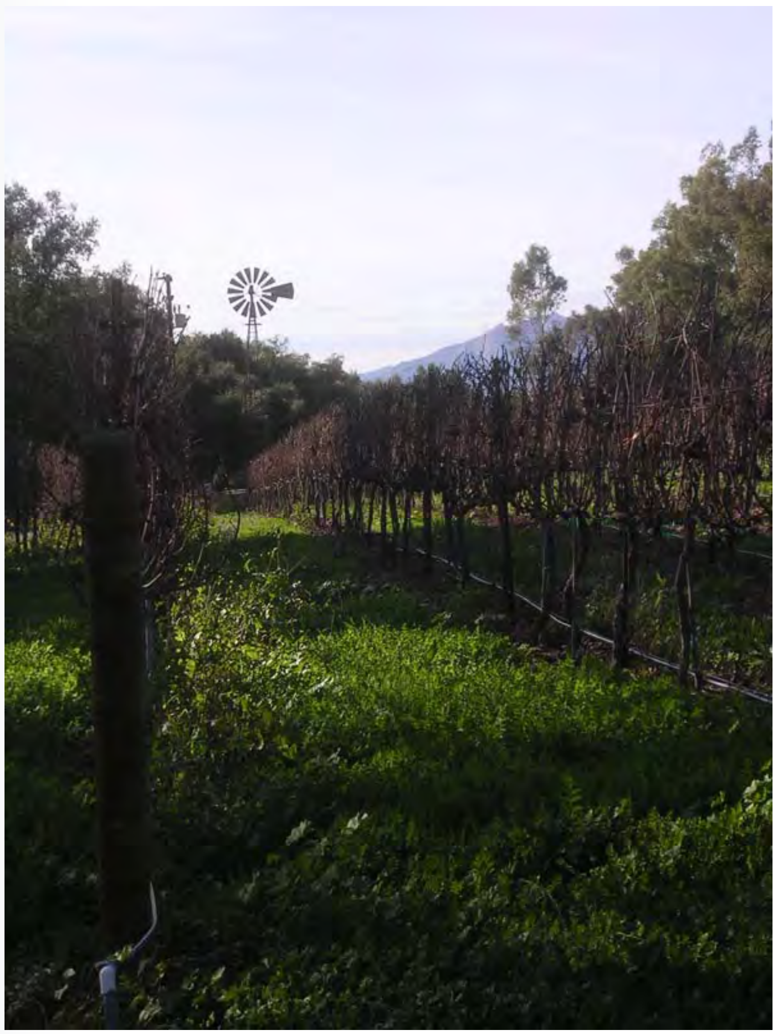
Ventura County
Watershed Protection District
Water Resources Division



2014 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."

2014 Annual Report of Groundwater Conditions

Cover Photo: Windmill Well in Upper Ojai Basin.

Ventura County Watershed Protection District
Water Resources Division
Groundwater Section

2014 Annual Report of Groundwater Conditions

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Executive Summary

The purpose of this report is to provide a high level summary of Calendar Year 2014 water quality and groundwater elevation conditions, and to highlight other significant administrative 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 first time and are included after this Executive Summary. These summary sheets include analysis of water level and water quality trends over a five year period as well as other key 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 2014 is the third consecutive year of below average rainfall in the County. The drought and regulatory constraints on surface water releases and diversions (from Lake Piru) have also caused a decrease in Santa Clara River water diversions, which has caused additional groundwater demand locally. Groundwater elevations have continued the trend from last year, declining in most parts of the County. 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, through adoption of Emergency Ordinance E, set forth mandatory cut backs in groundwater extractions over an eighteen month period for municipal, industry and agricultural users.

The County regulates groundwater well construction and destruction through its Well Ordinance, but does not regulate groundwater extraction. The purpose of the ordinance 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.

In 2014, the County updated Well Ordinance No. 4184 (now No. 4486). Specifically the Ordinance was updated with: (1) revised definitions, including additions for consistency with DWR Bulletin No. 118, and the newly enacted State of California Sustainable Groundwater Management Act; (2) better collection of water resources data from new water wells by requiring sounding tubes or other water level measuring equipment, sampling ports for water quality sampling, and calibrated flowmeters; (3) clearer reference to DWR Well Standards and setbacks; (4) installation of backflow prevention devices or check valves on all new wells; (5) requirements for down hole well disinfection and a prohibition of introduction of chemicals down hole; (6) incorporation of prohibitions from Urgency Well Ordinance No. 4466; and (7) the ability to impose administrative fines up to $1,000 per violation of the Ordinance.

Basin Summary Sheet Key

Groundwater Basin Name: **Groundwater Basin Surface Area:** **Irrigated Acreage:** **Watershed:** **Aquifers:** **California Department of Water Resources (DWR) Groundwater Basin Designation and Size:** **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 to / 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** **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. **Potable Water Sources** This section describes available potable water sources in the 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 - High, Medium or Low This section provides any notable comments by DWR about groundwater basin concerns.	
Groundwater Level Trend Notes: Level trending up Level trending down	Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend Level trending up Level trending down

Note: Oxnard Plain Basin Summary Sheet page layout varies from the key due to page size limitations.

Groundwater Basin Name:	Oxnard Plain Pressure
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)
DWR Groundwater Basin Population:	235,973 (2010)

Sources of Groundwater Recharge	**Subsurface Hydrologic Connection to Other Groundwater Basins**
Recharge Areas: Recharge to the subbasin is provided by 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. Subsurface flow from Santa Paula Subbasin makes its way over or across the Oak Ridge fault, and some underflow may come from the Las Posas and Pleasant Valley Basins on the east. Some amount of irrigation and septic system return also occurs. Imported State Project Water via Lake Piru release to Santa Clara River. (DWR Bulletin 118, 2006 update). **Potable Water Sources** Groundwater from Oxnard Plain Pressure Basin via various purveyors. Groundwater from Oxnard Forebay basin via United Water system. Imported State Project water from Calleguas MWD to various water purveyors.	North: Oxnard Forebay basin, Mound basin North to 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 (Final CASGEM Basin Prioritization Results - June 2014)

Known Water Supply Wells	**Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)**
Number of Wells: 890 Active: 368 Destroyed: 376 Abandoned: 60 Can't Locate: 86	Agricultural Extractions: 44,540 AF/Yr Municipal, Industrial, and Domestic Extractions: 21,148 AF/Yr Total: 65,688 AF/Yr

Groundwater Basin Name: Oxnard Plain Pressure

2014 Groundwater Levels in General for All Wells Gauged by County

UAS "Key" well 01N21W07H01S - December level was down 10.73 feet from the January measurement.

LAS "Key" well 01N21W32K01S - December level was up 8.10 feet from the January measurement.

In general for 25 wells measured in 2014 in the basin, water levels declined in 22 and rose in 3 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(42 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, 3 Wells
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 42 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 36 wells

5 Year Groundwater Level Trend 2010 - 2014

UAS "Key" well 01N21W07H01S: ↓

LAS "Key" well 01N21W32K01S: ↓

Upper System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

Lower System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
02N21W19A01S	↑	↑	↑	↑
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.

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Fillmore
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)
DWR Groundwater Basin Population:	16,417 (2010)

Known Water Supply Wells

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

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W05D01S - December level was down 9.4 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 reading with a slight rise in levels in December in a few wells.

2014 Groundwater Quality in General for All Wells Sampled by County

(7 wells)

The water in the 7 wells is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 7 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 7 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 03N20W05D01S: ↓

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

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: Recharge to the subbasin is provided by percolation of surface flow in the Santa Clara River, Sespe Creek, and minor tributary streams. Some of the surface flow in the Santa Clara River originates as release from Lake Piru and contains natural runoff of precipitation and imported State Water Project. (DWR Bulletin 118, 2006 update)

Potable Water Sources

Groundwater from the Fillmore Basin.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: Piru groundwater basin (upgradient).

West: Santa Paula groundwater basin (downgradient).

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Many groundwater quality impairments in the basin; Nitrates problematic during dry periods; High TDS, etc. (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Santa Paula
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)
DWR Groundwater Basin Population:	46,816 (2010)

Known Water Supply Wells

Number of Wells: 282
Active: 152
Destroyed: 74
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

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W02C01S - December level was down 7.2 feet from the March measurement.

In general for 8 of the 9 wells measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(1 well)

The water type for the 1 well is calcium sulfate type.

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

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N22W02C01S: ↓ (red)

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

(Based on 3 wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W02K09S	→	→	→	↑ (red)
03N21W15C06S	→	→	→	↓ (green)
03N21W16A02S	↑ (red)	↑ (red)	↑ (red)	↓ (green)

Two wells are in the southwest and three are in the northeast portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Recharge to the subbasin is provided by percolation of surface flow in the Santa Clara River, Santa Paula Creek, and other minor tributary streams. Some of the surface flow in the Santa Clara River originates as release from Lake Piru and contains natural runoff of precipitation and imported State Water Project water (UWCD 2000). Subsurface flow from Fillmore Subbasin, percolation of precipitation, and percolation of unused irrigation waters provide recharge as well. Groundwater in Santa Paula Subbasin flows generally toward the southwest. (DWR Bulletin 118, 2006 update)

Potable Water Sources

Groundwater from Santa Paula Basin.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: Fillmore groundwater basin (upgradient).

Southwest: Mound (downgradient), South: Oxnard Plain Forebay (downgradient).

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Nitrates can fluctuate significantly in the basin, and can be above MCL. Other inorganics present above MCL.TDS is known to be high. (Final CASGEM Basin Prioritization Results - June 2014)

Groundwater Level Trend Notes: Level trending up ↑ (green) Level trending down ↓ (red)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ (red) Level trending down ↓ (green)

Groundwater Basin Name:	Piru
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)
DWR Groundwater Basin Population:	2,666 (2010)

Known Water Supply Wells

Number of Wells: 189
Active: 151
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

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N19W25C02S - December level was down 14.6 feet from the March measurement.

In general for 5 wells consistently measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(7 wells)

Piru basin groundwater is mainly calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 7 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 7 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 04N19W25C02S: ↓

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

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: Groundwater recharge to the subbasin is by percolation of runoff from Piru Creek, Hopper Creek, and the Santa Clara River. Natural runoff and State Water Project water released from Piru Lake is diverted to percolation basins near the town of Piru (UWCD 2000). Direct percolation of precipitation, subsurface flow, and return of irrigation waters provide recharge as well (CSWRB 1956; UWCD 1999ab), from (DWR Bulletin 118, 2006 update)

Potable Water Sources

Groundwater from Piru Basin.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: East groundwater basin (upgradient).

West: Fillmore groundwater basin (downgradient).

DWR CASGEM Groundwater Basin Prioritization Level - High

DWR Impact Comments: GW Quality impacts: nitrates, storm runoff, leaking tanks, etc. (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

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)
DWR Groundwater Basin Population:	69,392 (2010)

Known Water Supply Wells

Number of Wells: 331
Active: 90
Destroyed: 170
Abandoned: 27
Can't Locate: 44

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)

Agricultural Extractions: 16,706 AF/Yr

Municipal, Industrial, and Domestic Extractions: 5,170 AF/Yr

Total: 21,876 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 01N21W03C01S - December level was down 38.20 feet from the January measurement.

In general for 13 wells measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County
(14 wells)

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

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 3 wells
Secondary MCL Exceedances for Chloride >250mg/l?	Yes, 4 wells
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 14 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 11 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 01N21W03C01S: ↓

Upper System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

Lower System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

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: DWR Bulletin 118 states recharge to the basin comes dominantly from subsurface flow across the Springville fault zone, through Fox Canyon gravels from the Arroyo Santa Rosa Valley Basin, and through fractures in the volcanic rocks that comprise the Santa Monica Mountains to the south. (DWR Bulletin 118, 2006 update). The County of Ventura notes that an important source of recharge is inflow from the East Las Posas Basin.

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: Oxnard Plain Pressure Basin.

East: East Las Posas Basin and Arroyo Santa Rosa (both upgradient).

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: 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 (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Mound
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)
DWR Groundwater Basin Population:	77,886 (2010)

Known Water Supply Wells

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

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W07M02S - December level was down 4.56 feet from the January measurement.

In general for 5 wells measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(3 wells)

The water type in 1 well is calcium magnesium sulfate type, 1 well is calcium sulfate type, and 1 well is sodium 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, 3 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 3 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N22W07M02S: ↓

The 5 year trend based on a review of six hydrographs from 2010 through 2014 is downward.

5 Year Groundwater Quality Trend 2010-2014

(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: The majority of recharge to the Mound Subbasin is from percolation of surface flow in the Santa Clara River and other minor tributary streams. Some of the surface flow in the Santa Clara River originates as release from Lake Piru and contains natural runoff of precipitation and imported State Water Project water (UWCD 2000). Subsurface flow from Santa Paula Subbasin, percolation of direct precipitation into the San Pedro Formation which crops out along the northern edge of the subbasin, and irrigation return provide recharge as well. (DWR Bulletin 118, 2006 update)

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

East: Santa Paula groundwater basin (upgradient).

South and Southeast: Oxnard Plain Pressure and Oxnard Plain Forebay.

Depending on the relative groundwater levels, subsurface water may flow into our out of the Mound Subbasin across the border with Oxnard Subbasin. (CSWRB 1956) from (DWR Bulletin 118, 2006 update)

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	East Las Posas
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)
DWR Groundwater Basin Population:	39,385 (2010)

Known Water Supply Wells

Number of Wells: 246
Active: 154
Destroyed: 58
Abandoned: 20
Can't Locate: 14

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)

Agricultural Extractions: 21,879 AF/Yr
Municipal Extractions: 2,958 AF/Yr
Total: 24,837 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W26R03S - December level was up 6.7 feet from the January measurement.

In general for 10 wells measured in 2014 in the basin, water levels declined in 6 wells and rose in 4 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County (6 wells)

The water type in 4 wells is sodium bicarbonate type, 1 well is calcium sulfate type, and 2 wells are sodium sulfate type.

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

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 03N20W26R03S: ↑ (up)

Water levels trends in this basin between 2010 and 2014 vary from downward in some wells and upward in others.

5 Year Groundwater Quality Trend 2010-2014

SWN	Nitrate	Chloride	TDS	Sulfate
02N20W09Q05/07S	→ (flat)	→ (flat)	↓ (down)	→ (flat)
02N20W16B06S	↑ (up)	↑ (up)	↑ (up)	↑ (up)
03N19W29K07/08S	↑ (up)	↓ (down)	↓ (down)	→ (flat)
03N19W29K06S	↓ (down)	→ (flat)	→ (flat)	↓ (down)

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

Sources of Groundwater Recharge

Basin Recharge: Las Posas Basins in general: 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 Bulletin 118, 2006 update). The County of Ventura notes that injection of imported water via injection in the Calleguas Municipal Water District ASR well field is a source of recharge.

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: West Las Posas Basin (undetermined magnitude of connection).

South/Southeast: South Las Posas Basin.

Southwest: Restrictive subsurface structure between Pleasant Valley basin and East Las Posas basin allows spillover from East Las Posas to Pleasant Valley.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

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)
DWR Groundwater Basin Population:	39,385 (2010)

Known Water Supply Wells

Number of Wells: 109
Active: 60
Destroyed: 38
Abandoned: 5
Can't Locate: 6

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)

Agricultural Extractions: 11,768 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,974 AF/Yr

Total: 13,742 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well trend for 2014 not determined due to data availability.

The 5 year trend based on 2010 through 2014 potentiometric surface maps is downward.

2014 Groundwater Quality in General for All Wells Sampled by County
(6 wells)

The water type in 1 well is calcium sulfate type, 2 wells are sodium sulfate type, and 4 wells are sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 1 wells
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 6 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 4 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N21W12H01S: ↓

Water levels trends in this basin between 2010 and 2014 vary between downward for most wells gauged by the County, but upward for other wells gauged by the County.

5 Year Groundwater Quality Trend 2010-2014

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

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Las Posas Basins in general: 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 Bulletin 118, 2006 update). The County of Ventura notes that subsurface flow from the west also moves into the basin.

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: East Las Posas Basin (undetermined magnitude of connection).

West: Oxnard Plain Forebay and Oxnard Plain Pressure basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Oxnard Plain Forebay
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)
DWR Groundwater Basin Population:	235,973 (2010) Note: DWR groups two County basins into Oxnard Subbasin (4-4.02)

Known Water Supply Wells

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

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)

Agricultural Extractions: 8,133 AF/Yr

Municipal, Industrial, and Domestic Extractions: 12,000 AF/Yr

Total: 20,133 AF/Yr

2014 Groundwater Levels in General for Wells Gauged by County and UWCD

"Key" well 02N22W12R01S - Note: Measurements from UWCD. Well was dry or obstructed at November measurement. September level was down 3.1 feet from the February measurement.

In general for 3 wells measured by VCWPD in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County
(4 wells)

Forebay basin: 3 samples are calcium sulfate type and one sample is sodium sulfate type

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

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N22W12R01S: ↓

Upper System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

Lower System

The 5 year trend based on a review of the Fall 2010 through Fall 2014 potentiometric surface maps is downward.

5 Year Groundwater Quality Trend 2010-2014

Upper System

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: Recharge to the subbasin is provided by percolation of surface flow from the Santa Clara River, into the Oxnard Forebay. (DWR Bulletin 118, 2006 update)

Potable Water Sources

Groundwater from Oxnard Plain Forebay basin. 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

Northwest: Santa Paula groundwater basin to the northwest (upgradient).

South: Oxnard Plain

Northwest: Mound groundwater basin. Flow into and out of Mound basin dependent on groundwater levels.

South/southwest: Oxnard Plain Pressure groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	South Las Posas
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)
DWR Groundwater Basin Population:	39,835 (2010)

Known Water Supply Wells

Number of Wells: 170
Active: 27
Destroyed: 80
Abandoned: 21
Can't Locate: 42

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015)

Agricultural Extractions: 1,770 AF/Yr

Municipal, Industrial, and Domestic Extractions: 114 AF/Yr

Total: 1,884 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N19W05K01S - December level was up 1.90 feet from the January measurement.

In general for 2 wells measured in 2014 in the basin, water levels rose over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(5 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 Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 5 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 5 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N22W05K01S: ↓

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

5 Year Groundwater Quality Trend 2010-2014

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W07B02S	↑	↓	↓	↓
02N19W07D02S	→	↓	↓	↓
02N20W01Q01S	↓	→	→	→
02N20W01Q02S	↑	→	↓	→

Wells are in the western portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Las Posas Basins in general: 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 Bulletin 118, 2006 update). The County of Ventura notes significant inflows from the east Simi Valley Basin.

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: TDS is generally high in this basin (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Cuyama Valley
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)
DWR Groundwater Basin Population:	1,236 (2010)

Known Water Supply Wells

Number of Wells: 148
Active: 111
Destroyed: 7
Abandoned: 10
Can't Locate: 20

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 2,820 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 618 AF/Yr
Total Demand Estimate: 3,438 AF/Yr

2014 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 8.60 feet from the Spring measurement.

In general for 4 wells measured in 2014 in the basin, water levels declined in three and rose in one well over the course of the year from the Spring reading to the Fall reading.

2014 Groundwater Quality in General for All Wells Sampled by County
(4 wells)

Cuyama Valley basin one sample is calcium sulfate type and three samples are sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 4 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 1 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 07N23W16R01S: ↓

In general for 2 wells consistently measured: ↓

5 Year Groundwater Quality Trend 2010-2014

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

Wells are in the northern portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration from the Cuyama River. (DWR Bulletin 118, 2006 update)

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 (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Arroyo Santa Rosa
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)
DWR Groundwater Basin Population:	2,211 (2010)

Known Water Supply Wells

Number of Wells: 85
Active: 39
Destroyed: 32
Abandoned: 5
Can't Locate: 9

Self Reported Groundwater Extraction to FCGMA (as of April 2, 2015) (West part of basin only)

Agricultural Extractions - 1,494 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 AF/Yr
Total Demand Estimate: 4,615 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N20W26B03S - December level was down 2.15 feet from the January measurement.

In general for 5 wells measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County (6 wells)

The water type In 4 of the wells is magnesium bicarbonate type and 2 wells are sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	Yes, 4 wells
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 6 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	No

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 02N20W26B03S: ↓

In general for 4 wells consistently measured: ↓

Also the trend for one well measured consistently since Dec 2011 is also down.

5 Year Groundwater Quality Trend 2010-2014

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

East: Tierra Rejada basin (upgradient). (MWH, 2013)

West: Pleasant Valley Basin (downgradient)

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Elevated sulfates, nitrates, and TDS (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Ojai Valley
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)
DWR Groundwater Basin Population:	8,268 (2010)

Known Water Supply Wells	**Self Reported Groundwater Extraction to OBGMA (as of April 6, 2015)**	**Water Demand Estimate**
Number of Wells: 337 Active: 188 Destroyed: 82 Abandoned: 15 Can't Locate: 52	Extractions: 4,172 AF/Yr	Irrigation Demand @ 2 AF/Ac:4,270 AF/Yr Municipal Demand @ 0.5AF/person/Yr: 4,134 AF/Yr Total Demand Estimate: 8,404 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N22W05L08S: - The well was measured only twice in 2014 - June & December. The December reading was down 10.95 feet from the June level.

In general for 15 wells measured in 2014 in the basin, water levels declined in 12 and rose in 3 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(10 wells)

Ojai Valley groundwater: 7 samples are calcium bicarbonate type, 1 sample is sodium bicarbonate type, and 2 samples are calcium sulfate type

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Exceedances for Chloride >250mg/l?	No
Secondary MCL Exceedances for TDS >500mg/l?	Yes, 10 wells
Secondary MCL Exceedances for Sulfate >250mg/l?	Yes, 1 wells

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 04N22W05L08S: ↓

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

5 Year Groundwater Quality Trend 2010-2014

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 Bulletin 118, 2006 update)

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

East: None

West: None. 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 (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Tierra Rejada
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)
DWR Groundwater Basin Population:	3,673 (2010)

Known Water Supply Wells

Number of Wells: 49
Active: 29
Destroyed: 8
Abandoned: 1
Can't Locate: 11

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 900 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 1,834 AF/Yr

Total Demand Estimate: 2,734 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

No key well is in this basin.

In general for 2 wells measured in 2014 in the basin, water levels declined over the course of the year from the 1st quarter reading to the last quarter reading.

2014 Groundwater Quality in General for All Wells Sampled by County

(10 wells)

Tierra Rejada groundwater: 9 samples are magnesium bicarbonate type and 1 well is sodium chloride type.

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

5 Year Groundwater Level Trend 2010 - 2014

In general for 3 wells consistently measured: ↓

5 Year Groundwater Quality Trend 2010-2014

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W10R02S	↑	→	→	→
02N19W11J03S	→	↑	↑	↑
02N19W14R03S	↑	↑	→	↑
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 Bulletin 118, 2006 update)

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

North, south and east: None

Southwest: Arroyo Santa Rosa basin.

DWR CASGEM Groundwater Basin Prioritization Level - Very Low

Impact Comments: Locally high nitrates documented in the basin (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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

Groundwater Basin Name:	Upper Ventura River
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)
DWR Groundwater Basin Population:	15,961 (2010)

Known Water Supply Wells

Number of Wells: 291
Active: 162
Destroyed: 45
Abandoned: 14
Can't Locate: 70

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 2,412 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 7,980 AF/Yr

Total Demand Estimate: 10,392 AF/Yr

2014 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N23W16C04S - December level was down 6.1 feet from the March measurement.

In general for 16 wells measured in 2014 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.

2014 Groundwater Quality in General for All Wells Sampled by County
(4 wells)

Upper Ventura River basin: The groundwater in 2 samples is sodium bicarbonate type, 1 well is calcium sulfate type, and 1 well is calcium bicarbonate type.

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

5 Year Groundwater Level Trend 2010 - 2014

"Key" well 04N23W16C04S: ↓

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

5 Year Groundwater Quality Trend 2010-2014

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W04H01S	↑	↑	↑	↑
04N23W09G03S	↑	↑	↑	↓

Wells are 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 Bulletin 118, 2006 update).

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

North and East: None
South: Lower Ventura River (downgradient).

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: TDS is known to be high in some parts of the basin (Final CASGEM Basin Prioritization Results - June 2014).

Groundwater Level Trend Notes: Level trending up ↑ Level trending down ↓

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 2014. Because groundwater conditions change over time, this report is prepared annually. Approximately half the work the County Groundwater Section staff does is field work. The field work includes inspection of permitted well sealing for new wells and destructions of old wells, as well as quarterly groundwater elevation sampling of approximately 150 wells, and fall groundwater quality sampling of water supply wells.

The purpose of conducting the field work is to protect groundwater quality and quantity by making sure that well seals are constructed as required by the California Department of Water Resources in order to reduce or eliminate the risk that improperly constructed well seals will be a conduit for migration of poor quality groundwater into better quality water, degrading water quality over time. The field data on groundwater elevations and water quality is also used to determine water level trends, water quality trends, and to create a database of useful data available to residents, consultants, and other professionals.

The County staff also conducts administrative work in the office which includes administrative permitting for wells and soil borings. County staff also contract with County Planning to conduct a portion of County Planning's California Environmental Quality Act reviews of projects. The Groundwater Section staff review a project's potential impacts to groundwater quality and quantity, along with surface water quantity, and provide that analysis to County Planning.

Calendar Year 2014 also included an update to the County's Well Ordinance. The previous well ordinance primarily controlled well construction and destruction. The well ordinance did not have very clear authorities to regulate wells once constructed, and this posed concerns over the years especially with respect to addressing abandoned wells, which can pose risks to groundwater. 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.

2014 is the third consecutive below average precipitation year. Groundwater elevations in most of the County basins showed a continuing decline during this extended drought. Required reductions in groundwater extractions were set in place in some areas of the County during the latter half of 2014. Water quality data was collected between August and December 2014. Data from 21 of the 150 wells exceeded the State of California's maximum contaminant level (mcl) for nitrate.

This 2014 report is also the first annual report that presents Basin Summary Sheets (immediately following the Executive Summary) 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 from past methods used in the County Annual Report, and we feel is a better summary. The synthesis of data included in the basin summary sheets was very challenging. The work effort highlighted gaps in data collection that were not previously made obvious with the earlier generation of annual reports. This new knowledge will guide future data collection more systematically in 2015 and future years.

1.1 – Summary of Accomplishments

Over the last 12 months the Groundwater Section:

- Issued 181 various types of well permits, including 92 for new water supply wells, 8 water supply well destructions and 11 for water supply well repairs or modifications. 64 inspections of sealing and perforation work were performed by Groundwater Staff.

- Sampled 150 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. All of the key well groundwater levels measured during spring 2014 were lower than the 2013 spring measurement.

- Completed potentiometric surface maps for the Santa Clara River Valley, Upper Aquifer System and Lower Aquifer System for 2014.

- Created numerous new maps and map layers using ArcView GIS.

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

- Compiled water level data gathered by Groundwater Staff with that gathered by other agencies and uploaded it to the CASGEM website semi-annually to maintain compliance with the State CASGEM program.

- Completed and published the 2013 Groundwater Section Annual Report.

1.2 - General County Information

The following sections contain a general overview regarding population, climate, surface water and changes in groundwater conditions in Ventura County for 2014.

1.2.1 – Population

On May 1, 2014, the California State Department of Finance estimated Ventura County's population to be 842,967, an increase of 0.8 percent over the revised 2013 population estimate of 836,153. The Cities of Port Hueneme and Santa Paula had the largest estimated percentage increase in population (1.6 percent) over the previous year.

1.2.2 - Climate

The mean annual daily air temperature at the National Weather Service Oxnard area office was 64.4[1] degrees Fahrenheit, with an average daily high of 74.9[1] degrees Fahrenheit and an average low of 54.0[1] degrees Fahrenheit. The average annual rainfall, countywide (based on preliminary data from all active rain gages), was approximately 7.9 inches for the 2013/2014 water year[2]. Throughout the County, precipitation for the 2013/2014 water year was between 33 and 52 percent of normal, with Simi Valley receiving 33% of normal, while the Matilija Dam area received 52% of the normal rainfall total. Figure 1-1 below shows various rain gage/area rainfall totals comparing water year 2013/2014 to normal precipitation totals for that gage/area. Normals are determined from the 1957-1992 base period (i.e. the most recent 35 year period that represents average rainfall from gages with 80-120 years of record).

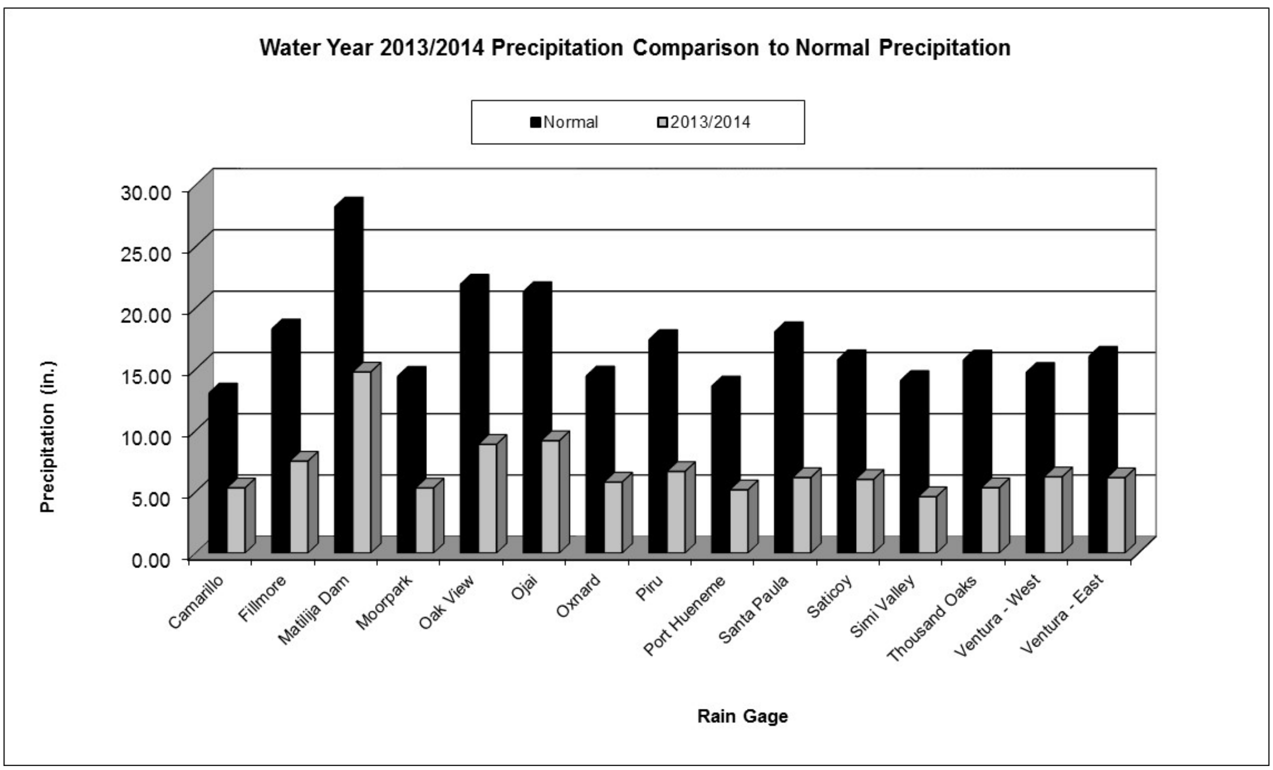


Figure 1-1: Chart comparing 2013/2014 rainfall totals to normal rainfall totals for the same area.

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

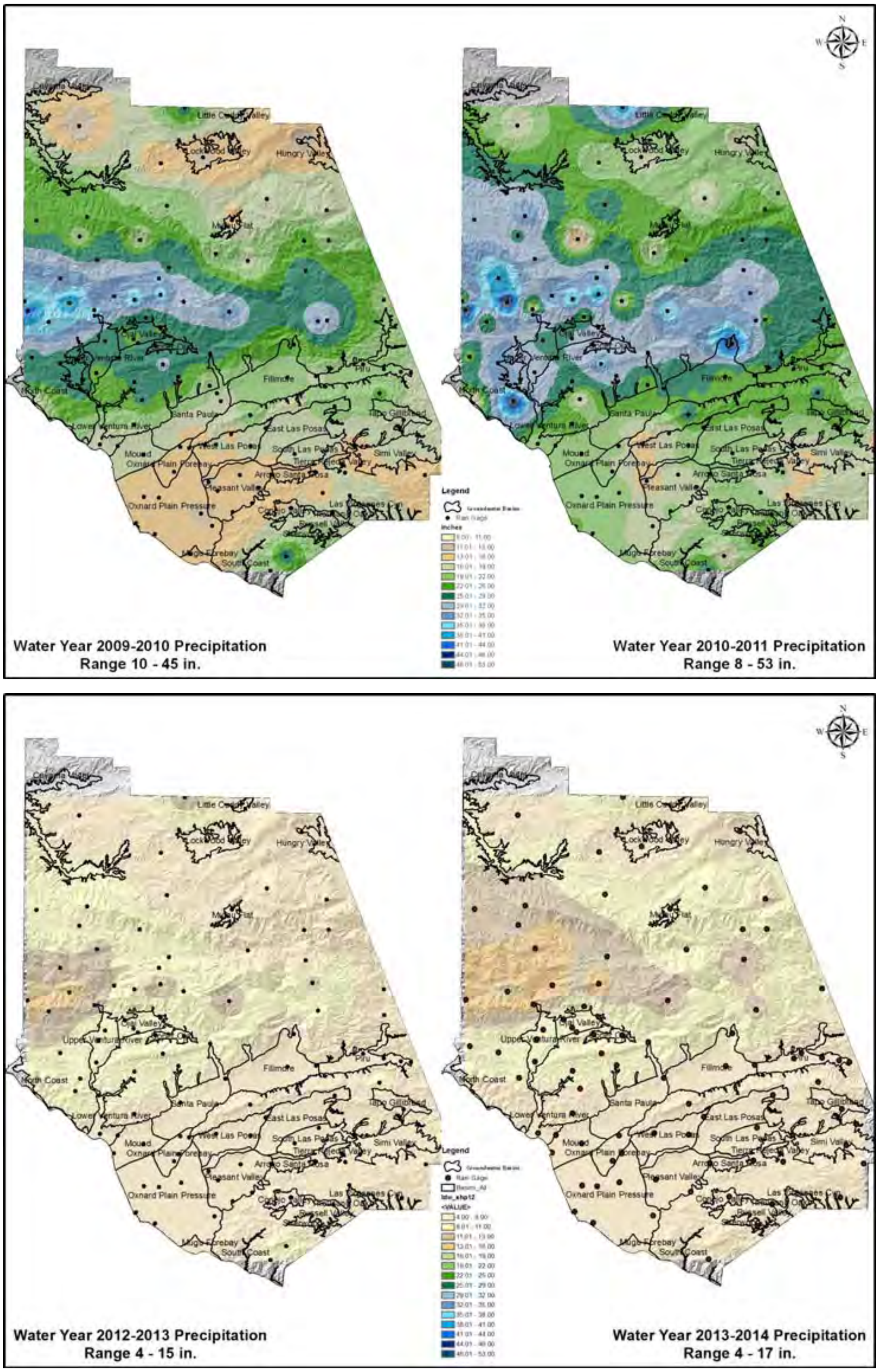


Figure 1-2: Generalized maps[3] comparing precipitation between wetter water years 2009/2010, 2010/2011 and water years 2012/2013 and 2013/2014.

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

The map above (Figure 1-2) shows a generalized distribution of rainfall across the county for water years 2012/2013 and 2013/2014. The chart below (Figure 1-3) depicts average rainfall for the period 1995/1996 to 2013/2014 for all of Ventura County.

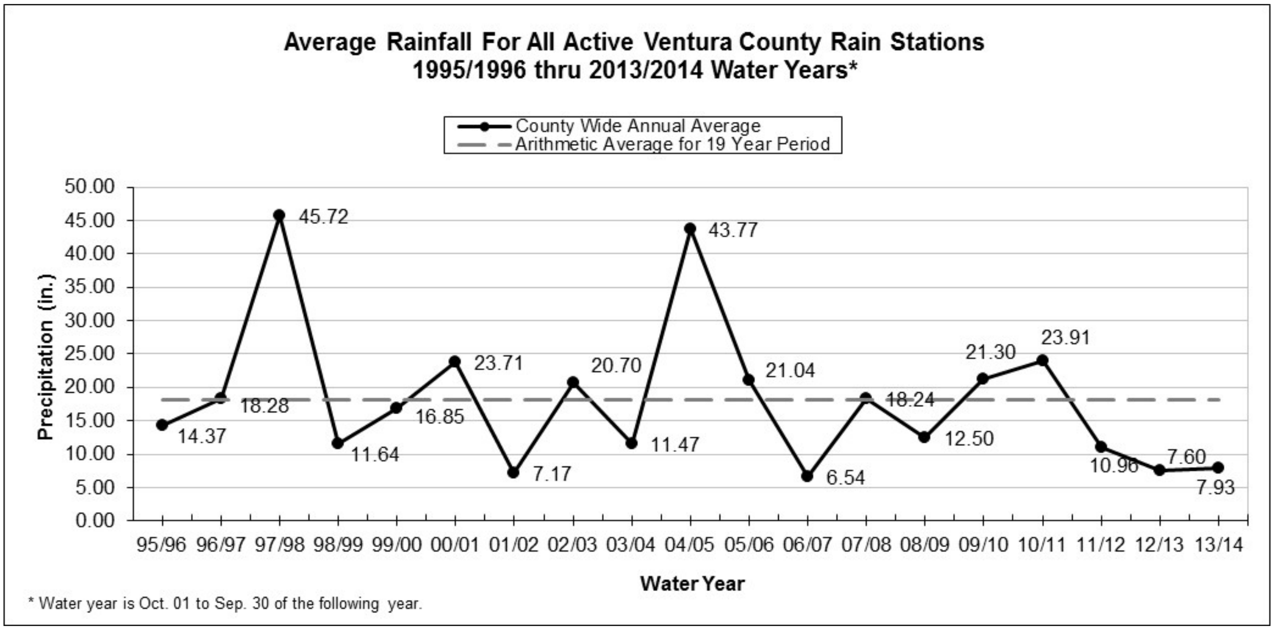


Figure 1-3: Chart comparing the average annual rainfall for Ventura County.

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 2014 United Water Conservation District (UWCD) released approximately 6,690[4] acre feet (AF) of water from Lake Piru, which includes a fish passage requirement of 5 cubic feet per second (cfs) per day. UWCD diverted 5,423[4] AF from the Santa Clara River at the Freeman Diversion Dam with 387[4] AF sent to the Saticoy Spreading Grounds, 1,935[4] AF sent to the El Rio Spreading Grounds and 578[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 2014 there was 18,404[4] AF of water in storage in Lake Piru, 131,600[5] AF in Lake Casitas and 10,000[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 2014 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.

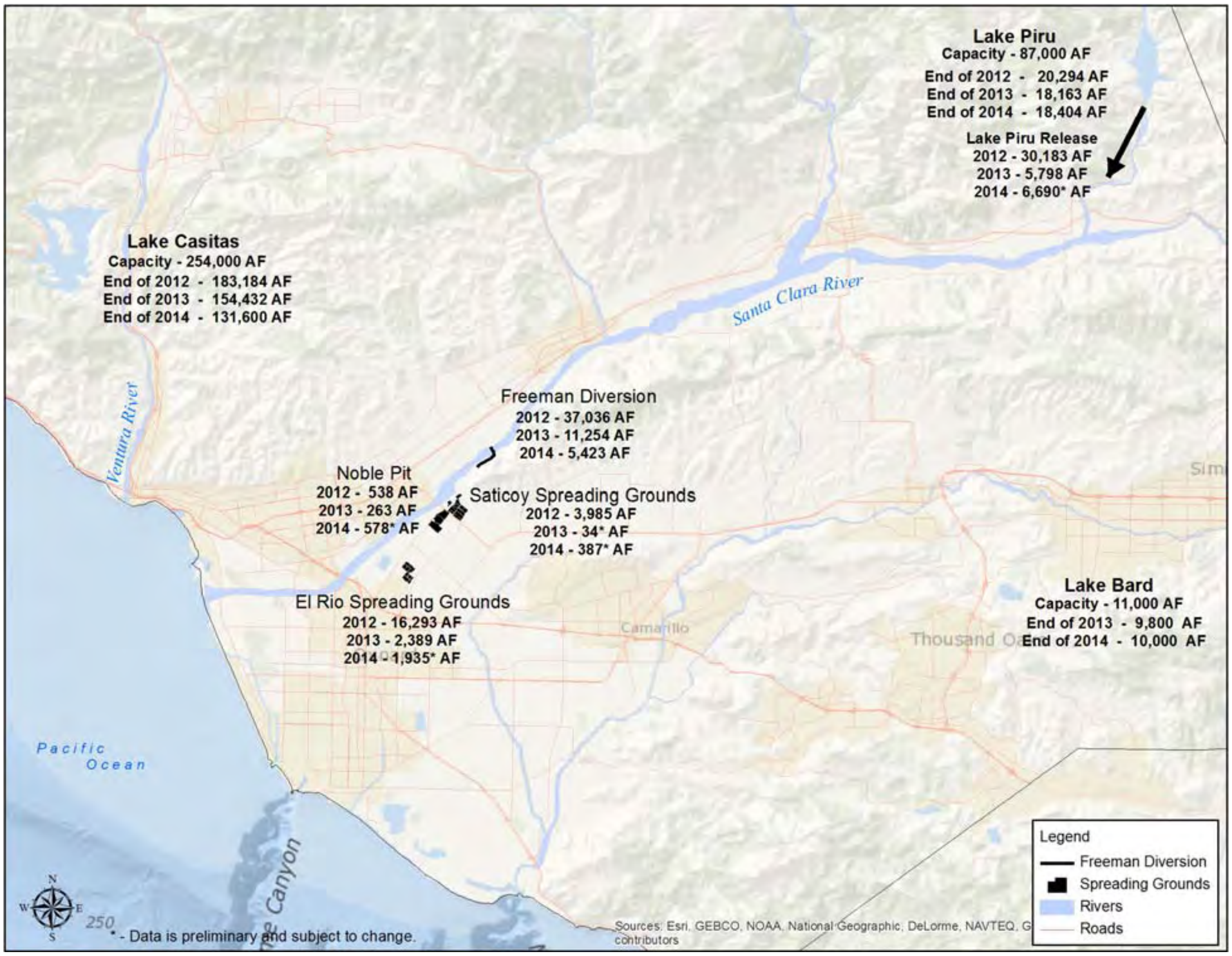


Figure 1-4: Map showing lake storage at the end of 2014 and Santa Clara River diversions.

1.2.4 – Groundwater

The majority of accessible groundwater is found in 32 groundwater basins within Ventura County. The groups of basins that make up the Santa Clara-Calleguas hydrologic unit contain the largest groundwater reserves in the County. The degree of interconnectedness of groundwater basins, and aquifers within each is highly variable. Groundwater basins in the north half of the County do not join directly with other basins, while groundwater basins in the Santa Clara-Calleguas hydrologic unit are connected in map view 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).

This 2014 report is also the first annual report that uses basin summary sheets for high and medium priority (per the State of California Basin priority designations) basins, and some additional basins that County staff felt appropriate to construct a basin summary sheet. The connection of upgradient and downgradient basins in map view is listed in these sections.

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. The previous well ordinance primarily controlled well construction and destruction. The well ordinance had limited authorities to regulate wells once constructed and operated especially with respect to addressing abandoned wells, which can pose risks to groundwater. The update of the ordinance was also used to better align the ordinance with the Sustainable Groundwater Management Act. This act requires development of groundwater sustainability plans and more careful management of groundwater resources over time. A component of this effort includes more clarity regarding well operation as it relates to extraction measurements, water quality and water level data. 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 very appropriate input from its stakeholders in the process. Ultimately the purpose of having a well ordinance is to regulate well construction, destruction, and operation in a manner designed to protect groundwater quality and quantity. The County's well ordinance follows well construction and destruction 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 groundwater extraction wells, cathodic protection wells, monitoring wells, and geotechnical borings. Permits are required to make sure that wells and borings are properly constructed and sealed in order to reduce the likelihood of migration of poor quality water into better quality water, and properly documenting well construction details and well placement. After County staff issues permits, staff inspects placement of well seals, documenting that the well was sealed per the California Department of Water Resources Well Standards.

The Groundwater Section issues permits for wells and engineering test holes throughout the County, except within the City of Oxnard. The Groundwater Section conditioned and issued 181 permits for wells and engineering test holes during calendar year 2014. 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 2004 to 2014.

Table 2-1: Permits issued by type for calendar year 2014.

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 2014	20	19	28	92	8	11	2	1	181

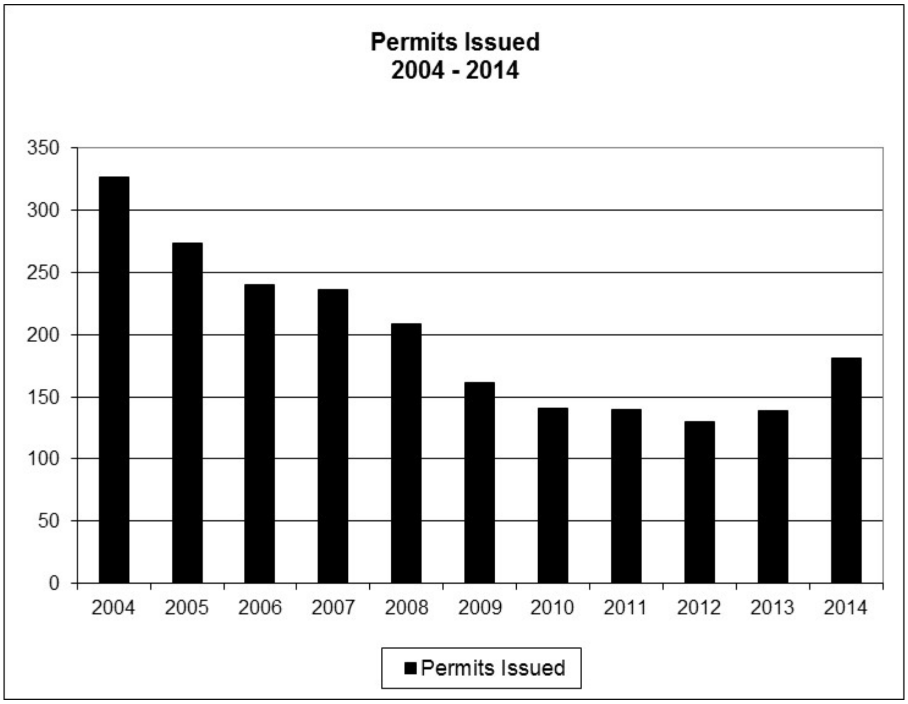


Figure 2-1: Permits issued for the period 2004 to 2014.

2.1.2 – 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 2014, staff performed 64 inspections throughout the County. Figure 2-2 on the following page shows the distribution of new well and well destruction locations inspected by Groundwater staff during 2014.

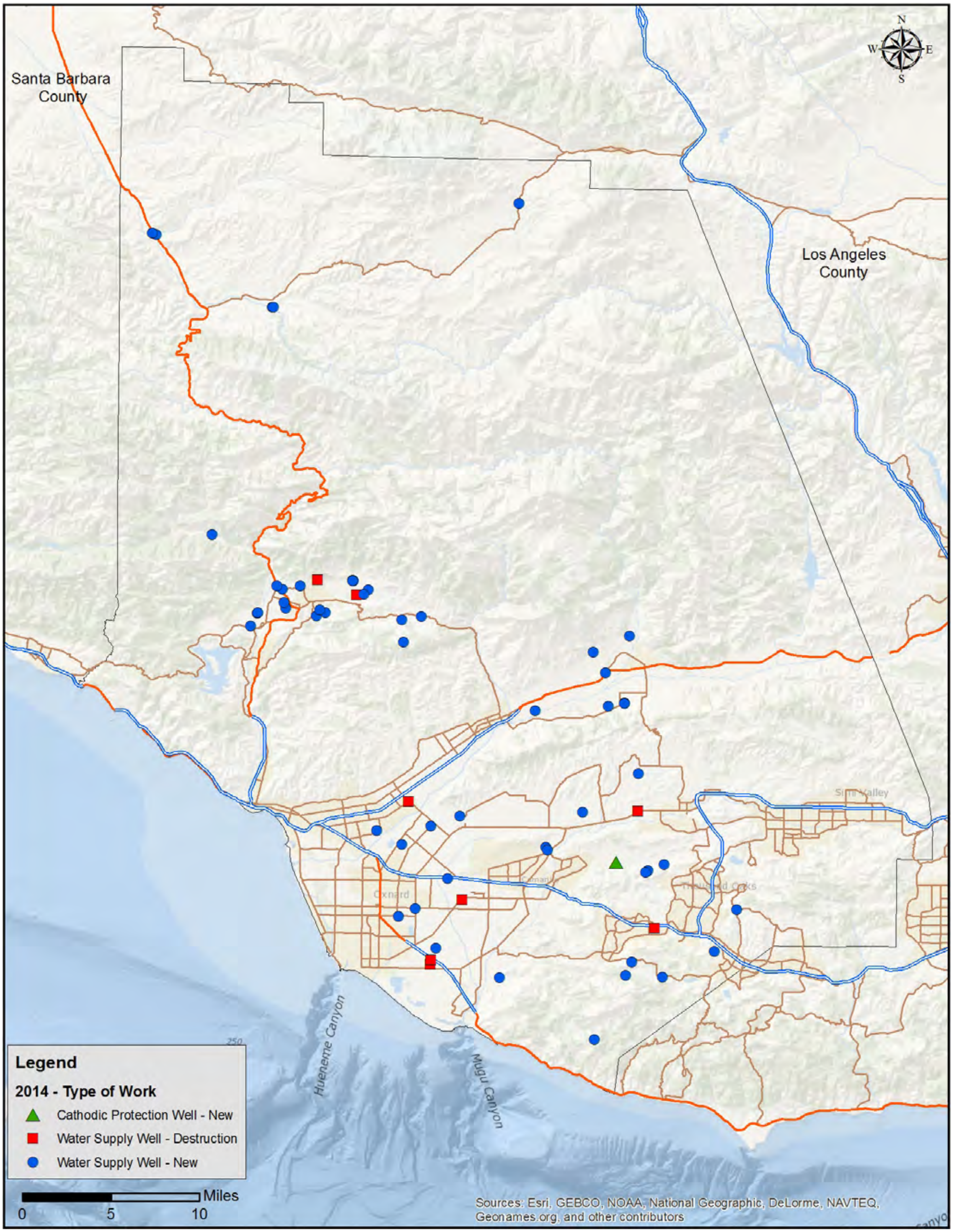


Figure 2-2: Location of well inspections in 2014.

2.2 – 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 2014 there were 8,986 well records in the database in the following categories.

2014 Status	Number
Active	3,952
Abandoned	418
Can't Locate	1,825
Non Compliant	91
Non Compliant Abandoned	139
Destroyed	2,546
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.
- There are several reasons why a well may be listed as "Can't Locate". Generally, though, "Can't Locate" wells are old rural wells for which the Groundwater Section has historic well location data but the locations are now in areas that have subsequently been urbanized. The current owner of the property where the historical well 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 registered geologist or civil engineer, and application fee must be submitted by the well owner to the Groundwater Section for review and approval.

Section 3.0
Groundwater Quality

3.1 – Water Quality Sampling

The Groundwater Section collects water quality data to analyze and obtain a general overview of the quality of the groundwater in 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 and is also used by stakeholders, consultants, and other professionals.

In 2014, Groundwater staff sampled a total of 150 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 general minerals under the Irrigation Suitability suite (see Appendix Laboratory methods). Analyses were conducted by Fruit Growers Laboratory in Santa Paula. Title 22 metals were also analyzed on select samples under the Inorganic Chemical Suite and four samples were analyzed for Gross Alpha particles. Analytical results were entered into the Section's database and used to describe the 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 south half of the County are shown below in Figure 3-1. Wells sampled in the north half of the County are shown on the following page in Figure 3-2.

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.

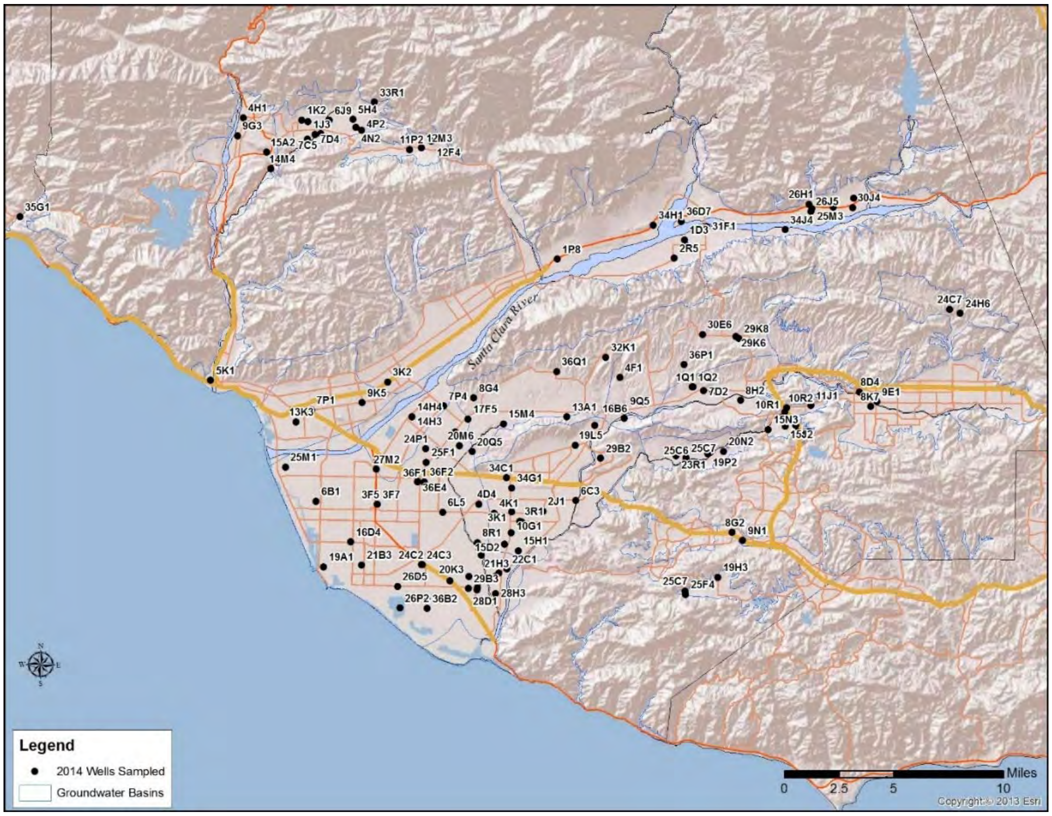


Figure 3-1: Map depicting sample locations for the south half of the County.

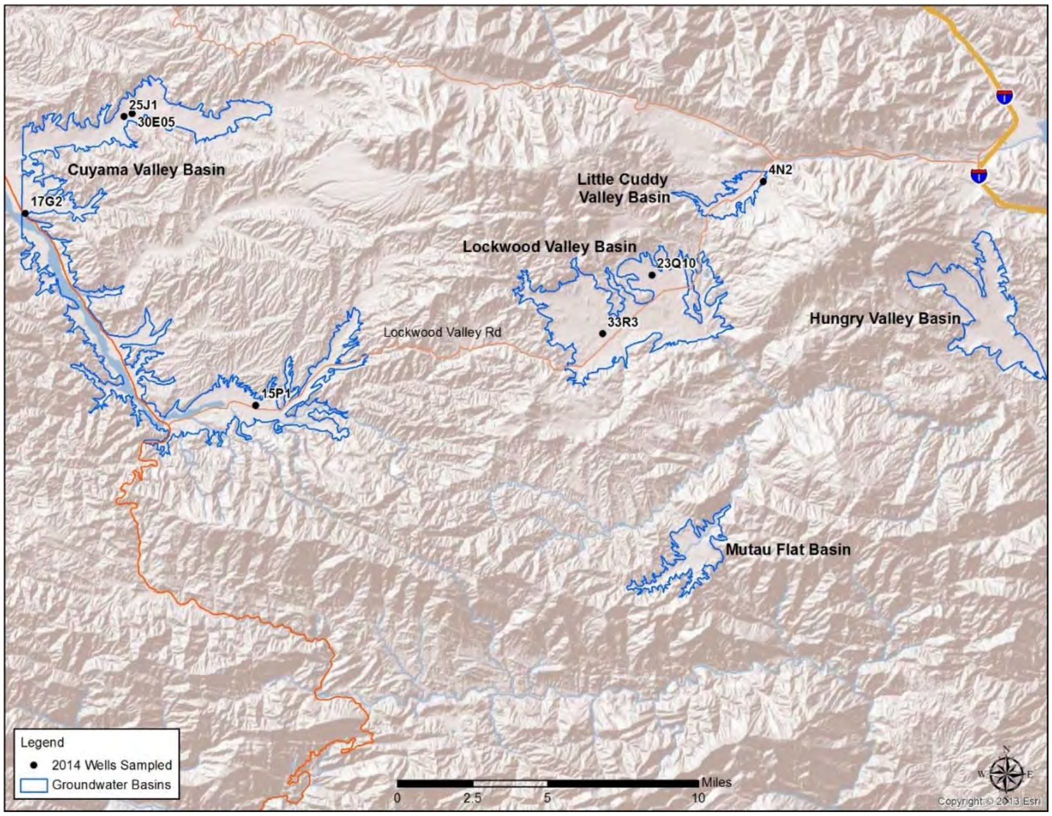


Figure 3-2: Map depicting sample locations for the northern half of the County.

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 inorganic chemicals adopted by the State of California. In order to be certified as a permanent domestic or municipal water supply, water from wells located in the County of Ventura must meet these standards.

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

Primary Contaminants	Chemical Formula	EPA MCL (mg/l)	CCR, Title 22 MCL (mg/l)
Antimony	Sb	0.006	0.006
Arsenic	As	0	0.01
Asbestos		7 MFL[1]	7 MFL[1]
Barium	Ba	2	1
Beryllium	Be	0.004	0.004
Cadmium	Cd	0.005	0.005
Chromium	Cr	0.1	0.05
Copper	Cu	1.3	
Cyanide		0.2	0.15
Fluoride	F^-	4	2
Lead	Pb	0	
Mercury	Hg	0.002	0.002
Nitrate (as Nitrogen)	N	10	10
Nitrate[2]	NO_3^-		45
Nitrite (as Nitrogen)	N	1	1
Selenium	Se	0.05	0.05
Thallium	Tl	0.0005	0.002
Secondary Contaminants			
Aluminum[3]	Al	0.5 to 0.2	
Chloride	Cl^-	250	

Table continued from previous page

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	

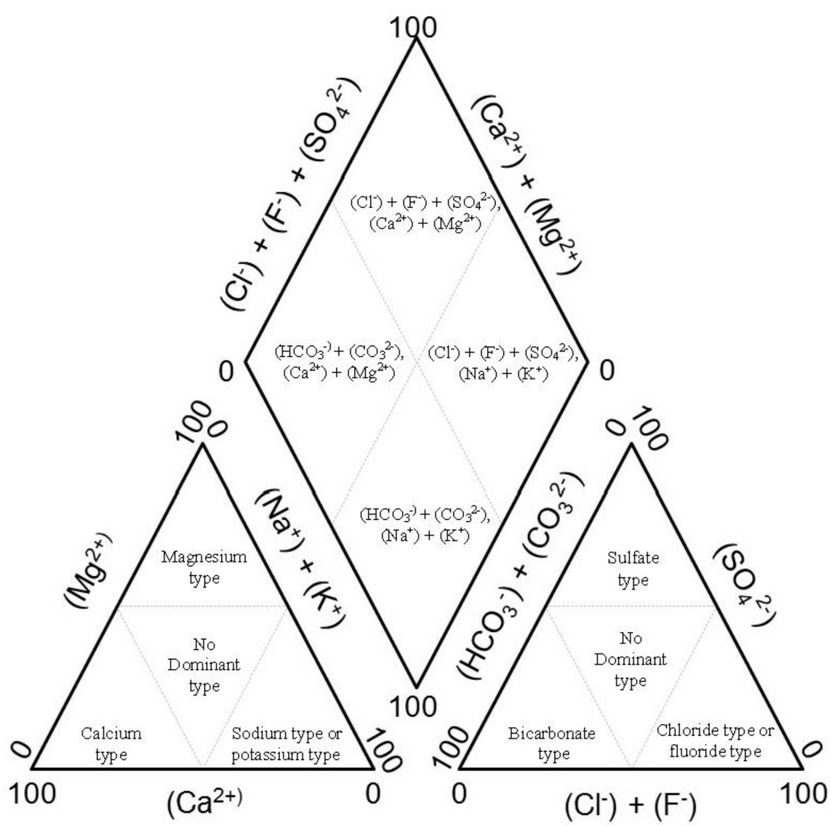
[1] MFL = Million fibers per liter longer than 10 um

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

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

One of the more widely used ways to present water quality data graphically is the trilinear or piper diagram. The major ionic species in most natural waters are Na^+, K^+, Ca^{++}, Mg^{++}, Cl^-, CO_3^{2-}, HCO_3^-, and SO_4^{2-}. A piper diagram can show the percentage composition of three ions. By grouping Na^+ and K^+ together, the major cations can be displayed on one piper diagram. Likewise, if CO_3^{2-} and HCO_3^- are grouped, there are three groups of major anions. Figure 3-3 shows the form of a piper diagram that is commonly used in water-chemistry studies. Analyses are plotted on the basis of the percent of each cation or anion.

Each apex of a triangle represents 100 percent concentration of one of the three constituents. The diamond-shaped field between the two triangles is used to represent the composition of water with respect to both cations and anions. 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. Then calculate the percent of each. The percentage is then plotted on the appropriate piper diagrams. 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.



For example, the figure below shows a plot of the water quality from one of the wells that was sampled this year. The cation and anion triangles have different ion groups from the figure above, but the principle is the same. 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.

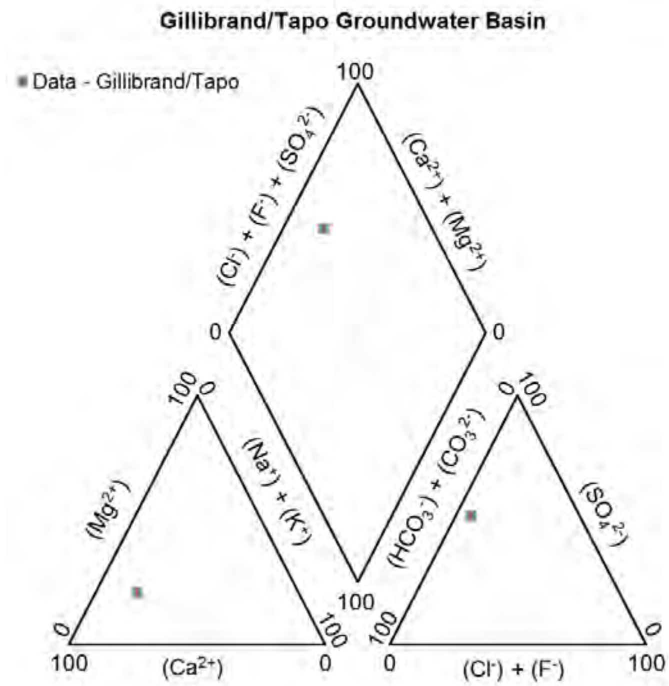


Figure 3-4: Piper diagram showing water quality of a well from Gillibrand/Tapo groundwater basin.

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, 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.

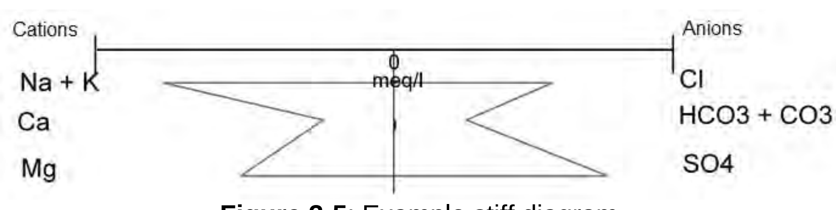


Figure 3-5: Example stiff diagram.

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 890 water supply wells in the Oxnard Plain

Pressure Basin; 368 are active. There are no wells perforated solely in the Grimes Canyon aquifer so the County cannot sample it specifically. The basin map in Figure 3-6 shows 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. Figure 3-7 shows the same information for wells sampled in the Lower Aquifer System.

3.2.1.1 - Oxnard Aquifer (UAS)

The Oxnard aquifer is the shallowest of the confined aquifers. 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 D-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 2013 report shows no significant change in water quality type.

Water from two of the wells has a concentration of iron (Fe) and manganese (Mn) above the secondary MCL for drinking water. Samples from all nine of the wells have sulfate (SO_4^{2-}) above the secondary MCL for drinking water; sulfate concentrations range from 370 to 1440mg/L. Total dissolved solids (TDS) ranged from 1070 to 2540 mg/l. Water from one of the wells sampled had nitrate (NO_3^-) concentration above the primary MCL for drinking water. Samples from two wells were analyzed for inorganic chemicals (Title 22 metals). The concentrations of all inorganic constituents 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 D-2, and stiff diagram Figure 3-6. Average depth to the main water bearing material is 200 ft. Three wells that are perforated only in the Mugu aquifer were sampled. TDS ranges from 966 to 1480 mg/l. The piper diagram, Figure D-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. Two of the wells sampled have sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water, two wells have iron concentrations above the secondary MCL, two wells have manganese concentrations above the secondary MCL, and one well had nitrate above the primary MCL. No water sample from a well perforated solely in the Mugu was analyzed for inorganic chemicals (Title 22 metals).

Figure D-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 three of the samples 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 D-4, shows a comparison of all the wells sampled in the UAS. TDS ranges from 986 to 1510 mg/l. Two of the wells have iron concentrations above the secondary MCL, one well has manganese concentration above the secondary MCL, and all have sulfate (SO_4^{2-}) above the secondary MCL.

OXNARD PLAIN PRESSURE BASIN
Upper Aquifer System

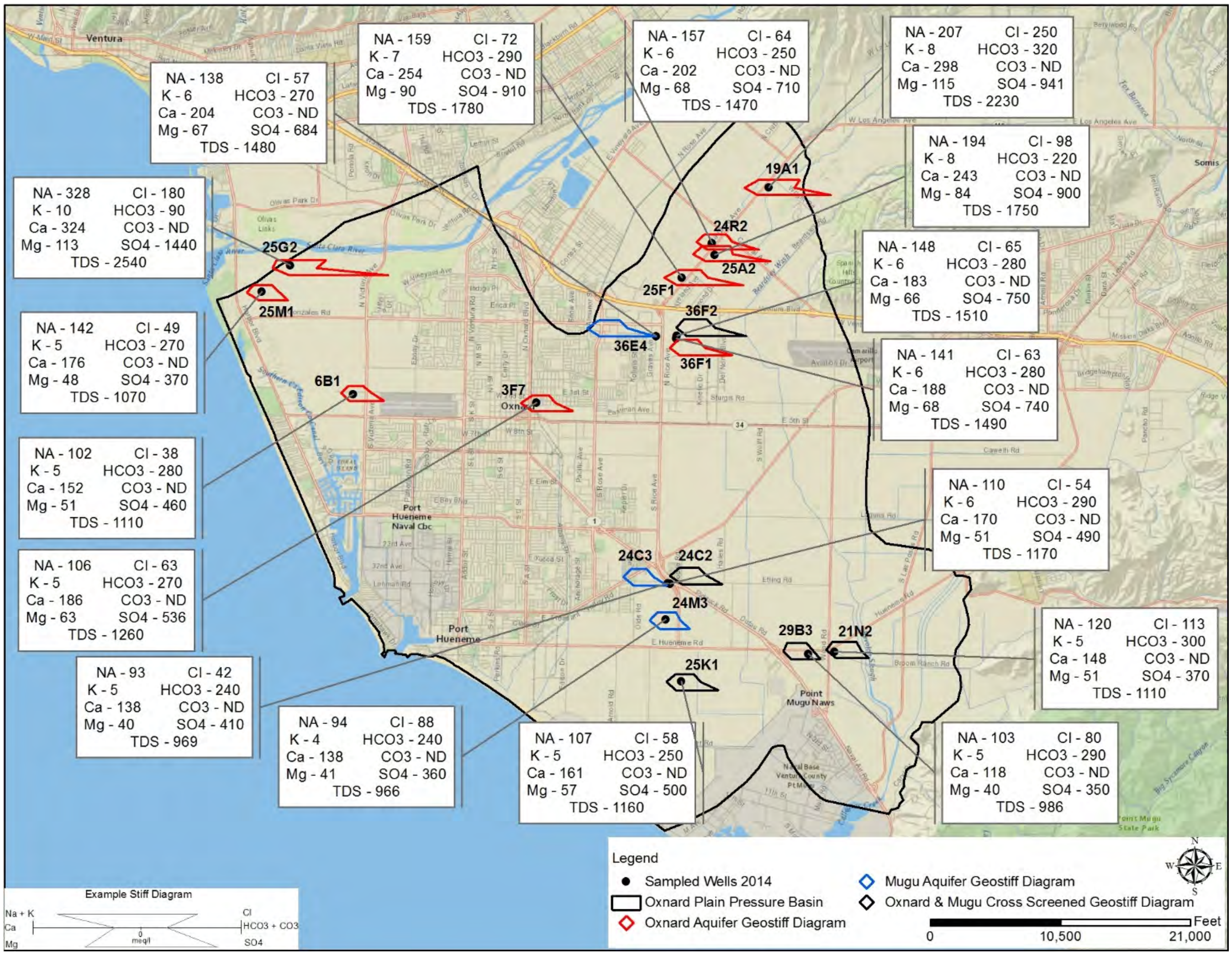


Figure 3-6: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for each aquifer.

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. Two wells screened solely in the Hueneme were sampled this year. Figure D-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. Both wells sampled have elevated TDS and sulfate (SO_4^{2-}) concentrations compared to the secondary 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 D-6, shows moderate to high variability in water quality of the wells sampled this year. Sodium is the dominant cation in only one sample. There is no dominant cation in the remainder of the samples, but data plots closest to the sodium type. Sulfate (SO_4^{2-}) is the dominant anion in three of the samples; bicarbonate is the dominant anion in one sample; and the remaining five samples are best described as a blend of sulfate and bicarbonate anions. The water type of the majority of the samples is sodium sulfate. For wells perforated solely in the Fox Canyon Aquifer sampled this year, TDS concentrations range from 522 mg/l to 1000 mg/l. Three water samples have iron (Fe) concentrations above the secondary MCL for drinking water and four water samples have manganese and sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water. One sample was analyzed for inorganic chemicals (Title 22 metals). The concentrations of all inorganic constituents were below the MCL for drinking water.

Twelve of the Oxnard Plain Pressure Basin wells that were sampled this year are perforated in both the Hueneme aquifer and the Fox Canyon aquifer and will be referred to as the LAS wells. Results for those wells are included in Appendix D and shown in blue on the map of the Lower Aquifer System (LAS) Figure 3-7. The piper diagram, Figure D-7, shows moderate variability in water quality of the wells sampled this year. Sodium is the dominant cation in two samples with no dominant cation in the remainder but three samples plot close to the sodium cation type and six samples plot close to the calcium cation type. Sulfate (SO_4^{2-}) is the dominant anion in seven of the samples; there is no dominant anion in the remainder of the samples but three plot near the sulfate anion type and two plot near the bicarbonate anion type. Two water samples are sodium bicarbonate type, three are sodium sulfate and the remainder are calcium sulfate. TDS concentration of water from these wells varies between 794 mg/l and 1070 mg/l. Samples from six LAS wells have iron and manganese concentrations above the secondary MCL for drinking water, and ten have sulfate above the secondary MCL. Water samples from three of the LAS wells were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents 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

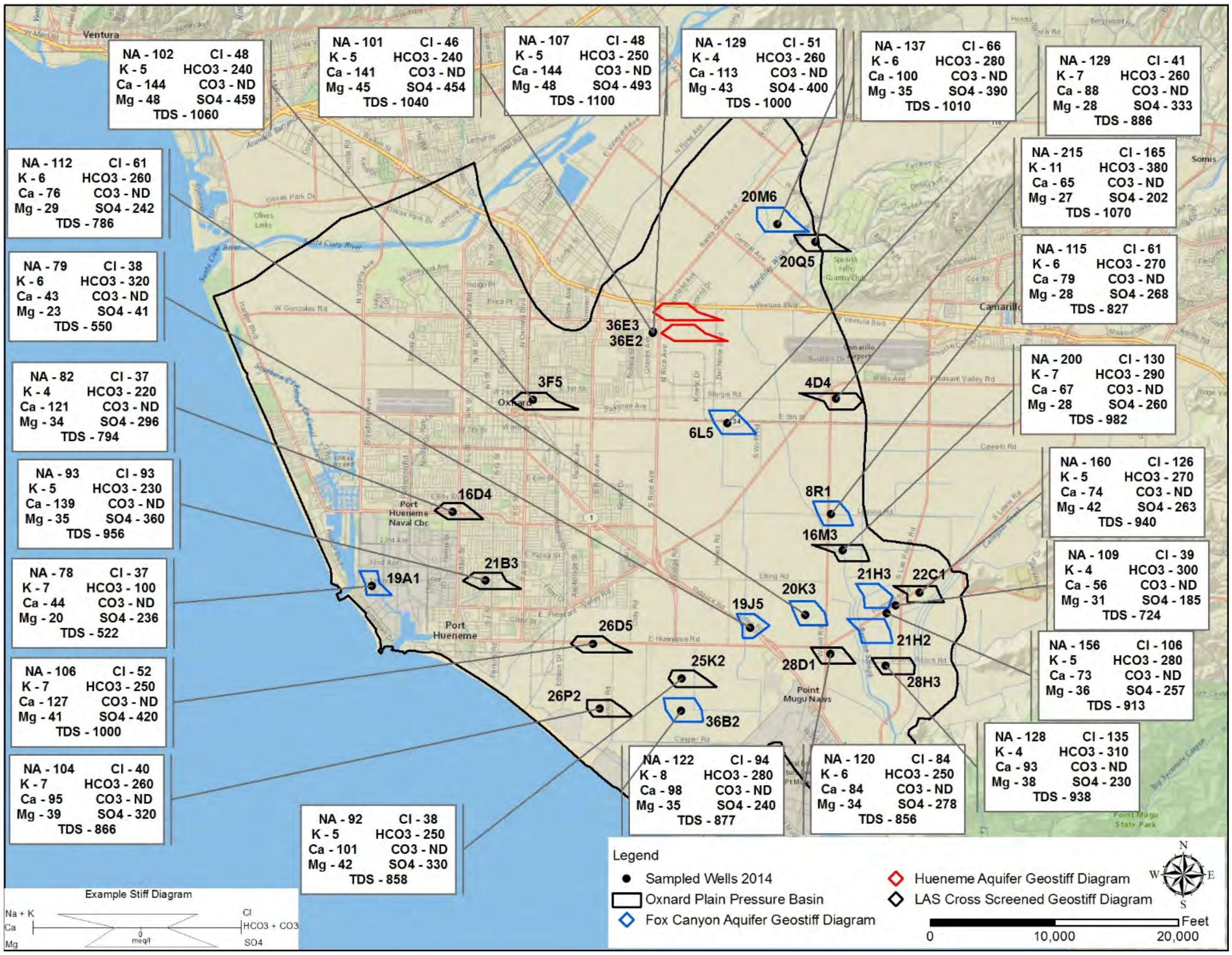
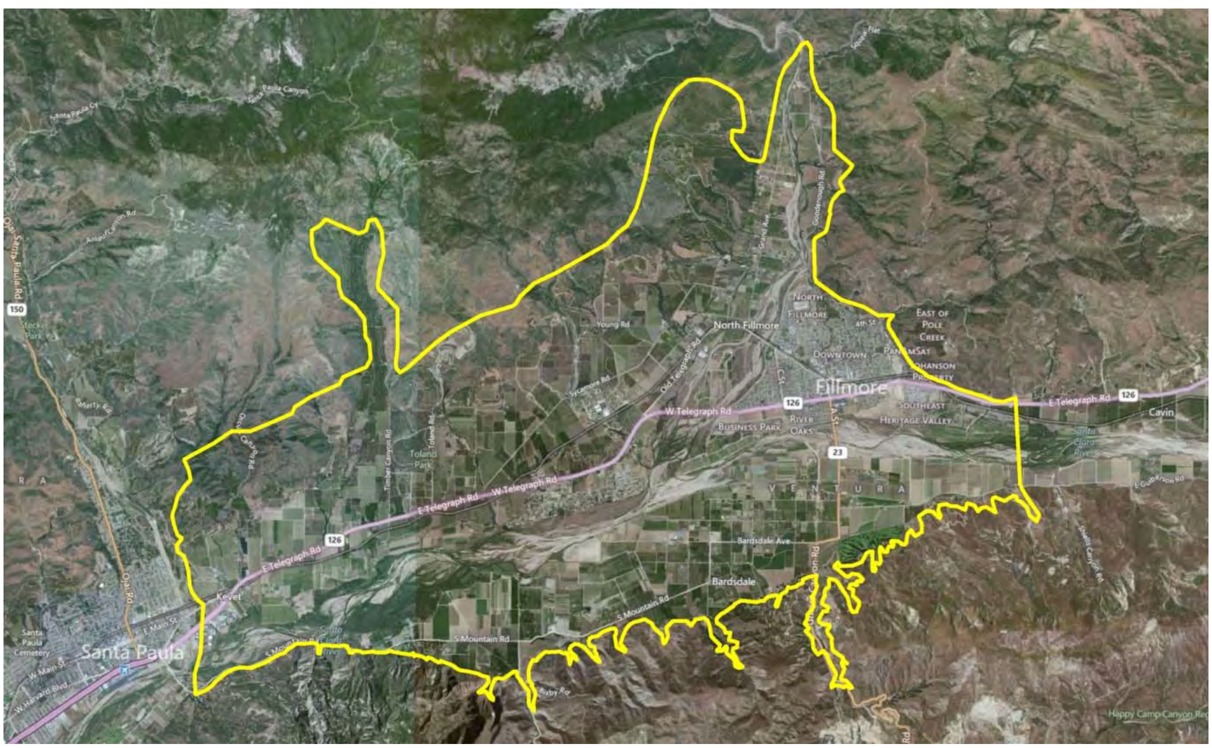


Figure 3-7: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 719 water supply wells in the Fillmore Basin; 462 are active. Historically, nitrate (NO_3^-) concentrations have been elevated, but of the seven wells sampled this year only one showed elevated NO_3^- concentration relative to the primary MCL for drinking water. The piper diagram, Figure D-9, 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. Groundwater samples from all seven wells are above the secondary MCL for drinking water for sulfate (SO_4^{2-}). TDS ranges from 838 mg/l to 2610 mg/l, well above the secondary MCL for drinking water. Water samples from three wells were analyzed for inorganic chemicals (Title 22 metals). Two wells have lead (Pb) above the primary MCL for drinking water. All other inorganic constituents 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 D-9 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.



Aerial photo showing the extent of the Fillmore groundwater basin.

FILLMORE BASIN

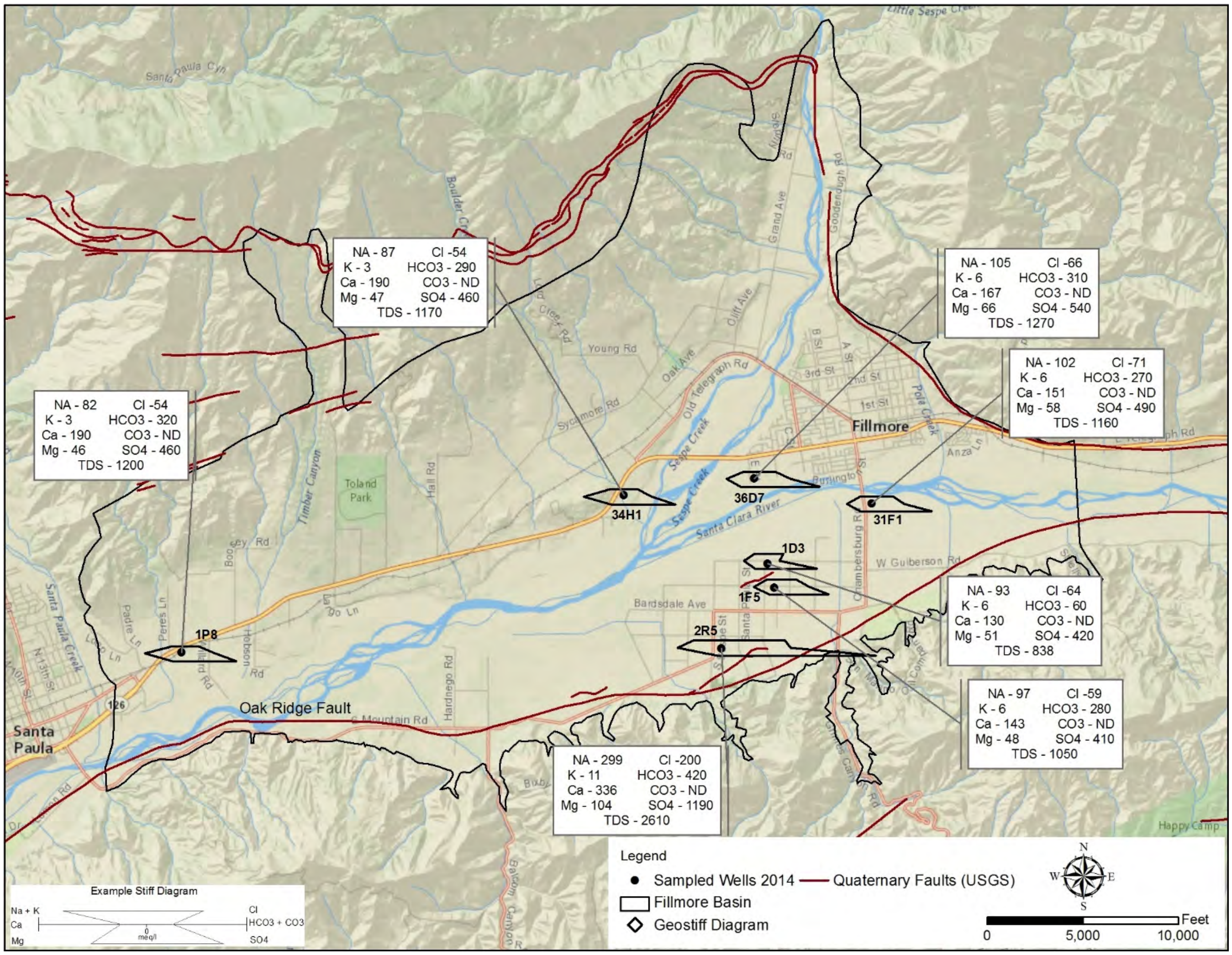


Figure 3-8: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 376 water supply wells in the Santa Paula Basin; 176 are active. Figure D-10, piper diagram, shows no significant change in the water quality since the previous sampling round. Calcium is the dominant cation; sulfate is the dominant anion. The water is calcium sulfate type. Only one well in the basin was sampled this season. TDS concentration for the well sampled is 1190 mg/l; above the current secondary MCL for drinking water. The water sample has concentrations above the secondary MCL for sulfate and manganese and the secondary MCL for iron. The water sample was not analyzed for inorganic chemicals (Title 22 metals). Figure 3-9 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 D-12, 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

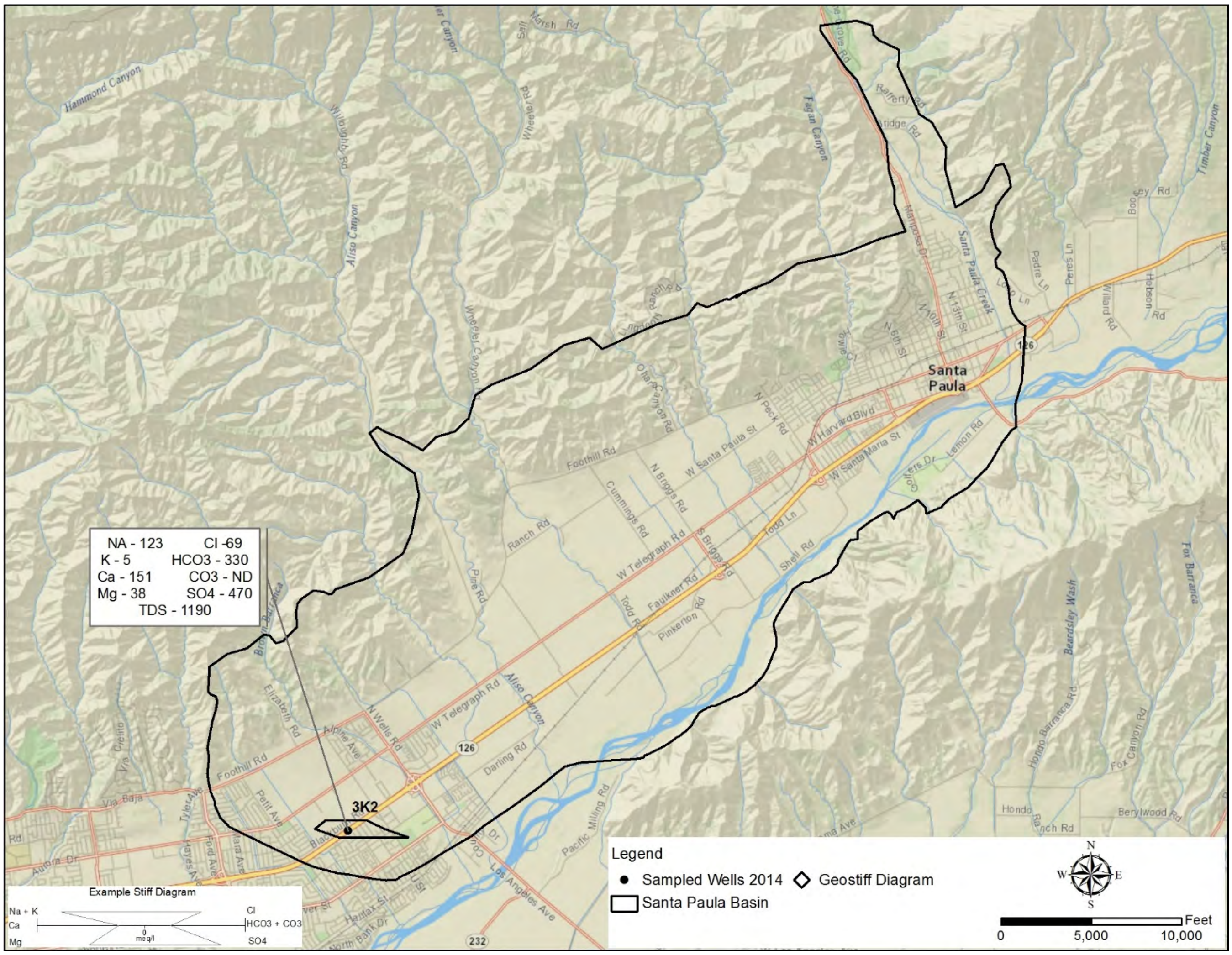


Figure 3-9: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

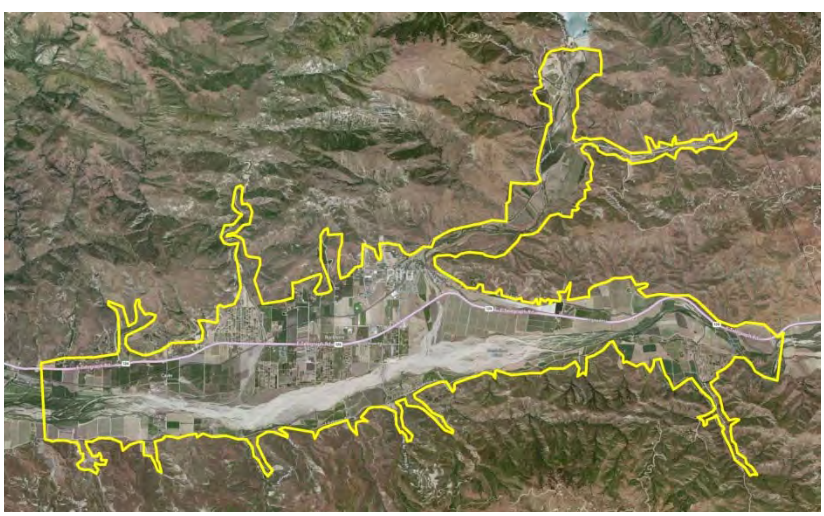
3.2.4 – Piru Basin

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 237 water supply wells in the Piru Basin; 165 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.

Seven wells were sampled in the Piru Basin during this round of sampling. None of the groundwater sampled has a Cl^- concentration above the chloride TMDL. The piper diagram, Figure D-11, shows moderate variability in water quality of the wells sampled this year. There is no dominant cation but the data plots closest to the calcium cation type. There is no dominant anion for two of the samples but the data plots closest to the sulfate anion type; sulfate is clearly the major anion for the remainder. The water is mainly calcium sulfate type. The TDS concentration of the water sampled this season varies from 834 to 2450 mg/l; all wells above the secondary MCL for drinking water; two wells have concentrations significantly above 2000 mg/l. Water samples from all seven wells have sulfate (SO_4^{-2}) concentrations greater than the secondary MCL for drinking water and two have manganese (Mn) concentrations greater than the secondary MCL. Figure 3-10 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 all seven wells were analyzed for inorganic chemicals (Title 22 metals). Two wells in the Piru Basin located south of Highway 126 have 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 two 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

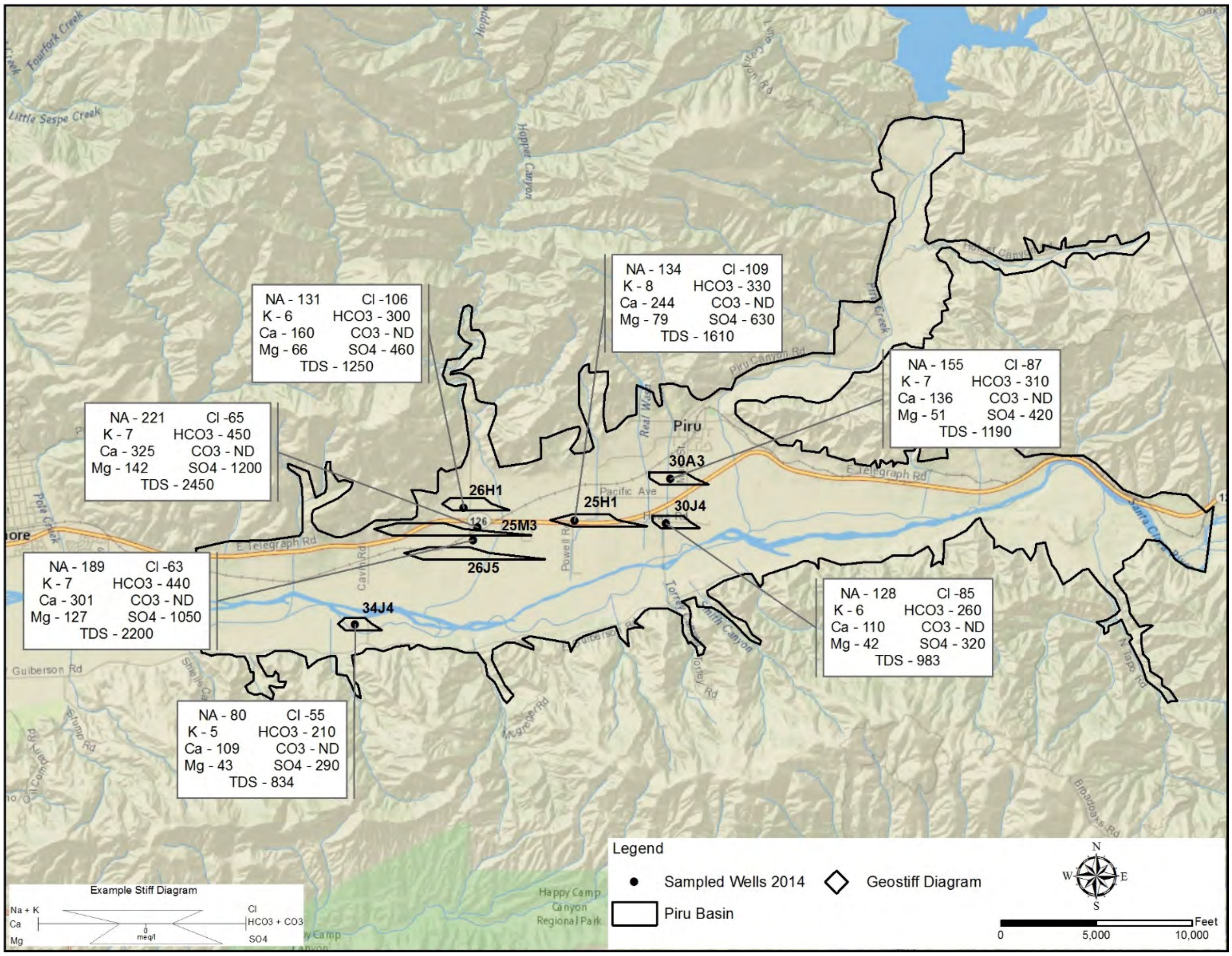
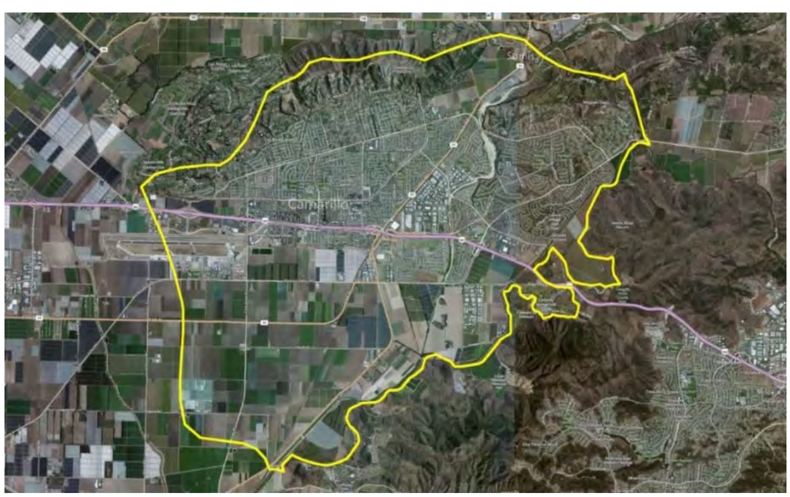


Figure 3-10: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 Shallow 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 331 water supply wells in the Pleasant Valley Basin; 90 are active. Fourteen wells were sampled during this round of sampling. The piper diagram, Figure D-13, shows moderate variability in water quality of the wells sampled this year. Calcium is the dominant cation for one of the samples, sodium is the dominant cation group for 3 wells and there is no dominant cation for the remainder but about half the remaining data plots close to the calcium cation type and half plot close to the sodium cation type. There is no dominant anion for six of the samples but data from five of those samples plot close to the sulfate (SO_4^{2-}) type and one plots close to the bicarbonate anion type; sulfate (SO_4^{2-}) is the major anion for the remainder of the samples. The water in one sample is sodium bicarbonate type; the remainder are calcium sulfate type. Figure D-13 shows a comparison of the wells based on whether the well is perforated in the upper zone, lower zone or volcanic material. Wells perforated in the upper zone tend to have higher concentrations of sulfate (SO_4^{2-}) than those in the lower zone or the volcanics. Those perforated in the lower zone tend to have more variation in chemistry than the upper zone. TDS concentrations vary from 795 to 4760 mg/l. Eleven of the wells have sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water. Three water samples have iron (Fe) concentrations above the secondary MCL for drinking water and nine have manganese (Mn) concentrations above the secondary MCL. Chloride (Cl^-) concentrations are above 117 mg/l in water samples from eleven wells. Samples from four 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. Two wells sampled this year were perforated solely in the shallow zone and have the poorest water quality; the highest sulfate, chloride and TDS concentrations. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). One well has lead (PB) above the primary MCL for drinking water. No other inorganic chemical was above the primary MCL. 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-}).



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

PLEASANT VALLEY BASIN

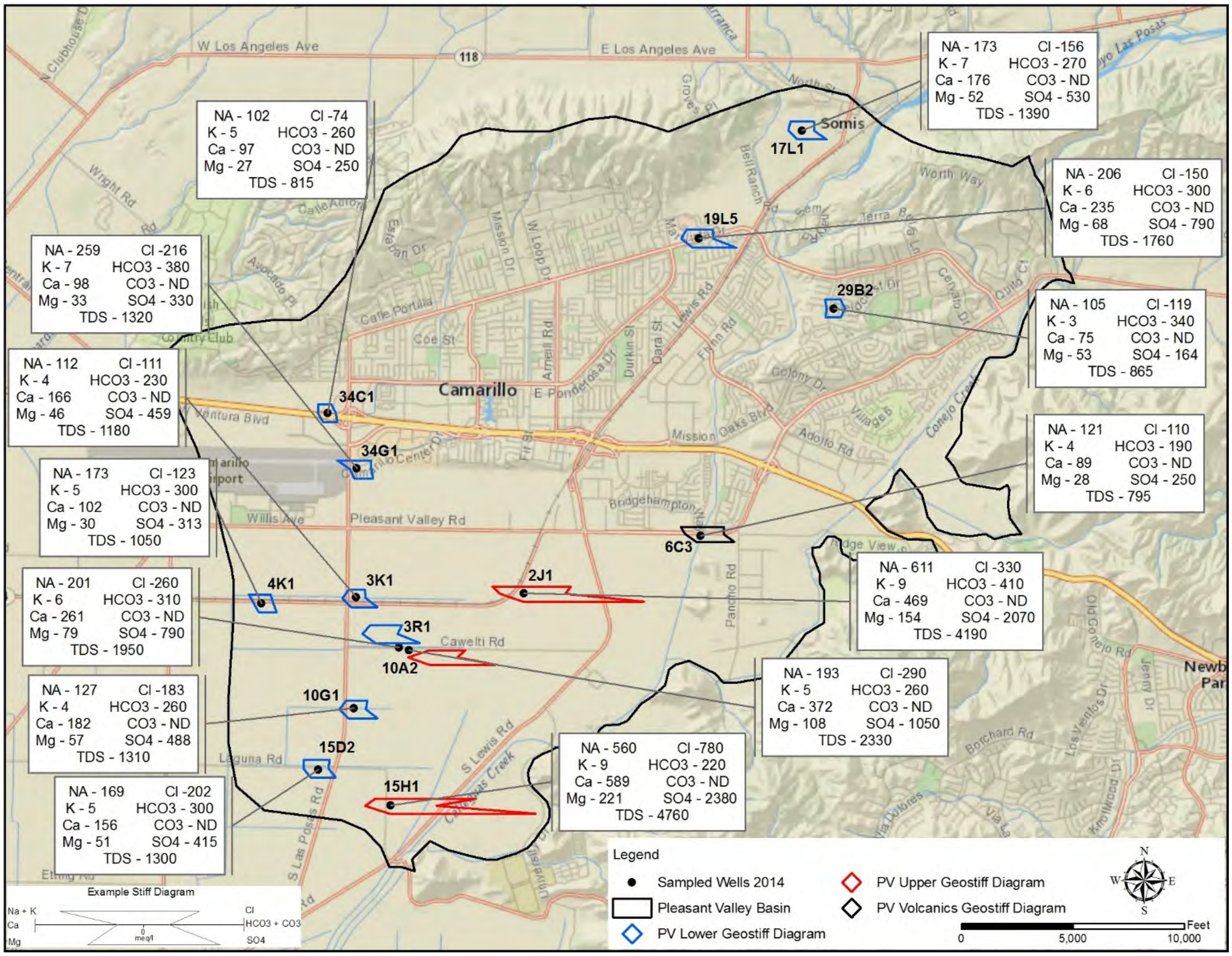


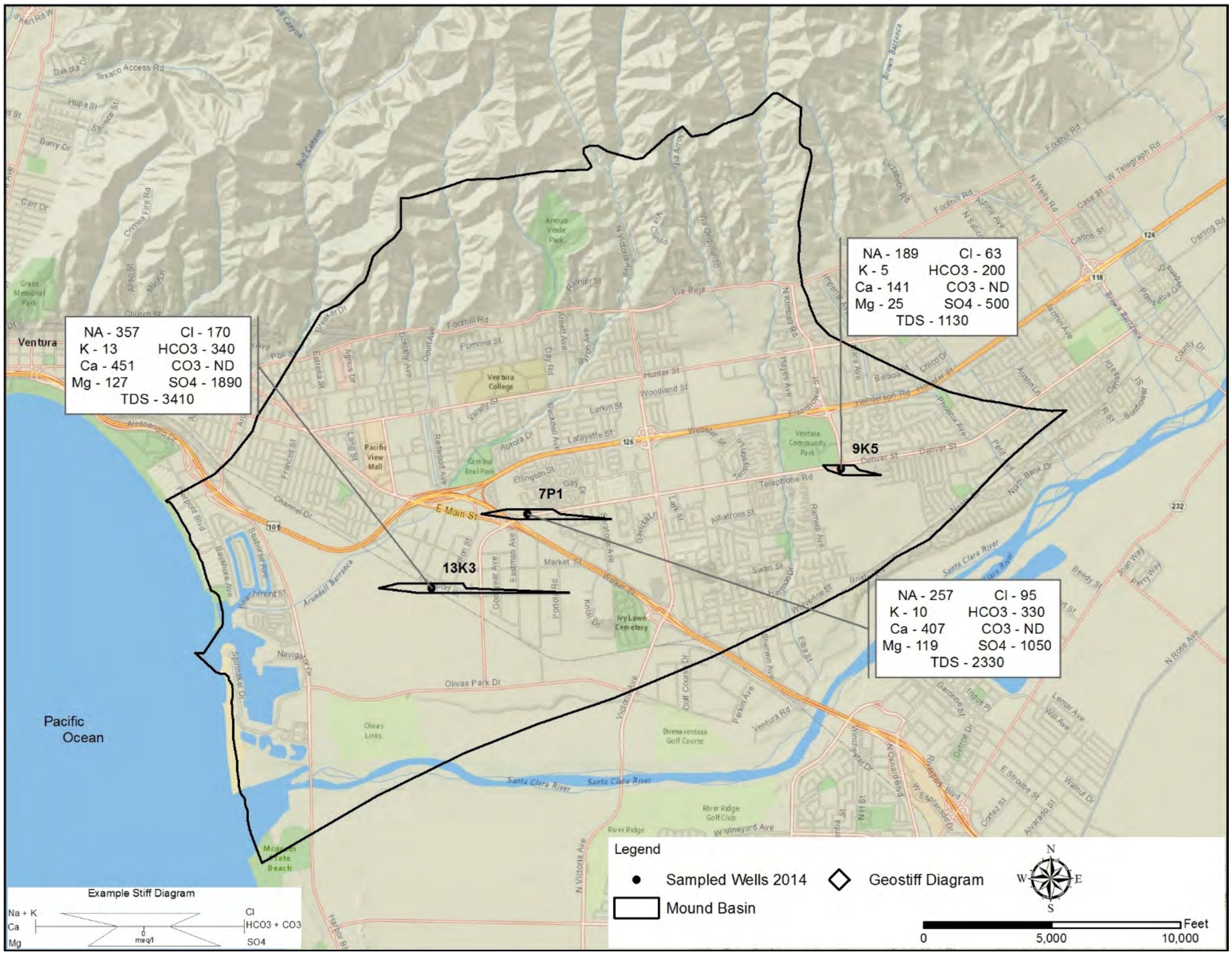
Figure 3-11: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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. Two of the three wells sampled this year are perforated in the LAS, much deeper than the other. One of the deep wells has slightly poorer quality than the shallower one but the second deep well has significantly better water quality. There are approximately 145 water supply wells in the Mound Basin; 27 are active water supply wells. Figure D-14, piper diagram, shows low variability in water quality of the wells sampled this year. There is no dominant cation for the water samples but one sample plots close to the calcium type, one plots close to the sodium type. The remaining sample does not have a dominant cation type; sulfate (SO_4^{2-}) is the dominant anion. One water is calcium magnesium sulfate type; one sample is calcium sulfate type and one is sodium sulfate type. TDS concentration for the wells sampled this year ranges from 1130 to 3410mg/l; all above the secondary MCL for drinking water. Sulfate (SO_4^{2-}) concentration is greater than the secondary MCL for drinking water in all three wells sampled, iron and manganese are above the secondary MCL in two wells of the wells sampled. Water quality of the wells sampled in the Mound Basin is similar to that in the Santa Paula Basin. Figure 3-12 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.

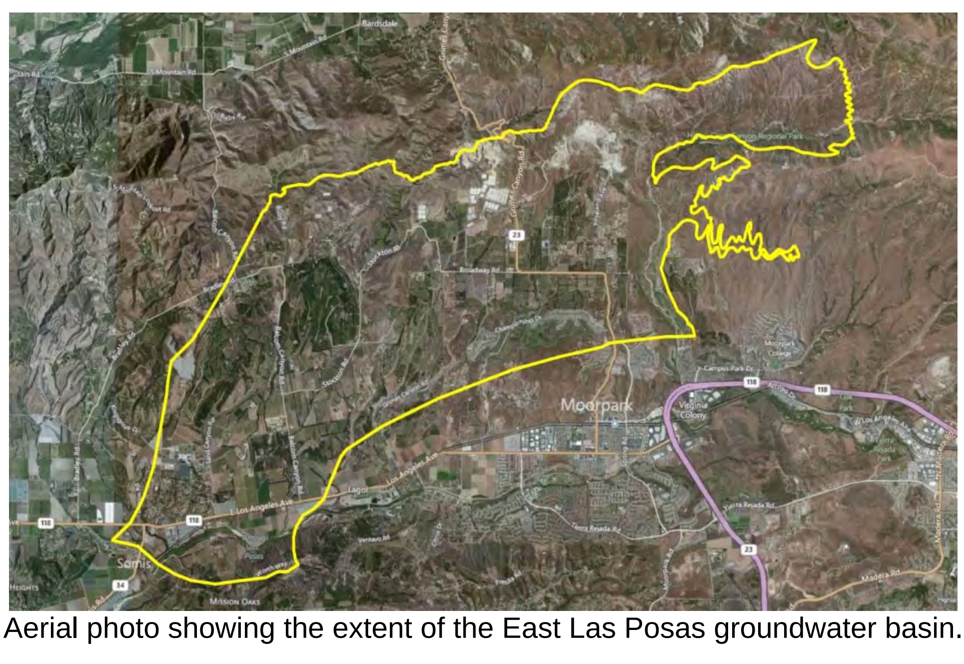
MOUND BASIN



<u>Figure 3-12</u>: 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 246 water supply wells in the East Las Posas Basin; 156 are active water supply wells. Figure D-15, piper diagram, shows moderate variability in water quality of the wells sampled this year. Calcium is the dominant cation for five of the wells sampled; there is no dominant cation for the remaining two wells but the data plots close to the sodium cation type. Sulfate (SO_4^{2-}) is the dominant anion for three of the wells; bicarbonate is the dominant anion for two of the wells sampled; and two wells have no dominant anion but the data plots close to the bicarbonate anion type. The water in one of the wells sampled is calcium sulfate type, two wells are sodium sulfate type and the remaining four wells are sodium bicarbonate type. Of the seven wells sampled in the East Las Posas Basin, the three wells located in the southwest portion of the basin near the Arroyo Las Posas, have very different water chemistry from the other four. TDS, sulfate and manganese are above the secondary MCL for drinking water in all three southwestern wells and they are the only ones that plot as sulfate type on the piper diagram. The remainder of the wells have good water quality with TDS ranging between 322 and 1470 mg/l. Water from three wells was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the primary MCL for drinking water. Figure D-18, 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. All three basins have the same water types but South Las Posas Basin generally has higher calcium, sodium, and sulfate concentrations. 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 3-13 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-}).



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

EAST LAS POSAS BASIN

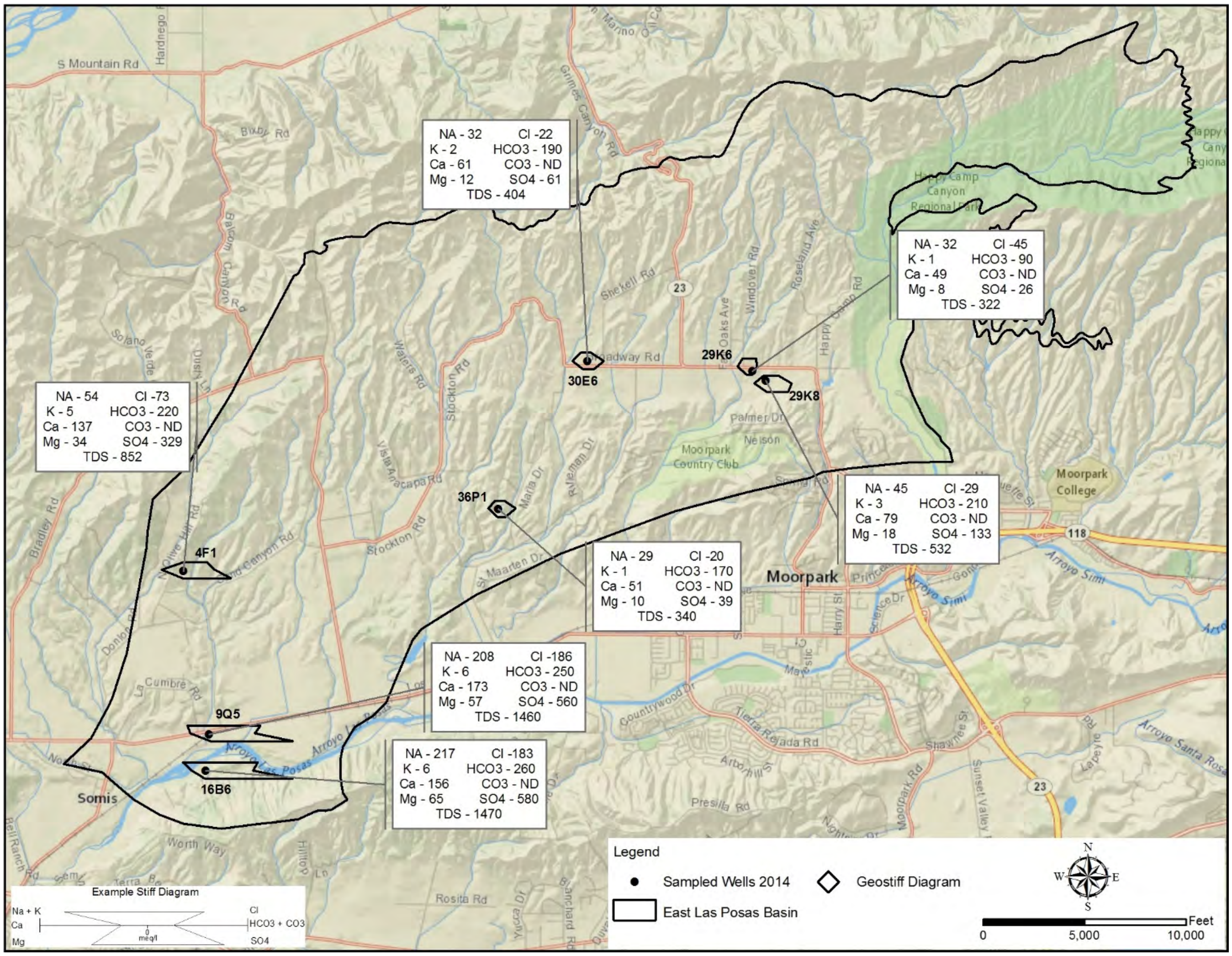


Figure 3-13: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.8 - West Las Posas Basin

There are approximately 109 water supply wells in the West Las Posas Basin; 60 of those are active wells. Figure D-16, piper diagram, shows moderate variability in water quality of the wells sampled this year. There is no dominant cation for the any of the samples but three plot close to the calcium cation type and three plot close to the sodium cation type. Bicarbonate is the dominant anion for two of the wells sampled; sulfate (SO_4^{2-}) is the dominant anion for three of the wells and one well has no dominant anion but plots close to the sulfate anion type. The water in three wells is sodium sulfate; one well is calcium sulfate type and the remaining two wells are calcium bicarbonate type. TDS is above the secondary MCL for drinking water in all five wells sampled in the West Las Posas Basin this year; ranging from 740 to 1190 of 1010 mg/L. One well has a nitrate concentration above the primary MCL for drinking water. Four wells have sulfate (SO_4^{2-}) above the secondary MCL; two have manganese concentrations above the MCL and one has iron concentration above 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. 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-}) 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

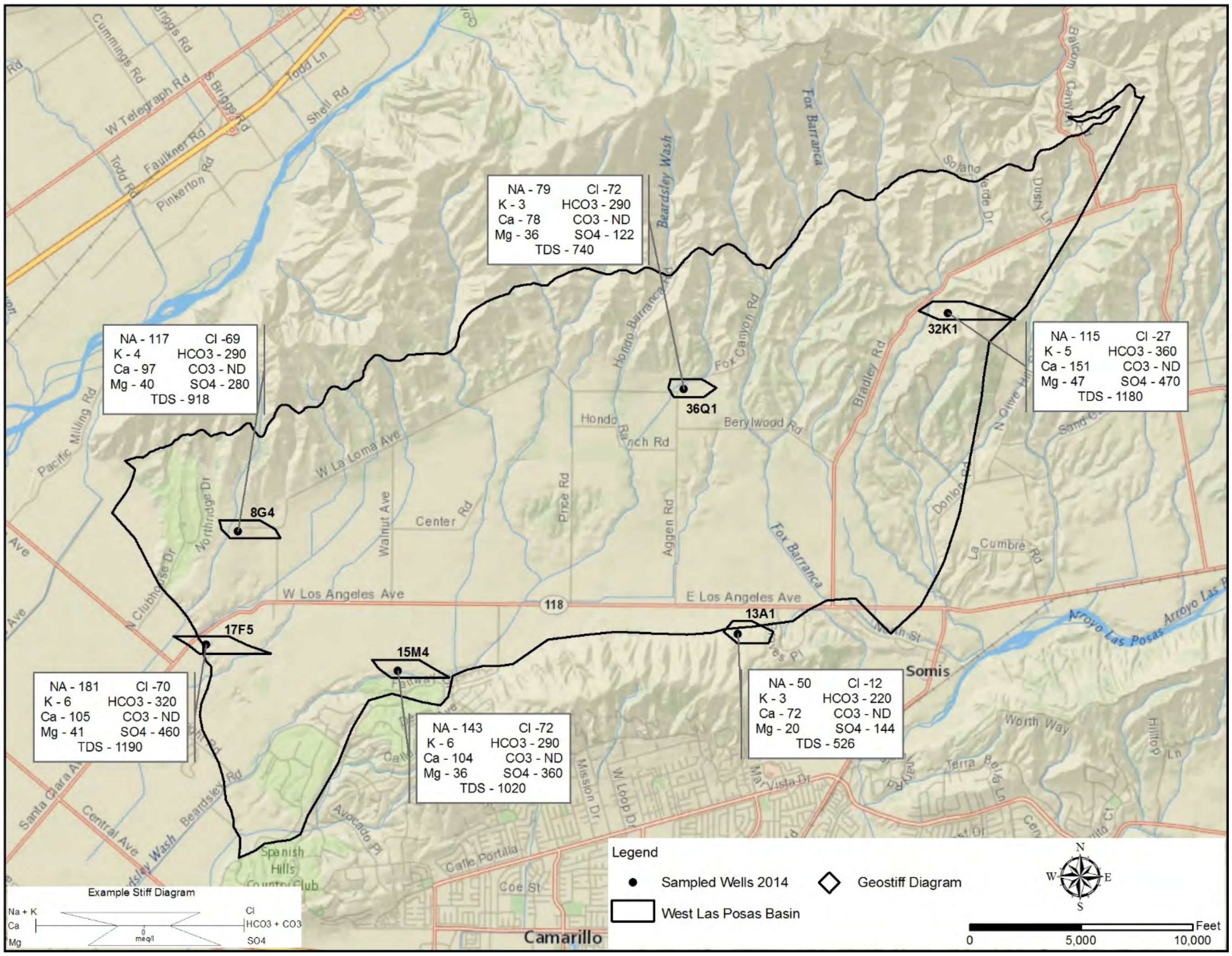
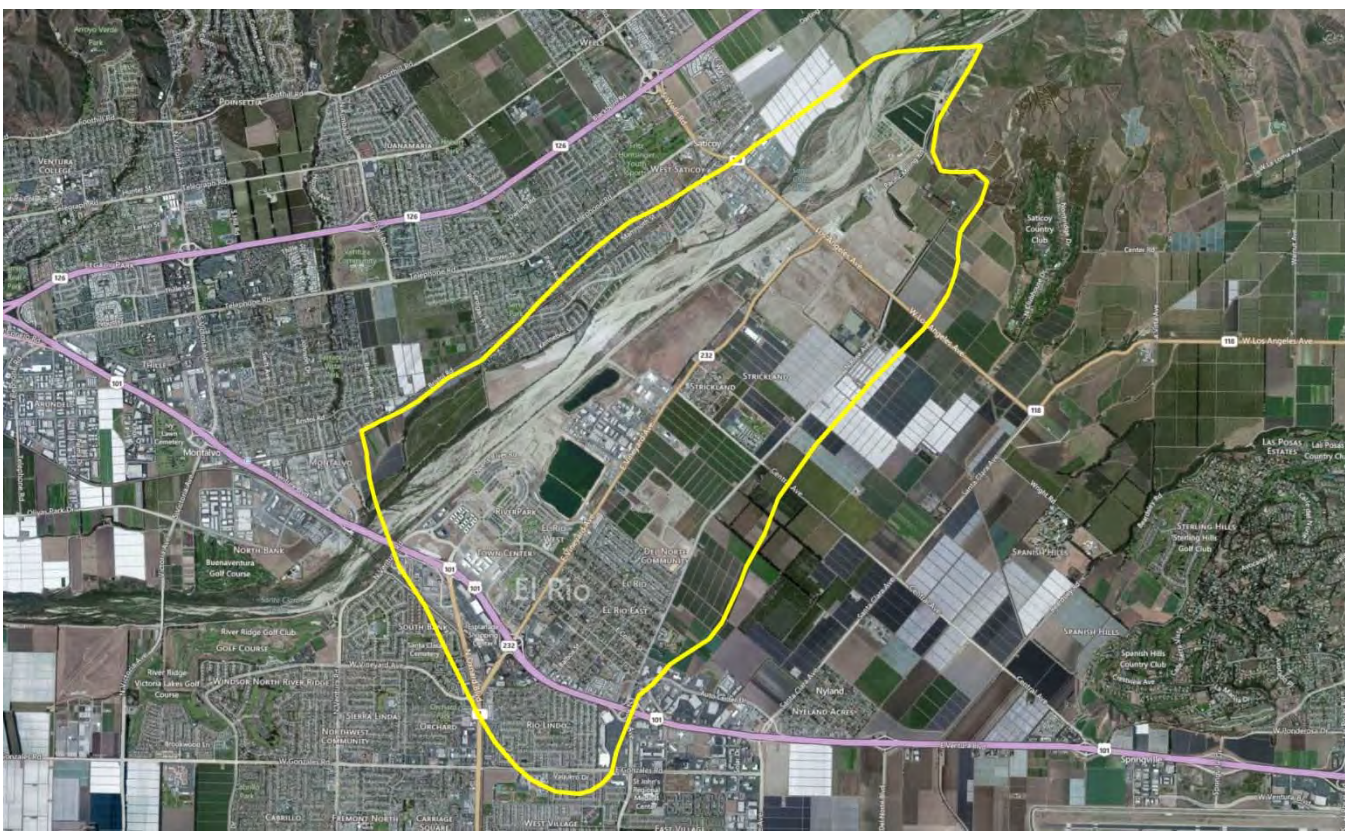


Figure 3-14: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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. Four wells were sampled this season. Figure D-19, piper diagram, shows low variability in water quality of the wells sampled this year. Figure D-19 shows a small difference between the upper and lower Forebay aquifers. The two Lower Forebay samples plot very closely while the two Upper Forebay aquifer wells show some variations in sulfate (SO_4^{2-}) and chloride concentrations. There is no dominant cation type but three samples plot close to the calcium type and one plots close to the sodium type; sulfate (SO_4^{2-}) is the dominant anion. The water in three samples is calcium sulfate type and the remaining sample is sodium sulfate type. The piper diagram, Figure D-20, shows that the wells sampled have very similar chemistry to that of the UAS of the Oxnard Plain Pressure Basin. All four wells sampled have TDS and sulfate concentrations above the secondary MCL for drinking water. None of the wells sampled this year have nitrate concentrations above the MCL for drinking water. 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-}) for the wells sampled in the Oxnard Forebay Basin.



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

OXNARD FOREBAY BASIN

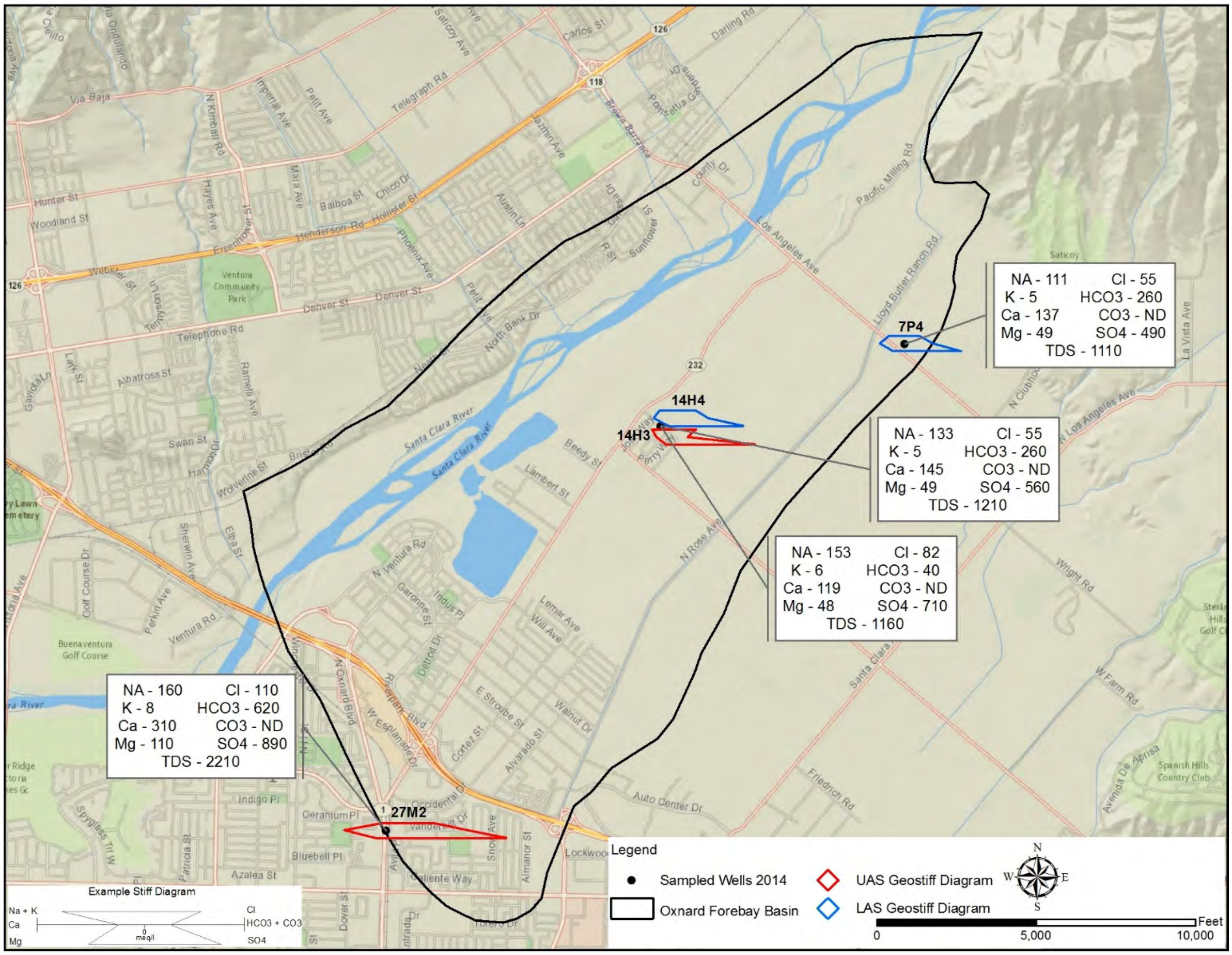
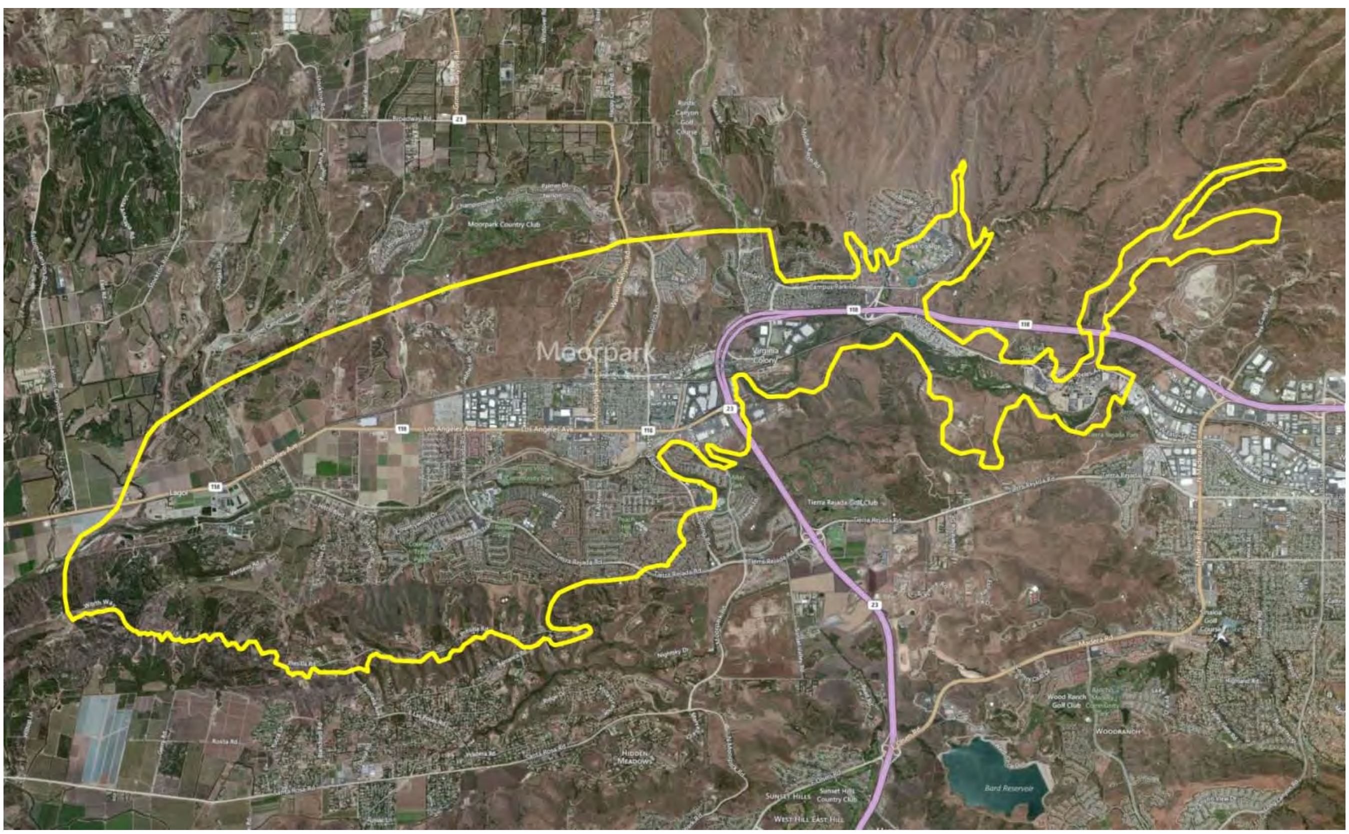


Figure 3-15: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 two wells sampled but the water chemistry is similar. There are approximately 170 water supply wells in the South Las Posas Basin; 27 are active. Figure D-17, 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 but plot close to the calcium cation type. Sulfate (SO_4^{2-}) is the dominant anion. 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 five wells sampled has TDS and 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 inorganic chemicals (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 D-18. 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-}) 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

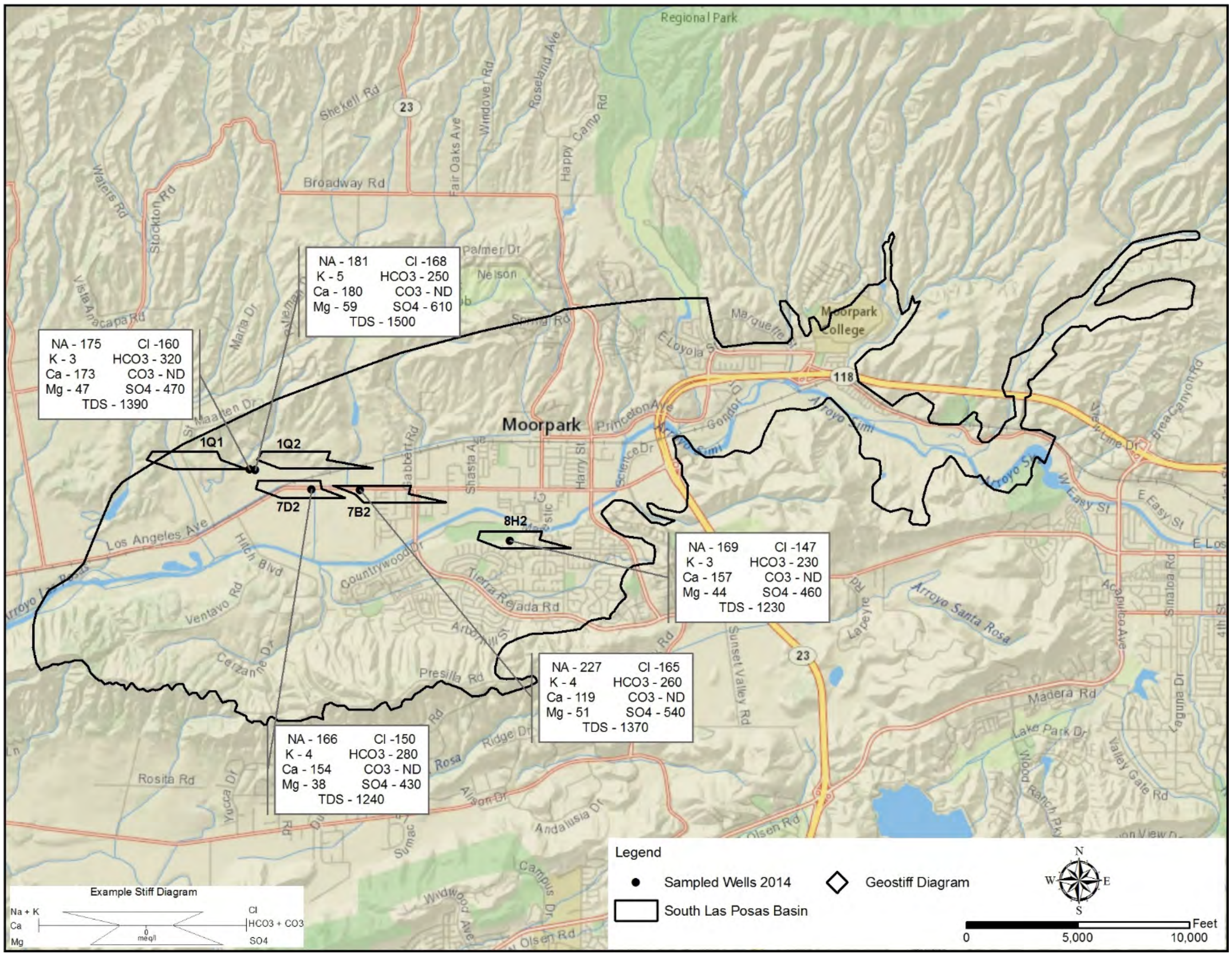
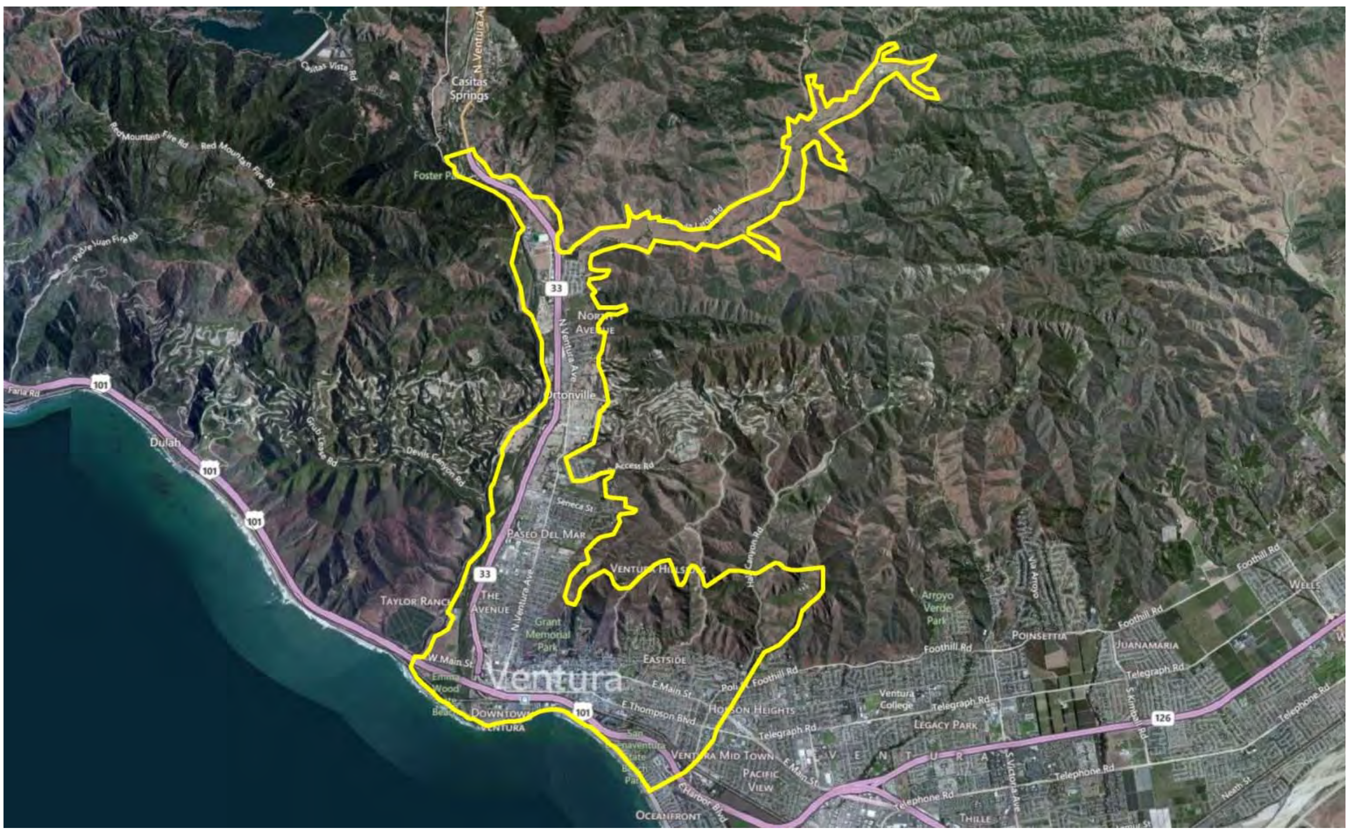


Figure 3-16: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 edge of the basin. There are approximately 29 water supply wells in the Lower Ventura River Basin; 14 are active wells. Figure D-21, shows the water quality of the one well sampled this year. There is no dominant cation or anion. The water type is closest to calcium sulfate type. The well sampled this year is located in river alluvium near the coast. Total dissolved solids, sulfate, iron, and chloride concentrations are above the secondary MCL. Figure 3-17 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 D-23 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

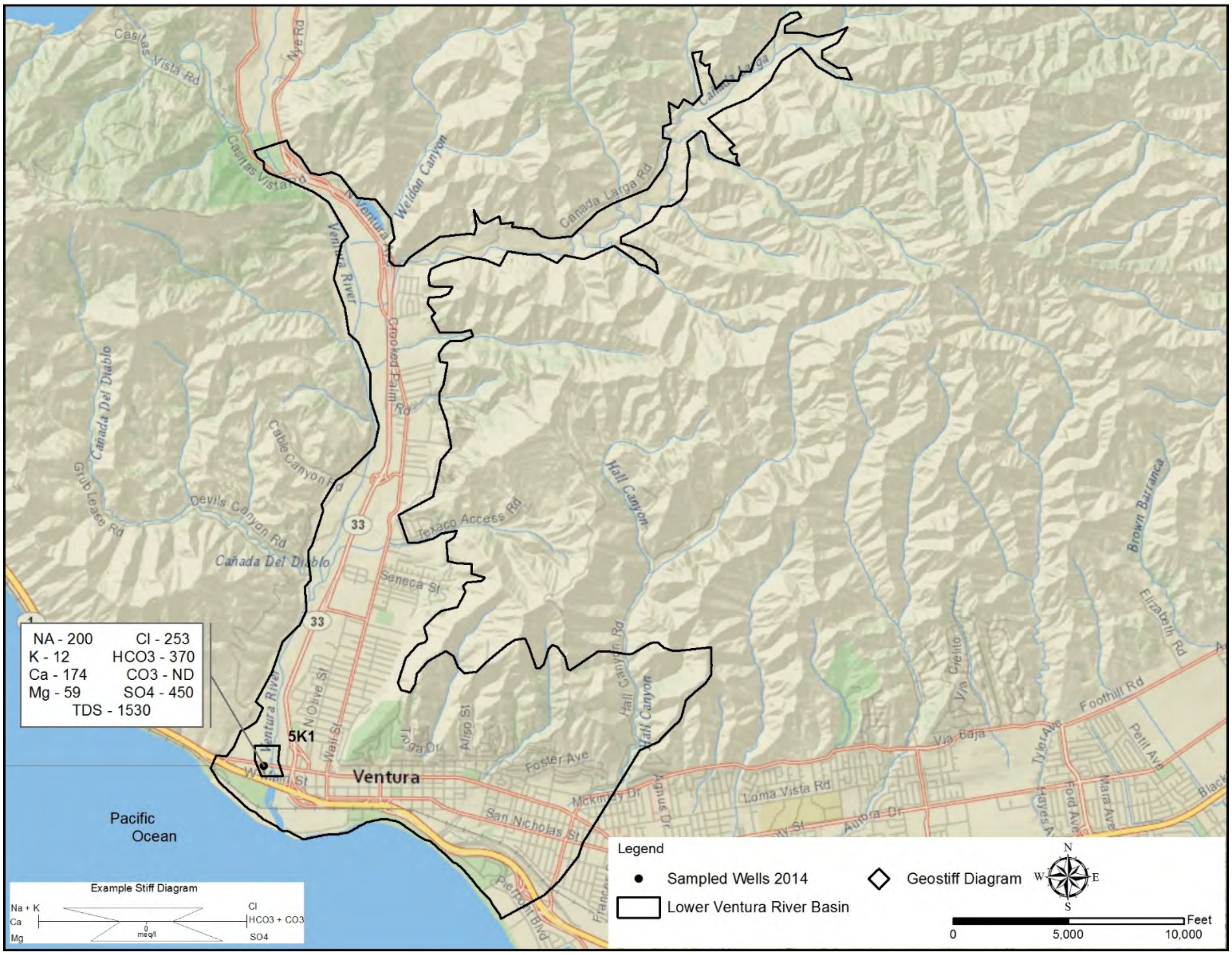
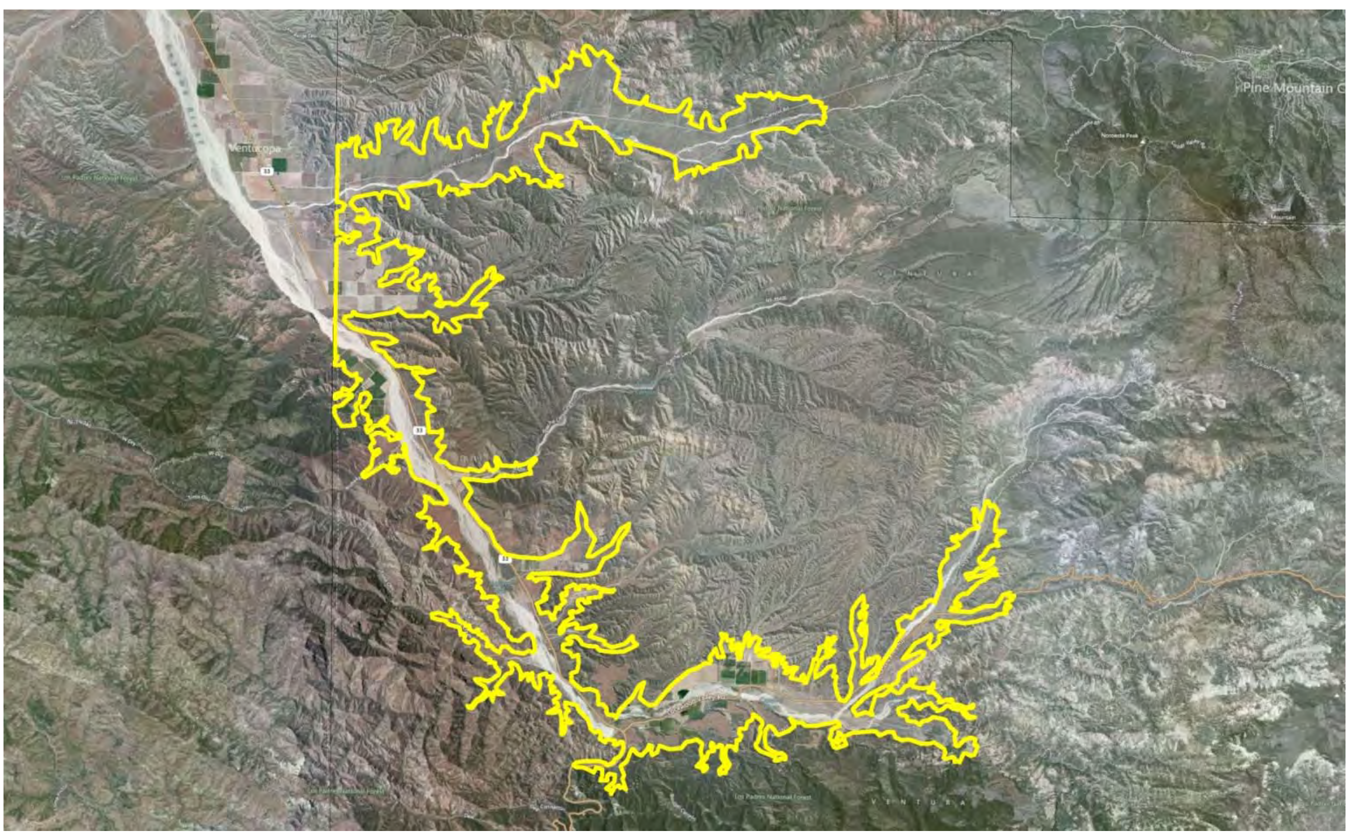


Figure 3-17: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 152 wells in the Cuyama Valley Basin; 106 are active water supply wells. Depth to the main water bearing unit varies between 40 to 170 feet below ground surface. Figure D-24, piper diagram, shows high variability in water quality of the wells sampled this year. The sodium group is the dominant cation in three samples; calcium is the dominant cation in the remaining sample. Sulfate (SO_4^{2-}) is the dominant anion in one sample; bicarbonate group is the dominant anion in one sample; and two samples have no dominant anion but plot close to the bicarbonate group. One sample is calcium sulfate type and three samples are sodium bicarbonate type. All four wells sampled this year have TDS above the secondary MCL for drinking water; three have elevated iron (Fe); and one has elevated sulfate (SO_4^{2-}). Water samples from all four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the primary MCL for drinking water. The piper diagram, Figure D-24, and stiff diagrams Figure 3-18 show the water quality in the north part of the basin is very different from that in the south but there are not enough samples to evaluate localized conditions. 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. 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 Cuyama Valley basin.



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

CUYAMA VALLEY BASIN

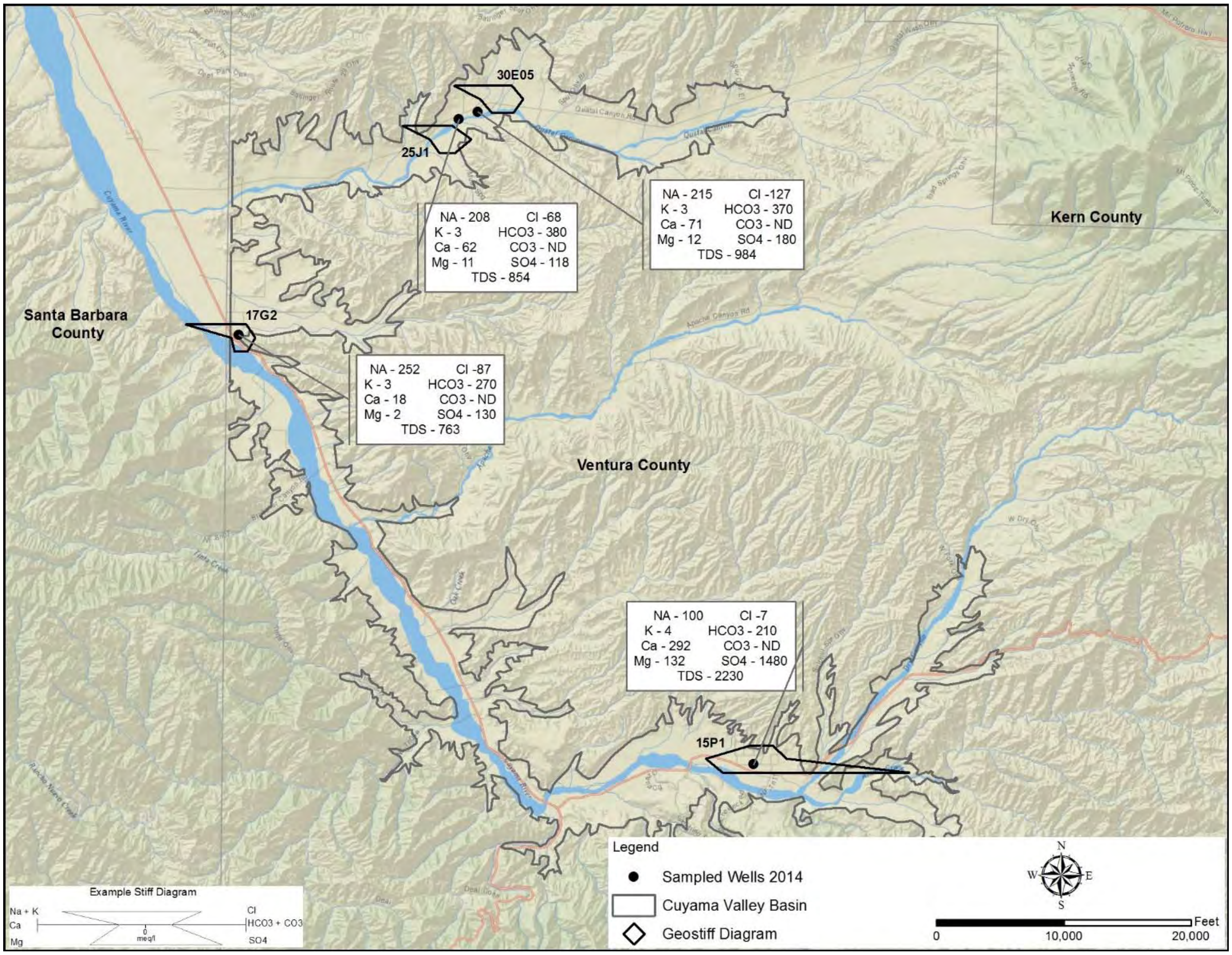


Figure 3-18: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

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 190 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 D-25, 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 elevated manganese. All three samples also have concentrations of boron and one has 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 inorganic chemicals (Title 22 metals). Lead (Pb) was above the primary MCL for drinking water. 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 Simi Valley basin.

sulfate (SO_4^{2-})

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

SIMI VALLEY BASIN

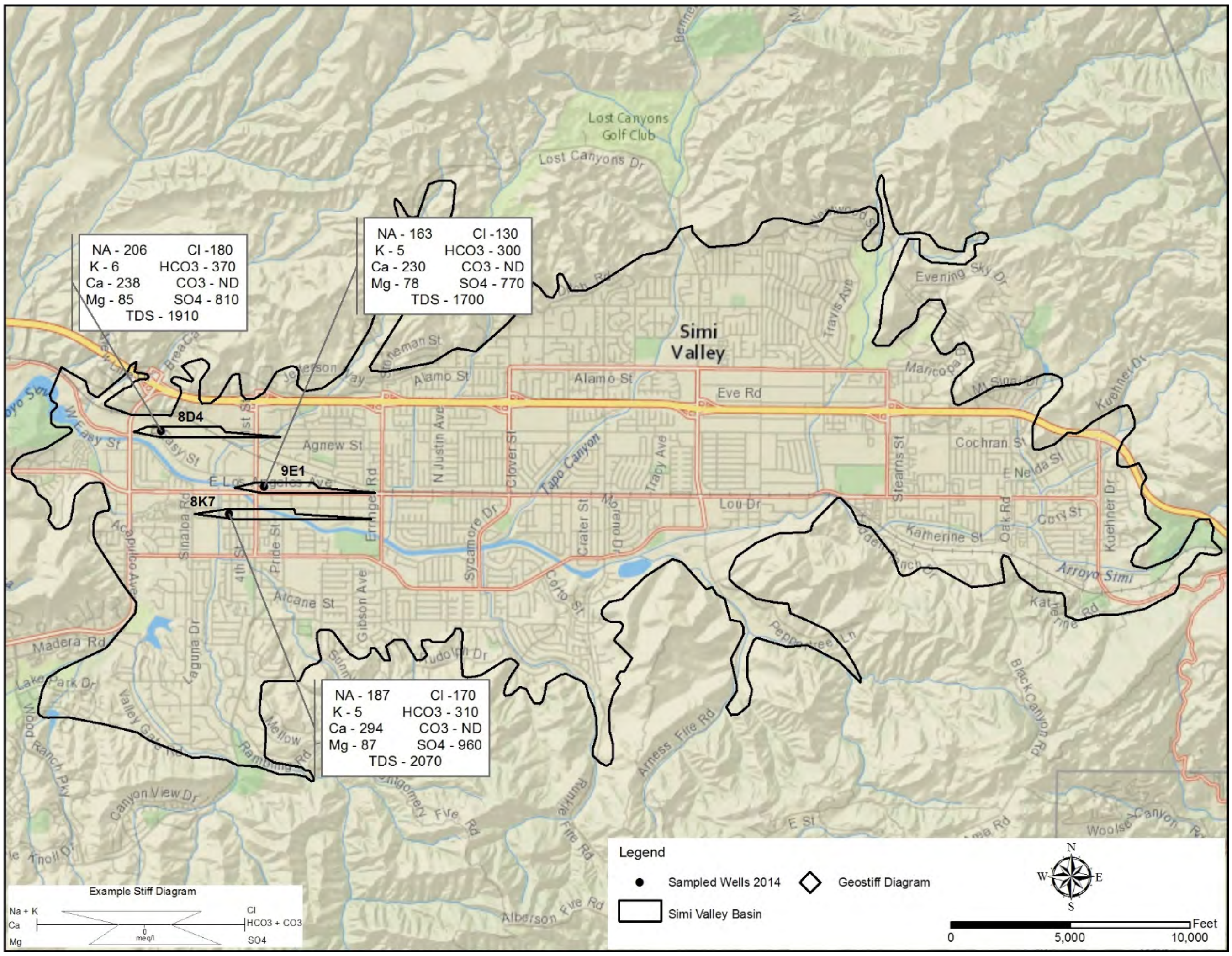
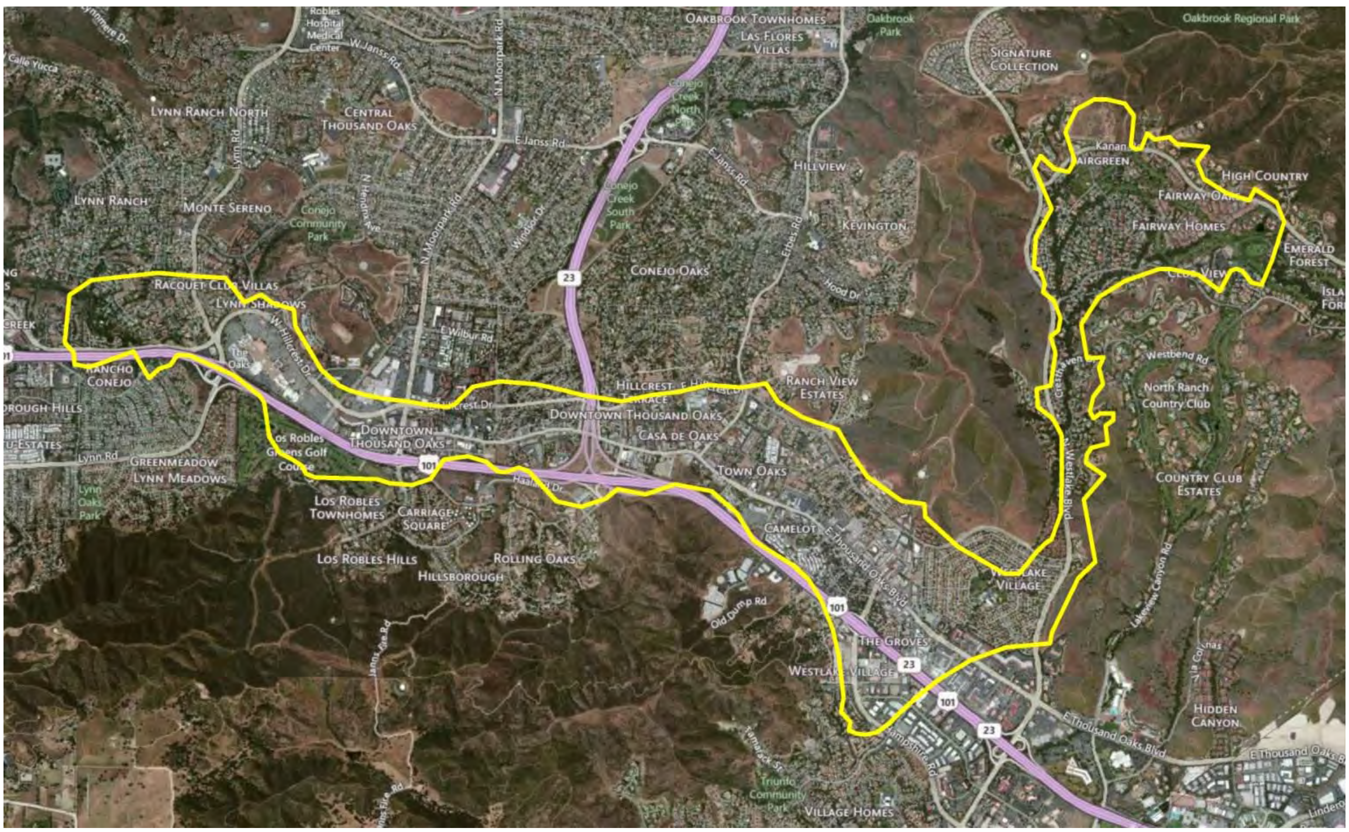


Figure 3-19: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

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 192 water supply wells in the Thousand Oaks Basin; 16 are active wells. Two wells at the west end of the basin were sampled this year. Figure D-26, piper diagram, shows the water quality of the wells sampled this year. There is no dominant cation but all samples plot close to the magnesium cation type; sulfate (SO_4^{2-}) is the dominant anion. The water is magnesium sulfate type. Concentrations of iron, sulfate (SO_4^{2-}) and TDS are above the secondary MCL for drinking water. Both samples were analyzed for inorganic chemicals (Title 22 metals). None of the inorganic chemicals was above the primary MCL for drinking water. Figure 3-20 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

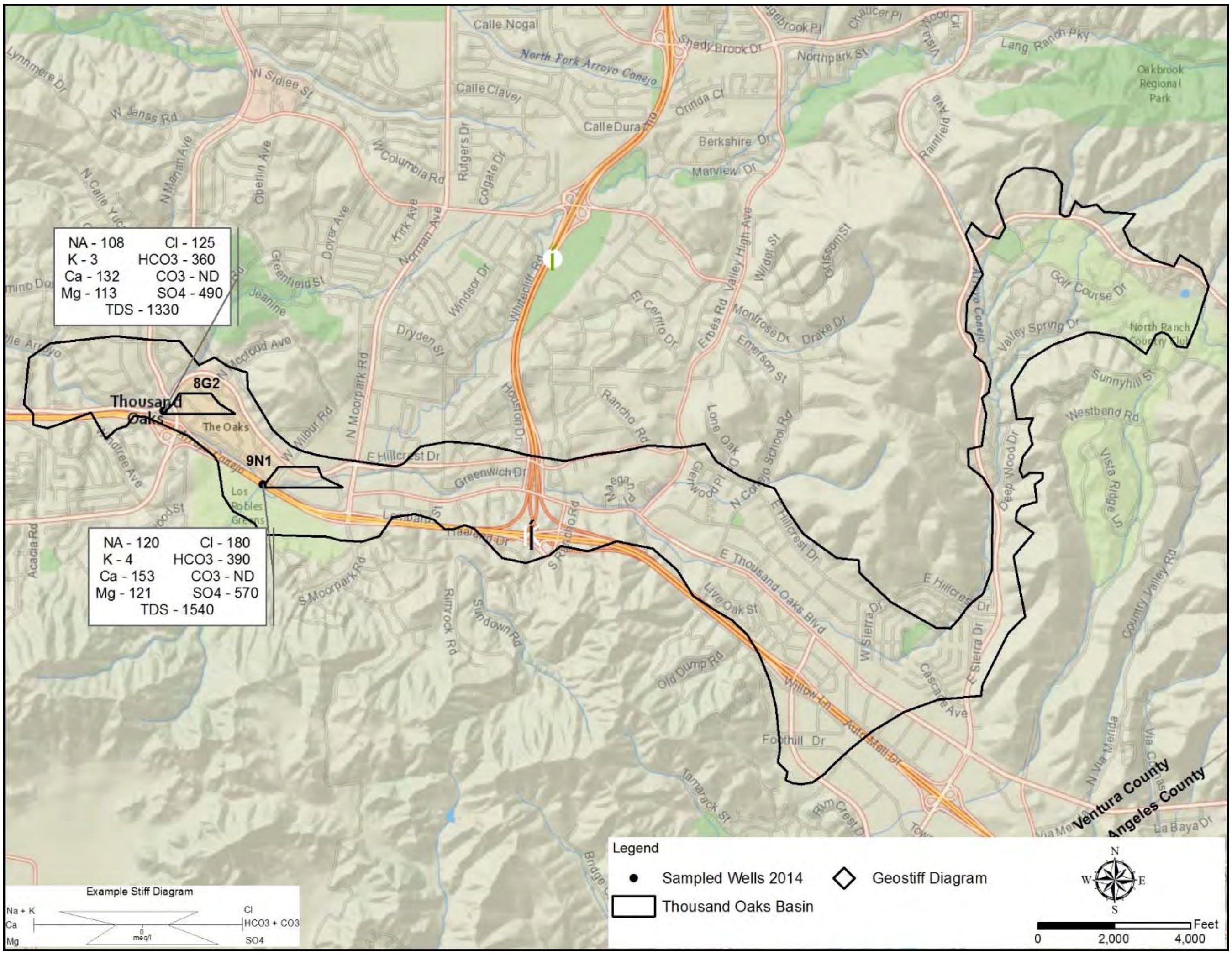
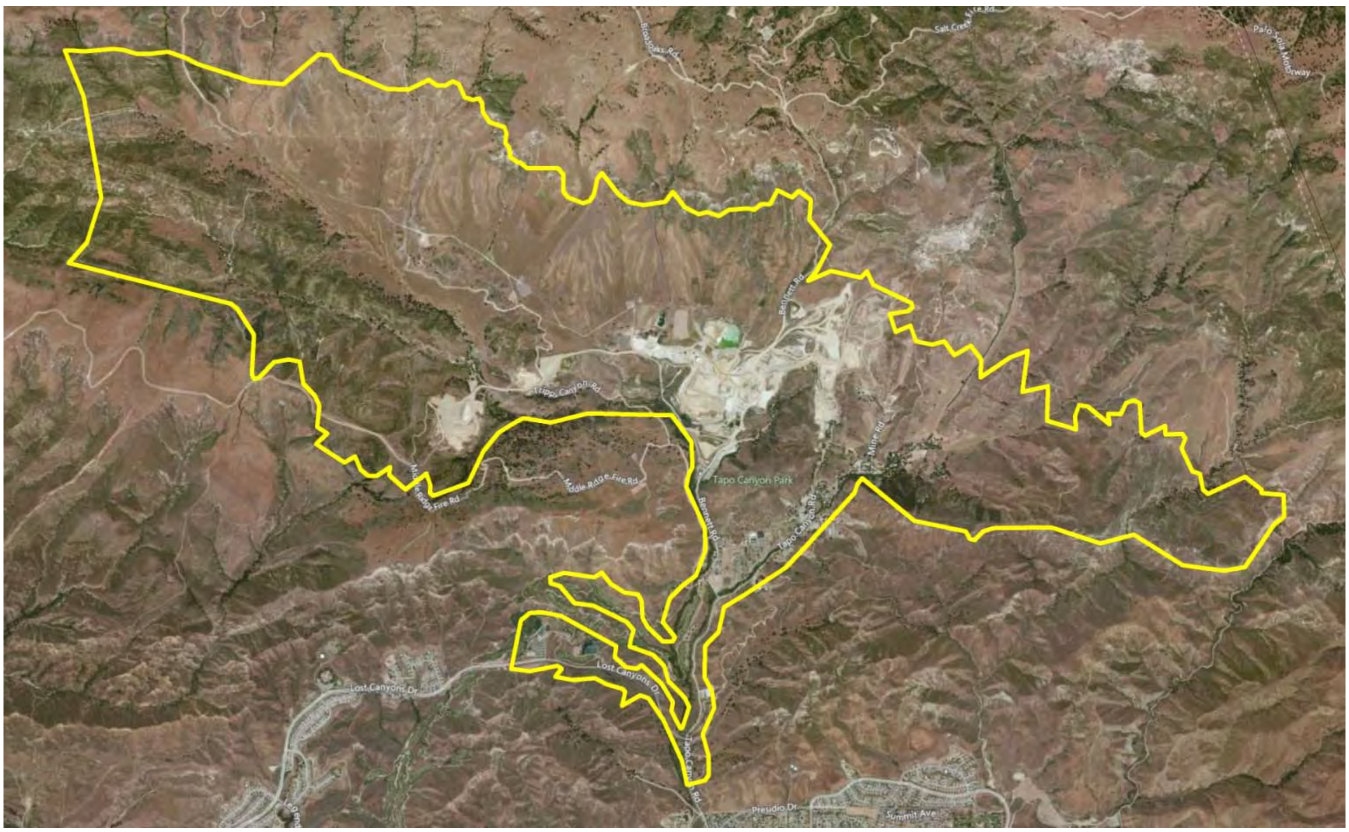


Figure 3-20: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.15 - Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley and has very good groundwater quality. 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. Figure D-27, piper diagram, shows water quality of the wells sampled this year. Calcium is the dominant cation and sulfate (SO_4^{2-}) is the dominant anion in the wells sampled. The water is calcium sulfate type. Two wells were sampled this year. 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 inorganic chemicals (Title 22 metals). Figure 3-21 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

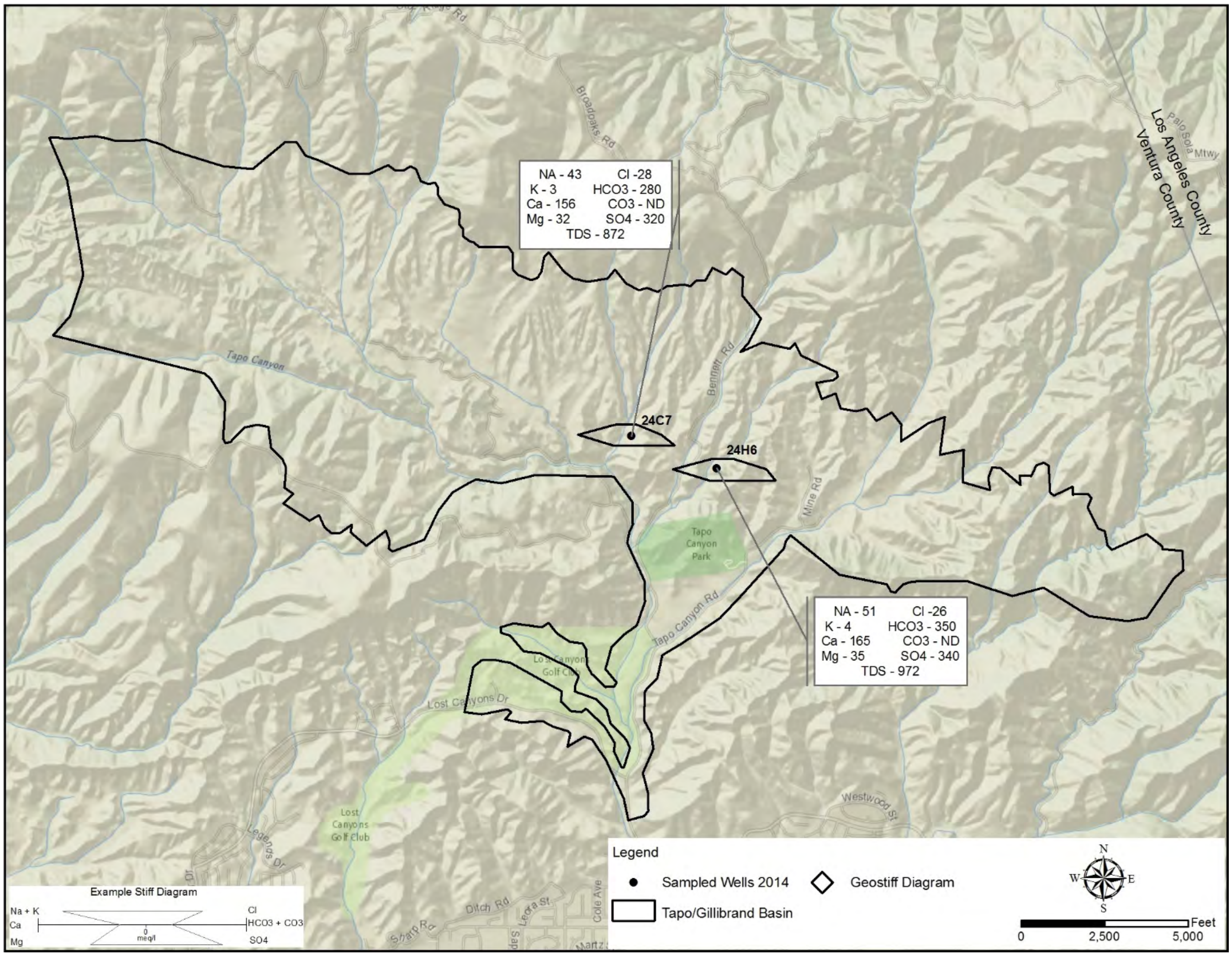


Figure 3-21: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

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). 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 85 water supply wells in the Arroyo Santa Rosa Basin; 39 are active wells. Figure D-29, piper diagram, shows moderate variation in water quality of the wells sampled this year. There is no dominant cation but four of the samples plot close to the magnesium cation type and two plot close to the sodium cation type. Bicarbonate is the dominant anion for one of the samples; there is no dominant anion for the remainder but they plot close to the bicarbonate cation type. Four of the water samples are magnesium bicarbonate type and two samples are sodium bicarbonate type. Water from four of the six wells sampled this year has nitrate (NO_3^-) concentrations higher than the primary MCL for drinking water. All six wells have TDS concentrations above the secondary MCL; ranging from 802 to 1110 mg/l. Chloride (Cl^-) concentrations in five of the wells are above the level that can cause agricultural beneficial uses for sensitive plants to be impaired, but is not above the primary MCL for drinking water. No water samples were analyzed for inorganic chemicals (Title 22 metals). Depth to water bearing material is approximately 50 feet. Figure D-31, 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 3-22 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 Arroyo Santa Rosa basin.

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

ARROYO SANTA ROSA BASIN

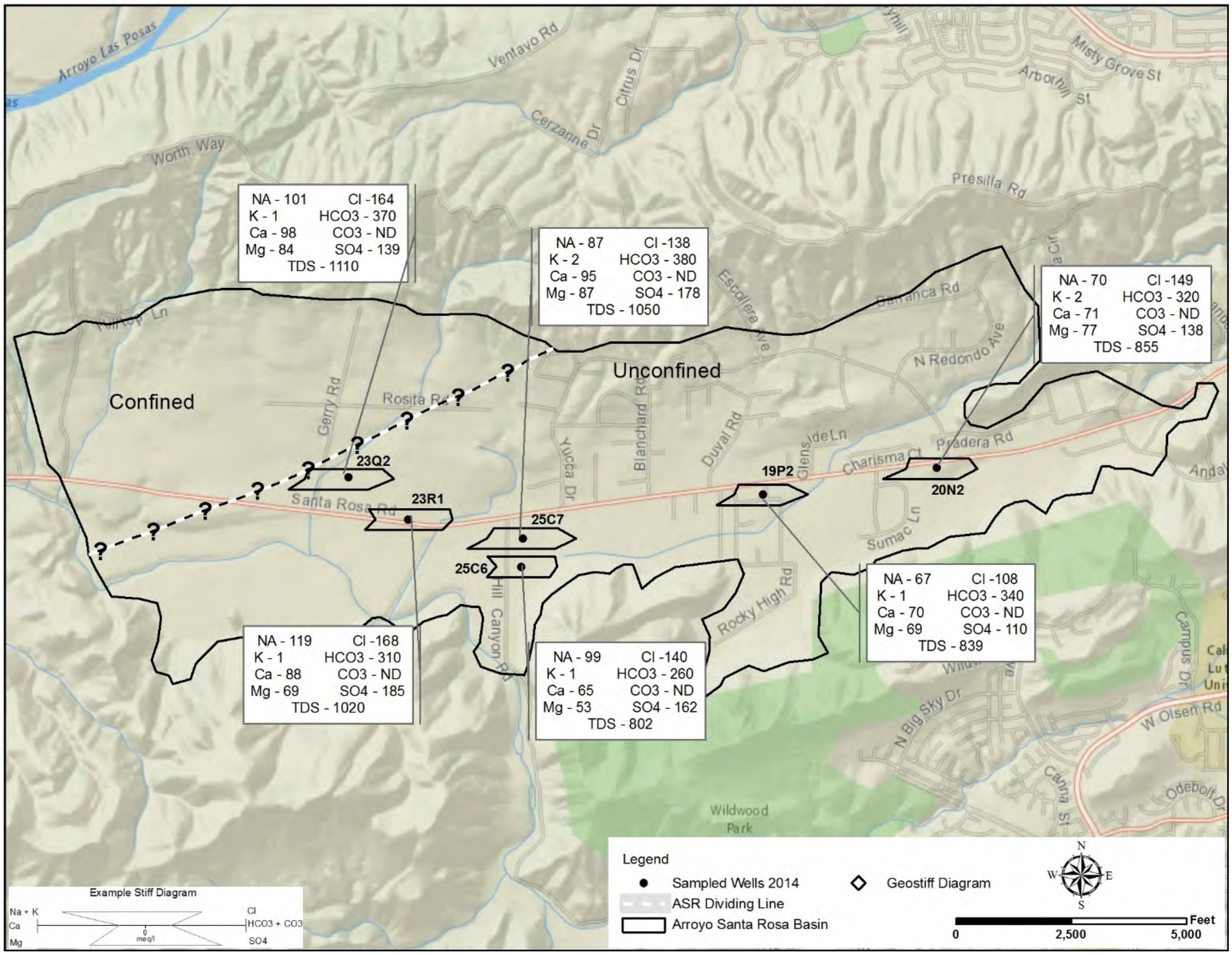


Figure 3-22: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-23 shows the geographic distribution of the wells sampled, with graduated symbols representing nitrate concentration for 2014. Figure 3-24 shows nitrate results for 1998 through 2014 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.

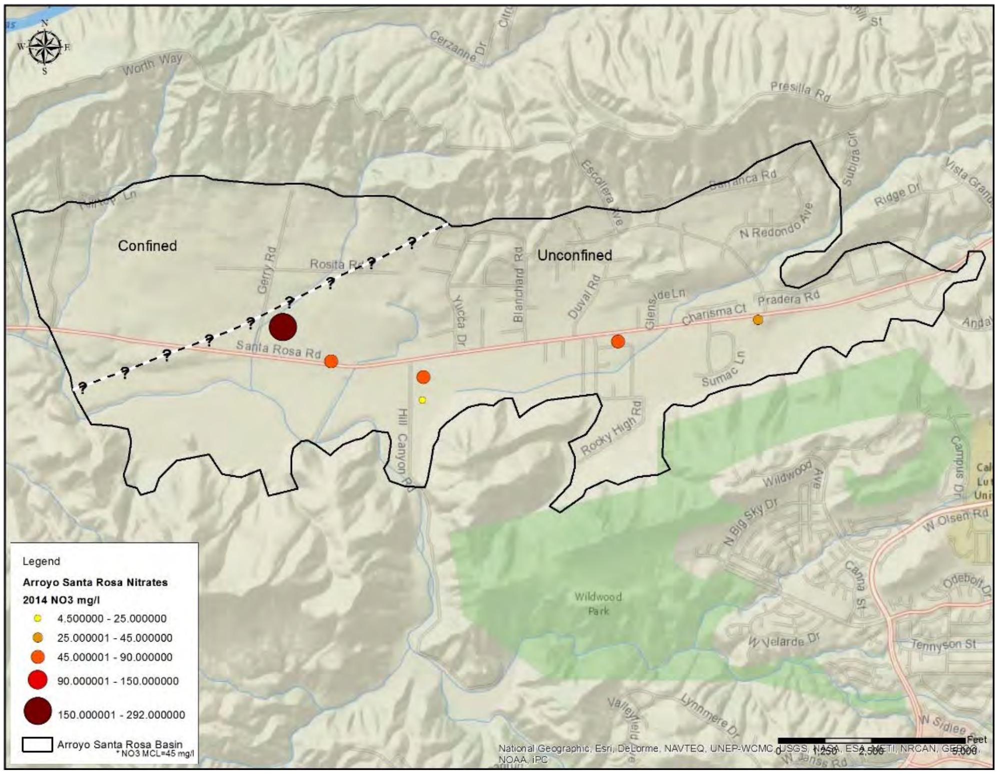


Figure 3-23: Map showing Nitrate results in mg/l for the year 2014.

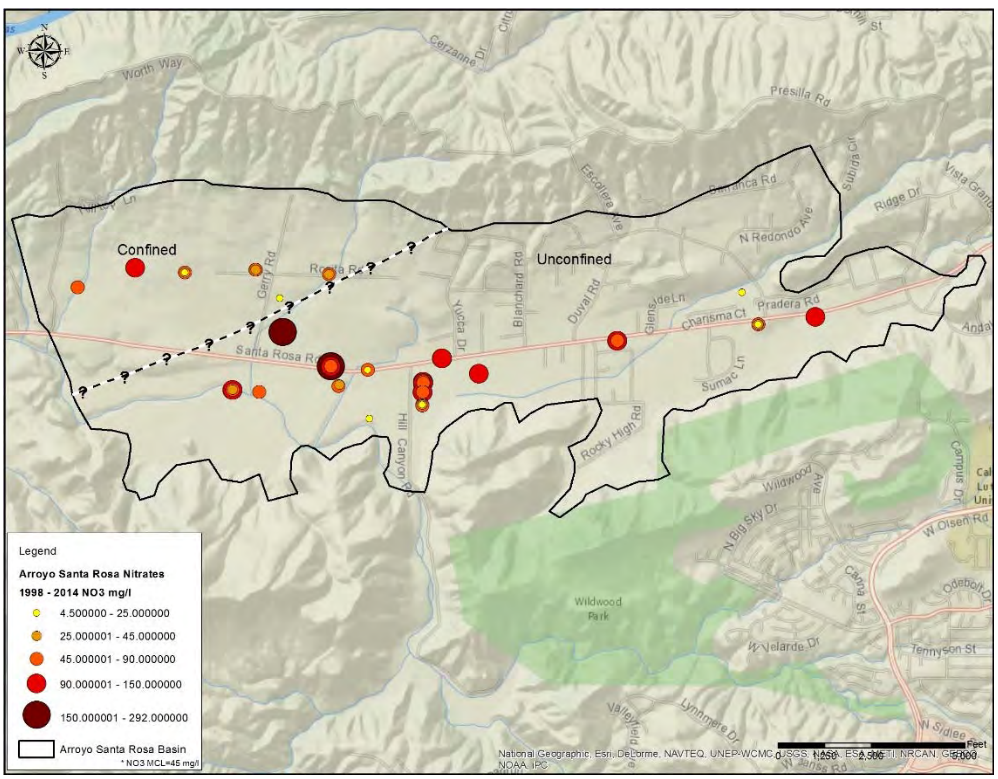
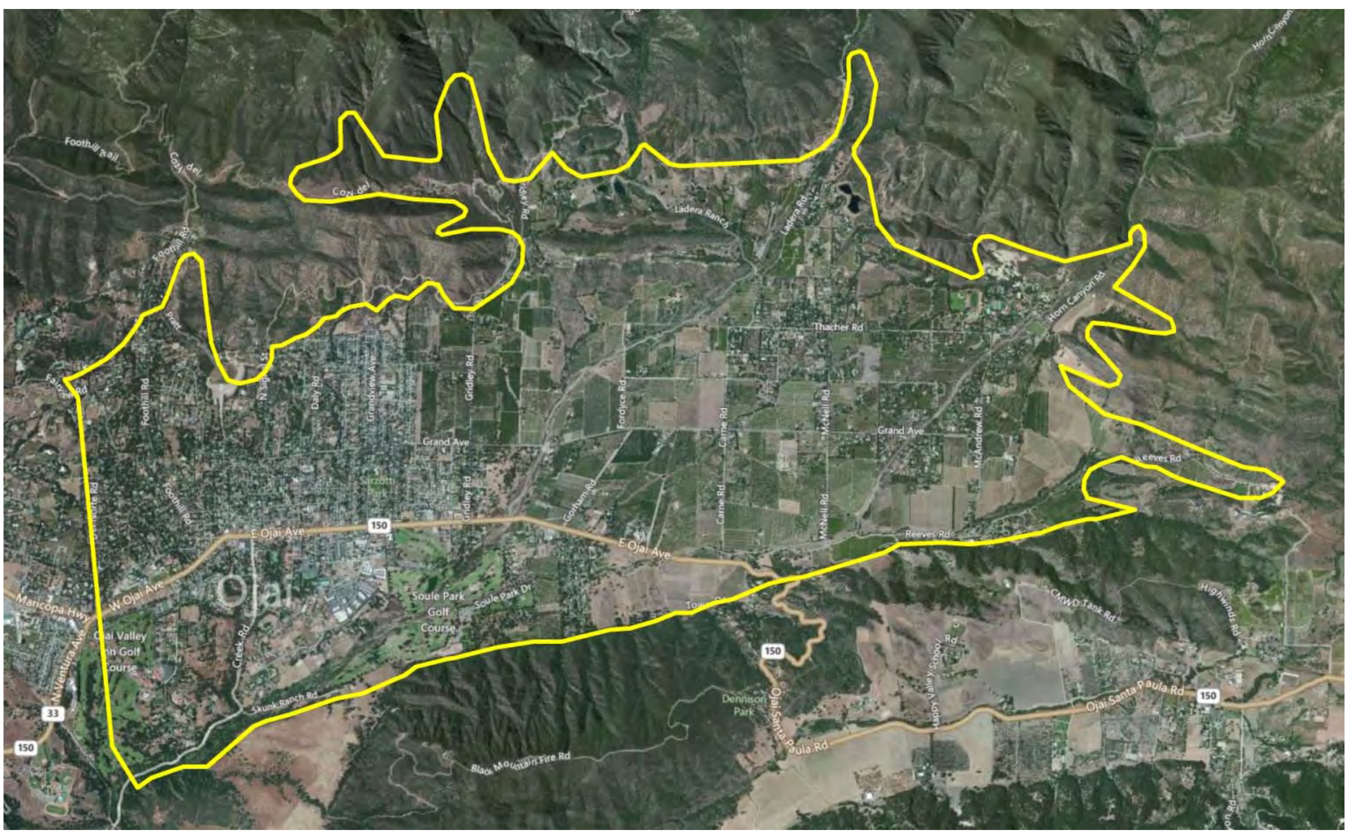


Figure 3-24: Map showing nitrate results for 1998 to 2014.

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 337 water supply wells in the Ojai Valley Basin; 188 are active wells. Depth to water bearing material is generally between 25 to 30 feet below ground surface. Figure D-33, piper diagram, shows moderate variation in water quality of the wells sampled this year. Calcium is the dominant cation group for nine of the samples; sodium is the dominant cation group for one sample. Sulfate (SO_4^{2-}) is the dominant anion for two samples; bicarbonate is the dominant anion for three of the samples and there is no dominant anion for the remaining samples but they plot close to the bicarbonate anion type. Seven samples are calcium bicarbonate type; one sample is sodium bicarbonate type and the remaining two samples are calcium sulfate type. All 10 wells sampled have TDS concentrations above the secondary MCL for drinking water. TDS ranges from 650 to 1190 mg/l. Two wells have iron (Fe), three wells have manganese (Mn), and one well has sulfate (SO_4^{2-}) concentrations above the secondary MCL for drinking water. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). One well has lead (Pb) above the primary MCL for drinking water. 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 Ojai Valley basin.



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

OJAI VALLEY BASIN

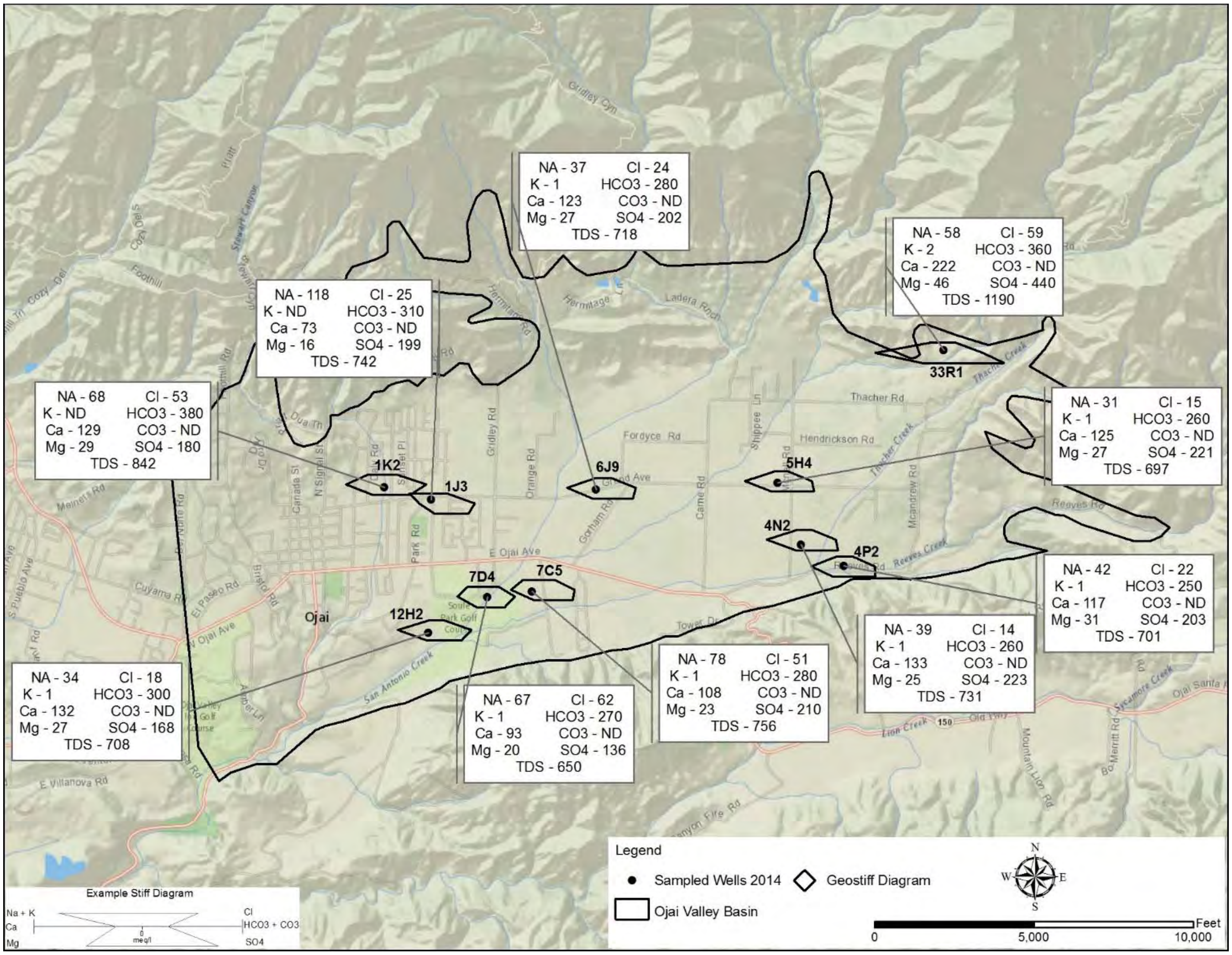
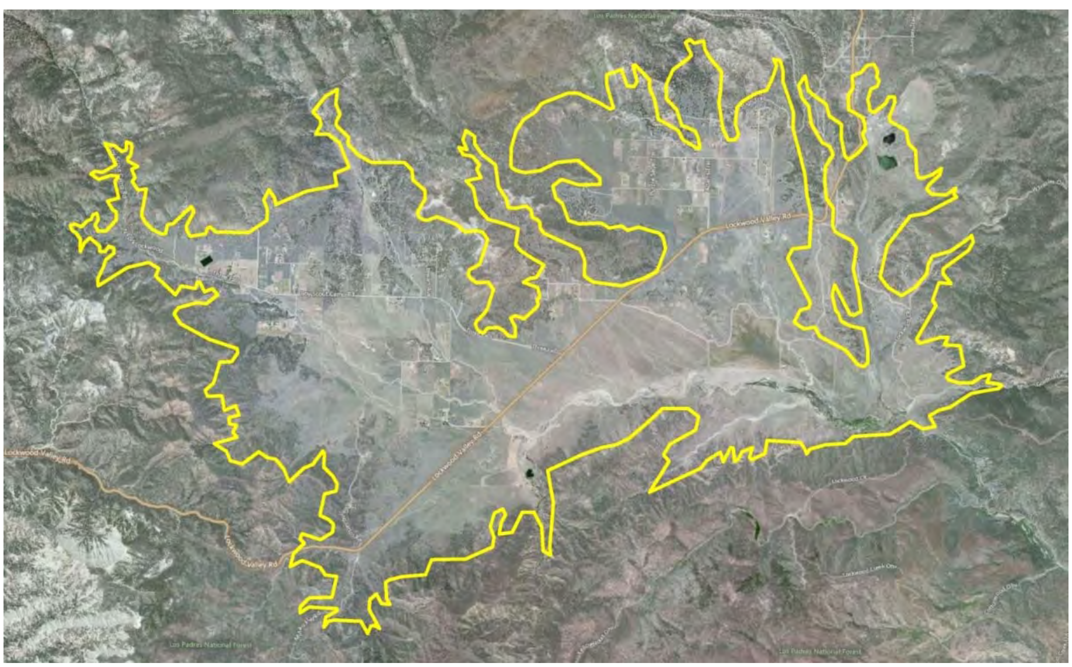


Figure 3-25: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

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 257 water supply wells in the Lockwood Valley Basin; 224 are active wells. Figure D-28, 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 both wells were also analyzed for inorganic chemicals (Title 22 metals). One has arsenic above the MCL but none of the remaining inorganic constituents were above the primary MCL for drinking water. Water from both wells was tested for radionuclides. The result for gross alpha on both 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 Groundwater section has not investigated the geologic source(s) of the radionuclides. Following the additional uranium testing, radionuclides in two of the wells were determined to be above the MCL for drinking water. Figure 3-26 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

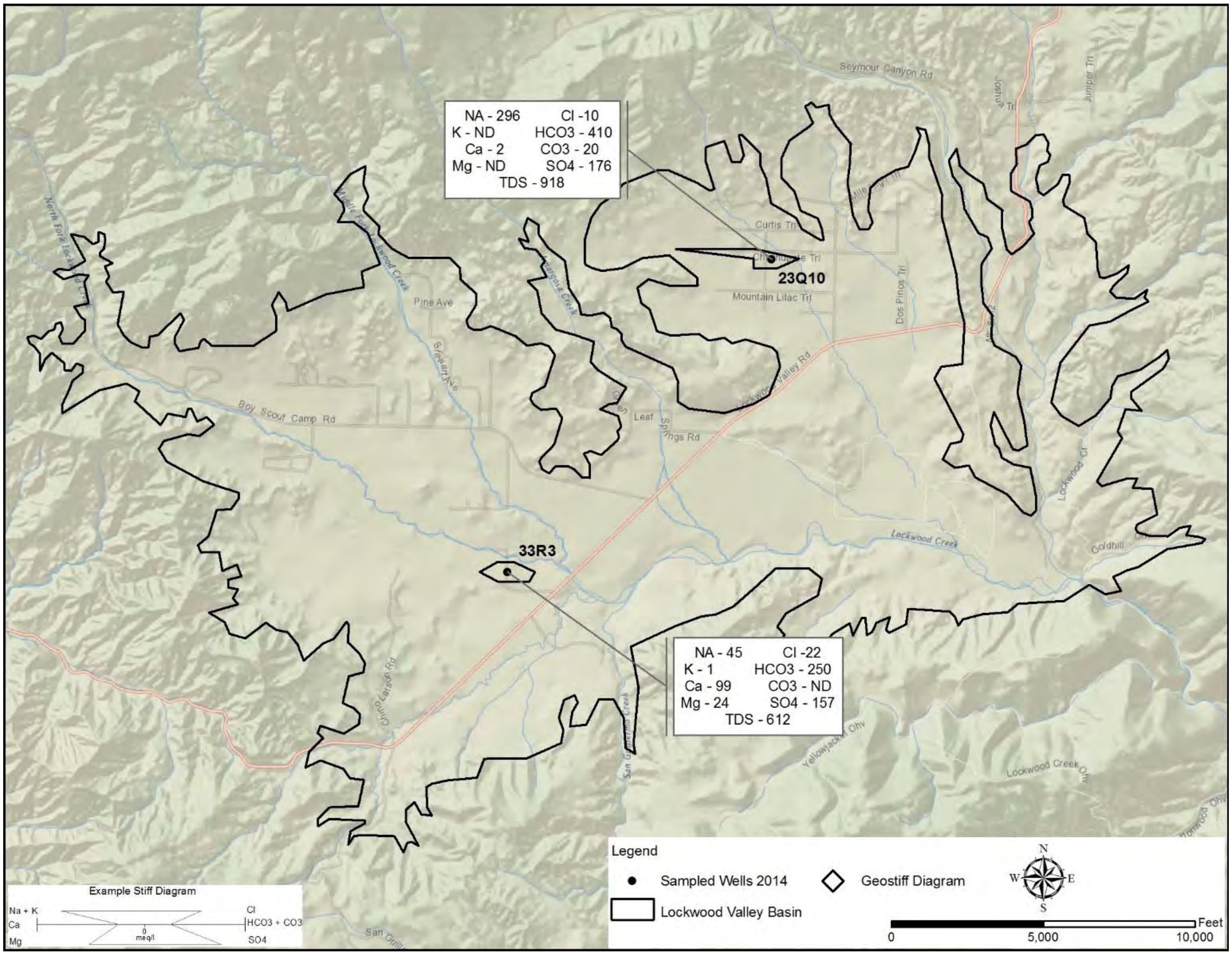


Figure 3-26: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.19 - Tierra Rejada Valley Basin

Depth to water bearing materials varies between 20 to 80 feet. There are approximately 49 water supply wells in the Tierra Rejada Valley Basin; 29 are active. Eleven wells were sampled this year. Figure D-30, piper diagram, shows high variation in water quality. The dominant cation for one well is sodium type; the remainder have no dominant cation but plot close to the magnesium type. The dominant anion for three samples is bicarbonate; the remainder have no dominant anion but seven plot close to bicarbonate type and one plots close to the chloride type. One well is sodium chloride type and the remainder are magnesium bicarbonate type. Ten wells have concentrations above the secondary MCL for TDS; ranging from 650 to 1190 mg/l. Nitrate was above the MCL for drinking water in four samples this year. Figure D-31, 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. Samples from four wells were analyzed for inorganic chemicals (Title 22 metals). Samples from both wells were also analyzed for inorganic chemicals (Title 22 metals). No inorganic constituents was above the primary MCL for drinking water. Figure 3-27 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

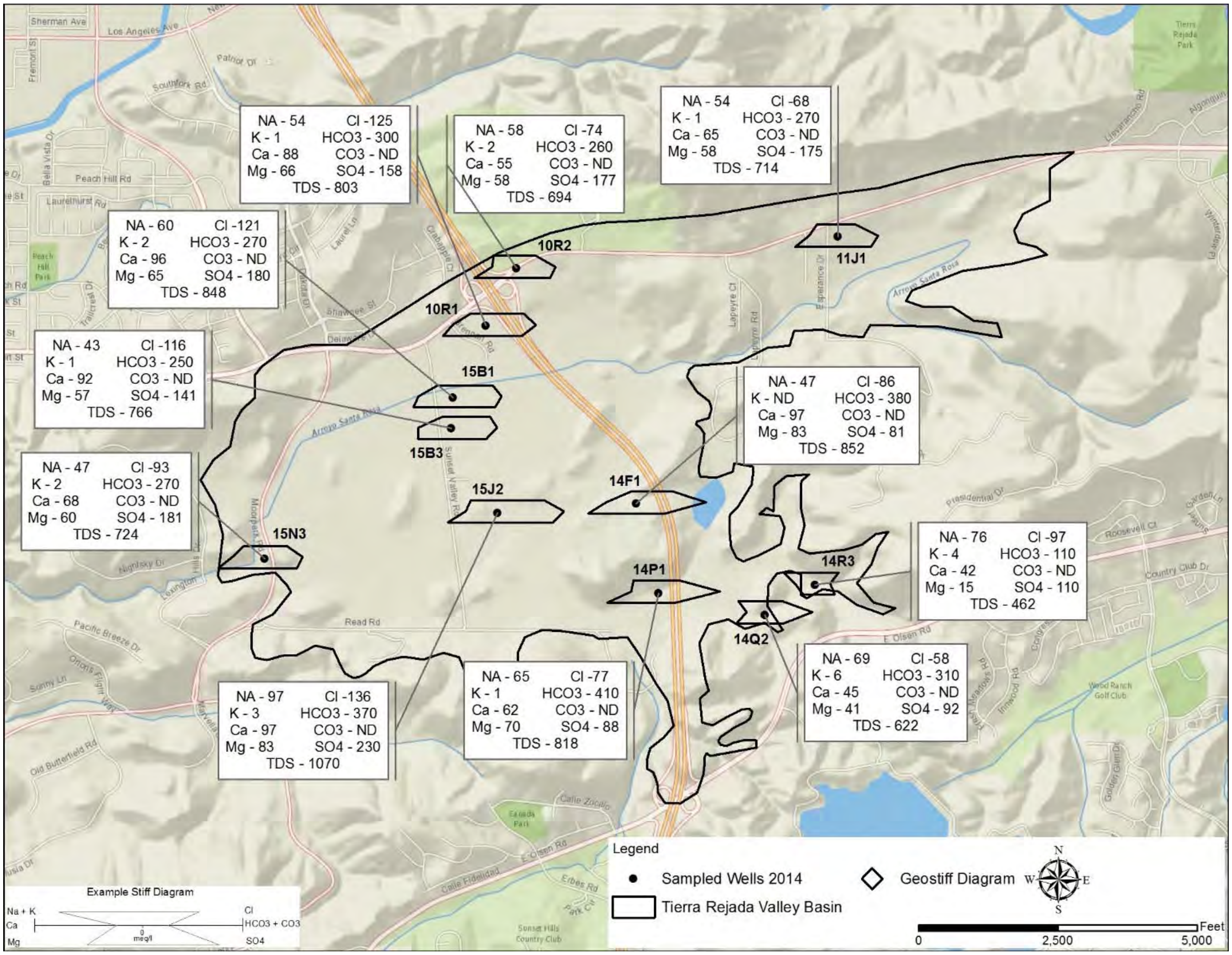


Figure 3-27: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-28 below shows nitrate concentrations for wells sampled in Tierra Rejada Basin in 2014. Groundwater from four 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.

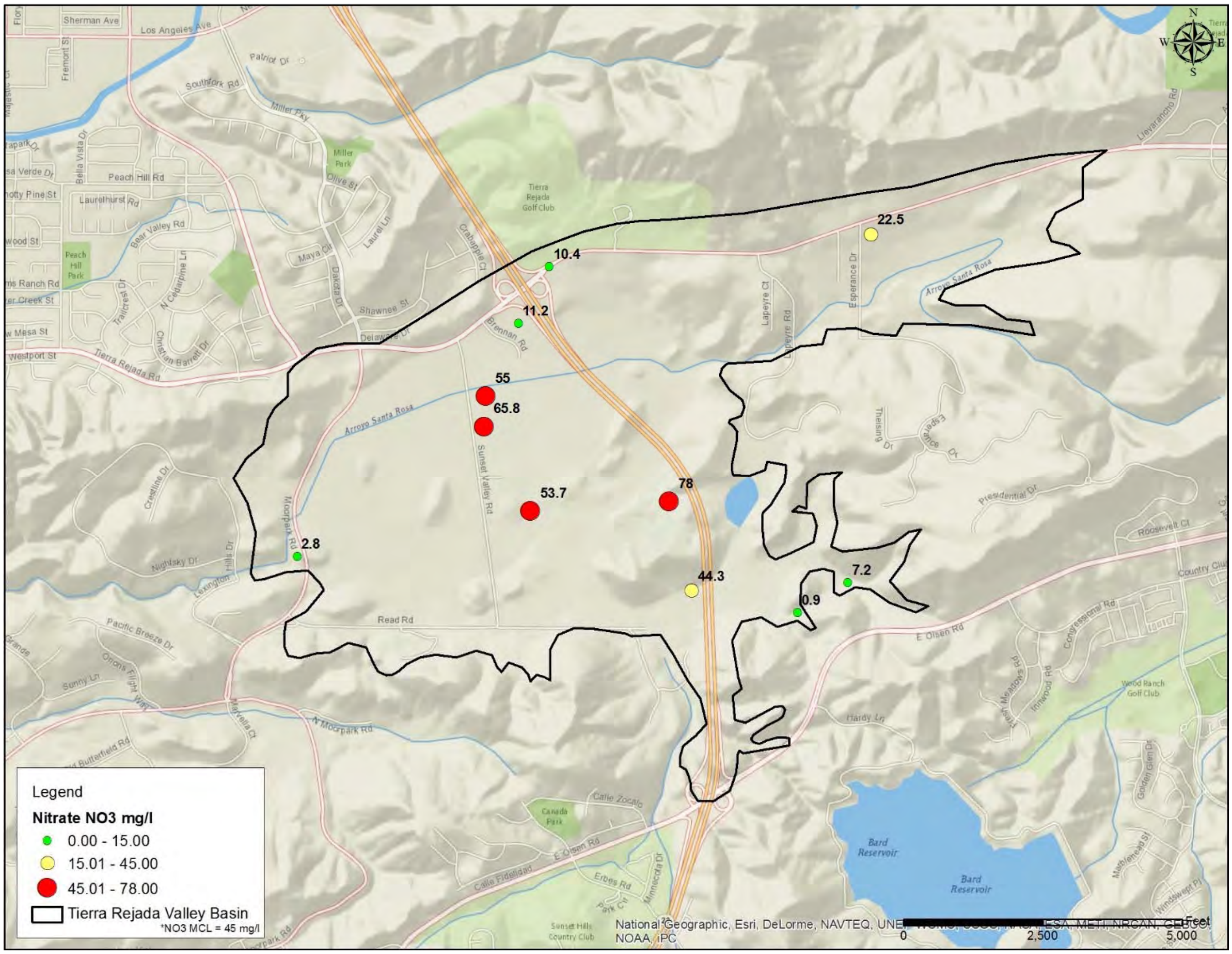
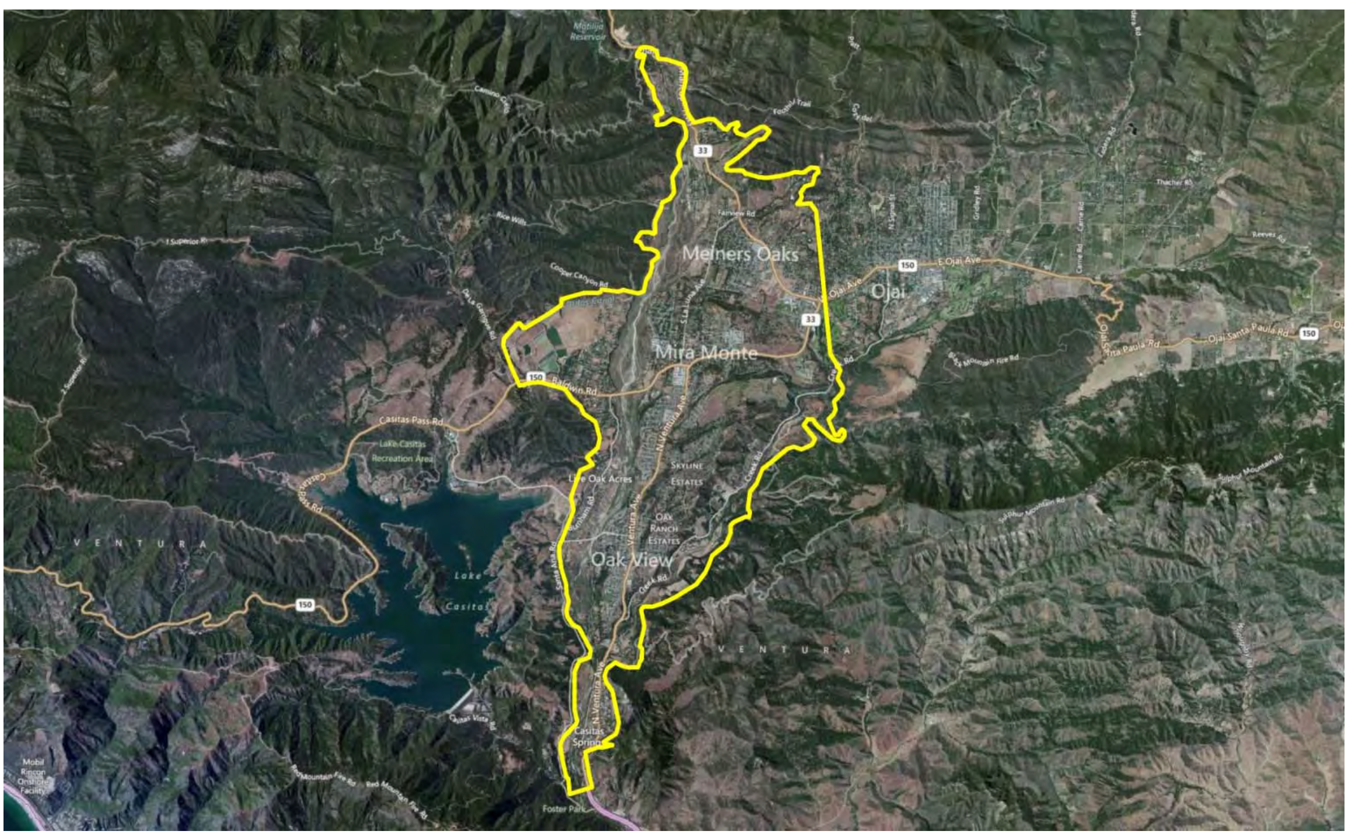


Figure 3-28: Map showing nitrate concentrations (mg/l). Four of the 11 wells sampled this year have a nitrate concentration above the MCL for drinking water.

3.2.20 - Upper Ventura River Basin

The Upper Ventura River Basin is mainly composed of thin alluvial deposits. There are approximately 291 water supply wells in the Upper Ventura River Basin; 162 are active wells. Figure D-22, piper diagram, shows high variation in water quality. The dominant cation for two wells is calcium; the dominant cation for one well is sodium type and one well has no dominant cation but it plots close to the sodium cation type. The dominant anion for one well is bicarbonate. The remainder have no dominant anion but two plot close to the bicarbonate anion type and one plots close to the sulfate anion type. Two wells are sodium bicarbonate type; one well is calcium sulfate type; and one well is calcium bicarbonate type. Three of the samples have TDS concentrations that exceed the secondary MCL for drinking water; ranging from 393 to 885 mg/l. One well has iron (Fe) and manganese (Mn) above the secondary MCL for drinking water, and one well has sulfate (SO_4^{2-}) concentration above the secondary MCL for drinking water. One well sampled has an extremely high zinc (Zn) concentration. Samples from all four wells were also analyzed for inorganic chemicals (Title 22 metals). One sample had lead (Pb) above the primary MCL for drinking water but no other inorganic constituent was above the MCL. Figure D-23, piper diagram, shows a comparison of the water chemistry for the Upper and Lower Ventura River Basins. Water chemistry is similar except the Upper Ventura River basin is higher in calcium.

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 Upper Ventura River basin.



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

Upper Ventura River Basin

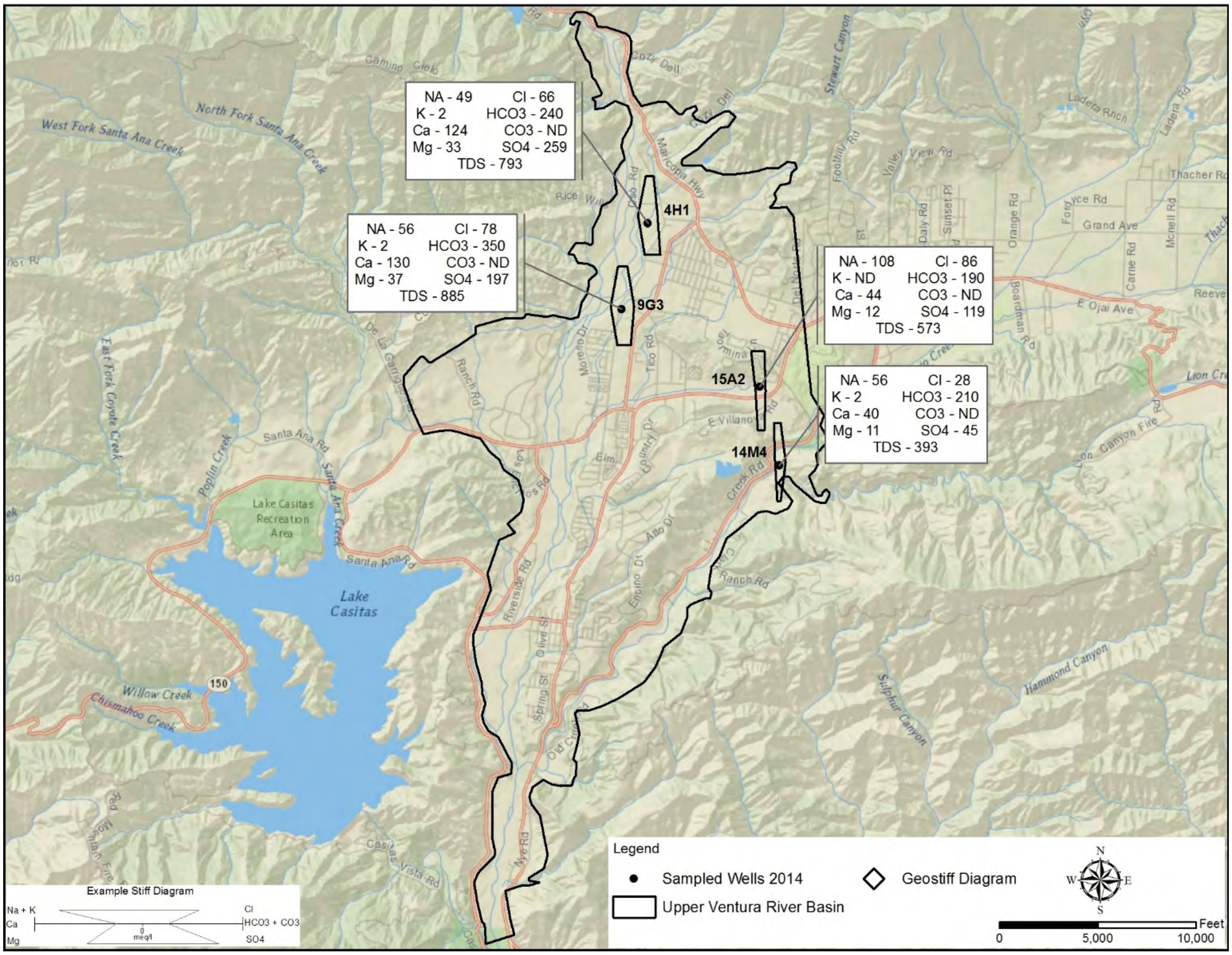


Figure 3-29: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.21 - North Coast Basin

The North Coast Basin does not fit the definition of a basin based solely on the Glossary of Geology definition 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 D-36, piper diagram, shows moderate variation in the water quality of the wells sampled this year. There is no dominant cation but both samples plot close to the calcium cation type. Sulfate (SO_4^{2-}) is the dominant anion in one sample, and one sample has no dominant anion but it plots close to the bicarbonate anion type. The water in one well is calcium sulfate type and the other is calcium bicarbonate type. Both samples have TDS above the secondary MCL, and one sample has sulfate (SO_4^{2-}) and zinc concentrations above the secondary MCL. Figure 3-31 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

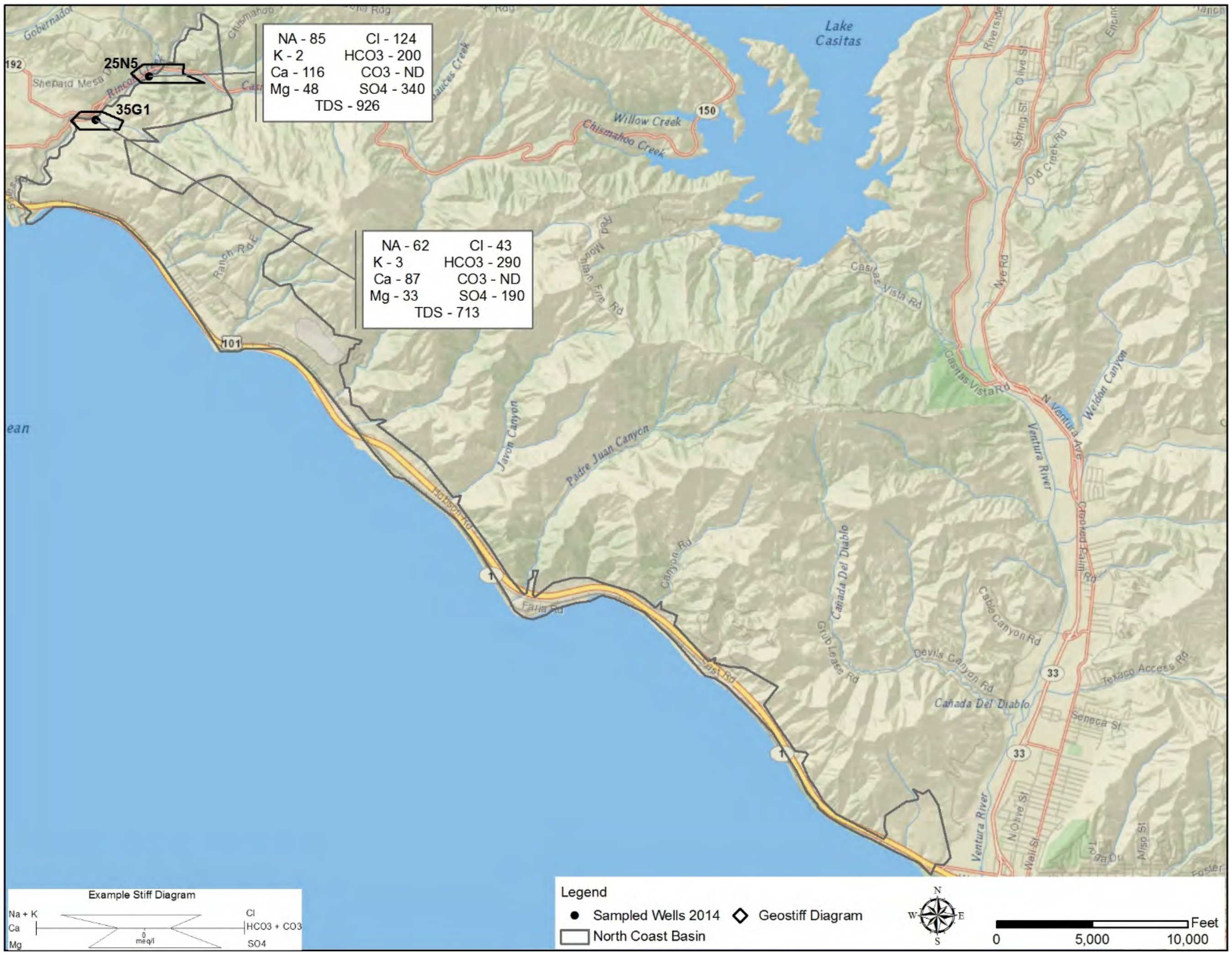


Figure 3-30: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.22 - Upper Ojai Basin

The Upper Ojai Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. 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 142 water supply wells in the Upper Ojai Basin; 101 are active wells. Three wells were sampled this year. Figure D-32, 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 one plots close to the calcium cation type and one plots close to the sodium 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, calcium bicarbonate type in one sample and sodium bicarbonate in one sample. TDS for the wells sampled this year ranged from 341 to 595 mg/l. One well has iron and manganese concentrations above the MCL for drinking water. Water samples from one well was analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. 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.

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

UPPER OJAI BASIN

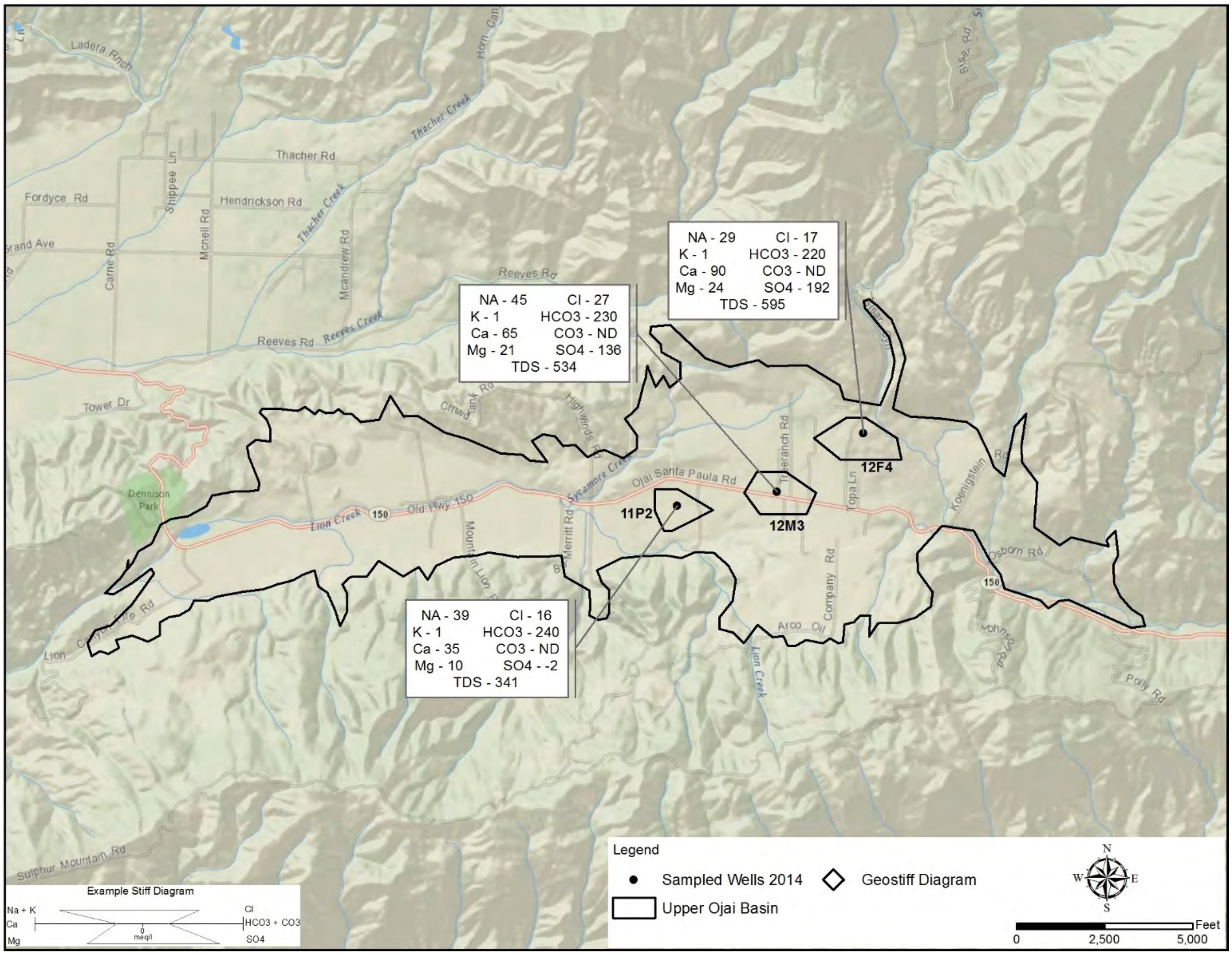
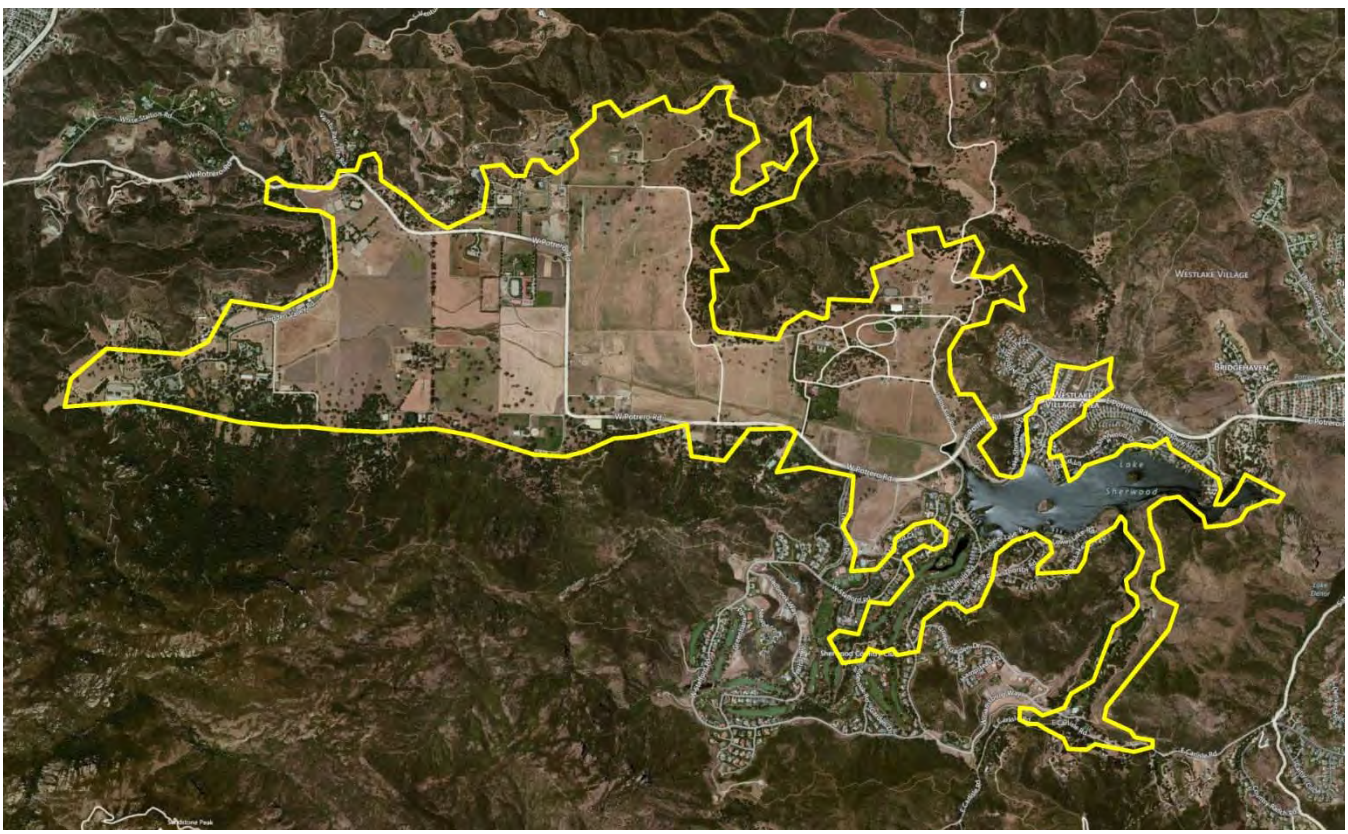


Figure 3-31: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.23 - Sherwood Basin

The Sherwood Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply 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 157 water supply wells in the Sherwood Basin; 101 are active. Three wells were sampled and analyzed this year. Figure D-37, piper diagram, shows high variation in the water quality of the wells sampled this year. Calcium is the dominant cation in one sample; 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 one sample has no dominant anion but plots close to the bicarbonate anion type. The water is calcium bicarbonate type in one sample; and magnesium bicarbonate type in one sample and sodium bicarbonate in the remaining sample. Iron (Fe) is above the secondary MCL in one well and TDS is above the secondary MCL in two wells. TDS concentrations range from 417 to 1060 mg/l for wells sampled this season. Water samples from two wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary 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 Sherwood basin.



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

SHERWOOD BASIN

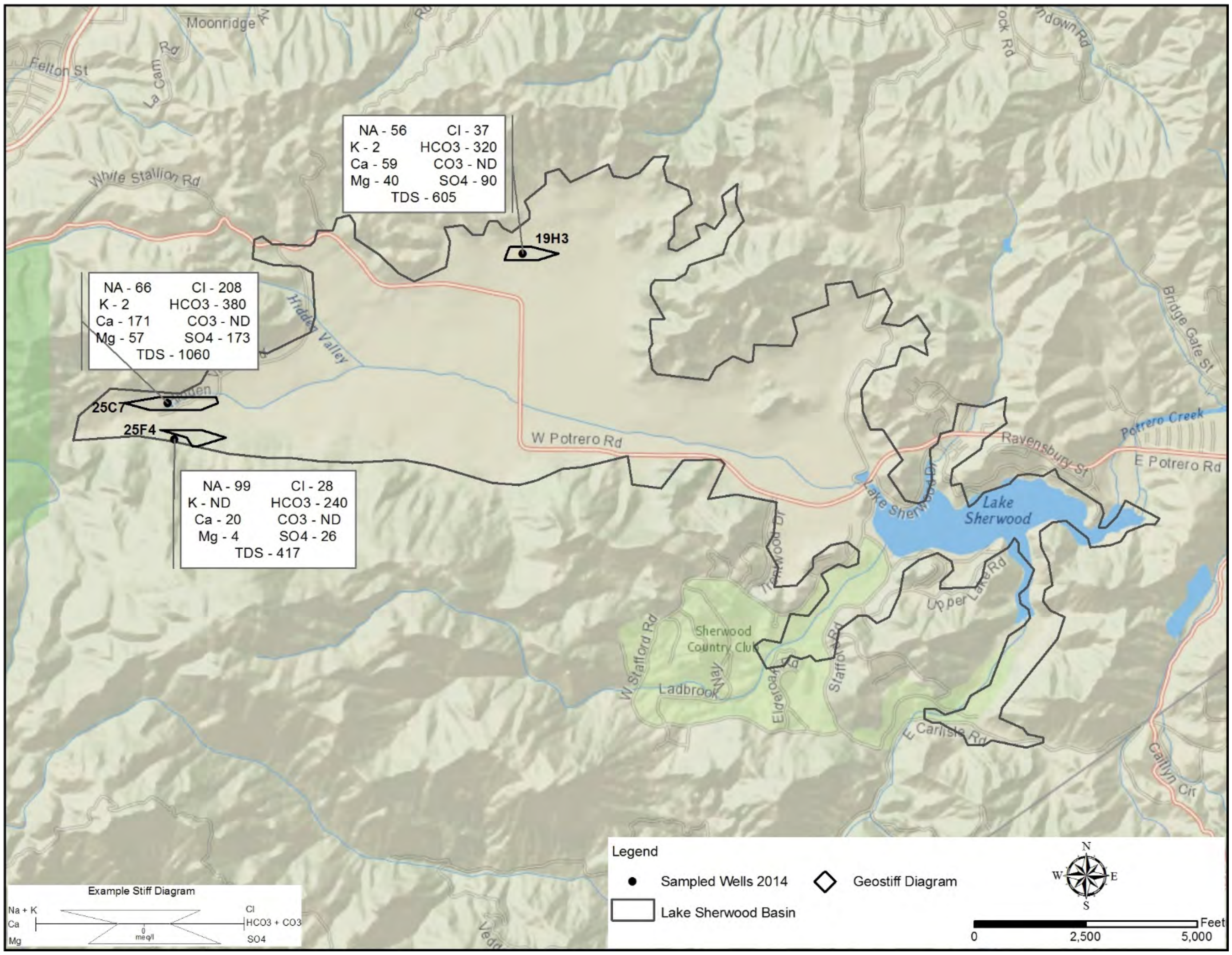
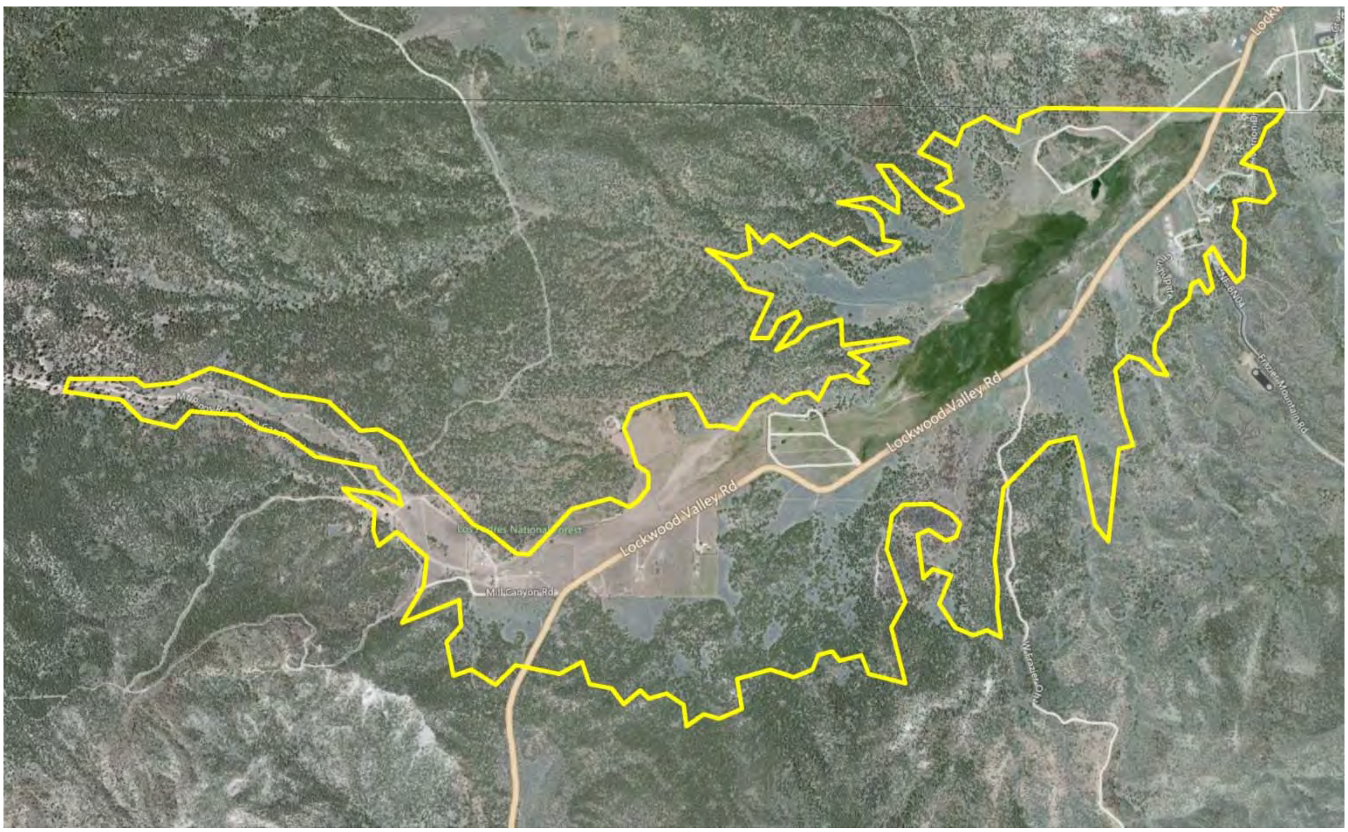


Figure 3-32: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.24 - 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 D-38, 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 inorganic chemicals (Title 22 metals) and gross alpha. No inorganic constituent or radionuclide was above the MCL for drinking water. 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 well sampled in the Little Cuddy Valley basin.



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

LITTLE CUDDY VALLEY BASIN

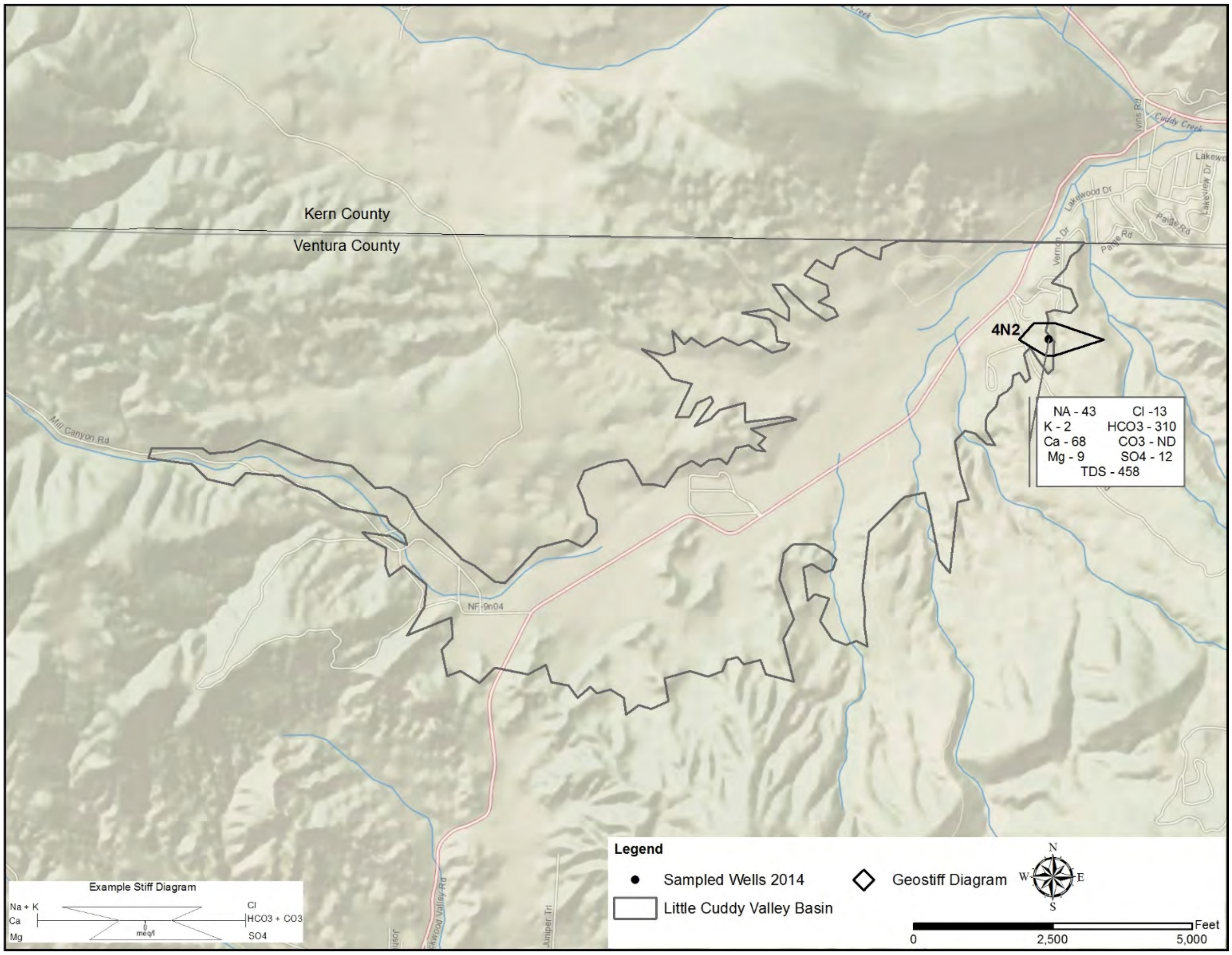


Figure 3-33: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

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 work with 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 2014, Groundwater staff gauged approximately 200 wells throughout the County. The well gauging procedures include contacting well owners to get approval to gauge wells, 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. Standard operating procedures also include verifying well pumps were off for 24 hours prior to gauging. Because the County does not own or operate wells it gauges (with some very limited exceptions) it relies on well owner permission to make wells available. The wells gauged include abandoned wells that are not in operation, and active wells that were off for 24 hours immediately prior to water level gauging. The County works to gauge 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 wells availability for gauging. For example, wells may be no longer available as a result of being temporarily inaccessible, 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 to best determine water level trends 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 2014.

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 representational data for the basin, or for a specific aquifer in a basin. Key wells are chosen based on their location in the basin, and availability of construction information and historical water level data.

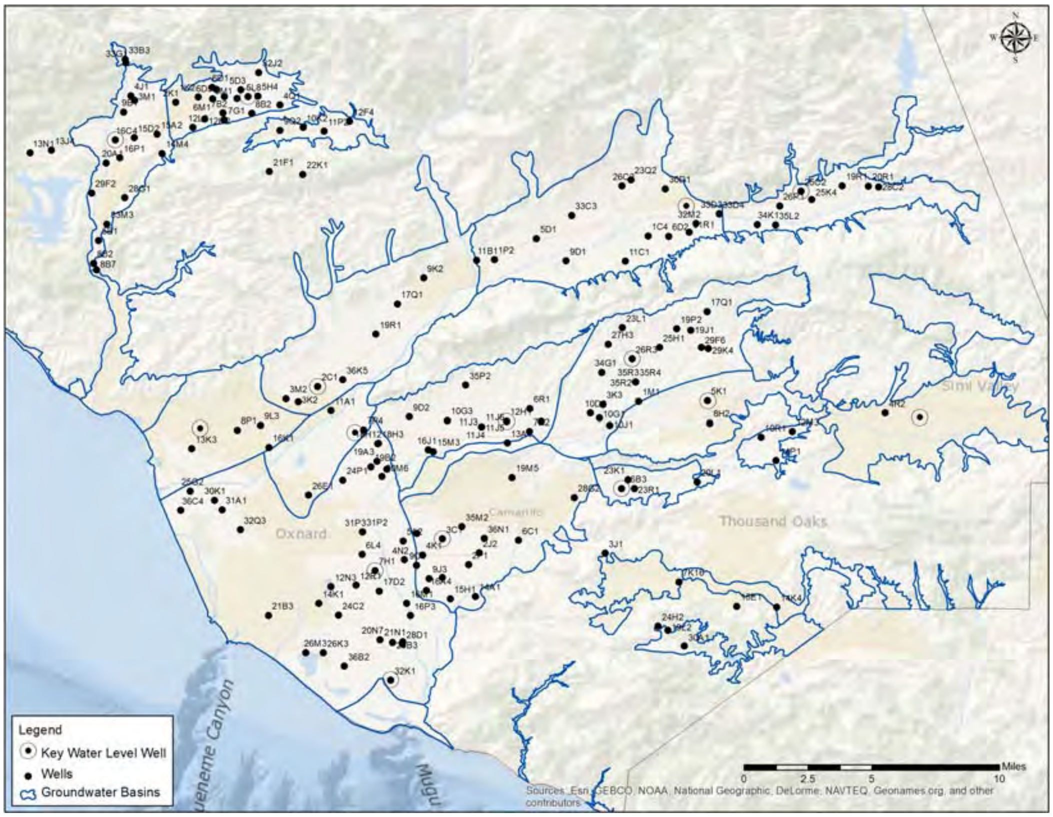


Figure 4-1: Water level wells measured in the southern half of the County.

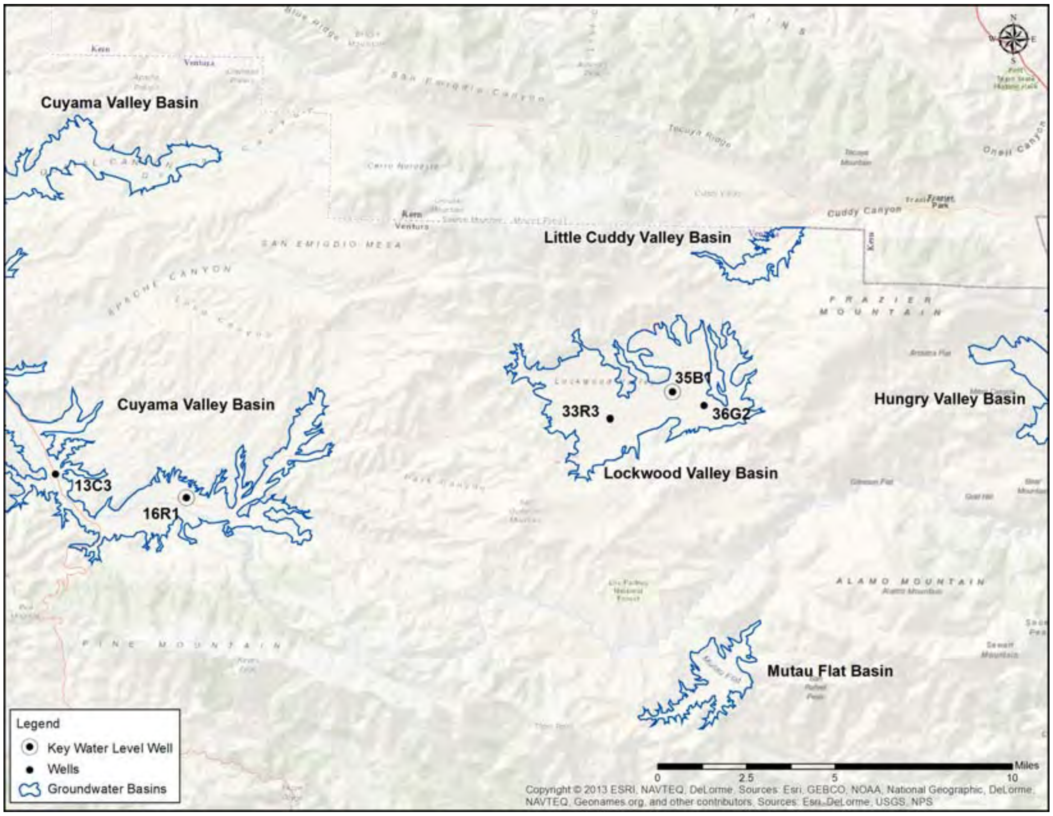


Figure 4-2: Water level wells measured in the northern half of the County.

4.1.3 – 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 below (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 wide part of the groundwater basin.

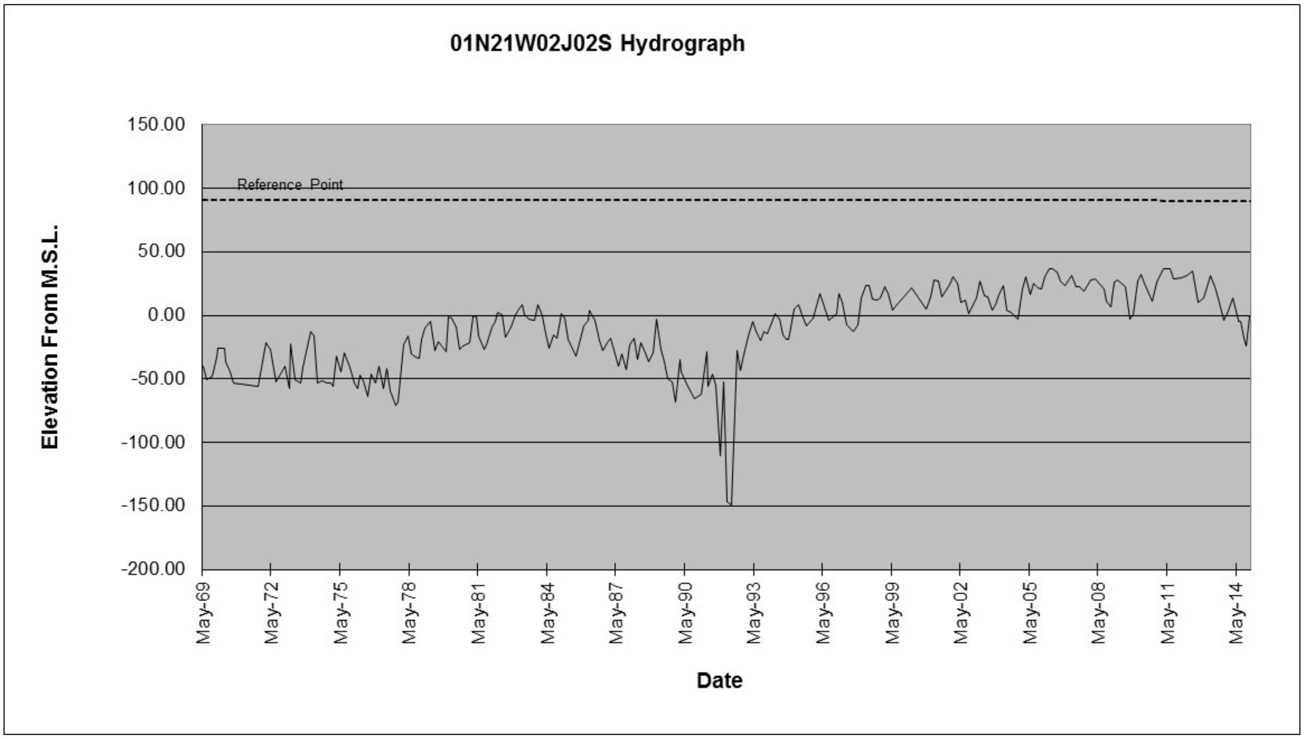


Figure 4-3: Water level hydrograph for Well No. 01N21W02J02S located in the Pleasant Valley basin. *reference point – the elevation of the measuring point of the well.

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 increase or decrease in water level for the year and the water level data referred to is the spring measurement or the first measurement of the year for those wells measured twice each year.

The Forebay area of the Oxnard Plain, responds quickly to seasonal and annual changes in precipitation and recharge. The water elevation in the Forebay area key Well No. 02N22W12R01S (UWCD) was down 29.06 feet from the 2013 measurement which was down 26.9 feet from the 2012 measurement. The water elevation in the Oxnard aquifer key Well No. 01N21W07H01S was down 16.1 feet from the previous spring. The water elevation in the Oxnard Plain Fox Canyon aquifer key Well No. 01N21W32K01S was down 36.5 feet from the 2013 spring measurement.

In the Pleasant Valley Grimes Canyon aquifer the water level elevation in key Well No. 01N21W03C01S was down 39.8 feet from the 2013 measurement.

In the Las Posas valley, the water level elevation in the West Las Posas basin key Well No. 02N21W12H01S was down 5.9 feet from the 2013 spring measurement. In the East Las Posas basin the water level elevation in key Well No. 03N20W26R03S was down 4.9 feet. The water levels in this well have 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 but was down slightly 1.1 feet in 2014. 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.

In the Santa Rosa Valley the water level elevation in key Well No. 02N20W26B03S was down 19.5 feet from the 2013 measurement. The water level elevation in the Simi Valley Basin key Well No. 02N18W10A02S was down 2.4 feet from the 2013 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 50.2 feet from the 2013 measurement after having been down 78.4 feet from the 2012 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 down 18.2 feet from the measurement in 2013.

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 22.3 feet in 2014 from 2013. The water level elevation in the Fillmore basin key well was down 1.9 feet after being down 3.5 feet the previous spring, and in the Santa Paula basin the water level elevation in the key well was down 3.7 feet from the 2013 measurement. In the Mound basin the water level elevation in key Well No. 02N22W07M02S was down 11.85 feet from the 2013 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 2014. The water level elevation in the Cuyama Valley basin key Well No. 07N23W16R01S was down 9.7 feet after being down 6.9 feet for the 2013 measurement.

4.1.5 – Groundwater Extractions

Groundwater is extracted and used for domestic, municipal and industrial uses, the majority of reported groundwater extractions in the Fox Canyon Groundwater Management agency is used for agricultural irrigation purposes. The FCGMA reports that approximately 60% of groundwater is extracted for agricultural purposes with the remaining 40% for municipal, industrial and domestic uses. The owners and operators of wells within the boundaries of any of the three Groundwater Management Agencies, Fox Canyon Groundwater Management Agency, Ojai Basin Groundwater Management Agency and United Water Conservation District, are required to report their groundwater extractions twice each year to the respective agency. Approximately 2,000 of the 3,500 plus active wells in the County are within one or more of these agency boundaries. Owners of wells located outside of these agencies are not required to report their extractions but are asked to report the status of their well to the County each year. The table at the top of the following page compares extractions reported to the three agencies for the years 2005 to 2014. Note: the boundaries of the FCGMA and UWCD overlap.

Table 4-1: Groundwater extractions within reporting agencies 2005-2014[3,1,2]

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2005-1	58,045.00	41,811.56	1,748.07
2005-2	95,174.00	64,578.80	2,880.39
Annual Total 2005	**153,219.00**	**106,390.35**	**4,628.46**
2006-1	65,469.00	43,697.47	1,722.17
2006-2	101,684.00	69,827.60	2,234.77
Annual Total 2006	**167,153.00**	**113,525.07**	**3,956.94**
2007-1	90,701.00	59,449.79	2,708.68
2007-2	108,289.70	77,642.73	2,759.06
Annual Total 2007	**198,990.70**	**137,092.52**	**5,467.74**
2008-1	90,997.65	63,821.98	2,650.38
2008-2	102,106.68	75,467.27	2,590.30
Annual Total 2008	**193,104.33**	**139,289.25**	**5,240.68**
2009-1	82,505.37	62,497.79	2,553.48
2009-2	104,049.64	81,274.51	2,871.94
Annual Total 2009	**186,555.01**	**143,772.30**	**5,425.42**
2010-1	69,541.85	52,696.43	2,004.86
2010-2	89,558.90	68,875.72	3,001.11
Annual Total 2010	**159,100.75**	**121,572.15**	**5,005.97**
2011-1	72,940.07	52,422.24	2,050.00
2011-2	86,560.99	62,933.95	3,099.00
Annual Total 2011	**159,501.06**	**115,356.19**	**5,149.00**
2012-1*	78,716.61	59,864.21	2,845.56
2012-2*	99,285.26	75,289.75	2,559.40
Annual Total 2012	**178,001.87**	**135,153.96**	**5,404.96**
2013-1*	87,336.86	64,598.02	2,805.76
2013-2*	116,708.94	88,742.19	2663.216
Annual Total 2013	**204,045.80**	**153,340.20**	**5,468.97**
2014-1**	101,577.29	84,487.15	2,230.65
2014-2***	96,929.59	43,398.51	1,941.20

*Reflects revised values for all agencies.

**Values are subject to change.

***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).

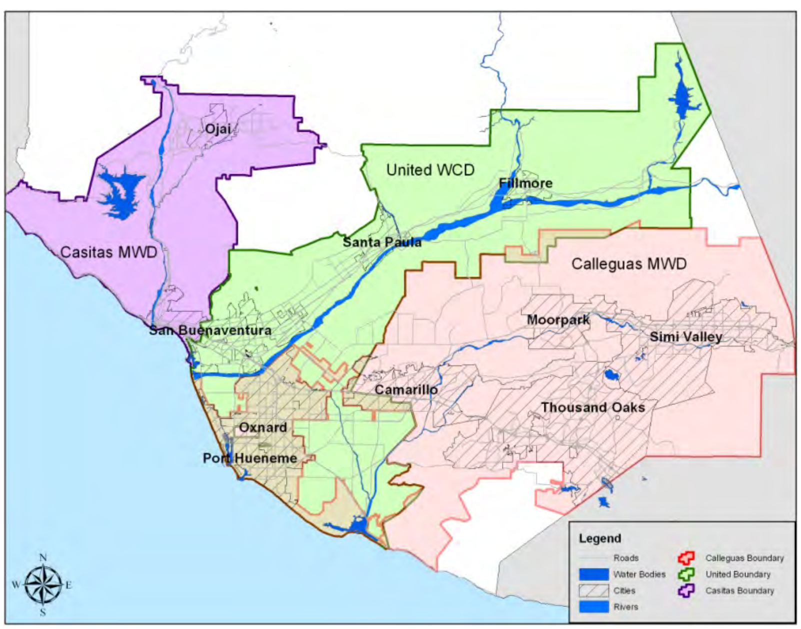


Figure 4-4: Map of the boundaries of the three wholesale water districts within the County.

[1] Data courtesy of FCGMA.
[2] Data courtesy of OBGMA.

4.2.1 – Surface & Imported Water Background

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

Two cities (Ventura and Oxnard) use a blend of imported water, groundwater and treated surface water to meet demands. The City of Ventura's water supply comes from treated water diverted from the Ventura River, groundwater extracted from City wells, and 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 over 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[4]. In 2014 Calleguas delivered 22,182.3[6] AF to VCWWD8 and 6,373.1[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 2014 Calleguas delivered 8,874.8[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 2014 these three water purveyors received 37,090[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 2014 Calleguas delivered 5,081.7[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).

[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.

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.

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 109,722[6] AF of treated SWP water in 2014. Calleguas delivered 106,293[6] AF of water to retailers in 2014 compared to 111,283[6] AF in 2013 and 104,104[6] AF in 2012. Production from the District's ASR wellfield was 866.58 AF in 2014. 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 3,837.89[6] AF of water was injected in 2014. 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 10,000[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 17,492[4] AF of water to retailers and end-users in 2014 down from 24,358[4] AF in 2013. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2014 there was 18,404[4] AF of water in storage in Lake Piru. UWCD released 6,690[4] *(preliminary data)* AF of water from the lake in 2014. UWCD did not import any State Project water into Ventura County from Lake Pyramid in 2014. Water released from Lake Piru flows down Piru Creek to the Santa Clara River where it is ultimately diverted downstream at the Freeman Diversion Dam. UWCD operates spreading basins in the Oxnard Forebay Groundwater Basin for the purpose of groundwater recharge. Some of the water diverted from the Santa Clara River at the Freeman diversion is sent to the spreading basins in Saticoy and El Rio, the remainder is sent through the Pleasant Valley Pipeline (PVP) and the Pumping Trough Pipeline (PTP). Table 4-2 and Figure 4-3 on the following page compare the volume of water diverted and sent to spreading grounds by UWCD. Annual precipitation for the period of 1996 to 2014 is also shown, however recharge to basins is also a function of State Water Project deliveries and restrictions from other agencies.

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

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)
1996	20.25	25608.38	24633.00	3806.00
1997	13.3	22323.03	25271.00	4412.00
1998	30.88	56934.95	43027.00	18710.00
1999	9.39	16538.51	17992.00	1285.00
2000	15.59	28620.11	23173.00	0.00
2001	22.4	26918.00	39434.00	8824.00
2002	8.97	5291.00	14886.00	32.00
2003	14.79	7158.00	26909.00	44.00
2004	16.13	8105.00	15061.00	0.00
2005	24.43	46872.00	52267.00	19490.00
2006	15.29	29005.00	40840.00	10709.00
2007	7.77	11404.00	18200.00	99.00
2008	14.07	28,631.00	19,631.00	8,562.00
2009	10.86	9,215	13,223	0.00
2010	22.07	15,108	30,125	995.00
2011	10.95	23,435.00	37,845.00	10,679.00
2012	8.79	3,985.00	16,293.00	538.00
2013	2.97	34	2,389	263
2014	9.5	387	1,935	578

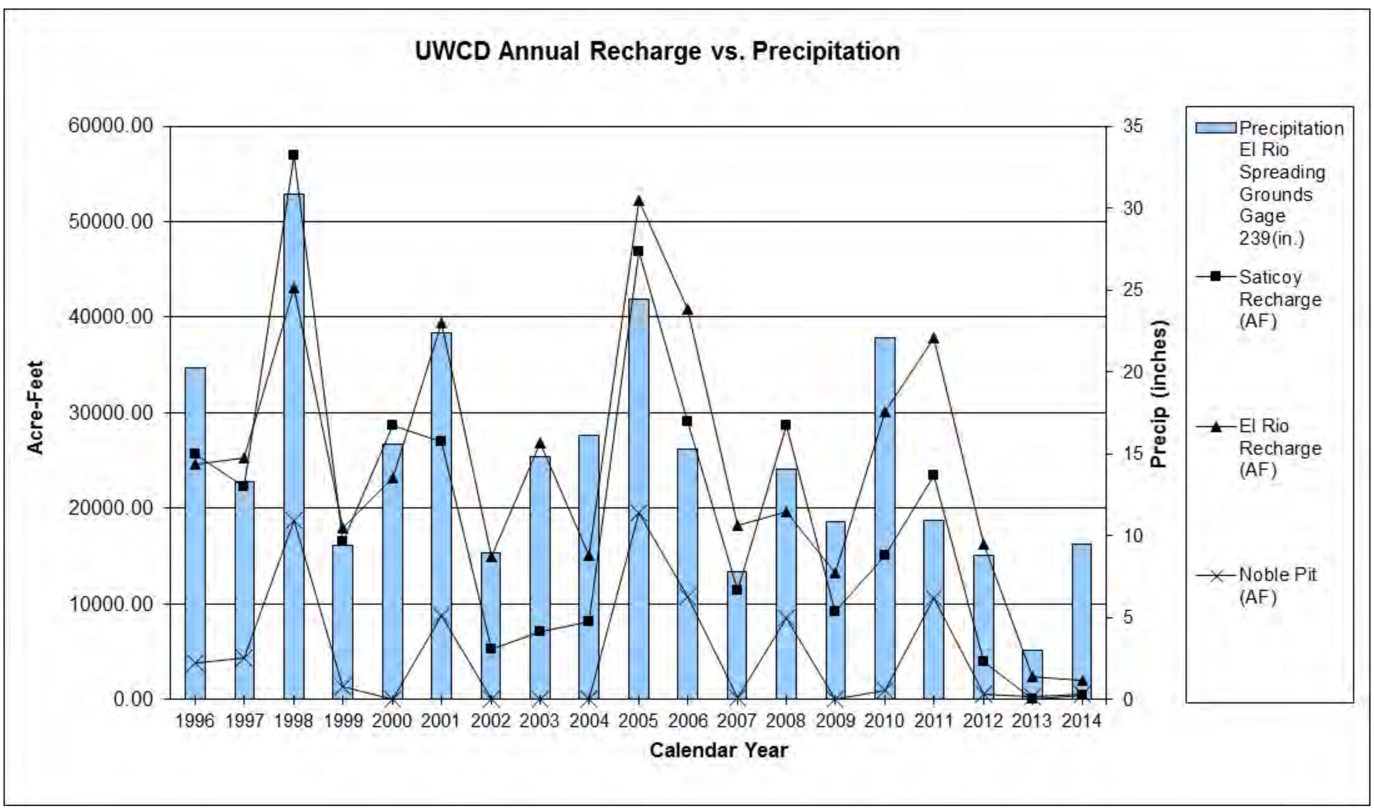


Figure 4-5: Graph depicting precipitation versus recharge for UWCD[4].

The Casitas Municipal Water District delivered 18,336[5] AF in 2014, with approximately 6,400[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 2014 there was 131,600[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 2014.

Table 4-3: Comparison of Wholesale District water deliveries 2005-2014.

	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

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 through assembling the 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 the contours in the report. 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 2014 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 2014 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 2014 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. No well data from the perched or semi-perched zone of the Oxnard Plain was used to generate these contours, and 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 2014 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

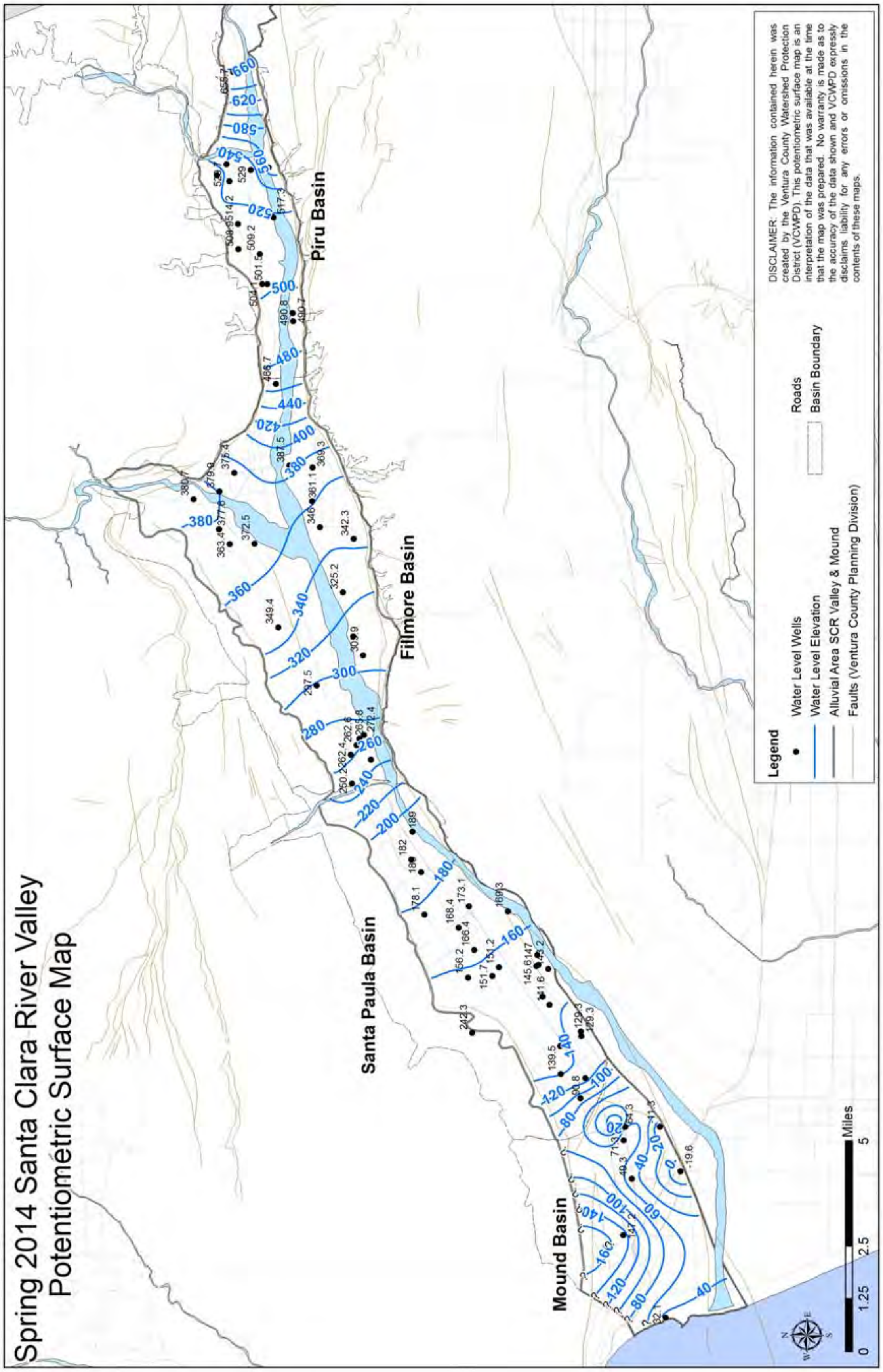


Figure 5-1: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for spring 2014.

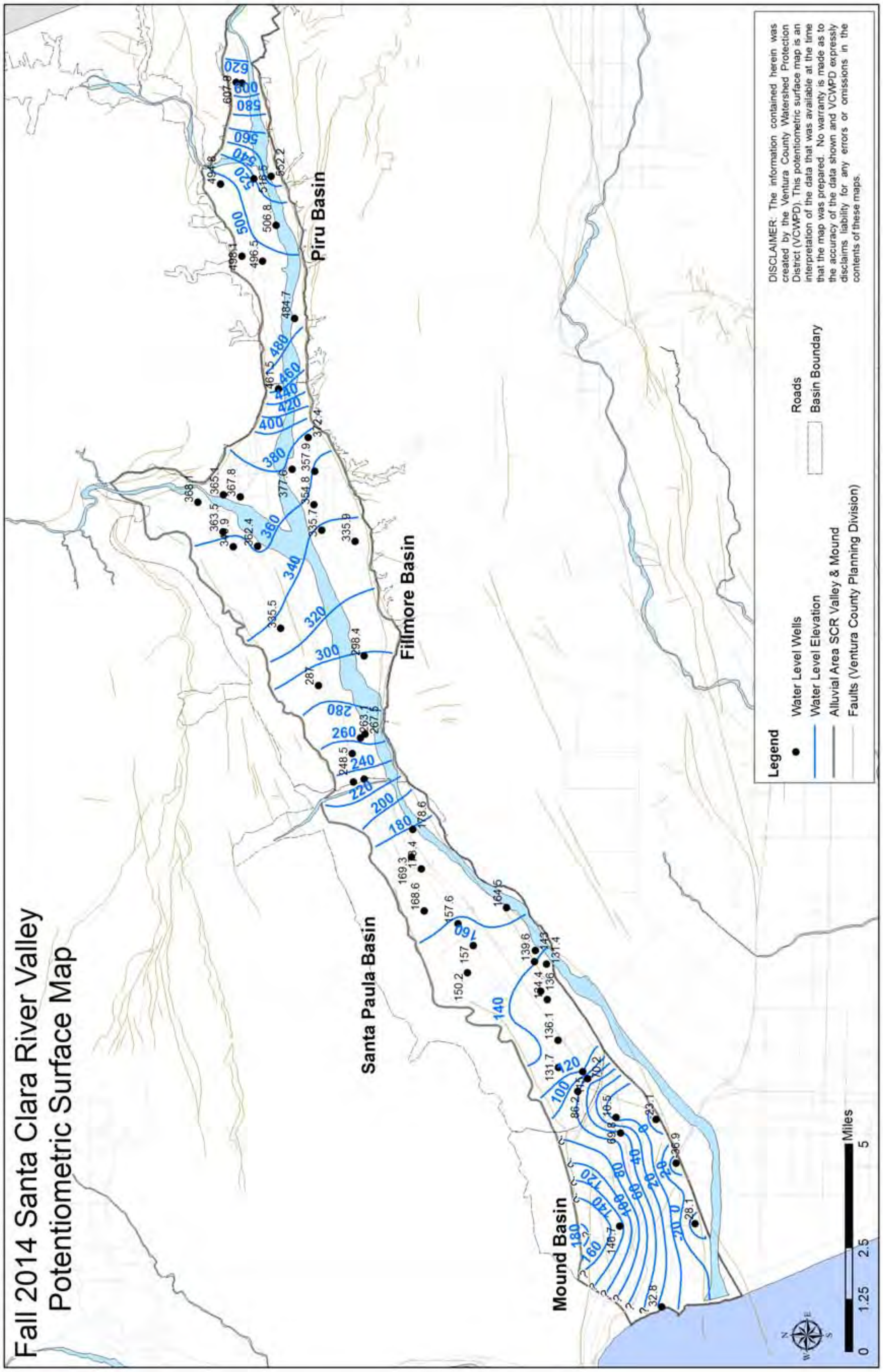


Figure 5-2: The map above depicts water level surface elevation contours for the Santa Clara River Valley area for fall 2014.

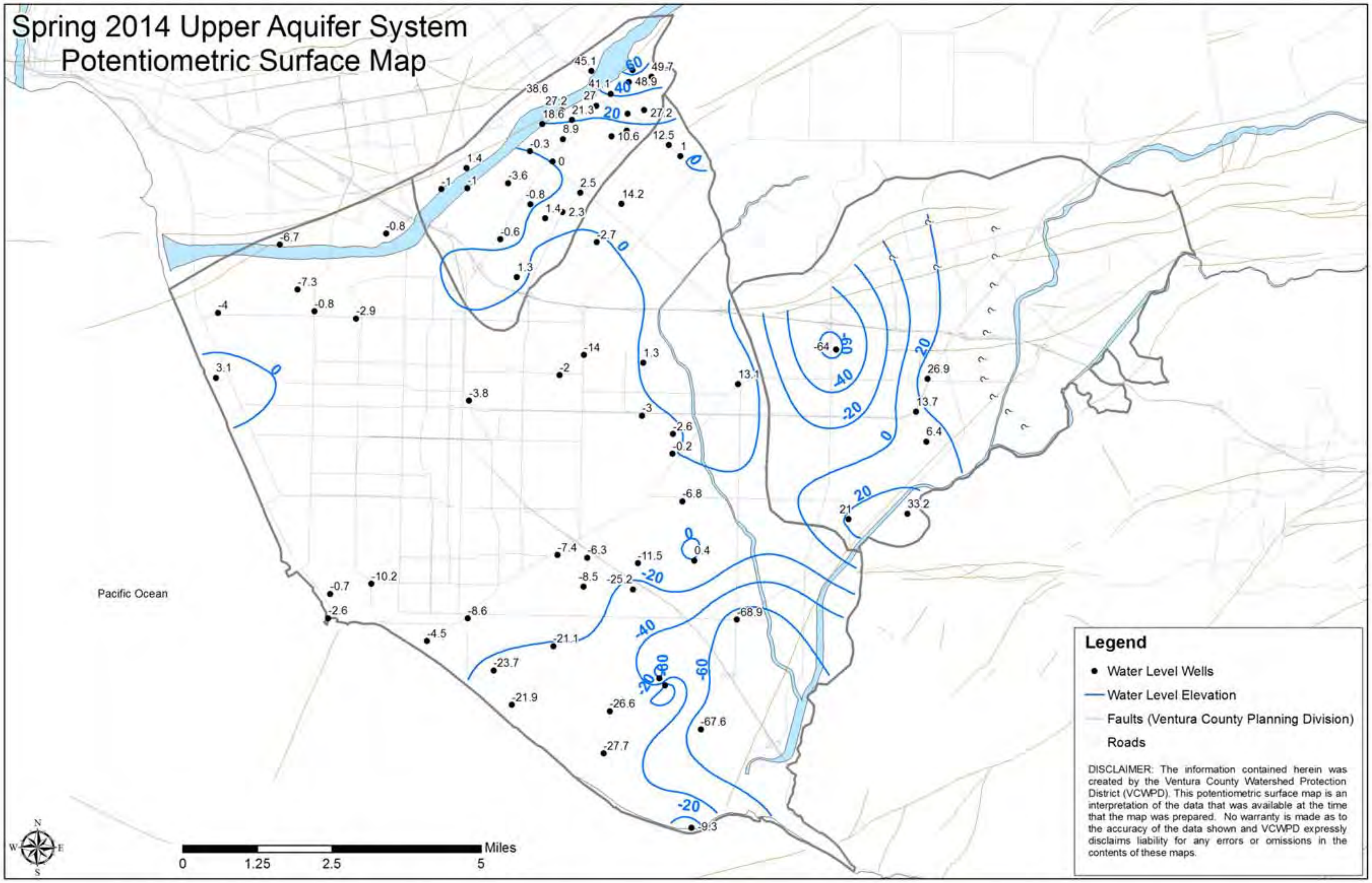


Figure 5-3: The map above depicts water level surface elevation contours for the Upper Aquifer System for spring 2014.

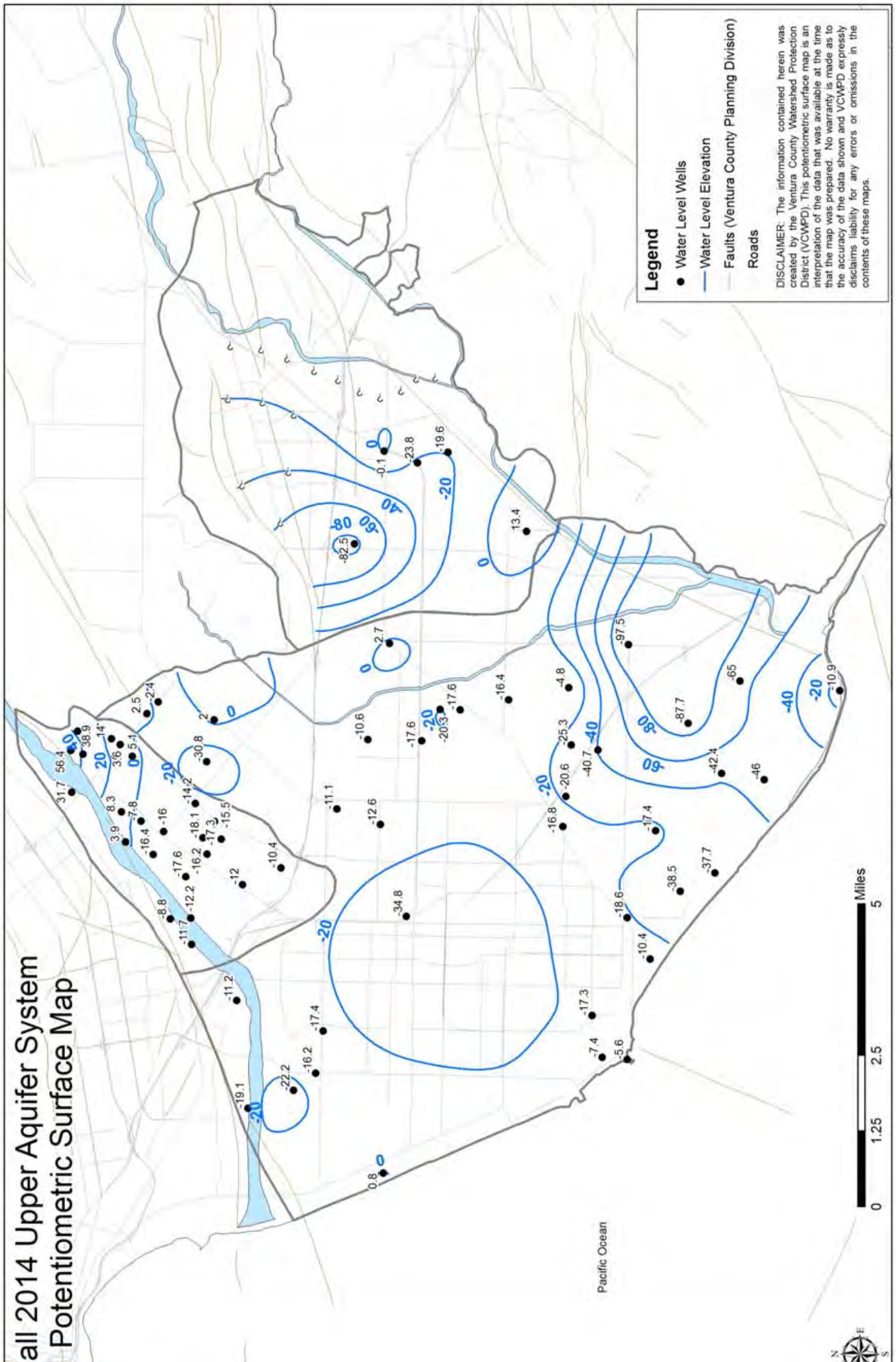


Figure 5-4: The map above depicts water level surface elevation contours for the Upper Aquifer System for fall 2014.

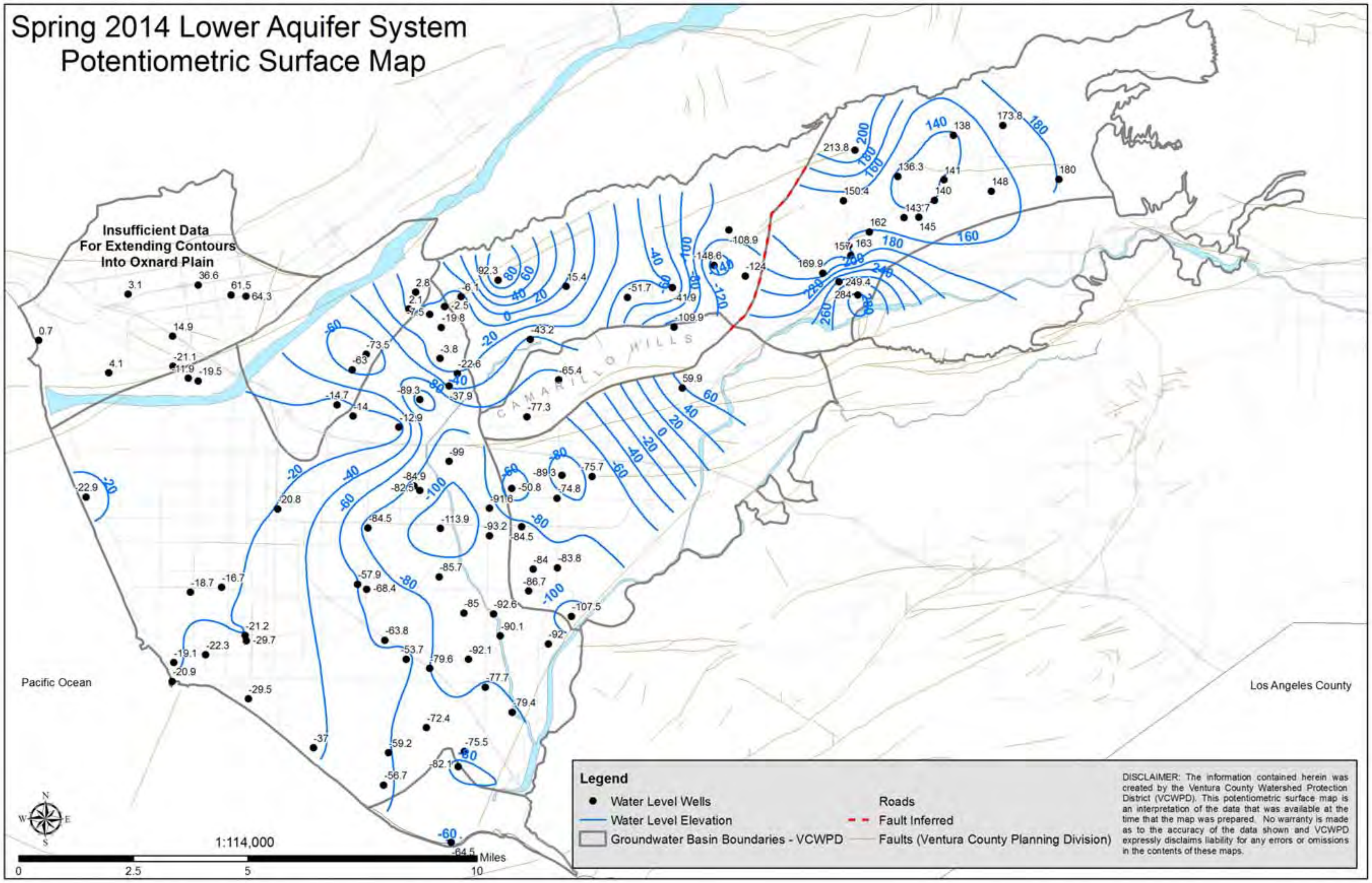


Figure 5-5: The map above depicts water level surface elevation contours for the Lower Aquifer System for spring 2014.

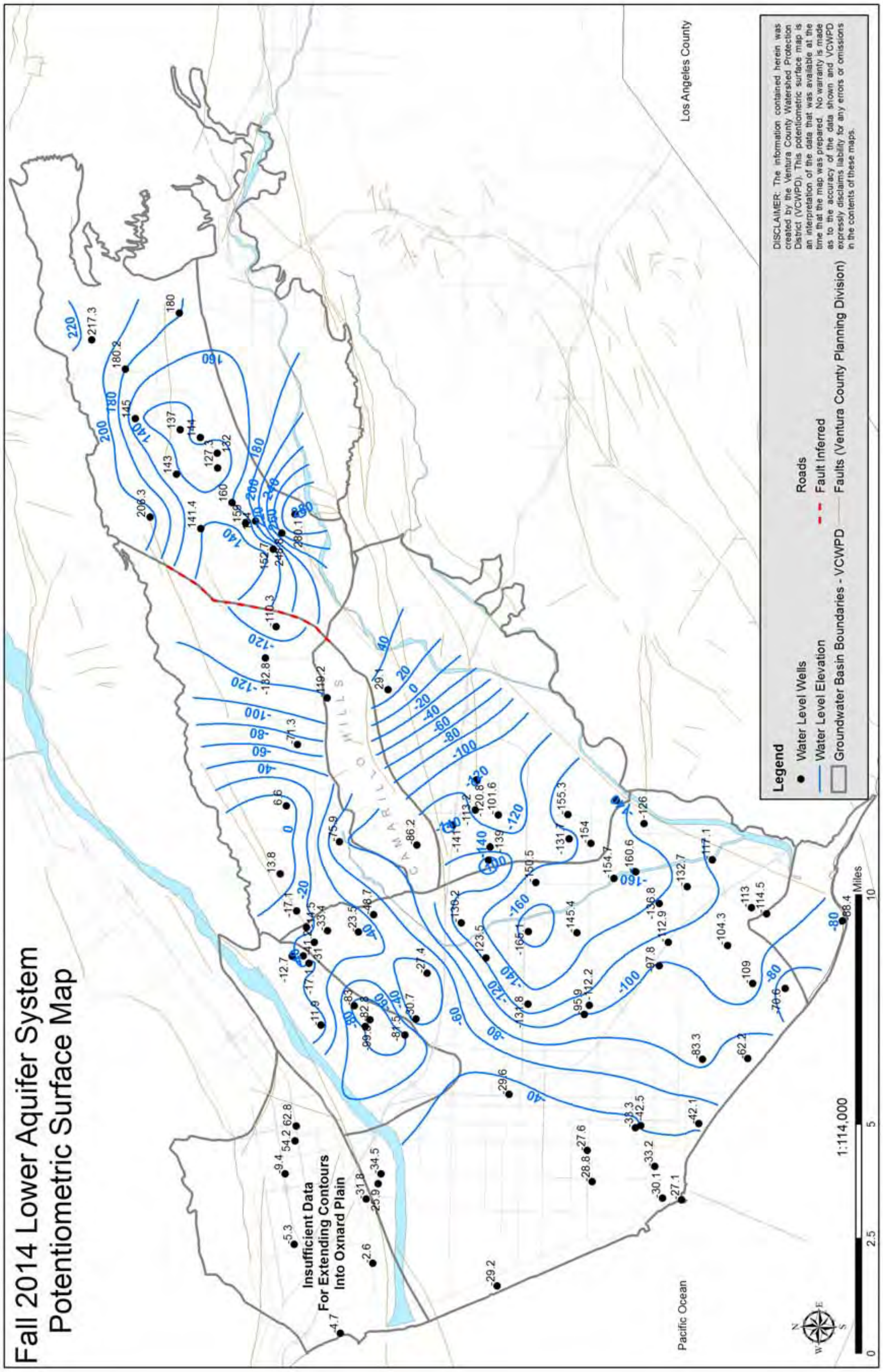


Figure 5-6: The map above depicts water level surface elevation contours for the Lower Aquifer System area for fall 2014.

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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.

5 - Casitas Municipal Water District, Production & Delivery Data, Chelbi Kelley - Personal Communication, February 2015.

6 - Calleguas Municipal Water District, Imported Water Volume & Delivery Data, Tony Goff - Personal Communication, February 2015.

7 - Fox Canyon Groundwater Management Agency, Groundwater Extraction Data, February 2015.

8 - Ojai Basin Groundwater Management Agency, Groundwater Extraction Data, Cece Van Der Meer - Personal Communication, February 2015.

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

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

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

Appendix A – Glossary of Groundwater Terms

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

Abandoned Well: Means any of the following:

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

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

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

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

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

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

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

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

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

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

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

FIGURES Page

Tables Page

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 2014 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)

AT KEY WELLS IN VENTURA COUNTY

		HISTORIC					
BASIN	WELL NUMBER	RECORD HIGH	RECORD LOW	WATER LEVEL	WATER LEVEL	WATER LEVEL	Change From Previous Year
	(RECORD)	(DATE)	(DATE)	(YEAR 2012)	(YEAR 2013)	(YEAR 2014)	(UP/DOWN)
OXNARD PLAIN							
Oxnard Aquifer	01N21W07H01S	3.4 ft.	88.4 ft.	16.3 ft.	25.0 ft.	41.1 ft.	DOWN 16.1 ft.
	(1/31-present)	(3/99)	(9/64)	(3/6)	(3/5)	(3/11)	
Forebay Area	02N22W12R01S	14.6 ft.	136.8 ft.	66.8 ft.	93.7 ft.	122.76	DOWN 29.06 ft.
(UWCD)	(5/31-present)	(6/98)	(2/91)	(3/29)	(4/9)	(3/26)	
Fox Canyon	01N21W32K01S	18.0 ft.	129.0 ft.	35.0 ft.	49 ft.	85.5 ft.	DOWN 36.5 ft.
Aquifer	(12/72-present)	(4/83)	(12/90)	(3/5)	(3/4)	(3/13)	
PLEASANT VALLEY							
Fox Canyon							
Aquifer							
Grimes Canyon	01N21W03C01S	87.5 ft.	253.9 ft.	91.8 ft.	107.3 ft.	147.1 ft.	DOWN 39.8 ft.
Aquifer	(2/73-present)	(8/95)	(11/91)	(3/7)	(3/6)	(3/11)	
WEST LAS POSAS	02N21W12H01S	422.2 ft.	501.8 ft.	449.6 ft.	453.9 ft.	459.8 ft.	DOWN 5.9 ft.
	(10/72-present)	(3/75)	(12/91)	(3/21)	(3/4)	(3/10)	
EAST LAS POSAS	03N20W26R03S	503.0 ft.	619.3 ft.	575 ft.	576.6 ft.	581.5 ft.	DOWN 4.9 ft.
	(1985-present)	(4/86)	(9/09)	(3/28)	(3/14)	(3/10)	
SOUTH LAS POSAS	02N19W05K01S	27.5 ft.	136.2 ft.	29.1 ft.	30.0 ft.	31.1 ft.	DOWN 1.1 ft.
	(6/75-present)	(7/06)	(6/75)	(3/21)	(3/20)	(3/10)	
SANTA ROSA	02N20W26B03S	13.2 ft.	60.3 ft.	28.5 ft.	39.4 ft.	58.9 ft.	DOWN 19.5 ft.
VALLEY	(10/72-present)	(4/79)	(11/04)	(3/8)	(3/7)	(3/12)	
SIMI VALLEY	02N18W10A02S	45.0 ft.	92.0 ft.	71.6 ft.	79.7 ft.	82.1 ft.	DOWN 2.4 ft.
	(12/84-present)	(2/98)	(6/92)	(3/8)	(3/15)	(3/1)	
VENTURA RIVER	04N23W16C04S	3.9 ft.	101.0 ft.	44.7 ft.	64.8 ft.	83.0 ft.	DOWN 18.2 ft.
	(7/49-present)	(3/83)	(2/91)	(3/13)	(3/5)	(3/11)	
OJAI VALLEY	04N22W05L08S	38.2 ft.	312.0 ft.	97.6 ft.	176 ft.	226.2	DOWN 50.2 ft.
	(10/49-present)	(4/78)	(9/51)	(3/15)	(3/12)	(6/13)	
MOUND	02N22W07M02S	126.6 ft.	176.2 ft.	146.4 ft.	148.7 ft.	160.55	DOWN 11.85 ft.
	(4/96-present)	(4/98)	(4/96)	(4/4)	(3/28)	(4/15)	
SANTA PAULA	02N22W02C01S	20.7 ft.	51.9 ft.	35.1 ft.	36.8 ft.	40.5 ft.	DOWN 3.7 ft.
	(10/72-present)	(4/83)	(12/91)	(3/5)	(3/4)	(3/10)	
FILLMORE	03N20W05D01S	107.8 ft.	163.7 ft.	134.2 ft.	137.7 ft.	139.6 ft.	DOWN 1.9 ft.
	(10/72-present)	(2/79)	(12/77)	(3/5)	(3/4)	(3/10)	
PIRU	04N19W25C02S	43.1 ft.	183.2 ft.	71.2 ft.	79.9 ft.	102.2 ft.	DOWN 22.3 ft.
	(9/61-present)	(3/93)	(10/65)	(3/5)	(3/4)	(3/10)	
LOCKWOOD VALLEY	08N21W35B01S	19.3 ft.	52.9 ft.	No Reading	No Reading	No Reading	
	(6/56-present)	(05/10)	(10/91)				
CUYAMA VALLEY	07N23W16R01S	15.0 ft.	47.5 ft.	32.5 ft.	39.4	49.1 ft.	DOWN 9.7 ft.
	(3/72-present)	(4/93)	(9/90)	(4/19)	(3/26)	(4/17)	
Data prepared: 2/20/2015							

Table B-1: Key Well Water Level Changes for 2013.

Appendix B – Key Water Level Wells

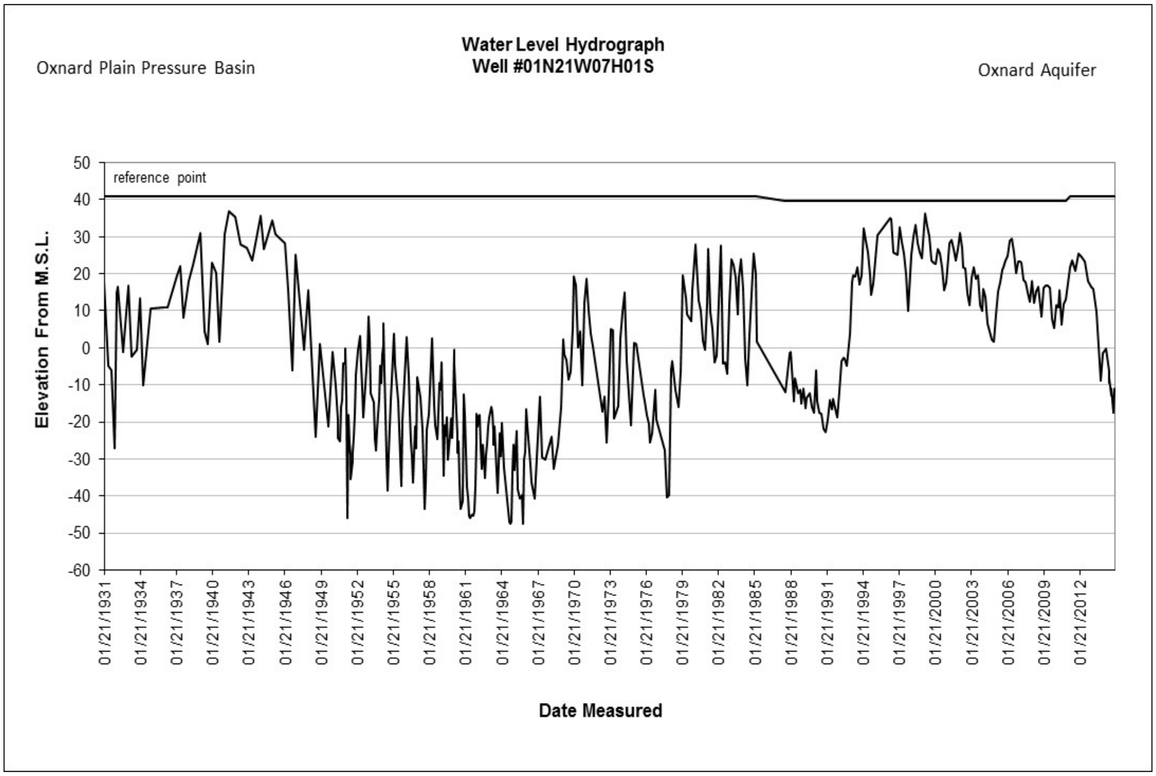

Figure B-2: Oxnard aquifer key well Hydrograph.

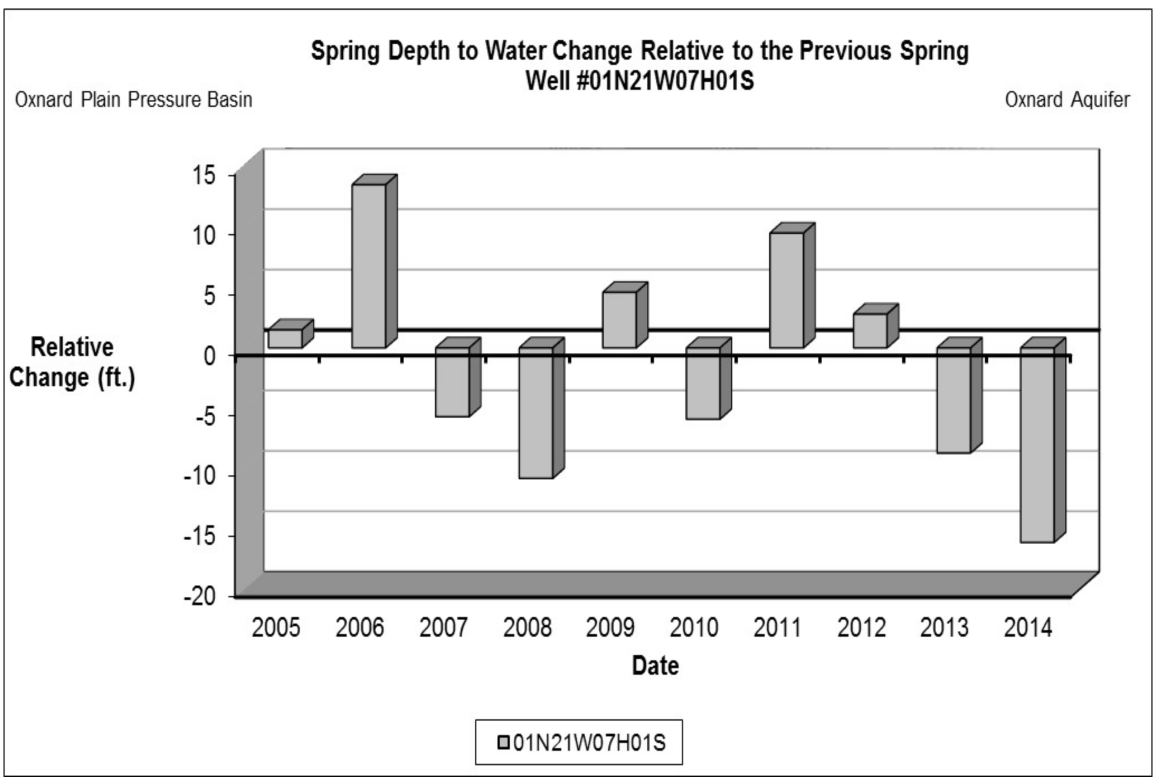

Figure B-3: Oxnard aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

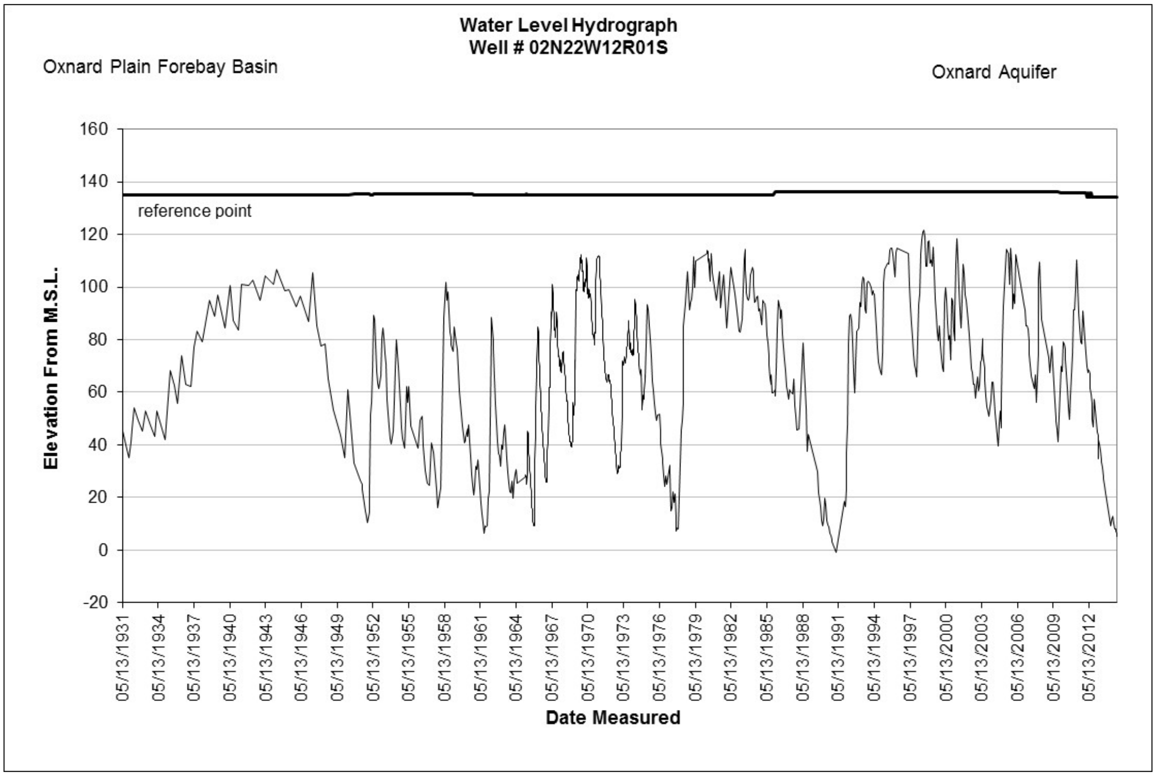

Figure B-4: Forebay area key well Hydrograph.

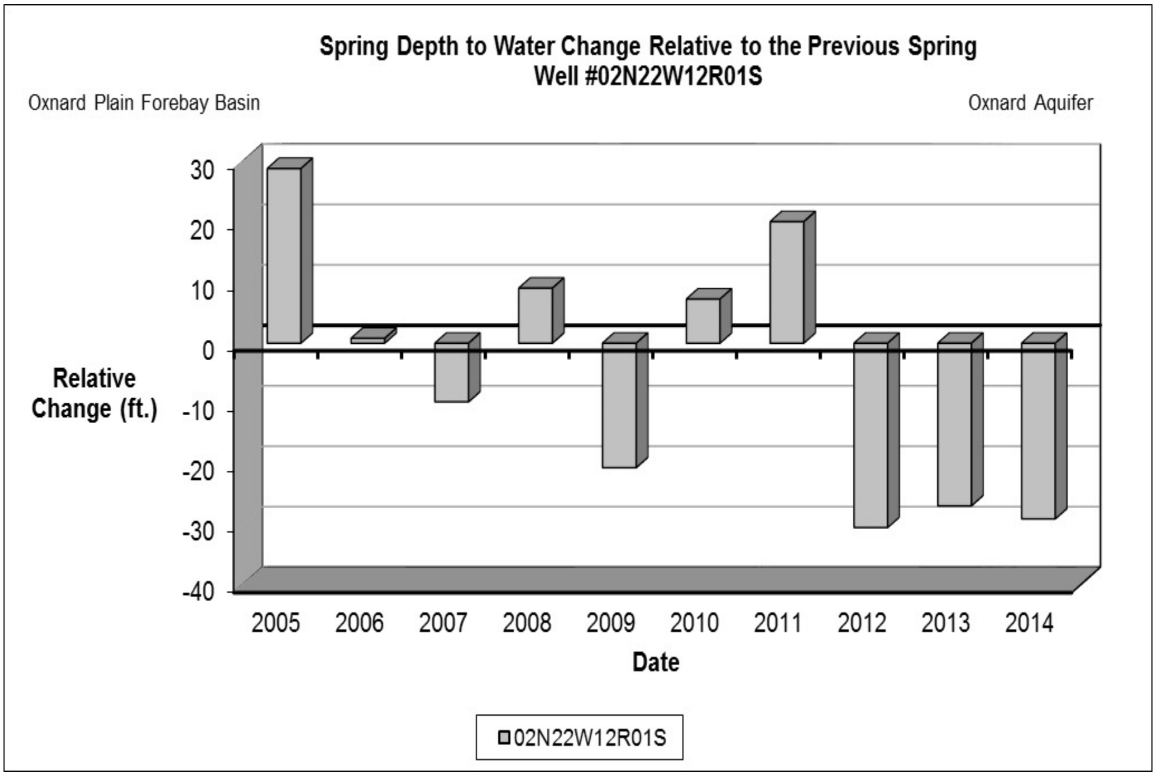

Figure B-5: Forebay Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

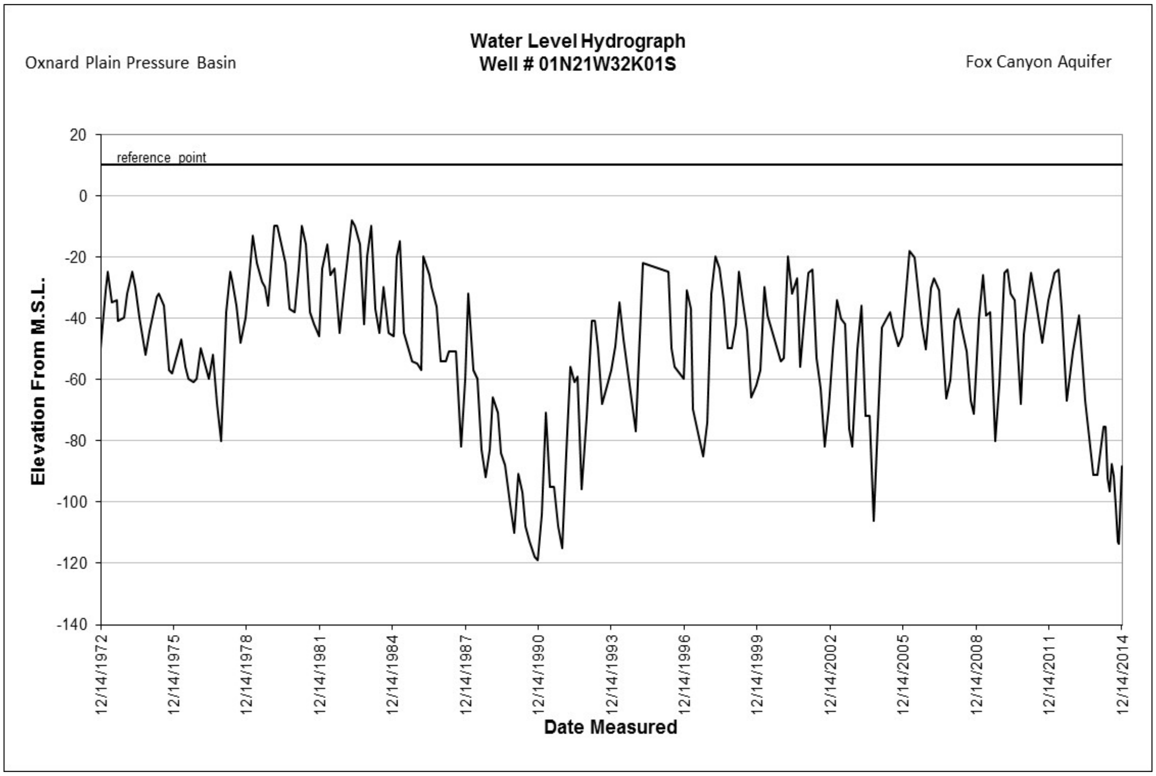

Figure B-6: Oxnard Plain Pressure Basin Fox Canyon Aquifer Key Well Hydrograph.

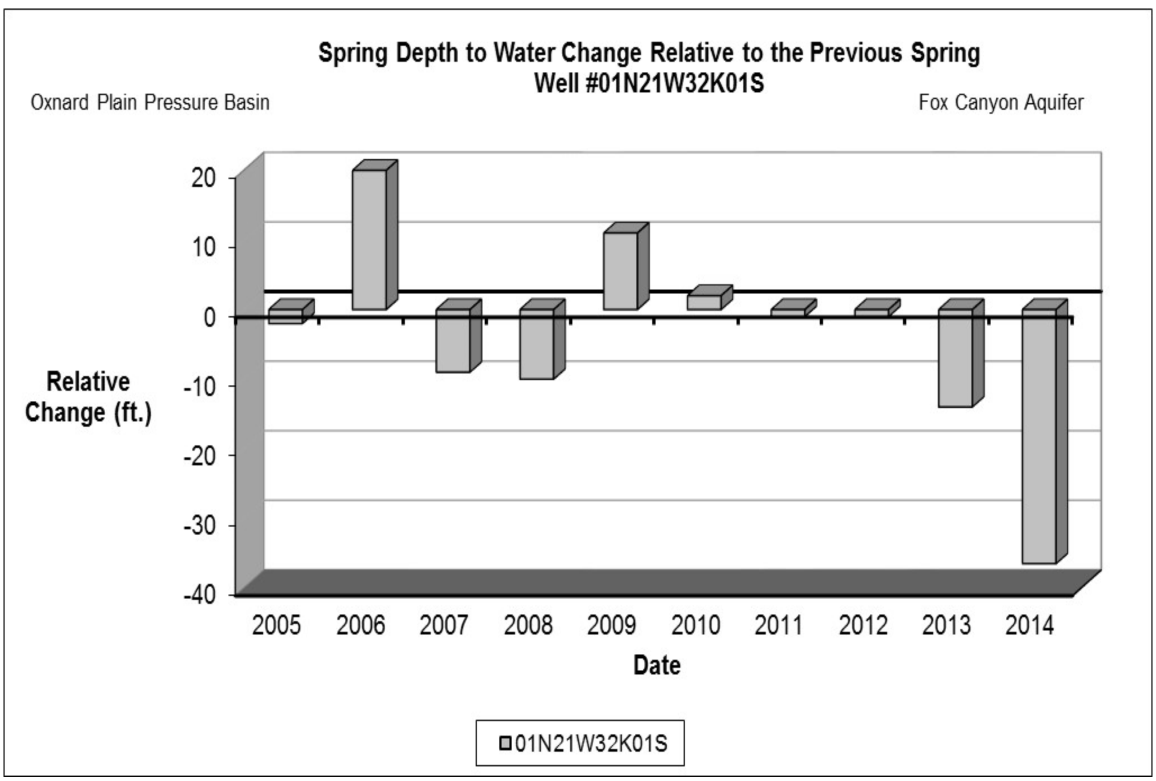

Figure B-7: Oxnard Plain Pressure Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

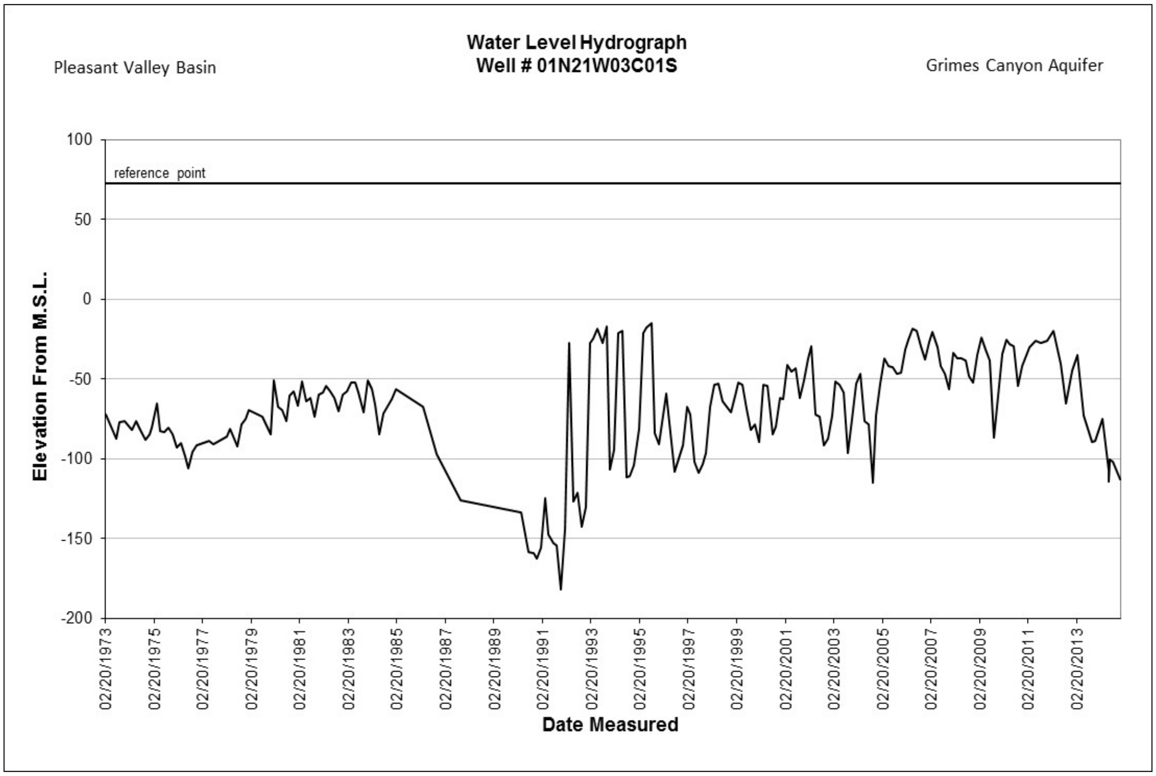

Figure B-8: Pleasant Valley Basin Fox Canyon Aquifer Key Well Hydrograph.

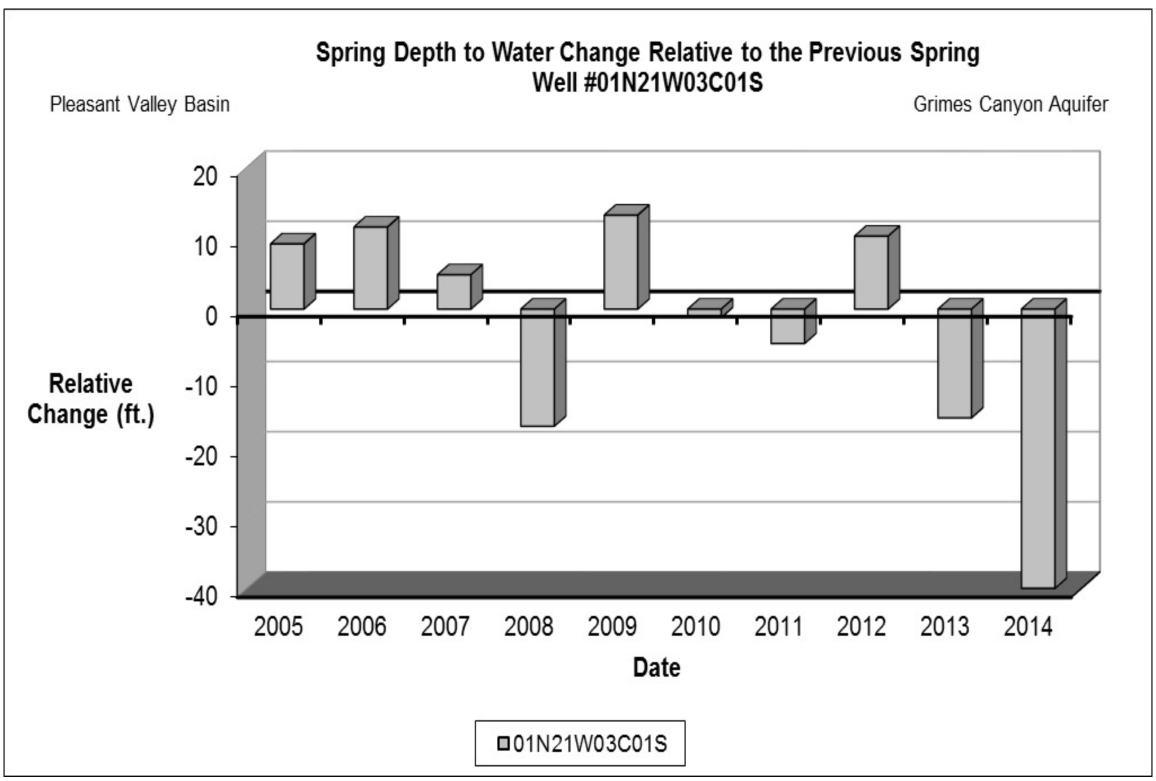

Figure B-9: Pleasant Valley Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

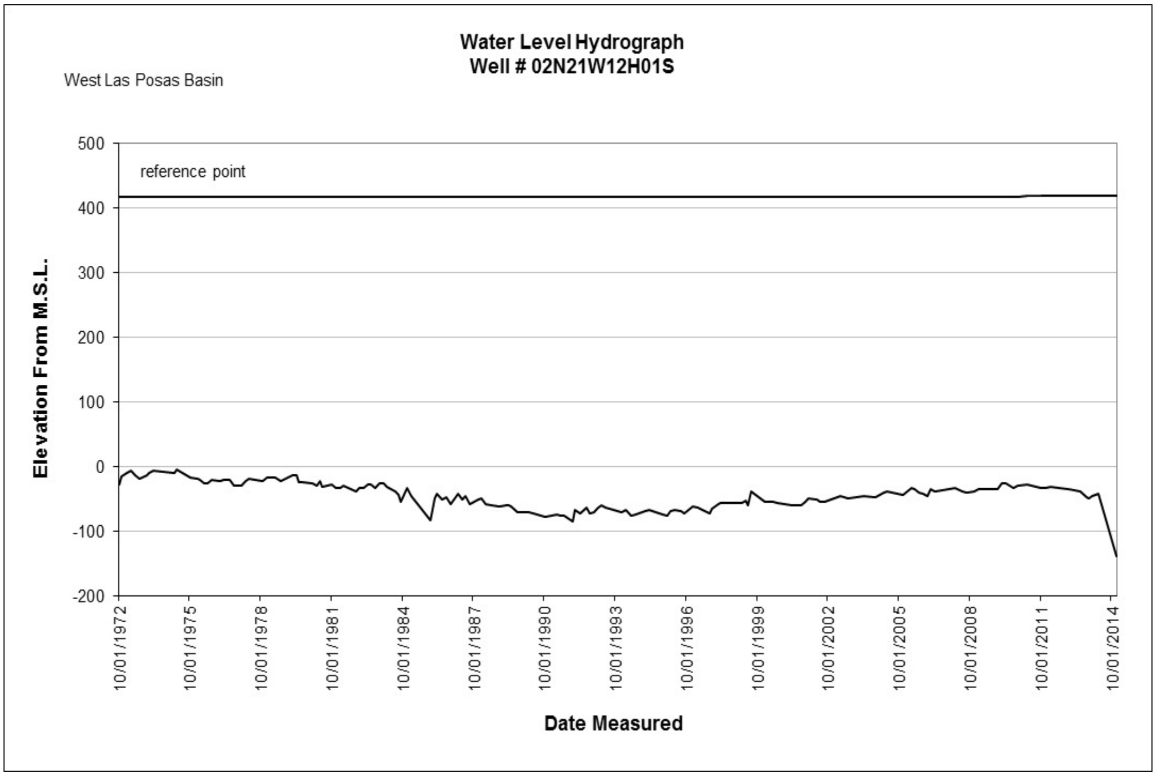

Figure B-10: West Las Posas Basin Key Well Hydrograph.

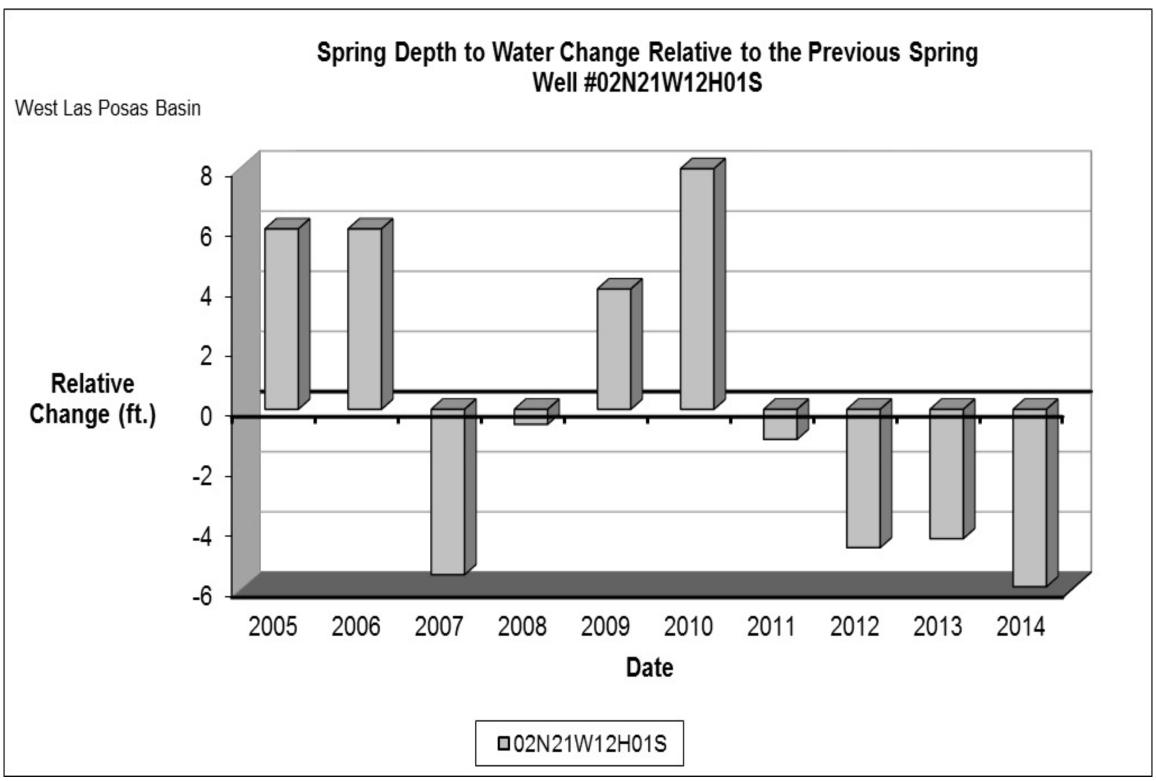

Figure B-11: West Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

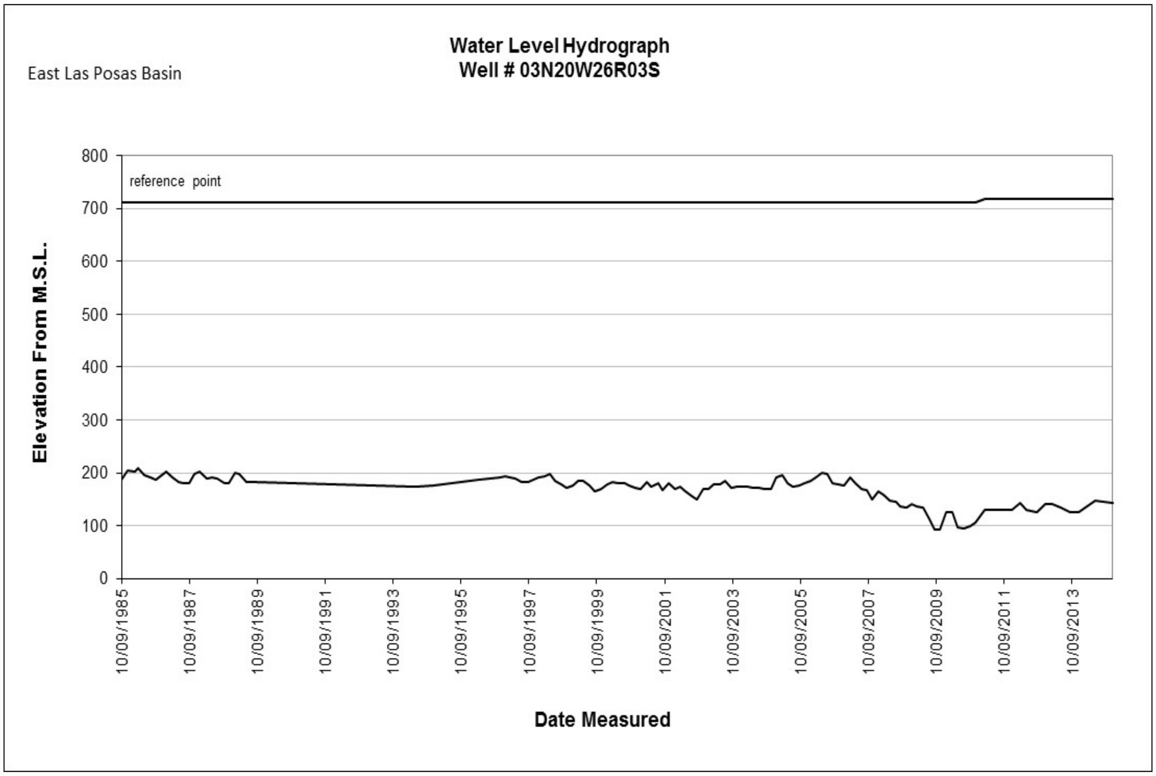

Figure B-12: East Las Posas Key Well Hydrograph.

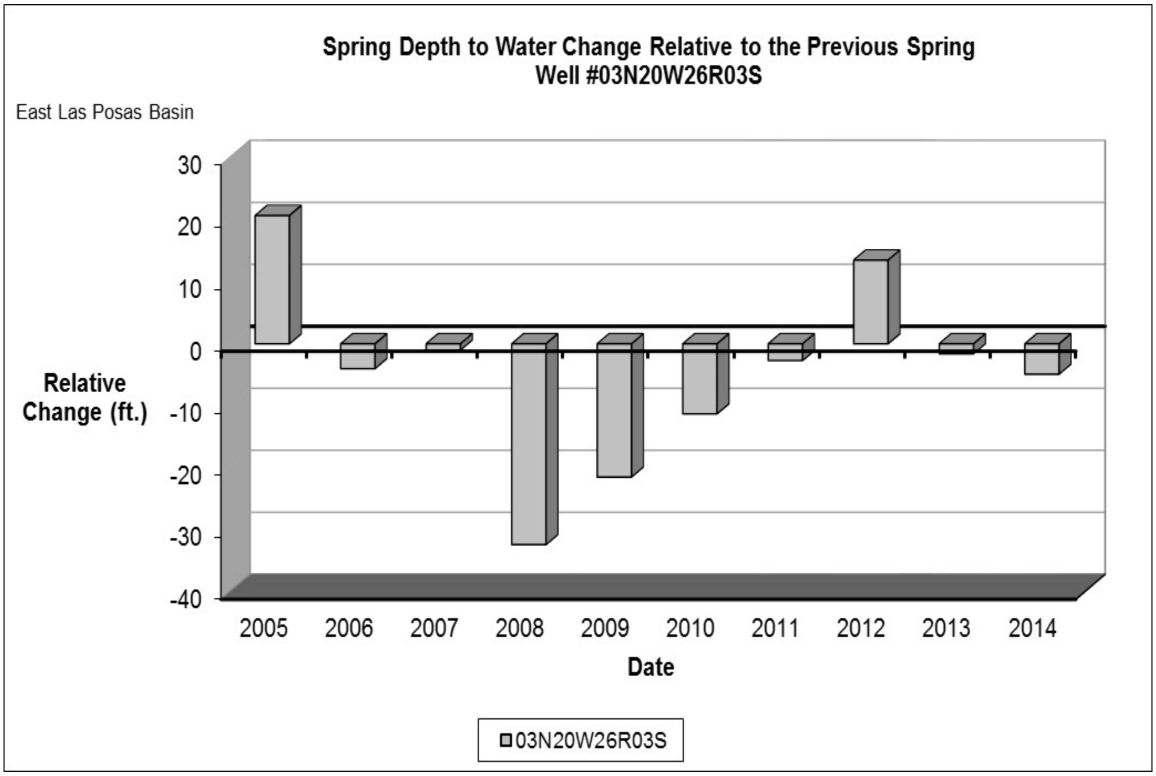

Figure B-13: East Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

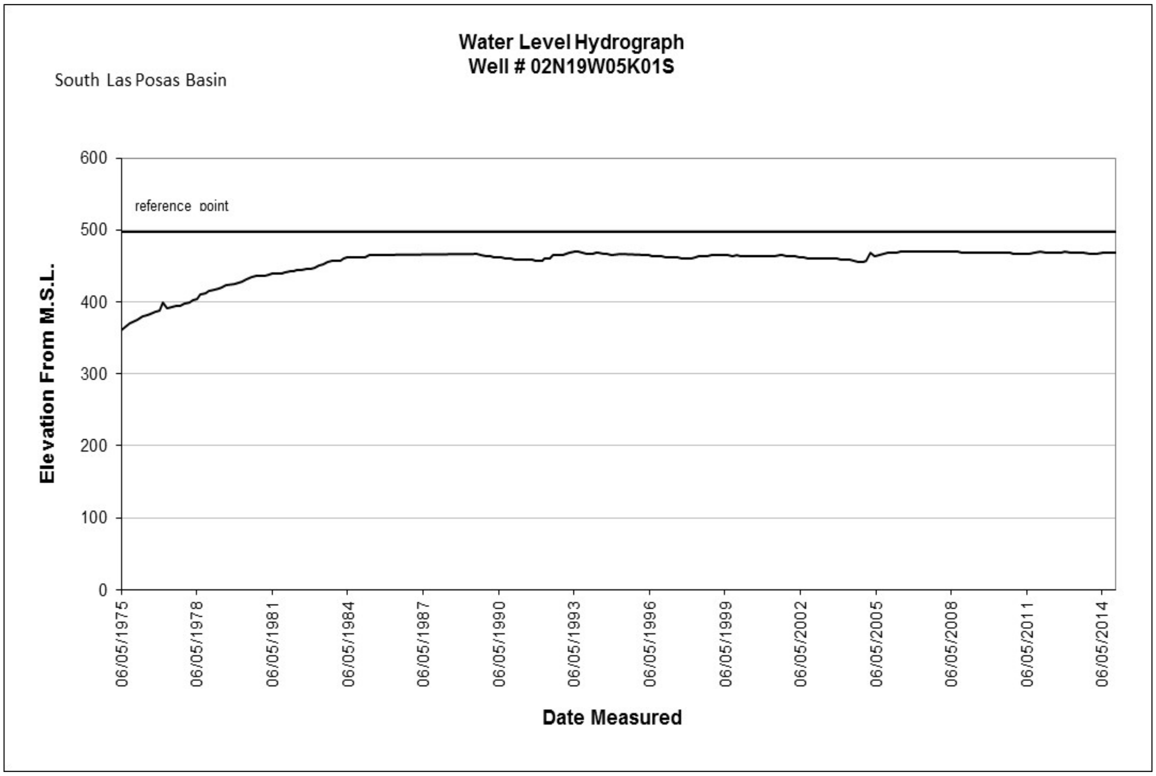

Figure B-14: South Las Posas Basin Key Well Hydrograph.

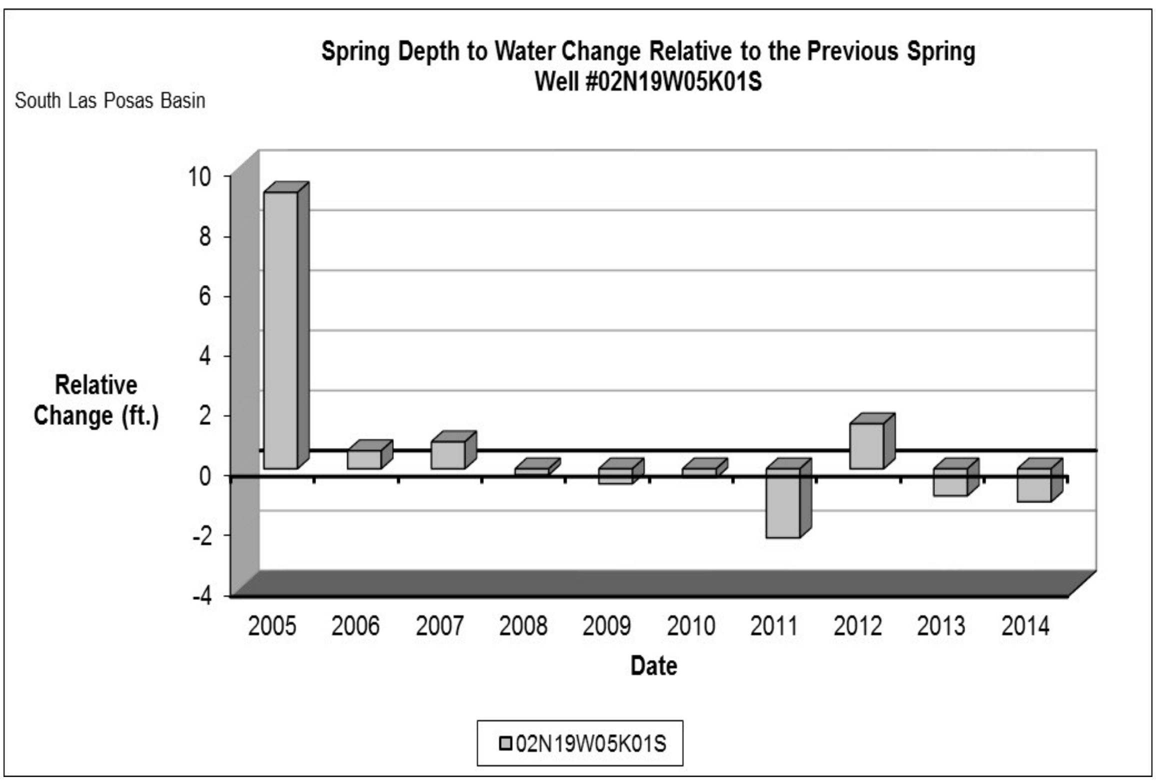

Figure B-15: South Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

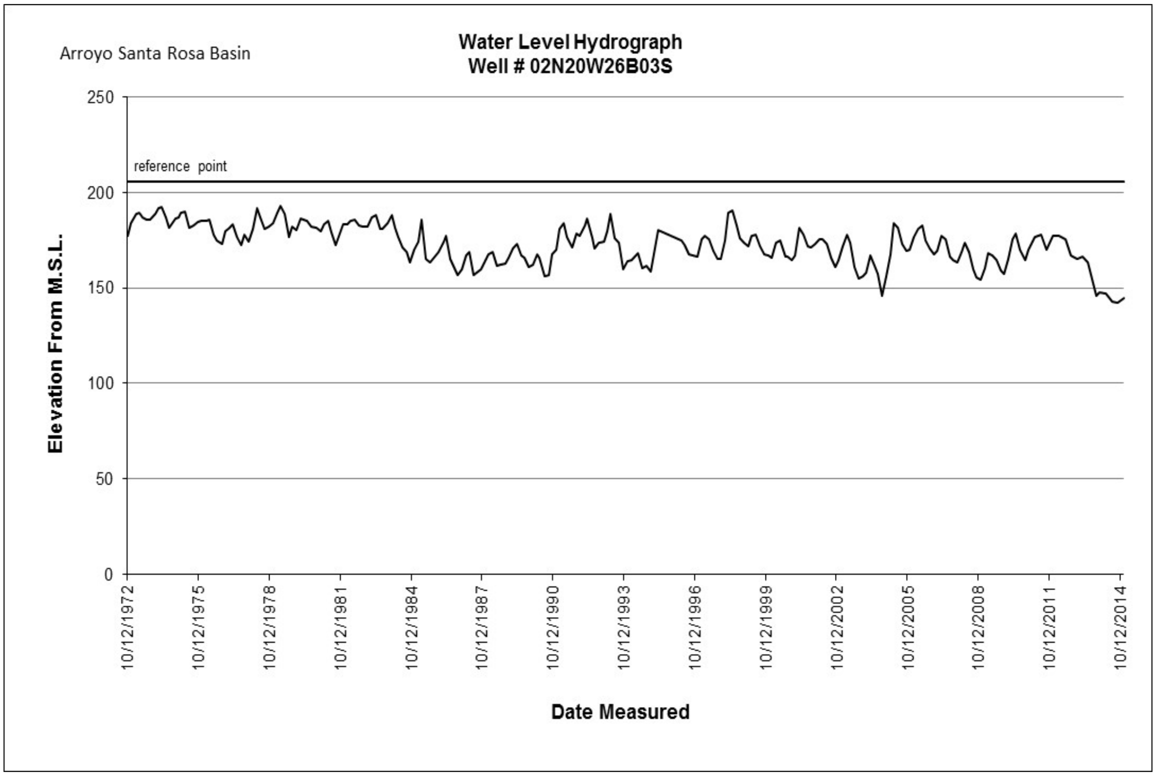

Figure B-16: Arroyo Santa Rosa Basin Key Well Hydrograph.

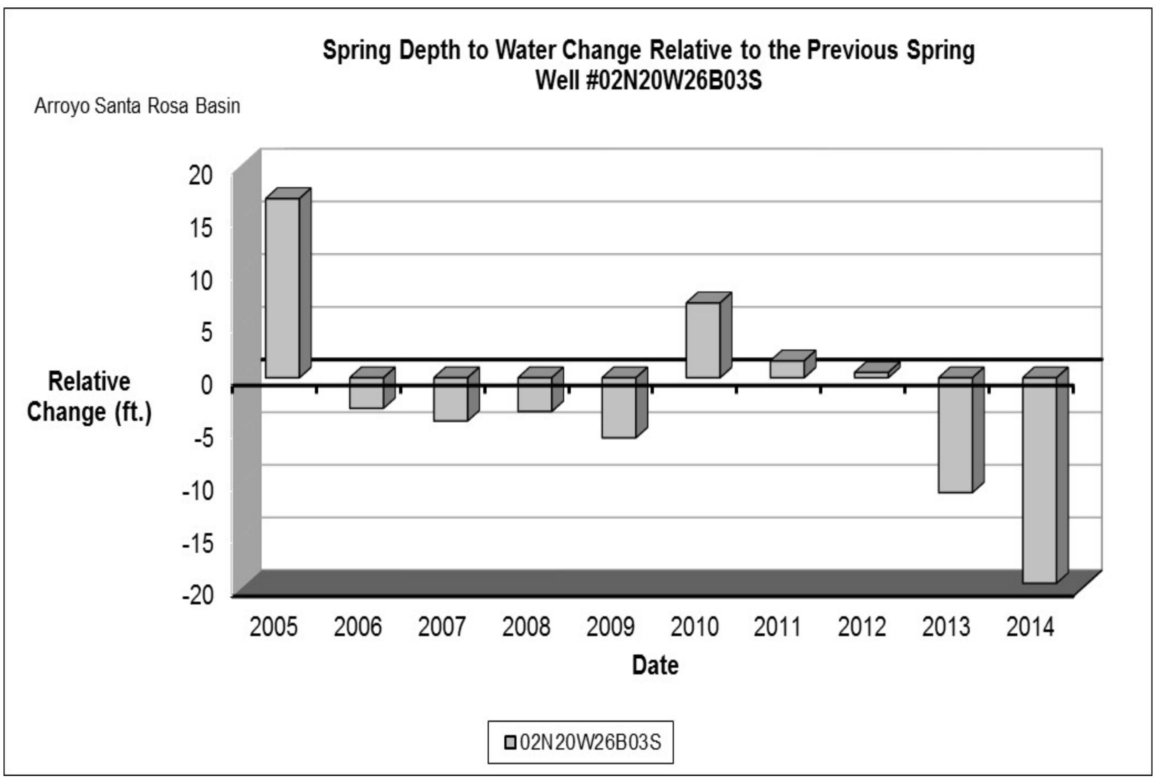

Figure B-17: Arroyo Santa Rosa Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

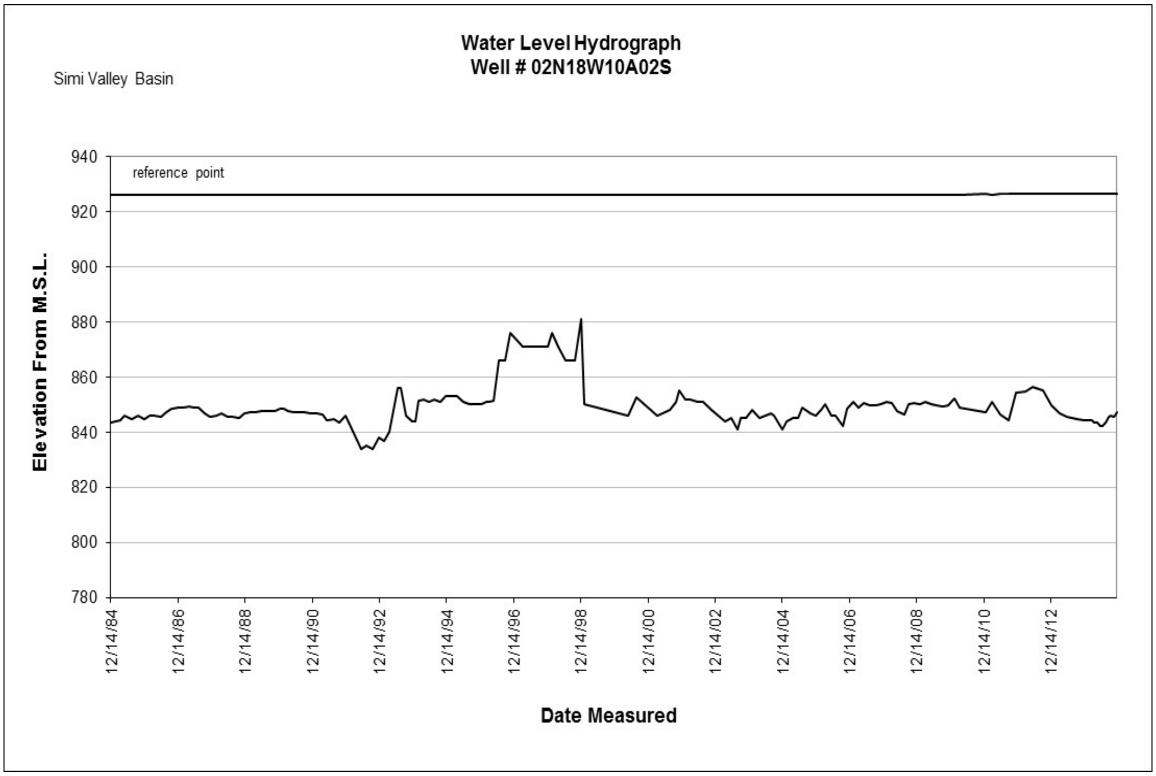

Figure B-18: Simi Valley Basin Key Well Hydrograph.

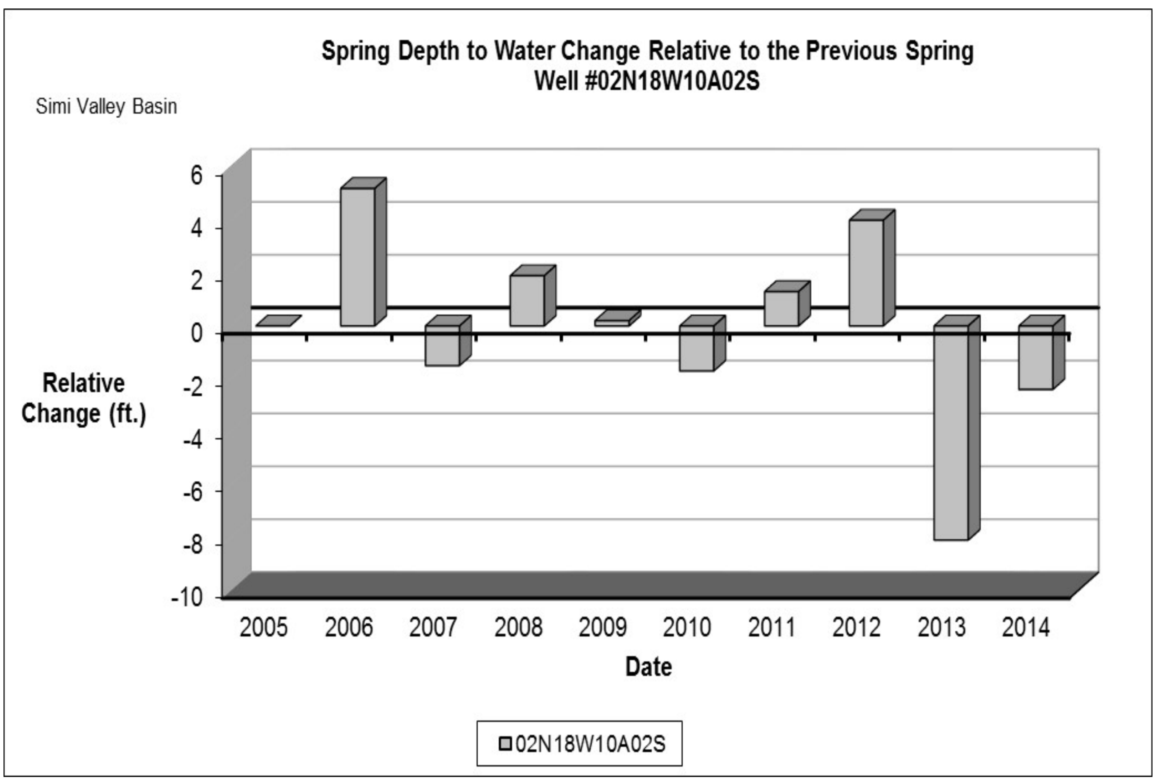

Figure B-19: Simi Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

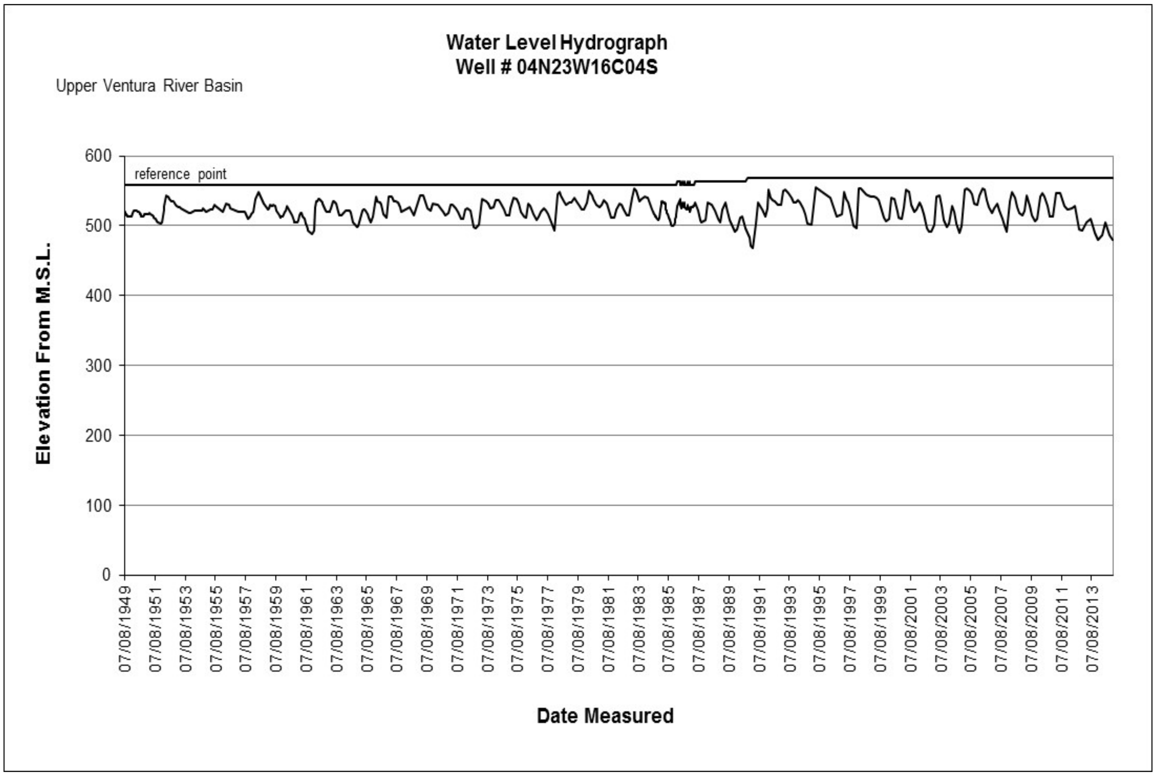

Figure B-20: Ventura River Basin Key Well Hydrograph.

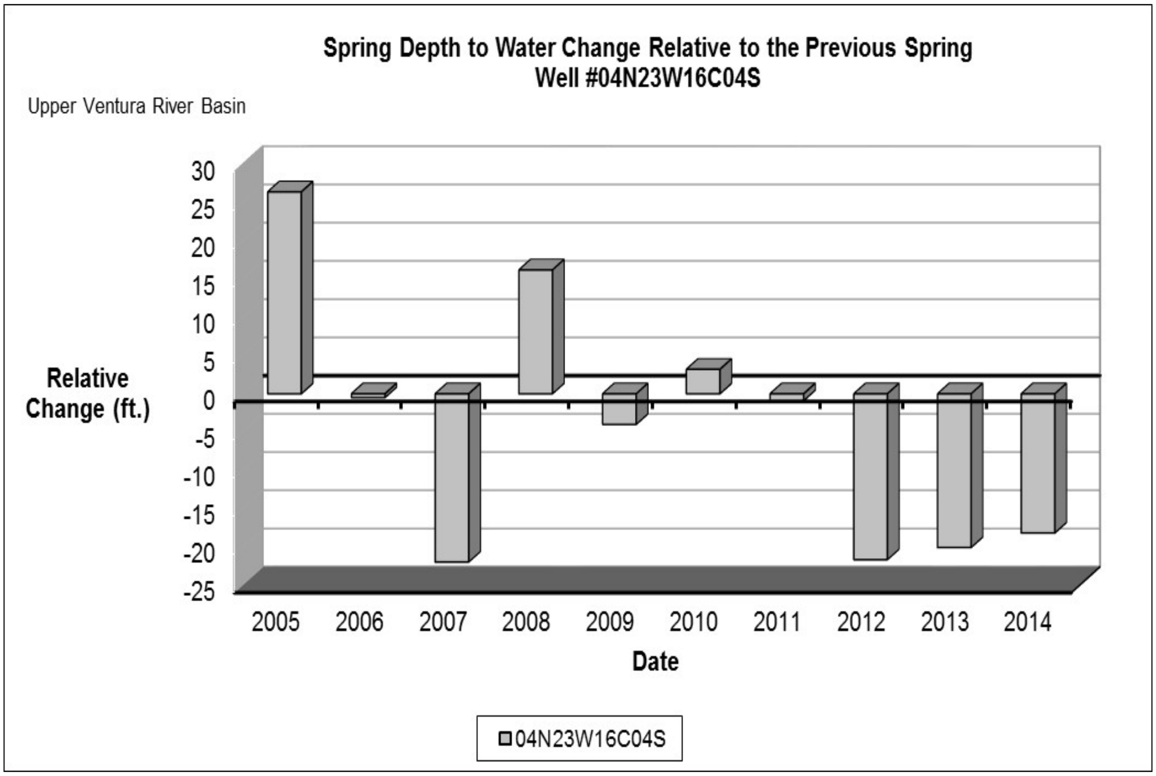

Figure B-21: Ventura River Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

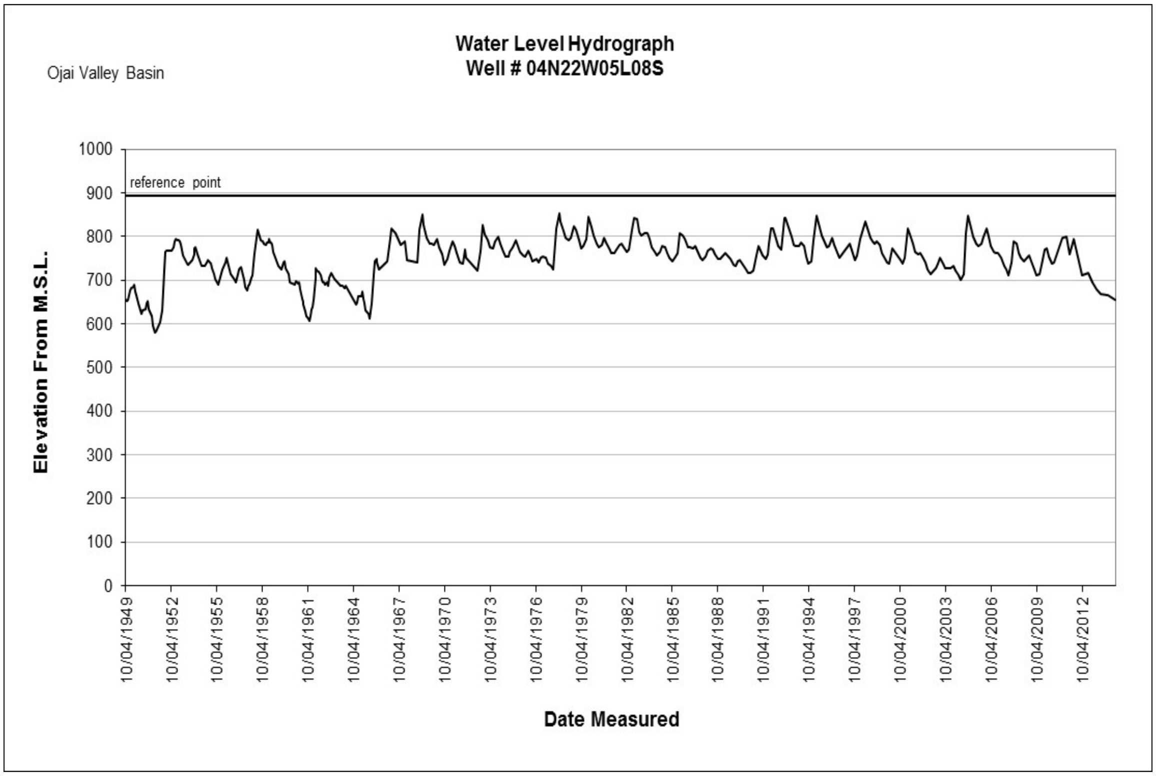

Figure B-22: Ojai Valley Basin Key Well Hydrograph.

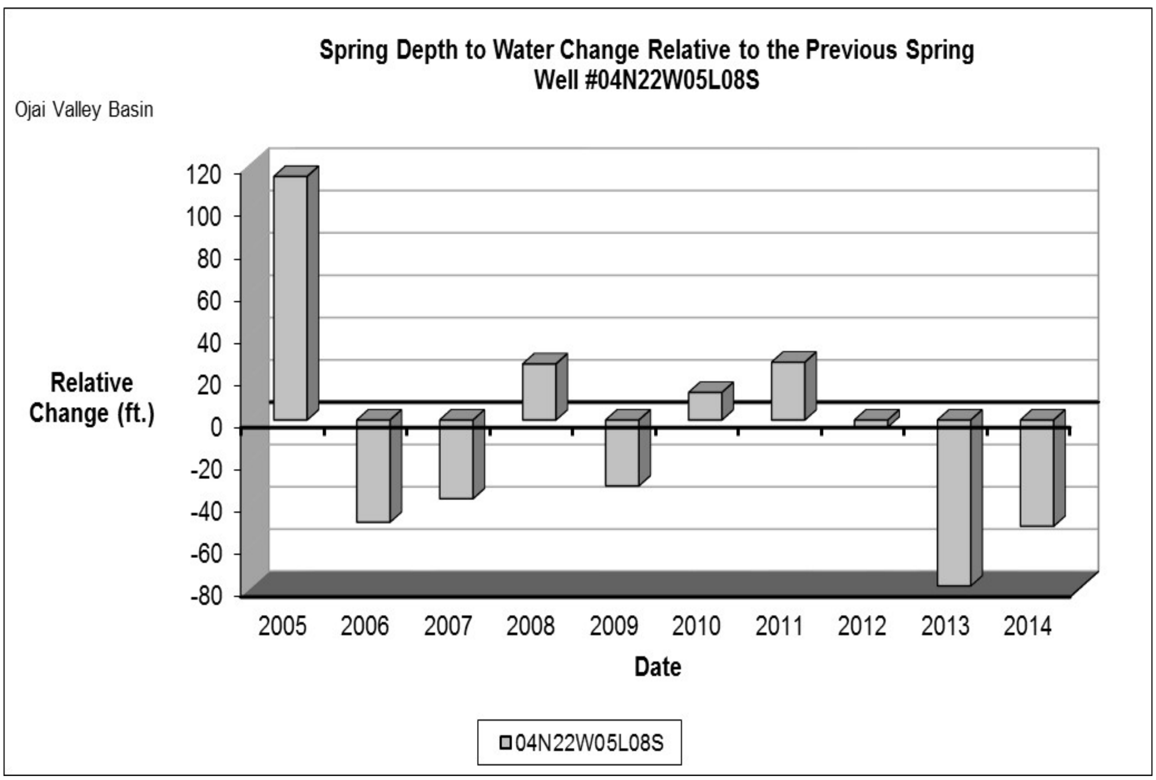

Figure B-23: Ojai Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

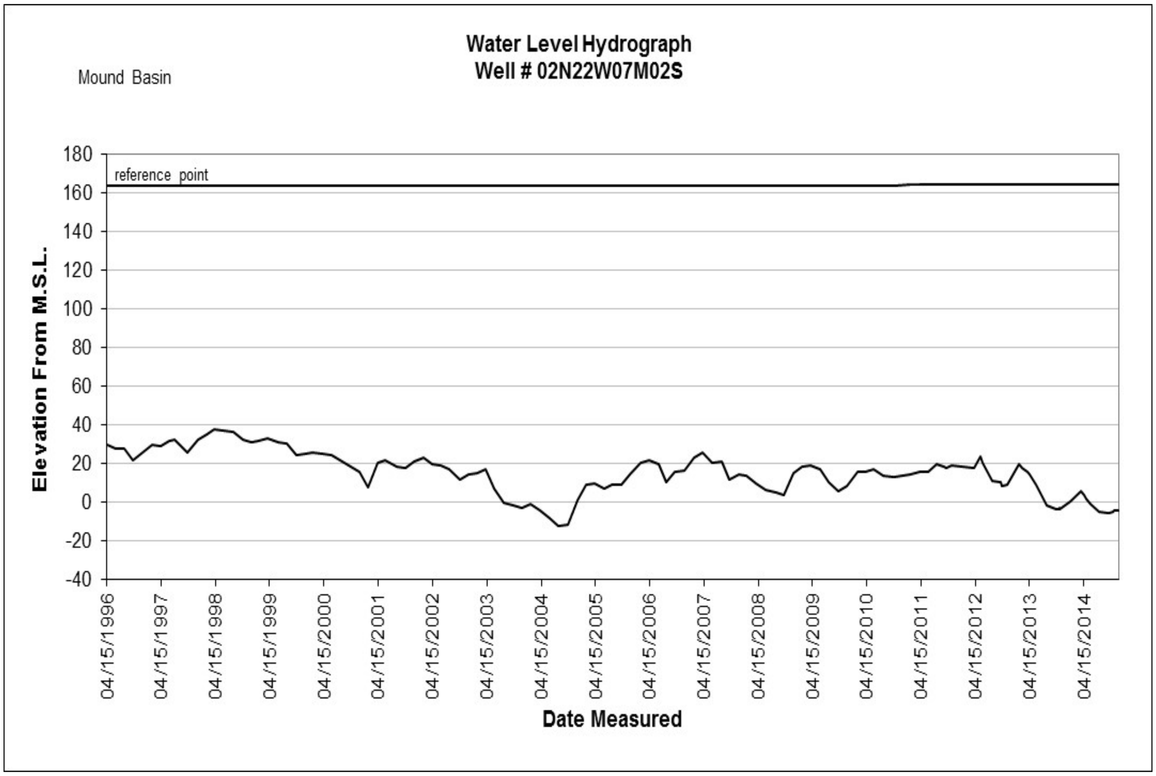

Figure B-24: Mound Basin Key Well Hydrograph.

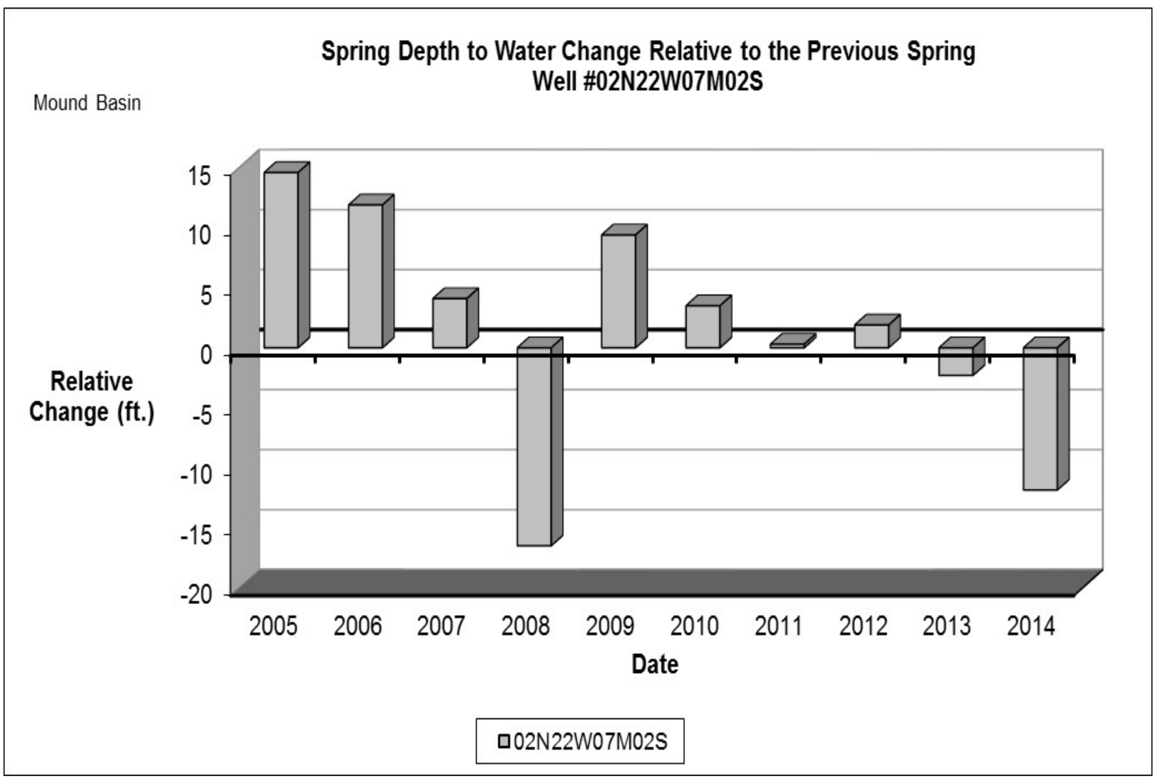

Figure B-25: Mound Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

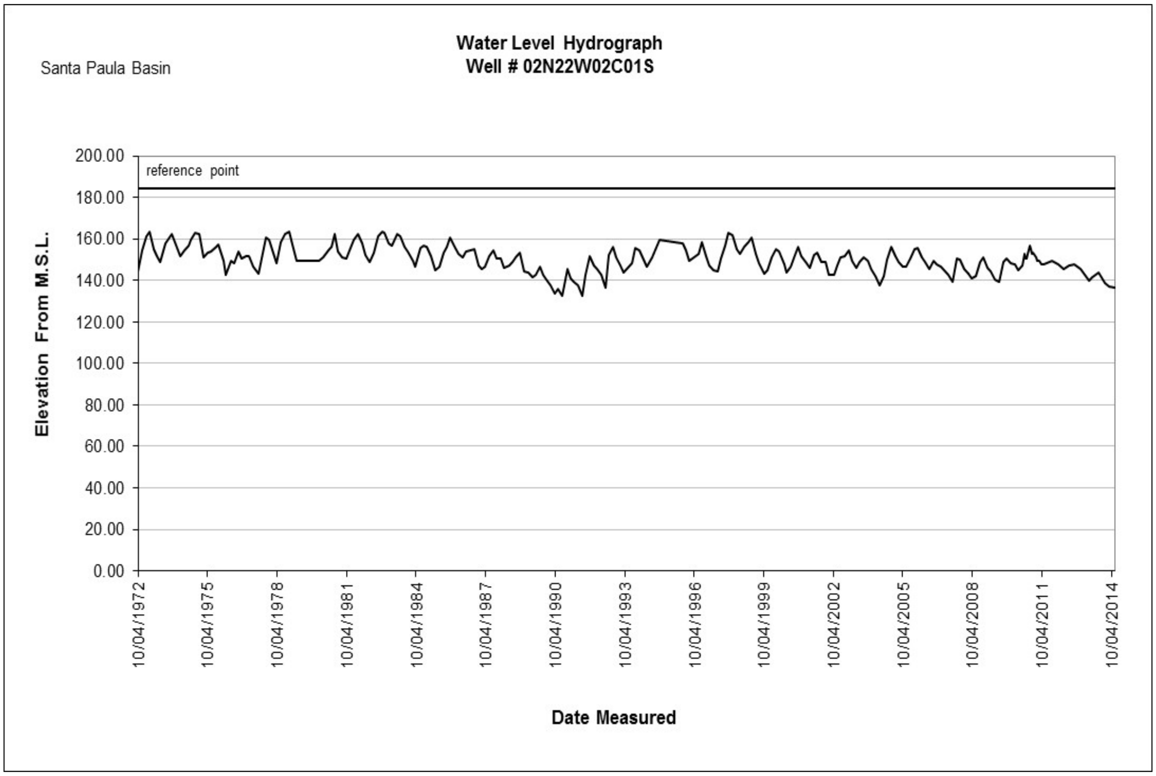

Figure B-26: Santa Paula Basin Key Well Hydrograph.

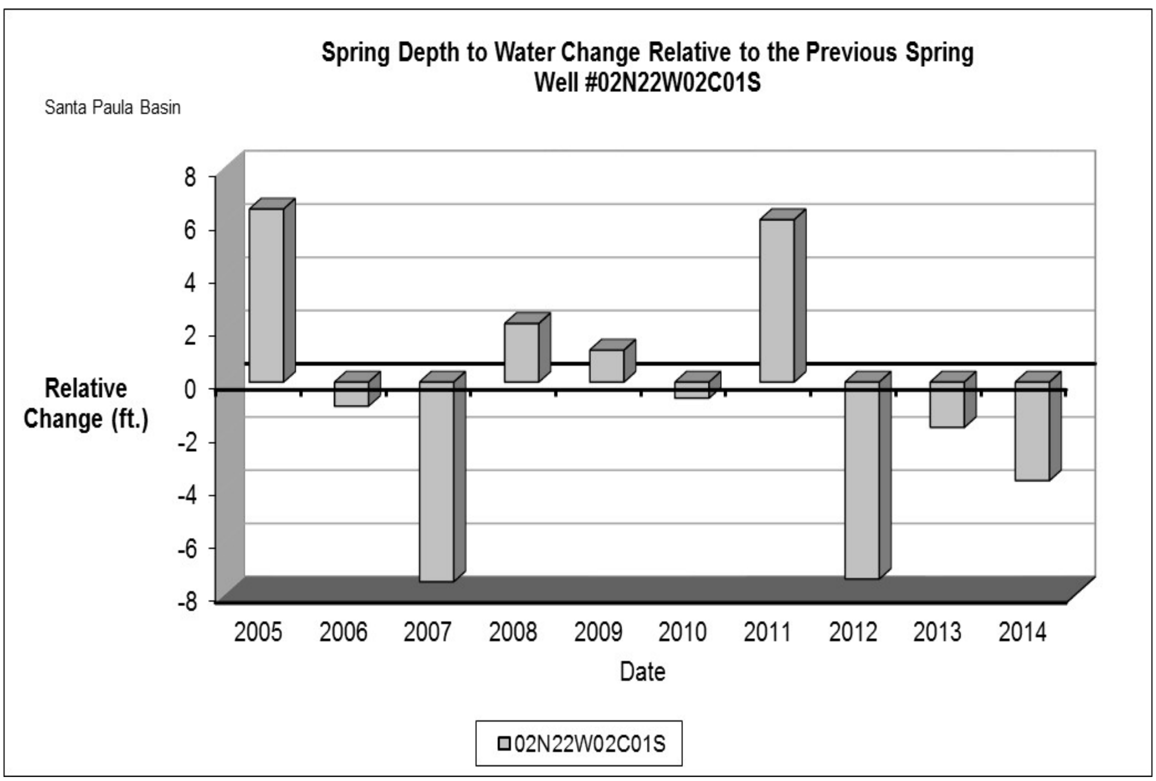

Figure B-27: Santa Paula Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

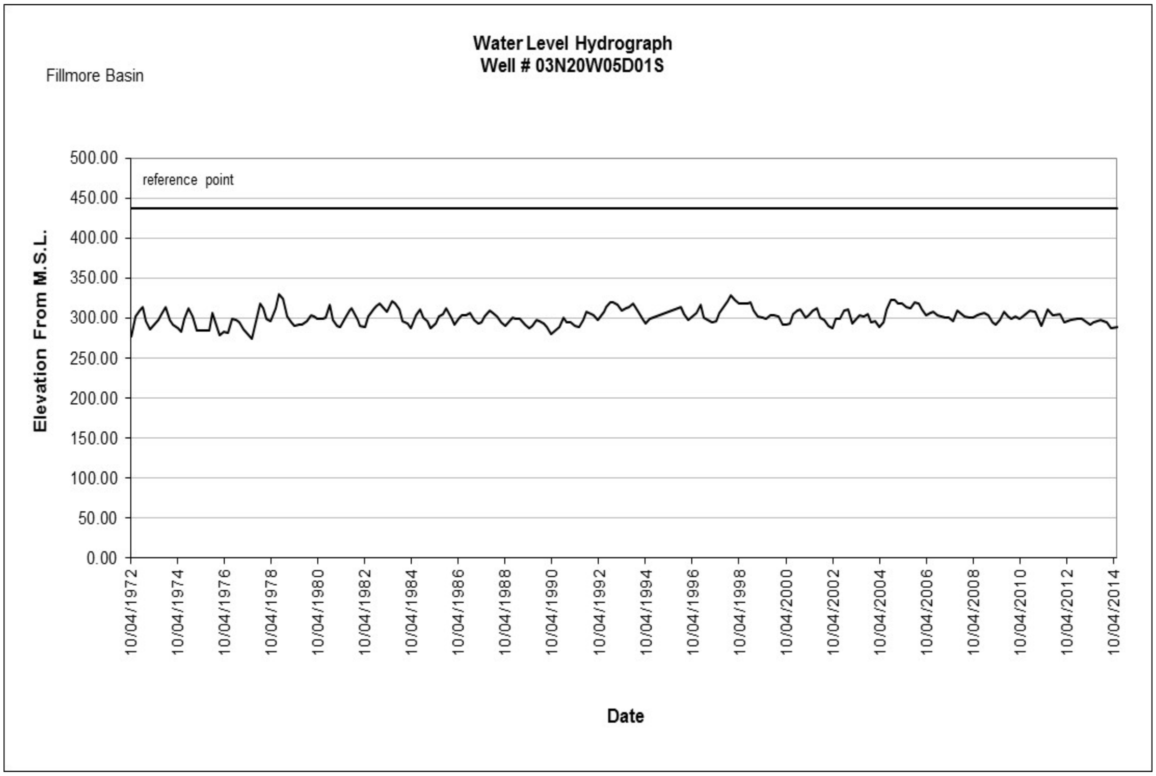

Figure B-28: Fillmore Basin Key Well Hydrograph.

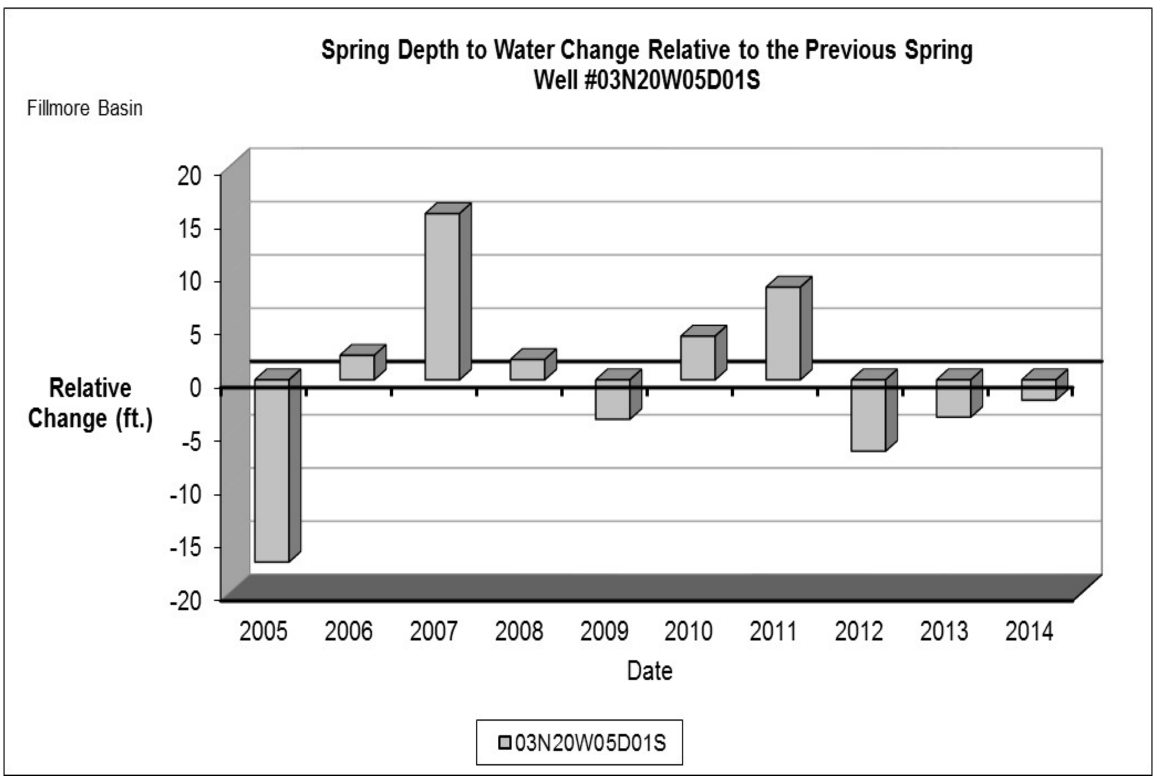

Figure B-29: Fillmore Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

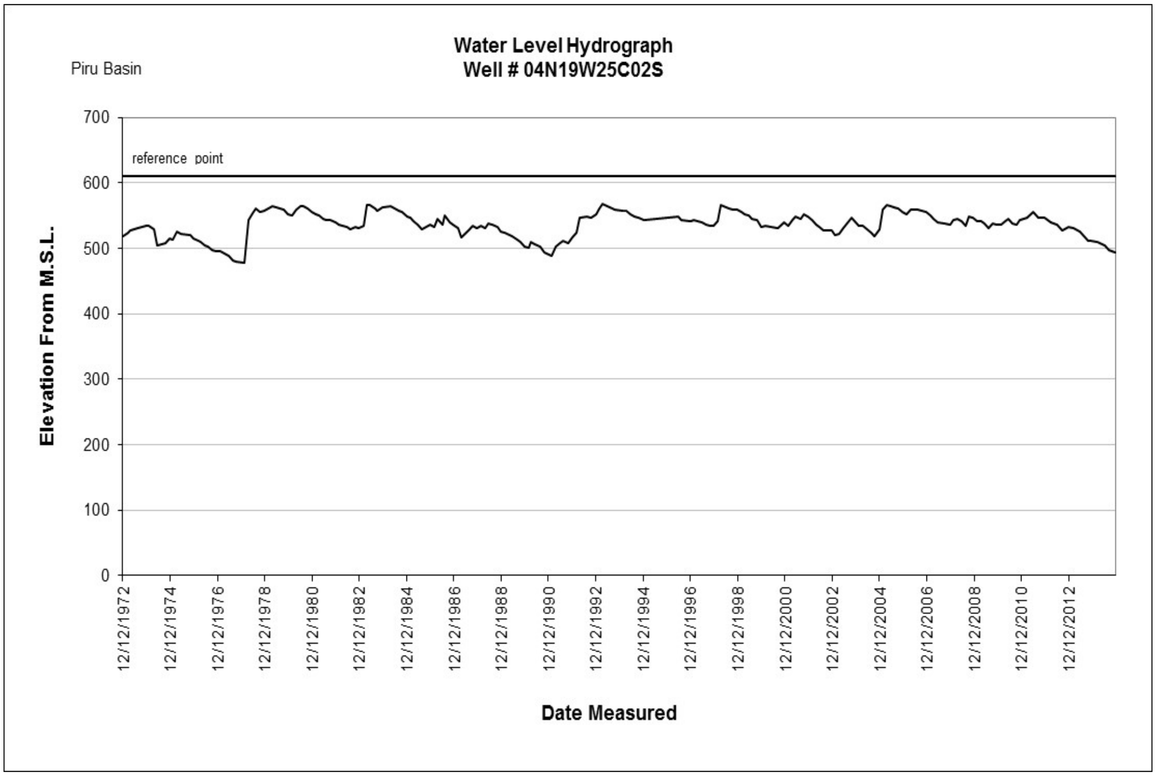

Figure B-30: Piru Basin Key Well Hydrograph.

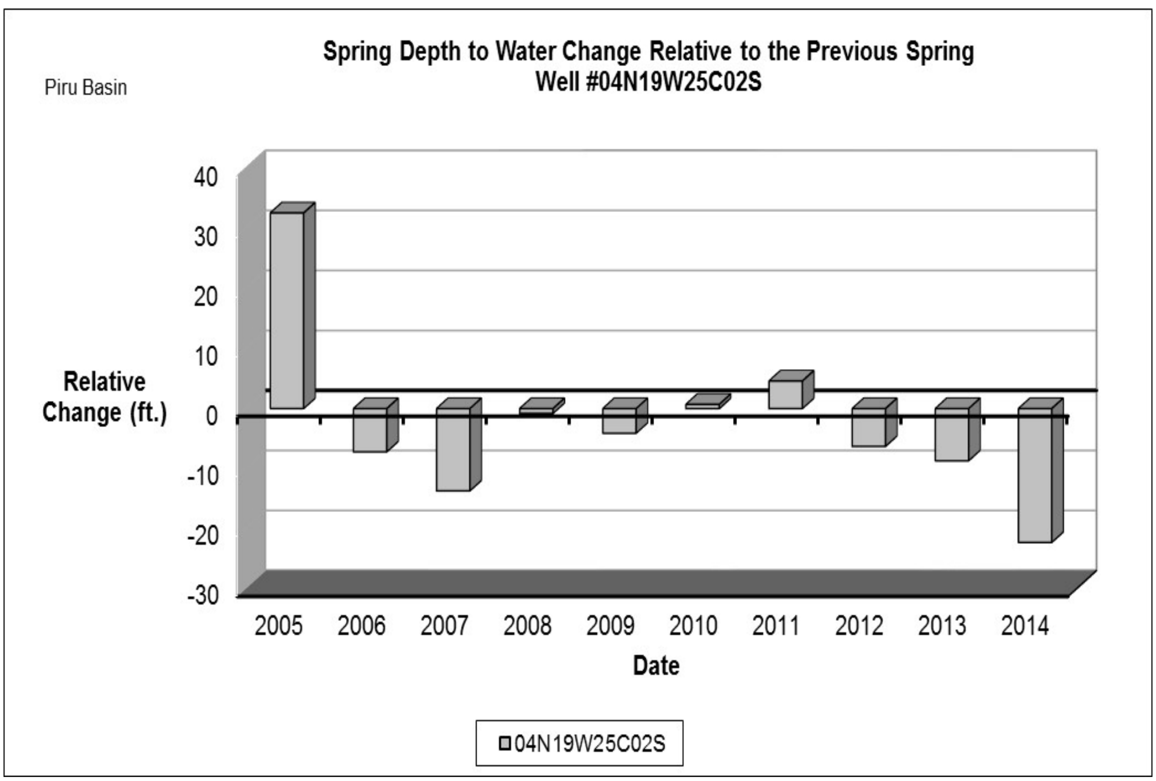

Figure B-31: Piru Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

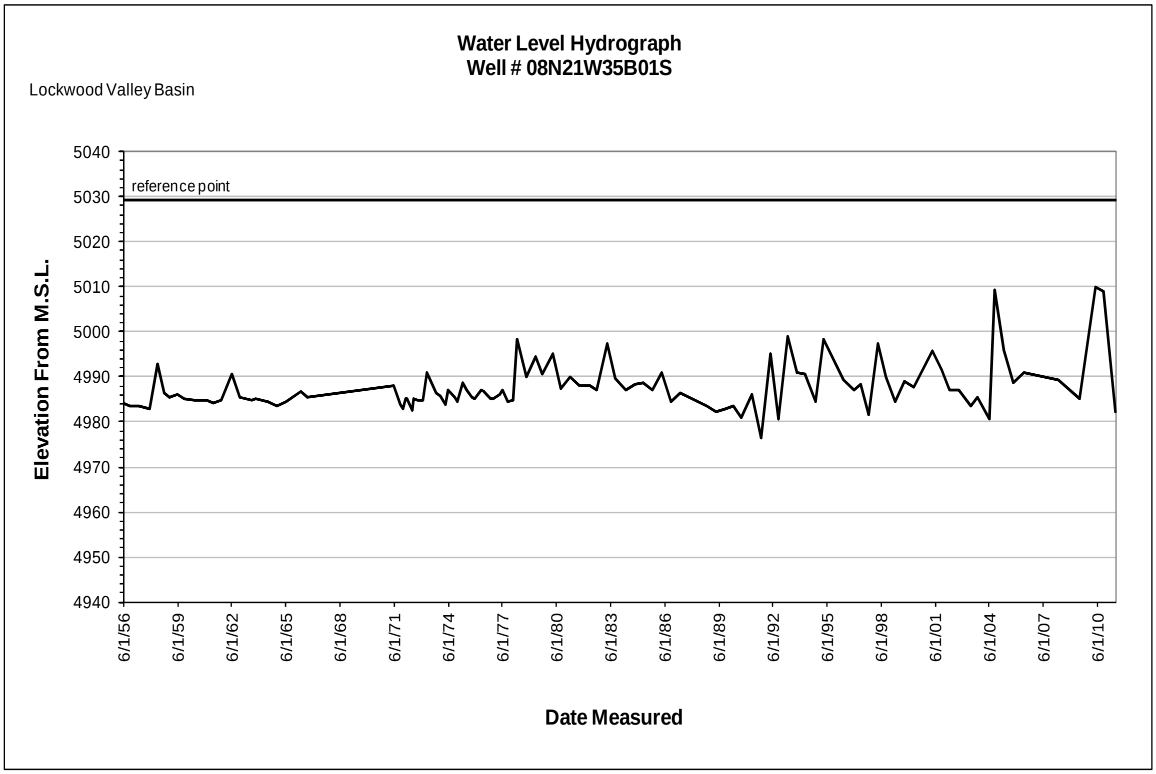

Figure B-32: Lockwood Valley Basin Key Well Hydrograph.

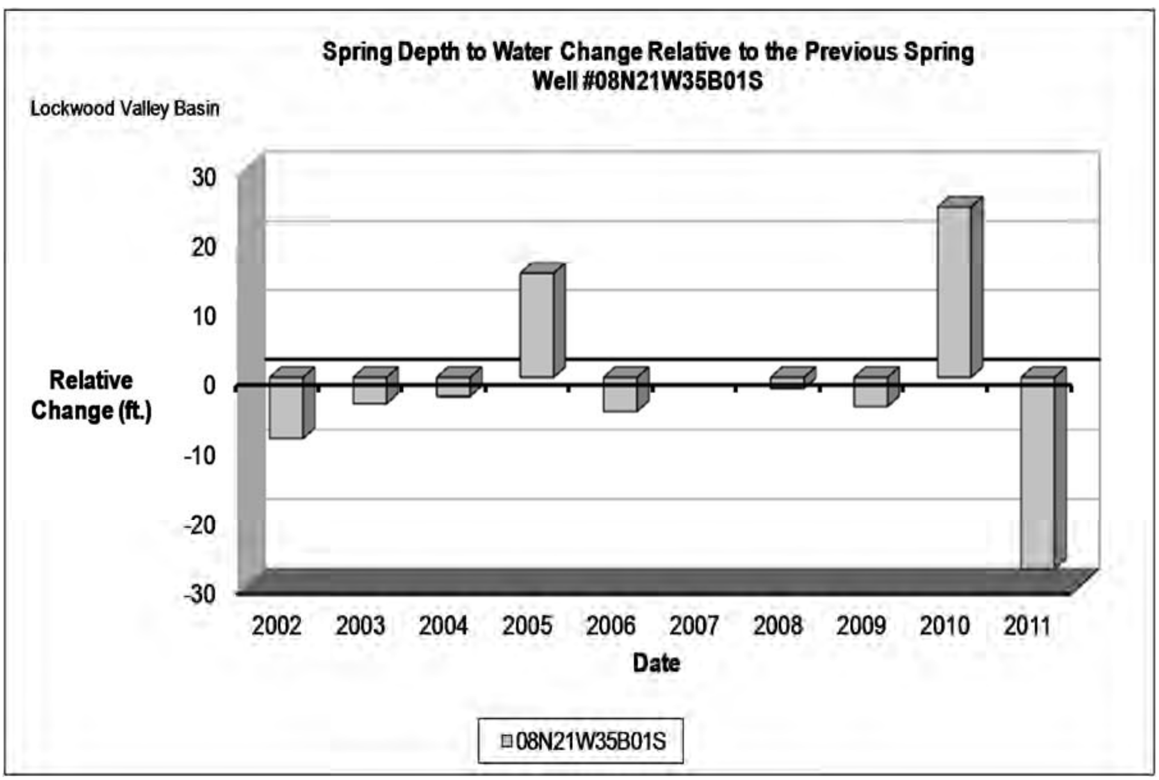

Figure B-33: Lockwood Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

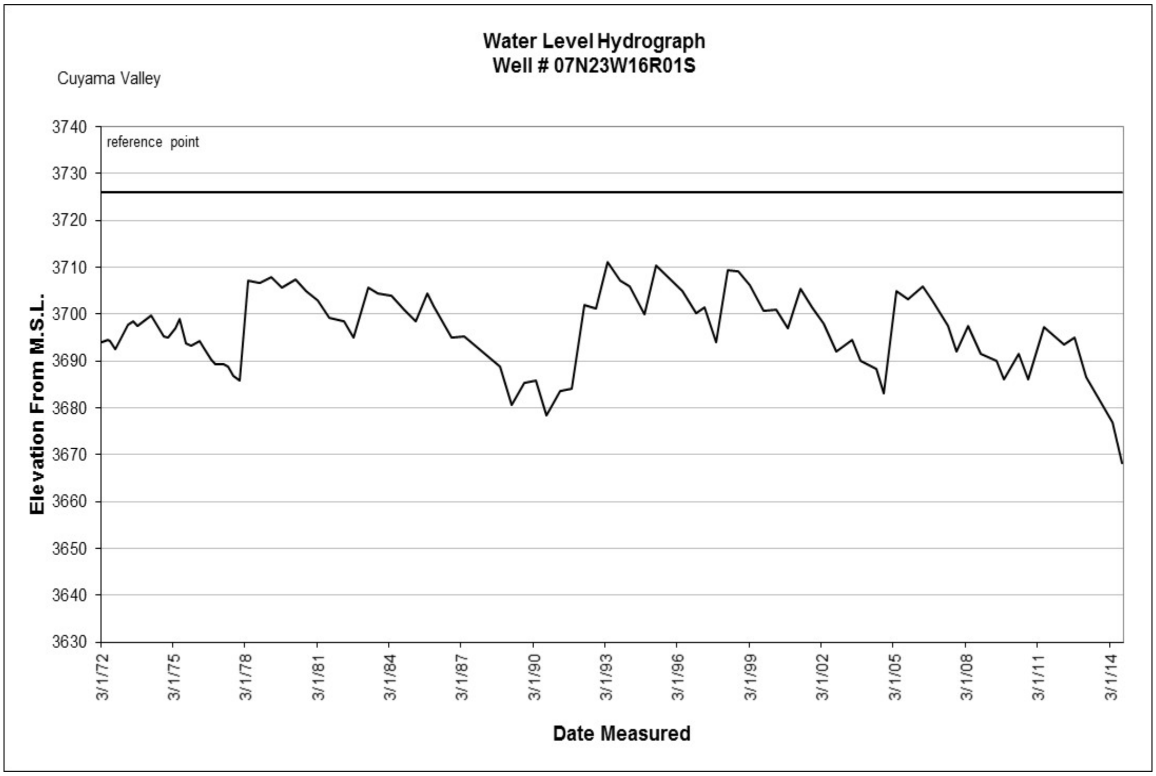

Figure B-34: Cuyama Valley Basin Key Well Hydrograph.

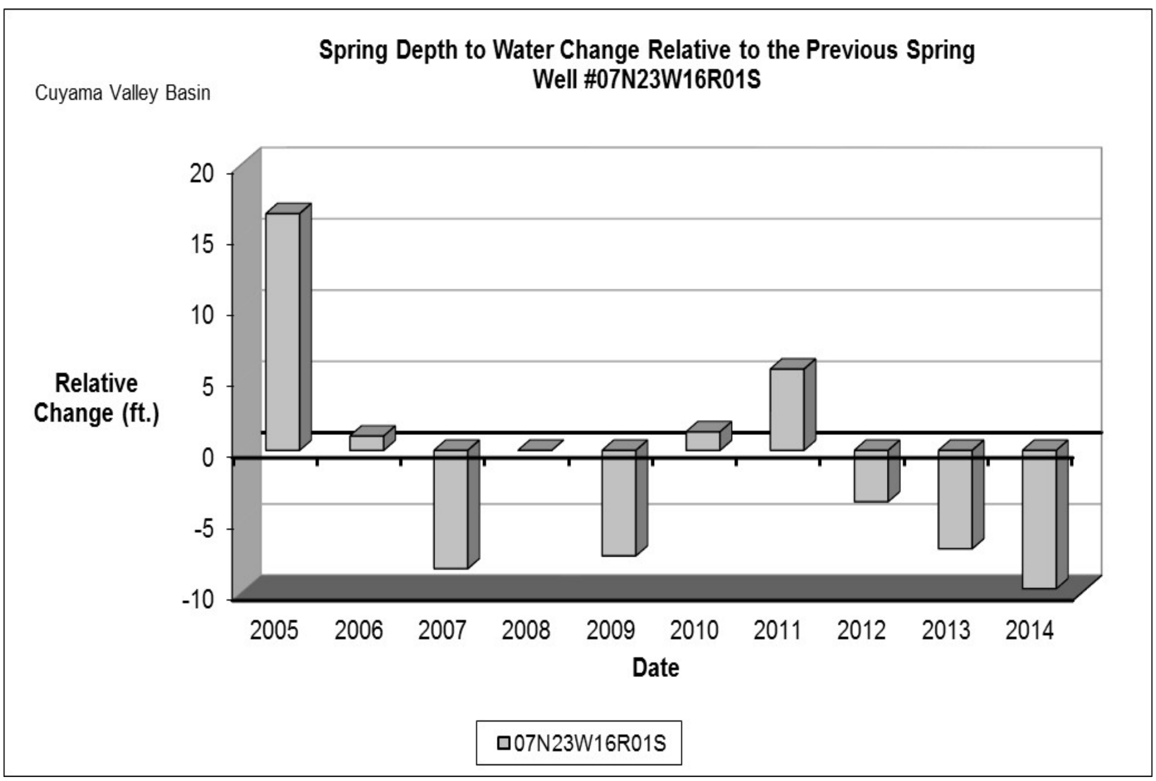

Figure B-35: Cuyama Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Arroyo Santa Rosa	02N19W20L01S	03/12/2014	307.66	63.20	244.46	
		06/13/2014	307.66	63	244.66	
		09/05/2014	307.66	NM	-----	Pumping
		12/10/2014	307.66	63.30	244.36	
	02N20W23G01S	03/12/2014	370.80	281.80	89.00	
		06/13/2014	370.80	284.10	86.70	
		09/05/2014	370.80	286.20	84.60	
		12/10/2014	370.80	287.00	83.80	
	02N20W23K01S	03/12/2014	274.11	201.79	72.32	
		06/13/2014	274.11	211.60	62.51	
		09/05/2014	274.11	218.23	55.88	
		12/10/2014	274.11	209.75	64.36	
	02N20W23R01S	03/12/2014	235.21	90.99	144.22	
		06/13/2014	235.21	NM	-----	Pumping
		09/05/2014	235.21	NM	-----	Pumping
		12/10/2014	235.21	94.9	140.31	
	02N20W26B03S*	03/12/2014	205.87	58.85	147.02	
		06/13/2014	205.87	62.90	142.97	
		09/05/2014	205.87	63.50	142.37	
		12/10/2014	205.87	61.00	144.87	
Conejo Valley	01N19W07K16S	03/18/2014	635.46	9.25	626.21	
		06/05/2014	635.46	9.80	625.66	
		09/10/2014	635.46	11.10	624.36	
		12/15/2014	635.46	10.00	625.46	
	01N20W03J01S	03/18/2014	764.40	44.60	719.80	
		06/05/2014	764.40	51.20	713.20	
		09/10/2014	764.40	52.50	711.90	
		12/15/2014	764.40	51.95	712.45	
Cuyama Valley	07N23W16R01S*	04/17/2014	3,726.00	49.10	3,676.90	
		09/08/2014	3,726.00	57.7	3668.3	
	07N23W16R02S	04/17/2014	3,726.00	45.70	3,680.30	
		10/21/2014	3,726.00	54.2	3671.8	
	07N24W13C03S	04/17/2014	3,435.00	41.80	3,393.20	
		10/21/2014	3,435.00	44.70	3,390.30	
	09N24W33J03S	04/17/2014	3,130.00	161.25	2,968.75	
		10/21/2014	3,130.00	161	2969	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fillmore	03N19W06D02S	03/10/2014	434.60	65.30	369.30	
		06/16/2014	434.60	68.00	366.60	
		09/02/2014	434.60	76.65	357.95	
		12/01/2014	434.60	77.83	356.77	
	03N20W01C04S	03/10/2014	404.58	43.50	361.08	
		06/16/2014	404.58	45.25	359.33	
		09/02/2014	404.58	49.80	354.78	
		12/01/2014	404.58	54.20	350.38	
	03N20W05D01S*	03/10/2014	437.12	139.60	297.52	
		06/16/2014	437.12	142.90	294.22	
		09/02/2014	437.12	150.12	287.00	
		12/01/2014	437.12	149.00	288.12	
	03N20W09D01S	03/10/2014	325.20	11.50	313.70	
		06/16/2014	325.20	NM	-----	Pumping
		09/02/2014	325.20	NM	-----	Special
		12/01/2014	325.20	19.7	305.5	
	03N20W11C01S	03/10/2014	397.11	54.80	342.31	
		06/16/2014	397.11	57.05	340.06	
		09/02/2014	397.11	61.25	335.86	
		12/01/2014	397.11	64.55	332.56	
	03N21W01P02S	03/10/2014	301.85	39.5	262.35	
		06/16/2014	301.85	50.79	251.06	
		09/02/2014	301.85	53.34	248.51	
		12/01/2014	301.85	53.85	248.00	
	03N21W11B01S	03/10/2014	336.24	86.02	250.22	
		06/16/2014	336.24	99.79	236.45	
		09/02/2014	336.24	100.10	236.14	
		12/01/2014	336.24	96.75	239.49	
	04N19W30D01S	03/10/2014	434.43	59.00	375.43	
		06/16/2014	434.43	NM	-----	Pumping
		09/02/2014	434.43	NM	-----	Pumping
		12/01/2014	434.43	68.20	366.23	
	04N19W31R01S	03/10/2014	448.85	NM	-----	Pumping
		06/16/2014	448.85	NM	-----	Pumping
		09/02/2014	448.85	76.40	372.45	
		12/01/2014	448.85	80.75	368.10	
	04N19W32M02S	03/10/2014	449.46	NM	Special	Pumping
		06/16/2014	449.46	NM	Special	Pumping
		09/02/2014	449.46	NM	Special	Pumping
		12/01/2014	449.46	33.7	415.76	
	04N19W33D03S	03/10/2014	477.43	NM	-----	Pumping
		06/16/2014	477.43	NM	-----	Pumping
		09/02/2014	477.43	NM	-----	Pumping
		12/01/2014	477.43	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
Fillmore	04N19W33D04S	03/10/2014	477.90	10.10	467.80	
		06/16/2014	477.90	14.10	463.80	
		09/02/2014	477.90	16.50	461.40	
		12/01/2014	477.90	18.85	459.05	
	04N20W23Q02S	03/10/2014	513.88	135.85	378.03	
		06/16/2014	513.88	141.29	372.59	
		09/02/2014	513.88	150.40	363.48	
		12/01/2014	513.88	150.2	363.68	
	04N20W26C02S	03/10/2014	505.35	142.00	363.35	
		06/16/2014	505.35	151.25	354.10	
		09/02/2014	505.35	155.40	349.95	
		12/01/2014	505.35	155.40	349.95	
	04N20W33C03S	03/10/2014	526.87	NM	-----	Special
		06/16/2014	526.87	NM	-----	Pumping
		09/02/2014	526.87	191.40	335.47	
		12/01/2014	526.87	177.70	349.17	
East Las Posas	02N20W01M01S	03/06/2014	470.05	NM	-----	Pumping
		06/06/2014	470.05	NM	-----	Special
		09/22/2014	470.05	NM	-----	Special
		12/19/2014	470.05	NM	-----	Special
	02N20W03K03S	03/06/2014	485.50	NM	-----	Special
		06/06/2014	485.50	NM	-----	Special
		09/22/2014	485.50	NM	-----	Special
		12/19/2014	485.50	NM	-----	Special
	02N20W10D02S	03/06/2014	459.53	289.60	169.93	
		06/06/2014	459.53	303.70	155.83	
		09/22/2014	459.53	306.80	152.73	
		12/11/2014	459.53	300.10	159.43	
	02N20W10G01S	03/06/2014	415.47	166.10	249.37	
		06/10/2014	415.47	162.25	253.22	
		09/22/2014	415.47	166.70	248.77	
		12/19/2014	415.47	160.40	255.07	
	02N20W10J01S	03/06/2014	406.87	122.90	283.97	
		06/06/2014	406.87	123.60	283.27	
		09/22/2014	406.87	126.80	280.07	
		12/19/2014	406.87	125.90	280.97	
	03N19W17Q01S	03/06/2014	1,311.06	NM	-----	Special
		06/06/2014	1,311.06	NM	-----	Special
		10/09/2014	1,311.06	1093.8	217.26	
		12/19/2014	1,311.06	NM	-----	Special

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
East Las Posas	03N19W19J01S	03/10/2014	1,026.90	853.10	173.80	
		06/06/2014	1,026.90	850.80	176.10	
		09/12/2014	1,026.90	846.70	180.20	
		12/19/2014	1,026.90	848.90	178.00	
	03N19W19P02S	03/10/2014	1,057.94	NM	-----	Special
		06/06/2014	1,057.94	NM	-----	Special
		09/12/2014	1,057.94	NM	-----	Special
		12/19/2014	1,057.94	NM	-----	Special
	03N19W29F06S	03/10/2014	855.20	255.20	600.00	
		06/10/2014	855.20	263.90	591.30	
		09/12/2014	855.20	276.90	578.30	
		12/11/2014	855.20	255.45	599.75	
	03N19W29K04S	03/10/2014	843.32	NM	-----	Special
		06/10/2014	843.32	NM	-----	Special
		09/12/2014	843.32	NM	-----	Special
		12/11/2014	843.32	NM	-----	Special
	03N20W23L01S	03/10/2014	970.30	NM	-----	Special
		06/10/2014	970.30	NM	-----	Special
		09/12/2014	970.30	NM	-----	Special
		12/11/2014	970.30	NM	-----	Special
	03N20W25H01S	03/10/2014	823.84	226.10	597.74	
		06/06/2014	823.84	NM	-----	Pumping
		09/17/2014	823.84	238.50	585.34	
		12/11/2014	823.84	228.20	595.64	
	03N20W26R03S*	03/10/2014	717.81	581.50	136.31	
		06/09/2014	717.81	570.60	147.21	
		09/17/2014	717.81	NM	-----	Pumping
		12/19/2014	717.81	574.80	143.01	
	03N20W27H03S	03/10/2014	840.25	626.40	213.85	
		06/23/2014	840.25	627.90	212.35	
		09/22/2014	840.25	634.00	206.25	
		12/11/2014	840.25	631.00	209.25	
	03N20W34G01S	03/10/2014	680.48	530.10	150.38	
		06/09/2014	680.48	533.80	146.68	
		09/22/2014	680.48	539.10	141.38	
		12/19/2014	680.48	531	149.48	
	03N20W35R03S	03/10/2014	572.67	427.80	144.87	
		06/09/2014	572.67	415.70	156.97	
		09/22/2014	572.67	445.40	127.27	
		12/19/2014	572.67	419.40	153.27	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
South Las Posas	02N19W05K01S*	03/10/2014	497.80	31.10	466.70	
		06/10/2014	497.80	29.34	468.46	
		09/12/2014	497.80	29.10	468.70	
		12/22/2014	497.80	29.20	468.60	
	02N19W08H02S	03/19/2014	494.87	24.90	469.97	
		06/10/2014	494.87	25.80	469.07	
		09/12/2014	494.87	NM	-----	Pumping
		12/22/2014	494.87	24.10	470.77	
West Las Posas	02N20W06R01S	03/06/2014	461.19	NM	-----	Pumping
		06/09/2014	461.19	NM	-----	Pumping
		09/12/2014	461.19	NM	-----	Pumping
		12/11/2014	461.19	NM	-----	Special
	02N20W07R02S	03/06/2014	395.00	NM	-----	Pumping
		06/06/2014	395.00	NM	-----	Pumping
		09/12/2014	395.00	NM	-----	Pumping
		12/19/2014	395.00	525.8	-130.8	
	02N21W09D02S	03/04/2014	323.75	231.42	92.33	
		06/29/2014	323.75	333.06	-9.31	
		09/11/2014	323.75	309.96	13.79	
		12/15/2014	323.75	312.30	11.45	
	02N21W10G03S	03/06/2014	381.01	365.60	15.41	
		07/14/2014	381.01	387.10	-6.09	
		09/22/2014	381.01	NM	-----	Pumping
		12/19/2014	381.01	374.40	6.61	
	02N21W11J03S	03/10/2014	379.39	431.10	-51.71	
		06/10/2014	379.39	441.20	-61.81	
		09/17/2014	379.39	450.70	-71.31	
		12/22/2014	379.39	432.90	-53.51	
	02N21W11J04S	03/10/2014	379.39	385.20	-5.81	
		06/10/2014	379.39	388.50	-9.11	
		09/17/2014	379.39	391.30	-11.91	
		12/22/2014	379.39	389.40	-10.01	
	02N21W11J05S	03/10/2014	379.39	210.40	168.99	
		06/10/2014	379.39	210.30	169.09	
		09/17/2014	379.39	212.90	166.49	
		12/22/2014	379.39	210.20	169.19	
	02N21W11J06S	03/10/2014	379.39	179.70	199.69	
		06/10/2014	379.39	178.70	200.69	
		09/17/2014	379.39	179.40	199.99	
		12/22/2014	379.39	180.20	199.19	
	02N21W12H01S*	03/10/2014	417.89	459.80	-41.91	
		06/10/2014	417.89	NM	-----	Special
		09/22/2014	417.89	NM	-----	Pumping
		12/19/2014	417.89	557.20	-139.31	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
West Las Posas	02N21W15M03S	03/06/2014	263.87	265.10	-1.23	
		06/09/2014	263.87	280.8	-16.93	
		09/15/2014	263.87	284.20	-20.33	
		12/11/2014	263.87	275.60	-11.73	
	02N21W16J01S	03/06/2014	259.90	12.90	247.00	
		06/09/2014	259.90	15.75	244.15	
		09/15/2014	259.90	15.80	244.10	
		12/11/2014	259.90	16.20	243.70	
	03N21W35P02S	03/05/2014	564.11	502.90	61.21	
		06/09/2014	564.11	514.00	50.11	
		07/14/2014	564.11	520.90	43.21	
		12/11/2014	564.11	504.50	59.61	
Little Cuddy Valley	08N20W08B01S	04/17/2014	5,300.00	10.50	5,289.50	
		09/08/2014	5,300.00	16.90	5,283.10	
Lockwood Valley	08N21W33R03S	04/17/2014	5,150.00	44.30	5,105.70	
		09/08/2014	5,150.00	NM	-----	Special
	08N21W35B01S*	04/17/2014	5,029.20	NM	-----	Dry
		09/08/2014	5,029.20	NM	-----	Special
	08N21W36G02S	04/17/2014	4,922.00	NM	-----	Special
		09/08/2014	4,922.00	NM	-----	Special
Mound	02N22W08P01S	03/13/2014	213.79	164.50	49.29	
		06/17/2014	213.79	169.10	44.69	
		09/04/2014	213.79	NM	-----	Pumping
		12/08/2014	213.79	173.70	40.09	
	02N22W09L03S	03/11/2014	251.25	189.70	61.55	
		06/17/2014	251.25	199.40	51.85	
		09/04/2014	251.25	195.85	55.40	
		12/08/2014	251.25	195.58	55.67	
	02N22W09L04S	03/11/2014	251.25	175	76.25	
		06/17/2014	251.25	178.73	72.52	
		09/04/2014	251.25	179.87	71.38	
		12/08/2014	251.25	184.40	66.85	
	02N22W16K01S	03/11/2014	149.37	160.70	-11.33	
		06/17/2014	149.37	166.80	-17.43	
		09/04/2014	149.37	172.45	-23.08	
		12/08/2014	149.37	173.52	-24.15	
	02N23W13K03S	03/11/2014	68.71	NM	-----	Pumping
		06/11/2014	68.71	72.00	-3.29	
		09/04/2014	68.71	NM	-----	Pumping
		12/08/2014	68.71	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
Ojai Valley	04N22W04Q01S	03/17/2014	1,045.50	NM	-----	Pumping
		06/24/2014	1,045.50	NM	-----	Pumping
		09/18/2014	1,045.50	NM	-----	Pumping
		12/17/2014	1,045.50	103.9	941.6	
	04N22W05D03S	03/17/2014	895.97	NM	-----	Tape Hung Up
		06/04/2014	895.97	236.20	659.77	
		09/18/2014	895.97	NM	-----	Tape Hung Up
		12/23/2014	895.97	NM	-----	Tape Hung Up
	04N22W05H04S	03/17/2014	950.22	NM	-----	Pumping
		06/13/2014	950.22	287.20	663.02	
		09/23/2014	950.22	307.20	643.02	
		12/23/2014	950.22	309.00	641.22	
	04N22W05L08S*	03/17/2014	892.09	NM	-----	Pumping
		06/13/2014	892.09	226.15	665.94	
		09/18/2014	892.09	NM	-----	Pumping
		12/19/2014	892.09	237.10	654.99	
	04N22W05M01S	03/17/2014	843.47	NM	-----	Pumping
		06/24/2014	843.47	187.90	655.57	
		09/18/2014	843.47	197.50	645.97	
		12/05/2014	843.47	197.80	645.67	
	04N22W06D01S	03/17/2014	846.66	142.70	703.96	
		06/04/2014	846.66	143.80	702.86	
		09/09/2014	846.66	146.80	699.86	
		12/23/2014	846.66	149.10	697.56	
	04N22W06D05S	03/11/2014	853.21	161.90	691.31	
		06/04/2014	853.21	148.50	704.71	
		09/09/2014	853.21	155.80	697.41	
		12/18/2014	853.21	164.70	688.51	
	04N22W06K03S	03/07/2014	801.80	155.00	646.80	
		12/08/2014	801.80	179.00	622.80	
	04N22W06K12S	03/19/2014	812.70	194.60	618.10	
		06/03/2014	812.70	204.50	608.20	
		09/09/2014	812.70	211.70	601.00	
		12/17/2014	812.70	182.90	629.80	
	04N22W06M01S	03/11/2014	794.78	94.90	699.88	
		06/04/2014	794.78	95.80	698.98	
		09/09/2014	794.78	96.10	698.68	
		12/05/2014	794.78	96.80	697.98	
	04N22W07B02S	03/05/2014	773.77	NM	-----	Pumping
		06/02/2014	773.77	142.80	630.97	
		09/09/2014	773.77	151.00	622.77	
		12/05/2014	773.77	140.60	633.17	

* - 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	04N22W07G01S	03/05/2014	771.20	NM	-----	Tape Hung Up
		06/02/2014	771.20	86.20	685.00	
		09/09/2014	771.20	92.6	678.6	
		12/17/2014	771.20	97.50	673.70	
	04N22W08B02S	03/17/2014	870.57	NM	-----	Pumping
		06/24/2014	870.57	197.50	673.07	
		09/18/2014	870.57	NM	-----	Pumping
		12/23/2014	870.57	208.70	661.87	
	04N23W01K02S	03/11/2014	786.38	52.60	733.78	
		06/04/2014	786.38	73.50	712.88	
		09/09/2014	786.38	71.70	714.68	
		12/05/2014	786.38	61.40	724.98	
	04N23W02K01S	03/11/2014	869.49	2.40	867.09	
		06/04/2014	869.49	NM	-----	Special
		09/16/2014	869.49	11.80	857.69	
		12/18/2014	869.49	3.60	865.89	
	04N23W12H02S	03/19/2014	716.61	42.80	673.81	
		06/24/2014	716.61	46.40	670.21	
		09/23/2014	716.61	50.40	666.21	
		12/18/2014	716.61	49.90	666.71	
	04N23W12L02S	03/19/2014	682.50	NM	-----	Tape Hung Up
		06/03/2014	682.50	NM	-----	Tape Hung Up
		09/11/2014	682.50	NM	-----	Tape Hung Up
		12/18/2014	682.50	NM	-----	Tape Hung Up
	05N22W32J02S	03/17/2014	1,139.80	56.40	1,083.40	
		06/24/2014	1,139.80	59.90	1,079.90	
		09/18/2014	1,139.80	60.90	1,078.90	
		12/19/2014	1,139.80	55.90	1,083.90	
Oxnard Plain Forebay	02N21W07P04S	03/19/2014	138.78	NM	-----	Pumping
		06/23/2014	138.78	172.7	-33.92	
		09/22/2014	138.78	180.00	-41.22	
		12/22/2014	138.78	167.40	-28.62	
	02N22W11A01S	03/10/2014	133.44	89.20	44.24	
		06/17/2014	133.44	99.2	34.24	
		09/02/2014	133.44	105.17	28.27	
		12/08/2014	133.44	99.05	34.39	
	02N22W26E01S	03/13/2014	86.96	85.70	1.26	
		06/12/2014	86.96	89.90	-2.94	
		09/05/2014	86.96	95.2	-8.24	
		12/08/2014	86.96	99.00	-12.04	

* - 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	01N21W04N02S	03/12/2014	43.33	136.50	-93.17	
		06/11/2014	43.33	175.90	-132.57	
		09/04/2014	43.33	188.60	-145.27	
		12/10/2014	43.33	163.40	-120.07	
	01N21W05A02S	03/11/2014	51.54	38.40	13.14	
		06/11/2014	51.54	43.00	8.54	
		09/04/2014	51.54	46.20	5.34	
		12/10/2014	51.54	47.85	3.69	
	01N21W06L04S	03/12/2014	47.85	50.80	-2.95	
		06/26/2014	47.85	58.35	-10.50	
		09/03/2014	47.85	62.35	-14.50	
		12/09/2014	47.85	62.90	-15.05	
	01N21W07H01S*	03/11/2014	40.87	41.10	-0.23	
		06/11/2014	40.87	47.20	-6.33	
		09/03/2014	40.87	51.75	-10.88	
		12/09/2014	40.87	51.83	-10.96	
	01N21W09C04S	03/12/2014	39.96	NM	-----	Pumping
		06/11/2014	39.96	167.3	-127.34	
		08/13/2014	39.96	159.6	-119.64	
		12/10/2014	39.96	157.5	-117.54	
	01N21W16M01S	03/11/2014	22.79	115.40	-92.61	
		06/11/2014	22.79	152.08	-129.29	
		09/03/2014	22.79	158.80	-136.01	
		12/09/2014	22.79	135.83	-113.04	
	01N21W16P03S	03/11/2014	19.39	109.50	-90.11	
		06/25/2014	19.39	145.00	-125.61	
		09/03/2014	19.39	157.75	-138.36	Nearby Pumping
		12/09/2014	19.39	139.20	-119.81	
	01N21W17D02S	03/11/2014	28.21	35.00	-6.79	
		06/11/2014	28.21	39.00	-10.79	
		09/03/2014	28.21	44.65	-16.44	
		12/09/2014	28.21	42.67	-14.46	
	01N21W21N01S	03/11/2014	15.74	84.60	-68.86	
		06/11/2014	15.74	96.90	-81.16	
		09/04/2014	15.74	100.75	-85.01	
		12/09/2014	15.74	104.58	-88.84	
	01N21W28D01S	03/11/2014	14.75	92.40	-77.65	
		06/11/2014	14.75	128.00	-113.25	
		10/20/2014	14.75	147.4	-132.65	
		12/09/2014	14.75	116.58	-101.83	
	01N21W29B03S	03/11/2014	18.19	0.00	18.19	
		06/25/2014	18.19	NM	-----	Pumping
		09/04/2014	18.19	NM	-----	Pumping
		12/09/2014	18.19	35.4	-17.21	

* - 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	01N21W32K01S*	03/13/2014	10.00	85.50	-75.50	
		06/16/2014	10.00	106.60	-96.60	
		09/15/2014	10.00	111.30	-101.30	
		12/08/2014	10.00	106.30	-96.30	
	01N22W12N03S	03/13/2014	38.46	96.33	-57.87	
		06/12/2014	38.46	118.75	-80.29	
		09/03/2014	38.46	120.8	-82.34	
		12/11/2014	38.46	122.30	-83.84	
	01N22W12R01S	03/13/2014	34.00	NM	-----	Special
		06/25/2014	34.00	NM	-----	Special
		09/04/2014	34.00	NM	-----	Special
		12/11/2014	34.00	NM	-----	Special
	01N22W14K01S	03/11/2014	33.97	NM	-----	Special
		06/11/2014	33.97	NM	-----	Special
		09/04/2014	33.97	NM	-----	Special
		12/09/2014	33.97	NM	-----	Special
	01N22W21B03S	03/11/2014	15.28	33.90	-18.62	
		06/11/2014	15.28	43.30	-28.02	
		09/04/2014	15.28	46.20	-30.92	
		12/09/2014	15.28	45.30	-30.02	
	01N22W24C02S	03/11/2014	29.10	35.40	-6.30	
		06/11/2014	29.10	43.50	-14.40	
		09/04/2014	29.10	46.00	-16.90	
		12/08/2014	29.10	44.35	-15.25	
	01N22W26K03S	03/11/2014	13.06	NM	-----	Pumping
		06/11/2014	13.06	NM	-----	Pumping
		09/04/2014	13.06	NM	-----	Pumping
		12/08/2014	13.06	83.40	-70.34	
	01N22W26M03S	03/11/2014	13.00	0.00	13.00	
		06/11/2014	13.00	0.00	13.00	
		10/16/2014	13.00	96.27	-83.27	
		12/08/2014	13.00	75.8	-62.8	
	01N22W36B02S	03/11/2014	11.50	NM	-----	Pumping
		06/11/2014	11.50	NM	-----	Pumping
		09/04/2014	11.50	NM	-----	Pumping
		12/09/2014	11.50	NM	-----	Pumping
	02N21W18H03S	03/26/2014	118.41	117.40	1.01	
		06/30/2014	118.41	130.00	-11.59	
		09/09/2014	118.41	120.80	-2.39	
		12/08/2014	118.41	121.8	-3.39	
	02N21W18H12S	03/26/2014	117.88	137.65	-19.77	
		06/29/2014	117.88	216.90	-99.02	
		09/09/2014	117.88	151.25	-33.37	
		12/08/2014	117.88	140.6	-22.72	

* - 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	02N21W19A03S	03/05/2014	102.70	106.50	-3.80	
		06/09/2014	102.70	122.10	-19.40	
		09/15/2014	102.70	126.20	-23.50	
		12/11/2014	102.70	128.40	-25.70	
	02N21W19B02S	03/26/2014	101.80	91.7	10.1	
		06/12/2014	101.80	95.40	6.40	
		09/05/2014	101.80	99.83	1.97	
		12/08/2014	101.80	103.6	-1.8	
	02N21W20F02S	03/05/2014	113.36	136.00	-22.64	
		07/14/2014	113.36	148.90	-35.54	
		09/15/2014	113.36	162.10	-48.74	
		12/11/2014	113.36	156.30	-42.94	
	02N21W20M06S	03/13/2014	92.09	130.00	-37.91	
		06/12/2014	92.09	136.50	-44.41	
		09/05/2014	92.09	NM	-----	Pumping
		12/08/2014	92.09	NM	-----	Pumping
	02N21W31P02S	03/13/2014	57.75	56.50	1.25	
		06/11/2014	57.75	63.10	-5.35	
		09/03/2014	57.75	67.80	-10.05	
		12/09/2014	57.75	68.25	-10.50	
	02N21W31P03S	03/13/2014	55.17	140.05	-84.88	
		06/11/2014	55.17	161.96	-106.79	
		09/03/2014	55.17	162.20	-107.03	
		12/09/2014	55.17	148.94	-93.77	
	02N22W24P01S	03/13/2014	94.30	97.00	-2.70	
		06/12/2014	94.30	106.55	-12.25	
		09/05/2014	94.30	NM	-----	Pumping
		12/08/2014	94.30	NM	-----	Pumping
	02N22W30K01S	03/11/2014	42.38	45.95	-3.57	
		06/11/2014	42.38	57.50	-15.12	
		09/04/2014	42.38	62.82	-20.44	
		12/09/2014	42.38	57.80	-15.42	
	02N22W31A01S	03/11/2014	42.30	43.05	-0.75	
		06/11/2014	42.30	52.62	-10.32	
		09/04/2014	42.30	58.67	-16.37	
		12/09/2014	42.30	55.23	-12.93	
	02N22W32Q03S	03/11/2014	40.10	NM	-----	Pumping
		06/11/2014	40.10	49.9	-9.8	
		09/04/2014	40.10	NM	-----	Special
		12/09/2014	40.10	54.80	-14.70	
	02N23W25G02S	03/11/2014	23.22	NM	-----	Special
		06/11/2014	23.22	NM	-----	Special
		09/04/2014	23.22	NM	-----	Special
		12/09/2014	23.22	37.6	-14.38	

* - 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	02N23W36C04S	03/11/2014	27.73	31.70	-3.97	
		06/11/2014	27.73	NM	-----	Tape Hung Up
		09/04/2014	27.73	NM	-----	Tape Hung Up
		12/09/2014	27.73	NM	-----	Tape Hung Up
Piru	04N18W19R01S	03/10/2014	655.63	130.30	525.33	
		06/16/2014	655.63	133.7	521.93	
		09/02/2014	655.63	NM	-----	Pumping
		12/01/2014	655.63	145.7	509.93	
	04N18W20R01S	03/10/2014	661.29	NM	-----	Pumping
		06/16/2014	661.29	NM	-----	Pumping
		09/02/2014	661.29	NM	-----	Pumping
		12/01/2014	661.29	NM	-----	Pumping
	04N18W28C02S	03/10/2014	676.44	NM	-----	Pumping
		06/16/2014	676.44	NM	-----	Pumping
		09/02/2014	676.44	NM	-----	Pumping
		12/01/2014	676.44	NM	-----	Pumping
	04N19W25C02S*	03/10/2014	611.09	102.20	508.89	
		06/16/2014	611.09	106.40	504.69	
		09/02/2014	611.09	113.00	498.09	
		12/01/2014	611.09	117.30	493.79	
	04N19W25K04S	03/10/2014	593.97	NM	-----	Pumping
		06/16/2014	593.97	NM	-----	Pumping
		09/02/2014	593.97	NM	-----	Pumping
		12/01/2014	593.97	41	552.97	
	04N19W26P01S	03/10/2014	563.00	58.9	504.1	
		06/16/2014	563.00	NM	-----	Pumping
		09/02/2014	563.00	NM	-----	Pumping
		12/01/2014	563.00	72.15	490.85	
	04N19W34K01S	03/10/2014	519.51	28.79	490.72	
		06/16/2014	519.51	NM	-----	Special
		09/02/2014	519.51	NM	-----	Special
		12/01/2014	519.51	40.4	479.11	
	04N19W35L02S	03/10/2014	541.08	NM	-----	Special
		06/16/2014	541.08	45.20	495.88	
		09/02/2014	541.08	NM	-----	Special
		12/01/2014	541.08	53.70	487.38	
Pleasant Valley	01N21W02J02S	03/12/2014	89.51	75.85	13.66	
		06/12/2014	89.51	92.99	-3.48	
		09/03/2014	89.51	107.60	-18.09	
		12/10/2014	89.51	89.60	-0.09	
	01N21W02P01S	03/12/2014	67.98	117.12	-49.14	
		06/12/2014	67.98	147.90	-79.92	
		09/03/2014	67.98	149.40	-81.42	
		12/10/2014	67.98	146.74	-78.76	

* - 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*	03/11/2014	72.28	147.10	-74.82	
		06/12/2014	72.28	179.70	-107.42	
		09/09/2014	72.28	NM	-----	Tape Hung Up
		12/10/2014	72.28	185.30	-113.02	
	01N21W04K01S	03/12/2014	47.52	132.00	-84.48	
		06/12/2014	47.52	168.95	-121.43	
		09/04/2014	47.52	NM	-----	Pumping
		12/10/2014	47.52	160.15	-112.63	
	01N21W09J03S	03/13/2014	30.56	114.60	-84.04	
		06/19/2014	30.56	149.40	-118.84	
		09/04/2014	30.56	162.30	-131.74	
		12/10/2014	30.56	148.00	-117.44	
	01N21W10G01S	03/12/2014	38.72	122.50	-83.78	
		06/12/2014	38.72	168.33	-129.61	
		10/20/2014	38.72	194	-155.28	
		12/10/2014	38.72	152.05	-113.33	
	01N21W14A01S	03/12/2014	50.11	16.95	33.16	
		06/12/2014	50.11	18.80	31.31	
		09/03/2014	50.11	20.10	30.01	
		12/10/2014	50.11	22.70	27.41	
	01N21W15H01S	03/13/2014	33.17	12.20	20.97	
		06/12/2014	33.17	13.80	19.37	
		09/03/2014	33.17	16.60	16.57	
		12/10/2014	33.17	17.37	15.80	
	01N21W16A04S	03/12/2014	25.69	112.40	-86.71	
		06/12/2014	25.69	147.25	-121.56	
		09/03/2014	25.69	155.42	-129.73	
		12/10/2014	25.69	131.6	-105.91	
	02N20W19M05S	03/12/2014	200.47	140.60	59.87	
		06/13/2014	200.47	148.50	51.97	
		09/04/2014	200.47	155.20	45.27	
		12/08/2014	200.47	157.70	42.77	
	02N21W33P02S	03/11/2014	64.63	115.40	-50.77	
		06/11/2014	64.63	139.30	-74.67	
		09/03/2014	64.63	128.70	-64.07	
		12/10/2014	64.63	136.80	-72.17	
	02N21W35M02S	03/12/2014	90.60	166.27	-75.67	
		06/12/2014	90.60	199.00	-108.40	
		10/20/2014	90.60	211.40	-120.80	
		12/10/2014	90.60	196.50	-105.90	
	02N21W36N01S	03/12/2014	111.18	84.33	26.85	
		06/12/2014	111.18	98.05	13.13	
		09/03/2014	111.18	103.00	8.18	
		12/10/2014	111.18	99.17	12.01	

* - 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*	03/10/2014	184.38	40.50	143.88	
		06/17/2014	184.38	45.58	138.80	
		09/02/2014	184.38	47.33	137.05	
		12/01/2014	184.38	47.70	136.68	
	02N22W03K02S	03/11/2014	248.75	124.70	124.05	
		06/17/2014	248.75	133.55	115.20	
		09/04/2014	248.75	133.80	114.95	
		12/08/2014	248.75	134.70	114.05	
	02N22W03M02S	03/11/2014	291.50	200.30	91.20	
		06/17/2014	291.50	203.48	88.02	
		09/04/2014	291.50	204.80	86.70	
		12/08/2014	291.50	207.70	83.80	
	03N21W09K02S	03/11/2014	362.18	NM	-----	Pumping
		06/17/2014	362.18	187.67	174.51	
		09/02/2014	362.18	NM	-----	Special
		12/01/2014	362.18	188.2	173.98	
	03N21W17Q01S	03/10/2014	283.35	110.25	173.10	
		06/17/2014	283.35	110.80	172.55	
		09/02/2014	283.35	114.73	168.62	
		12/01/2014	283.35	113.7	169.65	
	03N21W19R01S	03/10/2014	235.39	69.00	166.39	
		06/17/2014	235.39	74.6	160.79	
		09/02/2014	235.39	78.40	156.99	
		12/01/2014	235.39	77.65	157.74	
	03N21W30F01S	03/10/2014	221.21	69.00	152.21	
		06/17/2014	221.21	73.8	147.41	
		09/02/2014	221.21	NM	-----	Pumping
		12/01/2014	221.21	NM	-----	Pumping
	03N22W34R01S	03/11/2014	266.61	127.55	139.06	
		06/17/2014	266.61	NM	-----	Pumping
		09/04/2014	266.61	NM	-----	Pumping
		12/08/2014	266.61	132.50	134.11	
	03N22W36K05S	03/10/2014	180.89	39.00	141.89	
		06/17/2014	180.89	43.10	137.79	
		09/02/2014	180.89	46.50	134.39	
		12/01/2014	180.89	45.30	135.59	
Sherwood	01N19W19L02S	03/18/2014	1,082.00	268.90	813.10	
		06/05/2014	1,082.00	NM	-----	Special
		09/10/2014	1,082.00	NM	-----	Special
		12/15/2014	1,082.00	NM	-----	Special
	01N19W30A01S	03/18/2014	999.98	58.70	941.28	
		06/05/2014	999.98	61.8	938.18	
		09/10/2014	999.98	84.50	915.48	
		12/15/2014	999.98	57.70	942.28	

* - 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	02N18W04R02S	03/12/2014	870.00	48.60	821.40	
		06/13/2014	870.00	52.00	818.00	
		09/05/2014	870.00	51.55	818.45	
		12/11/2014	870.00	50.42	819.58	
	02N18W10A02S*	03/01/2014	926.40	82.10	844.30	
		06/01/2014	926.40	84.1	842.3	
		09/01/2014	926.40	80.90	845.50	
		12/01/2014	926.40	79.10	847.30	
Thousand Oaks	01N19W14K04S	03/18/2014	908.79	23.60	885.19	
		06/05/2014	908.79	24.10	884.69	
		09/10/2014	908.79	25.10	883.69	
		12/15/2014	908.79	24.70	884.09	
Tierra Rejada	02N19W10R01S	03/12/2014	619.29	111.10	508.19	
		06/13/2014	619.29	NM	-----	Pumping
		09/05/2014	619.29	121.3	497.99	
		12/11/2014	619.29	122.60	496.69	
	02N19W12M03S	03/12/2014	718.95	89.00	629.95	
		06/13/2014	718.95	89.65	629.3	
		09/05/2014	718.95	NM	-----	Pumping
		12/11/2014	718.95	91.20	627.75	
	02N19W14P01S	03/12/2014	678.12	NM	-----	Special
		06/13/2014	678.12	NM	-----	Pumping
		09/05/2014	678.12	NM	-----	Special
		12/11/2014	678.12	41.6	636.52	
Undefined	01N19W15E01S	03/18/2014	903.53	26.20	877.33	
		06/05/2014	903.53	27.20	876.33	
		09/10/2014	903.53	27.80	875.73	
		12/15/2014	903.53	26.80	876.73	
	01N20W24H02S	03/18/2014	1,126.54	NM	-----	Tape Hung Up
		06/05/2014	1,126.54	NM	-----	Tape Hung Up
		09/10/2014	1,126.54	NM	-----	Tape Hung Up
		12/15/2014	1,126.54	NM	-----	Tape Hung Up
	02N21W13A01S	04/11/2014	440.00	549.90	-109.90	
		06/09/2014	440.00	533.80	-93.80	
		09/22/2014	440.00	559.20	-119.20	
		12/22/2014	440.00	543.00	-103.00	
	04N22W22K01S	09/08/2014	2,400.00	247.50	2,152.50	
Upper Ojai	04N22W09Q02S	03/17/2014	1,278.80	23.60	1,255.20	
		06/03/2014	1,278.80	27.8	1251	
		09/11/2014	1,278.80	69.5	1209.3	
		12/22/2014	1,278.80	29.00	1,249.80	
	04N22W10K02S	03/17/2014	1,325.90	25.7	1300.2	
		06/03/2014	1,325.90	28.70	1,297.20	
		09/18/2014	1,325.90	36.80	1,289.10	
		12/22/2014	1,325.90	31.1	1294.8	

* - 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	04N22W11P02S	03/17/2014	1,420.60	28.50	1,392.10	
		06/03/2014	1,420.60	32.40	1,388.20	
		09/18/2014	1,420.60	22.40	1,398.20	
		12/22/2014	1,420.60	26.10	1,394.50	
	04N22W12F04S	03/19/2014	1,616.90	NM	-----	Pumping
		06/03/2014	1,616.90	156.60	1,460.30	
		09/24/2014	1,616.90	NM	-----	Pumping
		12/22/2014	1,616.90	170.7	1446.2	
Lower Ventura River	03N23W08B07S	03/05/2014	239.19	14.90	224.29	
		06/02/2014	239.19	15.30	223.89	
		09/09/2014	239.19	19.25	219.94	
		12/05/2014	239.19	22.20	216.99	
	03N23W32Q03S	03/20/2014	50.86	31.5	19.36	
		06/02/2014	50.86	NM	-----	Pumping
		09/23/2014	50.86	32.00	18.86	
		12/22/2014	50.86	NM	-----	Pumping
	03N23W32Q07S	03/20/2014	46.10	26.00	20.10	
		06/02/2014	46.10	NM	-----	Pumping
		09/25/2013	41,905.00	46.10	26.60	19.5
		12/05/2013	41,995.00	NM	-----	Pumping
Upper Ventura River	03N23W05B01S	03/05/2014	293.20	31.20	262.00	
		06/02/2014	293.20	26.90	266.30	
		09/09/2014	293.20	36.70	256.50	
		12/05/2014	293.20	43.40	249.80	
	03N23W08B02S	06/02/2014	249.30	NM	-----	Special
		09/09/2014	249.30	NM	-----	Special
		12/05/2014	249.30	NM	-----	Special
	04N23W03M01S	03/11/2014	760.85	101.60	659.25	
		06/03/2014	760.85	98.70	662.15	
		09/11/2014	760.85	102.60	658.25	
		12/17/2014	760.85	108.80	652.05	
	04N23W04J01S	03/11/2014	713.04	56.50	656.54	
		06/03/2014	713.04	65.60	647.44	
		09/11/2014	713.04	88.20	624.84	
		12/17/2014	713.04	58.90	654.14	
	04N23W09B01S	03/11/2014	662.30	34.50	627.80	
		06/03/2014	662.30	50.10	612.20	
		09/11/2014	662.30	64.40	597.90	
		12/17/2014	662.30	57.75	604.55	
	04N23W14M04S	03/19/2014	554.50	NM	-----	Tape Hung Up
		06/03/2014	554.50	NM	-----	Special
		09/23/2014	554.50	-0.1	554.6	Flowing
		12/23/2014	554.50	NM	-----	Special

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

Basin	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Upper Ventura River	04N23W15A02S	03/17/2014	680.90	82.30	598.60	
		06/03/2014	680.90	88.90	592.00	
		09/11/2014	680.90	90.20	590.70	
		12/18/2014	680.90	90.80	590.10	
	04N23W15D02S	03/11/2014	634.30	65.80	568.50	
		06/03/2014	634.30	150.40	483.90	
		09/16/2014	634.30	151.20	483.10	
		12/18/2014	634.30	161.10	473.20	
	04N23W16C04S*	03/11/2014	569.10	83.00	486.10	
		06/03/2014	569.10	64.10	505.00	
		09/16/2014	569.10	82.70	486.40	
		12/05/2014	569.10	89.10	480.00	
	04N23W16P01S	03/11/2014	619.89	70.10	549.79	
		06/03/2014	619.89	70.10	549.79	
		09/16/2014	619.89	70.75	549.14	
		12/05/2014	619.89	71.80	548.09	
	04N23W20A01S	03/05/2014	488.89	10.60	478.29	
		06/02/2014	488.89	26.40	462.49	
		09/16/2014	488.89	29.70	459.19	
		12/05/2014	488.89	32.50	456.39	
	04N23W28G01S	03/19/2014	402.37	13.20	389.17	
		06/04/2014	402.37	25.90	376.47	
		09/18/2014	402.37	31.10	371.27	
		12/18/2014	402.37	21.70	380.67	
	04N23W29F02S	03/05/2014	396.58	43.70	352.88	
		06/02/2014	396.58	30.70	365.88	
		09/16/2014	396.58	55.64	340.94	
		12/05/2014	396.58	55.20	341.38	
	04N23W33M03S	03/05/2014	331.80	12.40	319.40	
		06/02/2014	331.80	13.10	318.70	
		09/09/2014	331.80	21.75	310.05	
		12/05/2014	331.80	21.20	310.60	
	04N24W13J04S	03/11/2014	626.45	7.10	619.35	
		06/03/2014	626.45	10.75	615.70	
		09/16/2014	626.45	15.55	610.90	
		12/23/2014	626.45	11.75	614.70	
	04N24W13N01S	03/11/2014	642.12	5.75	636.37	
		06/03/2014	642.12	6.70	635.42	
		09/16/2014	642.12	8.20	633.92	
		12/05/2014	642.12	8.20	633.92	
	05N23W33B03S	03/11/2014	829.00	22.10	806.90	
		06/03/2014	829.00	25.60	803.40	
		09/11/2014	829.00	36.00	793.00	
		12/17/2014	829.00	21.90	807.10	
	05N23W33G01S	03/19/2014	816.21	20.80	795.41	
		06/03/2014	816.21	24.50	791.71	
		09/11/2014	816.21	28.10	788.11	
		12/17/2014	816.21	20.70	795.51	

* - Denotes basin key water level well.

Appendix D – Water Quality Section

TABLES Page

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	02N20W25C07S	10/29/2014	0.2	380	95	ND	138	ND	1460	0.2	100	2	87	10	80	87	178	1050	ND	7.3
Arroyo Santa Rosa	02N20W23Q02S	10/29/2014	0.2	370	98	ND	164	10	1580	ND	110	1	84	ND	151	101	139	1110	ND	7.2
Arroyo Santa Rosa	02N19W19P02S	10/29/2014	0.2	340	70	ND	108	ND	1170	0.2	80	1	69	ND	74	67	110	839	ND	7.6
Arroyo Santa Rosa	02N20W23R01S	10/29/2014	0.3	310	88	ND	168	ND	1480	ND	90	1	69	ND	84	119	185	1020	ND	7.4
Arroyo Santa Rosa	02N20W25C06S	10/29/2014	0.3	260	65	ND	140	ND	1180	0.2	80	1	53	ND	21	99	162	802	ND	7.2
Arroyo Santa Rosa	02N19W20N02S	12/11/2014	0.1	320	71	ND	149	20	1290	0.2	40	2	77	ND	28	70	138	855	60	7.8
Cuyama Valley	09N23W30E05S	10/21/2014	0.5	370	71	ND	127	20	1370	1.1	260	3	12	ND	5	215	180	984	20	7.6
Cuyama Valley	08N24W17G02S	10/21/2014	0.4	270	18	ND	87	ND	1260	1	1370	3	2	30	ND	252	130	763	310	8.3
Cuyama Valley	09N24W25J01S	10/21/2014	0.4	380	62	ND	68	20	1260	0.7	500	3	11	ND	3.4	208	118	854	60	7.4
Cuyama Valley	07N23W15P01S	10/21/2014	0.2	210	292	ND	7	ND	2310	1.1	570	4	132	ND	3.3	100	1480	2230	ND	7.5
Fillmore	03N20W01D03S	12/10/2014	0.6	60	130	ND	64	ND	1450	0.6	ND	6	51	ND	14	93	420	838	ND	7.1
Fillmore	03N20W01F05S	12/10/2014	0.5	280	143	ND	59	80	1410	0.6	ND	6	48	ND	11	97	410	1050	100	7.5
Fillmore	04N20W36D07S	12/29/2014	0.6	310	167	ND	66	ND	1550	0.6	100	6	66	160	11	105	540	1270	ND	7.1
Fillmore	03N21W01P08S	12/29/2014	0.3	320	190	ND	54	ND	1440	0.4	100	3	46	570	45	82	460	1200	1230	6.9
Fillmore	04N19W31F01S	12/29/2014	0.6	270	151	ND	71	ND	1450	0.6	370	6	58	50	6.4	102	490	1160	190	7.3
Fillmore	04N20W34H01S	12/30/2014	0.6	290	190	ND	54	20	1440	0.4	100	3	47	ND	43	87	460	1170	450	7.3
Fillmore	03N20W02R05S	12/30/2014	1.5	420	336	ND	200	ND	2850	0.5	130	11	104	20	49	299	1190	2610	ND	6.9
Gillibrand/Tapo	03N18W24H07S	10/22/2014	0.3	350	165	ND	26	ND	1170	ND	1040	4	35	90	0.8	51	340	972	ND	7.0
Gillibrand/Tapo	03N18W24C07S	10/22/2014	0.2	280	156	ND	28	20	1080	ND	90	3	32	ND	10	43	320	872	ND	7.0
Las Posas - East	02N20W16B06S	12/30/2014	0.8	260	156	ND	183	50	1920	0.3	650	6	65	40	3.4	217	580	1470	2730	7.2
Las Posas - East	02N20W09Q05S	12/30/2014	0.8	250	173	ND	186	ND	1920	0.3	120	6	57	60	20	208	560	1460	ND	7.3
Las Posas - East	03N20W36P01S	12/31/2014	ND	170	51	ND	20	ND	460	0.2	ND	1	10	ND	19	29	39	340	70	8.1
Las Posas - East	03N19W29K06S	12/31/2014	ND	90	49	ND	45	10	489	0.2	30	1	8	ND	71	32	26	322	ND	7.1
Las Posas - East	03N19W29K08S	12/31/2014	0.1	210	79	ND	29	ND	697	0.4	90	3	18	ND	15	45	133	532	ND	7.6
Las Posas - East	03N19W30E06S	12/31/2014	ND	190	61	ND	22	40	544	0.3	80	2	12	ND	24	32	61	404	40	7.6
Las Posas - East	02N20W04F01S	12/31/2014	0.1	220	137	ND	73	ND	1060	0.3	750	5	34	380	ND	54	329	852	ND	7.8
Las Posas - South	02N19W07B02S	10/22/2014	1	260	119	ND	165	ND	1860	0.8	100	4	51	10	4.7	227	540	1370	ND	7.2
Las Posas - South	02N19W07D02S	12/11/2014	0.8	280	154	ND	150	ND	1760	0.3	ND	4	38	ND	16	166	430	1240	ND	7.3
Las Posas - South	02N19W08H02S	12/22/2014	0.8	230	157	ND	147	ND	1670	0.3	250	3	44	10	23	169	460	1230	70	7.3
Las Posas - South	02N20W01Q02S	12/31/2014	0.6	250	180	ND	168	ND	1930	0.3	100	5	59	ND	44	181	610	1500	ND	7.7
Las Posas - South	02N20W01Q01S	12/31/2014	0.8	320	173	ND	160	280	1770	0.3	80	3	47	ND	44	175	470	1390	300	7.6

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Las Posas - West	02N21W17F05S	10/22/2014	0.6	320	105	ND	70	ND	1520	1.5	230	6	41	50	1.2	181	460	1190	ND	7.3
Las Posas - West	02N21W15M04S	10/22/2014	0.4	290	104	ND	72	ND	1330	0.3	210	6	36	60	7.8	143	360	1020	ND	7.5
Las Posas - West	02N21W08G04S	11/25/2014	0.4	290	97	ND	69	ND	1250	0.2	320	4	40	30	21	117	280	918	ND	7.1
Las Posas - West	03N20W32K01S	12/31/2014	0.3	360	151	ND	27	ND	1430	0.4	90	5	47	70	ND	115	470	1180	90	7.4
Las Posas - West	03N21W36Q01S	12/31/2014	0.3	290	78	ND	72	10	1030	0.4	150	3	36	ND	59	79	122	740	190	7.8
Little Cuddy Valley	08N20W04N02S	09/08/2014	ND	310	68	ND	13	20	576	0.2	60	2	9	ND	1	43	12	458	20	7.3
Lockwood Valley	08N21W33R03S	09/08/2014	0.8	250	99	ND	22	ND	820	0.3	90	1	24	ND	14	45	157	612	30	7.5
Lockwood Valley	08N21W23Q10S	09/08/2014	13	410	2	20	10	ND	1160	1	40	ND	ND	ND	2.9	296	176	918	ND	9.0
Mound	02N22W07P01S	11/25/2014	0.7	330	407	ND	95	ND	3250	ND	420	10	119	120	64	257	1050	2330	ND	6.9
Mound	02N23W13K03S	11/25/2014	0.8	340	451	ND	170	ND	3710	0.1	200	13	127	170	85	357	1890	3410	ND	7.0
Mound	02N22W09K05S	12/30/2014	0.5	200	141	ND	63	ND	1460	0.2	840	5	25	30	2.3	189	500	1130	130	7.4
North Coast	04N25W25N06S	12/31/2014	0.3	200	116	ND	124	150	1550	0.4	170	2	48	40	11	85	340	926	1650	7.3
North Coast	04N25W35G01S	12/31/2014	0.2	290	87	ND	43	ND	897	0.3	90	3	33	ND	5.1	62	190	713	ND	8.1
Ojai Valley	04N23W12H02S	09/23/2014	ND	300	132	ND	18	ND	916	0.2	200	1	27	ND	28	34	168	708	ND	7.2
Ojai Valley	04N22W06J09S	11/26/2014	0.1	280	123	ND	24	ND	938	0.2	90	1	27	ND	24	37	202	718	ND	6.9
Ojai Valley	04N22W05H04S	11/26/2014	ND	260	125	ND	15	10	926	0.2	180	1	27	ND	17	31	221	697	30	6.9
Ojai Valley	04N22W07C05S	11/26/2014	ND	280	108	ND	51	ND	1020	0.4	80	1	23	50	5	78	210	756	ND	6.9
Ojai Valley	04N23W01J03S	11/26/2014	0.1	310	73	ND	25	ND	971	0.5	60	ND	16	140	ND	118	199	742	ND	7.4
Ojai Valley	04N22W04P05S	11/26/2014	ND	250	117	ND	22	ND	921	0.3	100	1	31	ND	35	42	203	701	ND	7.1
Ojai Valley	04N22W04N02S	11/26/2014	ND	260	133	ND	14	ND	925	0.2	80	1	25	30	36	39	223	731	ND	7.1
Ojai Valley	04N22W07D04S	11/26/2014	ND	270	93	ND	62	ND	914	0.4	170	1	20	520	0.4	67	136	650	ND	7.3
Ojai Valley	05N22W33J01S	11/26/2014	ND	360	222	ND	59	ND	1460	0.3	2640	2	46	460	ND	58	440	1190	280	6.7
Ojai Valley	04N23W01K02S	11/26/2014	ND	380	129	ND	53	80	1110	0.4	410	ND	29	50	3.1	68	180	842	30	7.0
Oxnard Plain Forebay	02N22W27M02S	12/18/2014	1.2	620	310	ND	110	ND	2600	0.3	150	8	110	10	1.9	160	890	2210	ND	7.5
Oxnard Plain Forebay	02N21W07P04S	12/31/2014	0.6	260	137	ND	55	ND	1400	ND	640	5	49	120	0.5	111	490	1110	ND	7.8
Oxnard Plain Forebay	02N22W14H03S	12/31/2014	0.4	40	119	ND	82	ND	1540	0.5	13200	6	48	160	0.9	153	710	1160	ND	8.7
Oxnard Plain Forebay	02N22W14H04S	12/31/2014	0.6	260	145	ND	55	ND	1540	0.6	210	5	49	20	5.8	133	560	1210	ND	7.6
Oxnard Plain Pressure	01N21W04D04S	08/20/2014	0.6	380	65	ND	165	ND	1520	0.2	110	11	27	30	ND	215	202	1070	ND	7.8
Oxnard Plain Pressure	01N21W28H03S	08/20/2014	0.4	310	93	ND	135	ND	1320	ND	240	4	38	90	ND	128	230	938	ND	8.0
Oxnard Plain Pressure	01N21W28D01S	08/20/2014	0.4	250	84	ND	84	ND	1290	0.1	120	6	34	20	ND	120	278	856	ND	7.8

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	01N21W22C01S	08/20/2014	0.4	270	74	ND	126	ND	1430	0.1	170	5	42	40	ND	160	263	940	ND	7.8
Oxnard Plain Pressure	01N21W21K03S	08/20/2014	0.4	250	58	ND	46	ND	1080	ND	410	6	39	80	ND	116	275	790	ND	7.7
Oxnard Plain Pressure	01N21W21H03S	08/20/2014	0.3	300	56	ND	39	ND	990	ND	450	4	31	70	ND	109	185	724	ND	7.9
Oxnard Plain Pressure	01N21W21H02S	08/20/2014	0.4	280	73	ND	106	ND	1210	0.1	160	5	36	20	ND	156	257	913	ND	7.7
Oxnard Plain Pressure	01N21W08R01S	08/20/2014	0.3	270	79	ND	61	ND	1130	0.2	360	6	28	40	ND	115	268	827	ND	7.7
Oxnard Plain Pressure	01N22W03F05S	09/03/2014	0.7	240	144	ND	48	ND	1380	0.4	140	5	48	20	17	102	459	1060	ND	7.2
Oxnard Plain Pressure	01N22W03F07S	09/03/2014	0.7	270	186	ND	63	ND	1610	0.3	210	5	63	30	35	106	536	1260	ND	7.2
Oxnard Plain Pressure	01N21W20K03S	09/03/2014	0.5	260	76	ND	61	ND	1070	ND	140	6	29	50	ND	112	242	786	ND	7.5
Oxnard Plain Pressure	01N21W16M03S	09/03/2014	0.6	290	67	ND	130	ND	1390	0.1	70	7	28	20	ND	200	260	982	ND	7.3
Oxnard Plain Pressure	01N21W06L05S	09/03/2014	0.4	260	88	ND	41	ND	1200	ND	210	7	28	90	ND	129	333	886	30	7.6
Oxnard Plain Pressure	02N22W36E03S	09/03/2014	0.7	250	144	ND	48	ND	1420	0.4	190	5	48	50	ND	107	493	1100	ND	7.3
Oxnard Plain Pressure	02N22W36E04S	09/03/2014	0.9	270	204	ND	57	ND	1860	0.3	100	6	67	ND	56	138	684	1480	ND	7.2
Oxnard Plain Pressure	02N21W19A01S	09/03/2014	0.7	320	298	ND	250	ND	2820	0.2	130	8	115	10	92	207	941	2230	40	7.0
Oxnard Plain Pressure	02N22W36E02S	09/03/2014	0.7	240	141	ND	46	ND	1360	0.4	80	5	45	ND	7.4	101	454	1040	ND	7.3
Oxnard Plain Pressure	02N23W25M01S	11/25/2014	0.6	270	176	ND	49	ND	1650	0.2	100	5	48	410	14	142	370	1070	ND	7.0
Oxnard Plain Pressure	01N22W06B01S	11/25/2014	0.8	280	152	ND	38	ND	1490	0.4	150	5	51	ND	19	102	460	1110	ND	7.1
Oxnard Plain Pressure	01N22W25K02S	12/01/2014	0.6	250	101	ND	38	ND	1100	0.3	1030	5	42	130	ND	92	330	858	ND	7.5
Oxnard Plain Pressure	02N22W25F01S	12/08/2014	0.9	290	254	ND	72	10	2210	0.4	810	7	90	90	13	159	910	1780	70	7.6
Oxnard Plain Pressure	02N22W24P01S	12/08/2014	0.6	230	131	ND	46	ND	1170	0.5	100	4	44	ND	6.4	86	380	927	ND	7.3
Oxnard Plain Pressure	02N21W20M06S	12/08/2014	0.6	260	113	ND	51	ND	1360	0.1	280	4	43	110	1.6	129	400	1000	ND	7.6
Oxnard Plain Pressure	02N22W25A02S	12/08/2014	1	220	243	ND	98	ND	2270	0.4	710	8	84	ND	6	194	900	1750	ND	7.5
Oxnard Plain Pressure	02N22W24R02S	12/08/2014	0.9	250	202	ND	64	ND	1880	0.5	200	6	68	ND	13	157	710	1470	30	7.4
Oxnard Plain Pressure	01N21W21N02S	12/09/2014	0.5	300	148	ND	113	ND	1530	0.2	320	5	51	1080	ND	120	370	1110	ND	7.3
Oxnard Plain Pressure	02N23W25G02S	12/09/2014	0.8	90	324	ND	180	ND	3230	ND	180	10	113	ND	59	328	1440	2540	ND	7.6
Oxnard Plain Pressure	01N21W19J05S	12/09/2014	0.7	320	43	ND	38	310	718	0.2	750	6	23	ND	ND	79	41	550	440	7.9
Oxnard Plain Pressure	01N22W36B02S	12/09/2014	0.5	280	98	ND	94	ND	1250	0.3	280	8	35	110	ND	122	240	877	ND	7.5
Oxnard Plain Pressure	01N21W29B03S	12/09/2014	0.5	290	118	ND	80	ND	1350	0.3	ND	5	40	90	ND	103	350	986	ND	7.2
Oxnard Plain Pressure	01N22W16D04S	12/18/2014	0.7	220	121	ND	37	ND	1160	0.5	650	4	34	110	ND	82	296	794	40	7.8
Oxnard Plain Pressure	01N22W19A01S	12/18/2014	0.6	100	44	ND	37	ND	816	0.4	90	7	20	10	ND	78	236	522	880	8.7
Oxnard Plain Pressure	01N22W21B03S	12/18/2014	0.6	230	139	ND	93	10	1380	0.3	4620	5	35	280	0.6	93	360	956	70	7.8

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	01N22W24C03S	12/30/2014	0.8	240	138	ND	42	ND	1240	0.5	590	5	40	190	0.6	93	410	969	ND	7.4
Oxnard Plain Pressure	01N22W26P02S	12/30/2014	0.4	260	95	ND	40	ND	1110	0.2	520	7	39	80	0.5	104	320	866	ND	7.5
Oxnard Plain Pressure	01N22W26D05S	12/30/2014	0.6	250	127	ND	52	10	1270	0.2	1650	7	41	230	0.4	106	420	1000	ND	7.5
Oxnard Plain Pressure	01N22W24C02S	12/30/2014	0.8	290	170	ND	54	ND	1450	0.5	2810	6	51	430	0.4	110	490	1170	ND	7.2
Oxnard Plain Pressure	01N22W24M03S	12/30/2014	0.7	240	138	ND	88	ND	1270	0.5	1030	4	41	210	ND	94	360	966	30	7.2
Oxnard Plain Pressure	01N22W25K01S	12/30/2014	0.7	250	161	ND	58	ND	1450	0.5	290	5	57	ND	22	107	500	1160	80	7.4
Oxnard Plain Pressure	02N21W20Q05S	12/31/2014	0.6	280	100	ND	66	ND	1300	ND	760	6	35	80	0.4	137	390	1010	ND	7.9
Oxnard Plain Pressure	02N22W36F01S	12/31/2014	0.9	280	188	ND	63	ND	1740	0.6	260	6	68	20	0.6	141	740	1490	50	7.9
Oxnard Plain Pressure	02N22W36F02S	12/31/2014	0.9	280	183	ND	65	ND	1790	0.6	150	6	66	50	7.7	148	750	1510	ND	7.8
Piru	04N18W30A03S	12/30/2014	0.7	310	136	ND	87	ND	1560	0.5	290	7	51	ND	28	155	420	1190	90	7.3
Piru	04N19W25M03S	12/30/2014	0.9	450	325	ND	65	160	2780	0.7	130	7	142	730	38	221	1200	2450	ND	7.0
Piru	04N18W30J04S	12/30/2014	0.5	260	110	ND	85	ND	1310	0.6	210	6	42	ND	31	128	320	983	190	7.3
Piru	04N19W25H01S	12/30/2014	0.7	330	244	ND	109	ND	2010	0.5	110	8	79	ND	77	134	630	1610	ND	7.1
Piru	04N19W34J04S	12/30/2014	0.6	210	109	ND	55	ND	1120	0.7	100	5	43	ND	41	80	290	834	80	7.2
Piru	04N19W26J05S	12/30/2014	1	440	301	ND	63	ND	2540	0.7	130	7	127	690	20	189	1050	2200	ND	7.0
Piru	04N19W26H01S	12/30/2014	0.8	300	160	ND	106	ND	1630	0.6	90	6	66	ND	21	131	460	1250	30	7.2
Pleasant Valley	01N21W03R01S	08/20/2014	0.5	310	261	ND	260	ND	2660	ND	210	6	79	20	42	201	790	1950	ND	7.5
Pleasant Valley	01N21W03K01S	08/20/2014	0.4	230	166	ND	111	ND	1650	0.2	90	4	46	ND	52	112	459	1180	ND	7.5
Pleasant Valley	01N21W10G01S	08/20/2014	0.3	260	182	ND	183	ND	1830	0.1	210	4	57	120	5.6	127	488	1310	ND	7.6
Pleasant Valley	01N21W15D02S	08/20/2014	0.5	300	156	ND	202	ND	1870	0.1	110	5	51	170	0.9	169	415	1300	ND	7.8
Pleasant Valley	01N21W15H01S	08/20/2014	1.7	220	589	ND	780	ND	5760	ND	270	9	221	200	ND	560	2380	4760	ND	7.2
Pleasant Valley	01N21W04K01S	08/20/2014	0.5	300	102	ND	123	ND	1530	0.2	180	5	30	40	ND	173	313	1050	ND	7.8
Pleasant Valley	02N21W34G01S	08/20/2014	0.8	380	98	ND	216	ND	1930	0.2	170	7	33	30	ND	259	330	1320	ND	7.8
Pleasant Valley	01N21W02J01S	09/03/2014	1.9	410	469	ND	330	10	4760	0.1	180	9	154	60	140	611	2070	4190	450	7.0
Pleasant Valley	02N20W29B02S	10/29/2014	0.2	340	75	ND	119	ND	1230	0.4	120	3	53	60	5.6	105	164	865	ND	7.3
Pleasant Valley	02N20W17L01S	12/11/2014	0.6	270	176	ND	156	ND	1960	0.2	80	7	52	270	23	173	530	1390	30	7.1
Pleasant Valley	02N21W34C01S	12/18/2014	0.3	260	97	ND	74	ND	1180	0.3	570	5	27	50	ND	102	250	815	ND	7.7
Pleasant Valley	02N20W19L05S	12/18/2014	0.7	300	235	ND	150	ND	2350	0.1	430	6	68	200	0.9	206	790	1760	ND	7.5
Pleasant Valley	01N20W06C03S	12/30/2014	0.4	190	89	ND	110	ND	1110	0.5	620	4	28	60	2.6	121	250	795	ND	7.5
Pleasant Valley	01N21W10A02S	12/30/2014	0.5	260	372	ND	290	ND	2870	0.2	180	5	108	1510	47	193	1050	2330	2080	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
Santa Paula	02N22W03K02S	12/31/2014	0.5	330	151	ND	69	ND	1430	0.4	600	5	38	120	4.1	123	470	1190	50	8.0
Sherwood	01N20W25F04S	12/15/2014	0.1	240	20	ND	28	ND	563	ND	180	ND	4	20	ND	99	26	417	1100	7.8
Sherwood	01N20W25C07S	12/15/2014	0.1	380	171	ND	208	ND	1570	ND	110	2	57	20	1.3	66	173	1060	1600	7.0
Sherwood	01N19W19H03S	12/15/2014	0.1	320	59	ND	37	ND	863	0.1	350	2	40	30	1.2	56	90	605	260	7.5
Simi Valley	02N18W08K07S	10/22/2014	1	310	294	ND	170	ND	2510	ND	180	5	87	ND	53	187	960	2070	ND	6.8
Simi Valley	02N18W09E01S	10/22/2014	0.9	300	230	ND	130	230	2100	0.5	110	5	78	ND	27	163	770	1700	60	6.8
Simi Valley	02N18W08D04S	10/22/2014	1.1	370	238	ND	180	ND	2390	ND	180	6	85	250	19	206	810	1910	ND	6.8
Thousand Oaks	01N19W08G02S	12/15/2014	0.1	360	132	ND	125	ND	1820	ND	7100	3	113	180	0.6	108	490	1330	50	7.4
Thousand Oaks	01N19W09N01S	12/15/2014	0.2	390	153	ND	180	ND	2000	0.1	1400	4	121	40	ND	120	570	1540	ND	7.4
Tierra Rejada Valley	02N19W10R02S	10/22/2014	0.2	260	55	ND	74	ND	969	ND	80	2	58	ND	10	58	177	694	ND	7.1
Tierra Rejada Valley	02N19W11J03S	10/22/2014	0.2	270	65	ND	68	ND	989	ND	120	1	58	ND	23	54	175	714	90	7.3
Tierra Rejada Valley	02N19W14F01S	10/22/2014	0.1	380	97	ND	86	ND	1300	0.2	80	ND	83	ND	78	47	81	852	ND	7.0
Tierra Rejada Valley	02N19W14P01S	10/22/2014	0.2	410	62	ND	77	ND	1080	0.2	280	1	70	20	44	65	88	818	ND	7.3
Tierra Rejada Valley	02N19W15G01S	10/22/2014	0.1	250	92	ND	116	ND	1100	0.2	70	1	57	ND	66	43	141	766	ND	7.3
Tierra Rejada Valley	02N19W15J02S	10/22/2014	0.2	370	97	ND	136	30	1470	0.3	120	3	83	ND	54	97	230	1070	30	7.1
Tierra Rejada Valley	02N19W14Q02S	10/29/2014	ND	310	45	ND	58	ND	848	ND	130	6	41	80	0.9	69	92	622	60	7.5
Tierra Rejada Valley	02N19W15N03S	10/29/2014	ND	270	68	ND	93	ND	994	0.2	160	2	60	ND	2.8	47	181	724	200	7.5
Tierra Rejada Valley	02N19W10R01S	10/29/2014	ND	300	88	ND	125	ND	1150	ND	120	1	66	20	11	54	158	803	ND	7.6
Tierra Rejada Valley	02N19W14R03S	10/29/2014	0.2	110	42	ND	97	50	715	0.9	60	4	15	ND	7.2	76	110	462	190	7.4
Tierra Rejada Valley	02N19W15B01S	12/11/2014	0.1	270	96	ND	121	ND	1260	0.2	ND	2	65	ND	55	60	180	848	ND	7.2
U N D E F I N E D	02N21W13A01S	12/22/2014	0.1	220	72	ND	12	ND	674	0.2	370	3	20	40	4.3	50	144	526	ND	7.6
Upper Ojai	04N22W12M03S	09/24/2014	ND	230	65	ND	27	ND	701	0.4	60	1	21	30	8.6	45	136	534	ND	7.0
Upper Ojai	04N22W12F04S	09/24/2014	ND	220	90	ND	17	ND	757	0.3	60	1	24	ND	22	29	192	595	ND	7.2
Upper Ojai	04N22W11P02S	09/24/2014	ND	240	35	ND	16	ND	437	ND	2140	1	10	330	ND	39	ND	341	ND	7.5
Ventura River - Lower	02N23W05K01S	12/31/2014	0.9	370	174	ND	253	ND	1990	0.6	3540	12	59	130	6.7	200	450	1530	40	7.3
Ventura River - Upper	04N23W14M04S	09/23/2014	0.2	210	40	ND	28	ND	528	0.6	240	2	11	ND	ND	56	45	393	34500	7.4
Ventura River - Upper	04N23W15A02S	09/23/2014	0.3	190	44	ND	86	30	802	0.8	310	ND	12	100	13	108	119	573	40	7.0
Ventura River - Upper	04N23W09G03S	09/24/2014	0.4	350	130	ND	78	ND	1150	0.3	90	2	37	ND	35	56	197	885	ND	7.5
Ventura River - Upper	04N23W04H01S	09/24/2014	0.6	240	124	ND	66	ND	1060	0.6	80	2	33	ND	19	49	259	793	ND	7.4

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

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
Cuyama Valley	09N23W30E05S	10/21/2014	ND	ND	ND	28.7	ND	ND	1	1.1	ND	ND	7	ND	ND	ND
Cuyama Valley	08N24W17G02S	10/21/2014	ND	ND	ND	23.5	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
Cuyama Valley	07N23W15P01S	10/21/2014	ND	ND	ND	9.6	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
Cuyama Valley	09N24W25J01S	10/21/2014	ND	ND	ND	24.8	ND	ND	1	2.3	ND	ND	7	ND	ND	ND
Fillmore	04N19W31F01S	12/29/2014	ND	ND	ND	20.1	ND	ND	ND	ND	ND	2	4	ND	ND	2
Fillmore	03N21W01P08S	12/29/2014	ND	ND	ND	31.3	ND	ND	1	ND	ND	2	7	ND	ND	ND
Fillmore	03N20W02R05S	12/30/2014	ND	ND	ND	24	ND	0.6	1	ND	ND	4	18	ND	ND	3
Fillmore	04N20W34H01S	12/30/2014	ND	ND	ND	41.8	ND	ND	ND	ND	ND	3	5	ND	ND	ND
Las Posas - East	02N20W09Q05S	12/30/2014	ND	ND	3	25.5	ND	ND	ND	ND	ND	7	11	ND	ND	ND
Las Posas - East	02N20W04F01S	12/31/2014	ND	ND	ND	95.6	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
Las Posas - East	03N20W36P01S	12/31/2014	ND	ND	2	64.1	ND	ND	4	ND	ND	ND	6	ND	ND	14
Las Posas - West	02N21W08G04S	11/25/2014	ND	ND	ND	43.6	ND	ND	1	1.4	ND	ND	21	ND	ND	5
Little Cuddy Valley	08N20W04N02S	09/08/2014	ND	ND	ND	147	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
Lockwood Valley	08N21W33R03S	09/08/2014	ND	ND	ND	28	ND	ND	2	ND	ND	1	6	ND	ND	4
Lockwood Valley	08N21W23Q10S	09/08/2014	ND	ND	65	19.1	ND	ND	ND	ND	0.02	ND	23	ND	ND	125
North Coast	04N25W35G01S	12/31/2014	10	ND	ND	89.3	ND	ND	ND	ND	ND	1	3	ND	ND	2
North Coast	04N25W25N06S	12/31/2014	ND	ND	ND	61.5	ND	ND	1	12	ND	4	4	ND	ND	2
Ojai Valley	04N23W12H02S	09/23/2014	ND	ND	ND	28.5	ND	ND	1	ND	ND	ND	3	ND	ND	ND
Ojai Valley	04N23W01J03S	11/26/2014	ND	ND	ND	24.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ojai Valley	04N22W07C05S	11/26/2014	ND	ND	ND	21.4	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
Ojai Valley	05N22W33J01S	11/26/2014	ND	ND	ND	20.7	ND	ND	ND	4	ND	1	1	ND	ND	ND
Oxnard Plain Forebay	02N22W14H04S	12/31/2014	ND	ND	ND	17.1	ND	ND	ND	ND	ND	1	6	ND	ND	ND
Oxnard Plain Forebay	02N21W07P04S	12/31/2014	ND	ND	ND	22.6	ND	ND	ND	ND	ND	1	2	ND	ND	ND
Oxnard Plain Pressure	01N21W28D01S	08/20/2014	ND	ND	ND	32.8	ND	ND	1	ND	ND	ND	3	ND	ND	ND
Oxnard Plain Pressure	01N21W21K03S	08/20/2014	ND	ND	ND	65	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	01N22W03F07S	09/03/2014	ND	ND	4	28.3	ND	ND	1	0.6	ND	1	17	ND	ND	2

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	01N22W06B01S	11/25/2014	ND	ND	ND	19.7	ND	ND	ND	ND	ND	ND	18	ND	ND	3
Oxnard Plain Pressure	01N22W25K02S	12/01/2014	ND	ND	ND	65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	02N22W24P01S	12/08/2014	ND	ND	2	17.4	ND	0.3	1	ND	ND	ND	10	ND	ND	3
Oxnard Plain Pressure	02N21W20M06S	12/08/2014	ND	ND	3	28.6	ND	ND	ND	ND	0.02	ND	4	ND	ND	ND
Oxnard Plain Pressure	01N21W21N02S	12/09/2014	ND	ND	3	39.7	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
Oxnard Plain Pressure	01N22W16D04S	12/18/2014	20	ND	ND	25.2	ND	ND	ND	1	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	01N22W24C02S	12/30/2014	ND	ND	3	32	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
Oxnard Plain Pressure	02N22W36F02S	12/31/2014	ND	ND	ND	25	ND	0.3	ND	ND	ND	2	24	ND	ND	11
Piru	04N19W26H01S	12/30/2014	ND	ND	ND	22	ND	ND	1	ND	ND	2	4	ND	ND	3
Piru	04N19W26J05S	12/30/2014	ND	ND	3	20.7	ND	1	1	ND	ND	7	303	ND	ND	2
Piru	04N19W25M03S	12/30/2014	ND	ND	3	23.7	ND	1.3	1	ND	ND	8	327	ND	ND	3
Piru	04N19W25H01S	12/30/2014	ND	ND	ND	29.4	ND	0.3	1	ND	ND	2	11	ND	ND	3
Piru	04N18W30J04S	12/30/2014	ND	ND	ND	27	ND	ND	1	1.6	ND	3	4	ND	ND	ND
Piru	04N18W30A03S	12/30/2014	10	ND	ND	30.9	ND	ND	2	ND	ND	2	4	ND	ND	3
Piru	04N19W34J04S	12/30/2014	ND	ND	ND	18.2	ND	ND	ND	ND	ND	1	4	ND	ND	3
Pleasant Valley	01N21W03R01S	08/20/2014	ND	ND	2	41.6	ND	ND	2	ND	ND	1	19	ND	ND	6
Pleasant Valley	01N21W04K01S	08/20/2014	ND	ND	ND	34.4	ND	ND	2	ND	ND	ND	3	ND	ND	ND
Pleasant Valley	01N21W02J01S	09/03/2014	ND	ND	3	24.4	ND	ND	6	6.8	ND	2	25	ND	ND	10
Pleasant Valley	02N20W29B02S	10/29/2014	ND	ND	5	52.4	ND	ND	2	ND	ND	ND	3	ND	ND	20
Pleasant Valley	02N20W19L05S	12/18/2014	ND	ND	ND	43.6	ND	ND	ND	ND	ND	3	5	ND	ND	ND
Pleasant Valley	01N20W06C03S	12/30/2014	20	ND	2	49.3	ND	ND	ND	ND	ND	2	4	ND	ND	3
Sherwood	01N20W25C07S	12/15/2014	ND	ND	ND	53.8	ND	3.1	2	ND	ND	3	3	ND	ND	ND
Sherwood	01N19W19H03S	12/15/2014	ND	5	11	12.2	ND	ND	1	1.9	ND	6	ND	ND	ND	ND
Simi Valley	02N18W08K07S	10/22/2014	ND	ND	3	16	ND	ND	2	ND	ND	ND	50	ND	ND	8
Thousand Oaks	01N19W09N01S	12/15/2014	ND	ND	ND	23.4	ND	ND	1	ND	ND	ND	2	ND	ND	ND
Thousand Oaks	01N19W08G02S	12/15/2014	ND	ND	ND	20.4	ND	ND	1	ND	ND	ND	2	ND	ND	ND
Tierra Rejada Valley	02N19W10R02S	10/22/2014	ND	ND	ND	21.9	ND	ND	2	ND	ND	ND	2	ND	ND	31

Table D-2 Metals (cont.)

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Tierra Rejada Valley	02N19W14P01S	10/22/2014	ND	ND	2	4.4	ND	ND	3	ND	ND	ND	2	ND	ND	82
Tierra Rejada Valley	02N19W10R01S	10/29/2014	10	ND	ND	78.1	ND	ND	3	ND	ND	ND	6	ND	ND	43
Tierra Rejada Valley	02N19W15B01S	12/11/2014	ND	ND	3	83	ND	ND	4	ND	ND	ND	11	ND	ND	29
Upper Ojai	04N22W11P02S	09/24/2014	ND	ND	ND	191	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
Ventura River - Lower	02N23W05K01S	12/31/2014	ND	ND	5	35.4	ND	ND	ND	ND	ND	5	10	ND	ND	ND
Ventura River - Upper	04N23W14M04S	09/23/2014	ND	ND	2	86.7	ND	0.9	ND	122	ND	ND	9	ND	ND	ND
Ventura River - Upper	04N23W15A02S	09/23/2014	40	ND	ND	48.7	ND	ND	ND	2.1	ND	1	3	ND	ND	ND
Ventura River - Upper	04N23W04H01S	09/24/2014	ND	ND	ND	29.9	ND	ND	1	ND	ND	ND	2	ND	ND	ND
Ventura River - Upper	04N23W09G03S	09/24/2014	ND	ND	ND	40.8	ND	ND	2	ND	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	09/08/2014	4.55	1.6		
Lockwood Valley	08N21W33R03S	09/08/2014	3.21	2.1		
Lockwood Valley	08N21W23Q10S	09/08/2014	15.4	3.7		
Piru	04N19W25H01S	12/30/2014	14	3.5	5.67	1.5
Piru	04N18W30A03S	12/30/2014	8.26	2.4	3.14	1.2

* CE – Counting Error

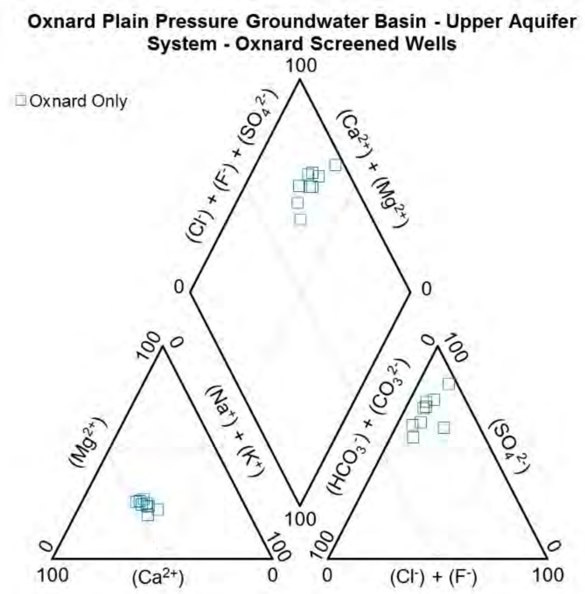

Figure D-1: Oxnard Aquifer piper diagram.

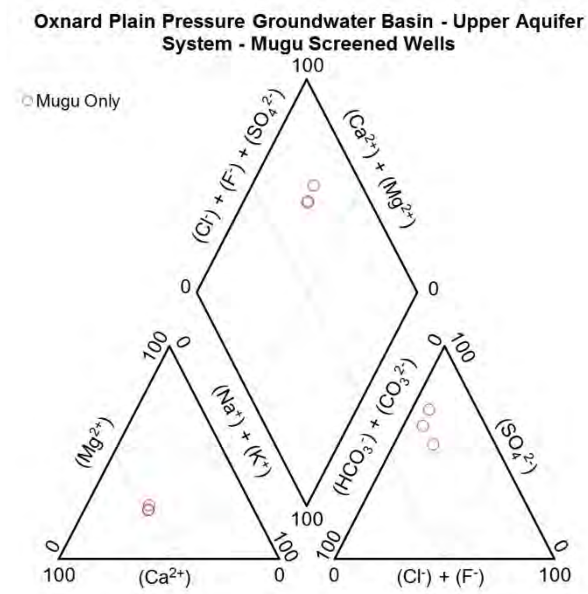

Figure D-2: Mugu Aquifer piper diagram.

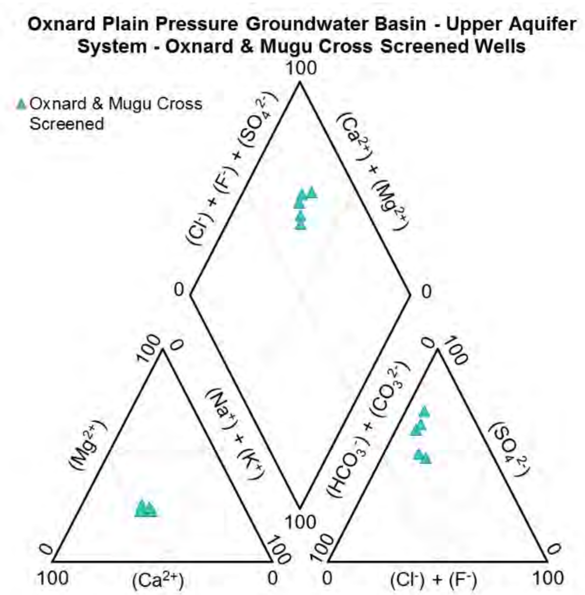

Figure D-3: Oxnard & Mugu Cross Screened piper diagram.

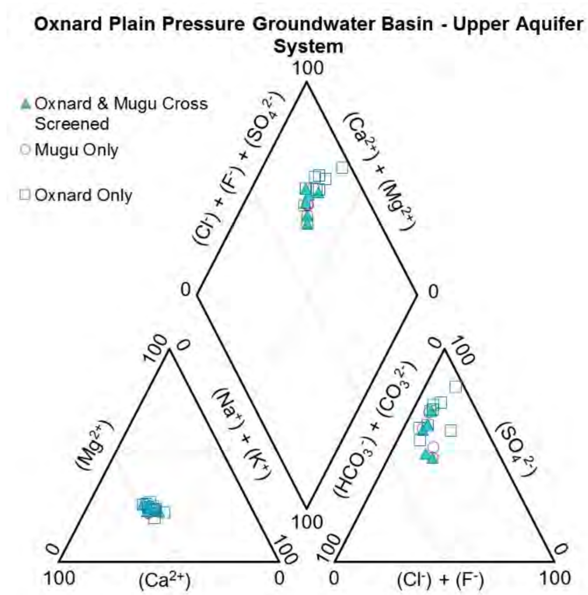

Figure D-4: All Upper Aquifer System piper diagram.

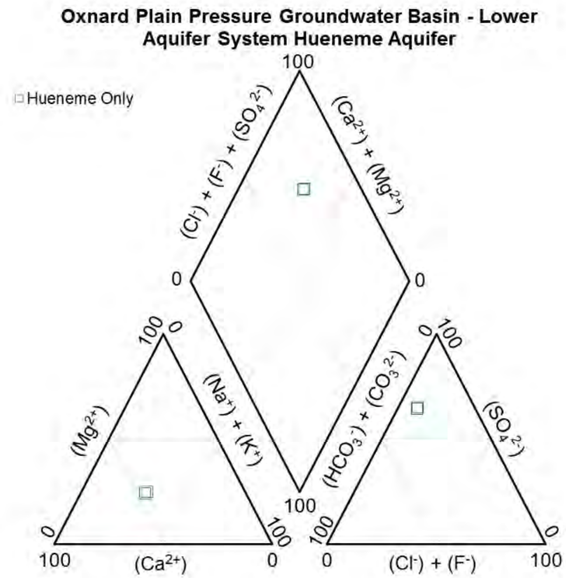

Figure D-5: Hueneme Aquifer piper diagram.

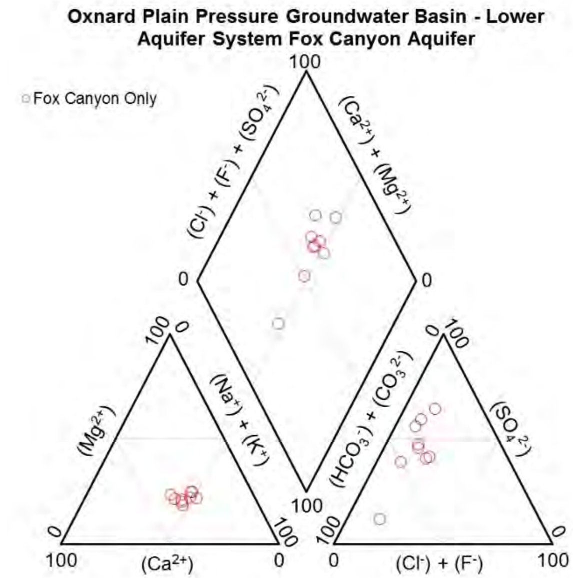

Figure D-6: Fox Canyon Aquifer piper diagram.

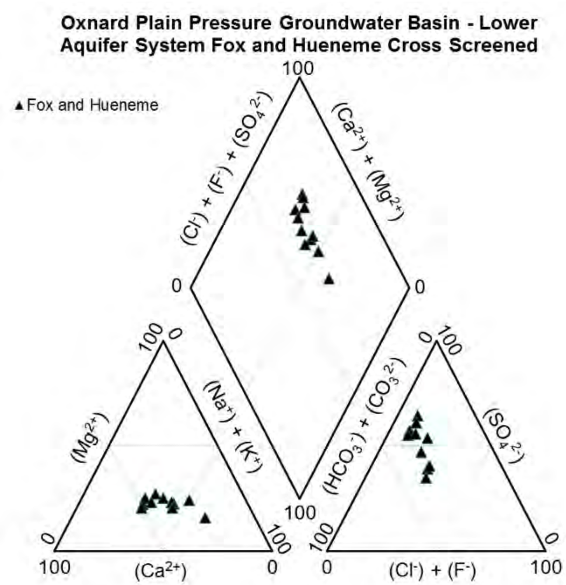

Figure D-7: Fox and Hueneme cross screened piper diagram.

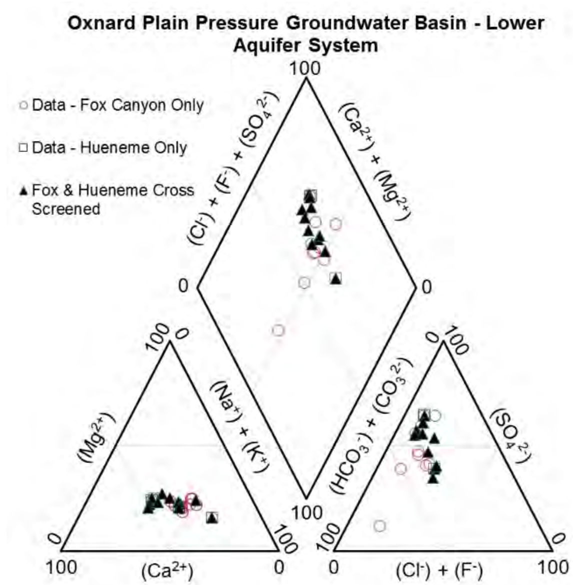

Figure D-8: All Lower Aquifer System piper diagram.

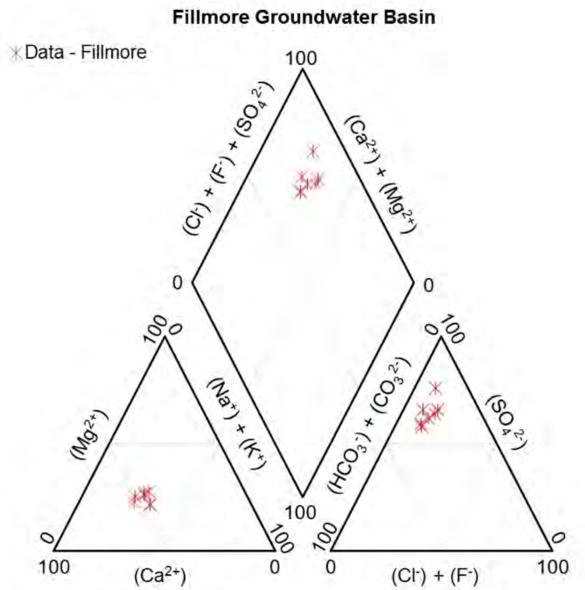

Figure D-9: Fillmore basin piper diagram.

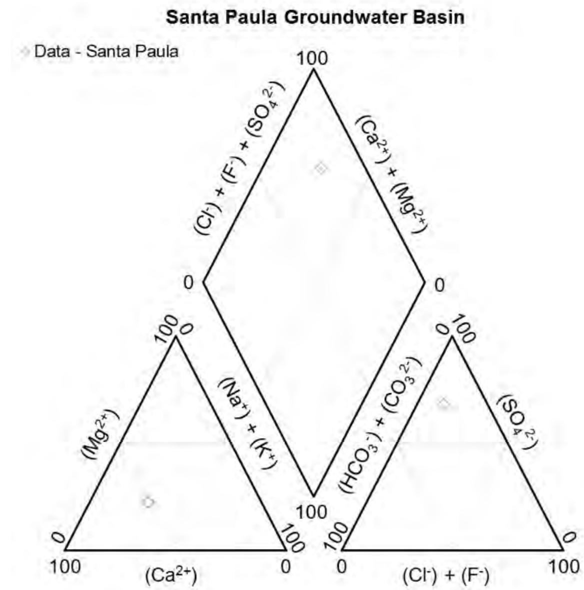

Figure D-10: Santa Paula basin piper diagram.

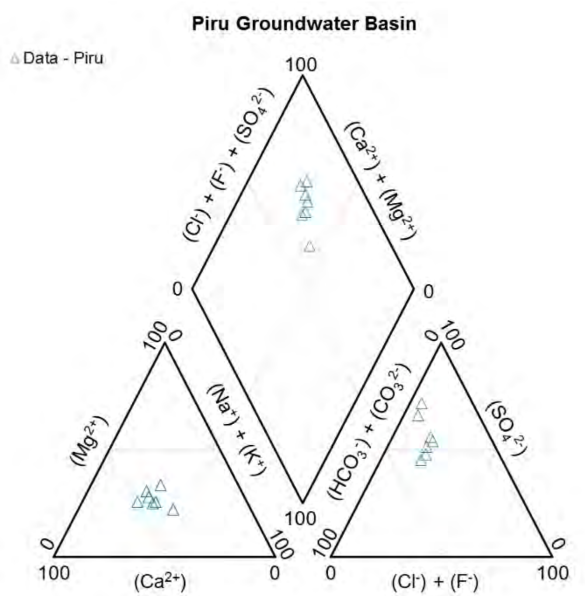

Figure D-11: Piru basin piper diagram.

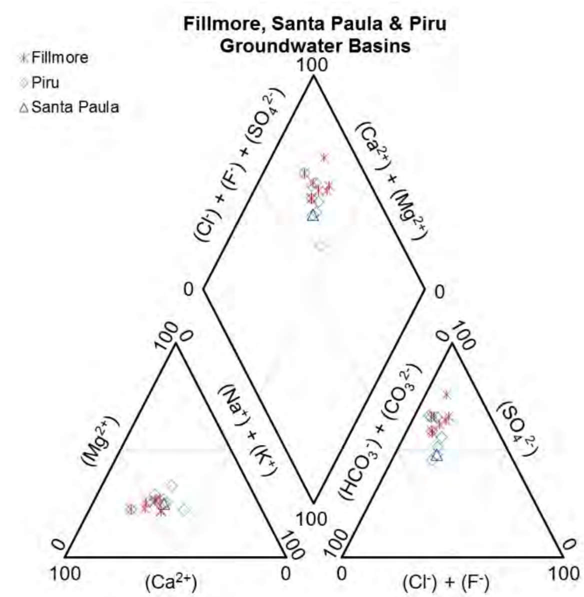

Figure D-12: Fillmore, Piru, and Santa Paula comparison piper diagram.

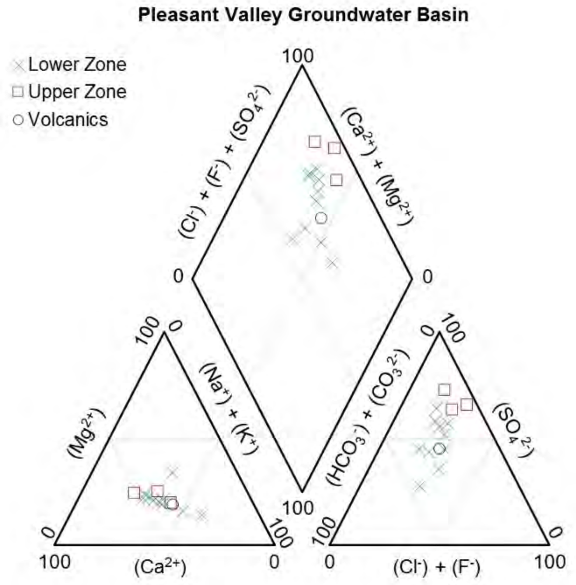

Figure D-13: Pleasant Valley basin piper diagram.

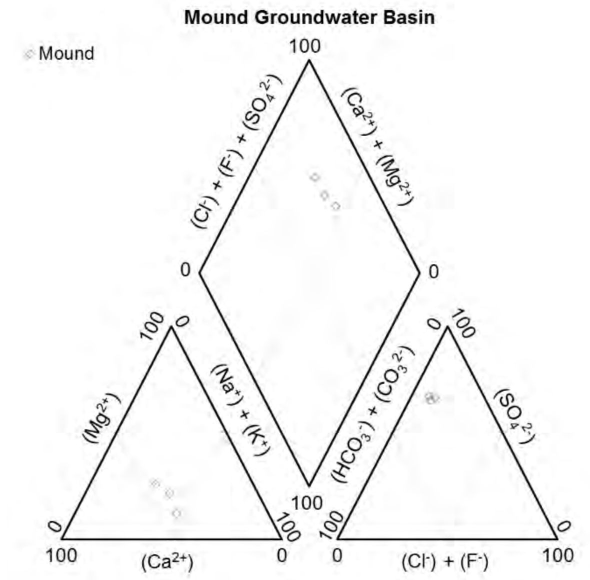

Figure D-14: Mound basin piper diagram.

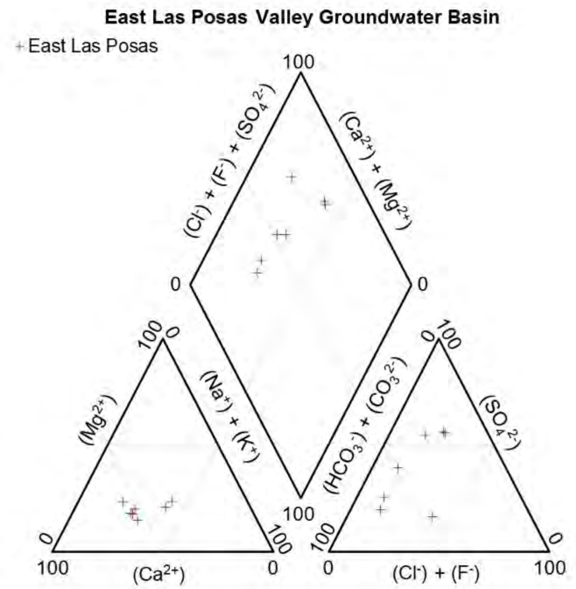

Figure D-15: East Las Posas basin piper diagram.

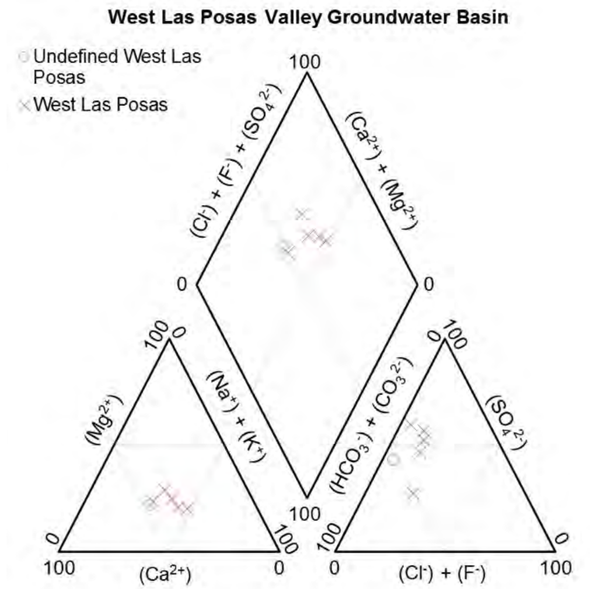

Figure D-16: West Las Posas basin piper diagram.

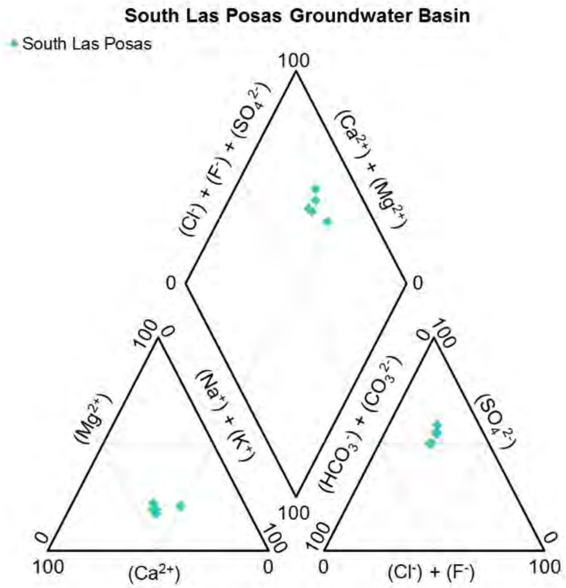

Figure D-17: South Las Posas basin piper diagram.

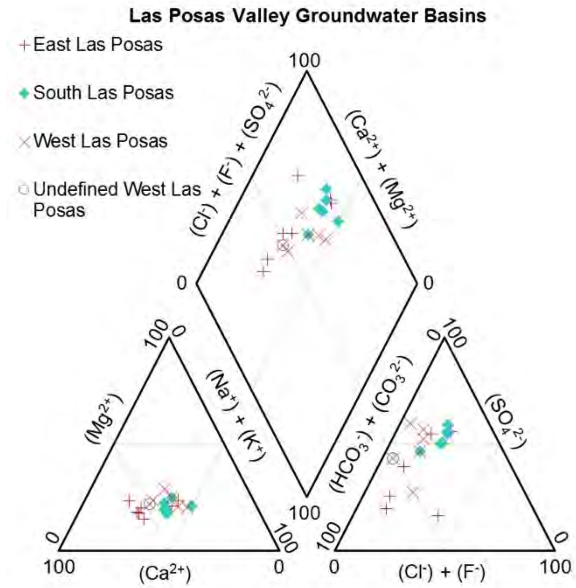

Figure D-18: All Las Posas basins comparison piper diagram.

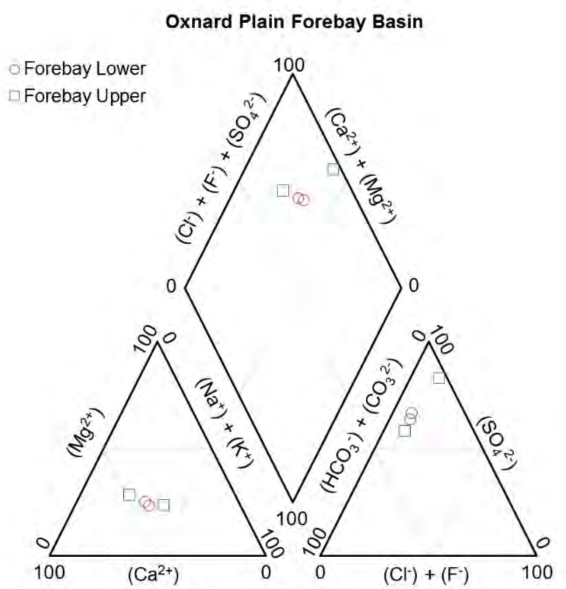

Figure D-19: Oxnard Forebay basin piper diagram.

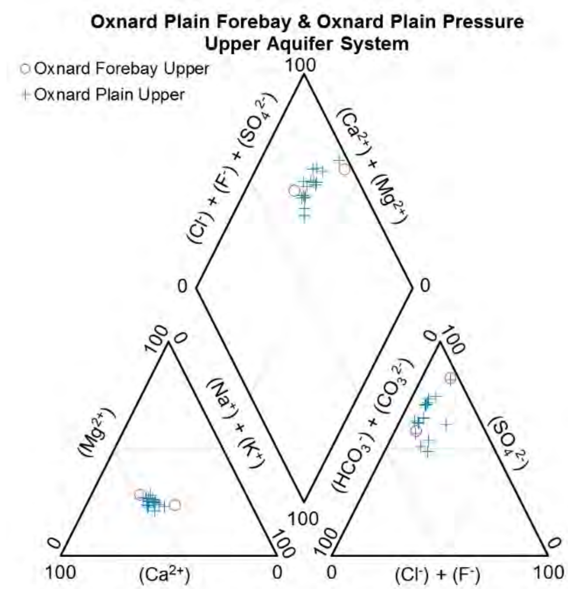

Figure D-20: Oxnard Forebay basin and UAS comparison piper diagram.

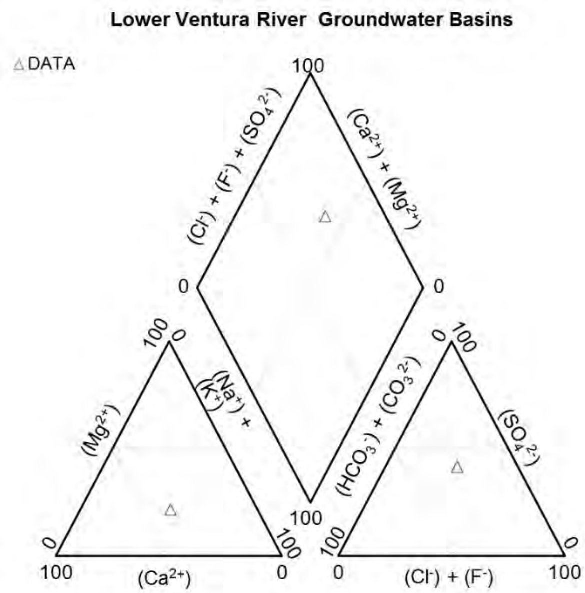

Figure D-21: Lower Ventura River basin piper diagram.

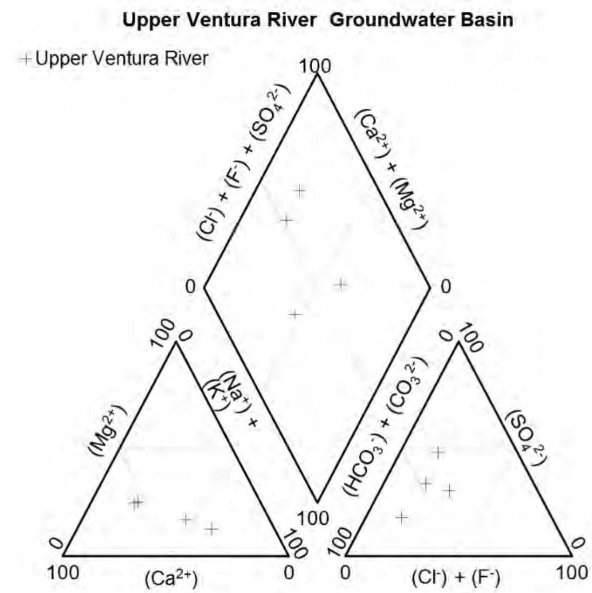

Figure D-22: Upper Ventura River basin piper diagram.

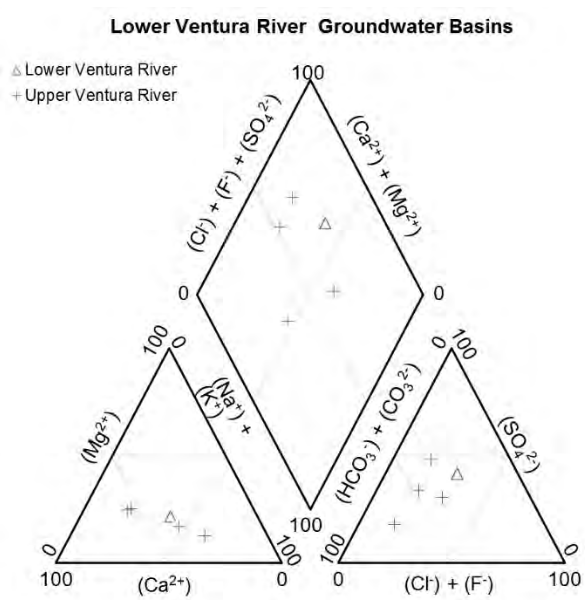

Figure D-23: Upper and Lower Ventura River basins piper diagram.

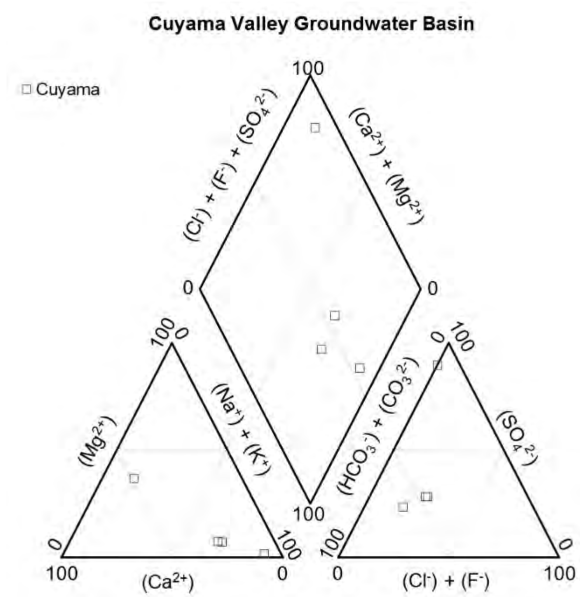

Figure D-24: Cuyama Valley basin piper diagram.

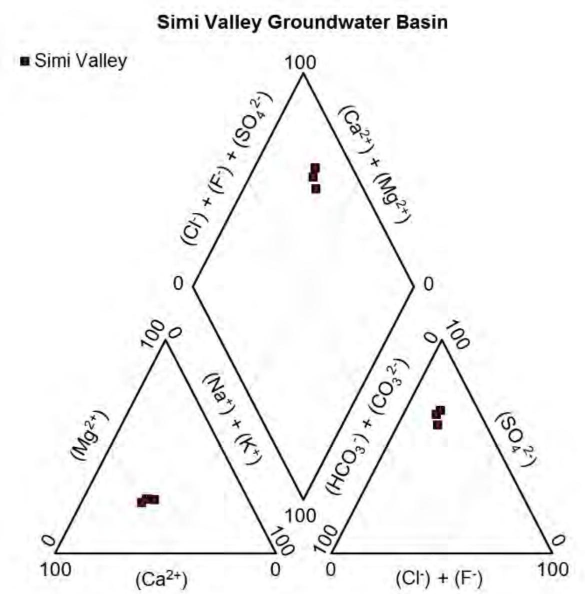

Figure D-25: Simi Valley basin piper diagram.

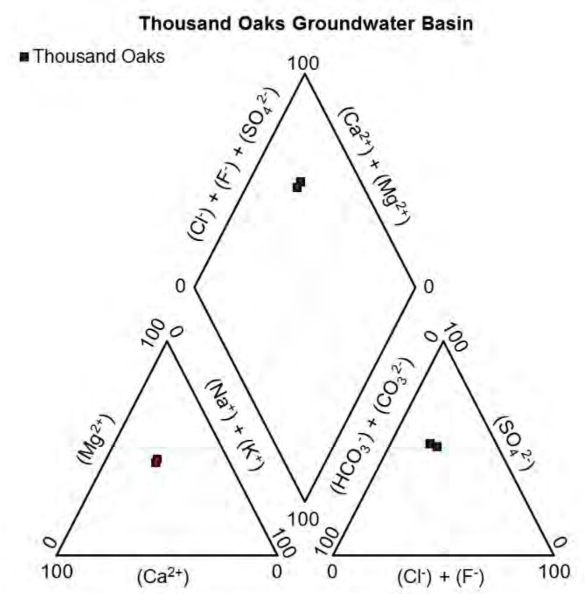

Figure D-26: Thousand Oaks basin piper diagram.

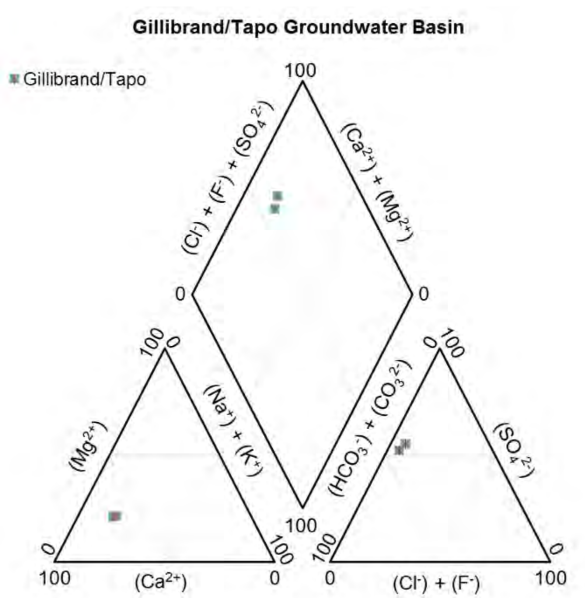

Figure D-27: Tapo/Gillibrand basin piper diagram.

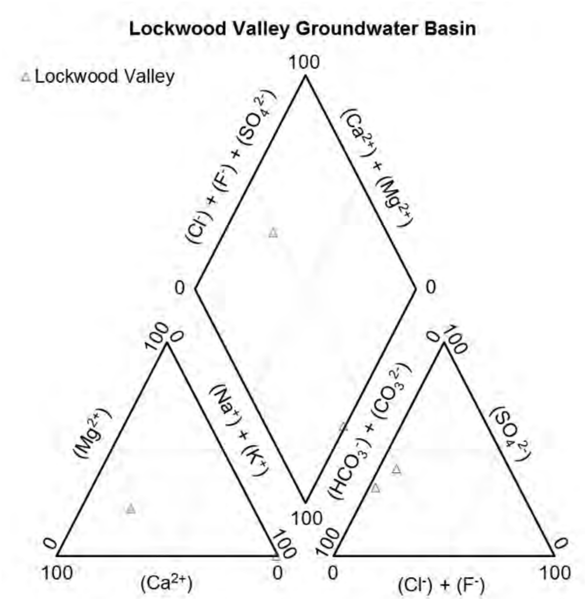

Figure D-28: Lockwood Valley basin piper diagram.

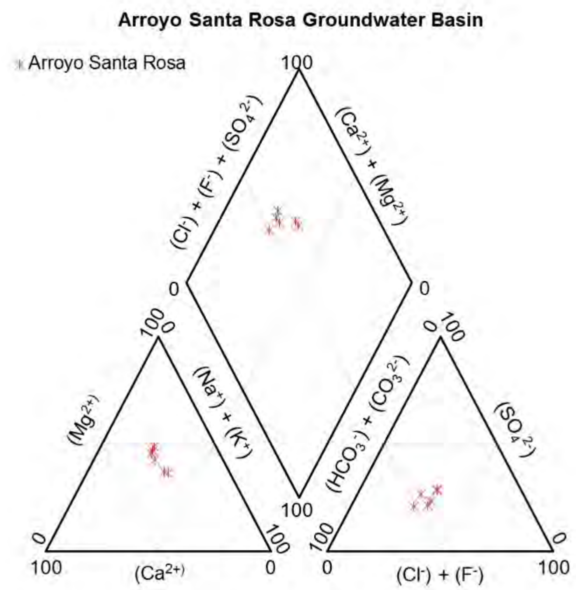

Figure D-29: Arroyo Santa Rosa basin piper diagram.

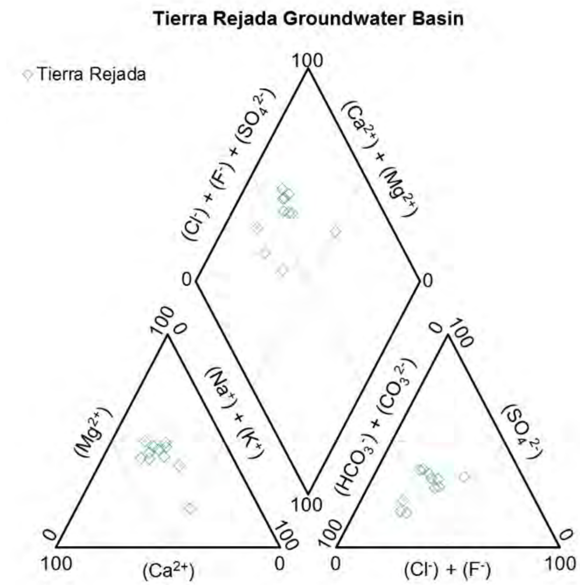

Figure D-30: Tierra Rejada basin piper diagram.

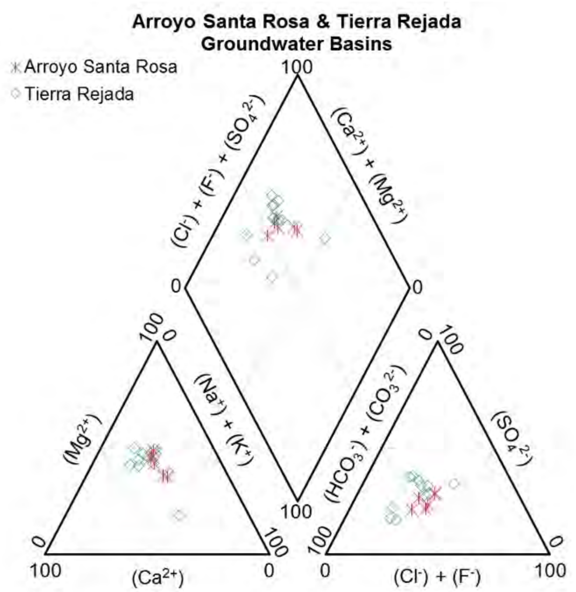

Figure D-31: Arroyo Santa Rosa & Tierra Rejada basins piper diagram.

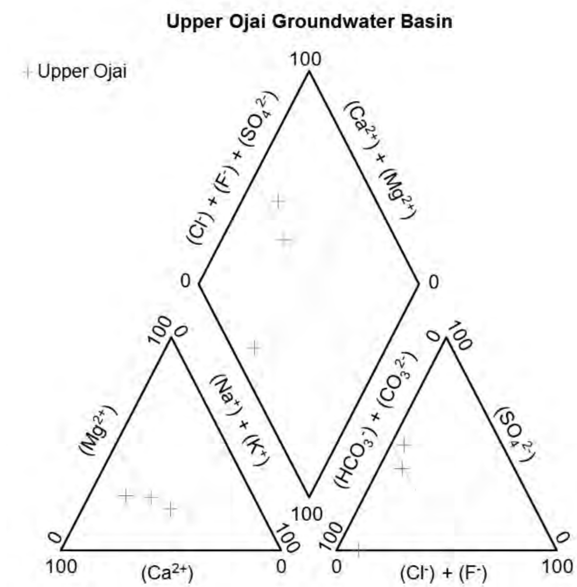

Figure D-32: Upper Ojai basin piper diagram.

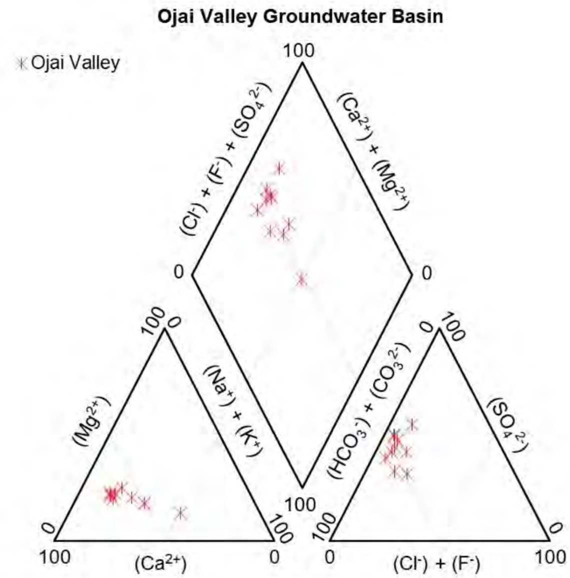

Figure D-33: Ojai Valley basin piper diagram.

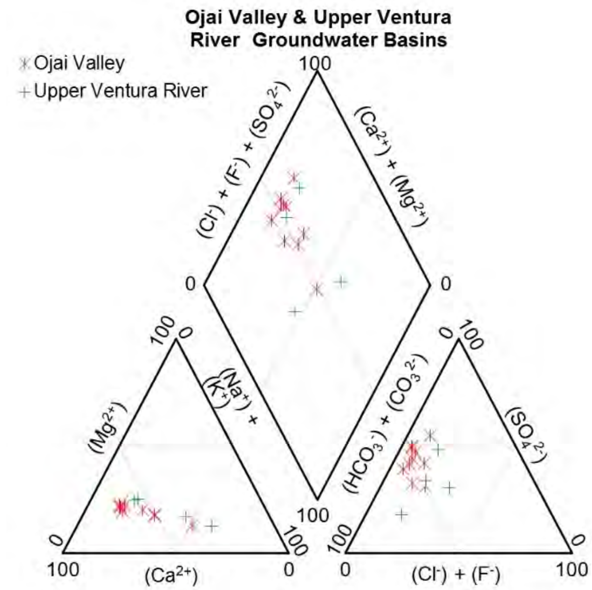

Figure D-34: Ojai Valley & Upper Ventura River basins comparison piper diagram.

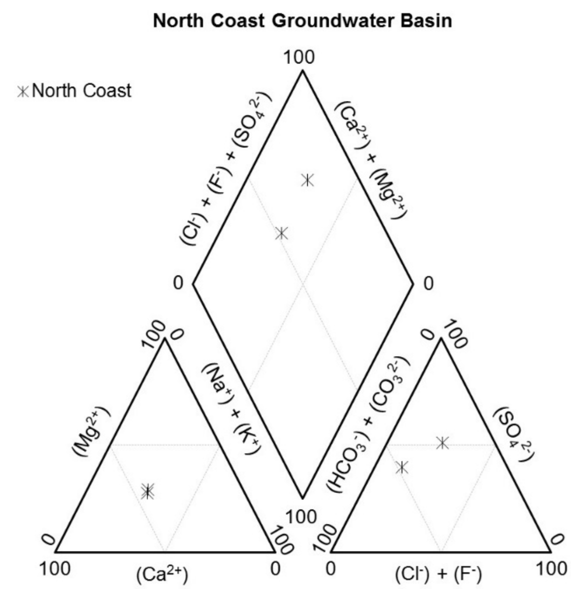

Figure D-35: North Coast basin piper diagram.

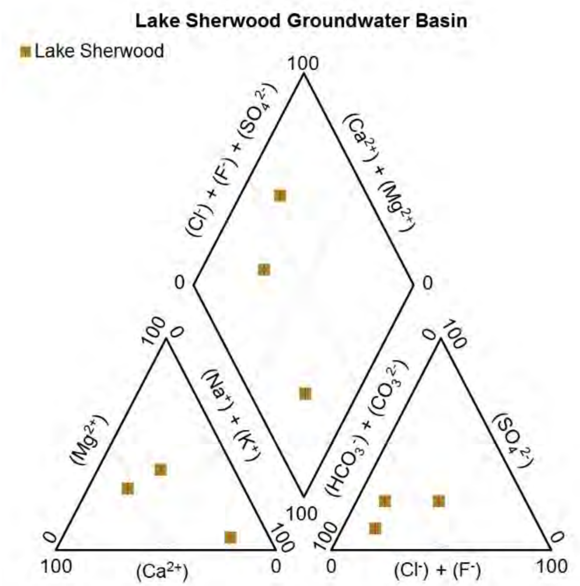

Figure D-36: Lake Sherwood basin piper diagram.

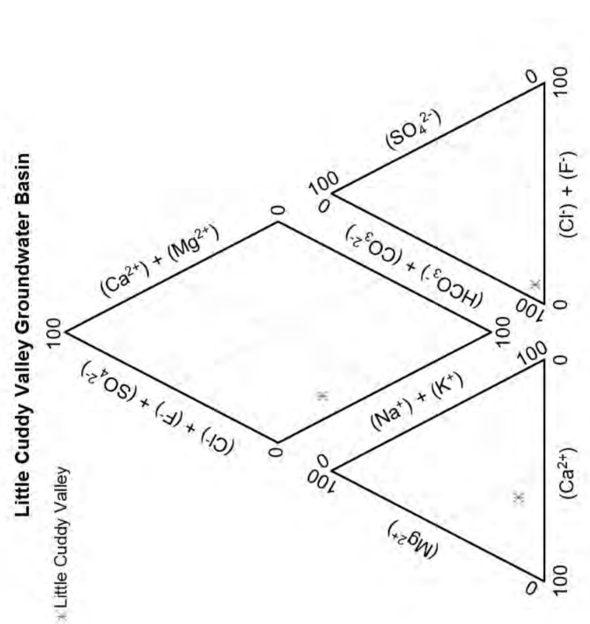

Figure D-37: Little Cuddy Valley basin piper diagram.