Ventura County
Watershed Protection District
Water Resources Division

2015 Annual Report of Groundwater Conditions

Ventura County
Watershed Protection District
Water 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."

2015 Annual Report of Groundwater Conditions

Cover Photo: Windmill Well in Upper Ojai Basin.

Ventura County Watershed Protection District
Water Resources Division
Groundwater Section

2015 Annual Report of Groundwater Conditions

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Executive Summary

The purpose of this report is to provide a summary of Calendar Year 2015 water quality and groundwater elevation conditions, and to highlight other significant activities. This report is written with a broad target audience in mind from residents to consultants and other professionals. The report presents information and data from a broad perspective and with greater detail for the groundwater basins. Basin summary sheets have been prepared for the second year and are included after this Executive Summary. These basin summary sheets include analysis of water level and water quality trends over a five year period as well as data regarding basin size, number and types of wells, amount of irrigated agriculture, and other key data. Subsequent report sections present more specific water level and water quality data for each of the studied basins, and finally appendices contain specific data used in the report.

Calendar year 2015 is the fourth consecutive year of below average rainfall in the County which is currently designated as an area of exceptional drought by the U.S. Drought Monitor (http://droughtmonitor.unl.edu/). The drought and regulatory constraints on surface water releases and diversions from Lake Piru have caused a decrease in Santa Clara River water diversions. As less surface water is available, groundwater demand increases locally. Groundwater elevations in most areas of the County have continued the declining trend from last year. Water quality samples from 221 wells were collected between August and December of 2015. Twenty eight of the wells sampled had nitrate (NO_3) concentrations above the State of California Maximum Contaminant Level (MCL) of 45 mg/l. Water quality trends within basins are generally unchanged from previous years, with varying trends among individual wells. Key water quality concerns in some basins continue to be high total dissolved solids (TDS), and nitrate exceeding the maximum contaminant level in localized areas.

Groundwater extraction in certain areas of the County is regulated by other agencies. In 2014, the Fox Canyon Groundwater Management Agency (FCGMA) set forth mandatory cut backs in groundwater extractions over an eighteen month period for municipal, industrial and agricultural users through adoption of Emergency Ordinance E. Emergency Ordinance E remains in effect until the drought conditions no longer exist and is currently at its maximum mandatory cut back requirement. On January 1, 2015, the Sustainable Groundwater Management Act (SGMA) became effective signaling a new era in groundwater management in California. As required under SGMA, all Bulletin 118 groundwater basins designated as high or medium priority and critically overdrafted, shall be managed by a groundwater sustainability plans (GSP) by January 31, 2020. Many of the basins underlying the County boundaries are designated as high or medium priority and three are critically overdrafted (Cuyama Valley Basin [DWR No. 3-13], Oxnard Basin [DWR No. 4-04.02] and Pleasant Valley Basin [DWR No. 4-06]). GSPs are currently being developed with the goal of achieving sustainable groundwater management of all basins within the County.

In 2014, the County updated Well Ordinance 4184 (now 4468) to reflect changes in new well construction and State Legislation. The County regulates groundwater well construction and destruction through its Well Ordinance, but does not regulate groundwater extraction. The purpose of Well Ordinance 4468 is to provide for protection of groundwater quality and supply by regulating the construction, maintenance, operation, use, repair, modification, and destruction of wells and engineering test holes (soil borings) in such a manner that the groundwater of the County will not be contaminated or polluted, and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety or welfare of the people of Ventura County.

Basin Summary Sheets

The following basin summary sheets provide an overview of data, trends, and facts for some of the larger groundwater basins in the County. Trends for groundwater levels were determined for 2015 and over the last five years. Trends for groundwater quality were determined for the last five year period. Trend analysis used sample sets with wells that were sampled or measured consistently over the five year period. In some instances this resulted in a small sample set. The spatial distribution of the wells may not cover the entire groundwater basin. Data from VCWPD and other agencies was used in the trend analysis.

Basin Summary Sheet Key

Groundwater Basin Surface Area: **Irrigated Acreage:** **Watershed:** **Aquifers:** **DWR Groundwater Basin Designation and Size:** **CASGEM Basin Priority:** **DWR Groundwater Basin Population:**	In this section you will find quick facts about the groundwater basin.
Known Water Supply Wells In this section you will find information about the number of wells, and other status, in the groundwater basin.	**Self Reported Groundwater Extraction / Extraction Estimate** In this section you will find information on groundwater extractions reported to an agency or an estimate of extractions if outside of an agency boundary.
Groundwater Levels in General for All Wells Gauged by County In this section you will find information about groundwater levels gauged by the County during the report year.	**Groundwater Quality in General for All Wells Sampled by County** In this section you will find information about groundwater quality for wells sampled by the County during the report year. Maximum Contaminant Level (MCL) is listed.
5 Year Groundwater Level Trend In this section you will find information about groundwater level trends over the last 5 year period for wells gauged by the County and other agencies.	**5 Year Groundwater Quality Trend 2011-2015** **SWN** **Nitrate** **Chloride** **TDS** **Sulfate** In this section you will find information about groundwater quality trends over the last 5 year period for wells sampled by the County and other agencies.
Sources of Groundwater Recharge This section describes sources of recharge to the groundwater basin.	**Subsurface Hydrologic Connection to Other Groundwater Basins** This section describes any known hydrologic connections between adjacent groundwater basins.
DWR CASGEM Groundwater Basin Prioritization Level - Medium This section provides any notable comments by DWR about groundwater basin concerns.	
Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend ➡ ; Level trending up ⬆ ; Level Trending down ⬇	

Oxnard Plain Pressure Basin

Groundwater Basin Surface Area:	47,167 acres
Irrigated Acreage:	≈21,540 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River and Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Oxnard Subbasin (4-4.02) Surface area 58,200 Acres. Note: DWR groups two County basins into Oxnard Subbasin (4-4.02) (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	235,973 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 895
Active: 371
Destroyed: 382
Abandoned: 57
Can't Locate: 85

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 51,168 AF/Yr

Municipal, Industrial, and Domestic Extractions: 11,946 AF/Yr

Total: 63,114 AF/yr

2015 Groundwater Levels in General for All Wells Gauged by County

UAS "Key" well 01N21W07H01S - December level was down 6.51 feet from the January measurement.

LAS "Key" well 01N21W32K01S - December level was down 38.10 feet from the January measurement.

In general for all wells consistently measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(66 wells)

UAS - Oxnard Pressure basin groundwater: Oxnard aquifer samples are calcium sulfate type. Mugu aquifer samples are calcium sulfate type.

LAS - Oxnard Pressure basin groundwater: Hueneme aquifer samples are calcium sulfate type. Fox Canyon aquifer samples are sodium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 2 wells
Secondary MCL Excedances for Chloride >250mg/l?	Yes, 4 wells
Secondary MCL Excedances for TDS >500mg/l?	Yes, 62 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 50 wells

5 Year Groundwater Level Trend 2011 - 2015

UAS "Key" well 01N21W07H01S: ↓

LAS "Key" well 01N21W32K01S: ↓

Upper System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

Lower System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W24R02S	↓	↑	↑	↑
02N22W25A02S	↓	↑	↑	↑
02N22W25F01S	↓	↑	↑	↑
02N23W25M01S	↓	↓	↓	↓

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W06L05S	→	→	↓	→
01N21W08R01S	→	→	↓	↓
01N21W19J05S	→	→	↓	→
01N21W20K03S	→	→	↓	→
01N21W21H02S	→	↓	↓	↓
01N21W21H03S	→	→	↑	↑
01N21W28D01S	→	↓	↓	↓
01N22W03F05S	↑	→	↓	→
01N22W16D04S	→	→	→	→
01N22W19A01S	→	→	↓	↓
02N21W20Q05S	→	↓	→	↓
02N22W36E02S	↓	→	↓	↓

For upper system, one well is in the northwest, the remaining wells are in the northeast. For lower system the wells are generally in the center of the basin along a northeast to southwest line, and a small group in the southeast.

Sources of Groundwater Recharge

Basin Recharge:percolation of surface flow from the Santa Clara River, into the Oxnard Forebay; precipitation and floodwater from the Calleguas Creek drainage percolate into the unconfined gravels near Mugu Lagoon. Some underflow may come from the Las Posas and Pleasant Valley Basins on the east. Flow into and out of Mound basin dependent on water levels. (DWR,

Potable Water Sources

Groundwater from Oxnard Plain Pressure Basin via various purveyors. Groundwater from Oxnard Forebay basin via United Water system. Surface water from Santa Clara River via United Water System. Imported State Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

North: Oxnard Forebay basin, Mound basin

East/Northeast: Pleasant Valley basin, West Las Posas basin

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per DWR Bulletin 118

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Fillmore Basin

Groundwater Basin Surface Area:	24,392 acres
Irrigated Acreage:	≈12,230 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Fillmore Subbasin (4-4.05). Surface area 20,842 acres. (DWR, 2006)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	16,417 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 625
Active: 454
Destroyed: 76
Abandoned: 32
Can't Locate: 63

Self Reported Groundwater Extraction to UWCD (as of March 3, 2015)

Agricultural Extractions: 50,244 AF/Yr

Municipal Extractions: 4,716 AF/Yr

Total Extractions: 54,960 AF/Yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W05D01S - December level was down 8.31 feet from the March measurement.

In general for all 14 wells measured in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter.

2015 Groundwater Quality in General for All Wells Sampled by County

(13 wells)

The water in the 13 wells is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 2 wells
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 13 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 13 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 03N20W05D01S: ↓

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
03N20W01D03S	↓	↓	↓	↓
03N20W01F05S	↓	→	↓	↓
03N20W02R05S	↓	→	↓	↓
03N21W01P08S	↑	↑	↑	→
04N19W31F01S	↓	↑	↑	→
04N20W36D07S	↓	↑	→	→

One well is at the western end of the basin, the remaining wells are in the southeast.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Piru basin. Surface flow percolation from Santa Clara River, Sespe Creek, and minor tributaries. (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Piru groundwater basin.
Downgradient: Yes, Santa Paula groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Many groundwater quality impairments in the basin; Nitrates problematic during dry periods; High TDS, etc. DWR Bulletin 118. REH - PubComm indicated WQ is localized and being managed

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Santa Paula Basin

Groundwater Basin Surface Area:	21,100 acres
Irrigated Acreage:	≈9,100 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Santa Paula Subbasin (4-4.04) Surface area 22,899 Acres. (DWR, 2014)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	46,816 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 283
Active: 152
Destroyed: 75
Abandoned: 11
Can't Locate: 45

Self Reported Groundwater Extraction to UWCD (as of March 3, 2015)

Agricultural Extractions: 18,161 AF/Yr

Municipal Extractions: 3,741 AF/Yr

Total Extractions: 21,902 AF/Yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W02C01S - December level was down 14.62 feet from the March measurement.

In general for 7 of the 9 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(6 wells)

The water type for the 6 wells is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 6 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 6 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N22W02C01S: ↓

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

(Based on 3 wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W02K09S	→	→	→	→
03N21W15C06S	→	→	↑	↑
03N21W16A02S	↑	→	↑	→

Four wells are in the southwest and two are in the northeast portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Fillmore basin. Surface flow percolation from Santa Clara River, and Santa Paula Creek (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Santa Paula Basin

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Fillmore groundwater basin.
Downgradient: Yes, Mound and Oxnard Plain Forebay groundwater basins

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Nitrates can fluctuate significantly in the basin, and above MCL. Other inorganics present above MCL.TDS is known to be high.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Piru Basin

Groundwater Basin Surface Area:	10,656 acres
Irrigated Acreage:	≈5,600 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Piru Subbasin (4-4.06). Surface area 8,915 acres. (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	2,666 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 190
Active: 152
Destroyed: 19
Abandoned: 6
Can't Locate: 13

Self Reported Groundwater Extraction to UWCD (as of March 3, 2015)

Agricultural Extractions: 11,517 AF/Yr

Municipal Extractions: 515 AF/Yr

Total Extractions: 12,032 AF/Yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N19W25C02S - December level was down 11.97 feet from the March measurement.

In general for 5 wells consistently measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(15 wells)

Piru basin groundwater is mainly calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 2 wells
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 15 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 15 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 04N19W25C02S: ↓

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
04N18W30A03S	↓	↓	↑	↑
04N18W30J04S	↑	↑	↑	↑
04N19W26H01S	↓	↑	↓	↓
04N19W26J05S	↑	→	↓	↓
04N19W34J04S	↑	→	↓	↓

One well is in the southwest, the remaining wells are in the north central portion.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from East basin. Surface flow percolation from Santa Clara River, Piru Creek and Hopper Creek. (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River and percolation ponds.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, East groundwater basin.
Downgradient: Yes, Fillmore groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

DWR Impact Comments:GW Quality impacts: nitrates, storm runoff, leaking tanks, etc. (DWR Bulletin118). High Selenium and other inorganics, average TDS was 1450 mg/l (Ventura Co 2011 annual gw report)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Pleasant Valley Basin

Groundwater Basin Name:	Pleasant Valley
Groundwater Basin Surface Area:	20,267 acres
Irrigated Acreage:	≈7,980 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Pleasant Valley Basin (4-6). Surface area 21,654 acres. (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	69,392 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 332
Active: 91
Destroyed: 171
Abandoned: 26
Can't Locate: 44

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 14,772 AF/Yr

Municipal, Industrial, and Domestic Extractions: 4,792 AF/Yr

Total: 19,564 AF/yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 01N21W03C01S - December level was down 41.88 feet from the January measurement.

In general for 13 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(19 wells)

Pleasant Valley basin groundwater: 1 sample is sodium sulfate type, and 13 samples are are calcium sulfate type

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 2 wells
Secondary MCL Excedances for Chloride >250mg/l?	Yes, 3 wells
Secondary MCL Excedances for TDS >500mg/l?	Yes, 19 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 14 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 01N21W03C01S: ↓

Upper System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

Lower System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W15H01S	→	↓	↓	↓

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W03K01S	↑	↑	→	↓
01N21W03R01S	↑	↓	→	↓
01N21W04K01S	→	↑	↑	↑
01N21W10G01S	→	↓	↓	→
01N21W15D02S	→	↓	↓	↓
02N21W34G01S	→	↑	→	→

One well is in the north central portion, the remaining are in the southwest.

Sources of Groundwater Recharge

Basin Recharge: dominantly from subsurface flow across the Springville fault zone. A modest amount of irrigation water and septic system effluent also contribute to basin recharge. (DWR, 2006)

Potable Water Sources

Groundwater from Pleasant Valley Basin, groundwater from Arroyo Santa Rosa basin via Camrosa Water District. Imported State Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West: Yes, Oxnard Plain Pressure Basin.

East: No.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: PC - Discharge of poor quality GW from dewatering wells and effluent discharge from the wastewater treatment facility into the Arroyo Simi have led to rising water levels in the basin along with higher TDS and Chloride levels.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Mound Basin

Groundwater Basin Surface Area:	12,023 acres
Irrigated Acreage:	≈2,075 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Mound Subbasin (4-4.03) Surface area 14,846 Acres. (DWR, 2014)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	77,886 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 78
Active: 29
Destroyed: 35
Abandoned: 6
Can't Locate: 8

Self Reported Groundwater Extraction to UWCD (as of March 3, 2015)

Agricultural Extractions: 2,687 AF/Yr

Municipal Extractions: 3,303 AF/Yr

Total Extractions: 5,990 AF/Yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W07M02S - December level was down 3.72 feet from the January measurement.

In general for 5 wells measured in 2015 in the basin, water levels declined in 3 wells and rose in 2 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(5 wells)

The water type in 4 wells are calcium sulfate type, 1 well is sodium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 5 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 5 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N22W07M02S: ↓

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

(Based on 5 wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W08F01S	→	↑	↓	↓
02N22W08G01S	↑	↑	↑	↑
02N23W15J01S	→	↑	→	↑
02N23W15J02S	→	↑	→	↑
02N23W15J03S	↑	↑	→	→

Wells are generally in the center of the basin along a east to west line.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Santa Paula basin. Surface flow percolation from Santa Clara River and, percolation of direct precipitation into the San Pedro Formation which crops out along the northern edge of the subbasin. (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Mound Basin, Ventura River Basin, Oxnard Plain Pressure Basin via Ventura Water System. Surface water from Ventura River diversion via Ventura Water System. Surface water from Lake Casitas via Casitas MWD to Ventura Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin.

East/Southeast: Yes, Oxnard Plain Forebay and Oxnard Plain Pressure groundwater basins. Flow into and out of basin dependent on groundwater levels.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (DWR Bulletin 118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

East Las Posas Basin

Groundwater Basin Surface Area:	19,771 acres
Irrigated Acreage:	≈7,784 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Los Posas Valley Basin (4-8) (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	39,385 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 248
Active: 155
Destroyed: 59
Abandoned: 21
Can't Locate: 13

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 20,915 AF/Yr

Municipal Extractions: 2,050 AF/Yr

Total: 22,964 AF/yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W26R03S - December level was down 15.5 feet from the January measurement.

In general for 10 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(13 wells)

The water type in 6 wells is calcium bicarbonate type and 7 wells are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 3 wells
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 9 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 4 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 03N20W26R03S: ↑

The 5 year trend based on 2011 through 2015 potentiometric surface maps varies.

The majority of the wells in the basin show a downward trend while a few of the wells show a rising trend.

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
02N20W09Q05/07S	↑	⇨	⇨	⇨
02N20W16B06S	↑	⇨	⇨	⇨
03N19W29K07/08S	↑	⇨	⇨	⇨
03N19W29K06S	↑	⇨	⇨	⇨

Two wells are located in the south, three wells are located in the east.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006) Imported State Project Water via injection in the Calleguas Municipal Water District ASR well field.

Potable Water Sources

Groundwater from East Las Posas basin. Imported State Project Water from Calleguas MWD to various purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West:Possible connection to West Las Posas basin in NW part of basin.

South/Southeast: South Las Posas Basin.

Southwest: Restrictive subsurface structure between Pleasant Valley basin and East Las Posas basin may cause spillover from East Las Posas to Pleasant Valley when basin is full.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Pubic Comment includes reports of subsidence, overdraft and saline intrusion (chloride from adjacent basin?)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend ⇨; Level trending up ↑; Level Trending down ↓

West Las Posas Basin

Groundwater Basin Name:	West Las Posas
Groundwater Basin Surface Area:	14,715 acres
Irrigated Acreage:	≈9,950 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Los Posas Valley Basin (4-8) (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	39,385 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 114
Active: 63
Destroyed: 39
Abandoned: 6
Can't Locate: 6

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 11,135 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,945 AF/Yr

Total: 13,080 AF/yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well trend for 2015 not determined due to data availability.

In general for 11 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County
(12 wells)

The water type in 10 wellw is calcium sulfate type, 2 calcium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 well
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 11 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 5 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N21W12H01S: ↓

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
02N21W15M04S	↑	↑	↑	↑
02N21W17F05S	→	→	↓	↓
03N21W36Q01S	↓	↓	↓	→
02N21W13A01S	→	→	↑	↑

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006)

Potable Water Sources

Groundwater from West Las Posas basin. State Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: Possible connection to East Las Posas basin in NW part of basin.

Southwest: Yes, Oxnard Plain Pressure basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Pubic Comment includes reports of subsidence, overdraft and saline intrusion (chloride from adjacent basin?)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Oxnard Plain Forebay Basin

Groundwater Basin Surface Area:	7,010 acres
Irrigated Acreage:	≈1,797 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Oxnard Subbasin (4-4.02) Surface area 58200 Acres. Note: DWR groups two County basins into Oxnard Subbasin (4-4.02) (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	235,973 (2010) Note: DWR groups two County basins into Oxnard Subbasin (4-4.02)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 304
Active: 105
Destroyed: 149
Abandoned: 18
Can't Locate: 32

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 7,628 AF/Yr

Municipal, Industrial, and Domestic Extractions: 11,912 AF/Yr

Total: 19,540 AF/yr

2015 Groundwater Levels in General for Wells Gauged by County and UWCD

"Key" well 02N22W12R01S - Note: Measurements from UWCD. Well is dry as of November 2014 measurement. This is an upper system well.

In general for 2 of 3 wells measured by VCWPD in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading. VCWPD was unable to measure 1 well in 2015.

2015 Groundwater Quality in General for All Wells Sampled by County
(3 wells)

Forebay basin: 3 samples are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 well
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 3 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 3 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N22W12R01S: Well is dry as of November 2014 measurement. This is an upper sysytem well.

Upper System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward. ↓

Lower System

The 5 year trend based on 2011 through 2015 potentiometric surface maps is downward. ↓

5 Year Groundwater Quality Trend 2011-2015

Upper System (Includes wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W27M02S	↓	↑	↑	↑
02N22W14P02S	↑	↑	↑	↑
02N22W23B02S	↑	↑	↑	↑
02N22W23C02S	↑	↑	↑	↑
02N22W23G03S	↑	↑	↑	↑
02N22W23K05S	↑	↑	↑	↑

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W13N02S	→	↑	→	→
02N22W23H04S	→	↑	↓	→
02N22W26B03S	→	↑	↓	→

Wells are located in the southeast portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: percolation of surface flow from the Santa Clara River and, some subsurface flow from Santa Paula Subbasin makes its way over or across the Oak Ridge fault. Some amount of irrigation return also occurs (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Oxnard Plain Forebay basin. Surface water from Santa Clara River diversion via United Water Conservation District. Groundwater from Oxnard Plain Pressure basin via Oxnard Water System. Imported State Project Water from Calleguas MWD via Oxnard Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin to the northwest and Oxnard Plain groundwater basin to the east and south.

Downgradient: Yes, Mound groundwater basin to the southwest. Oxnard Plain Pressure groundwater basin to the south and southwest. Flow into and out of Mound

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per DWR Bulletin 118

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

South Las Posas Basin

Groundwater Basin Surface Area:	10,189 acres
Irrigated Acreage:	≈2,233 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Los Posas Valley Basin (4-8) (DWR, 2014)
CASGEM Basin Priority:	High
DWR Groundwater Basin Population:	39,835 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 171
Active: 28
Destroyed: 80
Abandoned: 21
Can't Locate: 42

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016)

Agricultural Extractions: 1,765 AF/Yr

Municipal, Industrial, and Domestic Extractions: 82 AF/Yr

Total: 1,847 AF/yr

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N19W05K01S - December level was down 0.65 feet from the January measurement.

In general for 2 wells measured in 2015 in the basin, water level declined in one well and remained the same in the second well over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(4 wells)

The water type in one well is sodium sulfate and the remaining 4 wells are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 4 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 4 wells

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N22W05K01S: ↓

In general for 2 wells consistently measured, a slight downward trend: ↓

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W07B02S	↑	↓	↓	↓
02N19W07D02S	→	→	↓	↓
02N20W01Q01S	↓	→	↓	→

Wells are in the western portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006)

Potable Water Sources

Groundwater from South and East Las Posas basins. Imported State Project Water from Calleguas MWD to various purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West/Northwest: East Las Posas groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (DWR Bulletin 118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Cuyama Valley Basin

Groundwater Basin Surface Area:	16,560 acres
Irrigated Acreage:	≈1,410 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Cuyama River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Cuyama Valley (3-13) Surface area 242,114 Acres. (DWR, 2014)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	1,236 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 149
Active: 112
Destroyed: 7
Abandoned: 10
Can't Locate: 20

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac*: 2,820 AF/Yr
Municipal/Domestic Demand @ 0.5 AF/person/Yr*: 618 AF/Yr
Total Estimated Demand*: 3,438 AF/Yr

*Actual demand is not known, typical demands are assumed for this estimate.

2015 Groundwater Levels in General for All Wells Gauged by County

Note: Wells are measured twice per year in the Cuyama Valley basin.

"Key" well 07N23W16R01S - Fall level was down 3.10 feet from the Spring measurement.

Both spring and fall measurements were obtained only on the above well in the basin in 2015.

2015 Groundwater Quality in General for All Wells Sampled by County

(3 wells)

The water type for all three samples is sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 3 wells
Secondary MCL Excedances for Sulfate >250mg/l?	No

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 07N23W16R01S: ↓

In general for 2 wells consistently measured: ↓

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
09N23W30E05S	↓	↑	↑	↑
09N24W25J01S	↓	↑	↑	↑

Wells are in the northern portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Seepage from the Cuyama River. (DWR, 2006)

Potable Water Sources

Groundwater from Cuyama Valley groundwater basin.

Subsurface Hydrologic Connection to Other Groundwater Basins

Within Ventura County: None

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments:Local salinity and TDS impairments in basin (DWR Bulletin 118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend ⇨; Level trending up ↑; Level Trending down ↓

Arroyo Santa Rosa Basin

Groundwater Basin Surface Area:	3,270 acres
Irrigated Acreage:	≈1,755 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Arroyo Santa Rosa Valley Basin (4-7). Surface area 3,747 acres. (DWR, 2014)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	2,211 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 87
Active: 40
Destroyed: 33
Abandoned: 5
Can't Locate: 9

Self Reported Groundwater Extraction to FCGMA (as of March 30, 2016) (West part of basin only)

Agricultural Extractions - 1,254 Af/Yr
Municipal, Industrial and Domestic - 0 Af/Yr

Water Demand Estimate (Whole basin)

Irrigation Demand @ 2 AF/Ac*:3,510 AF/Yr
Municipal Demand @ 0.5AF/person/Yr: 1,105
Total Demand Estimate: 4,615 AF/Yr
*Actual demand is not known, typical demands are assumed for this estimate.

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N20W26B03S - December level was down 3.02 feet from the January measurement.

In general for 5 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(4 wells)
The water type In 1 of the wells is magnesium bicarbonate type and 8 wells are magnesium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 7 wells
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 9 wells
Secondary MCL Excedances for Sulfate >250mg/l?	No

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 02N20W26B03S: ↓

In general for 5 wells consistently measured: ↓

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W19P02S	↓	↑	↓	→
02N20W23R01S	↓	↓	↓	↓
02N20W25C06S	↓	→	↓	↓

Wells are generally in the southern central part of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Tierra Rejada basin. Surface flow percolation from Arroyo Santa Rosa and Conejo Creek. Waste water returns from residential onsite septic systems. (MWH, 2013)

Potable Water Sources

Groundwater from Arroyo Santa Rosa Basin. Imported State Project Water via Calleguas Municipal Water District.

Non-Potable Water Source

Reclaimed water from Hill Canyon Waste Water Treatment Plant via Conejo Creek.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Arroyo Santa Rosa basin receive some subsurface inflow from Tierra Rejada basin. (MWH, 2013)

Downgradient: No

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (DWR Bulletin 118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Ojai Valley Basin

Groundwater Basin Surface Area:	6,470 acres
Irrigated Acreage:	≈2,135 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Ojai Valley Basin (4-2). Surface area 6,851 acres. (DWR, 2014)
CASGEM Basin Priority:	Medium
DWR Groundwater Basin Population:	8,268 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 341
Active: 191
Destroyed: 82
Abandoned: 15
Can't Locate: 53

2015 Self Reported Groundwater Extractions to OBGMA

Extractions: 3,643 Af/yr

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac*:4,270 AF/Yr
Municipal Demand @ 0.5 AF/person/Yr*: 4,134
Total Estimated Demand*: 8,404 AF/Yr

*Actual demand is not known, typical demands are assumed for this estimate.

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N22W05L08S: - The December reading was down 55.80 feet from the March level.

In general for 13 wells consistently measured in 2015 in the basin, water levels declined in all wells over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County
(15 wells)

Ojai Valley groundwater: 4 samples are calcium bicarbonate type, 1 sample is sodium bicarbonate type, and 10 samples are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 well
Secondary MCL Excedances for Chloride >250mg/l?	Yes, 1 well
Secondary MCL Excedances for TDS >500mg/l?	Yes, 14 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 1 well

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 04N22W05L08S: ↓

In general for 17 wells consistently measured: (15 wells) ↓ (2 wells) →

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
04N22W04P05S	↑	↑	↑	↑
04N23W01K02S	↓	↓	↓	↓
05N22W33J01S	→	↓	↓	↓

One well is in the west, one is in the northeast, and one is in the southeast.

Sources of Groundwater Recharge

Basin Recharge:infiltration of precipitation on the valley floor, and percolation of surface waters through alluvial channels. (DWR, 2006)

Potable Water Sources

Groundwater from Ojai Valley Basin. Surface water from Lake Casitas via Casitas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: No. The basin is drained by Thacher and San Antonio Creeks to the Ventura River. (DWR, 2006)

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: High nitrates and sulfates reported in the basin. Medium to high levels of nitrates reported in the basin

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Tierra Rejada Basin

Groundwater Basin Surface Area:	1,774 acres
Irrigated Acreage:	≈450 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Tierra Rejada (4-15) Surface area 4,611 Acres. (DWR, 2014)
CASGEM Basin Priority:	Very Low
DWR Groundwater Basin Population:	3,673 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 51
Active: 31
Destroyed: 8
Abandoned: 1
Can't Locate: 11

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac*:900 AF/Yr
Municipal/Domestic Demand @ 0.5 AF/person/Yr*: 1,834 AF/Yr
Total Estimated Demand*: 2,734 AF/Yr

*Actual demand is not known, typical demands are assumed for this estimate.

2015 Groundwater Levels in General for All Wells Gauged by County

No key well is in this basin.

In general for 3 wells measured in 2015 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(8 wells)

Tierra Rejada groundwater: 1 sample is magnesium bicarbonate type, 1 well is calcium bicarbonate and 6 well are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 2 wells
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 8 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	No

5 Year Groundwater Level Trend 2011 - 2015

In general for 3 wells consistently measured: ↓

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W10R02S	↑	↑	↓	→
02N19W11J03S	→	→	→	→
02N19W14Q02S	↓	↓	↓	↑
02N19W15J02S	→	↓	↓	↓
02N19W15N03S	→	↓	↓	→

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Percolation of rainfall to the valley floor, stream flow, and irrigation return.(DWR, 2006)

Potable Water Sources

Groundwater from Tierra Rejada Basin, Arroyo Santa Rosa Basin via Camrosa Water District. State Project Water from Calleguas MWD via Camrosa Water District.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: Yes, some subsurface flow into Arroyo Santa Rosa basin.

DWR CASGEM Groundwater Basin Prioritization Level - Very Low

Impact Comments: Locally high nitrates documented in the basin (DWR Bulletin 118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Upper Ventura River Basin

Groundwater Basin Surface Area:	9,360 acres
Irrigated Acreage:	≈1,206 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Ventura River Valley Basin, Upper Ventura River Subbasin (4-3.01) Surface area 7,430 acres. (DWR, 2014)
CASGEM Basin Prioritv:	Medium
DWR Groundwater Basin Population:	15,961 (2010)

Known Water Supply Wells (as of Feb. 2016)

Number of Wells: 293
Active: 164
Destroyed: 45
Abandoned: 14
Can't Locate: 70

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac*: 2,412 AF/Yr
Municipal/Domestic Demand @ 0.5 AF/person/Yr*: 7,980 AF/Yr
Total Estimated Demand*: 10,392 AF/Yr

*Actual demand is not known, typical demands are assumed for this estimate.

2015 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N23W16C04S - December level was down 23.0 feet from the March measurement.

In general for 16 wells measured in 2015 in the basin, water levels declined in 14 wells and rose in 2 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2015 Groundwater Quality in General for All Wells Sampled by County

(2 wells)

Upper Ventura River basin: The groundwater in 1 well is sodium sulfate type, 1 well is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 2 wells
Secondary MCL Excedances for Sulfate >250mg/l?	No

5 Year Groundwater Level Trend 2011 - 2015

"Key" well 04N23W16C04S: ↓

In general for 16 wells consistently measured: (14 wells) ↓ (2 wells) →

5 Year Groundwater Quality Trend 2011-2015

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W09G03S	→	↑	→	↓

Well is in the north portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: percolation of flow in the Ventura River and, to a lesser extent, by percolation of rainfall to the valley floor and excess irrigation water. (DWR, 2006)

Potable Water Sources

Groundwater from Lower Ventura River basin. Surface water from Lake Casitas via Casitas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No.
Downgradient: Lower Ventura River basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: TDS is known to be high in some parts of the basin (DWR Bulletin 118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend →; Level trending up ↑; Level Trending down ↓

Section 1.0
Introduction

This report is a summary of work activities by County of Ventura Groundwater Section staff during calendar year 2015. Because groundwater conditions change over time, this report is prepared annually. Approximately fifty percent of the County staff's time in the Groundwater Section is dedicated to conducting field work. The field work includes:

- Inspection of permitted well sealing for new wells,
- Inspection of permitted destruction of old wells,
- Quarterly groundwater elevation measuring of approximately 180 wells, and
- Fall groundwater quality sampling of water supply wells.

Field work is critical to the protection of groundwater quality and quantity by ensuring well seals are properly constructed as required by the California Department of Water Resources (DWR) and Ventura County Well Ordinances. Improperly constructed well seals have the potential to act as a conduit for migration of contaminants and poor quality groundwater into better quality water, degrading water quality over time. The County strives to reduce or eliminate the risk that improperly constructed well seals can pose to our groundwater basins. Groundwater elevation and water quality data collected during field activities is used to determine water level and water quality trends, and to create a database available to residents, consultants, and other professionals.

The County staff also conducts administrative work which includes issuing permits for wells and soil borings, review of Discretionary Entitlement permit applications, and California Environmental Quality Act (CEQA) project reviews. County staff reviews Discretionary Entitlement permit applications and CEQA projects to assess a project's potential to impact groundwater quality and quantity, surface water quantity, and to verify a permanent water supply. Review findings are provided to the County Planning Division.

2015 is the fourth consecutive below average precipitation year. Groundwater elevations in most of the County basins showed a continuing decline during this extended drought. Water quality data was collected between August and December 2015. Data from 28 of the 221 wells exceeded the State of California's maximum contaminant level (mcl) for nitrate.

This 2015 report is the second annual report that presents Basin Summary Sheets for high and medium priority basins (per the State of California Basin priority designations), and some additional basins that County staff felt appropriate to include. Past County annual reports focused on providing data with some general findings about basin water quality and water level trends. The new basin summary sheets are a one page data sheet that provides facts and figures, and any water level and water quality trend data. The method of describing trends in these sheets is more complete than past methods used in the County Annual Report, and we feel is a better summary.

1.1 – Summary of Accomplishments

Over the last 12 months the Groundwater Section:

- Issued 117 various types of well permits, including 49 for new water supply wells, 4 water supply well destructions and 7 for water supply well repairs or modifications. 78 inspections of sealing and perforation work were performed by Groundwater Staff.

- Sampled 221 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. Of the fourteen groundwater basin "Key" wells measured during spring 2015 six were higher than the 2014 spring measurement and eight had declined from the spring 2014 measurement levels.

- Completed spring and fall potentiometric surface maps for: the Santa Clara River Valley, Upper Aquifer System, and Lower Aquifer System for 2015.

- Assisted the Fox Canyon Groundwater Management Agency (FCGMA) and other departments and Agencies with groundwater and mapping needs.

- Collaborated with other agencies to compile semi-annual groundwater level data and uploaded it to the California Statewide Groundwater Elevation Monitoring (CASGEM) website.

- Completed review and conditioning of numerous discretionary entitlement permits and CEQA documents.

- Completed and published the 2014 Groundwater Section Annual Report.

1.2 - General County Information

The County of Ventura was formed on January 1, 1873, when it separated from Santa Barbara County and is one of 58 counties in the State of California. Geographically, the county offers 42 miles of coastline and the Los Padres National Forest, which accounts for 46% of the county's land mass in the northern portion of the county. Fertile valleys in the southern half of the county make Ventura County a leading agricultural producer. Together, farming and the Los Padres National Forest occupy half of the county's 1.2 million acres.

A mild year-round climate, along with scenic geography makes the area attractive to the 850,000 culturally and ethnically diverse people who call Ventura County home. The unincorporated areas, along with the ten incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and San Buenaventura (Ventura) ranks Ventura as the 11th most populous county in the State.

The following sections contain a general overview regarding population, climate, surface water and changes in groundwater conditions in Ventura County for 2015.

1.2.1 – Population

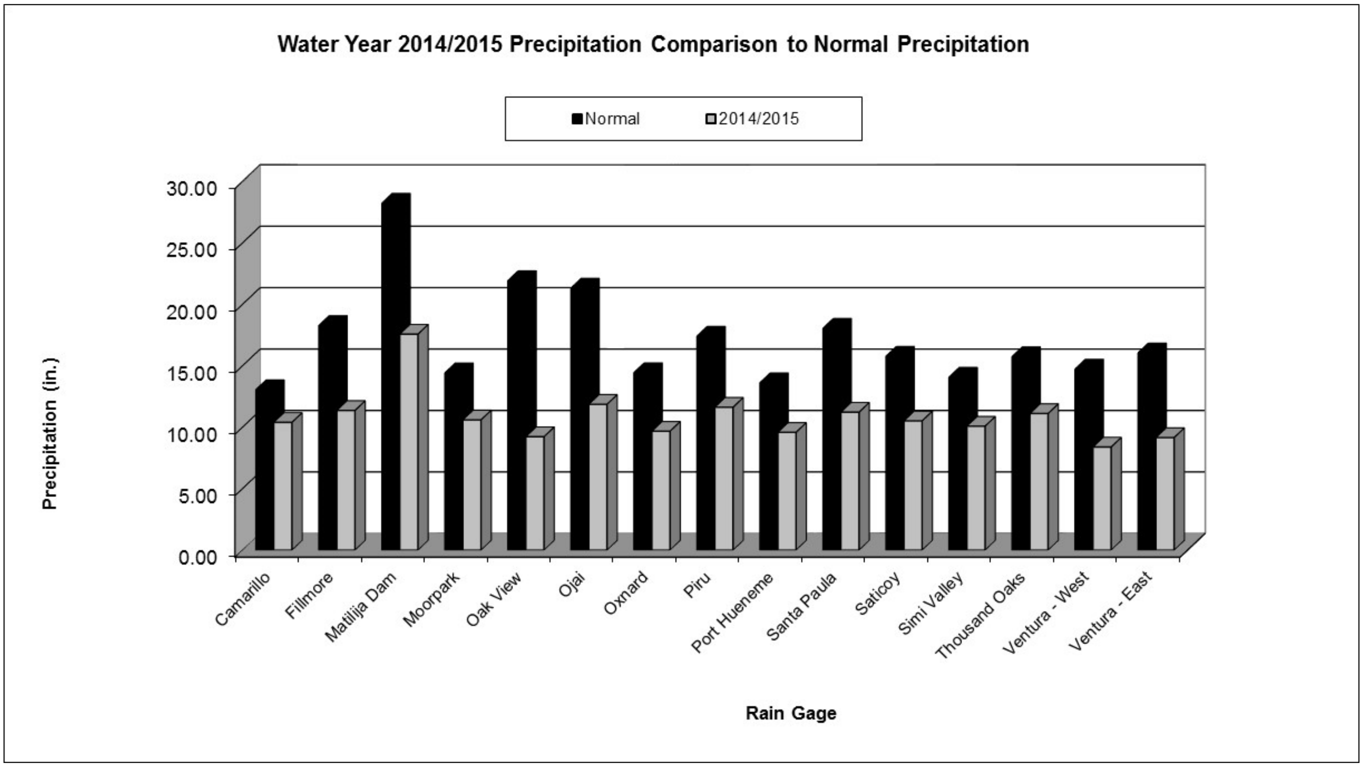
On May 1, 2015, the California State Department of Finance estimated Ventura County's population to be 848,073, an increase of 0.7 percent over the revised 2014 population estimate of 842,385. The Cities of Port Hueneme and Moorpark had the largest estimated percentage increase in population (1.7 and 1.6 percent respectively) over the previous year. Ventura County's population is expected to exceed 900,000 by the year 2025.

1.2.2 - Climate

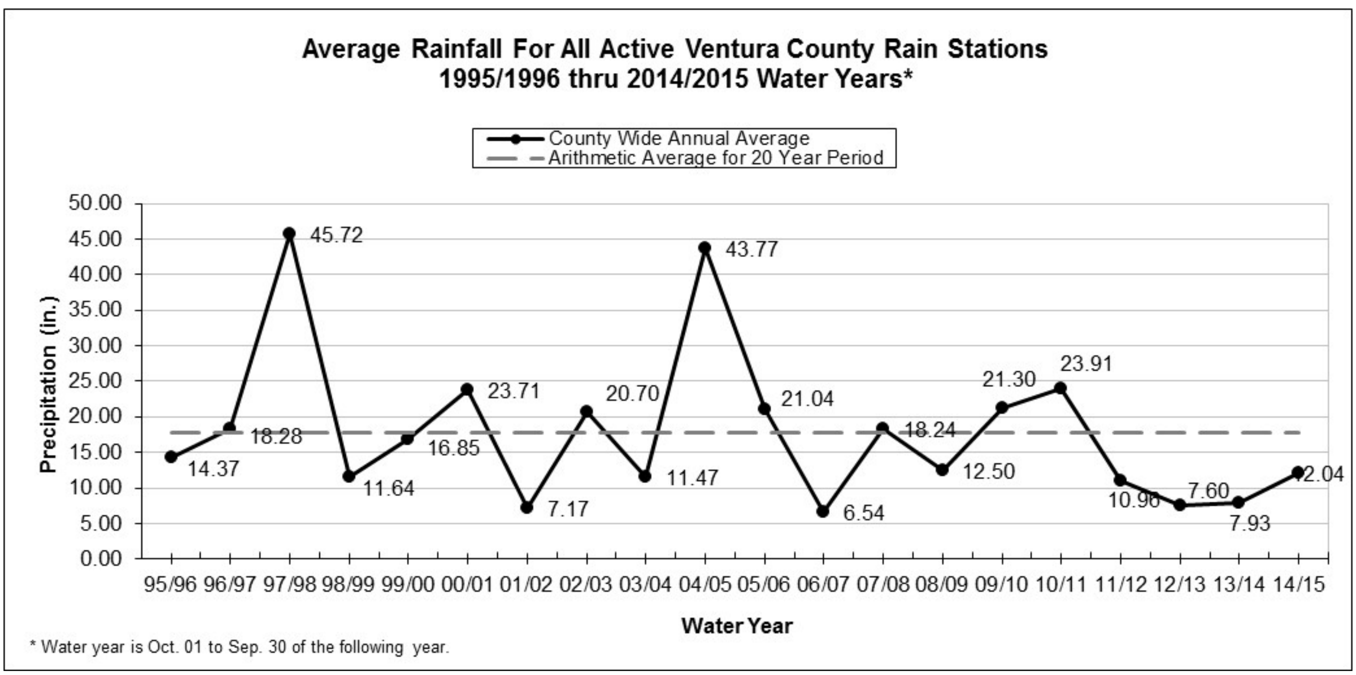
The mean annual daily air temperature at the National Weather Service Oxnard area office was 68.1[1] degrees Fahrenheit, with an average daily high of 79.3[1] degrees Fahrenheit and an average low of 57.0[1] degrees Fahrenheit. The average annual rainfall, countywide (based on preliminary data from all active rain gages), was approximately 12 inches for the 2014/2015 water year[2]. Throughout the County, precipitation for the 2014/2015 water year was generally less than normal and ranged between 42 and 80 percent of normal. Oak View received 42% of normal, while the Camarillo area received 80% of the normal rainfall total. Figure 1-1 shows various rain gage/area rainfall totals comparing water year 2014/2015 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 1-2 shows a generalized distribution of rainfall across the county for wetter water years (2009 to 2010 and 2010 to 2011) and for drier water years (2013 to 2014 and 2014 to 2015). Figure 1-3 depicts average rainfall for the periods from 1995 to 1996 and 2014 to 2015 for all of Ventura County.

[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 is *preliminary* and subject to change.



<u>Figure 1-1</u>: Chart comparing 2014/2015 rainfall totals to normal rainfall totals for the same area.



<u>Figure 1-2</u>: Chart comparing the average annual rainfall for Ventura County.

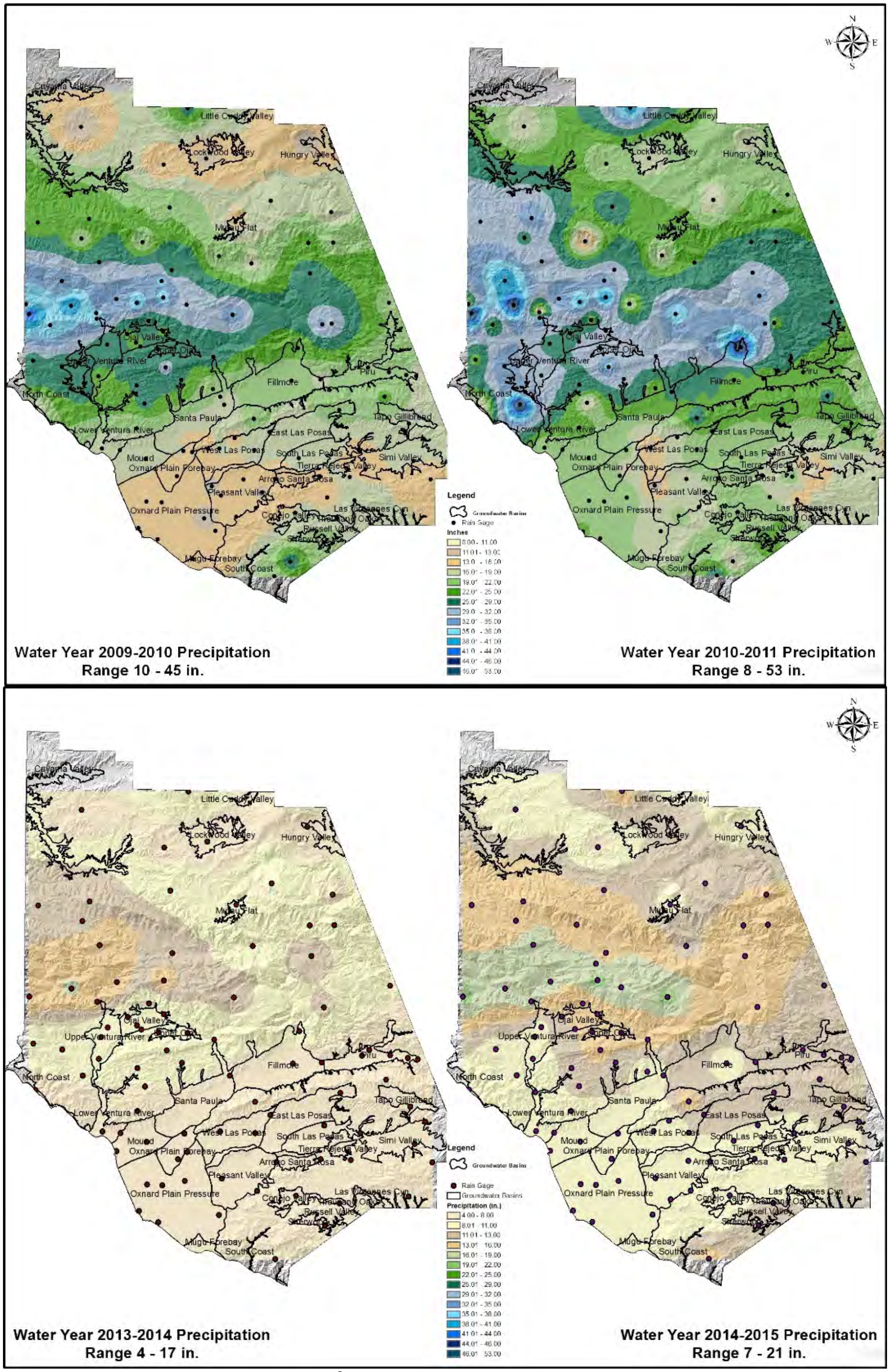


Figure 1-3: Generalized precipitation maps[3] comparing precipitation between wetter water years 2009/2010, 2010/2011 and drier water years 2013/2014 and 2014/2015.

[3] Based on data from all active Ventura County rain gages. Data is *preliminary* and subject to change.

1.2.3 – Surface Water

The presence of surface water is an important consideration in a groundwater conditions report because surface water resources may be hydrologically linked to groundwater resources. The natural connection between surface water and groundwater is typically understood in natural recharge of aquifers from surface water (losing streams), and discharge of groundwater to surface water (gaining streams). Surface water diversions to agriculture allow for use of surface water instead of extracting groundwater. Use of surface water to artificially recharge groundwater is an important part of conjunctively using surface and groundwater together.

In calendar year 2015 United Water Conservation District (UWCD) released approximately 6,533[4] acre feet (AF) of water from Lake Piru, which includes a fish passage requirement of 5 cubic feet per second (cfs) per day (3,622 AFY). UWCD diverted 2,640[4] AF from the Santa Clara River at the Freeman Diversion Dam with 1,231[4] AF sent to the Saticoy Spreading Grounds, 1,285[4] AF sent to the El Rio Spreading Grounds and 0[4] 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). At the end of 2015 there was 11,534[4] AF of water in storage in Lake Piru, 103,886[5] AF in Lake Casitas and 9,360[6] AF in Lake Bard. Casitas Water District releases 3,200 AF per year from Lake Casitas for the Robles Diversion Fish Passage.

In the Oxnard Plain, calendar year 2015 included reduced diversions of surface water for direct agricultural use and groundwater recharge. The reductions were a funciton of climatic conditions (drought) and regulatory constraints on releases of surface water from Lake Piru.

[4] Data provided courtesy of UWCD is preliminary and subject to change per UWCD. Freeman diversion data from UWCD operations logs.
[5] Data provided courtesy of Casitas MWD.
[6] Data provided courtesy of Calleguas MWD.

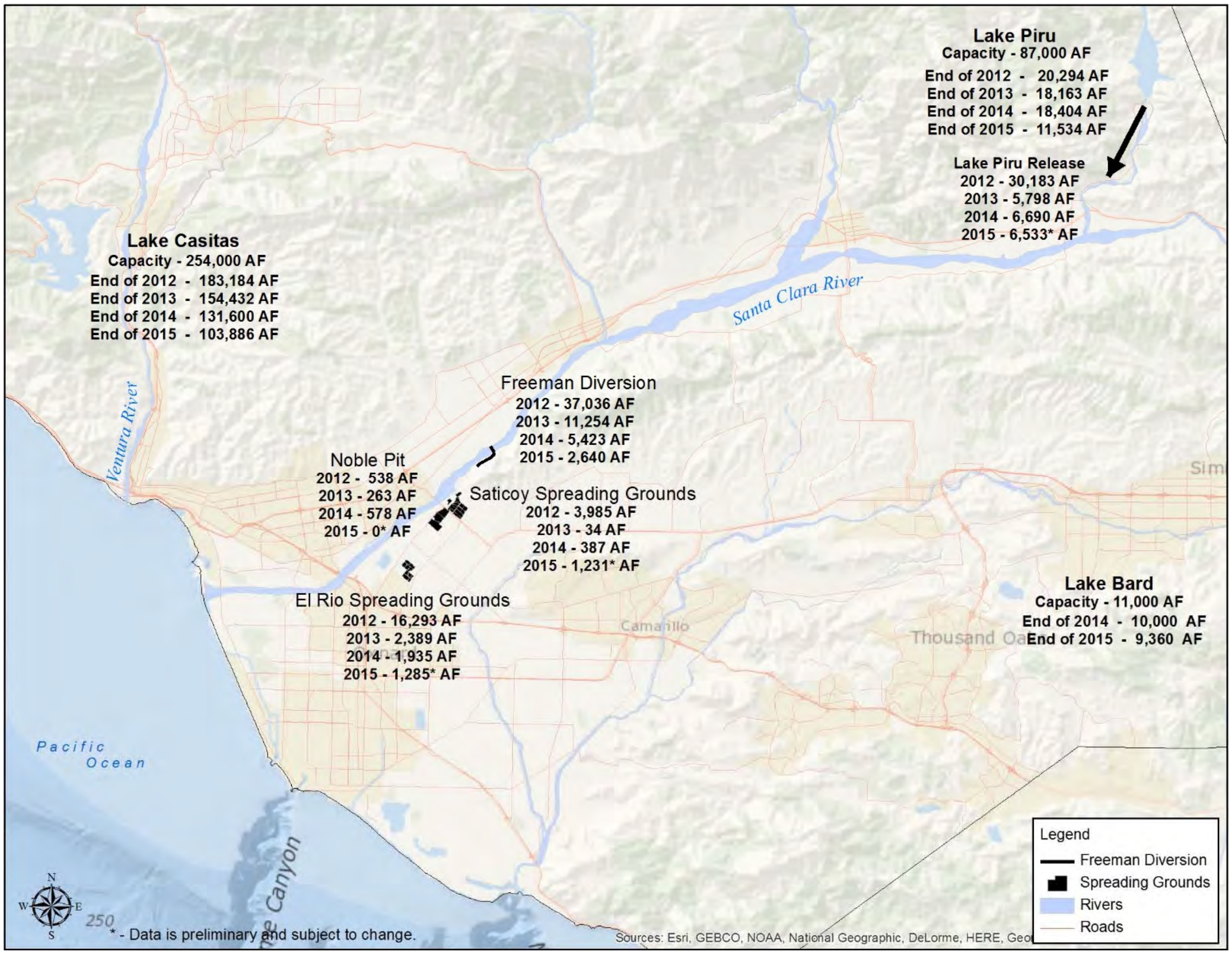


Figure 1-4: Map showing lake storage at the end of 2015 and Santa Clara River diversions.

1.2.4 – Groundwater

The majority of accessible groundwater is found in 32 groundwater basins within Ventura County. The group of basins in the south half of the County contain the largest groundwater reserves. The degree of interconnectedness of groundwater basins and aquifers within each basin is highly variable. Groundwater basins in the north half of the County do not join directly with other basins, while some groundwater basins in the south half of the County are connected on the surface and in the subsurface to varying degrees. 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 infiltration of rainfall and river/streamflow, artificially through injection of imported water (Calleguas Municipal Water District) and spreading of diverted river water into recharge basins (United Water Conservation District).

Groundwater extraction data in certain basins is known and presented later in this report. Groundwater extraction data has been coarsely estimated in other basins.

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

Section 2.0
Duties and Responsibilities

2.1 – Well Ordinance

The County's Well Ordinance was updated in 2014 with the goal of regulating well construction, destruction, and operation in a manner designed to protect groundwater quality and quantity. The ordinance was updated to better align with the Sustainable Groundwater Management Act (SGMA). SGMA requires development of groundwater sustainability plans and sustainable management of our groundwater basins at the local level. The well ordinance update effort was significant, and opened up dialogue between the County and stakeholders regarding how well permits and well operation should be regulated. Overall the effort is considered a success and the County appreciates the input from its stakeholders in the process. The County's well ordinance follows well construction and destructions requirements set forth by the State of California Department of Water Resources.

2.1.1 – Permits

Permits are required in the County for construction and destruction of wells and soil borings such as groundwater extraction wells, cathodic protection wells, monitoring wells, and geotechnical borings. Permits are required to ensure wells and borings are properly constructed and sealed to mitigate the likelihood of migration of contaminants and poor quality water into better quality water and to document well construction details and well placement. After County staff issues a well permit, staff inspects placement of well seals to verify that the well was sealed per the California DWR Well Standards.

The Groundwater Section issues permits for wells and engineering test holes throughout the County, except within the City of Oxnard, which issues their own well permits within the City of Oxnard boundaries. The Groundwater Section conditioned and issued 117 permits for wells and engineering test holes during calendar year 2015. 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 2006 to 2015.

Table 2-1: Permits issued by type for calendar year 2015.

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	Geothermal Heat Exchange	**TOTAL**
Number 2015	22	11	23	49	4	7	1	0	117

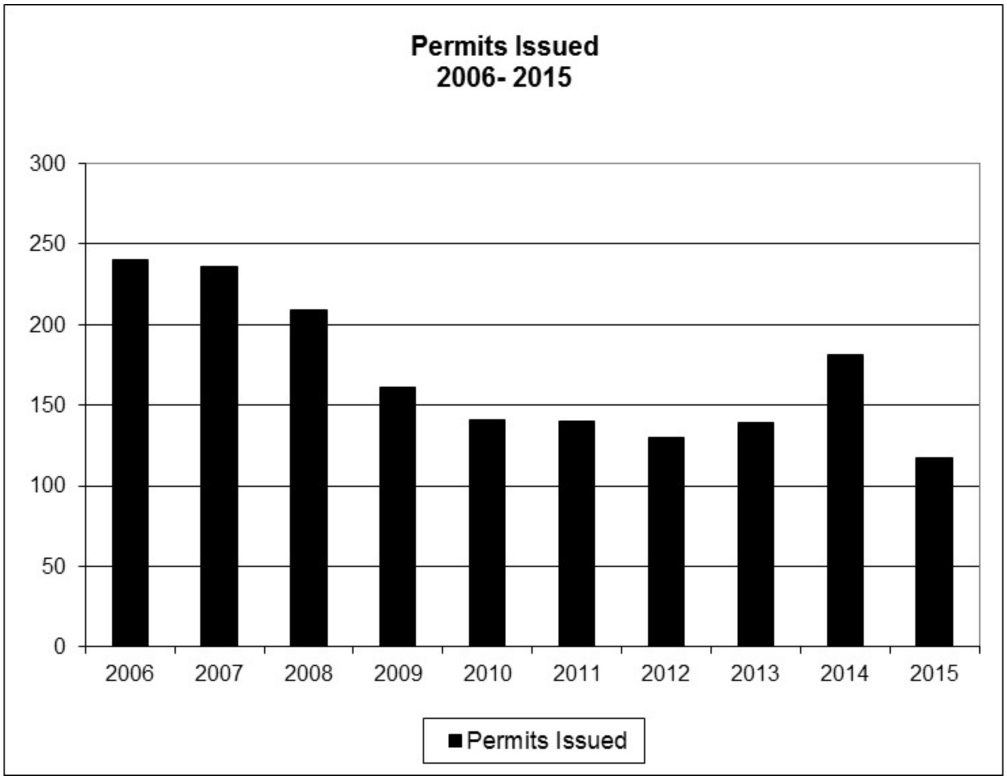


Figure 2-1: Permits issued for the period 2006 to 2015.

2.2 – Inspections

Groundwater Section staff perform inspections on all well perforation and sealing work for each new water supply well, water 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 2015, staff performed 78 inspections throughout the County. Figure 2-2 shows the distribution of new well and well destruction locations inspected by Groundwater staff during 2015.

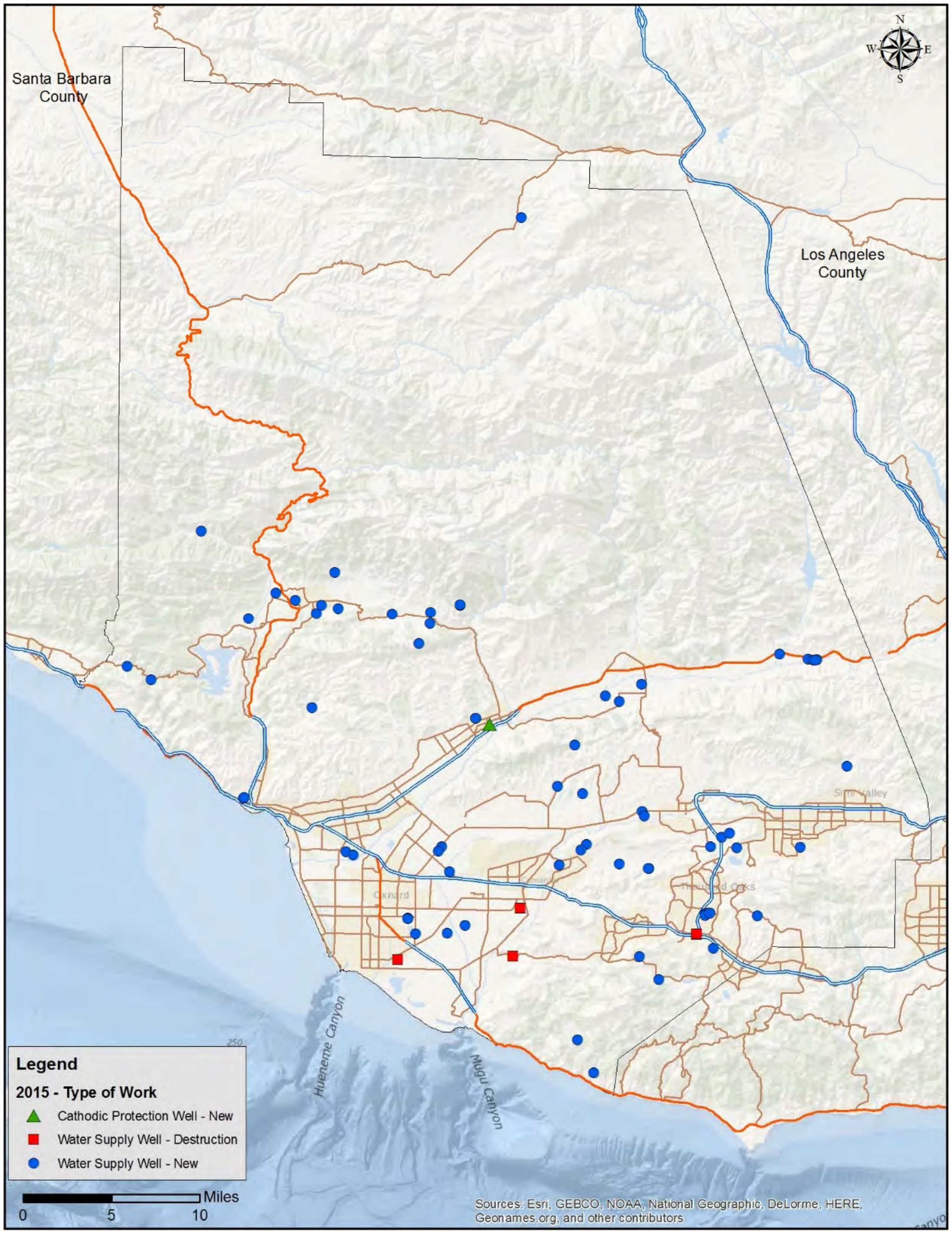


Figure 2-2: Location of well inspections in 2015.

2.3 – Inventory and Status of Wells

The Groundwater Section maintains an inventory of wells and their status in a database. There are several purposes of maintaining this information which include verifying well locations, tracking owner-reported well operation in order to determine if a well is abandoned, tracking well ownership, and assisting land owners in determining if wells are on particular parcels. 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 2015 there were 9,054 well records in the database in the following categories.

2015 Status	**Number**
Active	4,016
Abandoned	416
Can't Locate	1,821
Non Compliant	88
Non Compliant Abandoned	136
Destroyed	2,562
Exempt	15

- 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. 4468.
- 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.
- '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. There are several reasons why a well may be listed as "Can't Locate." The current owner of the property where the historical well was understood 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-Compliant 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. 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 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 professional 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 water quality data to analyze and obtain a general overview of the quality of the groundwater in Ventura County groundwater basins. We also work with and share groundwater quality data with other data collecting organizations in the County. This is very important as there is no other systematic county wide groundwater quality monitoring program in place. Without the data, groundwater quality may not be known. Collected data is publically available, upon request, and is also used by stakeholders, consultants, and other professionals.

In 2015, Groundwater staff sampled a total of 221 water supply wells throughout the County. The well sampling procedures include contacting well owners to get approval to sample wells, obtaining sample bottles from the laboratory, collecting water samples, delivering the samples to the laboratory within the sample holding times, receiving the water quality analyses from the lab, entering water quality data in the database, and providing a copy of the data to the well owner. Because the County does not own or operate the wells it samples (with some very limited exceptions) it relies on well owner permission to make their wells available. Some of the wells sampled are large capacity wells and are only sampled when normally in operation. The County works to sample many of the same wells each year, but because the County does not own most of the wells, it is not always able to control the well's availability for sampling. Sometimes wells are not available to sample for various reasons, e.g. the pump is being repaired, rainy weather makes pumping unnecessary, lock on gate changes, etc. When a preferred well cannot be sampled, County staff will seek to find an alternative well to sample. The process is flexible, but can also be limiting because County staff may not always be able to sample the same well year after year, and long term water quality from individual wells is valuable to determine water quality trends.

All samples were analyzed for irrigation suitability to determine the concentration of general minerals (see Appendix D – Water Quality Section). Analyses were conducted by Fruit Growers Laboratory in Santa Paula. California Title 22 metals were also analyzed on select samples and eleven samples were analyzed for Gross Alpha particles. Analytical results were entered into the Section's database and used to describe the chemistry of groundwater in the basins sampled. Complete results are listed in Appendix D, and general interpretations of the data are detailed in the following sub-sections. Because the wells sampled each year may vary care must be taken when comparing data from past reports. We make an effort to sample certain wells every year and sample additional wells as time and budget allow. Wells sampled in the north half of the County are shown in Figure 3-1. Wells sampled in the south half of the County are shown in Figure 3-2.

Additional groundwater quality data that was not used in this report is available from other sources, including data from water districts and agencies that collect and analyze groundwater samples for their own use. Organic groundwater chemistry data is also available for some areas of the County through the State Regional Water Quality Control Board's Geotracker website for environmental cleanup sites.

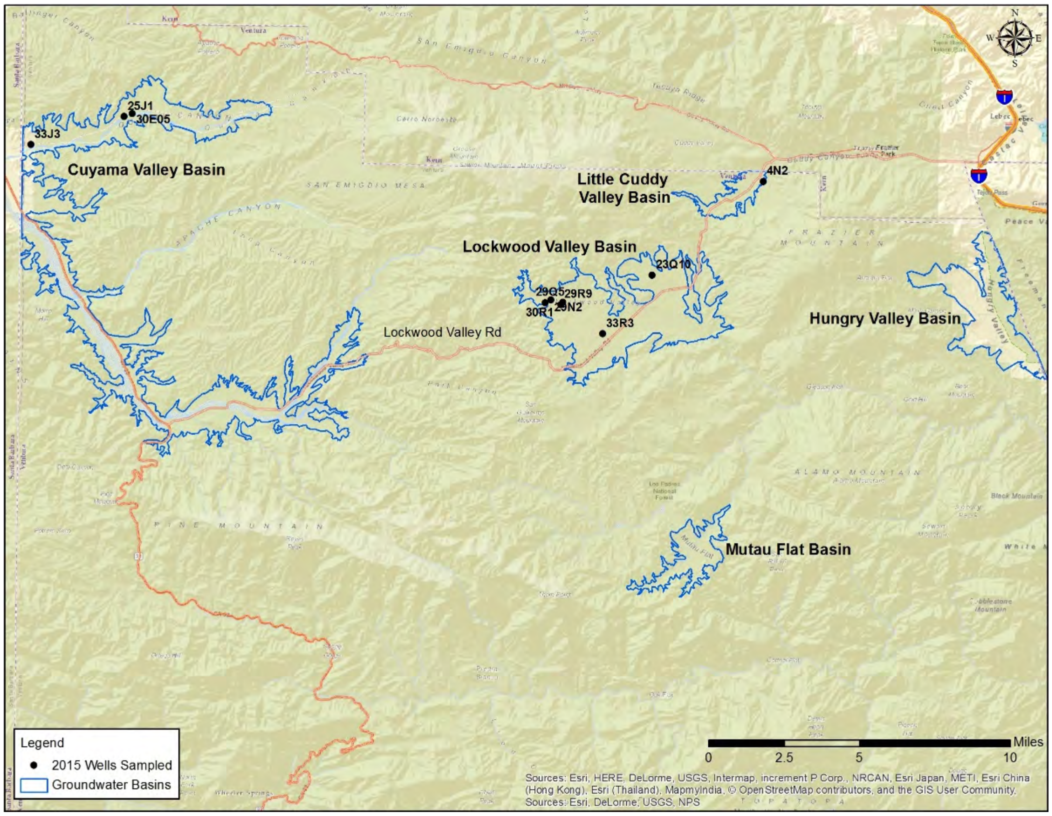


Figure 3-1: Map depicting sample locations for the northern half of the County.

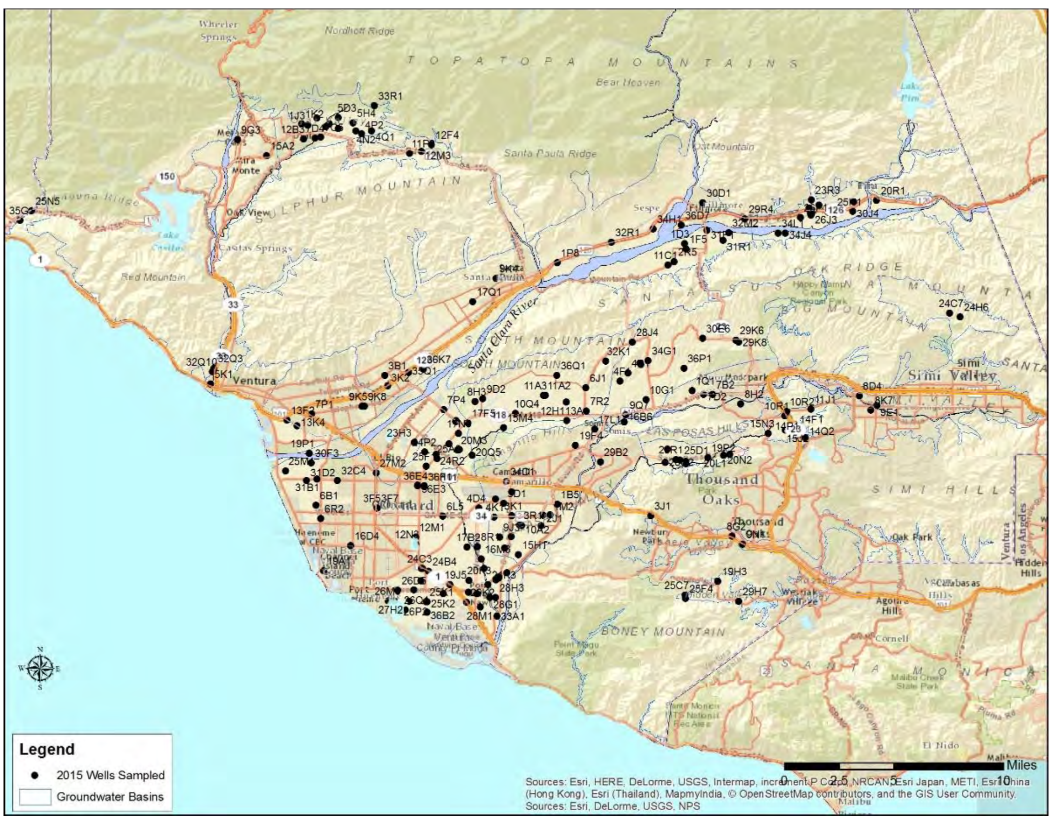


Figure 3-2: Map depicting sample locations for the south half of the County.

3.2 – Current Conditions

General interpretations of the groundwater quality data for each groundwater basin sampled this year is included in this section. Unless otherwise listed, the data interpretation is limited to data collected by the County staff. Basin summaries are presented in order from largest to smallest total available storage capacity as reported in California Department of Water Resources Bulletin No. 118. Ventura County groundwater, in general, has slightly high total dissolved solids and sulfate (SO_4^{2-}). Several areas are nitrate impacted (meaning Basin Management Water Quality Objectives for nitrate are exceeded).

The Groundwater Section uses 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 metals 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

Table continued from previous page **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 major ionic species in most natural waters are Na^+, K^+, Ca^{++}, Mg^{++}, Cl^-, CO_3^{2-}, HCO_3^-, and SO_4^{2-}. As water flows through an aquifer it assumes a diagnostic chemical composition from interactions with the lithology. One of the more widely used ways to present water chemistry graphically is the trilinear or piper diagram. The diagram is comprised of three pieces: a ternary diagram in the lower left representing the cations (positive charged ions), a ternary diagram in the lower right representing the anions (negative charged ions), and a diamond plot in the middle representing a combination of the two. The diamond diagram tells you different things depending on what you're plotting. For groundwater, the top quadrant is calcium sulfate waters, the left quadrant is calcium bicarbonate waters, the right quadrant is sodium chloride waters, and the bottom quadrant is sodium bicarbonate waters. Figure 3-3 shows the form of a piper diagram.

The first step in determining the water type is to convert the concentration of each anion or cation group in a sample to milliequivalents/L (meq/L) and normalize the concentrations. The percent concentrations are then plotted on the appropriate ternary diagram. The position of the points are projected parallel to the magnesium and sulfate axes, respectively until they intersect in the center field (Fetter, 1988). Piper diagrams for each basin are located in Appendix D starting on pg. 140.

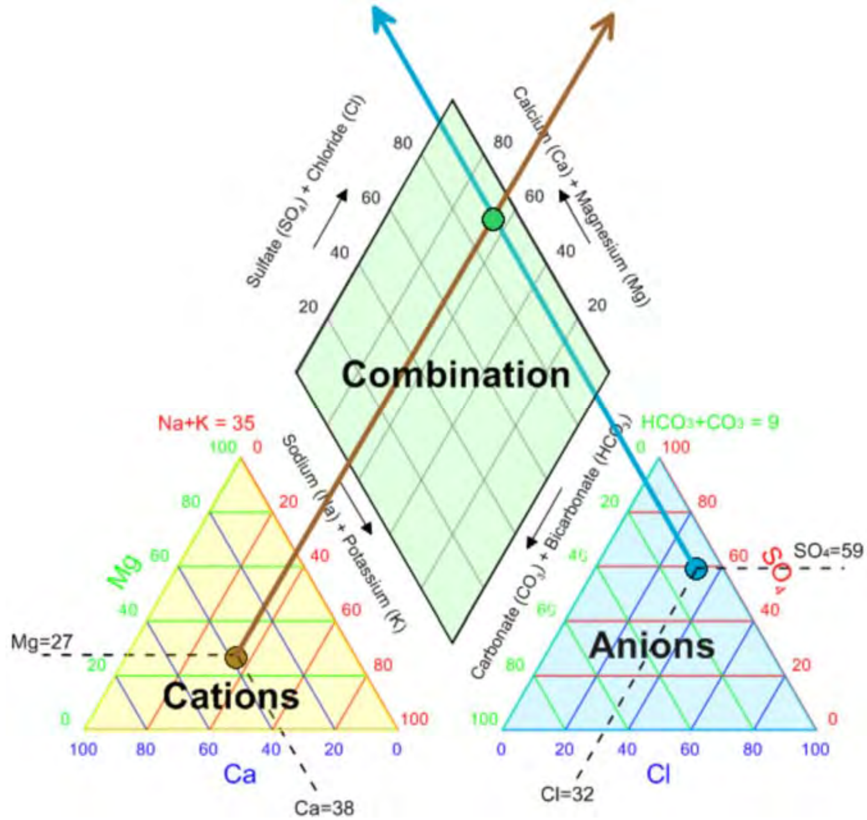


Figure 3-3: Example of a piper diagram.

Figure 3-4 shows a plot of the water quality from a well sampled this year. The cations plot as calcium type on the cations triangle and the anions plot in the sulfate type on the anions triangle. Positions of the points projected on to the diamond shaped center field shows the water is calcium sulfate type.

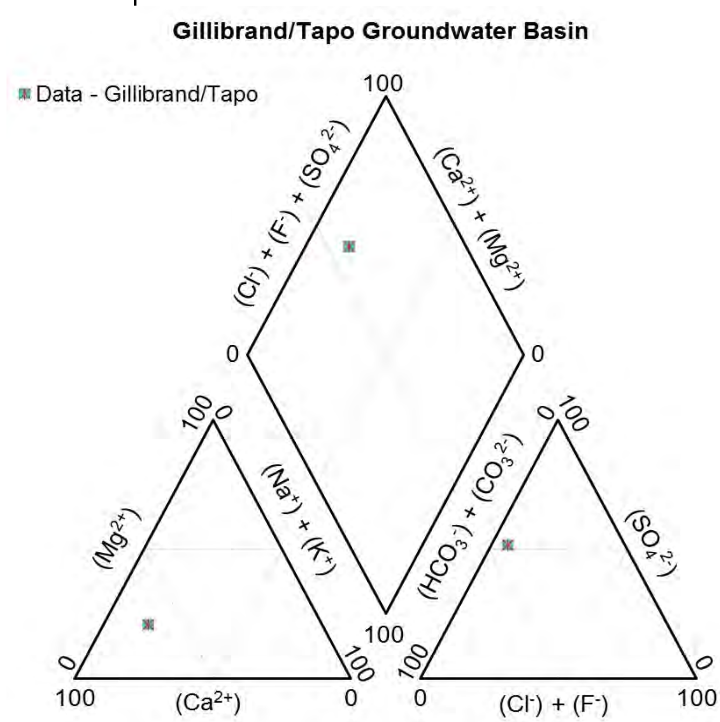


Figure 3-4: Piper diagram showing water quality of a well from Gillibrand/Tapo groundwater basin.

A second method to present results, a stiff diagram, is shown in Figure 3-5. The same cations and anions that are plotted in the piper diagrams are also shown in the stiff diagrams. The ions are plotted on either side of a vertical axis in milliequivalents per liter (meq/L), cations on the left of the axis and anions on the right. The polygonal shape created is useful in making a quick visual comparison between water from different sources. Stiff diagrams for wells sampled this year are included on each basin map.

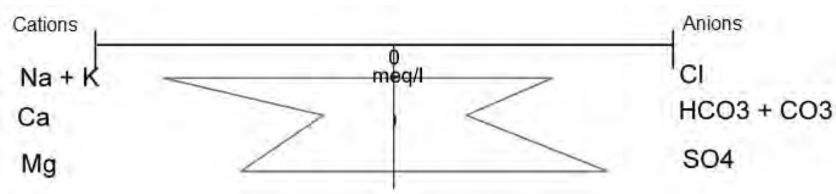


Figure 3-5: Example stiff diagram.

3.2.1 - Oxnard Plain Pressure Basin

The Oxnard Plain Pressure Basin is the largest and most complex 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, from shallowest to deepest, 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, from shallowest to deepest, the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are approximately 895 water supply wells in the Oxnard Plain Pressure Basin; 371 are active. There are no wells perforated solely in the Grimes Canyon aquifer so the County cannot sample it specifically. The basin map in Figures 3-6 thru 3-8 show approximate well locations and (in call out boxes) concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Upper Aquifer System of the Oxnard Plain Pressure Basin. Figures 3-9 and 3-10 show 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. The Oxnard aquifer is the most developed (based on the number of wells) production zone. Average depth to the main water bearing material is 80 feet making it the easiest and least expensive aquifer in which to construct a water supply well. The piper diagram, Figure E-1 shows low variability in water quality of the wells sampled this year. There is no dominant cation, though data plot closest to a calcium cation type; sulfate is clearly the major anion. The water is best classified as a calcium sulfate type. Groundwater samples were collected from nine wells in the Oxnard Aquifer. A comparison of the stiff diagrams with those from the 2014 report shows no significant change in water quality type.

Water from one of the wells has a concentration of iron (Fe) and water from four of the wells have manganese (Mn) concentrations above the secondary MCL for drinking water. Samples from all twelve of the wells have sulfate (SO_4^{2-}) and TDS concentrations above the secondary MCL for drinking water; sulfate concentrations range from 350 to 2050 mg/L. Total dissolved solids (TDS) ranged from 829 to 4043 mg/l. Water from two of the wells sampled have nitrate (NO_3^-) concentration above the primary MCL for drinking water. Samples from four wells were analyzed for Title 22 metals. Lead concentration was above the MCL for drinking water. The concentrations of all other Title 22 metals were below the MCL for drinking water.

Groundwater plumes with elevated nitrate concentrations are common in the northern portion of the basin. Sources of nitrate are nitrogen based fertilizers in agricultural areas and septic systems in residential 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 diagram, Figure E-2, and stiff diagram Figure 3-7. Average depth to the main water bearing material is 200 ft. Five wells that are perforated only in the Mugu aquifer were sampled. The piper diagram, Figure E-2, shows low variability in water quality of the wells sampled this year. There is no clearly dominant cation, though data plots closest to a calcium cation type; sulfate (SO_4^{2-}) is clearly the major anion. The water is best classified as a calcium sulfate type. All five wells sampled have TDS concentrations above the MCL for drinking water. TDS ranges from 898 to 1560 mg/l. All five wells sampled have sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water, three wells have iron concentrations above the secondary MCL, three wells have manganese concentrations above the secondary MCL. One water sample was analyzed for Title 22 metals. The concentrations of all the Title 22 metals were below the MCL for drinking water.

Figure E-3, piper diagram shows water chemistry of Upper Aquifer wells that are screened in both the Oxnard and Mugu aquifers. It shows moderate variability in water quality of the wells sampled this year. There is no dominant cation but the data plots close to the calcium cation type; sulfate (SO_4^{2-}) is the dominant anion in seven of the samples, chloride is the dominant anion in one sample, and there is no dominant anion for two samples but the data plots close to the sulfate anion type. The water is calcium sulfate type. The piper diagram, Figure E-4, shows a comparison of all the wells sampled in the UAS. TDS ranges from 772 to 1920 mg/l. Five of the wells have iron concentrations above the secondary MCL, nine wells have manganese and sulfate (SO_4^{2-}) above the secondary MCL and all ten wells have TDS concentrations above the secondary MCL.

OXNARD PLAIN PRESSURE BASIN
Upper Aquifer System

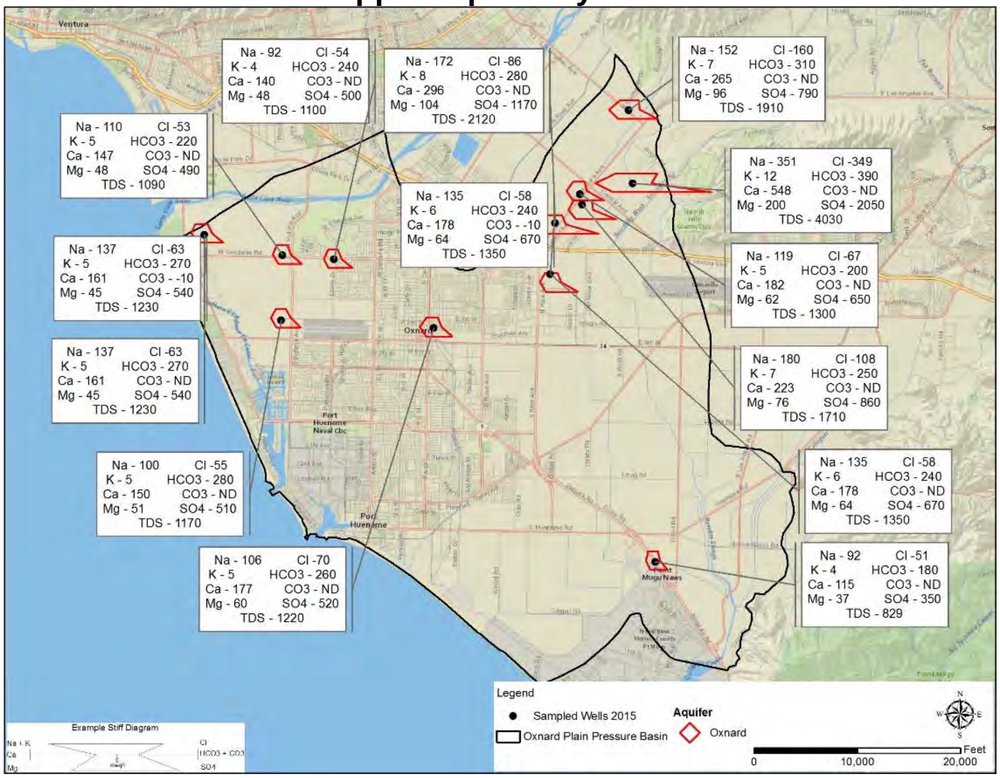


Figure 3-6: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for the Oxnard aquifer.

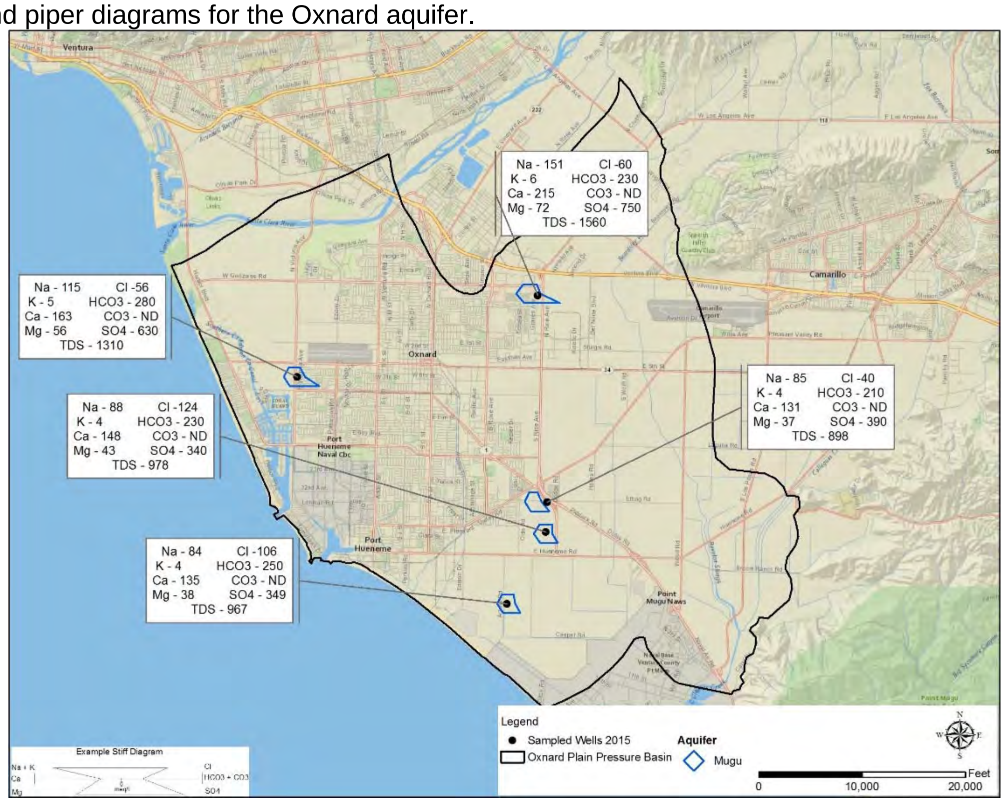


Figure 3-7: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for the Mugu aquifer.

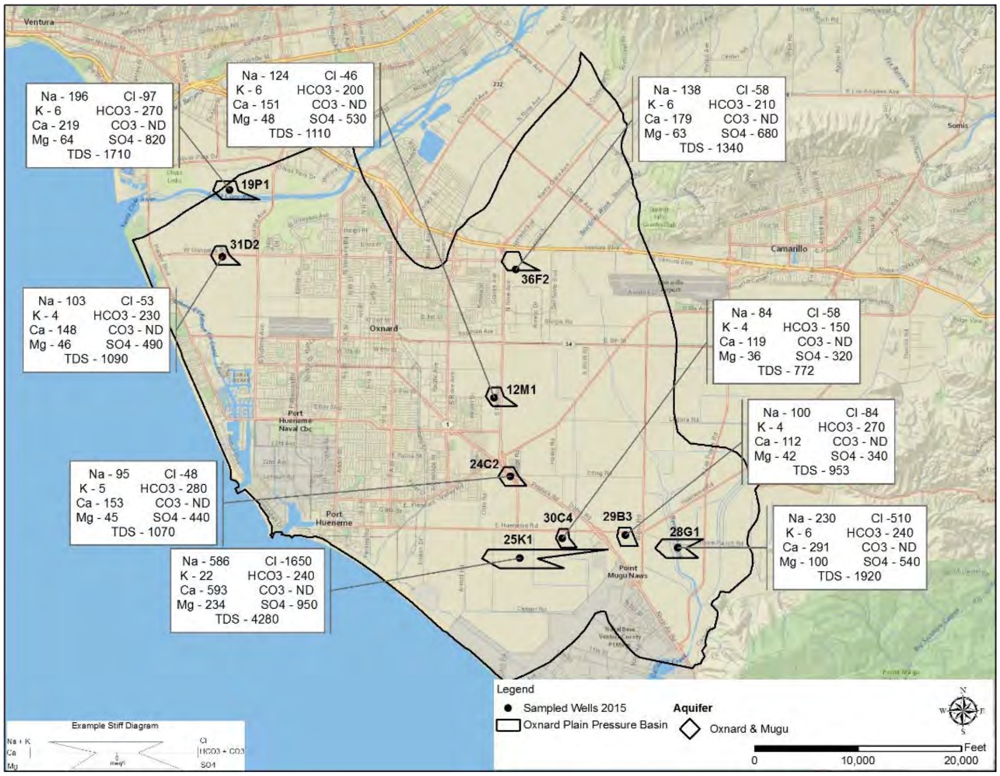


Figure 3-8: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for wells screened in both the Oxnard and Mugu aquifers.

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 aquifer difficult. Five wells screened solely in the Hueneme aquifer were sampled this year. Figure E-5, piper diagram, shows low variability in water quality of the wells sampled this year. There is no clearly dominant cation, though the data plots closest to a calcium cation type; sulfate (SO_4^{2-}) is the major anion. The water is best classified as a calcium sulfate type. All five wells sampled have elevated TDS and sulfate (SO_4^{2-}) concentrations compared to the secondary MCL for drinking water. Two samples have iron and three samples have manganese concentrations above 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 based on the number of wells and depth of perforations. 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.

The piper diagram, Figure E-6, shows moderate to high variability in water quality of the wells sampled this year. Sodium is the dominant cation in two samples. There is no dominant cation in the remainder of the samples. Bicarbonate is the dominant anion in two samples; two samples have no dominant anion; and sulfate (SO_4^{2-}) is the dominant anion in remaining 12 samples of the samples. The water type of the majority of the samples is calcium sulfate. There is more variation in water chemistry compared to last year. More wells were sampled and there is a higher concentration of calcium and sulfate. For wells perforated solely in the Fox Canyon Aquifer sampled this year, TDS concentrations range from 449 mg/l to 1050 mg/l; all 16 wells sampled have TDS above the secondary MCL for drinking water. Eight water samples have iron (Fe^{+}) concentrations above the secondary MCL for drinking water. One well had a concentration of iron (Fe^{+}) at approximately 45 times MCL. The same well had a manganese (Mn^{+}) concentration of almost 10 times the MCL. These high levels can be attributed to corrosion in the well or well equipment. The water came out black and would not clean up. Six water samples have manganese (Mn^{+}) and twelve have sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water. Four samples were analyzed for Title 22 metals. One sample had lead above the MCL for drinking water. The concentrations of all remaining Title 22 metals were below the MCL for drinking water.

Six 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 LAS wells. Results for those wells are included in Appendix D and shown on the map of the Lower Aquifer System (LAS) Figure 3-10. The piper diagram, Figure E-7, shows moderate variability in water quality of the wells sampled this year. Sodium is the dominant cation in one sample with no dominant cation in the remainder, but samples plot close to the calcium cation type. Sulfate (SO_4^{2-}) is the dominant anion in five of the samples; there is no dominant anion in the remaining sample but it plots near the bicarbonate anion type. One water sample is sodium sulfate type and the remainder are calcium sulfate. TDS concentration of water from these wells varies between 859 mg/l and 1380 mg/l. Samples from four wells have iron above the secondary MCL and three have manganese concentrations above the secondary MCL for drinking water. Five have sulfate above the secondary MCL and all six have TDS concentrations above the secondary MCL for drinking water. Water samples from four of the Hueneme/Fox wells were analyzed for Title 22 metals. One sample has lead above the MCL but all remaining Title 22 metals were well below the primary MCL for drinking water.

Four of the Oxnard Plain Pressure Basin wells that were sampled this year are perforated in the Fox Canyon and the Grimes Canyon aquifers. They are also referred to as LAS wells. Results for those wells are included in Appendix D and shown on the map of the Lower Aquifer System (LAS) Figure 3-10. The piper diagram, Figure E-8, shows moderate variability in water quality of the wells sampled this year. Sodium is the dominant cation in three samples with no dominant cation in the fourth. Sulfate (SO_4^{2-}) is the dominant anion in one of the samples; there is no dominant anion in the remaining samples. Three water samples are sodium sulfate type and the remainder is calcium sulfate. TDS concentration of water from these wells varies between 886 mg/l and 1120 mg/l. Samples from three wells have iron above the secondary MCL and one has manganese concentration above the secondary MCL for drinking water. One has sulfate above the secondary MCL, one has chloride above and all four have TDS concentrations above the secondary MCL for drinking water. A water sample from one of the Fox/Grimes wells was analyzed for Title 22 metals. One sample has lead above the MCL but all remaining Title 22 metals were well below the primary MCL for drinking water.

Four of the Oxnard Plain Pressure Basin wells that were sampled this year are perforated in the Hueneme Fox Canyon and the Grimes Canyon aquifers. They are also referred to as LAS wells. Results for those wells are included in Appendix D and shown on the map of the Lower Aquifer System (LAS) Figure 3-10. The piper diagram, Figure E-9, shows moderate variability in water quality of the wells sampled this year. Sodium is the dominant cation in one sample with no dominant cation in the remaining three samples. Sulfate (SO_4^{2-}) is the dominant anion in one of the samples; there is no dominant anion in the remaining samples. Three water samples are calcium sulfate type and the remaining sample is sodium sulfate type. TDS concentration of water from these wells varies between 772 mg/l and 1370 mg/l. A sample from one well has manganese concentration above the secondary MCL for drinking water and one has sulfate above the secondary MCL, and all four have TDS concentrations above the secondary MCL for drinking water. A water sample from one of the Fox/Hueneme/Grimes wells was analyzed for Title 22 metals. All Title 22 metals were well below the primary MCL for drinking water.

Aerial photo showing the extent of the Oxnard Pressure Plain groundwater basin.

OXNARD PLAIN PRESSURE BASIN
Lower Aquifer System

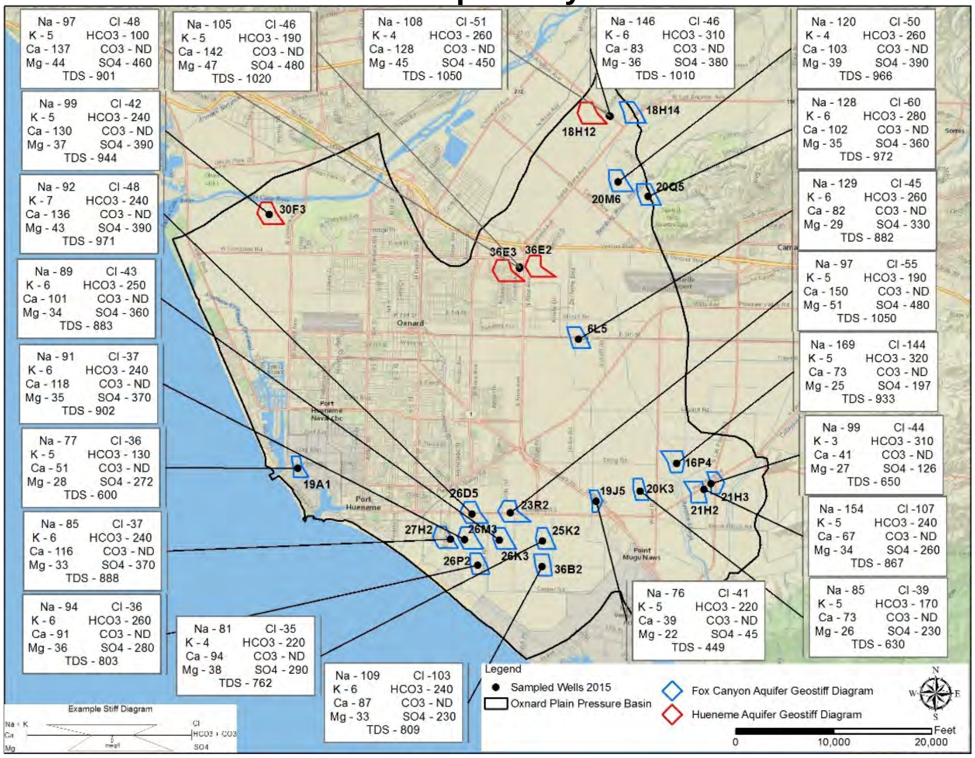


Figure 3-9: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for the Hueneme and Fox Canyon aquifers.

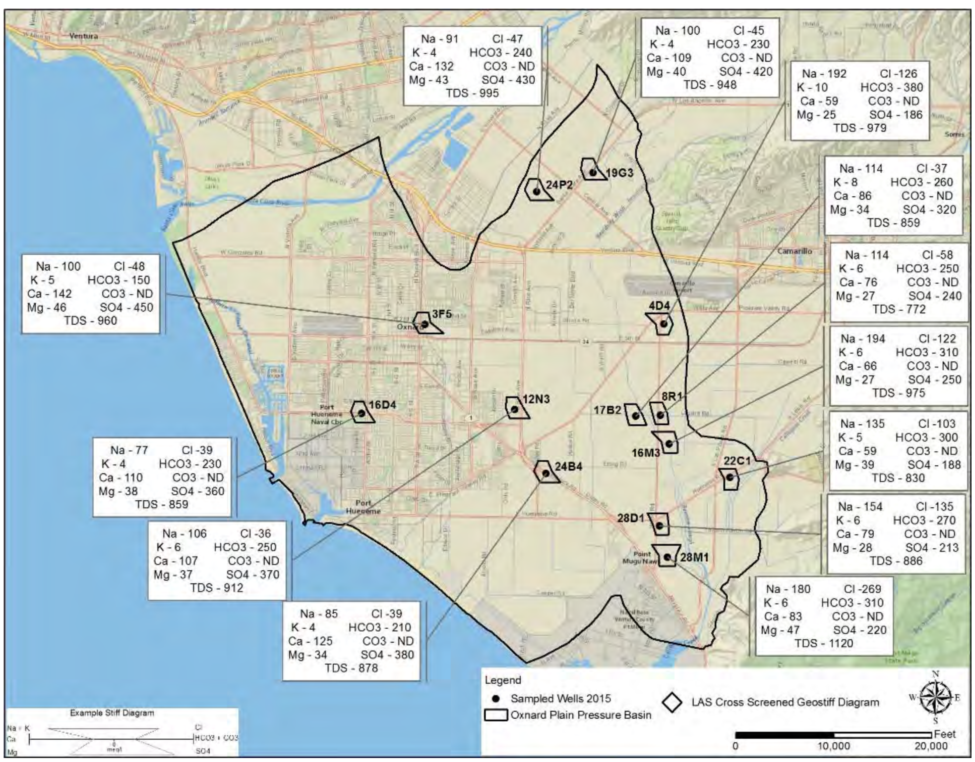
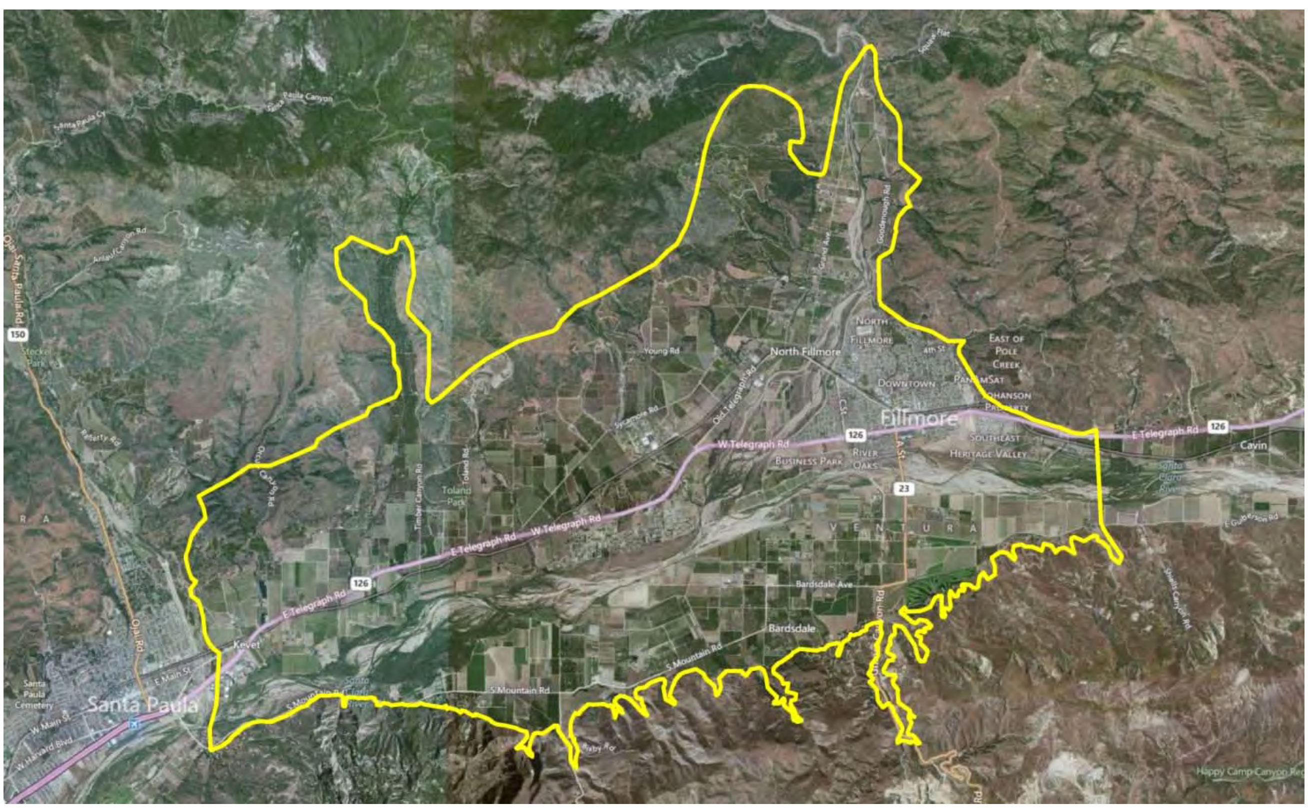


Figure 3-10: Map showing approximate location of sampled LAS cross screened wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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. Despite the depth of the basin, County records indicate that water wells are generally no deeper than approximately 950 feet. Water quality can vary greatly depending on depth of the well. Shallow groundwater is generally younger and recharged by river flows. Deeper groundwater is older and has acquired chemistry through dissolution of constituents from the surrounding sediments. There are approximately 625 water supply wells in the Fillmore Basin; 454 are active. Historically, nitrate (NO_3^-) concentrations have been elevated, but of the thirteen wells sampled this year only two showed elevated NO_3^- concentration relative to the primary MCL for drinking water. The piper diagram, Figure E-12, shows low variability in water quality of the wells sampled this year. The dominant cation for two samples is calcium; there is no dominant cation for the remainder of the samples. Data plots closest to a calcium cation type. Sulfate is the major anion. The water is calcium sulfate type. TDS ranges from 946 mg/l to 2250 mg/l, well above the secondary MCL for drinking water. Groundwater samples from all thirteen wells are above the secondary MCL for drinking water for sulfate (SO_4^{2-}) and water from two wells is above the secondary MCL for manganese. A water sample from one well was analyzed for Title 22 metals. All Title 22 metals are below the primary MCL for drinking water. Water quality tends to become poorer to the south east portion of the basin in the vicinity of the Oak Ridge fault. Figure 3-11 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Fillmore Basin.

Water samples from all the wells sampled in the Fillmore, Santa Paula and Piru Basins were compared in a piper diagram, Figure E-15. The piper diagram shows low variability; the data from the three is very similar and the water type for all is calcium sulfate.



Aerial photo showing the extent of the Fillmore groundwater basin.

FILLMORE BASIN

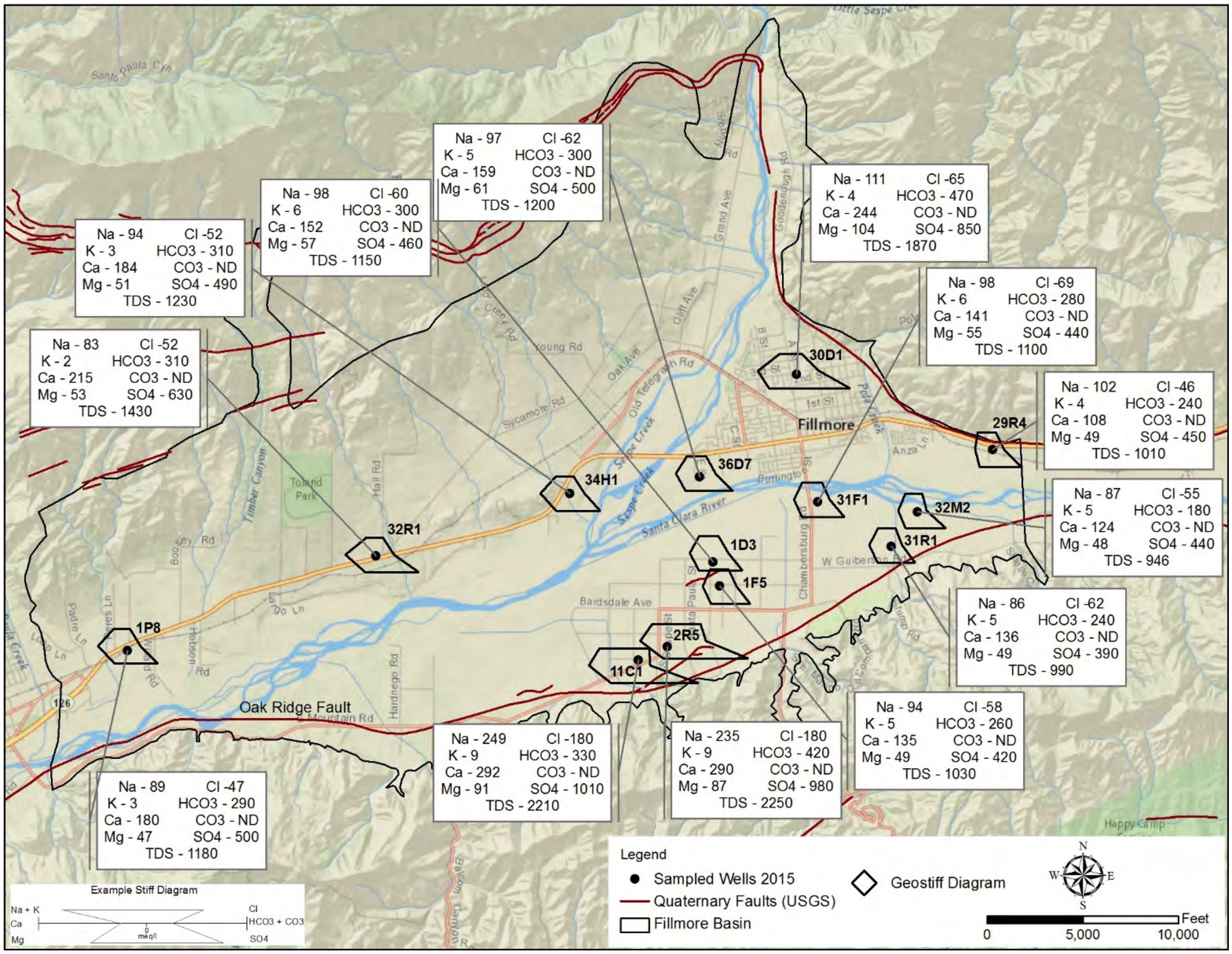


Figure 3-11: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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. There are approximately 283 water supply wells in the Santa Paula Basin; 152 are active. Figure E-13, piper diagram, shows no significant change in the water quality since the previous sampling round. Calcium is the dominant cation in one sample; the remainder have no dominant cation. Sulfate is the dominant anion. The water is calcium sulfate type. TDS concentrations range from 1010 mg/l to 2610 mg/l; all above the current secondary MCL for drinking water. Six water samples have concentrations above the secondary MCL for sulfate, five have manganese above the secondary MCL and one is above the secondary MCL for iron. Two water samples were analyzed for Title 22 metals. All Title 22 metals are below the primary MCL for drinking water. Figure 3-12 shows approximate well location and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the well sampled in the Santa Paula Basin.

Figure E-15, piper diagram, compares water samples from the up-gradient Piru and Fillmore Basins to the Santa Paula Basin. The water chemistry is similar.

Aerial photo showing the extent of the Santa Paula groundwater basin.

SANTA PAULA BASIN

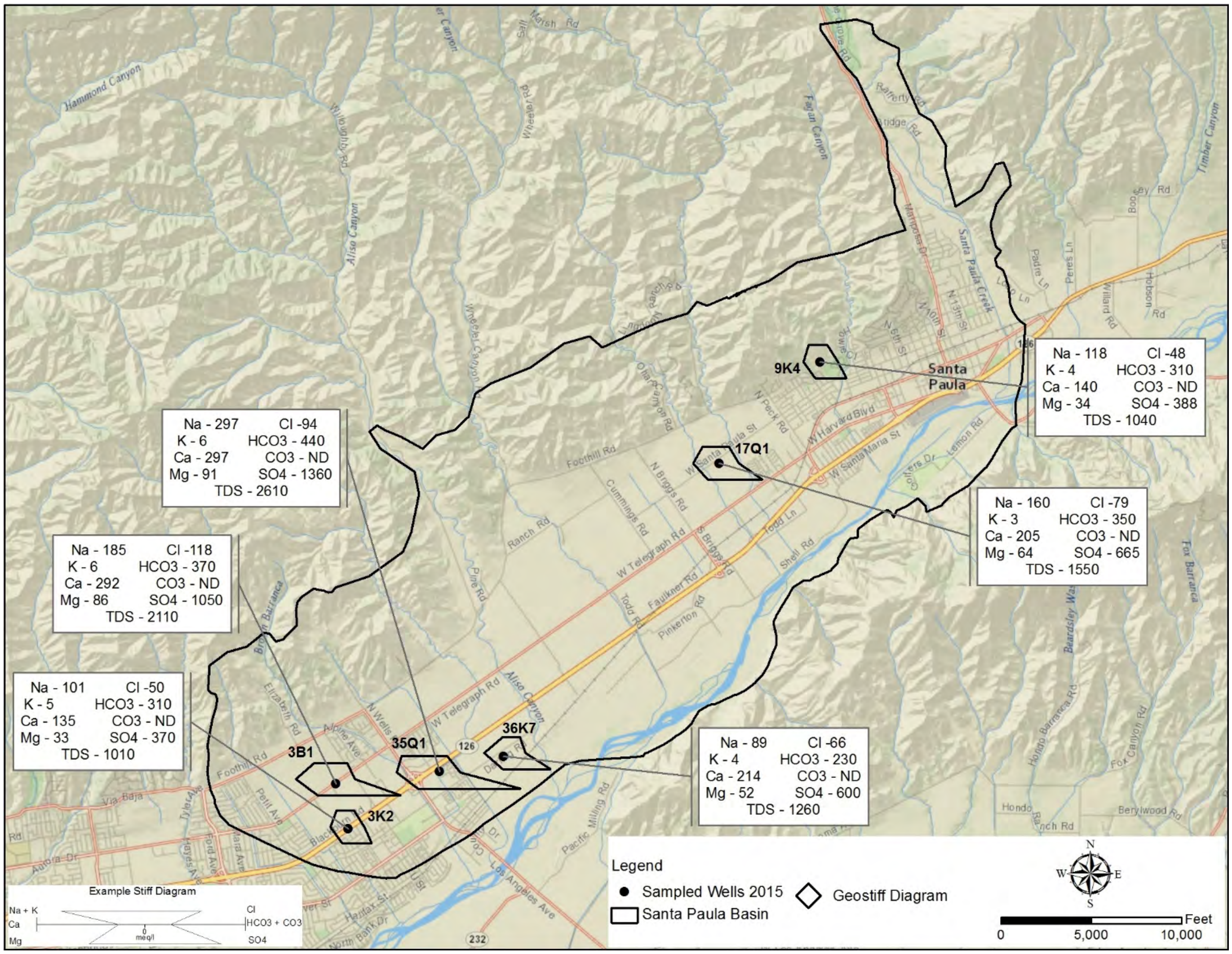


Figure 3-12: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

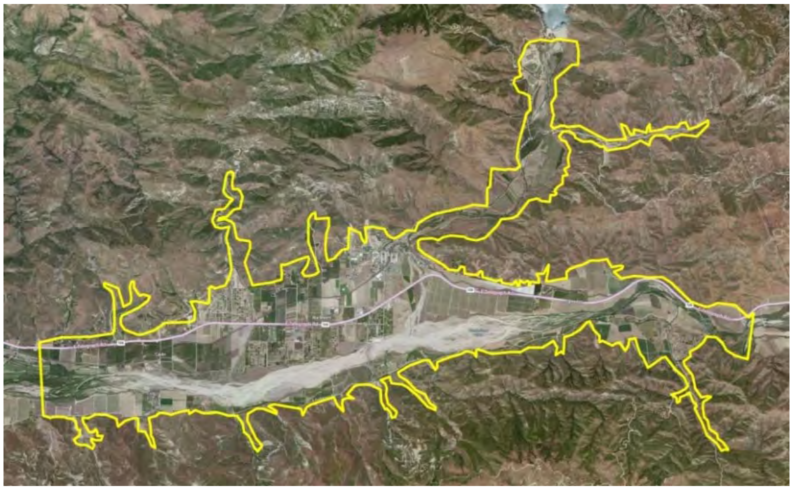
3.2.4 – Piru Basin

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. There are approximately 190 water supply wells in the Piru Basin; 151 are active. 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.

Fifteen wells were sampled in the Piru Basin during this round of sampling. None of the groundwater sampled has a chloride (Cl^-) concentration above the chloride TMDL. The piper diagram, Figure E-14, shows moderate variability in water quality of the wells sampled this year. There is no dominant cation for 14 samples; calcium is the dominant cation for the remaining sample and the data plots closest to the calcium cation type. There is no dominant anion for three of the samples; sulfate is the dominant anion for the remainder. The water is calcium sulfate type. The TDS concentration of the water sampled this season varies from 894 to 2820 mg/l; all wells above the secondary MCL for drinking water; three wells have concentrations significantly above 2000 mg/l. Water samples from all fifteen wells have sulfate (SO_4^{-2}) concentrations greater than the secondary MCL for drinking water, five have manganese (Mn) concentrations greater than the secondary MCL, and one sample has an iron (Fe^+) concentration above the MCL. Figure 3-13 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).

Water samples from six wells were analyzed for Title 22 metals. One well has lead (Pb) above the Primary MCL for drinking water. One well located south of Highway 126 has consistently been found to have selenium levels that exceed the primary MCL for drinking water of 0.05 mg/l (50 µg/l). 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. Owners of the wells have been notified by Ventura County Environmental Health Department about possible adverse health effects from ingestion of water containing selenium.

Radiochemistry analysis was completed on water from one of the wells. Gross alpha was below the primary MCL for drinking water.



Aerial photo showing the extent of the Piru groundwater basin.

PIRU BASIN

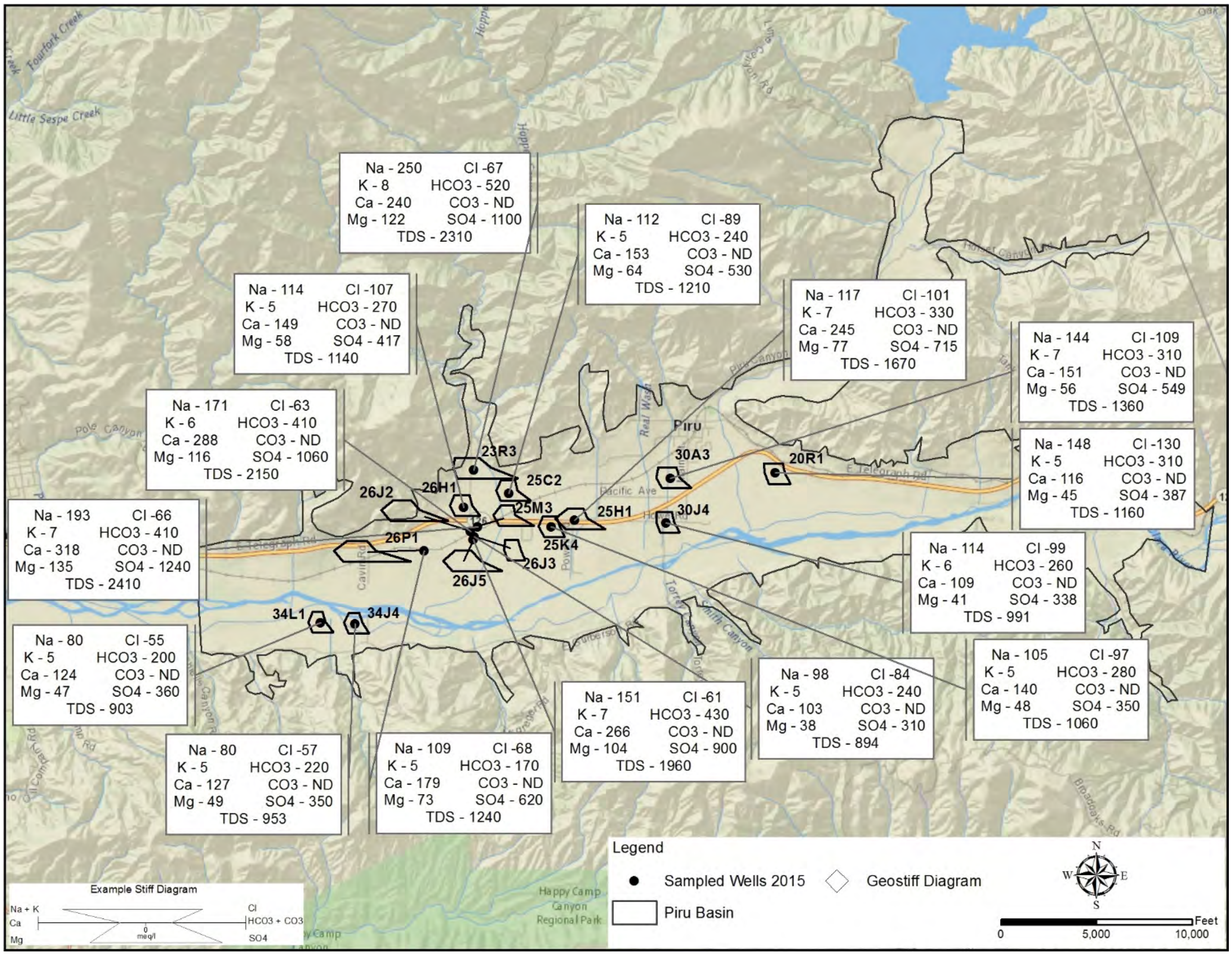


Figure 3-13: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.5 - Pleasant Valley Basin

In the Pleasant Valley Basin groundwater quality can vary greatly throughout the basin. The upper-most groundwater bearing unit at 35 to 60 feet is not used because the water quality is very poor. Permeable lenses of alluvial sands, gravels, silts, and clays of recent to Upper Pleistocene age that vary in thickness from a few feet to several hundred feet are equivalent to but not connected with the Oxnard Aquifer and are referred to here as the Upper zone. Depth to the main water bearing unit is approximately 400 to 500 feet. This deeper zone is referred to in this section as the Lower Zone. It is made up of marine sands and gravels of the lower-most member of the early Pleistocene San Pedro Formation and is known as the Fox Canyon Aquifer. The Grimes Canyon aquifer underlies the Fox Canyon aquifer at depths below 1000 feet and is penetrated by only the deepest wells. There are approximately 332 water supply wells in the Pleasant Valley Basin; 91 are active. Eighteen wells were sampled during this round of sampling; three perforated in the Upper zone and 15 perforated in the Lower zone.

The piper diagram, Figure E-16, shows a comparison of the wells based on whether the well is perforated in the upper zone or lower zone. Wells perforated in the upper zone tend to have higher concentrations of sulfate (SO_4^{2-}) than those in the lower zone. The piper diagram shows moderate variability in water quality of the wells in the lower zone and low variability for the wells in the upper zone. Water from the Upper zone wells show calcium (Ca^+) is the dominant cation for one of the samples and the remaining two samples have no dominant cation but plot very close to the calcium (Ca^+). Sulfate (SO_4^{2-}) is the dominant anion. The water in the Upper zone is calcium sulfate type. Water from the lower zone wells show sodium (Na^+) is the dominant anion for one well, and there is no dominant anion for the remainder. Sulfate (SO_4^{2-}) is the dominant anion for five samples and there is no dominant anion for the remaining ten samples but the data plots close to the sulfate (SO_4^{2-}) type. The water in one sample is sodium sulfate type; the remainder are calcium sulfate type.

TDS concentrations for all water samples (upper and lower zones) vary from 698 to 4340 mg/l. All nineteen wells sampled have TDS concentrations above the secondary MCL for drinking water. Fourteen of the wells have sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water. Five water samples have iron (Fe) concentrations above the secondary MCL for drinking water and six have manganese (Mn) concentrations above the secondary MCL. Chloride (Cl^-) concentrations are above 117 mg/l in water samples from fifteen wells. Samples from three wells have Cl^- concentrations above the secondary MCL for drinking water, but the LARWQCB Basin Plan indicates that agricultural beneficial uses are impaired when the concentration is above 117 mg/l. Water samples from seven wells were analyzed for Title 22 metals. Five wells have lead (Pb) above the primary MCL for drinking water. No other Title 22 metal was above the primary MCL. Figure 3-14 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).

Aerial photo showing the extent of the Pleasant Valley groundwater basin.

PLEASANT VALLEY BASIN

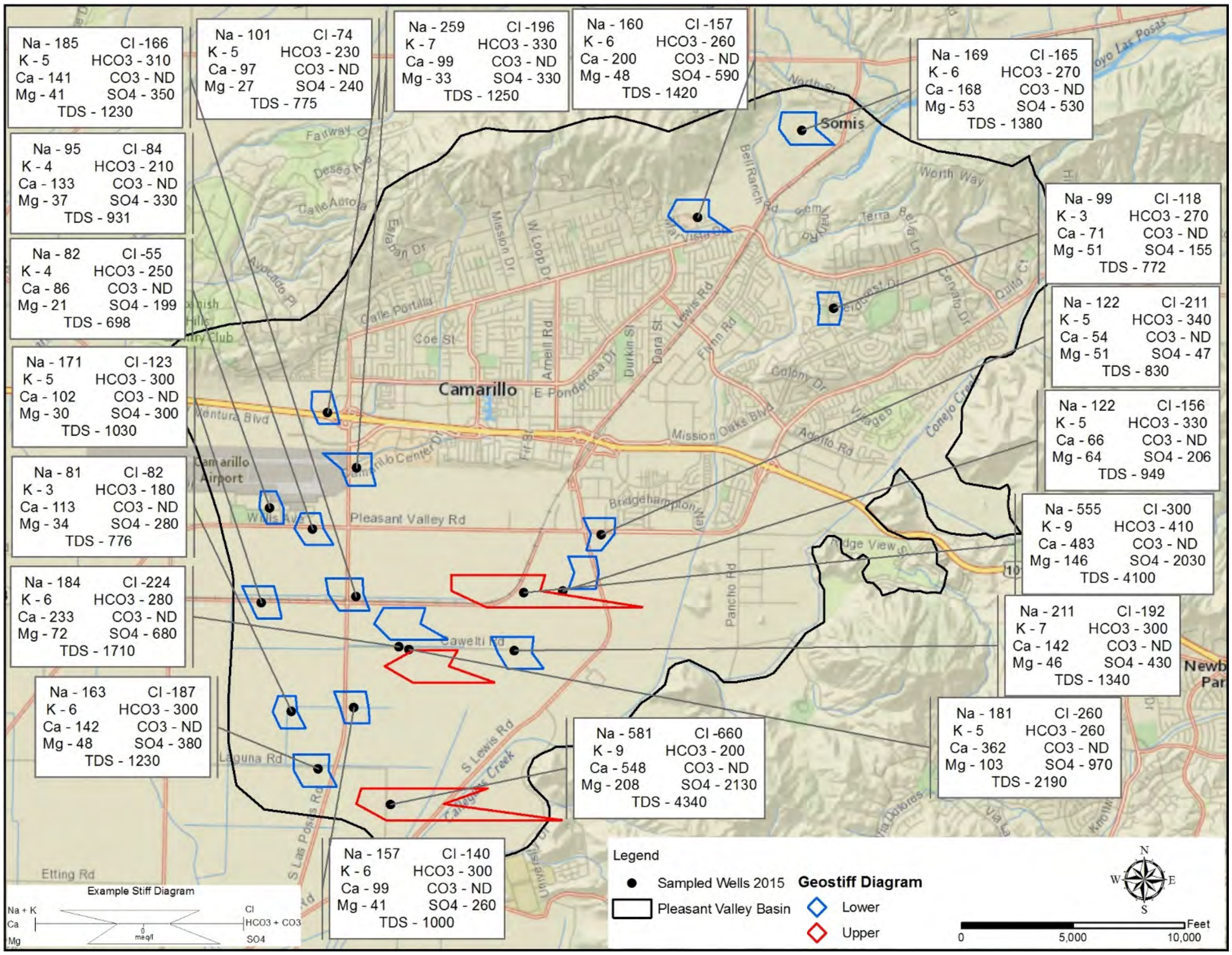


Figure 3-14: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.6 - Mound Basin

The Mound Basin water bearing units consist of Quaternary alluvium and the San Pedro Formation. These formations are divided into the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). The UAS consists of undifferentiated Holocene alluvium that make up the Oxnard aquifer and older Pleistocene alluvium that makes up the Mugu Aquifer. The alluvium consists of silts and clays with lenses of sand and gravel and reaches a maximum thickness of about 500 feet. The LAS consists dominantly of fine sands and gravels of the San Pedro Formation and extends as deep as 4,000 feet. The upper part of the San Pedro formation consists of variable amounts of clay, silty clay and sand. A series of inter-bedded water-bearing sands in this section are time equivalent to the Hueneme aquifer of the Oxnard Basin. The lower part of the San Pedro formation consists primarily of sand and gravel zones with layers of clay and silt and is known as the Fox Canyon aquifer in the Oxnard plain and extends into the Mound Basin. Groundwater is generally unconfined in the alluvium and confined in the San Pedro Formation. Historic water quality data for the basin shows that water quality is generally better in the lower zone but our data does not show that this year. Three of the five wells sampled this year are perforated in the LAS, much deeper than the other two. One of those wells has water quality that is significantly better than the other LAS wells. One of the shallow UAS wells has water quality that is similar to the deep wells and one well has significantly worse water quality.

There are approximately 78 water supply wells in the Mound Basin; 29 are active water supply wells. Figure E-17, piper diagram, shows low to moderate variability in water quality of all the wells sampled this year, LAS and UAS. Sodium is the dominant cation for one water sample and one sample plots close to the calcium type; there is no dominant cation for the remaining three water samples. Sulfate (SO_4^{2-}) is the dominant anion for all samples. One sample is sodium sulfate type and the remaining samples are calcium sulfate type.

TDS concentration for the wells sampled this year ranges from 1070 to 3000 mg/l; all above the secondary MCL for drinking water. Sulfate (SO_4^{2-}) concentration and manganese are greater than the secondary MCL for drinking water in all five wells sampled; iron is above the secondary MCL in three of the wells. Figure 3-15 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).

Aerial photo showing the extent of the Mound groundwater basin.

MOUND BASIN

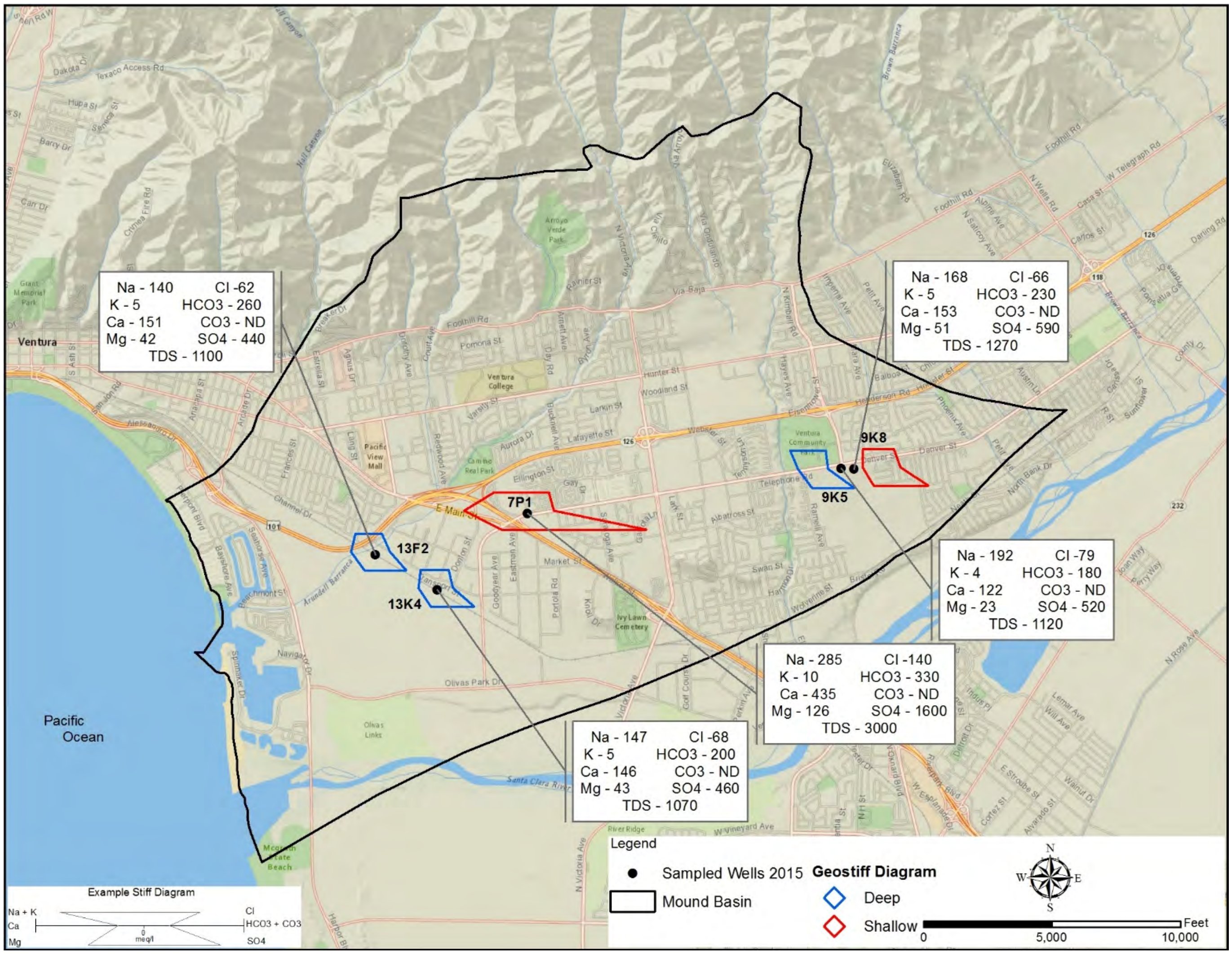


Figure 3-15: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.7 - East Las Posas Basin

Water bearing material of the East Las Posas Basin consists of Recent and Pleistocene alluvial deposits of varying thickness. Water bearing material consists primarily of sand or a mixture of sand and gravel identified as the Fox Canyon Aquifer in this basin and is the basal member of the Pleistocene age, San Pedro Formation (Stokes, 1971). The Fox Canyon aquifer is generally considered to be confined in the East Las Posas Basin. However data indicates the Fox Canyon Aquifer receives recharge from leakage from aquifers located above it (FCGMA 2007 Basin Management Plan). The exact hydrogeologic connectivity is not well understood. Depth to the upper water bearing unit is approximately 120 to 150 feet and to the lower unit is approximately 530 to 580 feet. There are approximately 248 water supply wells in the East Las Posas Basin; 155 are active water supply wells.

Figure E-18, piper diagram, shows moderate variability in water quality of the wells sampled this year. Calcium is the dominant cation for nine of the wells sampled; there is no dominant cation for the remaining four wells. Sulfate (SO_4^{2-}) is the dominant anion for five of the wells; bicarbonate is the dominant anion for six of the wells sampled; and two wells have no dominant anion. The water in seven of the wells sampled is calcium sulfate type, six of the wells are calcium bicarbonate type. Of the thirteen 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 from the other nine. TDS and sulfate are above the secondary MCL for drinking water in all three southwestern wells and they all have elevated chloride (Cl^-), not above the drinking water MCL but above the level that could be harmful to crops. The remainder of the wells have good water quality with TDS ranging between 261 and 805 mg/l. Water from three wells was analyzed for Title 22 metals. Lead (Pb) concentration is above the primary MCL for drinking water in one sample. No other Title 22 metal was above the primary MCL for drinking water.

Figure E-21, piper diagram, shows a comparison of East, West, and South Las Posas water chemistry. There is moderate variability in the water quality of the combined basins. The South Las Posas basin has less variability but fewer wells were sampled in that basin. The majority of the water samples from all three basins is in two main groups, those with sulfate (SO_4^{2-}) as the dominant anion, calcium sulfate type and those with no dominant anion but which plot near the bicarbonate type, calcium bicarbonate type. The water chemistry of East and West Las Posas Basins is fairly similar, even though, based on the sharp change in water level between the East Las Posas and West Las Posas basins, the degree of hydrologic connection appears to be limited. Figure 3-16 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).

Aerial photo showing the extent of the East Las Posas groundwater basin.

EAST LAS POSAS BASIN

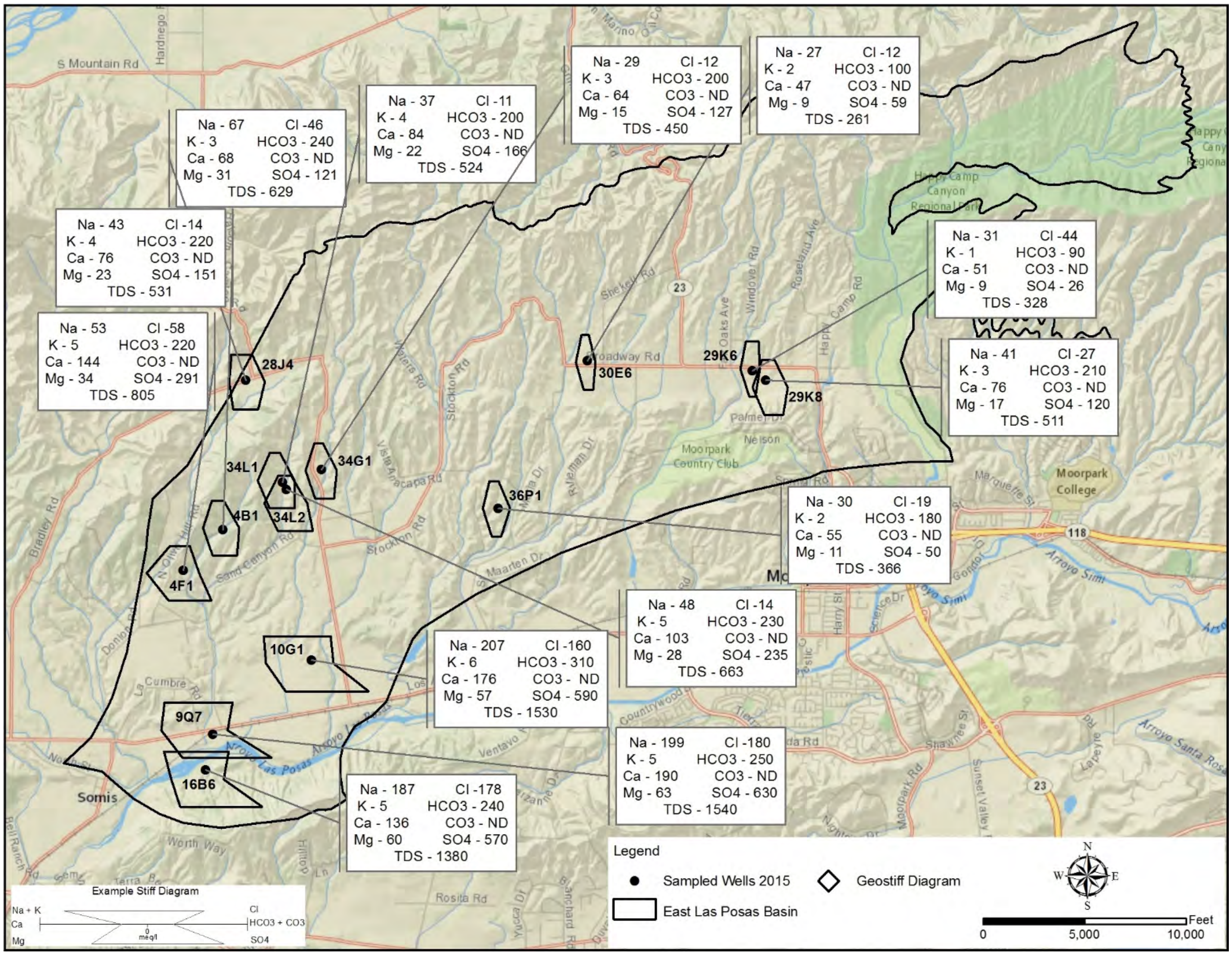


Figure 3-16: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.8 - West Las Posas Basin

There are approximately 114 water supply wells in the West Las Posas Basin; 63 of those are active wells. Figure E-19, piper diagram, shows moderate variability in water quality of the wells sampled this year. Calcium (Ca^{2+}) is the dominant cation for two of the samples and there is no dominant cation for the remainder. Bicarbonate (HCO_3^-) is the dominant anion for two of the wells sampled; sulfate (SO_4^{2-}) is the dominant anion for six of the wells and four wells have no dominant anion but plot close to the bicarbonate (HCO_3^-) anion type. The water in ten wells is calcium sulfate type and the remaining two wells are calcium bicarbonate type.

TDS is above the secondary MCL for drinking water in eleven of the wells sampled in the West Las Posas Basin this year; ranging from 300 to 1380 mg/L. One well has a nitrate concentration above the primary MCL for drinking water. Five wells have sulfate (SO_4^{2-}) above the secondary MCL; six have manganese concentrations above the MCL. Four wells have iron concentration above the MCL for drinking water, one over 28 times the MCL. The piper diagram also shows water quality data for one well, 13A1, that is just outside the mapped basin boundary. The chemistry of this well is very similar to that of the wells inside the mapped boundary. It is most similar to the well to the northwest, 36Q1, which has a water level at approximately the same elevation. Water from four wells was analyzed for Title 22 metals. Lead (Pb) concentration is above the primary MCL for drinking water in two samples. No other Title 22 metal was above the primary MCL for drinking water. Figure 3-17 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the West Las Posas Basin.

Aerial photo showing the extent of the West Las Posas groundwater basin.

WEST LAS POSAS BASIN

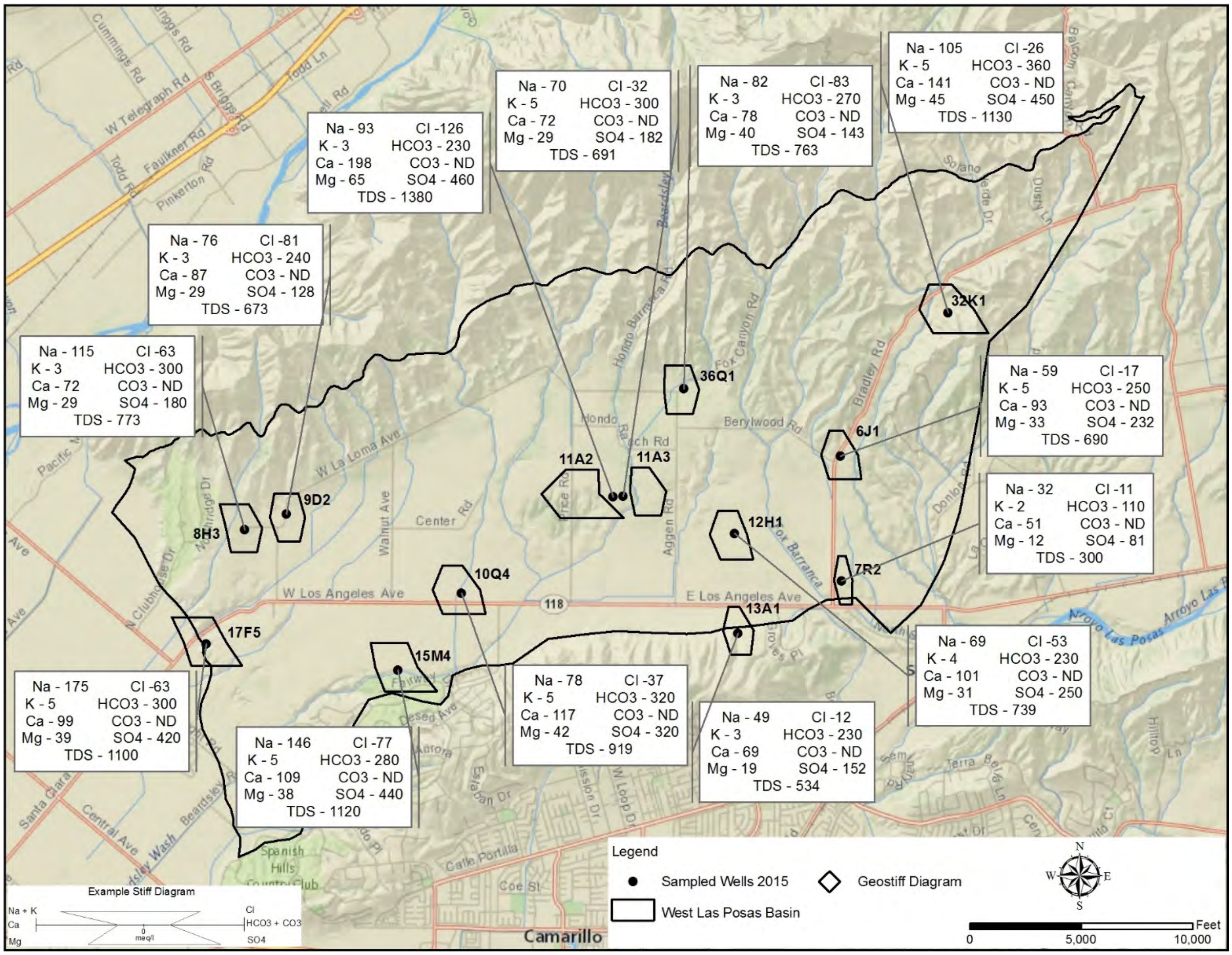
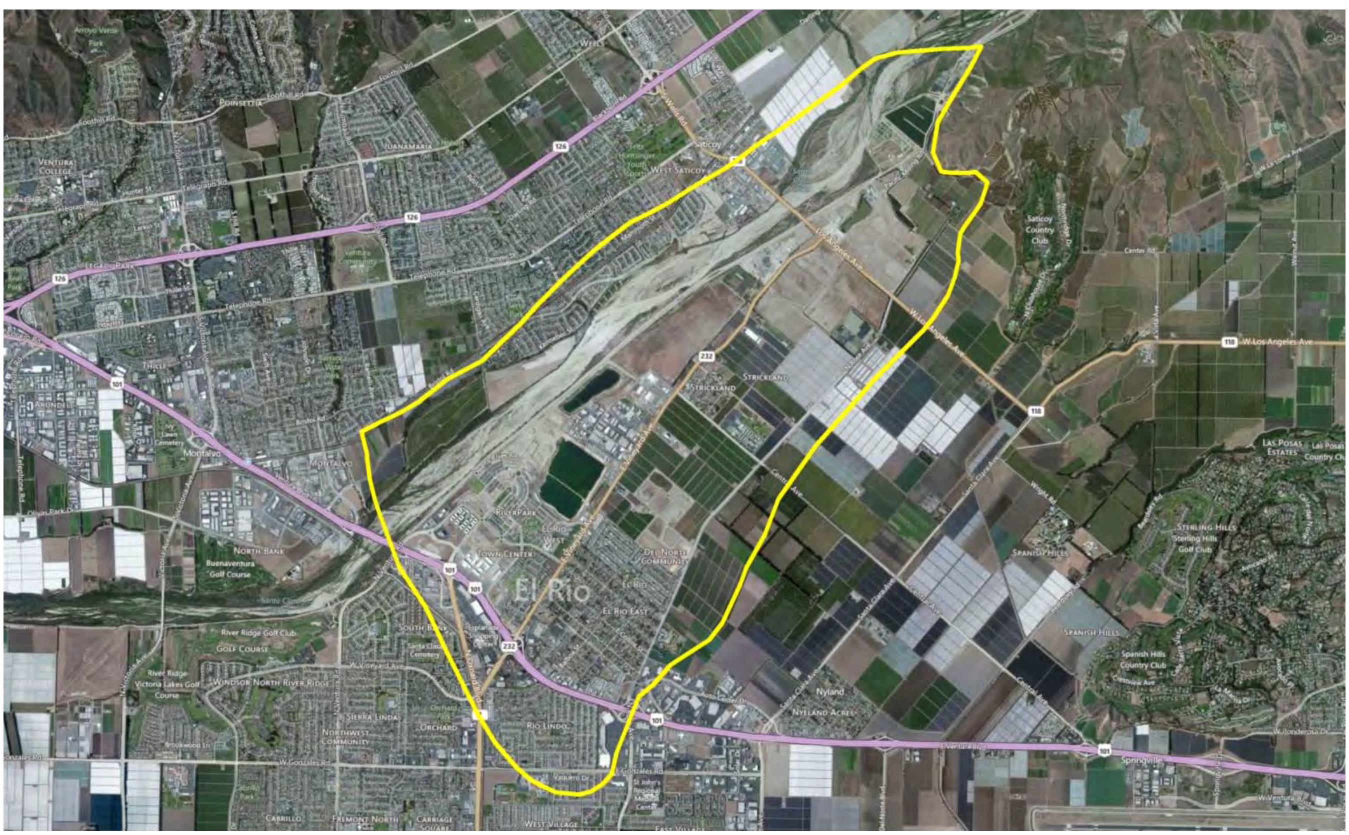


Figure 3-17: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.9 – Oxnard Plain Forebay Basin

The Oxnard Plain 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. There are approximately 304 water supply wells in the Oxnard Plain Forebay Basin; 105 are active wells. The Oxnard Plain 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. Three wells in the Oxnard Plain Forebay Basin were sampled this season; two in the Upper Aquifer System and one in the Lower Aquifer System. Figure E-22, piper diagram, shows low variability in water quality of all three wells sampled this year. The piper diagram shows there is a small difference between the upper and lower Forebay aquifers. There is no dominant cation type but the three samples plot close to the calcium type; sulfate (SO_4^{2-}) is the dominant anion. The water in all three samples is calcium sulfate type. The piper diagram, Figure E-23, shows that the wells sampled have very similar chemistry to that of the UAS of the Oxnard Plain Pressure Basin.

All three wells sampled have TDS and sulfate concentrations above the secondary MCL for drinking water and one had manganese (Mn^+) concentration above the MCL. One of the wells sampled this year has a nitrate concentration above the MCL for drinking water. Water from one well was analyzed for Title 22 metals. None of the Title 22 metals was above the primary MCL for drinking water. Figure 3-18 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Oxnard Forebay Basin.



Aerial photo showing the extent of the Oxnard Plain Forebay groundwater basin.

OXNARD FOREBAY BASIN

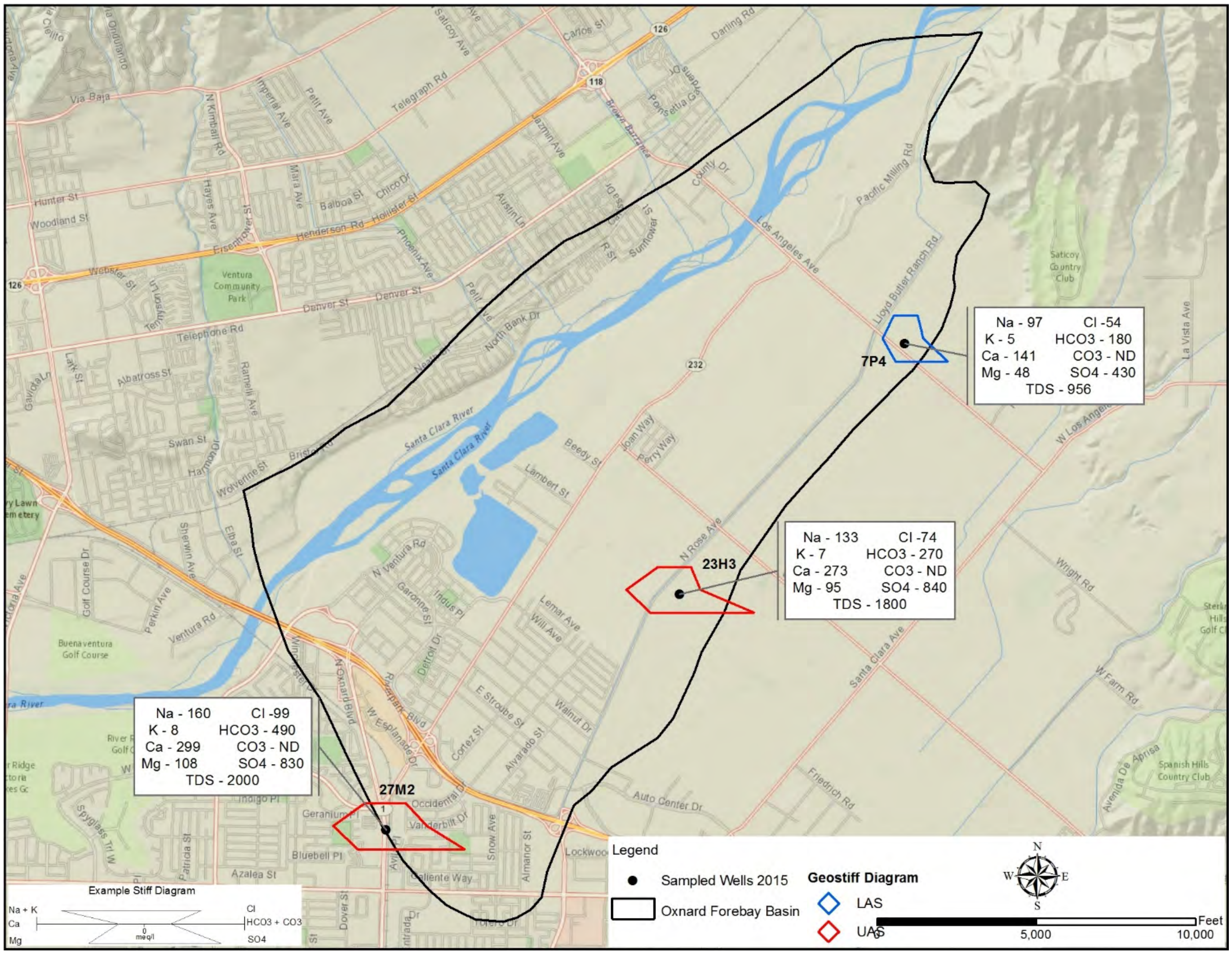
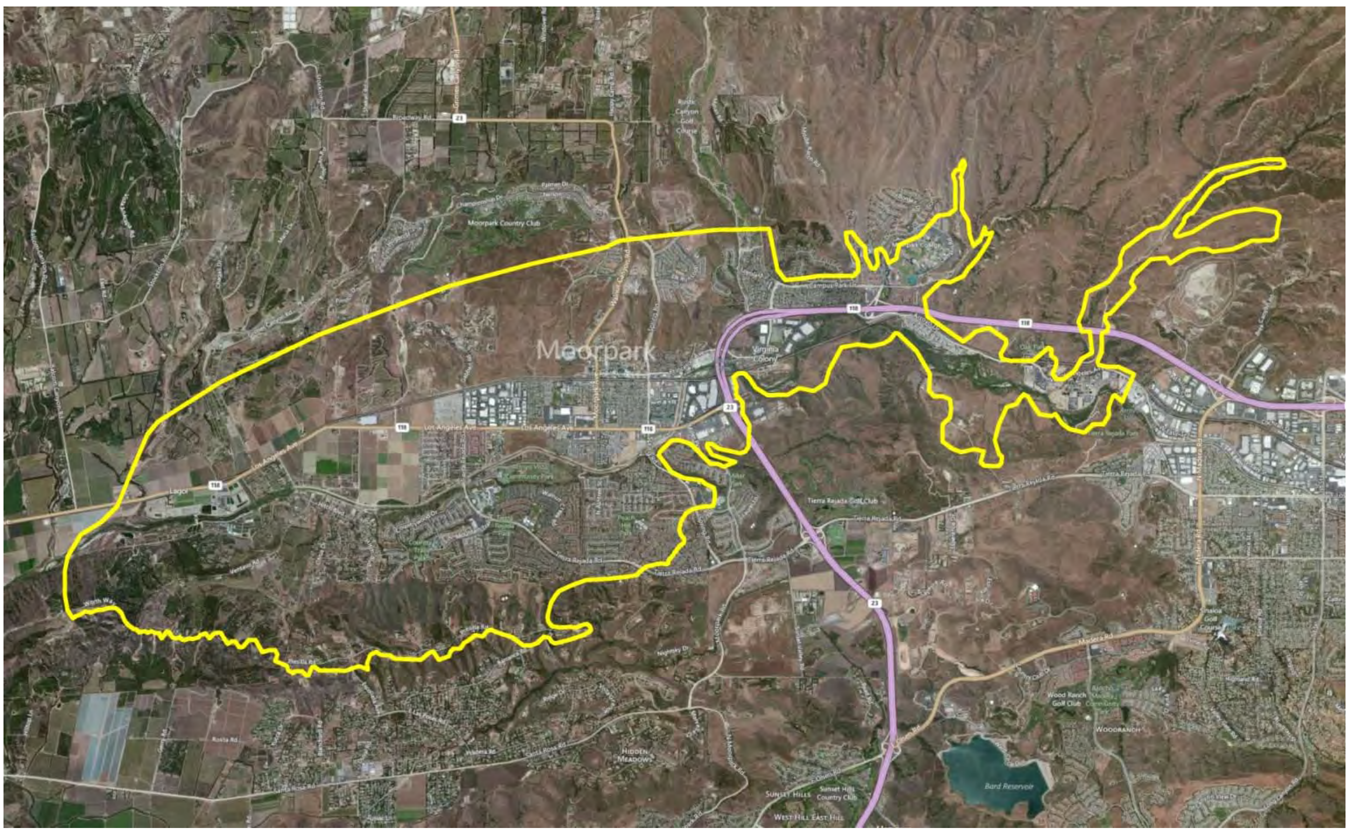


Figure 3-18: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.10 - South Las Posas Basin

The upper water bearing unit in the South Las Posas Basin is approximately 25 to 50 feet below ground surface and the lower is at approximately 350 to 500 feet below ground surface. Generally, deeper wells perforated in the Fox Canyon aquifer tend to have better water quality than the upper unit, however that has changed some over the years. Well 07B02 is perforated much deeper than the other three wells sampled but the water chemistry is similar. There are approximately 171 water supply wells in the South Las Posas Basin; 28 are active. Figure E-20, piper diagram, shows low variability in water quality of the wells sampled this year. The dominant cation for one well is sodium; the remaining three samples have no dominant cation. Sulfate (SO_4^{2-}) is the dominant anion in all three samples. The water type of one well is sodium sulfate; the remainder of the wells are calcium sulfate type. The South Las Posas Basin has had no significant change in water quality over the past year. Water from all four wells sampled has TDS and sulfate SO_4^{2-} concentrations above the secondary MCL for drinking water and elevated chloride; not above the secondary MCL for drinking water (but high enough to be detrimental for some agricultural uses). No sample was analyzed for Title 22 metals. Water chemistry in the South Las Posas Basin is fairly consistent across the basin. A comparison of the East, West, and South Las Posas Basins is shown in the piper diagram, Figure E-21. Figure 3-19 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the South Las Posas Basin.



Aerial photo showing the extent of the South Las Posas groundwater basin.

SOUTH LAS POSAS BASIN

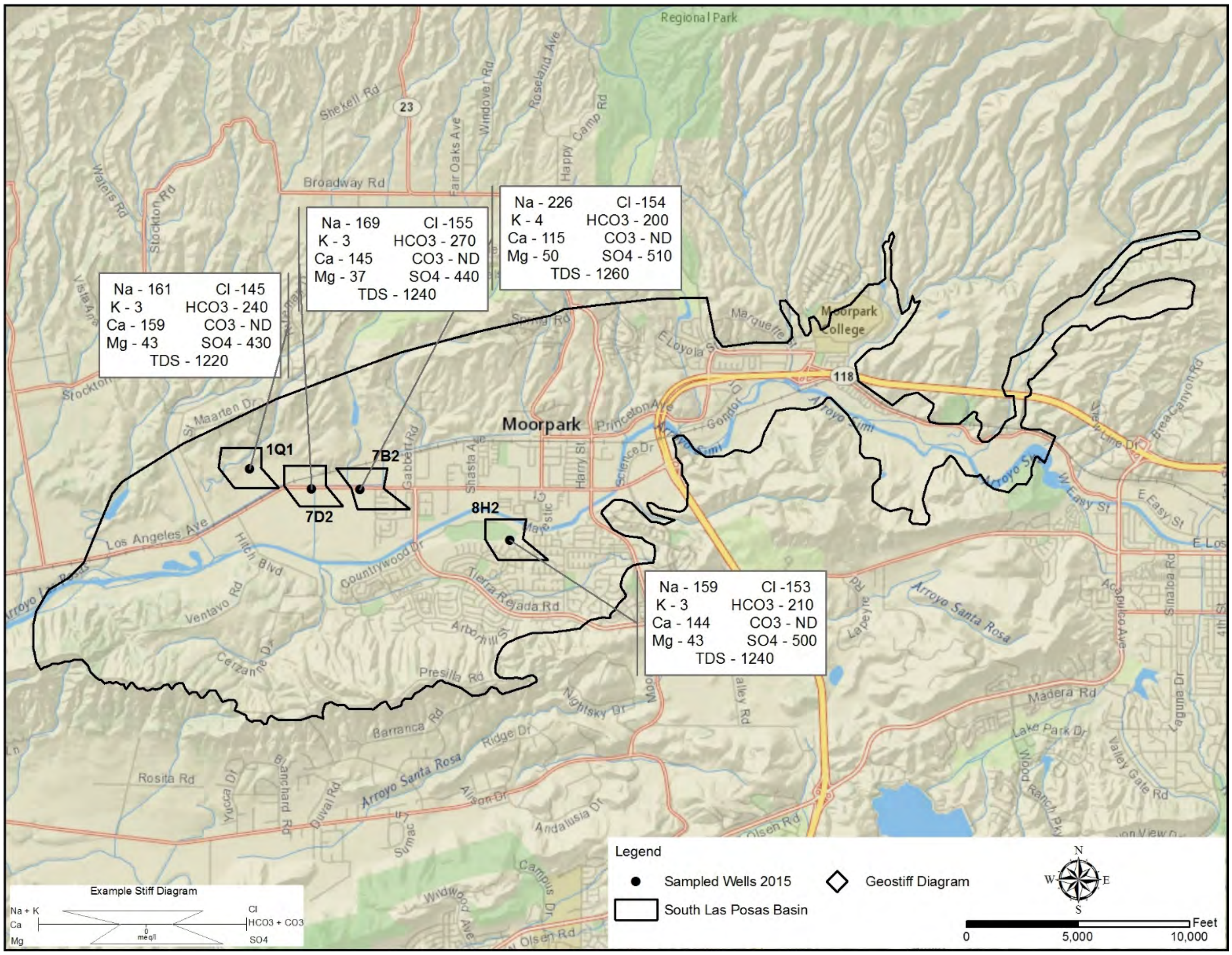
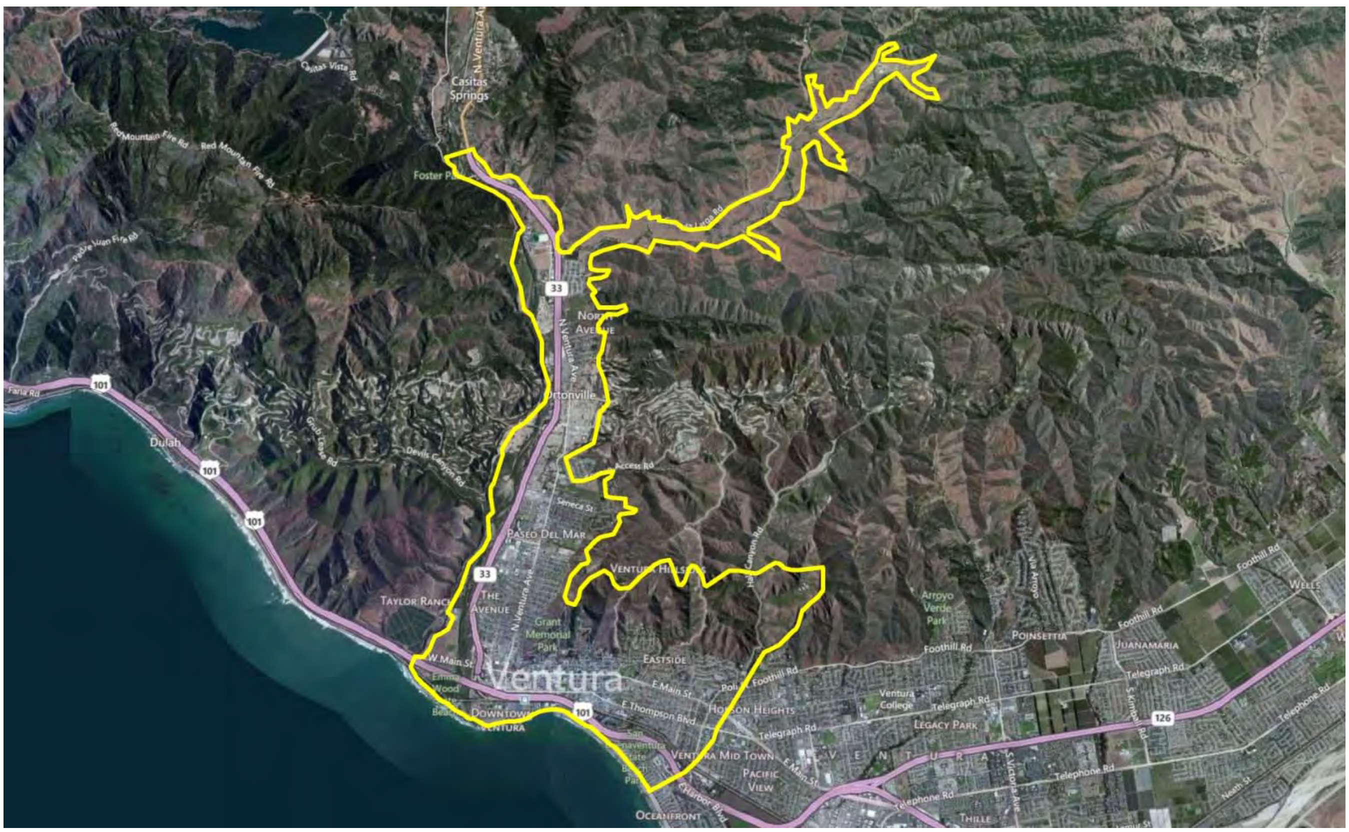


Figure 3-19: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 below ground surface in the floodplain and deeper as the ground surface elevation increases towards the edges of the basin. There are approximately 32 water supply wells in the Lower Ventura River Basin; 17 are active wells. The piper diagram, Figure E-24, shows the water quality of the three wells sampled this year. There is no dominant cation or anion. The water type is calcium sulfate type. The wells sampled this year are located in river alluvium near the coast. Total dissolved solids and sulfate concentrations in all three wells are above the secondary MCL. Iron (Fe^{+}) is above the secondary MCL in one well and manganese (Mn^{+}) and chloride (Cl^{-}) are above the secondary MCL in two wells. Figure 3-20 shows the approximate well location and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Lower Ventura River basin. Piper diagram Figure E-26 shows a comparison of the chemistry between Upper and Lower Ventura River Basins.



Aerial photo showing the extent of the Lower Ventura River groundwater basin.

LOWER VENTURA RIVER BASIN

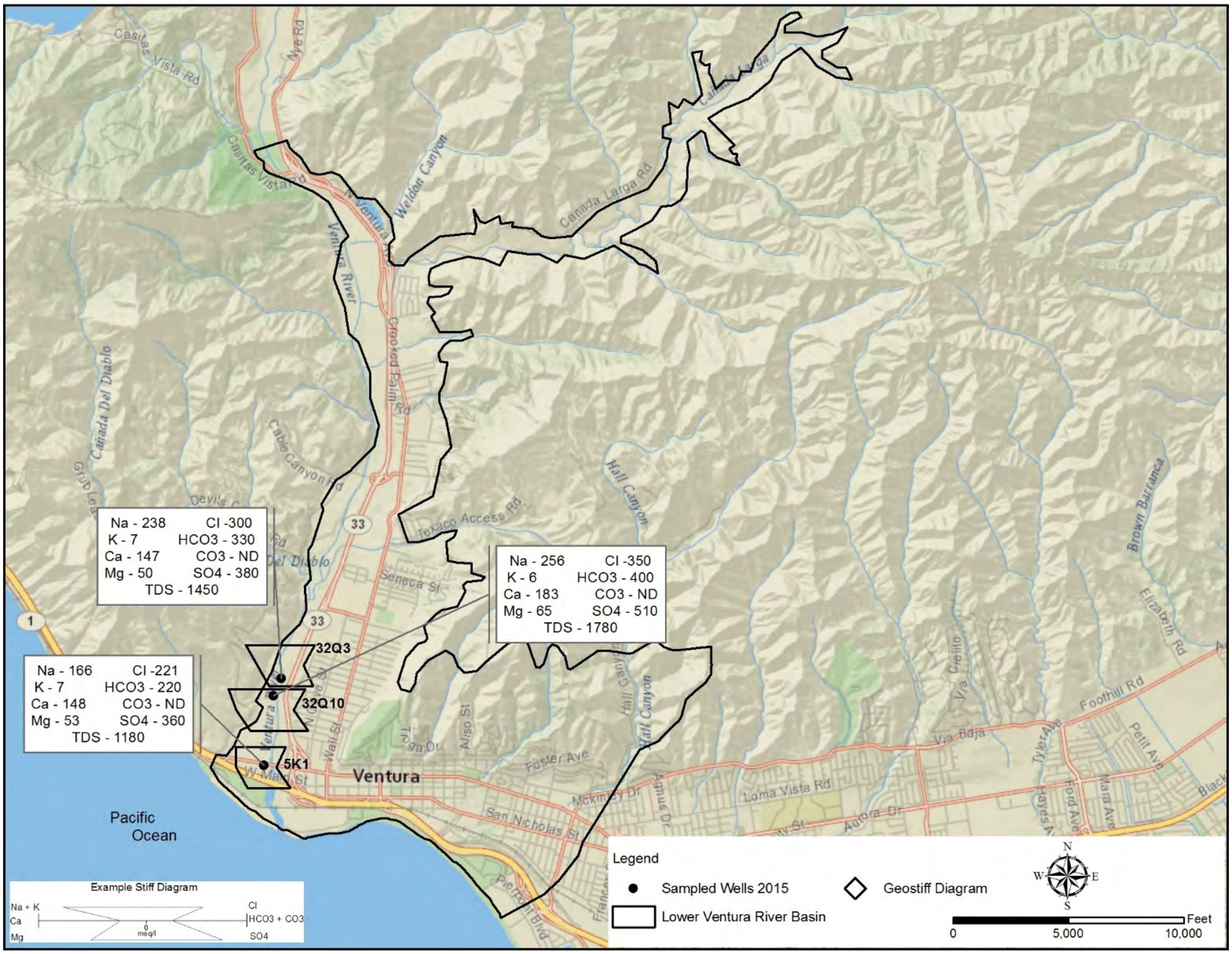
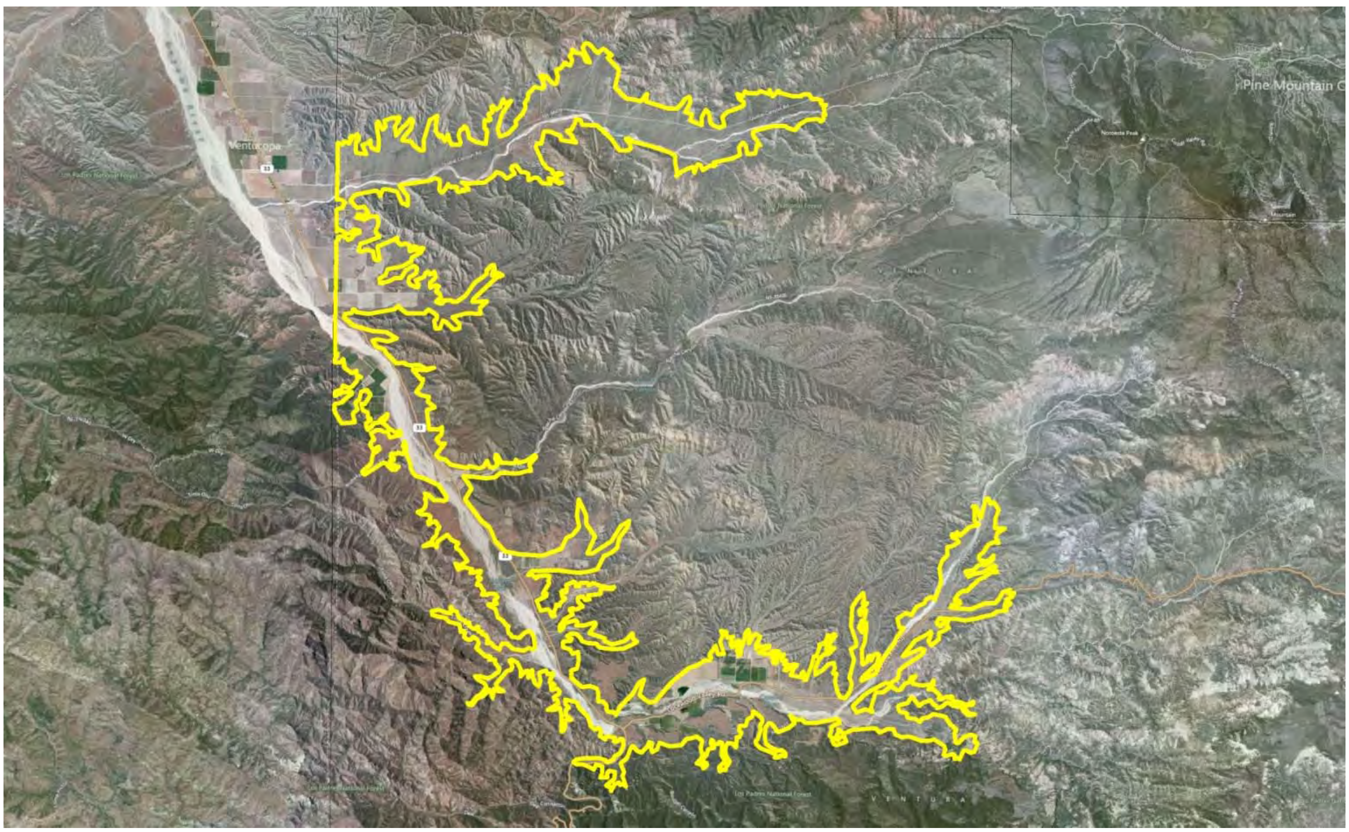


Figure 3-20: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.12 - Cuyama Valley Basin

The Cuyama Valley Basin is in a remote area in northwestern Ventura County. The aerial photo and the map in Figure 3-18 show only the portion of the basin that is in Ventura County. There are approximately 149 wells in the Cuyama Valley Basin; 112 are active water supply wells. Depth to the main water bearing unit varies between 40 to 170 feet below ground surface. Figure E-27, piper diagram, shows low variability in water quality of the wells sampled this year. Sodium (Na^+) is the dominant cation in the three samples; there is no dominant anion. All three samples are sodium bicarbonate type. The wells sampled this year have TDS above the secondary MCL for drinking water; no other constituent was elevated. Water samples from all three wells were analyzed for Title 22 metals. None of the Title 22 metals was above the primary MCL for drinking water. California Department of Water Resources Groundwater Bulletin No. 118 indicates groundwater quality has been deteriorating in some areas because of cycling and evaporation of irrigation water. All three wells sampled have good water quality but are located in the northern part of the basin where there is not as much irrigation. Figure 3-21 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Cuyama Valley basin.



Aerial photo showing the extent of the Cuyama Valley groundwater basin.

CUYAMA VALLEY BASIN

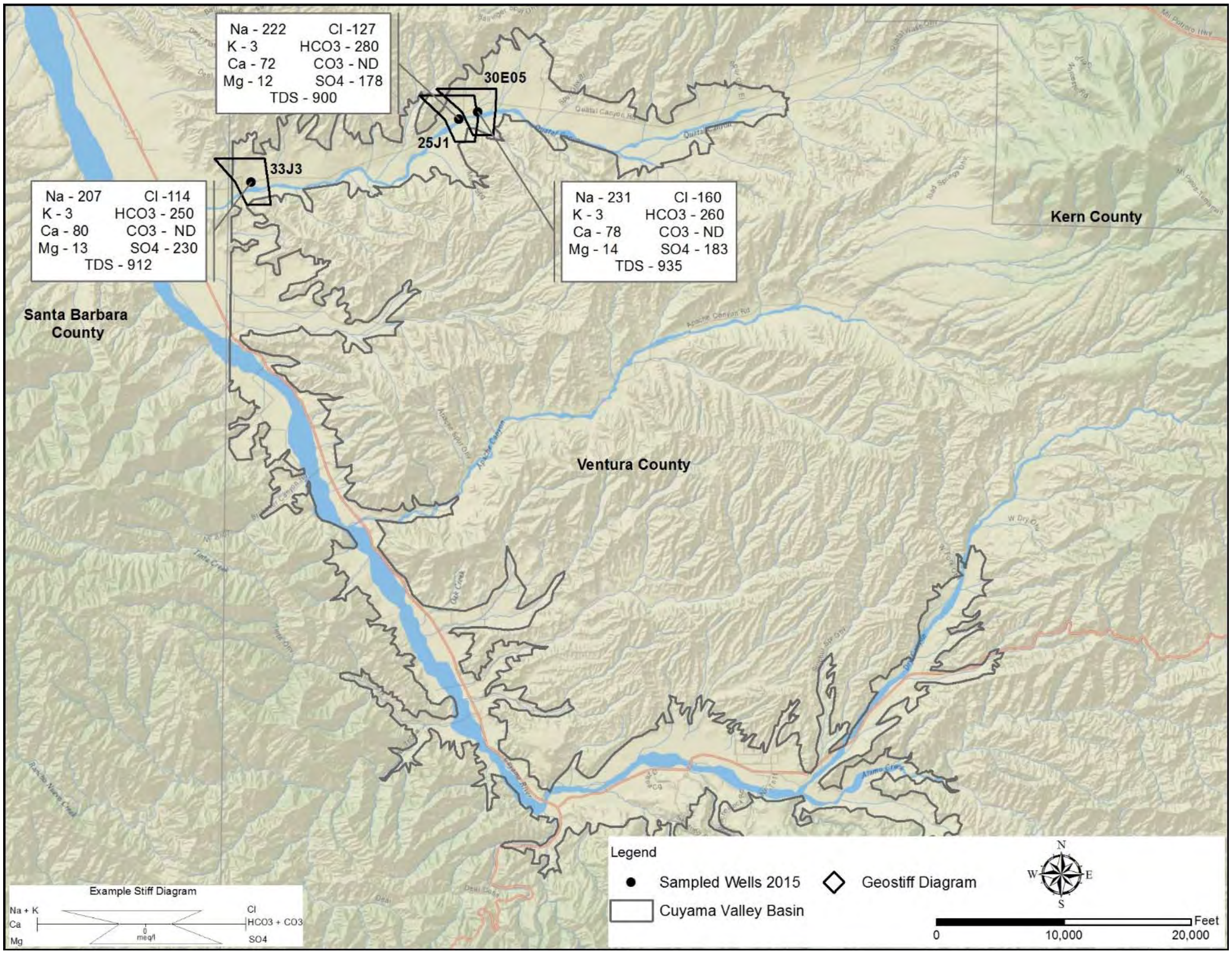


Figure 3-21: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.13 - Simi Valley Basin

The Simi Valley Basin drains to the west and, historically, water quality becomes more enriched in salts farther west in the basin. There are approximately 191 water supply wells in the Simi Valley Basin; 43 are active wells. 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 pump down the water table when groundwater gets too high. Figure E-28, piper diagram, shows low variability in water quality of the wells sampled this year. There is no dominant cation but all three samples plot close to the calcium cation type; sulfate (SO_4^{2-}) is the dominant anion. The water is calcium sulfate type. The three wells sampled this year, all dewatering wells, located in the western half of the basin, have sulfate (SO_4^{2-}), and TDS concentrations above the secondary MCL for drinking water and one well has manganese (Mn^+) above the MCL and one has iron concentration that is about ten times the secondary MCL for drinking water. All three samples also have concentrations of boron and two have chloride that exceed agricultural beneficial uses, but neither constituent is above the primary MCL for drinking water. A water sample from one well was analyzed for Title 22 metals. None of the Title 22 metals was above the primary MCL for drinking water. Figure 3-22 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Simi Valley basin.

Aerial photo showing the extent of the Simi Valley groundwater basin.

SIMI VALLEY BASIN

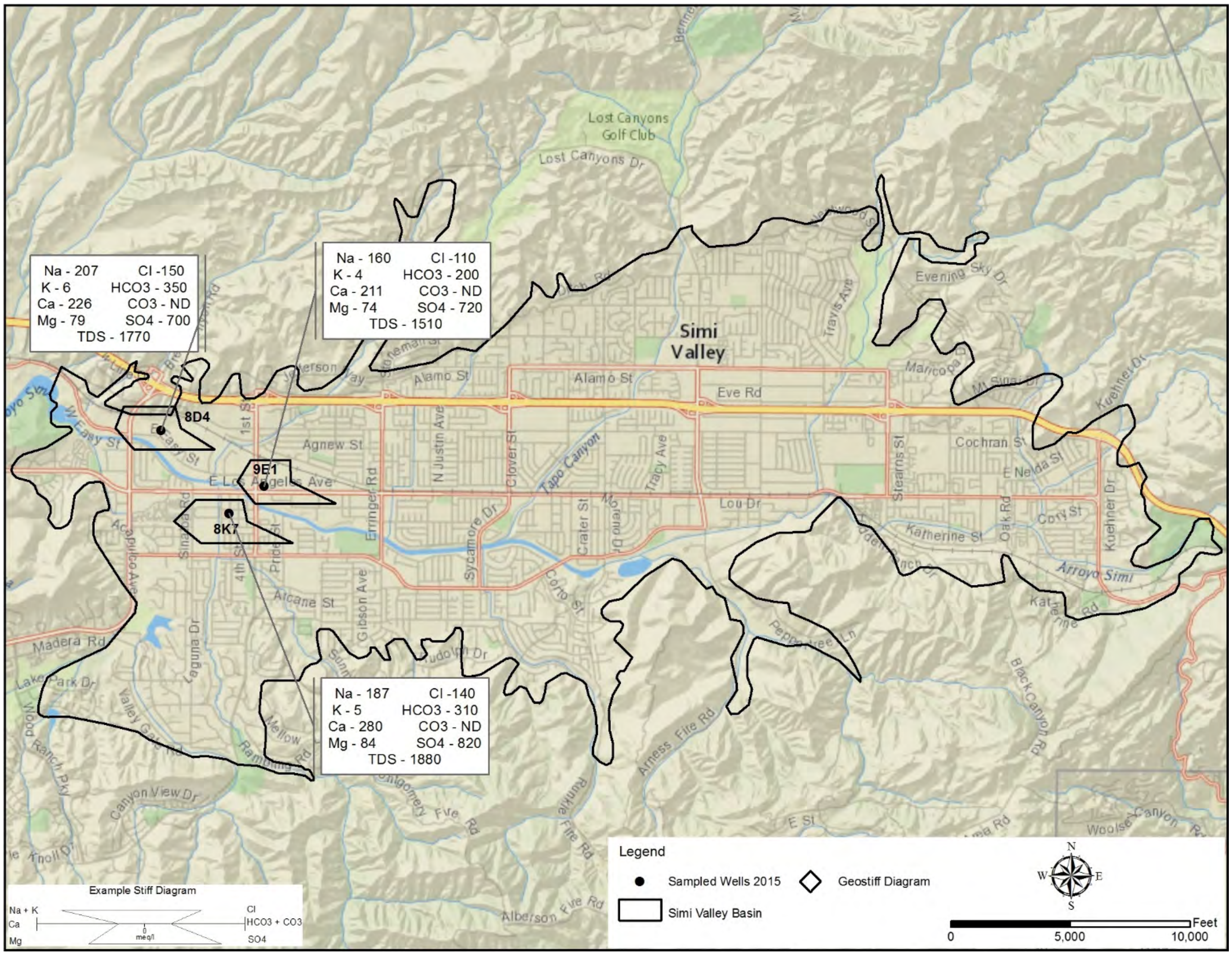
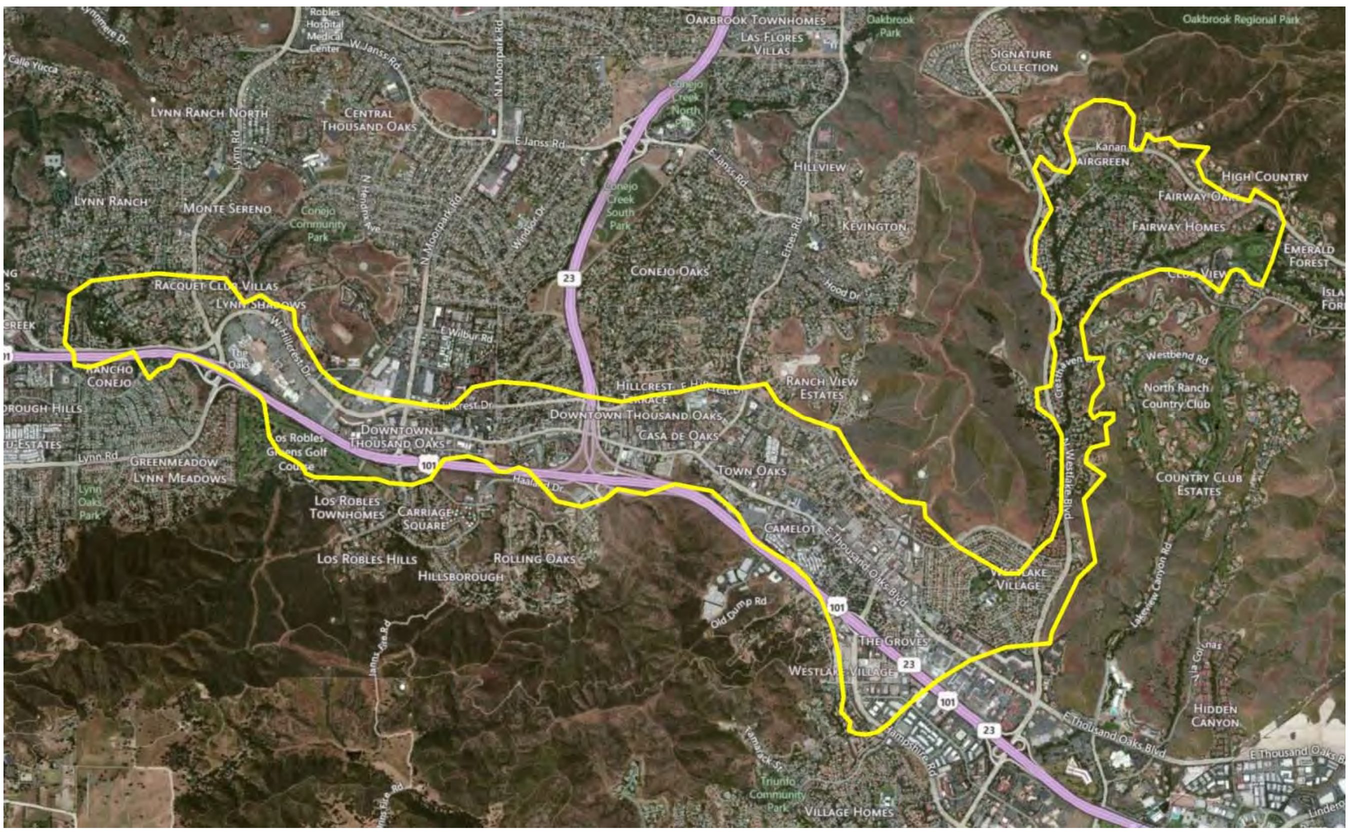


Figure 3-22: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.14 - Thousand Oaks Basin

The Thousand Oaks Basin has very few active water wells available for sampling. The depth to the water bearing unit is approximately 25 to 30 feet. There are approximately 194 water supply wells in the Thousand Oaks Basin; 18 are active wells. Two wells at the west end of the basin were sampled this year. Figure E-29, piper diagram, shows the water quality of the wells sampled this year. There is no dominant cation but the water plots close to the magnesium type (Mg^{2+}); sulfate (SO_4^{2-}) is the dominant anion in one sample and there is no dominant cation for the other well. The water is magnesium sulfate type. Concentrations of iron, sulfate (SO_4^{2-}) and TDS are above the secondary MCL for drinking water and manganese (Mn^{+}) is above the MCL in one sample. Neither sample was analyzed for Title 22 metals. Figure 3-23 shows approximate well location and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in Thousand Oaks basin.



Aerial photo showing the extent of the Thousand Oaks groundwater basin.

THOUSAND OAKS BASIN

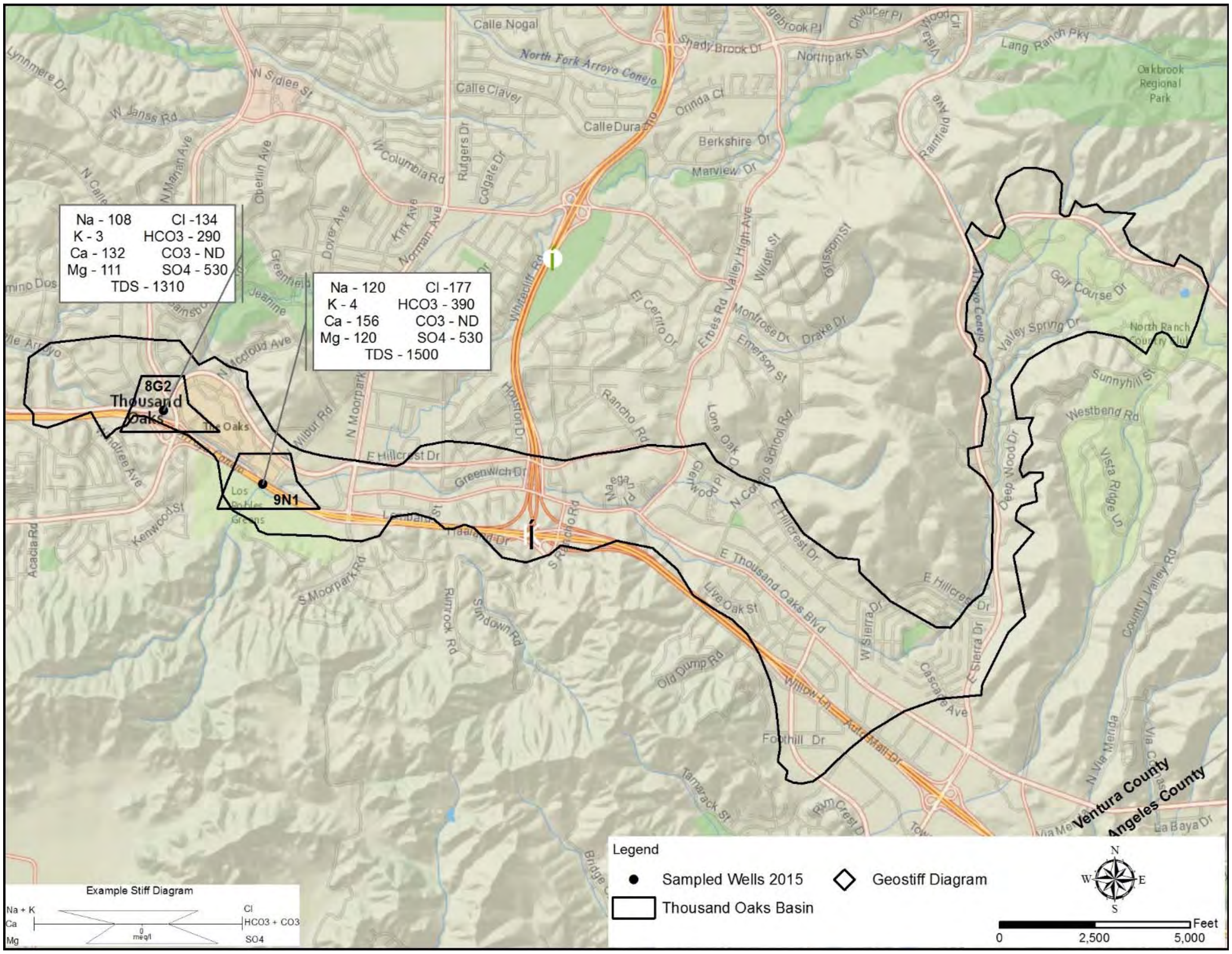
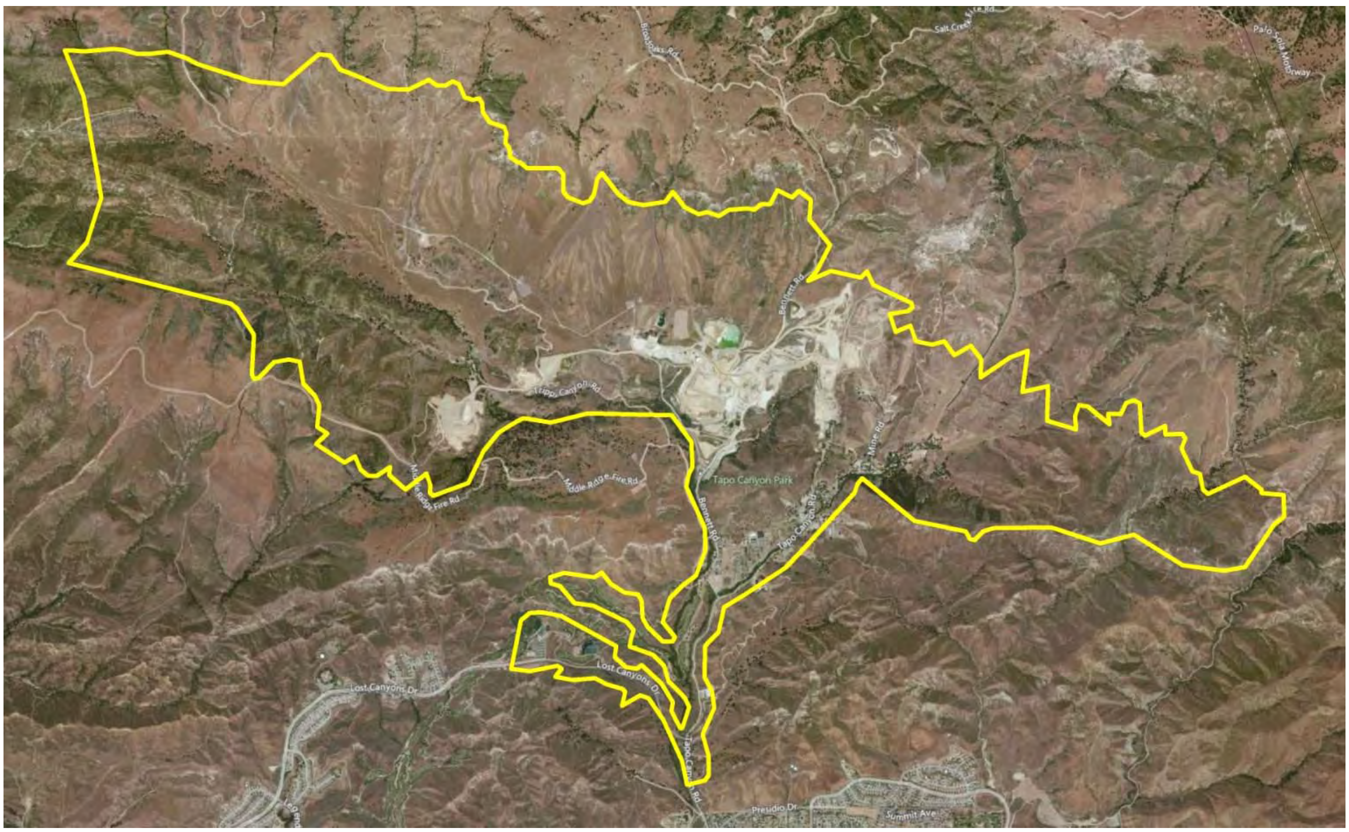


Figure 3-23: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.15 - Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley. There are approximately 46 water supply wells in the Tapo/Gillibrand Basin; 42 are active wells. The City of Simi Valley operates several wells in the basin as a backup water supply. Two wells were sampled this year. Figure E-30, piper diagram, shows water quality of the wells sampled this year. Calcium is the dominant cation in both wells and sulfate (SO_4^{2-}) is the dominant anion in one of the wells sampled. The water is calcium sulfate type. TDS and SO_4^{2-} concentrations are above the secondary MCL for drinking water in both wells; iron (Fe) and manganese (Mn) are above the secondary MCL in one well. Neither well was analyzed for Title 22 metals. Figure 3-24 shows approximate well location and concentration of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the well sampled in Tapo/Gillibrand basin.



Aerial photo showing the extent of the Tapo/Gillibrand groundwater basin.

TAPO/GILLIBRAND BASIN

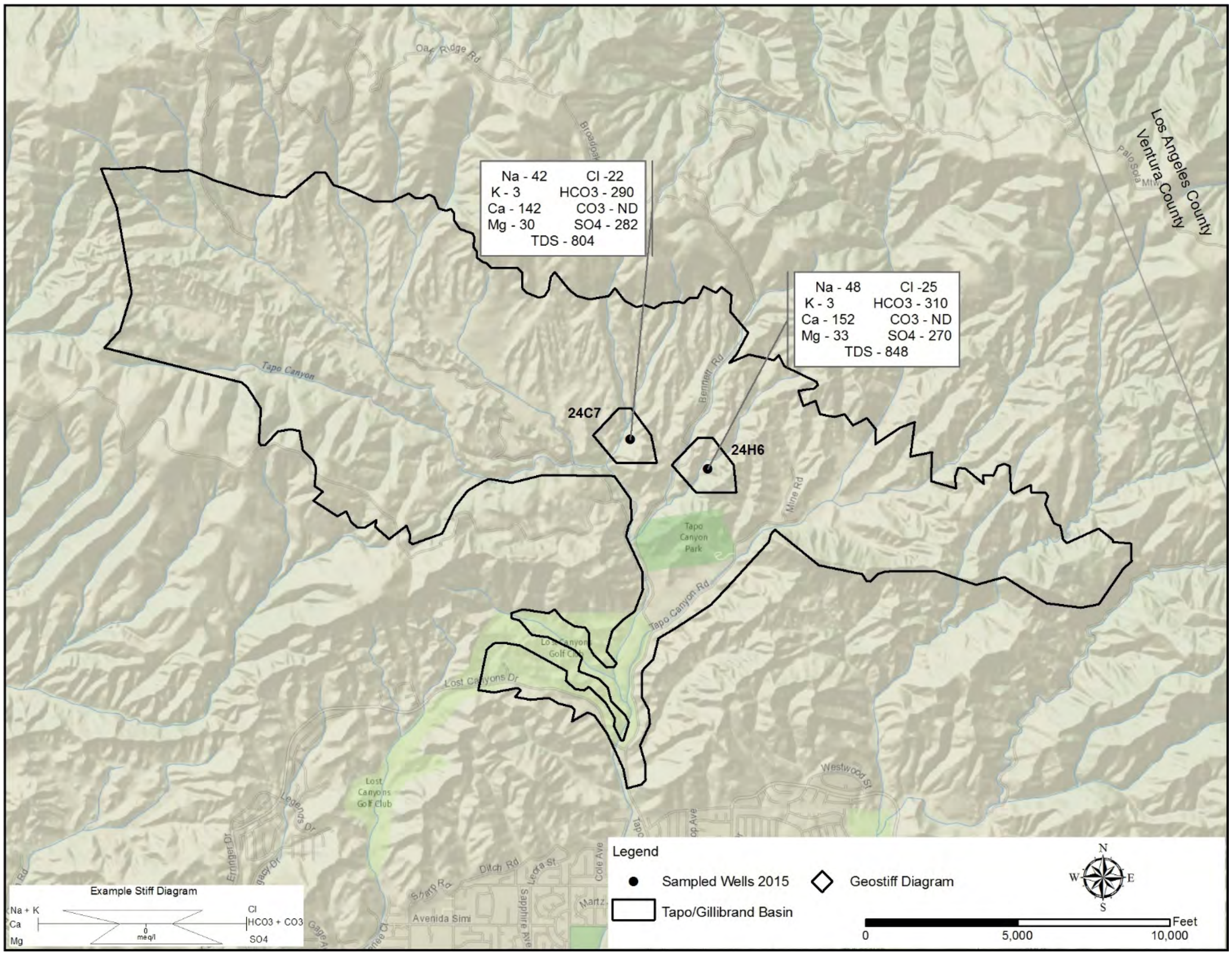


Figure 3-24: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.16 - Arroyo Santa Rosa Basin

The water bearing units of the Arroyo Santa Rosa Basin occupy almost the entire area beneath the Santa Rosa Valley, but the area west of the Bailey Fault is generally considered to be hydrogeologically separate from the area east of the fault (1997 Santa Rosa Basin Groundwater Management Plan) although some leakage across the fault does occur (CMWD, 2013). Depth to water bearing material is approximately 50 feet. The water bearing units west of the fault are confined and those located east of the fault are unconfined. The degree of groundwater movement across the fault is not clearly understood. The Arroyo Santa Rosa Basin has a large area dedicated to agricultural use and a high number of individual septic systems; two main sources of nitrate to the groundwater. A large portion of recharge to the basin is discharge from the Thousand Oaks Hill Canyon Wastewater Treatment Plant. There are approximately 87 water supply wells in the Arroyo Santa Rosa Basin; 40 are active wells. Figure E-32, piper diagram, shows moderate variation in water quality of the wells sampled this year. Magnesium (Mg^{2+}) is the dominant cation in one sample and the remainder of the samples plot close to the magnesium cation type. Bicarbonate is the dominant anion for one of the samples; there is no dominant anion for the remainder. One of the water samples is magnesium bicarbonate type and the remainder are magnesium sulfate type. Water from seven of the nine wells sampled this year have nitrate (NO_3^-) concentrations higher than the primary MCL for drinking water. All nine wells have TDS concentrations above the secondary MCL; ranging from 775 to 1120 mg/l. Chloride (Cl^-) concentrations in eight of the wells are above the level that can cause agricultural beneficial uses for sensitive plants to be impaired, but are not above the primary MCL for drinking water. Two water samples were analyzed for Title 22 metals. Lead (Pb) was above the primary MCL for drinking water in one sample. None of the other Title 22 metals was above the primary MCL for drinking water. Figure E-34, piper diagram, shows a comparison of water chemistry between Tierra Rejada Basin and Arroyo Santa Rosa Basin groundwater. The water chemistry is similar but with more variation in the Tierra Rejada Samples. Figure 3-25 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Arroyo Santa Rosa basin.

Aerial photo showing the extent of the Arroyo Santa Rosa groundwater basin.

ARROYO SANTA ROSA BASIN

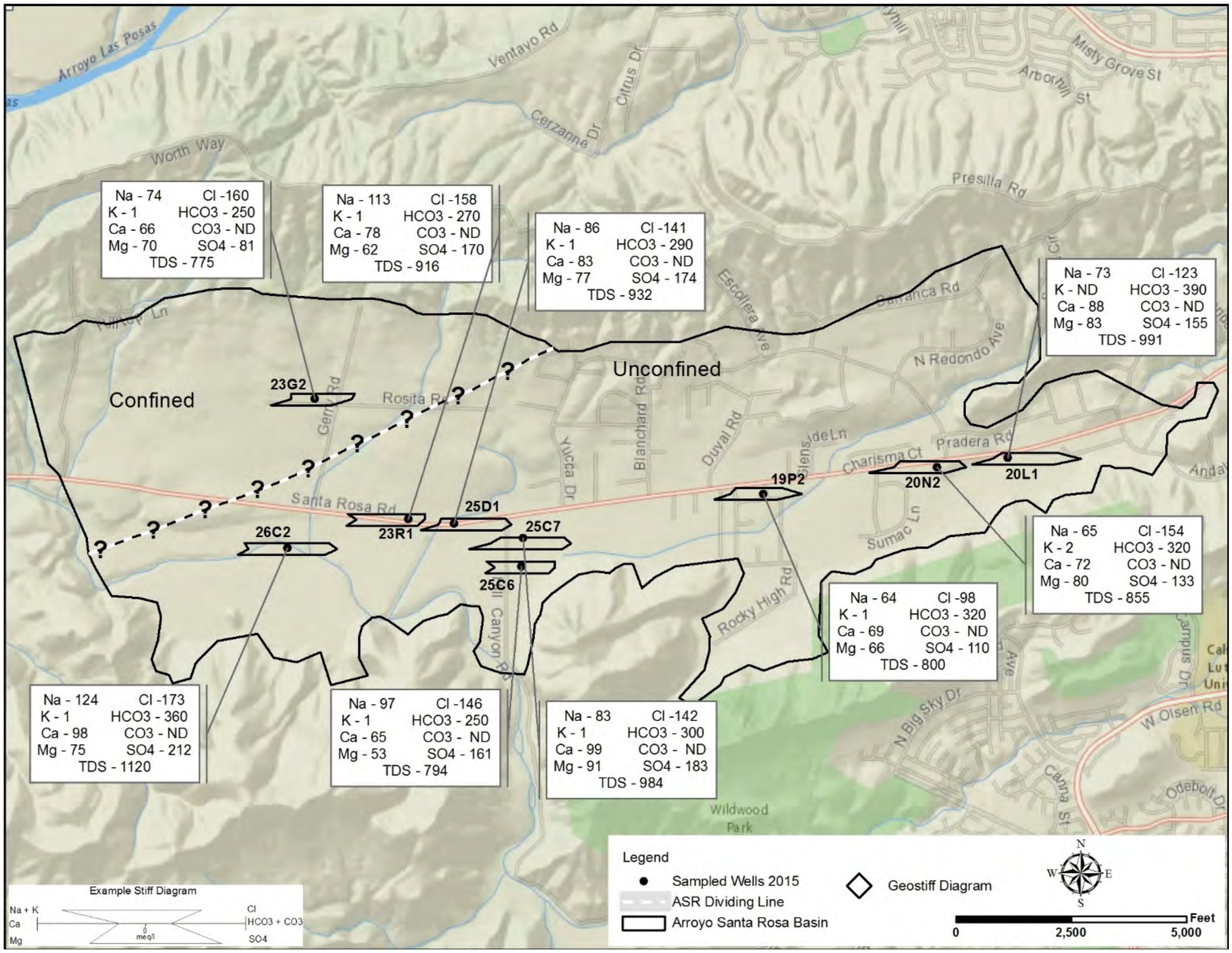


Figure 3-25: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-26 shows the geographic distribution of the wells sampled, with graduated symbols representing nitrate concentration for 2015. Figure 3-27 shows nitrate results for 2006 through 2015 in the same manner. The Groundwater Section has used three or more wells with nitrate concentrations above the state primary 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 many years. Management practices now in place include limiting the number of large animals and generally restricting septic systems to lots greater than 2.875 acres. It is not clear that the management practices are having the desired effect of reducing nitrate but no groundwater samples collected this year had nitrate (NO_3^-) concentration above 108 mg/l and in previous years some wells have been as high as 292 mg/l.

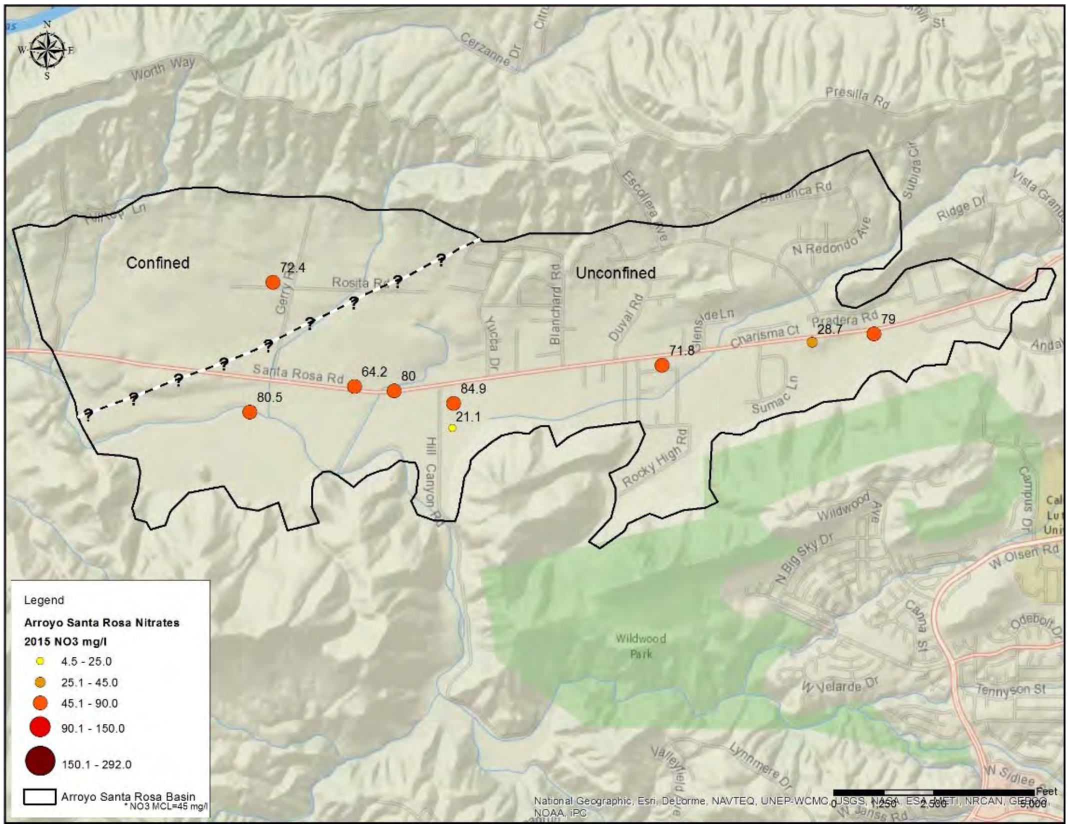


Figure 3-26: Map showing Nitrate results in mg/l for the year 2015.

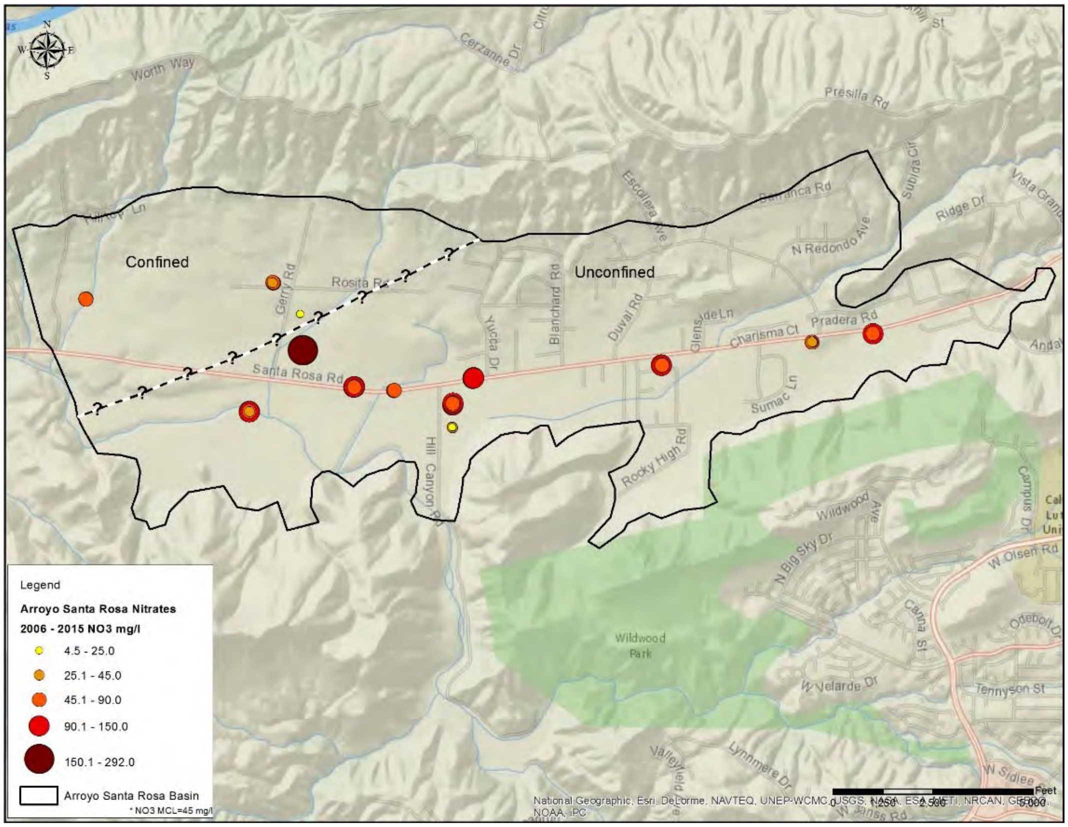
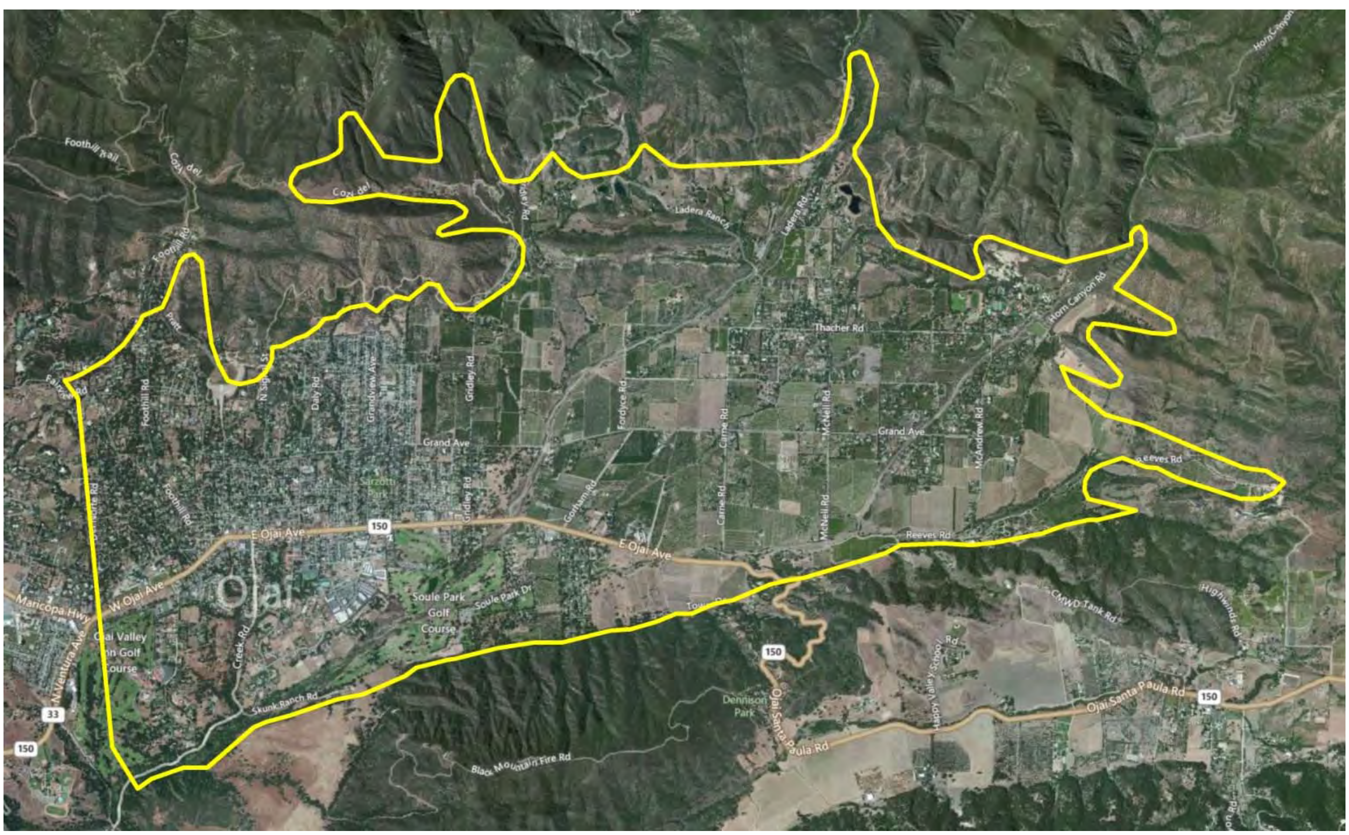


Figure 3-27: Map showing nitrate results for 2006 to 2015.

3.2.17 - Ojai Valley Basin

The aquifer system of the Ojai Valley Basin is considered unconfined except in the western end of the basin where a semi-confining to confining clay layer is present. The Ojai Valley Basin water quality is considered good. There are approximately 341 water supply wells in the Ojai Valley Basin; 191 are active wells. Depth to water bearing material is generally between 25 to 30 feet below ground surface. Figure E-36, piper diagram, shows high variation in water quality of the wells sampled this year. Calcium is the dominant cation group for eleven of the samples; sodium is the dominant cation group for one sample and the remaining three samples have no dominant cation. Sulfate (SO_4^{2-}) is the dominant anion for four samples; bicarbonate is the dominant anion for five of the samples, chloride (Cl^-) is the dominant anion for one sample and there is no dominant anion for the remaining five samples but they plot close to the bicarbonate anion type. Four samples are calcium bicarbonate type; one sample is sodium bicarbonate type; the remaining samples are calcium sulfate type.

Fourteen of the fifteen wells sampled have TDS concentrations above the secondary MCL for drinking water. TDS ranges from 421 to 1520 mg/l. Two wells have iron (Fe), four wells have manganese (Mn), one well has sulfate (SO_4^{2-}), one has chloride (Cl^-) and one has nitrate (NO_3^{2-}) concentrations above the secondary MCL for drinking water. Water samples from three wells were analyzed for Title 22 metals. One well has lead (Pb) above the primary MCL for drinking water. None of the remaining Title 22 metals were above the primary MCL for drinking water. Figure 3-28 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Ojai Valley basin.



Aerial photo showing the extent of the Ojai Valley groundwater basin.

OJAI VALLEY BASIN

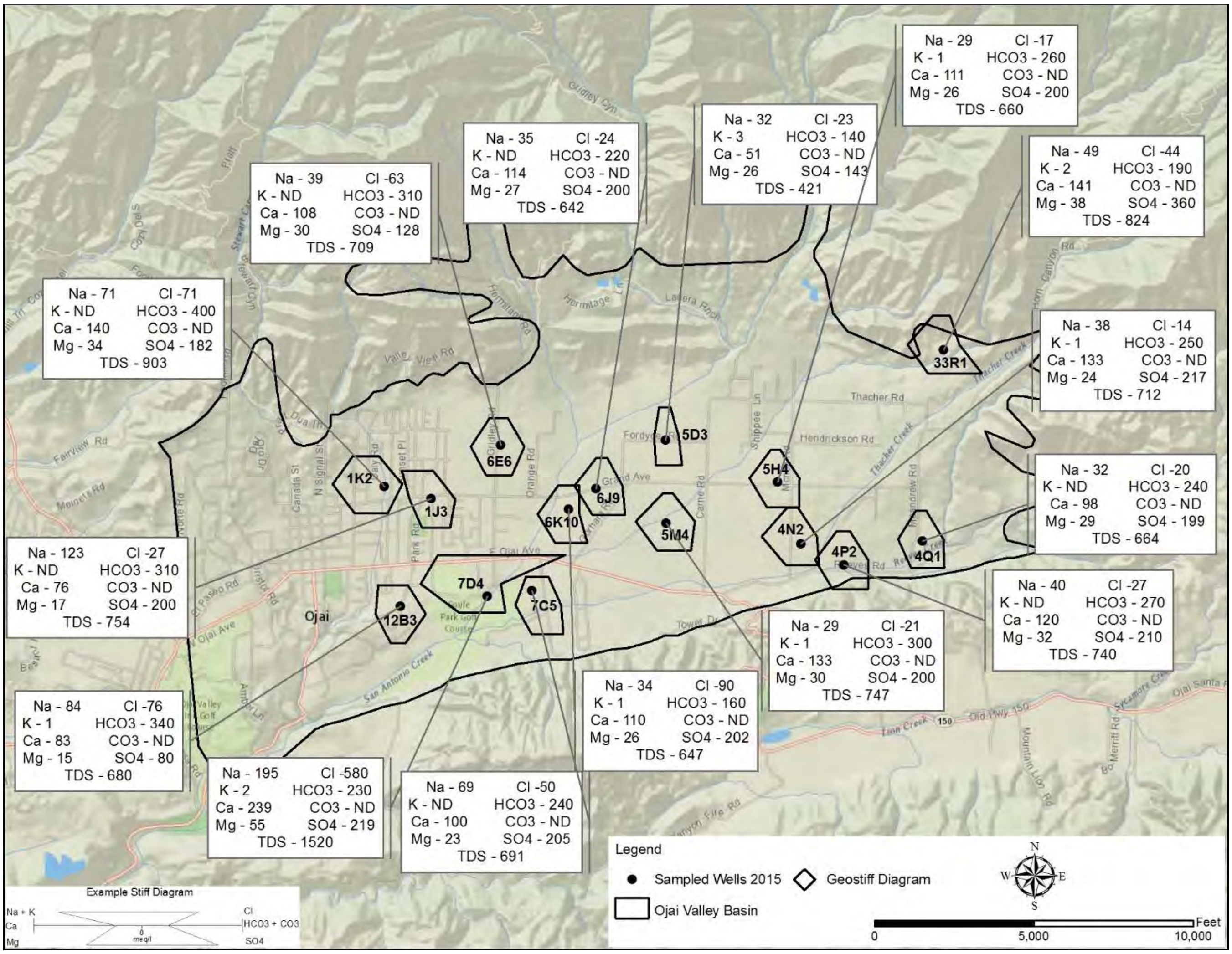
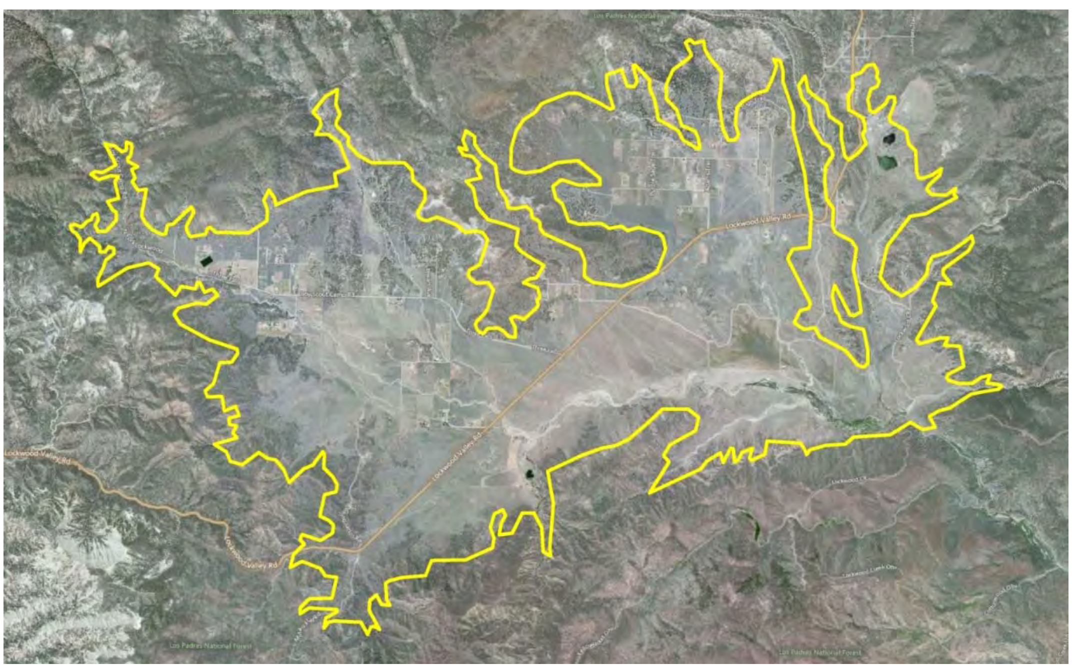


Figure 3-28: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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. Depth to water bearing material is approximately 55 to 60 feet. There are approximately 260 water supply wells in the Lockwood Valley Basin; 216 are active wells. Figure E-31, piper diagram, shows moderate variation in groundwater chemistry of the wells sampled this year. Calcium is the dominant cation and bicarbonate is the dominant anion. The two samples are calcium bicarbonate type. Two wells were sampled this year and both have TDS concentrations above the secondary MCL for drinking water and five have sulfate (SO_4^{2-}) above the secondary MCL. Samples from all six wells were also analyzed for Title 22 metals and radionuclides. One has arsenic above the California MCL for Title 22 metals, but four are above the EPA standards for drinking water. None of the remaining Title 22 metals were above the primary MCL for drinking water.

The result for gross alpha on five of the samples was above 5 pCi/L; that level requires 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. The geologic source(s) of the radionuclides have not been investigated. Following the additional uranium testing, radionuclides were determined to be above the MCL for drinking water in only one of the samples. Figure 3-29 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Lockwood Valley basin.



Aerial photo showing the extent of the Lockwood Valley groundwater basin.

LOCKWOOD VALLEY BASIN

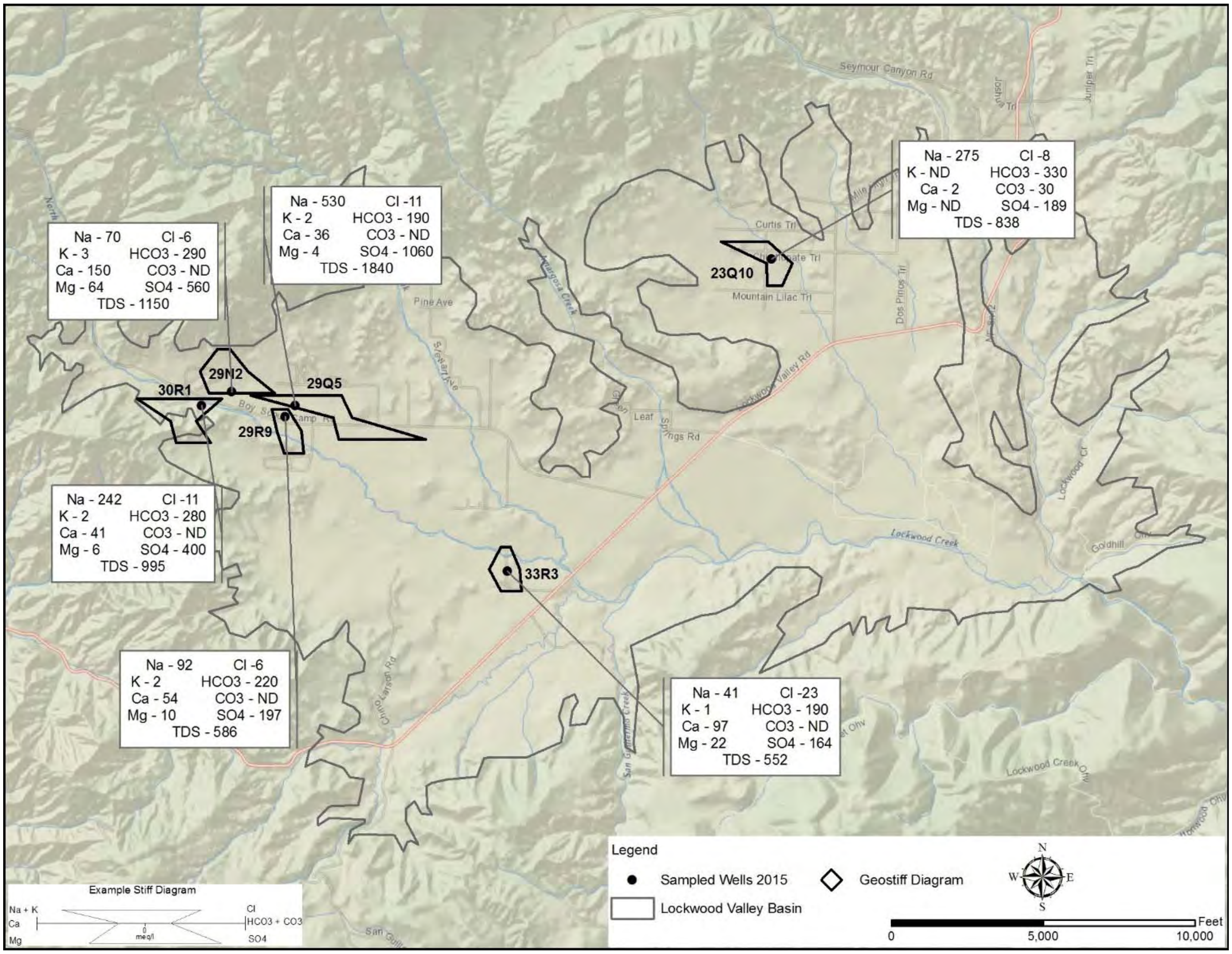


Figure 3-29: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.19 - Tierra Rejada Valley Basin

Depth to water bearing materials varies between 20 to 80 feet. There are approximately 51 water supply wells in the Tierra Rejada Valley Basin; 31 are active. Eight wells were sampled this year. Figure E-33, piper diagram, shows high variation in water quality. The dominant cation for two wells is magnesium (Mg^{2+}); the remainder have no dominant cation but plot close to the magnesium type. The dominant anion for two samples is bicarbonate; the remainder have no dominant anion. One well is calcium bicarbonate, type, one is magnesium bicarbonate type and the remaining six are calcium sulfate type. All eight wells have concentrations above the secondary MCL for TDS; ranging from 503 to 1000 mg/l. One well is above the MCL for iron, one above the MCL for manganese and nitrate was above the MCL for drinking water in two samples this year. Samples from two wells were also analyzed for Title 22 metals. No Title 22 metal was above the primary MCL for drinking water. Figure E-34, piper diagram, shows a comparison of water chemistry between Tierra Rejada and Arroyo Santa Rosa Basins.

Chemistry in the two basins is similar but there is more variation in Tierra Rejada with slightly higher bicarbonate and sulfate. Figure 3-30 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Tierra Rejada basin.

Aerial photo showing the extent of the Tierra Rejada Valley groundwater basin.

TIERRA REJADA BASIN

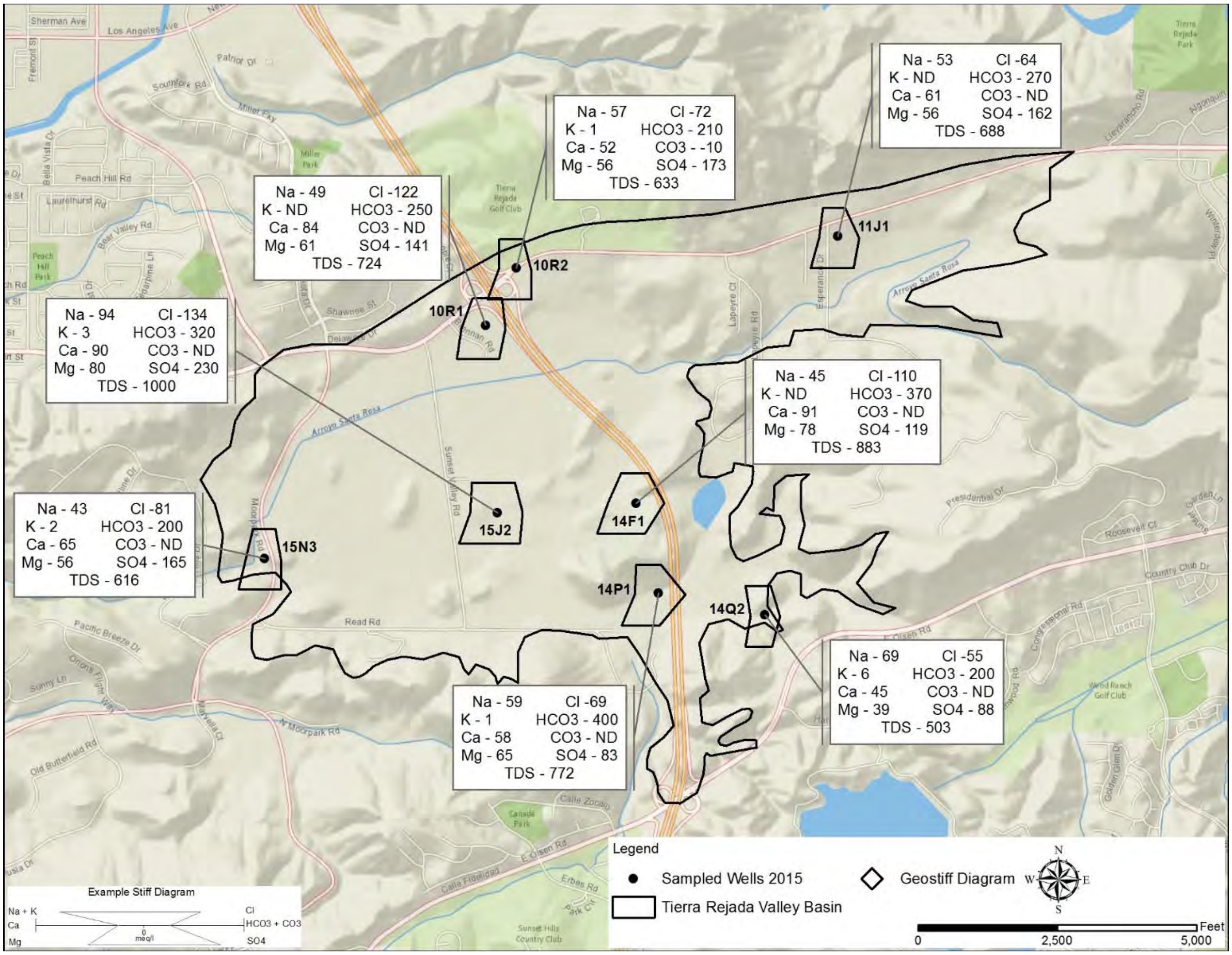


Figure 3-30: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-31 below shows nitrate concentrations for wells sampled in Tierra Rejada Basin in 2015. Groundwater from two of the wells sampled this year has a nitrate concentration that exceeds the primary MCL for drinking water. Other wells sampled in the past that had elevated nitrate concentrations were not available for sampling this year.

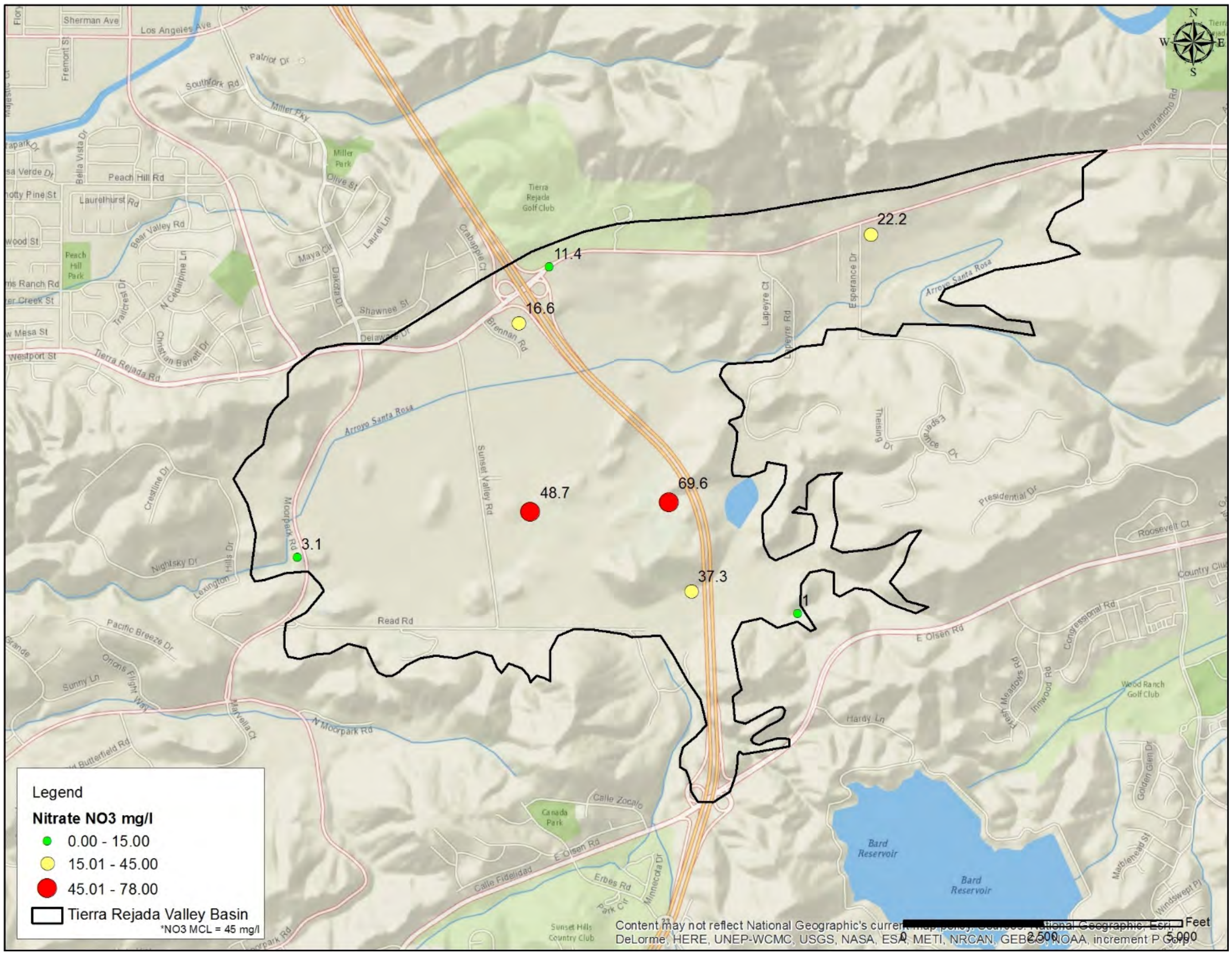
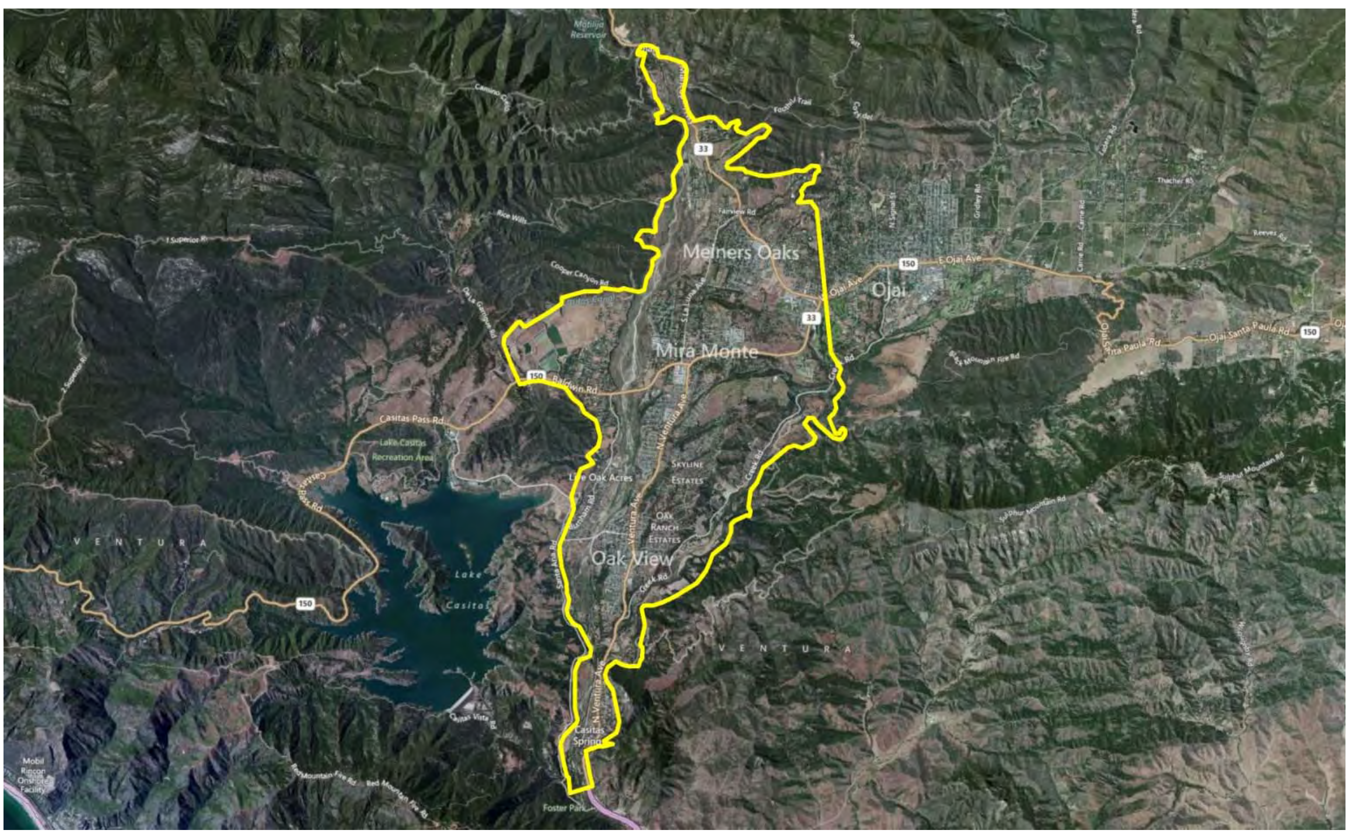


Figure 3-31: Map showing nitrate concentrations (mg/l). Two of the eight wells sampled this year have a nitrate concentration above the MCL for drinking water.

3.2.20 - Upper Ventura River Basin

The Upper Ventura River Basin is mainly composed of thin alluvial deposits. There are approximately 293 water supply wells in the Upper Ventura River Basin; 164 are active wells. Figure E-25, piper diagram, shows moderate variation in water quality. The dominant cation for one well is calcium and the dominant cation for one well is sodium type. There is no dominant anion for either well. One well is sodium sulfate type and one well is calcium sulfate type. Both samples have TDS concentrations that exceed the secondary MCL for drinking water; ranging from 548 to 815 mg/l. One well has manganese (Mn^{+}) above the secondary MCL for drinking water. A sample from one well was also analyzed for Title 22 metals. Lead (Pb) was above the primary MCL for drinking water but no other Title 22 metal was above the MCL. Figure E-26, piper diagram, shows a comparison of the water chemistry for the Upper and Lower Ventura River Basins. Water chemistry type is similar except the Upper Ventura River basin has a higher calcium concentration and lower sulfate. Figure 3-32 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Upper Ventura River basin.



Aerial photo showing the extent of the Upper Ventura River groundwater basin.

UPPER VENTURA RIVER BASIN

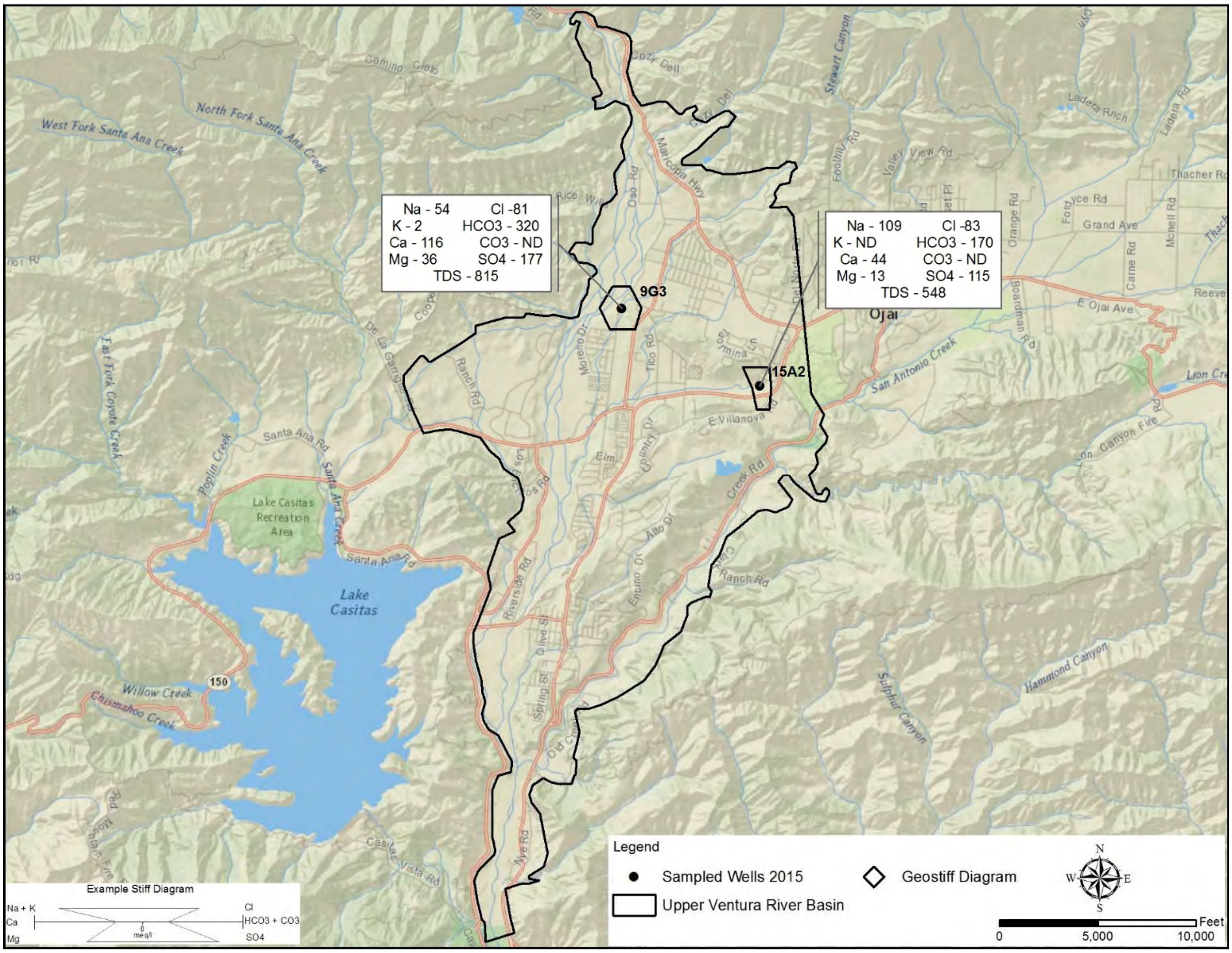
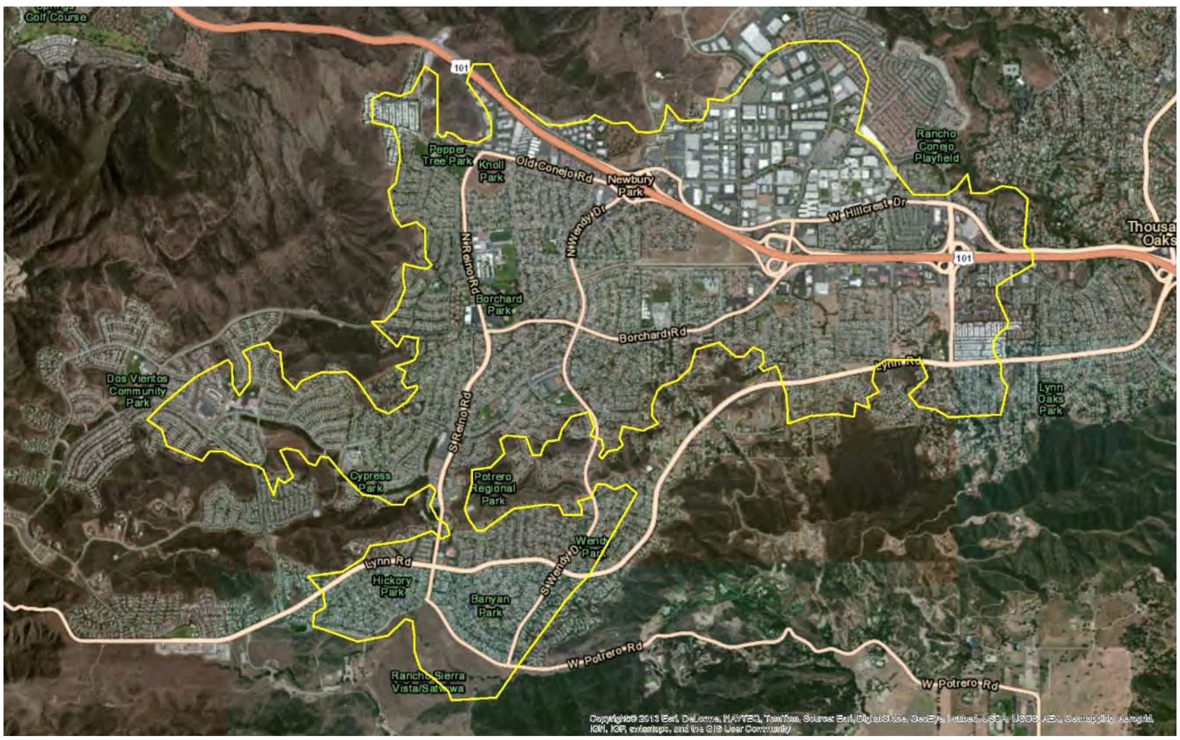


Figure 3-32: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.21 – Conejo Valley Basin

The Conejo Valley Basin has very few active water wells available for sampling. The depth to groundwater averages about 50 feet. There are approximately 167 wells in the Conejo Valley Basin; 11 are active water supply wells. One well located at the northwest corner of the basin was sampled this year. Figure E-38, piper diagram, shows water quality of the well sampled this year. Magnesium is the dominant cation; there is no dominant anion. The water is magnesium bicarbonate type. TDS concentration is above the secondary MCL for drinking water. The sample was analyzed for Title 22 metals. Lead was above the MCL but no other Title 22 metal was above the MCL for drinking water.

Figure 3-33 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Upper Ventura River basin.



Aerial photo showing the extent of the Conejo Valley groundwater basin.

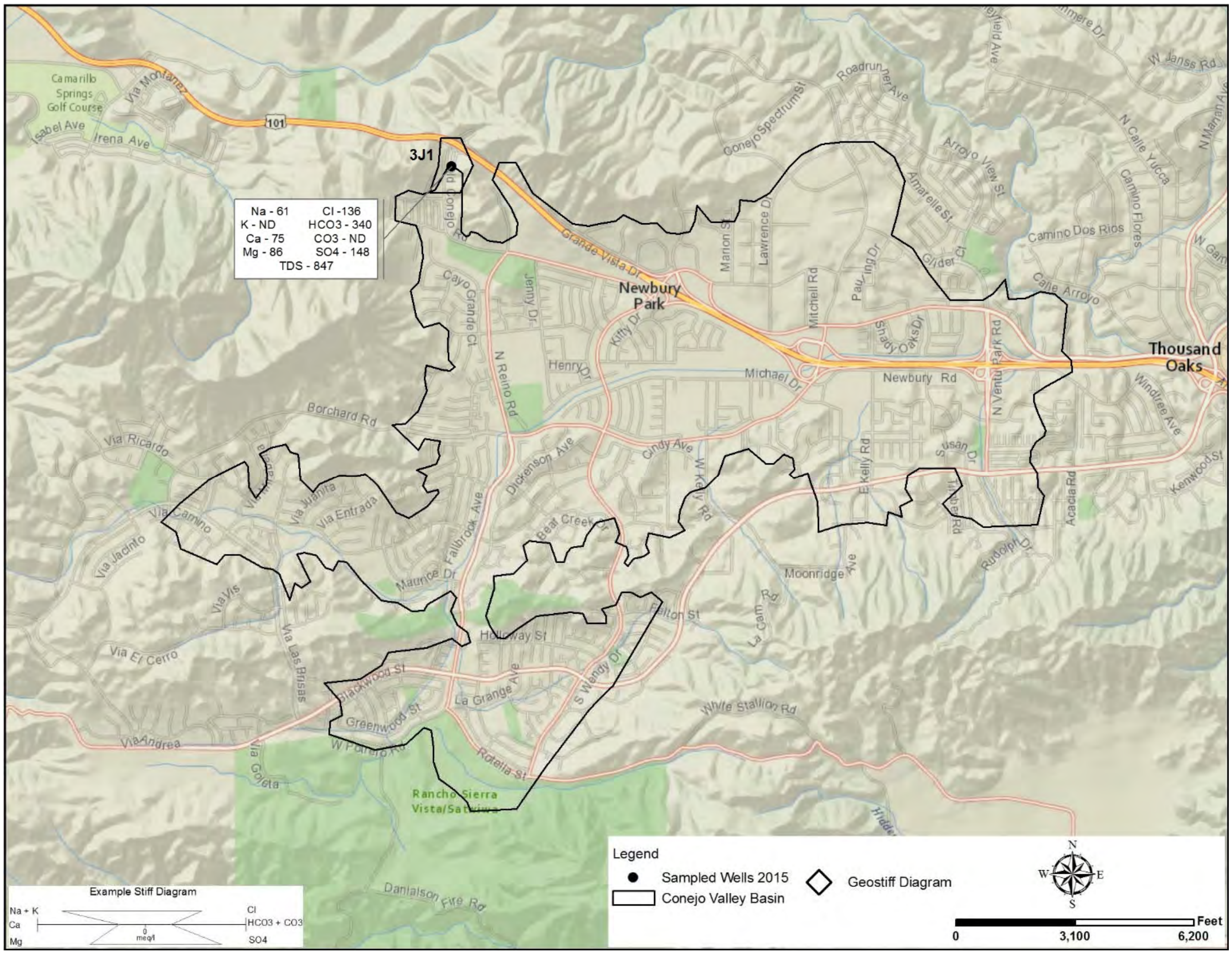


Figure 3-33: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.22 - North Coast Basin

The North Coast Basin does not fit the definition of a basin based solely on the Glossary of Geology definition that defines a basin as 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 26 water supply wells in the North Coast Basin; only 8 are active wells with the majority in the northwest portion along Rincon Creek. Water samples were collected from two wells at the northwest end of the basin. Figure E-39, piper diagram, shows moderate variation in the water quality of the wells sampled this year. There is no dominant cation and no dominant anion. The water in both wells is calcium sulfate type. Both samples have TDS above the secondary MCL, and one sample has sulfate (SO_4^{2-}) concentration above the secondary MCL. Figure 3-34 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the North Coast basin.

Aerial photo showing the extent of the North Coast groundwater basin.

NORTH COAST BASIN

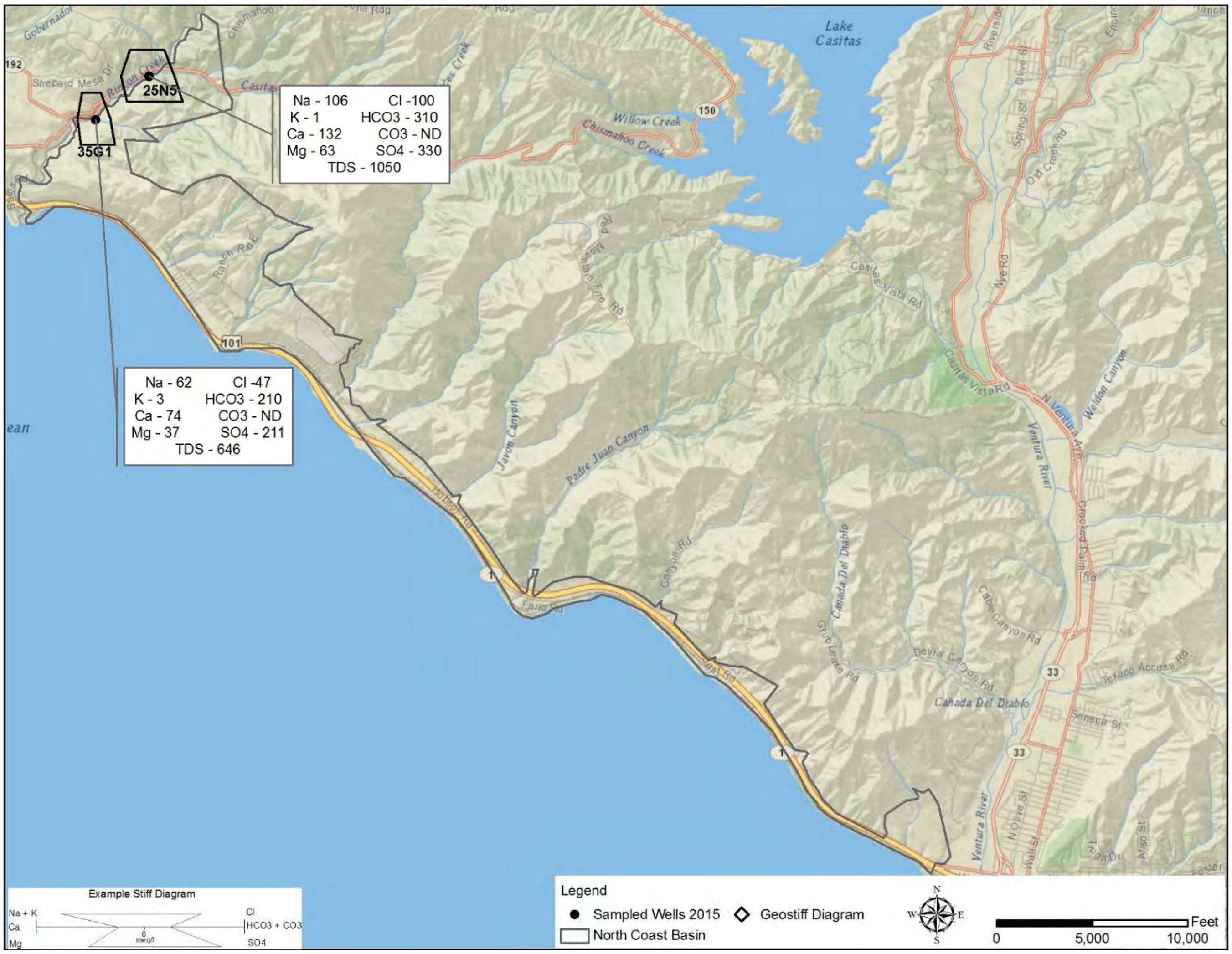
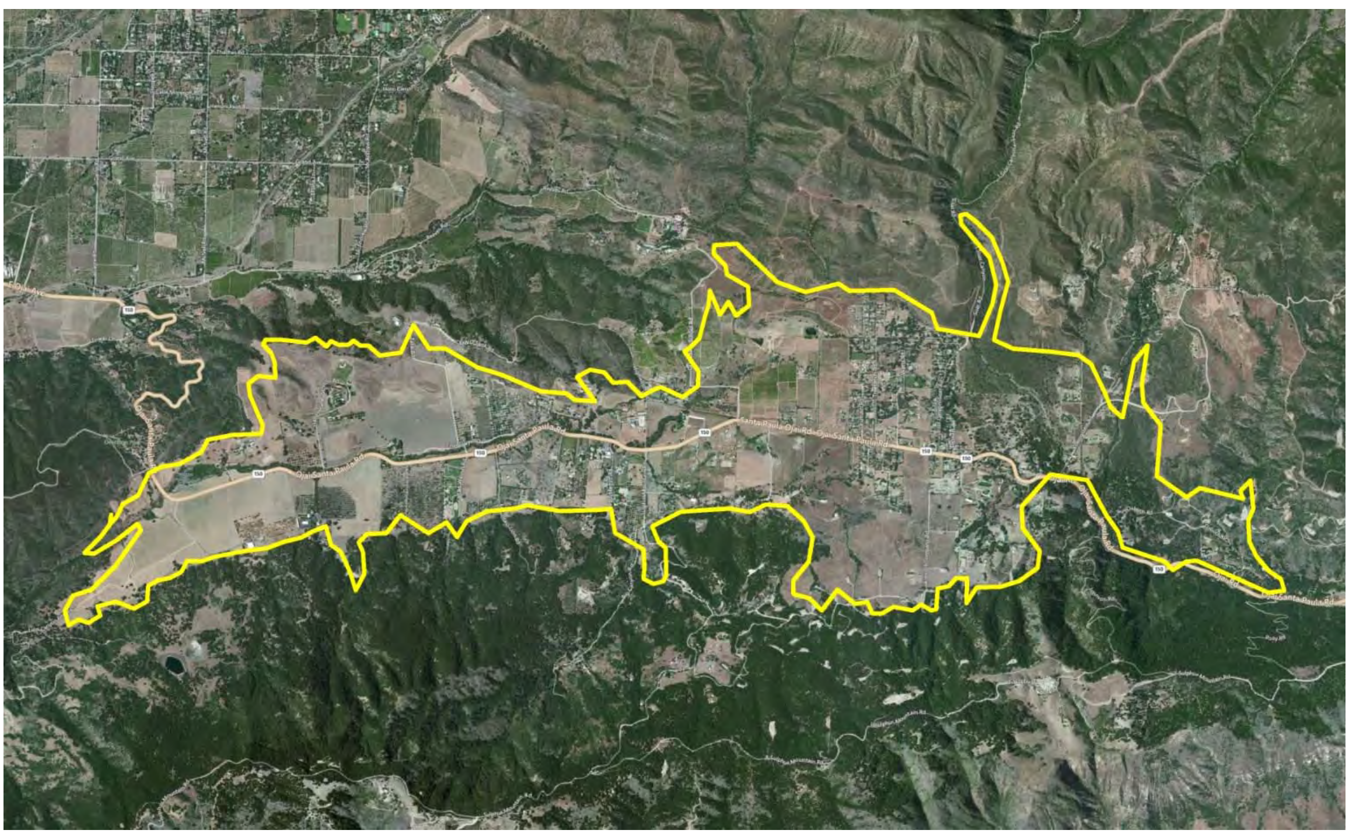


Figure 3-34: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.23 - Upper Ojai Basin

The Upper Ojai Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. The average thickness of water bearing deposits is approximately 60 feet and is encountered approximately 45 to 60 feet below ground surface. Groundwater quality is considered good, but varies seasonally and usually has better quality during winter months. There are approximately 149 water supply wells in the Upper Ojai Basin; 106 are active wells. Three wells were sampled this year. Figure E-35, piper diagram, shows high variation in the water quality of the wells sampled this year. Calcium is the dominant cation in one sample and there is no dominant cation in the remaining two samples but they plot close to the calcium cation type. Bicarbonate is the dominant anion in two samples, and sulfate is the dominant anion in the remaining sample. The water is calcium sulfate type in one sample and calcium bicarbonate type in the other two samples. TDS for the wells sampled this year ranged from 341 to 595 mg/l and is above the secondary MCL for drinking water in one of the wells. One well has iron (Fe) above the MCL for drinking water and two have manganese (Mn^{+}) concentrations above the MCL for drinking water. No water sample was analyzed for Title 22 metals. Figure 3-35 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled.



Aerial photo showing the extent of the Upper Ojai groundwater basin.

UPPER OJAI BASIN

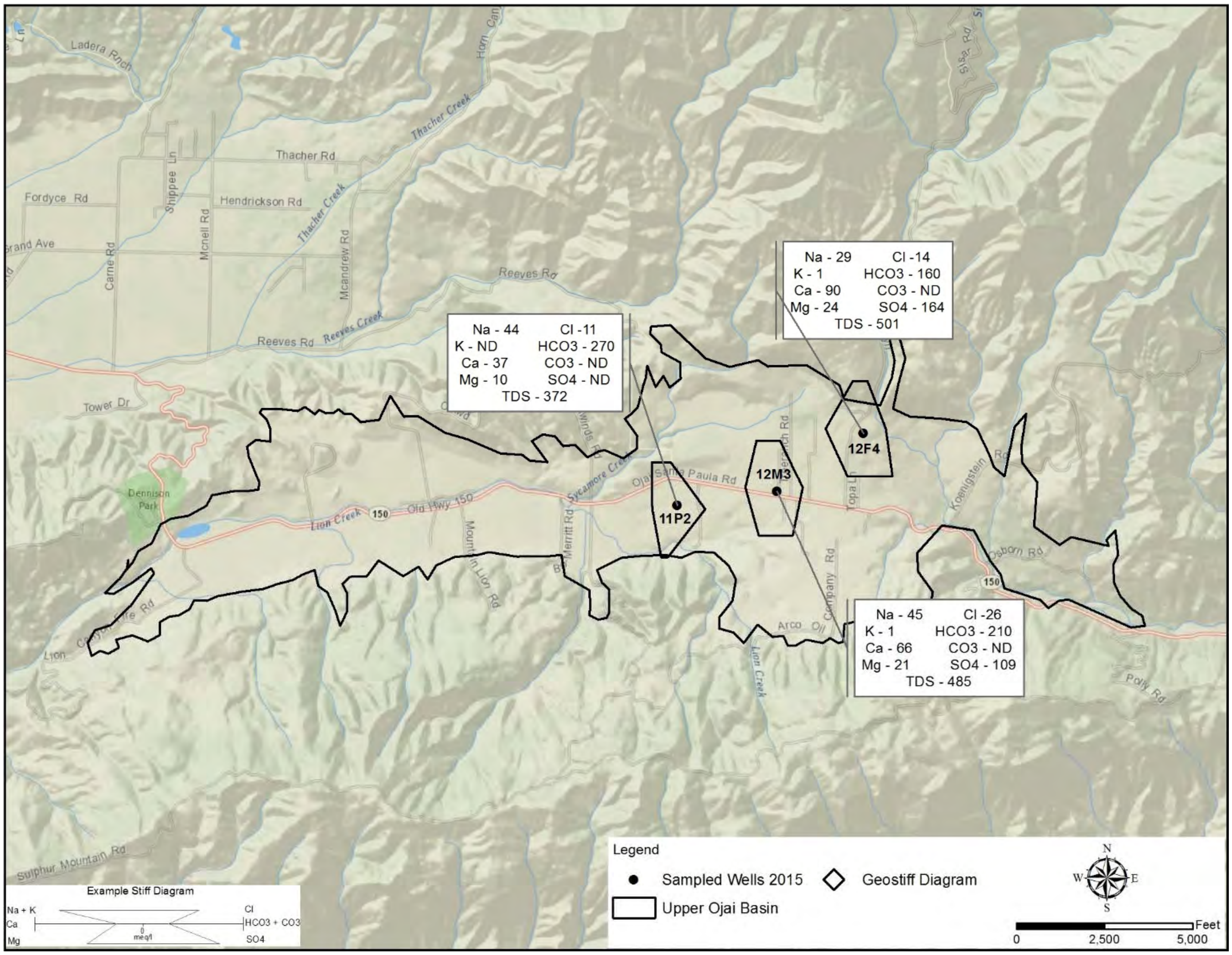
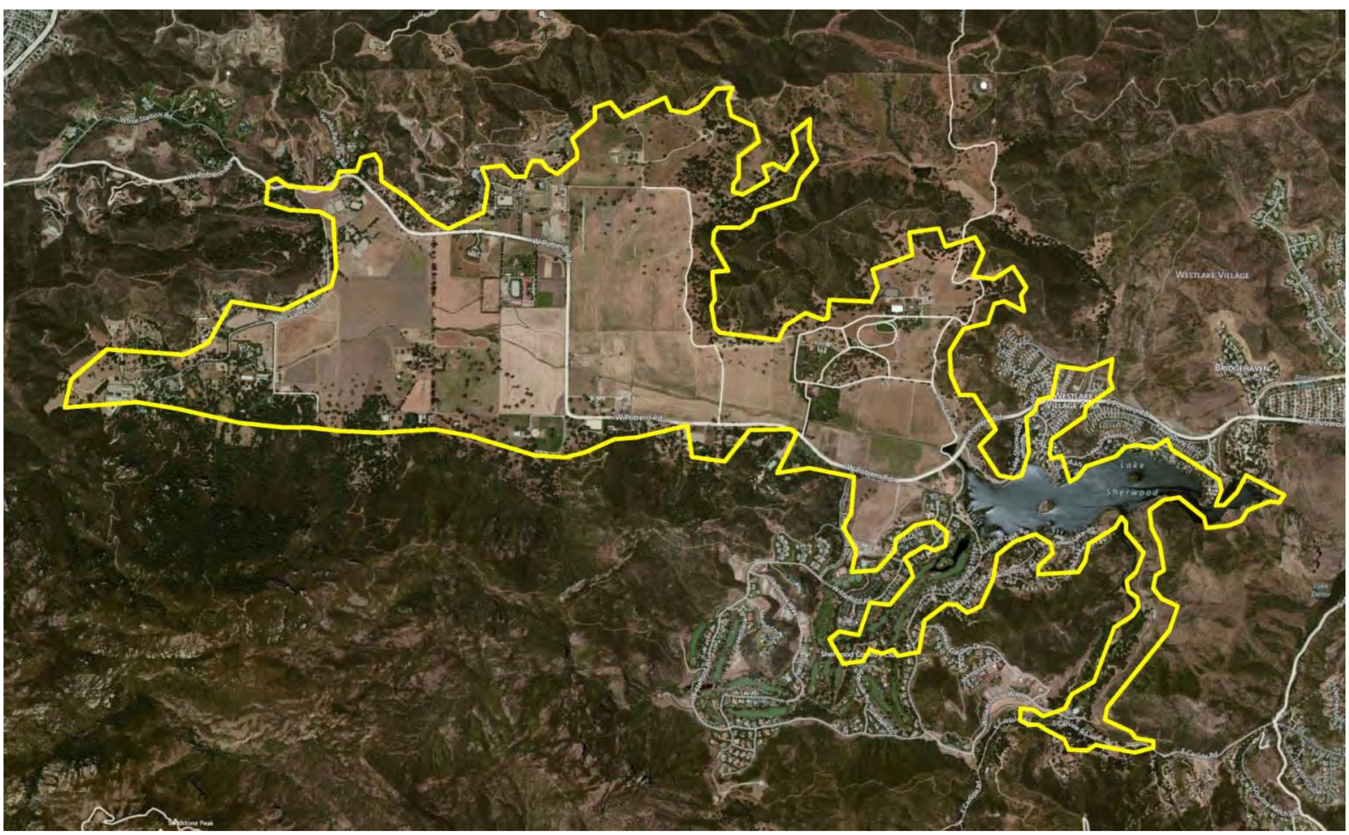


Figure 3-35: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.24 - Sherwood Basin

The Sherwood Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply throughout the basin because much of the water is stored in fractures. The water quality varies because of the heterogeneous nature of the aquifer. There are approximately 156 water supply wells in the Sherwood Basin; 100 are active. Four wells were sampled and analyzed this year. Figure E-40, piper diagram, shows moderate variation in the water quality of the wells sampled this year. Calcium is the dominant cation in two samples; sodium potassium group in one sample and there is no dominant cation in the remaining sample. Bicarbonate is the dominant anion in two samples, and two samples have no dominant anion. The water is calcium sulfate type in two samples, calcium bicarbonate type in one sample, and sodium bicarbonate in the remaining sample.

Iron (Fe) is above the secondary MCL in two wells; manganese (Mn^+) and sulfate (SO_4^{2-}) are above the secondary MCL in one well; and TDS is above the secondary MCL in three wells. TDS concentrations range from 374 to 1060 mg/l for wells sampled this season. Water samples from two wells were analyzed for Title 22 metals. Lead concentration in one well was above the primary MCL for drinking water. No other Title 22 metal was above the primary MCL for drinking water. Figure 3-36 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Sherwood basin.



Aerial photo showing the extent of the Lake Sherwood groundwater basin.

SHERWOOD BASIN

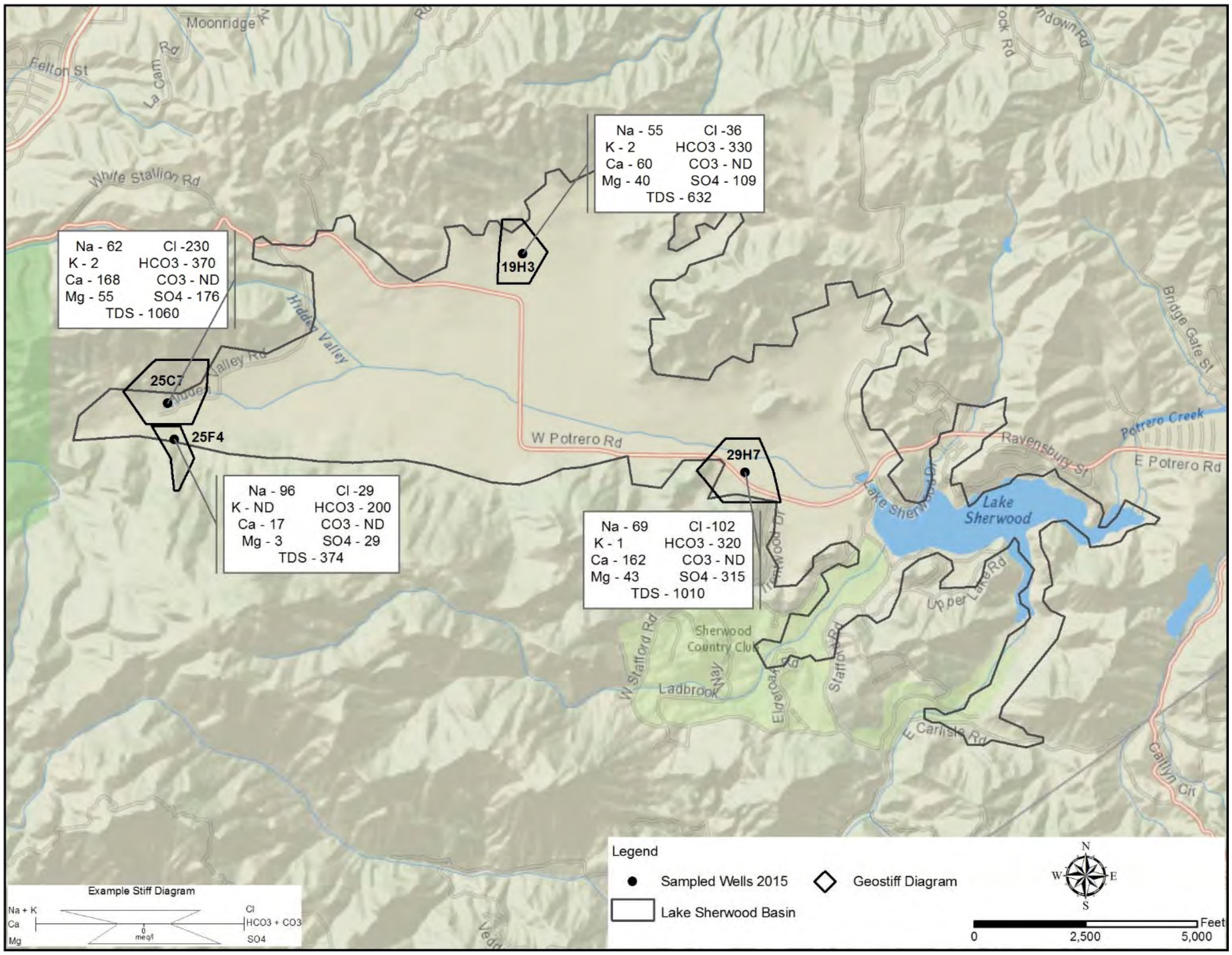
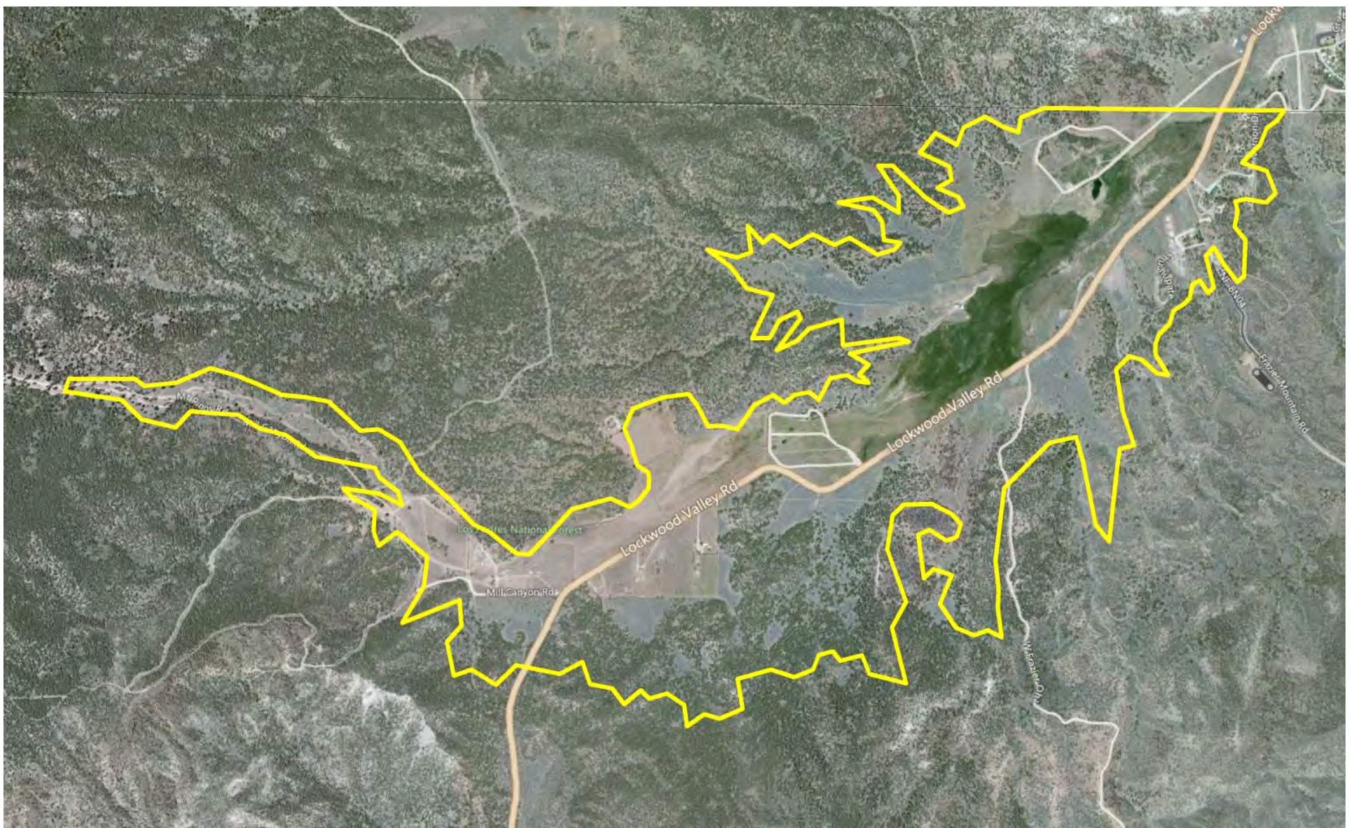


Figure 3-36: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.25 - Little Cuddy Valley Basin

The Little Cuddy Valley Basin is located in the northeastern part of Ventura County near the Kern County Line. Groundwater bearing layers consist of permeable sediment lenses in the Quaternary and Tertiary rocks and Holocene shallow alluvium with the syncline that makes up the valley floor. Depth to water bearing material is approximately 20 to 30 feet. Historically groundwater quality has been considered very good. There are approximately 29 water supply wells in the Little Cuddy Valley Basin; 27 are active wells. One well was sampled in the basin this year. Figure E-41, piper diagram, shows the water quality of the well sampled this year. Calcium is the dominant cation and bicarbonate is the dominant anion in the sample. The water is calcium bicarbonate type. No chemical constituent is above the MCL for drinking water. The sample was analyzed for Title 22 metals and gross alpha. Lead is above the MCL for drinking water. No other Title 22 metal or radionuclide was above the MCL for drinking water. Figure 3-37 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the well sampled in the Little Cuddy Valley basin.



Aerial photo showing the extent of the Little Cuddy Valley groundwater basin.

LITTLE CUDDY VALLEY BASIN

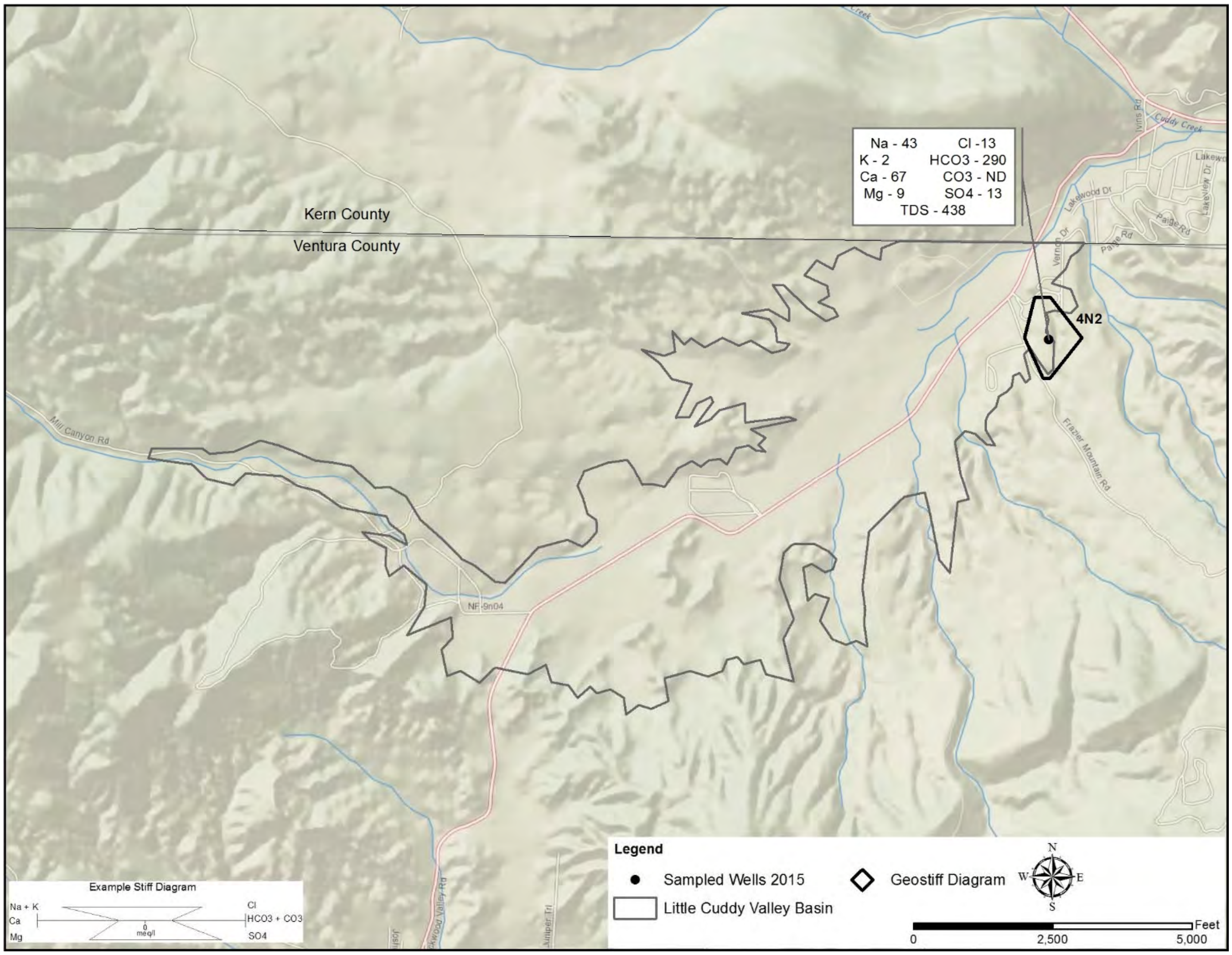


Figure 3-37: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

Section 4.0
Water Quantity

4.1 – Groundwater

The Groundwater Section collects groundwater elevation data in order to determine the general groundwater elevations and to determine if water in storage is increasing or decreasing. We also collaborate and share groundwater elevation data with other data collecting organizations in the County. The data is also used in certain basins to generate generalized potentiometric surface maps to determine the direction of groundwater movement. This groundwater elevation monitoring program is very important as there is no other systematic county wide groundwater elevation monitoring program in place. Without the data, groundwater elevations may not be known. Collected data is publically available and is also used by stakeholders, consultants, and other professionals.

In 2015, Groundwater staff gauged approximately 200 wells throughout the County. The County's standard well gauging procedures include:

- Contacting well owners to get approval to gauge wells,
- Verifying well pumps are off for at least 24 hours prior to gauging,
- Using a measuring device to obtain groundwater elevation data,
- Recording field data on a log sheet and any data qualifiers, and
- Entering water quality data in the database.

The County does not own or operate any of the wells gauged, except with very limited exceptions, and relies on well owner permission to access wells. The gauged wells include abandoned wells that are not in operation, and active wells that were off for at least 24 hours prior to water level gauging. The County strives to gauge many of the same wells each year, but because the County does not own the wells, it is not always able to control the wells availability for gauging. For example, wells may not be available due to temporary inaccessibility, pumping, or the well may have been destroyed. When a preferred well cannot be gauged, County staff will seek to find an alternative well to gauge. The process is flexible, but also limited because gauging the same well year after year is not always possible.

The following sub-sections describe the Groundwater Section's annual groundwater level monitoring program, involvement in the California Statewide Groundwater Elevation Monitoring (CASGEM) program, as well as, a general overview of water use in the County for 2015.

4.1.1 – CASGEM Program

The CASGEM Program was developed by the Department of Water Resources (DWR) in response to the passing of Senate Bill Number 6 in November 2009. The law directs that groundwater elevations in all basins and subbasins in California be regularly and systematically monitored, preferably by local entities, with the goal of demonstrating seasonal and long-term trends in groundwater elevations. DWR is directed to make the resulting information readily and widely available. The CASGEM program established a permanent, locally-managed system to monitor groundwater elevation in California's alluvial groundwater basins and subbasins identified in DWR Bulletin No. 118. The CASGEM program relies and builds on the many, established local long-term groundwater monitoring and management programs.

The Ventura County Watershed Protection District (VCWPD) acts as the Umbrella Monitoring Entity for Ventura County. The Groundwater Section staff collect water level data quarterly or semi-annually. The County compiles data it collects along with water level measurements taken by other agencies and uploads it to the CASGEM website a minimum of two times per year.

4.1.2 – 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, by Groundwater Staff, quarterly in approximately 200 wells throughout the County. In the southern half of the County, water levels are 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 representative 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.

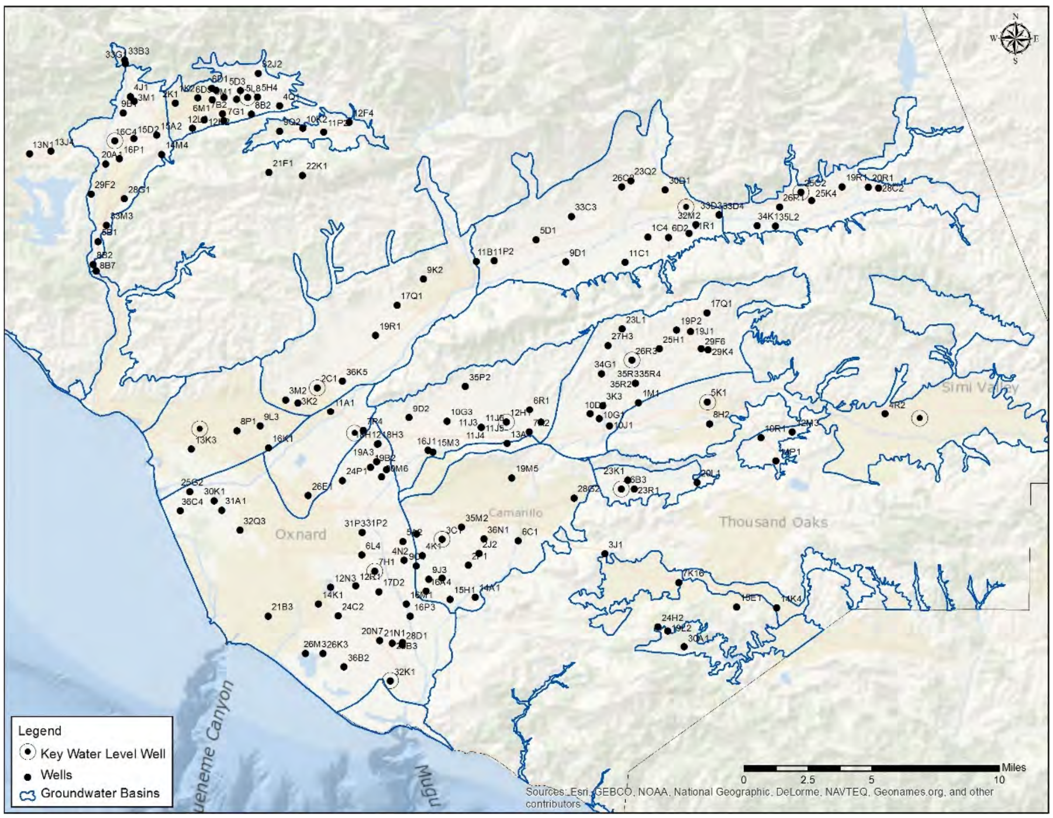


Figure 4-1: Water level wells measured in the southern half of the County.

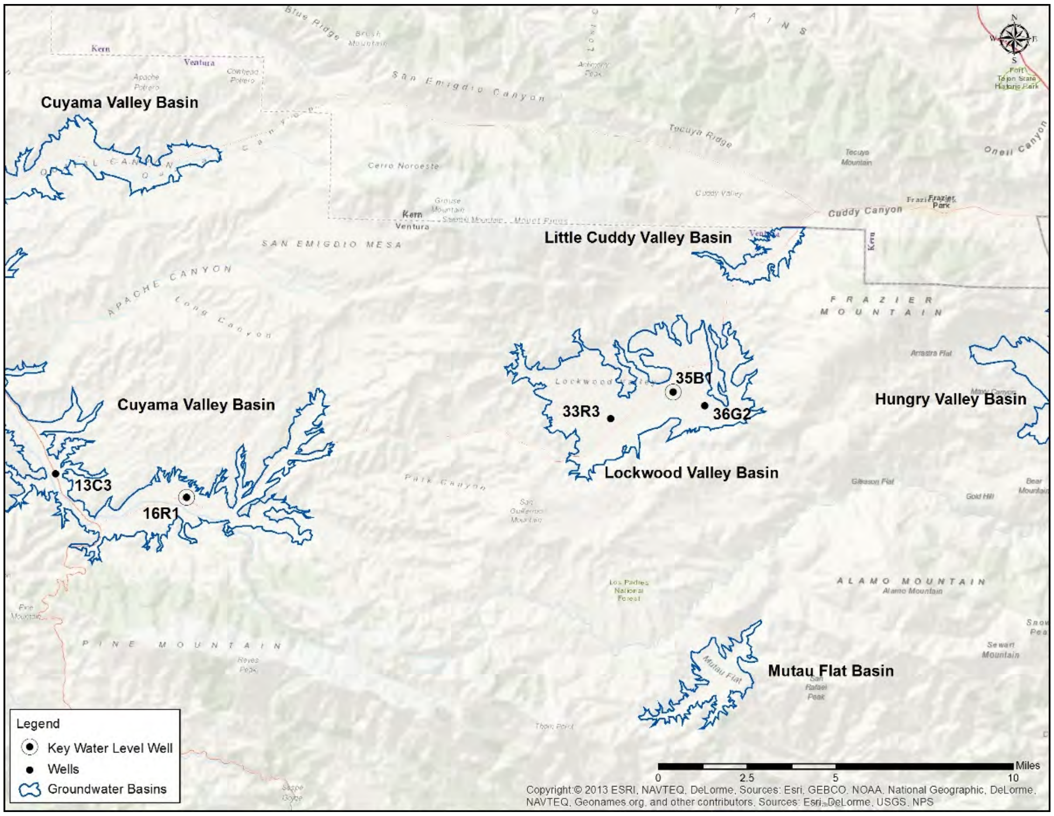


Figure 4-2: Water level wells measured in the northern half of the County.

4.1.3 – Water Level Hydrographs

The Groundwater Section maintains a database of groundwater elevations from gauged wells throughout the County. The database produces hydrographs for wells displaying groundwater elevations over time, in some cases over decades. This data along with climate, stream flow, groundwater recharge, groundwater quality and pumping data can be used to evaluate 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 in (Figure 4-3).

Key wells are special wells the County gauges year after year to provide the most consistent data set. The Key wells were established by the County decades ago as monitoring points considered to represent groundwater elevations over a broad area of the groundwater basin.

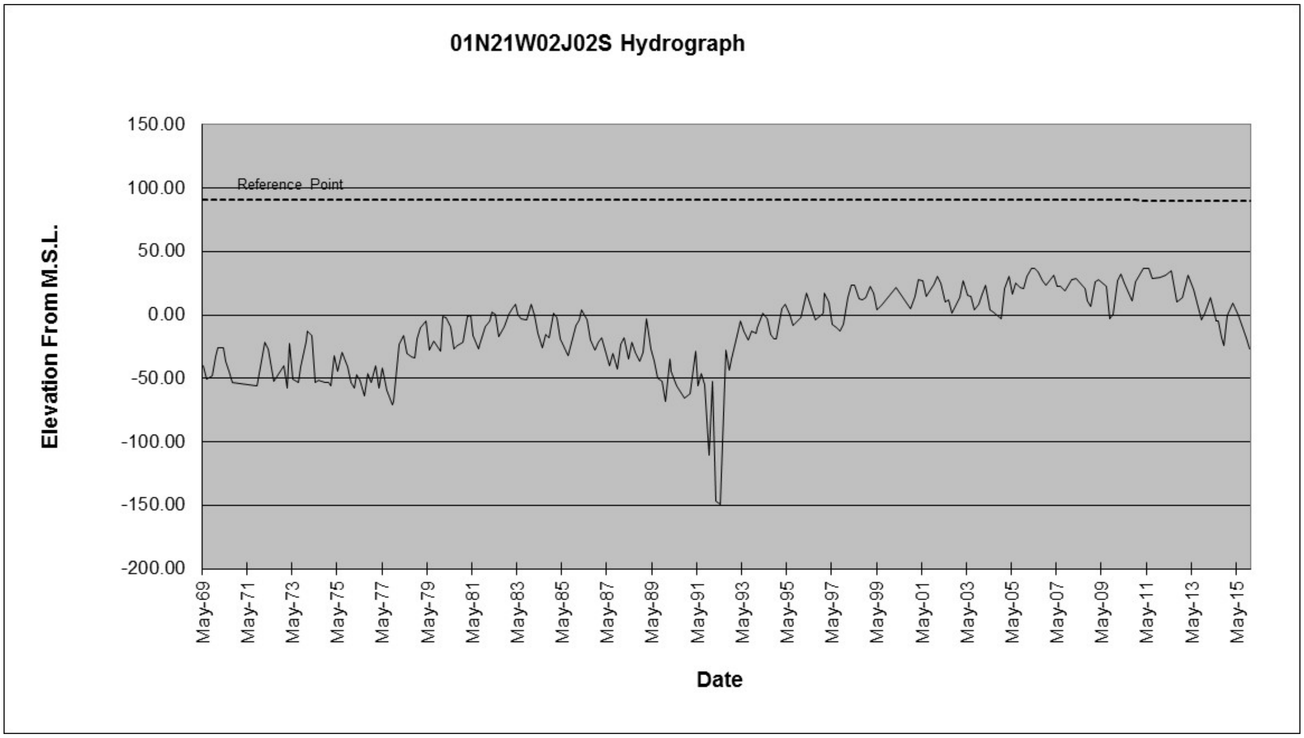


Figure 4-3: Water level hydrograph for Well No. 01N21W02J02S located in the Pleasant Valley basin. *reference point – the elevation of the measuring point of the well.

4.1.4 – 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 changes in water level and the water level data for the year, refer to the spring measurement (first measurement) of the year for those wells measured biannually. In general, groundwater levels in Ventura County show a downward trend due to exceptional drought conditions California is currently experiencing, and with increased reliance on groundwater resources.

The Forebay area of the Oxnard Plain, responds quickly to seasonal and annual changes in precipitation and recharge. The Forebay area key Well No. 02N22W12R01S (UWCD) is dry, meaning the water level elevation is now below the bottom most portion of the well screen. The water level elevation in the Oxnard aquifer key Well No. 01N21W07H01S was down 12.7 feet from the previous spring. The water level elevation in the Oxnard Plain Fox Canyon aquifer key Well No. 01N21W32K01S was up 7.3 feet from the 2014 spring measurement.

In the Pleasant Valley Grimes Canyon aquifer the water level elevation in key Well No. 01N21W03C01S was down 8.8 feet from the 2014 measurement.

In the Las Posas valley, the East Las Posas basin key Well No. 03N20W26R03S water level elevation was up 10.2 feet from the 2014 measurement. The water levels in this well had been declining over the previous ten year period, with the exception 2007. The water level elevation in the South Las Posas key Well No. 02N19W05K01S continued its slight upward trend of the past several years rising 3.0 feet in 2015. The depth to water in this well has risen from 136 feet to as high as 27 feet below ground surface since 1975. This trend is attributed to groundwater recharge from treated effluent from upstream waste water treatment plant discharges and groundwater discharge to surface from the Simi Valley basin. The key well for the West Las Posas basin was not measured in 2015.

In the Santa Rosa Valley the water level elevation in key Well No. 02N20W26B03S was up 3.8 feet from the 2014 measurement. The water level elevation in the Simi Valley Basin key Well No. 02N18W10A02S was up 1.2 feet from the 2014 measurement. This well has seen only slight changes in depth over the past ten years (less than plus or minus 10 feet).

In the Ojai Valley, the water level elevation in key Well No. 04N22W05L08S was down 5.1 feet from the 2014 measurement after having been down 50.2 feet from the 2013 measurement. 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 up 13.1 feet from the measurement in 2014.

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 down 14.1 feet in 2015 from 2014. The water level elevation in the Fillmore basin key well was down 3.7 feet after being down 1.9 feet the previous spring, and in the Santa Paula basin the water level elevation in the key well was down 2.7 feet from the 2014 measurement. In the Mound basin the water level elevation in key Well No. 02N22W07M02S was down 6.7 feet from the 2014 spring measurement.

In the north half of the County the Lockwood Valley basin key Well No. 08N21W35B01S was unable to be measured in the spring of 2015. The water level elevation in the Cuyama Valley basin key Well No. 07N23W16R01S was down 7.0 feet from the 2014 measurement.

4.1.5 – Groundwater Extractions

Groundwater is extracted for domestic, municipal and industrial uses, with the majority of reported groundwater extractions in the Fox Canyon Groundwater Management Agency (FCGMA) 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 2 to 4 times 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. Table 4-1 compares extractions reported to the three agencies for the years 2005 to 2015. Note: the boundaries of the FCGMA and UWCD overlap.

Table 4-1: Groundwater extractions within reporting agencies 2005-2015[3,1,2]

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2005-1	58,045.00	42,133.62	1,748.07
2005-2	95,174.00	64,688.76	2,880.39
Annual Total 2005	**153,219.00**	**106,822.38**	**4,628.46**
2006-1	65,469.00	43,659.82	1,722.17
2006-2	101,684.00	70,011.27	2,234.77
Annual Total 2006	**167,153.00**	**113,671.09**	**3,956.94**
2007-1	90,701.00	59,711.06	2,708.68
2007-2	108,289.70	77,666.25	2,759.06
Annual Total 2007	**198,990.70**	**137,377.32**	**5,467.74**
2008-1	90,997.65	64,582.83	2,650.38
2008-2	102,106.68	75,655.54	2,590.30
Annual Total 2008	**193,104.33**	**140,238.36**	**5,240.68**
2009-1	82,505.37	63,066.07	2,553.48
2009-2	104,049.64	83,007.28	2,871.94
Annual Total 2009	**186,555.01**	**146,073.36**	**5,425.42**
2010-1	69,541.85	54,876.68	2,004.86
2010-2	89,558.90	71,518.05	3,001.11
Annual Total 2010	**159,100.75**	**126,394.73**	**5,005.97**
2011-1	72,940.07	54,357.81	2,050.00
2011-2	86,560.99	65,877.62	3,099.00
Annual Total 2011	**159,501.06**	**120,235.43**	**5,149.00**
2012-1*	78,716.61	59,904.02	2,845.56
2012-2*	99,285.26	75,327.91	2,559.40
Annual Total 2012	**178,001.87**	**135,231.94**	**5,404.96**
2013-1*	87,336.86	64,736.60	2,805.76
2013-2*	116,708.94	88,897.64	2663.216
Annual Total 2013	**204,045.80**	**153,634.24**	**5,468.97**
2014-1*	101,577.29	85,037.29	2,232.15
2014-2*	101,468.80	65,333.37	2,144.20
Annual Total 2014	**203,046.09**	**150,370.65**	**4,376.35**
2015-1**	85,905.46	70,829.16	1,815.92
2015-2**	105,269.83	70,532.78	1,826.66
Annual Total 2015* **	**191,175.29**	**141,361.94**	**3,642.58**

*Reflects revised values for all agencies.

**Values are subject to change. *FCGMA as of 04/04/2016, UWCD as 04/01/2016.*

***Preliminary - Values do not reflect full reporting.

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).

[1] Data courtesy of FCGMA.

[2] Data courtesy of OBGMA.

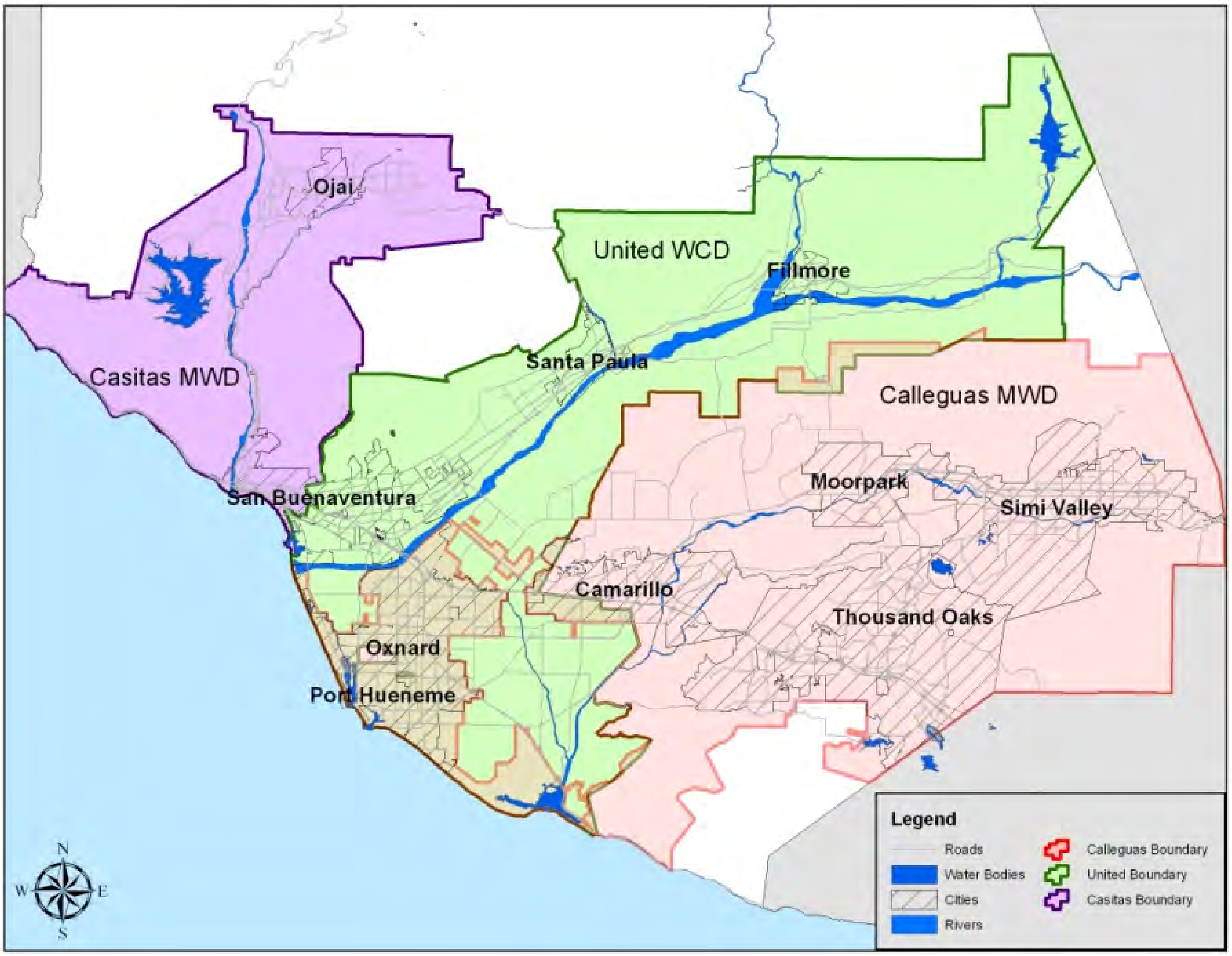


Figure 4-4: Map of the boundaries of the three wholesale water districts within the County.

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 any 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 surface water from Lake Casitas delivered by Casitas MWD. The City of Oxnard receives water from UWCD, imported water from Calleguas Municipal Water District 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 residents receive water from Ventura County Water Works District 8 (VCWWD8). The District 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 one well and blends it with imported water from Calleguas (10% groundwater, 90% imported water)[3]. VCWWD8 serves 68% of demand or approximately 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[4]. In 2015 Calleguas delivered 17,866[6] AF to VCWWD8 and 5,245.9[6] AF to GSWC.

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 2015 Calleguas delivered 7,704.85[6] AF to VCWWD1. 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 2015 these three water purveyors received 30,966.6[6] AF 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 2015 Calleguas delivered 4,550.43[6] AF 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)[5] and is sent to Canyon 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 groundwater basins, or from fractured volcanic rock and bedrock in areas outside of groundwater basins.

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[3] Golden State Water Company, 2010 Urban Water Management Plan – Simi Valley.

[4] Ventura County Waterworks District No. 8, City of Simi Valley, 2010 Urban Water Management Plan.

[5] Data from City of Santa Paula 2010 Urban Water Management Plan

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. The Calleguas Municipal Water District imported a total of 87,794.6[6] AF of treated SWP water in 2015. Calleguas delivered 89,044.6[6] AF of water to retailers in 2015 compared to 106,293[6] AF in 2014 and 111,283[6] AF in 2013. Production from the District's ASR wellfield was 4384.18 AF in 2015. Some imported water is also injected in the East Las Posas groundwater basin through the Las Posas Aquifer Storage and Recovery (ASR) Project. In the ASR wellfield 5,372.63[6] AF of water was injected in 2015. 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 9,360[6] AF. The Las Posas Basin ASR wellfield currently has 18 wells, operated by Calleguas. The wells are 800 to 1,200 feet deep and perforate the Fox Canyon Aquifer (Calleguas 2007).

UWCD delivered 16,293[4] AF of water to retailers and end-users in 2015 down from 17,492[4] AF in 2014. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2015 there was 11,534[4] AF of water in storage in Lake Piru. UWCD released 6,533[4] *(preliminary data)* AF of water from the lake in 2015. UWCD imported 630 AF of State Project water into Ventura County from Lake Pyramid in 2015. 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 compare the volume of water diverted and sent to spreading grounds by UWCD. Annual precipitation for the period of 1997 to 2015 is also shown, however recharge to basins is also a function of State Water Project deliveries and restrictions from other agencies.

Table 4-2: Comparison of precipitation versus recharge water volume by Calendar Year for UWCD[4].

CY Year	Precipitation El Rio Spreading Grounds Gage 239(in.)	Saticoy Recharge (AF)	El Rio Recharge (AF)	Noble Pit (AF)
1997	13.3	22,323.03	25,271.00	4,412.00
1998	30.88	56,934.95	43,027.00	18,710.00
1999	9.39	16,538.51	17,992.00	1,285.00
2000	15.59	28,620.11	23,173.00	0.00
2001	22.4	26,918.00	39,434.00	8,824.00
2002	8.97	5,291.00	14,886.00	32.00
2003	14.79	7,158.00	26,909.00	44.00
2004	16.13	8,105.00	15,061.00	0.00
2005	24.43	46,872.00	52,267.00	19,490.00
2006	15.29	29,005.00	40,840.00	10,709.00
2007	7.77	11,404.00	18,200.00	99.00
2008	14.07	28,631.00	19,631.00	8,562.00
2009	10.86	9,215.00	13,223.00	0.00
2010	22.07	15,108	30,125.00	995.00
2011	10.95	23,435.00	37,845.00	10,679.00
2012	8.79	3,985.00	16,293.00	538.00
2013	2.97	34.00	2,389.00	263
2014	9.5	387.00	1,935.00	578
2015	5.09	1,231.00	1,285.00	0.00

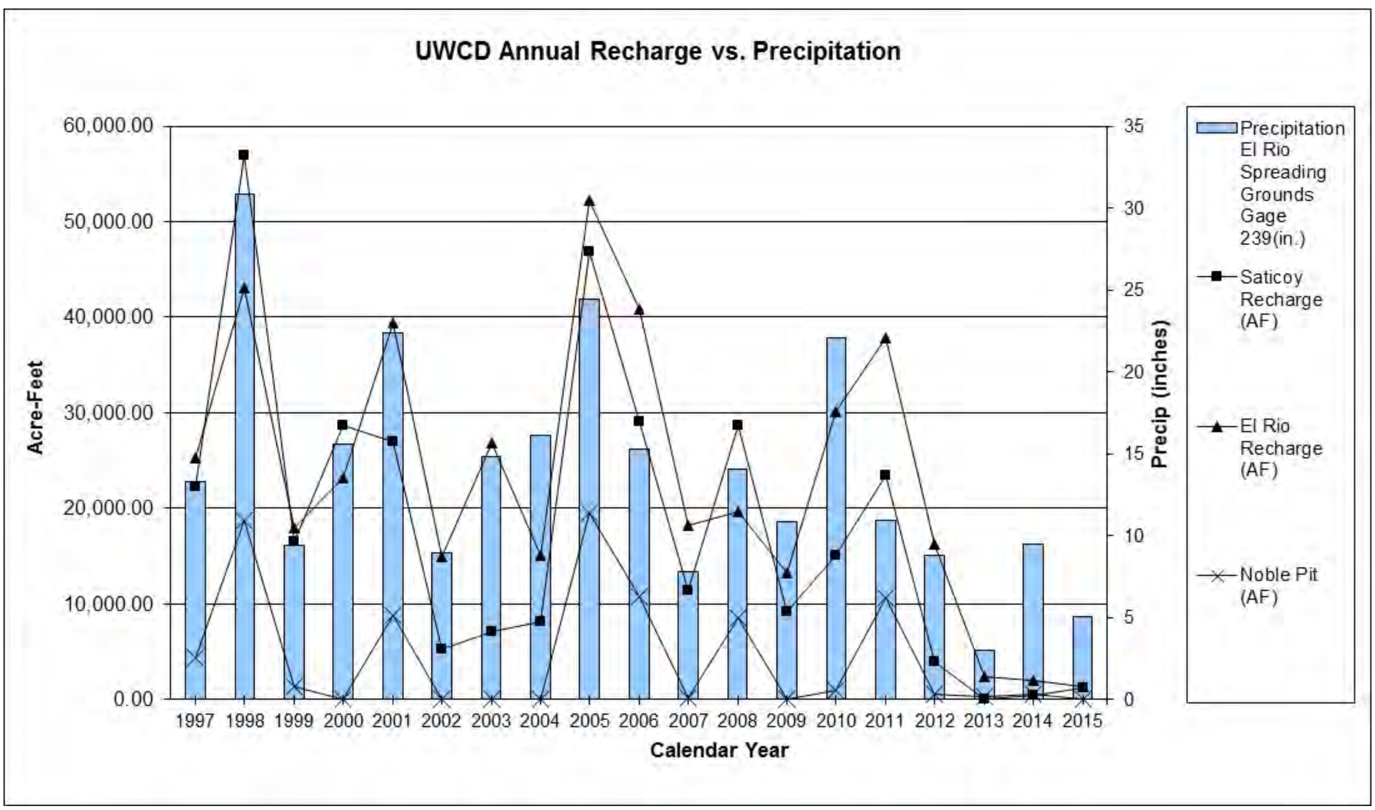

Figure 4-5: Graph depicting precipitation versus recharge for UWCD[4].

The Casitas Municipal Water District delivered 16,272[5] AF in 2015, with approximately 5,773[5] AF sold to retail water purveyors. 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 2015 there was 103,886[5] AF 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 2015.

<u>Table 4-3</u>: Comparison of Wholesale District water deliveries 2005-2015.

	Total 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	97,218.00	31,868.00	142,525.25
2012	15,268.49	104,104.00	32,638.00	152,010.49
2013	18,270.00	111,283.00	24,358.10	153,911.10
2014	18,336.00	106,293.00	17,491.94	142,120.94
2015	16,272.00	89,044.60	16292.62	121,609.22
Period Total	**179,798.22**	**1,205,274.00**	**340,393.23**	**1,461,735.29**

Section 5.0
Potentiometric Surface Maps

5.1 – Mapping

Potentiometric surface maps are used to visually represent groundwater elevations over broad areas. County staff develops these maps for the Santa Clara and Calleguas Creek watersheds by assembling groundwater elevation data (from both County gauged wells and wells gauged by other organizations within the County) for spring and fall periods, inputting the data into a database and using ESRI's ArcMap GIS software, and the 3D Analyst Extension to generate potentiometric contours. The map development process is iterative. The software is used to develop the initial potentiometric surface maps. After the maps are created they are reviewed by County staff. Initial draft maps are circulated to staff, the data reviewed, adjustments made, and the maps finalized. Human input into the maps is especially important as it relates to edge of basin flowlines, selection of data, and in some cases removal of erroneous or misleading data.

5.1.1 –Maps

The following pages contain a series of potentiometric surface maps created from 2015 groundwater level data for the a) Santa Clara River Valley, b) the upper aquifer system of the Oxnard Plain and Pleasant Valley, and c) the lower aquifer system of the Oxnard Plain, Pleasant Valley, and Las Posas Valley Basins.

Figures 5-1 thru 5-2 on pages 81-82 are generalized potentiometric surface maps for 2015 for the Santa Clara River Valley area encompassing the Mound, Santa Paula, Fillmore, and Piru groundwater basins. 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 groundwater basin lines on the maps.

Figures 5-3 thru 5-4 on pages 83-84 are generalized potentiometric surface maps for 2015 for the upper aquifer system of the Oxnard Plain and Pleasant Valley area. Note that 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. Well data from the perched or semi-perched zone of the Oxnard Plain was not used to generate these contours. Some water levels represent confined conditions.

Figures 5-5 thru 5-6 on pages 85-86 are generalized groundwater potentiometric surface maps for the lower aquifer system for 2015 of the Oxnard Plain, Pleasant Valley and Las Posas Valley area. In previous reports we have used the Moorpark anticline as a boundary between the East and South Las Posas Basins to map the potentiometric surface. DWR Bulletin 118 does not divide the Las Posas Basin, but maps it as one large basin. That plus additional reports, indicate there may not be a significant groundwater flow barrier in that location. This technical issue will benefit from additional research in the future. In this report the potentiometric surface is mapped to reflect no barrier to flow between the East Las Posas Basin and the South Las Posas Basin. Data points for wells perforated in the shallow sand and gravel zones of the Las Posas Valley were not used to generate these contours.

The Groundwater Section welcomes comments and suggestions concerning the potentiometric surface maps presented on the following pages or the report in general. Please contact Jeff Dorrington at jeff.dorrington@ventura.org

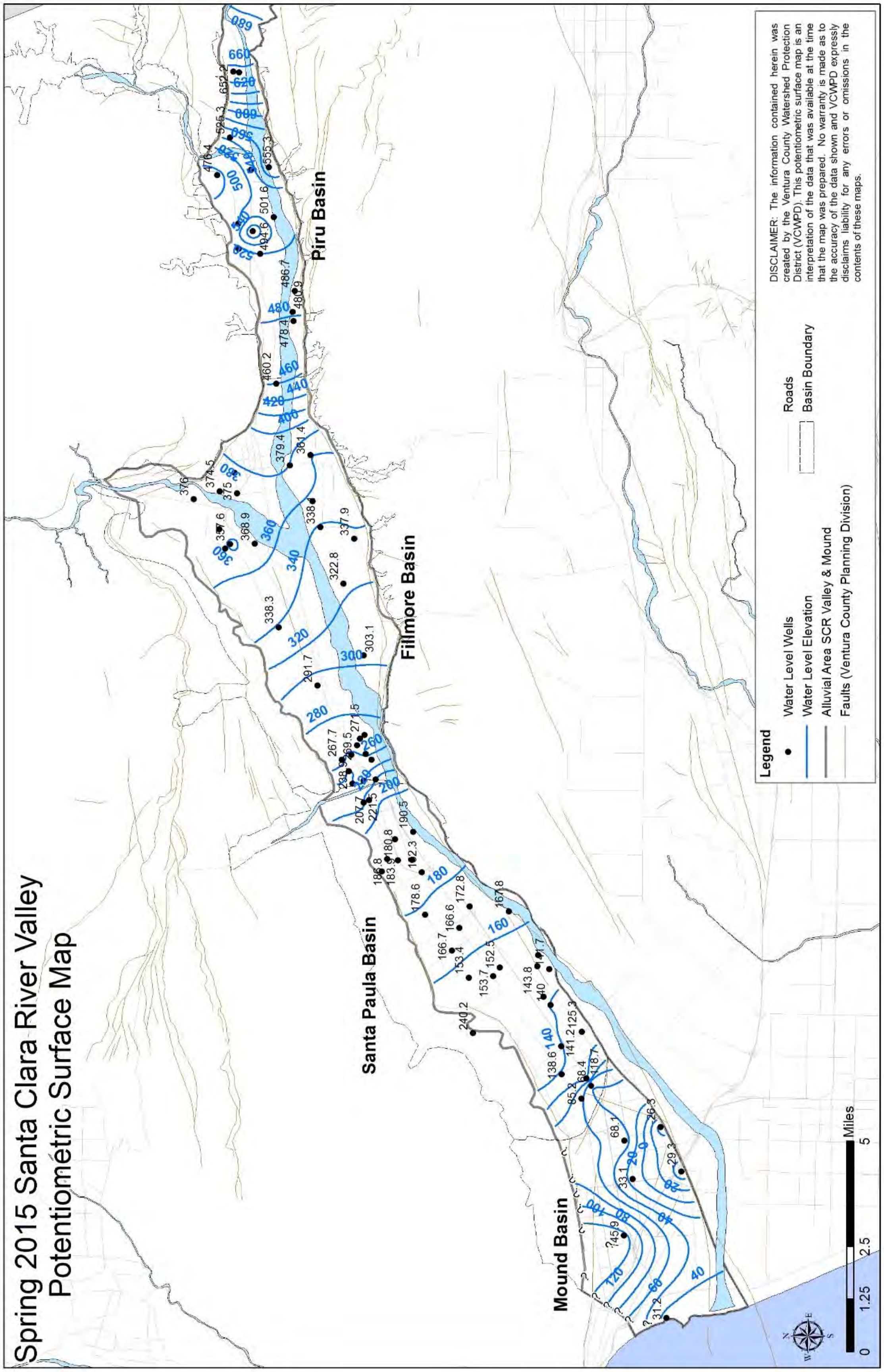

Figure 5-1: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for spring 2015.

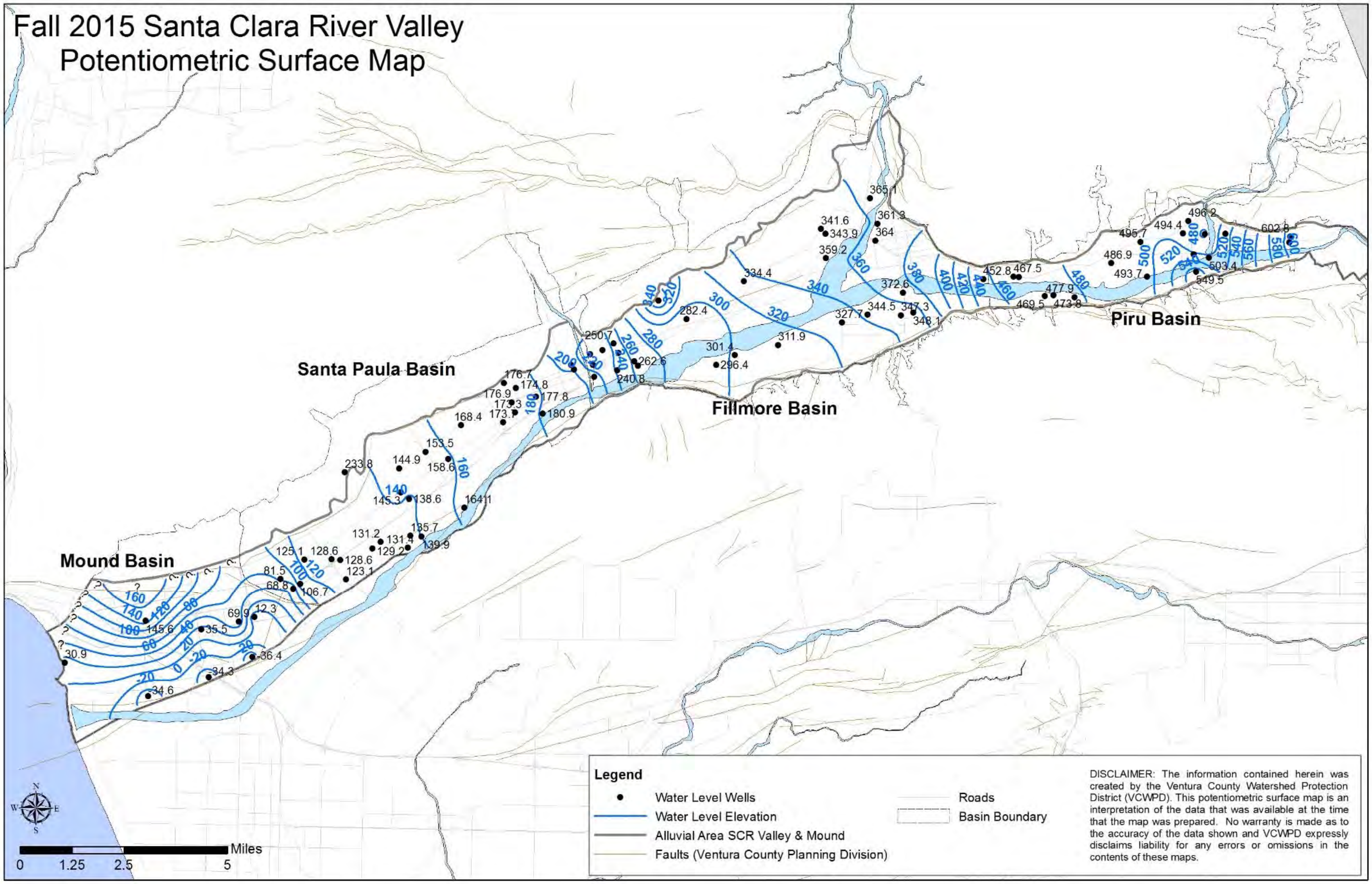

Figure 5-2: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for fall 2015.

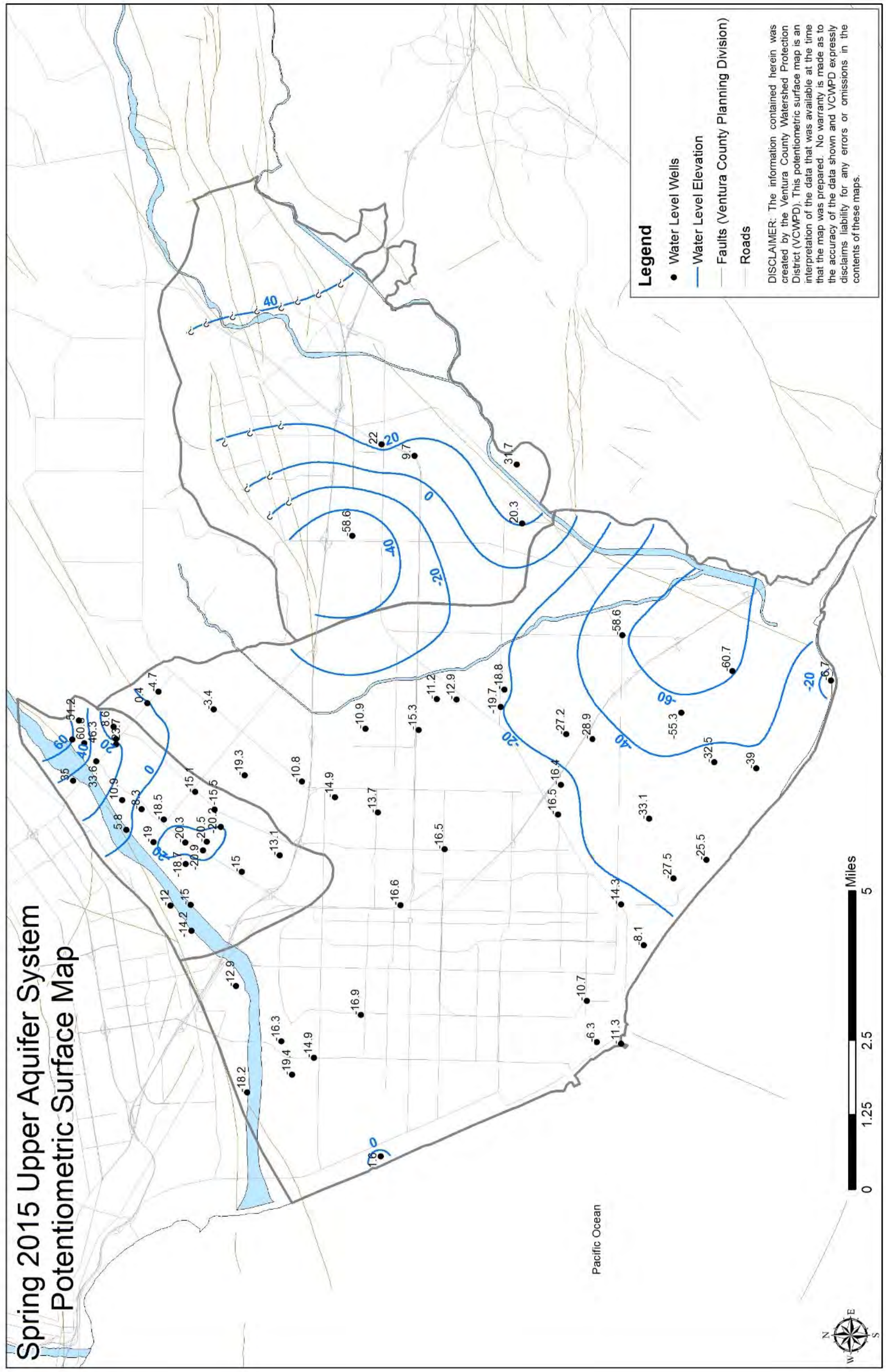

Figure 5-3: The map above depicts water level surface elevation contours for the Upper Aquifer System for spring 2015.

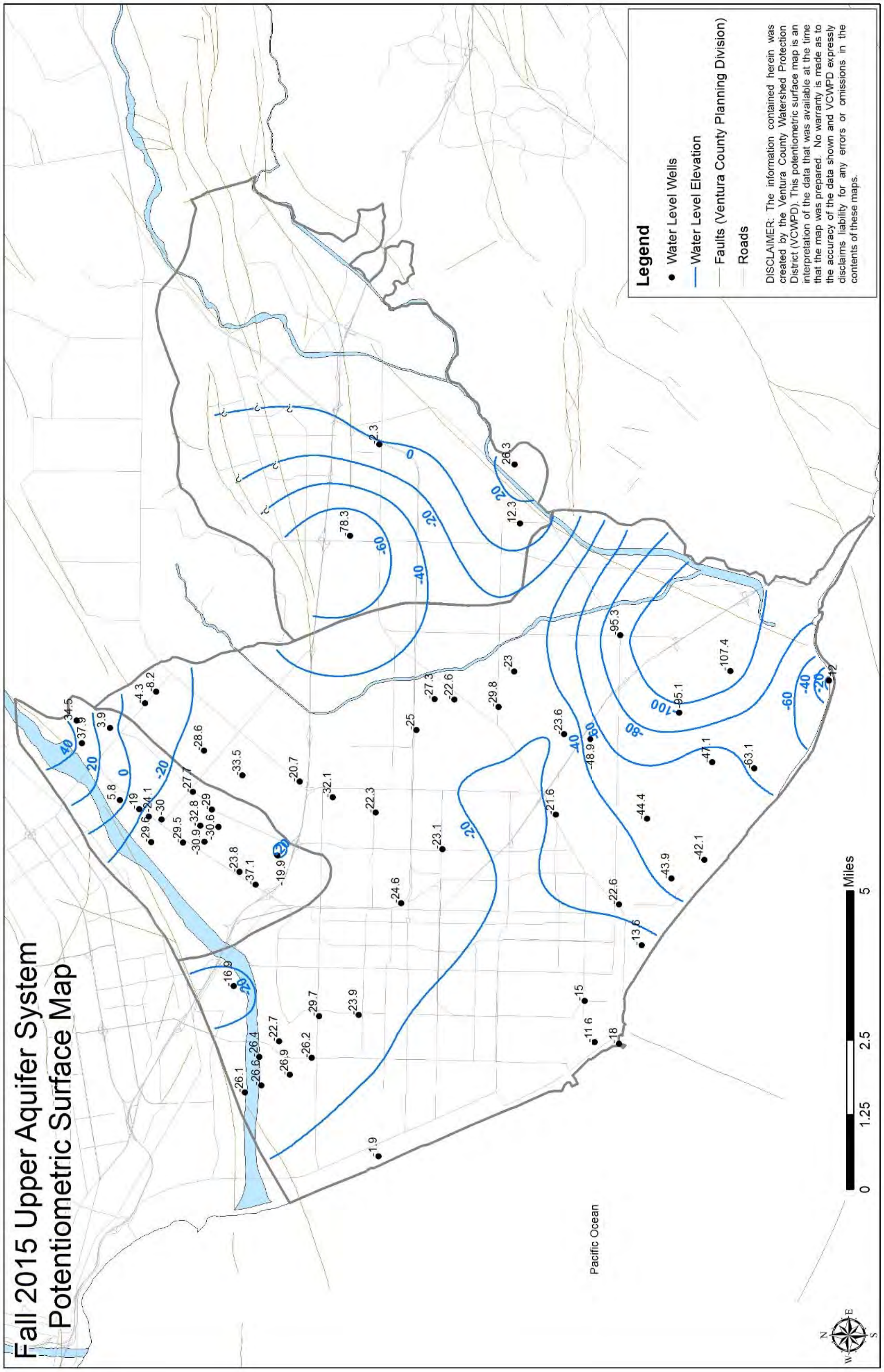

Figure 5-4: The map above depicts water level surface elevation contours for the Upper Aquifer System for fall 2015.

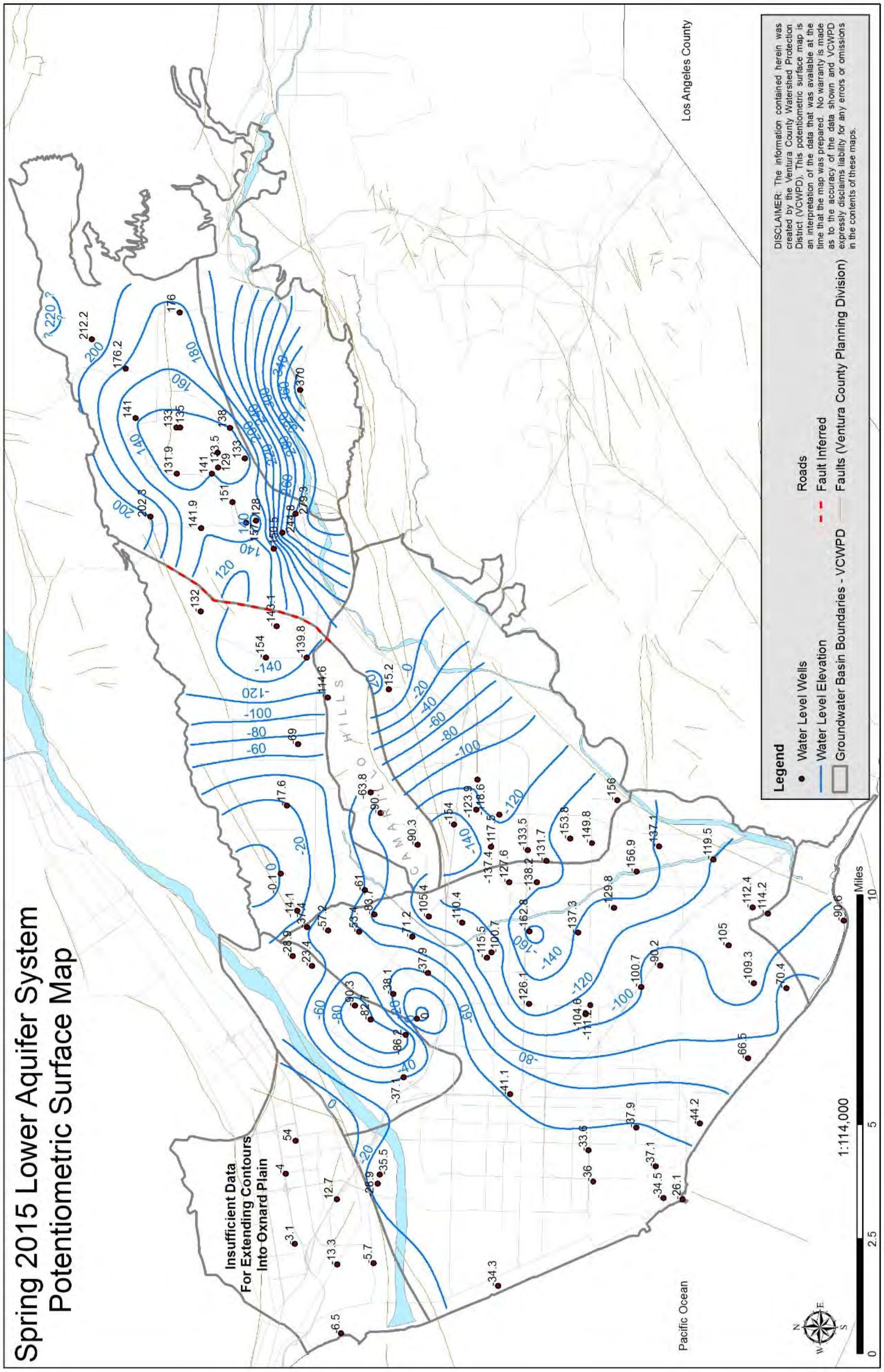

Figure 5-5: The map above depicts water level surface elevation contours for the Lower Aquifer System for spring 2015.

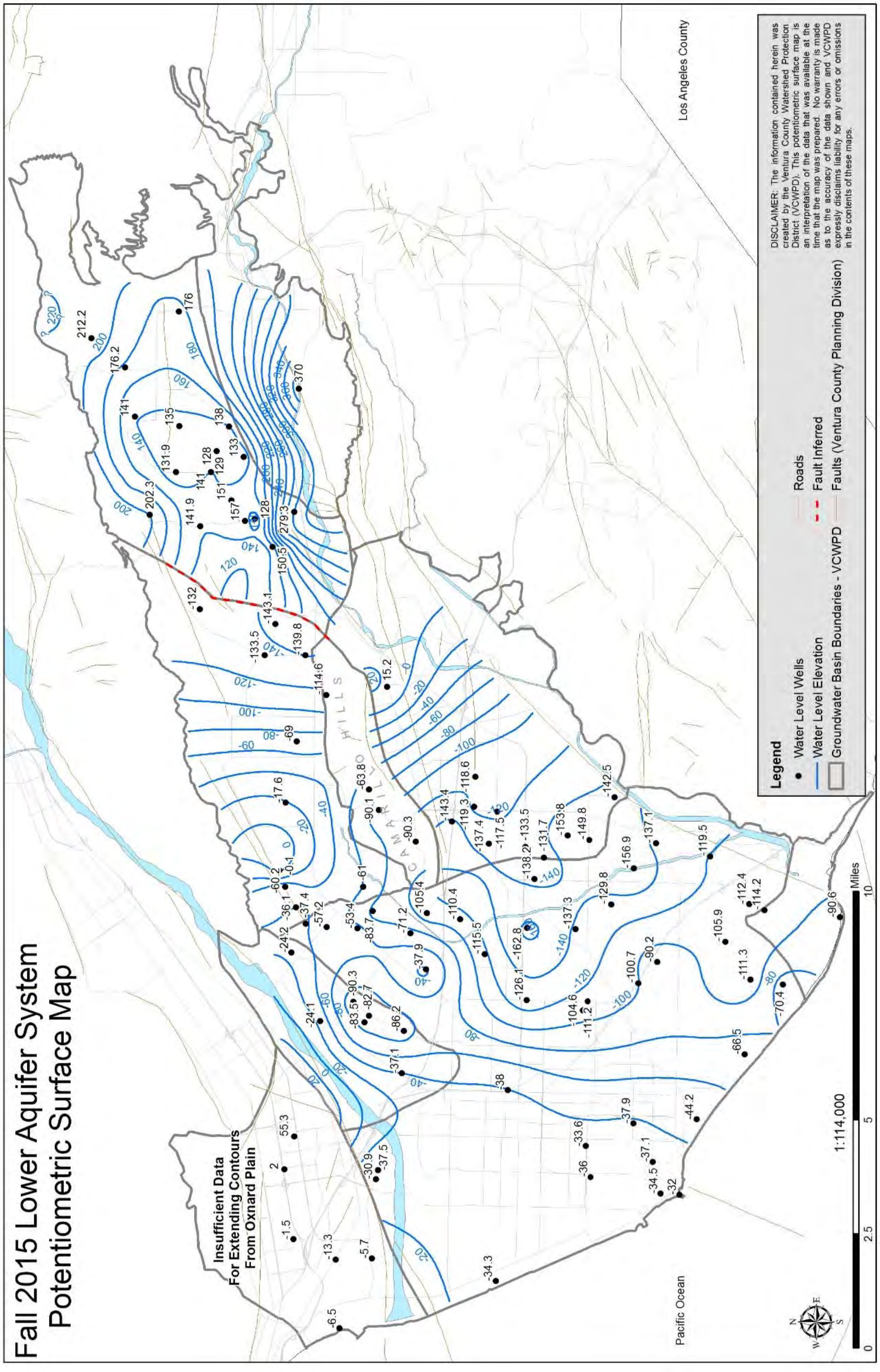

Figure 5-6: The map above depicts water level surface elevation contours for the Lower Aquifer System area for fall 2015.

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(Footnotes)

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

2 - Water Year defined as: October 1 to September 30 of the following year. VCWPD precipitation data is *preliminary* and subject to change.

3 - Based on data from all active Ventura County rain gages. Data is *preliminary* and subject to change.

4 - United Water Conservation District, Water Extraction, Production & Delivery Data, Dan Detmer; Murray McEachron - Personal Communication, February 2015.

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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.

Appendix A – Glossary of Groundwater Terms

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.

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. 4468: 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, 1999 and most recently in December 2014. 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

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Appendix B – Key Water Level Wells

Key water levels for the most significant groundwater basins are depicted on the following pages to provide visual representations of groundwater conditions over time. Note that the time duration of data may vary.

Each of the following pages is organized to describe the key water level well measured by staff. Each well listed includes a line graph (hydrograph) of groundwater levels measured 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. The hydrographs are accompanied by an up-down graph to track change from the previous spring.

The following summary sheet for 2015 is used by Groundwater Section Staff to track long-term trends. 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.

Key wells were selected many years ago 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. Standard operating procedure for County Groundwater Staff is to have well pumps off for 24 hours prior to gauging.

Appendix B – Key Water Level Wells

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

Appendix B– Key Water Level Wells
SPRING WATER LEVELS – (Depth to groundwater)

BASIN	WELL NUMBER	RECORD HIGH	RECORD LOW	WATER LEVEL	WATER LEVEL	WATER LEVEL	Change From Previous Year
	(RECORD)	(DATE)	(DATE)	(YEAR 2013)	(YEAR 2014)	(YEAR 2015)	(UP/DOWN)
OXNARD PLAIN							
Oxnard Aquifer	01N21W07H01S	3.4 ft.	88.4 ft.	25.0 ft.	41.1 ft.	53.8 ft.	DOWN 12.7 ft.
	(1/31-present)	(3/1999)	(9/1964)	(3/5)	(3/11)	(3/17)	
Forebay Area	02N22W12R01S	14.6 ft.	Dry	93.7 ft.	122.76	Dry	
(UWCD)	(5/31-present)	(6/1998)	(3/2016)	(4/9)	(3/26)		
Fox Canyon	01N21W32K01S	18.0 ft.	129.0 ft.	49 ft.	85.5 ft.	78.2 ft.	UP 7.3 ft.
Aquifer	(12/72-present)	(4/1983)	(12/1990)	(3/4)	(3/13)	(3/9)	
PLEASANT VALLEY							
Fox Canyon							
Aquifer							
Grimes Canyon	01N21W03C01S	87.5 ft.	253.9 ft.	107.3 ft.	147.1 ft.	155.9 ft.	DOWN 8.8 ft.
Aquifer	(2/73-present)	(8/1995)	(11/1991)	(3/6)	(3/11)	(3/18)	
WEST LAS POSAS	02N21W12H01S	422.2 ft.	501.8 ft.	453.9 ft.	459.8 ft.	No Reading	
	(10/72-present)	(3/1975)	(12/1991)	(3/4)	(3/10)		
EAST LAS POSAS	03N20W26R03S	503.0 ft.	619.3 ft.	576.6 ft.	581.5 ft.	571.3 ft.	UP 10.2 ft.
	(1985-present)	(4/1986)	(9/2009)	(3/14)	(3/10)	(3/10)	
SOUTH LAS POSAS	02N19W05K01S	27.5 ft.	136.2 ft.	30.0 ft.	31.1 ft.	28.1 ft.	UP 3.0 ft.
	(6/75-present)	(7/2006)	(6/1975)	(3/20)	(3/10)	(3/13)	
SANTA ROSA	02N20W26B03S	13.2 ft.	60.3 ft.	39.4 ft.	58.9 ft.	55.1 .ft	UP 3.8 ft.
VALLEY	(10/72-present)	(4/1979)	(11/2004)	(3/7)	(3/12)	(3/18)	
SIMI VALLEY	02N18W10A02S	45.0 ft.	92.0 ft.	79.7 ft.	82.1 ft.	80.9 ft.	UP 1.2 ft.
	(12/84-present)	(2/1998)	(6/1992)	(3/15)	(3/1)	(3/2)	
VENTURA RIVER	04N23W16C04S	3.9 ft.	101.0 ft.	64.8 ft.	83.0 ft.	69.9 ft.	UP 13.1 ft.
	(7/49-present)	(3/1983)	(2/1991)	(3/5)	(3/11)	(3/4)	
OJAI VALLEY	04N22W05L08S	38.2 ft.	312.0 ft.	176 ft.	226.2	231.3 ft.	DOWN 5.1 ft.
	(10/49-present)	(4/1978)	(9/1951)	(3/12)	(6/13)	(3/5)	
MOUND	02N22W07M02S	126.6 ft.	176.2 ft.	148.7 ft.	160.6	167.3	DOWN 6.7 ft.
	(4/96-present)	(4/1998)	(4/1996)	(3/28)	(4/15)	(3/18)	
SANTA PAULA	02N22W02C01S	20.7 ft.	51.9 ft.	36.8 ft.	40.5 ft.	43.2 ft.	DOWN 3.7 ft.
	(10/72-present)	(4/1983)	(12/1991)	(3/4)	(3/10)	(3/16)	
FILLMORE	03N20W05D01S	107.8 ft.	163.7 ft.	137.7 ft.	139.6 ft.	143.3 ft.	DOWN 3.7 ft.
	(10/72-present)	(2/1979)	(1219/77)	(3/4)	(3/10)	(3/16)	
PIRU	04N19W25C02S	43.1 ft.	183.2 ft.	79.9 ft.	102.2 ft.	116.3 ft.	DOWN 14.1 ft.
	(9/61-present)	(3/1993)	(10/1965)	(3/4)	(3/10)	(3/16)	
LOCKWOOD VALLEY	08N21W35B01S	19.3 ft.	52.9 ft.	No Reading	No Reading	No Reading	
	(6/56-present)	(05/2010)	(10/1991)				
CUYAMA VALLEY	07N23W16R01S	15.0 ft.	47.5 ft.	39.4	49.1 ft.	56.1	DOWN 7.0 ft.
	(3/72-present)	(4/1993)	(9/1990)	(3/26)	(4/17)	(3/27)	

Data prepared:
2/11/2016

Table B-1: Key Well Water Level Changes for 2015.

Appendix B – Key Water Level Wells

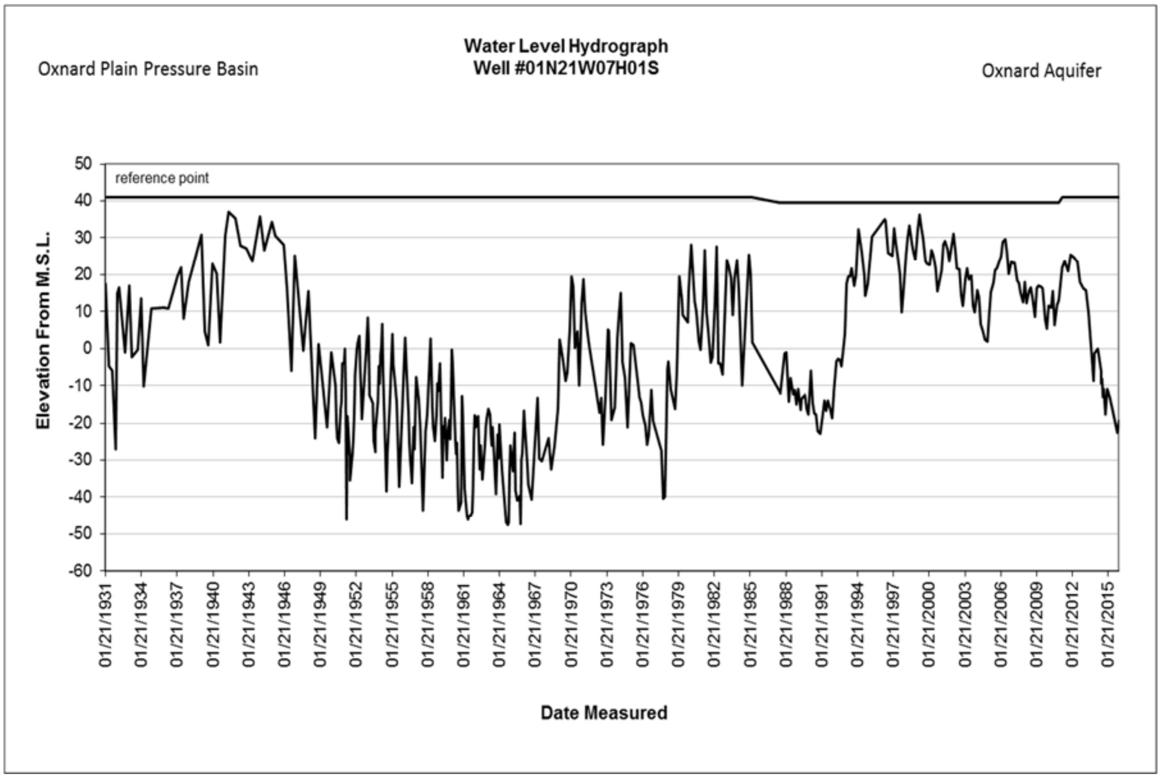

Figure B-2: Oxnard aquifer key well Hydrograph.

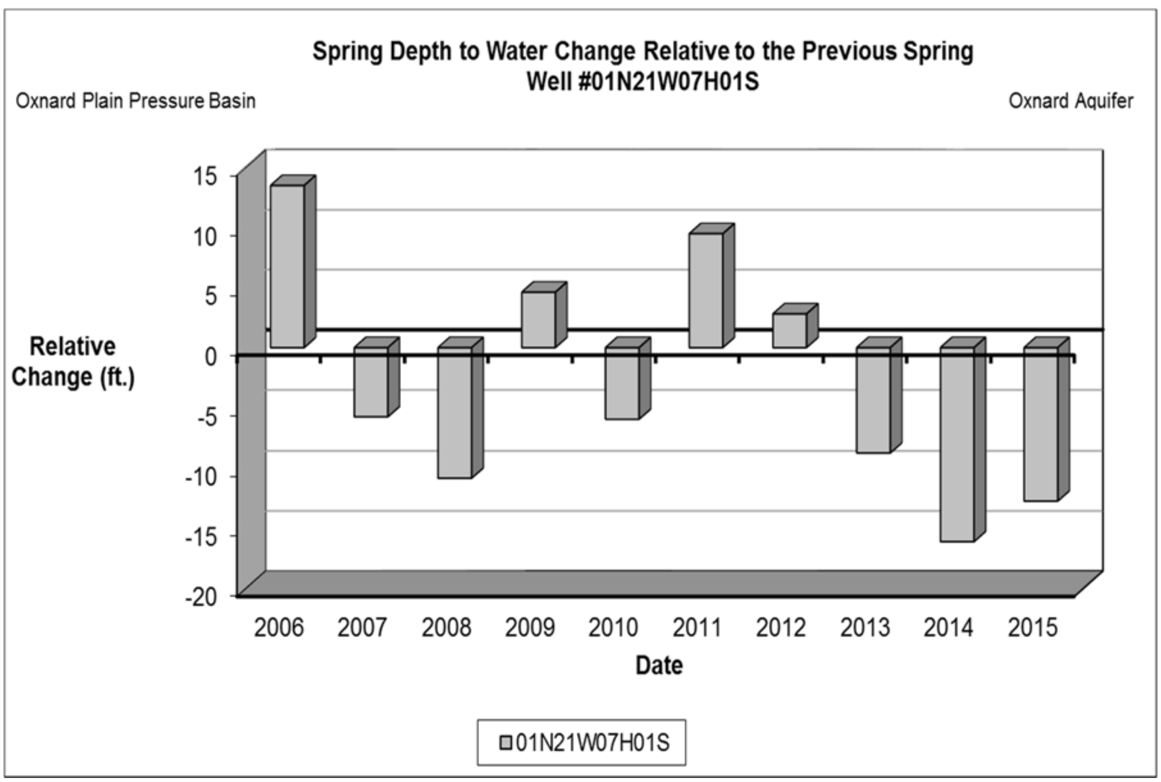

Figure B-3: Oxnard aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

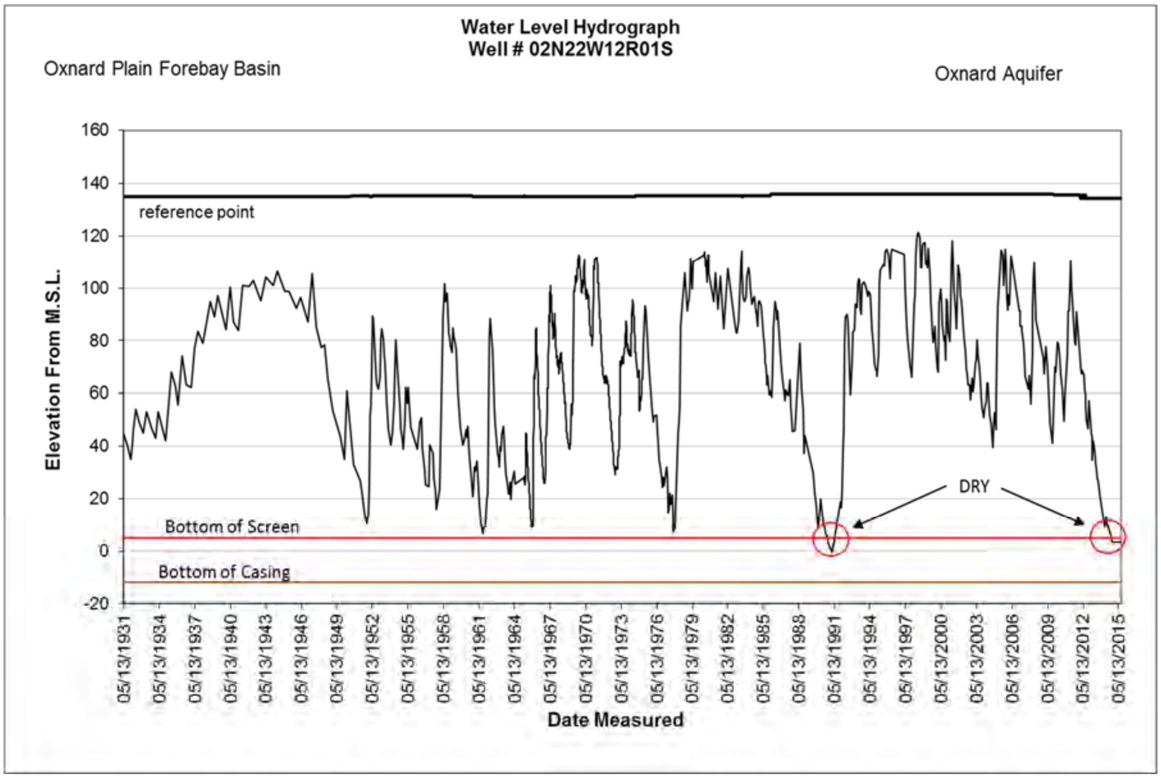

Figure B-4: Forebay area key well Hydrograph.

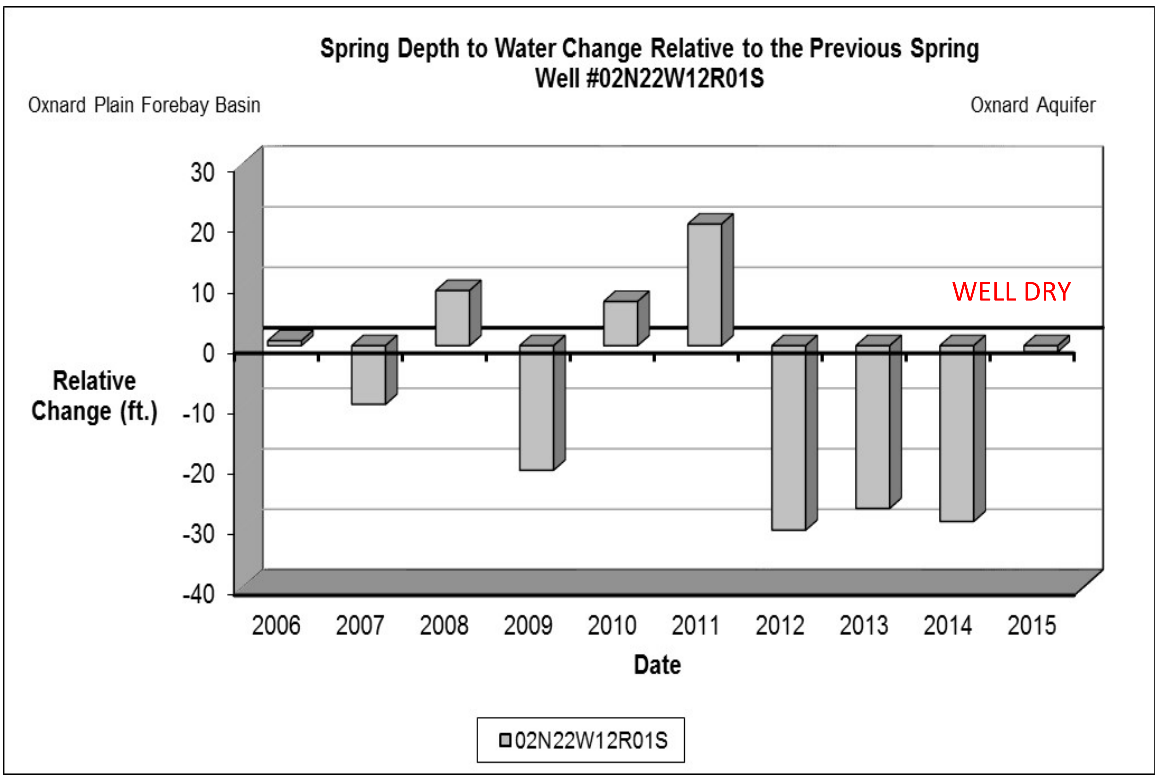

Figure B-5: Forebay Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

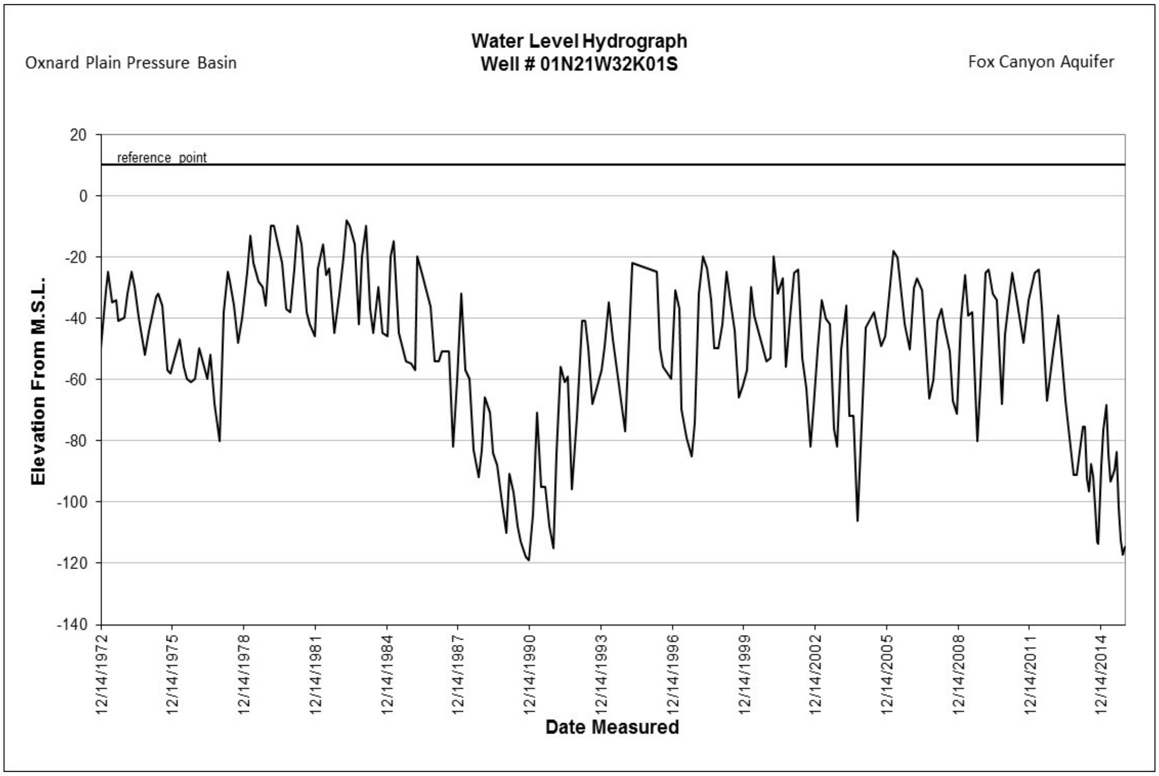

Figure B-6: Oxnard Plain Pressure Basin Fox Canyon Aquifer Key Well Hydrograph.

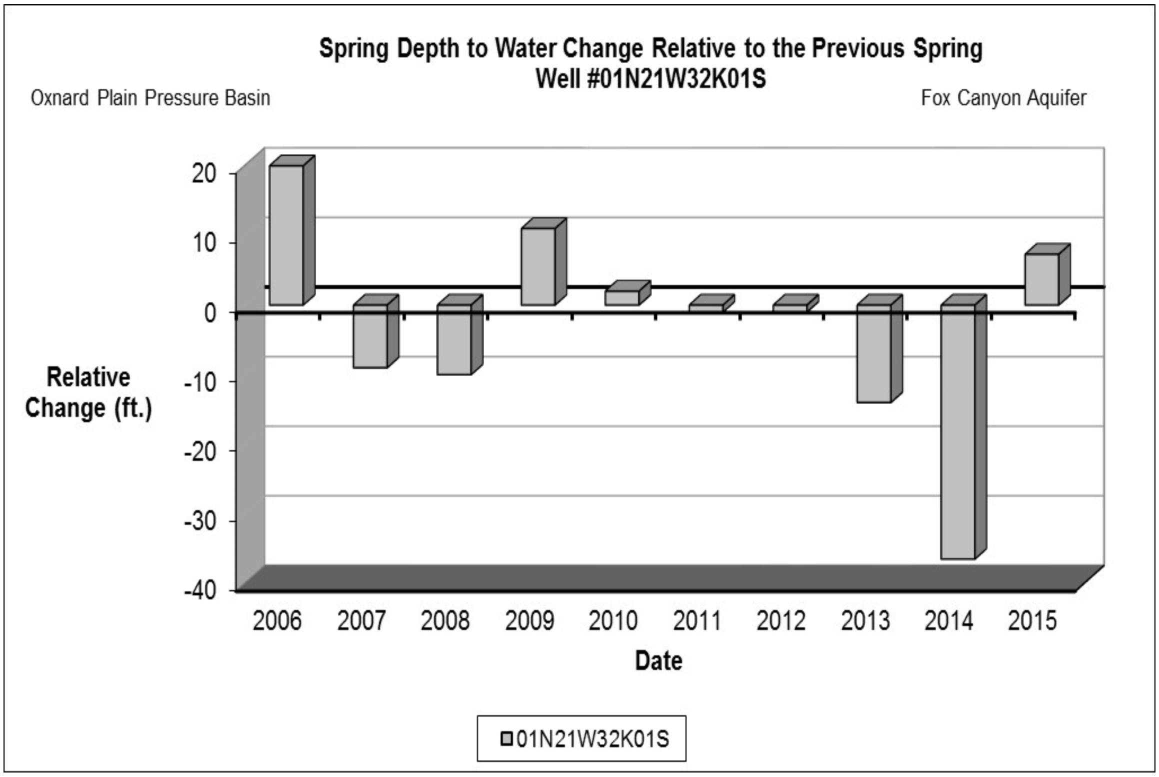

Figure B-7: Oxnard Plain Pressure Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

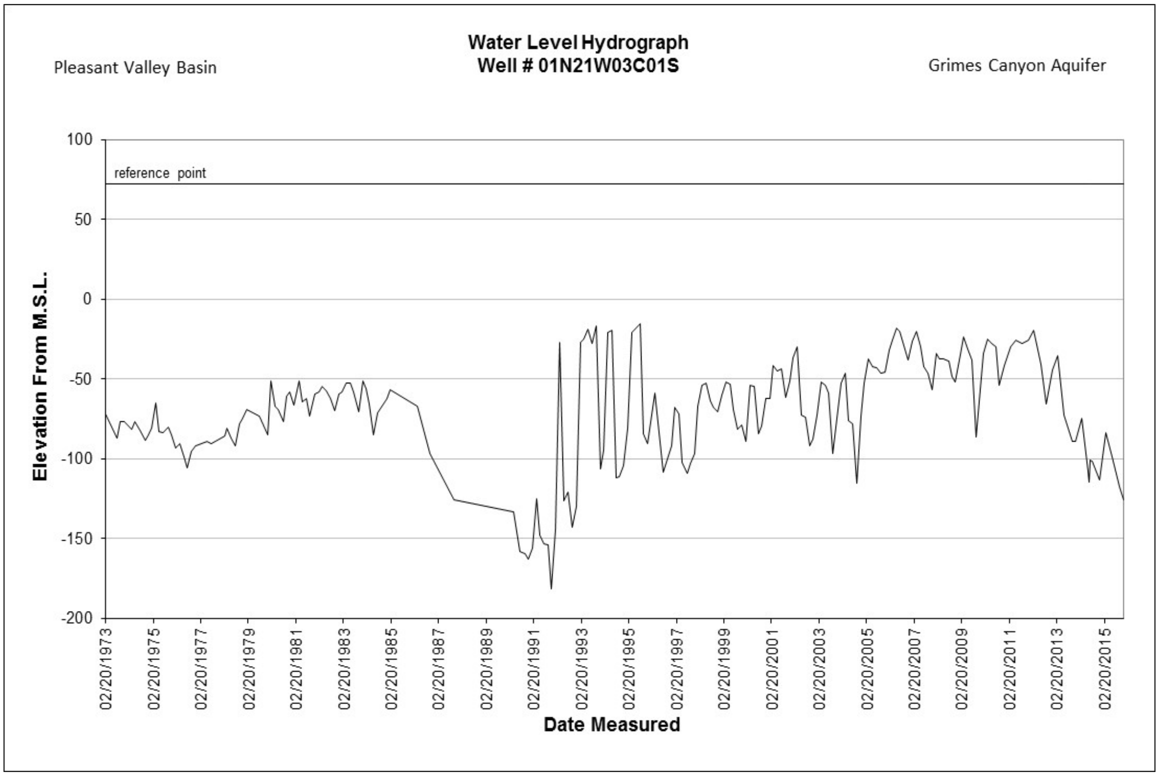

Figure B-8: Pleasant Valley Basin Fox Canyon Aquifer Key Well Hydrograph.

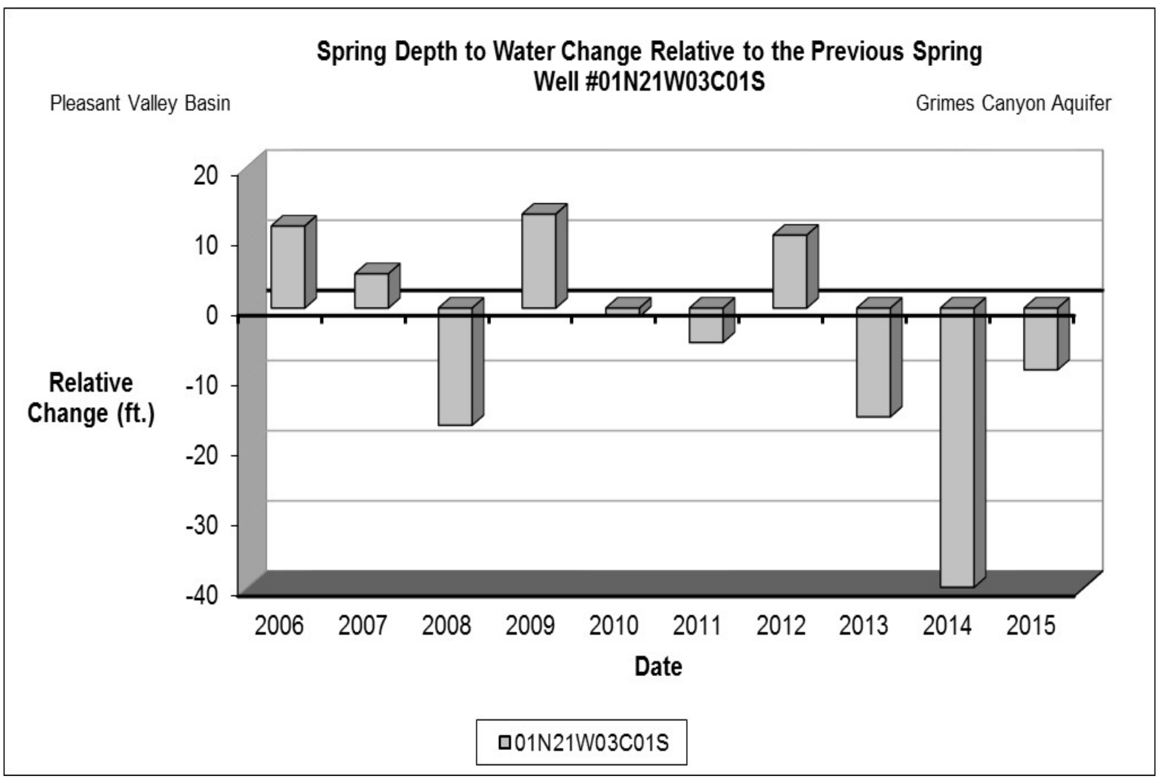

Figure B-9: Pleasant Valley Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

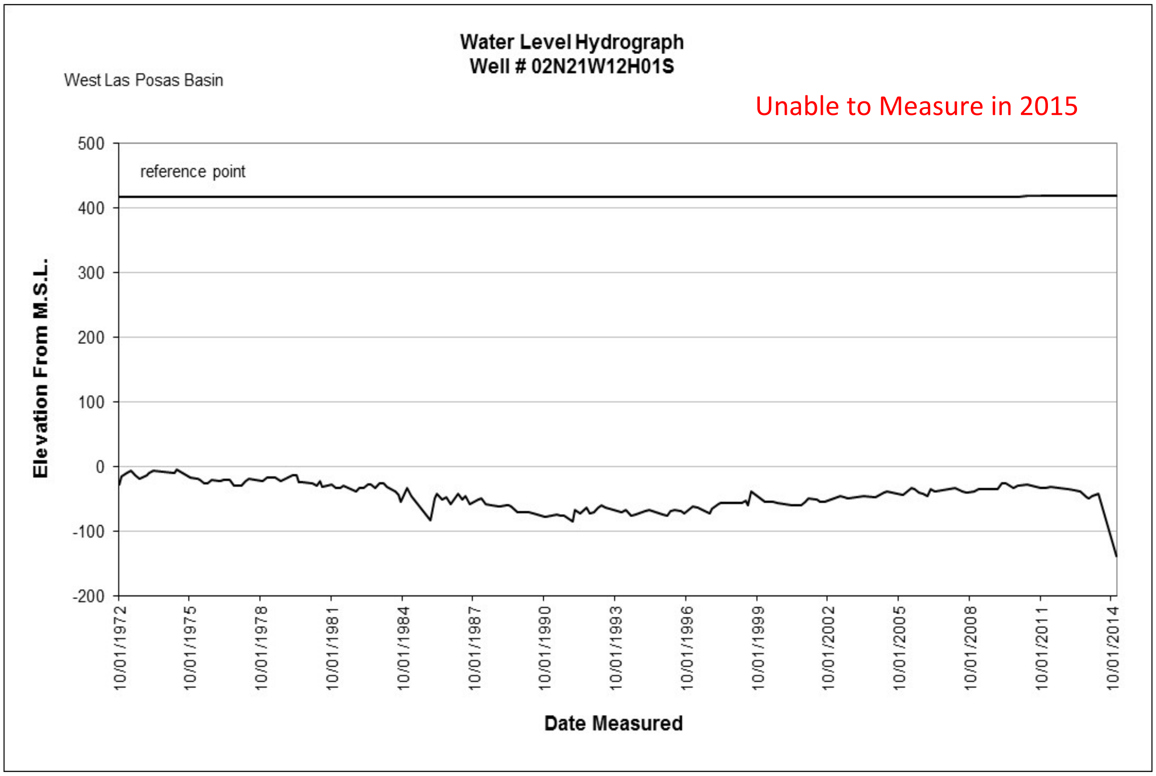

Figure B-10: West Las Posas Basin Key Well Hydrograph.

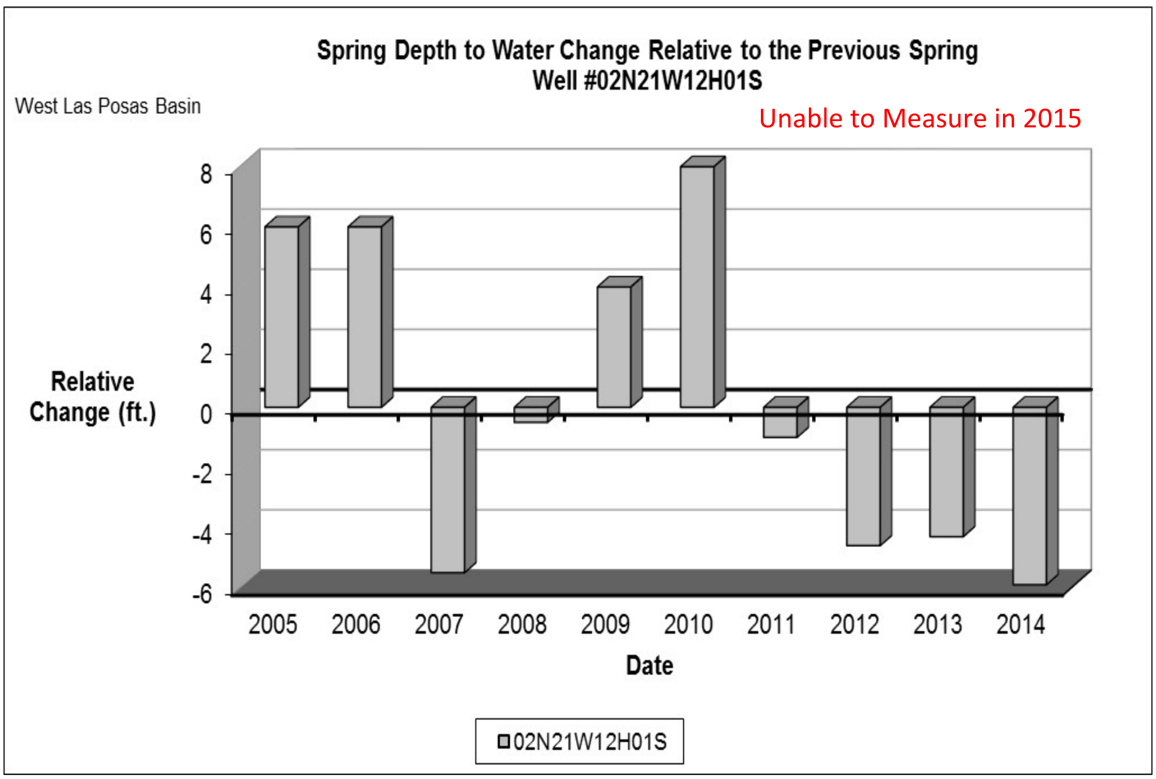

Figure B-11: West Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

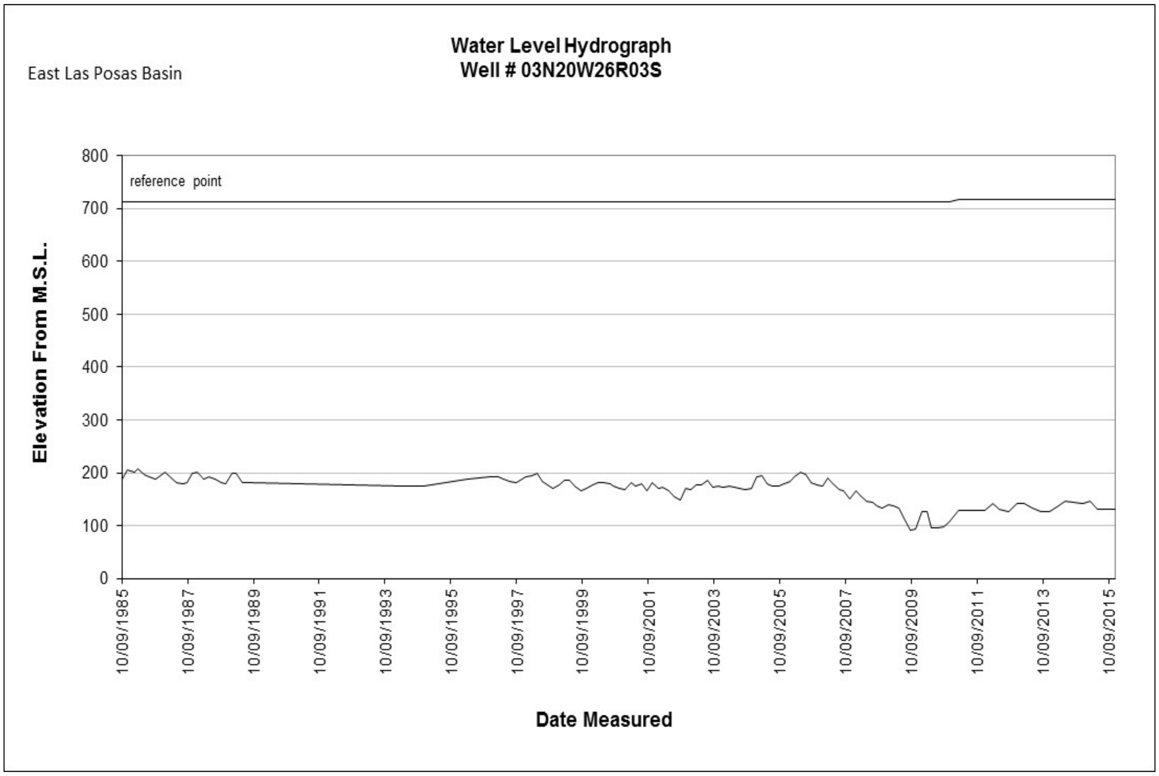

Figure B-12: East Las Posas Key Well Hydrograph.

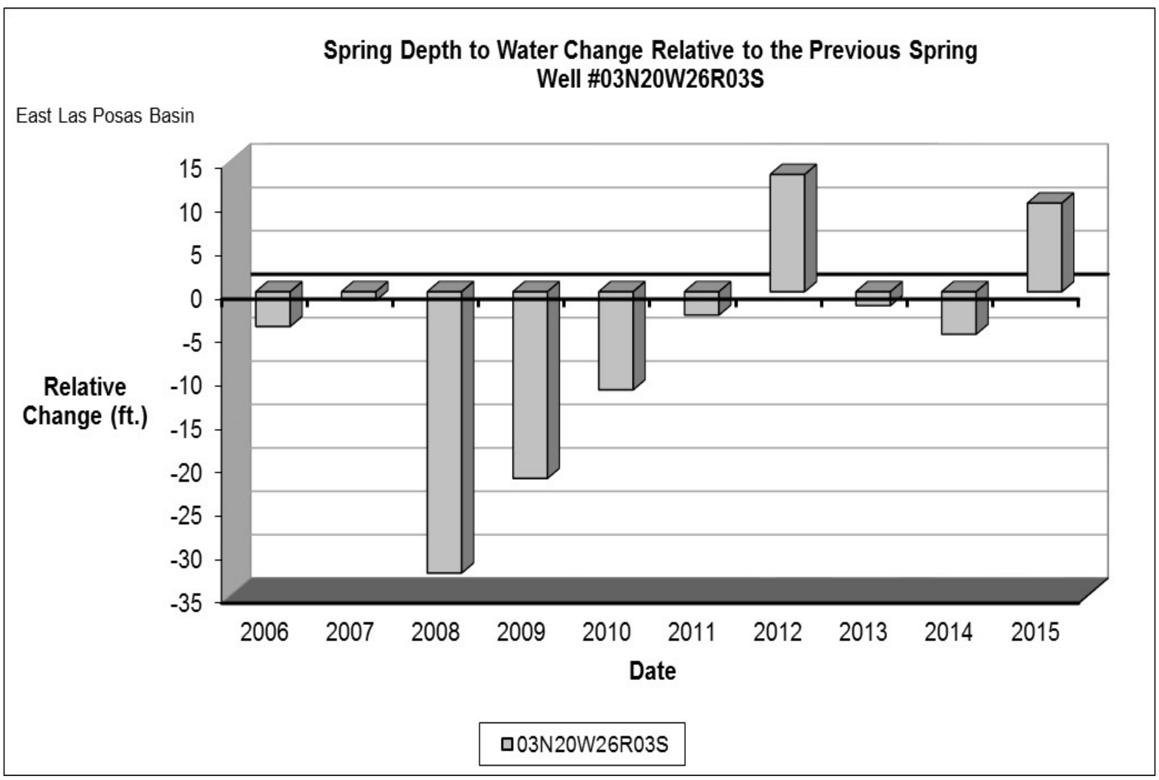

Figure B-13: East Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

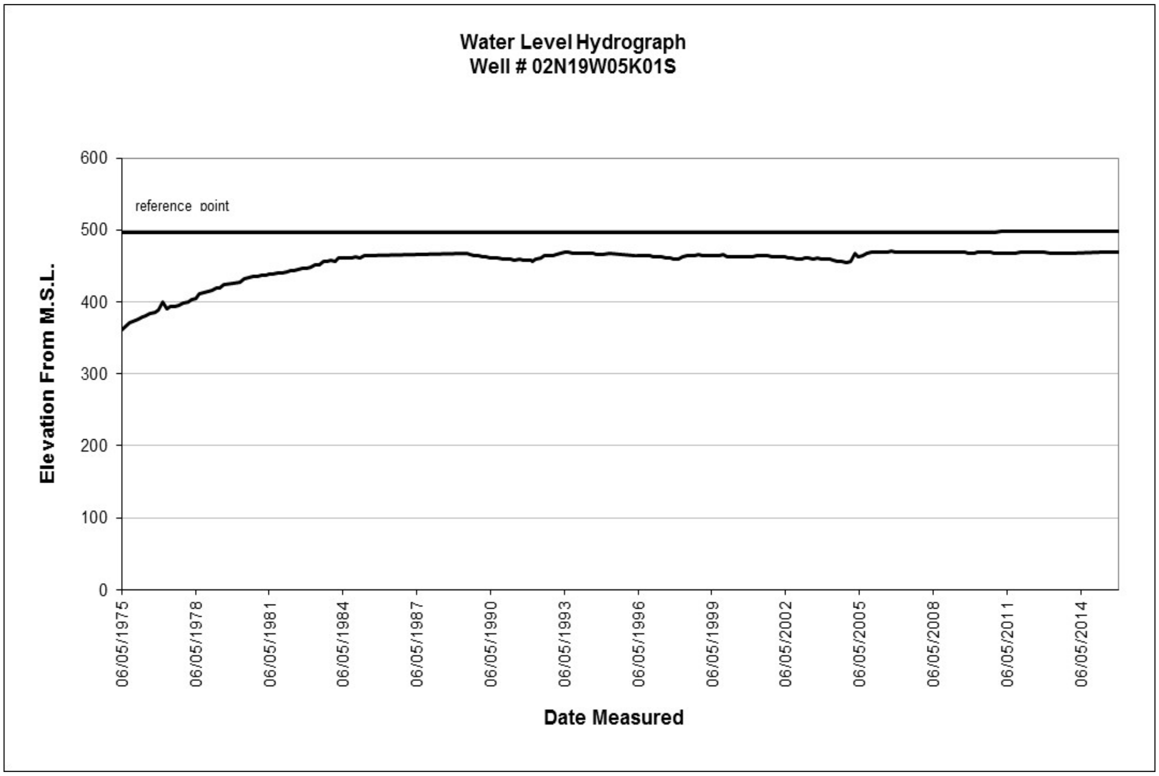

Figure B-14: South Las Posas Basin Key Well Hydrograph.

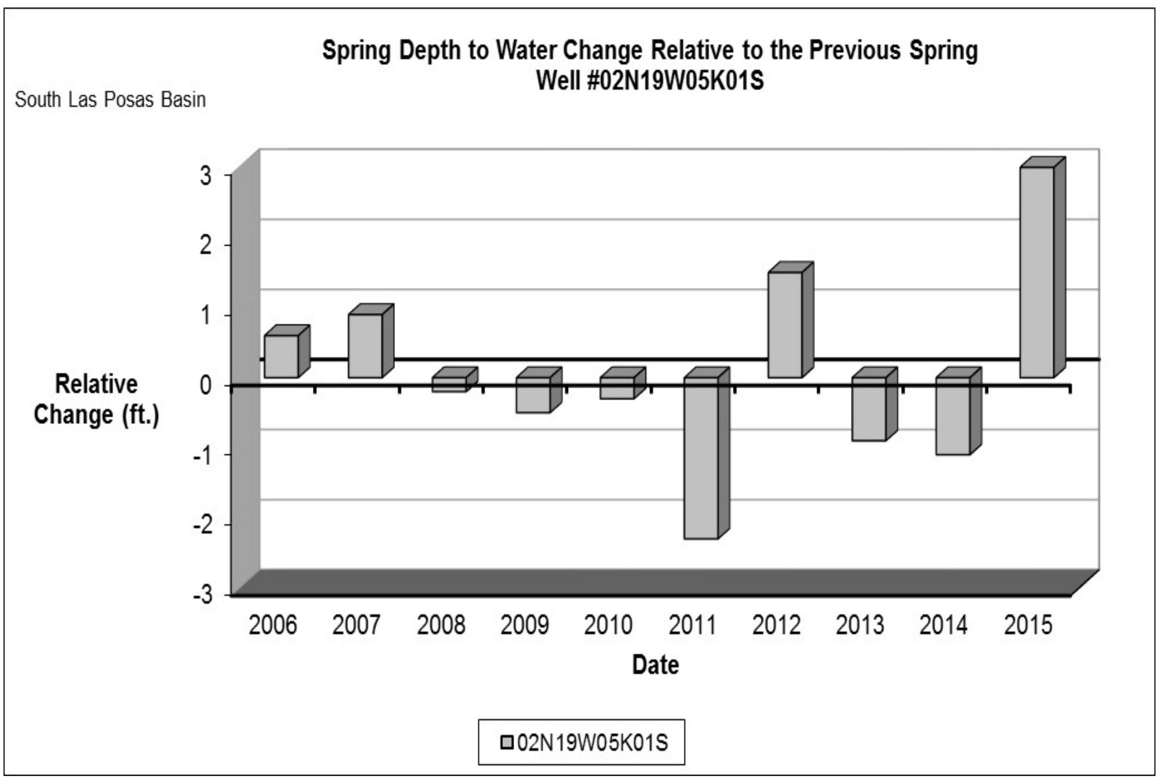

Figure B-15: South Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

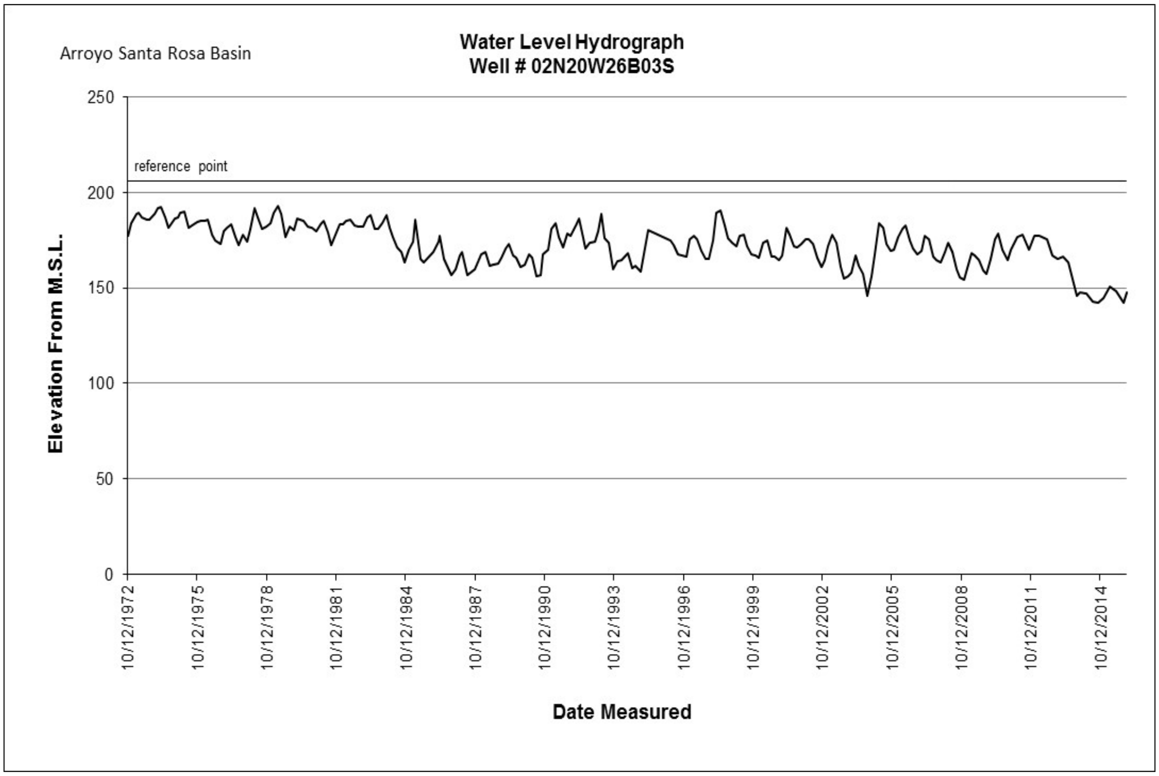

Figure B-16: Arroyo Santa Rosa Basin Key Well Hydrograph.

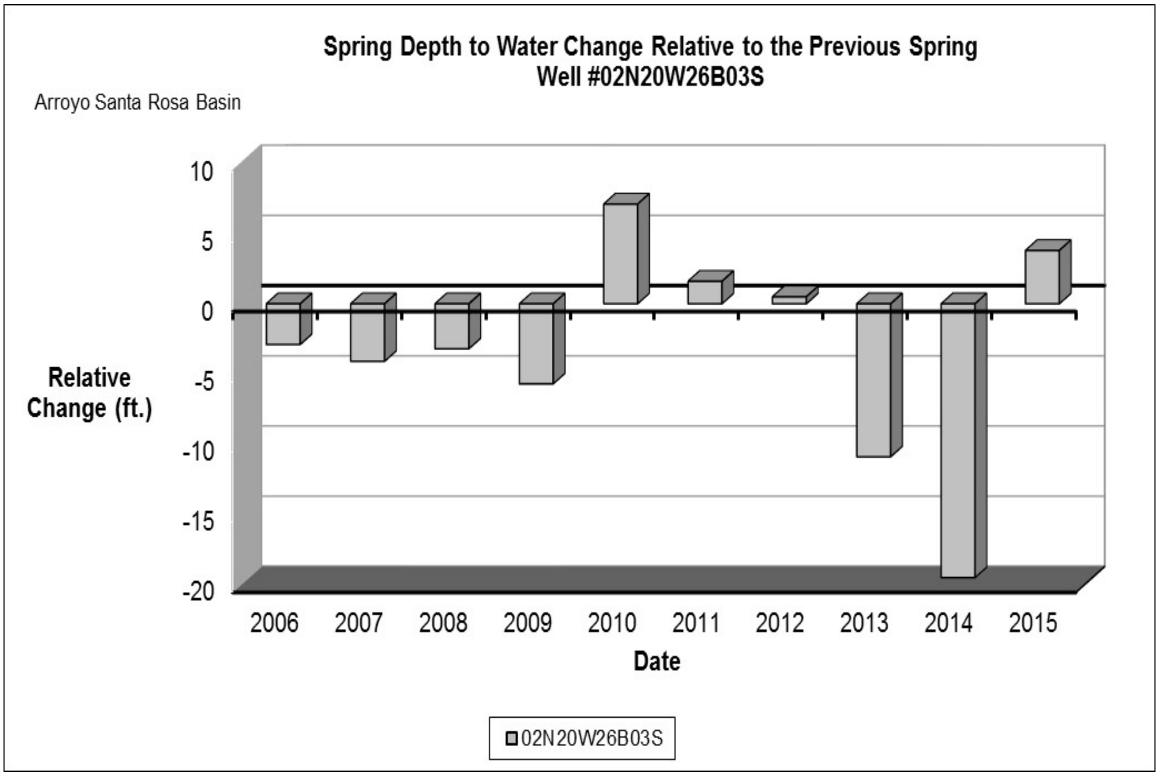

Figure B-17: Arroyo Santa Rosa Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

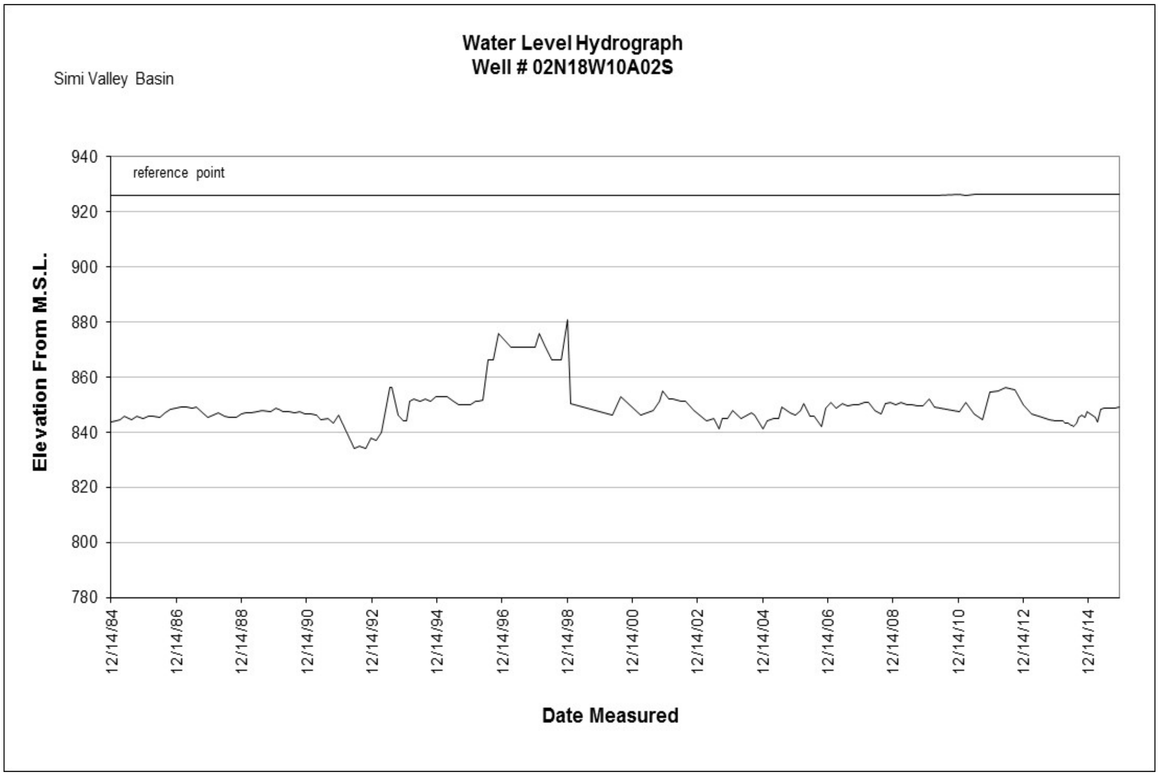

Figure B-18: Simi Valley Basin Key Well Hydrograph.

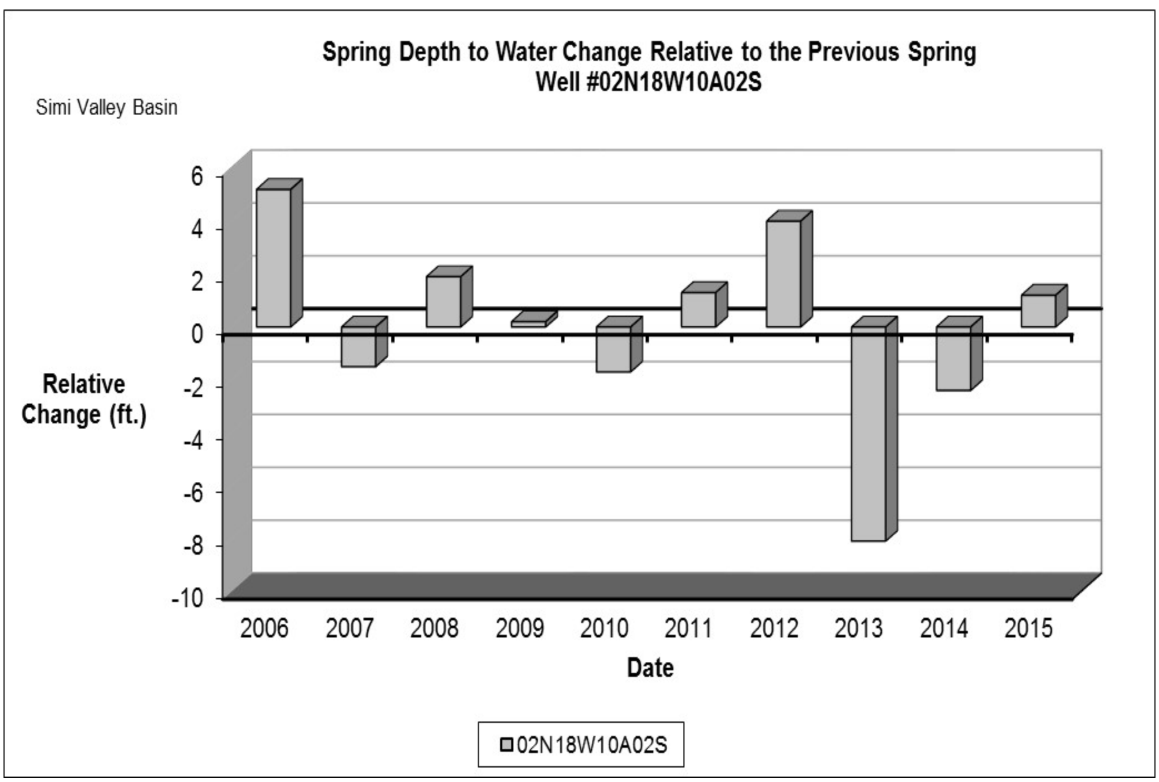

Figure B-19: Simi Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

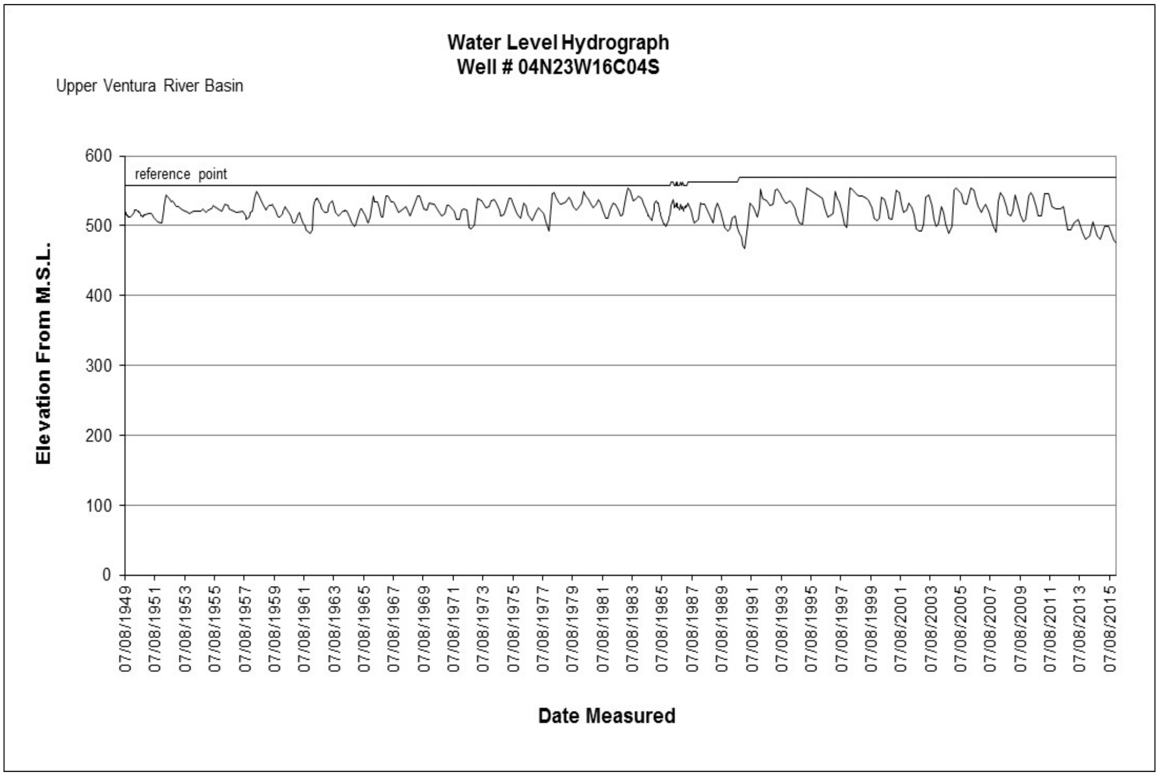

Figure B-20: Ventura River Basin Key Well Hydrograph.

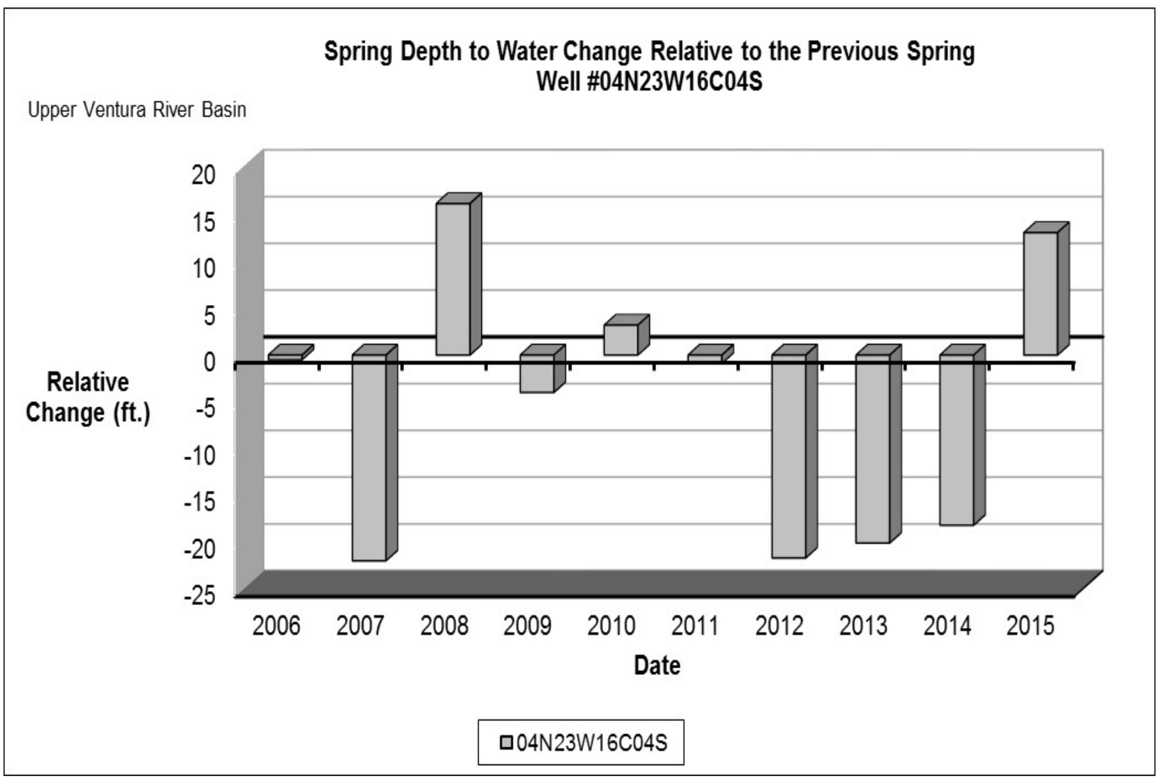

Figure B-21: Ventura River Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

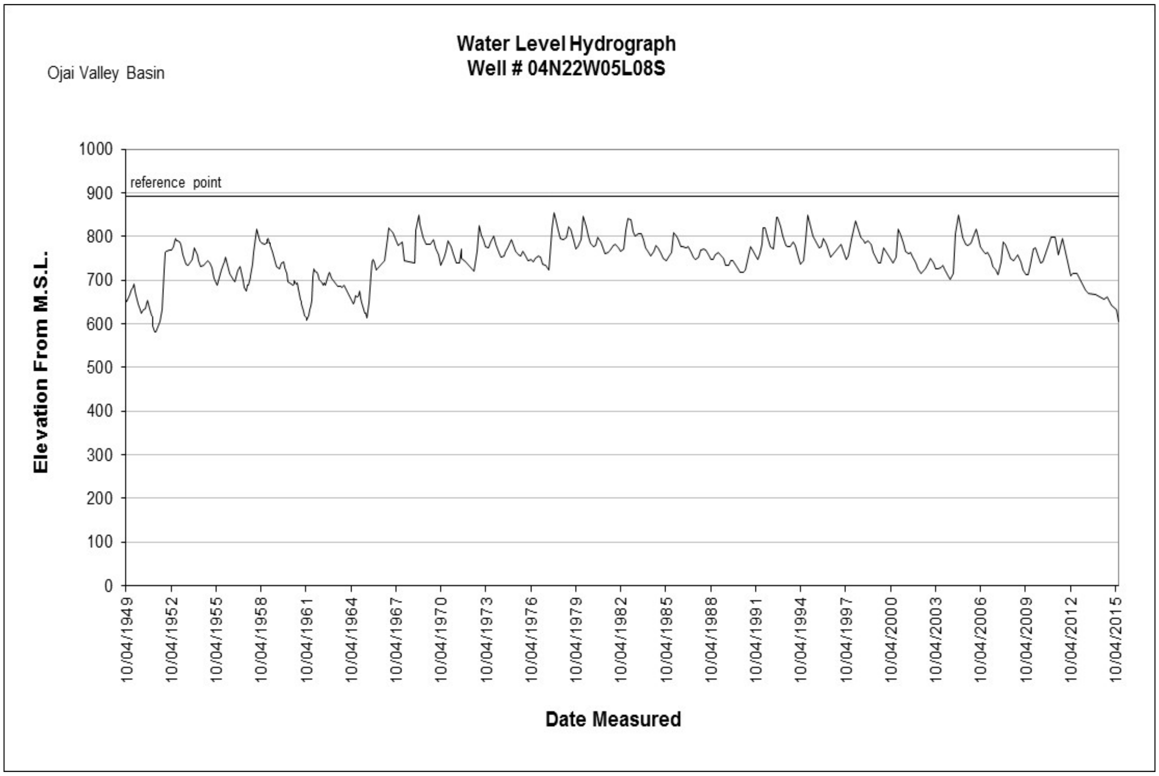

Figure B-22: Ojai Valley Basin Key Well Hydrograph.

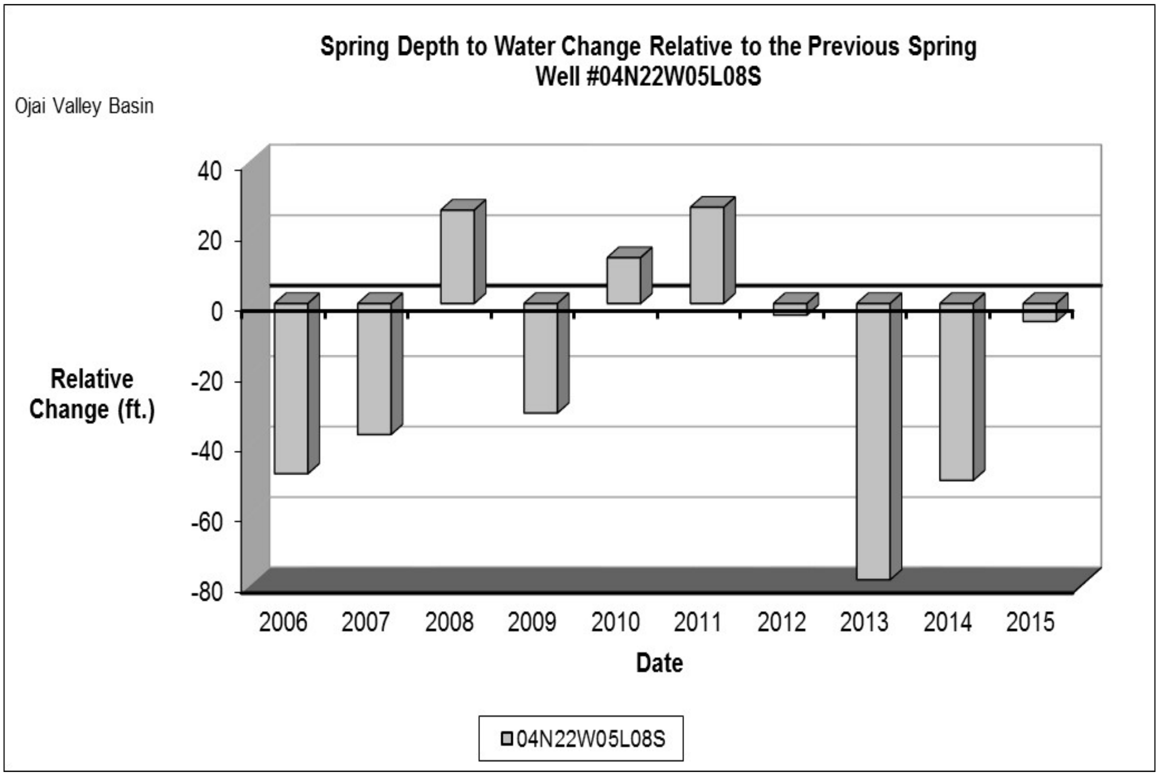

Figure B-23: Ojai Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

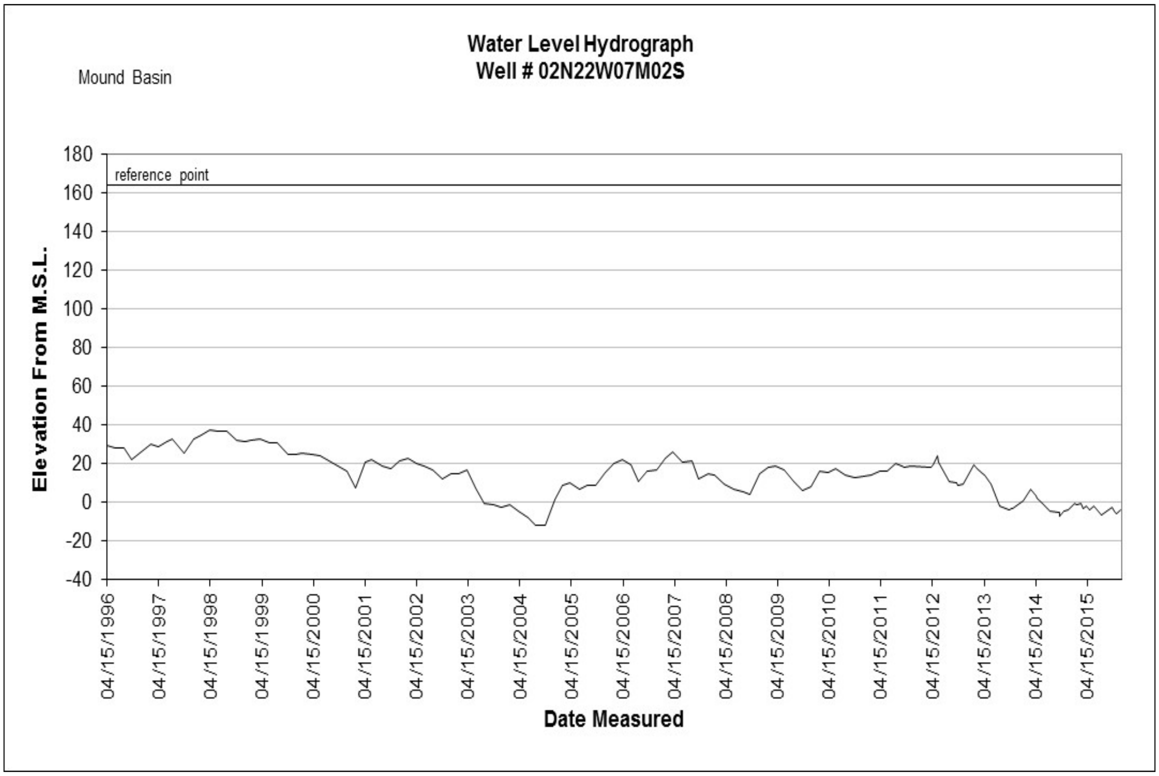

Figure B-24: Mound Basin Key Well Hydrograph.

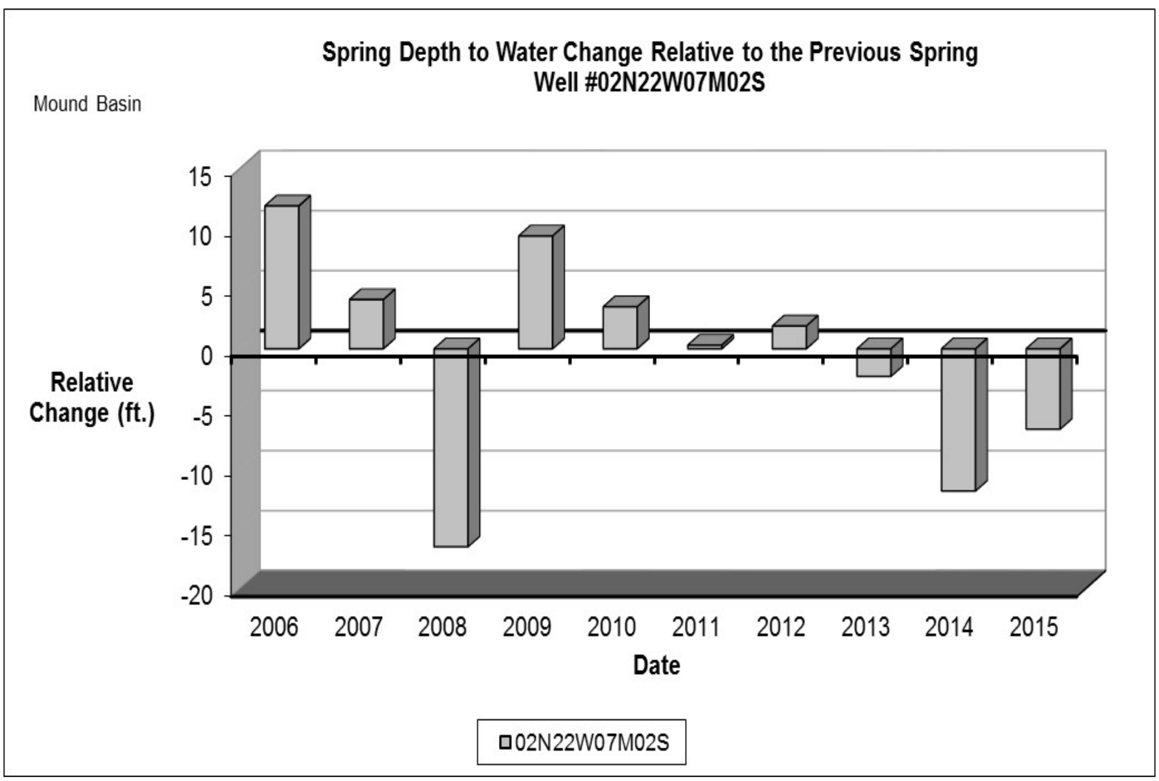

Figure B-25: Mound Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

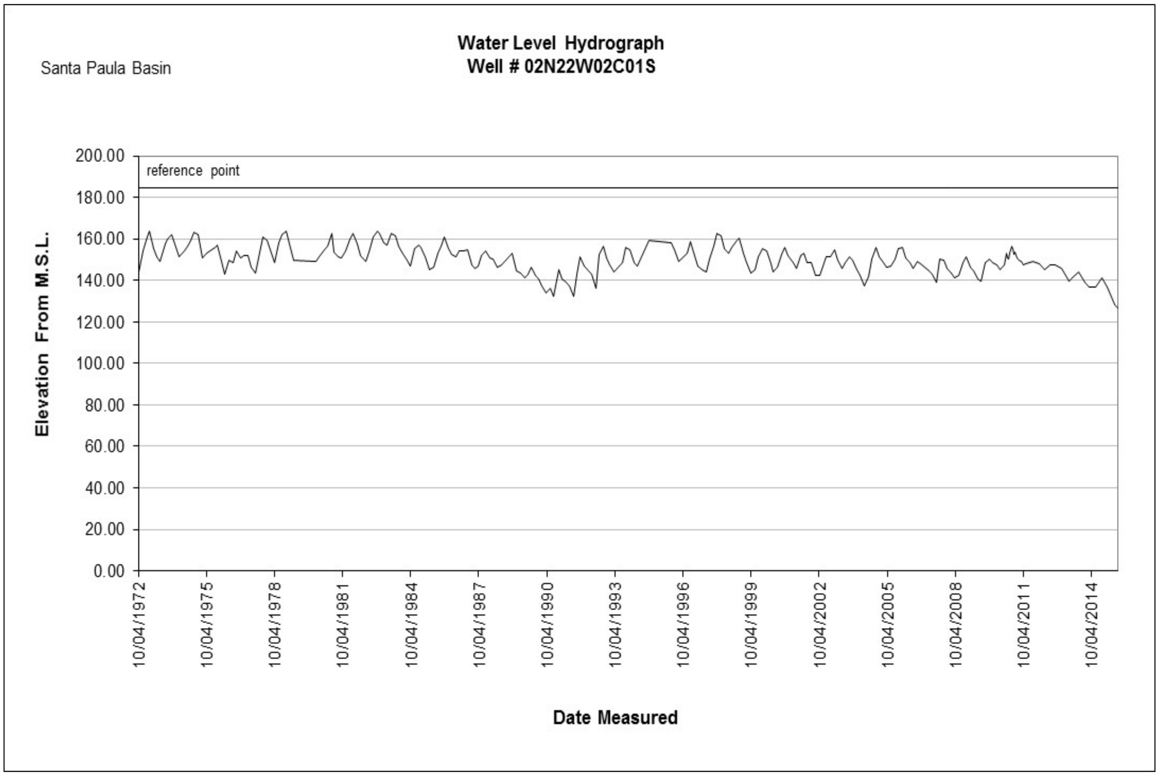

Figure B-26: Santa Paula Basin Key Well Hydrograph.

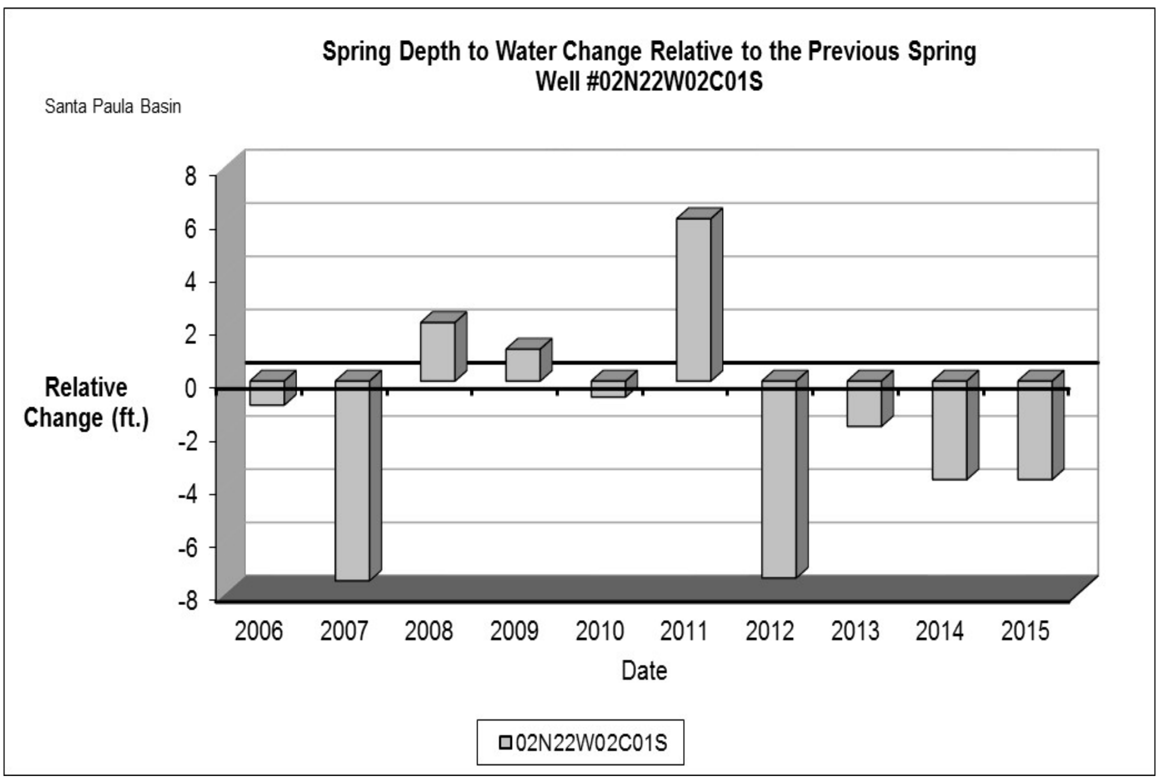

Figure B-27: Santa Paula Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

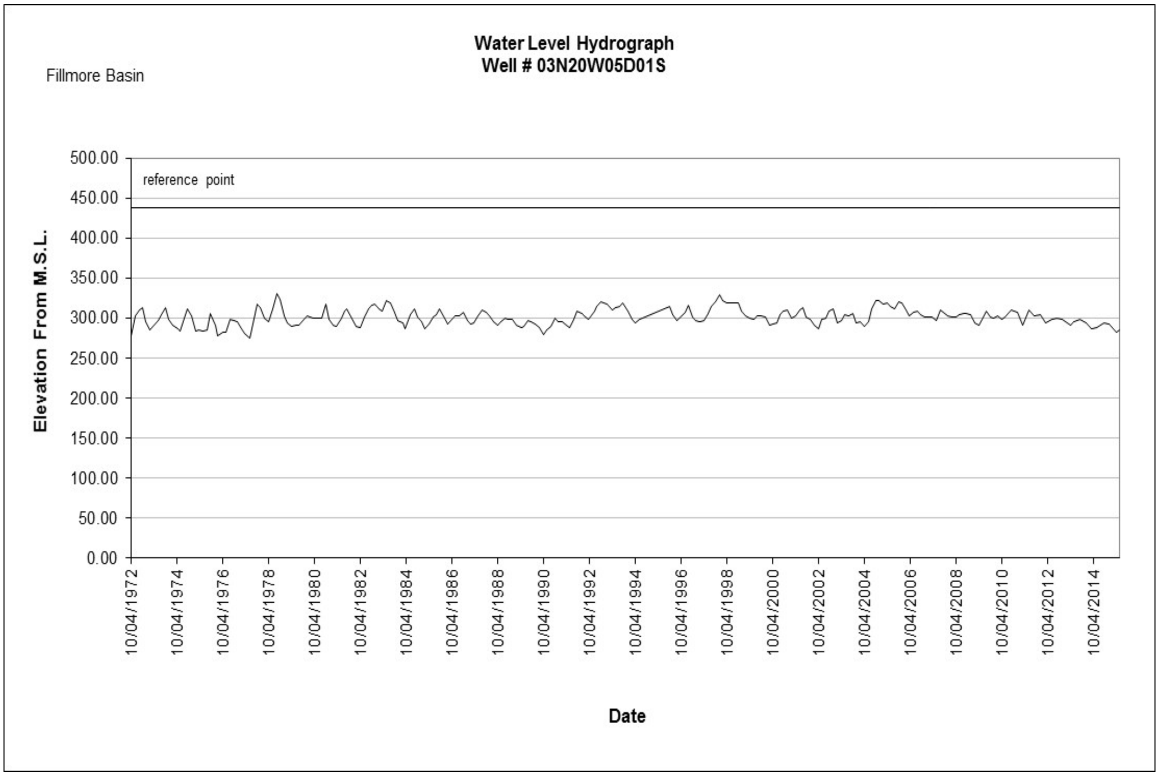

Figure B-28: Fillmore Basin Key Well Hydrograph.

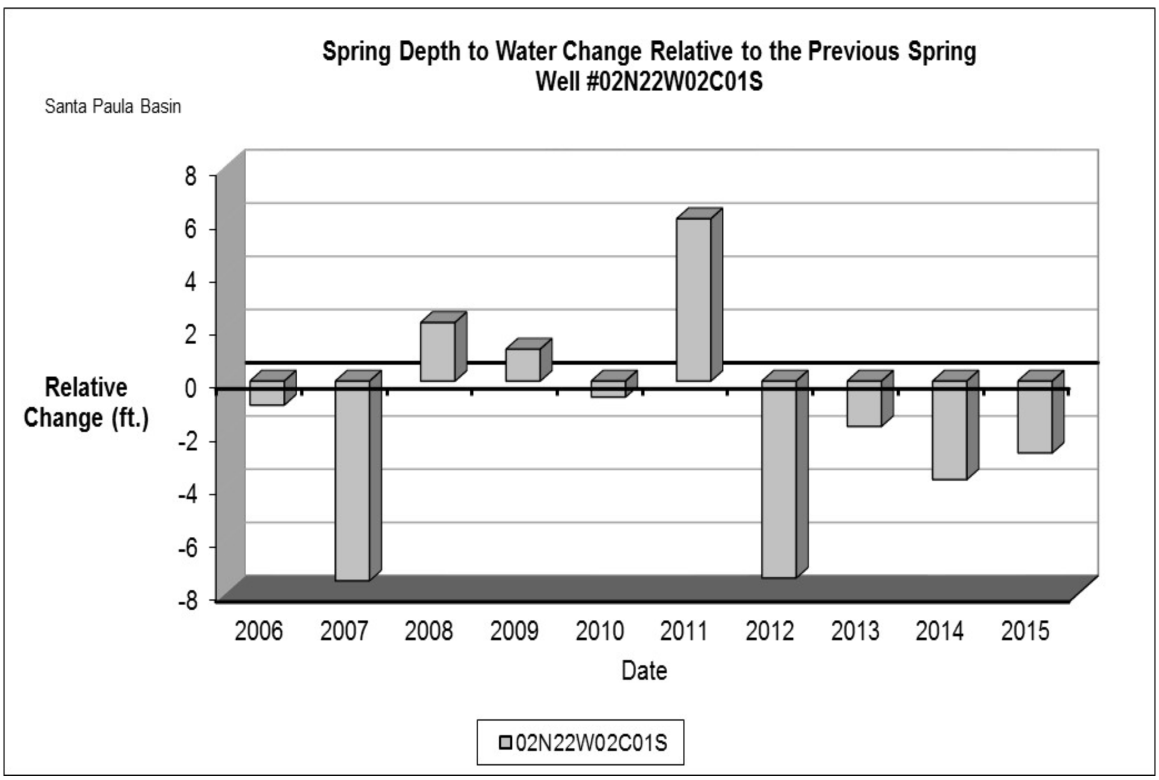

Figure B-29: Fillmore Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

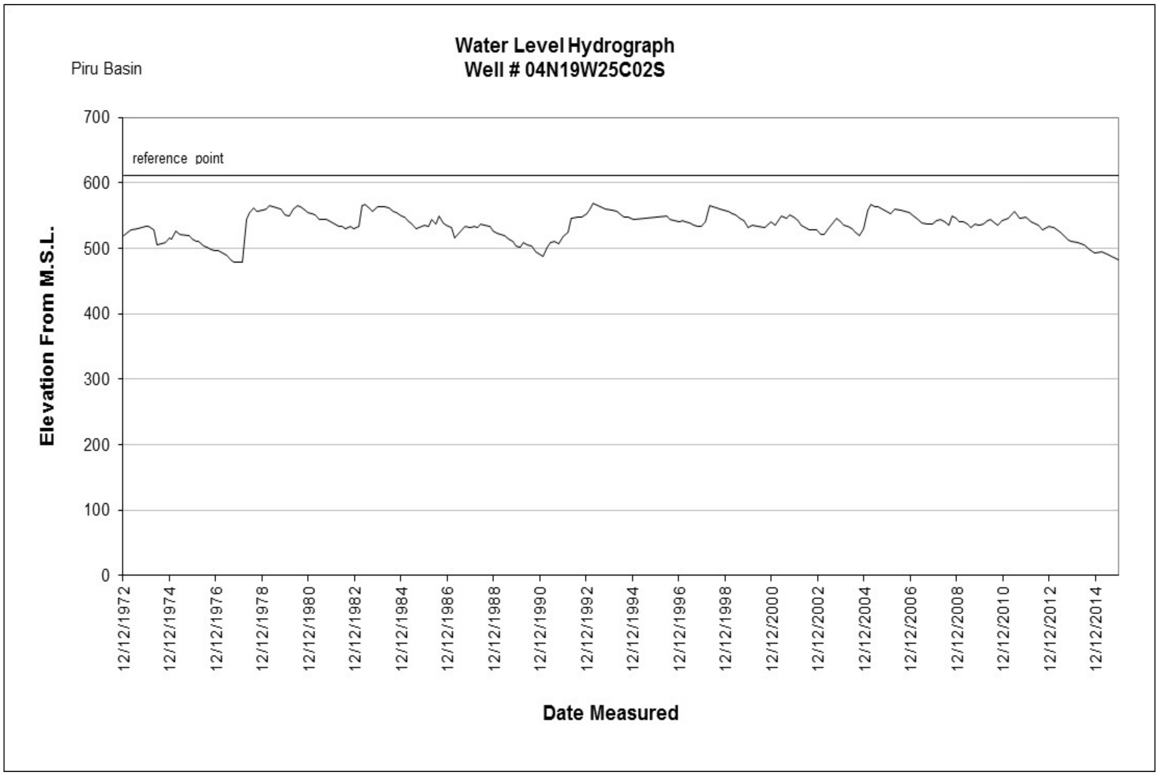

Figure B-30: Piru Basin Key Well Hydrograph.

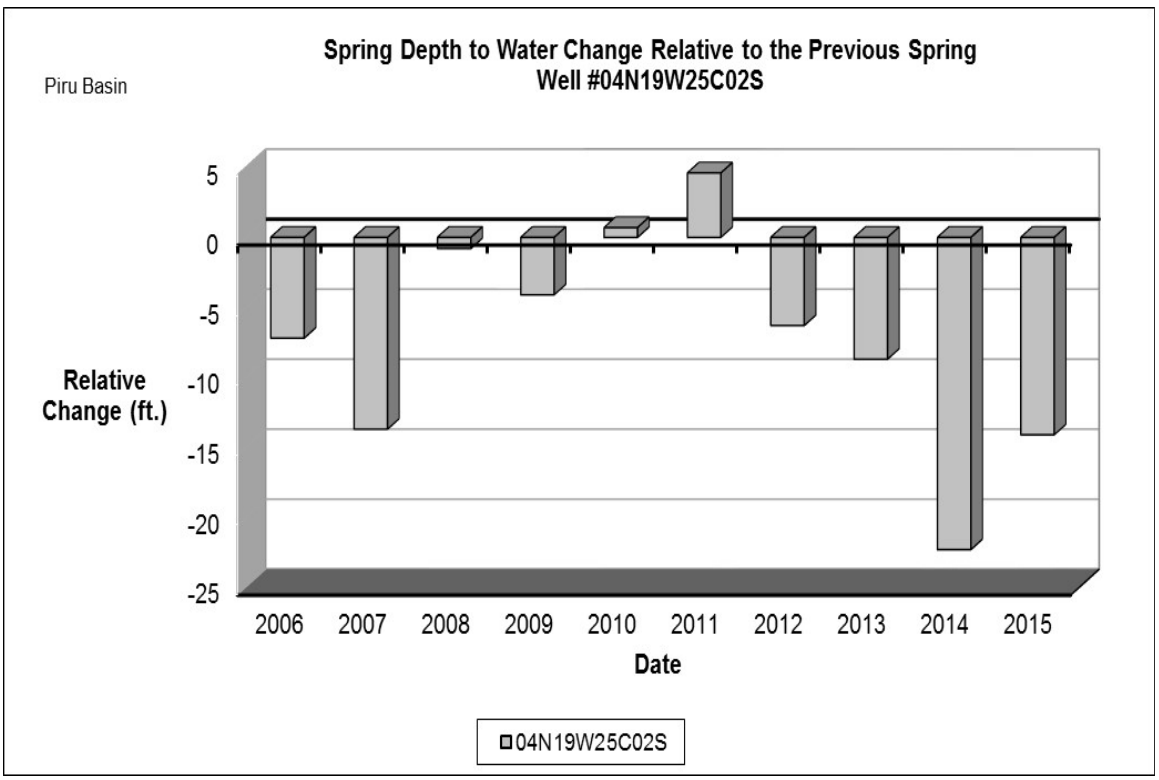

Figure B-31: Piru Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

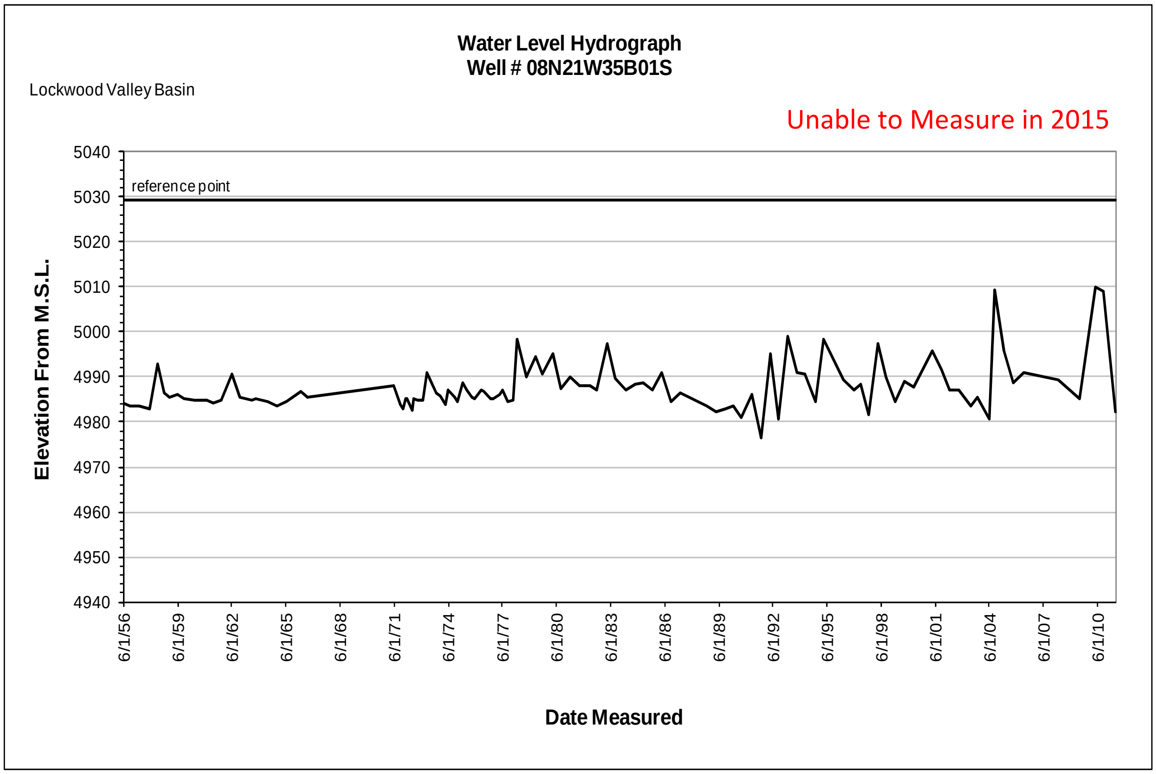

Figure B-32: Lockwood Valley Basin Key Well Hydrograph.

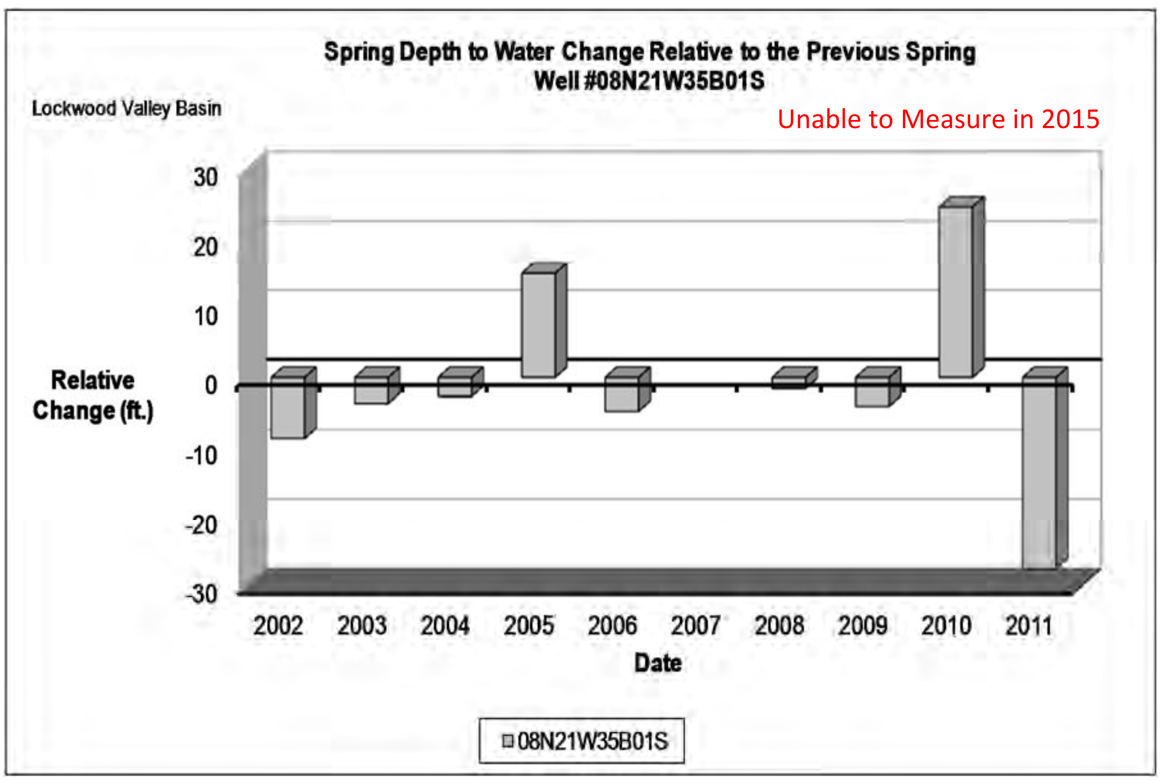

Figure B-33: Lockwood Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

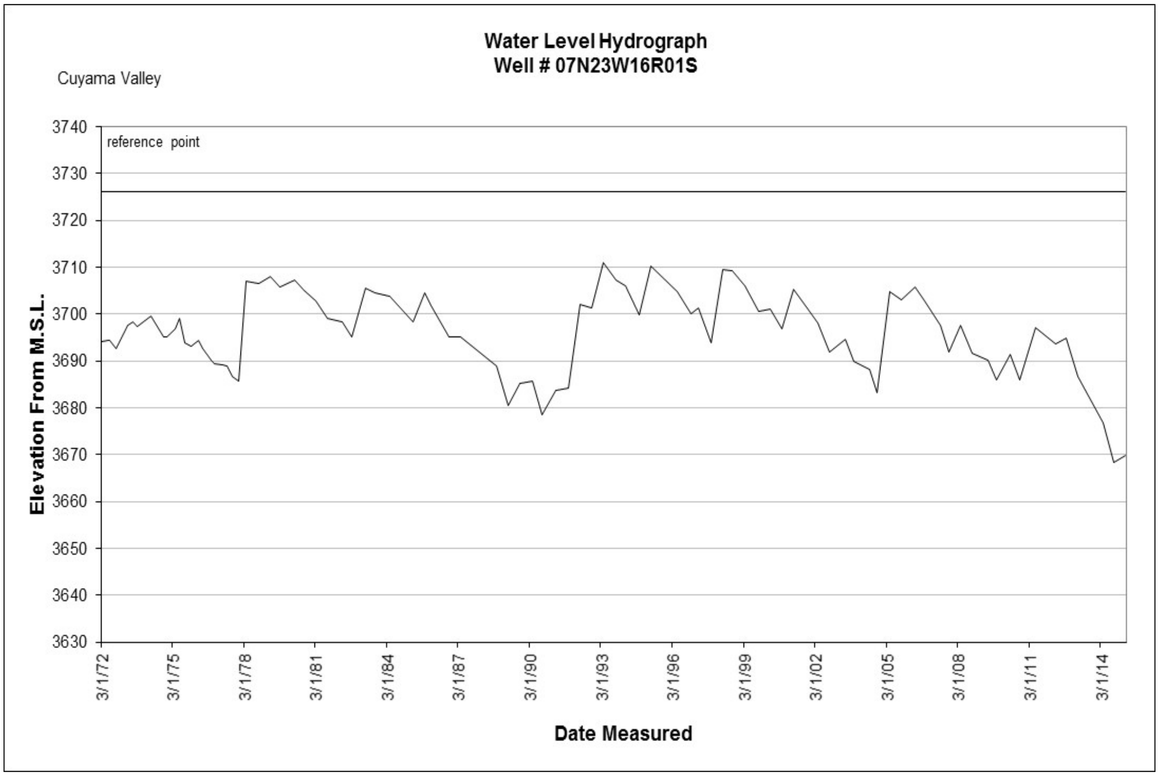

Figure B-34: Cuyama Valley Basin Key Well Hydrograph.

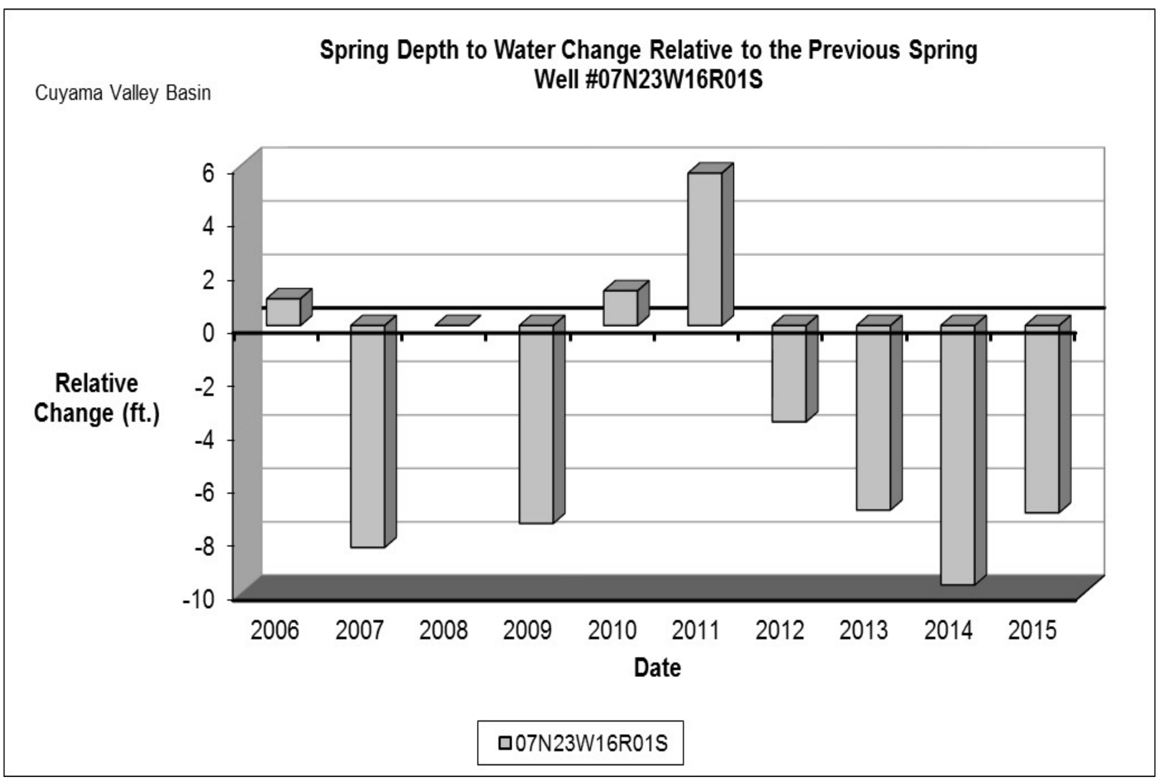

Figure B-35: Cuyama Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Arroyo Santa Rosa	02N19W20L01S	03/18/2015	307.66	63.30	244.36	
		06/17/2015	307.66	63.30	244.36	
		10/13/2015	307.66	NM	-----	Pumping
		12/07/2015	307.66	NM	-----	Pumping
	02N20W23G01S	03/18/2015	370.80	283.75	87.05	
		06/17/2015	370.80	287.85	82.95	
		10/13/2015	370.80	288.50	82.30	
		12/07/2015	370.80	289.50	81.30	
	02N20W23K01S	03/18/2015	274.11	201.86	72.25	
		06/17/2015	274.11	205.25	68.86	
		10/13/2015	274.11	213.00	61.11	
		12/07/2015	274.11	214.20	59.91	
	02N20W23R01S	03/18/2015	235.21	NM	-----	Pumping
		06/17/2015	235.21	89.65	145.56	
		10/13/2015	235.21	NM	-----	Pumping
		12/07/2015	235.21	NM	-----	Pumping
	02N20W26B03S*	03/18/2015	205.87	55.08	150.79	
		06/17/2015	205.87	57.30	148.57	
		10/13/2015	205.87	63.70	142.17	
		12/07/2015	205.87	58.10	147.77	
Conejo Valley	01N19W07K16S	03/12/2015	635.46	9.30	626.16	
		06/10/2015	635.46	10.70	624.76	
		10/23/2015	635.46	12.60	622.86	
		12/29/2015	635.46	12.80	622.66	
	01N20W03J01S	03/12/2015	764.40	47.70	716.70	
		06/10/2015	764.40	52.10	712.30	
		11/04/2015	764.40	56.90	707.50	
		12/29/2015	764.40	58.40	706.00	
Cuyama Valley	07N23W16R01S*	03/27/2015	3,726.00	56.10	3,669.90	
		09/16/2015	3,726.00	NM	-----	Special
		11/05/2015	3,726.00	59.20	3,666.80	
	07N23W16R02S	03/27/2015	3,726.00	NM	-----	Pumping
		11/05/2015	3,726.00	NM	-----	Special
	07N24W13C03S	03/27/2015	3,435.00	46.30	3,388.70	
		09/16/2015	3,435.00	NM	-----	Special
		11/05/2015	3,435.00	50.00	3,385.00	
	09N24W33J03S	03/27/2015	3,130.00	NM	-----	Pumping
		11/05/2015	3,130.00	161.70	2,968.30	
Fillmore	03N19W06D02S	03/16/2015	434.60	NM	-----	Pumping
		06/15/2015	434.60	79.20	355.40	
		10/12/2015	434.60	87.33	347.27	
		12/02/2015	434.60	90.30	344.30	
	03N20W01C04S	03/16/2015	404.58	49.08	355.50	
		06/15/2015	404.58	53.50	351.08	
		10/12/2015	404.58	60.10	344.48	
		12/02/2015	404.58	61.55	343.03	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fillmore	03N20W05D01S*	03/16/2015	437.12	143.27	293.85	
		06/15/2015	437.12	144.30	292.82	
		10/14/2015	437.12	154.77	282.35	
		12/02/2015	437.12	151.58	285.54	
	03N20W09D01S	03/16/2015	325.20	NM	-----	Pumping
		06/15/2015	325.20	NM	-----	Pumping
		10/12/2015	325.20	23.80	301.40	
		12/02/2015	325.20	25.53	299.67	
	03N20W11C01S	03/16/2015	397.11	59.20	337.91	
		06/15/2015	397.11	64.00	333.11	
		10/12/2015	397.11	NM	-----	Pumping
		12/02/2015	397.11	72.70	324.41	
	03N21W01P02S	03/16/2015	301.85	48.10	253.75	
		06/15/2015	301.85	51.30	250.55	
		10/12/2015	301.85	54.60	247.25	
		12/02/2015	301.85	57.40	244.45	
	03N21W11B01S	03/16/2015	336.24	96.00	240.24	
		06/15/2015	336.24	98.20	238.04	
		10/14/2015	336.24	105.90	230.34	
		12/03/2015	336.24	105.40	230.84	
	04N19W30D01S	03/16/2015	434.43	62.50	371.93	
		06/15/2015	434.43	NM	-----	Pumping
		10/12/2015	434.43	NM	-----	Tape Hung Up
		12/02/2015	434.43	NM	-----	Pumping
	04N19W31R01S	03/16/2015	448.85	NM	-----	Pumping
		06/15/2015	448.85	NM	-----	Pumping
		10/12/2015	448.85	NM	-----	Pumping
		12/02/2015	448.85	NM	-----	Pumping
	04N19W32M02S	03/16/2015	449.46	NM	-----	Pumping
		06/15/2015	449.46	NM	-----	Pumping
		10/12/2015	449.46	NM	-----	Pumping
		12/02/2015	449.46	NM	-----	Pumping
	04N19W33D03S	03/16/2015	477.43	18.40	459.03	
		06/15/2015	477.43	NM	-----	Pumping
		10/12/2015	477.43	NM	-----	Pumping
		12/02/2015	477.43	NM	-----	Pumping
	04N19W33D04S	03/16/2015	477.90	NM	-----	Pumping
		06/15/2015	477.90	20.95	456.95	
		10/12/2015	477.90	25.15	452.75	
		12/02/2015	477.90	26.50	451.40	
	04N20W23Q02S	03/16/2015	513.88	141.57	372.31	
		06/15/2015	513.88	149.40	364.48	
		10/14/2015	513.88	NM	-----	Pumping
		12/02/2015	513.88	160.32	353.56	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fillmore	04N20W26C02S	03/16/2015	505.35	147.80	357.55	
		06/15/2015	505.35	123.70	381.65	
		10/14/2015	505.35	161.40	343.95	
		12/02/2015	505.35	163.00	342.35	
	04N20W33C03S	03/16/2015	526.87	NM	-----	Special
		06/15/2015	526.87	NM	-----	Pumping
		10/14/2015	526.87	NM	-----	Pumping
		12/02/2015	526.87	NM	-----	Pumping
Las Posas - East	02N20W01M01S	03/10/2015	470.05	NM	-----	Inaccessible
		10/22/2015	470.05	NM	-----	Special
		12/22/2015	470.05	NM	-----	Special
	02N20W03K03S	03/10/2015	485.50	NM	-----	Special
		10/22/2015	485.50	NM	-----	Special
		12/22/2015	485.50	NM	-----	Special
	02N20W10D02S	03/10/2015	459.53	294.00	165.53	
		06/08/2015	459.53	309.10	150.43	
		10/27/2015	459.53	309.00	150.53	
		12/22/2015	459.53	112.80	346.73	
	02N20W10G01S	03/10/2015	415.47	155.90	259.57	
		06/08/2015	415.47	160.90	254.57	
		10/27/2015	415.47	170.70	244.77	
		12/24/2015	415.47	167.90	247.57	
	02N20W10J01S	03/10/2015	406.87	121.10	285.77	
		06/04/2015	406.87	123.70	283.17	
		10/27/2015	406.87	127.60	279.27	
		12/22/2015	406.87	127.80	279.07	
	03N19W17Q01S	10/15/2015	1,311.06	1,098.90	212.16	
		12/22/2015	1,311.06	NM	-----	Inaccessible
	03N19W19J01S	03/09/2015	1,026.90	847.20	179.70	
		06/05/2015	1,026.90	845.80	181.10	
		10/21/2015	1,026.90	850.70	176.20	
		12/21/2015	1,026.90	854.10	172.80	
	03N19W19P02S	03/09/2015	1,057.94	NM	-----	Special
		10/21/2015	1,057.94	NM	-----	Special
		12/21/2015	1,057.94	NM	-----	Inaccessible
	03N19W29F06S	03/09/2015	855.20	253.70	601.50	
		06/05/2015	855.20	256.80	598.40	
		10/21/2015	855.20	275.20	580.00	
		12/21/2015	855.20	273.20	582.00	
	03N19W29K04S	03/13/2015	843.32	NM	-----	Special
		10/29/2015	843.32	NM	-----	Special
		12/22/2015	843.32	NM	-----	Inaccessible
	03N20W23L01S	03/10/2015	970.30	NM	-----	Special
		10/21/2015	970.30	NM	-----	Special
		12/21/2015	970.30	NM	-----	Inaccessible

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Las Posas - East	03N20W25H01S	03/10/2015	823.84	NM	-----	Pumping
		06/08/2015	823.84	217.90	605.94	
		10/21/2015	823.84	NM	-----	Pumping
		12/21/2015	823.84	218.40	605.44	
	03N20W26R03S*	03/10/2015	717.81	571.30	146.51	
		06/05/2015	717.81	587.00	130.81	
		11/02/2015	717.81	585.90	131.91	
		12/21/2015	717.81	586.80	131.01	
	03N20W27H03S	03/09/2015	840.25	631.90	208.35	
		06/05/2015	840.25	632.30	207.95	
		10/27/2015	840.25	637.90	202.35	
		12/21/2015	840.25	640.30	199.95	
	03N20W34G01S	03/09/2015	680.48	535.40	145.08	
		06/05/2015	680.48	NM	-----	Pumping
		10/29/2015	680.48	538.60	141.88	
		12/21/2015	680.48	538.70	141.78	
	03N20W35R02S	03/09/2015	572.67	416.10	156.57	
		10/29/2015	572.67	444.70	127.97	
		12/21/2015	572.67	NM	-----	Special
	03N20W35R03S	03/09/2015	572.67	417.10	155.57	
		06/04/2015	572.67	431.30	141.37	
		10/29/2015	572.67	436.10	136.57	
		12/21/2015	572.67	430.30	142.37	
	03N20W35R04S	03/09/2015	572.67	301.50	271.17	
		10/29/2015	572.67	308.00	264.67	
		12/21/2015	572.67	NM	-----	Special
Las Posas - South	02N19W05K01S*	03/13/2015	497.80	28.10	469.70	
		10/29/2015	497.80	28.10	469.70	
		12/22/2015	497.80	28.75	469.05	
	02N19W08H02S	03/13/2015	494.87	23.80	471.07	
		10/29/2015	494.87	24.10	470.77	
		12/22/2015	494.87	23.80	471.07	
Las Posas - West	02N20W05D01S	12/21/2015	569.00	693.10	-124.10	
	02N20W06R01S	03/09/2015	461.19	585.40	-124.21	
		06/04/2015	461.19	585.70	-124.51	
		10/27/2015	461.19	594.70	-133.51	
		12/24/2015	461.19	592.70	-131.51	
	02N20W07R02S	03/16/2015	395.00	533.70	-138.70	
		10/22/2015	395.00	534.80	-139.80	
		12/22/2015	395.00	536.10	-141.10	
	02N21W08H03S	12/21/2015	334.21	397.90	-63.69	
	02N21W09D02S	03/09/2015	323.75	323.80	-0.05	
		06/01/2015	323.75	314.60	9.15	
		10/27/2015	323.75	323.80	-0.05	
		12/14/2015	323.75	309.96	13.79	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Las Posas - West	02N21W10G03S	03/09/2015	381.01	375.50	5.51	
		06/23/2015	381.01	390.50	-9.49	
		10/28/2015	381.01	398.60	-17.59	
		12/24/2015	381.01	397.60	-16.59	
	02N21W11J03S	03/16/2015	379.39	430.40	-51.01	
		06/04/2015	379.39	443.70	-64.31	
		10/22/2015	379.39	448.40	-69.01	
		12/24/2015	379.39	448.80	-69.41	
	02N21W11J04S	03/16/2015	379.39	388.00	-8.61	
		06/04/2015	379.39	391.20	-11.81	
		10/22/2015	379.39	395.70	-16.31	
		12/24/2015	379.39	395.60	-16.21	
	02N21W11J05S	03/16/2015	379.39	206.70	172.69	
		06/04/2015	379.39	206.50	172.89	
		10/22/2015	379.39	209.90	169.49	
		12/24/2015	379.39	210.40	168.99	
	02N21W11J06S	03/16/2015	379.39	177.90	201.49	
		06/04/2015	379.39	177.40	201.99	
		10/22/2015	379.39	178.40	200.99	
		12/24/2015	379.39	179.50	199.89	
	02N21W12H01S*	03/16/2015	417.89	NM	-----	Pumping
		10/22/2015	417.89	NM	-----	Pumping
		12/24/2015	417.89	NM	-----	Pumping
	02N21W15M03S	03/09/2015	263.87	287.70	-23.83	
		06/05/2015	263.87	324.60	-60.73	
		10/22/2015	263.87	317.50	-53.63	
		12/21/2015	263.87	315.50	-51.63	
	02N21W16J01S	03/09/2015	259.90	15.50	244.40	
		06/04/2015	259.90	16.60	243.30	
		10/22/2015	259.90	17.20	242.70	
		12/21/2015	259.90	17.40	242.50	
	03N20W32H03S	03/09/2015	673.00	0.00	673.00	
		06/05/2015	673.00	725.10	-52.10	
		10/21/2015	673.00	783.80	-110.80	
		12/21/2015	673.00	807.50	-134.50	
	03N21W35P02S	03/09/2015	564.11	498.50	65.61	
		06/04/2015	564.11	506.50	57.61	
		10/27/2015	564.11	517.90	46.21	
		12/21/2015	564.11	523.20	40.91	
Little Cuddy Valley	08N20W08B01S	03/27/2015	5,300.00	15.70	5,284.30	
		11/05/2015	5,300.00	18.10	5,281.90	
Lockwood Valley	08N21W33R03S	03/27/2015	5,150.00	45.10	5,104.90	
		11/05/2015	5,150.00	46.30	5,103.70	
	08N21W35B01S*	03/27/2015	5,029.20	NM	-----	Tape Hung Up
		11/05/2015	5,029.20	NM	-----	Tape Hung Up
	08N21W36G02S	03/27/2015	4,922.00	27.40	4,894.60	
		11/05/2015	4,922.00	30.50	4,891.50	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Mound	02N22W08P01S	03/18/2015	213.79	180.65	33.14	
		06/15/2015	213.79	180.65	33.14	
		10/14/2015	213.79	178.34	35.45	
		12/03/2015	213.79	173.72	40.07	
	02N22W09L03S	03/16/2015	251.25	197.75	53.50	
		06/15/2015	251.25	195.60	55.65	
		10/14/2015	251.25	196.00	55.25	
		12/03/2015	251.25	196.67	54.58	
	02N22W09L04S	03/16/2015	251.25	180.67	70.58	
		06/15/2015	251.25	182.85	68.40	
		10/14/2015	251.25	181.74	69.51	
		12/03/2015	251.25	182.45	68.80	
	02N22W16K01S	03/16/2015	149.37	175.66	-26.29	
		06/15/2015	149.37	178.20	-28.83	
		10/14/2015	149.37	185.80	-36.43	
		12/03/2015	149.37	185.25	-35.88	
	02N23W13K03S	03/17/2015	68.71	79.50	-10.79	
		06/15/2015	68.71	NM	-----	Pumping
		10/16/2015	68.71	82.00	-13.29	
		12/08/2015	68.71	NM	-----	Pumping
Ojai Valley	04N22W04Q01S	03/05/2015	1,045.50	99.10	946.40	
		06/24/2015	1,045.50	NM	-----	Pumping
		11/06/2015	1,045.50	114.00	931.50	
		12/18/2015	1,045.50	115.20	930.30	
	04N22W05D03S	03/05/2015	895.97	NM	-----	Tape Hung Up
		10/27/2015	895.97	NM	-----	Tape Hung Up
		12/18/2015	895.97	NM	-----	Tape Hung Up
	04N22W05H04S	03/05/2015	950.22	342.20	608.02	
		06/24/2015	950.22	NM	-----	Pumping
		11/06/2015	950.22	NM	-----	Pumping
		12/18/2015	950.22	NM	-----	Pumping
	04N22W05L08S*	03/05/2015	892.09	231.30	660.79	
		06/24/2015	892.09	248.60	643.49	
		11/06/2015	892.09	260.70	631.39	
		12/17/2015	892.09	287.10	604.99	
	04N22W05M01S	03/04/2015	843.47	195.20	648.27	
		06/11/2015	843.47	197.50	645.97	
		10/26/2015	843.47	NM	-----	Tape Hung Up
		12/16/2015	843.47	NM	-----	Pumping
	04N22W06D01S	03/04/2015	846.66	147.30	699.36	
		06/11/2015	846.66	150.60	696.06	
		11/03/2015	846.66	152.20	694.46	
		12/16/2015	846.66	152.50	694.16	
	04N22W06D05S	03/04/2015	853.21	166.60	686.61	
		06/11/2015	853.21	165.50	687.71	
		11/03/2015	853.21	177.40	675.81	
		12/16/2015	853.21	177.30	675.91	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Ojai Valley	04N22W06K03S	02/28/2015	801.80	172.00	629.80	
		06/19/2015	801.80	204.00	597.80	
		11/03/2015	801.80	NM	-----	Special
		11/23/2015	801.80	223.00	578.80	
	04N22W06K12S	03/04/2015	812.70	180.50	632.20	
		06/03/2015	812.70	207.70	605.00	
		10/27/2015	812.70	224.80	587.90	
		12/17/2015	812.70	231.90	580.80	
	04N22W06M01S	03/04/2015	794.78	97.80	696.98	
		06/03/2015	794.78	97.60	697.18	
		10/28/2015	794.78	97.80	696.98	
		12/16/2015	794.78	99.60	695.18	
	04N22W07B02S	03/04/2015	773.77	122.00	651.77	
		06/02/2015	773.77	156.40	617.37	
		10/26/2015	773.77	160.70	613.07	
		12/16/2015	773.77	161.70	612.07	
	04N22W07G01S	03/04/2015	771.20	NM	-----	Tape Hung Up
		06/02/2015	771.20	98.80	672.40	
		11/03/2015	771.20	0.00	771.20	
		12/16/2015	771.20	NM	-----	Tape Hung Up
	04N22W08B02S	03/11/2015	870.57	207.10	663.47	
		06/24/2015	870.57	NM	-----	Pumping
		11/06/2015	870.57	248.80	621.77	
		12/18/2015	870.57	235.20	635.37	
	04N23W01K02S	03/04/2015	786.38	58.00	728.38	
		06/03/2015	786.38	75.80	710.58	
		10/28/2015	786.38	64.90	721.48	
		12/16/2015	786.38	62.90	723.48	
	04N23W02K01S	03/05/2015	869.49	2.75	866.74	
		10/28/2015	869.49	9.70	859.79	
		12/16/2015	869.49	9.40	860.09	
	04N23W12H02S	03/13/2015	716.61	48.50	668.11	
		06/02/2015	716.61	52.20	664.41	
		11/03/2015	716.61	54.80	661.81	
		12/16/2015	716.61	55.20	661.41	
	04N23W12L02S	03/05/2015	682.50	NM	-----	Tape Hung Up
		06/11/2015	682.50	NM	-----	Tape Hung Up
		11/03/2015	682.50	21.70	660.80	
		12/15/2015	682.50	NM	-----	Inaccessible
	05N22W32J02S	03/11/2015	1,139.80	58.10	1,081.70	
		06/24/2015	1,139.80	59.70	1,080.10	
		10/27/2015	1,139.80	59.00	1,080.80	
		12/17/2015	1,139.80	58.80	1,081.00	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Oxnard Plain Forebay	02N21W07P04S	03/09/2015	138.78	NM	-----	Pumping
		06/04/2015	138.78	NM	-----	Pumping
		10/27/2015	138.78	NM	-----	Pumping
		12/21/2015	138.78	NM	-----	Special
	02N22W11A01S	03/16/2015	133.44	100.36	33.08	
		06/15/2015	133.44	105.35	28.09	
		10/14/2015	133.44	109.00	24.44	
		12/03/2015	133.44	111.36	22.08	
	02N22W26E01S	03/18/2015	86.96	100.05	-13.09	
		06/17/2015	86.96	103.20	-16.24	
		10/14/2015	86.96	106.83	-19.87	
		12/09/2015	86.96	108.96	-22.00	
Oxnard Plain Pressure	01N21W04N02S	03/17/2015	43.33	139.78	-96.45	
		06/16/2015	43.33	155.67	-112.34	
		10/15/2015	43.33	181.55	-138.22	
		12/09/2015	43.33	190.65	-147.32	
	01N21W05A02S	03/18/2015	51.54	NM	-----	Destroyed
	01N21W06L04S	03/17/2015	47.85	63.15	-15.30	
		06/17/2015	47.85	66.70	-18.85	
		10/15/2015	47.85	72.85	-25.00	
		12/09/2015	47.85	70.70	-22.85	
	01N21W07H01S*	03/17/2015	40.87	53.82	-12.95	
		06/17/2015	40.87	58.00	-17.13	
		10/15/2015	40.87	63.45	-22.58	
		12/09/2015	40.87	60.33	-19.46	
	01N21W09C04S	03/17/2015	39.96	132.60	-92.64	
		06/16/2015	39.96	144.32	-104.36	
		10/15/2015	39.96	171.67	-131.71	
		12/09/2015	39.96	183.45	-143.49	
	01N21W16M01S	03/17/2015	22.79	127.42	-104.63	
		06/16/2015	22.79	134.83	-112.04	
		10/15/2015	22.79	175.50	-152.71	
		12/08/2015	22.79	179.20	-156.41	
	01N21W16P03S	03/17/2015	19.39	126.36	-106.97	
		06/16/2015	19.39	140.83	-121.44	
		10/15/2015	19.39	176.25	-156.86	
		12/08/2015	19.39	174.20	-154.81	
	01N21W17D02S	03/17/2015	28.21	47.00	-18.79	
		06/16/2015	28.21	47.05	-18.84	
		10/15/2015	28.21	NM	-----	Pumping
		12/09/2015	28.21	49.20	-20.99	
	01N21W20N07S	03/19/2015	16.98	NM	-----	Special
		06/16/2015	16.98	NM	-----	Special
		10/16/2015	16.98	NM	-----	Special
		12/08/2015	16.98	NM	-----	Special

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Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Oxnard Plain Pressure	01N21W21N01S	03/17/2015	15.74	74.30	-58.56	
		06/16/2015	15.74	91.80	-76.06	
		10/15/2015	15.74	111.00	-95.26	
		12/08/2015	15.74	117.00	-101.26	
	01N21W28D01S	03/17/2015	14.75	97.88	-83.13	
		06/16/2015	14.75	116.60	-101.85	
		10/15/2015	14.75	NM	-----	Pumping
		12/08/2015	14.75	NM	-----	Pumping
	01N21W29B03S	03/17/2015	18.19	36.36	-18.17	
		06/16/2015	18.19	NM	-----	Pumping
		10/16/2015	18.19	NM	-----	Pumping
		12/08/2015	18.19	47.04	-28.85	
	01N21W32K01S*	03/09/2015	10.00	78.20	-68.20	
		06/15/2015	10.00	101.50	-91.50	
		10/19/2015	10.00	122.40	-112.40	
		12/14/2015	10.00	124.70	-114.70	
	01N22W12N03S	03/18/2015	38.46	108.36	-69.90	
		06/18/2015	38.46	122.89	-84.43	
		10/13/2015	38.46	143.05	-104.59	
		12/09/2015	38.46	147.10	-108.64	
	01N22W12R01S	03/18/2015	34.00	NM	-----	Special
		06/17/2015	34.00	NM	-----	Special
		10/13/2015	34.00	NM	-----	Special
		12/09/2015	34.00	117.17	-83.17	
	01N22W14K01S	03/17/2015	33.97	NM	-----	Tape Hung Up
		06/16/2015	33.97	NM	-----	Tape Hung Up
		10/16/2015	33.97	86.80	-52.83	
		12/08/2015	33.97	55.65	-21.68	
	01N22W21B03S	03/17/2015	15.28	43.33	-28.05	
		06/16/2015	15.28	47.52	-32.24	
		10/16/2015	15.28	53.14	-37.86	
		12/08/2015	15.28	54.00	-38.72	
	01N22W24C02S	03/17/2015	29.10	45.47	-16.37	
		06/16/2015	29.10	47.52	-18.42	
		10/16/2015	29.10	38.28	-9.18	
		12/08/2015	29.10	30.60	-1.50	
	01N22W26K03S	03/17/2015	13.06	78.70	-65.64	
		06/16/2015	13.06	84.90	-71.84	
		10/16/2015	13.06	NM	-----	Pumping
		12/08/2015	13.06	NM	-----	Pumping
	01N22W26M03S	03/17/2015	13.00	NM	-----	Pumping
		06/18/2015	13.00	78.90	-65.90	
		10/16/2015	13.00	NM	-----	Pumping
		12/08/2015	13.00	NM	-----	Pumping
	01N22W36B02S	03/17/2015	11.50	NM	-----	Pumping
		06/18/2015	11.50	82.20	-70.70	
		10/16/2015	11.50	NM	-----	Pumping
		12/08/2015	11.50	NM	-----	Pumping

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Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Oxnard Plain Pressure	02N21W18H03S	03/23/2015	118.41	123.10	-4.69	
		06/22/2015	118.41	137.25	-18.84	
		10/26/2015	118.41	126.60	-8.19	
		12/14/2015	118.41	124.00	-5.59	
	02N21W18H12S	03/09/2015	117.88	150.60	-32.72	
		06/01/2015	117.88	164.50	-46.62	
		10/26/2015	117.88	175.10	-57.22	
		12/14/2015	117.88	169.40	-51.52	
	02N21W19A03S	03/09/2015	102.70	122.70	-20.00	
		06/04/2015	102.70	137.40	-34.70	
		10/21/2015	102.70	156.10	-53.40	
		12/22/2015	102.70	138.50	-35.80	
	02N21W19B02S	03/18/2015	101.80	105.17	-3.37	
		06/17/2015	101.80	108.80	-7.00	
		10/14/2015	101.80	112.20	-10.40	
		12/09/2015	101.80	114.10	-12.30	
	02N21W20F02S	03/10/2015	113.36	159.30	-45.94	
		06/04/2015	113.36	172.80	-59.44	
		10/27/2015	113.36	197.10	-83.74	
		12/22/2015	113.36	178.20	-64.84	
	02N21W20M06S	03/18/2015	92.09	NM	-----	Pumping
		06/17/2015	92.09	NM	-----	Pumping
		10/14/2015	92.09	NM	-----	Pumping
		12/07/2015	92.09	160.90	-68.81	
	02N21W31P02S	03/17/2015	57.75	68.62	-10.87	
		06/17/2015	57.75	72.42	-14.67	
		10/15/2015	57.75	NM	-----	Pumping
		12/09/2015	57.75	77.00	-19.25	
	02N21W31P03S	03/17/2015	55.17	140.92	-85.75	
		06/17/2015	55.17	148.70	-93.53	
		10/15/2015	55.17	170.68	-115.51	
		12/09/2015	55.17	171.15	-115.98	
	02N22W24P01S	03/19/2015	94.30	113.64	-19.34	
		06/17/2015	94.30	NM	-----	Pumping
		10/14/2015	94.30	127.83	-33.53	
		12/09/2015	94.30	124.75	-30.45	
	02N22W30K01S	03/17/2015	42.38	60.67	-18.29	
		06/16/2015	42.38	62.70	-20.32	
		10/20/2015	42.38	68.25	-25.87	
		12/08/2015	42.38	69.20	-26.82	
	02N22W31A01S	03/17/2015	42.30	57.20	-14.90	
		06/16/2015	42.30	59.15	-16.85	
		10/20/2015	42.30	65.00	-22.70	
		12/08/2015	42.30	65.49	-23.19	
	02N22W32Q03S	03/17/2015	40.10	57.00	-16.90	
		06/16/2015	40.10	58.20	-18.10	
		10/20/2015	40.10	64.00	-23.90	
		12/08/2015	40.10	NM	-----	Pumping

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Oxnard Plain Pressure	02N23W25G02S	03/17/2015	23.22	NM	-----	Special
		06/16/2015	23.22	NM	-----	Special
		10/20/2015	23.22	NM	-----	Special
		12/08/2015	23.22	NM	-----	Special
	02N23W36C04S	03/17/2015	27.73	NM	-----	Tape Hung Up
		06/16/2015	27.73	NM	-----	Tape Hung Up
		10/16/2015	27.73	NM	-----	Tape Hung Up
		12/08/2015	27.73	52.00	-24.27	
Piru	04N18W19R01S	03/16/2015	655.63	NM	-----	Pumping
		06/15/2015	655.63	150.00	505.63	
		10/12/2015	655.63	161.24	494.39	
		12/02/2015	655.63	163.80	491.83	
	04N18W20R01S	03/16/2015	661.29	NM	-----	Pumping
		06/15/2015	661.29	NM	-----	Pumping
		10/12/2015	661.29	NM	-----	Pumping
		12/02/2015	661.29	NM	-----	Pumping
	04N18W28C02S	03/16/2015	676.44	NM	-----	Pumping
		06/15/2015	676.44	NM	-----	Pumping
		10/12/2015	676.44	NM	-----	Pumping
		12/02/2015	676.44	177.10	499.34	
	04N19W25C02S*	03/16/2015	611.09	116.33	494.76	
		06/15/2015	611.09	119.60	491.49	
		10/12/2015	611.09	NM	-----	Pumping
		12/02/2015	611.09	128.30	482.79	
	04N19W25K04S	03/16/2015	593.97	41.45	552.52	
		06/15/2015	593.97	NM	-----	Pumping
		10/12/2015	593.97	42.45	551.52	
		12/02/2015	593.97	NM	-----	Pumping
	04N19W26P01S	03/16/2015	563.00	NM	-----	Pumping
		06/15/2015	563.00	77.00	486.00	
		10/12/2015	563.00	NM	-----	Pumping
		12/02/2015	563.00	NM	-----	Pumping
	04N19W34K01S	03/16/2015	519.51	41.12	478.39	
		06/15/2015	519.51	44.75	474.76	
		10/12/2015	519.51	50.00	469.51	
		12/02/2015	519.51	51.10	468.41	
	04N19W35L02S	03/16/2015	541.08	54.42	486.66	
		06/15/2015	541.08	58.35	482.73	
		10/12/2015	541.08	63.20	477.88	
		12/02/2015	541.08	64.80	476.28	
Pleasant Valley	01N21W02J02S	03/17/2015	89.51	79.83	9.68	
		06/16/2015	89.51	89.85	-0.34	
		10/13/2015	89.51	107.27	-17.76	
		12/08/2015	89.51	116.42	-26.91	
	01N21W02P01S	03/17/2015	67.98	121.43	-53.45	
		06/16/2015	67.98	140.47	-72.49	
		10/13/2015	67.98	159.75	-91.77	
		12/08/2015	67.98	174.30	-106.32	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Pleasant Valley	01N21W03C01S	03/18/2015	72.28	155.92	-83.64	
		06/17/2015	72.28	171.05	-98.77	
		10/15/2015	72.28	189.80	-117.52	
		12/07/2015	72.28	197.80	-125.52	
	01N21W04K01S	03/17/2015	47.52	137.60	-90.08	
		06/16/2015	47.52	150.85	-103.33	
		10/15/2015	47.52	NM	-----	Pumping
		12/08/2015	47.52	NM	-----	Pumping
	01N21W09J03S	03/19/2015	30.56	152.10	-121.54	
		06/25/2015	30.56	139.40	-108.84	
		10/16/2015	30.56	184.40	-153.84	
		12/16/2015	30.56	180.70	-150.14	
	01N21W10G01S	03/17/2015	38.72	NM	-----	Pumping
		06/16/2015	38.72	149.55	-110.83	
		10/15/2015	38.72	NM	-----	Pumping
		12/08/2015	38.72	NM	-----	Pumping
	01N21W14A01S	03/17/2015	50.11	18.40	31.71	
		06/16/2015	50.11	20.75	29.36	
		10/13/2015	50.11	23.95	26.16	
		12/08/2015	50.11	26.57	23.54	
	01N21W15H01S	03/17/2015	33.17	12.83	20.34	
		06/16/2015	33.17	15.53	17.64	
		10/13/2015	33.17	20.83	12.34	
		12/08/2015	33.17	22.65	10.52	
	01N21W16A04S	03/17/2015	25.69	132.17	-106.48	
		06/16/2015	25.69	147.48	-121.79	
		10/15/2015	25.69	175.49	-149.80	
		12/08/2015	25.69	182.00	-156.31	
	02N20W19M05S	03/18/2015	200.47	161.85	38.62	
		06/17/2015	200.47	176.40	24.07	
		10/13/2015	200.47	185.30	15.17	
		12/07/2015	200.47	171.30	29.17	
	02N20W28G02S	03/18/2015	170.60	NM	-----	Special
		06/17/2015	170.60	NM	-----	Special
		10/13/2015	170.60	NM	-----	Special
		12/08/2015	170.60	NM	-----	Special
	02N21W33P02S	03/18/2015	64.63	106.80	-42.17	
		06/16/2015	64.63	124.60	-59.97	
		10/15/2015	64.63	136.00	-71.37	
		12/09/2015	64.63	154.25	-89.62	
	02N21W35M02S	03/17/2015	90.60	175.10	-84.50	
		06/16/2015	90.60	190.60	-100.00	
		10/13/2015	90.60	209.16	-118.56	
		12/08/2015	90.60	216.57	-125.97	
	02N21W36N01S	03/17/2015	111.18	89.19	21.99	
		06/16/2015	111.18	96.76	14.42	
		10/13/2015	111.18	113.45	-2.27	
		12/08/2015	111.18	121.67	-10.49	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Santa Paula	02N22W02C01S*	03/16/2015	184.38	43.23	141.15	
		06/15/2015	184.38	47.85	136.53	
		10/14/2015	184.38	55.83	128.55	
		12/03/2015	184.38	57.85	126.53	
	02N22W03K02S	03/16/2015	248.75	132.75	116.00	
		06/16/2015	248.75	134.40	114.35	
		10/14/2015	248.75	142.10	106.65	
		12/03/2015	248.75	143.40	105.35	
	02N22W03M02S	03/16/2015	291.50	206.38	85.12	
		06/16/2015	291.50	207.30	84.20	
		10/14/2015	291.50	210.00	81.50	
		12/03/2015	291.50	212.45	79.05	
	03N21W09K02S	03/16/2015	362.18	NM	-----	Special
		06/15/2015	362.18	NM	-----	Special
		10/14/2015	362.18	187.55	174.63	
		12/03/2015	362.18	189.00	173.18	
	03N21W17Q01S	03/16/2015	283.35	104.80	178.55	
		06/15/2015	283.35	NM	-----	Pumping
		10/14/2015	283.35	NM	-----	Pumping
		12/03/2015	283.35	116.70	166.65	
	03N21W19R01S	03/16/2015	235.39	NM	-----	Pumping
		06/15/2015	235.39	NM	-----	Pumping
		10/14/2015	235.39	NM	-----	Pumping
		12/03/2015	235.39	NM	-----	Pumping
	03N21W30F01S	03/16/2015	221.21	NM	-----	Pumping
		06/15/2015	221.21	NM	-----	Pumping
		10/14/2015	221.21	NM	-----	Pumping
		12/03/2015	221.21	NM	-----	Pumping
	03N22W34R01S	03/16/2015	266.61	NM	-----	Pumping
		06/16/2015	266.61	133.85	132.76	
		10/14/2015	266.61	141.54	125.07	
		12/03/2015	266.61	147.75	118.86	
	03N22W36K05S	03/16/2015	180.89	43.80	137.09	
		06/15/2015	180.89	42.90	137.99	
		10/14/2015	180.89	51.70	129.19	
		12/03/2015	180.89	53.50	127.39	
Sherwood	01N19W19L02S	03/12/2015	1,082.00	343.40	738.60	
		06/10/2015	1,082.00	346.80	735.20	
		11/04/2015	1,082.00	208.60	873.40	
		12/29/2015	1,082.00	NM	-----	Casing Wet
	01N19W30A01S	03/12/2015	999.98	59.90	940.08	
		06/10/2015	999.98	58.60	941.38	
		10/23/2015	999.98	80.90	919.08	
		12/29/2015	999.98	57.90	942.08	
Simi Valley	02N18W04R02S	03/18/2015	870.00	50.60	819.40	
		06/17/2015	870.00	49.30	820.70	
		10/13/2015	870.00	49.33	820.67	
		12/07/2015	870.00	49.60	820.40	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Simi Valley	02N18W10A02S	03/02/2015	926.40	80.90	845.50	
		06/01/2015	926.40	77.60	848.80	
		10/01/2015	926.40	77.70	848.70	
		12/01/2015	926.40	77.50	848.90	
Thousand Oaks	01N19W14K04S	03/12/2015	908.79	23.80	884.99	
		06/10/2015	908.79	24.10	884.69	
		11/04/2015	908.79	26.20	882.59	
		12/29/2015	908.79	26.10	882.69	
Tierra Rejada Valley	02N19W10R01S	03/18/2015	619.29	123.70	495.59	
		06/17/2015	619.29	126.40	492.89	
		10/13/2015	619.29	131.80	487.49	
		12/07/2015	619.29	135.50	483.79	
	02N19W12M03S	03/18/2015	718.95	91.60	627.35	
		06/17/2015	718.95	94.90	624.05	
		10/13/2015	718.95	93.25	625.70	
		12/07/2015	718.95	93.60	625.35	
	02N19W14P01S	03/18/2015	678.12	31.50	646.62	
		06/17/2015	678.12	31.72	646.40	
		10/13/2015	678.12	33.33	644.79	
		12/07/2015	678.12	NM	-----	Pumping
U N D E F I N E D	01N19W02L01S	03/12/2015	945.42	48.80	896.62	
		06/10/2015	945.42	47.60	897.82	
		11/04/2015	945.42	NM	-----	Inaccessible
		12/29/2015	945.42	50.80	894.62	
	01N19W15E01S	03/12/2015	903.53	25.60	877.93	
		06/10/2015	903.53	27.50	876.03	
		10/23/2015	903.53	28.90	874.63	
		12/29/2015	903.53	29.30	874.23	
	01N20W24H02S	03/12/2015	1,126.54	NM	-----	Inaccessible
		06/10/2015	1,126.54	NM	-----	Tape Hung Up
		11/04/2015	1,126.54	NM	-----	Tape Hung Up
		12/29/2015	1,126.54	NM	-----	Tape Hung Up
	02N21W13A01S	03/16/2015	440.00	545.30	-105.30	
		06/23/2015	440.00	549.90	-109.90	
		10/29/2015	440.00	554.60	-114.60	
		12/21/2015	440.00	807.50	-367.50	
Upper Ojai	04N22W09Q02S	03/11/2015	1,278.80	30.00	1,248.80	
		06/03/2015	1,278.80	NM	-----	Pumping
		11/03/2015	1,278.80	86.40	1,192.40	
		12/18/2015	1,278.80	NM	-----	Pumping
	04N22W10K02S	03/16/2015	1,325.90	32.30	1,293.60	
		06/03/2015	1,325.90	57.30	1,268.60	
		11/02/2015	1,325.90	39.60	1,286.30	
		12/18/2015	1,325.90	37.40	1,288.50	
	04N22W11P02S	03/11/2015	1,420.60	27.20	1,393.40	
		06/03/2015	1,420.60	33.60	1,387.00	
		11/02/2015	1,420.60	35.50	1,385.10	
		12/18/2015	1,420.60	28.90	1,391.70	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Upper Ojai	04N22W12F04S	03/16/2015	1,616.90	NM	-----	Pumping
		06/24/2015	1,616.90	NM	-----	Pumping
		10/29/2015	1,616.90	175.20	1,441.70	
		12/18/2015	1,616.90	175.70	1,441.20	
Ventura River - Lower	03N23W08B07S	03/04/2015	239.19	14.25	224.94	
		06/22/2015	239.19	14.10	225.09	
		10/26/2015	239.19	21.70	217.49	
		12/14/2015	239.19	24.20	214.99	
	03N23W32Q03S	03/13/2015	50.86	32.50	18.36	
		11/06/2015	50.86	NM	-----	Pumping
		12/31/2015	50.86	31.00	19.86	
	03N23W32Q07S	03/13/2015	46.10	26.80	19.30	
		11/06/2015	46.10	NM	-----	Pumping
		12/31/2015	46.10	NM	-----	Pumping
Ventura River - Upper	03N23W05B01S	03/04/2015	293.20	34.90	258.30	
		06/22/2015	293.20	32.60	260.60	
		10/26/2015	293.20	45.50	247.70	
		12/14/2015	293.20	48.40	244.80	
	03N23W08B02S	03/04/2015	249.30	NM	-----	Inaccessible
		10/26/2015	249.30	NM	-----	Special
		12/14/2015	249.30	NM	-----	Inaccessible
	04N23W03M01S	03/11/2015	760.85	97.90	662.95	
		06/11/2015	760.85	101.80	659.05	
		10/27/2015	760.85	104.80	656.05	
		12/15/2015	760.85	105.60	655.25	
	04N23W04J01S	03/11/2015	713.04	59.20	653.84	
		06/11/2015	713.04	69.40	643.64	
		10/27/2015	713.04	NM	-----	Tape Hung Up
		12/15/2015	713.04	76.90	636.14	
	04N23W09B01S	03/11/2015	662.30	38.10	624.20	
		06/11/2015	662.30	61.80	600.50	
		10/27/2015	662.30	71.10	591.20	
		12/15/2015	662.30	89.20	573.10	
	04N23W14M04S	03/11/2015	554.50	NM	-----	Flowing
		06/11/2015	554.50	NM	-----	Flowing
		11/03/2015	554.50	NM	-----	Flowing
		12/17/2015	554.50	NM	-----	Flowing
	04N23W15A02S	03/05/2015	680.90	89.70	591.20	
		06/11/2015	680.90	90.60	590.30	
		11/03/2015	680.90	97.20	583.70	
		12/15/2015	680.90	92.30	588.60	
	04N23W15D02S	03/05/2015	634.30	155.70	478.60	
		06/22/2015	634.30	145.40	488.90	
		10/26/2015	634.30	154.50	479.80	
		12/15/2015	634.30	157.20	477.10	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Ventura River - Upper	04N23W16C04S	03/04/2015	569.10	69.90	499.20	
		06/22/2015	569.10	69.80	499.30	
		11/06/2015	569.10	90.10	479.00	
		12/14/2015	569.10	92.90	476.20	
	04N23W16P01S	03/04/2015	619.89	71.30	548.59	
		06/22/2015	619.89	71.50	548.39	
		10/26/2015	619.89	73.10	546.79	
		12/14/2015	619.89	73.40	546.49	
	04N23W20A01S	03/04/2015	488.89	28.10	460.79	
		06/22/2015	488.89	29.00	459.89	
		10/26/2015	488.89	32.20	456.69	
		12/14/2015	488.89	32.70	456.19	
	04N23W28G01S	03/11/2015	402.37	21.10	381.27	
		06/11/2015	402.37	28.60	373.77	
		11/03/2015	402.37	NM	-----	Dry
		12/17/2015	402.37	NM	-----	Dry
	04N23W29F02S	03/04/2015	396.58	40.60	355.98	
		06/22/2015	396.58	41.20	355.38	
		10/26/2015	396.58	58.50	338.08	
		12/14/2015	396.58	57.10	339.48	
	04N23W33M03S	03/05/2015	331.80	14.90	316.90	
		06/22/2015	331.80	20.40	311.40	
		10/26/2015	331.80	23.90	307.90	
		12/14/2015	331.80	24.00	307.80	
	04N24W13J04S	03/04/2015	626.45	6.70	619.75	
		06/22/2015	626.45	12.40	614.05	
		11/06/2015	626.45	16.30	610.15	
		12/15/2015	626.45	15.90	610.55	
	04N24W13N01S	03/04/2015	642.12	7.80	634.32	
		11/06/2015	642.12	10.90	631.22	
		12/15/2015	642.12	11.10	631.02	
	05N23W33B03S	03/11/2015	829.00	23.40	805.60	
		06/11/2015	829.00	30.20	798.80	
		10/27/2015	829.00	34.80	794.20	
		12/15/2015	829.00	30.10	798.90	
	05N23W33G01S	03/11/2015	816.21	21.20	795.01	
		06/11/2015	816.21	NM	-----	Pumping
		10/27/2015	816.21	NM	-----	Pumping
		12/15/2015	816.21	NM	-----	Pumping

* - Denotes basin key water level well.

Appendix D – Water Quality Section

TABLES Page

Table D-1: General Mineral 135
Table D-2: California Title 22 Metals.. 142
Table D-3: Radiochemistry.. 144

General Minerals Table D-1			
Mineral	Abbreviation	Reported Units	Laboratory Analytical Method
Boron	B	mg/l	EPA 200.7
Bicarbonate	HCO_3^-	mg/l	SM23320B
Calcium	Ca	mg/l	EPA 200.7
Copper	Cu	µg/l	EPA 200.7
Carbonate	CO_3^{2-}	mg/l	SM23320B
Chloride	Cl^-	mg/l	EPA 300.0
Electrical Conductivity	eC	µmhos/cm	SM2510B
Fluoride	F^-	mg/l	EPA 300.0
Iron	Fe	µg/l	EPA 200.7
Potassium	K	mg/l	EPA 200.7
Magnesium	Mg	mg/l	EPA 200.7
Manganese	Mn	µg/l	EPA 200.7
Nitrate	NO_3^-	mg/l	SM4500NO3F
Sodium	Na	mg/l	EPA 200.7
Sulfate	SO_4^{2-}	mg/l	EPA 300.0
Total Dissolved Solids	TDS	mg/l	EPA 200.7
Zinc	Zn	µg/l	EPA 200.7
pH	pH	units	SM4500-H B

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	09/21/2015	0.3	320	69	ND	98	ND	1140	0.4	ND	1	66	ND	71.8	64	110	800	ND	7.3
Arroyo Santa Rosa	02N19W20L01S	08/13/2015	0.2	390	88	ND	123	20	1390	0.2	ND	ND	83	ND	79	73	155	991	50	7.4
Arroyo Santa Rosa	02N19W20N02S	08/13/2015	0.2	320	72	ND	154	ND	1300	0.3	110	2	80	ND	28.7	65	133	855	40	7.8
Arroyo Santa Rosa	02N20W23G03S	08/13/2015	0.2	250	66	ND	160	ND	1280	0.2	ND	1	70	ND	72.4	74	81	775	ND	7.5
Arroyo Santa Rosa	02N20W23R01S	08/13/2015	0.3	270	78	ND	158	ND	1420	0.3	ND	1	62	ND	64.2	113	170	916	ND	7.5
Arroyo Santa Rosa	02N20W25C06S	09/21/2015	0.4	250	65	ND	146	ND	1200	0.4	ND	1	53	ND	21.1	97	161	794	ND	7.3
Arroyo Santa Rosa	02N20W25C07S	09/21/2015	0.3	300	99	ND	142	ND	1500	0.3	ND	1	91	10	84.9	83	183	984	ND	7.3
Arroyo Santa Rosa	02N20W25D01S	09/21/2015	0.3	290	83	ND	141	10	1400	0.3	ND	1	77	ND	80	86	174	932	ND	7.2
Arroyo Santa Rosa	02N20W26C02S	08/13/2015	0.4	360	98	ND	173	ND	1630	0.3	ND	1	75	ND	80.5	124	212	1120	ND	7.3
Conejo Valley	01N20W03J01S	11/04/2015	0.2	340	75	ND	136	ND	1240	0.2	60	ND	86	ND	0.8	61	148	847	130	7
Cuyama Valley	09N23W30E05S	11/05/2015	0.5	260	78	ND	160	ND	1450	1	50	3	14	ND	4.74	231	183	935	ND	7
Cuyama Valley	09N24W25J01S	11/05/2015	0.4	280	72	ND	127	ND	1350	1.1	50	3	12	ND	4.7	222	178	900	ND	6.8
Cuyama Valley	09N24W33J03S	11/05/2015	0.4	250	80	ND	114	ND	1330	0.7	40	3	13	ND	14.4	207	230	912	ND	6.5
Fillmore	03N20W01D03S	09/09/2015	0.6	300	152	ND	60	ND	1480	0.6	40	6	57	ND	18	98	460	1150	40	7.4
Fillmore	03N20W01F05S	09/09/2015	0.6	260	135	ND	58	40	1370	0.8	ND	5	49	ND	10.2	94	420	1030	190	7.5
Fillmore	03N20W02R05S	12/09/2015	1.2	420	290	ND	180	ND	2980	0.6	ND	9	87	30	43.5	235	980	2250	ND	6.9
Fillmore	03N20W11C01S	10/12/2015	1.4	330	292	ND	180	ND	2840	0.5	ND	9	91	30	51.6	249	1010	2210	ND	7.3
Fillmore	03N21W01P08S	09/09/2015	0.6	290	180	ND	47	ND	1510	0.6	ND	3	47	320	27	89	500	1180	ND	7.2
Fillmore	04N19W29R04S	12/02/2015	0.4	240	108	ND	46	ND	1410	0.7	ND	4	49	ND	7.4	102	450	1010	ND	7
Fillmore	04N19W30D01S	12/02/2015	0.6	470	244	ND	65	ND	2320	0.6	ND	4	104	720	23	111	850	1870	ND	6.7
Fillmore	04N19W31F01S	09/09/2015	0.7	280	141	ND	69	ND	1440	0.8	40	6	55	ND	6.4	98	440	1100	100	7.1
Fillmore	04N19W31R01S	10/12/2015	0.6	240	136	ND	62	ND	1380	0.8	ND	5	49	30	21.6	86	390	990	ND	7.3
Fillmore	04N19W32M02S	10/12/2015	0.6	180	124	ND	55	ND	1320	0.7	50	5	48	50	6.2	87	440	946	ND	7.4
Fillmore	04N20W32R01S	12/09/2015	0.2	310	215	ND	52	ND	1720	0.5	ND	2	53	20	82.8	83	630	1430	ND	7.1
Fillmore	04N20W34H01S	12/09/2015	0.5	310	184	ND	52	ND	1580	0.6	90	3	51	ND	44.1	94	490	1230	ND	7.1
Fillmore	04N20W36D07S	09/09/2015	0.7	300	159	ND	62	ND	1550	0.8	ND	5	61	10	10.7	97	500	1200	50	7.3
Gillibrand/Tapo	03N18W24C07S	09/01/2015	0.2	290	142	ND	22	10	1050	0.2	ND	3	30	ND	4	42	282	804	ND	7.1
Gillibrand/Tapo	03N18W24H07S	09/01/2015	0.2	310	152	ND	25	ND	1160	0.3	840	3	33	80	6.3	48	270	848	ND	7.1
Las Posas - East	02N20W04B01S	12/07/2015	ND	220	76	ND	14	ND	373	0.3	390	4	23	140	ND	43	151	531	ND	7.3
Las Posas - East	02N20W04F01S	12/07/2015	ND	220	144	ND	58	ND	1100	0.3	700	5	34	400	ND	53	291	805	ND	7.1
Las Posas - East	02N20W09Q07S	09/01/2015	0.7	250	190	ND	180	ND	2140	0.4	ND	5	63	225	27.3	199	630	1540	ND	7.3
Las Posas - East	02N20W10G01S	09/01/2015	0.8	310	176	ND	160	ND	2070	0.2	90	6	57	20	55.1	207	590	1530	ND	7.4
Las Posas - East	02N20W16B06S	12/22/2015	0.7	240	136	ND	178	ND	1940	0.5	110	5	60	50	ND	187	570	1380	ND	7.6
Las Posas - East	03N19W29K06S	12/07/2015	ND	90	51	ND	44	ND	508	0.2	ND	1	9	ND	76.1	31	26	328	ND	6.7
Las Posas - East	03N19W29K08S	09/01/2015	0.1	210	76	ND	27	ND	706	0.4	ND	3	17	ND	16.2	41	120	511	ND	7.3
Las Posas - East	03N19W30E06S	09/01/2015	ND	100	47	ND	12	50	437	0.3	140	2	9	10	5	27	59	261	40	7.3
Las Posas - East	03N20W28J04S	09/01/2015	0.2	240	68	ND	46	ND	890	0.6	ND	3	31	ND	52.2	67	121	629	ND	7.4
Las Posas - East	03N20W34G01S	08/21/2015	ND	200	64	ND	12	ND	599	0.3	560	3	15	140	ND	29	127	450	ND	7.3
Las Posas - East	03N20W34L01S	12/07/2015	ND	200	84	ND	11	ND	705	0.4	490	4	22	240	ND	37	166	524	ND	7.1
Las Posas - East	03N20W34L02S	12/07/2015	ND	230	103	ND	14	ND	864	0.2	640	5	28	190	ND	48	235	663	ND	7.1
Las Posas - East	03N20W36P01S	12/07/2015	ND	180	55	ND	19	ND	489	0.2	50	2	11	ND	18.9	30	50	366	50	7.3

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
Las Posas - South	02N19W07B02S	09/01/2015	0.9	200	115	ND	154	ND	1860	0.7	40	4	50	10	4.1	226	510	1260	ND	7.1
Las Posas - South	02N19W07D02S	08/21/2015	0.8	270	145	ND	155	ND	1740	0.4	ND	3	37	ND	16.3	169	440	1240	ND	7
Las Posas - South	02N19W08H02S	12/22/2015	0.7	210	144	ND	153	ND	1770	0.5	40	3	43	ND	23.5	159	500	1240	120	7.4
Las Posas - South	02N20W01Q01S	09/01/2015	0.7	240	159	ND	145	ND	1750	0.3	ND	3	43	ND	36	161	430	1220	ND	7.1
Las Posas - West	02N20W06J01S	09/01/2015	0.1	250	93	ND	17	ND	951	0.3	410	5	33	180	0.5	59	232	690	ND	7.4
Las Posas - West	02N20W07R02S	09/01/2015	ND	110	51	ND	11	ND	498	0.3	190	2	12	70	0.7	32	81	300	ND	7.6
Las Posas - West	02N21W08H03S	09/08/2015	0.3	300	72	ND	63	10	1110	0.4	70	3	29	40	10.6	115	180	773	20	7.2
Las Posas - West	02N21W09D02S	09/08/2015	0.2	240	87	ND	81	120	1000	0.3	8610	3	29	110	28.6	76	128	673	180	6.9
Las Posas - West	02N21W10Q04S	10/06/2015	0.2	320	117	ND	37	ND	1160	0.3	510	5	42	90	ND	78	320	919	ND	7.3
Las Posas - West	02N21W11A02S	09/24/2015	0.2	230	198	ND	126	ND	1890	0.3	30	3	65	ND	208	93	460	1380	ND	7.4
Las Posas - West	02N21W11A03S	09/24/2015	0.2	300	72	ND	32	ND	925	0.3	160	5	29	50	0.7	70	182	691	ND	7.7
Las Posas - West	02N21W12H01S	09/10/2015	0.2	230	101	ND	53	20	1010	0.3	210	4	31	80	1	69	250	739	30	7.5
Las Posas - West	02N21W15M04S	08/21/2015	0.4	280	109	ND	77	ND	1480	0.2	40	5	38	60	24.3	146	440	1120	ND	7.4
Las Posas - West	02N21W17F05S	09/08/2015	0.6	300	99	ND	63	ND	1520	0.2	190	5	39	50	0.9	175	420	1100	ND	7.2
Las Posas - West	03N20W32K01S	12/22/2015	0.2	360	141	ND	26	30	1440	0.4	570	5	45	270	0.4	105	450	1130	60	7.6
Las Posas - West	03N21W36Q01S	09/10/2015	0.2	270	78	ND	83	ND	1080	0.4	ND	3	40	ND	63.5	82	143	763	70	7.3
Little Cuddy Valley	08N20W04N02S	12/30/2015	ND	290	67	ND	13	40	567	0.3	ND	2	9	ND	1.1	43	13	438	70	7.3
Lockwood Valley	08N21W23Q10S	12/30/2015	11	330	2	30	8	ND	1160	2	ND	ND	ND	ND	2.5	275	189	838	ND	8.8
Lockwood Valley	08N21W29N02S	12/30/2015	2.7	290	150	ND	6	ND	1400	7	370	3	64	20	1.7	70	560	1150	140	7.6
Lockwood Valley	08N21W29Q05S	12/30/2015	6.2	190	36	ND	11	ND	2680	1.3	70	2	4	ND	1.1	530	1060	1840	ND	8
Lockwood Valley	08N21W29R09S	12/30/2015	0.7	220	54	ND	6	ND	827	1.1	ND	2	10	ND	4.1	92	197	586	140	7.8
Lockwood Valley	08N21W30R01S	12/30/2015	1.1	280	41	ND	11	60	1300	0.6	900	2	6	20	12.3	242	400	995	20	8
Lockwood Valley	08N21W33R03S	12/30/2015	0.8	190	97	ND	23	20	836	0.5	70	1	22	ND	13.5	41	164	552	90	7.4
Mound	02N22W07P01S	08/21/2015	0.7	330	435	ND	140	ND	3670	0.3	150	10	126	180	71	285	1600	3000	ND	6.7
Mound	02N22W09K05S	08/21/2015	0.6	180	122	ND	79	30	1610	0.2	690	4	23	240	2.1	192	520	1120	180	7.1
Mound	02N22W09K08S	08/21/2015	0.6	230	153	ND	66	ND	1810	0.4	50	5	51	570	2.9	168	590	1270	ND	7.1
Mound	02N23W13F02S	10/16/2015	0.6	260	151	ND	62	ND	1610	0.4	830	5	42	280	ND	140	440	1100	60	7.1
Mound	02N23W13K04S	10/16/2015	0.7	200	146	ND	68	ND	1620	0.4	720	5	43	300	0.7	147	460	1070	ND	7.1
North Coast	04N25W25N06S	09/29/2015	0.3	310	132	ND	100	ND	1670	0.6	ND	1	63	ND	8.5	106	330	1050	ND	7.6
North Coast	04N25W35G01S	09/29/2015	0.3	210	74	ND	47	460	992	0.4	ND	3	37	ND	1.8	62	211	646	320	7.5
Ojai Valley	04N22W04N02S	12/10/2015	ND	250	133	ND	14	220	921	0.3	50	1	24	40	34.8	38	217	712	ND	7.2
Ojai Valley	04N22W04P05S	12/10/2015	0.1	270	120	ND	27	ND	980	0.3	70	ND	32	ND	41	40	210	740	80	6.9
Ojai Valley	04N22W04Q01S	09/29/2015	ND	240	98	ND	20	40	916	0.3	150	ND	29	ND	46.2	32	199	664	120	7.8
Ojai Valley	04N22W05D03S	12/10/2015	0.2	140	51	ND	23	20	598	0.4	810	3	26	90	2.2	32	143	421	590	7.2
Ojai Valley	04N22W05H04S	09/29/2015	ND	260	111	ND	17	50	916	0.3	180	1	26	ND	15.7	29	200	660	120	7.2
Ojai Valley	04N22W05M04S	12/10/2015	ND	300	133	ND	21	ND	962	0.2	320	1	30	10	32.4	29	200	747	ND	7
Ojai Valley	04N22W06E06S	09/29/2015	ND	310	108	ND	63	ND	979	0.3	ND	ND	30	ND	30.4	39	128	709	20	7.2
Ojai Valley	04N22W06J09S	09/29/2015	ND	220	114	ND	24	ND	959	0.3	ND	ND	27	ND	21.3	35	200	642	ND	7.3
Ojai Valley	04N22W06K10S	09/29/2015	ND	160	110	ND	90	ND	1220	0.3	ND	1	26	ND	23.4	34	202	647	ND	7.5
Ojai Valley	04N22W07C05S	09/29/2015	ND	240	100	ND	50	ND	1040	0.5	ND	ND	23	30	3.6	69	205	691	ND	7.4
Ojai Valley	04N22W07D04S	09/29/2015	0.3	230	239	ND	580	ND	2810	0.4	ND	2	55	1100	ND	195	219	1520	ND	7.4

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
Ojai Valley	04N23W01J03S	12/10/2015	0.1	310	76	ND	27	10	979	0.6	30	ND	17	100	ND	123	200	754	ND	7.4
Ojai Valley	04N23W01K02S	12/10/2015	0.1	400	140	ND	71	ND	1150	0.5	40	ND	34	ND	4.4	71	182	903	ND	7
Ojai Valley	04N23W12B03S	12/10/2015	ND	340	83	ND	76	ND	935	0.8	ND	1	15	590	ND	84	80	680	260	7.2
Ojai Valley	05N22W33J01S	09/29/2015	ND	190	141	ND	44	ND	1240	0.5	90	2	38	30	ND	49	360	824	ND	7.6
Oxnard Plain Forebay	02N21W07P04S	09/08/2015	0.6	180	141	ND	54	ND	1420	0.5	630	5	48	110	0.5	97	430	956	ND	7.1
Oxnard Plain Forebay	02N22W23H03S	09/08/2015	0.8	270	273	ND	74	ND	2330	0.5	ND	7	95	ND	112	133	840	1800	ND	6.9
Oxnard Plain Forebay	02N22W27M02S	09/02/2015	1.1	490	299	ND	99	ND	2470	0.4	440	8	108	20	0.6	160	830	2000	ND	7
Oxnard Plain Pressure	01N21W04D04S	09/09/2015	0.6	380	59	ND	126	ND	1370	0.3	60	10	25	30	0.5	192	186	979	ND	7.3
Oxnard Plain Pressure	01N21W06L05S	10/06/2015	0.4	260	82	ND	45	ND	1180	0.2	230	6	29	80	1.1	129	330	882	40	7.5
Oxnard Plain Pressure	01N21W08R01S	09/09/2015	0.4	250	76	ND	58	ND	1090	0.3	300	6	27	40	0.5	114	240	772	ND	7.4
Oxnard Plain Pressure	01N21W16M03S	09/10/2015	0.6	310	66	ND	122	ND	1380	0.3	ND	6	27	20	ND	194	250	975	ND	7.4
Oxnard Plain Pressure	01N21W16P04S	09/24/2015	0.5	320	73	ND	144	ND	1360	0.4	420	5	25	10	ND	169	197	933	ND	7.4
Oxnard Plain Pressure	01N21W17B02S	09/10/2015	0.5	260	86	ND	37	ND	1120	0.2	760	8	34	100	ND	114	320	859	190	7.4
Oxnard Plain Pressure	01N21W19J05S	09/02/2015	0.6	220	39	ND	41	ND	700	0.3	ND	5	22	ND	0.4	76	45	449	ND	7.4
Oxnard Plain Pressure	01N21W20K03S	09/24/2015	0.5	170	73	ND	39	ND	976	0.2	220	5	26	20	1.9	85	230	630	ND	7.9
Oxnard Plain Pressure	01N21W21H01S	09/24/2015	0.5	390	198	ND	330	ND	2270	0.2	330	4	67	450	ND	178	390	1560	ND	7.6
Oxnard Plain Pressure	01N21W21H02S	10/16/2015	0.5	240	67	ND	107	ND	1330	0.2	110	5	34	20	ND	154	260	867	ND	7.3
Oxnard Plain Pressure	01N21W21H03S	09/24/2015	0.4	310	41	ND	44	ND	885	0.2	490	3	27	50	ND	99	126	650	ND	8
Oxnard Plain Pressure	01N21W21K03S	09/02/2015	0.5	290	70	ND	125	ND	1260	0.2	60	5	40	30	0.4	152	230	913	ND	7.4
Oxnard Plain Pressure	01N21W22C01S	09/09/2015	0.5	300	59	ND	103	ND	1220	0.2	250	5	39	30	0.5	135	188	830	60	7.5
Oxnard Plain Pressure	01N21W28D01S	09/09/2015	0.5	270	79	ND	135	ND	1300	0.3	370	6	28	20	0.5	154	213	886	50	7.4
Oxnard Plain Pressure	01N21W28G01S	09/02/2015	0.5	240	291	ND	510	ND	2970	0.2	990	6	100	1600	0.5	230	540	1920	ND	7.2
Oxnard Plain Pressure	01N21W28H03S	09/02/2015	0.4	260	90	ND	137	ND	1340	0.3	90	5	39	80	0.4	144	216	892	ND	7.9
Oxnard Plain Pressure	01N21W28M01S	09/30/2015	0.5	310	83	ND	269	ND	1790	0.2	650	6	47	40	0.4	180	220	1120	ND	7.3
Oxnard Plain Pressure	01N21W29B03S	09/30/2015	0.5	270	112	ND	84	ND	1350	0.4	50	4	42	790	0.6	100	340	953	ND	7.2
Oxnard Plain Pressure	01N21W29K02S	09/24/2015	0.6	180	115	ND	51	ND	1250	0.3	210	4	37	680	ND	92	350	829	ND	7.5
Oxnard Plain Pressure	01N21W30C04S	10/16/2015	0.7	150	119	ND	58	ND	1240	0.5	1100	4	36	460	ND	84	320	772	ND	7.3
Oxnard Plain Pressure	01N21W33A01S	09/30/2015	0.4	310	78	ND	200	ND	1580	0.1	40	4	51	170	ND	148	180	971	ND	7.7
Oxnard Plain Pressure	01N22W03F05S	09/02/2015	0.7	150	142	ND	48	ND	1380	0.6	40	5	46	20	18.4	100	450	960	ND	7.1
Oxnard Plain Pressure	01N22W03F07S	09/02/2015	0.7	260	177	ND	70	ND	1620	0.5	80	5	60	30	22.5	106	520	1220	ND	7.2
Oxnard Plain Pressure	01N22W06B01S	08/24/2015	0.8	280	150	ND	55	ND	1510	0.7	90	5	51	ND	16.6	100	510	1170	ND	7.3
Oxnard Plain Pressure	01N22W06R02S	08/24/2015	0.8	280	163	ND	56	ND	1670	0.6	ND	5	56	10	7.4	115	630	1310	ND	7.2
Oxnard Plain Pressure	01N22W12M01S	09/10/2015	0.7	200	151	ND	46	ND	1530	0.3	350	6	48	250	ND	124	530	1110	ND	7.1
Oxnard Plain Pressure	01N22W12N03S	12/10/2015	0.5	250	107	ND	36	ND	1220	0.2	410	6	37	130	ND	106	370	912	ND	7.5
Oxnard Plain Pressure	01N22W16D04S	09/30/2015	0.6	230	110	ND	39	ND	1190	0.7	2300	4	38	90	0.6	77	360	859	30	7.4
Oxnard Plain Pressure	01N22W19A01S	09/30/2015	0.6	130	51	ND	36	ND	875	0.5	40	5	28	20	0.5	77	272	600	900	8
Oxnard Plain Pressure	01N22W23R02S	10/16/2015	0.6	190	150	ND	55	ND	1500	0.5	40	5	51	30	22.1	97	480	1050	ND	7.3
Oxnard Plain Pressure	01N22W24B04S	09/02/2015	0.6	210	125	ND	39	ND	1170	0.4	130	4	34	180	1	85	380	878	ND	7.4
Oxnard Plain Pressure	01N22W24C02S	09/10/2015	0.7	280	153	ND	48	ND	1400	0.6	740	5	45	350	ND	95	440	1070	ND	7.3
Oxnard Plain Pressure	01N22W24C03S	09/10/2015	0.7	210	131	ND	40	ND	1210	0.6	630	4	37	190	ND	85	390	898	20	7.2
Oxnard Plain Pressure	01N22W24M03S	09/10/2015	0.6	230	148	ND	124	ND	1390	0.5	550	4	43	220	ND	88	340	978	ND	7.2

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
Oxnard Plain Pressure	01N22W25K01S	09/10/2015	0.9	240	593	ND	1650	ND	6740	0.2	9200	22	234	2000	ND	586	950	4280	40	7
Oxnard Plain Pressure	01N22W25K02S	09/10/2015	0.6	220	94	ND	35	ND	1080	0.4	680	4	38	120	ND	81	290	762	ND	7.4
Oxnard Plain Pressure	01N22W26D05S	09/10/2015	0.5	240	136	ND	48	380	1280	0.3	14000	7	43	480	15	92	390	971	80	7.4
Oxnard Plain Pressure	01N22W26K03S	08/24/2015	0.5	250	101	ND	43	ND	1200	0.2	450	6	34	90	ND	89	360	883	ND	7.5
Oxnard Plain Pressure	01N22W26M03S	09/10/2015	0.5	240	118	ND	37	ND	1200	0.2	290	6	35	190	5.2	91	370	902	ND	7.5
Oxnard Plain Pressure	01N22W26P02S	09/10/2015	0.4	260	91	ND	36	ND	1100	0.2	50	6	36	10	ND	94	280	803	ND	7.6
Oxnard Plain Pressure	01N22W26Q01S	08/24/2015	0.6	250	135	ND	106	ND	1340	0.6	490	4	38	290	ND	84	349	967	ND	7.2
Oxnard Plain Pressure	01N22W27H02S	09/24/2015	0.5	240	116	ND	37	ND	1200	0.2	370	6	33	170	0.5	85	370	888	ND	7.8
Oxnard Plain Pressure	01N22W36B02S	09/30/2015	0.5	240	87	ND	103	ND	1260	0.4	460	6	33	90	0.4	109	230	809	ND	7.4
Oxnard Plain Pressure	02N21W17N03S	09/24/2015	0.4	290	85	ND	57	ND	1070	0.3	60	3	26	140	8.3	97	209	776	ND	7.7
Oxnard Plain Pressure	02N21W18H01S	09/08/2015	0.5	310	265	ND	160	20	2460	0.4	90	7	96	ND	130	152	790	1910	30	6.9
Oxnard Plain Pressure	02N21W18H12S	09/08/2015	0.6	260	128	ND	51	ND	1400	0.4	340	4	45	120	1.6	108	450	1050	ND	7.2
Oxnard Plain Pressure	02N21W18H14S	09/24/2015	0.4	310	83	ND	46	ND	1320	0.2	340	6	36	50	0.4	146	380	1010	ND	7.8
Oxnard Plain Pressure	02N21W19G03S	10/06/2015	0.6	230	109	ND	45	ND	1250	0.3	1800	4	40	130	ND	100	420	948	ND	7.6
Oxnard Plain Pressure	02N21W20M03S	09/08/2015	1.2	390	548	ND	349	ND	4660	0.2	90	12	200	440	127	351	2050	4030	ND	6.8
Oxnard Plain Pressure	02N21W20M06S	09/08/2015	0.6	260	103	ND	50	ND	1320	0.2	260	4	39	100	ND	120	390	966	ND	7.4
Oxnard Plain Pressure	02N21W20Q05S	09/08/2015	0.6	280	102	ND	60	ND	1320	0.3	640	6	35	80	0.6	128	360	972	ND	7.2
Oxnard Plain Pressure	02N22W19P01S	09/02/2015	0.6	270	219	ND	97	ND	2100	0.4	ND	6	64	190	33.1	196	820	1710	ND	7.1
Oxnard Plain Pressure	02N22W24P02S	09/21/2015	0.7	240	132	ND	47	ND	1290	0.7	30	4	43	ND	7.1	91	430	995	ND	7.4
Oxnard Plain Pressure	02N22W24R02S	09/21/2015	0.8	200	182	ND	67	ND	1700	0.7	50	5	62	ND	19.2	119	650	1300	30	7.3
Oxnard Plain Pressure	02N22W25A02S	09/21/2015	1	250	223	ND	108	ND	2200	0.5	140	7	76	10	7.7	180	860	1710	110	7.4
Oxnard Plain Pressure	02N22W25F01S	09/21/2015	1	280	296	ND	86	20	2520	0.4	1900	8	104	70	1	172	1170	2120	30	7.3
Oxnard Plain Pressure	02N22W30F03S	09/02/2015	0.6	240	130	ND	42	ND	1230	0.5	1000	5	37	140	0.5	99	390	944	ND	7.3
Oxnard Plain Pressure	02N22W31B01S	09/02/2015	0.7	220	147	ND	53	ND	1420	0.6	ND	5	48	ND	18.5	110	490	1090	ND	7.4
Oxnard Plain Pressure	02N22W31D02S	09/02/2015	0.7	230	148	ND	53	ND	1430	0.6	50	4	46	260	17.9	103	490	1090	ND	7.2
Oxnard Plain Pressure	02N22W32C04S	08/24/2015	0.6	240	140	ND	54	ND	1420	0.7	ND	4	48	ND	22.9	92	500	1100	ND	7.3
Oxnard Plain Pressure	02N22W36E02S	09/02/2015	0.7	100	137	ND	48	ND	1310	0.6	ND	5	44	ND	9.2	97	460	901	ND	7.3
Oxnard Plain Pressure	02N22W36E03S	09/02/2015	0.7	190	142	ND	46	ND	1370	0.6	140	5	47	50	0.6	105	480	1020	ND	7.2
Oxnard Plain Pressure	02N22W36E04S	09/02/2015	0.9	230	215	ND	60	ND	1950	0.5	ND	6	72	ND	71.3	151	750	1560	30	7.2
Oxnard Plain Pressure	02N22W36F01S	09/02/2015	0.9	240	178	ND	58	ND	1700	0.5	280	6	64	30	0.7	135	670	1350	50	7.4
Oxnard Plain Pressure	02N22W36F02S	09/02/2015	0.8	210	179	ND	58	ND	1750	0.6	ND	6	63	50	7.9	138	680	1340	ND	7.4
Oxnard Plain Pressure	02N23W25M01S	09/02/2015	0.6	270	161	ND	63	ND	1540	0.4	ND	5	45	430	11.1	137	540	1230	30	7.3
Piru	04N18W20R01S	12/02/2015	0.6	310	116	ND	130	ND	1650	0.6	ND	5	45	ND	22.6	148	387	1160	ND	6.7
Piru	04N18W30A03S	12/09/2015	0.6	310	151	ND	109	ND	1940	0.6	310	7	56	ND	38.5	144	549	1360	120	7
Piru	04N18W30J04S	12/09/2015	0.5	260	109	ND	99	ND	1430	0.6	110	6	41	ND	23.7	114	338	991	170	7.1
Piru	04N19W23R03S	12/09/2015	0.5	520	240	ND	67	ND	2780	0.7	210	8	122	440	0.5	250	1100	2310	ND	7.2
Piru	04N19W25C02S	10/12/2015	0.7	240	153	ND	89	ND	1620	0.9	ND	5	64	ND	15.1	112	530	1210	ND	7
Piru	04N19W25H01S	12/09/2015	0.6	330	245	ND	101	ND	2120	0.6	60	7	77	ND	74	117	715	1670	ND	7.2
Piru	04N19W25K04S	09/11/2015	0.6	280	140	ND	97	ND	1490	0.7	ND	5	48	ND	39.1	105	350	1060	ND	7.4
Piru	04N19W25M03S	09/09/2015	0.9	410	318	ND	66	20	2790	0.9	ND	7	135	720	42.2	193	1240	2410	ND	7
Piru	04N19W25M03S	12/09/2015	0.9	440	311	ND	58	30	2820	0.6	ND	6	129	690	49.8	179	1160	2330	ND	7

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
Piru	04N19W26H01S	12/09/2015	0.7	270	149	ND	107	ND	1610	0.7	ND	5	58	ND	22.2	114	417	1140	ND	7.3
Piru	04N19W26J02S	09/09/2015	0.9	410	288	ND	63	ND	2510	0.8	40	6	116	480	32.2	171	1060	2150	ND	7
Piru	04N19W26J03S	12/09/2015	0.5	240	103	ND	84	ND	1260	0.7	ND	5	38	ND	15	98	310	894	ND	7.3
Piru	04N19W26J05S	09/09/2015	0.8	430	266	ND	61	ND	2330	0.7	ND	7	104	790	35.6	151	900	1960	40	7.1
Piru	04N19W26P01S	10/12/2015	0.7	170	179	ND	68	ND	1690	0.7	ND	5	73	60	16.9	109	620	1240	ND	7.3
Piru	04N19W34J04S	09/11/2015	0.6	220	127	ND	57	ND	1330	0.7	ND	5	49	ND	64.1	80	350	953	ND	7.4
Piru	04N19W34L01S	09/11/2015	0.6	200	124	ND	55	ND	1280	0.8	ND	5	47	ND	30.8	80	360	903	ND	7.3
Pleasant Valley	01N21W01B05S	09/30/2015	0.3	340	54	ND	211	ND	1370	0.1	50	5	51	60	ND	122	47	830	ND	7.3
Pleasant Valley	01N21W01M02S	09/30/2015	0.3	330	66	ND	156	120	1450	0.2	111	5	64	50	ND	122	206	949	700	7.6
Pleasant Valley	01N21W02J01S	09/10/2015	2	410	483	ND	300	60	4710	0.2	80	9	146	40	171	555	2030	4100	220	7
Pleasant Valley	01N21W03D01S	09/09/2015	0.5	210	133	ND	84	20	1330	0.3	190	4	37	20	37.9	95	330	931	30	7.3
Pleasant Valley	01N21W03K01S	09/09/2015	0.7	310	141	ND	166	ND	1780	0.3	ND	5	41	ND	32.8	185	350	1230	ND	7.3
Pleasant Valley	01N21W03R01S	09/09/2015	0.6	280	233	ND	224	ND	2330	0.2	ND	6	72	20	31.1	184	680	1710	ND	7
Pleasant Valley	01N21W04K01S	09/09/2015	0.6	300	102	ND	123	ND	1470	0.4	320	5	30	50	0.6	171	300	1030	30	7.4
Pleasant Valley	01N21W09J03S	10/16/2015	0.3	180	113	ND	82	ND	1200	0.3	70	3	34	ND	2.8	81	280	776	ND	7.2
Pleasant Valley	01N21W10A02S	09/02/2015	0.5	260	362	ND	260	ND	2840	0.2	40	5	103	1500	52	181	970	2190	1100	7.3
Pleasant Valley	01N21W10G01S	09/09/2015	0.5	300	99	ND	140	ND	1510	0.3	70	6	41	40	1.1	157	260	1000	ND	7.4
Pleasant Valley	01N21W12D02S	09/10/2015	0.7	300	142	ND	192	ND	1870	0.3	40	7	46	ND	14.6	211	430	1340	ND	7.3
Pleasant Valley	01N21W15D02S	09/09/2015	0.6	300	142	ND	187	ND	1740	0.2	ND	6	48	160	1.1	163	380	1230	20	7.2
Pleasant Valley	01N21W15H01S	09/02/2015	1.8	200	548	ND	660	ND	5550	ND	2000	9	208	1900	0.5	581	2130	4340	ND	7.1
Pleasant Valley	02N20W17L01S	09/09/2015	0.7	270	168	ND	165	ND	1880	0.4	840	6	53	280	17.2	169	530	1380	20	7.2
Pleasant Valley	02N20W19F04S	09/09/2015	0.7	260	200	ND	157	ND	1920	0.2	140	6	48	140	0.6	160	590	1420	20	7.1
Pleasant Valley	02N20W29B02S	09/21/2015	0.3	270	71	ND	118	ND	1190	0.5	ND	3	51	50	4.8	99	155	772	ND	7.3
Pleasant Valley	02N21W33R02S	09/09/2015	0.3	250	86	ND	55	ND	962	0.4	470	4	21	40	0.6	82	199	698	ND	7.3
Pleasant Valley	02N21W34C01S	09/09/2015	0.3	230	97	ND	74	ND	1150	0.4	510	5	27	50	0.5	101	240	775	ND	7.3
Pleasant Valley	02N21W34G01S	09/09/2015	0.9	330	99	ND	196	ND	1880	0.3	100	7	33	30	0.5	259	330	1250	20	7.4
Santa Paula	02N22W03B01S	12/31/2015	0.6	370	292	ND	118	ND	2500	0.4	900	6	86	530	0.7	185	1050	2110	ND	7
Santa Paula	02N22W03K02S	10/06/2015	0.5	310	135	ND	50	ND	1290	0.4	60	5	33	30	1.7	101	370	1010	ND	7.2
Santa Paula	03N21W09K04S	12/10/2015	0.4	310	140	ND	48	ND	1350	0.3	300	4	34	440	ND	118	388	1040	ND	7.2
Santa Paula	03N21W17Q01S	12/02/2015	0.8	350	205	ND	79	ND	2070	0.4	ND	3	64	80	27.8	160	665	1550	ND	6.8
Santa Paula	03N22W35Q01S	08/21/2015	1	440	297	ND	94	ND	3000	0.3	60	6	91	760	28	297	1360	2610	20	7
Santa Paula	03N22W36K07S	10/16/2015	0.4	230	214	ND	66	ND	1730	0.3	120	4	52	140	ND	89	600	1260	ND	7.2
Sherwood	01N19W19H03S	12/29/2015	0.1	330	60	ND	36	ND	871	0.1	ND	2	40	20	ND	55	109	632	40	7.3
Sherwood	01N19W29H07S	12/29/2015	ND	320	162	ND	102	40	1470	ND	3400	1	43	320	ND	69	315	1010	920	6.9
Sherwood	01N20W25C07S	12/29/2015	0.1	370	168	ND	230	ND	1710	0.1	30	2	55	ND	0.9	62	176	1060	1500	6.8
Sherwood	01N20W25F04S	12/29/2015	ND	200	17	ND	29	ND	570	ND	3100	ND	3	50	ND	96	29	374	170	7.7
Simi Valley	02N18W08D04S	09/01/2015	1.1	350	226	ND	150	ND	2360	0.4	190	6	79	400	26.9	207	700	1770	ND	6.9
Simi Valley	02N18W08K07S	09/01/2015	1	310	280	ND	140	10	2500	0.4	3000	5	84	ND	52.4	187	820	1880	80	7.1
Simi Valley	02N18W09E01S	09/01/2015	0.8	200	211	ND	110	ND	2100	0.6	ND	4	74	ND	26.6	160	720	1510	ND	7
Thousand Oaks	01N19W08G02S	11/04/2015	0.1	290	132	ND	134	10	1790	ND	7700	3	111	180	ND	108	530	1310	80	7.1
Thousand Oaks	01N19W09N01S	11/04/2015	0.2	390	156	ND	177	ND	1970	ND	1300	4	120	40	ND	120	530	1500	ND	7.2

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
Tierra Rejada Valley	02N19W10R01S	08/13/2015	ND	250	84	ND	122	ND	1130	0.3	ND	ND	61	30	16.6	49	141	724	ND	7.3
Tierra Rejada Valley	02N19W10R02S	08/13/2015	0.2	210	52	ND	72	ND	970	0.4	ND	1	56	ND	11.4	57	173	633	ND	7.3
Tierra Rejada Valley	02N19W11J03S	08/13/2015	0.2	270	61	ND	64	ND	983	0.2	80	ND	56	ND	22.2	53	162	688	110	7.6
Tierra Rejada Valley	02N19W14F01S	08/13/2015	0.1	370	91	ND	110	ND	1270	0.2	ND	ND	78	ND	69.6	45	119	883	ND	7.2
Tierra Rejada Valley	02N19W14P01S	08/13/2015	0.1	400	58	ND	69	20	1060	0.2	220	1	65	20	37.3	59	83	772	120	7.8
Tierra Rejada Valley	02N19W14Q02S	08/13/2015	0.1	200	45	ND	55	ND	886	0.2	80	6	39	80	1	69	88	503	40	8
Tierra Rejada Valley	02N19W15J02S	08/13/2015	0.2	320	90	ND	134	ND	1480	0.2	ND	3	80	ND	48.7	94	230	1000	20	7.4
Tierra Rejada Valley	02N19W15N03S	09/21/2015	0.2	200	65	ND	81	ND	943	0.4	620	2	56	30	3.1	43	165	616	ND	7
U N D E F I N E D	02N21W13A01S	10/06/2015	0.1	230	69	ND	12	ND	705	0.4	150	3	19	70	ND	49	152	534	ND	7.5
Upper Ojai	04N22W11P02S	09/11/2015	0.1	270	37	ND	11	ND	467	ND	2000	ND	10	170	0.5	44	ND	372	ND	7.4
Upper Ojai	04N22W12F04S	09/11/2015	ND	160	90	ND	14	ND	752	0.3	ND	1	24	ND	18.9	29	164	501	ND	7
Upper Ojai	04N22W12M03S	09/11/2015	ND	210	66	ND	26	ND	706	0.4	ND	1	21	70	6.6	45	109	485	ND	7.1
Ventura River - Lower	02N23W05K01S	09/29/2015	0.8	220	148	ND	221	ND	2000	0.4	380	7	53	200	1.3	166	360	1180	ND	7.6
Ventura River - Lower	03N23W32Q03S	12/31/2015	1.1	330	147	ND	300	ND	2110	0.5	60	7	50	250	ND	238	380	1450	ND	7.2
Ventura River - Lower	03N23W32Q10S	12/31/2015	1.1	400	183	ND	350	ND	2450	0.6	100	6	65	50	6.2	256	510	1780	ND	7.1
Ventura River - Upper	04N23W09G03S	09/29/2015	0.4	320	116	ND	81	ND	1180	0.3	ND	2	36	ND	29	54	177	815	30	7.4
Ventura River - Upper	04N23W15A02S	11/03/2015	0.3	170	44	ND	83	ND	807	0.8	30	ND	13	140	12.9	109	115	548	20	7.5

* Undefined – This well is outside of known groundwater basin boundaries.

California Title 22 Metals

Metals Table D-2			
Element Name	Element Symbol	Reported Units	Laboratory Analytical Method
Aluminum	Al	µg/l	EPA 200.8
Antimony	Sb	µg/l	EPA 200.8
Arsenic	As	µg/l	EPA 200.8
Barium	Ba	µg/l	EPA 200.8
Beryllium	Be	µg/l	EPA 200.8
Cadmium	Cd	µg/l	EPA 200.8
Chromium	Cr	µg/l	EPA 200.8
Lead	Pb	µg/l	EPA 200.8
Mercury	Hg	µg/l	EPA 245.1
Nickel	Ni	µg/l	EPA 200.8
Selenium	Se	µg/l	EPA 200.8
Silver	Ag	µg/l	EPA 200.8
Thallium	Tl	µg/l	EPA 200.8
Vanadium	V	µg/l	EPA 200.8

Radio Chemistry

Radio Chemistry Table D-3			
Name	Element Symbol	Reported Units	Laboratory Analytical Method
Gross Alpha		pCi/l	EPA 900.0
Uranium	U	pCi/l	EPA 908.0

Table D-2 Metals

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Arroyo Santa Rosa	02N19W19P02S	09/21/2015	ND	ND	3	16.5	ND	ND	19	ND	ND	1	3	ND	ND	60
Arroyo Santa Rosa	02N20W25D01S	09/21/2015	ND	ND	4	16.4	ND	ND	7	1.8	ND	4	6	ND	ND	64
Conejo Valley	01N20W03J01S	11/04/2015	ND	ND	ND	0.6	ND	ND	5	0.9	ND	ND	1	ND	ND	23
Cuyama Valley	09N23W30E05S	11/05/2015	ND	ND	ND	30.2	ND	ND	4	ND	ND	ND	7	ND	ND	2
Cuyama Valley	09N24W33J03S	11/05/2015	ND	ND	ND	31.2	ND	ND	4	ND	ND	ND	9	ND	ND	3
Fillmore	04N20W32R01S	12/09/2015	ND	ND	ND	53	ND	ND	2	ND	ND	ND	6	ND	ND	ND
Gillibrand/Tapo	03N18W24C07S	09/01/2015	ND	ND	3	39.2	ND	ND	3	1.6	ND	ND	19	ND	ND	10
Las Posas - East	02N20W04B01S	12/07/2015	ND	ND	ND	31.5	ND	ND	2	1.2	ND	ND	ND	ND	ND	ND
Las Posas - East	02N20W10G01S	09/01/2015	ND	ND	ND	29.6	ND	ND	3	ND	ND	5	15	ND	ND	ND
Las Posas - East	03N20W36P01S	12/07/2015	ND	ND	2	60.8	ND	ND	7	ND	ND	ND	4	ND	ND	14
Las Posas - West	02N21W08H03S	09/08/2015	ND	ND	ND	59.5	ND	ND	3	1.3	ND	ND	13	ND	ND	5
Las Posas - West	02N21W09D02S	09/08/2015	ND	ND	2	63.6	ND	ND	4	7.3	ND	2	17	ND	ND	9
Las Posas - West	02N21W10Q04S	10/06/2015	ND	ND	ND	39	ND	ND	4	ND	0.03	ND	ND	ND	ND	ND
Las Posas - West	02N21W15M04S	08/21/2015	ND	ND	2	40.7	ND	ND	2	ND	0.02	ND	20	ND	ND	ND
Little Cuddy Valley	08N20W04N02S	12/30/2015	ND	ND	ND	131	ND	0.2	5	0.9	ND	1	ND	ND	ND	3
Lockwood Valley	08N21W23Q10S	12/30/2015	10	ND	68	21.3	ND	ND	6	ND	ND	ND	14	ND	ND	111
Lockwood Valley	08N21W29N02S	12/30/2015	ND	ND	ND	31.8	ND	ND	5	0.5	ND	2	1	ND	ND	2
Lockwood Valley	08N21W29Q05S	12/30/2015	ND	ND	8	10.9	ND	ND	3	ND	ND	ND	11	ND	ND	15
Lockwood Valley	08N21W29R09S	12/30/2015	ND	ND	6	12.5	ND	ND	3	0.7	0.07	ND	2	ND	ND	16
Lockwood Valley	08N21W30R01S	12/30/2015	390	ND	4	28.6	ND	ND	6	4.1	ND	1	4	ND	ND	14
Lockwood Valley	08N21W33R03S	12/30/2015	ND	ND	ND	25.5	ND	ND	5	ND	ND	ND	10	ND	ND	5
Mound	02N23W13F02S	10/16/2015	ND	ND	7	24	ND	ND	3	ND	ND	ND	2	ND	ND	ND
North Coast	04N25W25N06S	09/29/2015	ND	ND	ND	23.1	ND	ND	6	ND	ND	ND	7	ND	ND	3
Ojai Valley	04N22W04Q01S	09/29/2015	60	ND	ND	31.7	ND	ND	3	3.1	ND	5	ND	ND	ND	ND
Ojai Valley	04N22W07C05S	09/29/2015	ND	ND	ND	18.1	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
Ojai Valley	04N22W07D04S	09/29/2015	ND	ND	ND	49.5	ND	0.4	4	ND	0.02	ND	6	ND	ND	ND
Oxnard Plain Forebay	02N21W07P04S	09/08/2015	ND	ND	ND	22.3	ND	ND	2	ND	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	01N21W08R01S	09/09/2015	20	ND	5	101	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	01N21W16M03S	09/10/2015	ND	ND	ND	77.8	ND	ND	5	ND	ND	ND	1	ND	ND	14
Oxnard Plain Pressure	01N21W16P04S	09/24/2015	ND	ND	ND	46.6	ND	ND	3	0.7	ND	ND	3	ND	ND	ND
Oxnard Plain Pressure	01N21W28G01S	09/02/2015	10	ND	5	79.4	ND	ND	4	ND	ND	2	7	ND	ND	ND
Oxnard Plain Pressure	01N21W29K02S	09/24/2015	ND	ND	3	21.7	ND	ND	2	ND	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	01N21W33A01S	09/30/2015	ND	ND	ND	81.2	ND	ND	3	ND	ND	ND	5	ND	ND	2
Oxnard Plain Pressure	01N22W03F05S	09/02/2015	ND	ND	ND	21.4	ND	ND	3	ND	ND	1	13	ND	ND	3

Table D-2 Metals (cont.)

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Oxnard Plain Pressure	01N22W03F07S	09/02/2015	ND	ND	2	41.6	ND	0.3	3	ND	ND	2	18	ND	ND	3
Oxnard Plain Pressure	01N22W06B01S	08/24/2015	ND	ND	ND	19.2	ND	ND	3	1	ND	ND	19	ND	ND	4
Oxnard Plain Pressure	01N22W19A01S	09/30/2015	ND	ND	ND	21.9	ND	ND	1	1.2	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	01N22W23R02S	10/16/2015	ND	ND	4	24.1	ND	ND	2	ND	ND	ND	15	ND	ND	2
Oxnard Plain Pressure	01N22W25K02S	09/10/2015	50	ND	7	50.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	01N22W26Q01S	08/24/2015	30	ND	ND	43.2	ND	ND	2	ND	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	02N21W18H12S	09/08/2015	ND	ND	ND	24.6	ND	ND	2	ND	ND	ND	7	ND	ND	ND
Oxnard Plain Pressure	02N21W18H14S	09/24/2015	ND	ND	ND	40.4	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	02N22W24P02S	09/21/2015	ND	ND	ND	16.4	ND	ND	3	ND	ND	ND	5	ND	ND	3
Oxnard Plain Pressure	02N22W30F03S	09/02/2015	ND	ND	ND	20.2	ND	ND	3	ND	ND	ND	1	ND	ND	ND
Oxnard Plain Pressure	02N22W36E02S	09/02/2015	ND	ND	ND	20.5	ND	ND	3	ND	ND	2	15	ND	ND	3
Oxnard Plain Pressure	02N22W36F02S	09/02/2015	ND	ND	ND	23.5	ND	0.3	2	ND	ND	1	24	ND	ND	12
Piru	04N18W30A03S	12/09/2015	ND	ND	ND	39.5	ND	0.3	4	ND	ND	3	5	ND	ND	4
Piru	04N18W30J04S	12/09/2015	ND	ND	ND	30.9	ND	ND	3	1.2	ND	2	4	ND	ND	2
Piru	04N19W23R03S	12/09/2015	70	ND	ND	23.3	ND	1.2	5	ND	ND	13	5	ND	ND	4
Piru	04N19W25M03S	12/09/2015	ND	ND	6	24.6	ND	1.3	4	ND	ND	7	339	ND	ND	4
Piru	04N19W26H01S	12/09/2015	ND	ND	ND	21.8	ND	ND	3	ND	ND	2	4	ND	ND	3
Piru	04N19W26J03S	12/09/2015	ND	ND	ND	21	ND	ND	3	ND	ND	2	3	ND	ND	3
Pleasant Valley	01N21W01M02S	09/30/2015	ND	ND	ND	144	ND	1.5	3	77.1	ND	45	3	ND	ND	ND
Pleasant Valley	01N21W04K01S	09/09/2015	140	ND	ND	52.6	ND	ND	ND	0.9	ND	ND	2	ND	ND	ND
Pleasant Valley	01N21W12D02S	09/10/2015	1350	ND	ND	264	ND	ND	4	0.9	ND	5	ND	ND	ND	4
Pleasant Valley	01N21W15D02S	09/09/2015	ND	ND	2	40.4	ND	ND	ND	ND	ND	ND	4	ND	ND	3
Pleasant Valley	02N20W19F04S	09/09/2015	ND	ND	ND	46.1	ND	ND	ND	0.6	ND	4	2	ND	ND	ND
Pleasant Valley	02N21W33R02S	09/09/2015	ND	ND	ND	52.2	ND	ND	ND	ND	ND	1	ND	ND	ND	ND
Pleasant Valley	02N21W34G01S	09/09/2015	ND	ND	ND	42.8	ND	ND	2	4.2	ND	ND	3	ND	ND	ND
Santa Paula	02N22W03B01S	12/31/2015	ND	ND	3	25.7	ND	ND	5	ND	ND	4	6	ND	ND	ND
Santa Paula	03N21W09K04S	12/10/2015	ND	ND	4	26.9	ND	ND	2	ND	ND	ND	1	ND	ND	ND
Sherwood	01N19W19H03S	12/29/2015	ND	6	9	11.8	ND	ND	3	ND	ND	4	ND	ND	ND	ND
Sherwood	01N20W25C07S	12/29/2015	ND	ND	ND	58.7	ND	0.7	4	0.6	ND	1	2	ND	ND	ND
Simi Valley	02N18W08D04S	09/01/2015	ND	ND	2	14.6	ND	ND	4	ND	ND	2	16	ND	ND	4
Tierra Rejada Valley	02N19W10R01S	08/13/2015	ND	ND	ND	66.8	ND	ND	6	ND	ND	ND	5	ND	ND	51
Ventura River - Lower	02N23W05K01S	09/29/2015	ND	ND	4	30.5	ND	ND	4	ND	ND	3	6	ND	ND	ND
Ventura River - Lower	03N23W32Q10S	12/31/2015	ND	ND	4	31.9	ND	0.2	5	ND	ND	5	12	ND	ND	2
Ventura River - Upper	04N23W15A02S	11/03/2015	ND	ND	ND	44.6	ND	ND	2	1.3	ND	ND	2	ND	ND	ND

Table D-3 Radiochemistry

GW Basin	SWN	Date	Alpha pCi/L	CE	Uranium pCi/L	CE
Little Cuddy Valley	08N20W04N02S	12/30/2015	4.32	1.52	1.61	0.93
Lockwood Valley	08N21W23Q10S	12/30/2015	16.5	3.41	15.7	2.44
Lockwood Valley	08N21W29N02S	12/30/2015	4.87	2.28	3.12	1.19
Lockwood Valley	08N21W29Q05S	12/30/2015	14	4.59	11.9	2.14
Lockwood Valley	08N21W29R09S	12/30/2015	11.2	2.49	8.41	1.82
Lockwood Valley	08N21W30R01S	12/30/2015	22.4	4.69	27	3.18
Lockwood Valley	08N21W33R03S	12/30/2015	5.12	1.75	3.31	1.21
Ojai Valley	04N23W12B03S	12/10/2015	5.78	2.26		
Oxnard Plain Pressure	01N21W21H02S	10/16/2015	0.15	0.966		
Piru	04N19W23R03S	12/09/2015	6.15	3.3		
U N D E F I N E D	02N21W13A01S	10/06/2015	0.028	1.1		

* CE – Counting Error

Appendix E – Piper Diagrams

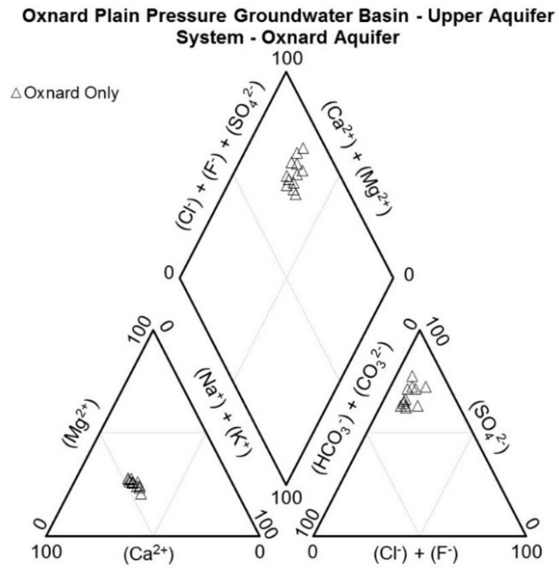

Figure E-1: Oxnard Aquifer piper diagram.

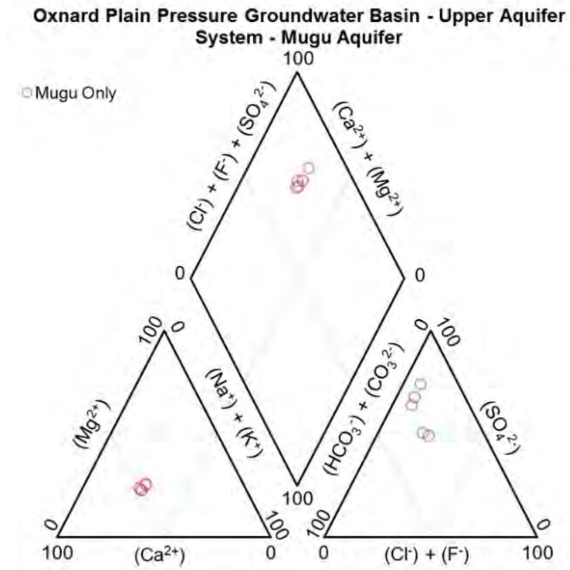

Figure E-2: Mugu Aquifer piper diagram.

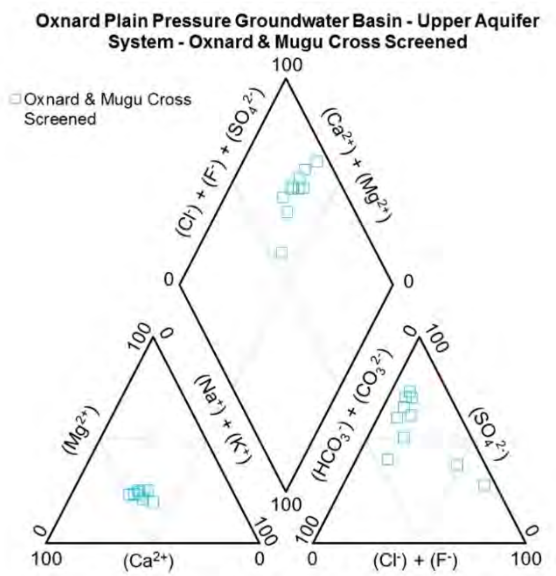

Figure E-3: Oxnard & Mugu Cross Screened piper diagram.

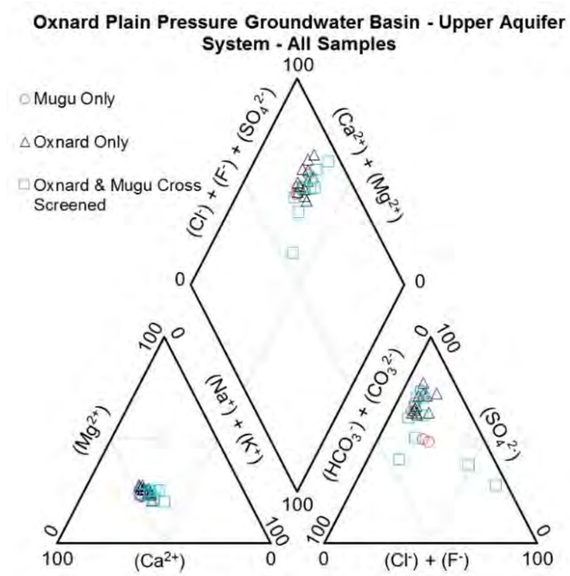

Figure E-4: All Upper Aquifer System piper diagram.

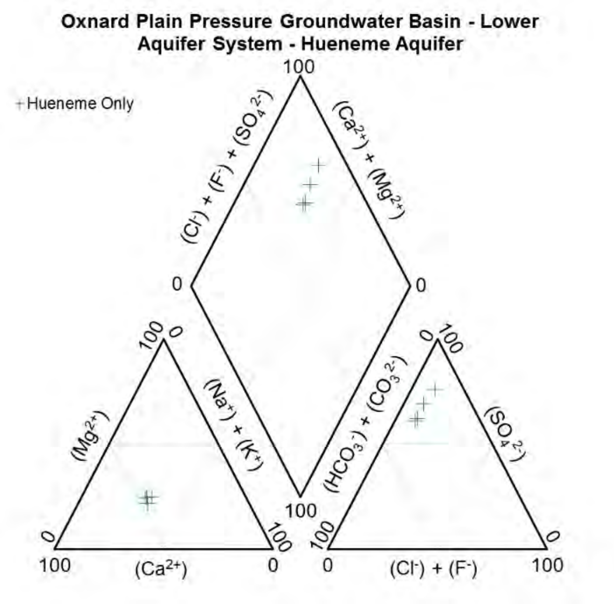

Figure E-5: Hueneme Aquifer piper diagram.

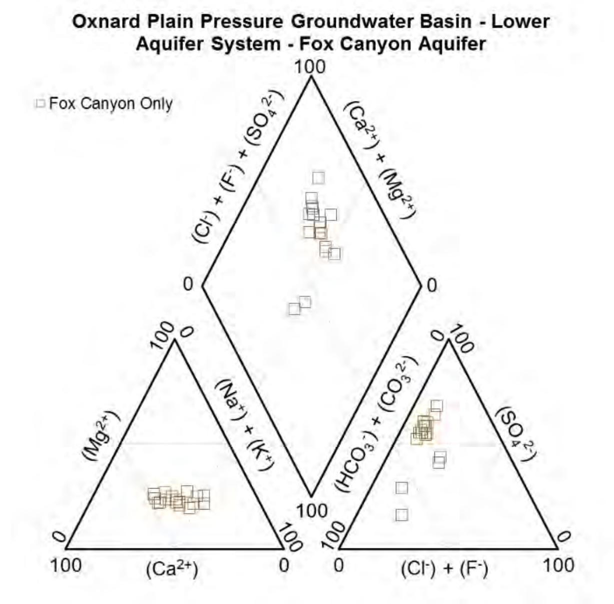

Figure E-6: Fox Canyon Aquifer piper diagram.

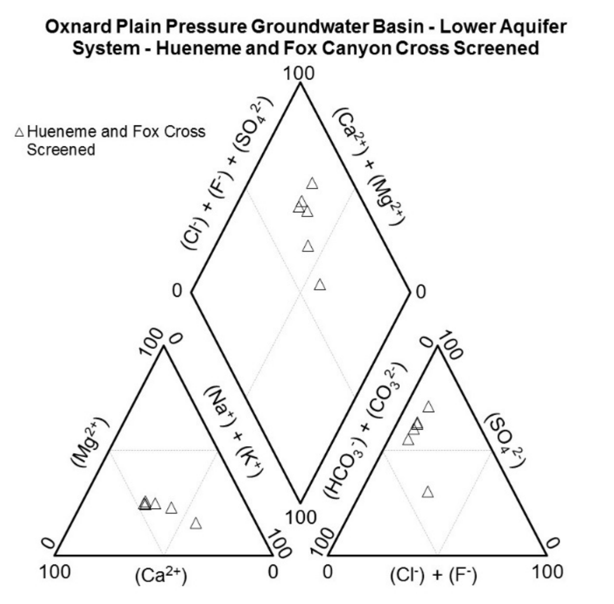

Figure E-7: Fox and Hueneme cross screened piper diagram.

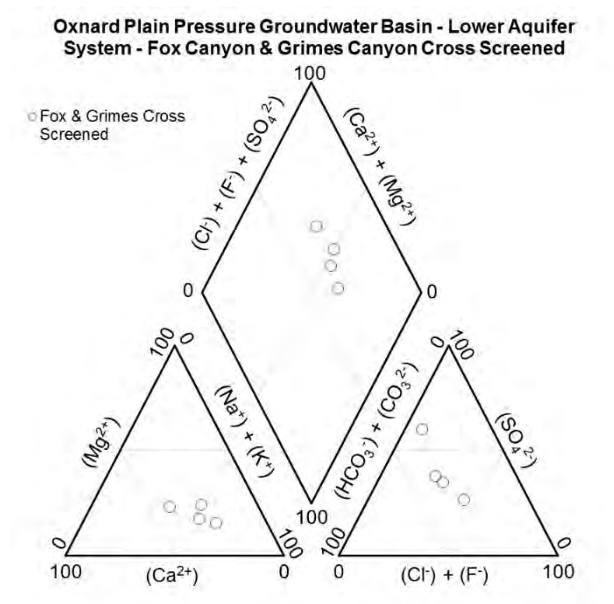

Figure E-8: Fox and Grimes cross screened piper diagram.

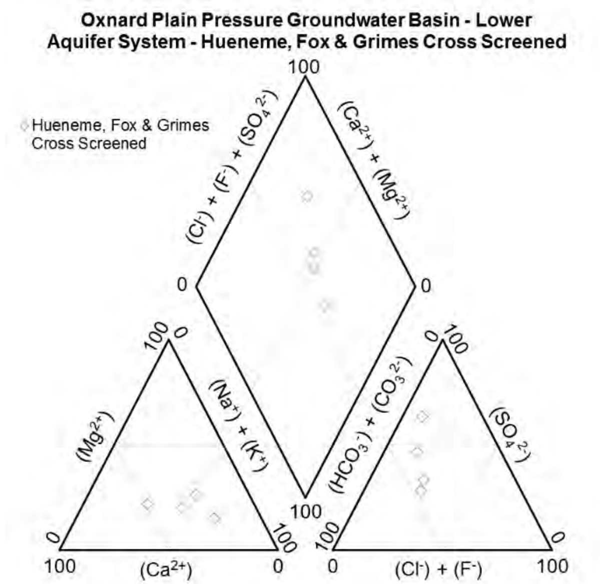

Figure E-9: Hueneme, Fox & Grimes cross screened piper diagram.

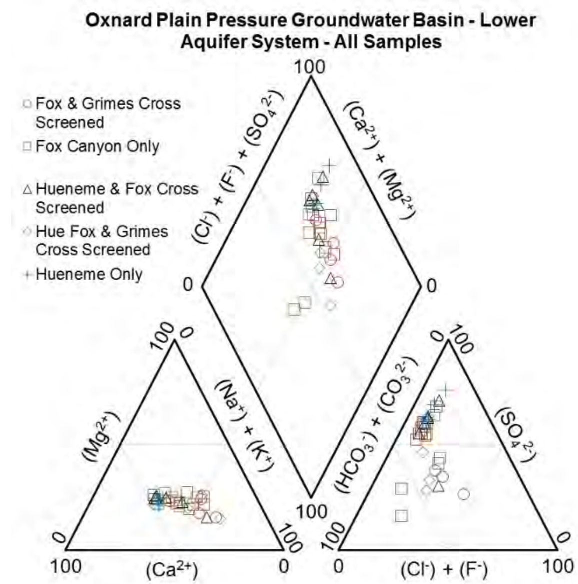

Figure E-10: All Lower Aquifer System piper diagram.

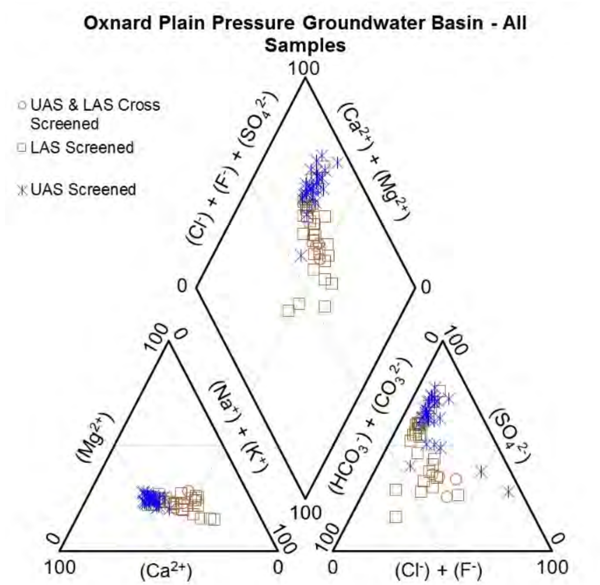

Figure E-11: Oxnard Plain Pressure Basin all samples piper diagram.

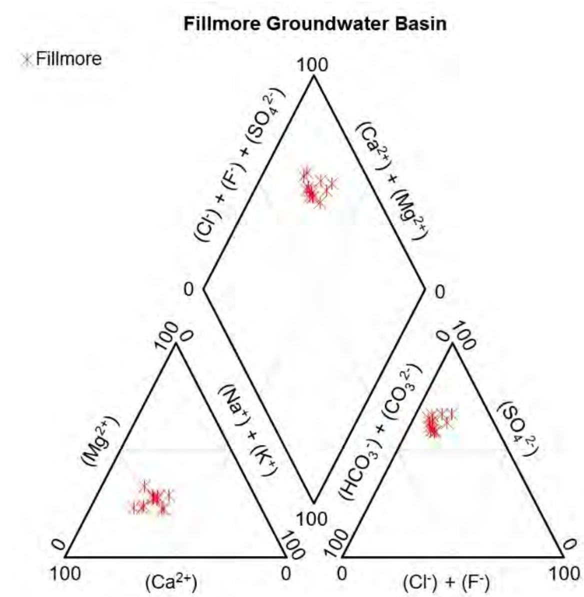

Figure E-12: Fillmore basin piper diagram.

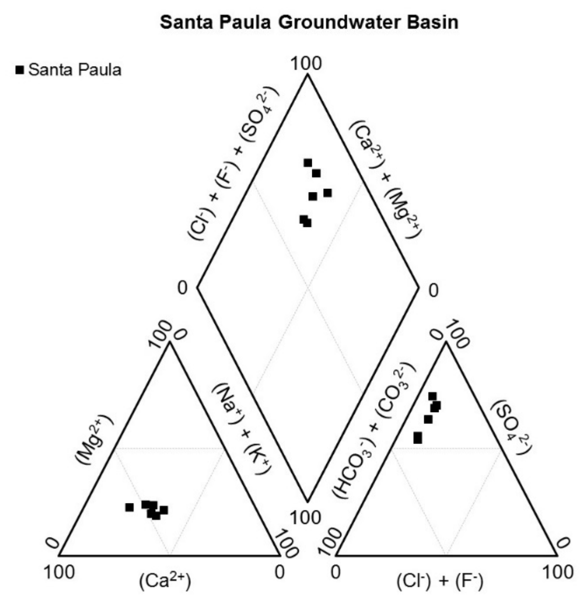

Figure E-13: Santa Paula basin piper diagram.

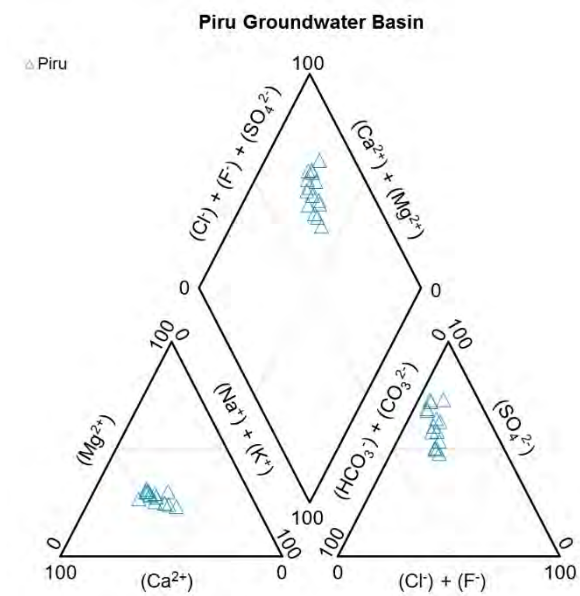

Figure E-14: Piru basin piper diagram.

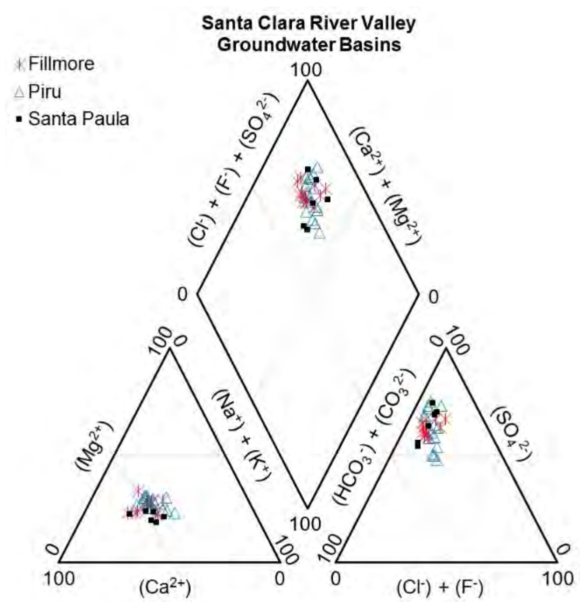

Figure E-15: Fillmore, Piru, and Santa Paula comparison piper diagram.

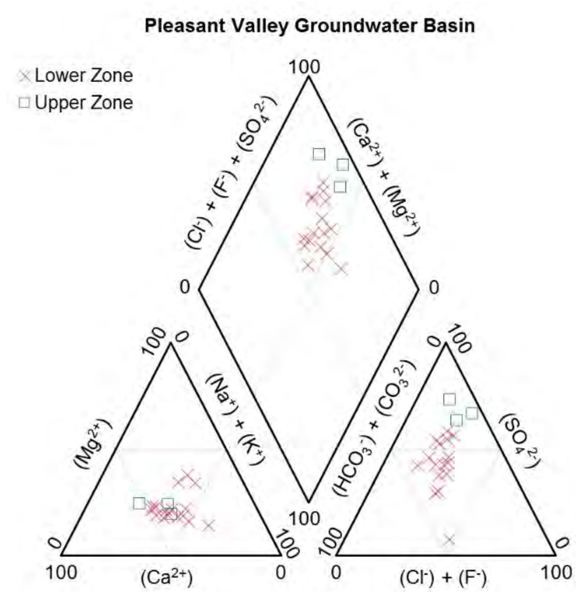

Figure E-16: Pleasant Valley basin piper diagram.

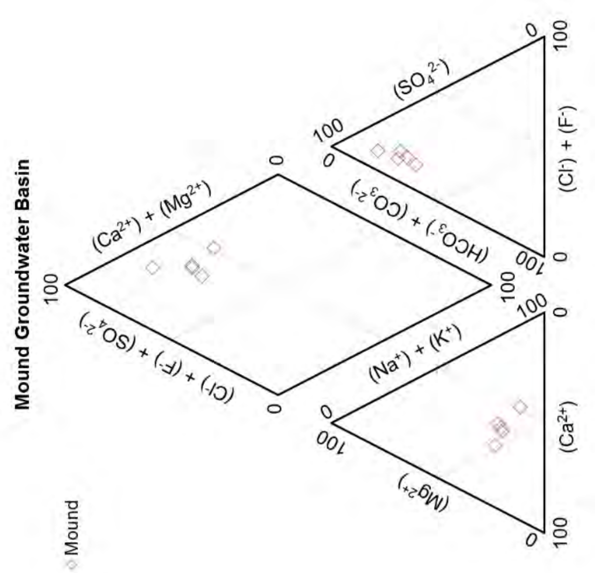

Figure E-17: Mound basin piper diagram.

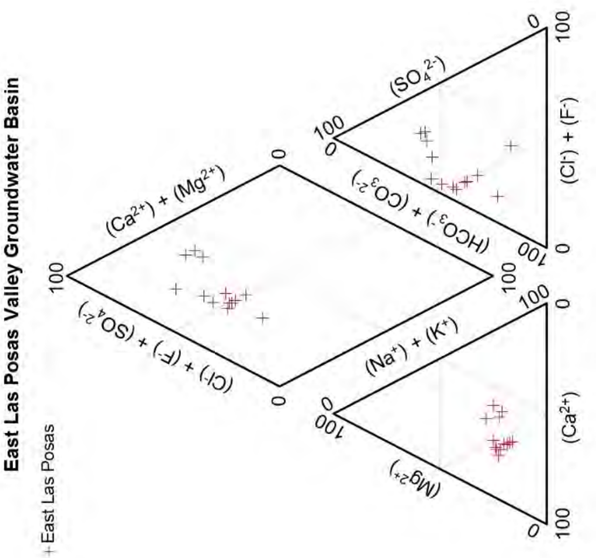

Figure E-18: East Las Posas basin piper diagram.

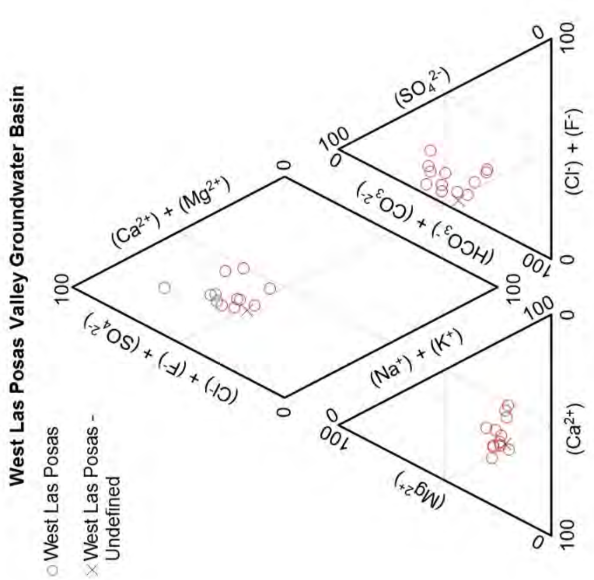

Figure E-19: West Las Posas basin piper diagram.

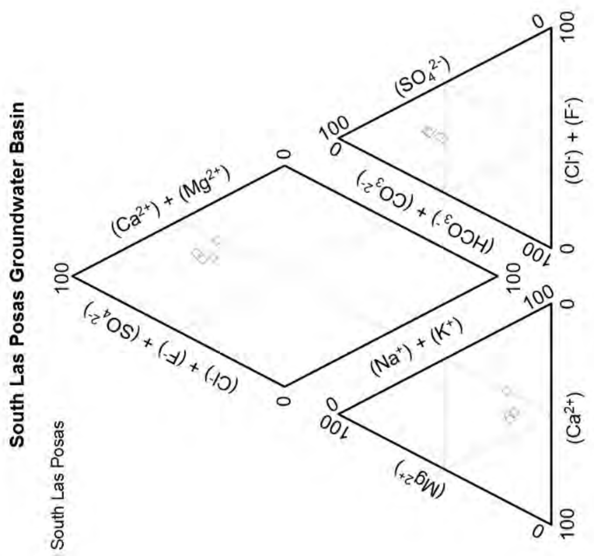

Figure E-20: South Las Posas basin piper diagram.

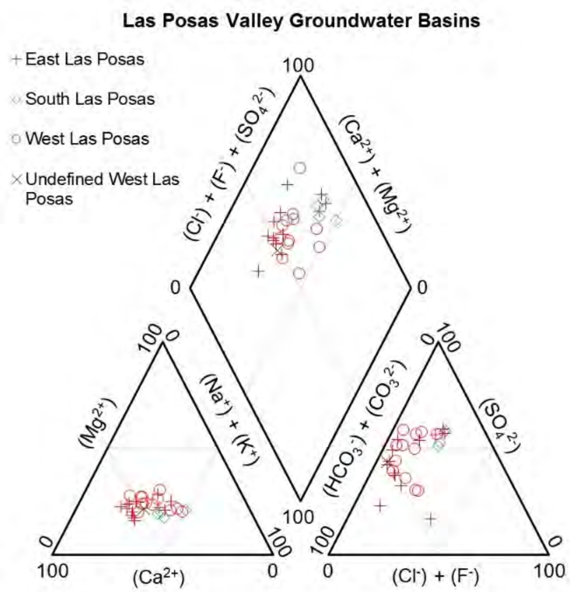

Figure E-21: All Las Posas basins comparison piper diagram.

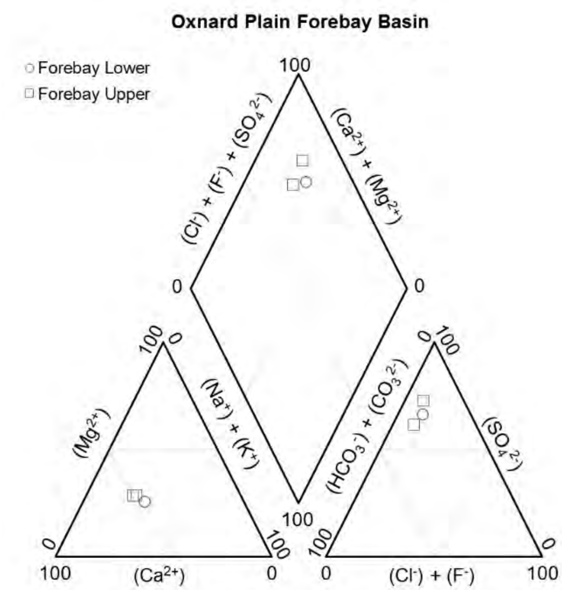

Figure E-22: Oxnard Forebay basin piper diagram.

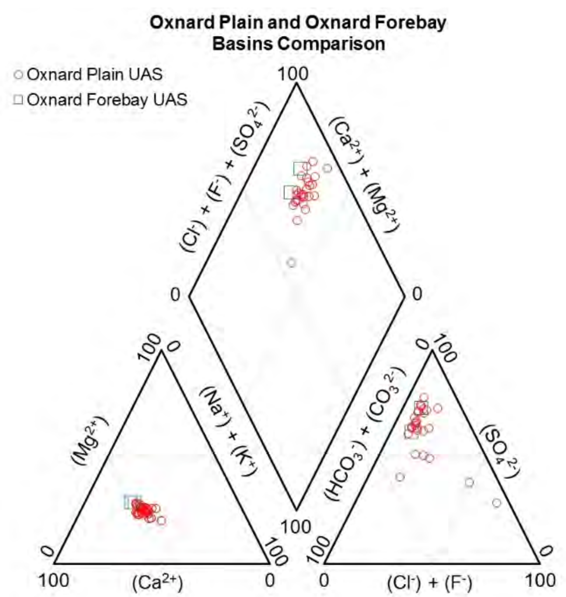

Figure E-23: Oxnard Plain Basins UAS comparison piper diagram.

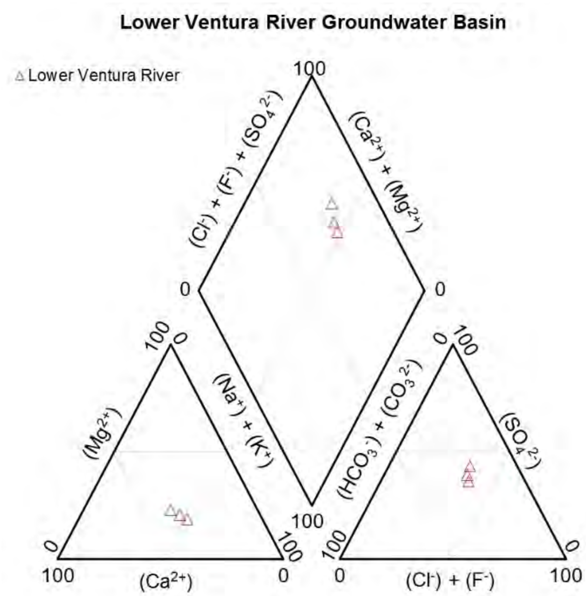

Figure E-24: Lower Ventura River basin piper diagram.

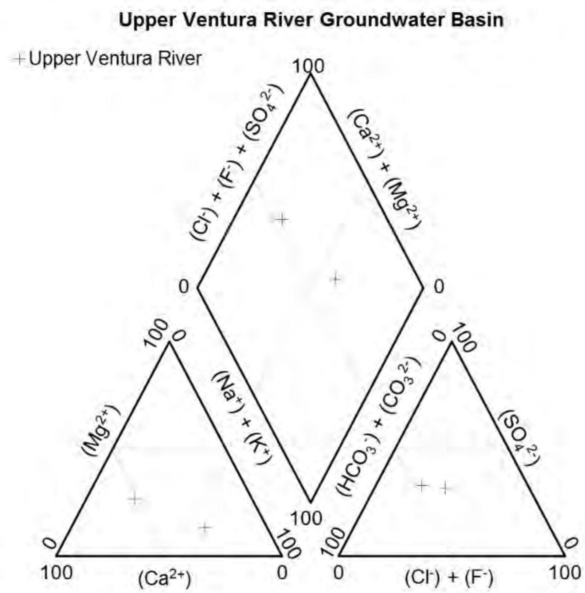

Figure E-25: Upper Ventura River basin piper diagram.

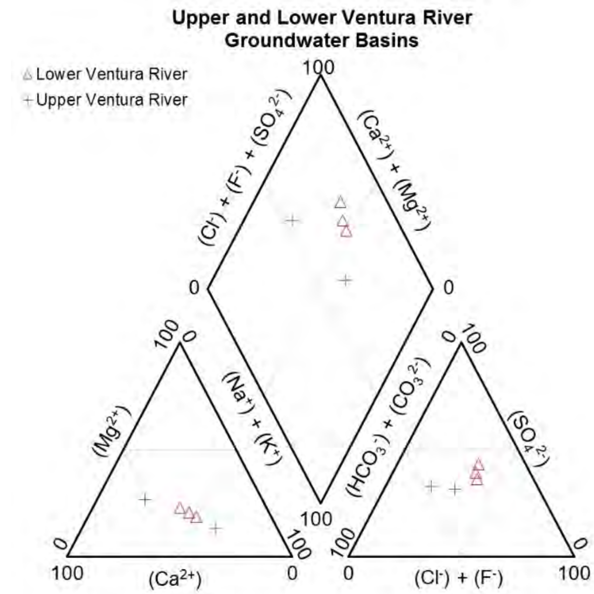

Figure E-26: Upper and Lower Ventura River basins piper diagram.

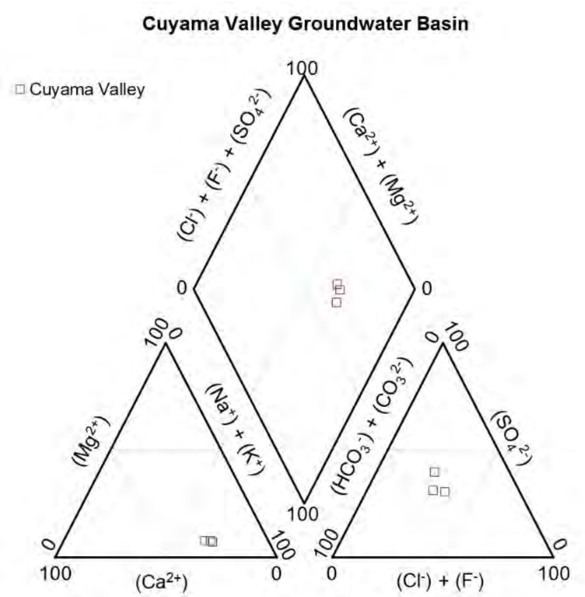

Figure E-27: Cuyama Valley basin piper diagram.

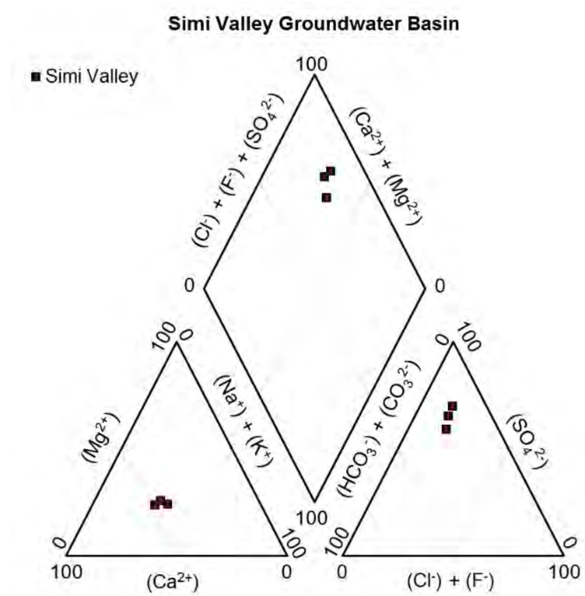

Figure E-28: Simi Valley basin piper diagram.

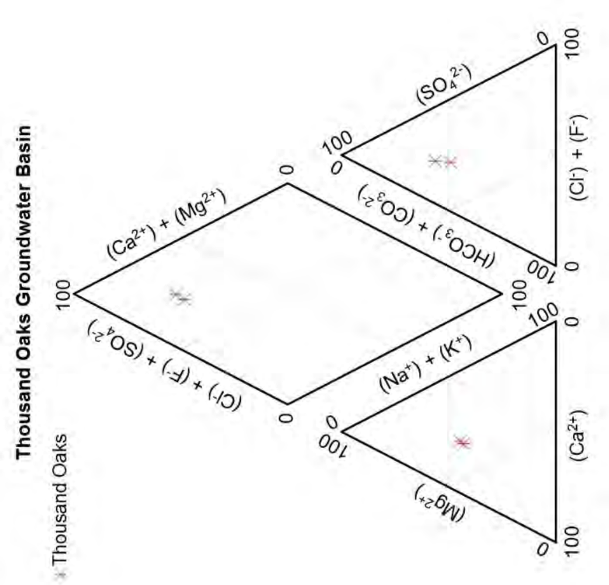

Figure E-29: Thousand Oaks basin piper diagram.

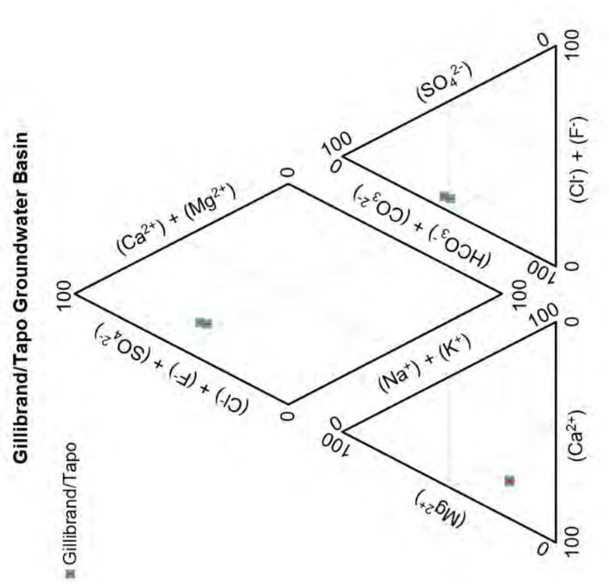

Figure E-30: Tapo/Gillibrand basin piper diagram.

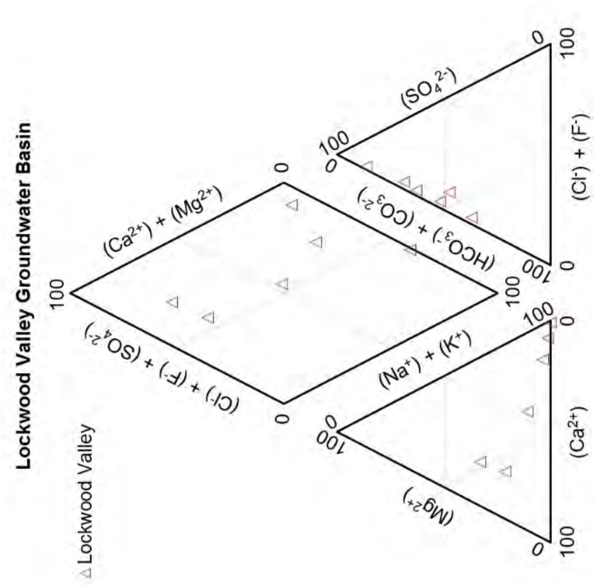

Figure E-31: Lockwood Valley basin piper diagram.

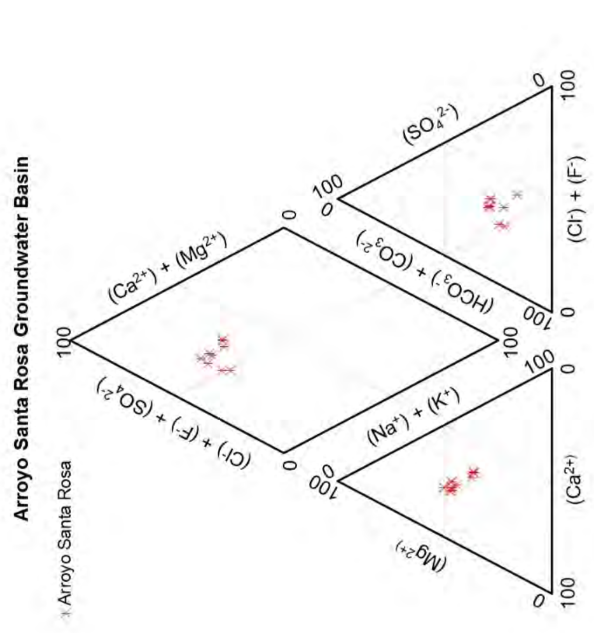

Figure E-32: Arroyo Santa Rosa basin piper diagram.

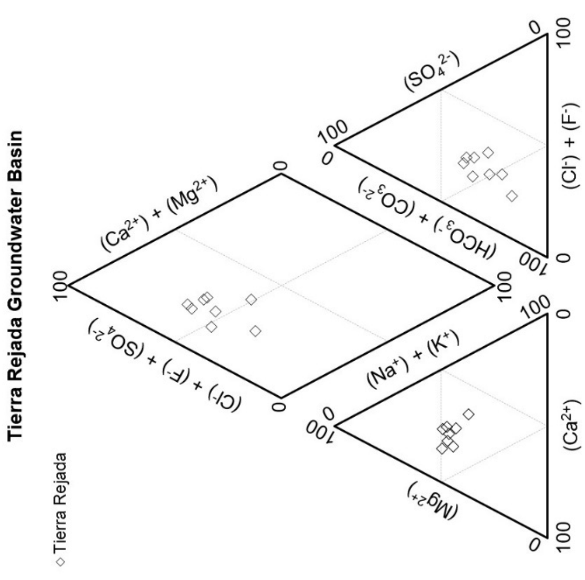

Figure E-33: Tierra Rejada basin piper diagram.

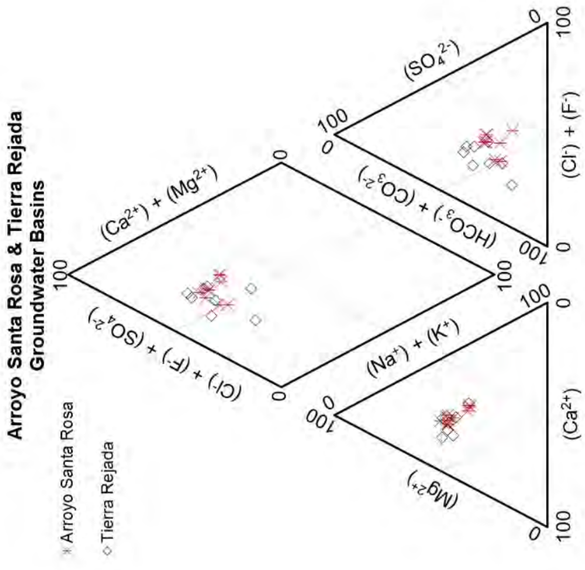

Figure E-34: Arroyo Santa Rosa & Tierra Rejada basins piper diagram.

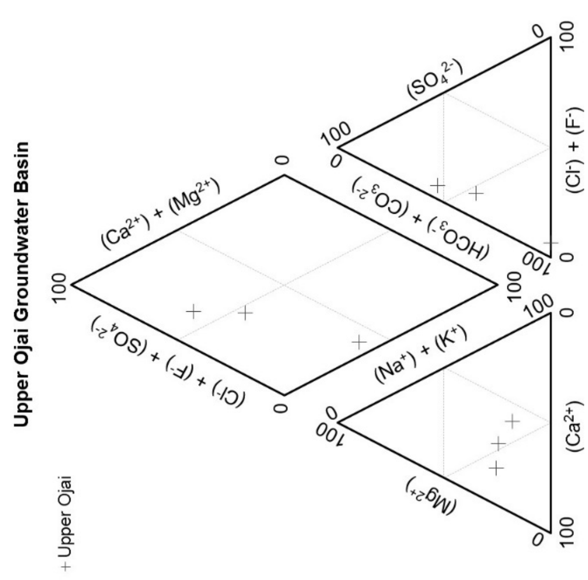

Figure E-35: Upper Ojai basin piper diagram.

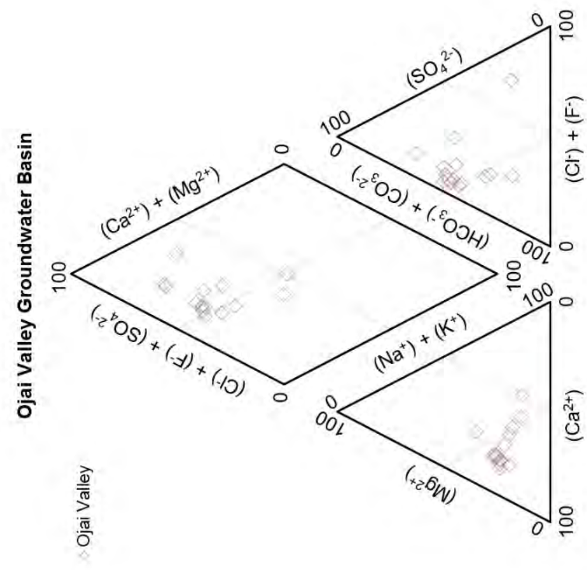

Figure E-36: Ojai Valley basin piper diagram.

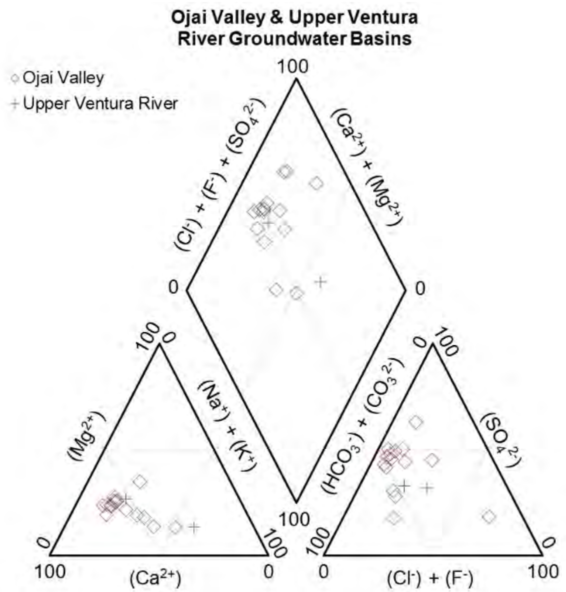

Figure E-37: Ojai Valley & Upper Ventura River comparison piper diagram.

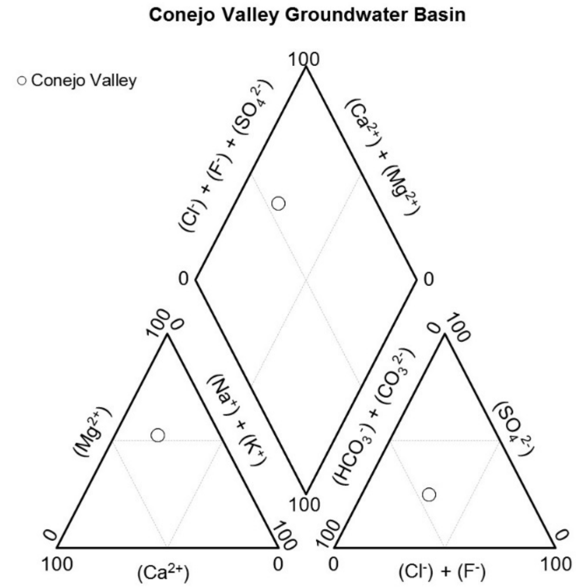

Figure E-38: Conejo Valley basin piper diagram.

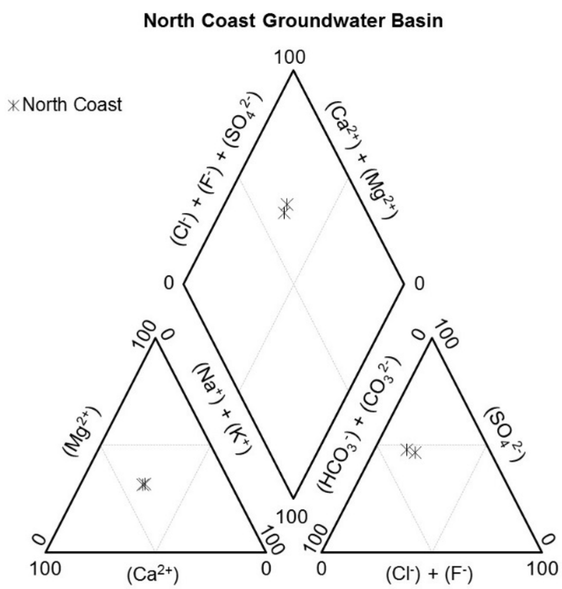

Figure E-39: North Coast basin piper diagram.

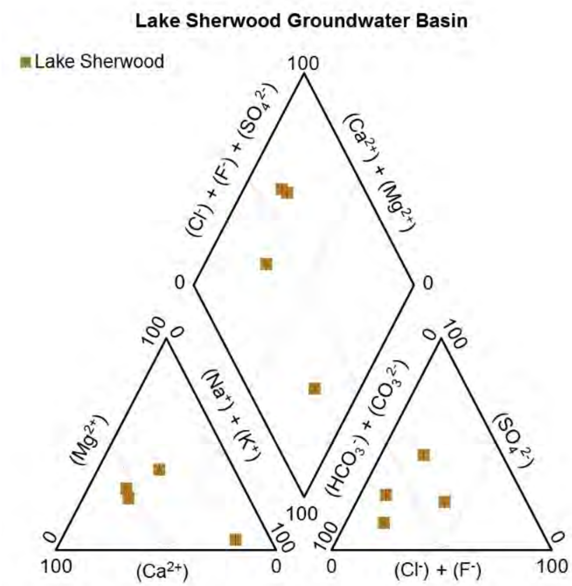

Figure E-40: Lake Sherwood basin piper diagram.

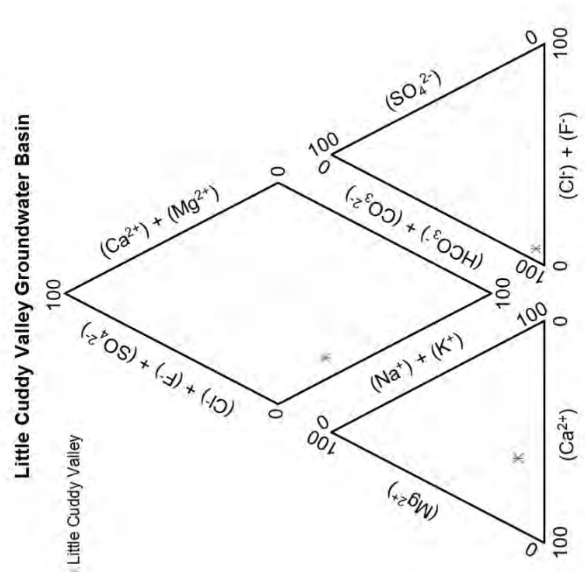

Figure E-41: Little Cuddy Valley basin piper diagram.