Annual Report Covering Water Year 2022

Ojai Valley Groundwater Basin

MARCH 2023

Prepared for:

OJAI BASIN GROUNDWATER MANAGEMENT AGENCY
417 Bryant Circle, Suite 112
Ojai, California 93023
Plan Manager: John Mundy

Prepared by:

DUDEK

605 Third Street
Encinitas, California 92024
Contact: Trevor Jones, PhD
Devin Pritchard-Peterson, PG

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Signature Page

This Annual Report for Water Year 2022 for the Ojai Valley Groundwater Basin was prepared under the direction of a Professional Geologist licensed in the State of California consistent with professional standards of practice.

PROFESSIONAL GEOLOGIST
DEVIN S. PRITCHARD-PETERSON
No. 10133
STATE OF CALIFORNIA

Devin Pritchard-Peterson, PG No. 10133

PROFESSIONAL GEOLOGIST
MATT E. NAFTALY
No. 9839
STATE OF CALIFORNIA

Matt Naftaly, PG No. 9839, PH 13-H-5003

Trevor Jones, PhD

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AF	acre-feet
bgs	below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
CMWD	Casitas Municipal Water District
County	County of Ventura
DWR	California Department of Water Resources
DDMWs	depth-discrete monitoring wells
ETo	reference evapotranspiration
GPM	gallons per minute
MSL	mean sea level
NOAA	National Oceanic and Atmospheric Administration
OBGM	Ojai Basin Groundwater Model
OBGMA	Ojai Basin Groundwater Management Agency
OVGB	Ojai Valley Groundwater Basin
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
RMP	Representative Monitoring Point
SGMA	Sustainable Groundwater Management Act
SACSGRP	San Antonio Creek Spreading Grounds Rehabilitation Project
SWN	State Well Number
VCWPD	Ventura County Watershed Protection District

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Executive Summary

This annual report for the Ojai Valley Groundwater Basin (OVGB) was prepared for submittal to the California Department of Water Resources (DWR) per Article 7, Section 356.2—Annual Reports, of the California Code of Regulations.[1] This report was prepared for the Ojai Basin Groundwater Management Agency (OBGMA) for the OVGB (DWR Basin No. 4-002) (Figure 1). OBGMA submitted to DWR a Draft Final Groundwater Sustainability Plan (GSP) for the OVGB for DWR's review and approval in compliance with the Sustainable Groundwater Management Act (SGMA). The Draft Final GSP was adopted at the Board of Directors meeting held on January 6, 2022 and submitted to DWR on January 31, 2022. SGMA regulations require an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP. This annual report provides an update on the groundwater conditions in the OVGB for water year 2022 (October 1, 2021 through September 30, 2022). Key findings of this annual report are:

- Hydrographs for the 23 wells in the groundwater elevation monitoring network were generated to analyze historical and current groundwater elevation trends. Pressure transducer data are available for five wells and show seasonal fluctuations in groundwater levels in the OVGB.
- Groundwater elevation contour maps were generated for the primary production aquifer to analyze the seasonal high and seasonal low groundwater conditions for water year 2022. The contour maps indicate that groundwater elevations are highest in the northern and eastern portions of the OVGB, adjacent to the Topa Topa Mountains, and lowest in the southwestern part of the OVGB in the vicinity of San Antonio Creek. The direction of regional groundwater flow is away from the Topa Topa Mountains towards the southwest.
- Groundwater elevations at representative monitoring points (RMPs) remained above established minimum thresholds in water year 2022.
- Groundwater extraction totaled approximately 3,527 acre-feet (AF) in water year 2022; the agriculture sector accounting for approximately 55% of total extractions.
- Surface water use (Lake Casitas water imported by Casitas Municipal Water District [CMWD]) totaled approximately 2,578 AF in water year 2022.
- Total water use was approximately 6,105 AF in water year 2022.
- Change in groundwater storage was calculated using a linear regression model to correlate seasonal high groundwater elevations measured at key well 04N22W05L008S to simulated cumulative change in groundwater storage extracted from the Ojai Basin Groundwater Model (OBGM). Annual change in storage in water year 2022 was 934 AF. Since spring 2014, groundwater in storage in the OVGB has increased approximately 4,541 AF.
- The OBGMA continues to monitor streamflow in San Antonio Creek and its tributaries, and groundwater levels in both the perched aquifer and primary production aquifer, to improve understanding of the OVGB hydrogeology.
- The OBGMA prepared and submitted to DWR a Proposition 68 Round 2 Application on December 15, 2022 to obtain funds to implement projects and management actions to support the sustainable management of the OVGB.

1 Title 23, Division 2, Chapter 1.5, Subchapter 2 of the California Code of Regulations, which is commonly referred to as the Groundwater Sustainability Plan Regulations (GSP Regulations).

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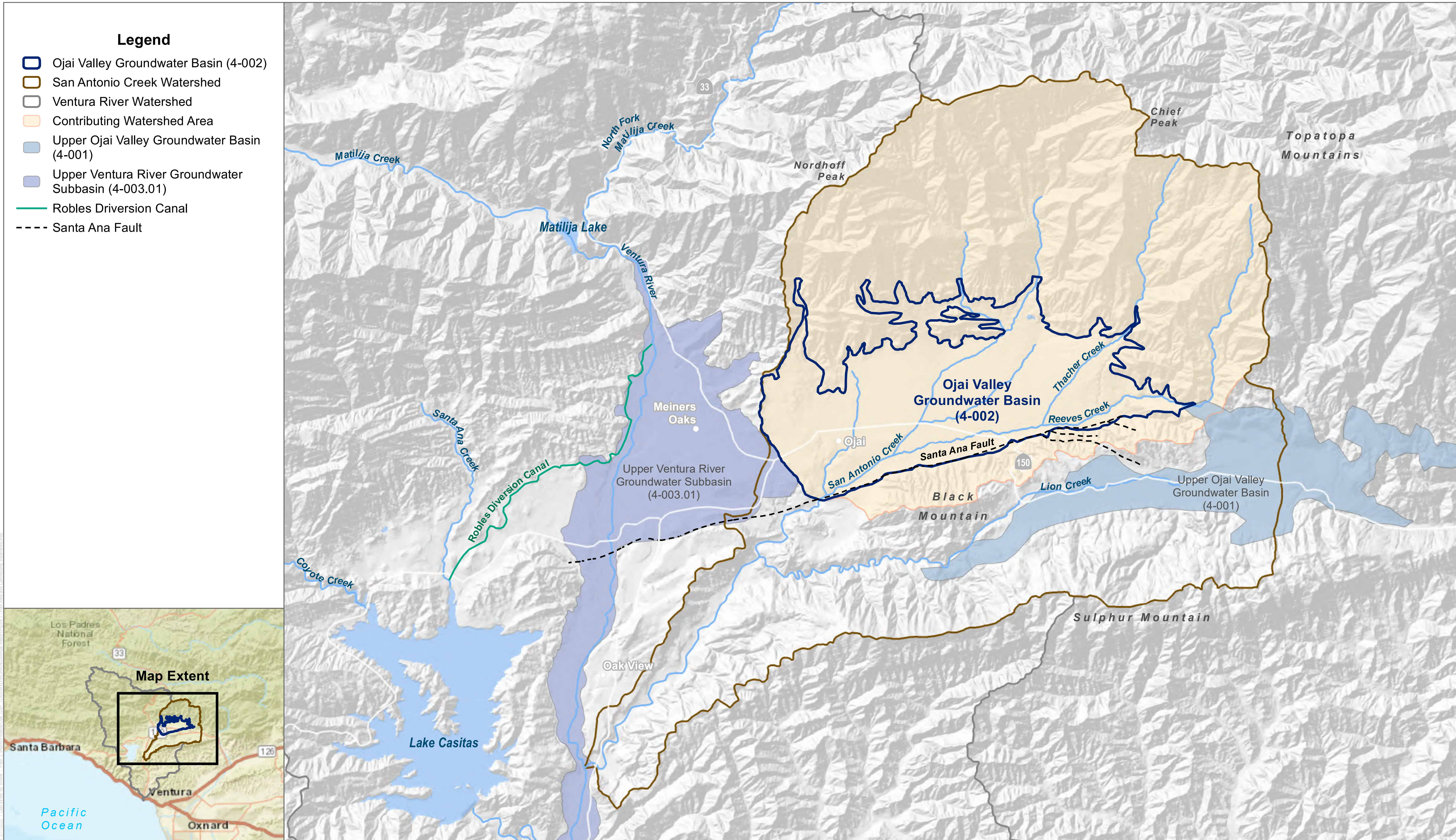

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DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS

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FIGURE 1

Plan Area and Contributing Watershed

Annual Report for the Ojai Valley Groundwater Basin

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1 Introduction

The Ojai Basin Groundwater Management Agency (OBGMA), acting as the Groundwater Sustainability Agency (GSA) for the Ojai Valley Groundwater Basin (OVGB; DWR Basin No. 4-002), developed a Groundwater Sustainability Plan (GSP) in compliance with the 2014 Sustainable Groundwater Management Act (SGMA) (California Water Code Section 10720–10737.8, et al.) and the California Department of Water Resources (DWR) GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). The OBGMA submitted the Draft Final GSP to the DWR on January 31, 2022. The Draft Final GSP for the OVGB is currently under review by DWR. Information regarding the GSP including stakeholder process is available from the OBGMA website:

http://obgma.com/

SGMA regulations require an annual report be submitted to DWR by April 1 following GSP adoption. The OBGMA submitted the first annual report to DWR on April 1, 2022, which documented groundwater conditions in the basin over the 2020 and 2021 water years. This is the second annual report for the OVGB since GSP adoption and documents groundwater conditions for the 2022 water year.

For the purposes of this annual report, the plan area is defined as the OVGB (Figure 1), which has a surface area of approximately 5,913.4 acres, or 9.2 square miles, and underlies the City of Ojai in the western part of Ventura County (County). The OVGB's boundaries are formed by Tertiary age[2] consolidated rocks associated with the Topa Topa Mountains of California's Transverse Ranges to the north and east, the Upper Ojai Valley Groundwater Basin (DWR Basin No. 4-001) to the east, the Santa Ana Fault and Black Mountain to the south, and the Upper Ventura River Groundwater Subbasin (DWR Basin No. 4-003.01) to the west (Figure 1) (DWR 2004). The eastern and western boundaries of the OVGB correspond to recognized bedrock highs that limit groundwater exchange flow between the OVGB and adjacent basins. The potential flow of groundwater between the OVGB and Upper Ventura River Subbasin is considered likely to be very small due to the low hydraulic conductivity of the geologic materials (bedrock) that form the boundary between the two groundwater basins (DWR 2004; Kear 2005).

This report is organized to provide all of the required components of an annual report as per Article 7, Section 356.2—Annual Reports, including groundwater elevation, groundwater extraction, and surface water supply data, and an evaluation of change in groundwater in storage. A discussion of the monitoring network and implementation progress is also provided.

[2] Geologic period from 66 million to 2.6 million years ago. The geologic timescale classifies this time period as the Cenozoic Era that includes the Paleogene and Neogene Periods.

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2 Hydrogeologic Setting

The following subsections describe climate conditions, including precipitation, temperature, evapotranspiration, surface water and drainage features, and principal aquifer and aquitard characteristics in the OVGB.

2.1 Precipitation

The climate of the OVGB is Mediterranean, with warm, dry summers and cool, wet, winters. Precipitation is highly variable in the OVGB—seasonally, and from year to year. Precipitation typically occurs in just a few significant storms each year, which can come any time between October and April, with over 90% of the precipitation occurring between November and April (WCVC 2019). The Parameter-Elevation Regressions on Independent Slopes Model (PRISM) 30-year (1991–2020) digital elevation model precipitation data shows that the average annual precipitation in the OVGB ranges from about 22 inches per year in the southwestern part of the OVGB to nearly 26 inches per year in the northernmost parts of the OVGB along the southern flank of the Topa Topa Mountains (Figure 2).

Precipitation in the OVGB is monitored by four weather stations, three of which are maintained by the Ventura County Watershed Protection District (VCWPD) and one by the National Oceanic and Atmospheric Administration (NOAA). Five additional VCWPD precipitation stations and one California Irrigation Management Information System (CIMIS) reference evapotranspiration (ETo) station located outside of the OVGB, but in the vicinity, provide additional climate data (Table 1 and Figure 2).

Table 1. Weather Stations in the Vicinity of the OVGB

Station Name (Station No.)	Latitude	Longitude	Elevation (feet MSL)	Period of Record
National Oceanic and Atmospheric Administration				
Ojai, California, US (USC00046399)	34.4477	-119.2275	745	5/1/1905 – Present
Ventura County Watershed Protection District				
Ojai-County Fire Station (030D)	34.44806	-119.2313	760	10/1/1980 – Present
Ojai-Thacher School (059)	34.46664	-119.1804	1,440	10/1/1915 – Present
Upper Ojai-Happy Valley (064B)	34.43722	-119.1899	1,320	10/1/1970 – Present
Ojai-Bower Tree Farm (153A)	34.44139	-119.2219	780	10/1/1977 – Present
Ojai-Stewart Canyon (165)	34.46053	-119.2486	970	10/1/1956 – Present
Meiners Oaks-County Fire Station (218)	34.44461	-119.2852	730	10/1/1964 – Present
Senior Gridley Canyon - Type B (300)	34.48192	-119.2088	2,514	10/1/1992 – Present
Nordhoff Ridge - Type C (303)	34.50989	-119.2308	4,112	10/1/1997 – Present
California Irrigation Management Information System				
Santa Paula (198)	34.324639	-119.10488	218	3/30/2005 – Present

Source: NOAA 2023; CIMIS 2023; VCWPD 2023.
Notes: MSL = mean sea level.

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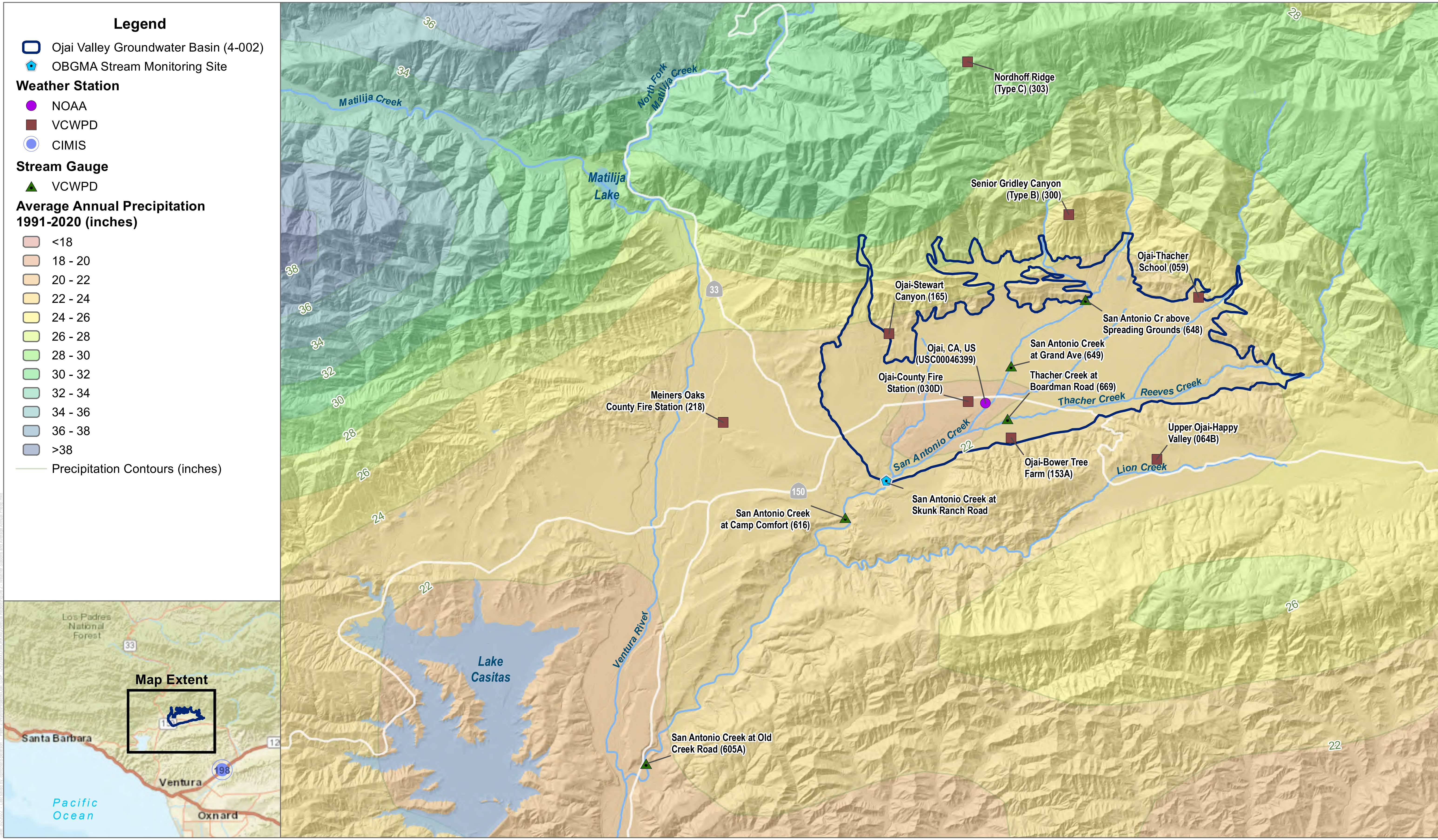

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DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; NOAA; VCWPD; PRISM

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FIGURE 2

Weather Stations and Average Annual Precipitation

Annual Report for the Ojai Valley Groundwater Basin

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The weather station with the longest and most complete data record is the NOAA Ojai, California, US (USC00046399) station (herein abbreviated as the "Ojai station") located near the center of the OVGB at an elevation of 745 feet mean sea level (MSL). The period of record for the Ojai station extends from May 1, 1905 to present. Total water year precipitation at the Ojai station for water years with a complete data record[3] ranges from a low of 5.46 inches, measured in 2021, to a high of 48.58 inches, measured in 1998. The average precipitation over the period from water year 1906 to 2022 was 20.48 inches (Figure 3) (NOAA 2023). Since water year 1906, 45 of the years were dry, 57 were average, and 15 were wet.[4] Wet years highly influence the long-term average precipitation.

Measurements collected at the Ojai station indicate the OVGB received approximately 16.4 inches of precipitation in the 2022 water year. This is approximately 80% of the 1906–2022 historical average annual precipitation rate.

2.2 Temperature

Temperatures within the OVGB fluctuate on a seasonal basis from warm summers to cool winters. August and September are typically the hottest months in the OVGB. Based on the Ojai station, the average annual temperature in the OVGB over the period from May 1, 1905 to September 30, 2022 was 61°F, ranging from an average low of 45°F in the winter to an average high of 78°F in the summer. The historical all-time minimum and maximum temperature recorded at the Ojai station are 13°F and 119°F, respectively (NOAA 2023).

3 Of the 117 water years with precipitation data, 99 years have a complete data record, which is defined for purposes of this report as having no more than 30 days missing in any given water year.

4 Water years were classified as dry if precipitation was less than 75% of the average precipitation, average if precipitation was between 75% and 150% of the average precipitation, and wet if precipitation was greater than 150% of the average precipitation.

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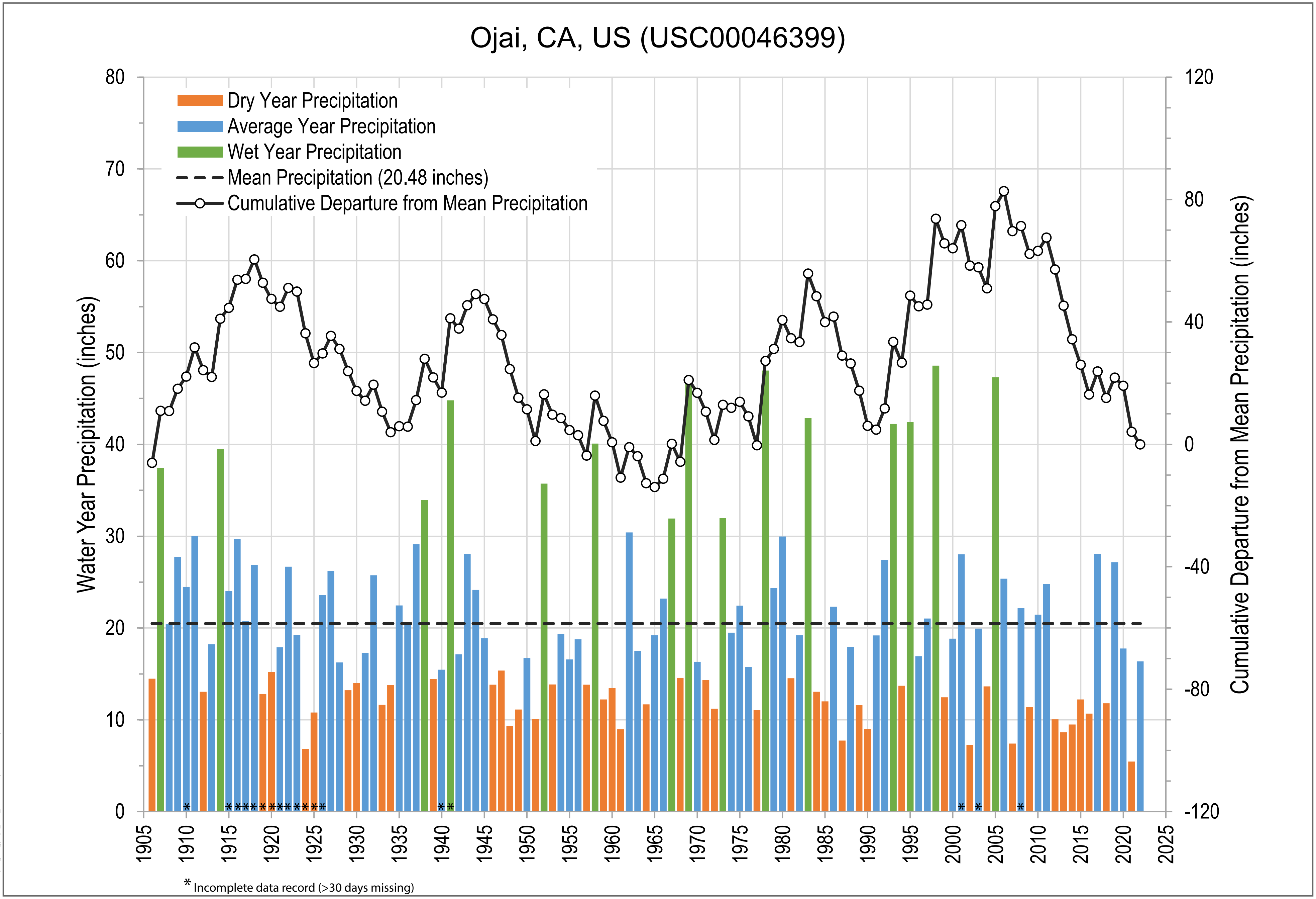

SOURCE: NOAA

FIGURE 3

Water Year Precipitation

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2.3 Evapotranspiration

Reference evapotranspiration in the OVGB was calculated from the data collected at CIMIS Station 198 (located approximately 10 miles south-southeast of the southern basin boundary in Santa Paula, California) on a daily basis since 2005 (Table 1). The average ETo measured at CIMIS Station 198 between 2005 and 2022 is 53.07 inches per year (Table 2). In contrast, the average annual precipitation in the OVGB, based on the Ojai station (Figure 3) is 20.27 inches per year. The ETo values calculated from the CIMIS data reflect the amount of water theoretically transpired by grass or alfalfa if supplied by irrigation, but do not represent the actual transpiration from any specific crop or native vegetation. To calculate the evapotranspiration rate for a specific crop or native vegetation, the ETo is multiplied by a crop coefficient to adjust the water consumption for each crop relative to the water consumption for alfalfa.

Table 2. Reference Evapotranspiration Totals for Station 198

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
2005	—	—	—	3.03	8.56	8.63	7.32	5.66	4.74	3.53	3.07	2.32	—
2006	3.15	3.43	3.13	3.53	4.59	5.49	5.58	5.67	4.56	3.74	3.01	3.01	48.89
2007	2.74	2.74	4.21	4.13	5.06	5.80	6.00	5.50	4.51	4.40	2.55	2.60	50.24
2008	2.52	2.69	4.94	5.69	5.47	6.56	6.20	5.76	4.87	4.73	3.17	2.13	54.73
2009	3.81	2.60	4.27	4.8	5.57	5.18	6.71	5.62	4.97	4.04	3.21	2.17	52.95
2010	2.45	2.34	4.71	4.86	6.39	5.85	5.80	6.20	4.88	2.98	3.01	1.78	51.25
2011	3.40	3.12	3.95	4.93	6.14	5.16	6.06	5.55	4.11	3.70	2.96	2.65	51.73
2012	3.33	3.53	3.99	4.76	6.19	5.88	6.03	6.31	4.92	3.79	2.38	1.72	52.83
2013	3.20	3.16	4.03	4.92	6.26	5.88	5.87	5.99	5.03	4.26	2.93	3.10	54.63
2014	3.39	2.74	4.48	5.57	6.72	6.12	6.24	5.73	4.88	4.11	3.04	1.52	54.54
2015	2.09	2.48	4.08	4.92	5.08	5.29	5.90	6.38	5.35	4.11	3.47	2.71	51.86
2016	2.16	4.19	4.19	5.59	5.29	6.00	6.90	6.08	5.11	3.57	2.72	2.40	54.2
2017	1.88	1.69	4.71	5.80	5.87	6.07	6.65	5.86	4.68	4.83	2.59	3.52	54.15
2018	2.87	3.12	3.52	5.31	4.92	6.11	6.87	6.58	4.70	4.12	3.39	2.48	53.99
2019	2.25	2.12	4.18	5.16	5.36	4.53	6.52	6.44	5.17	5.25	2.94	2.52	52.44
2020	2.50	3.61	3.26	4.52	6.61	5.77	6.80	6.19	4.66	4.08	2.89	3.16	54.05
2021	3.06	3.47	4.53	5.27	5.71	6.53	6.56	6.00	4.62	4.16	3.06	1.53	54.50
2022	3.24	3.69	4.59	5.34	5.87	6.33	6.38	6.26	5.12	3.47	3.26	1.73	55.28
Average	2.83	2.98	4.16	4.90	5.87	5.95	6.36	5.99	4.83	4.05	2.98	2.39	53.07

Source: CIMIS 2023.
Note: All values are in inches.

2.4 Surface Water and Drainage Features

The OVGB is within the San Antonio Creek watershed which is one of the largest sub-watersheds of the Ventura River watershed. The San Antonio Creek watershed is approximately 32,743.1 acres, or 51.2 square miles and completely encompasses the OVGB (Figure 1). The portion of the San Antonio Creek watershed contributing recharge to the OVGB is approximately 20,340.8 acres, or 31.8 square miles. The San Antonio Creek watershed is characterized by tectonically active mountains dominated by chaparral and exposed bedrock with narrow ephemeral and intermittent streams. There are no major surface water reservoirs within the San Antonio Creek watershed. San Antonio Creek is the largest stream in the San Antonio Creek watershed and is fed by four primary tributary streams including McNell Creek, Thacher Creek, Reeves Creek, and Lion Creek, the last-mentioned being located outside of the OVGB. A number of small named and unnamed ephemeral drainages also contribute flow to San Antonio Creek. Recharge to the OVGB occurs through percolation of surface waters through alluvial channels, infiltration of precipitation that falls directly on the valley floor, subsurface flow, and septic and irrigation return flow (DWR 2004).

2.5 Stream Flow Measurements

Streamflow records are available for four active stream gaging stations on San Antonio Creek, in addition to one active gaging station on Thacher Creek (Table 3 and Figure 2). The stream gage with the longest and most complete data record is the San Antonio Creek at Old Creek (605A)[5] station located at the outlet of San Antonio Creek near the confluence with the Ventura River. The period of record for station 605A extends from October 1, 1949 to September 30, 2022. Peak flow at the outlet of San Antonio Creek typically occurs between December and April of any given water year and baseflow generally falls to 0 cubic feet per second (cfs) between June and October. There are some exceptions, particularly in 1969, 1978, 1983, 1993, 1995, 1998, and 2005 when flow continued through the summer months. The highest gaged flow was 10,405 cfs in January 1969. The water year with the lowest recorded stream discharge was 1951, where reportedly no flow occurred, and the water year with the highest recorded stream discharge was 1969 at 78,403 acre-feet (AF). The average water year stream discharge for the period of record is 10,840 AF (Figure 4). Wet years highly influence the long-term average stream discharge.

The OBGMA has measured streamflow in San Antonio Creek at the outflow of the OVGB since July 2019. Stream discharge measurements consist of manual readings collected on a monthly frequency at Skunk Ranch Road (Figure 2). In water year 2022, stream discharge at the OVGB outflow ranged from 0.01 cfs in August 2022 to 1.63 cfs in January 2022 (Figure 5). The data indicate that, in general, stream discharge during the summer ranges from approximately 0.1 to 1 cfs, and in the winter ranges from approximately 1 to 3 cfs (Figure 5). Higher stream discharge rates at this location are correlated with periods of rainfall in the OVGB and contributing watershed.

Table 3. Stream Gages in the Vicinity of the OVGB

Station Name (Station No.)	Latitude	Longitude	Elevation (feet MSL)	Period of Record
Ventura County Watershed Protection District				
San Antonio Creek at Camp Comfort (616)[a]	34.42703	-119.2585	577	10/1/2018 – 10/1/2019
San Antonio Cr above Spreading Grounds (648)[a]	34.46636	-119.2053	—	10/1/2013 – 10/1/2014
San Antonio Creek at Grand Ave (649)[a]	34.45436	-119.2218	—	10/1/2013 – 10/1/2016
Thacher Creek at Boardman Road (669)[ab]	34.44481	-119.2227	—	10/1/2002 – 10/1/2008
San Antonio Creek at Old Creek Road (605A)[ac]	34.38256	-119.3027	—	10/1/1949 – 10/1/2022

5 The San Antonio Creek at Old Creek (605A) station was installed just upstream of the inactive San Antonio Creek at Hwy 33 (605) station. Together these stations provide daily stream discharge at the outlet of San Antonio Creek for the period from October 1, 1949 to September 30, 2020.

Table 3. Stream Gages in the Vicinity of the OVGB

Station Name (Station No.)	Latitude	Longitude	Elevation (feet MSL)	Period of Record
Ojai Basin Groundwater Management Agency				
San Antonio Creek at Skunk Ranch Road[d]	34.43373	-119.249434	—	7/29/2019 - Present

Source: VCWPD 2023.
Notes: MSL = mean sea level; — = data are not available.
[a] Site listed as active on the VCWPD Hydrologic Data Server but period of record does not extend to present.
[b] Peak event only site.
[c] Site located near inactive San Antonio Creek at Hwy 33 (605) station. The period of record for station 605 extends from October 1, 1949 to September 30, 2014.
[d] The OBGMA measurements at San Antonio Creek at Skunk Ranch Road include manual stream flow measurements and automated data logger readings.

2.6 Principal Aquifer and Aquitards

Water-bearing units of the OVGB include alluvial deposits and fractures and interstices of underlying Tertiary rocks. The alluvium is composed of units of sand, gravel, and clay up to 50 to 100 feet thick that pinch out toward the lateral edges of the OVGB (Figure 6) (Kear 2005; DBS&A 2011, 2020). The alluvial deposits are the most productive units in the OVGB, with well yields ranging from 100 to 600 gallons per minute (GPM) (DWR 2004). The weathered Tertiary rocks are typically consolidated and yield minor amounts of poor-quality water, with well yields typically between 2 to 5 GPM, but reaching a maximum of about 50 GPM (DWR 2004). The contact of the alluvial unconsolidated deposits of Pleistocene to Holocene age with the Tertiary rocks define the base of the OVGB. The primary storage units for groundwater are approximately four discrete sand and gravel units on the order of up to 100 feet thick each, which are sourced near the alluvial fan heads in the northeast side of the Ojai Valley (Kear 2005; OBGMA 2018). The individual coarse-grained sand and gravel aquifer units comprising the primary production aquifer are thickest in the northern and eastern areas of the OVGB and thinnest in the southern and western areas of the OVGB where fine grained lacustrine and floodplain deposits of up to approximately 100 feet thick predominate as confining layers creating a multi-layered aquifer system (DBS&A 2011; Kear 2005; OBGMA 2018). The uppermost confining clay unit, which generally extends from approximately 30 to 130 feet below ground surface (bgs), is the thickest and most extensive aquitard and separates the primary production aquifer from a shallow perched aquifer (Kear 2005, 2021; OBGMA 2018). The shallow perched aquifer generally extends from approximately 15 to 30 feet bgs and is present in the southwestern portion of the OVGB (Figures 6 and 7) (Kear 2005, 2021). Groundwater within the primary production aquifer is predominantly under unconfined conditions near the alluvial fan heads and semi-confined to mostly confined in the central, southern, and western portions of the OVGB (Kear 2005, 2021). The alluvial deposits are deepest in the central and southern areas of the OVGB (Kear 2005; DBS&A 2011, 2020). The maximum total thickness of the alluvial deposits is approximately 900 feet (DBS&A 2011, 2020).

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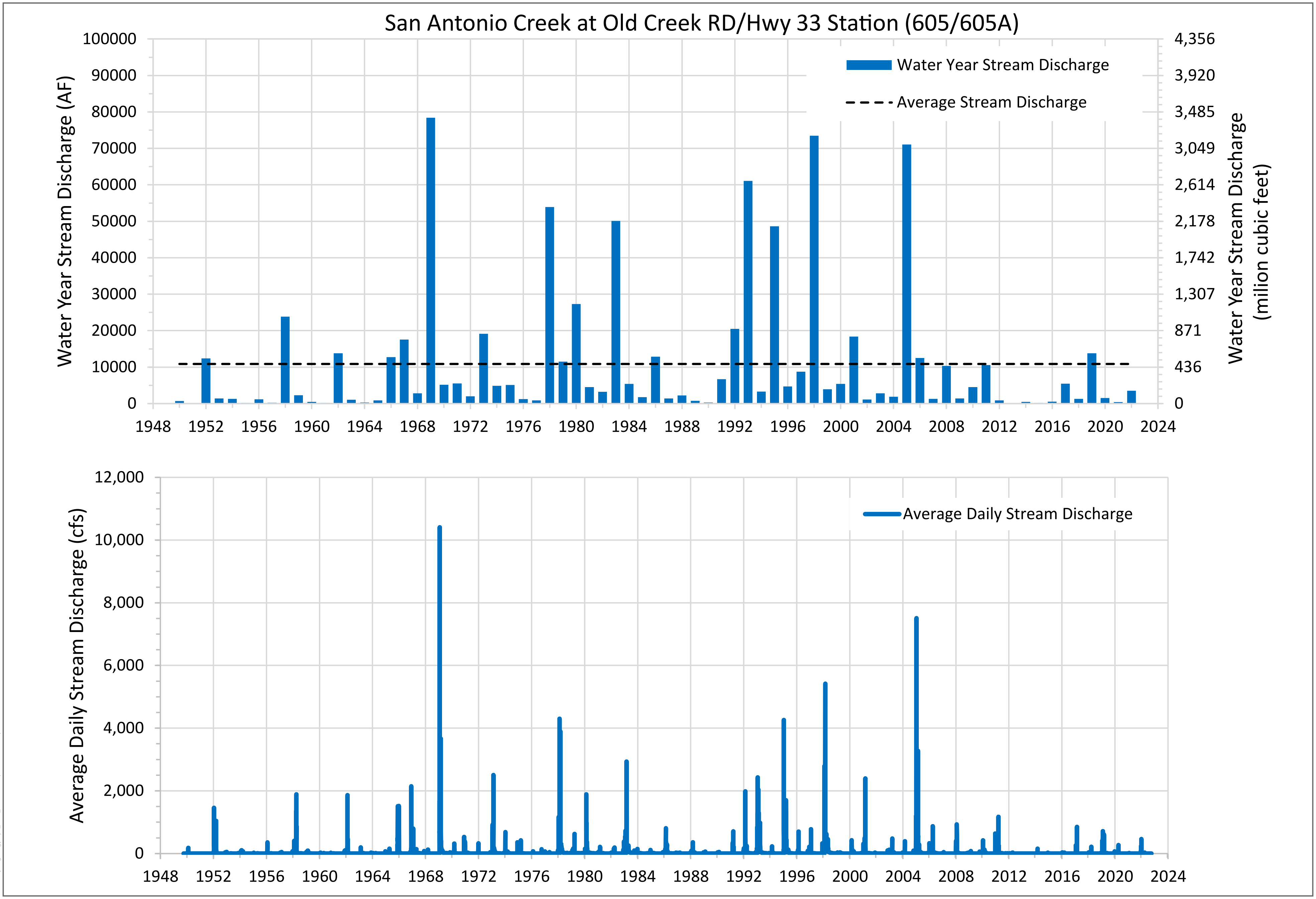

SOURCE: VCWPD

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FIGURE 4

San Antonio Creek Stream Discharge at Confluence with Ventura River

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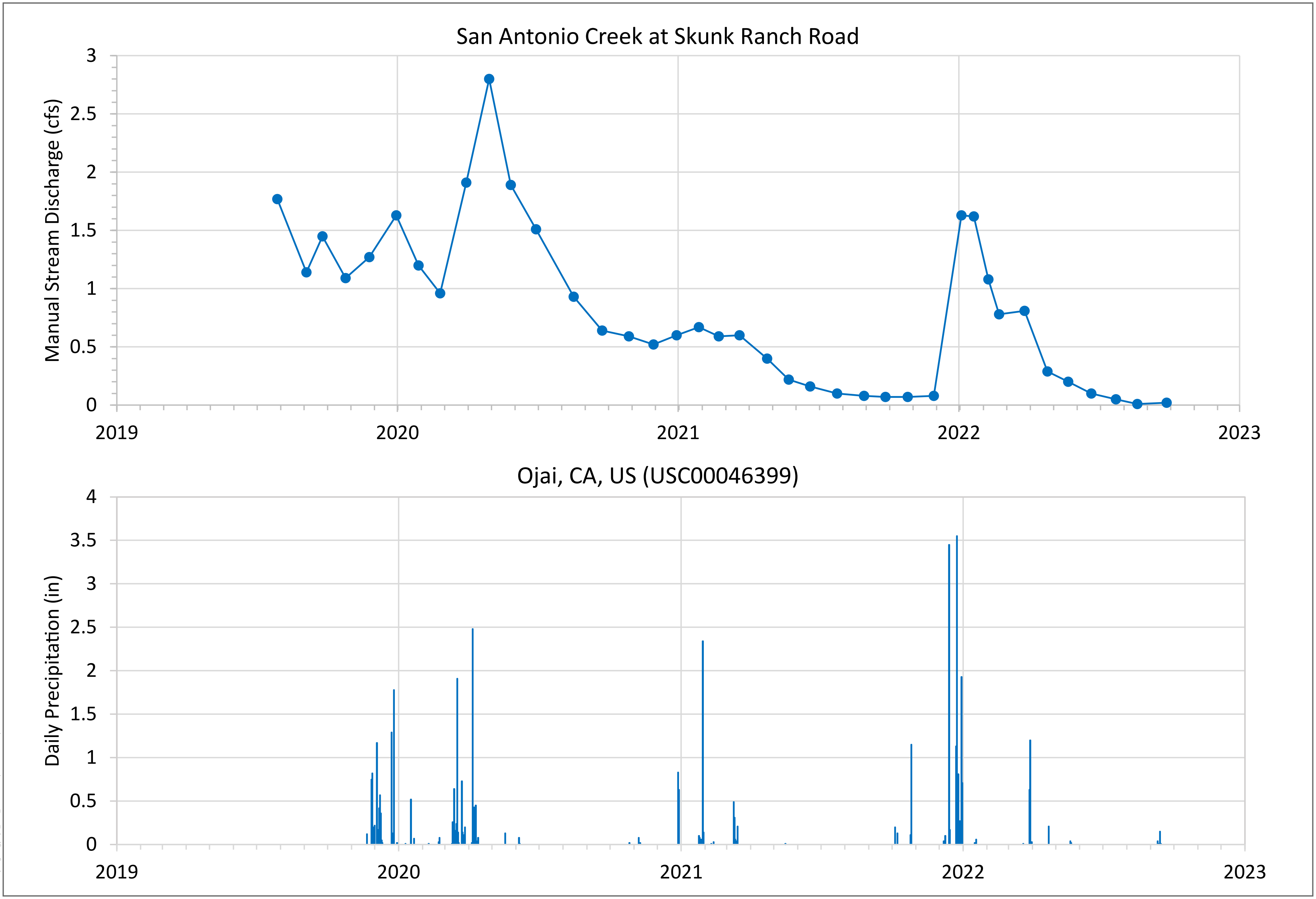

SOURCE: OBGMA; NOAA

FIGURE 5

San Antonio Creek Stream Discharge at Ojai Valley Groundwater Basin Outflow

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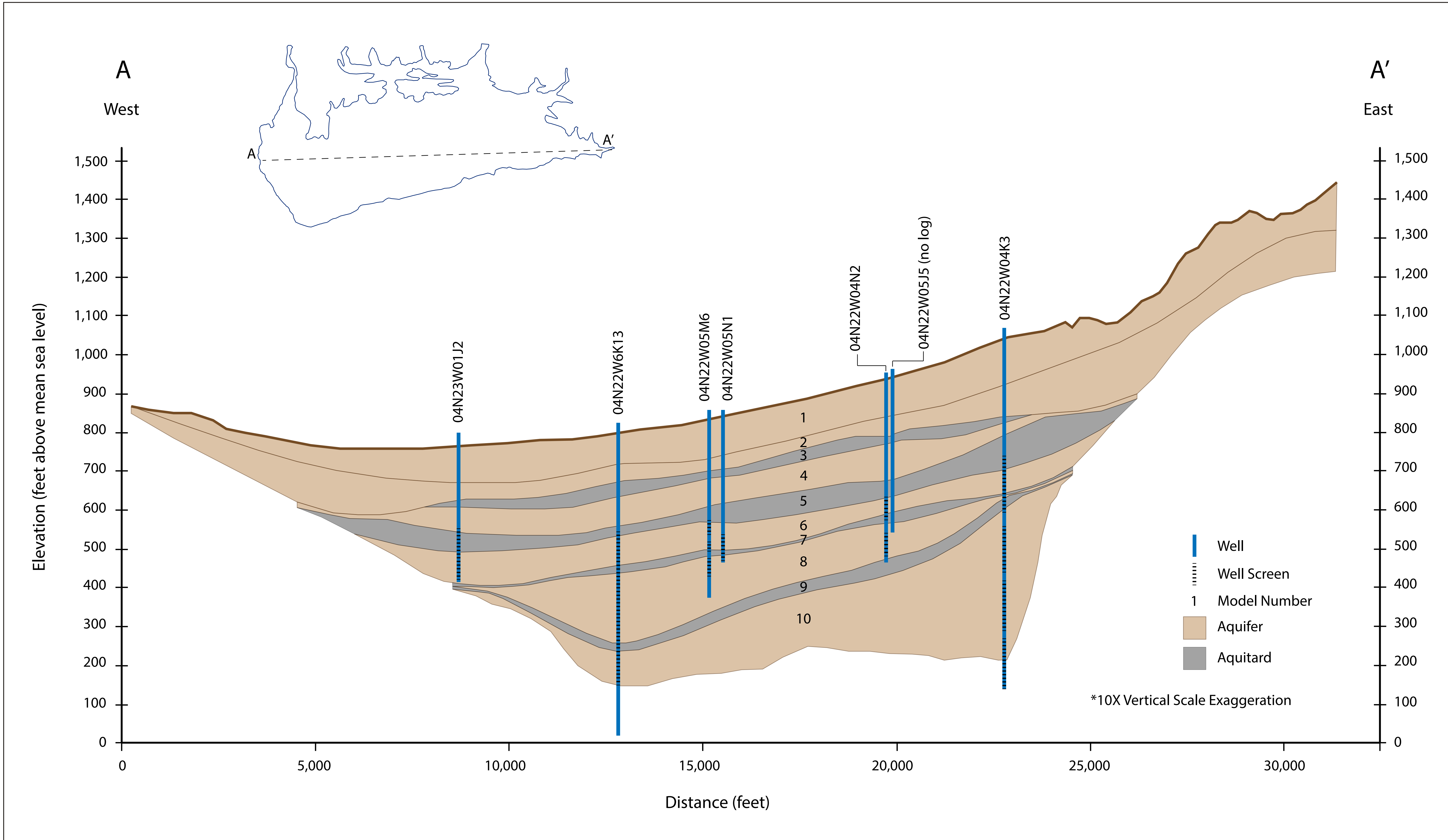

SOURCE: Adopted from DBS&A

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FIGURE 6

A - A' Geologic Cross-Section

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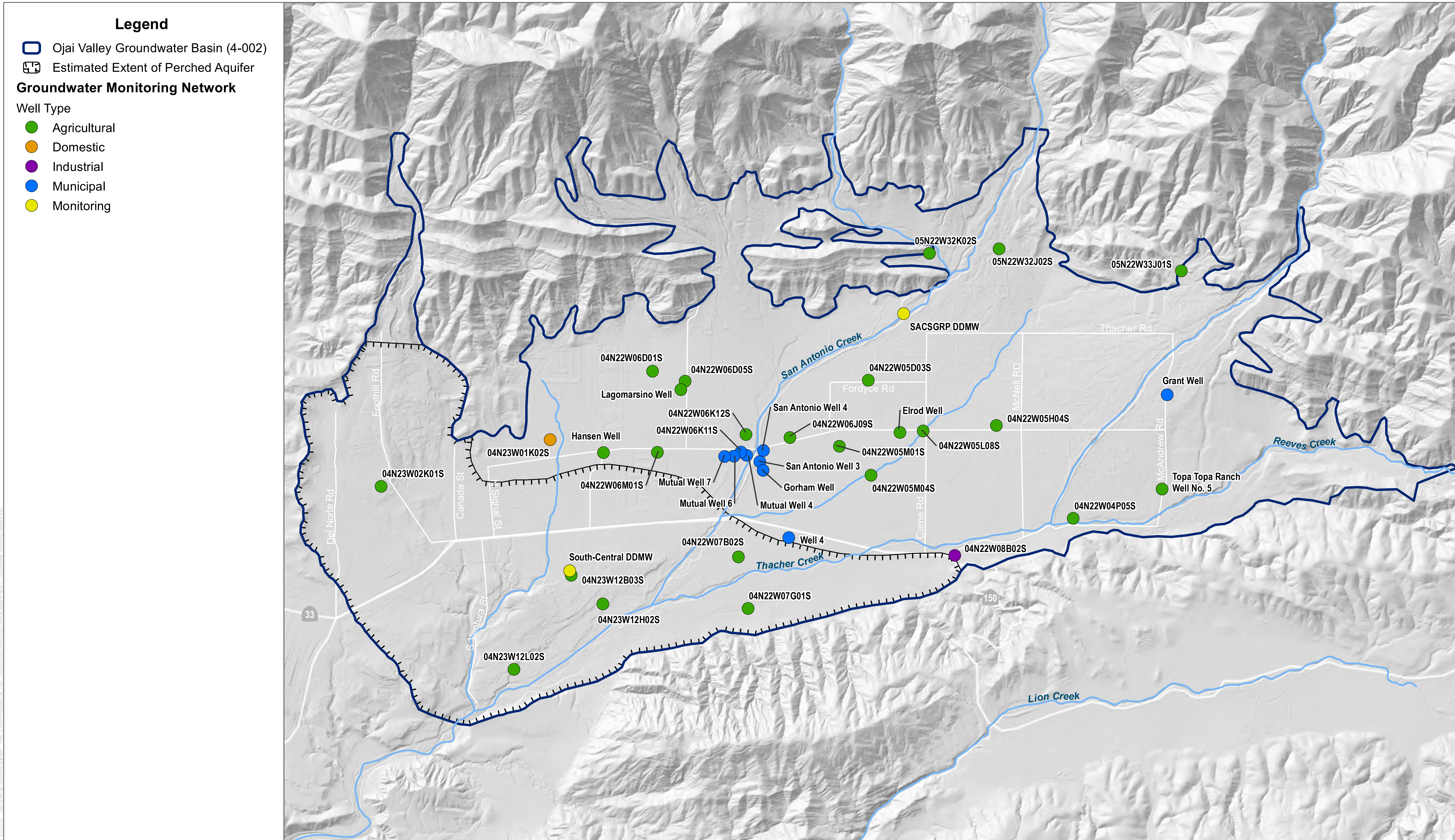

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DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

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FIGURE 7

Groundwater Monitoring Network

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3 Groundwater Monitoring

The following subsections describe the OVGB groundwater monitoring network and frequency of monitoring.

3.1 Monitoring Network

The VCWPD and OBGMA are the two primary entities who monitor groundwater levels in the OVGB. The VCWPD previously acted as the California Statewide Groundwater Elevation Monitoring umbrella monitoring entity for Ventura County and continues to routinely monitor groundwater levels in 18 wells (the number of wells monitored by VCWPD is based on accessibility) in the OVGB. In addition, OBGMA monitors groundwater levels in seven wells, several of which have automated data loggers for continuous measurement of groundwater levels. The wells monitored by OBGMA include five privately-owned production wells and two depth-discrete monitoring wells (DDMWs). The two depth-discrete monitoring wells include the San Antonio Creek Spreading Grounds Rehabilitation Project (SACSGRP) DDMW located in the northern part of the OVGB and the South-Central DDMW located in the southern part of the OVGB in an easement granted to the OBGMA by the City of Ojai (Figure 7). Both depth-discrete monitoring wells consists of four casings with various completion depths and are used to evaluate groundwater elevation trends by aquifer zone. Wells that are routinely monitored for groundwater levels are shown in Figure 7 and Table 4. Available data from these 23 wells are uploaded to the SGMA Portal Monitoring Network Module by the OBGMA.

Table 4. Current Groundwater Monitoring Network

Well Name	SWN	CASGEM ID	Well Use	Representative Monitoring Point	Monitoring Entity	Groundwater Monitoring Networks		
						Elevation	Quality	Production
South Central DDMW	—	—	Monitoring	Yes[a]	OBGMA	Yes	Yes	No
SACSGRP DDMW	05N22W32P002S–006S	—	Monitoring	Yes	OBGMA	Yes	Yes	No
Elrod Well	04N22W05L003S	—	Agricultural	Yes	OBGMA	Yes	No	Yes
Lagomarsino Well	04N22W06E006S	—	Agricultural	Yes[b]	OBGMA, VCWPD	Yes	Yes	Yes
Hansen Well	04N23W01J003S	—	Agricultural	Yes	OBGMA, VCWPD	Yes	Yes	Yes
Topa Topa Ranch Well No. 5	04N22W04Q001S	2813	Agricultural	Yes	OBGMA, VCWPD	Yes	Yes	Yes
—	04N22W05L008S	2816	Agricultural	Yes	VCWPD	Yes	No	Yes
Mutual Well 4	04N22W06K003S	—	Municipal	Yes	OBGMA, SWRCB, VCWPD	Yes	Yes	Yes
Mutual Well 5	04N22W06K011S	—	Municipal	No	SWRCB	No	Yes	Yes
Mutual Well 6	04N22W06K015S	—	Municipal	No	SWRCB	No	Yes	Yes
Mutual Well 7	—	—	Municipal	No	SWRCB	No	Yes	Yes
Gorham Well	04N22W06K013S	—	Municipal	No	SWRCB	No	Yes	Yes
Well 4	04N22W07A005S	—	Municipal	No	SWRCB	No	Yes	Yes
Grant Well	—	—	Municipal	No	SWRCB	No	Yes	Yes
San Antonio Well 3	04N22W06K010S	—	Municipal	No	SWRCB, VCWPD	No	Yes	Yes
San Antonio Well 4	04N22W06K014S	—	Municipal	No	SWRCB, VCWPD	No	Yes	Yes
—	05N22W32K002S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	04N23W12B003S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	04N22W06J009S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	04N22W05M004S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	04N22W04P005S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	05N22W33J001S	—	Agricultural	No	VCWPD	No	Yes	Yes
—	04N22W06D001S	2818	Agricultural	No	VCWPD	Yes	No	Yes

Table 4. Current Groundwater Monitoring Network

Well Name	SWN	CASGEM ID	Well Use	Representative Monitoring Point	Monitoring Entity	Groundwater Monitoring Networks		
						Elevation	Quality	Production
—	04N23W01K002S	2837	Domestic	No	VCWPD	Yes	Yes	Yes
—	04N22W07G001S	2826	Agricultural	No	VCWPD	Yes	No	Yes
—	04N22W08B002S	26333	Industrial	No	VCWPD	Yes	No	Yes
—	04N22W05H004S	39777	Agricultural	No	VCWPD	Yes	Yes	Yes
—	04N22W05M001S	2817	Agricultural	No	VCWPD	Yes	No	Yes
—	04N22W07B002S	2824	Agricultural	No	VCWPD	Yes	No	Yes
—	04N22W05D003S	2814	Agricultural	No	VCWPD	Yes	Yes	Yes
—	04N22W06M001S	2822	Agricultural	No	VCWPD	Yes	No	Yes
—	04N23W02K001S	46068	Agricultural	No	VCWPD	Yes	No	Yes
—	05N22W32J002S	38094	Agricultural	No	VCWPD	Yes	No	Yes
—	04N23W12L002S	26381	Agricultural	No	VCWPD	Yes	No	Yes
—	04N22W06K012S	26330	Agricultural	No	VCWPD	Yes	No	Yes
—	04N23W12H002S	26380	Agricultural	No	VCWPD	Yes	Yes	Yes
—	04N22W06D005S	46108	Agricultural	No	VCWPD	Yes	No	Yes

Notes: — = not available or not applicable; SWN = state well number; CASGEM = California Statewide Groundwater Elevation Monitoring Program; OBGMA = Ojai Basin Groundwater Management Agency; VCWPD = Ventura County Watershed Protection District; SWRCB = State Water Resources Control Board.

[a] The South Central DDMW well was constructed in 2021. Because this well is new and monitoring began in June 2021, minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

[b] The pressure transducer and data logger in Lagomarsino Well had the cable cut by a contractor and has not been recovered, but is in the process of being replaced. Minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

3.2 Frequency of Monitoring

VCWPD monitors groundwater levels on a quarterly basis and compiles this data with groundwater level measurements taken by other agencies. Similarly, OBGMA monitors groundwater levels a minimum of two times per year in the spring and fall.

4 Groundwater Conditions

The following subsections provide a description of the OVGB groundwater elevation contour maps and hydrographs developed using groundwater level data collected at monitoring wells in water year 2022.

4.1 Groundwater Elevation Contour Maps

Groundwater elevation data for wells in the monitoring network were compiled and reviewed for accuracy and completeness to ensure data are representative of static groundwater conditions. Groundwater level measurements for extraction wells were not taken while actively pumping to ensure the contours generated are generally representative of static conditions (i.e., not influenced by active pumping of a water well). Groundwater elevation data representative of the seasonal high and seasonal low groundwater conditions were then selected for contouring. In the OVGB, the seasonal high typically occurs between March and June and the seasonal low typically occurs between September and December, although the seasonal high/low varies from year to year and by well (Appendix A). As described in Section 3.2, groundwater levels are measured on a quarterly basis, typically in the months of March, June, October, and December. For purposes of generating groundwater elevation contour maps to illustrate the seasonal high and seasonal low groundwater conditions in the primary production aquifer for the 2022 water year, March 2022 groundwater level measurements were used to show the seasonal high and October 2021 groundwater level measurements were used to show the seasonal low (Figures 8 and 9). Additionally, October 2021 represents the start of the 2022 water year, and March 2022 represents the mid-point of the water year. Groundwater elevation contours were generated using version 10.8.1 of the 3D Analyst and Spatial Analyst tools within ArcGIS software.

Historically, and in water year 2022, groundwater elevations were highest in the northern and eastern portions of the OVGB, adjacent to the Topa Topa Mountains, and lowest in the southwestern part of the OVGB in the vicinity of San Antonio Creek. In October 2021, the predominant direction of groundwater flow was towards the southwest and the hydraulic gradient was approximately 0.031 feet/feet, as measured between wells 05N22W32J002S, 04N23W01K002S, and 04N22W07G001S. Groundwater elevations ranged from a high of approximately 1,065 feet MSL in the northeastern part of the OVGB to a low of approximately 660 feet MSL in the central part of the OVGB (Figure 8). The October 2021 groundwater elevation contour map shows a slight pumping depression in the central part of the OVGB (Figure 8). In March 2022, the predominant direction of groundwater flow was towards the southwest and the hydraulic gradient was approximately 0.027 feet/feet, as measured between wells 04N22W04Q001S, 04N23W01K002S, and 04N22W07G001S. Groundwater elevations ranged from a high of approximately 958 feet MSL in the eastern part of the OVGB (well 05N22W32J002S was not measured in March 2022) to a low of approximately 679 feet MSL in the southwestern part of the OVGB (Figure 9).

4.2 Groundwater Elevation Hydrographs

Groundwater elevation hydrographs were produced for each well in the groundwater elevation monitoring network. Available data for each well were plotted through 2022 (Appendix A).

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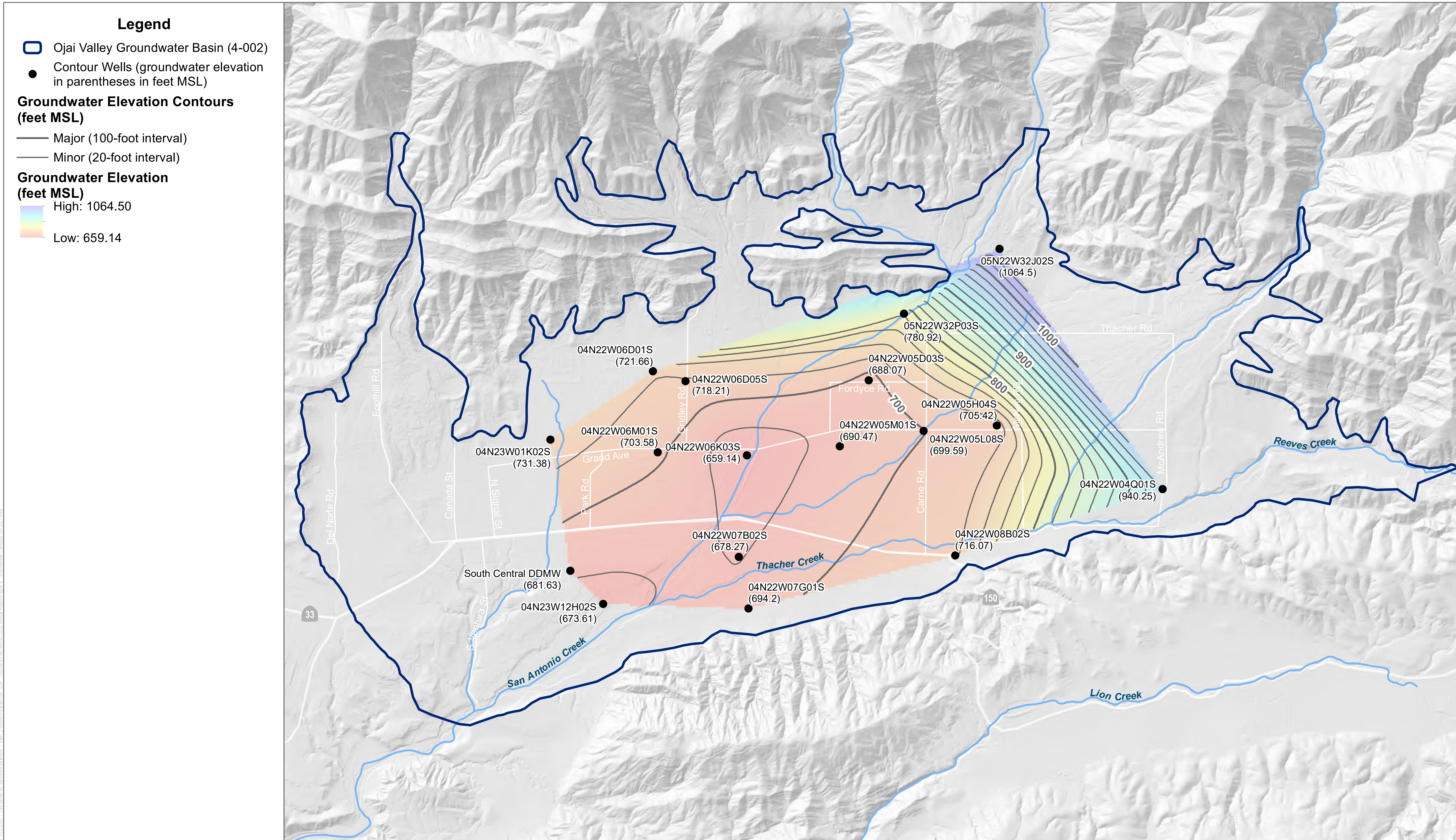

DRAFT

DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

FIGURE 8

Groundwater Elevation Contours October 2021

Annual Report for the Ojai Valley Groundwater Basin

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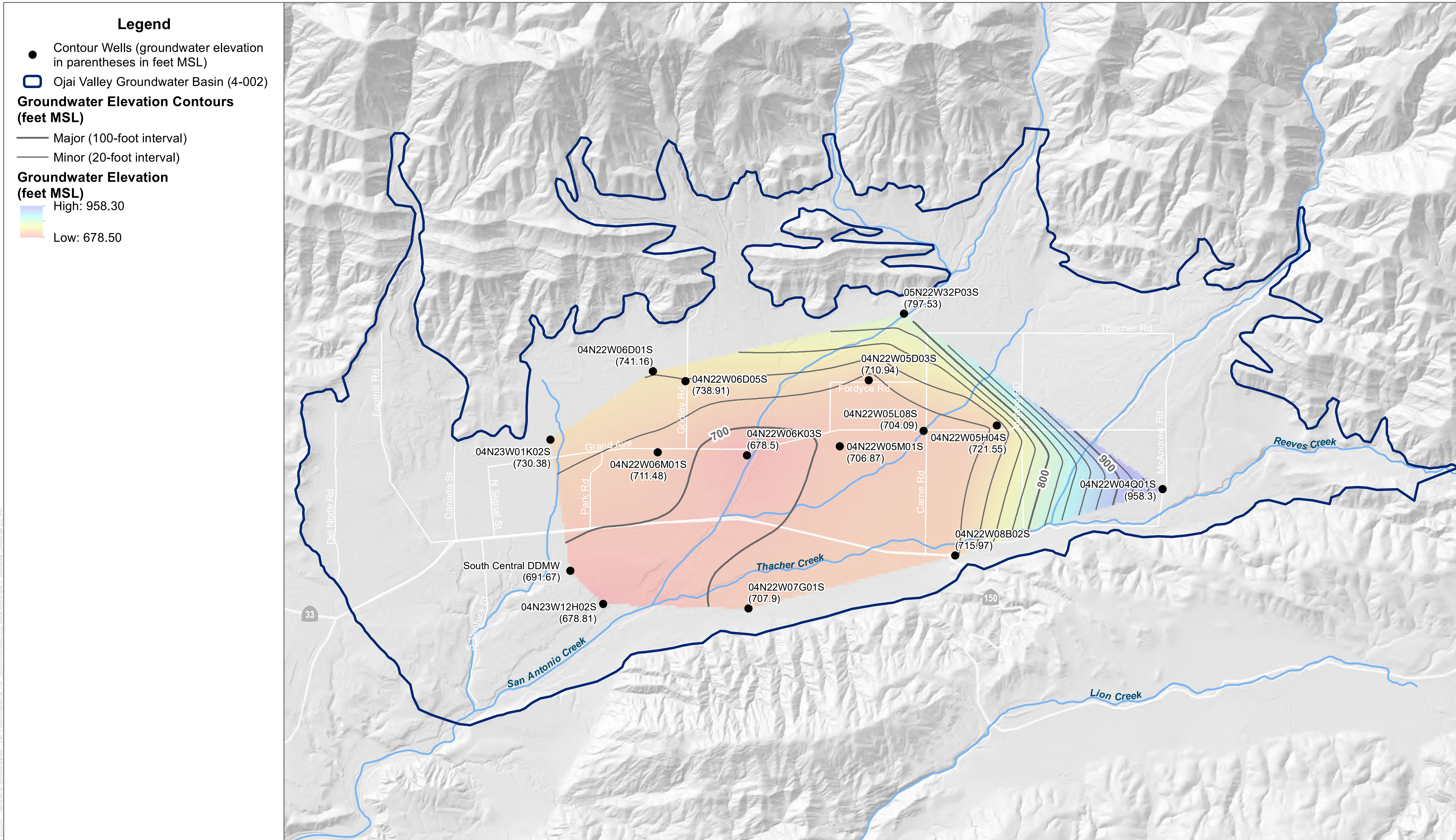

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DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

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FIGURE 9

Groundwater Elevation Contours March 2022

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4.3 Representative Monitoring Points

The key indicator well in the OVGB has historically been well 04N22W05L008S located near the center of the basin. Six additional wells were identified in the GSP as representative monitoring points (RMPs) where groundwater level minimum thresholds were established. The six RMPs include Elrod Well[6], Topa Topa Ranch Well No. 5, Lagomarsino Well, Hansen Well, Mutual Well 4, and SACSGRP DDMW. The recently installed South Central DDMW is also included as an RMP, although a minimum threshold for groundwater levels is not yet established for the well. The minimum threshold and measurable objectives for this well will be evaluated during the first five-year GSP evaluation. The location of each RMP is shown in Figure 10. The minimum threshold established at each RMP, as well as the groundwater elevation measured in October 2021 (i.e., seasonal low), is included in Table 5.

Groundwater elevations at the start of the 2022 water year (e.g., fall 2021) were lower than the start of the 2021 (e.g., fall 2020) (Table 5). Groundwater elevation declines during this period were largest in the central part of the OVGB, where groundwater levels at the Elrod well, Hansen well, and Mutual Well 4 declined by approximately 30 feet. These declines are reflective of the dry 2021 water year. Precipitation during the winter months of the 2022 water year supported groundwater elevation recoveries throughout parts of the OVGB. In the eastern portion of the OVGB, the spring 2022 groundwater elevations measured at well 04N22W05L008S, Elrod Well, and Topa Topa Ranch Well No. 5 were approximately 8 to 18 feet higher than spring 2021. Farther west, in the central part of the OVGB, spring 2022 groundwater elevations were approximately 10 to 23 feet lower than spring 2021 (Table 5). As shown in Table 5, groundwater elevations at RMPs remained above established minimum thresholds in water 2022.

The groundwater elevation data shown in Table 5 for Elrod Well, Lagomarsino Well, Hansen Well, SACSGRP DDMW, and South Central DDMW relies in part on provisional pressure transducer data that is subject to revision. The OBGMA continues to evaluate opportunities to improve the groundwater monitoring program to remain consistent with best management practices (DWR 2016); as described in Section 7 of this annual report, the OBGMA plans to prepare a sampling and analysis plan and quality assurance plan for data collection and monitoring of sustainability indicators. Groundwater level minimum thresholds at RMPs are to be further developed based on additional data collection and as part of the 5-year GSP update.

6 Groundwater levels in Elrod Well and Well 04N22W05L008S are closely correlated. Due to reported access issues at well 04N22W05L008S, Elrod Well was selected as a RMP. The minimum threshold established at the Elrod Well is based on the historical groundwater level record of well 04N22W05L008S. Both wells are monitored on a regular basis.

Table 5. Representative Monitoring Points Groundwater Elevations and Minimum Thresholds

Well Name	SWN	Well Use	Fall Groundwater Conditions		Spring Groundwater Conditions		Minimum Threshold (feet MSL)	Current Operational flexibility (feet)[b]
			October 2021 (feet MSL)	Change from 2020 (feet)[a]	March 2022 (feet MSL)	Change from 2021 (feet)[a]		
Elrod Well	04N22W05L003S	Agricultural	698.84	-33.73	716.48	18.26	576.3	+122.5
—	04N22W05L008S	Agricultural	699.59	-0.9	704.09	8.4	576.3	+123.3
Topa Topa Ranch Well No. 5	04N22W04Q001S	Agricultural	940.25	-5.55	958.30	11.4	915.9	+24.4
Lagomarsino Well	04N22W06E006S	Agricultural	—	—	—	—	TBD[c]	—
Hansen Well	04N23W01J003S	Agricultural	660.13	-33.10	690.23	-23.17	567.5	+92.6
Mutual Well 4	04N22W06K003S	Municipal	659.14	-30.86	678.50	-10.4	556.5	+102.6
SACSGRP DDMW	05N22W32P003S	Monitoring	780.92	-3.85	797.90	3.1	771.6	+9.3
South Central DDMW	—	Monitoring	681.63	—	691.67	—	TBD[d]	—

Notes: SWN = state well number; bgs = below ground surface; MSL = mean sea level; — = not available; TBD = to be determined.

a Represents change in groundwater elevation measured at each key well between October 2020 and October 2021 or March 2021 and March 2022. Negative (-) values denote single year decline in groundwater elevation. Positive (+) values denote single year increase in groundwater elevation.

b Current Operational Flexibility is defined as the difference between the seasonal low groundwater elevation (e.g., fall 2021) and the minimum threshold groundwater elevation. Positive (+) values denote that current groundwater elevations are higher than the minimum threshold.

c The pressure transducer and data logger in Lagomarsino Well had the cable cut by a contractor and has not been recovered, but is in the process of being replaced. Minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

d The South Central DDMW well was constructed in 2021. Because this well is new and monitoring began in June 2021, minimum thresholds and measurable objectives will be established as part of the 5-year GSP update.

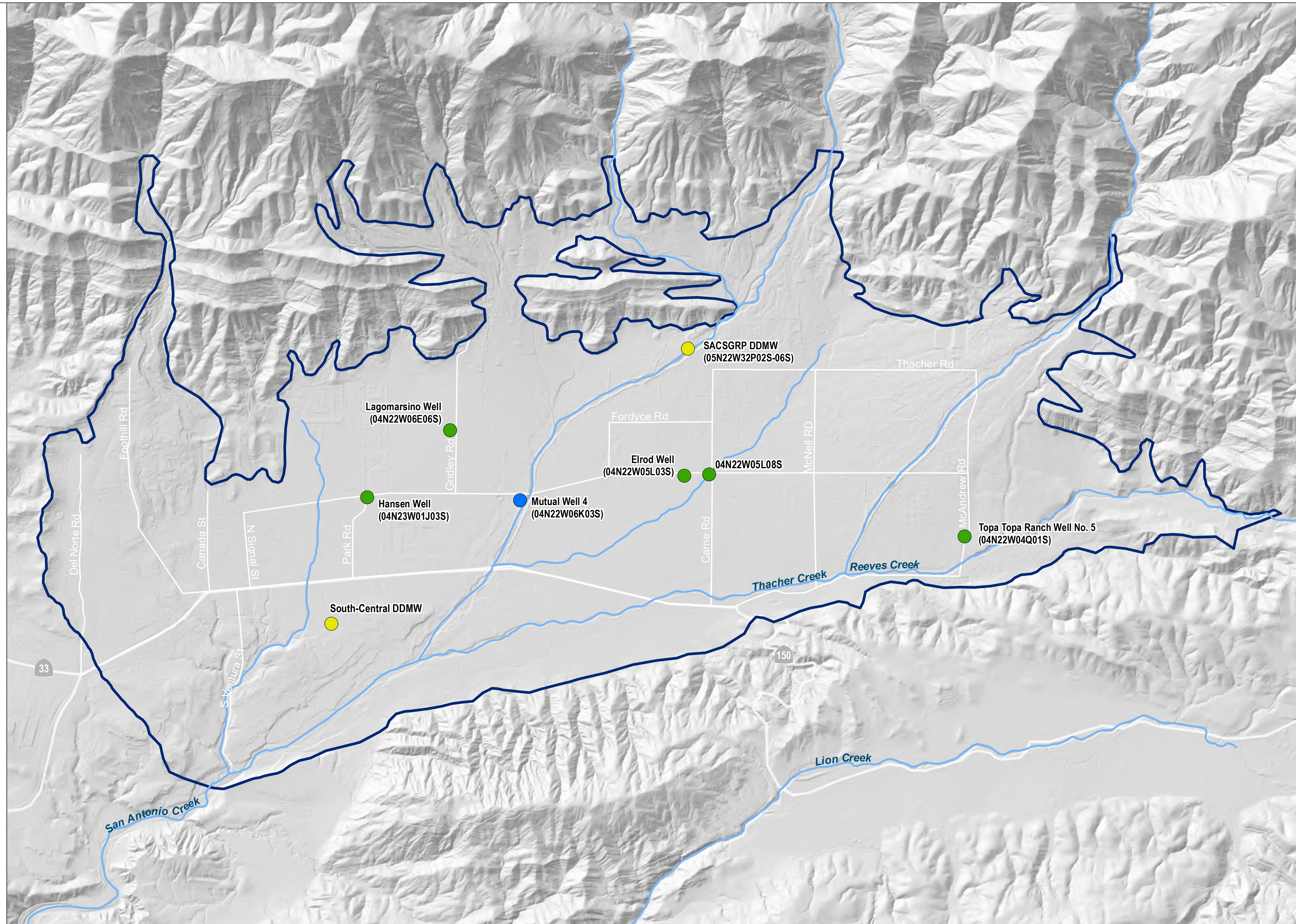
Legend

Ojai Valley Groundwater Basin (4-002)

Representative Monitoring Point

Well Type

- Agricultural
- Municipal
- Monitoring



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DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

FIGURE 10

Representative Monitoring Points

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5 Water Use

The following subsections describe water use in the OVGB including groundwater extraction, imported surface water, and total water use,

5.1 Groundwater Extraction

The OBGMA is mandated by its enabling act (Senate Bill No. 534) to monitor groundwater extractions from all active wells within the OVGB. The OBGMA requires well operators to accurately measure and report extractions as precisely as possible, regardless of volume extracted, using flow meters and a standardized Groundwater Extraction Form in January, April, July, and October of each year. The number of active wells varies from year to year due to construction and destruction of wells, well owners not pumping due to changes in agricultural use, or well owners obtaining water from other sources. Currently, there are approximately 184 active wells in the OVGB.

Groundwater extraction categories can be broken into four primary sectors: 1) agricultural use; 2) domestic use; 3) municipal/industrial use; and 4) Ojai Water System (Casitas Municipal Water District). In water year 2022, the total volume of groundwater extracted from the OVGB was approximately 3,527 AF, of which approximately 1,927 AF (55%) was for agriculture, 308 AF (9%) was for domestic, 69 AF (2%) was for municipal/industrial, and 1,223 AF (35%) was for Ojai Water System (Table 6). The 2022 water year total extraction of approximately 3,500 AF is approximately 600 to 1,500 AF lower than the estimated basin sustainable yield (OBGMA 2022), and approximately 1,000 AF less than reported total groundwater extraction in water years 2020 and 2021. Figure 11 illustrates the general location and volume of groundwater extractions. The decrease in groundwater extraction from water years 2020 and 2021 to water year 2022 is due in part to the fact that water year 2022 was an average water year. However, groundwater extraction reporting for water year 2022 is preliminary and the OBGMA anticipates additional reporting. The OBGMA is currently working to update and improve the groundwater extraction metering program and will revise the groundwater extraction volumes reported herein as additional data are received.

Table 6. Reported Groundwater Extractions

Groundwater User Type	Groundwater Extraction (AF)		
	Water Year 2020	Water Year 2021	Water Year 2022[a]
Agriculture	2,661	2,784	1,927
Domestic	399	251	308
Municipal/Industrial	57	80	69
Ojai Water System	1,340	1,246	1,223
Total	**4,456**	**4,361**	**3,527**

Source: OBGMA 2023.
Note: AF = acre-feet.

[a] Groundwater extraction reporting for water year 2022 is preliminary and the OBGMA anticipates additional reporting. The OBGMA is currently working to update and improve the groundwater extraction metering program and will revise the groundwater extraction volumes reported herein as additional data are received.

5.2 Surface Water Use

There is currently no surface water extracted for use from the OVGB and no water was diverted from San Antonio Creek to the San Antonio Creek Spreading Grounds in water year 2022.

Water from Lake Casitas is imported to the OVGB by Casitas Municipal Water District (CMWD) and used to meet agricultural and domestic demands (OBGMA 2018). Water from Lake Casitas is also blended with poorer quality groundwater by some water purveyors in the OVGB to improve water quality (OBGMA 2018). Lake Casitas has a total capacity of approximately 238,000 AF.

In water year 2022, approximately 2,577 AF of Lake Casitas water was consumed in the OVGB, of which approximately 325 AF was used by customers within the Ojai Water System and 2,253 AF was used by customers outside of the Ojai Water System (Table 7). The Ojai Water System service area boundary is shown in Figure 11.

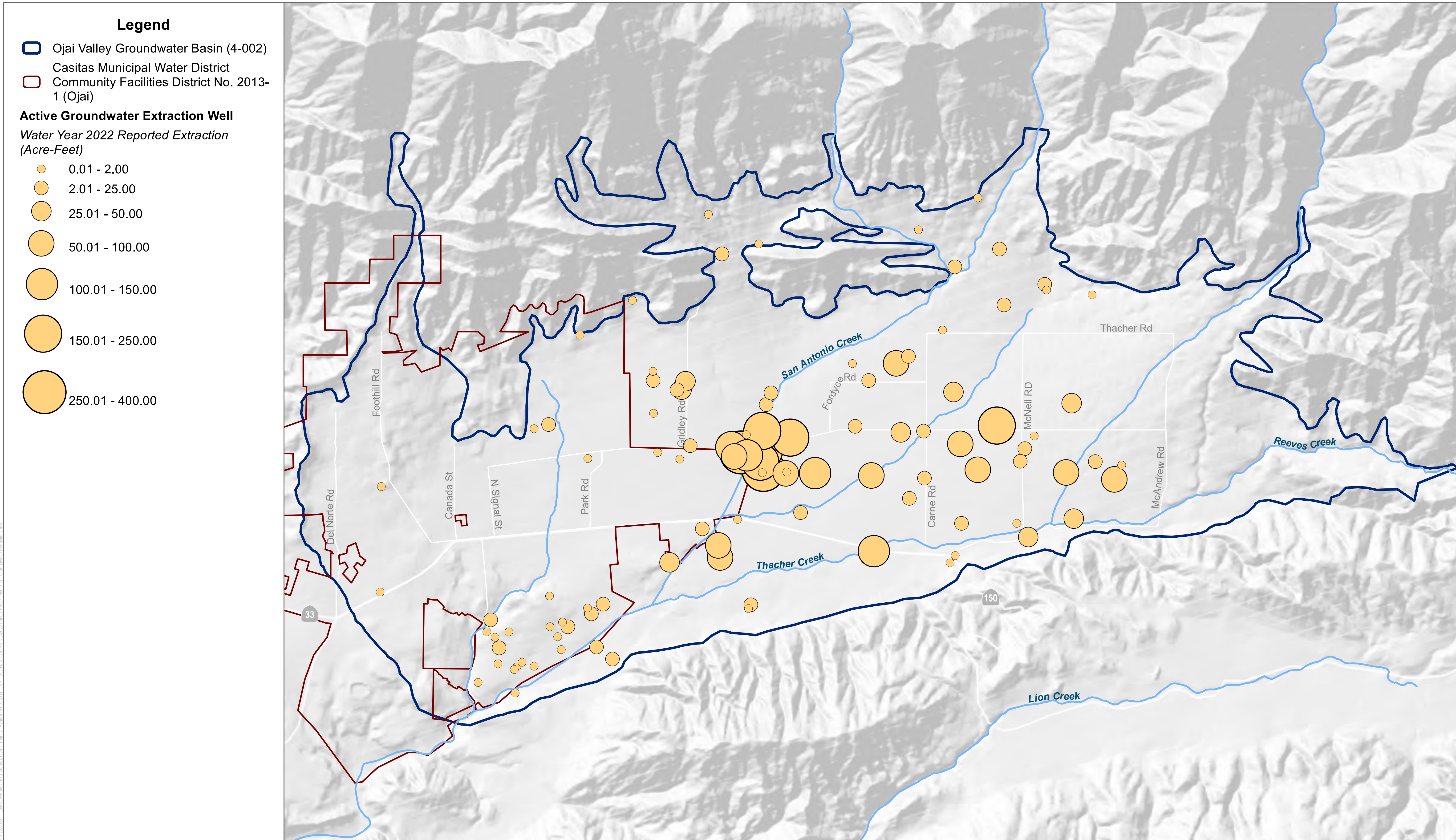
Table 7. Estimated Lake Casitas Water Consumption in OVGB

Water Year	Lake Casitas Water Use in OVGB within Ojai Water System (AF)	Lake Casitas Water Use in OVGB outside Ojai Water System (AF)	Total (AF)
2020	218	2,002	2,220
2021	439	2,745	3,183
2022	325	2,253	2,578

Source: CMWD 2023.
Notes: AF = acre-feet.

5.3 Total Water Use

Total water use in the OVGB is equivalent to the sum of groundwater extractions and surface water supplied by Casitas Municipal Water District from Lake Casitas. The total water use in water year 2022 was approximately 6,105 AF.



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DATUM: NAD 1983 DATA SOURCE: ESRI; DWR; USGS; VCWPD; OBGMA

DUDEK

0 0.5 1 Miles

FIGURE 11

Groundwater Extractions

Annual Report for the Ojai Valley Groundwater Basin

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6 Change in Groundwater Storage

The water year 2022 change in groundwater in storage in the OVGB was calculated using a linear regression model to correlate spring (i.e., seasonal high) groundwater elevations measured at well 04N22W05L008S (Figure 12) to simulated cumulative change in groundwater storage extracted from the Ojai Basin Groundwater Model (OBGM) (DBS&A 2020). For the purposes of this report and analysis, groundwater levels measured in March of each year are considered the seasonal high or spring level. This linear regression model provides an estimate of the cumulative change in storage since the spring of 1971. While this method does not capture the spatial variability in groundwater storage change that results from local hydrologic, hydrogeologic, and operational conditions, the strong correlation between the OBGM cumulative change in storage and spring groundwater elevations measured at well 04N22W05L008S (R^2 = 0.88; Figures 12 and 13) indicates this simple correlation provides a reasonable estimate of net change in groundwater storage across the entirety of the OVGB.

Annual and cumulative change in storage for water year 2022 is summarized in Table 8 and presented in Figures 14 and 15. Results from the linear regression model indicate groundwater in storage increased by approximately 934 AF in water year 2022 (Table 8 and Figure 14). This increase is attributable to the climate conditions in the 2022 water year in which precipitation in the OVGB was approximately 81% of the long-term average and approximately 200% higher than the previous water year. The increase in storage in water year 2022 reflects the strong correlation between climate and groundwater conditions in the OVGB. Since spring 2014, groundwater in storage in the OVGB has increased approximately 4,541 AF (Table 8 and Figure 15). Annual change in storage for water year 2022 is shown in map view in Figure 16.

Table 8. Annual and Cumulative Change in Storage in the OVGB

Water Year	Water Year Type	Spring Groundwater Elevation (ft MSL)[a]	Change in Spring Groundwater Elevation (ft)	Estimated Annual Change in Storage[b] (AF)	Cumulative Change in Storage Since Spring 2014 (AF)
2020	Average	749.19	17.20	1,912	9,555
2021	Dry	695.69	-53.50	-5,948	3,607[c]
2022	Average	704.09	8.40	934	4,541

Notes: MSL = mean sea level; ft = feet; AF = acre-feet.

a Spring groundwater elevation measured at well 04N22W05L008S.

b Annual change in storage calculated from spring to spring. For example, water year 2022 storage change represents storage change between spring 2021 and spring 2022.

c The water year 2021 cumulative change in storage presented in the water year 2021 annual report was a typo. This typo did not impact the reported annual change in storage. The 2021 cumulative change in storage was corrected as part of this water year 2022 annual report.

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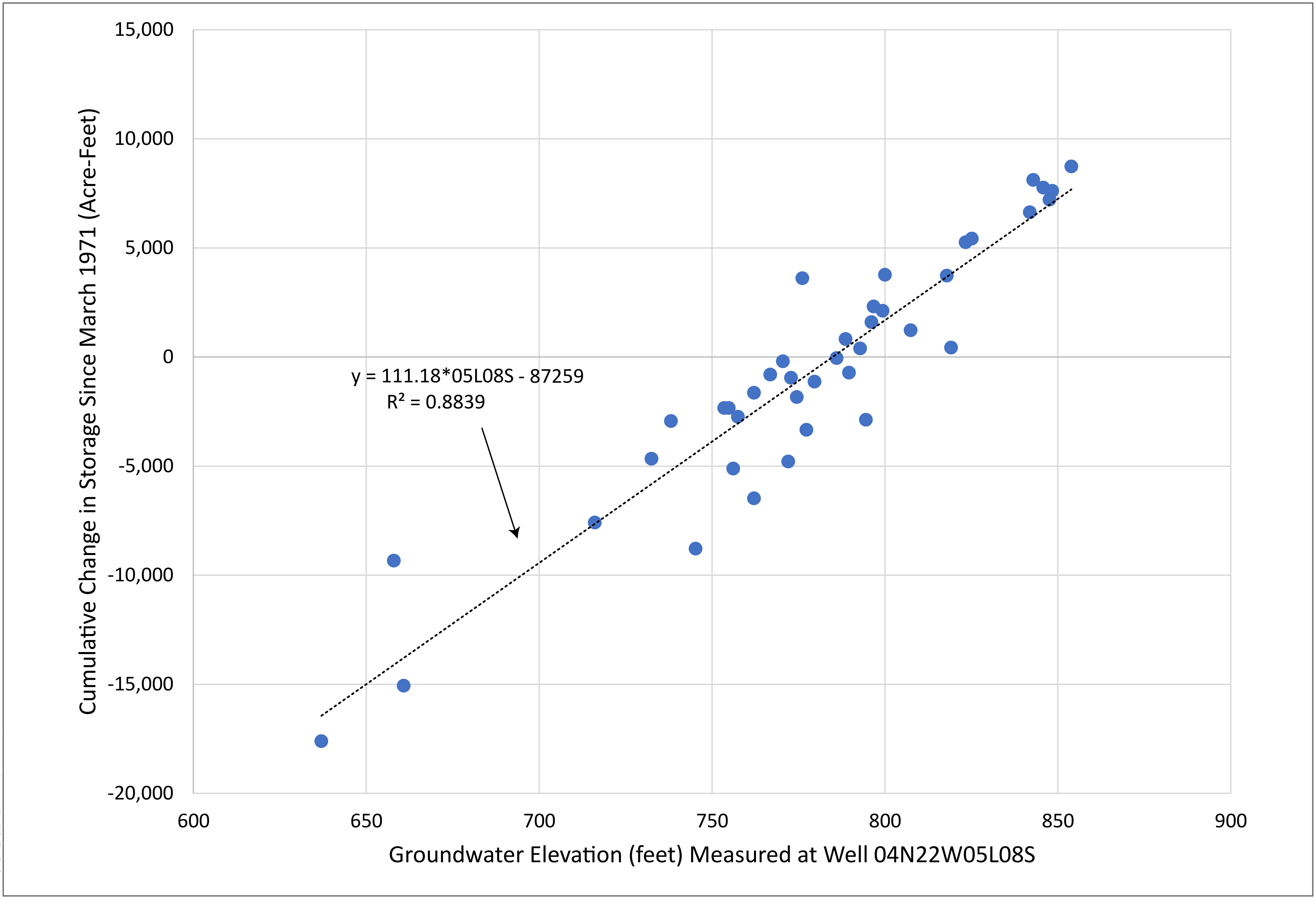

SOURCE: DBS&A 2020

FIGURE 12

Linear Regression Model Developed using Well 04N22W05L008S and the OBGM

Annual Report for the Ojai Valley Groundwater Basin

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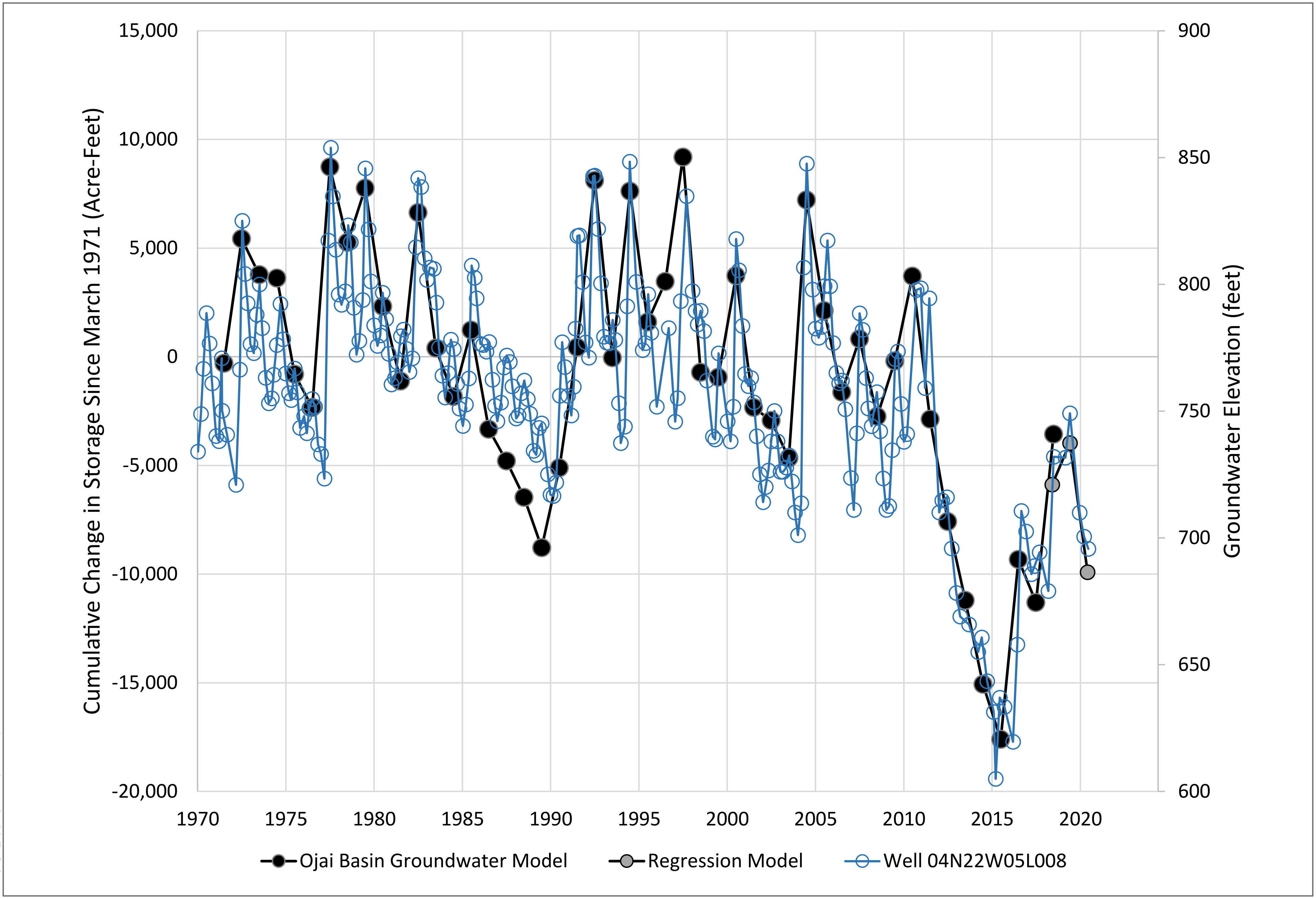

SOURCE: DBS&A 2020

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FIGURE 13

Validation of Linear Regression Model Developed using Well 04N22W05L008S and the OBGM

Annual Report for the Ojai Valley Groundwater Basin

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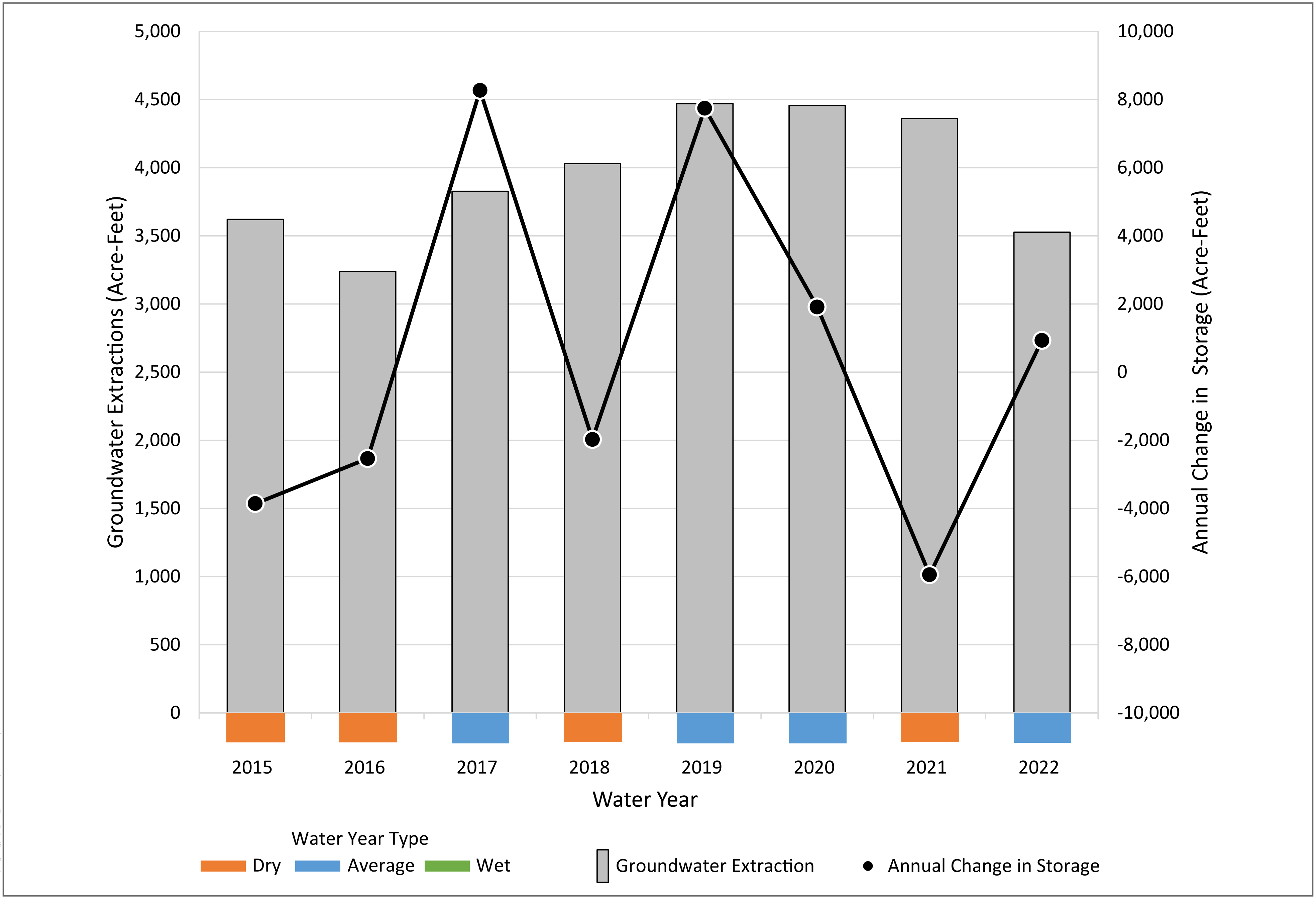

SOURCE: DBS&A 2020

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FIGURE 14

Groundwater Extractions and Annual Change in Storage in the OVGB

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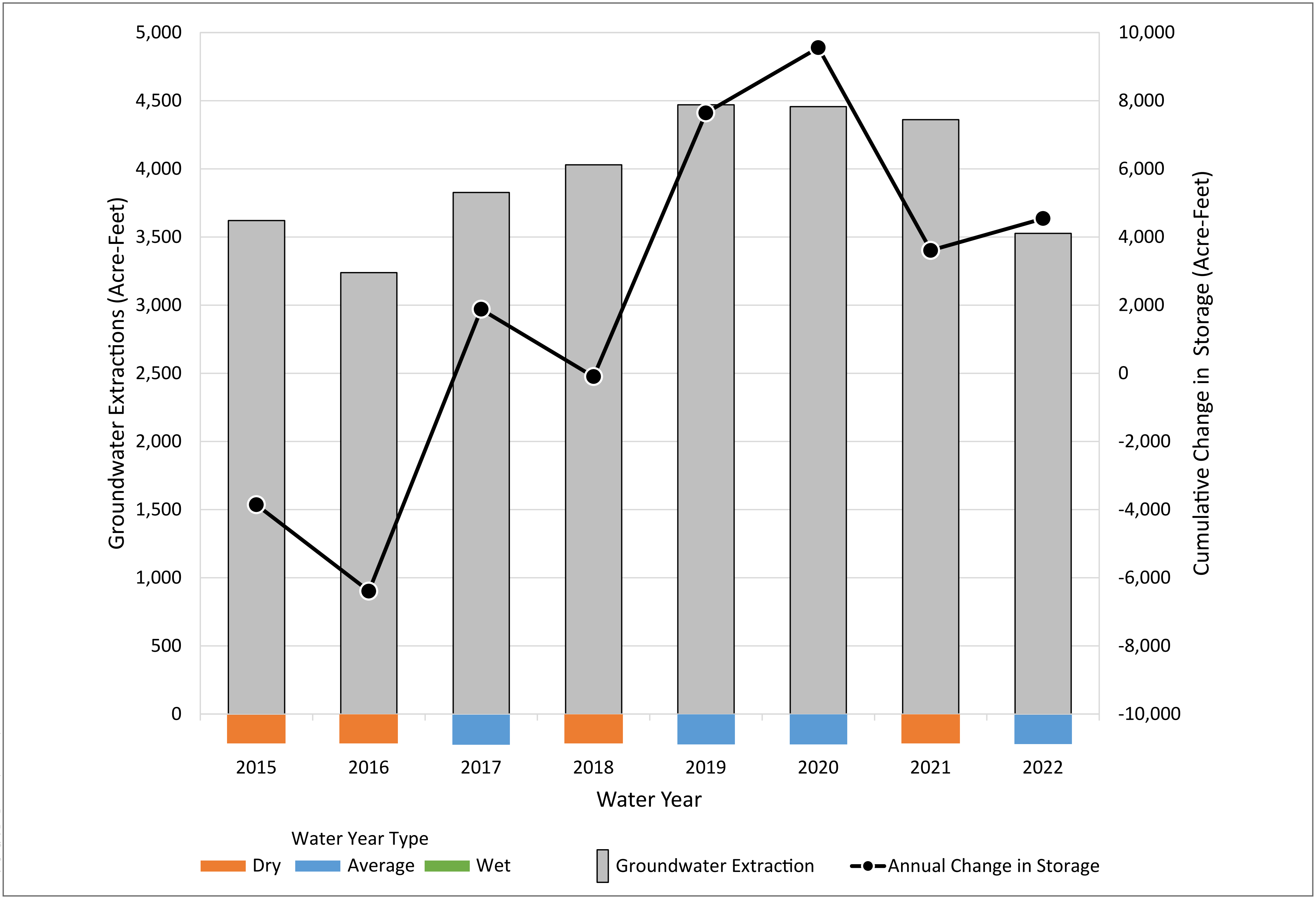

SOURCE: DBS&A 2020

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FIGURE 15

Groundwater Extractions and Cumulative Change in Storage in the OVGB

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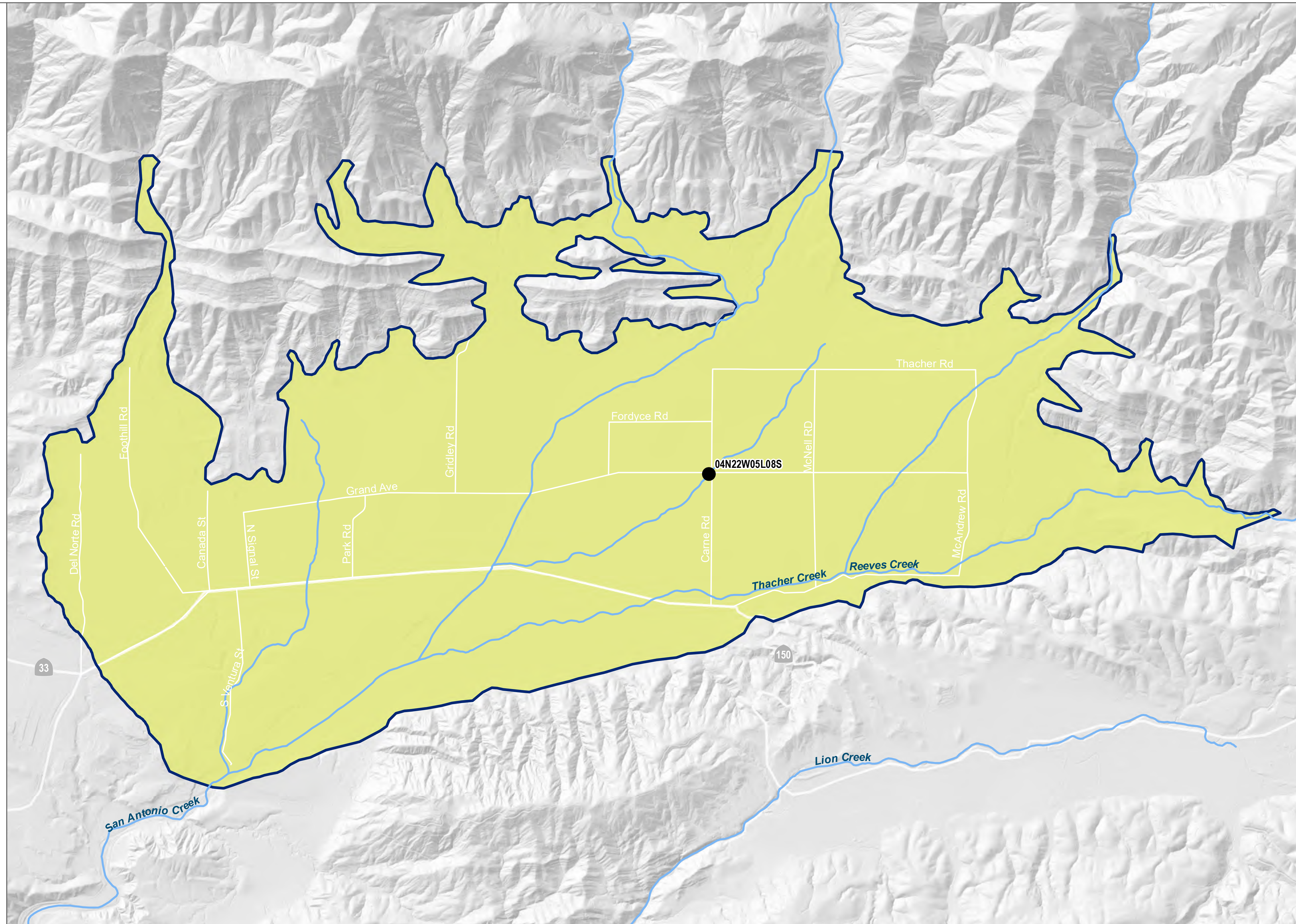
Legend

- Ojai Valley Groundwater Basin (4-002)
- Storage Change Correlation Well

Annual Change in Storage (Acre-Feet)

- < -6,000
- -5,999 to -4,000
- -3,999 to -2,000
- -1,999 to 0
- 1 to 2,000
- 2,001 to 4,000
- 4,001 to 6,000
- > 6,000

Note: Change in storage calculated at the basin-wide scale based on a corerlation between spring groundwater elevations measured at well 04N22W05L08S and simulated change in storage extracted from the Ojai Basin Groundwater Model



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DATUM: NAD 1983 DATA SOURCE: DWR; USGS; VCWPD; OBGMA

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0 0.5 1 Miles

FIGURE 16

Water Year 2022 Annual Change in Storage

Annual Report for the Ojai Valley Groundwater Basin

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7 GSP Implementation Progress

The GSP for the OVGB was submitted to DWR in January 2022. This section provides an update on GSP implementation progress since the GSP was submitted.

The OBGMA has continued to monitor streamflow in San Antonio Creek and its tributaries to document trends and improve understanding of the OVGB hydrogeology. Work has included:

- Monthly flow transect surveys of San Antonio Creek stream flow near the basin boundary
- Continuous (i.e., 10-minute) stream gage measurements in San Antonio Creek near the basin boundary
- Monthly stream surveys to document the wetted extent and discharge of the major creeks transecting the OVGB, in addition to mapping of points of stream infiltration in recharge areas and groundwater exfiltration in the discharge areas
- Comparison of instantaneous County stream gage data with transect surveys

The OBGMA continues to monitor groundwater levels in both the perched aquifer and primary production aquifer to evaluate groundwater level dynamics within and between aquifer units. The data was used to improve understanding of the hydraulic connectivity and lack thereof between aquifer units.

The OBGMA has funded all GSP work completed to date by wellhead fixed fees and extraction charges assessed to pumpers in the OVGB. The OBGMA prepared and submitted to DWR a Proposition 68 Round 2 Application on December 15, 2022 to implement the GSP. The projects and management actions to implement if funds are received include:

1. Update Groundwater Extraction Metering Program
2. Prepare Groundwater Dependent Ecosystem Assessment
3. Develop Data Management System
4. Annual Reporting and Monitoring
5. Prepare Sampling and Analysis Plan and Quality Assurance Plan
6. Revise Numerical Groundwater Model
7. Develop Comprehensive Conjunctive Use Management Plan
8. Evaluate Feasibility of Bringing San Antonio Creek Spreading Grounds Back into Operation
9. Explore Opportunity to Implement Focused Recharge
10. Simulate Extreme Climate Scenarios

The OBGMA anticipates potential acquisition of grant funds in mid to late 2023. Once grant funds are secured, the OBGMA will begin implementation of the above projects and management actions. If grant funding is not awarded, the OBGMA will determine what additional extraction charges and rate rulemaking is required to fund necessary GSP implementation projects and management actions beyond those currently authorized under the current OBGMA budget.

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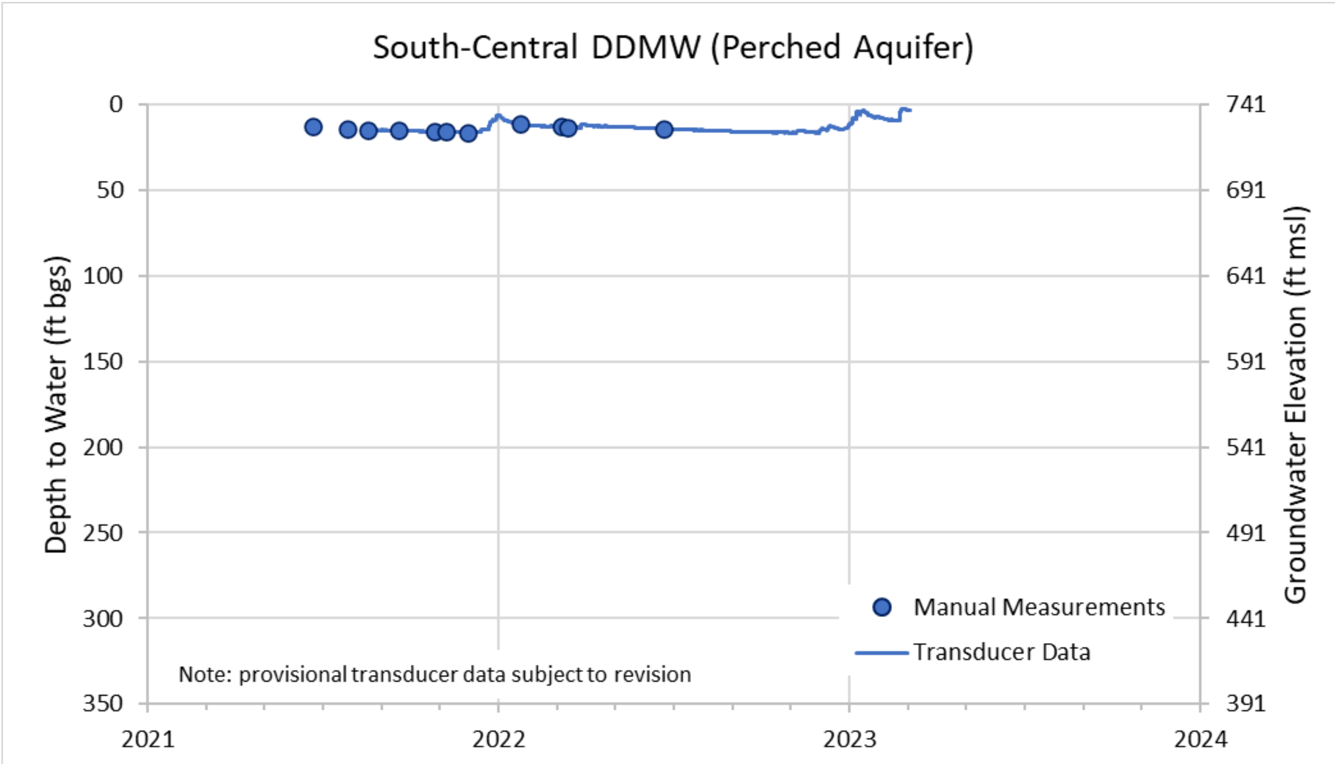
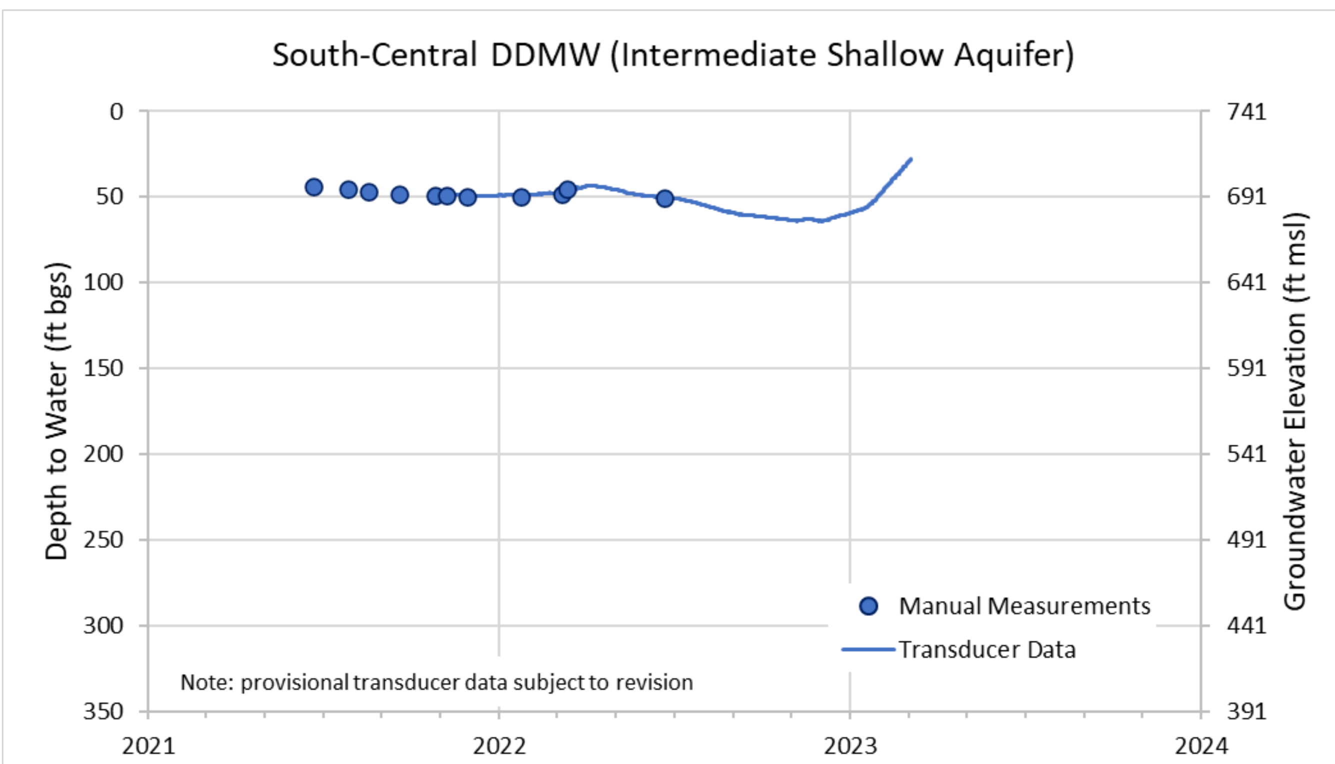
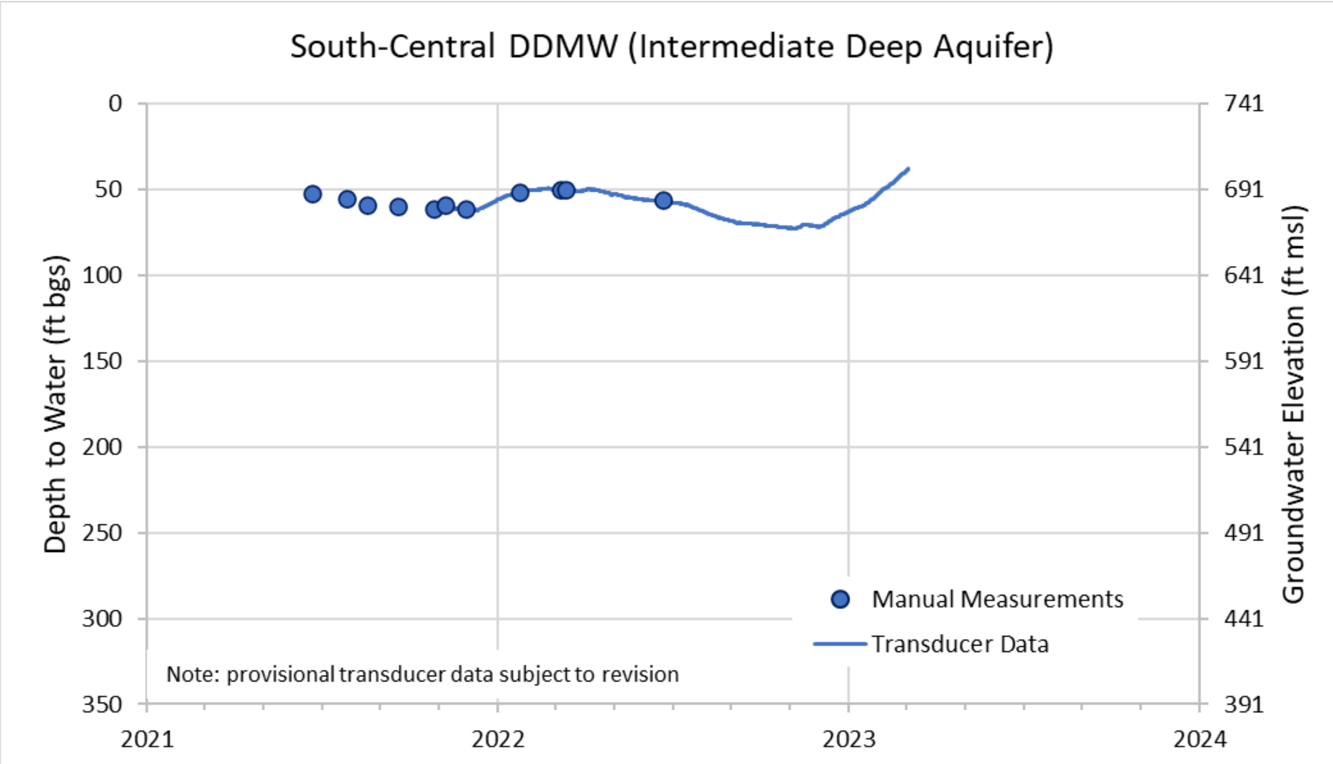
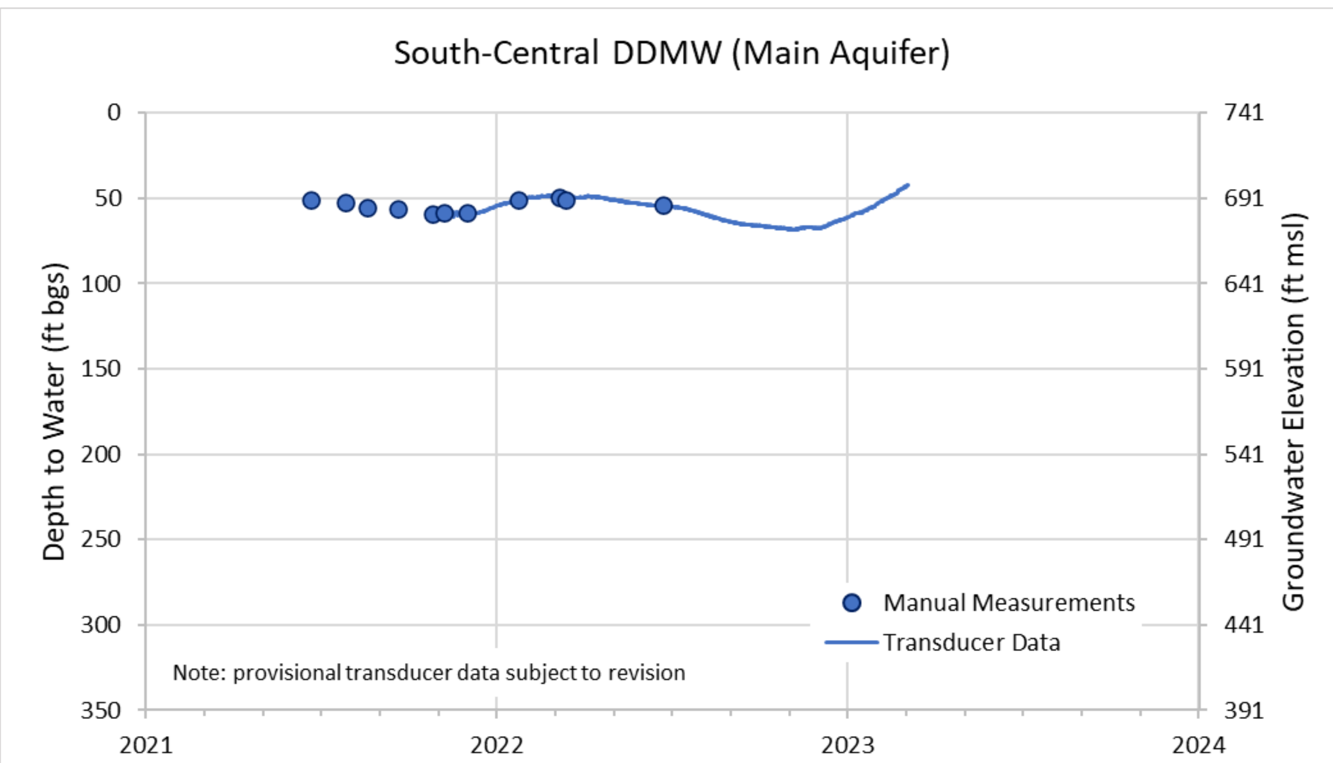
Appendix A

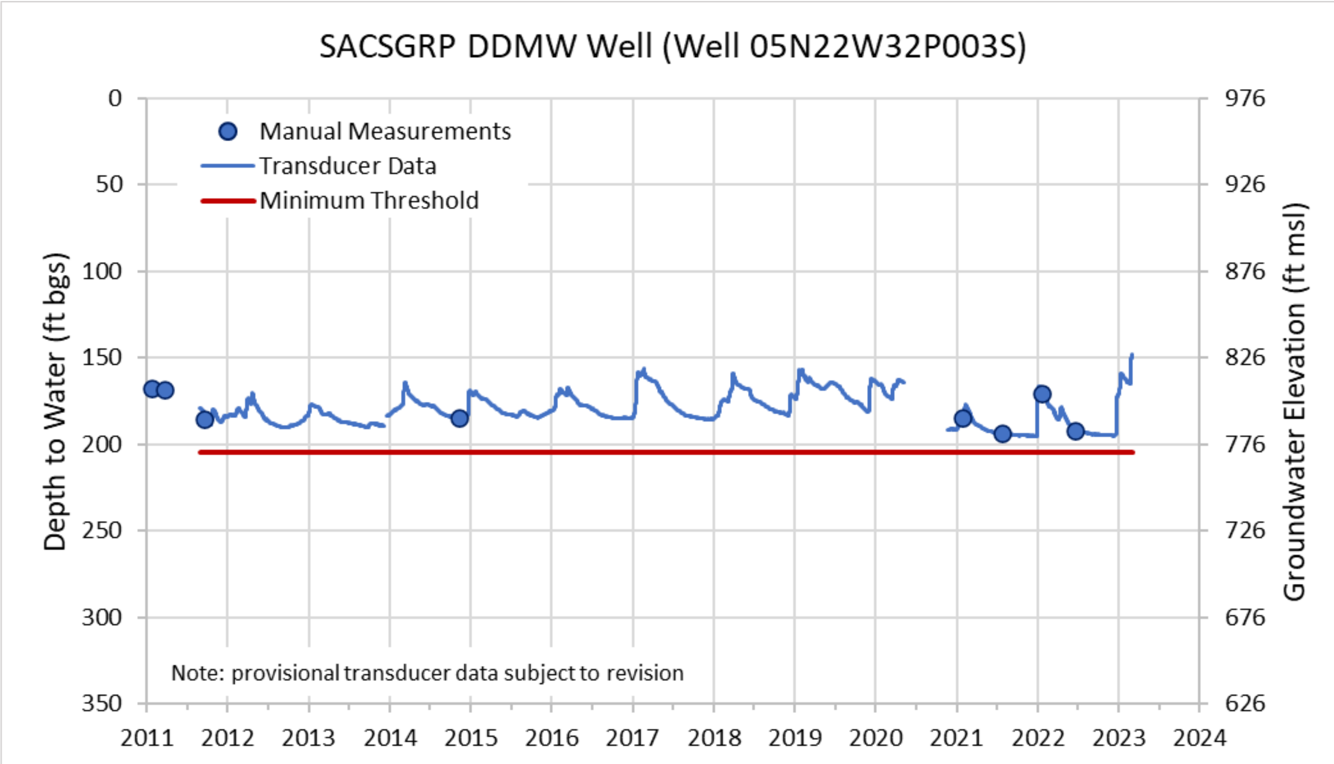
Groundwater Elevation Monitoring Well Hydrographs

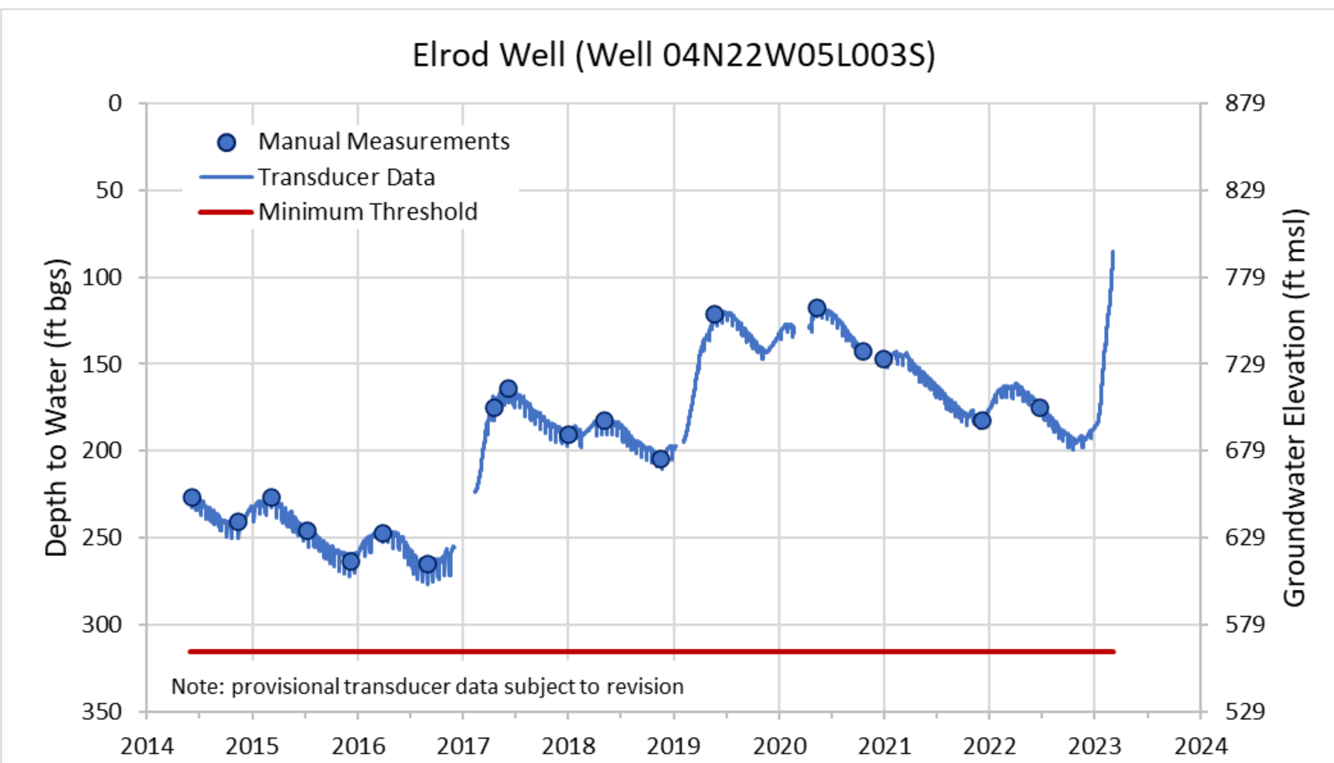

South-Central DDMW (Perched Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

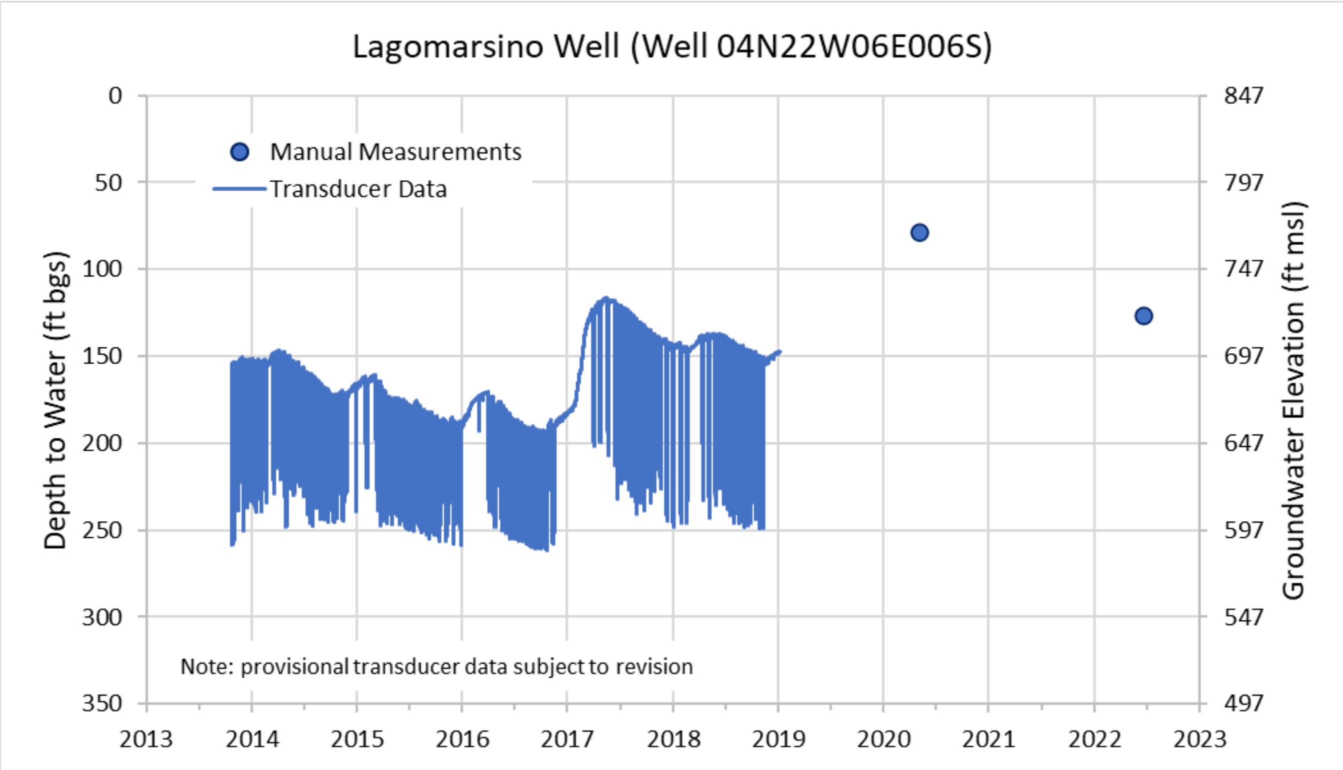

South-Central DDMW (Intermediate Shallow Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

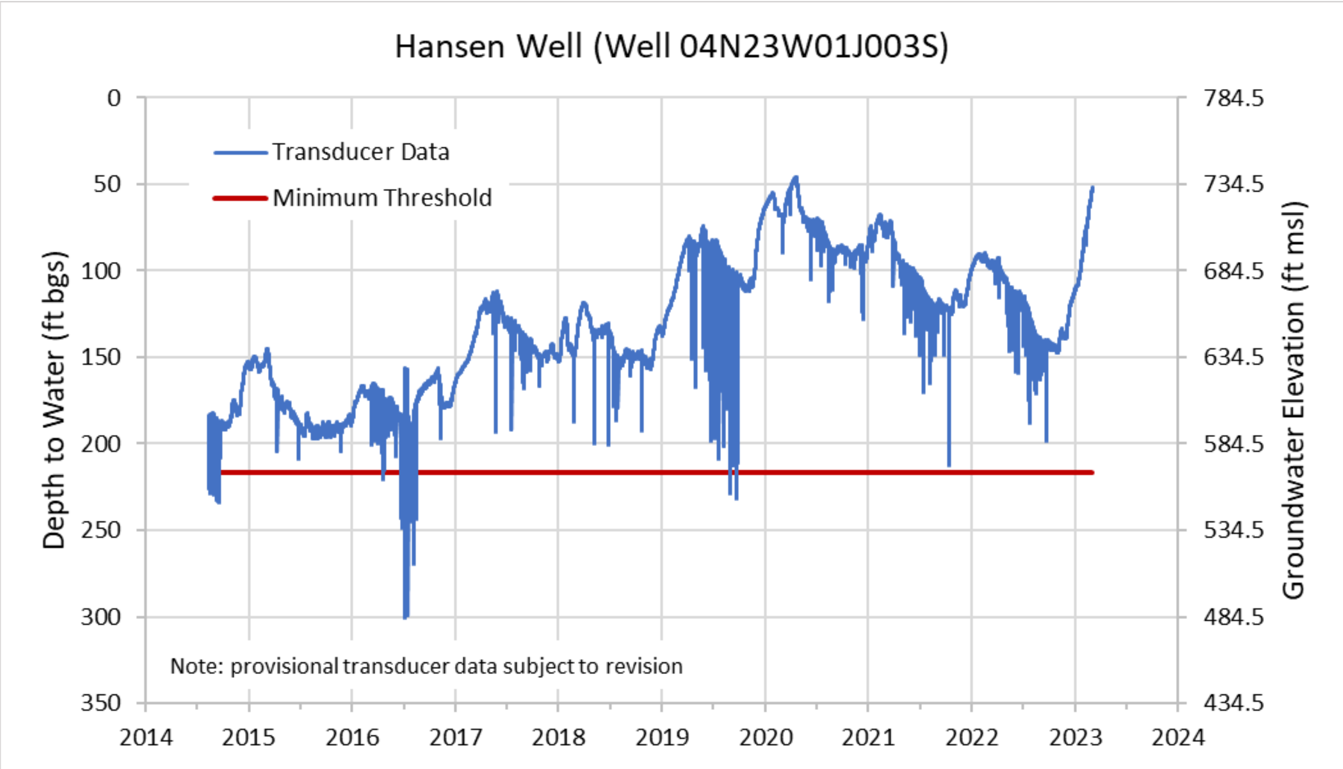

South-Central DDMW (Intermediate Deep Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision

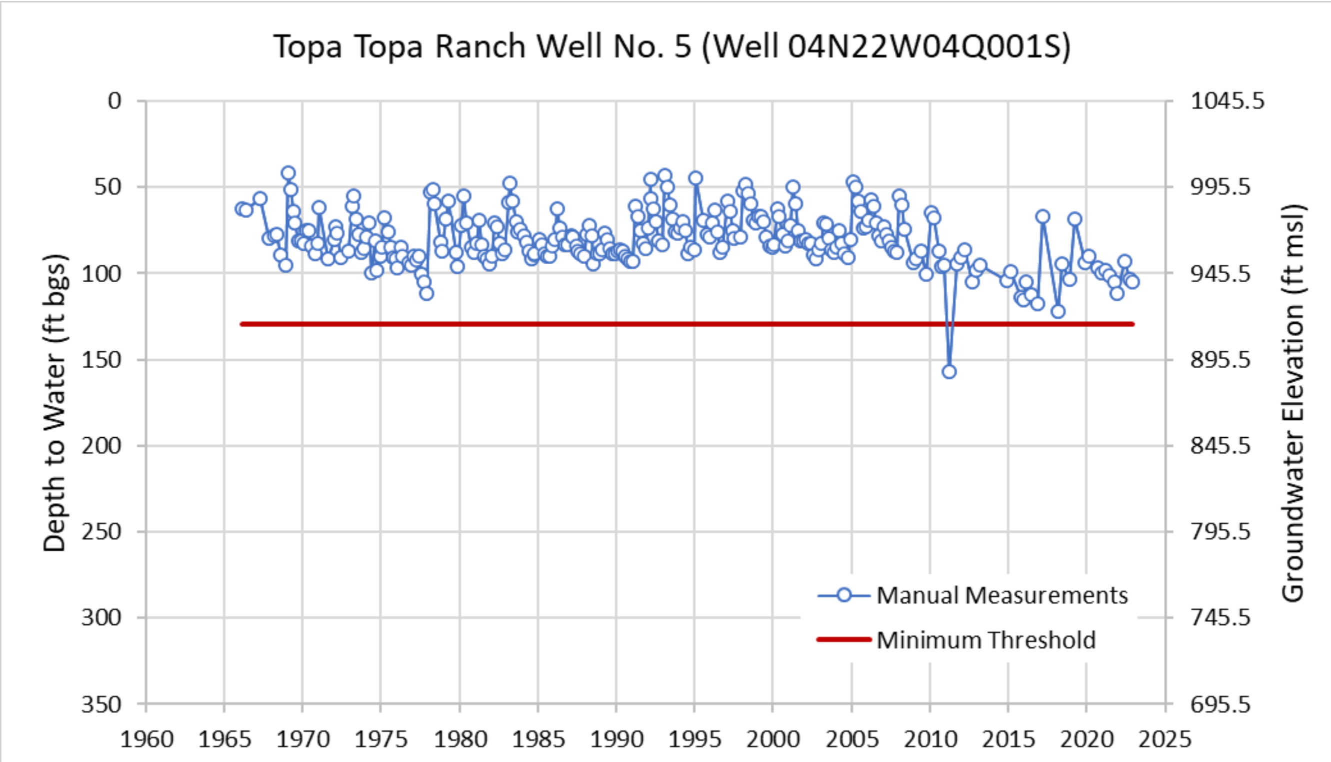

South-Central DDMW (Main Aquifer)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
741
691
641
591
541
491
441
391
2021
2022
2023
2024
Manual Measurements
Transducer Data
Note: provisional transducer data subject to revision


SACSGRP DDMW Well (Well 05N22W32P003S)
Manual Measurements
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
976
926
876
826
776
726
676
626
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Note: provisional transducer data subject to revision

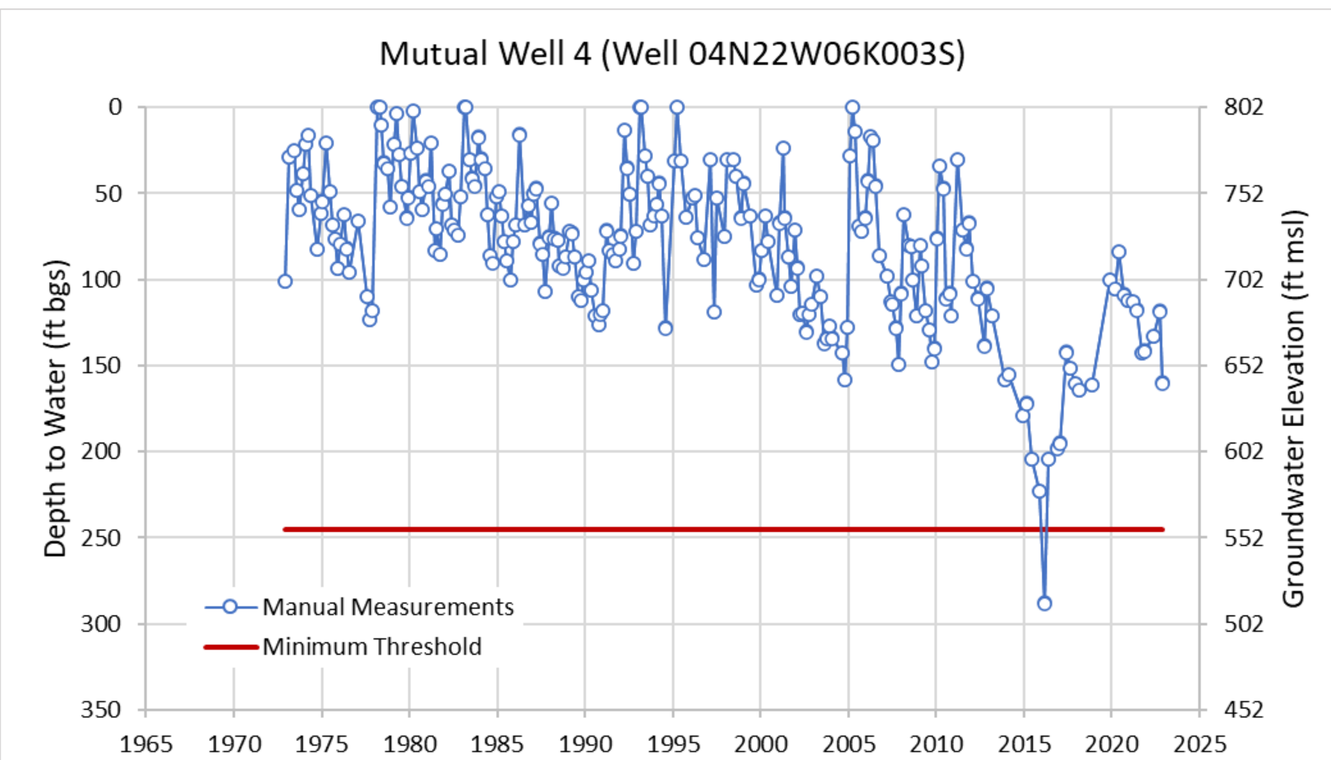

Elrod Well (Well 04N22W05L003S)
Manual Measurements
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
879
829
779
729
679
629
579
529
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Note: provisional transducer data subject to revision


Lagomarsino Well (Well 04N22W06E006S)
Manual Measurements
Transducer Data
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
847
797
747
697
647
597
547
497
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Note: provisional transducer data subject to revision

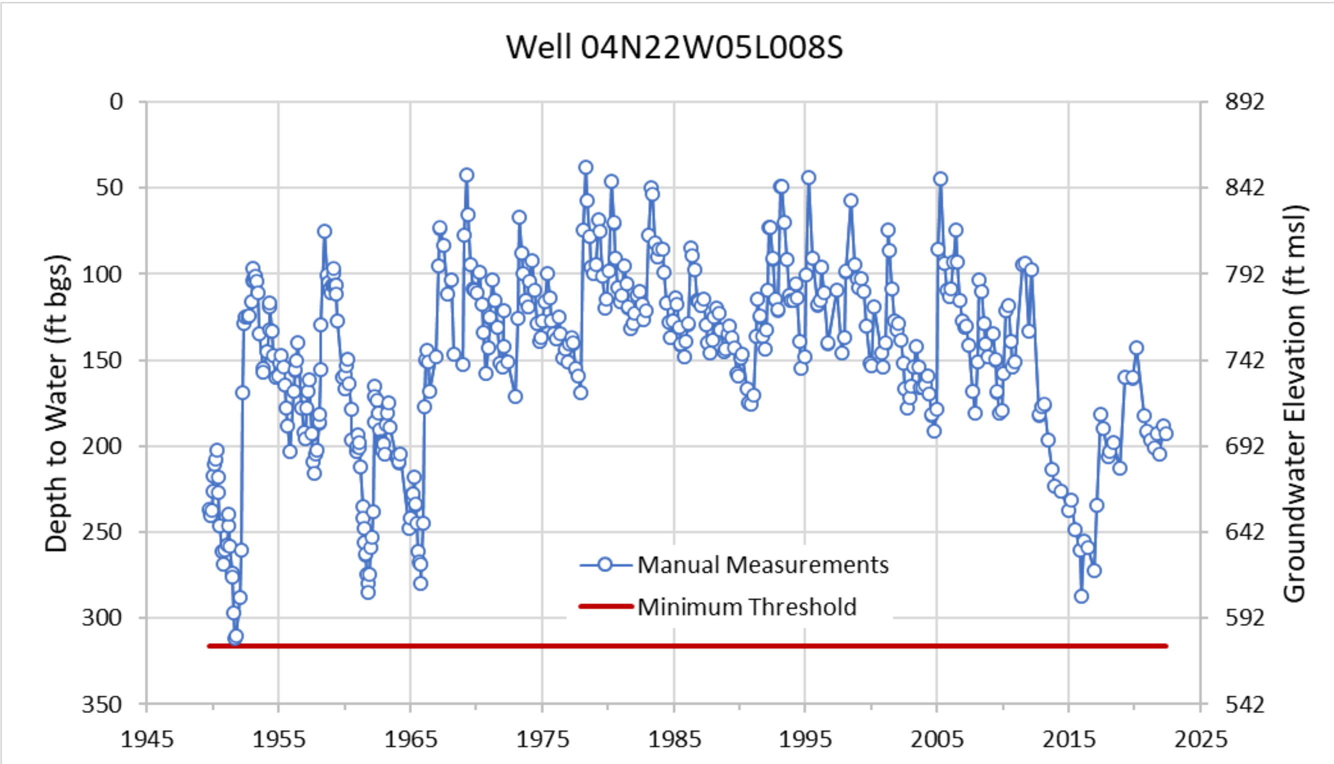

Hansen Well (Well 04N23W01J003S)
Transducer Data
Minimum Threshold
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
784.5
734.5
684.5
634.5
584.5
534.5
484.5
434.5
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Note: provisional transducer data subject to revision

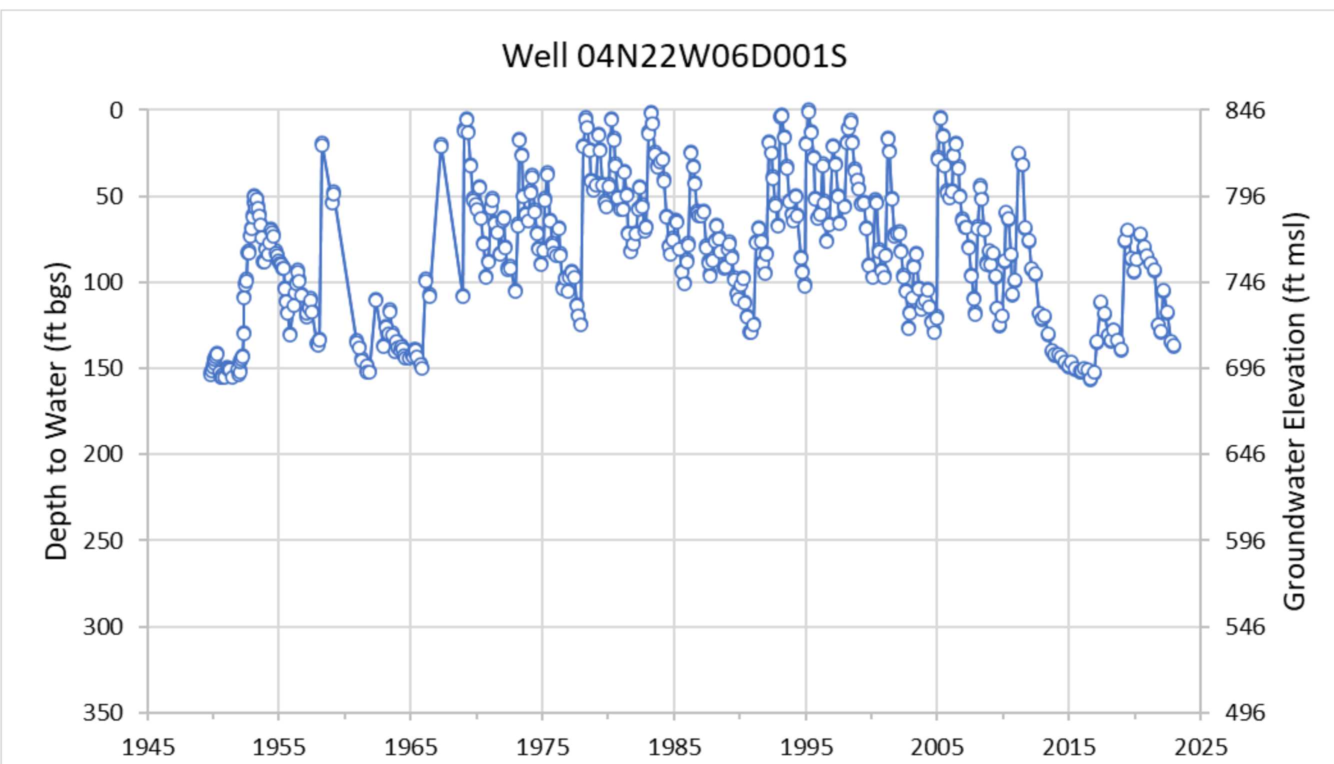


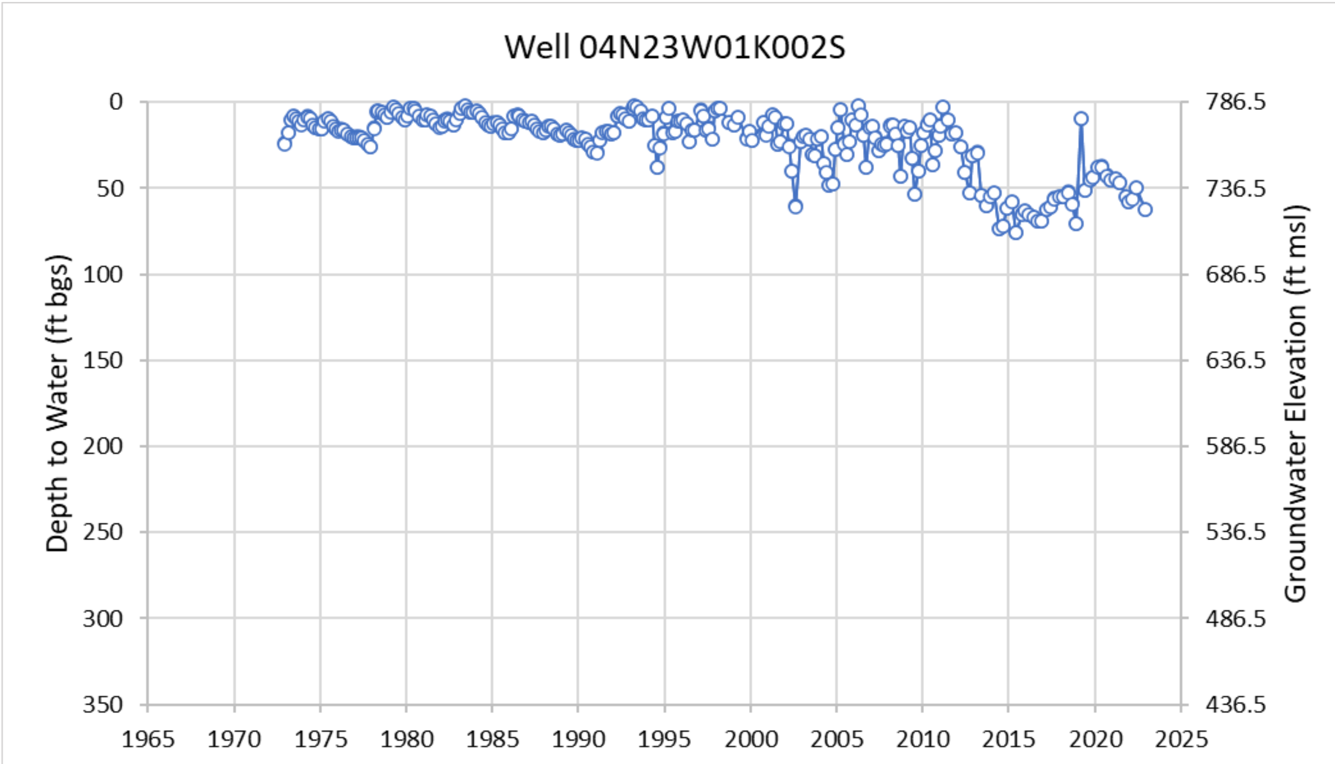
Topa Topa Ranch Well No. 5 (Well 04N22W04Q001S)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
1045.5
995.5
945.5
895.5
845.5
795.5
745.5
695.5
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Manual Measurements
Minimum Threshold

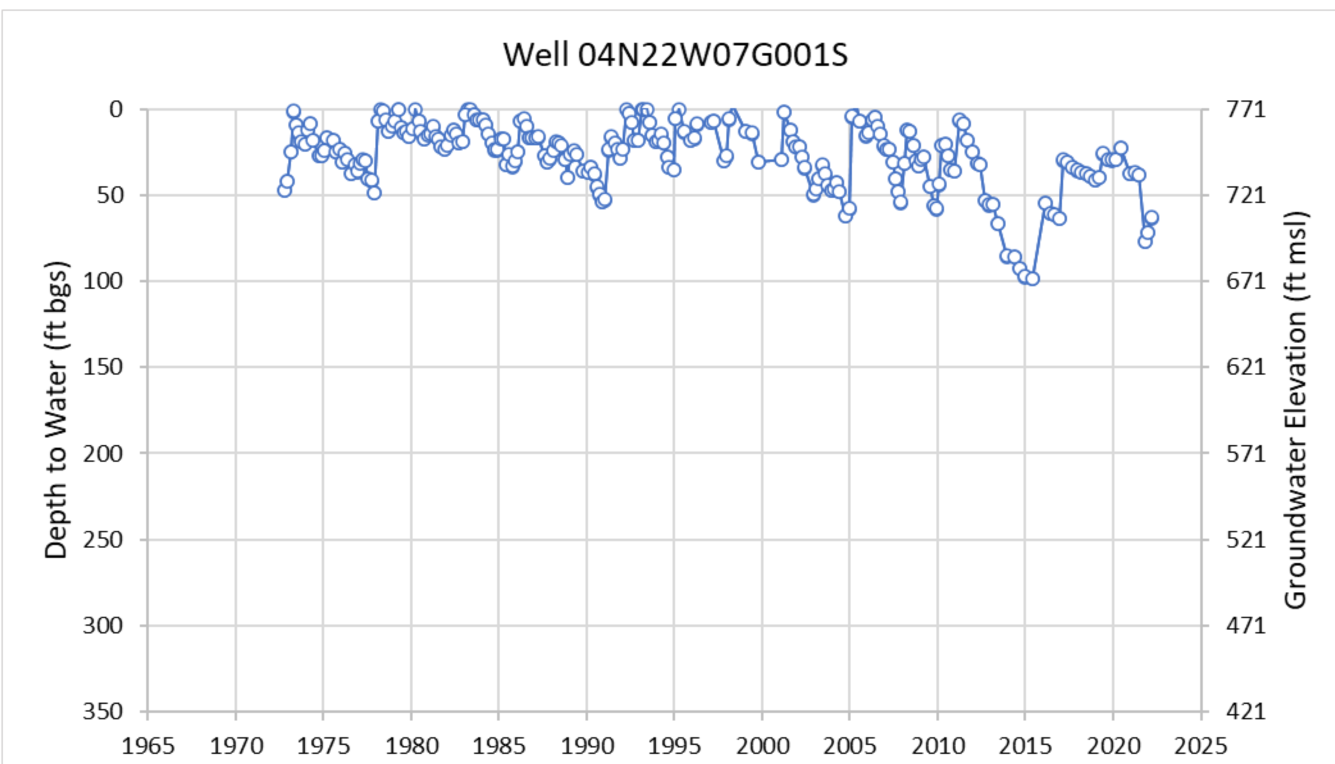


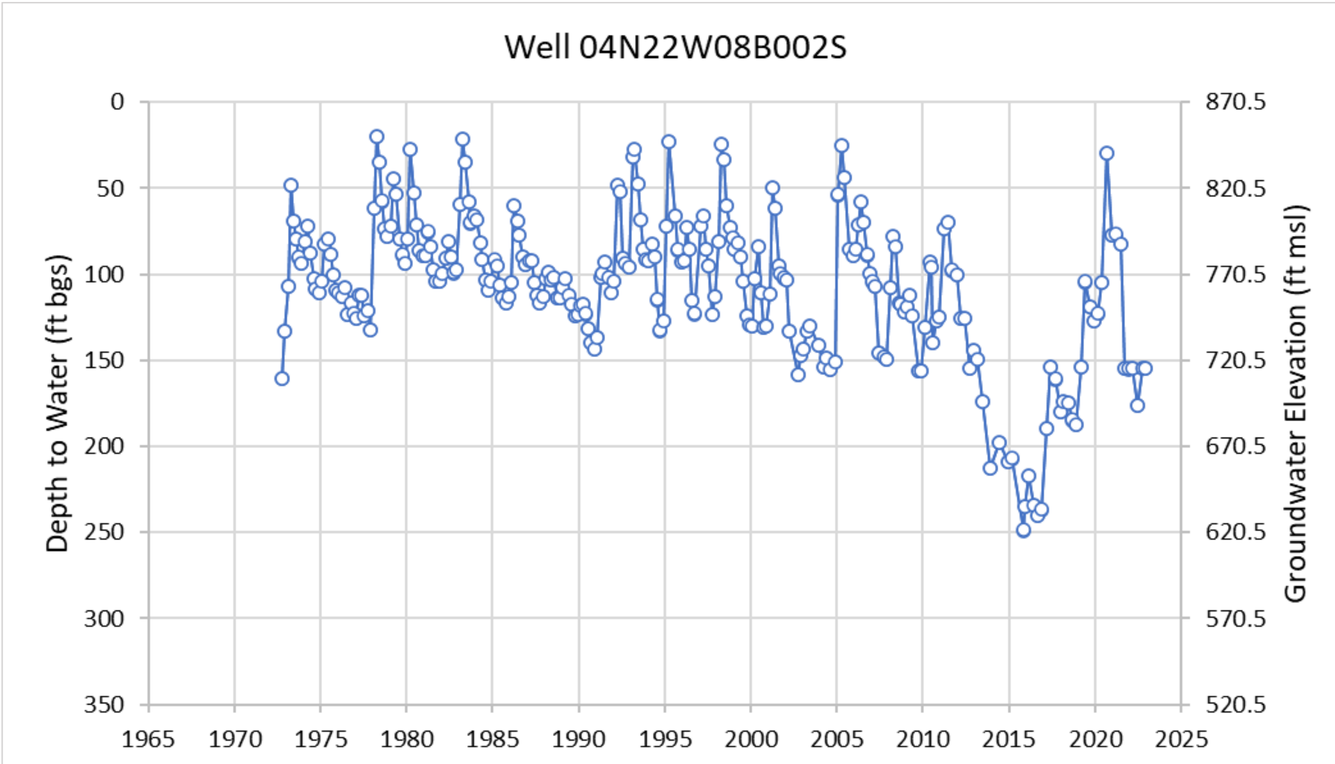
Mutual Well 4 (Well 04N22W06K003S)
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
802
752
702
652
602
552
502
452
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Manual Measurements
Minimum Threshold

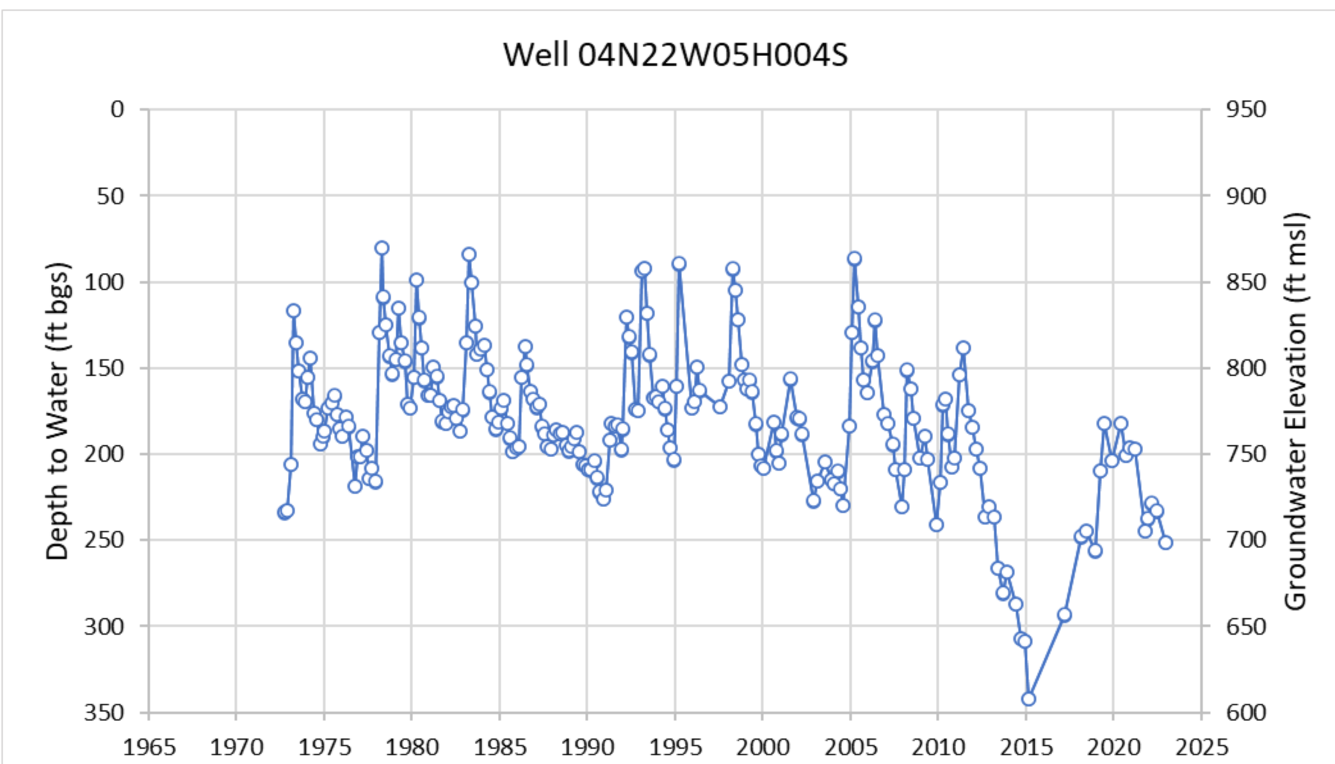

Well 04N22W05L008S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
892
842
792
742
692
642
592
542
1945
1955
1965
1975
1985
1995
2005
2015
2025
Manual Measurements
Minimum Threshold

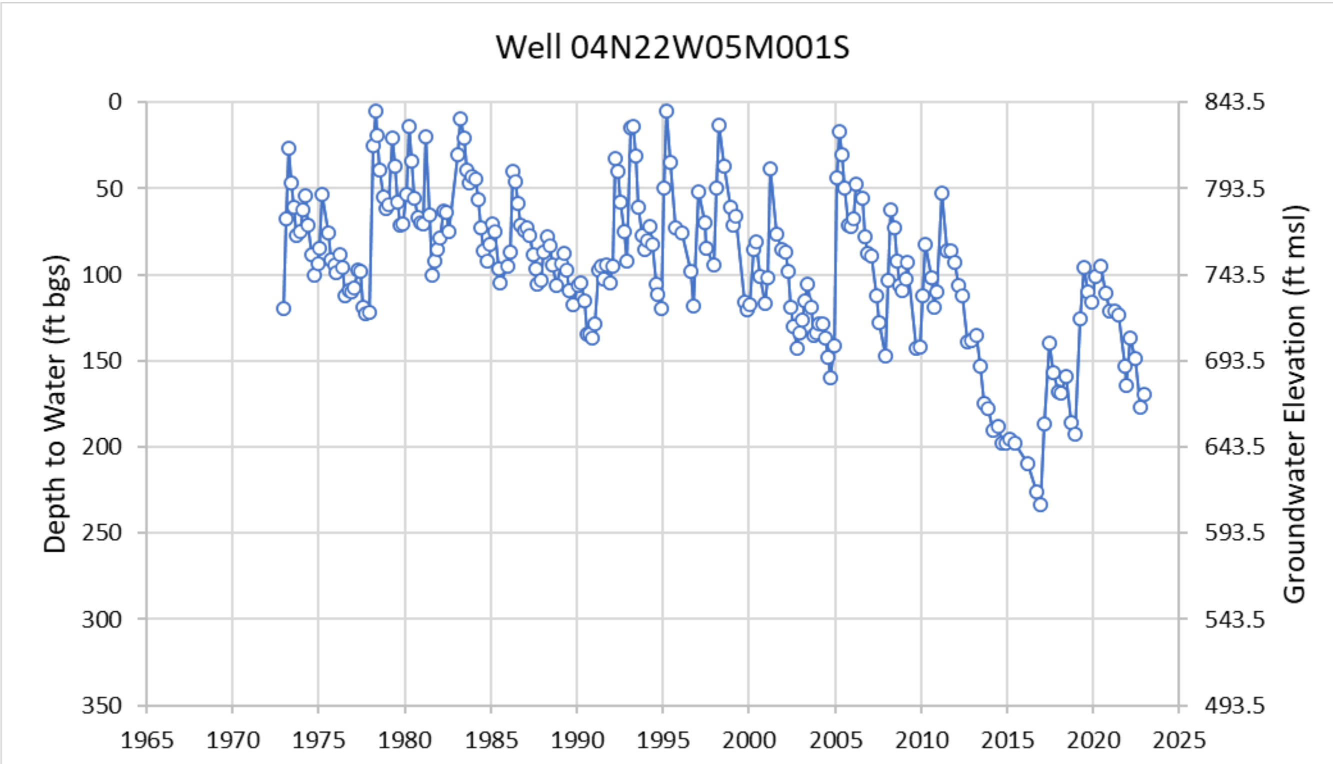

Well 04N22W06D001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
846
796
746
696
646
596
546
496
1945
1955
1965
1975
1985
1995
2005
2015
2025

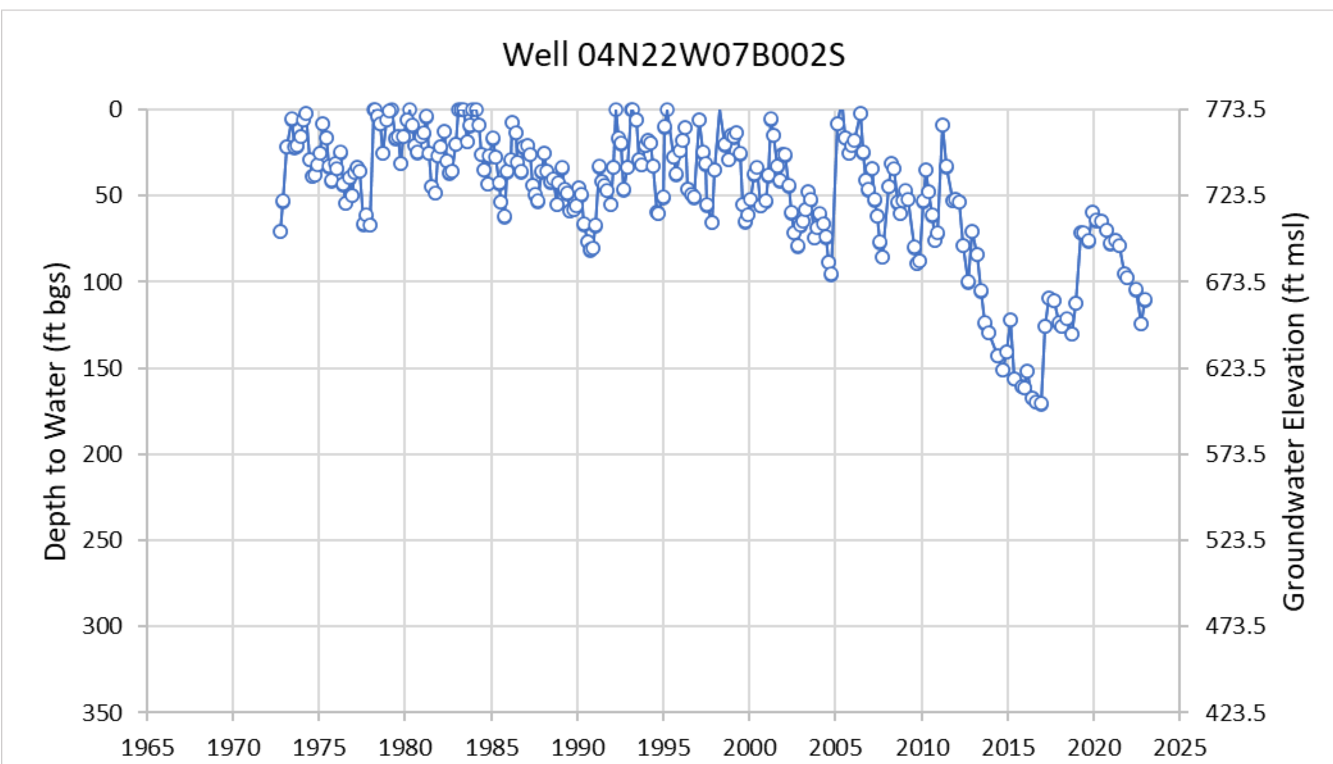

Well 04N23W01K002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
786.5
736.5
686.5
636.5
586.5
536.5
486.5
436.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

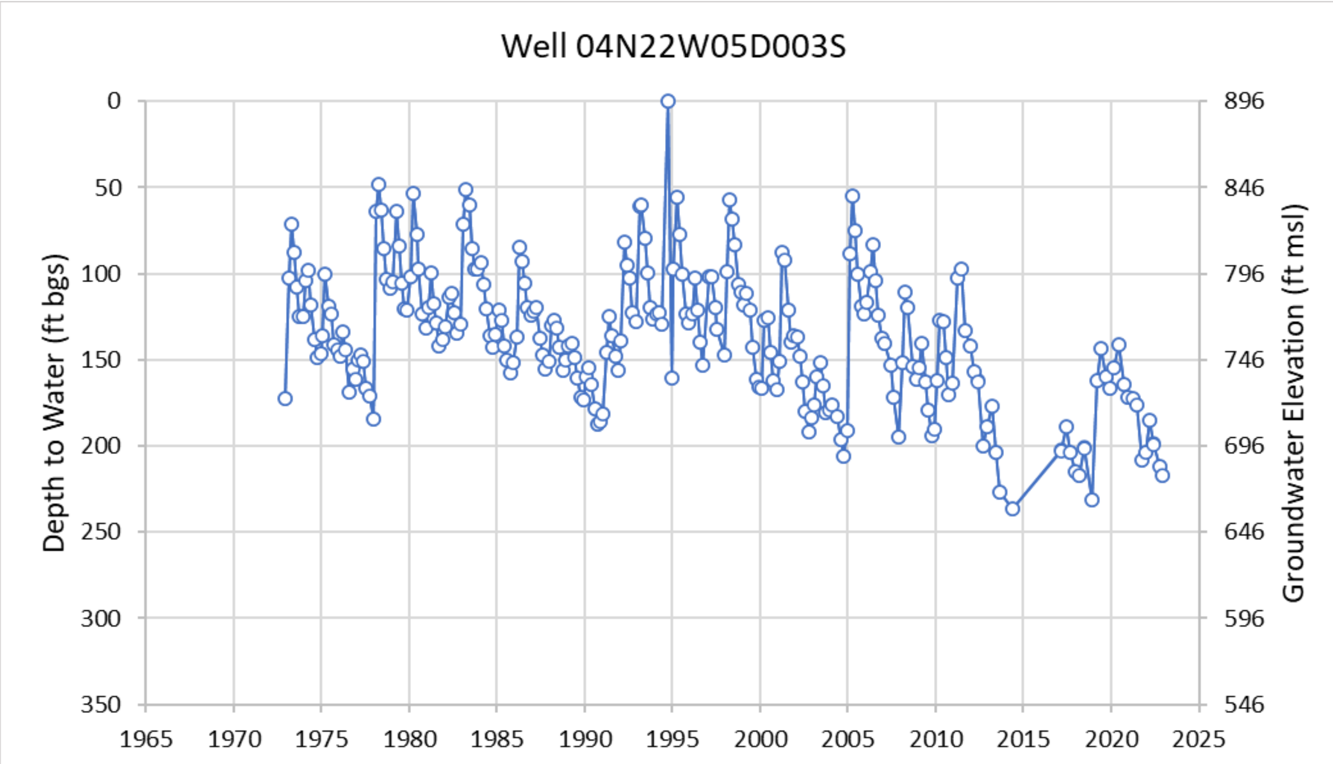

Well 04N22W07G001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
771
721
671
621
571
521
471
421
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

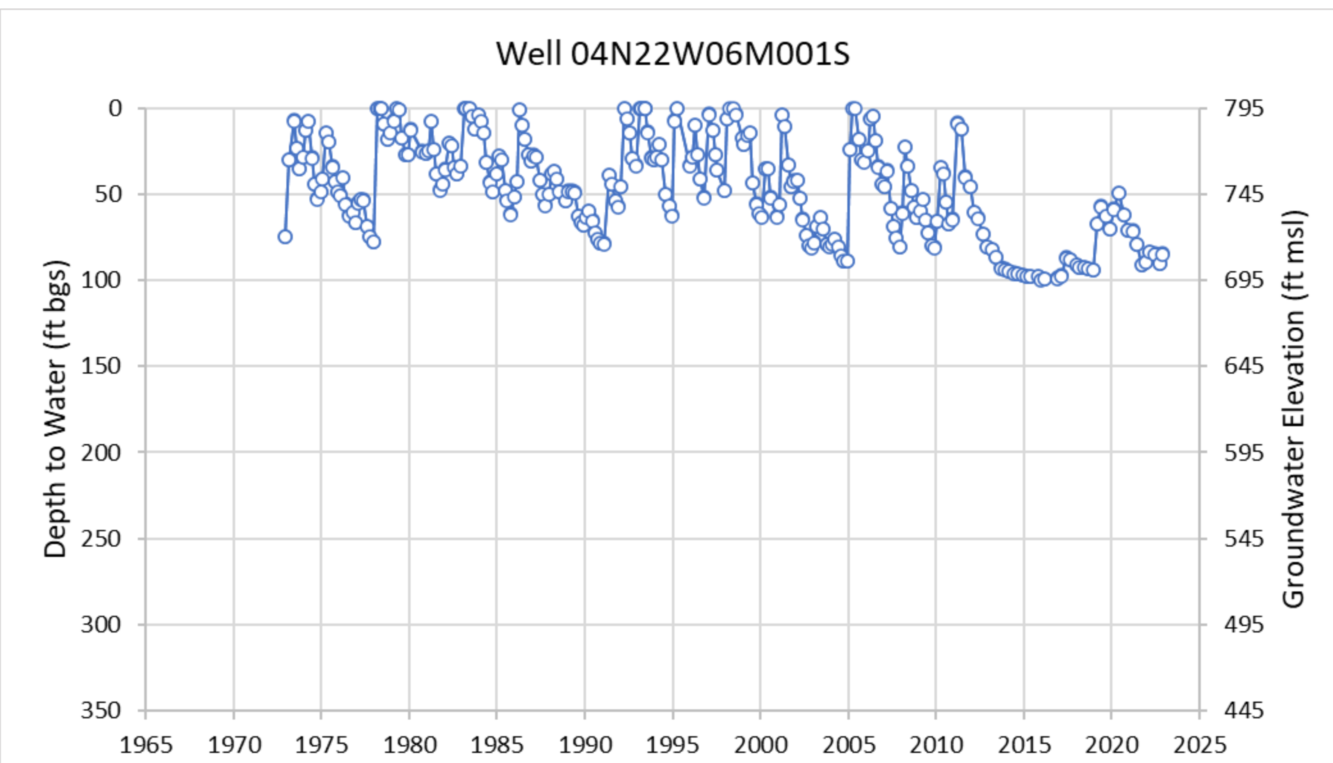

Well 04N22W08B002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
870.5
820.5
770.5
720.5
670.5
620.5
570.5
520.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

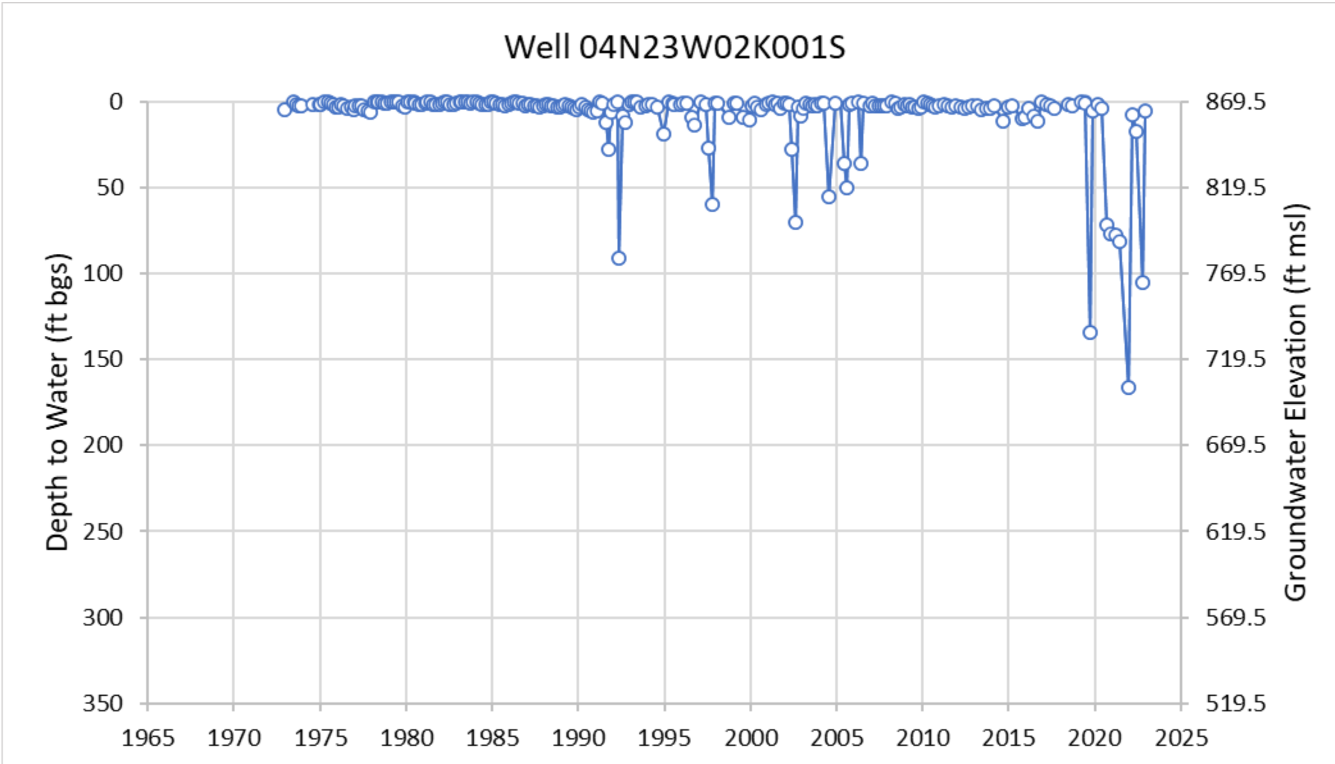

Well 04N22W05H004S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
950
900
850
800
750
700
650
600
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W05M001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
843.5
793.5
743.5
693.5
643.5
593.5
543.5
493.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

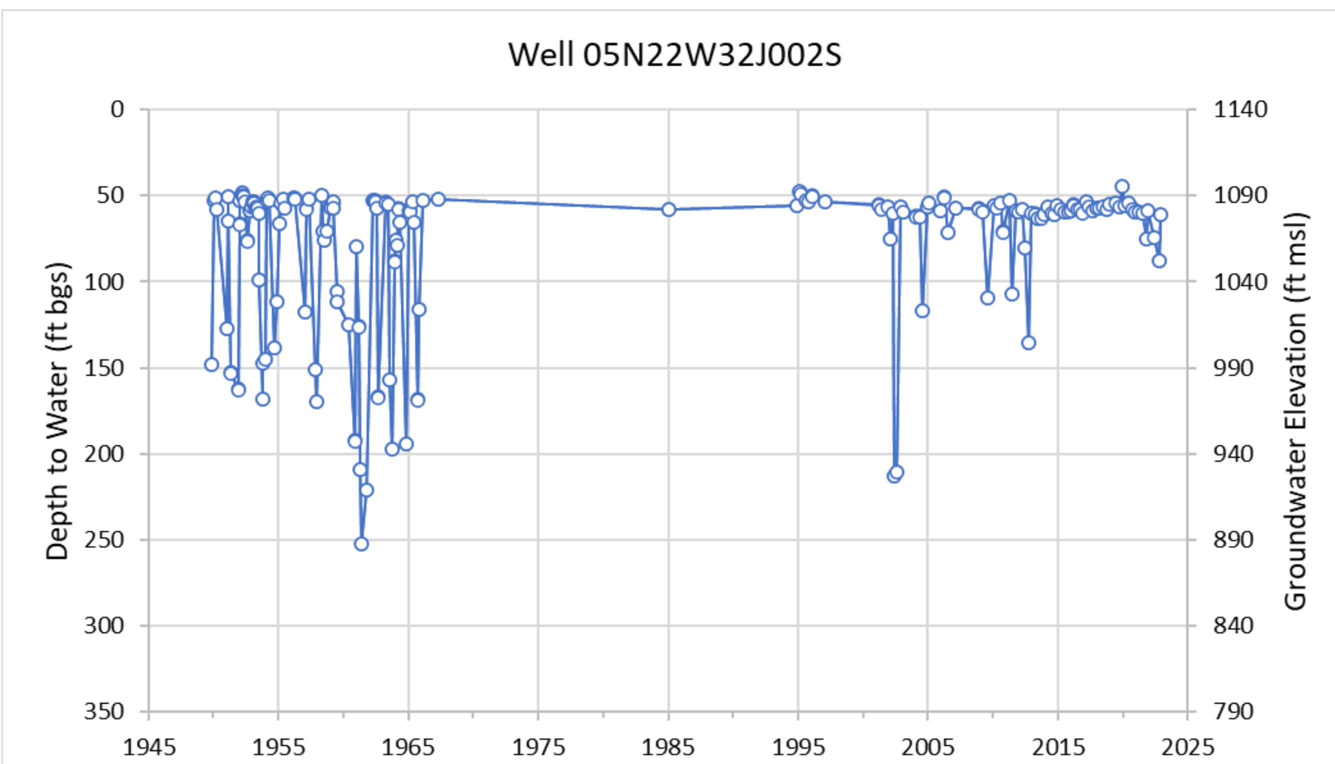

Well 04N22W07B002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
773.5
723.5
673.5
623.5
573.5
523.5
473.5
423.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W05D003S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
896
846
796
746
696
646
596
546
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

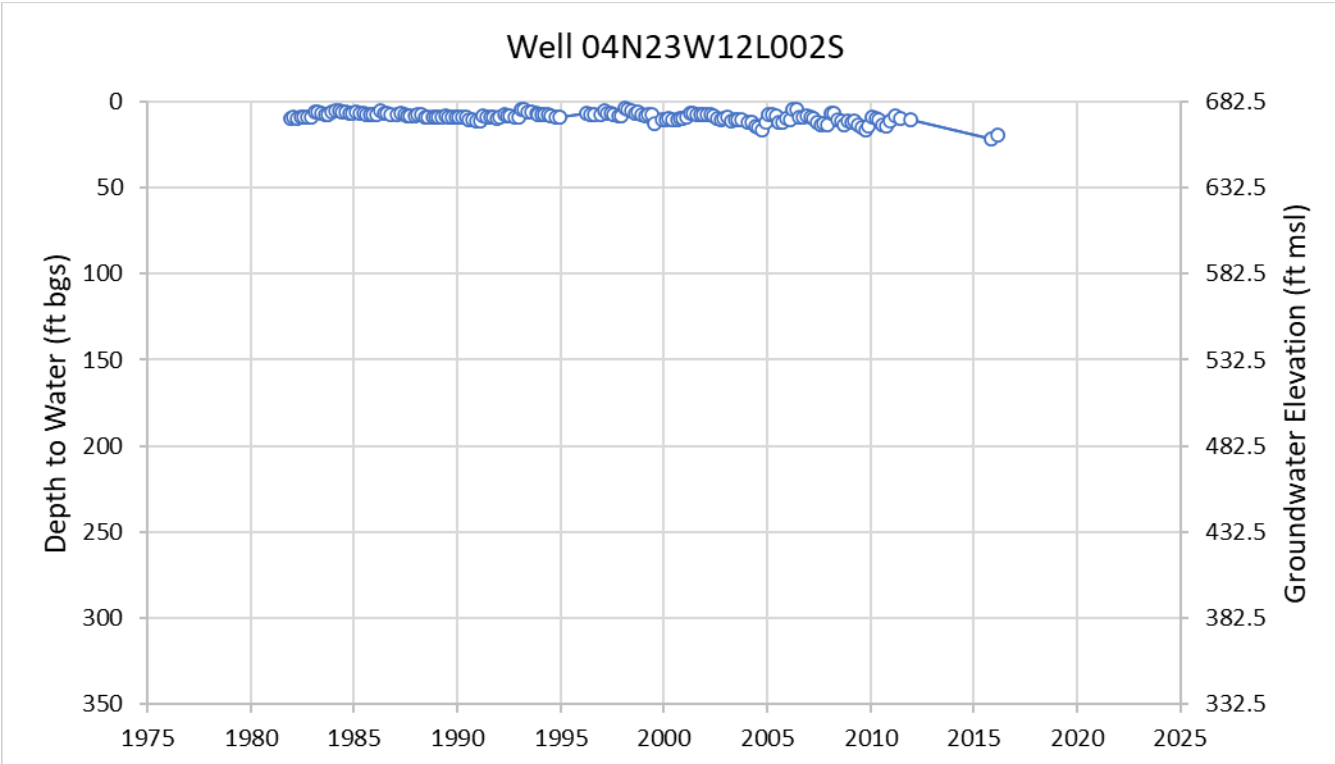

Well 04N22W06M001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
795
745
695
645
595
545
495
445
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025



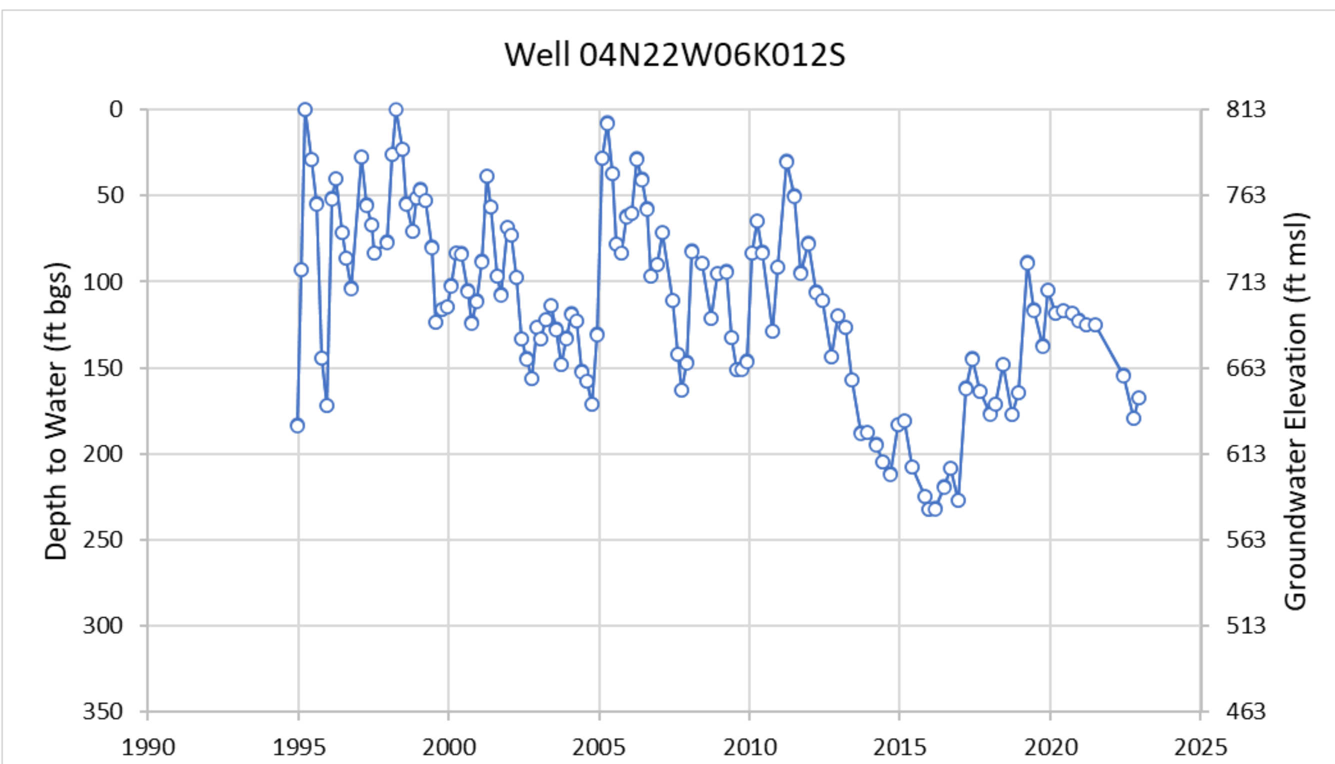
Well 04N23W02K001S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
869.5
819.5
769.5
719.5
669.5
619.5
569.5
519.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025



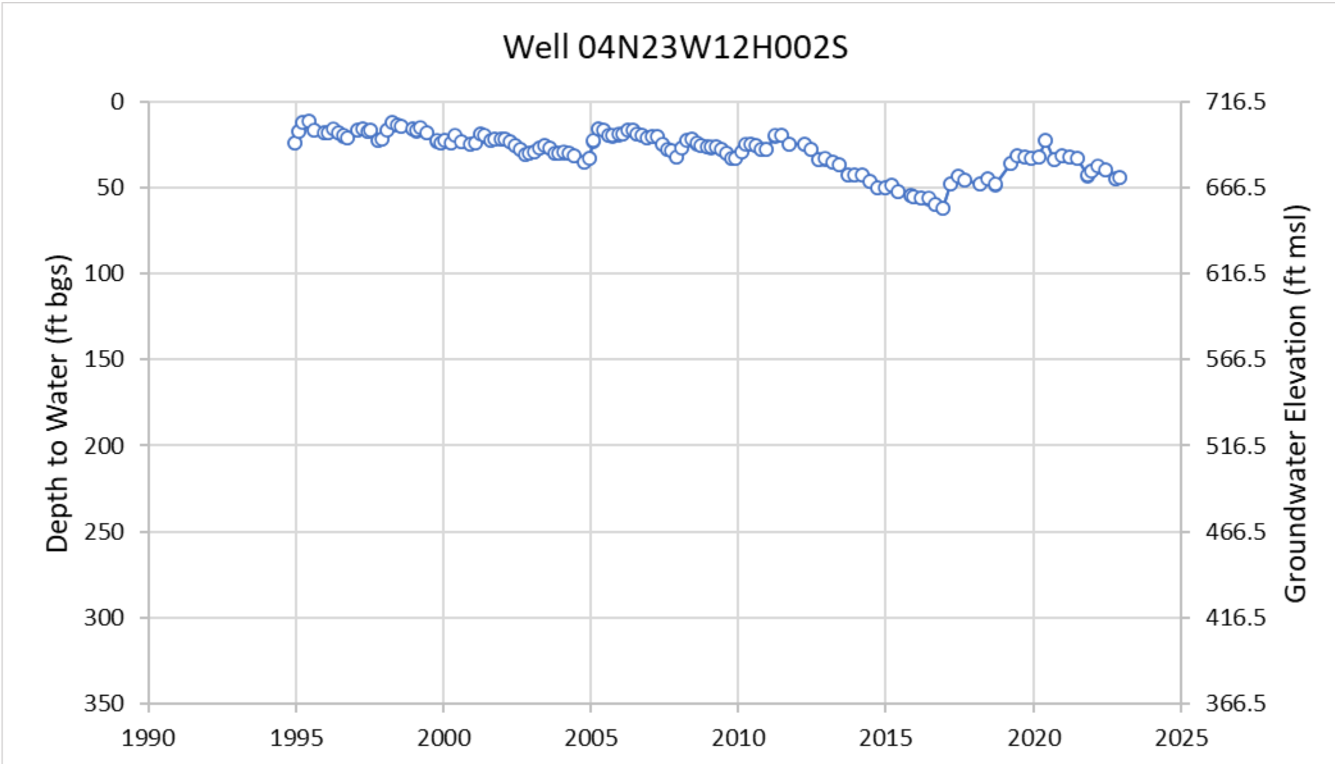
Well 05N22W32J002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
1140
1090
1040
990
940
890
840
790
1945
1955
1965
1975
1985
1995
2005
2015
2025

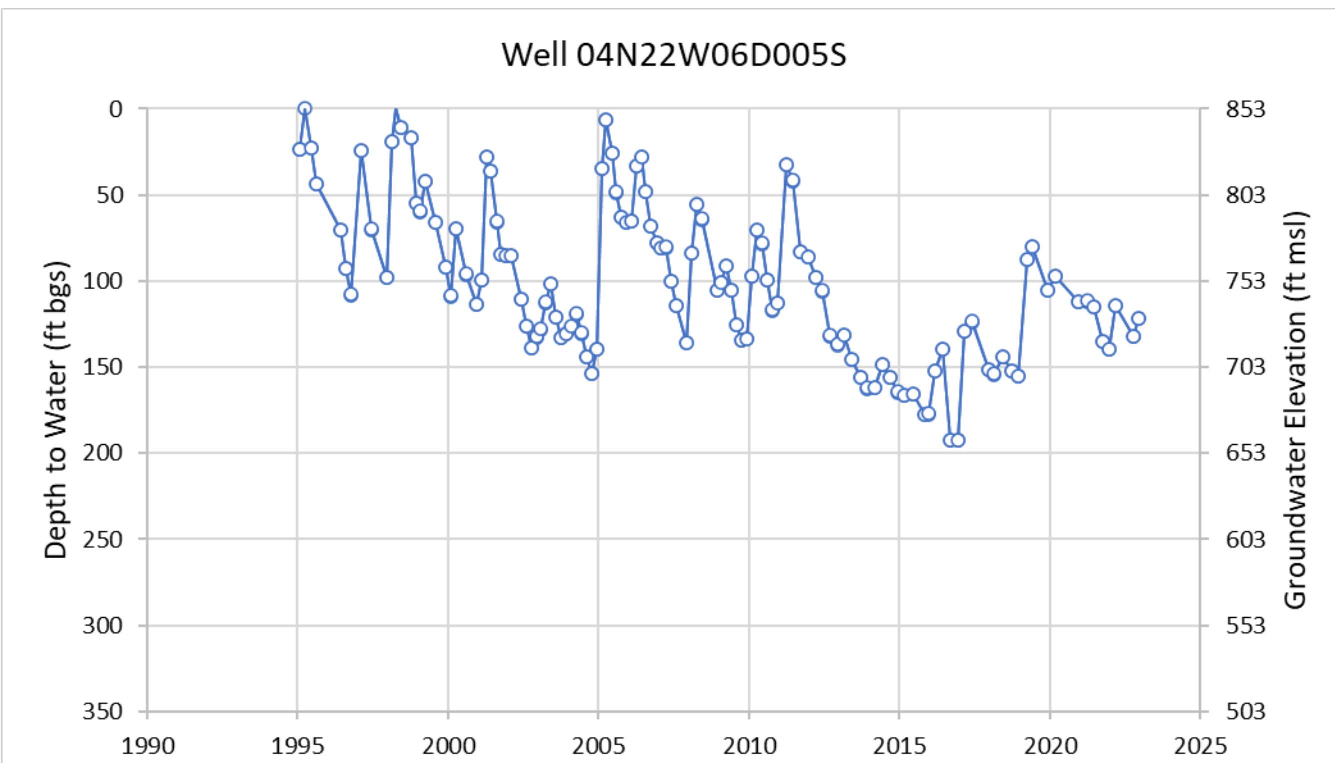


Well 04N23W12L002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
682.5
632.5
582.5
532.5
482.5
432.5
382.5
332.5
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025



Well 04N22W06K012S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
813
763
713
663
613
563
513
463
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N23W12H002S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
716.5
666.5
616.5
566.5
516.5
466.5
416.5
366.5
1990
1995
2000
2005
2010
2015
2020
2025


Well 04N22W06D005S
Depth to Water (ft bgs)
Groundwater Elevation (ft msl)
0
50
100
150
200
250
300
350
853
803
753
703
653
603
553
503
1990
1995
2000
2005
2010
2015
2020
2025