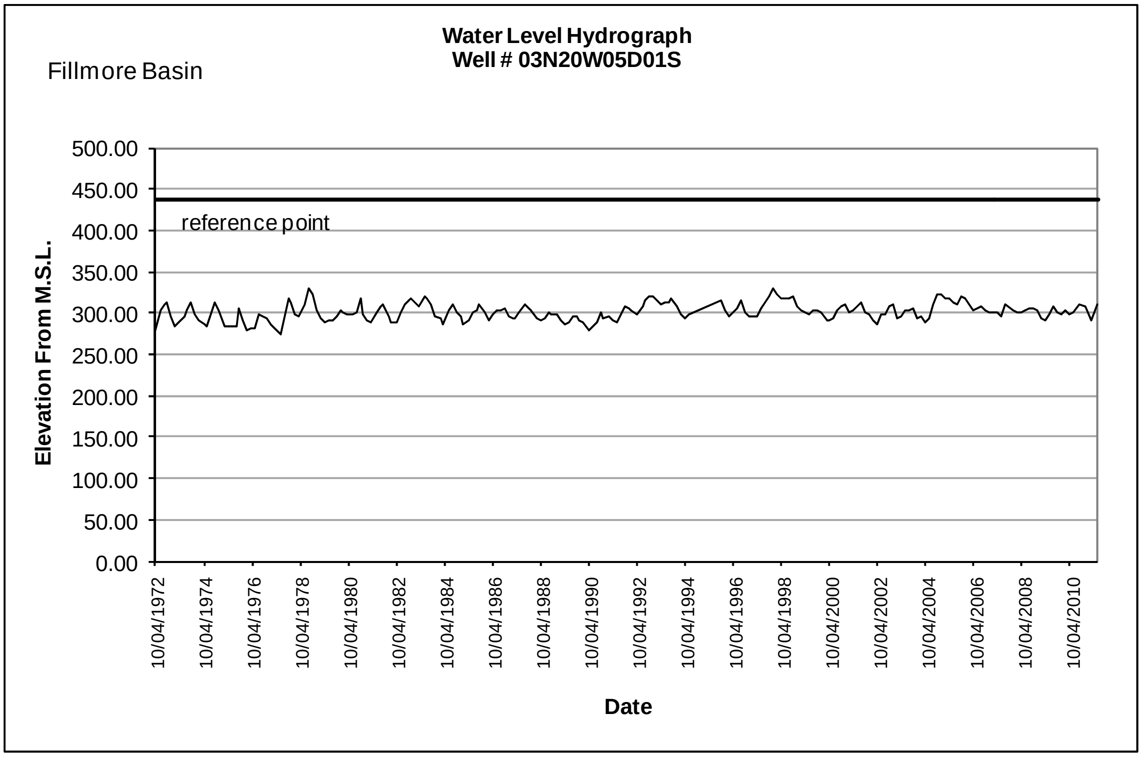


Figure B-28: Fillmore Basin Key Well Hydrograph.

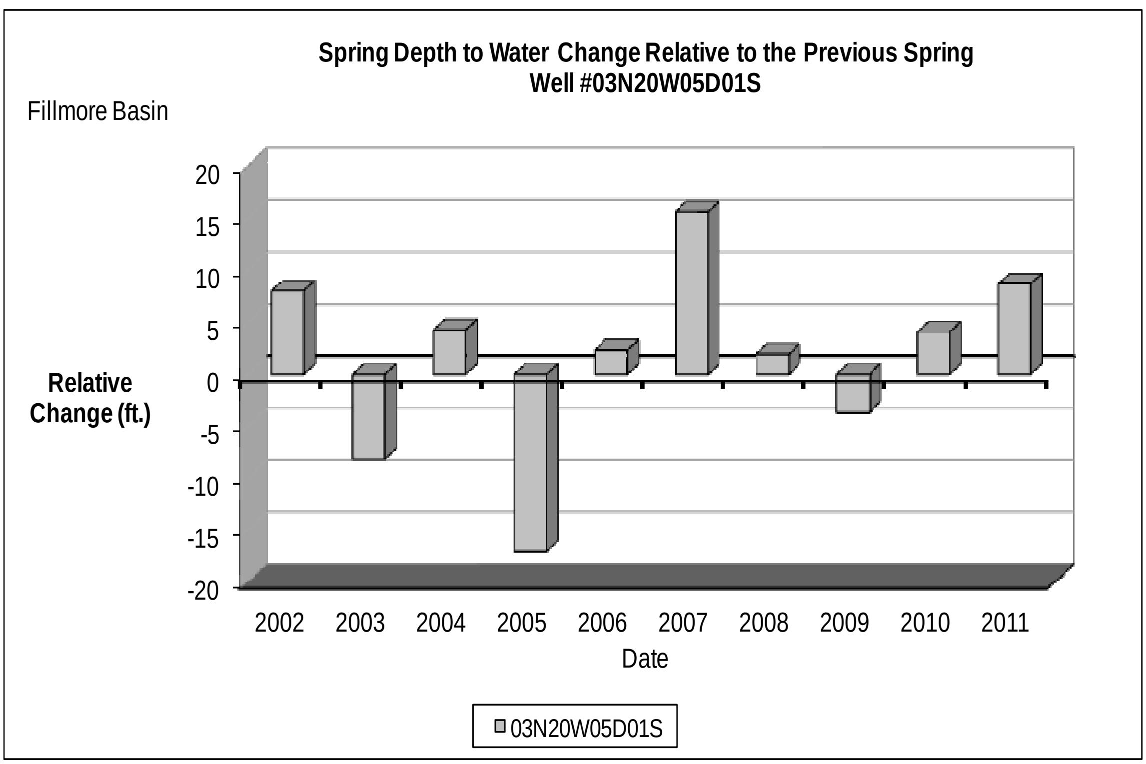


Figure B-29: Fillmore Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

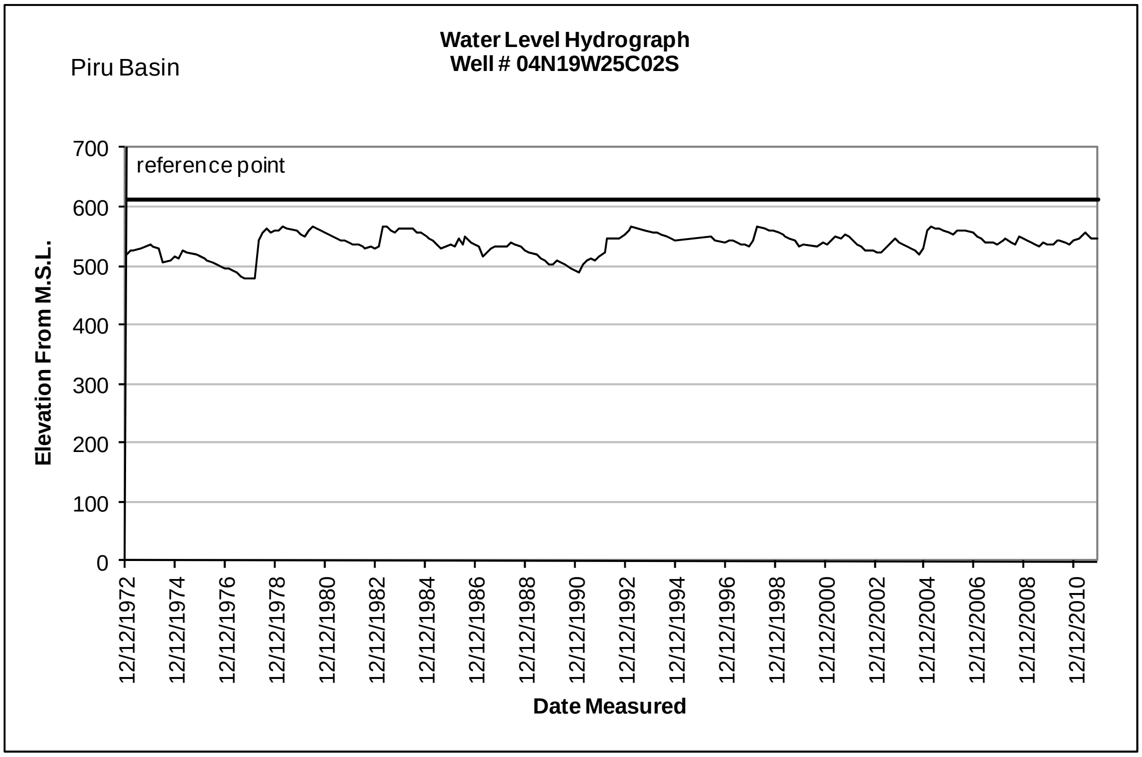


Figure B-30: Piru Basin Key Well Hydrograph.

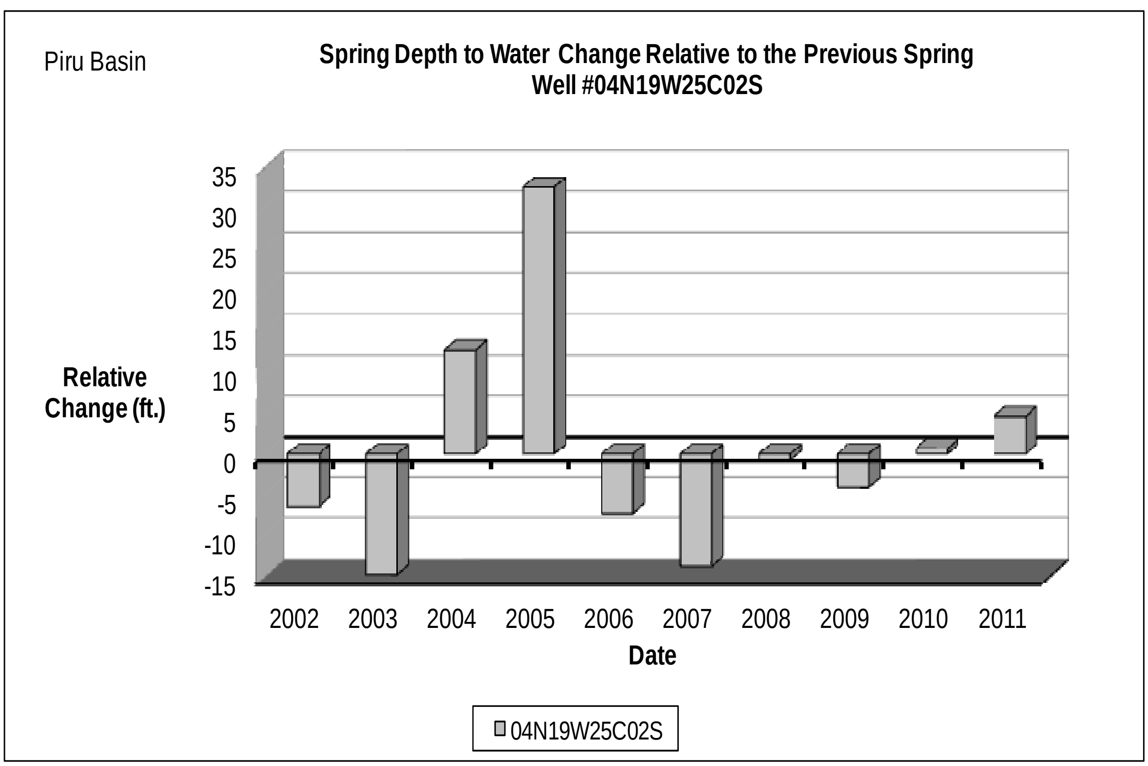


Figure B-31: Piru Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

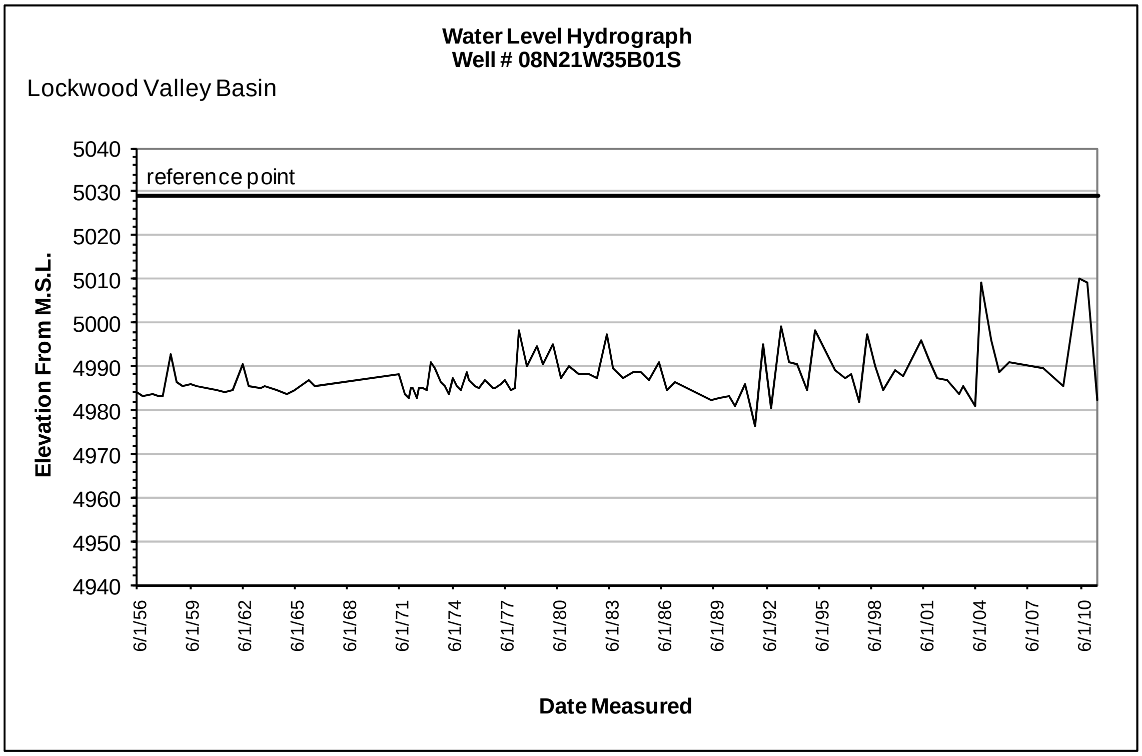


Figure B-32: Lockwood Valley Basin Key Well Hydrograph.

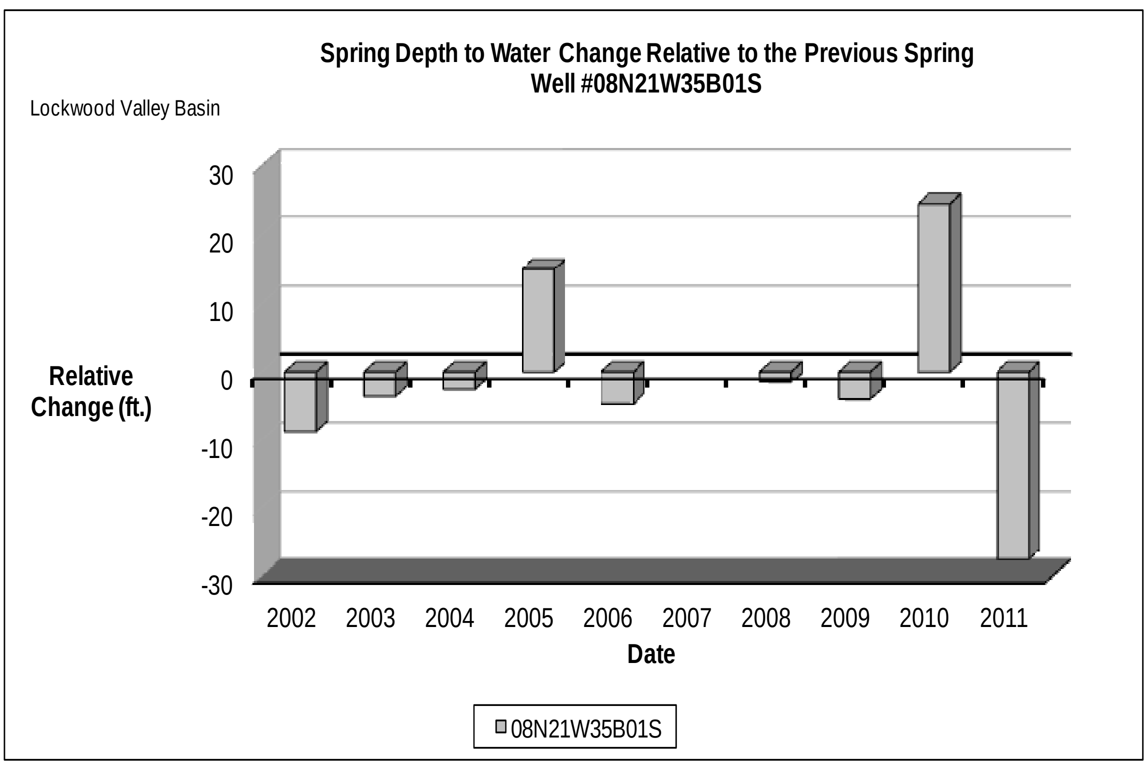


Figure B-33: Lockwood Valley Basin spring depth to water change relative to previous spring.

Appendix B – Key Water Level Wells

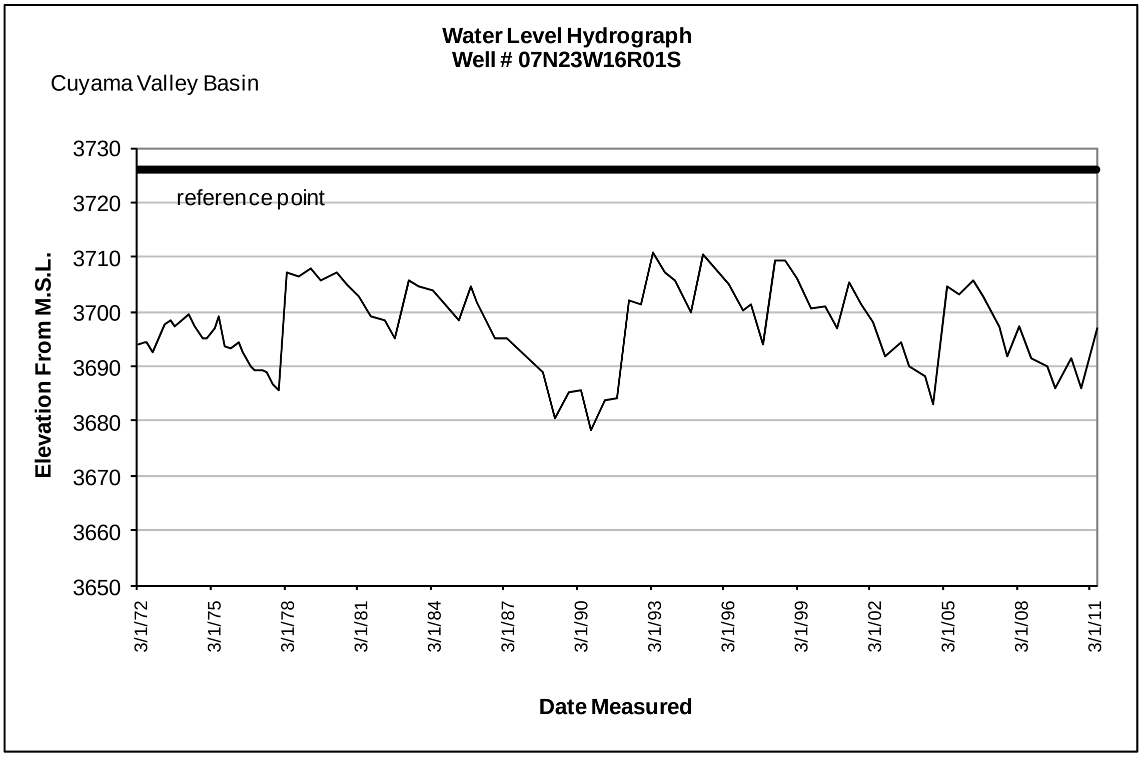


Figure B-34: Cuyama Valley Basin Key Well Hydrograph.

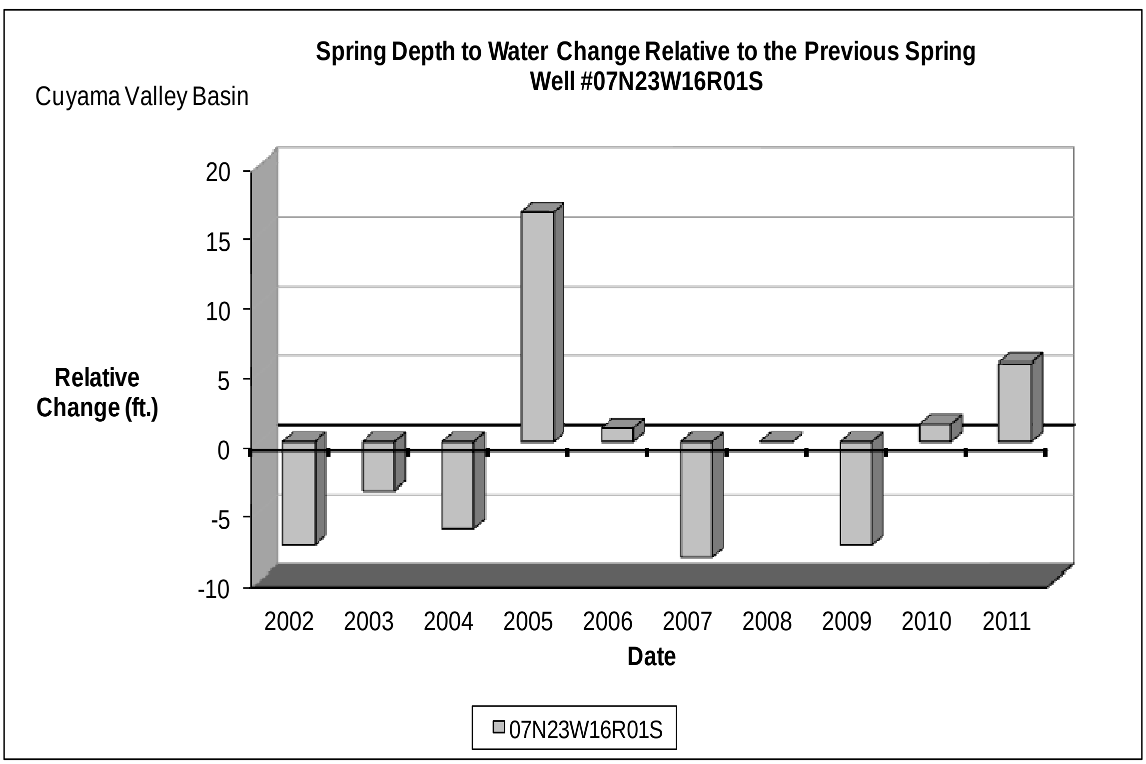


Figure B-35: Cuyama Valley Basin spring depth to water change relative to previous spring.

Appendix C – Groundwater Level Measurement Data

Arroyo Santa Rosa	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N19W20L01S	3/11/2011	307.66	NM	-----	Special
	02N20W22K01S	3/11/2011	250.00	143.00	107.00	
	02N20W23K01S	3/11/2011	274.10	184.70	89.40	
	02N20W23R01S	3/11/2011	235.20	60.10	175.10	
	02N20W26B03S	3/11/2011	205.90	29.00	176.90	
Second Measure	02N19W20L01S	6/9/2011	307.66	NM	-----	Pumping
	02N20W23K01S	6/14/2011	274.11	196.20	77.91	
	02N20W23R01S	6/9/2011	235.21	NM	-----	Pumping
	02N20W26B03S	6/9/2011	205.87	28.00	177.87	
Third Measure	02N19W20L01S	9/12/2011	307.66	52.80	254.86	
	02N20W23K01S	9/12/2011	274.11	213.30	60.81	
	02N20W23R01S	9/12/2011	235.21	70.12	165.09	
	02N20W26B03S	9/9/2011	205.87	35.71	170.16	
Fourth Measure	02N19W20L01S	12/8/2011	307.66	53.60	254.06	
	02N20W23K01S	12/8/2011	274.11	197.80	76.31	
	02N20W23R01S	12/8/2011	235.21	0.00	235.21	Pumping
	02N20W26B03S	12/8/2011	205.87	28.60	177.27	

Conejo Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W07K16S	3/1/2011	635.50	5.40	630.10	
	01N20W03J01S	3/1/2011	764.40	36.10	728.30	
Second Measure	01N19W07K16S	6/16/2011	635.46	6.62	628.84	
	01N20W03J01S	6/16/2011	764.40	32.50	731.90	
Third Measure	01N19W07K16S	9/19/2011	635.46	8.35	627.11	
	01N20W03J01S	9/19/2011	764.40	47.00	717.40	
Fourth Measure	01N19W07K16S	12/20/2011	635.46	9.20	626.26	
	01N20W03J01S	12/20/2011	764.40	43.00	721.40	

Cuyama Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	07N23W16R01S	6/23/2011	3,726.00	28.90	3,697.10	Nearby Pumping
	07N24W13C03S	6/23/2011	3,435.00	24.05	3,410.95	
Second Measure	07N23W16R01S	12/15/2011	3,726.00	NM	-----	Special
	07N24W13C03S	12/15/2011	3,435.00	NM	-----	Special

Appendix C – Groundwater Level Measurement Data

Fillmore	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N19W06D02S	3/9/2011	434.60	46.30	388.30	
	03N20W01C04S	3/9/2011	404.60	27.70	376.90	
	03N20W05D01S	3/9/2011	437.12	127.50	309.62	
	03N20W09D01S	3/9/2011	325.20	6.50	318.70	
	03N20W11C01S	3/9/2011	397.10	42.80	354.30	
	03N21W01P02S	3/17/2011	301.85	33.95	267.90	
	03N21W11B01S	3/9/2011	336.24	78.70	257.54	
	04N19W30D01S	3/9/2011	434.40	40.70	393.70	
	04N19W31R01S	3/9/2011	448.80	47.90	400.90	
	04N19W32M02S	3/9/2011	449.50	15.00	434.50	
	04N19W33D03S	3/9/2011	477.43	4.00	473.43	
	04N19W33D04S	3/9/2011	477.90	NM	-----	Pumping
	04N20W23Q02S	3/9/2011	513.90	137.70	376.20	
	04N20W26C02S	3/9/2011	505.40	NM	-----	Pumping
	04N20W33C03S	3/9/2011	526.80	158.60	368.20	
Second Measure	03N19W06D02S	6/15/2011	434.60	46.45	388.15	
	03N20W01C04S	6/7/2011	404.58	27.20	377.38	
	03N20W05D01S	6/7/2011	437.12	129.95	307.17	
	03N20W09D01S	6/7/2011	325.20	8.00	317.20	
	03N20W11C01S	6/7/2011	397.11	42.77	354.34	
	03N21W01P02S	6/7/2011	301.85	42.00	259.85	
	03N21W11B01S	6/7/2011	336.24	88.40	247.84	
	04N19W30D01S	6/15/2011	434.43	37.90	396.53	
	04N19W31R01S	6/7/2011	448.85	NM	-----	Pumping
	04N19W32M02S	6/7/2011	449.46	14.01	435.45	
	04N19W33D03S	6/7/2011	477.43	3.10	474.33	
	04N19W33D04S	6/7/2011	477.90	NM	-----	Pumping
	04N20W23Q02S	6/7/2011	513.88	124.60	389.28	
	04N20W26C02S	6/7/2011	505.35	115.00	390.35	
	04N20W33C03S	6/15/2011	526.87	157.50	369.37	
Third Measure	03N19W06D02S	9/7/2011	434.60	49.30	385.30	
	03N20W01C04S	9/7/2011	404.58	29.63	374.95	
	03N20W05D01S	9/7/2011	437.12	146.60	290.52	
	03N20W09D01S	9/7/2011	325.20	NM	-----	Pumping
	03N20W11C01S	9/7/2011	397.11	45.06	352.05	
	03N21W01P02S	9/7/2011	301.85	45.88	255.97	
	03N21W11B01S	9/8/2011	336.24	95.32	240.92	
	04N19W30D01S	9/29/2011	434.43	44.20	390.23	
	04N19W31R01S	9/7/2011	448.85	NM	-----	Pumping
	04N19W32M02S	9/7/2011	449.46	15.03	434.43	
	04N19W33D03S	9/7/2011	477.43	2.70	474.73	
	04N19W33D04S	9/7/2011	477.90	NM	-----	Pumping
	04N20W23Q02S	9/29/2011	513.88	124.80	389.08	
	04N20W26C02S	9/7/2011	505.35	146.20	359.15	
	04N20W33C03S	9/7/2011	526.87	172.00	354.87	

Appendix C – Groundwater Level Measurement Data

Fillmore	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	03N19W06D02S	12/5/2011	434.60	46.00	388.60	
	03N20W01C04S	12/5/2011	404.58	27.11	377.47	
	03N20W05D01S	12/5/2011	437.12	127.06	310.06	
	03N20W09D01S	12/5/2011	325.20	7.65	317.55	
	03N20W11C01S	12/5/2011	397.11	43.10	354.01	
	03N21W01P02S	12/5/2011	301.85	47.60	254.25	
	03N21W11B01S	12/5/2011	336.24	96.30	239.94	
	04N19W30D01S	12/5/2011	434.43	NM	-----	Pumping
	04N19W31R01S	12/5/2011	448.85	NM	-----	Pumping
	04N19W32M02S	12/5/2011	449.46	NM	-----	Pumping
	04N19W33D03S	12/5/2011	477.43	NM	-----	Pumping
	04N19W33D04S	12/5/2011	477.90	4.25	473.65	
	04N20W23Q02S	12/5/2011	513.88	122.20	391.68	
	04N20W26C02S	12/5/2011	505.35	130.50	374.85	
	04N20W33C03S	12/5/2011	526.87	134.10	392.77	

East Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N20W01M01S	4/6/2011	470.05	NM	-----	Pumping
	02N20W03K03S	3/3/2011	485.50	NM	-----	Special
	02N20W10D02S	3/7/2011	459.53	268.10	191.43	
	02N20W10G01S	3/2/2011	415.50	141.50	274.00	
	02N20W10J01S	3/2/2011	406.87	110.65	296.22	
	03N19W17Q01S	3/7/2011	1,311.06	NM	-----	Special
	03N19W19J01S	3/7/2011	1,026.90	844.80	182.10	
	03N19W19P02S	3/7/2011	1,057.94	NM	-----	Special
	03N19W29F06S	3/7/2011	855.20	233.50	621.70	
	03N19W29K04S	3/7/2011	843.32	NM	-----	Special
	03N20W23L01S	3/7/2011	970.30	NM	-----	Special
	03N20W25H01S	3/7/2011	823.84	227.00	596.84	
	03N20W26R03S	3/7/2011	717.81	588.50	129.31	
	03N20W27H03S	3/7/2011	840.25	598.70	241.55	
	03N20W34G01S	3/7/2011	680.48	NM	-----	Special
	03N20W35R02S	3/7/2011	572.67	432.40	140.27	
	03N20W35R03S	3/7/2011	572.67	432.70	139.97	
	03N20W35R04S	3/7/2011	572.67	293.70	278.97	

Appendix C – Groundwater Level Measurement Data

East Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	02N20W01M01S	6/27/2011	470.05	NM	-----	Pumping
	02N20W03K03S	6/27/2011	485.50	NM	-----	Special
	02N20W10D02S	6/28/2011	459.53	NM	-----	Pumping
	02N20W10G01S	6/28/2011	415.47	150.40	265.07	
	02N20W10J01S	6/28/2011	406.87	112.85	294.02	
	03N19W17Q01S	6/28/2011	1,311.06	NM	-----	Pumping
	03N19W19J01S	6/28/2011	1,026.90	840.30	186.60	
	03N19W19P02S	6/28/2011	1,057.94	NM	-----	Special
	03N19W29F06S	6/28/2011	855.20	238.70	616.50	
	03N19W29K04S	6/28/2011	843.32	NM	-----	Pumping
	03N20W23L01S	6/28/2011	970.30	NM	-----	Inaccessible
	03N20W25H01S	6/28/2011	823.84	NM	-----	Pumping
	03N20W26R03S	6/28/2011	717.81	NM	-----	Inaccessible
	03N20W27H03S	6/28/2011	840.25	NM	-----	Pumping
	03N20W34G01S	6/28/2011	680.48	NM	-----	Pumping
	03N20W35R02S	6/28/2011	572.67	445.00	127.67	
	03N20W35R03S	6/28/2011	572.67	446.80	125.87	
	03N20W35R04S	6/28/2011	572.67	293.60	279.07	
Third Measure	02N20W01M01S	9/22/2011	470.05	NM	-----	Pumping
	02N20W03K03S	9/22/2011	485.50	NM	-----	Special
	02N20W10D02S	9/22/2011	459.53	281.50	178.03	
	02N20W10G01S	9/22/2011	415.47	159.90	255.57	
	02N20W10J01S	9/22/2011	406.87	116.40	290.47	
	03N19W17Q01S	9/22/2011	1,311.06	NM	-----	Pumping
	03N19W19J01S	9/28/2011	1,026.90	847.10	179.80	
	03N19W19P02S	9/28/2011	1,057.94	NM	-----	Special
	03N19W29F06S	9/28/2011	855.20	240.00	615.20	
	03N19W29K04S	9/22/2011	843.32	NM	-----	Pumping
	03N20W23L01S	9/28/2011	970.30	NM	-----	Special
	03N20W25H01S	10/12/2011	823.84	NM	-----	Pumping
	03N20W26R03S	9/28/2011	717.81	754.60	-36.79	
	03N20W27H03S	9/22/2011	840.25	602.90	237.35	
	03N20W34G01S	10/26/2011	680.48	528.20	152.28	
	03N20W35R02S	9/16/2011	572.67	441.40	131.27	
	03N20W35R03S	9/16/2011	572.67	442.80	129.87	
	03N20W35R04S	9/16/2011	572.67	294.10	278.57	

Appendix C – Groundwater Level Measurement Data

East Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	02N20W01M01S	12/27/2011	470.05	NM	-----	Pumping
	02N20W03K03S	12/27/2011	485.50	NM	-----	Special
	02N20W10D02S	12/15/2011	459.53	277.90	181.63	
	02N20W10G01S	12/15/2011	415.47	NM	-----	Pumping
	02N20W10J01S	12/15/2011	406.87	113.43	293.44	
	03N19W17Q01S	12/15/2011	1,311.06	NM	-----	Special
	03N19W19J01S	12/27/2011	1,026.90	848.20	178.70	
	03N19W19P02S	12/27/2011	1,057.94	0.00	1,057.94	
	03N19W29F06S	12/15/2011	855.20	234.70	620.50	
	03N19W29K04S	12/27/2011	843.32	NM	-----	Pumping
	03N20W23L01S	12/27/2011	970.30	NM	-----	Special
	03N20W25H01S	12/27/2011	823.84	223.80	600.04	
	03N20W26R03S	12/27/2011	717.81	588.00	129.81	
	03N20W27H03S	12/27/2011	840.25	NM	-----	Special
	03N20W34G01S	12/27/2011	680.48	NM	-----	Pumping
	03N20W35R02S	12/27/2011	572.67	NM	-----	Special
	03N20W35R03S	12/27/2011	572.67	431.80	140.87	
	03N20W35R04S	12/27/2011	572.67	NM	-----	Special

South Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N19W05K01S	3/7/2011	497.80	30.55	467.25	
	02N19W08H02S	3/7/2011	494.87	22.70	472.17	
Second Measure	02N19W05K01S	6/27/2011	497.80	30.45	467.35	
	02N19W08H02S	6/28/2011	494.87	23.40	471.47	
Third Measure	02N19W05K01S	9/22/2011	497.80	29.60	468.20	
	02N19W08H02S	9/22/2011	494.87	49.00	445.87	
Fourth Measure	02N19W05K01S	12/15/2011	497.80	28.63	469.17	
	02N19W08H02S	12/15/2011	494.87	23.00	471.87	

Appendix C – Groundwater Level Measurement Data

West Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N20W06R01S	3/2/2011	459.00	NM	-----	Pumping
	02N20W07R02S	4/6/2011	395.00	474.30	-79.30	
	02N20W08F01S	3/3/2011	436.17	539.70	-103.53	
	02N21W09D02S	3/2/2011	323.75	226.80	96.95	
	02N21W10G03S	4/1/2011	381.01	346.10	34.91	
	02N21W11J03S	3/3/2011	373.39	413.20	-39.81	
	02N21W11J04S	3/3/2011	373.39	373.80	-0.41	
	02N21W11J05S	3/3/2011	373.39	209.20	164.19	
	02N21W11J06S	3/3/2011	373.39	181.70	191.69	
	02N21W12H01S	3/7/2011	417.89	444.90	-27.01	
	02N21W15M03S	3/7/2011	263.90	135.90	128.00	
	02N21W16J01S	3/7/2011	259.90	10.55	249.35	
	03N21W35P02S	3/2/2011	564.11	508.60	55.51	
Second Measure	02N20W06R01S	6/28/2011	461.19	NM	-----	Inaccessible
	02N20W07R02S	6/28/2011	395.00	504.70	-109.70	
	02N20W08F01S	6/27/2011	436.17	NM	-----	Pumping
	02N21W09D02S	6/28/2011	323.75	231.40	92.35	
	02N21W10G03S	6/30/2011	381.01	389.10	-8.09	
	02N21W11J03S	6/27/2011	379.39	418.30	-38.91	
	02N21W11J04S	6/27/2011	379.39	374.10	5.29	
	02N21W11J05S	6/27/2011	379.39	208.90	170.49	
	02N21W11J06S	6/27/2011	379.39	180.10	199.29	
	02N21W12H01S	6/27/2011	417.89	NM	-----	Pumping
	02N21W15M03S	6/28/2011	263.87	136.10	127.77	
	02N21W16J01S	6/28/2011	259.90	10.60	249.30	
	03N21W35P02S	6/28/2011	564.11	NM	-----	Pumping
Third Measure	02N20W06R01S	9/28/2011	461.19	507.70	-46.51	
	02N20W07R02S	9/22/2011	395.00	NM	-----	Pumping
	02N20W08F01S	9/22/2011	436.17	NM	-----	Pumping
	02N21W09D02S	9/16/2011	323.75	226.80	96.95	
	02N21W10G03S	10/12/2011	381.01	350.10	30.91	
	02N21W11J03S	9/22/2011	379.39	433.90	-54.51	
	02N21W11J04S	9/22/2011	379.39	378.70	0.69	
	02N21W11J05S	9/22/2011	379.39	209.60	169.79	
	02N21W11J06S	9/22/2011	379.39	180.30	199.09	
	02N21W12H01S	10/12/2011	417.89	451.60	-33.71	
	02N21W15M03S	9/28/2011	263.87	134.40	129.47	
	02N21W16J01S	9/28/2011	259.90	11.60	248.30	
	03N21W35P02S	9/16/2011	564.11	557.10	7.01	

Appendix C – Groundwater Level Measurement Data

West Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	02N20W06R01S	12/19/2011	461.19	NM	-----	Pumping
	02N20W07R02S	12/27/2011	395.00	485.00	-90.00	
	02N20W08F01S	12/19/2011	436.17	NM	-----	Pumping
	02N21W09D02S	12/19/2011	323.75	215.25	108.50	
	02N21W10G03S	12/15/2011	381.01	NM	-----	Pumping
	02N21W11J03S	12/19/2011	379.39	428.10	-48.71	
	02N21W11J04S	12/19/2011	379.39	376.90	2.49	
	02N21W11J05S	12/19/2011	379.39	207.10	172.29	
	02N21W11J06S	12/19/2011	379.39	179.40	199.99	
	02N21W12H01S	12/27/2011	417.89	450.40	-32.51	
	02N21W15M03S	12/15/2011	263.87	136.80	127.07	
	02N21W16J01S	12/15/2011	259.90	11.80	248.10	
	03N21W35P02S	12/27/2011	564.11	537.20	26.91	

Lockwood Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	08N21W33R03S	6/23/2011	5,150.00	37.33	5,112.67	
	08N21W35B01S	6/23/2011	5,029.20	46.80	4,982.40	
	08N21W36G02S	6/23/2011	4,922.00	20.00	4,902.00	
Second Measure	08N21W33R03S	12/15/2011	5,150.00	NM	-----	Special
	08N21W35B01S	12/15/2011	5,029.20	NM	-----	Special
	08N21W36G02S	12/15/2011	4,922.00	NM	-----	Special

Mound	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N22W08P01S	3/16/2011	213.79	159.90	53.89	
	02N22W09L03S	3/14/2011	251.25	187.50	63.75	
	02N22W09L04S	3/14/2011	251.25	162.70	88.55	
	02N22W16K01S	3/14/2011	149.40	118.00	31.40	
	02N23W13K03S	3/14/2011	68.71	NM	-----	Inaccessible
Second Measure	02N22W08P01S	6/8/2011	213.79	148.30	65.49	
	02N22W09L03S	6/8/2011	251.25	187.50	63.75	
	02N22W09L04S	6/8/2011	251.25	161.30	89.95	
	02N22W16K01S	6/8/2011	149.37	107.22	42.15	
	02N23W13K03S	6/8/2011	68.71	60.14	8.57	
Third Measure	02N22W08P01S	9/23/2011	213.79	146.00	67.79	
	02N22W09L03S	9/8/2011	251.25	187.20	64.05	
	02N22W09L04S	9/8/2011	251.25	161.20	90.05	
	02N22W16K01S	9/8/2011	149.37	115.10	34.27	
	02N23W13K03S	9/1/2011	68.71	65.05	3.66	

Appendix C – Groundwater Level Measurement Data

Mound	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	02N22W08P01S	12/6/2011	213.79	146.00	67.79	
	02N22W09L03S	12/6/2011	251.25	188.40	62.85	
	02N22W16K01S	12/6/2011	149.37	112.10	37.27	
	02N23W13K03S	12/6/2011	68.71	58.60	10.11	

Ojai Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	04N22W04Q01S	3/29/2011	1,045.50	157.10	888.40	
	04N22W05D03S	3/29/2011	896.00	102.20	793.80	
	04N22W05H04S	3/29/2011	950.20	154.10	796.10	
	04N22W05L08S	3/29/2011	892.10	NM	-----	Pumping
	04N22W05M01S	3/29/2011	843.50	52.90	790.60	
	04N22W06D01S	3/29/2011	846.66	25.50	821.16	
	04N22W06D05S	3/29/2011	853.21	32.80	820.41	
	04N22W06K03S	3/30/2011	801.80	30.00	771.80	
	04N22W06K12S	3/29/2011	812.70	30.10	782.60	
	04N22W06M01S	3/29/2011	794.80	8.80	786.00	
	04N22W07B02S	3/29/2011	773.80	9.15	764.65	
	04N22W07G01S	3/29/2011	771.20	6.70	764.50	
	04N22W08B02S	3/29/2011	870.57	73.30	797.27	
	04N23W01K02S	3/22/2011	786.40	2.92	783.48	
	04N23W02K01S	3/29/2011	869.50	1.50	868.00	
	04N23W12H02S	3/29/2011	716.61	20.00	696.61	
	04N23W12L02S	3/10/2011	682.50	8.10	674.40	
	05N22W32J02S	3/29/2011	1,139.80	53.00	1,086.80	
Second Measure	04N22W04Q01S	6/29/2011	1,045.50	NM	-----	Pumping
	04N22W05D03S	6/23/2011	895.97	97.60	798.37	
	04N22W05H04S	6/23/2011	950.22	138.50	811.72	
	04N22W05L08S	6/23/2011	892.09	94.27	797.82	
	04N22W05M01S	6/23/2011	843.47	85.80	757.67	
	04N22W06D01S	6/23/2011	846.66	32.00	814.66	
	04N22W06D05S	6/20/2011	853.21	41.90	811.31	
	04N22W06K03S	7/8/2011	801.80	71.30	730.50	
	04N22W06K12S	6/29/2011	812.70	50.00	762.70	
	04N22W06M01S	6/20/2011	794.78	12.10	782.68	
	04N22W07B02S	6/23/2011	773.77	33.10	740.67	
	04N22W07G01S	6/20/2011	771.20	8.50	762.70	
	04N22W08B02S	6/29/2011	870.57	70.10	800.47	
	04N23W01K02S	6/23/2011	786.38	10.36	776.02	
	04N23W02K01S	6/20/2011	869.49	2.50	866.99	
	04N23W12H02S	6/23/2011	716.61	19.50	697.11	
	04N23W12L02S	6/23/2011	682.50	9.90	672.60	
	05N22W32J02S	6/23/2011	1,139.80	106.90	1,032.90	

Appendix C – Groundwater Level Measurement Data

Ojai Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Third Measure	04N22W04Q01S	9/15/2011	1,045.50	94.75	950.75	
	04N22W05D03S	9/14/2011	895.97	133.35	762.62	
	04N22W05H04S	9/14/2011	950.22	175.00	775.22	
	04N22W05L08S	9/20/2011	892.09	93.60	798.49	
	04N22W05M01S	9/20/2011	843.47	86.00	757.47	
	04N22W06D01S	9/14/2011	846.66	69.00	777.66	
	04N22W06D05S	9/13/2011	853.21	83.00	770.21	
	04N22W06K03S	10/5/2011	801.80	82.00	719.80	
	04N22W06K12S	9/14/2011	812.70	94.70	718.00	
	04N22W06M01S	9/13/2011	794.78	40.10	754.68	
	04N22W07B02S	10/13/2011	773.77	53.00	720.77	
	04N22W07C05S	9/15/2011	763.40	64.33	699.07	
	04N22W07G01S	9/15/2011	771.20	18.30	752.90	
	04N22W08B02S	9/20/2011	870.57	97.70	772.87	
	04N23W01K02S	9/15/2011	786.40	18.18	768.22	
	04N23W02K01S	9/13/2011	869.49	2.95	866.54	
	04N23W12H02S	9/27/2011	716.61	25.10	691.51	
	04N23W12L02S	9/14/2011	682.50	NM	-----	Tape Hung Up
	05N22W32J02S	10/13/2011	1,139.80	58.70	1,081.10	
Fourth Measure	04N22W04Q01S	12/19/2011	1,045.50	90.47	955.03	
	04N22W05D03S	12/19/2011	895.97	141.80	754.17	
	04N22W05H04S	12/19/2011	950.22	184.60	765.62	
	04N22W05L08S	12/19/2011	892.09	133.00	759.09	
	04N22W05M01S	12/21/2011	843.47	92.50	750.97	
	04N22W06D01S	12/14/2011	846.66	76.10	770.56	
	04N22W06D05S	12/14/2011	853.21	86.20	767.01	
	04N22W06K03S	11/30/2011	801.80	67.00	734.80	
	04N22W06K12S	12/19/2011	812.70	77.50	735.20	
	04N22W06M01S	12/14/2011	794.78	45.70	749.08	
	04N22W07B02S	12/14/2011	773.77	52.00	721.77	
	04N22W07G01S	12/14/2011	771.20	25.20	746.00	
	04N22W08B02S	12/19/2011	870.57	100.00	770.57	
	04N23W01K02S	12/14/2011	786.38	17.40	768.98	
	04N23W02K01S	12/14/2011	869.49	2.47	867.02	
	04N23W12H02S	12/19/2011	716.61	NM	-----	Special
	04N23W12L02S	12/19/2011	682.50	10.65	671.85	
	05N22W32J02S	12/19/2011	1,139.80	59.00	1,080.80	

Oxnard Plain Forebay	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N21W07P04S	3/7/2011	138.78	NM	-----	Pumping
	02N22W11A01S	3/9/2011	133.40	37.90	95.50	
	02N22W26E01S	3/16/2011	87.10	46.48	40.62	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Forebay	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	02N21W07P04S	6/29/2011	138.78	120.75	18.03	
	02N22W11A01S	6/7/2011	133.44	36.19	97.25	
	02N22W26E01S	6/14/2011	86.96	37.80	49.16	
Third Measure	02N21W07P04S	9/19/2011	138.78	119.80	18.98	
	02N22W11A01S	9/23/2011	133.44	55.67	77.77	
	02N22W26E01S	9/12/2011	86.96	43.95	43.01	
Fourth Measure	02N21W07P04S	12/27/2011	138.78	NM	-----	Pumping
	02N22W11A01S	12/5/2011	133.44	52.80	80.64	
	02N22W26E01S	12/7/2011	86.96	39.00	47.96	

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N21W04N02S	3/15/2011	43.33	75.13	-31.80	
	01N21W05A02S	3/15/2011	51.54	16.59	34.95	
	01N21W06L04S	3/14/2011	47.85	22.70	25.15	
	01N21W07H01S	3/14/2011	40.87	19.05	21.82	
	01N21W09C04S	3/15/2011	39.96	74.01	-34.05	
	01N21W16M01S	3/15/2011	22.79	60.14	-37.35	
	01N21W16P03S	3/15/2011	19.39	54.50	-35.11	
	01N21W17D02S	3/15/2011	28.21	14.44	13.77	
	01N21W20N07S	3/14/2011	16.98	NM	-----	Special
	01N21W21N01S	3/14/2011	15.70	34.00	-18.30	
	01N21W28D01S	3/14/2011	14.75	43.40	-28.65	
	01N21W29B03S	3/31/2011	18.20	10.52	7.68	
	01N21W32K01S	3/21/2011	10.00	35.00	-25.00	
	01N22W12N03S	3/16/2011	38.46	52.43	-13.97	
	01N22W12R01S	3/15/2011	34.00	47.95	-13.95	
	01N22W14K01S	3/15/2011	34.00	15.20	18.80	
	01N22W21B03S	3/15/2011	15.30	8.27	7.03	
	01N22W24C02S	3/15/2011	29.10	15.39	13.71	
	01N22W26K03S	3/15/2011	13.06	34.90	-21.84	
	01N22W26M03S	3/15/2011	13.00	31.00	-18.00	
	01N22W36B02S	3/15/2011	11.50	30.00	-18.50	
	02N21W18H03S	3/15/2011	118.41	49.50	68.91	
	02N21W18H12S	3/15/2011	117.88	NM	-----	Pumping
	02N21W19A03S	3/2/2011	102.70	50.80	51.90	
	02N21W19B02S	3/15/2011	101.80	43.00	58.80	
	02N21W20F02S	3/2/2011	113.36	90.00	23.36	
	02N21W20M06S	3/15/2011	92.09	96.30	-4.21	
	02N21W31P02S	3/14/2011	57.80	23.00	34.80	
	02N21W31P03S	3/14/2011	55.17	83.30	-28.13	
	02N22W24P01S	3/16/2011	94.30	45.50	48.80	
	02N22W30K01S	3/14/2011	42.38	20.40	21.98	
	02N22W31A01S	3/14/2011	42.30	19.00	23.30	
	02N22W32Q03S	3/16/2011	40.10	17.66	22.44	
	02N23W25G02S	3/14/2011	23.22	3.90	19.32	
	02N23W36C04S	3/14/2011	27.73	9.00	18.73	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	01N21W04N02S	6/8/2011	43.33	83.42	-40.09	
	01N21W05A02S	6/8/2011	51.54	14.05	37.49	
	01N21W06L04S	6/8/2011	47.85	18.70	29.15	
	01N21W07H01S	6/8/2011	40.87	17.12	23.75	
	01N21W09C04S	6/14/2011	39.96	80.30	-40.34	
	01N21W16M01S	6/8/2011	22.79	67.00	-44.21	
	01N21W16P03S	6/8/2011	19.39	72.00	-52.61	
	01N21W17D02S	6/8/2011	28.21	11.16	17.05	
	01N21W20N07S	6/8/2011	16.98	NM	-----	Special
	01N21W21N01S	6/8/2011	15.74	41.34	-25.60	
	01N21W28D01S	6/8/2011	14.75	55.22	-40.47	
	01N21W29B03S	6/8/2011	18.19	14.17	4.02	
	01N21W32K01S	6/6/2011	10.00	45.00	-35.00	
	01N22W12N03S	6/8/2011	38.46	55.00	-16.54	
	01N22W12R01S	6/17/2011	34.00	47.70	-13.70	
	01N22W14K01S	6/8/2011	33.97	12.60	21.37	
	01N22W21B03S	6/8/2011	15.28	6.41	8.87	
	01N22W24C02S	6/8/2011	29.10	14.40	14.70	
	01N22W26K03S	6/8/2011	13.06	40.79	-27.73	
	01N22W26M03S	6/8/2011	13.00	38.40	-25.40	
	01N22W36B02S	6/8/2011	11.50	36.35	-24.85	
	02N21W18H03S	6/9/2011	118.41	34.00	84.41	
	02N21W18H12S	6/9/2011	117.88	87.80	30.08	
	02N21W19A03S	6/30/2011	102.70	63.00	39.70	
	02N21W19B02S	6/9/2011	101.80	25.60	76.20	
	02N21W20F02S	6/28/2011	113.36	111.80	1.56	
	02N21W20M06S	6/14/2011	92.09	95.13	-3.04	
	02N21W31P02S	6/8/2011	57.75	17.61	40.14	
	02N21W31P03S	6/8/2011	55.17	82.55	-27.38	
	02N22W24P01S	6/14/2011	94.30	39.80	54.50	
	02N22W30K01S	6/8/2011	42.38	16.95	25.43	
	02N22W31A01S	6/8/2011	42.30	15.25	27.05	
	02N22W32Q03S	6/17/2011	40.10	12.49	27.61	
	02N23W25G02S	6/8/2011	23.22	-0.10	23.32	Flowing
	02N23W36C04S	6/8/2011	27.73	5.90	21.83	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Third Measure	01N21W04N02S	9/6/2011	43.33	96.01	-52.68	
	01N21W05A02S	8/31/2011	51.54	12.00	39.54	
	01N21W06L04S	8/31/2011	47.85	21.14	26.71	
	01N21W07H01S	8/31/2011	40.87	19.90	20.97	
	01N21W09C04S	9/6/2011	39.96	NM	-----	Special
	01N21W16M01S	8/31/2011	22.79	89.89	-67.10	
	01N21W16P03S	8/31/2011	19.39	81.50	-62.11	
	01N21W17D02S	8/31/2011	28.21	13.68	14.53	
	01N21W20N07S	8/31/2011	16.98	NM	-----	Special
	01N21W21N01S	9/6/2011	15.74	50.66	-34.92	
	01N21W28D01S	9/6/2011	14.75	69.97	-55.22	
	01N21W29B03S	8/31/2011	18.19	13.80	4.39	
	01N21W32K01S	9/5/2011	10.00	58.00	-48.00	
	01N22W12N03S	9/1/2011	38.46	57.83	-19.37	
	01N22W12R01S	9/6/2011	34.00	50.38	-16.38	
	01N22W14K01S	9/1/2011	33.97	15.44	18.53	
	01N22W21B03S	8/31/2011	15.28	8.80	6.48	
	01N22W24C02S	9/1/2011	29.10	17.22	11.88	
	01N22W26K03S	9/1/2011	13.06	59.10	-46.04	
	01N22W26M03S	8/31/2011	13.00	NM	-----	Pumping
	01N22W36B02S	8/31/2011	11.50	53.50	-42.00	
	02N21W18H03S	9/13/2011	118.41	50.30	68.11	
	02N21W18H12S	9/13/2011	117.88	NM	-----	Pumping
	02N21W19A03S	9/16/2011	102.70	75.00	27.70	
	02N21W19B02S	9/12/2011	101.80	38.50	63.30	
	02N21W20F02S	10/12/2011	113.36	119.00	-5.64	
	02N21W20M06S	9/12/2011	92.09	105.59	-13.50	
	02N21W31P02S	8/31/2011	57.75	20.50	37.25	
	02N21W31P03S	8/31/2011	55.17	102.56	-47.39	
	02N22W24P01S	9/13/2011	94.30	50.36	43.94	
	02N22W30K01S	9/1/2011	42.38	19.82	22.56	
	02N22W31A01S	9/1/2011	42.30	17.20	25.10	
	02N22W32Q03S	9/1/2011	40.10	14.80	25.30	
	02N23W25G02S	9/1/2011	23.22	2.28	20.94	
	02N23W36C04S	9/1/2011	27.73	7.51	20.22	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	01N21W04N02S	12/6/2011	43.33	82.00	-38.67	
	01N21W05A02S	12/6/2011	51.54	13.80	37.74	
	01N21W06L04S	12/6/2011	47.85	17.90	29.95	
	01N21W07H01S	12/6/2011	40.87	15.50	25.37	
	01N21W09C04S	12/6/2011	39.96	NM	-----	Special
	01N21W16M01S	12/6/2011	22.79	72.45	-49.66	
	01N21W16P03S	12/6/2011	19.39	61.49	-42.10	
	01N21W17D02S	12/7/2011	28.21	10.22	17.99	
	01N21W20N07S	12/6/2011	16.98	NM	-----	Special
	01N21W21N01S	12/6/2011	15.74	47.68	-31.94	
	01N21W28D01S	12/6/2011	14.75	51.95	-37.20	
	01N21W29B03S	12/6/2011	18.19	12.70	5.49	
	01N21W32K01S	12/5/2011	10.00	44.00	-34.00	
	01N22W12N03S	12/7/2011	38.46	54.50	-16.04	
	01N22W12R01S	12/7/2011	34.00	48.10	-14.10	
	01N22W14K01S	12/6/2011	33.97	11.40	22.57	
	01N22W21B03S	12/6/2011	15.28	6.40	8.88	
	01N22W24C02S	12/6/2011	29.10	13.67	15.43	
	01N22W26K03S	12/7/2011	13.06	43.90	-30.84	
	01N22W26M03S	12/6/2011	13.00	NM	-----	Pumping
	01N22W36B02S	12/6/2011	11.50	45.26	-33.76	
	02N21W18H03S	12/7/2011	118.41	NM	-----	Pumping
	02N21W18H12S	12/7/2011	117.88	NM	-----	Pumping
	02N21W19A03S	12/19/2011	102.70	55.80	46.90	
	02N21W19B02S	12/7/2011	101.80	35.70	66.10	
	02N21W20F02S	12/19/2011	113.36	NM	-----	Special
	02N21W20M06S	12/7/2011	92.09	NM	-----	Pumping
	02N21W31P02S	12/6/2011	57.75	18.00	39.75	
	02N21W31P03S	12/6/2011	55.17	109.20	-54.03	
	02N22W24P01S	12/7/2011	94.30	45.14	49.16	
	02N22W30K01S	12/6/2011	42.38	17.17	25.21	
	02N22W31A01S	12/6/2011	42.30	14.50	27.80	
	02N22W32Q03S	12/6/2011	40.10	NM	-----	Pumping
	02N23W25G02S	12/6/2011	23.22	-0.10	23.32	Flowing
	02N23W36C04S	12/6/2011	27.73	5.33	22.40	

Piru	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	04N18W19R01S	3/9/2011	655.50	81.90	573.60	
	04N18W20R01S	3/9/2011	661.30	64.90	596.40	
	04N18W28C02S	3/9/2011	676.40	85.83	590.57	
	04N19W25C02S	3/9/2011	611.10	64.90	546.20	
	04N19W25K04S	3/17/2011	593.97	38.00	555.97	
	04N19W26P01S	3/9/2011	563.00	30.28	532.72	
	04N19W34K01S	3/17/2011	519.50	9.24	510.26	
	04N19W35L02S	3/9/2011	541.10	14.80	526.30	

Appendix C – Groundwater Level Measurement Data

Piru	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	04N18W19R01S	6/7/2011	655.63	65.14	590.49	
	04N18W20R01S	6/15/2011	661.29	48.60	612.69	
	04N18W28C02S	6/7/2011	676.44	NM	-----	Pumping
	04N19W25C02S	6/7/2011	611.09	54.80	556.29	
	04N19W25K04S	6/7/2011	593.97	37.50	556.47	
	04N19W26P01S	6/7/2011	563.00	25.74	537.26	
	04N19W34K01S	6/15/2011	519.51	7.33	512.18	
	04N19W35L02S	6/7/2011	541.08	10.09	530.99	
Third Measure	04N18W19R01S	9/8/2011	655.63	81.10	574.53	
	04N18W20R01S	9/8/2011	661.29	61.00	600.29	
	04N18W28C02S	9/7/2011	676.44	NM	-----	Pumping
	04N19W25C02S	9/7/2011	611.09	64.75	546.34	
	04N19W25K04S	9/29/2011	593.97	37.00	556.97	
	04N19W26P01S	9/7/2011	563.00	NM	-----	Pumping
	04N19W34K01S	9/8/2011	519.51	9.46	510.05	
	04N19W35L02S	9/7/2011	541.08	13.66	527.42	
Fourth Measure	04N18W19R01S	12/5/2011	655.63	NM	-----	Pumping
	04N18W20R01S	12/5/2011	661.29	63.30	597.99	
	04N18W28C02S	12/5/2011	676.44	86.80	589.64	
	04N19W25C02S	12/5/2011	611.09	64.20	546.89	
	04N19W25K04S	12/5/2011	593.97	NM	-----	Pumping
	04N19W26P01S	12/5/2011	563.00	NM	-----	Pumping
	04N19W34K01S	12/5/2011	519.51	7.10	512.41	
	04N19W35L02S	12/5/2011	541.08	9.06	532.02	

Pleasant Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N20W06C01S	3/14/2011	125.87	48.40	77.47	
	01N21W02J02S	3/14/2011	89.51	53.10	36.41	
	01N21W02P01S	3/14/2011	67.98	70.16	-2.18	
	01N21W03C01S	3/14/2011	72.30	102.20	-29.90	
	01N21W04K01S	3/15/2011	47.52	75.06	-27.54	
	01N21W09J03S	3/31/2011	30.56	53.10	-22.54	
	01N21W10G01S	3/14/2011	38.72	66.10	-27.38	
	01N21W14A01S	3/14/2011	50.11	10.00	40.11	
	01N21W15H01S	3/14/2011	33.17	1.47	31.70	
	01N21W16A04S	3/14/2011	25.69	68.20	-42.51	
	02N20W19M05S	3/15/2011	200.47	113.95	86.52	
	02N20W28G02S	3/15/2011	170.60	NM	-----	Special
	02N21W33P02S	3/14/2011	64.63	55.80	8.83	
	02N21W35M02S	3/14/2011	90.60	124.00	-33.40	
	02N21W36N01S	3/14/2011	111.18	65.95	45.23	

Appendix C – Groundwater Level Measurement Data

Pleasant Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	01N20W06C01S	6/9/2011	125.87	47.00	78.87	
	01N21W02J02S	6/9/2011	89.51	52.90	36.61	
	01N21W02P01S	6/9/2011	67.98	75.28	-7.30	
	01N21W03C01S	6/9/2011	72.28	98.27	-25.99	
	01N21W04K01S	6/9/2011	47.52	82.23	-34.71	
	01N21W09J03S	6/17/2011	30.56	62.95	-32.39	
	01N21W10G01S	6/9/2011	38.72	75.63	-36.91	
	01N21W14A01S	6/9/2011	50.11	7.80	42.31	
	01N21W15H01S	6/9/2011	33.17	0.50	32.67	
	01N21W16A04S	6/9/2011	25.69	67.50	-41.81	
	02N20W19M05S	6/9/2011	200.47	97.15	103.32	
	02N20W28G02S	6/9/2011	170.60	NM	-----	Special
	02N21W33P02S	6/8/2011	64.63	56.45	8.18	
	02N21W35M02S	6/9/2011	90.60	NM	-----	Pumping
	02N21W36N01S	6/9/2011	111.18	55.50	55.68	
Third Measure	01N20W06C01S	9/1/2011	125.87	63.80	62.07	
	01N21W02J02S	8/31/2011	89.51	60.86	28.65	
	01N21W02P01S	8/31/2011	67.98	86.90	-18.92	
	01N21W03C01S	8/31/2011	72.28	99.80	-27.52	
	01N21W04K01S	8/31/2011	47.52	93.80	-46.28	
	01N21W09J03S	9/23/2011	30.56	85.53	-54.97	
	01N21W10G01S	9/6/2011	38.72	103.81	-65.09	
	01N21W14A01S	9/6/2011	50.11	8.70	41.41	
	01N21W15H01S	9/6/2011	33.17	1.05	32.12	
	01N21W16A04S	9/6/2011	25.69	85.60	-59.91	
	02N20W19M05S	9/9/2011	200.47	113.20	87.27	
	02N21W33P02S	8/31/2011	64.63	61.10	3.53	
	02N21W35M02S	8/31/2011	90.60	119.40	-28.80	
	02N21W36N01S	8/31/2011	111.18	68.00	43.18	
Fourth Measure	01N20W06C01S	12/7/2011	125.87	45.27	80.60	
	01N21W02J02S	12/7/2011	89.51	59.80	29.71	
	01N21W02P01S	12/7/2011	67.98	75.00	-7.02	
	01N21W03C01S	12/7/2011	72.28	98.10	-25.82	
	01N21W04K01S	12/6/2011	47.52	80.00	-32.48	
	01N21W09J03S	12/7/2011	30.56	63.10	-32.54	
	01N21W10G01S	12/7/2011	38.72	71.12	-32.40	
	01N21W14A01S	12/7/2011	50.11	9.06	41.05	
	01N21W15H01S	12/7/2011	33.17	1.78	31.39	
	01N21W16A04S	12/7/2011	25.69	62.80	-37.11	
	02N20W19M05S	12/7/2011	200.47	110.86	89.61	
	02N20W28G02S	12/7/2011	170.60	NM	-----	Special
	02N21W33P02S	12/6/2011	64.63	59.20	5.43	
	02N21W35M02S	12/7/2011	90.60	118.70	-28.10	
	02N21W36N01S	12/7/2011	111.18	62.90	48.28	

Appendix C – Groundwater Level Measurement Data

Santa Paula	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N22W02C01S	3/9/2011	184.38	NM	-----	Special
	02N22W03K02S	3/14/2011	248.75	115.40	133.35	
	02N22W03M02S	3/14/2011	291.50	189.00	102.50	
	03N21W09K02S	3/9/2011	362.18	NM	-----	Special
	03N21W17Q01S	3/9/2011	283.35	99.00	184.35	
	03N21W19R01S	3/9/2011	235.39	55.80	179.59	
	03N21W30F01S	3/9/2011	221.21	59.10	162.11	
	03N22W34R01S	3/14/2011	266.61	117.20	149.41	
	03N22W36K05S	3/9/2011	180.89	24.80	156.09	
Second Measure	02N22W02C01S	6/7/2011	184.38	NM	-----	Special
	02N22W03K02S	6/7/2011	248.75	115.19	133.56	
	02N22W03M02S	6/7/2011	291.50	186.40	105.10	
	03N21W09K02S	6/15/2011	362.18	168.56	193.62	
	03N21W17Q01S	6/7/2011	283.35	100.00	183.35	
	03N21W19R01S	6/7/2011	235.39	NM	-----	Special
	03N21W30F01S	6/7/2011	221.21	NM	-----	Special
	03N22W34R01S	6/7/2011	266.61	NM	-----	Special
	03N22W36K05S	6/7/2011	180.89	27.04	153.85	
Third Measure	02N22W02C01S	9/8/2011	184.38	38.50	145.88	
	02N22W03K02S	9/8/2011	248.75	117.95	130.80	
	02N22W03M02S	9/8/2011	291.50	187.80	103.70	
	03N21W09K02S	9/29/2011	362.18	175.43	186.75	
	03N21W17Q01S	9/8/2011	283.35	104.50	178.85	
	03N21W19R01S	9/8/2011	235.39	NM	-----	Pumping
	03N22W36K05S	9/8/2011	180.89	34.90	145.99	
Fourth Measure	02N22W02C01S	12/5/2011	184.38	32.80	151.58	
	02N22W03K02S	12/6/2011	248.75	115.65	133.10	
	02N22W03M02S	12/6/2011	291.50	187.65	103.85	
	03N21W09K02S	12/5/2011	362.18	NM	-----	Pumping
	03N21W17Q01S	12/5/2011	283.35	103.90	179.45	
	03N21W19R01S	12/5/2011	235.39	62.40	172.99	
	03N22W36K05S	12/5/2011	180.89	26.95	153.94	

Sherwood	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W19L02S	3/1/2011	1,082.00	254.90	827.10	
	01N19W30A01S	3/1/2011	1,000.00	31.50	968.50	
Second Measure	01N19W19L02S	6/16/2011	1,082.00	197.20	884.80	
	01N19W30A01S	6/16/2011	999.98	23.20	976.78	
Third Measure	01N19W19L02S	9/22/2011	1,082.00	226.90	855.10	
	01N19W30A01S	9/19/2011	999.98	31.50	968.48	

Appendix C – Groundwater Level Measurement Data

Sherwood	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	01N19W19L02S	12/20/2011	1,082.00	219.50	862.50	
	01N19W30A01S	12/20/2011	999.98	30.90	969.08	

Simi Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N18W04R02S	3/11/2011	870.00	48.00	822.00	
	02N18W10A02S	3/11/2011	926.00	75.60	850.80	
Second Measure	02N18W04R02S	6/9/2011	870.00	49.45	820.55	
	02N18W10A02S	6/9/2011	926.40	80.00	846.40	
Third Measure	02N18W04R02S	9/9/2011	870.00	50.15	819.85	
	02N18W10A02S	9/9/2011	926.40	82.00	844.40	
Fourth Measure	02N18W10A02S	12/1/2011	926.40	72.00	854.40	
	02N18W04R02S	12/8/2011	870.00	46.90	823.10	

Thousand Oaks	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W14K04S	3/1/2011	908.80	21.93	886.87	
Second Measure	01N19W14K04S	6/16/2011	908.79	18.05	890.74	
Third Measure	01N19W14K04S	9/19/2011	908.79	22.70	886.09	
Fourth Measure	01N19W14K04S	12/20/2011	908.79	NM	-----	Inaccessible

Tierra Rejada	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N19W10R01S	3/11/2011	619.29	97.90	521.39	
	02N19W12M03S	3/11/2011	719.00	88.00	631.00	
	02N19W14P01S	3/11/2011	678.10	27.80	650.30	
Second Measure	02N19W10R01S	6/9/2011	619.29	93.00	526.29	
	02N19W12M03S	6/9/2011	718.95	84.60	634.35	
	02N19W14P01S	6/9/2011	678.12	26.42	651.70	
Third Measure	02N19W10R01S	9/9/2011	619.29	95.89	523.40	
	02N19W12M03S	9/9/2011	718.95	84.59	634.36	
	02N19W14P01S	9/9/2011	678.12	29.37	648.75	
Fourth Measure	02N19W10R01S	12/8/2011	619.29	94.30	524.99	
	02N19W12M03S	12/8/2011	718.95	84.50	634.45	
	02N19W14P01S	12/8/2011	678.12	30.20	647.92	

Appendix C – Groundwater Level Measurement Data

Undefined	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W15E01S	3/1/2011	903.60	18.80	884.80	
	01N20W24H02S	3/1/2011	1,126.50	102.00	1,024.50	
	02N21W13A01S	3/3/2011	440.00	522.20	-82.20	
	04N22W22K01S	3/30/2011	2,400.00	238.70	2,161.30	
Second Measure	01N19W15E01S	6/16/2011	903.53	18.80	884.73	
	01N20W24H02S	6/16/2011	1,126.54	82.80	1,043.74	
	02N21W13A01S	6/28/2011	440.00	522.20	-82.20	
Third Measure	01N19W15E01S	9/19/2011	903.53	23.00	880.53	
	01N20W24H02S	9/19/2011	1,126.54	90.80	1,035.74	
	02N21W13A01S	10/12/2011	440.00	526.90	-86.90	
Fourth Measure	02N21W13A01S	12/15/2011	440.00	536.09	-96.09	
	04N22W21F01S	12/15/2011	2,570.00	NM	-----	Special
	04N22W22K01S	12/15/2011	2,400.00	NM	-----	Special
	01N19W15E01S	12/20/2011	903.53	NM	-----	Special
	01N20W24H02S	12/20/2011	1,126.54	99.60	1,026.94	

Upper Ojai	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	04N22W09Q02S	3/8/2011	1,278.80	16.50	1,262.30	
	04N22W10K02S	3/8/2011	1,325.90	15.80	1,310.10	
	04N22W11P02S	3/8/2011	1,420.60	8.60	1,412.00	
	04N22W12F04S	3/30/2011	1,616.90	115.10	1,501.80	
Second Measure	04N22W09Q02S	6/29/2011	1,278.80	14.95	1,263.85	
	04N22W10K02S	6/29/2011	1,325.90	24.10	1,301.80	
	04N22W11P02S	6/29/2011	1,420.60	12.45	1,408.15	
	04N22W12F04S	6/29/2011	1,616.90	NM	-----	Pumping
Third Measure	04N22W09Q02S	9/15/2011	1,278.80	17.75	1,261.05	
	04N22W10K02S	9/15/2011	1,325.90	15.50	1,310.40	
	04N22W11P02S	9/15/2011	1,420.60	18.16	1,402.44	
	04N22W12F04S	9/15/2011	1,616.90	NM	-----	Pumping
Fourth Measure	04N22W09Q02S	12/19/2011	1,278.80	NM	-----	Inaccessible
	04N22W10K02S	12/19/2011	1,325.90	22.08	1,303.82	
	04N22W11P02S	12/19/2011	1,420.60	17.74	1,402.86	
	04N22W12F04S	12/19/2011	1,616.90	139.40	1,477.50	

Appendix C – Groundwater Level Measurement Data

Lower Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N23W08B07S	3/4/2011	239.20	13.50	225.70	
Second Measure	03N23W08B07S	6/20/2011	239.19	14.00	225.19	
Third Measure	03N23W08B07S	9/13/2011	239.19	14.90	224.29	
Fourth Measure	03N23W08B07S	12/13/2011	239.19	14.90	224.29	

Upper Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N23W05B01S	3/4/2011	293.20	23.20	270.00	
	03N23W08B02S	3/8/2011	249.30	15.10	234.20	
	04N23W03M01S	3/10/2011	760.80	87.10	673.70	
	04N23W04J01S	3/10/2011	713.00	40.10	672.90	
	04N23W09B01S	3/8/2011	662.30	16.30	646.00	
	04N23W14M04S	3/10/2011	554.50	-----	554.60	Flowing
	04N23W15A02S	3/10/2011	680.90	86.50	594.40	
	04N23W15D02S	3/8/2011	634.30	103.10	531.20	
	04N23W16C04S	3/8/2011	569.10	23.00	546.10	
	04N23W16P01S	3/8/2011	619.89	67.10	552.79	
	04N23W20A01S	3/8/2011	488.90	NM	-----	Special
	04N23W28G01S	3/10/2011	402.40	9.10	393.30	
	04N23W29F02S	3/8/2011	396.50	12.80	383.70	
	04N23W33M03S	3/8/2011	331.80	13.45	318.35	
	04N24W13J04S	3/8/2011	626.40	6.40	620.00	
	04N24W13N01S	3/8/2011	642.10	-----	642.20	Flowing
	05N23W33B03S	3/10/2011	829.00	22.55	806.45	
	05N23W33G01S	3/10/2011	816.20	20.10	796.10	
Second Measure	03N23W05B01S	6/20/2011	293.20	22.80	270.40	
	03N23W08B02S	6/20/2011	249.30	15.00	234.30	
	04N23W03M01S	6/20/2011	760.85	86.30	674.55	
	04N23W04J01S	6/20/2011	713.04	42.00	671.04	
	04N23W09B01S	6/20/2011	662.30	15.45	646.85	
	04N23W14M04S	6/23/2011	554.50	-----	554.60	Flowing
	04N23W15A02S	6/21/2011	680.90	NM	-----	Pumping
	04N23W15D02S	6/20/2011	634.30	93.20	541.10	
	04N23W16C04S	6/20/2011	569.10	22.70	546.40	
	04N23W16P01S	6/20/2011	619.89	64.50	555.39	
	04N23W20A01S	6/20/2011	488.89	8.05	480.84	
	04N23W28G01S	6/23/2011	402.37	8.70	393.67	
	04N23W29F02S	6/20/2011	396.58	11.58	385.00	
	04N23W33M03S	6/20/2011	331.80	13.30	318.50	
	04N24W13J04S	6/20/2011	626.45	6.67	619.78	
	04N24W13N01S	6/20/2011	642.12	-----	642.22	Flowing
	05N23W33B03S	6/21/2011	829.00	23.90	805.10	
	05N23W33G01S	6/20/2011	816.21	20.75	795.46	

Appendix C – Groundwater Level Measurement Data

Upper Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Third Measure	03N23W05B01S	9/13/2011	293.20	25.75	267.45	
	03N23W08B02S	9/13/2011	249.30	16.40	232.90	
	04N23W03M01S	9/20/2011	760.85	94.50	666.35	
	04N23W04J01S	9/20/2011	713.04	63.10	649.94	
	04N23W09B01S	9/20/2011	662.30	43.70	618.60	
	04N23W14M04S	9/14/2011	554.50	-----	554.60	Flowing
	04N23W15A02S	9/15/2011	680.90	85.40	595.50	
	04N23W15D02S	9/13/2011	634.30	104.85	529.45	
	04N23W16C04S	9/13/2011	569.10	40.80	528.30	
	04N23W16P01S	9/13/2011	619.89	65.20	554.69	
	04N23W20A01S	9/13/2011	488.89	13.15	475.74	
	04N23W28G01S	9/14/2011	402.37	11.20	391.17	
	04N23W29F02S	9/13/2011	396.58	19.20	377.38	
	04N23W33M03S	9/13/2011	331.80	13.75	318.05	
	04N24W13J04S	9/13/2011	626.45	7.60	618.85	
	04N24W13N01S	9/13/2011	642.12	-----	642.22	Flowing
	05N23W33B03S	9/20/2011	829.00	26.50	802.50	
	05N23W33G01S	9/20/2011	816.21	21.90	794.31	
Fourth Measure	03N23W05B01S	12/13/2011	293.20	27.90	265.30	
	03N23W08B02S	12/13/2011	249.30	16.55	232.75	
	04N23W03M01S	12/21/2011	760.85	96.10	664.75	
	04N23W04J01S	12/21/2011	713.04	NM	-----	Pumping
	04N23W09B01S	12/21/2011	662.30	33.00	629.30	
	04N23W14M04S	12/19/2011	554.50	-----	554.60	Flowing
	04N23W15A02S	12/14/2011	680.90	83.60	597.30	
	04N23W15D02S	12/14/2011	634.30	117.00	517.30	
	04N23W16C04S	12/14/2011	569.10	45.51	523.59	
	04N23W16P01S	12/14/2011	619.89	66.28	553.61	
	04N23W20A01S	12/13/2011	488.89	21.50	467.39	
	04N23W28G01S	12/19/2011	402.37	12.10	390.27	
	04N23W29F02S	12/13/2011	396.58	29.50	367.08	
	04N23W33M03S	12/13/2011	331.80	14.20	317.60	
	04N24W13J04S	12/14/2011	626.45	6.83	619.62	
	04N24W13N01S	12/14/2011	642.12	-----	642.22	Flowing
	05N23W33B03S	12/21/2011	829.00	NM	-----	Pumping
	05N23W33G01S	12/21/2011	816.21	21.65	794.56	

Appendix D – Water Quality Section

TABLES — Page

FIGURES — Page

PIPER AND STIFF DIAGRAMS

General Minerals

Constituents

B – Boron (mg/l)
HCO_3^- – Bicarbonate (mg/l)
Ca – Calcium (mg/l)
Cu – Copper (µg/l)
CO_3^{2-} – Carbonate (mg/l)
Cl^- – Chloride (mg/l)
eC – Electrical Conductivity *(µmhos/cm)*
F^- – Fluoride (mg/l)
Fe – Iron (µg/l)
K – Potassium (mg/l)
Mg – Magnesium (mg/l)
Mn – Manganese (µg/l)
NO_3^- – Nitrate (mg/l)
Na – Sodium (mg/l)
SO_4^{2-} – Sulfate (mg/l)
TDS – Total Dissolved Solids (mg/l)
Zn – Zinc (µg/l)
pH *(units)*

Laboratory Analytical Methods

Chemical Constituent	Method
B, Ca, Cu, Fe, K, Mg, Mn, Na, Z, TDS by Summation	EPA 200.7
CO_3^{2-}, HCO_3^- ,	SM23320B
Cl^-, F^- , SO_4^{2-},	EPA 300.0
NO^{3-},	SM4500NO3F
pH	SM4500-H B
eC	SM2510B

Table D-1 General Minerals

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Arroyo Santa Rosa	02N19W19P02S	8/30/2011	0.2	350	71	ND	95	ND	1130	0.2	ND	1	69	ND	81.6	67	109	844	ND	7.6
Arroyo Santa Rosa	02N19W20N02S	10/19/2011	0.2	250	48	ND	174	ND	1210	0.2	90	2	83	ND	29.9	69	142	798	360	7.9
Arroyo Santa Rosa	02N20W22K02S	9/9/2011	0.3	340	84	ND	175	ND	1490	0.1	70	2	84	20	69.4	105	188	1050	ND	6.8
Arroyo Santa Rosa	02N20W23G03S	8/23/2011	0.2	320	52	ND	126	ND	1060	0.2	210	2	54	40	38.7	87	61	741	ND	7.5
Arroyo Santa Rosa	02N20W23K01S	9/9/2011	0.2	310	47	ND	75	ND	881	0.1	ND	1	49	20	10.6	63	80	637	ND	6.7
Arroyo Santa Rosa	02N20W23R01S	8/23/2011	0.3	330	100	ND	178	ND	1530	0.2	80	1	77	ND	85.3	132	209	1110	ND	7.2
Arroyo Santa Rosa	02N20W24Q03S	8/30/2011	0.2	430	97	ND	140	ND	1540	0.2	ND	2	92	ND	108	89	184	1150	ND	7.4
Arroyo Santa Rosa	02N20W25C06S	8/30/2011	0.3	280	72	ND	148	ND	1250	0.2	ND	1	58	ND	23.7	108	182	875	ND	7.5
Arroyo Santa Rosa	02N20W25C07S	8/30/2011	0.2	440	102	ND	141	ND	1530	0.2	60	2	92	20	86.5	86	187	1140	ND	7.4
Arroyo Santa Rosa	02N20W25D01S	8/30/2011	0.3	340	84	ND	142	ND	1360	0.2	ND	1	76	ND	61.8	92	187	984	ND	7.7
Arroyo Santa Rosa	02N20W26C02S	9/9/2011	0.4	370	109	ND	180	ND	1660	0.2	70	1	81	ND	108	130	240	1210	ND	6.6
Cuyama Valley	07N23W15P01S	8/25/2011	0.3	210	309	ND	8	ND	2250	1.2	3140	5	125	ND	2.6	105	1310	2080	110	7.1
Cuyama Valley	07N23W15P04S	8/25/2011	0.1	140	90	ND	7	ND	885	ND	3170	3	15	30	1.7	97	341	696	110	7.4
Cuyama Valley	08N24W17G02S	9/21/2011	0.4	260	19	ND	119	ND	1230	0.4	390	2	2	30	0.6	251	191	845	ND	7.2
Cuyama Valley	09N23W30E05S	9/21/2011	0.4	360	67	ND	85	ND	1200	1.1	1870	2	10	60	5.2	193	168	891	30	7.1
Cuyama Valley	09N24W25J01S	9/21/2011	0.4	360	59	ND	69	ND	1160	1.1	60	2	10	ND	5.5	204	167	878	ND	7.0
Fillmore	03N19W06C03S	8/1/2011	0.7	290	185	ND	66	ND	1610	0.6	210	6	61	ND	42.8	107	550	1310	60	7.5
Fillmore	03N20W01D03S	8/1/2011	0.6	270	173	ND	74	20	1600	0.7	50	6	63	ND	45.1	109	520	1260	40	7.2
Fillmore	03N20W01F05S	8/1/2011	0.6	270	151	ND	56	320	1410	0.7	1040	6	52	ND	15.2	103	470	1120	130	7.3
Fillmore	03N20W02R05S	9/9/2011	1.4	410	331	ND	190	50	2920	0.5	100	10	99	20	52.7	270	1130	2490	ND	6.9
Fillmore	03N20W09D01S	9/7/2011	0.8	330	202	ND	77	ND	1800	0.7	80	7	70	ND	30.5	138	650	1510	ND	6.8
Fillmore	03N21W01P08S	7/28/2011	0.6	280	180	ND	45	10	1410	0.6	60	3	45	340	23	93	480	1150	ND	7.1
Fillmore	04N19W29R04S	9/7/2011	0.4	240	138	ND	46	ND	1390	0.8	60	6	53	ND	6.3	122	510	1120	ND	6.9
Fillmore	04N19W31F01S	8/1/2011	0.6	260	135	ND	61	ND	1340	0.7	60	5	51	ND	9.8	99	420	1040	40	7.3
Fillmore	04N19W32M02S	9/8/2011	0.6	260	135	ND	55	ND	1240	0.9	270	5	47	60	2.5	87	410	1000	60	7.4
Fillmore	04N20W13P03S	8/1/2011	1.1	270	151	ND	55	ND	1240	0.7	ND	3	38	ND	13.1	77	349	957	ND	7.0
Fillmore	04N20W32R01S	8/9/2011	0.1	300	220	ND	52	ND	1600	0.5	70	2	57	ND	97.2	73	530	1330	ND	7.0
Fillmore	04N20W36D07S	8/1/2011	0.7	310	175	ND	60	ND	1620	0.8	ND	6	67	180	11.9	112	550	1290	ND	7.2
Gillibrand/Tapo	03N18W24C07S	10/11/2011	0.2	270	143	ND	25	30	1030	0.2	100	3	30	10	13.3	42	285	812	20	7.1
Gillibrand/Tapo	03N18W24H07S	10/11/2011	0.2	330	139	ND	29	ND	1030	0.4	660	4	30	100	0.6	47	241	821	ND	7.1
Las Posas - East	02N20W09Q07S	8/10/2011	0.8	260	220	ND	220	ND	2190	0.3	100	6	71	250	15.2	209	780	1780	ND	7.3
Las Posas - East	02N20W10G01S	9/15/2011	0.8	310	187	ND	170	ND	2120	0.2	110	7	60	60	51.3	210	640	1640	ND	7.2
Las Posas - East	02N20W16B06S	8/10/2011	0.8	260	162	ND	177	ND	1850	0.4	310	6	63	60	2.4	187	570	1430	ND	7.3
Las Posas - East	03N19W29K06S	8/15/2011	ND	90	51	ND	42	10	493	0.3	ND	2	8	ND	67.9	32	29	322	ND	7.0
Las Posas - East	03N19W29K07S	8/15/2011	0.1	190	75	ND	28	20	618	0.3	80	2	12	ND	16.3	40	98	462	ND	7.5

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Las Posas - East	03N20W27H03S	9/9/2011	0.2	290	109	ND	32	ND	920	0.3	170	4	27	60	0.8	53	207	723	20	7.0
Las Posas - East	03N20W34G01S	9/15/2011	ND	190	67	ND	11	ND	577	0.2	500	3	15	140	ND	30	122	438	ND	7.5
Las Posas - South	02N19W07B02S	8/15/2011	1	270	122	ND	160	ND	1880	0.7	100	4	51	10	ND	249	540	1400	30	7.2
Las Posas - South	02N19W07D02S	8/15/2011	0.8	310	167	ND	149	ND	1760	0.4	60	3	40	ND	14.9	199	460	1340	ND	7.0
Las Posas - South	02N19W08G01S	8/15/2011	0.7	220	149	ND	154	20	1620	0.3	170	4	39	30	17.4	178	440	1200	130	7.2
Las Posas - South	02N20W01Q01S	8/15/2011	0.7	310	183	ND	149	ND	1780	0.3	70	3	49	ND	47.7	182	460	1380	ND	6.9
Las Posas - South	02N20W01Q02S	8/30/2011	0.9	280	157	ND	180	ND	2000	0.6	70	5	49	ND	11.9	233	620	1540	ND	7.5
Las Posas - West	02N20W06J01S	9/9/2011	0.1	280	94	ND	18	ND	927	0.3	390	5	32	160	ND	60	233	722	ND	6.9
Las Posas - West	02N21W09D02S	8/31/2011	0.2	280	90	ND	93	ND	1010	0.3	ND	3	31	20	25.8	85	147	760	ND	7.3
Las Posas - West	02N21W11A02S	8/10/2011	0.2	240	205	ND	133	ND	1720	0.2	80	3	67	ND	220	104	470	1400	20	7.2
Las Posas - West	02N21W15M04S	9/15/2011	0.4	290	109	ND	71	ND	1370	0.3	220	6	37	100	10	152	380	1060	ND	7.5
Las Posas - West	02N21W17F05S	8/10/2011	0.7	320	112	ND	67	ND	1500	0.2	350	6	42	50	0.7	183	510	1240	40	7.6
Las Posas - West	03N21W36Q01S	8/10/2011	0.2	270	88	ND	87	ND	1060	0.5	90	4	43	ND	67.1	94	141	793	ND	7.4
Lockwood Valley	08N21W23Q10S	9/21/2011	11.1	400	9	ND	12	ND	988	1.6	ND	ND	1	ND	12.4	226	113	775	ND	8.6
Lockwood Valley	08N21W29Q05S	10/10/2011	6.5	220	43	ND	12	ND	2480	1.2	ND	3	8	ND	4.7	541	1000	1830	ND	7.8
Lockwood Valley	08N21W30R01S	10/10/2011	1.1	260	38	ND	9	ND	1310	0.6	ND	2	5	ND	10.2	253	390	968	ND	7.6
Lockwood Valley	08N21W33R03S	9/21/2011	0.7	240	106	ND	19	ND	814	0.6	80	2	23	ND	13.7	41	190	635	30	7.0
Mound	02N22W07P01S	8/10/2011	0.6	320	331	ND	105	ND	2510	0.3	260	9	96	150	38.9	190	1140	2230	ND	7.2
Mound	02N22W09K07S	9/7/2011	0.5	200	138	ND	62	ND	1450	0.3	430	5	23	220	0.7	180	540	1150	100	6.4
Mound	02N22W09K08S	7/28/2011	0.6	290	182	ND	71	ND	1840	0.3	140	7	55	110	7.5	194	680	1490	ND	7.4
Mound	02N22W10N02S	9/8/2011	0.7	300	237	ND	62	ND	2150	0.6	90	6	74	ND	26	193	980	1880	ND	7.2
Mound	02N22W17M02S	10/12/2011	0.7	330	173	ND	93	ND	1710	0.3	660	7	46	240	ND	179	560	1390	ND	7.5
Mound	02N23W13F02S	7/28/2011	0.6	360	152	ND	62	ND	1500	0.4	370	6	39	300	ND	155	440	1210	ND	7.3
Mound	02N23W13G01S	7/28/2011	0.6	320	217	ND	78	ND	1910	0.3	180	7	64	120	3.3	168	750	1610	ND	7.2
Mound	02N23W13K04S	8/10/2011	0.7	340	171	ND	76	ND	1620	0.4	940	6	47	360	ND	177	530	1350	ND	7.6
North Coast	02N23W05C01S	8/9/2011	0.6	360	100	ND	74	ND	1350	0.1	15200	7	35	1040	4.1	169	300	1050	ND	7.1
North Coast	04N25W25N06S	8/9/2011	0.4	450	146	ND	86	ND	1560	0.5	ND	2	66	ND	10.5	120	360	1240	ND	7.0
North Coast	04N25W35A07S	8/9/2011	0.3	420	119	ND	89	ND	1290	0.2	830	2	52	290	6.6	93	216	998	280	7.0
North Coast	04N25W35G01S	8/9/2011	0.4	410	144	ND	95	ND	1460	0.4	60	2	55	ND	23.2	101	300	1130	ND	6.9
Ojai Valley	04N22W04P05S	10/21/2011	ND	260	121	ND	22	ND	899	0.4	ND	1	30	ND	30.8	40	201	706	ND	7.3
Ojai Valley	04N22W05C01S	9/27/2011	0.2	260	126	ND	116	ND	1120	0.4	270	1	21	500	3.6	80	169	777	20	6.6
Ojai Valley	04N22W05D03S	10/21/2011	ND	240	126	ND	24	ND	900	0.3	460	1	30	ND	13.1	34	240	708	ND	7.3
Ojai Valley	04N22W05H04S	10/21/2011	ND	290	133	ND	14	ND	887	0.2	70	1	29	ND	18.5	24	199	709	ND	7.2
Ojai Valley	04N22W06K10S	9/26/2011	0.3	270	133	ND	113	ND	1210	0.4	50	1	28	70	22.3	88	199	855	ND	7.0
Ojai Valley	04N22W06M01S	9/26/2011	ND	320	120	ND	96	ND	1160	0.3	ND	1	32	120	26.2	75	155	826	90	6.9

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Ojai Valley	04N22W07D04S	11/3/2011	0.2	280	236	ND	580	ND	2420	0.5	ND	2	50	1800	ND	179	191	1520	ND	7.0
Ojai Valley	04N23W02P01S	11/3/2011	0.1	800	150	ND	230	ND	1950	0.4	50	ND	152	ND	23.8	51	84	1490	40	7.0
Ojai Valley	04N23W12H02S	9/27/2011	ND	290	137	ND	20	ND	943	0.3	60	1	26	ND	32.3	32	201	740	30	6.8
Ojai Valley	05N22W32K02S	9/27/2011	0.2	290	113	ND	49	ND	951	0.7	60	1	14	40	4.5	78	162	712	110	6.8
Ojai Valley	05N22W33J01S	11/3/2011	ND	350	230	ND	79	ND	1520	0.3	2100	2	47	460	ND	55	480	1240	90	7.0
Oxnard Pl. Fore.	02N21W07P04S	8/30/2011	0.6	260	142	ND	53	20	1360	0.6	530	5	45	110	ND	96	500	1100	ND	7.6
Oxnard Pl. Fore.	02N22W23H03S	8/26/2011	0.7	260	172	ND	63	ND	1510	0.6	80	5	53	ND	38.8	114	520	1230	ND	7.3
Oxnard Pl. Fore.	02N22W27M02S	10/12/2011	0.6	240	138	ND	49	ND	1290	0.7	90	5	45	ND	10.8	93	430	1010	30	7.3
Oxnard Pl. Press.	01N21W06L05S	7/26/2011	0.5	250	97	ND	41	ND	1170	ND	350	9	31	110	ND	134	390	952	30	7.6
Oxnard Pl. Press.	01N21W08R01S	8/26/2011	0.4	280	86	ND	61	ND	1120	0.3	270	7	28	40	ND	134	290	886	ND	7.5
Oxnard Pl. Press.	01N21W16M03S	8/31/2011	0.6	320	68	ND	136	ND	1380	0.3	ND	7	27	20	ND	208	270	1040	ND	7.5
Oxnard Pl. Press.	01N21W18Q02S	10/24/2011	0.7	250	146	ND	64	ND	1340	0.6	550	5	41	450	ND	93	430	1030	ND	7.4
Oxnard Pl. Press.	01N21W19J05S	7/26/2011	0.6	360	45	ND	42	ND	731	ND	130	6	24	ND	ND	85	13	575	790	7.8
Oxnard Pl. Press.	01N21W20K03S	7/26/2011	0.5	250	87	ND	62	ND	1080	0.2	140	6	31	ND	ND	122	275	833	70	7.4
Oxnard Pl. Press.	01N21W21H02S	8/26/2011	0.5	290	89	ND	137	ND	1400	0.3	170	6	37	20	ND	186	300	1050	20	7.4
Oxnard Pl. Press.	01N21W21H03S	7/26/2011	0.3	320	40	ND	45	70	743	ND	4980	3	24	80	ND	99	56	587	1160	7.7
Oxnard Pl. Press.	01N21W22C01S	8/26/2011	0.4	310	66	ND	125	ND	1240	0.2	270	5	40	50	ND	153	212	911	ND	7.4
Oxnard Pl. Press.	01N21W28D01S	8/26/2011	0.6	310	95	ND	198	ND	1530	0.3	460	6	32	20	ND	206	250	1100	20	7.4
Oxnard Pl. Press.	01N21W28H03S	7/26/2011	0.5	330	74	ND	169	ND	1360	0.1	150	5	40	40	ND	179	174	971	ND	7.6
Oxnard Pl. Press.	01N21W29K02S	10/24/2011	0.6	280	119	ND	49	ND	1240	0.2	320	5	39	670	ND	96	360	948	ND	7.5
Oxnard Pl. Press.	01N21W30C04S	8/26/2011	0.6	220	127	ND	45	120	1160	0.7	90	4	42	ND	5.5	82	400	925	ND	7.3
Oxnard Pl. Press.	01N22W03F05S	10/12/2011	0.7	270	136	ND	46	ND	1340	0.7	70	5	44	20	12.9	99	450	1060	ND	7.1
Oxnard Pl. Press.	01N22W03F07S	10/12/2011	0.7	280	170	ND	56	ND	1530	0.6	90	6	57	10	20.3	108	530	1230	ND	7.1
Oxnard Pl. Press.	01N22W06B01S	8/30/2011	0.7	260	143	ND	52	ND	1350	0.7	80	5	46	ND	17.8	97	460	1080	ND	7.5
Oxnard Pl. Press.	01N22W06R02S	7/26/2011	0.8	260	171	ND	53	ND	1460	0.7	50	5	52	ND	10.2	116	550	1220	ND	7.3
Oxnard Pl. Press.	01N22W12M01S	10/12/2011	0.6	240	121	ND	55	ND	1260	0.5	870	5	41	90	2.7	100	410	975	ND	7.6
Oxnard Pl. Press.	01N22W12N03S	10/12/2011	0.5	250	110	ND	38	ND	1210	0.2	540	7	36	140	ND	116	390	947	ND	7.3
Oxnard Pl. Press.	01N22W16D04S	8/31/2011	0.6	220	118	ND	39	10	1120	0.6	2260	4	35	220	ND	84	380	881	40	7.3
Oxnard Pl. Press.	01N22W19A01S	8/31/2011	0.6	210	92	ND	40	ND	1010	0.7	130	5	30	70	ND	79	312	769	300	7.6
Oxnard Pl. Press.	01N22W21B06S	8/31/2011	0.5	240	125	ND	41	ND	1160	0.3	3340	5	31	180	ND	89	380	911	30	7.0
Oxnard Pl. Press.	01N22W23R02S	10/3/2011	0.6	240	125	ND	54	ND	1220	0.5	640	7	37	160	ND	90	370	924	ND	7.4
Oxnard Pl. Press.	01N22W24B04S	8/26/2011	0.6	230	125	ND	40	ND	1150	0.4	1040	4	34	50	ND	94	390	917	460	7.5
Oxnard Pl. Press.	01N22W25K01S	9/1/2011	0.7	220	779	ND	2240	ND	7320	0.3	8460	16	226	2450	0.6	415	650	4550	ND	6.9
Oxnard Pl. Press.	01N22W25K02S	8/31/2011	0.6	250	102	ND	41	ND	1090	0.4	560	5	39	120	ND	88	321	846	90	7.4
Oxnard Pl. Press.	01N22W26M03S	8/31/2011	0.5	250	123	ND	39	ND	1210	0.3	320	6	37	190	ND	96	400	951	ND	7.5

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Oxnard Pl. Press.	01N22W26P02S	9/15/2011	0.5	260	94	ND	41	ND	1110	0.2	160	7	36	10	ND	100	340	878	ND	7.8
Oxnard Pl. Press.	01N22W26Q01S	8/31/2011	0.6	250	133	ND	71	ND	1210	0.6	390	4	37	290	ND	87	360	943	ND	7.4
Oxnard Pl. Press.	01N22W36H01S	10/24/2011	0.6	280	137	ND	250	ND	1610	0.3	790	8	47	250	ND	124	217	1060	ND	7.4
Oxnard Pl. Press.	02N21W19A01S	8/10/2011	0.8	290	199	ND	94	ND	1910	0.6	80	7	73	ND	59.8	169	720	1610	ND	7.2
Oxnard Pl. Press.	02N21W20M03S	8/10/2011	0.8	340	421	ND	330	ND	3410	0.3	130	10	145	420	119	248	1310	2940	ND	7.0
Oxnard Pl. Press.	02N21W20Q05S	8/26/2011	0.6	280	113	ND	59	ND	1300	0.2	590	6	35	80	ND	145	400	1040	ND	7.5
Oxnard Pl. Press.	02N22W19J03S	7/28/2011	0.6	260	156	ND	55	ND	1440	0.6	120	5	43	170	1.4	129	510	1160	ND	7.5
Oxnard Pl. Press.	02N22W19P01S	10/12/2011	0.7	300	263	ND	120	40	2350	0.3	120	7	73	630	46.9	199	960	1970	100	7.2
Oxnard Pl. Press.	02N22W24P01S	9/1/2011	0.6	240	126	ND	45	ND	1240	0.6	ND	4	42	ND	5.7	87	440	990	ND	7.3
Oxnard Pl. Press.	02N22W24P02S	9/1/2011	0.7	240	138	ND	52	110	1340	0.7	80	5	45	ND	8	99	490	1080	30	7.4
Oxnard Pl. Press.	02N22W24R02S	8/23/2011	0.7	250	184	ND	59	ND	1620	0.6	230	6	63	ND	38.5	121	590	1310	140	7.2
Oxnard Pl. Press.	02N22W25A02S	8/10/2011	0.7	240	160	ND	55	ND	1430	0.6	2350	5	54	ND	23	106	500	1140	330	7.4
Oxnard Pl. Press.	02N22W25E01S	8/10/2011	1.2	310	278	ND	73	ND	2400	0.3	90	8	112	ND	116	193	1010	2100	ND	7.2
Oxnard Pl. Press.	02N22W25F01S	8/23/2011	0.8	250	172	ND	55	ND	1600	0.6	850	6	62	ND	23.6	127	600	1300	ND	7.2
Oxnard Pl. Press.	02N22W25P04S	11/3/2011	0.9	270	223	ND	69	ND	2040	0.6	ND	7	74	20	9.3	159	890	1700	ND	7.3
Oxnard Pl. Press.	02N22W30F03S	11/3/2011	0.6	250	133	ND	45	ND	1280	0.6	890	5	38	140	0.4	97	440	1010	120	7.4
Oxnard Pl. Press.	02N22W30Q01S	8/30/2011	0.6	250	134	ND	44	ND	1270	0.7	170	5	40	170	3	96	440	1010	330	7.7
Oxnard Pl. Press.	02N22W31D02S	8/23/2011	0.6	260	158	ND	56	ND	1470	0.6	60	5	47	240	20.7	112	510	1170	ND	7.2
Oxnard Pl. Press.	02N22W32C04S	10/12/2011	0.7	240	156	ND	54	ND	1460	0.7	100	6	53	ND	33.5	110	500	1150	ND	7.3
Oxnard Pl. Press.	02N22W36E02S	10/12/2011	0.7	250	146	ND	47	20	1370	0.7	280	5	46	10	10.5	106	480	1090	60	7.2
Oxnard Pl. Press.	02N22W36E03S	10/12/2011	0.6	240	134	ND	50	ND	1300	0.6	140	6	41	100	ND	102	420	994	ND	7.3
Oxnard Pl. Press.	02N22W36E05S	10/12/2011	0.9	270	180	ND	56	ND	1720	0.7	100	7	67	40	18.2	132	650	1380	ND	7.2
Oxnard Pl. Press.	02N22W36F01S	11/3/2011	0.9	270	187	ND	60	ND	1760	0.7	320	6	64	30	0.8	128	720	1440	ND	7.4
Oxnard Pl. Press.	02N23W25G02S	9/1/2011	0.7	190	344	ND	200	ND	3220	0.3	80	9	106	40	72.2	340	1560	2820	ND	7.2
Oxnard Pl. Press.	02N23W25M01S	11/3/2011	0.6	280	197	ND	84	ND	1810	0.5	ND	5	54	500	18.3	142	660	1440	ND	7.3
Piru	04N18W28C02S	9/8/2011	0.6	270	106	ND	138	ND	1450	1.1	50	5	44	ND	9.9	158	390	1120	ND	7.3
Piru	04N18W30A02S	9/7/2011	0.7	300	137	ND	129	ND	1560	0.8	70	6	46	ND	13.6	173	410	1220	ND	6.7
Piru	04N18W30A03S	8/9/2011	0.7	300	156	ND	117	20	1590	0.5	80	8	58	ND	41.9	125	420	1220	110	7.2
Piru	04N18W30J04S	8/2/2011	0.5	200	80	ND	63	ND	1070	0.7	50	5	29	ND	7	112	285	782	150	7.5
Piru	04N19W23R03S	8/18/2011	0.5	460	197	ND	45	ND	2170	0.5	90	7	109	110	3.7	192	890	1900	ND	7.3
Piru	04N19W25H01S	8/2/2011	0.6	260	134	ND	101	ND	1370	0.7	60	6	46	ND	24.3	108	360	1040	ND	7.4
Piru	04N19W25K04S	8/2/2011	0.6	270	152	ND	87	ND	1400	0.7	60	6	46	ND	31.2	99	380	1070	ND	7.3
Piru	04N19W25M03S	8/2/2011	0.8	420	294	ND	58	10	2690	0.9	80	8	125	790	22.5	225	1300	2450	ND	7.4
Piru	04N19W26H01S	8/9/2011	0.7	270	169	ND	97	ND	1640	0.7	70	5	66	ND	27.1	122	510	1270	ND	7.2
Piru	04N19W26J01S	8/2/2011	0.7	400	257	ND	60	10	2230	0.4	80	7	97	30	50.4	172	900	1940	ND	7.0

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Piru	04N19W26J03S	8/2/2011	0.6	250	120	ND	93	ND	1340	0.8	50	6	45	ND	21.8	116	350	1000	ND	7.3
Piru	04N19W26J04S	8/2/2011	0.7	250	129	ND	103	ND	1440	0.7	1090	6	51	20	27.9	130	380	1080	ND	7.3
Piru	04N19W26J05S	8/2/2011	1	430	299	ND	64	ND	2490	0.8	90	8	118	660	21.1	177	1120	2240	ND	7.0
Piru	04N19W26P01S	9/8/2011	0.7	310	176	ND	69	ND	1650	0.8	60	6	70	40	22.2	106	590	1350	ND	7.1
Piru	04N19W34D03S	8/9/2011	0.7	270	147	ND	68	10	1400	0.7	70	6	53	ND	26.3	101	430	1100	30	7.3
Piru	04N19W34D05S	8/9/2011	0.7	280	160	ND	66	ND	1480	0.7	70	6	59	ND	26.8	108	480	1190	ND	7.1
Piru	04N19W34J04S	8/2/2011	0.6	220	130	ND	56	ND	1280	0.8	50	5	50	ND	9	88	460	1020	40	7.3
Pleasant Valley	01N21W01B05S	7/26/2011	0.3	370	65	ND	224	ND	1350	ND	260	7	56	70	ND	148	55	925	ND	7.5
Pleasant Valley	01N21W03K01S	8/26/2011	0.4	250	168	ND	126	ND	1590	0.3	70	5	44	ND	22.2	132	480	1230	ND	6.9
Pleasant Valley	01N21W03R01S	8/26/2011	0.6	300	260	ND	300	ND	2410	0.2	90	6	76	20	23	198	810	1970	ND	6.9
Pleasant Valley	01N21W04K01S	8/26/2011	0.3	250	77	ND	58	30	873	0.3	1990	4	23	500	0.4	80	159	652	ND	7.5
Pleasant Valley	01N21W10G01S	8/26/2011	0.5	300	102	ND	171	ND	1480	0.3	140	6	40	30	ND	177	330	1130	ND	7.2
Pleasant Valley	01N21W12D02S	8/31/2011	0.7	400	250	ND	390	20	2970	0.2	100	5	110	210	ND	252	880	2290	40	7.2
Pleasant Valley	01N21W15D02S	8/26/2011	0.4	290	209	ND	232	ND	1980	0.2	120	5	61	240	ND	163	600	1560	ND	7.1
Pleasant Valley	01N21W15H01S	7/26/2011	1.7	260	672	ND	840	ND	5500	ND	2900	10	231	2190	ND	526	2410	4950	ND	7.2
Pleasant Valley	02N20W17L01S	8/10/2011	0.8	260	184	ND	188	ND	1920	0.4	190	6	54	290	25.3	183	590	1490	ND	7.3
Pleasant Valley	02N20W19L05S	8/26/2011	0.7	330	274	ND	180	ND	2400	0.2	340	7	73	210	0.5	214	930	2010	30	7.1
Pleasant Valley	02N20W29B02S	8/30/2011	0.2	350	76	ND	131	ND	1220	0.3	80	3	50	50	5	108	166	890	ND	7.7
Pleasant Valley	02N21W34C01S	8/26/2011	0.3	270	105	ND	74	ND	1120	0.3	350	5	27	50	ND	111	280	872	ND	7.4
Pleasant Valley	02N21W34G01S	8/26/2011	0.7	350	94	ND	184	ND	1710	0.3	180	7	30	30	ND	259	320	1240	ND	6.8
Santa Paula	02N22W03E01S	8/10/2011	0.6	370	305	ND	110	ND	2400	0.2	1050	7	87	560	0.5	195	1010	2080	ND	7.1
Santa Paula	02N22W03L01S	7/28/2011	0.8	420	372	ND	140	ND	3080	0.4	1940	9	113	820	ND	283	1420	2760	ND	7.0
Santa Paula	03N21W09K04S	8/1/2011	0.4	310	151	ND	52	ND	1380	0.4	380	4	34	440	ND	125	420	1100	ND	7.4
Santa Paula	03N21W19R01S	9/8/2011	0.7	360	228	ND	64	ND	1800	0.5	70	4	62	140	15.8	121	690	1550	ND	7.2
Santa Paula	03N22W35Q01S	8/10/2011	1.1	450	332	ND	101	ND	2870	0.4	130	8	96	750	33.4	307	1300	2630	50	7.2
Santa Paula	03N22W36K07S	8/10/2011	0.4	310	230	ND	68	20	1610	0.4	310	5	52	150	ND	99	700	1460	ND	7.4
Sherwood	01N19W19H03S	10/26/2011	ND	380	103	ND	57	10	987	0.1	2600	2	47	90	12.9	41	124	767	1490	7.5
Sherwood	01N19W29H09S	10/26/2011	ND	300	197	ND	123	30	1520	ND	220	1	32	490	9.5	96	400	1160	3310	7.2
Sherwood	01N20W25C07S	10/26/2011	0.1	380	80	ND	80	ND	1040	ND	2950	2	42	50	ND	70	117	771	6670	7.4
Sherwood	01N20W25F04S	10/26/2011	ND	270	31	ND	32	10	580	ND	1000	ND	8	40	ND	83	28	452	580	7.7
Simi Valley	02N17W16A10S	10/11/2011	ND	370	49	ND	47	ND	1030	0.8	1700	4	28	80	ND	139	155	793	630	7.7
Simi Valley	02N18W08D04S	10/11/2011	1.1	360	235	ND	160	ND	2380	0.4	130	7	87	330	13.9	107	840	1810	ND	7.2
Simi Valley	02N18W08K07S	10/11/2011	1	300	288	ND	160	ND	2480	0.6	670	6	86	ND	52.3	189	990	2070	ND	7.1
Simi Valley	02N18W10A02S	10/11/2011	1.4	330	267	ND	180	20	2650	0.5	280	8	92	ND	64.6	121	1030	2090	30	7.2
Thousand Oaks	01N19W08G02S	7/26/2011	ND	360	150	ND	142	ND	1750	0.2	2220	3	112	150	ND	110	540	1420	ND	7.1

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Thousand Oaks	01N19W09N01S	7/26/2011	0.1	380	168	ND	187	ND	1900	0.3	1530	4	118	40	ND	126	560	1540	ND	7.0
Tierra Rejada Valley	02N19W10R02S	9/9/2011	0.2	270	56	ND	69	110	966	0.3	80	2	58	ND	8.2	59	172	696	510	6.6
Tierra Rejada Valley	02N19W11J03S	8/15/2011	0.2	270	65	ND	61	ND	942	0.1	100	1	56	ND	21.6	57	161	693	ND	7.3
Tierra Rejada Valley	02N19W14F01S	8/23/2011	0.1	380	109	ND	132	10	1330	0.2	90	1	90	ND	93	50	132	987	40	7.2
Tierra Rejada Valley	02N19W14Q02S	10/11/2011	ND	330	43	ND	62	ND	866	ND	50	7	46	30	5.6	72	78	644	60	7.7
Tierra Rejada Valley	02N19W14R03S	10/11/2011	ND	310	31	ND	36	ND	692	0.1	190	5	37	20	7.6	63	41	531	80	7.4
Tierra Rejada Valley	02N19W15B03S	9/30/2011	0.1	270	115	ND	153	10	1350	0.2	780	ND	70	30	75.5	54	171	909	660	7.3
Tierra Rejada Valley	02N19W15F01S	9/30/2011	0.1	250	93	ND	110	ND	1170	0.3	700	1	64	40	63.5	54	163	799	ND	7.4
Tierra Rejada Valley	02N19W15G01S	9/28/2011	0.2	250	144	ND	121	ND	1120	0.3	1220	3	21	30	64.4	82	147	833	ND	7.6
Tierra Rejada Valley	02N19W15J02S	8/23/2011	0.2	380	95	ND	146	20	1480	ND	150	4	82	ND	42.3	110	250	1110	130	7.5
Tierra Rejada Valley	02N19W15M02S	9/28/2011	0.2	350	106	ND	120	10	1310	0.3	190	1	69	20	28.2	74	215	964	ND	7.4
Tierra Rejada Valley	02N19W15N03S	8/30/2011	0.1	270	67	ND	86	ND	975	0.3	100	2	57	ND	3.4	46	167	699	ND	7.4
U N D E F I N E D	02N20W18A01S	8/10/2011	ND	180	81	ND	25	10	665	0.3	130	3	17	40	4.8	44	146	501	ND	7.5
U N D E F I N E D	02N21W13A01S	8/15/2011	0.08	210	67	ND	12	3	608	0.3	590	3	17	43	0.7	42	118	470	20	7.2
Undefined	04N22W14Q01S	10/13/2011	0.2	160	58	ND	17	30	567	0.4	60	3	20	10	3.2	25	120	407	70	7.0
Undefined	04N22W36C03S	7/28/2011	2.2	810	132	ND	590	ND	3850	0.9	220	12	71	20	5.6	710	560	2890	60	7.2
Upper Ojai	04N22W08Q01S	9/26/2011	0.3	430	68	ND	21	ND	916	0.7	100	3	16	30	ND	126	44	709	ND	7.1
Upper Ojai	04N22W11J01S	8/18/2011	ND	200	66	ND	30	ND	634	0.3	50	1	22	ND	38.9	38	83	481	ND	7.1
Ven. River - Lower	02N23W05K01S	8/9/2011	0.7	370	132	ND	119	ND	1550	0.5	230	9	44	130	2.1	156	360	1190	ND	7.2
Ven. River - Lower	03N23W32Q01S	8/9/2011	0.7	320	129	ND	87	ND	1380	0.6	70	5	42	80	1.7	131	360	1080	ND	7.1
Ven. River - Upper	04N23W04H01S	8/9/2011	0.4	240	104	ND	19	10	848	0.4	ND	3	26	ND	6	44	237	679	210	7.1
Ven. River - Upper	04N23W09G03S	8/9/2011	0.4	320	125	ND	50	ND	1060	0.3	50	2	35	ND	23.9	52	212	820	370	6.9
Ven. River - Upper	04N23W29F02S	8/9/2011	0.5	240	104	ND	22	ND	840	0.5	100	2	25	ND	6.2	40	203	643	ND	7.2

* Undefined – These wells are outside of known groundwater basin boundaries.

Inorganic Metals and Radio Chemistry
Elements (µg/L)

Al – Aluminum
Sb – Antimony
As – Arsenic
Ba – Barium
Be – Beryllium
Cd – Cadmium
Cr – Chromium
Pb – Lead
Hg – Mercury
Ni – Nickel
Se – Selenium
Ag – Silver
Tl – Thallium
V – Vanadium

Laboratory Methods

Chemical Constituent	Method
Al, Sb, As, Ba, Be, Cd, Cr, Pb, Ni, Se, Ag, Tl, B	EPA 200.8
Hg	EPA 245.1
Gross Alpha	EPA 900.0
Uranium,	EPA 908.0

Table D-2 Inorganic Metals

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Arroyo Santa Rosa	02N19W19P02S	8/30/2011	ND	ND	3.00	18.00	ND	ND	16.00	1.2	ND	ND	4.00	ND	ND	63.00
Arroyo Santa Rosa	02N20W22K02S	9/9/2011	ND	ND	3.00	89.00	ND	ND	6.00	ND	ND	5.00	5.00	ND	ND	57.00
Arroyo Santa Rosa	02N20W23G03S	8/23/2011	30.00	ND	4.00	34.00	ND	ND	2.00	0.4	ND	ND	4.00	ND	ND	66.00
Arroyo Santa Rosa	02N20W25C06S	8/30/2011	ND	ND	6.00	20.00	ND	ND	2.00	0.3	ND	12.00	6.00	ND	ND	56.00
Arroyo Santa Rosa	02N20W25D01S	8/30/2011	ND	ND	4.00	19.00	ND	ND	2.00	4.3	ND	4.00	5.00	ND	ND	65.00
Cuyama Valley	07N23W15P01S	8/25/2011	ND	ND	ND	10.00	ND	ND	ND	ND	ND	1.00	ND	ND	ND	ND
Cuyama Valley	07N23W15P04S	8/25/2011	20.00	ND	3.00	11.00	ND	ND	4.00	0.6	ND	ND	ND	ND	ND	5.00
Cuyama Valley	08N24W17G02S	9/21/2011	ND	ND	ND	24.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cuyama Valley	09N24W25J01S	9/21/2011	ND	ND	ND	23.00	ND	ND	ND	ND	ND	ND	6.00	ND	ND	ND
Fillmore	03N19W06C03S	8/1/2011	10.00	ND	ND	29.00	ND	0.00	ND	ND	ND	1.00	11.00	ND	ND	3.00
Fillmore	03N20W01F05S	8/1/2011	ND	ND	ND	24.00	ND	ND	1.00	0.7	ND	2.00	5.00	ND	ND	3.00
Fillmore	03N20W02R05S	9/9/2011	ND	ND	ND	23.00	ND	ND	ND	0.6	ND	2.00	16.00	ND	ND	2.00
Fillmore	03N20W09D01S	9/7/2011	ND	ND	ND	24.00	ND	ND	ND	ND	ND	2.00	10.00	ND	ND	3.00
Fillmore	03N21W01P08S	7/28/2011	ND	ND	ND	32.00	ND	0.00	ND	ND	ND	ND	8.00	1.00	ND	ND
Fillmore	04N19W32M02S	9/8/2011	ND	ND	ND	21.00	ND	ND	ND	31.8	ND	4.00	2.00	ND	ND	ND
Fillmore	04N20W13P03S	8/1/2011	ND	ND	ND	23.00	ND	ND	ND	ND	ND	ND	7.00	ND	ND	ND
Fillmore	04N20W32R01S	8/9/2011	ND	ND	ND	45.00	ND	ND	ND	ND	ND	ND	7.00	ND	ND	ND
Fillmore	04N20W36D07S	8/1/2011	ND	ND	ND	14.00	ND	0.00	ND	ND	ND	ND	11.00	ND	ND	3.00
Las Posas - East	02N20W10G01S	9/15/2011	ND	ND	ND	31.00	ND	ND	ND	0.4	ND	6.00	18.00	ND	ND	ND
Las Posas - East	03N19W29K06S	8/15/2011	ND	ND	2.00	192.00	ND	ND	3.00	2.3	ND	ND	4.00	ND	ND	22.00
Las Posas - East	03N19W29K07S	8/15/2011	ND	ND	ND	65.00	ND	ND	6.00	4.7	ND	ND	6.00	ND	ND	13.00
Las Posas - South	02N19W07B02S	8/15/2011	ND	ND	ND	15.00	ND	ND	ND	ND	ND	12.00	2.00	ND	ND	7.00
Las Posas - West	02N20W06J01S	9/9/2011	ND	ND	ND	56.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Las Posas - West	02N21W15M04S	9/15/2011	ND	ND	2.00	37.00	ND	ND	ND	0.4	ND	1.00	19.00	ND	ND	ND
Las Posas - West	03N21W36Q01S	8/10/2011	ND	ND	ND	48.00	ND	ND	6.00	0.2	ND	ND	39.00	ND	ND	6.00
Lockwood Valley	08N21W23Q10S	9/21/2011	ND	ND	57.00	39.00	ND	ND	1.00	ND	ND	ND	15.00	ND	ND	64.00
Lockwood Valley	08N21W29Q05S	10/10/2011	ND	ND	9.00	11.00	ND	ND	ND	ND	ND	ND	11.00	ND	ND	14.00
Lockwood Valley	08N21W30R01S	10/10/2011	ND	ND	5.00	15.00	ND	ND	1.00	ND	ND	ND	3.00	ND	ND	14.00
Lockwood Valley	08N21W33R03S	9/21/2011	ND	ND	ND	27.00	ND	ND	1.00	0.4	ND	ND	5.00	ND	ND	4.00
Mound	02N22W07P01S	8/10/2011	ND	ND	2.00	27.00	ND	ND	ND	ND	ND	1.00	56.00	ND	ND	3.00
Mound	02N22W09K08S	7/28/2011	ND	ND	ND	20.00	ND	ND	1.00	ND	ND	ND	5.00	ND	ND	ND
Mound	02N22W10N02S	9/8/2011	ND	ND	ND	26.00	ND	ND	ND	ND	ND	2.00	18.00	ND	ND	2.00
Mound	02N22W17M02S	10/12/2011	ND	ND	ND	25.00	ND	ND	ND	0.6	ND	ND	4.00	ND	ND	ND
North Coast	04N25W25N06S	8/9/2011	ND	ND	ND	24.00	ND	ND	1.00	0.4	ND	ND	6.00	ND	ND	ND
Arroyo Santa Rosa	02N19W19P02S	8/30/2011	ND	ND	3.00	18.00	ND	ND	16.00	1.2	ND	ND	4.00	ND	ND	63.00

Table D-2 Inorganic Metals (cont.)

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
North Coast	04N25W35A07S	8/9/2011	ND	ND	3.00	60.00	ND	ND	1.00	ND	ND	ND	12.00	ND	ND	ND
North Coast	04N25W35G01S	8/9/2011	10.00	ND	ND	32.00	ND	ND	1.00	ND	ND	ND	5.00	ND	ND	ND
Ojai Valley	04N22W04P05S	10/21/2011	ND	ND	ND	33.00	ND	ND	ND	ND	ND	ND	3.00	ND	ND	ND
Ojai Valley	04N22W05C01S	9/27/2011	ND	ND	ND	180.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ojai Valley	04N22W05D03S	10/21/2011	10.00	ND	ND	28.00	ND	ND	ND	0.7	ND	2.00	ND	ND	ND	ND
Ojai Valley	04N22W06K10S	9/26/2011	ND	ND	ND	52.00	ND	ND	ND	ND	ND	1.00	2.00	ND	ND	ND
Ojai Valley	04N22W06M01S	9/26/2011	ND	ND	ND	144.00	ND	ND	ND	0.4	ND	ND	3.00	ND	ND	ND
Ojai Valley	04N23W12H02S	9/27/2011	ND	ND	ND	29.00	ND	ND	ND	0.3	ND	ND	3.00	ND	ND	ND
Ojai Valley	05N22W32K02S	9/27/2011	ND	ND	ND	63.00	ND	ND	ND	ND	ND	ND	7.00	ND	ND	2.00
Oxnard Pl. Fore.	02N22W23H03S	8/26/2011	ND	ND	2.00	24.00	ND	ND	ND	ND	ND	2.00	11.00	ND	ND	2.00
Oxnard Pl. Press.	01N21W06L05S	7/26/2011	40.00	ND	ND	72.00	ND	ND	ND	0.7	ND	ND	ND	ND	ND	ND
Oxnard Pl. Press.	01N21W28D01S	8/26/2011	240.00	ND	ND	41.00	ND	ND	ND	0.8	ND	1.00	6.00	ND	ND	ND
Oxnard Pl. Press.	01N22W03F05S	10/12/2011	ND	ND	ND	20.00	ND	ND	ND	ND	ND	ND	13.00	ND	ND	3.00
Oxnard Pl. Press.	01N22W03F07S	10/12/2011	ND	ND	ND	41.00	ND	ND	ND	0.3	ND	ND	21.00	ND	ND	3.00
Oxnard Pl. Press.	01N22W12M01S	10/12/2011	800.00	ND	ND	42.00	0.00	0.00	1.00	0.3	ND	2.00	ND	ND	0.00	3.00
Oxnard Pl. Press.	01N22W12N03S	10/12/2011	ND	ND	ND	42.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Pl. Press.	01N22W19A01S	8/31/2011	ND	ND	ND	26.00	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND
Oxnard Pl. Press.	01N22W23R02S	10/3/2011	ND	ND	ND	42.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Pl. Press.	01N22W36H01S	10/24/2011	ND	ND	ND	114.00	ND	ND	ND	ND	ND	ND	6.00	ND	ND	ND
Oxnard Pl. Press.	02N21W20M03S	8/10/2011	ND	ND	4.00	37.00	ND	ND	ND	ND	ND	2.00	89.00	ND	ND	3.00
Oxnard Pl. Press.	02N22W24P02S	9/1/2011	ND	ND	ND	19.00	ND	ND	ND	0.5	ND	1.00	ND	ND	ND	ND
Oxnard Pl. Press.	02N22W30Q01S	8/30/2011	ND	ND	ND	27.00	ND	ND	ND	ND	ND	ND	28.00	ND	ND	ND
Oxnard Pl. Press.	02N22W31D02S	8/23/2011	ND	ND	ND	21.00	ND	ND	ND	1.1	ND	1.00	11.00	ND	ND	2.00
Oxnard Pl. Press.	02N22W32C04S	10/12/2011	ND	ND	ND	20.00	ND	ND	ND	ND	ND	ND	11.00	ND	ND	3.00
Oxnard Pl. Press.	02N23W25M01S	9/1/2011	ND	ND	ND	80.00	ND	ND	ND	ND	ND	ND	11.00	ND	ND	ND
Piru	04N18W30A02S	9/7/2011	ND	ND	ND	25.00	ND	ND	ND	ND	ND	5.00	5.00	ND	ND	2.00
Piru	04N18W30A03S	8/9/2011	ND	ND	ND	30.00	ND	ND	2.00	0.5	ND	3.00	5.00	ND	ND	3.00
Piru	04N18W30J04S	8/2/2011	ND	ND	ND	20.00	ND	ND	ND	0.2	ND	1.00	3.00	ND	ND	ND
Piru	04N19W23R03S	8/18/2011	ND	ND	ND	18.00	ND	ND	2.00	ND	ND	7.00	5.00	ND	ND	3.00
Piru	04N19W25H01S	8/2/2011	ND	ND	ND	20.00	ND	ND	1.00	0.3	ND	2.00	5.00	ND	ND	3.00
Piru	04N19W25K04S	8/2/2011	ND	ND	ND	18.00	ND	ND	2.00	ND	ND	1.00	5.00	ND	ND	3.00
Piru	04N19W25M03S	8/2/2011	ND	ND	7.00	23.00	ND	1.00	2.00	ND	ND	5.00	403.00	ND	ND	4.00
Piru	04N19W26H01S	8/9/2011	ND	ND	ND	21.00	ND	ND	ND	ND	ND	2.00	6.00	ND	ND	3.00
Piru	04N19W26J01S	8/2/2011	ND	ND	ND	21.00	ND	1.00	1.00	0.7	ND	5.00	7.00	ND	ND	3.00
Piru	04N19W26J03S	8/2/2011	ND	ND	ND	21.00	ND	ND	2.00	ND	ND	1.00	4.00	ND	ND	3.00

Table D-2 Inorganic Metals (cont.)

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Piru	04N19W26J05S	8/2/2011	ND	ND	5.00	20.00	ND	1.00	2.00	ND	ND	6.00	195.00	ND	ND	2.00
Piru	04N19W34D03S	8/9/2011	ND	ND	ND	19.00	ND	ND	ND	1.1	ND	2.00	9.00	ND	ND	3.00
Piru	04N19W34D05S	8/9/2011	ND	ND	ND	18.00	ND	ND	ND	ND	ND	ND	13.00	ND	ND	3.00
Piru	04N19W34J04S	8/2/2011	ND	ND	ND	18.00	ND	ND	1.00	0.2	ND	1.00	6.00	ND	ND	3.00
Pleasant Valley	01N21W01B05S	7/26/2011	ND	ND	ND	455.00	ND	ND	1.00	ND	ND	ND	5.00	ND	ND	ND
Pleasant Valley	01N21W03K01S	8/26/2011	ND	ND	ND	27.00	ND	ND	2.00	0.7	ND	1.00	10.00	ND	ND	5.00
Pleasant Valley	01N21W04K01S	8/26/2011	600.00	ND	3.00	45.00	ND	ND	4.00	3.4	ND	3.00	ND	ND	ND	4.00
Pleasant Valley	01N21W12D02S	8/31/2011	ND	ND	ND	50.00	ND	ND	ND	0.3	ND	ND	7.00	ND	ND	ND
Pleasant Valley	01N21W15D02S	8/26/2011	ND	ND	3.00	42.00	ND	ND	ND	ND	ND	1.00	5.00	ND	ND	4.00
Pleasant Valley	02N20W19L05S	8/26/2011	ND	ND	2.00	52.00	ND	ND	ND	0.4	ND	4.00	4.00	ND	ND	ND
Santa Paula	02N22W03E01S	8/10/2011	ND	ND	3.00	26.00	ND	ND	ND	ND	ND	ND	5.00	ND	ND	ND
Santa Paula	02N22W03L01S	7/28/2011	ND	ND	4.00	24.00	ND	ND	1.00	ND	ND	ND	7.00	ND	ND	ND
Santa Paula	03N21W09K04S	8/1/2011	ND	ND	5.00	27.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Santa Paula	03N22W35Q01S	8/10/2011	ND	ND	2.00	22.00	ND	ND	ND	0.4	ND	1.00	64.00	ND	ND	2.00
Sherwood	01N19W29H09S	10/26/2011	ND	3.00	ND	38.00	ND	ND	ND	4.4	ND	16.00	ND	ND	ND	ND
Sherwood	01N20W25C07S	10/26/2011	ND	ND	2.00	78.00	ND	1.00	2.00	7.5	ND	ND	3.00	ND	ND	ND
Simi Valley	02N18W08D04S	10/11/2011	ND	ND	ND	14.00	ND	ND	ND	0.3	ND	ND	11.00	ND	ND	ND
Simi Valley	02N18W10A02S	10/11/2011	110.00	ND	3.00	18.00	ND	ND	4.00	0.4	ND	ND	55.00	ND	ND	12.00
Thousand Oaks	01N19W08G02S	7/26/2011	ND	ND	ND	21.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tierra Rejada Valley	02N19W10R02S	9/9/2011	ND	ND	ND	21.00	ND	ND	2.00	7.4	ND	13.00	3.00	ND	ND	27.00
Tierra Rejada Valley	02N19W14R03S	10/11/2011	ND	ND	4.00	8.00	ND	ND	ND	0.7	ND	ND	ND	ND	ND	16.00
Tierra Rejada Valley	02N19W15G01S	9/28/2011	ND	ND	3.00	14.00	ND	ND	5.00	ND	ND	ND	10.00	ND	ND	30.00
Tierra Rejada Valley	02N19W15J02S	8/23/2011	ND	ND	3.00	12.00	ND	ND	2.00	8	ND	1.00	7.00	ND	ND	20.00
Undefined	04N22W14Q01S	10/13/2011	10.00	ND	ND	78.00	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND
Undefined	04N22W36C03S	7/28/2011	ND	ND	3.00	332.00	ND	ND	ND	0.3	ND	ND	18.00	ND	ND	3.00
Upper Ojai	04N22W08Q01S	9/26/2011	ND	ND	4.00	302.00	ND	ND	ND	ND	ND	2.00	3.00	ND	ND	ND
Upper Ojai	04N22W11J01S	8/18/2011	ND	ND	ND	48.00	ND	ND	1.00	2.6	ND	ND	ND	ND	ND	ND
Ventura River - Lower	02N23W05K01S	8/9/2011	ND	ND	ND	28.00	ND	ND	ND	0.2	ND	3.00	4.00	ND	ND	ND
Ventura River - Lower	03N23W32Q01S	8/9/2011	ND	ND	ND	22.00	ND	ND	ND	ND	ND	3.00	2.00	ND	ND	ND
Ventura River - Upper	04N23W04H01S	8/9/2011	ND	ND	ND	28.00	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND
Ventura River - Upper	04N23W09G03S	8/9/2011	ND	ND	ND	36.00	ND	ND	2.00	ND	ND	ND	ND	ND	ND	ND
Ventura River - Upper	04N23W29F02S	8/9/2011	ND	ND	ND	23.00	ND	ND	ND	ND	ND	ND	2.00	ND	ND	ND
Piru	04N19W26J05S	8/2/2011	ND	ND	5.00	20.00	ND	1.00	2.00	ND	ND	6.00	195.00	ND	ND	2.00
Piru	04N19W34D03S	8/9/2011	ND	ND	ND	19.00	ND	ND	ND	1.1	ND	2.00	9.00	ND	ND	3.00
Piru	04N19W34D05S	8/9/2011	ND	ND	ND	18.00	ND	ND	ND	ND	ND	ND	13.00	ND	ND	3.00

Table D-3 Radiochemistry

Groundwater Basin	SWN	Date	Alpha pCi/L	CE	Uranium pCi/L	CE
Piru	04N19W23R03S	8/18/2011	8.43	3.8	5.37	1.7
Piru	04N18W19R01S	9/7/2011	4.07	2		
Lockwood Valley	08N21W33R03S	9/21/2011	7.81	2.5		
Lockwood Valley	08N21W29Q05S	10/10/2011	20.9	6.1	9.1	1.7

* CE – Counting Error

Piper and Stiff Diagrams

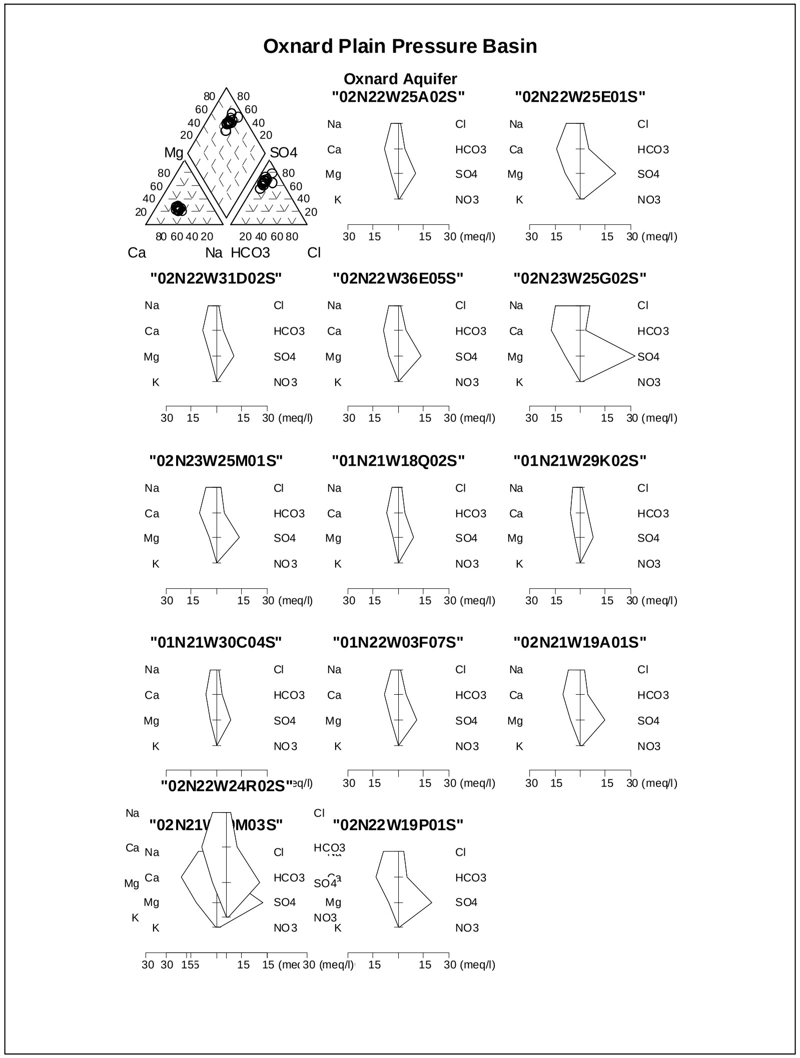


Figure D-1: Piper and Stiff diagrams showing water quality. for the Oxnard Aquifer groundwater

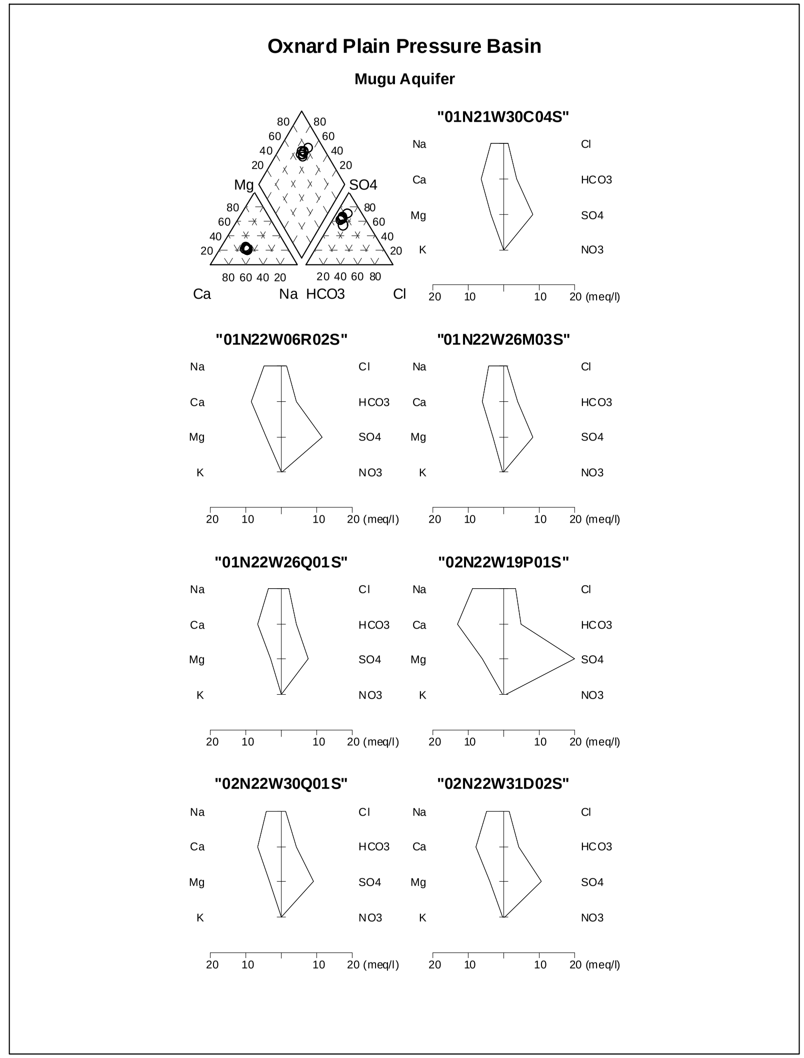


Figure D-2: Piper and Stiff diagrams showing water quality for the Mugu Aquifer groundwater

Piper and Stiff Diagrams

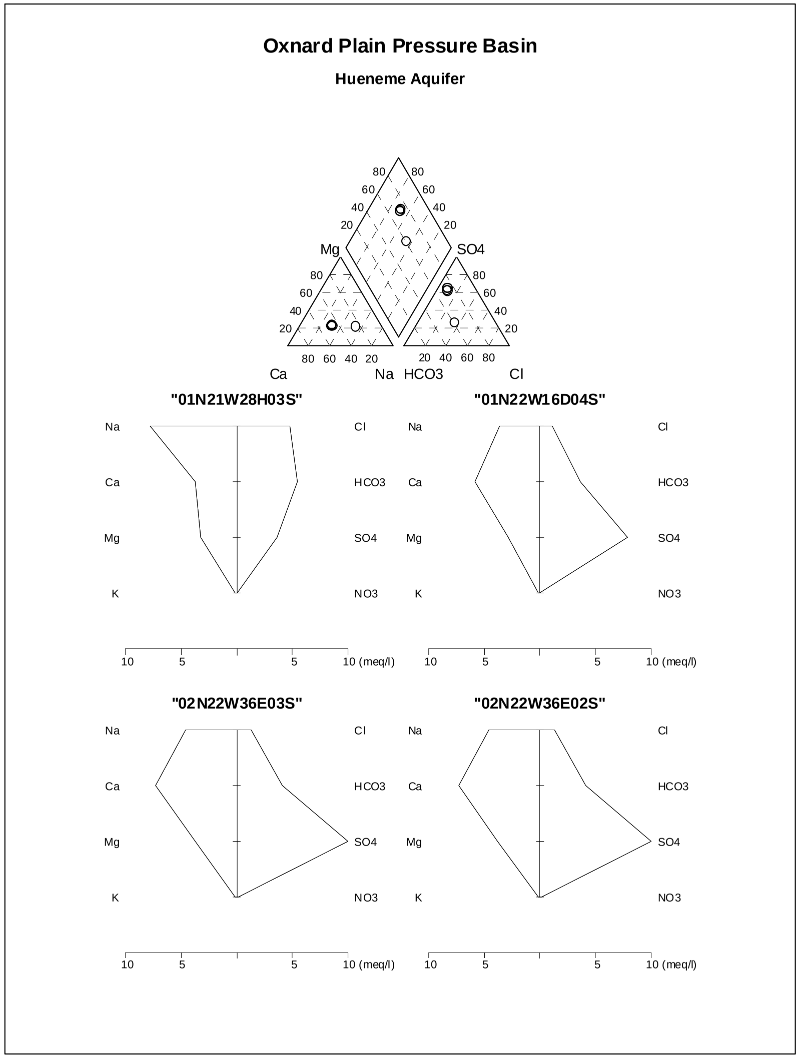


Figure D-3: Piper and Stiff diagrams showing water quality for the Hueneme Aquifer groundwater.

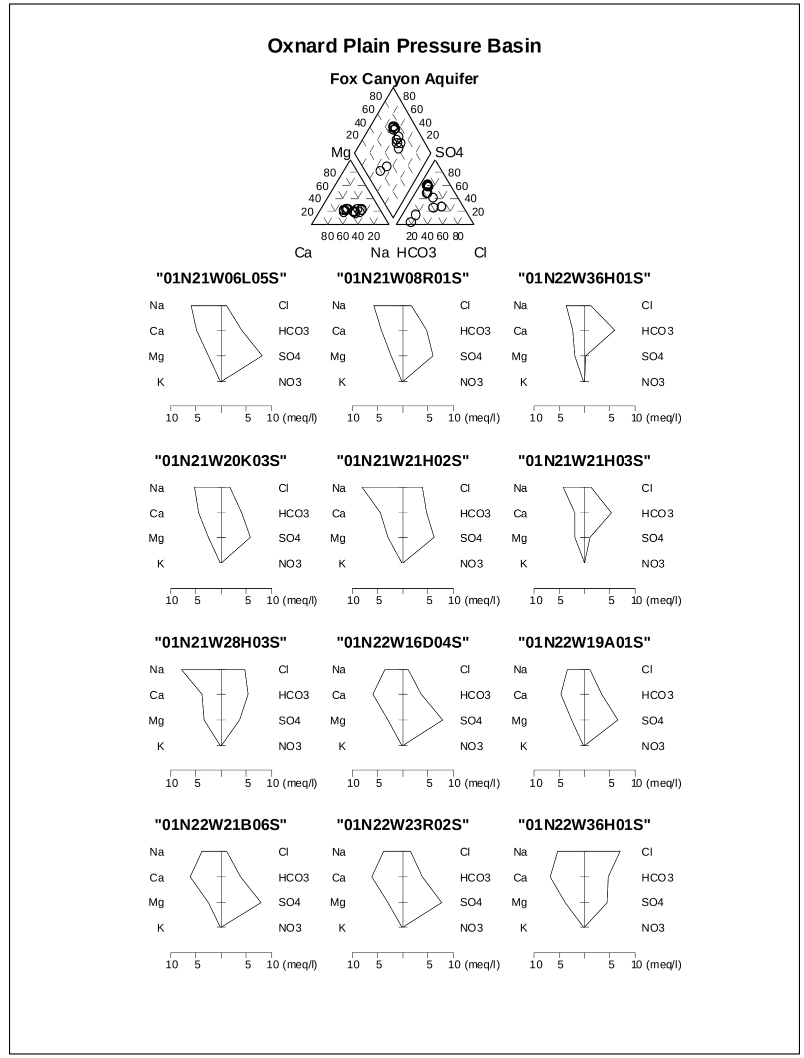


Figure D-4: Piper and Stiff diagrams showing water quality for the Fox Canyon Aquifer groundwater.

Piper and Stiff Diagrams

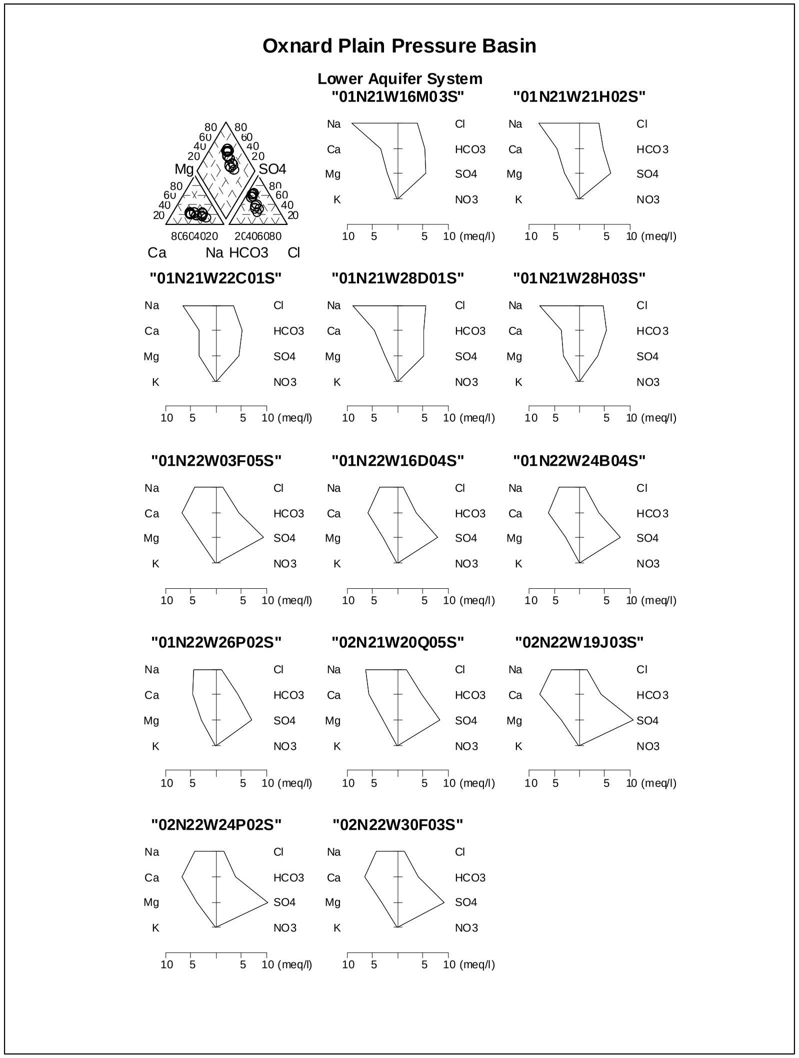


Figure D-5: Piper and Stiff diagrams showing water quality for the Lower Aquifer System groundwater.

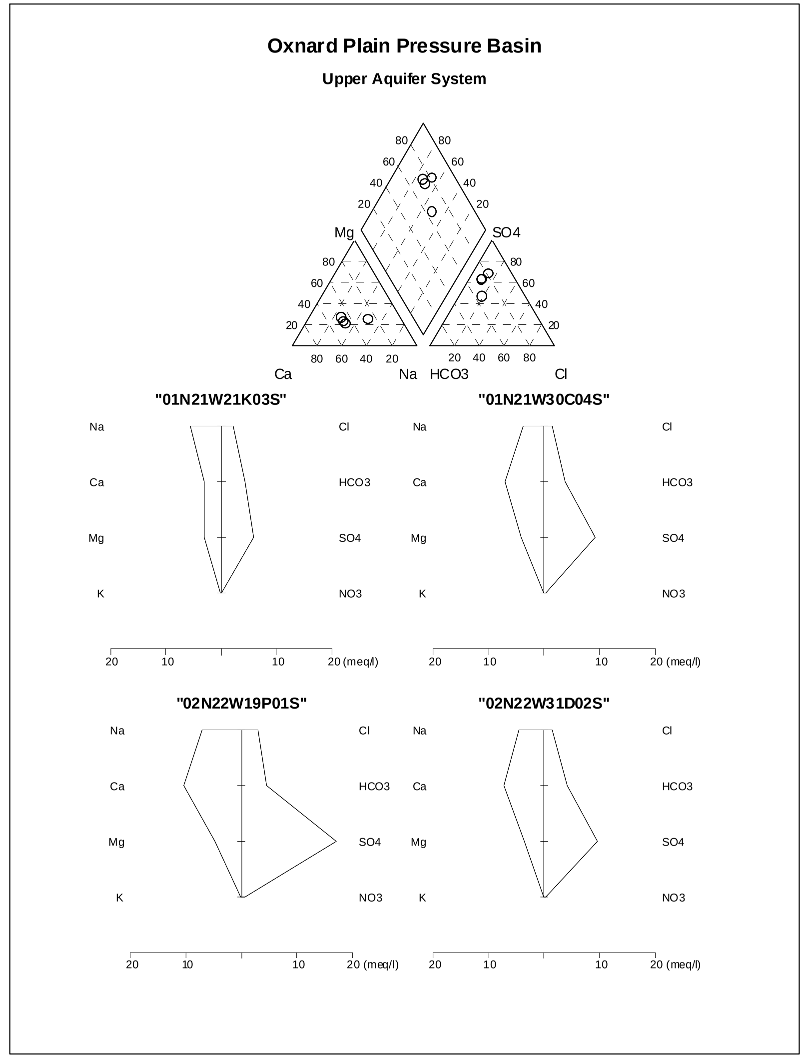
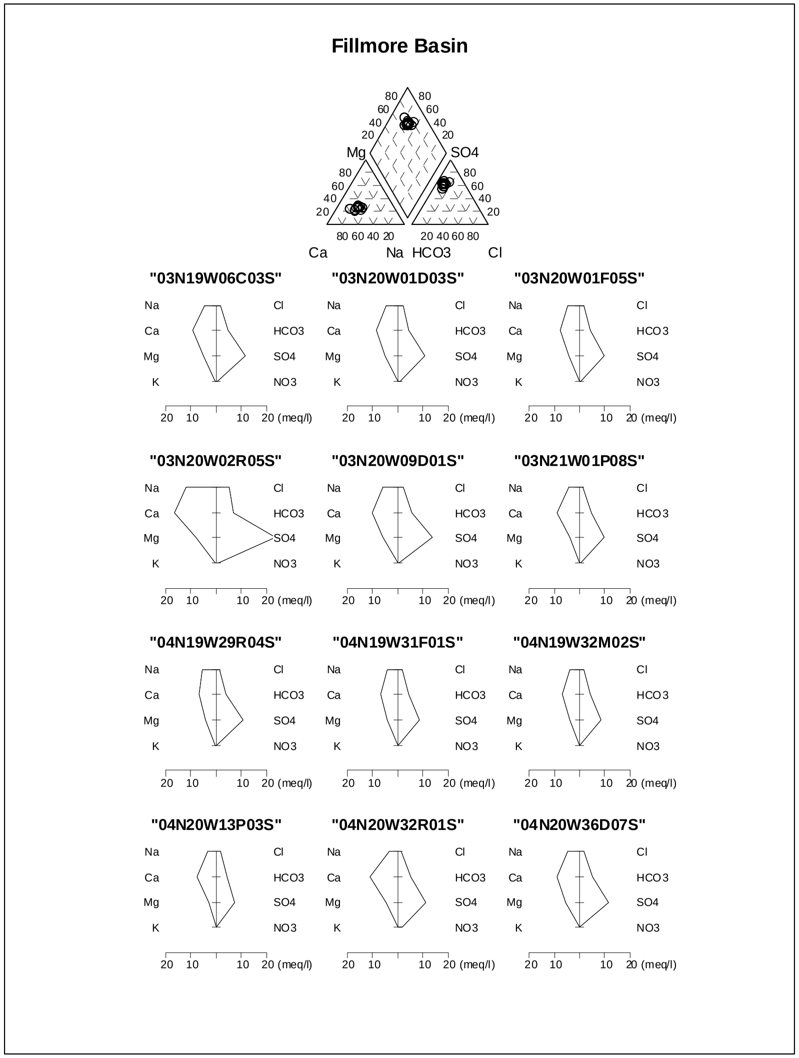


Figure D-6: Piper and Stiff diagrams showing water quality for the Upper Aquifer System groundwater.

Piper and Stiff Diagrams



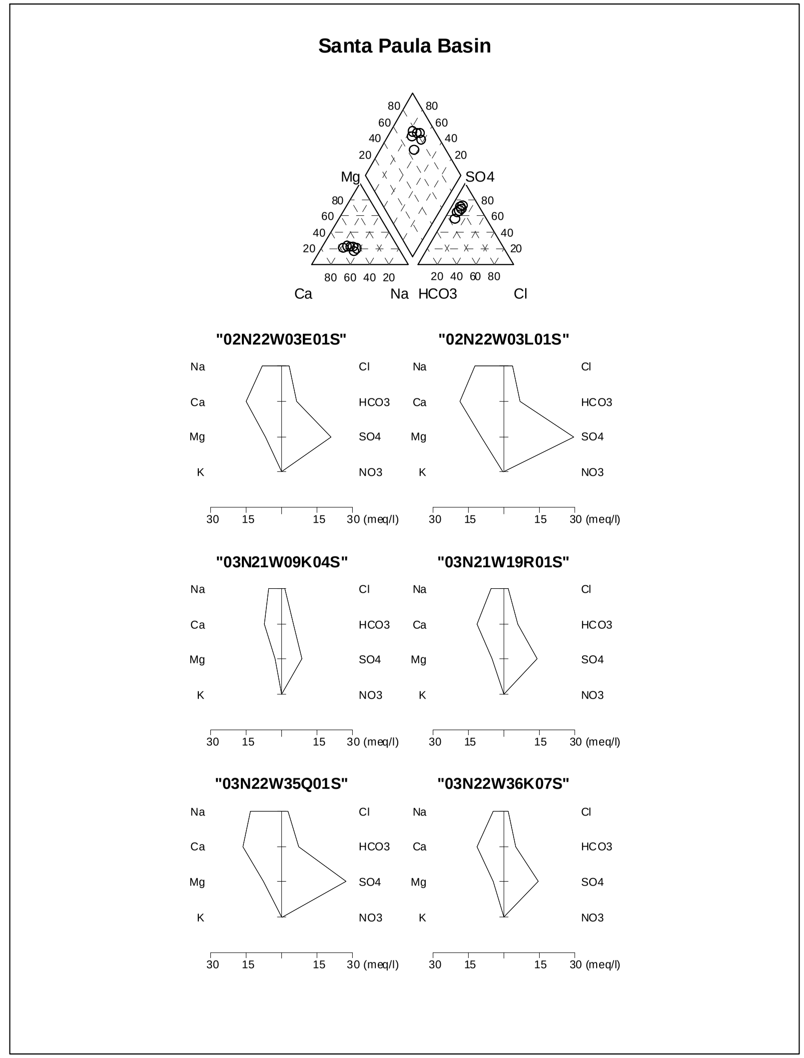


Figure D-7: Piper and Stiff diagrams showing water quality for Fillmore Basin groundwater

Figure D-8: Piper and Stiff diagrams showing water quality for Santa Paula Basin groundwater.

Piper and Stiff Diagrams

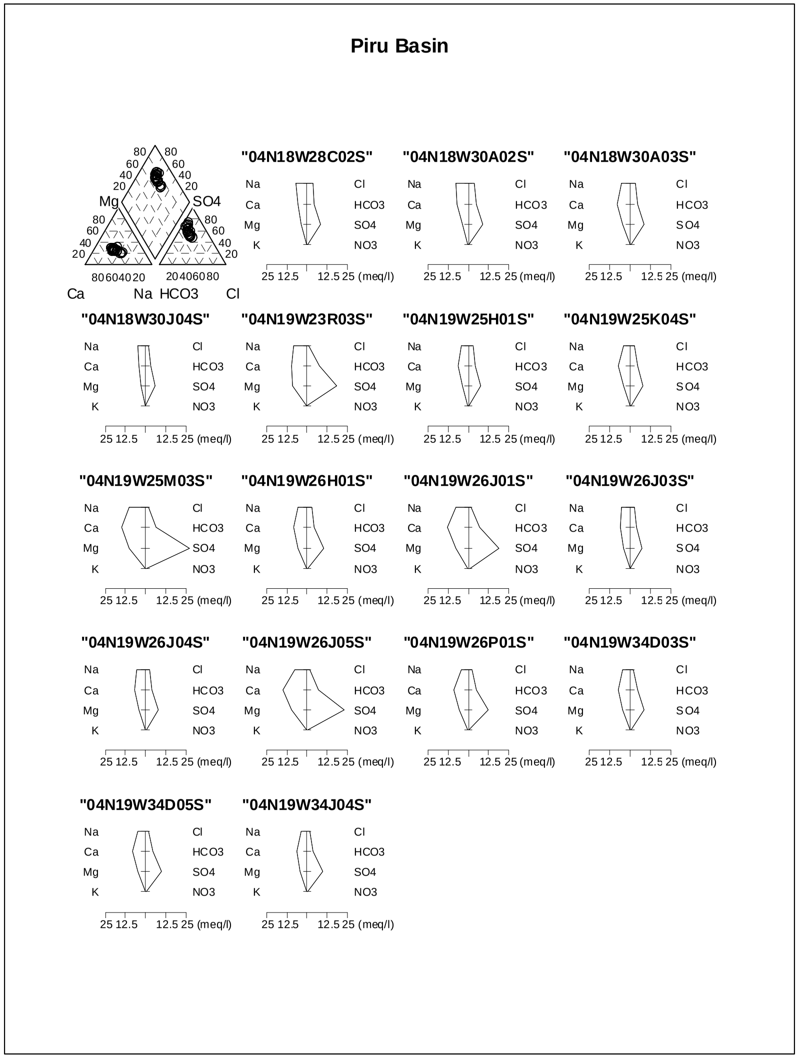


Figure D-9: Piper and Stiff diagrams showing water quality for Piru Basin groundwater.

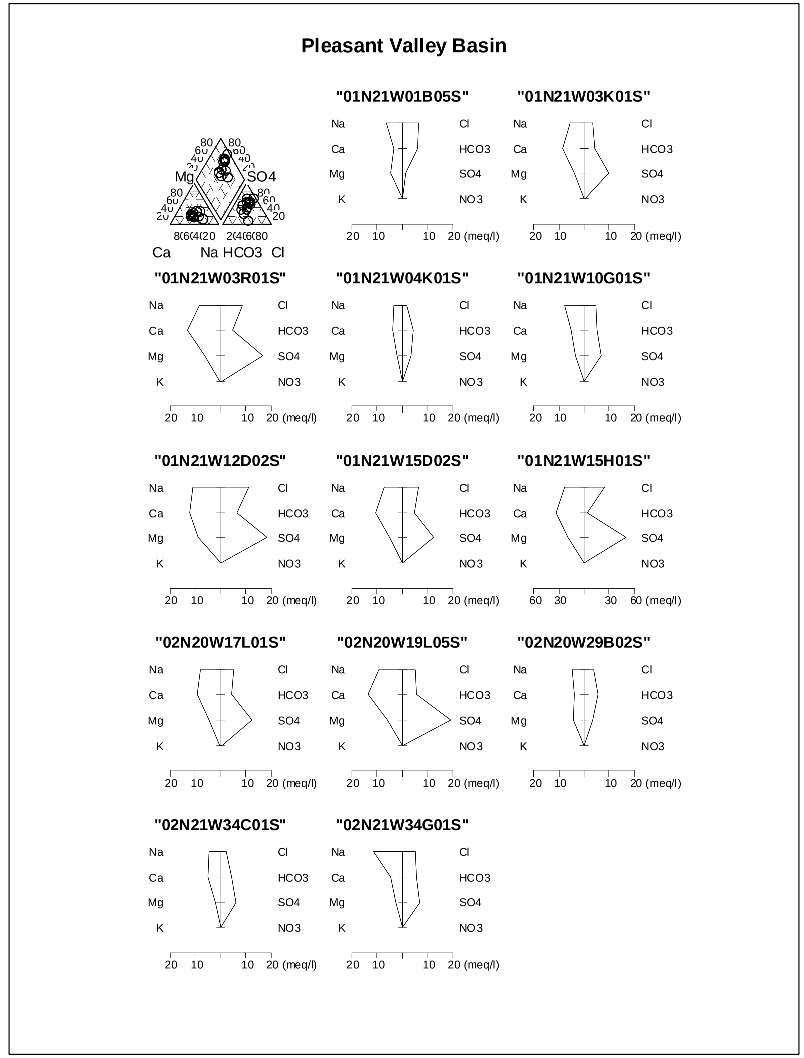


Figure D-10: Piper and Stiff diagrams showing water quality for Pleasant Valley Basin groundwater.

Piper and Stiff Diagrams

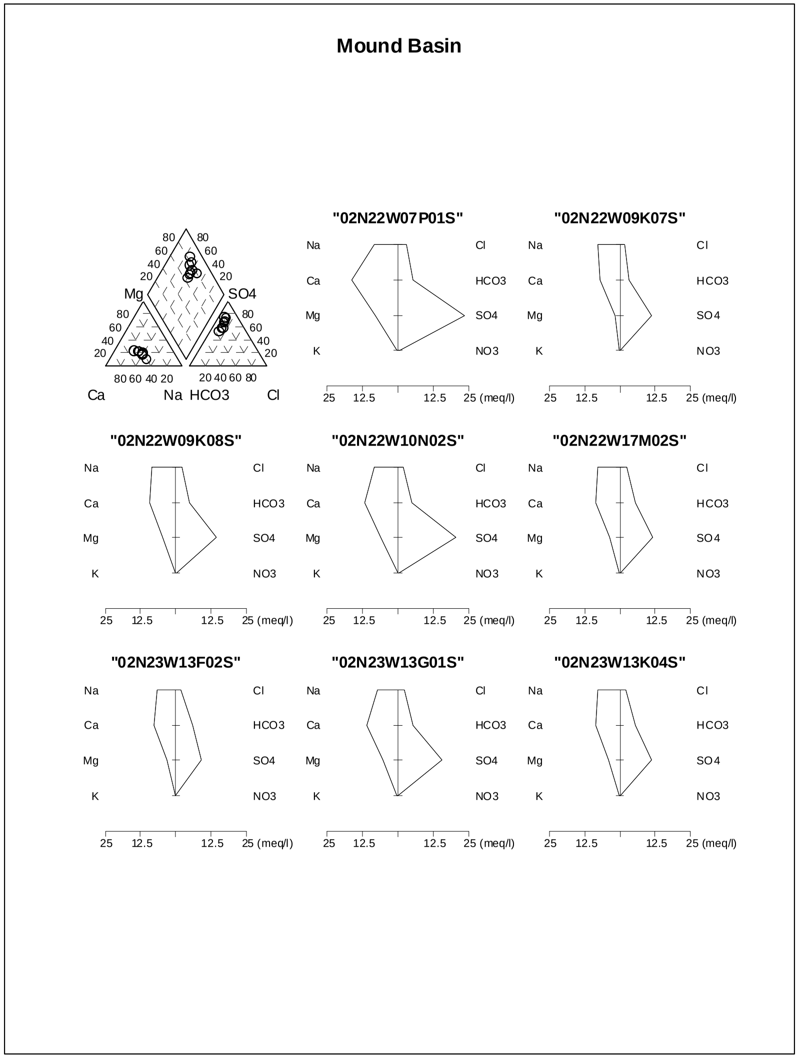


Figure D-11: Piper and Stiff diagrams showing water quality for Mound Basin groundwater.

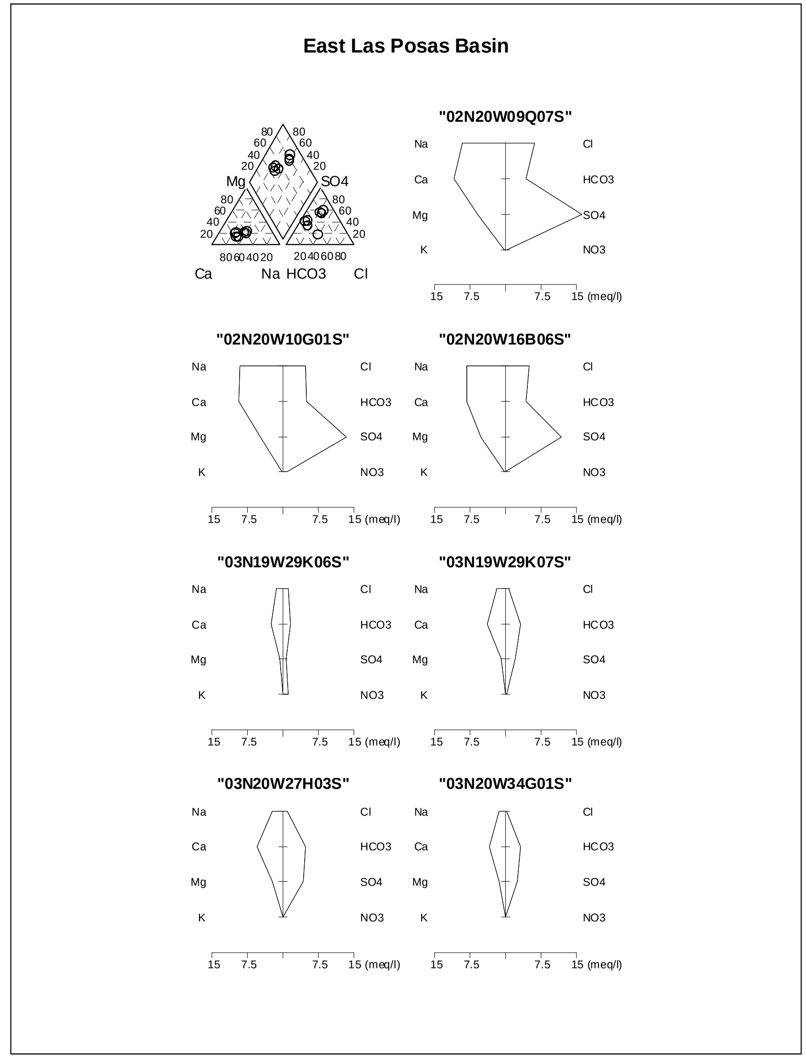


Figure D-12: Piper and Stiff diagrams showing water quality for East Las Posas Basin groundwater.

Piper and Stiff Diagrams

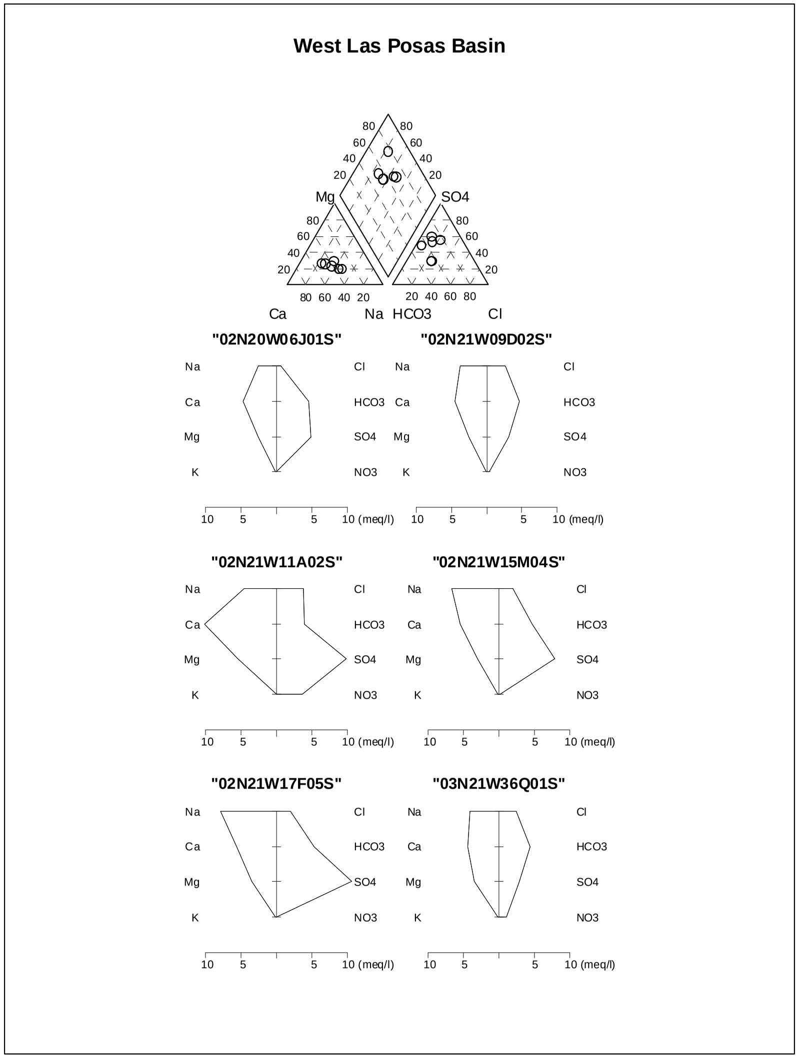


Figure D-13: Piper and Stiff diagrams showing water quality for West Las Posas Basin groundwater.

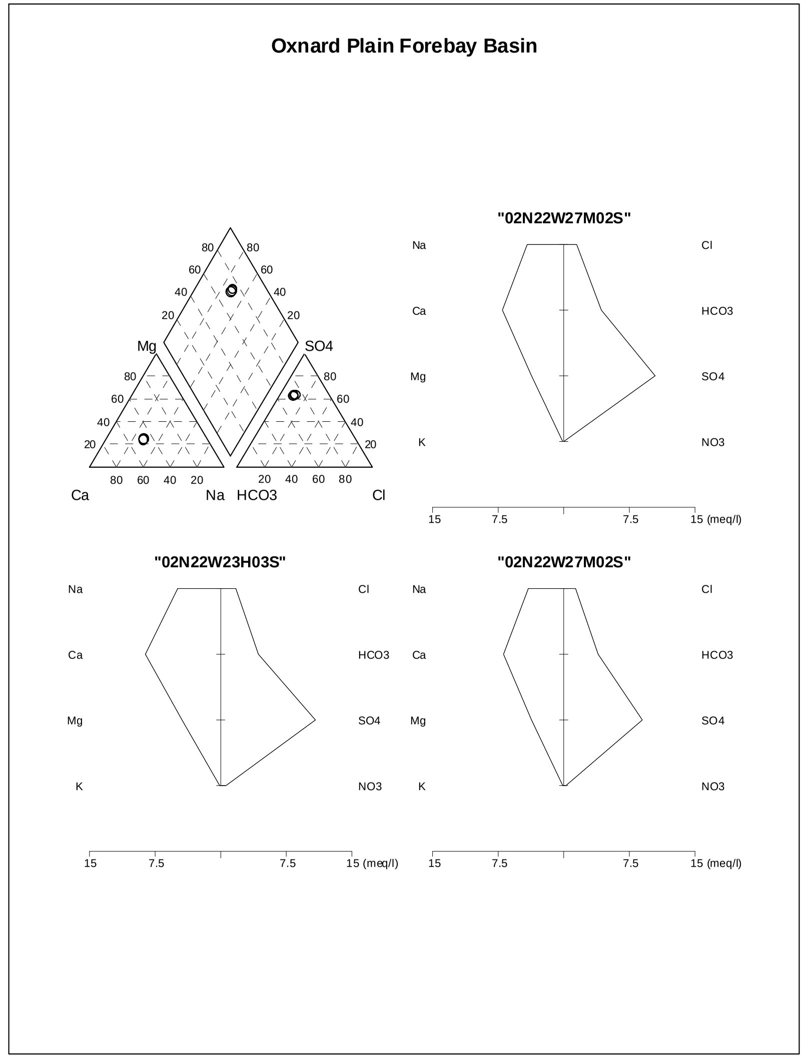


Figure D-14: Piper and Stiff diagrams showing water quality for Oxnard Plain Forebay Basin groundwater.

Piper and Stiff Diagrams

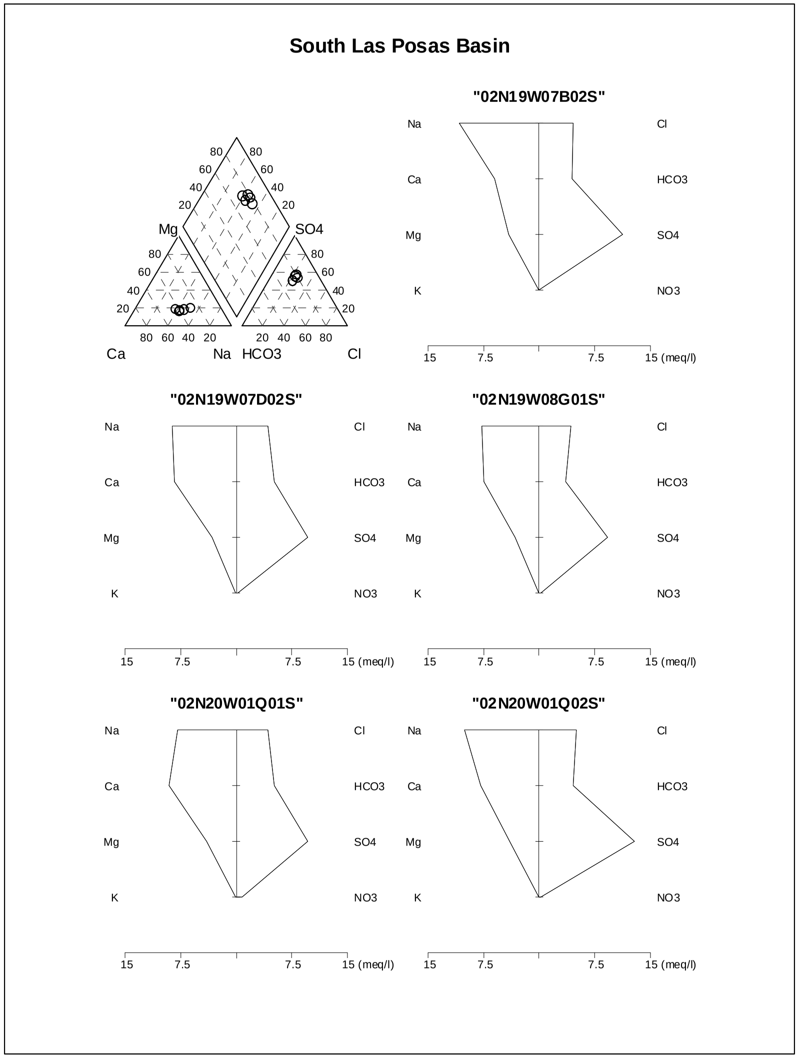


Figure D-15: Piper and Stiff diagrams showing water quality for South Las Posas Basin groundwater.

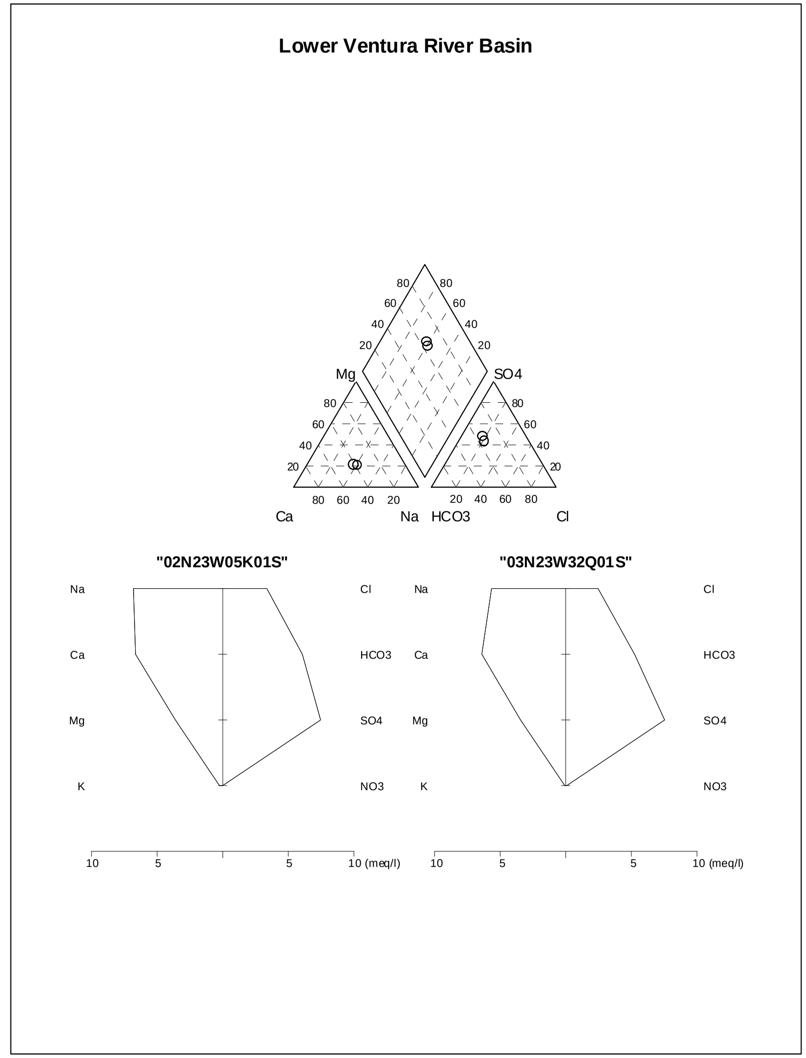


Figure D-16: Piper and Stiff diagrams showing water quality for Lower Ventura River Basin groundwater.

Piper and Stiff Diagrams

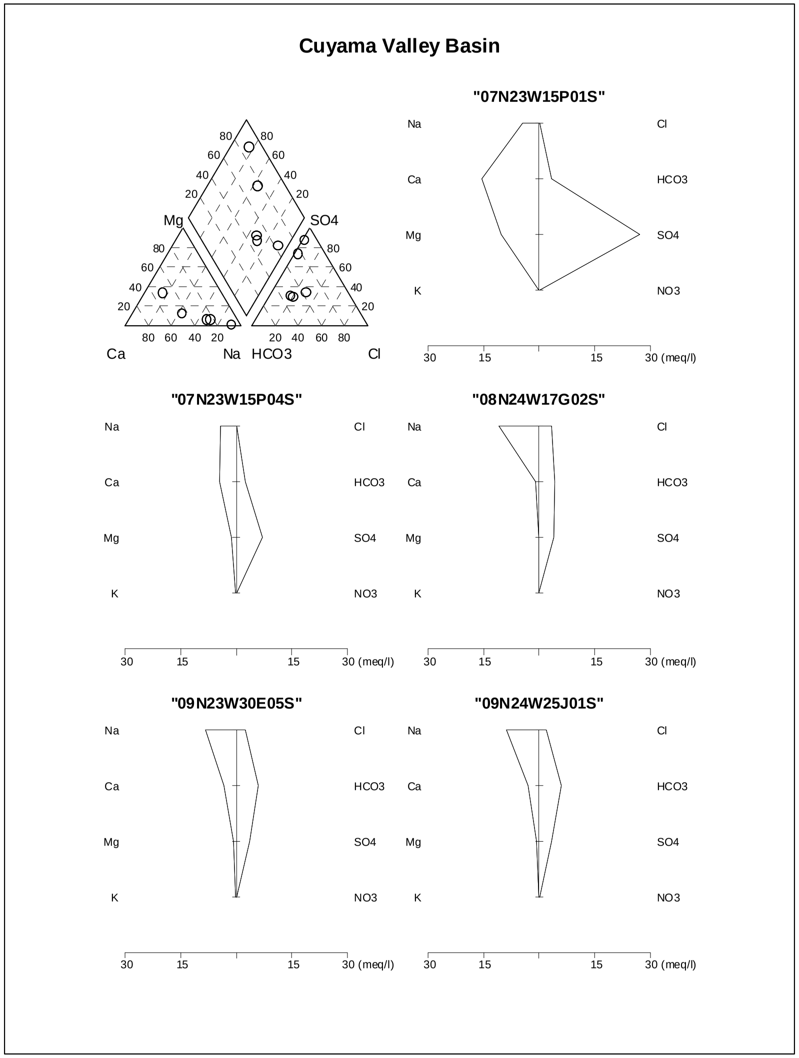


Figure D-17: Piper and Stiff diagrams showing water quality. for Cuyama Valley Basin groundwater

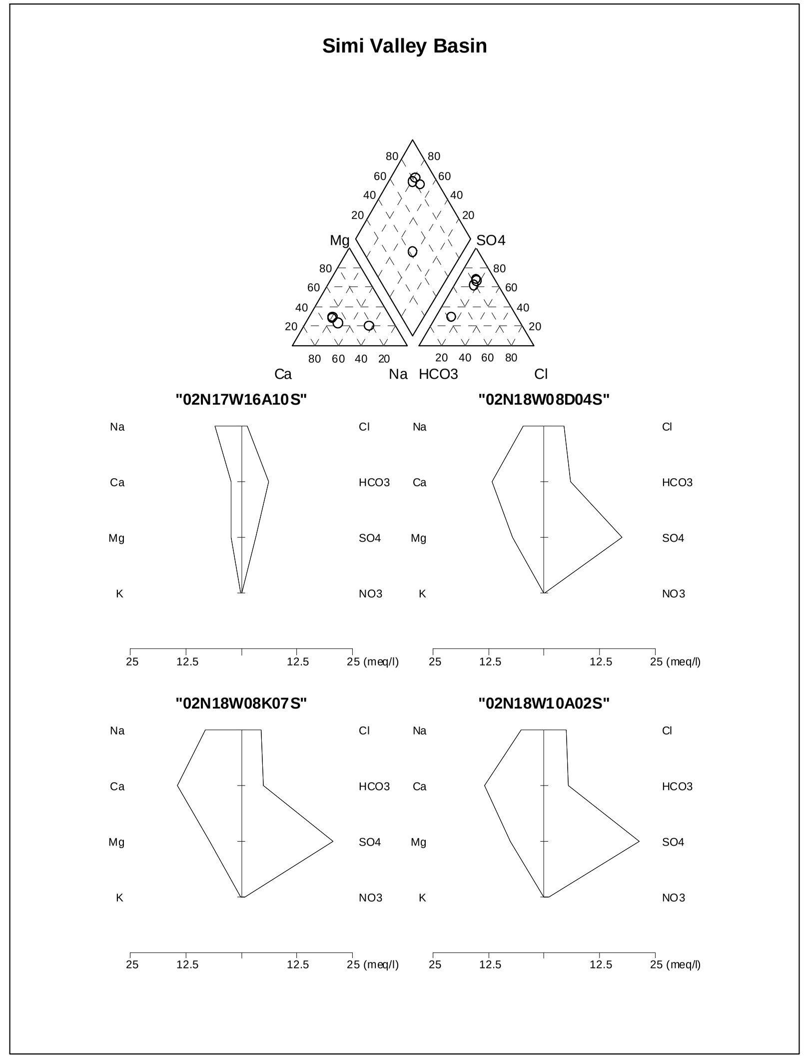


Figure D-18: Piper and Stiff diagrams showing water quality for Simi Valley Basin groundwater.

Piper and Stiff Diagrams

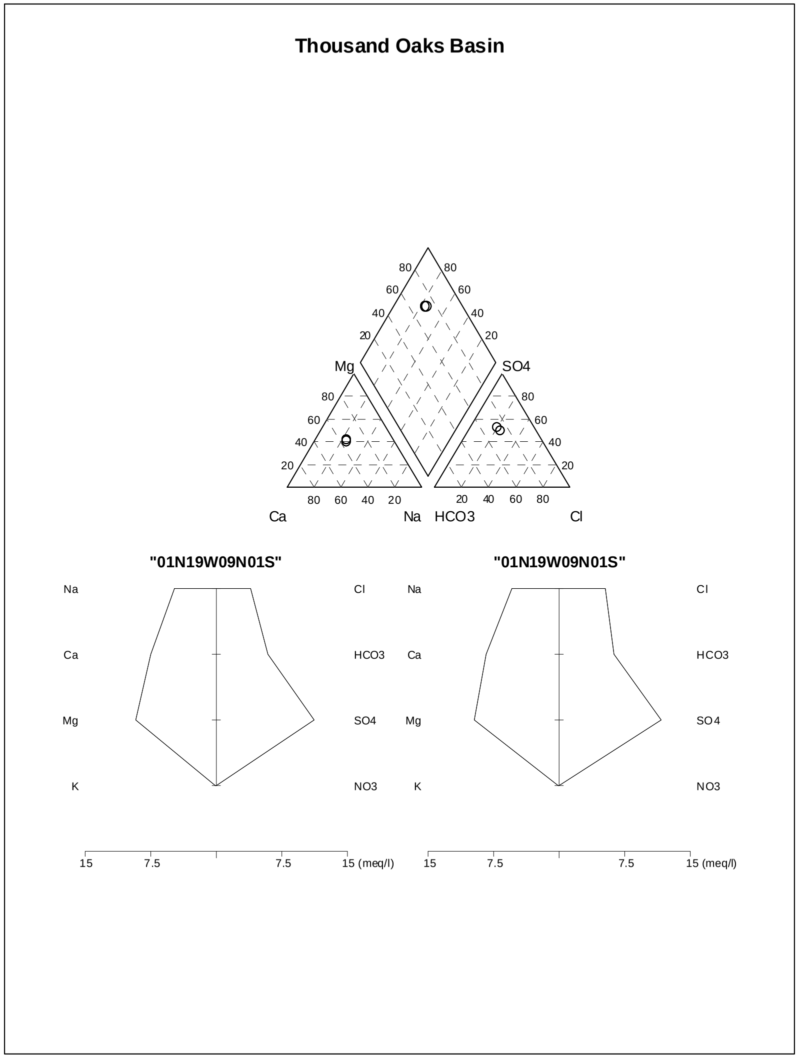


Figure D-19: Piper and Stiff diagrams showing water quality for Thousand Oaks Basin groundwater.

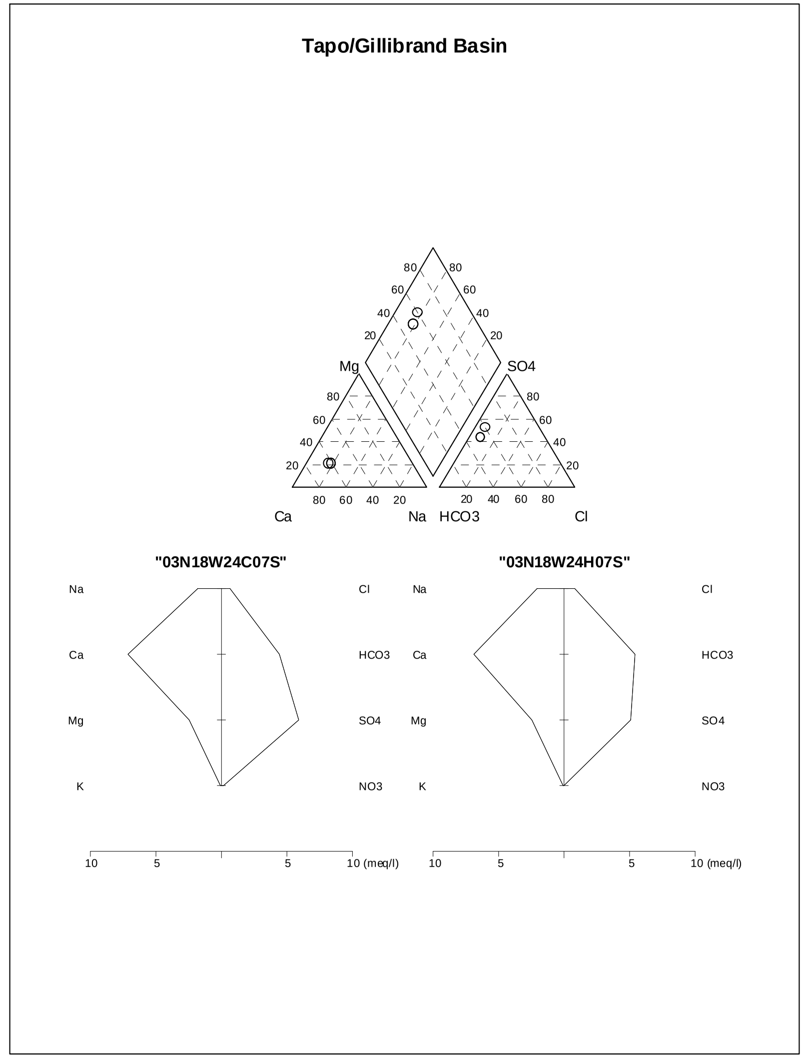
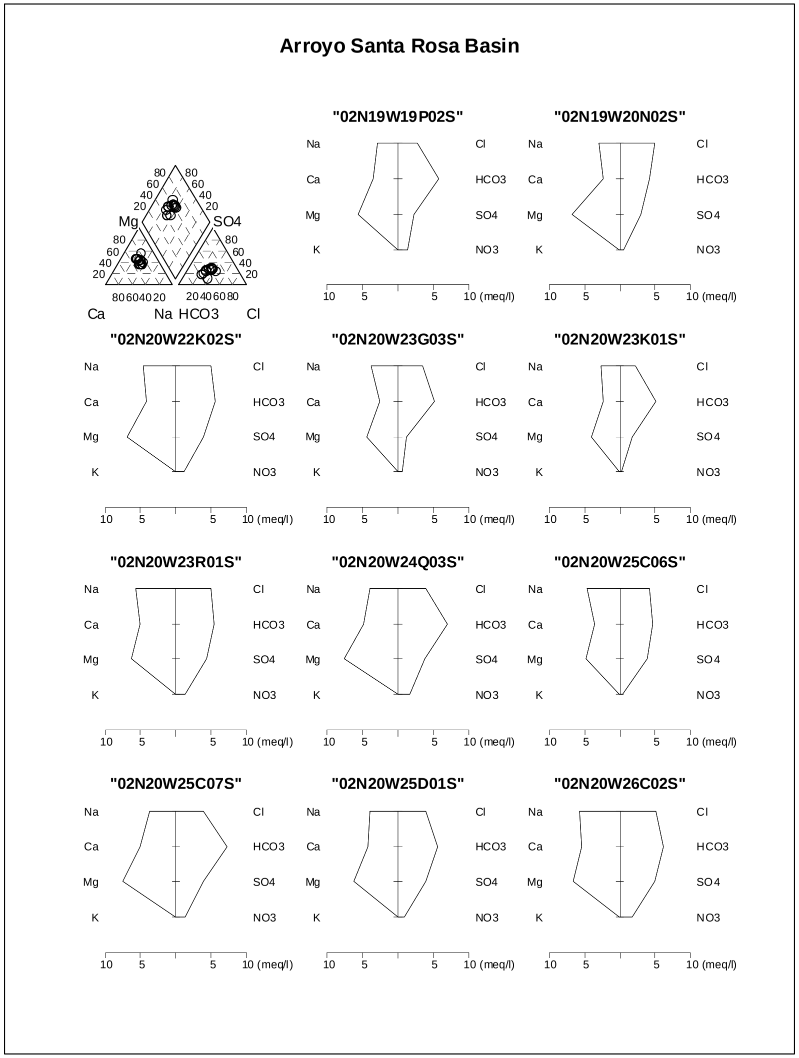


Figure D-20: Piper and Stiff diagrams showing water quality for the Tapop/Gillibrand Basin.

Piper and Stiff Diagrams



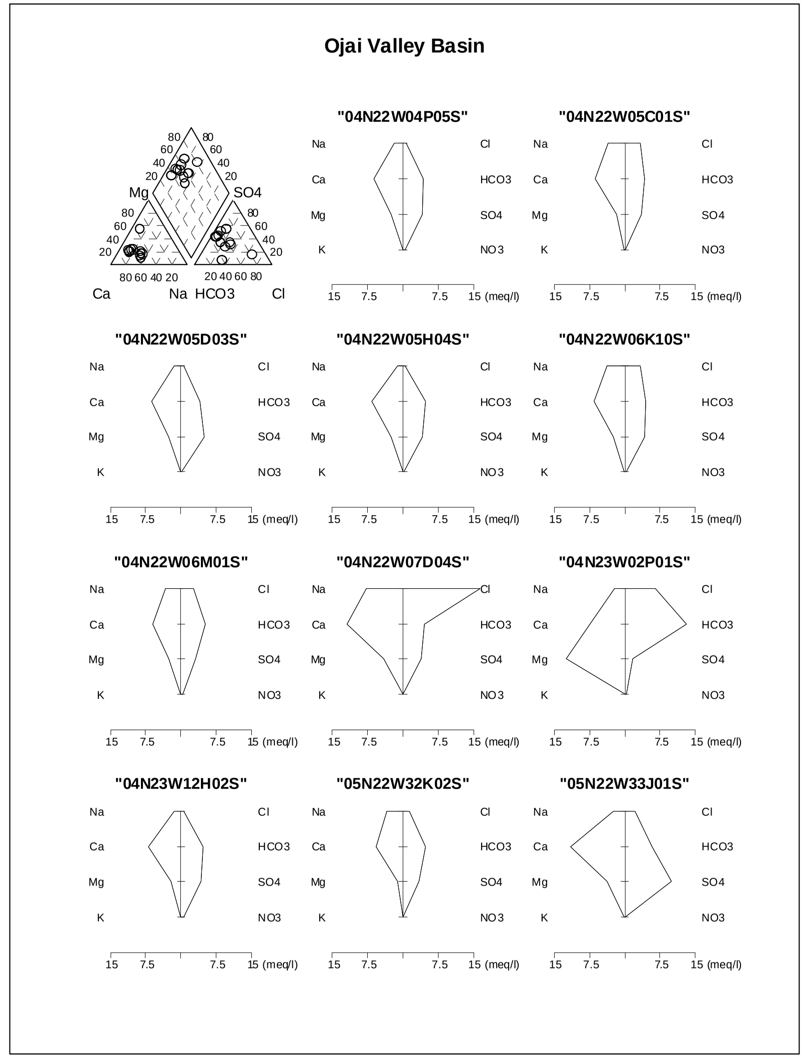


Figure D-21: Piper and Stiff diagrams showing water quality for Arroyo Santa Rosa Basin groundwater.

Figure D-22: Piper and Stiff diagrams showing water quality for Ojai Valley Basin groundwater.

Piper and Stiff Diagrams

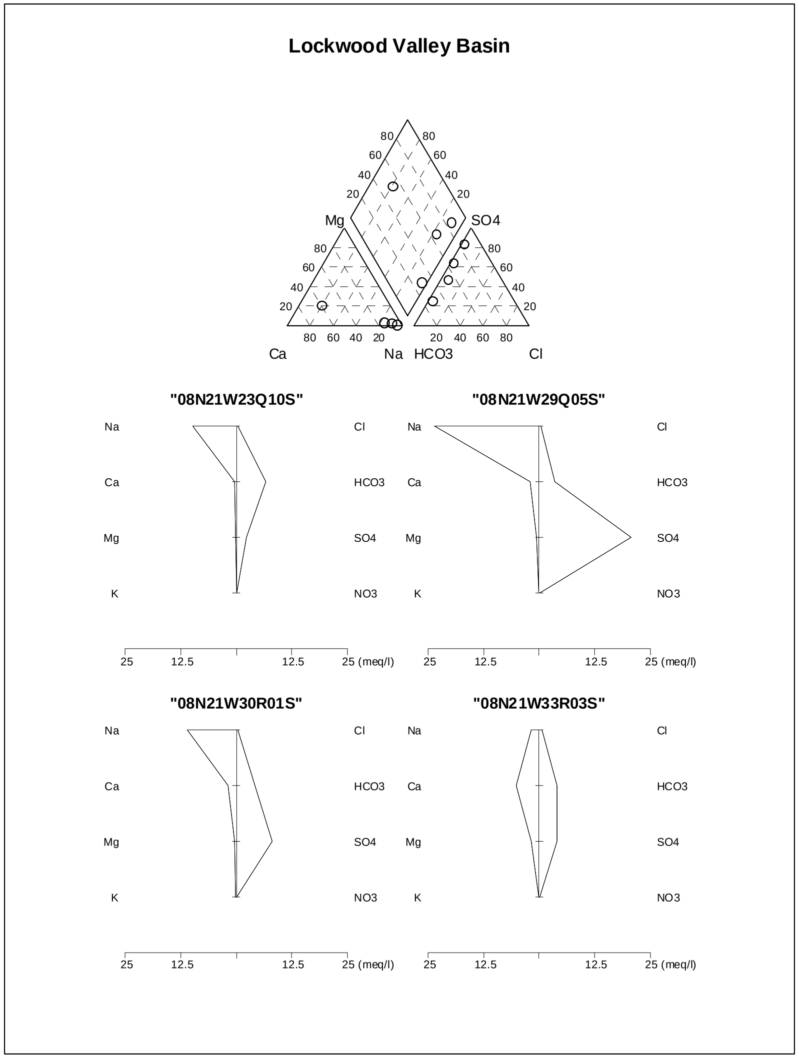


Figure D-23: Piper and Stiff diagrams showing water quality for Lockwood Valley Basin groundwater.

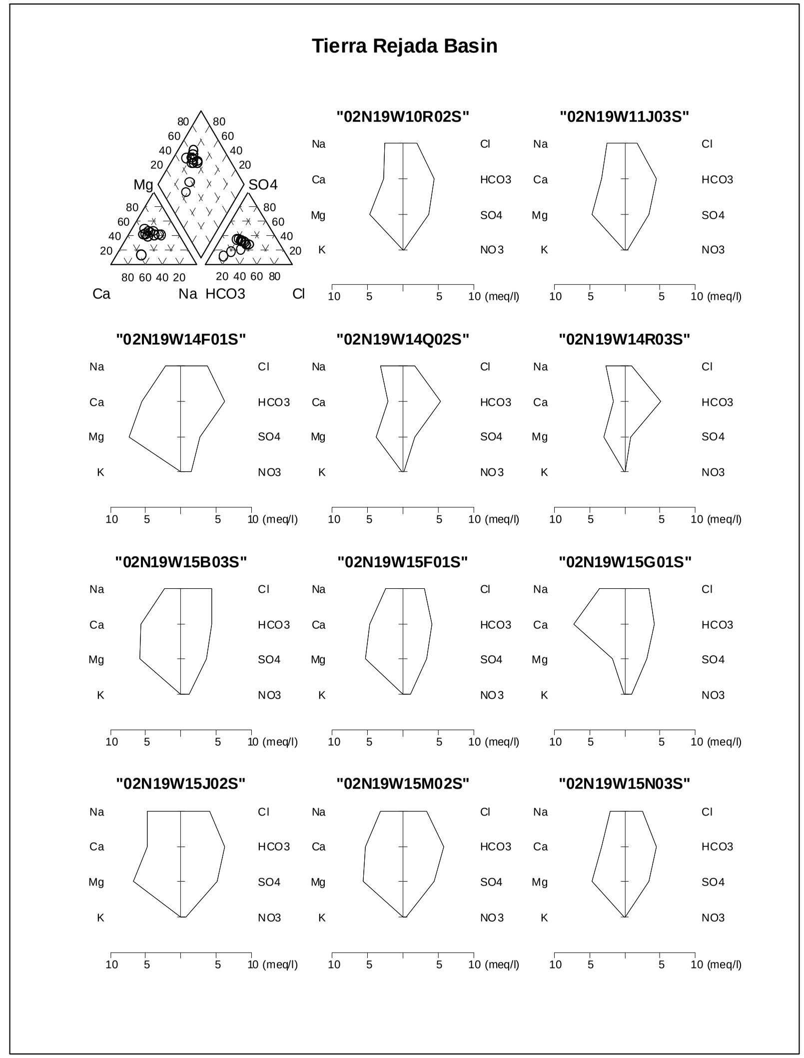


Figure D-24: Piper and Stiff diagrams showing water quality for Tierra Rejada Basin groundwater.

Piper and Stiff Diagrams

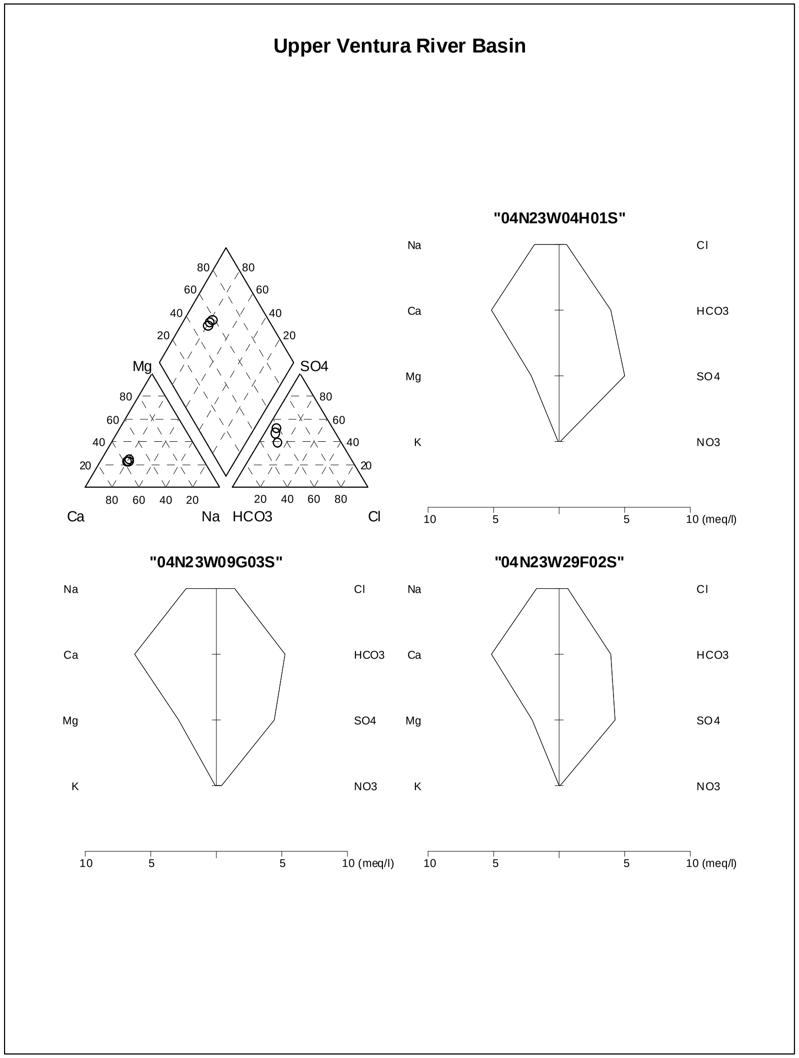


Figure D-25: Piper and Stiff diagrams showing water quality for Upper Ventura River Basin groundwater.

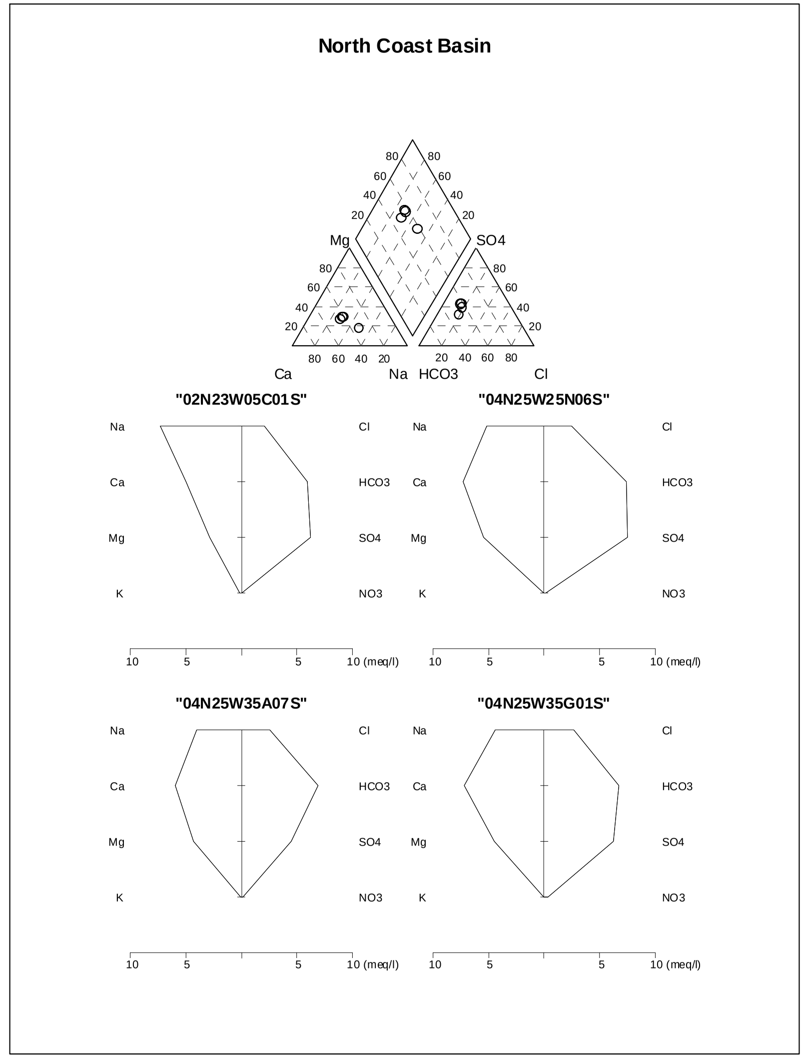


Figure D-26: Piper and Stiff diagrams showing water quality for North Coast Basin groundwater.

Piper and Stiff Diagrams

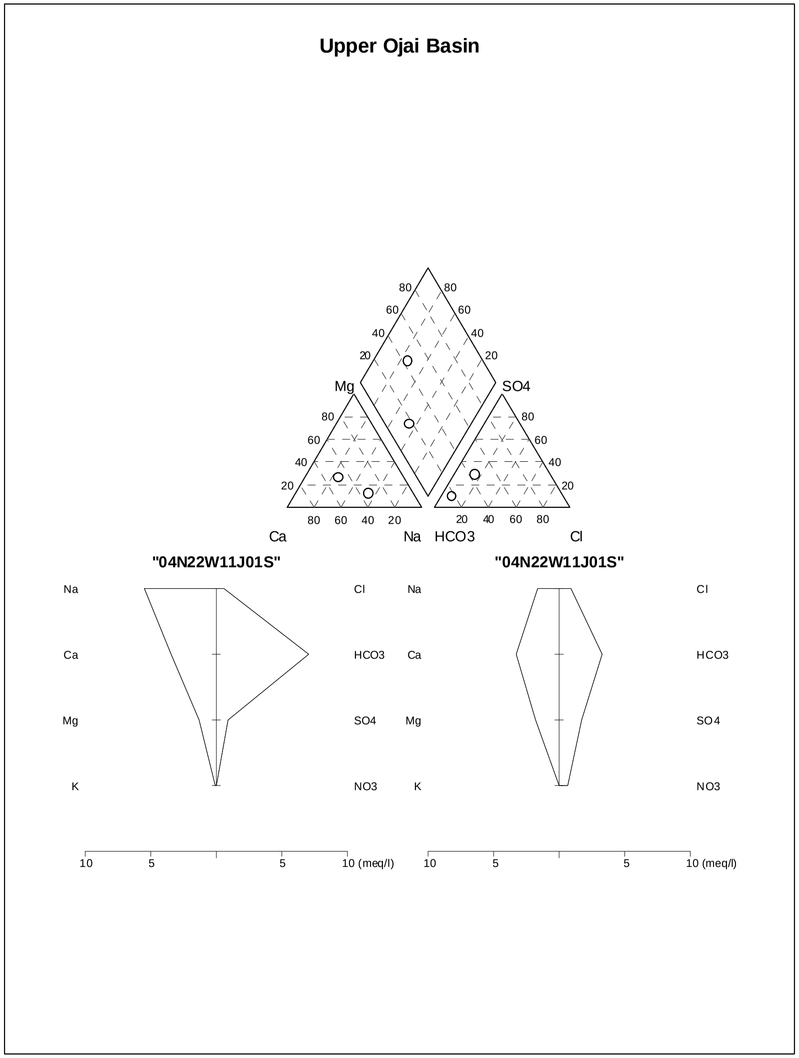


Figure D-27: Piper and Stiff diagrams showing water quality for Upper Ojai Basin groundwater.

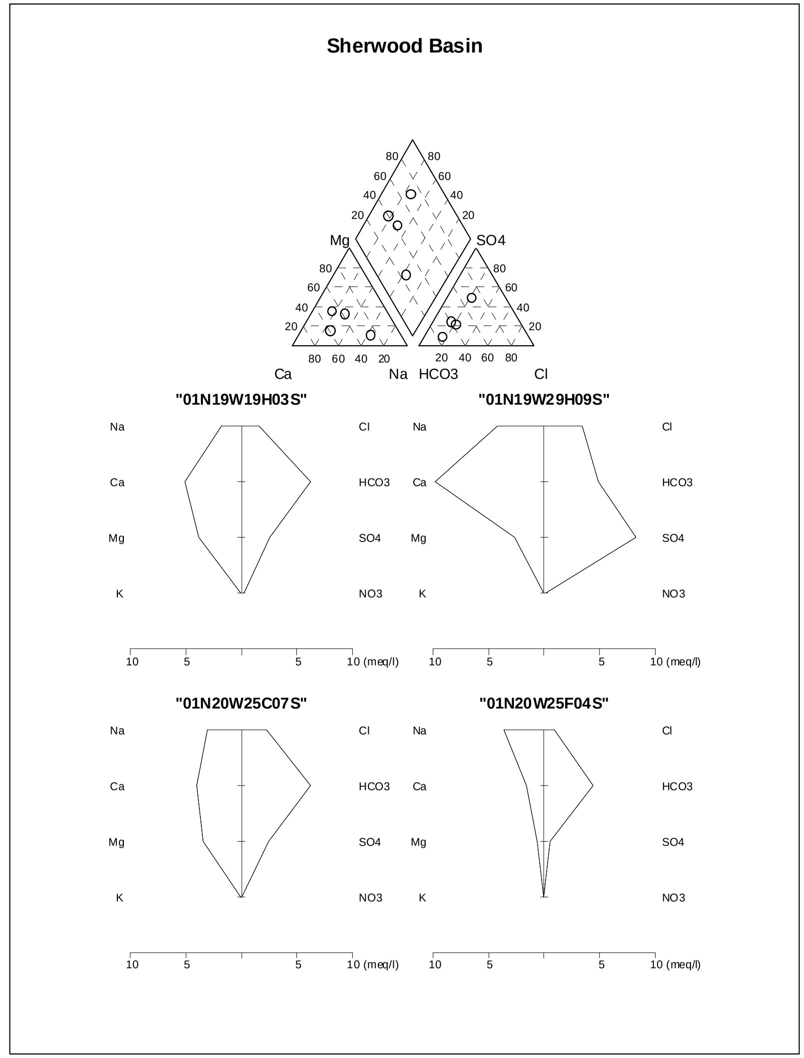


Figure D-28: Piper and Stiff diagrams showing water quality for Sherwood Basin groundwater.