Las Posas Valley Basin Groundwater Sustainability Plan

2024 Annual Report Covering Water Year 2023

MARCH 2024

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Executive Summary

The Fox Canyon Groundwater Management Agency (FCGMA), the Groundwater Sustainability Agency (GSA) for the portions of the Las Posas Valley Basin (LPVB) within its jurisdictional boundaries, in coordination with the other two GSAs in the LPVB, has prepared this fifth annual report for the Las Posas Valley Basin (LPVB) Groundwater Sustainability Plan (GSP) in compliance with the 2014 Sustainable Groundwater Management Act (SGMA) (California Water Code, Section 10720 et seq.). This annual report covers the entire LPVB. The GSP for the LPVB was submitted to the Department of Water Resources (DWR) on January 13, 2020 and was approved by DWR on January 13, 2022. SGMA regulations require that an annual report be submitted to 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 LPVB for water year 2023 (October 1, 2022 through September 30, 2023).

The LPVB received 33.8 inches of precipitation in the 2023 water year. This was the wettest year since SGMA was enacted and the third wettest year measured in the LPVP since 1956. The long-term average precipitation, measured between 1956 and 2023, for the LPVB is 15.3 inches per year. The average precipitation in the LPVB between 2016 and 2023 was 15.6 inches per year.

Groundwater elevations in the Fox Canyon aquifer increased throughout the majority of the LPVB between spring 2022 and 2023. In the West Las Posas Management Area (WLPMA), increases in groundwater elevations ranged from approximately 1 to 15 feet. In the ELPMA, groundwater elevations were approximately 2 to 50 feet higher in spring 2023 than spring 2022, except in the far northern part of the ELPMA, where spring 2023 groundwater elevations were 7 to 8 feet lower than the previous spring. Spring 2023 groundwater elevations were 4 to 40 feet higher than the minimum threshold groundwater elevations in the WLPMA and 25 to 175 feet above the minimum threshold groundwater elevations in the ELPMA. Although the 2016 to 2023 average annual precipitation was approximately equal to the 1956 to 2015 average, spring 2023 groundwater elevations in both the WLPMA and ELPMA were lower than 2015, with the largest declines measured in northern ELPMA and the eastern part of the WLPMA.

In the WLPMA, the volume of groundwater in storage increased by approximately 6,600 AF in water year 2023, with the largest increases occurring in the western portion of management area, near the Oxnard Subbasin. In the ELPMA, the volume of groundwater in storage increased by approximately 6,000 AF in water year 2023. During the 2023 water year, Calleguas Municipal Water District (CMWD) operated its Aquifer Storage and Recovery (ASR) well field to both extract and inject imported water temporarily stored in the ELPMA. Over this period, CMWD extracted approximately 2,090 AF of temporarily stored imported water and injected approximately 4,060 AF of imported water for temporary storage, resulting in a net increase in the volume of imported water temporarily stored in the ELPMA of approximately 1,970 AF. The total water year 2023 increase in groundwater in storage of approximately 12,600 AF is the largest estimated recovery during the 2016-2023 period. Since 2015, groundwater in storage has declined by approximately 5,300 AF in the LPVB.

FCGMA has undertaken several steps toward implementing the GSP and filling data gaps identified in the GSP. At the request of FCGMA, DWR installed a nested monitoring well cluster in 2019 near the boundary between the Pleasant Valley Basin (PVB) and ELPMA, an area identified in the GSP as a critical location where groundwater elevation measurements were lacking. Construction of this well cluster helps address critical gaps in the monitoring network that impact the aerial coverage of groundwater elevation measurements. In addition, in 2022, FCGMA solicited project descriptions from various agencies in the LPVB to include in a grant application submitted to DWR

under their Sustainable Groundwater Management Grant Program's SGMA Implementation Round 2 funding opportunity and incorporate into future modeling for the 2025 GSP Update for the LPVB.

On July 10, 2023, the Santa Barbara Superior Court issued a decision adopting a judgement in *Las Posas Valley Water Rights Coalition, et al., v. Fox Canyon Groundwater Management Agency*, Santa Barbara Sup. Ct. No. VENC100509700 (Judgement). The Judgement adjudicates all groundwater rights in the LPVB and provides for the LPVB's sustainable management pursuant to SGMA. The Judgment appoints FCGMA as the Watermaster for the LPVB responsible for overseeing implementation of the Judgement.

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1 Background and Plan Area

1.1 Background

FCGMA, the GSA for the portions of the Las Posas Valley Basin (LPVB; DWR Bulletin 118 Basin No. 4-008) within its jurisdictional boundaries, has prepared this fifth annual report for the LPVB GSP in compliance with SGMA (California Water Code, Section 10720 et seq.). SGMA requires that an annual report be submitted to DWR by April 1 of each year following the adoption of the GSP. FCGMA adopted a GSP for the LPVB in December 2019 and submitted the GSP to DWR on January 13, 2020. DWR approved the LPVB GSP on January 13, 2022.

FCGMA is one of three Groundwater Sustainability Agencies (GSAs) in the LPVB. The other two GSAs are the Camrosa Water District (CWD) Las Posas Basin GSA and the Las Posas Basin Outlying Areas GSA (County of Ventura). This annual report applies to the entirety of the LPVB. To coordinate management and reporting in the LPVB, FCGMA and CWD have executed a Memorandum of Understanding, and FCGMA and the County have formed a Joint Powers Authority.

1.1.1 Fox Canyon Groundwater Management Agency

FCGMA is an independent special district formed by the California Legislature in 1982 to manage and protect the aquifers within its jurisdiction for the common benefit of the public, and all agricultural and M&I users (FCGMA et al. 2007). FCGMA's boundaries include all land overlying the Fox Canyon Aquifer (FCA) and includes portions of the LPVB (4-008), the Oxnard Subbasin (4-004.02), the Pleasant Valley Basin (4-006), and the Arroyo Santa Rosa Valley Basin (ASRVB; 4-007).

FCGMA is governed by a Board of Directors (Board) with five members who represent: (1) the County of Ventura (County), (2) the United Water Conservation District (UWCD), (3) seven mutual water companies and water districts within the Agency[1], (4) five incorporated cities which are all or a portion of each is within the FCGMA jurisdictional area[2], and (5) a farmer representative. The Board members representing the County, UWCD, the mutual water companies and water districts, and the incorporated cities are appointed by their respective organizations or groups. The representative for the farmers is appointed by the other four seated Board members from a list of candidates jointly supplied by the Ventura County Farm Bureau and the Ventura County Agricultural Association. An alternate Board member is selected by each appointing agency or group in the same manner as the regular member and acts in place of the regular member in case of absence or inability to act. All members and alternates serve for a 2-year term of office, or until the member or alternate is no longer an eligible official of the member agency. Information regarding current FCGMA Board representatives can be found on the FCGMA website[3].

1 The seven mutual water companies and water districts are: Alta Mutual Water Company, Pleasant Valley County Water District (PVCWD), Berylwood Mutual Water Company, Calleguas Municipal Water District (CMWD), CWD, Zone Mutual Water Company, and Del Norte Mutual Water Company.
2 The five incorporated cities within the FCGMA jurisdictional area are: Ventura, Oxnard, Camarillo, Port Hueneme, and Moorpark
3 FCGMA Website: https://fcgma.org/

1.1.2 LPVB Groundwater Sustainability Plan

The GSP for the LPVB defined the conditions under which the groundwater resources of the entire LPVB will be managed sustainably in the future (FCGMA 2019). Although DWR has defined the LPVB as a single groundwater basin, there is limited hydraulic connection between the eastern and western parts of the LPVB (FCGMA 2019). Hydrogeologic differences in the controls on groundwater recharge and groundwater production necessitated the definition of three management areas in the LPVB. These management areas are the West Las Posas Management Area (WLPMA), the East Las Posas Management Area (ELPMA) and the Epworth Gravels Management Area. The Epworth Gravels Management Area is a shallow unconfined aquifer located within the geographic boundaries of the ELPMA, but separated from the underlying Fox Canyon and Grimes Canyon aquifers.

The GSP evaluated groundwater conditions in four hydrostratigraphic units in the WLPMA: the shallow alluvial system, the Upper San Pedro Formation, the Fox Canyon aquifer, and the Grimes Canyon aquifer (FCGMA 2019). The WLPMA is hydrogeologically connected to the Oxnard Subbasin to the west. The shallow alluvial system is in connection with the Upper Aquifer System (UAS) in the Oxnard Subbasin, and the Upper San Pedro Formation, Fox Canyon aquifer, and Grimes Canyon aquifer compose the Lower Aquifer System (LAS) in the LPVB (FCGMA 2019).

In the ELPMA the GSP evaluated groundwater conditions in the Epworth Gravels, Shallow Alluvial aquifer, the Upper San Pedro Formation, the Fox Canyon aquifer, and the Grimes Canyon aquifer (FCGMA 2019). The Upper San Pedro Formation is not a primary aquifer but is a source of water to the underlying Fox Canyon aquifer. Geologic folding and faulting of the region has resulted in variations in thickness, elevation, and exposure of the Fox Canyon aquifer in the ELPMA. This folding was found to result in differential impacts from groundwater elevation declines in the ELPMA (FCGMA 2019).

The primary sustainability goal for the LPVB adopted in the GSP is "to maintain a sufficient volume of groundwater in storage in each management area so that there is no significant and unreasonable decline in groundwater elevation or storage over wet and dry climatic cycles" (FCGMA 2019). Additionally, "groundwater levels in the WLPMA should be maintained at elevations that are high enough to not inhibit the ability of the Oxnard Subbasin to prevent net landward migration of the saline water impact front after 2040" (FCGMA 2019). These goals were established based on both historical and potential future undesirable results to the groundwater resources of the LPVB from six sustainability indicators: chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletions of interconnected surface water. The LPVB was found not to experience direct impacts from seawater intrusion or depletion of interconnected surface water.

The GSP established minimum threshold groundwater elevations, which varied geographically within the WLPMA and ELPMA (FCGMA 2019). These groundwater elevations were selected to avoid undesirable results in the LPVB. In addition to minimum threshold groundwater elevations, the GSP also established measurable objective groundwater elevations. Measurable objective groundwater elevations are higher than the minimum threshold groundwater elevations to allow for operational flexibility during drought periods (FCGMA 2019). Minimum threshold and measurable objective groundwater elevations were established at one representative monitoring point (or "key well") in the Epworth Gravels Management Area, fifteen representative monitoring points in the ELPMA, and five representative monitoring points in the WLPMA (FCGMA 2019).

The GSP documented conditions throughout the LPVB through the fall of 2015. Previous annual reports evaluated progress toward sustainability based on a review of groundwater elevation data, groundwater extraction data, surface water supply used, or surface water supply available for use, total water used, and change in groundwater

storage between the fall of 2015 and the end of water year 2022[4]. This annual report documents the conditions in the LPVB and the progress toward sustainability for water year 2023.

1.1.3 Las Posas Valley Water Rights Coalition, et al. v. Fox Canyon Groundwater Management Agency

On July 10, 2023, the Santa Barbara Superior Court issued a decision adopting a judgement in *Las Posas Valley Water Rights Coalition, et al., v. Fox Canyon Groundwater Management Agency* (VENC100509700; Judgement). The Judgement adjudicates all groundwater rights in the LPVB and provides for the LPVB's sustainable management pursuant to SGMA. The Judgment established FCGMA as the Watermaster for the LPVB responsible for overseeing implementation of the Judgement.

The Judgement requires that FCGMA prepare and submit annual reports for the LPVB that include information on groundwater allocations[5], progress towards implementing the Basin Optimization Plan and Projects, accounting of Calleguas Municipal Water District's (CMWD) Aquifer Storage and Recover (ASR) Project operations, annual fiscal reporting, and a review of Watermaster activities, in addition to the information required to be included under SGMA. In their role as Watermaster and GSA for the LPVB, FCGMA is required to submit the annual reports to both DWR and the Court no later than April 1 of each year.

The Judgement was finalized in July, 10 months in to the 2023 water year. Consequently, the additional information required by the Judgement will first be included in the 2025 annual report.

1.2 Plan Area

The LPVB is bounded to the north by South Mountain and Oak Ridge; to the northeast and east by the foothills of Big Mountain; to the south by the Springville Fault (western segment of the Simi–Santa Rosa Fault) and the Las Posas Hills; and to the west by the Oxnard Subbasin of the Santa Clara River Valley Basin (Figure 1-1).

In the Camarillo Hills area, the Springville Fault Zone is believed to form a groundwater flow barrier at depth between the aquifers in the LPVB and the PVB, based on historical hydraulic head differences of up to 60 feet across the fault zone (Turner 1975). However, shallow alluvial deposits in the vicinity of Arroyo Las Posas and the Somis Gap are in hydraulic communication with the PVB (CMWD 2017). On the west, the WLPMA is in hydrogeologic communication with the Oxnard Subbasin. The boundary between the LPVB and Oxnard Subbasin is a jurisdictional boundary.

1.2.1 Climate

The climate of the LPVB is typical of coastal Southern California, with average daily temperatures generally ranging from 54°F to 84°F in summer and from 40°F to 74°F in the winter (FCGMA 2019). Typically, most of the precipitation in the Ventura County region falls between November and April. Precipitation is measured at several stations in the LPVB (Figure 1-2). Water year precipitation, measured at Stations 002 and 190, in the central LPVB is highly variable, ranging from 3.5 inches in 2021 to 39.0 inches in 2005 (Figure 1-3; Las Posas Valley Basin

[4] A water year begins on October 1 and ends on September 30 of the following year. The convention for naming the water year is to name the water year based on the year in which it ends. For example, the 2022 water year begins on October 1, 2021 and ends on September 30, 2022.

[5] This includes annual allocation accounting, annual allocation calculations, an updated groundwater allocation schedule, a compilation of new or replacement well applications, and summary of new water use applications.

Historical Water Year Precipitation). On average, the LPVB received approximately 15.3 inches of precipitation per water year between 1956 and 2023[6]. In water year 2023, the LPVB received 33.8 inches of precipitation. Water year 2023 was the third wettest year measured between 1956 and 2023.

The GSP for the LPVB included precipitation through the 2015 water year, the year that SGMA was enacted (FCGMA 2019). Since 2015, the LPVB has experienced one wet[7] water year (2023), three above normal water years (2017, 2019, and 2020), one below normal water year (2022), two dry water years (2016 and 2018), and one critically dry water year (2021). Water year 2021 was the driest water year on record in the LPVB. The average annual precipitation in the LPVB between 2016 and 2023 was 15.6 inches per year, which is approximately equal to the 1956 to 2023 average.

1.2.2 Surface Water and Drainage Features

The dominant surface water body in the LPVB is Arroyo Las Posas, located in the ELPMA (Figure 1-1). In the easternmost portion of the LPVB, Arroyo Las Posas is named Arroyo Simi, and Arroyo Las Posas becomes Calleguas Creek in the PVB. Arroyo Las Posas, which drains a watershed larger than the area of the LPVB, is a source of recharge to the ELPMA. Dry weather flows in Arroyo Las Posas result from upstream wastewater treatment plant and dewatering well discharges to the Arroyo Simi (FCGMA 2019).

There is one active streamflow gauging station in the LPVB. This station, gauge 841A, which is maintained by the Ventura County Watershed Protection District (VCWPD), is located on Arroyo Simi above Hitch Blvd. (Figures 1-2 and 1-4). Streamflow measured at gauge 841 since water year 2010 is presented in Table 1-1.

Table 1-1. Streamflow on Arroyo Las Posas for Water Years 2010 through 2023

Water Year	Average Daily Flow (cfs) at Gauge 841A
2010	38.5
2011	51.1
2012	25.3
2013	17.5
2014	NM
2015	17.7
2016	15.0
2017	31.0
2018	14.7
2019	22.5
2020	22.6
2021	9.5

6 Long-term mean precipitation was calculated using precipitation measured at Station 190 over the period from water year 1956 through 2023.

7 Water years have been classified into five types based on their relationship to the mean water year precipitation. The five types are: critical, dry, below normal, above normal, and wet. Critical water years are < 50% of the mean annual precipitation. Dry water years are ≥ 50% and <75% of the mean annual precipitation. Below normal water years are ≥ 75% and <100% of the mean annual precipitation. Above normal water years are ≥ 100% and <150% of the mean annual precipitation. Wet water years are ≥ 150% of the mean annual precipitation.

Table 1-1. Streamflow on Arroyo Las Posas for Water Years 2010 through 2023

Water Year	Average Daily Flow (cfs) at Gauge 841A
2022	24.8
2023	50.9

Notes:
cfs – cubic feet per second
NM – not measured

Average daily flows in Arroyo Las Posas reflect the water year precipitation (Section 1.2.1) with the highest daily average flows measured at gauge 841A during the 2010 to 2023 period occurring in 2010, 2011, 2017, and 2023. Water years 2010, 2011 and 2017 were above normal water years in which water year precipitation was approximately 140% of the long-term mean. Daily average flow measured at gauge 841A in the 2023 water year was approximately 190% of the 2010 to 2023 average (Table 1-1; Figure 1-4). Daily average flows were highest between January and March of 2023, when the LPVB received approximately 24 inches of precipitation.

1.3 Annual Report Organization

This is the fifth Annual Report prepared since the GSP for the LPVB was submitted to DWR. This annual report is organized according to the GSP Emergency Regulations. Chapter 1 provides the background information on the GSP, the LPVB, and the FCGMA. Chapter 2 provides information on the groundwater conditions in the LPVB since 2015, including groundwater elevations, groundwater extractions, surface water supply, total water available, and change in groundwater storage. Chapter 3 provides an update on the GSP implementation.

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2 Groundwater Conditions

This chapter presents the groundwater conditions in the LPVB during water year 2023. A comparison of water year 2023 conditions to water year 2022 is provided to characterize the impact that water year type, groundwater production, surface water, imported water and recycled water availability in water year 2023 have had on groundwater conditions in the LPVB. Additionally, data from water year 2015 is provided for context.

2.1 Groundwater Elevations

Groundwater elevation contour maps are presented in Figures 2-1 through 2-10: the Shallow Alluvial aquifer in Figures 2-1 and 2-2, the Epworth Gravels aquifer in Figures 2-3 and 2-4, the Upper San Pedro Formation in Figures 2-5 and 2-6, the Fox Canyon aquifer in Figures 2-7 and 2-8, and the Grimes Canyon aquifer in Figures 2-9 and 2-10. These maps show the seasonal low groundwater elevations for the fall of 2022 and seasonal high groundwater elevations for the spring of 2023. Groundwater elevations are best defined in the Fox Canyon aquifer (Figures 2-7 and 2-8), and least well constrained in the Grimes Canyon aquifer (Figures 2-9 and 2-10).

Fall and spring groundwater elevations for the 2023 water year were defined as any groundwater elevation measured between October 2 and October 31, 2022, and March 2 and March 31, 2023, respectively. These four-week measurement windows are the same measurement windows used to generate fall and spring groundwater elevation contours for the 2023 Annual Report covering water year 2022. The GSP recommended collecting groundwater elevations within a two-week window in the future (FCGMA 2019a). FCGMA has been prioritizing recommendations made in the GSP and evaluating the timeframe and feasibility of implementing these recommendations.

Groundwater elevations in the LPVB are measured in both groundwater monitoring and production wells. However, the groundwater elevation contour maps are based on the groundwater elevations measured at wells screened solely within an individual aquifer. The intent of using groundwater elevations from wells screened within a single aquifer is to accurately represent groundwater flow directions within an aquifer, as well as vertical gradients between aquifers.

2.1.1 Groundwater Elevation Contour Maps

2.1.1.1 Shallow Alluvial Aquifer

Fall 2022 groundwater elevations in the Shallow Alluvial aquifer in the ELPMA ranged from a low of 150 feet mean sea level (ft msl) at well 02N20W17J06S to a high of 481 ft msl at well 02N19W09E01S (Figure 2-1). The groundwater elevation low of 150 ft msl occurred along the western most reach of Arroyo Las Posas within the LPVB, near the boundary with the PVB (Figure 2-1). East of well 02N19W07K04S, measured fall 2022 groundwater elevations were equal to those measured in fall 2021. Near the boundary with PVB, fall 2022 groundwater elevations were approximately 1 to 3 feet lower than they were in fall 2021, and 1 to 10 feet lower than they were in fall 2015.

Spring 2023 groundwater elevations ranged from a low of approximately 191 ft msl at well 02N20W17J06S to a high of 483 ft msl at well 02N19W09E01S (Figure 2-2). Spring 2023 groundwater elevations were higher than they

were in spring 2022. Since 2015, spring groundwater elevations have increased between 1 and 5 feet in the Shallow Alluvial aquifer at all wells except well 02N20W10K02S, where groundwater elevations declined by 3 feet.

2.1.1.2 Epworth Gravels Aquifer

The fall 2022 groundwater elevations measured at wells 03N19W29F06S and 03N19W30M02S were approximately 588 ft msl and 622 ft msl, respectively (Figure 2-3). These were the only wells measured in the Epworth Gravels aquifer in fall 2022. Fall 2022 groundwater elevations were 2 feet higher than fall 2021 at well 03N19W30M02S and 46 feet higher than fall 2021 at well 03N19W29F06S. Groundwater elevations at these wells were similar to those measured in fall 2015.

In spring 2023, the groundwater elevation at well 03N19W29F06S was approximately 609 ft msl, and approximately 623 ft msl at well 03N19W30M02S. The spring 2023 groundwater elevation measured at well 03N19W30M02S is equal to the spring 2022 measurement and is approximately 3.5 feet higher than it was in spring 2015. The spring 2022 groundwater elevation measured at well 03N19W29F06S is approximately 16 feet higher than it was in spring 2022 and 7 feet higher than spring 2015.

2.1.1.3 Upper San Pedro Formation

In fall 2022, groundwater elevations in the Upper San Pedro Formation in the WLPMA ranged from a low of approximately -76 ft msl (measured at well 02N21W15M03S) to a high of approximately 244 ft msl (measured at well 02N21W16J01S (Figure 2-5). Between fall 2021 and 2022, groundwater elevations in the Upper San Pedro increased by approximately 2 to 10 feet in western WLPMA. In the central WLPMA, groundwater elevation changes varied with geographic location and ranged from declines of approximately 7 feet (measured at well 02N21W11J04S) to groundwater elevation increases of approximately 8 feet (measured at well 02N21W10G03S). The fall 2022 groundwater elevations were approximately 10 to 36 feet lower than fall 2015 at all wells except 02N21W16J01S, where the fall 2022 groundwater elevation was approximately 1 foot higher than 2015.

In spring 2023, groundwater elevations in the Upper San Pedro Formation in the WLPMA ranged from a low of -69 ft msl at well 02N21W15M03S to high of 248 ft msl at well 02N21W16J01S (Figure 2-6). Between spring 2022 and 2023, groundwater elevations in the Upper San Pedro increased by approximately 3 to 14 feet in western WLPMA and 4 to 10 feet in central WLPMA. Spring 2023 groundwater elevations were approximately 3 to 45 feet lower than spring 2015 conditions in western WLPMA and approximately 7 to 35 feet below fall 2015 in central WLPMA.

In the ELPMA groundwater elevations within the Upper San Pedro Formation were measured at wells 02N19W07K03S and 03N20W35R04S in fall 2022 (Figure 2-5). The groundwater elevation at well 02N19W07K03S, adjacent to Arroyo Simi-Las Posas, was 436 ft msl and the groundwater elevation at well 03N20W35R04S, in the central portion of the management area, was 261.35 ft msl (Figure 2-5). The fall 2022 groundwater elevation measured at well 02N19W07K03S was approximately 1 foot lower than it was in fall 2015. The groundwater elevation was not measured at well 02N19W07K03S in fall 2021. The fall 2022 groundwater elevation measured at 03N20W35R04S was approximately 1 foot lower than the fall 2021 elevation and approximately 11 feet lower than the fall 2015 elevation.

In the ELPMA, spring 2023 groundwater elevations ranged from 439 ft msl at well 02N19W07K03S to approximately 262 ft msl at well 03N20W35R04S (Figure 2-6). Spring 2023 groundwater elevations along Arroyo

Las Posas were 2 feet higher than spring 2022 conditions. Well 02N19W07K03S was not measured in spring 2015. Within the trough of the Moorpark syncline (FCGMA 2019; Figure 2-2), the spring 2023 groundwater elevation was approximately equal to spring 2022 and 10 feet lower than spring 2015.

2.1.1.4 Fox Canyon Aquifer

Fall 2022 groundwater elevations in the Fox Canyon aquifer in the WLPMA ranged from a low of approximately -175 ft msl at well 02N21W13A01S to a high of approximately -43 ft msl at well 02N20W12H01S (Figure 2-7). Between fall 2022 and fall 2023 groundwater elevation declines in the WLPMA ranged from approximately 2 feet at well 02N20W18A01S to approximately 5 feet at well 02N21W11J03S. Fall 2022 groundwater elevations in the WLPMA were between 17 and 61 feet lower than they were in fall 2015 (measured at wells 02N21W11J03S and 02N21W13A01S, respectively).

Spring 2023 groundwater elevations in the WLPMA ranged from a low of approximately -167 ft msl at well 02N21W13A01S to a high of approximately -29 ft msl at well 02N20W12H01S (Figure 2-8). Spring groundwater elevations generally increased between 2022 and 2023. At well 02N21W13A01S, located in southeastern WLPMA, the spring 2023 groundwater elevation was approximately 5 feet higher than spring 2022 and in central WLPMA, the spring 2023 groundwater elevations were approximately 13 feet to 15 feet higher than spring 2022 elevations (measured at wells 02N21W11J03S and 02N21W12H01S, respectively).

While groundwater elevations recovered between spring 2022 and 2023, spring 2023 groundwater elevations in the WLPMA remained lower than they were in spring 2015. In the southeastern part of the WLPMA, the spring 2023 groundwater elevation measured at well 02N21W13A01S was approximately 62 feet lower than 2015. At well 02N21W11J03S, the spring 2023 groundwater elevation was approximately 15 feet lower than spring 2015. At the boundary with the Oxnard Subbasin, the spring 2023 groundwater elevation was approximately 37 feet lower than spring 2015 (measured at well 02N21W17F05S).

In the ELPMA, fall 2022 groundwater elevations ranged from a high of approximately 271 ft msl at well 02N20W10J01S to a low of approximately 103 ft msl at well 03N20W26R03S (Figure 2-7). Between fall 2021 and fall 2022, groundwater elevations in southern ELPMA, near Arroyo Las Posas, declined by approximately 3 feet. Near the Moorpark anticline, groundwater elevations declined by approximately 24 ft msl (wells 03N20W35R03S and 03N20W35R02S). In the northern part of ELPMA, groundwater level declines ranged from approximately 5 to 20 feet (wells 03N19W31B01S and 03N20W26R03S).

Fall 2022 groundwater elevations in the ELPMA were lower than fall 2015. Along the axis of the Moorpark anticline (FCGMA 2019; Figure 2-2), where groundwater elevations are influenced by CMWD's Aquifer Storage and Recovery (ASR) operations, the fall 2022 groundwater elevation was 23 feet lower than the 2015 elevation at well 03N20W35R02S and 29 feet lower than the 2015 elevation at well 03N20W35R03S. Farther west, fall 2022 groundwater elevations were approximately 33 feet lower than fall 2015 at well 02N20W03H01S. Along the base of Oak Ridge, the fall 2022 groundwater elevation measured at well 03N19W19J01S was approximately 9 feet lower than fall 2015.

Spring 2023 groundwater elevations in the ELPMA ranged from a high of approximately 283 ft msl at well 02N20W10J01S to a low of approximately 129 ft msl at well 03N20W26R03S (Figure 2-8). Like the WLPMA, groundwater elevations generally increased between spring 2022 and 2023. In the southern ELPMA, near Arroyo Las Posas, the spring 2023 groundwater elevation measured at well 02N20W10J01S was approximately 4 feet higher than spring 2022. Downgradient of this well, groundwater elevations were approximately 25 feet higher than

spring 2022 (measured at well 02N20W03H01S). North of the Moorpark anticline, spring 2023 groundwater elevations ranged from approximately 8 feet lower to 2 feet higher than spring 2022 groundwater elevations (measured at wells 03N19W19J01S and 03N20W35R02S, respectively).

Spring 2023 groundwater elevations in the ELPMA were generally lower than spring 2015. Near the Arroyo Las Posas, spring 2023 groundwater elevations were approximately 2 feet lower than spring 2015. Between the axis of the Moorpark anticline and the base of Oak Ridge, the spring 2022 groundwater elevations were approximately 10 to 25 feet lower than spring 2015. Well 03N19W31B01S in the ELPMA is the only well at which groundwater elevations increased - by approximately 19 feet - between spring 2015 and 2023.

2.1.1.5 Grimes Canyon Aquifer

Of the eight wells screened solely within the Grimes Canyon aquifer in the WLPMA, groundwater elevations were only measured at wells 02N21W18A02S and 02N21W22G01S in fall 2022. The fall 2022 groundwater elevations were approximately -106 ft msl and -102 ft msl at wells 02N21W18A02S and 02N21W22G01S, respectively (Figure 2-9). These measurements are approximately 11 feet and 15 feet lower than fall 2015 (at wells 02N21W18A02S and 02N21W22G01S, respectively) and 1 foot lower than fall 2021 at well 02N21W18A02S. Well 02N21W22G01S was not measured fall 2021.

Well 02N21W18A02S was the only WLPMA well screened in the Grimes Canyon aquifer measured in spring 2023 (Figure 2-10). The groundwater elevation at this well was -96.8 ft msl. This elevation is approximately 18 feet lower than Spring 2015.

The fall 2022 groundwater elevation was only measured at one well ,03N19W19P02S ,in the Grimes Canyon aquifer in the ELPMA (Figure 2-9). The groundwater elevation at this well was 121.34 ft msl. This well was not measured in fall 2021 or fall 2015. Spring 2023, groundwater elevations were not measured in either of the two wells screened solely in the Grimes Canyon aquifer in the ELPMA (Figure 2-10)

Table 2-1. Water Year 2023 Groundwater Elevations, Minimum Thresholds, Measurable Objectives, and Interim Milestones for Representative Monitoring Wells in the LPVB

Well Number	Management Area	Aquifer	Fall Groundwater Conditions			Spring Groundwater Conditions			Minimum Threshold (ft MSL)	Measurable Objective (ft MSL)	2025 Interim Milestone (ft MSL)
			2022 Groundwater Elevation (ft MSL)	Change from 2021 to 2022 (feet)[a]	Change from 2015 to 2022 (feet)[b]	2023 Groundwater Elevation (ft MSL)	Change from 2022 to 2023 (feet)[a]	Change from 2015 to 2023 (feet)[b]			
03N19W29F06S	Epworth Gravels	Epworth Gravels	587.6	1.6	**-11.0**	608.7	13.7	7	555	585	581
02N20W09Q08S	ELPMA	Shallow Alluvial	261.0	**-3.0**	**-10.0**	274.0	2.0	1.4	170	270	—
02N20W12MMW1	ELPMA	Shallow Alluvial	368.0	**-1.0**	-	375.0	3.0	-	300	370	—
02N20W01B02S	ELPMA	Fox	104.5	**-21.5**	-	188.5	58.5	-	80	120	—
02N20W03H01S	ELPMA	Fox	118.0	**-10.0**	**-33.7**	145.0	25.0	**-19.5**	100	135	—
02N20W04F02S	ELPMA	Fox	Destroyed	-	-	Destroyed	-	-	100	145	—
02N20W10D02S	ELPMA	Fox	124.7	**-6.5**	**-25.8**	154.8	9.0	**-10.7**	80	130	—
02N20W10G01S	ELPMA	Fox	238.6	-	-	252.8	-	-	100	230	—
02N20W10J01S	ELPMA	Fox	270.7	**-2.7**	**-8.6**	283.4	4.2	**-2.4**	110	250	—
03N19W19J01S	ELPMA	Fox	153.7	**-6.7**	**-22.5**	151.8	**-8.0**	**-27.9**	130	160	—
03N19W28N03S	ELPMA	Fox	159.0	**-5.0**	**-22.0**	156.0	**-7.0**	**-25.8**	130	170	—
03N19W31B01S	ELPMA	Fox	144.0	**-5.0**	**-2.5**	174.0	26.0	18.5	105	145	—
03N20W34G01S	ELPMA	Fox	121.4	**-4.6**	**-20.5**	136.7	5.3	**-8.4**	75	130	—
03N20W35R03S	ELPMA	Fox	107.8	**-23.6**	**-28.8**	131.4	1.0	**-24.2**	105	145	139
03N20W26R03S	ELPMA	Fox	103.5	**-19.8**	-	128.6	2.2	**-17.9**	100	120	—
03N20W35R02S	ELPMA	Grimes	108.3	**-23.2**	**-20.5**	131.9	1.5	**-24.7**	105	145	133
02N20W06R01S	WLPMA	LAS[c]	-187.0	14.9	-	NM	-	-	-170	-125	-147
02N20W08F01S	WLPMA	LAS	NM	-	-	-164.9	64.9	-	-195	-150	—
02N21W16J03S	WLPMA	LAS	NM	-	-	NM	-	-	-75	-45	-71
02N21W11J03S	WLPMA	LAS	-85.7	**-5.4**	**-16.7**	-65.9	14.9	**-14.9**	-70	-50	-64
02N21W12H01S	WLPMA	LAS	-43.2	3.6	-	-28.5	13.7	-	-70	-45	—

ft MSL = feet mean sea level
NM = not measured

[a] Data in this column shows the difference between water year groundwater elevations measured at each representative monitoring site. Positive (+) values indicate that seasonal high or low groundwater elevations have increased from water year 2022 conditions. Negative (-) values indicate that seasonal high or low groundwater elevations have decreased from water year 2022 conditions. Groundwater elevation declines from 2020 conditions are presented in bold font. Blank cells in this column indicate that data was not measured in the current, or previous, water year.

[b] Data in this column shows the difference between water year 2022 and water year 2015 groundwater elevations measured at each representative monitoring site. Positive (+) values indicate that seasonal high or low groundwater elevations have increased from water year 2015 conditions. Negative (-) values indicate that seasonal high or low groundwater elevations have decreased from water year 2015 conditions. Groundwater elevation declines from 2015 conditions are presented in bold font. Blank cells in this column indicate that data was not measured in the current, or previous, water year.

[c] In the WLPMA, the LAS consists of the Fox Canyon aquifer and Grimes Canyon aquifer (FCGMA 2019)

2.1.2 Groundwater Elevation Hydrographs

Groundwater elevation hydrographs for each of the key wells identified in the GSP are presented in Figures 2-11 through 2-13. These key wells are the designated representative monitoring sites for the LPVB (FCGMA 2019). Well 02N20W04F02S, one of the representative monitoring wells in the ELPMA, was destroyed, on July 28, 2016 and, therefore, hasn't been measured since adoption of the GSP (Table 2-1). FCGMA is currently working to identify a suitable replacement monitoring site for inclusion in subsequent annual reports. Additionally, groundwater elevations in well 02N21W16J03S have not been measured since May 2016 (Table 2-1).

In the WLPMA, spring 2023 groundwater elevations were measured in three of the five representative monitoring wells (Table 2-1). At these wells, the spring 2023 groundwater elevations were approximately 14 to 65 feet higher than in spring 2022. The spring 2023 groundwater elevations at these wells were approximately 15 feet lower than spring 2015. All spring 2023 groundwater elevations measured in the WLPMA were above the minimum threshold groundwater elevations (Table 2-1).

In the ELPMA, spring 2023 groundwater elevations were between 1 and 59 feet higher than spring 2022 groundwater elevations at all representative monitoring wells except wells 03N19W19J01S and 03N19W28N03S (Table 2-1). The spring groundwater elevations at these two wells were approximately 8 and 7 feet lower in 2023 than 2022 (respectively). Spring 2023 groundwater elevations in the ELPMA were approximately 2 to 24 feet lower than spring 2015 elevations at all wells except well 03N19W31B01S,screened in the FCA, well02N20W09Q08S screened in the Shallow Alluvial aquifer, and well 03N19W29F06S, screened in the Epworth Gravels aquifer (Table 2-1). In these wells, groundwater elevations were between 1.4 and 18.5 feet higher than they were in Spring 2015. Spring 2023 groundwater elevations in the Fox Canyon aquifer remained above the established minimum threshold groundwater elevations at all wells in the ELPMA.

2.2 Groundwater Extraction

On December 14, 2020, the FCGMA adopted an Ordinance to Establish an Extraction Allocation System for the Las Posas Valley Groundwater Basin. The ordinance was designed to facilitate sustainable groundwater management under SGMA. The new allocation system went into effect on October 1, 2021 (start of water year 2022[8]) and transitioned from calendar year to water year reporting for groundwater extractions.

Historically, groundwater extractions in the LPVB have been reported to the FCGMA in two periods (semi-annually) over the course of a single calendar year. Because groundwater extractions are not reported monthly, groundwater production prior to calendar year 2021 cannot be reported on a water year basis. Therefore, the groundwater extractions for 2016 through 2020 reported in Table 2-2 and Table 2-3, and shown on Figures 2-16 through 2-19, follow the historical precedent and represent calendar year extractions.

Due to the transition from calendar year to water year reporting, the water year 2021 groundwater extractions reported in Tables 2-2 and 2-3 represent: (i) a combination of reported and estimated extractions for the period from October 1, 2020 through December 31, 2020, and (ii) a combination of reported and estimated extractions for the period from January 1, 2021 through September 30, 2021. Agricultural extractions between October and December 2020 were estimated using monthly AMI data that were validated against the 2020 calendar year extraction reports. Municipal and domestic extractions between October and December 2020 were estimated by

[8] Water year 2022 covers the period from October 1, 2021 through September 30, 2022.

assuming that 50% of the reported extraction between June and December occurred between October and December.

The water year 2023 extractions presented in Tables 2-2 and 2-3 represent the extractions reported to FCGMA over the 2023 reporting period as of January 26, 2024, and do not include estimates of extractions from non-reporting wells based on AMI data. FCGMA had received complete reporting from approximately 70% of the operators within the LPVB. In water year 2022, extraction from the operators with incomplete reporting accounted for approximately 15% of the total extractions in the basin. The water year 2023 extractions presented in Tables 2-2 and 2-3 will be updated upon receipt of additional data during preparation of the 2025 GSP annual report for the LPVB.

2.3 Surface Water Supply

There are no locally derived sources of surface water in the LPVB (FCGMA 2019).

Table 2-2. Reported Annual Groundwater Extractions in the WLPMA by Aquifer System and Water Use Sector

Year	Reporting Complete / Estimated Percentage Complete (%)[a]	Shallow Alluvial System (Acre-Feet)				Lower Aquifer System (Acre-Feet)				Wells in Unassigned Aquifer Systems (Acre-Feet)				Total (Acre-Feet)
		AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	
CY 2016	Yes	1,316	0	1	1,317	11,291	2,371	0	13,662	178	372	33	583	**15,562**
CY 2017	Yes	1,348	0	1	1,349	11,197	2,321	0	13,518	569	386	44	999	**15,866**
CY 2018	Yes	903	0	1	904	10,184	1,511	0	11,695	1,287	376	42	1,705	**14,304**
CY 2019	Yes	675	0	16	691	10,171	2,023	0	12,194	1,013	218	25	1,256	**14,141**
CY 2020	Yes	1,031	0	18	1,049	11,622	2,115	0	13,737	1,214	183	41	1,437	**16,223**
WY 2021	Yes	1,006	0	1	1,006	13,380	1,910	0	15,290	1,185	470	30	1,686	**17,982**
WY 2022[b]	Yes	1,031	0	18	1,049	11,492	2,115	0	13,607	1,220	183	56	1,459	**16,115**
WY 2023[c]	No/70%	362	0	0	362	5,930	1,412	0	7,342	2,202	178	30	2,410	**10,115**

Notes: AG = Agriculture ; Dom = domestic; M&I = Municipal and Industrial; CY = Calendar Year (January 1 through December 31); WY = Water Year (October 1 through September 30)

[a] Qualifier indicates whether extraction reporting is complete for the given year. "Yes" indicates no additional reporting is anticipated. "No" indicates that additional reporting is anticipated. The percentage included after the "No" qualifier represents the estimated total percentage of operators who have reported extractions to FCGMA as of January 26, 2024.

[b] Groundwater extractions updated using additional extraction reporting.

[c] Groundwater extractions are preliminary and expected to change. Additional extraction reporting is anticipated.

Table 2-3. Reported Annual Groundwater Extractions in the ELPMA by Aquifer System and Water Use Sector

Year	Reporting Complete / Estimated Percentage Complete (%)[a]	Epworth Gravels Aquifer (Acre-Feet)				Upper San Pedro Formation (Acre-Feet)				Fox Canyon Aquifer (Acre-Feet)				Grimes Canyon Aquifer (Acre-Feet)				Wells in Multiple or Unassigned Aquifers (Acre-Feet)				Total (Acre-Feet)
		AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	AG	M&I	Dom	Sub-total	
CY 2016	Yes	1,052	0	0	1,052	583	0	0	583	11,270	1,128	0	12,398	384	87	1	472	8,424	98	18	8,540	**23,045**
CY 2017	Yes	924	0	0	924	580	0	0	580	11,900	1,093	0	12,993	453	91	1	545	9,008	131	29	9,168	**24,210**
CY 2018	Yes	766	0	0	766	562	0	0	562	10,944	1,393	0	12,337	500	92	1	593	8,579	418	29	9,026	**23,284**
CY 2019	Yes	744	0	0	744	217	0	0	217	11,059	1,295	0	12,354	272	99	0	371	6,573	128	20	6,721	**20,407**
CY 2020	Yes	865	0	0	865	133	0	0	133	11,791	1,626	0	13,417	569	121	1	692	8,287	289	19	8,595	**23,702**
WY 2021	Yes	817	0	0	817	150	0	0	150	13,125	1,830	0	14,954	474	146	2	622	9,784	290	32	10,105	**26,647**
WY 2022[b]	Yes	865	0	0	865	133	0	0	133	11,791	1,809	0	13,600	438	121	1	622	8,268	290	25	8,916	**24,074**
WY 2023[c]	No/70%	388	0	0	388	185	0	0	185	5,535	2,733	0	8,269	57	115	0	173	6,438	114	24	6,576	**15,591**

Notes: AG = Agriculture ; Dom = domestic; M&I = Municipal and Industrial; CY = Calendar Year (January 1 through December 31); WY = Water Year (October 1 through September 30)

[a] Qualifier indicates whether extraction reporting is complete for the given year. "Yes" indicates no additional reporting is anticipated. "No" indicates that additional reporting is anticipated. The percentage included after the "No" qualifier represents the estimated total percentage of operators who have reported extractions to FCGMA January 26, 2024

[b] Groundwater extractions updated using additional extraction reporting.

[c] Groundwater extractions are preliminary and expected to change. Additional extraction reporting is anticipated.

2.4 Imported Water Supply

Imported water supplies consist of imported Metropolitan Water District of Southern California (State Water Project and/or Colorado River water) water provided by CMWD to local water purveyors and imported groundwater and Conejo Creek water provided by CWD. CMWD is largest imported water supplier to the LPVB and has provided approximately 97% of the imported water to the LPVB since water year 2015 (Table 2-4). Table 2-4 summarizes imported water supplies to the LPVB from water year 2016 to water year 2023.

CWD provided imported water to the LPVB through water year 2023. Consistent with their historical reporting precedent, CWD provided data for the period 2016 through 2020 on a calendar year basis. In order to convert the imported water supply data from calendar year to water year, 25% of CWD's imported water from a given calendar year was assigned to the following water year, and 75% of the calendar year imported water was assigned to the current water year. This division, while approximate, is based on the monthly split between water year and calendar year, with January through September (75% of the calendar year) belonging to the current water year, and October through December (25% of the calendar year) belonging to the following water year. For this annual report, CWD updated their reporting to summarize their water deliveries on a water year basis. CWD deliveries for water years 2021, 2022, and 2023 reflect CWD's updated water year reporting.

Table 2-4. Total Imported Water Supplies in the LPVB

Water Year	CMWD (Acre-Feet)						CWD (Acre-feet)								
	WLPMA		ELPMA			Sub-total	GW Pumped in PVB and used in LPVB		GW Pumped in SRV and used in LPVB		Imported from CMWD to ELPMA		Sub-total	Nonpotable water delivered for Ag	Total
	M&I	Ag	M&I	Ag	ASR Injections[a]		M&I	Ag	M&I	Ag	M&I	Ag			
2016	697	762	5,210	1,966	946	9,581	10	13	21	29	54	76	203	122	**9,906**
2017	541	372	5,526	1,896	4,066	12,401	9	13	33	43	51	69	218	99	**12,718**
2018	1,011	772	6,296	2,298	2,056	12,433	10	13	33	45	53	71	225	97	**12,754**
2019	666	384	5,195	1,802	6,814	14,861	9	13	26	35	54	73	210	139	**15,210**
2020	544	379	5,460	1,884	2,866	11,133	11	15	17	24	69	90	226	132	**11,493**
2021	968	352	6,041	2,023	683	10,067	15	21	15	21	69	91	233	144	**10,444**
2022	506	347	4,720	1,602	1,057	8,232	20	28	20	82	49	64	262	103	**8,597**
2023	353	219	4,075	1,385	4,059	10,092	0	0	0	0	48	45	93	370	**10,555**

Notes: M&I = Municipal and Industrial; Ag = Agriculture; ASR = Aquifer Storage and Recovery; NR = Not Reported, SRV = Santa Rosa Valley Basin, PVB = Pleasant Valley Basin
CWMD = Calleguas Municipal Water District; CWD = Camrosa Water District

[a] ASR injections are stored water in the ELPMA.

2.5 Total Water Available

Total available water was tabulated from the groundwater extractions reported in Tables 2-2 and 2-3, the imported water supplies reported in Table 2-4, and wastewater treated at the Moorpark Wastewater Treatment Plant (MWTP) and used by AG and M&I operators in the LPVB. Total available water is reported in Table 2-5 by water year. To convert the reported groundwater pumping from calendar year to water year for 2016 through 2020, 25% of groundwater production from a given calendar year was assigned to the following water year, and 75% of the calendar year production was assigned to the current water year. This division, while approximate, is based on the monthly split between water year and calendar year, with January through September (75% of the calendar year) belonging to the current water year, and October through December (25% of the calendar year) belonging to the following water year.

Similar to Table 2-2, the groundwater extractions for water years 2021 and 2022 presented in Table 2-5 represent a combination of reported AMI-estimated extractions for the period from October 1, 2020, through September 30, 2022, and groundwater extractions for water year 2023 represent extractions that were reported to FCGMA prior to January 26, 2024.

Table 2-5. Total Water Available in the LPVB

Water Year	Extraction Reporting Complete / Estimated Percentage Complete (%)[a]	Groundwater (acre-feet)			Recycled Water (acre-feet)		Imported Water (acre-feet)		Total[b] (acre-Feet)
		Ag	Dom	M&I	Ag	M&I	Ag	M&I	
2016	Yes	34,872	53	4,160	-	598	2,969	5,991	48,643
2017	Yes	35,610	69	4,031	-	765	2,492	6,160	49,127
2018	Yes	34,296	72	3,848	-	897	3,296	7,402	49,811
2019	Yes	31,474	64	3,770	-	823	2,446	5,950	44,527
2020	Yes	34,315	74	4,191	-	861	2,525	6,102	48,068
2021	Yes	39,920	64	4,645	-	1,244	2,652	7,108	55,633
2022[c]	Yes	30,767	24	3,362	-	949	2,226	5,315	40,643
2023[d]	No/70%	21,098	54	4,553	18	717	2,020	4,476	32,936

Notes: Ag = Agriculture; Dom = Domestic; M&I = Municipal and Industrial; - = Not Reported.

[a] Qualifier indicates whether extraction reporting is complete for the given year. "Yes" indicates no additional reporting is anticipated. "No" indicates that additional reporting is anticipated. The percentage included after the "No" qualifier represents the estimated total percentage of operators who have reported extractions to FCGMA January 26, 2024

[b] Total water available in the LPVB does not include CMWD ASR injections which are considered stored water in the ELPMA. ASR injection totals are summarized in Table 2-4.

[c] Groundwater extraction reporting for 2022 was updated based on additional extraction reporting.

[d] Groundwater extraction reporting for 2023 are preliminary and expected to change. Additional extraction reporting is anticipated.

2.6 Change in Groundwater Storage

Change in storage estimates were calculated in the LPVB by comparing annual seasonal high groundwater elevations from water years 2016 through 2023. The change in storage for the Fox Canyon aquifer between spring 2022 and spring 2023 is shown in Figure 2-15. Annual and cumulative change in storage for water years 2016 through 2023 are presented in Tables 2-6A and 2-6C and Figures 2-16 through 2-19.

Change in groundwater in storage was calculated using a series of linear regression models that correlate measured groundwater elevations to simulated storage change values extracted from the Ventura Regional Groundwater Flow Model (UWCD, 2018) for the WLPMA and the CMWD numerical groundwater flow model for the ELPMA (CMWD, 2018). This methodology differs from previous estimates of storage change presented in the 2020 and 2021 Annual Reports and addresses identified data gaps by: (1) removing the influence of contouring algorithms on the resulting estimates of storage change, and (2) providing an estimate of storage change across the majority of the ELPMA and WLPMA. A comparison of the estimated change in storage using the two methodologies is provided in the 2022 Annual Report covering water year 2021 (FCGMA, 2022).

2.6.1 Fox Canyon Aquifer

Change in groundwater storage in the Fox Canyon aquifer was calculated for approximately 11,500 acres of the 17,400 acres of the WLPMA and 21,300 acres of the 27,200 acres of ELPMA. This corresponds to change in storage estimates that represent approximately 66% of the Fox Canyon aquifer in the WLPMA and 78% of the Fox Canyon aquifer in the ELPMA. Prior estimates of storage change presented in the 2019 and 2020 Annual Reports for the Las Posas Valley Basin represented changes in storage within the Fox Canyon aquifer over approximately 18% of the WLPMA and 19% of the ELPMA.

Groundwater in storage increased between spring 2022 and spring 2023 across the majority of the LPVB. In the ELPMA, groundwater storage increases ranged from approximately 1 acre-foot per 100 acres (AF/100A) north of the Moorpark Anticline to approximately 174 AF/100A near the Arroyo Las Posas (Figure 2-15). These estimated changes in groundwater in storage represent local groundwater elevation increases that range from approximately 1 to 40 feet. Despite the general increase in groundwater in storage, groundwater in storage locally declined in the northeastern-most part of the ELPMA, where groundwater elevations declined by approximately 8 feet over the 2023 water year at well 03N20W19J01S (Figure 2-15).

Between spring 2022 and 2023, the groundwater in storage in the Fox Canyon aquifer of the ELPMA increased by approximately 6,000 AF (Table 2-6a). During the 2023 water year, CMWD extracted 2,089 AF of stored water from the LPVB and injected a total of 4,058 AF of stored water. In 2021 and 2022, in response to limited State Water Project allocations and a Drought Emergency declaration from the Governor, CMWD produced approximately 4,000 AF of its pre-stored water in the LPVB. The injection of 4,058 AF in water year 2023 brings the total temporary stored water in the LPVB back to similar levels as before the drought emergency of 2022. Groundwater in storage in the ELPMA is impacted by CMWD ASR operations, the water year hydrology, and groundwater production in the ELPMA. Because groundwater production reporting is incomplete, the relative impacts of the water year hydrology and groundwater production rates on change in storage cannot be determined.

In the WLPMA, groundwater in storage increased between spring 2022 and 2023 by an estimated 6,600 AF (Table 2-6a). The rates of groundwater storage increase were highest near the Oxnard Subbasin, where groundwater elevations increased by an estimated 50 to 77 feet (Table 2-6b). Along the boundary between the WLPMA and Oxnard Subbasin, groundwater in storage increased by approximately 50 AF/100A to 206 AF/100A. Near the Somis Fault, groundwater in storage is estimated to have increased by approximately 5 AF/100A to 50 AF/100A (Figure 2-15). However, it should be noted that groundwater storage estimates in this part of the LPVB are associated with a higher degree of uncertainty because groundwater elevations were not measured at the same wells during consecutive spring measurement events.

Table 2-6a. Annual Change in Storage (Acre-feet) in the Fox Canyon Aquifer in the LPVB

Water Year	Water Year Type	LPVB[a]		
		WLPMA[a]	ELPMA[a]	Total
2016	Dry	-224	-1,289	-1,513
2017	Above Normal	-4,411	-526	-4,936
2018	Dry	-1,592	-3,880	-5,472
2019	Above Normal	129	-446	-316
2020	Above Normal	2,474	5,698	8,173
2021	Critically Dry	-5,895	-5,372	-11,266
2022	Below Normal	-2,333	-2,743	-5,076
2023	Wet	6,613	6,029	12,642

Notes: ELPMA change in storage includes ASR injections in 2016 through 2023.
[a]Change in groundwater storage for water years 2016 through 2020 was updated during preparation of the 2022 Annual Report (FCGMA 2022) using correlations between measured groundwater elevations and modeled storage change extracted from the Ventura Regional Flow Model (UCWD 2018) and CMWD numerical groundwater flow model (CMWD, 2018). A discussion of this approach is provided in FCGMA (2022).

Estimates of groundwater change in storage described above require consecutive water year measurements. Spring groundwater elevations were not measured during consecutive water years at wells 02N20W07R02S and 02N20W06R01S in the WLPMA and at well 03N19W31B01S in the ELPMA. The missing groundwater elevations were estimated by using nearby wells (Table 2-6b). Because there was not sufficient measurement overlap between well 02N20W07R02S and nearby wells, the local change in storage value for water year 2022 was estimated using a correlation between modeled change in storage and groundwater elevations measured at well 02N20W18A01S. This correlation equation is described in FCGMA (2022). Additionally, because groundwater levels were not measured during the spring measurement window[9] at either 02N20W07R02S or 02N20W18A01S, the change in groundwater storage in this part of the basin was estimated using a measurement from 02N20W18A01S collected on April 10, 2023.

Table 2-6b. Estimated Groundwater Elevations

SWN	Missing Period	Correlation Well	Correlation Statistic (R^2)	Groundwater Elevation Measured at Correlation Well (ft msl)	Estimated Groundwater Elevation (ft msl)
02N20W06R01S	Spring 2022	02N21W12H01S	0.3380	-42.21	**-124.09**
03N19W31B01S	Spring 2021	03N19W31H01S	0.6132	140.30	**137.1**

Groundwater in storage increased by approximately 12,600 AF in water year 2023, which is the largest estimated increase in storage during the 2016-2023 period. This increase in groundwater in storage likely reflects a combination of wetter-than-normal hydrology and CMWD's ASR operations during the 2023 water year. Importantly, as previously noted, the estimated change in storage values in the WLPMA are associated with a high degree of

[9] As described in Section 2.1, the spring measurement window is from March 2 to March 31, 2023.

uncertainty because groundwater elevations are not measured at the same wells during consecutive spring measurement events. The FCGMA, as part of their GSP implementation activities, continues to evaluate opportunities to install dedicated monitoring wells and improve access/coordination with local operators to reduce these uncertainties and data gaps. The change in storage volumes reported include ASR operations between 2016 and 2023[10].

Table 2-6c. Cumulative Change in Storage (Acre-feet) in the Fox Canyon Aquifer in the LPVB

Water Year	Water Year Type	LPVB		
		WLPMA[a]	ELPMA[a]	Total
2016	Dry	-224	-1,289	-1,513
2017	Above Normal	-4,635	-1,814	-6,449
2018	Dry	-6,227	-5,694	-11,921
2019	Above Normal	-6,098	-6,140	-12,237
2020	Above Normal	-3,623	-441	-4,064
2021	Critically Dry	-9,518	-5,813	-15,331
2022	Below Normal	-11,851	-8,556	-20,406
2023	Wet	-2,739	-2,555	-5,294

Notes: ELPMA change in storage includes ASR injections in 2016 through 2023.

[a] Change in groundwater storage for water years 2016 through 2020 was updated during preparation of the 2022 Annual Report (FCGMA 2022) using correlations between measured groundwater elevations and modeled storage change extracted from the Ventura Regional Flow Model (UCWD 2018) and CMWD numerical groundwater flow model (CMWD, 2018). A discussion of this approach is provided in FCGMA (2022).

[10] CMWD's ASR operations impact groundwater elevations in the vicinity of the Moorpark Anticline in the ELPMA. Groundwater elevation changes that result from CMWD's ASR operations are included in the linear regression models used to estimate storage change.

3 GSP Implementation Progress

The GSP for the LPVB was submitted to DWR in January 2020 and approved by DWR in January 2022. This is the fifth annual report prepared since the GSP was submitted. The GSP implementation progress described in this report covers work that began during development of the GSP as well as work that has been conducted since the GSP was submitted. FCGMA continues to engage with stakeholders as part of the GSP implementation efforts.

Project Implementation Progress

During development of the GSP, FCGMA identified the northern Pleasant Valley, adjacent to the boundary between the PVB and the ELPMA, as a critical area in which aquifer specific groundwater elevations were lacking. This is an area where subsurface flows between the two basins are poorly constrained. At FCGMA's request, DWR installed two new nested monitoring wells in this area in 2019 per FCGMA's technical specifications. Combined, the new nested wells are screened in the Older Alluvium (one each in the Oxnard aquifer equivalent, and Mugu aquifer equivalent), Upper San Pedro Formation (Hueneme aquifer equivalent), and the Fox Canyon aquifer (one each in the upper and basal portions). Groundwater elevation data from these wells were incorporated into this annual report to better represent groundwater conditions at the boundary between the LPVB and PVB.

In the 2022 calendar year, FCGMA solicited project descriptions and details for projects that were not included in the initial GSP (FCGMA 2022). FCGMA incorporated these projects into a funding application submitted to DWR's Sustainable Groundwater Management Program's GSP Implementation Round 2 funding opportunity. FCGMA was not awarded funding as part of this program but continues to evaluate and pursue funding options and opportunities to implement projects that support groundwater sustainability in the LPVB.

Management Action Implementation Progress

FCGMA has made progress on several management actions since adoption of the GSP. These management actions can be implemented over a shorter time period than large capital projects and, while not sufficient on their own to achieve sustainability, play an important role in progressing toward sustainable use of the groundwater resources in the Las Posas Valley Basin.

First, the FCGMA Board adopted a fixed-extraction allocation ordinance for the LPVB in December 2020 that went into effect on October 1, 2021. This allows for a better understanding of the impacts of climate and extraction on groundwater elevations and change in groundwater storage in the LPVB.

Second, in anticipation of the additional reporting associated with implementing the allocation ordinance, FCGMA is conducting an analysis of its data management system needs. The updated data management system will incorporate the new AMI data and will be structured to allow for land-based extraction assignments. Changes to the data management system will target the specific needs of the FCGMA moving toward sustainable management of the LPVB by 2040.

Third, FCGMA has continued to evaluate implementing a replenishment fee that could be used to purchase water for delivery in lieu of groundwater production in the WLPMA.

Lastly, FCGMA has begun preparing the first periodic evaluation of the GSP, which is due to DWR in January 2025. This evaluation will provide an assessment of the basin setting and groundwater conditions based on new data collected since submittal of the GSP; an evaluation of the established sustainable management criteria, monitoring network, and data gaps; and a comprehensive description of GSP implementation activities in the LPVB.

The progress made over the past year on projects and management actions applicable to the LPVB demonstrates FCGMA's commitment to allocating the necessary time and resources to ensure the long-term sustainable management of the groundwater resources of the LPVB.

Las Posas Valley Adjudication

In addition to groundwater management actions undertaken as part of SGMA, the Judgement for the LPVB outlines key groundwater management activities to be implemented in the 2024 water year. These are:

1) The development of a Basin Optimization Plan that identifies and prioritizes a suite of technically feasible and economically viable projects that can be implemented in the LPVB prior to 2040 to maintain the yield of the basin at 40,000 AFY.

2) The development of a Basin Optimization Yield Study that quantifies the benefits of each project identified in the Basin Optimization Plan, ranks each project's ability to achieve and maintain sustainability in the LPVB, and establishes a Basin Optimization Yield and Rampdown Rate.

The Judgement also requires FCGMA, as Watermaster for the LPVB, to establish a Policy Advisory Committee (PAC) and a Technical Advisory Committee (TAC), consisting of LPVB stakeholders and consultants, to advise the Watermaster on basin management issues and provide a diverse range of policy and technical views. The LPVB PAC held its first meeting on December 7, 2023. It is anticipated that the TAC will be established during the first quarter of 2024.

In addition to the establishment of the PAC and TAC, FCGMA has:

(i) Prepared a scope of work to develop the Basin Optimization Plan for the LPVB.

(ii) Prepared a draft scope of work to develop the Basin Optimization Yield Study for the LPVB.

FCGMA anticipates implementing the Basin Optimization Plan scope of work and providing the draft Basin Optimization Yield Study scope of work to the LPVB PAC and TAC for comment and feedback. Both activities are anticipated to begin in the first quarter of the 2024 calendar year.

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4 References

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United Water Conservation District (UWCD). 2018. Ventura Regional Groundwater Flow Model and Updated Hydrogeologic Conceptual Model: Oxnard Plain, Oxnard Forebay, Pleasant Valley, West Las Posas, and Mound Groundwater Basins. Open File Report 2018-02. July 2018.

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5 Figures

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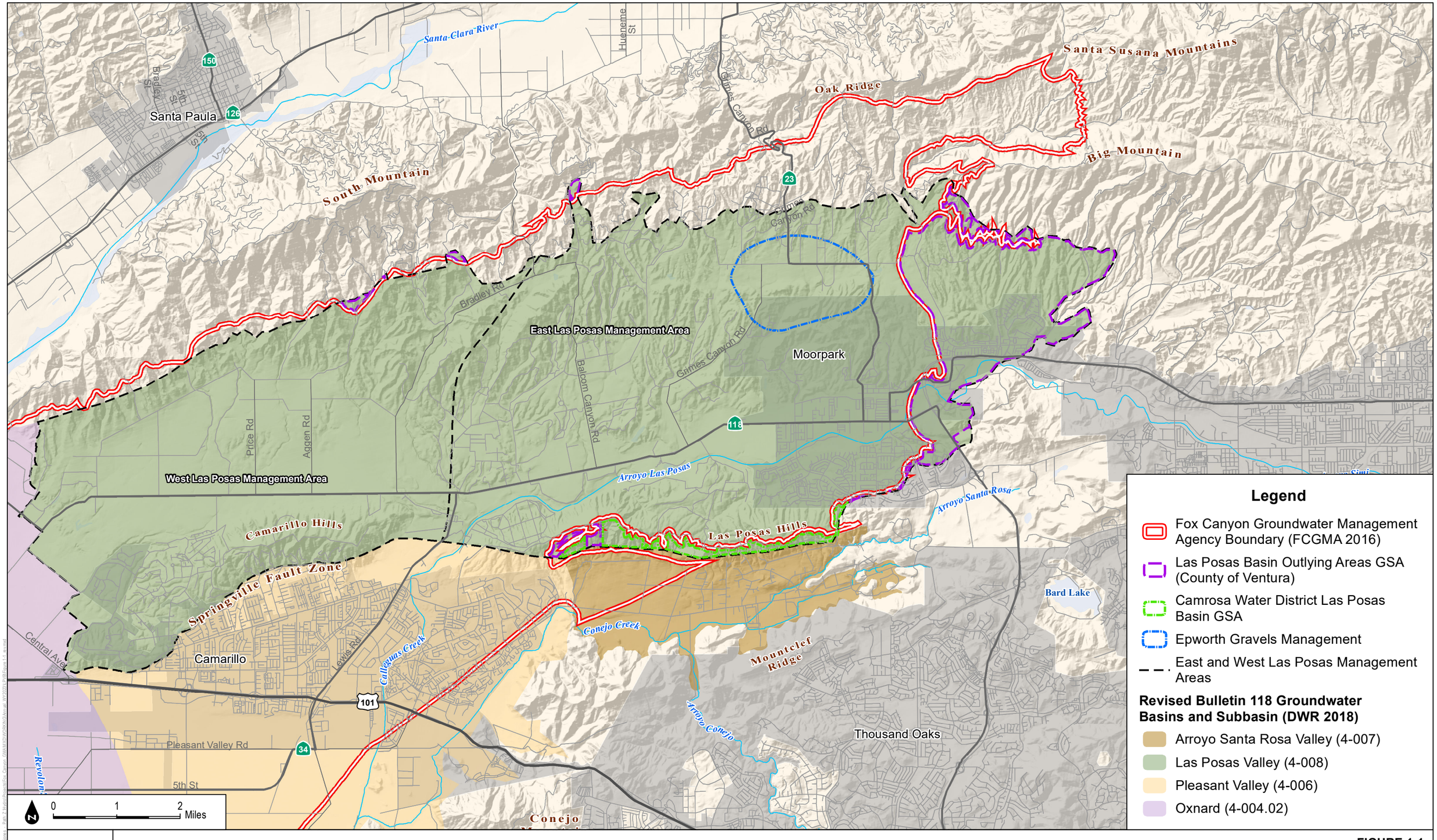

Legend

- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Basin Outlying Areas GSA (County of Ventura)
- Camrosa Water District Las Posas Basin GSA
- Epworth Gravels Management
- East and West Las Posas Management Areas

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2018)

- Arroyo Santa Rosa Valley (4-007)
- Las Posas Valley (4-008)
- Pleasant Valley (4-006)
- Oxnard (4-004.02)

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SOURCE: DWR; Ventura County

FIGURE 1-1

Vicinity Map for the Las Posas Valley Basin

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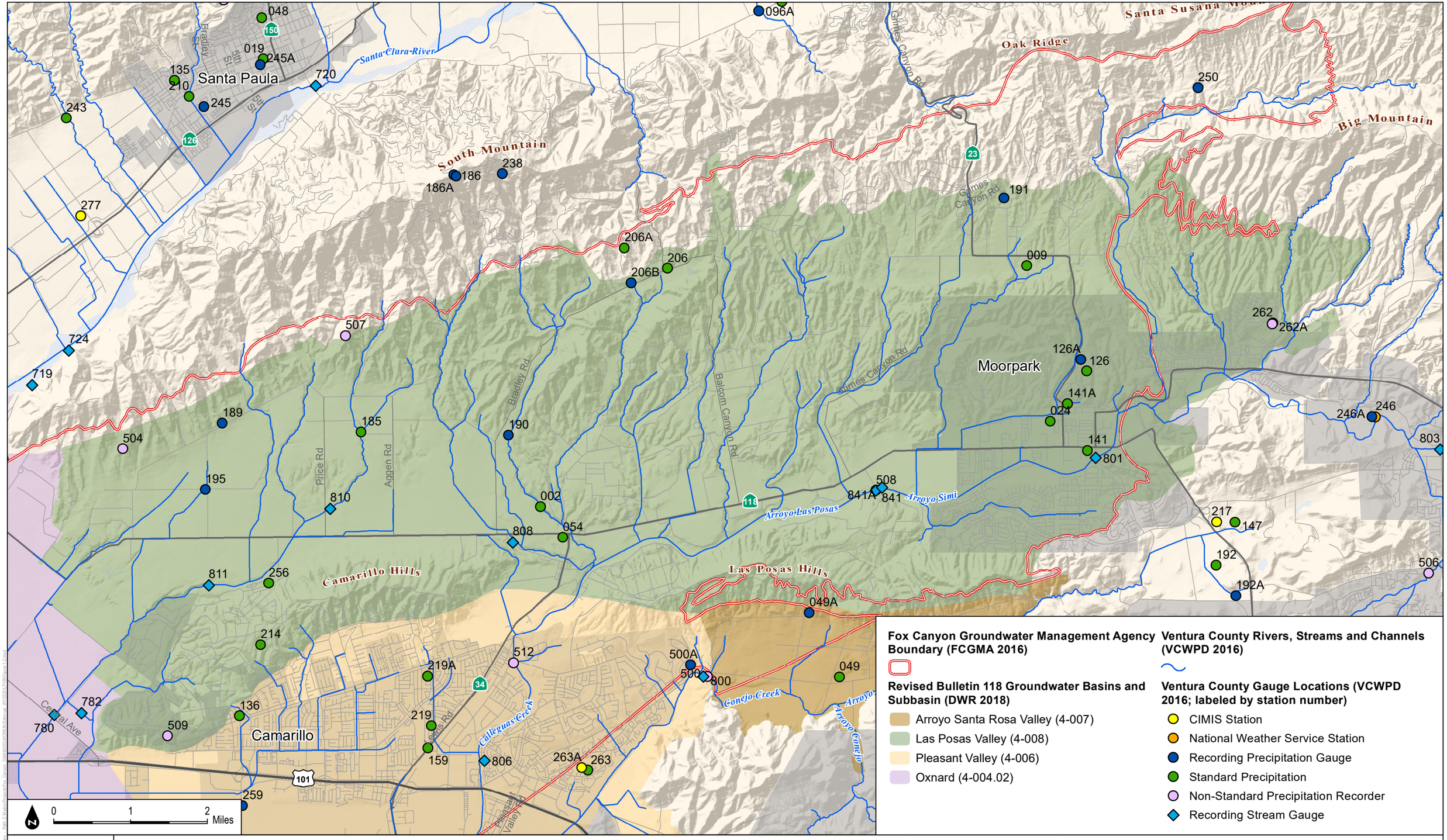

SOURCE: DWR; Ventura County; VCWPD

FIGURE 1-2

Precipitation and Stream Gauges in the Las Posas Valley Basin

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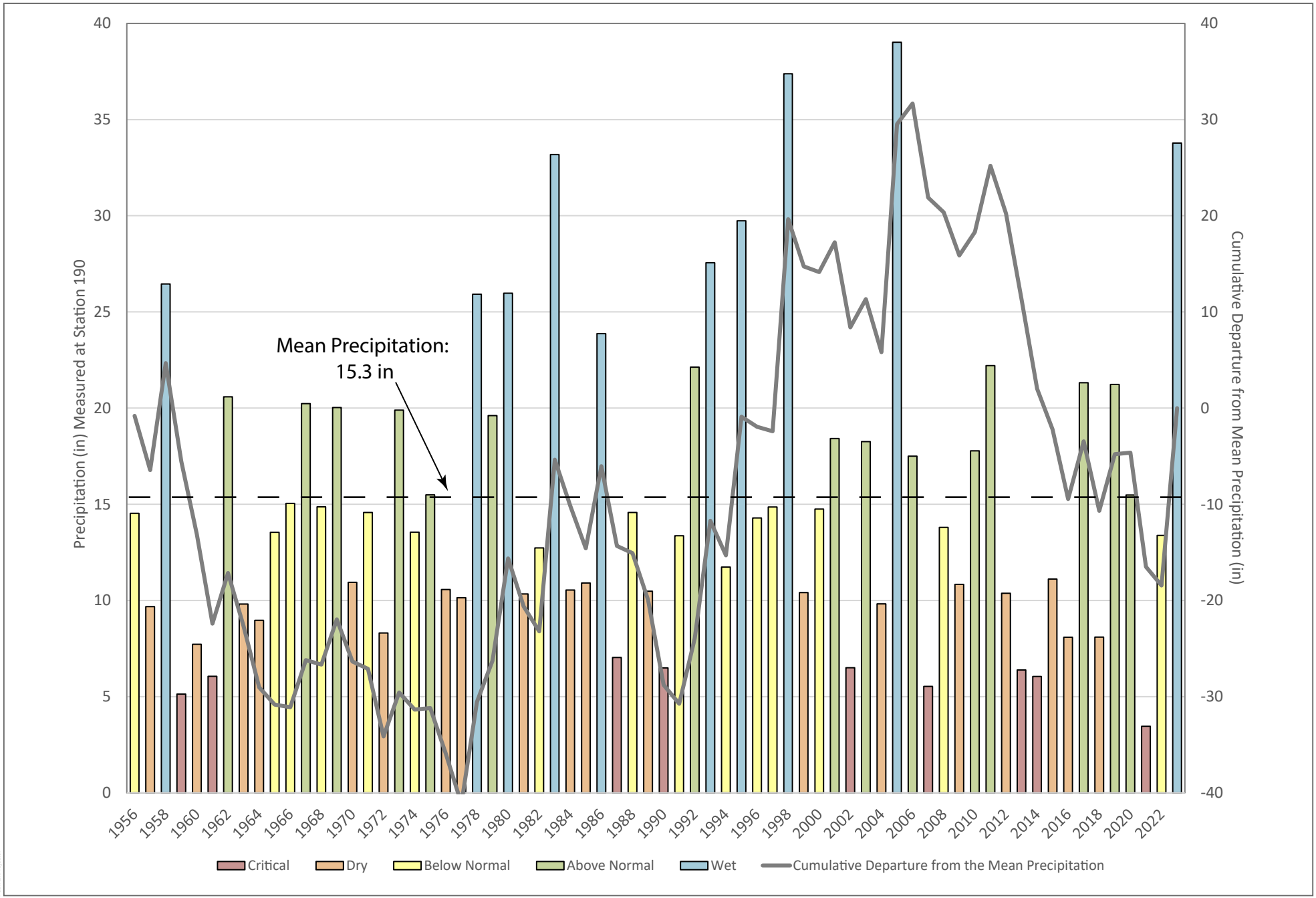

Note: Water year is October 1 through September 30. Water year type is based on the percentage of the water year precipitation compared to the mean precipitation. Types are defined as: Critical (<50% of mean), Dry (>50% to <75% of man), Below Normal (>75% to <100% of mean), Above Normal (>100% to <150% of mean), and Wet (>150% of mean).

FIGURE 1-3

Las Posas Valley Basin Historical Water Year Precipitation

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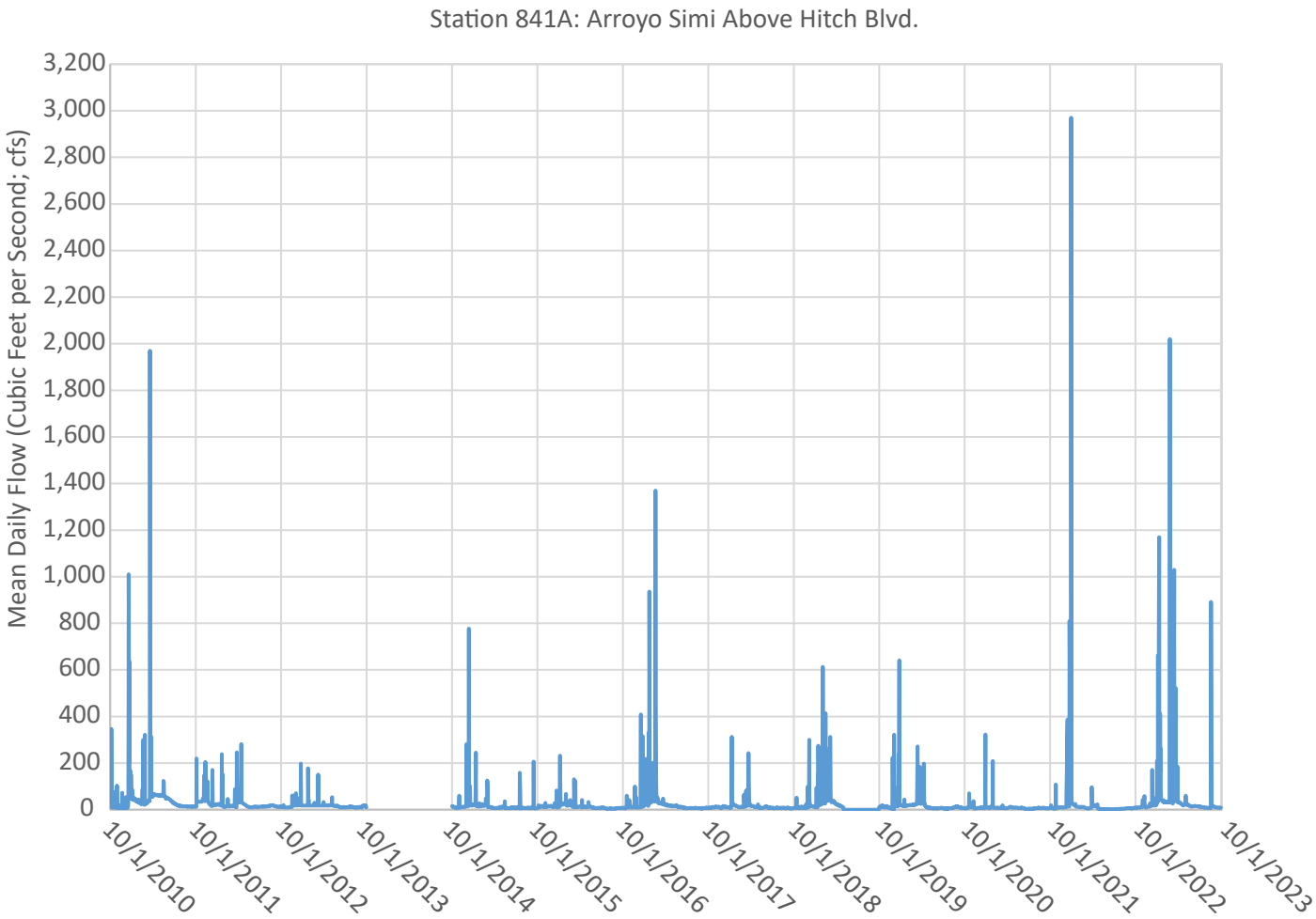

SOURCE: Ventura County Watershed Protection District (VCWPD) Hydrologic Data Server (https://www.vcwatershed.net/hydrodata/)

FIGURE 1-4

Las Posas Valley Basin Stream Gauge Data

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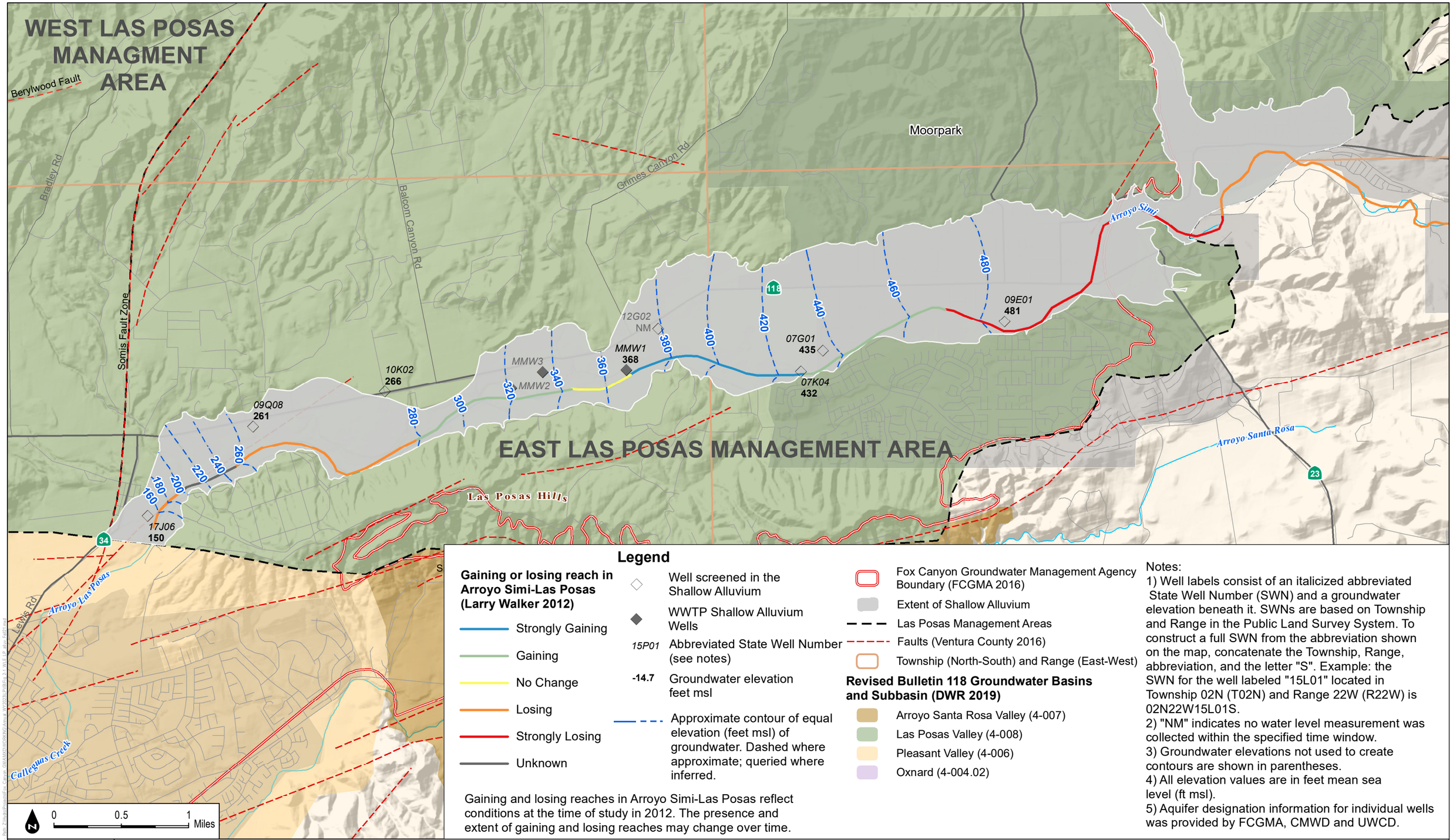

Legend

Gaining or losing reach in Arroyo Simi-Las Posas (Larry Walker 2012)

- Strongly Gaining
- Gaining
- No Change
- Losing
- Strongly Losing
- Unknown

- Well screened in the Shallow Alluvium
- WWTP Shallow Alluvium Wells
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.

Gaining and losing reaches in Arroyo Simi-Las Posas reflect conditions at the time of study in 2012. The presence and extent of gaining and losing reaches may change over time.

- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Extent of Shallow Alluvium
- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2019)

- Arroyo Santa Rosa Valley (4-007)
- Las Posas Valley (4-008)
- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-1

Groundwater Elevation Contours in the Shallow Alluvium, October 2 to 31, 2022

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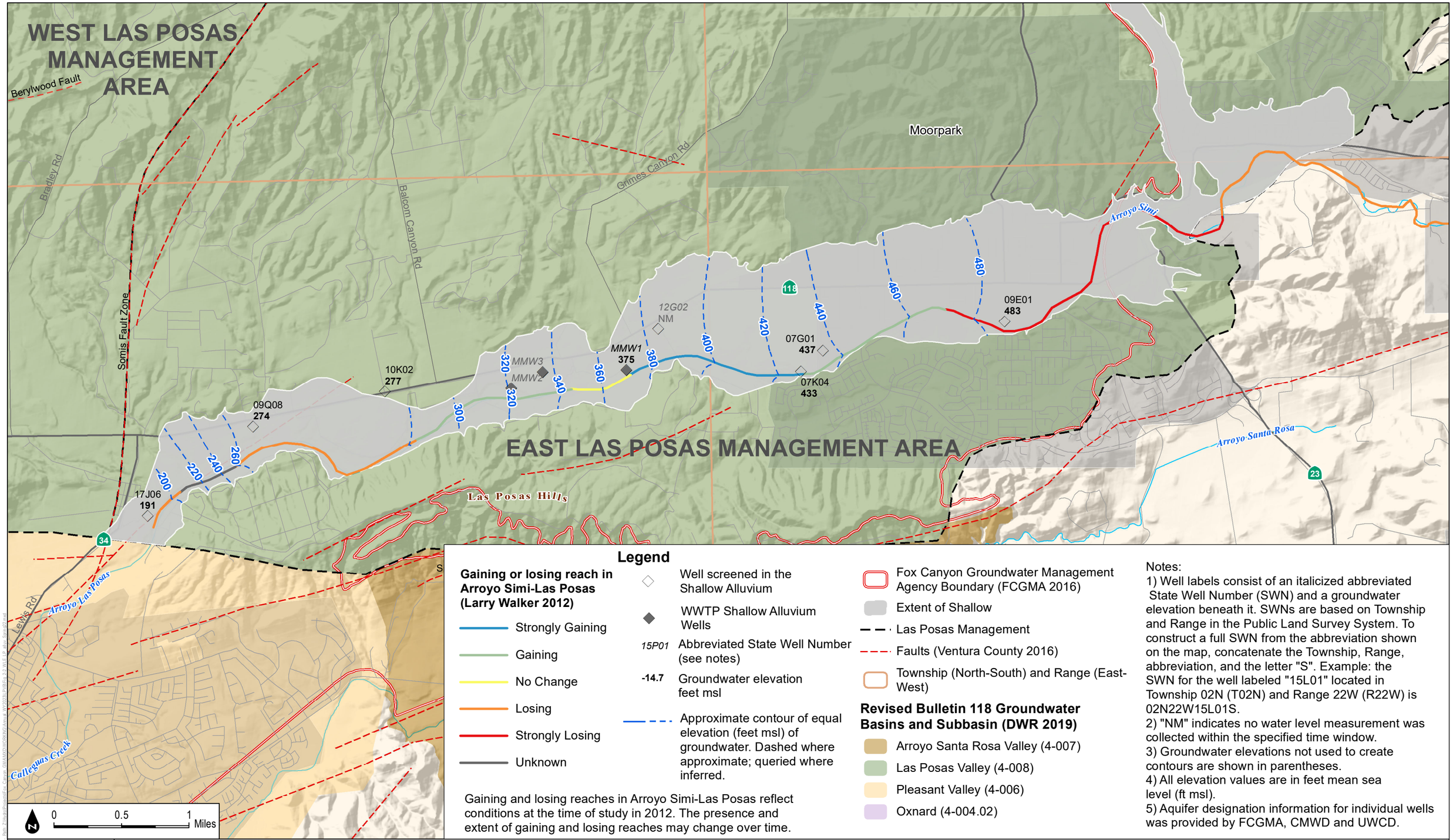

Legend

Gaining or losing reach in Arroyo Simi-Las Posas (Larry Walker 2012)

- Strongly Gaining
- Gaining
- No Change
- Losing
- Strongly Losing
- Unknown

- Well screened in the Shallow Alluvium
- WWTP Shallow Alluvium Wells
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.

Gaining and losing reaches in Arroyo Simi-Las Posas reflect conditions at the time of study in 2012. The presence and extent of gaining and losing reaches may change over time.

- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Extent of Shallow
- Las Posas Management
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

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Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-2

Groundwater Elevation Contours in the Shallow Alluvium, March 2 to 31, 2023

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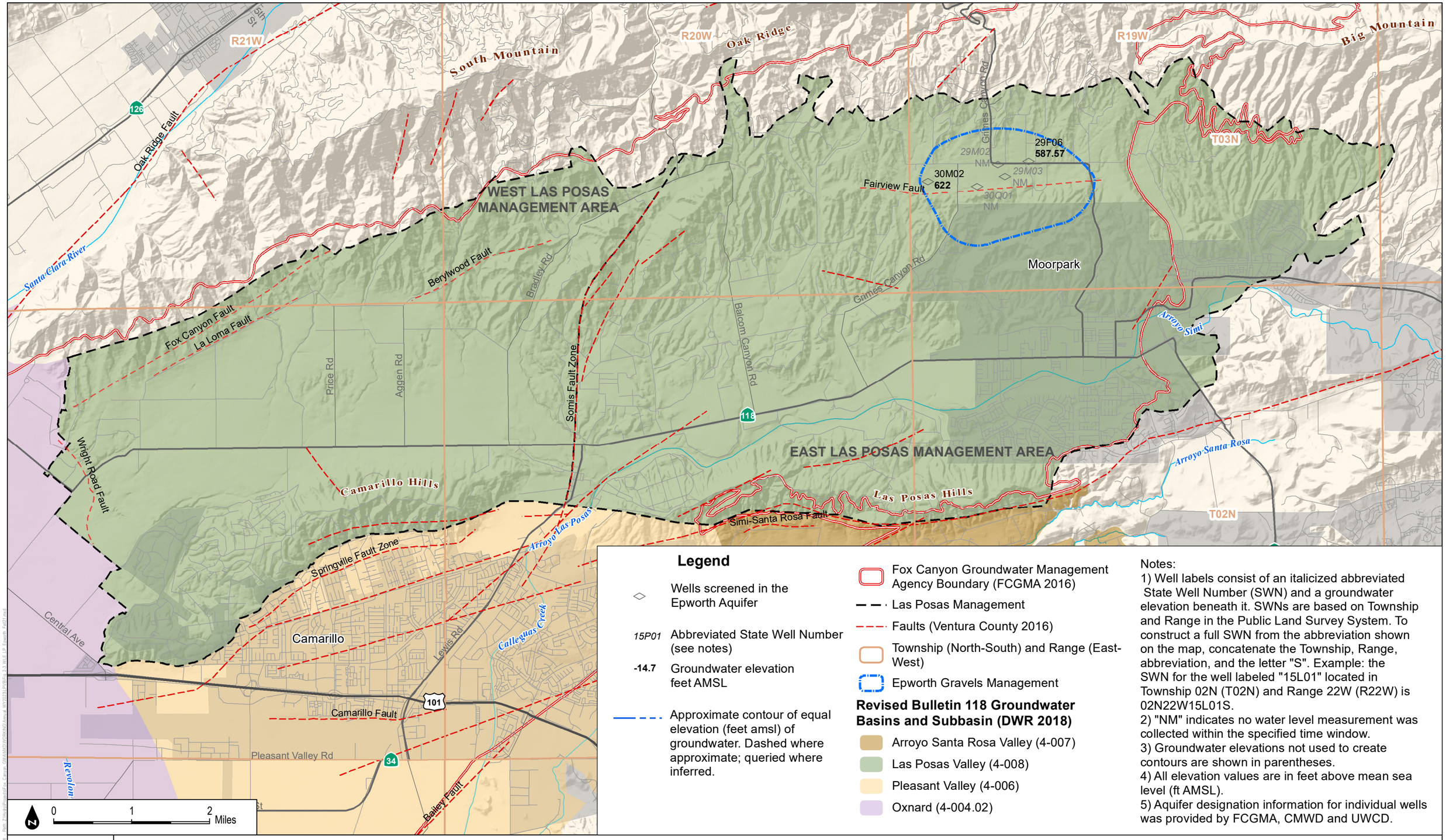

Legend

- Wells screened in the Epworth Aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet AMSL
- Approximate contour of equal elevation (feet amsl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)
- Epworth Gravels Management

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2018)

- Arroyo Santa Rosa Valley (4-007)
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- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
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2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet above mean sea level (ft AMSL).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

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SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-3

Groundwater Elevation Contours in the Epworth Gravels Aquifer, October 2 to October 31, 2022

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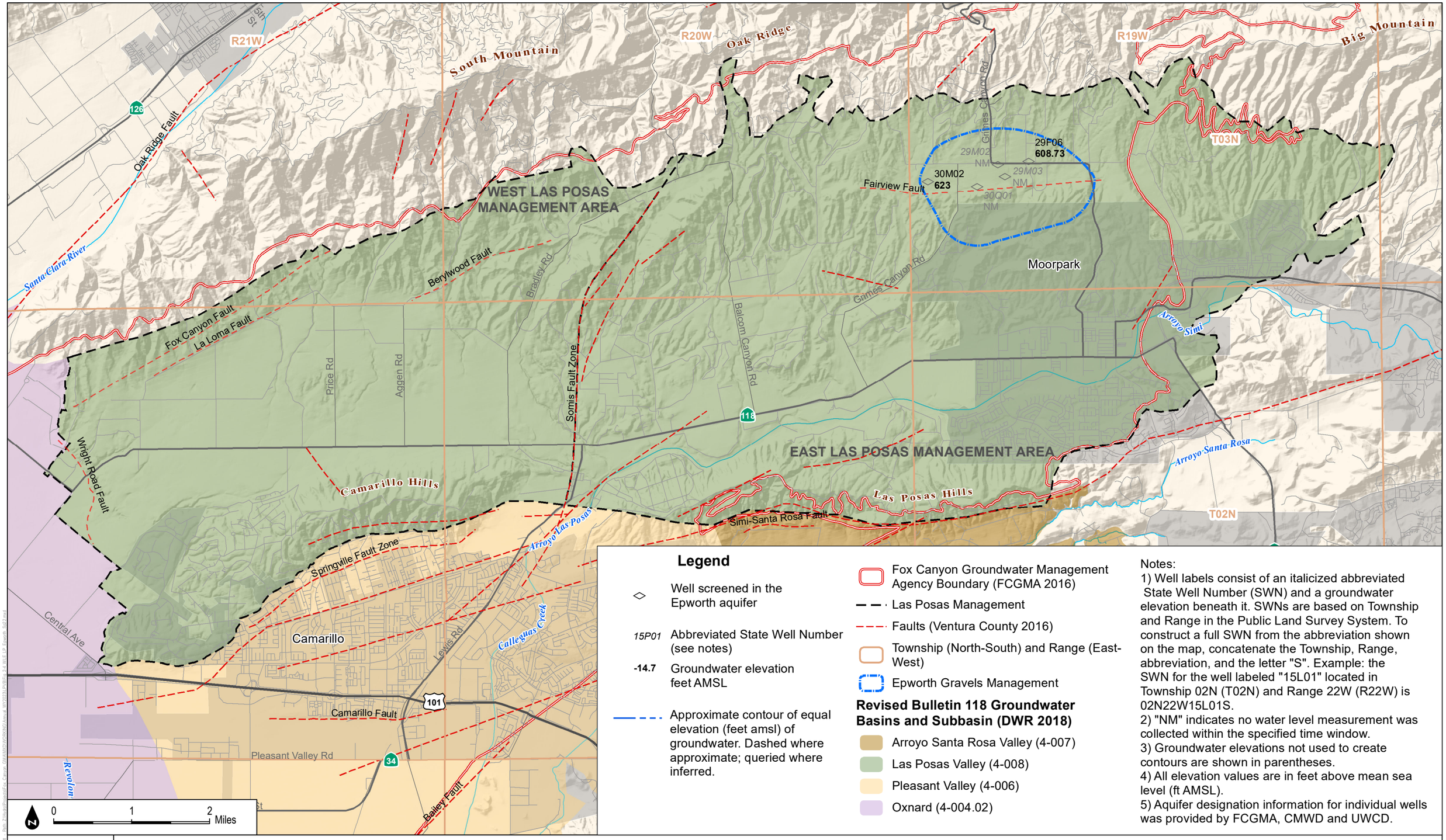

Legend

- ◇ Well screened in the Epworth aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet AMSL
- Approximate contour of equal elevation (feet amsl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)
- Epworth Gravels Management

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2018)

- Arroyo Santa Rosa Valley (4-007)
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Notes:
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2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet above mean sea level (ft AMSL).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-4

Groundwater Elevation Contours in the Epworth Gravels Aquifer, March 2 to March 31, 2023

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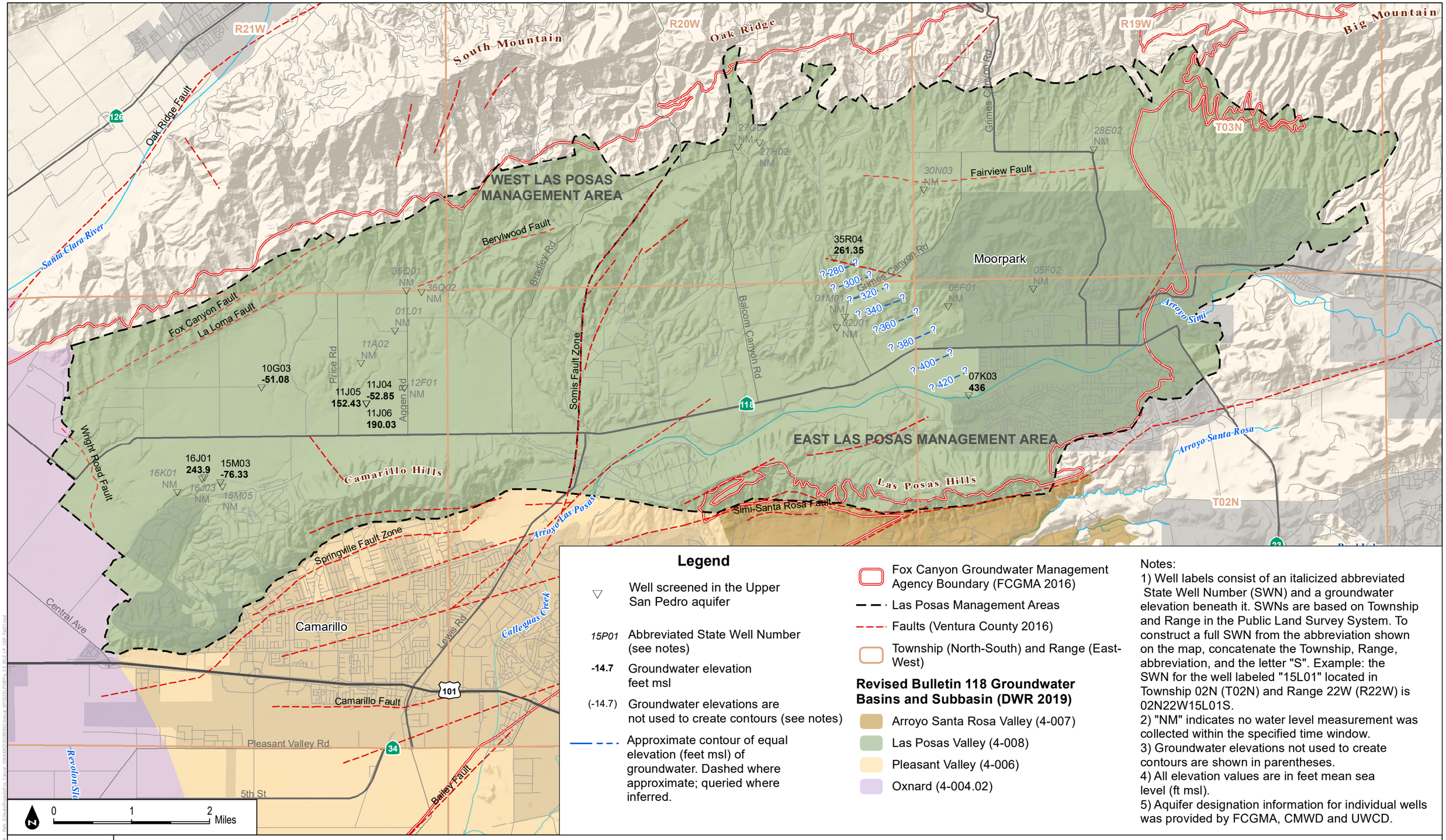

Legend

- ▽ Well screened in the Upper San Pedro aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- (-14.7) Groundwater elevations are not used to create contours (see notes)
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

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Notes:
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2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-5

Groundwater Elevation Contours in the Upper San Pedro Formation, October 2 to October 31, 2022

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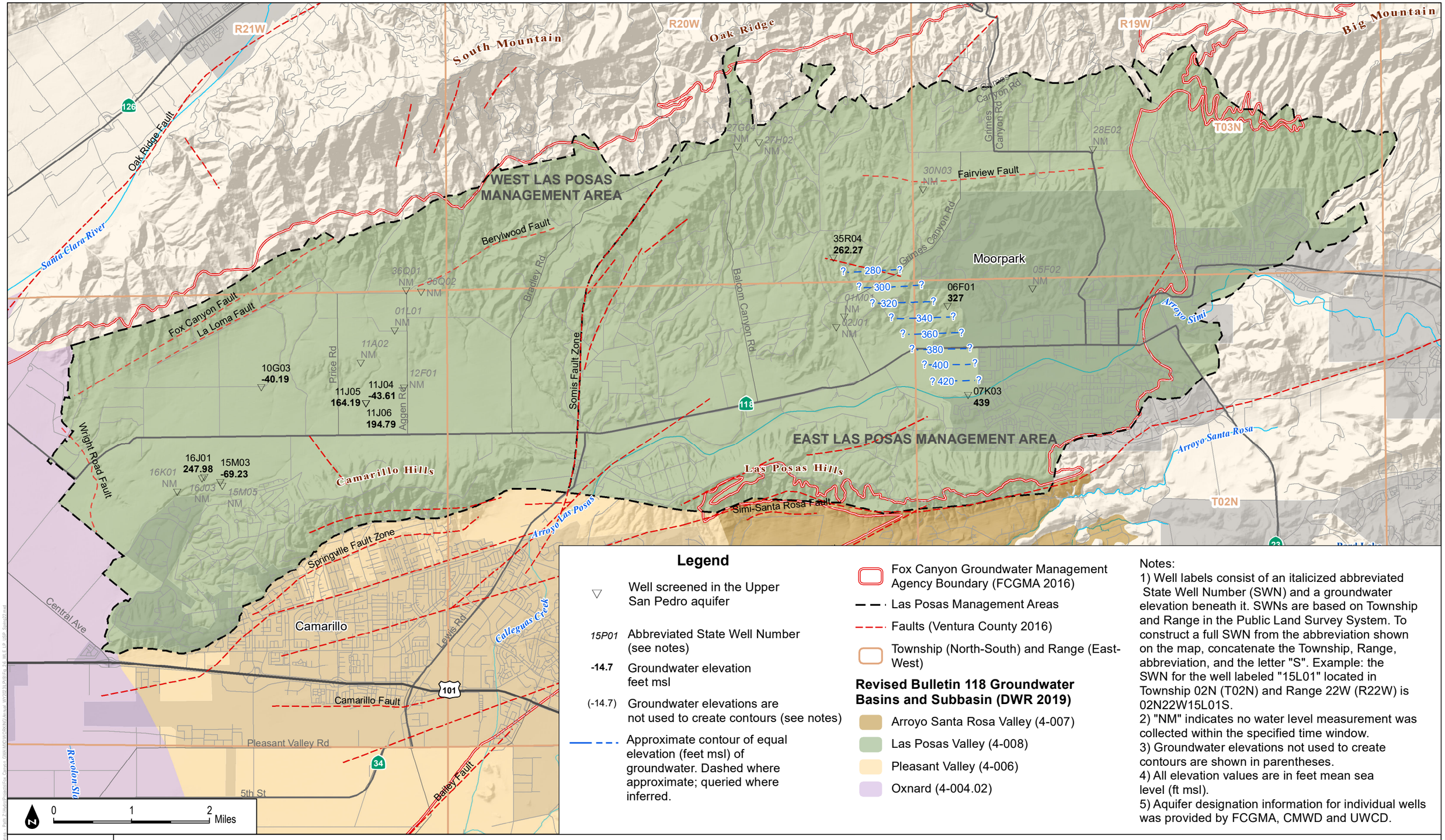

Legend

- ▽ Well screened in the Upper San Pedro aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- (-14.7) Groundwater elevations are not used to create contours (see notes)
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2019)

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- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-6

Groundwater Elevation Contours in the Upper San Pedro Formation, March 2 to March 31, 2023

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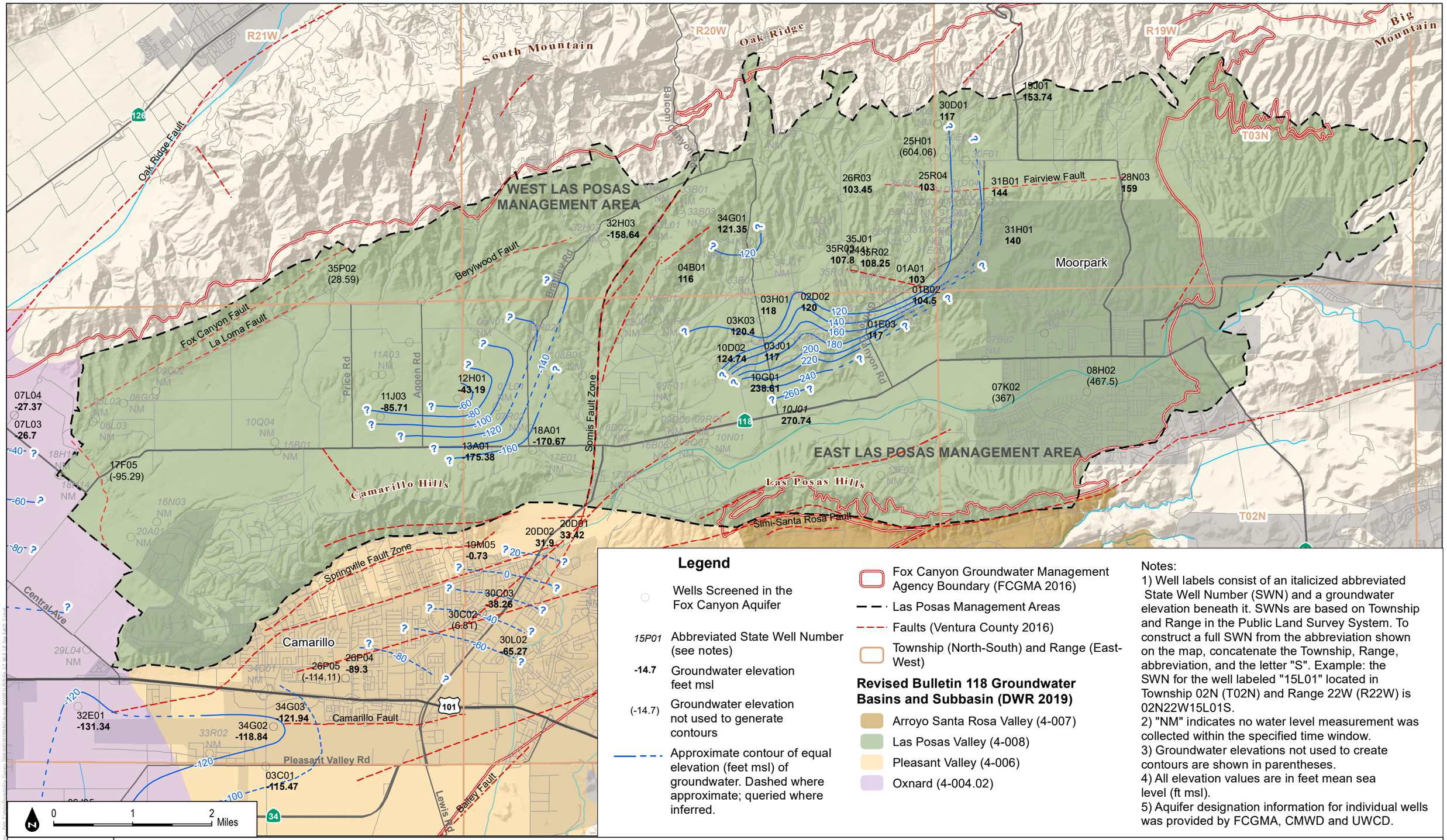

Legend

- Wells Screened in the Fox Canyon Aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- (-14.7) Groundwater elevation not used to generate contours
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

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- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-7

Groundwater Elevation Contours in the Fox Canyon Aquifer, October 2 to October 31, 2022

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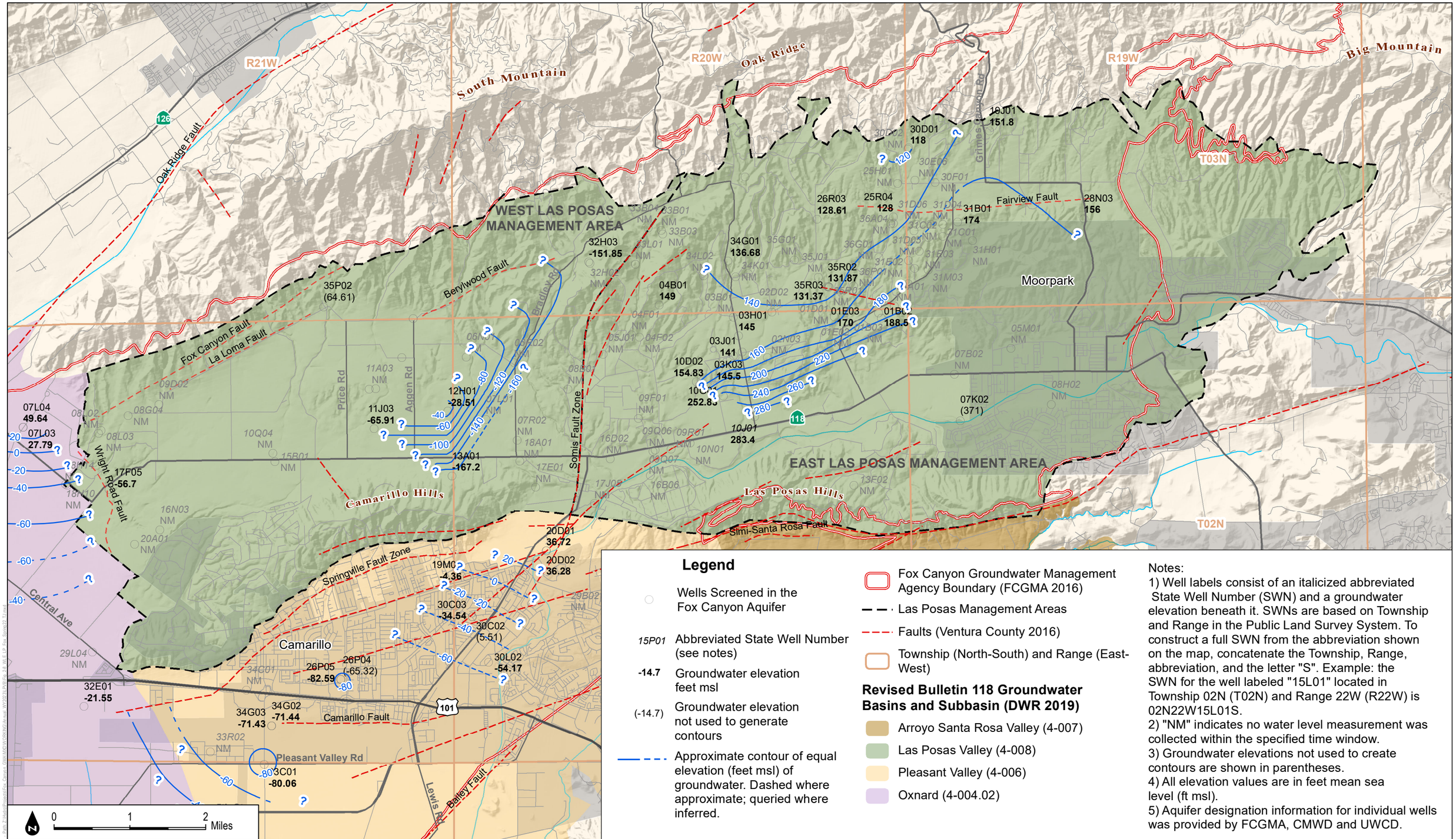

Legend

- Wells Screened in the Fox Canyon Aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet msl
- (-14.7) Groundwater elevation not used to generate contours
- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
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- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

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- Las Posas Valley (4-008)
- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-8

Groundwater Elevation Contours in the Fox Canyon Aquifer, March 2 to March 31, 2023

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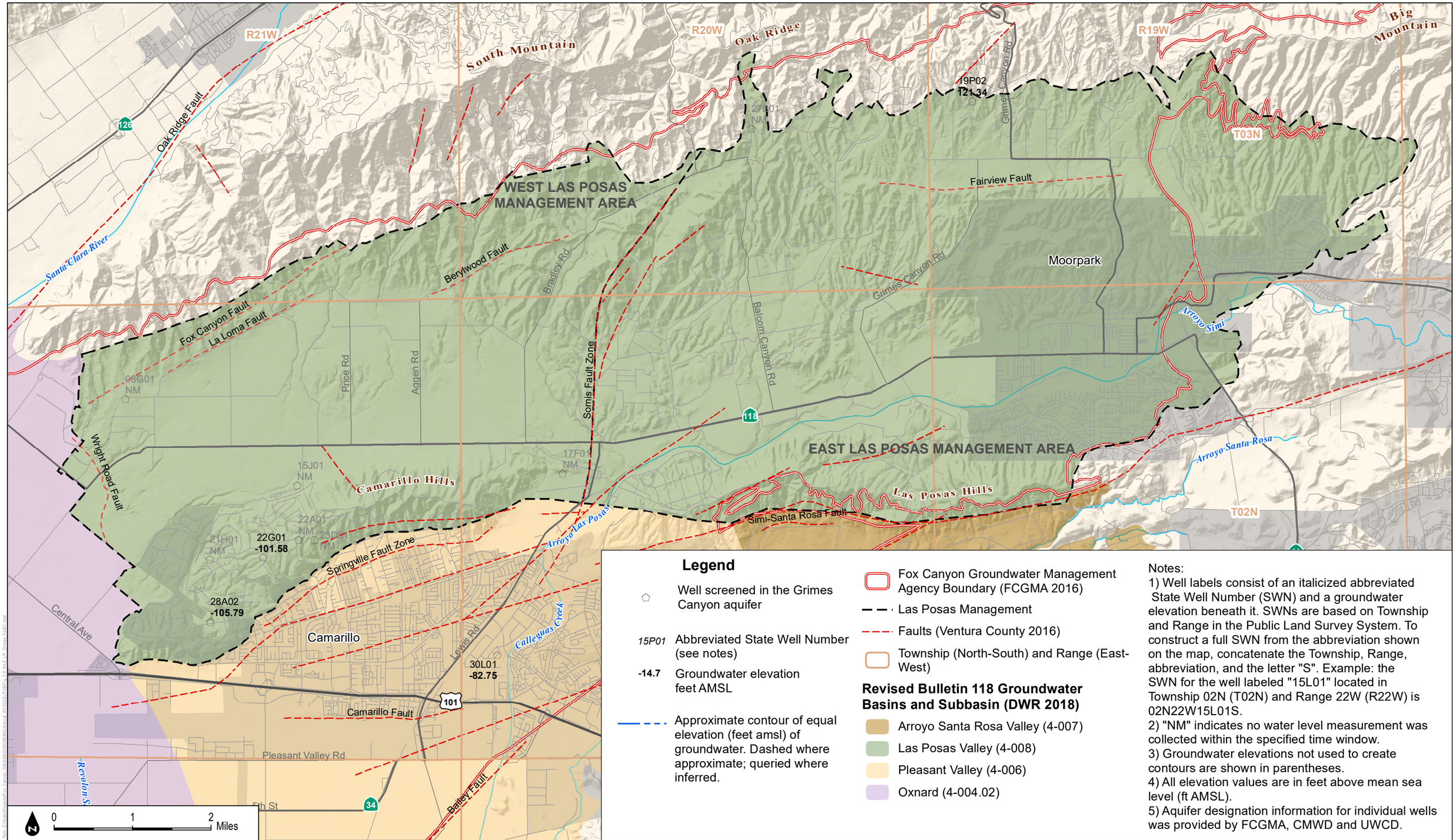

Legend

- Well screened in the Grimes Canyon aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet AMSL
- Approximate contour of equal elevation (feet amsl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

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Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet above mean sea level (ft AMSL).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-9

Groundwater Elevation Contours in the Grimes Canyon Aquifer, October 2-31, 2022

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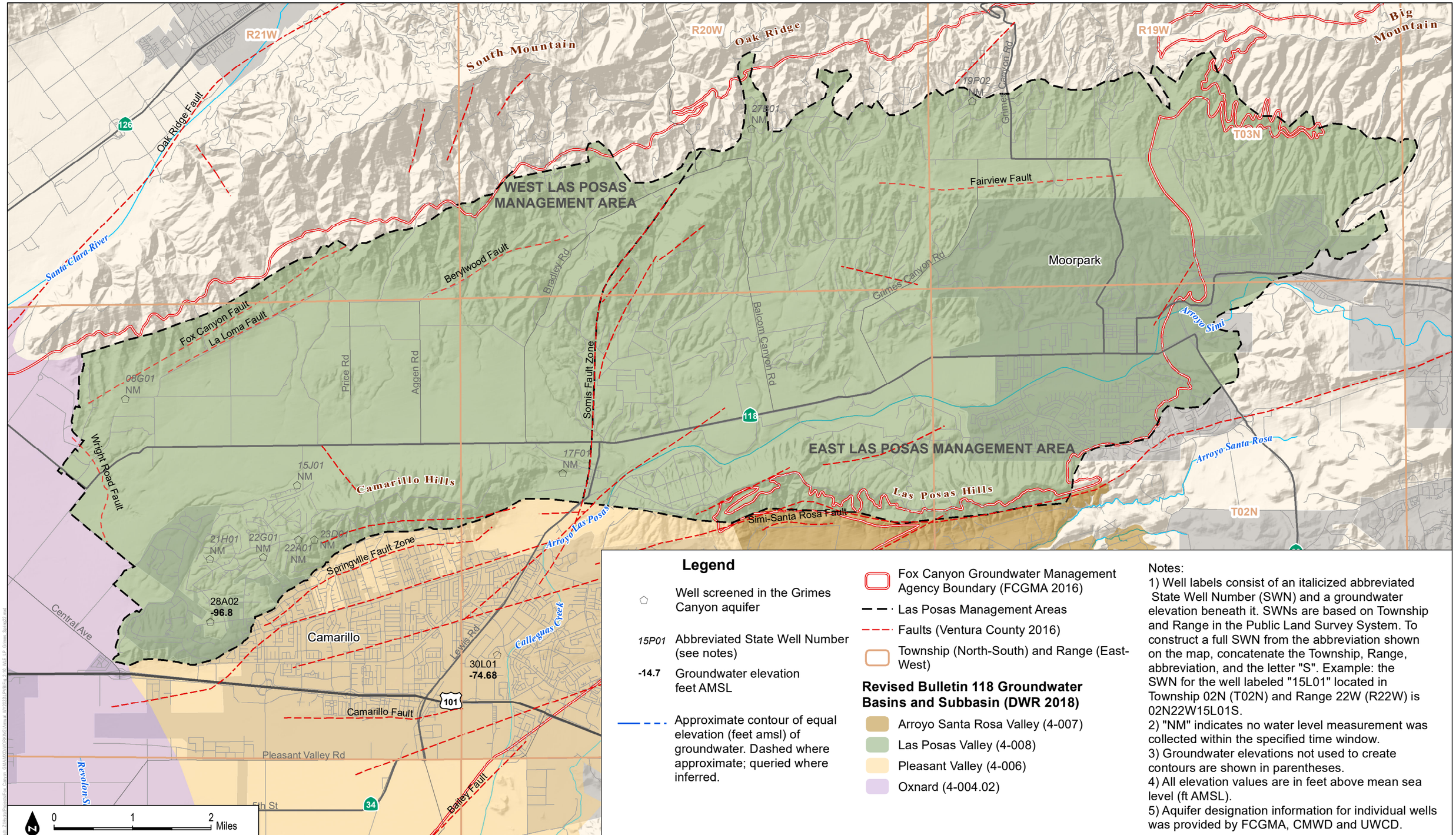

Legend

- Well screened in the Grimes Canyon aquifer
- *15P01* Abbreviated State Well Number (see notes)
- **-14.7** Groundwater elevation feet AMSL
- Approximate contour of equal elevation (feet amsl) of groundwater. Dashed where approximate; queried where inferred.
- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Las Posas Management Areas
- Faults (Ventura County 2016)
- Township (North-South) and Range (East-West)

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2018)

- Arroyo Santa Rosa Valley (4-007)
- Las Posas Valley (4-008)
- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) "NM" indicates no water level measurement was collected within the specified time window.
3) Groundwater elevations not used to create contours are shown in parentheses.
4) All elevation values are in feet above mean sea level (ft AMSL).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD.

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-10

Groundwater Elevation Contours in the Grimes Canyon Aquifer, March 2-31, 2023

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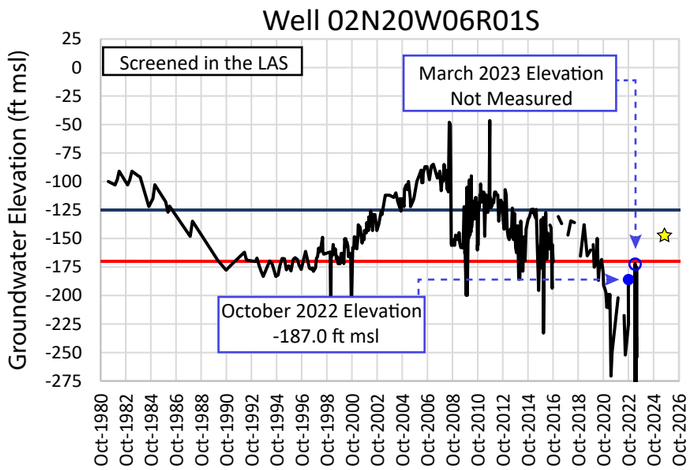

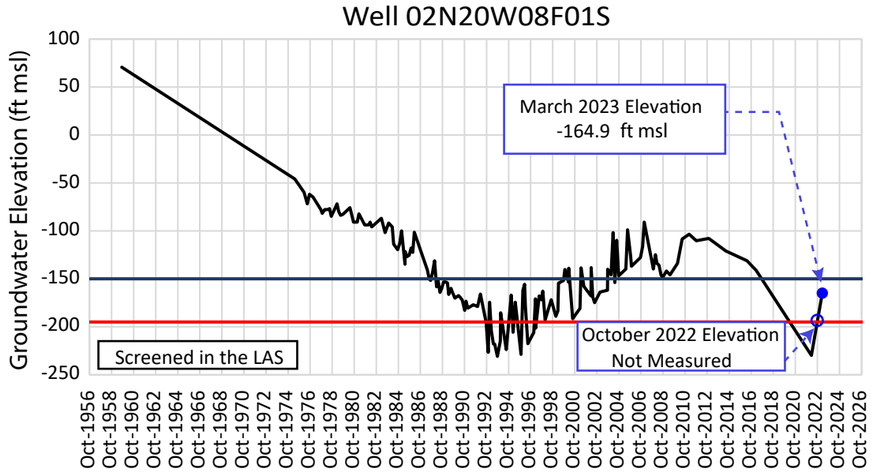

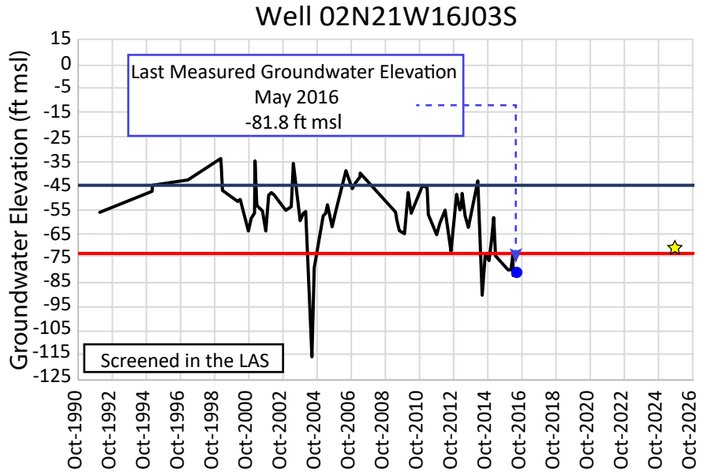

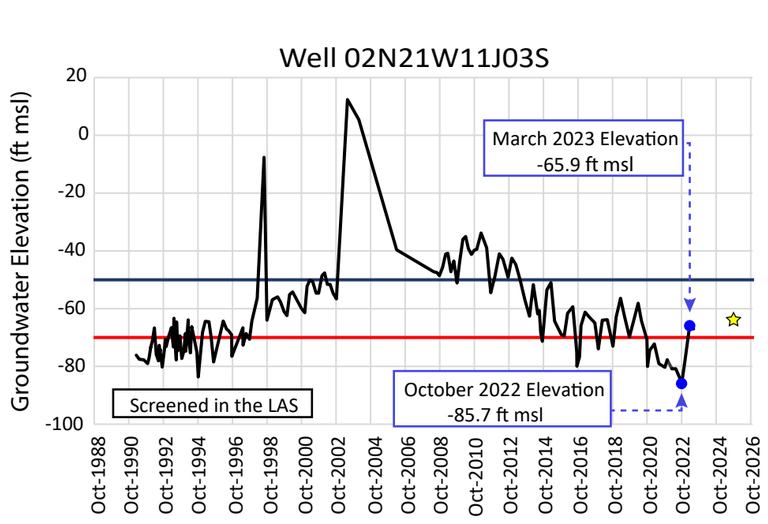

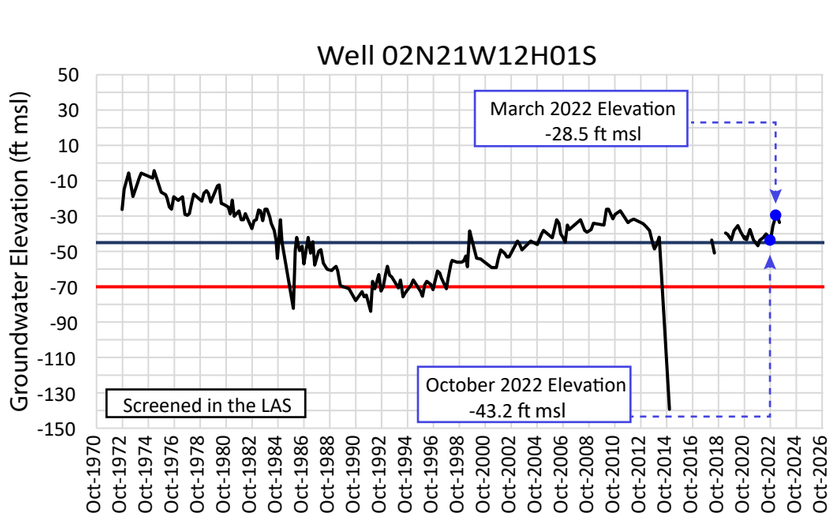

Groundwater Elevation | Minimum Threshold | Measurable Objective | 2025 Interim Milestone

Measurement not colledcted between October 2 and October 31,2022 or March 2 and March 31 2023

Note: 2025 Interim milestone groundwater elevations are not established for wells where 2015 groundwater elevations were higher than the established minimum thresholds

FIGURE 2-11

Groundwater Elevation Hydrographs for Representative Wells in the WLPMA

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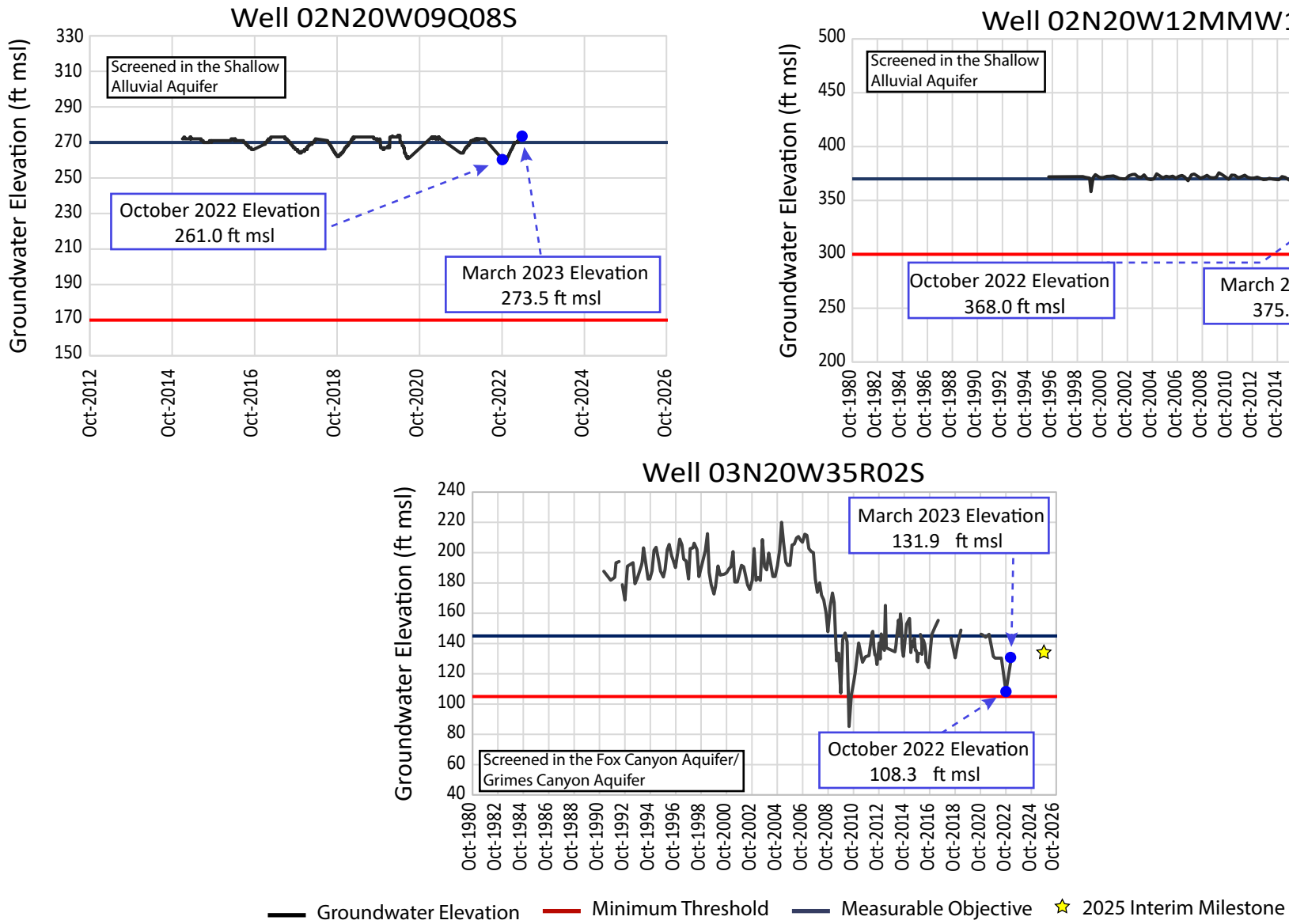

Note: 2025 Interim milestone groundwater elevations are not established for wells where 2015 groundwater elevations were higher than the established minimum thresholds

FIGURE 2-12a

Groundwater Elevation Hydrographs for Representative Wells Screened in the East Las Posas Management Area

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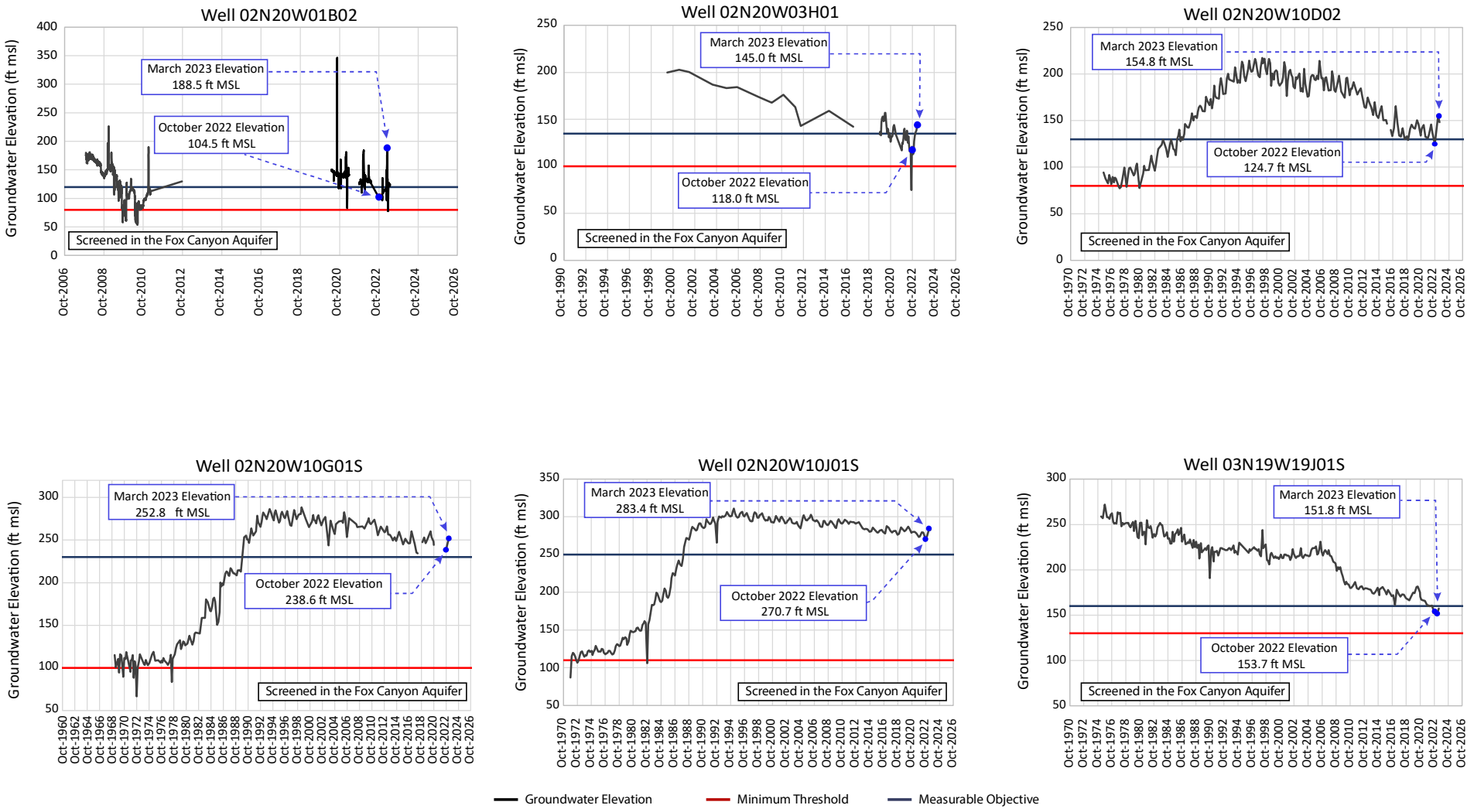

Note: 2025 Interim milestone groundwater elevations are not established for wells where 2015 groundwater elevations were higher than the established minimum thresholds

FIGURE 2-12b

Groundwater Elevation Hydrographs for Representative Wells in the East Las Posas Management Area

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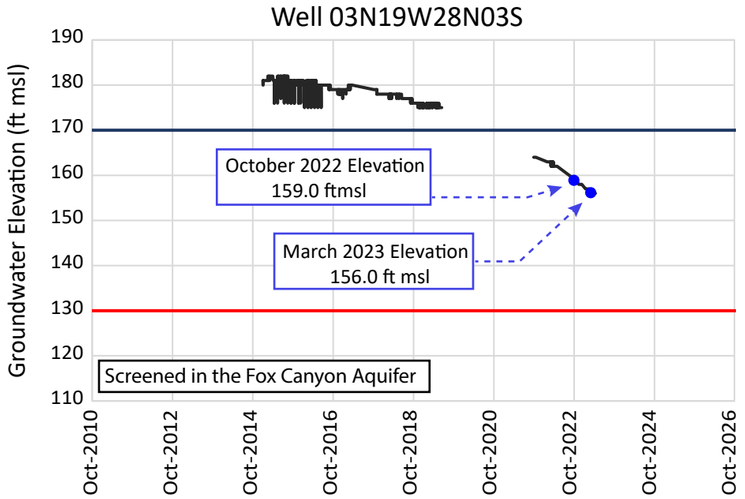

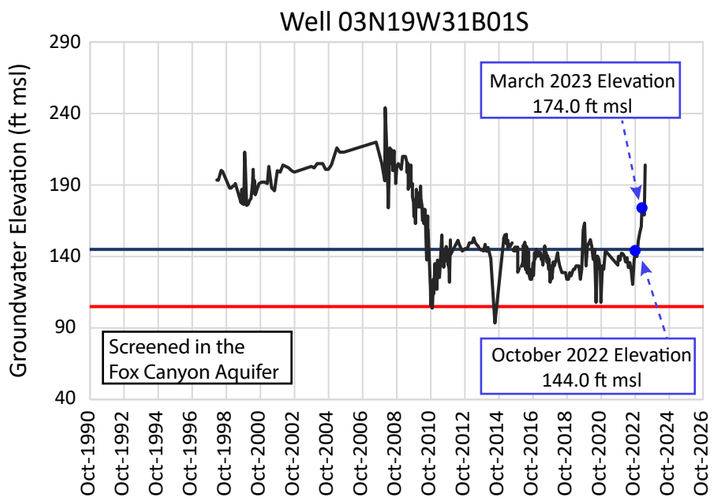

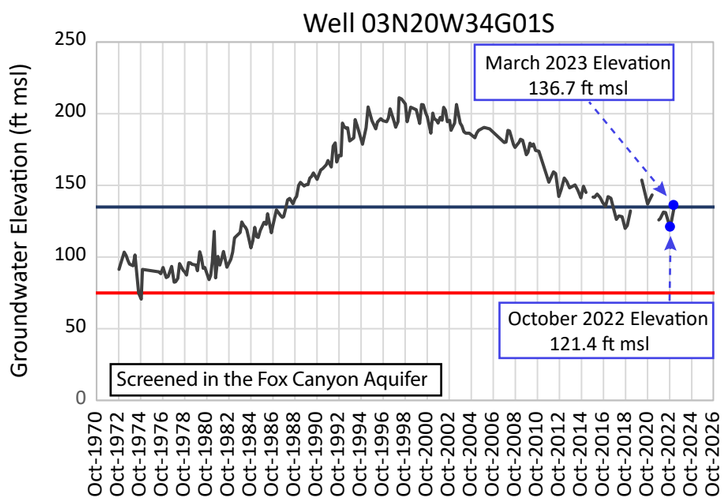

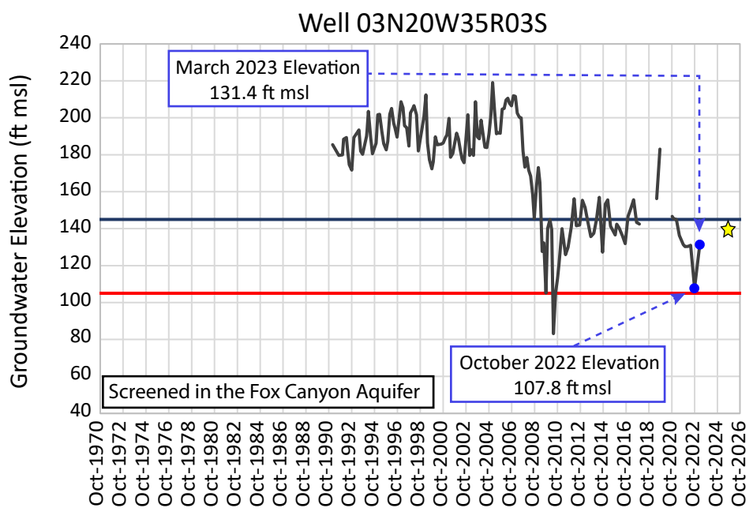

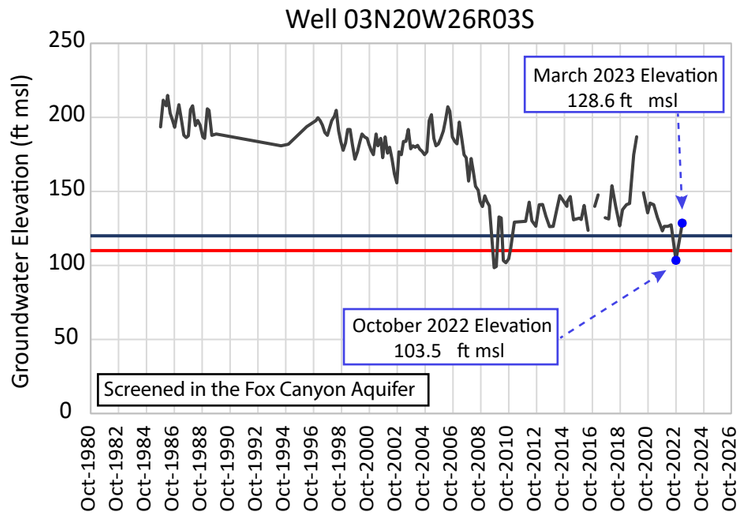

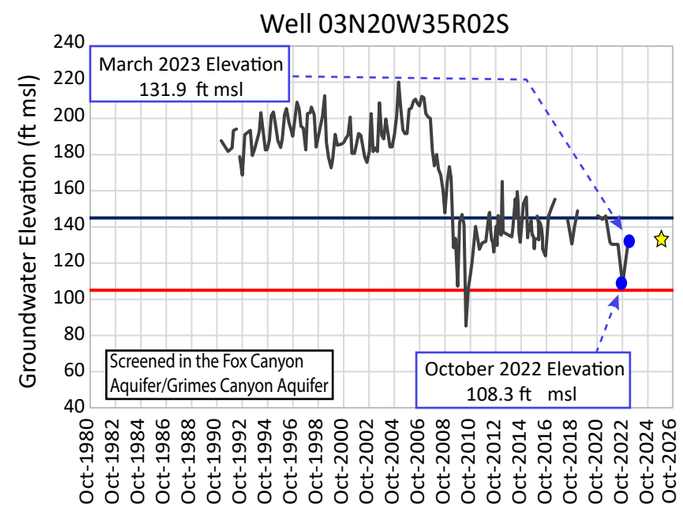

Groundwater Elevation — Minimum Threshold — Measurable Objective — 2025 Interim Milestone

Note: 2025 Interim milestone groundwater elevations are not established for wells where 2015 groundwater elevations were higher than the established minimum thresholds

FIGURE 2-12c

Groundwater Elevation Hydrographs for Representative Wells in the East Las Posas Management Area

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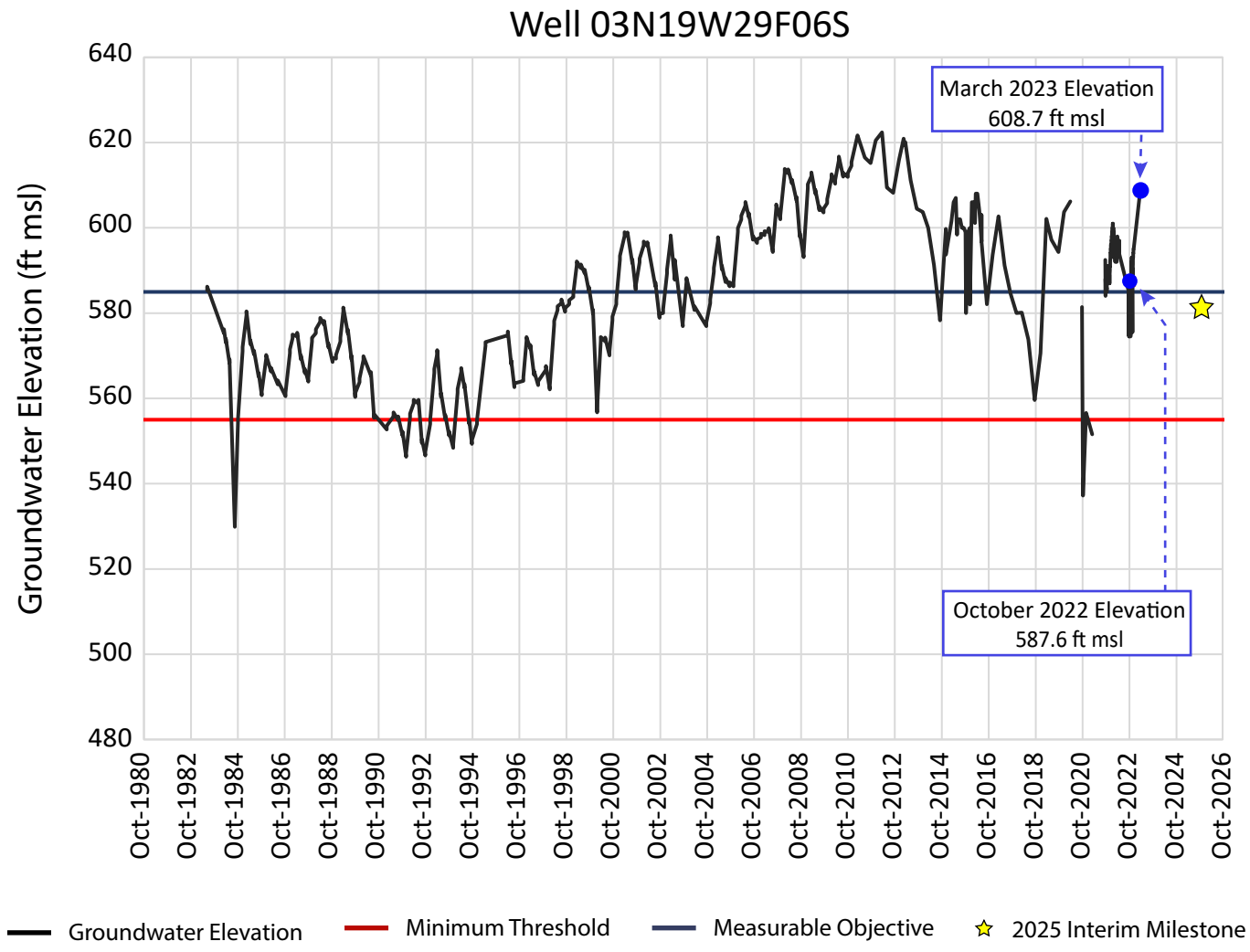

FIGURE 2-13

Groundwater Elevation Hydrograph for the Representative Well Screened in the Epworth Gravels Aquifer

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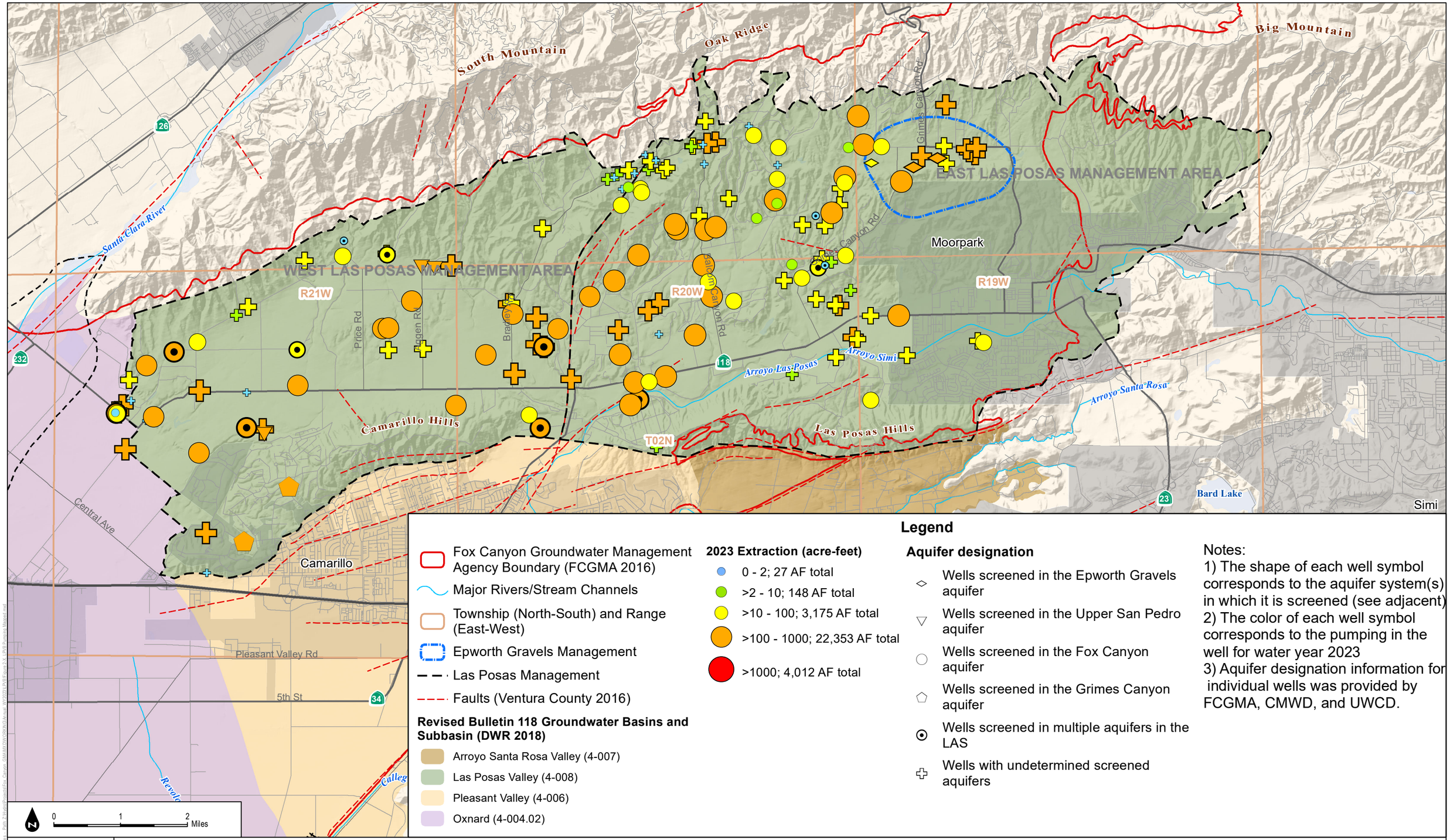

SOURCE: DWR, FCGMA, VCWPD, UWCD, CMWD

FIGURE 2-14

Groundwater Production (Acre-feet) in the Las Posas Valley Basin between October 1, 2022 and September 30, 2023

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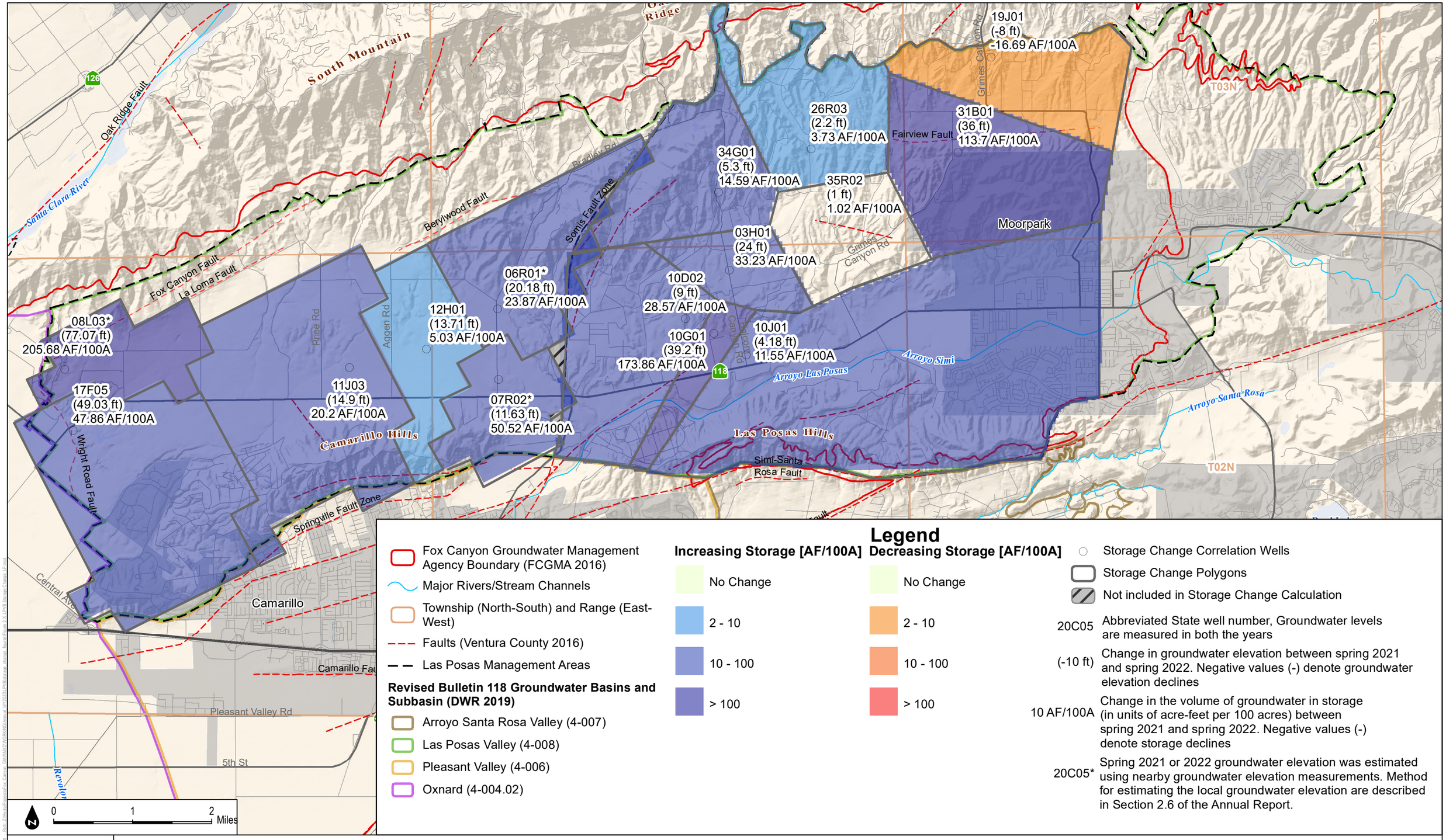

Legend

- Fox Canyon Groundwater Management Agency Boundary (FCGMA 2016)
- Major Rivers/Stream Channels
- Township (North-South) and Range (East-West)
- Faults (Ventura County 2016)
- Las Posas Management Areas

Revised Bulletin 118 Groundwater Basins and Subbasin (DWR 2019)

- Arroyo Santa Rosa Valley (4-007)
- Las Posas Valley (4-008)
- Pleasant Valley (4-006)
- Oxnard (4-004.02)

Increasing Storage [AF/100A]	Decreasing Storage [AF/100A]
No Change	No Change
2 - 10	2 - 10
10 - 100	10 - 100
> 100	> 100

- Storage Change Correlation Wells
- Storage Change Polygons
- Not included in Storage Change Calculation

20C05	Abbreviated State well number, Groundwater levels are measured in both the years
(-10 ft)	Change in groundwater elevation between spring 2021 and spring 2022. Negative values (-) denote groundwater elevation declines
10 AF/100A	Change in the volume of groundwater in storage (in units of acre-feet per 100 acres) between spring 2021 and spring 2022. Negative values (-) denote storage declines
20C05*	Spring 2021 or 2022 groundwater elevation was estimated using nearby groundwater elevation measurements. Method for estimating the local groundwater elevation are described in Section 2.6 of the Annual Report.

SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

FIGURE 2-15

Change in Storage in the Fox Canyon Aquifer: Spring 2022 to Spring 2023

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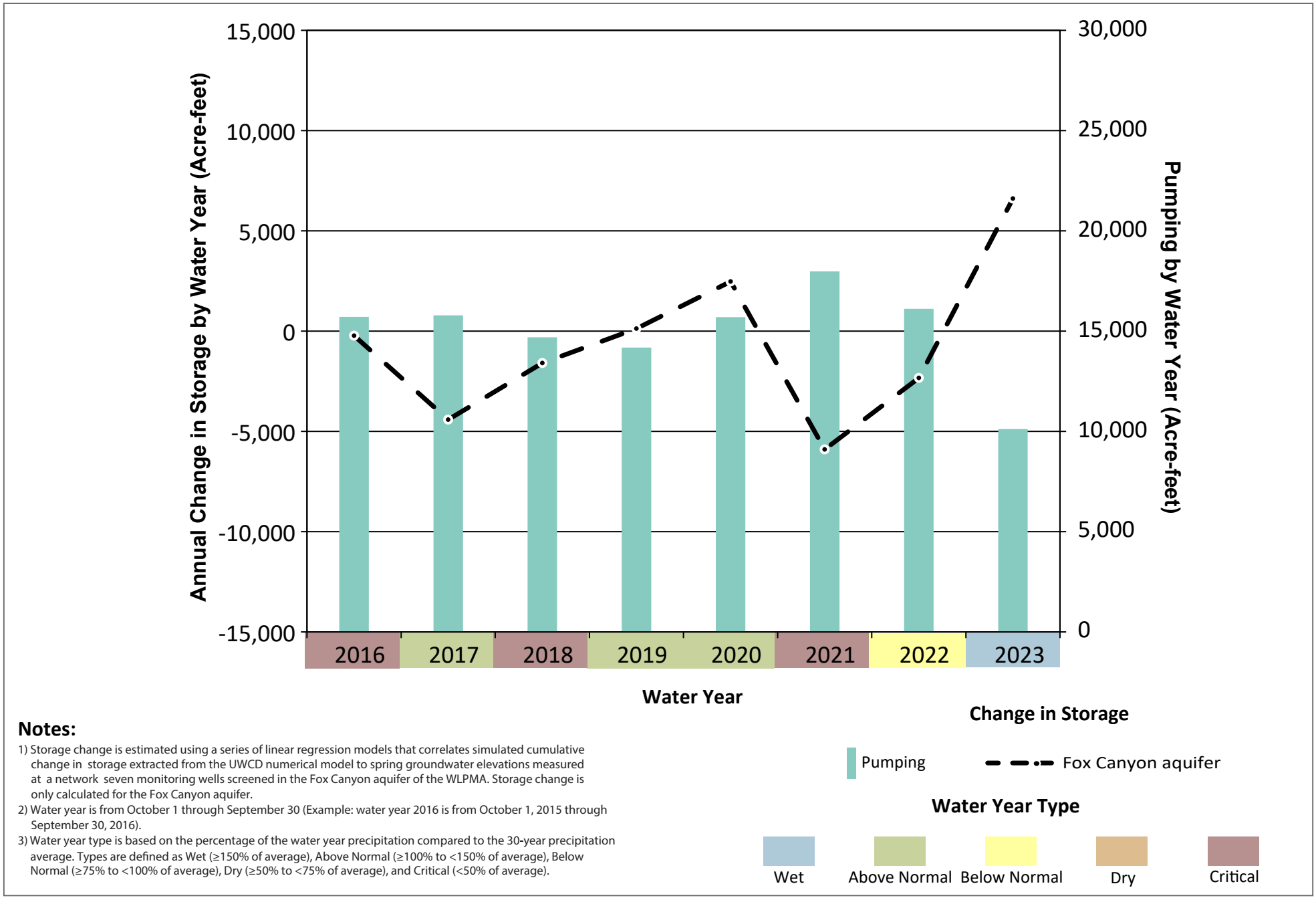

Notes:

1) Storage change is estimated using a series of linear regression models that correlates simulated cumulative change in storage extracted from the UWCD numerical model to spring groundwater elevations measured at a network seven monitoring wells screened in the Fox Canyon aquifer of the WLPMA. Storage change is only calculated for the Fox Canyon aquifer.
2) Water year is from October 1 through September 30 (Example: water year 2016 is from October 1, 2015 through September 30, 2016).
3) Water year type is based on the percentage of the water year precipitation compared to the 30-year precipitation average. Types are defined as Wet (≥150% of average), Above Normal (≥100% to <150% of average), Below Normal (≥75% to <100% of average), Dry (≥50% to <75% of average), and Critical (<50% of average).

FIGURE 2-16

Water Year Type, Groundwater Use, and Annual Change in Storage in the West Las Posas Management Area

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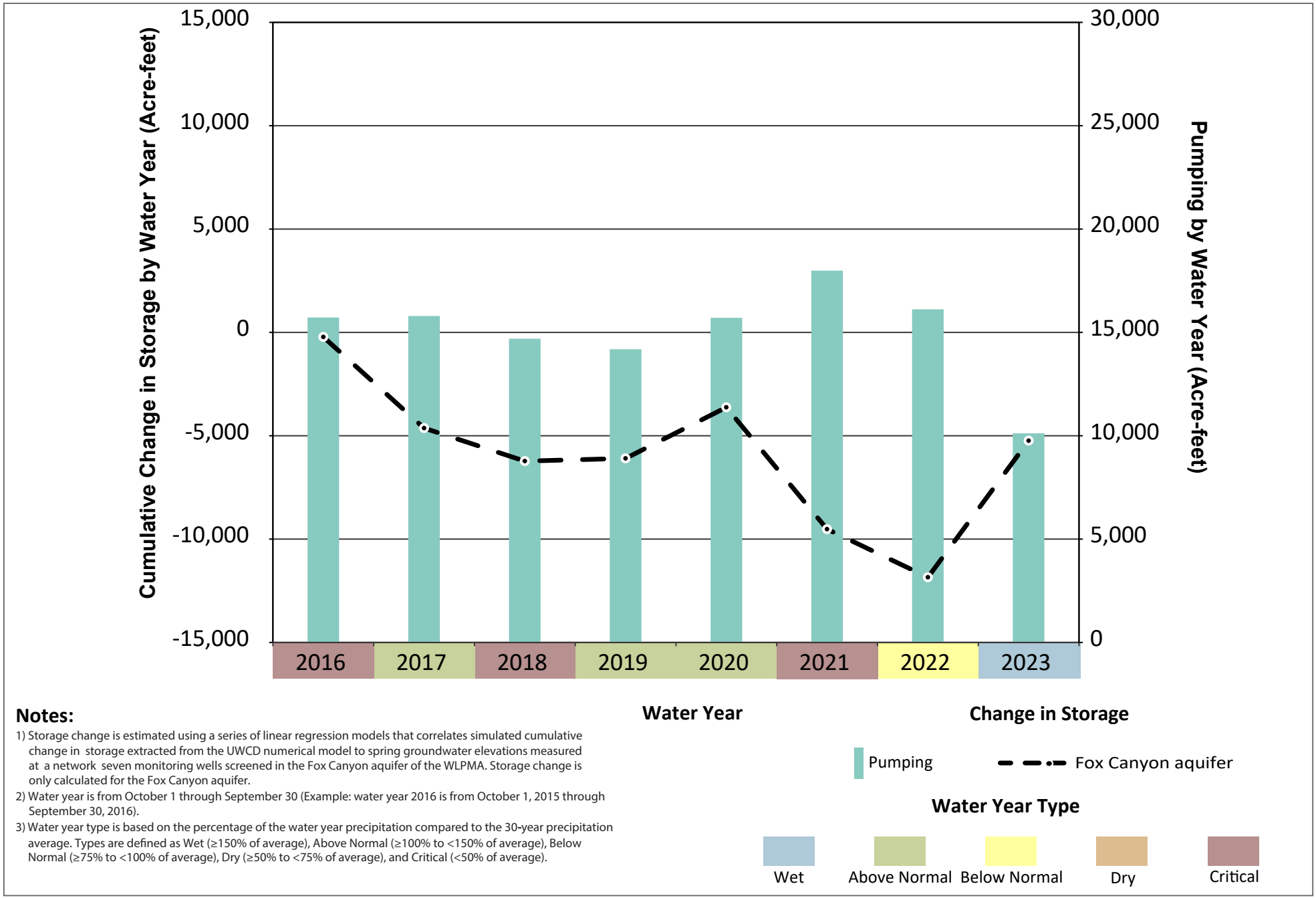

Notes:

1) Storage change is estimated using a series of linear regression models that correlates simulated cumulative change in storage extracted from the UWCD numerical model to spring groundwater elevations measured at a network seven monitoring wells screened in the Fox Canyon aquifer of the WLPMA. Storage change is only calculated for the Fox Canyon aquifer.
2) Water year is from October 1 through September 30 (Example: water year 2016 is from October 1, 2015 through September 30, 2016).
3) Water year type is based on the percentage of the water year precipitation compared to the 30-year precipitation average. Types are defined as Wet (≥150% of average), Above Normal (≥100% to <150% of average), Below Normal (≥75% to <100% of average), Dry (≥50% to <75% of average), and Critical (<50% of average).

FIGURE 2-17

DUDEK

Water Year Type, Groundwater Use, and Cumulative Change in Storage in the West Las Posas Management Area

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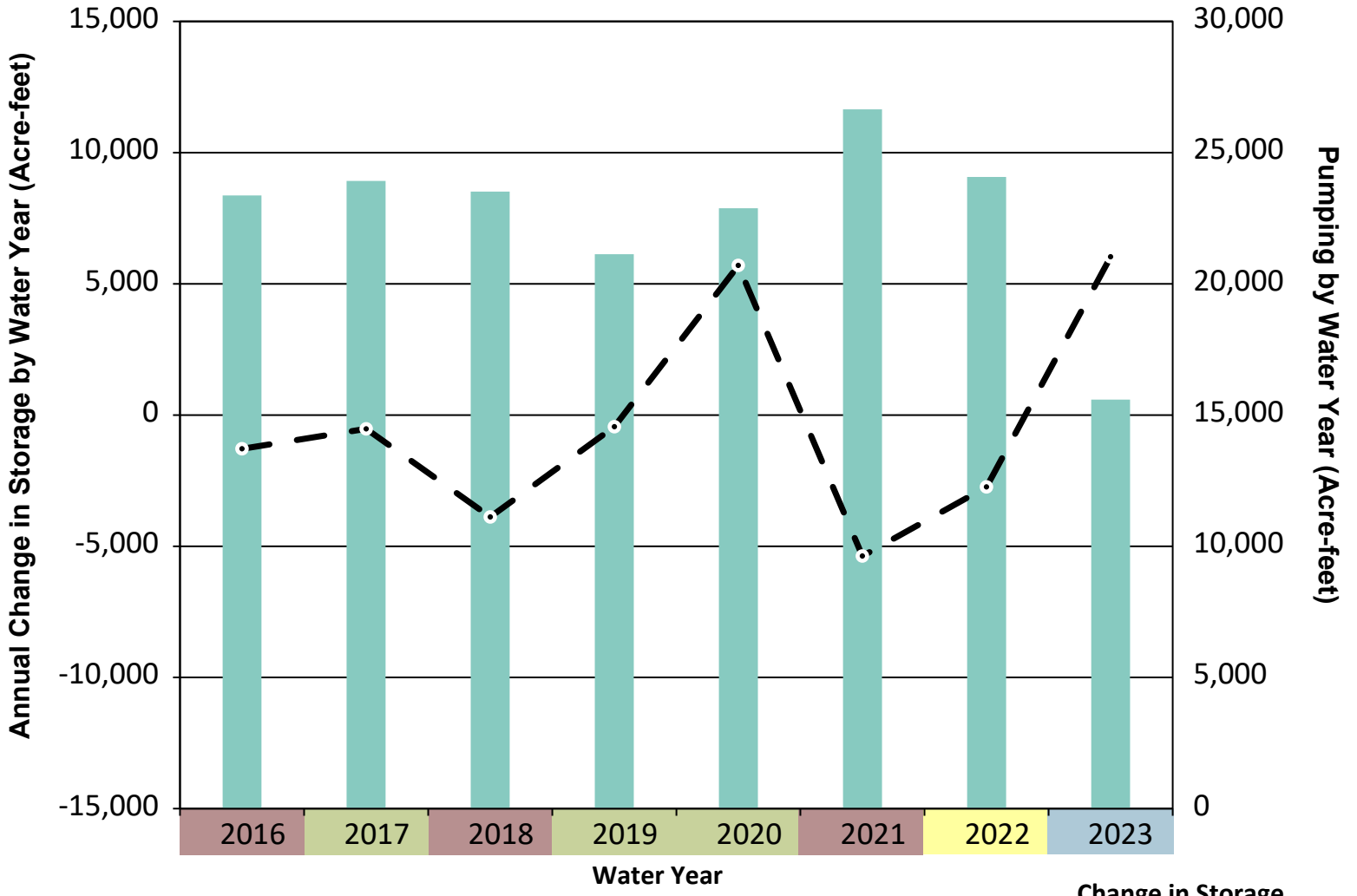

Notes:

1) Storage change is estimated using a series of linear regression models that correlates simulated cumulative change in storage extracted from the CMWD numerical model to spring groundwater elevations measured at a network of nine monitoring wells screened in the Fox Canyon aquifer of the WLPMA. Storage change is only calculated for the Fox Canyon aquifer.
2) Water year is from October 1 through September 30 (Example: water year 2016 is from October 1, 2015 through September 30, 2016).
3) Water year type is based on the percentage of the water year precipitation compared to the 30-year precipitation average. Types are defined as Wet (≥150% of average), Above Normal (≥100% to <150% of average), Below Normal (≥75% to <100% of average), Dry (≥50% to <75% of average), and Critical (<50% of

Change in Storage

Pumping — Fox Canyon aquifer

Water Year Type

Wet | Above Normal | Below Normal | Dry | Critical

FIGURE 2-18

Water Year Type, Groundwater Use, and Annual Change in Storage in the East Las Posas Management Area

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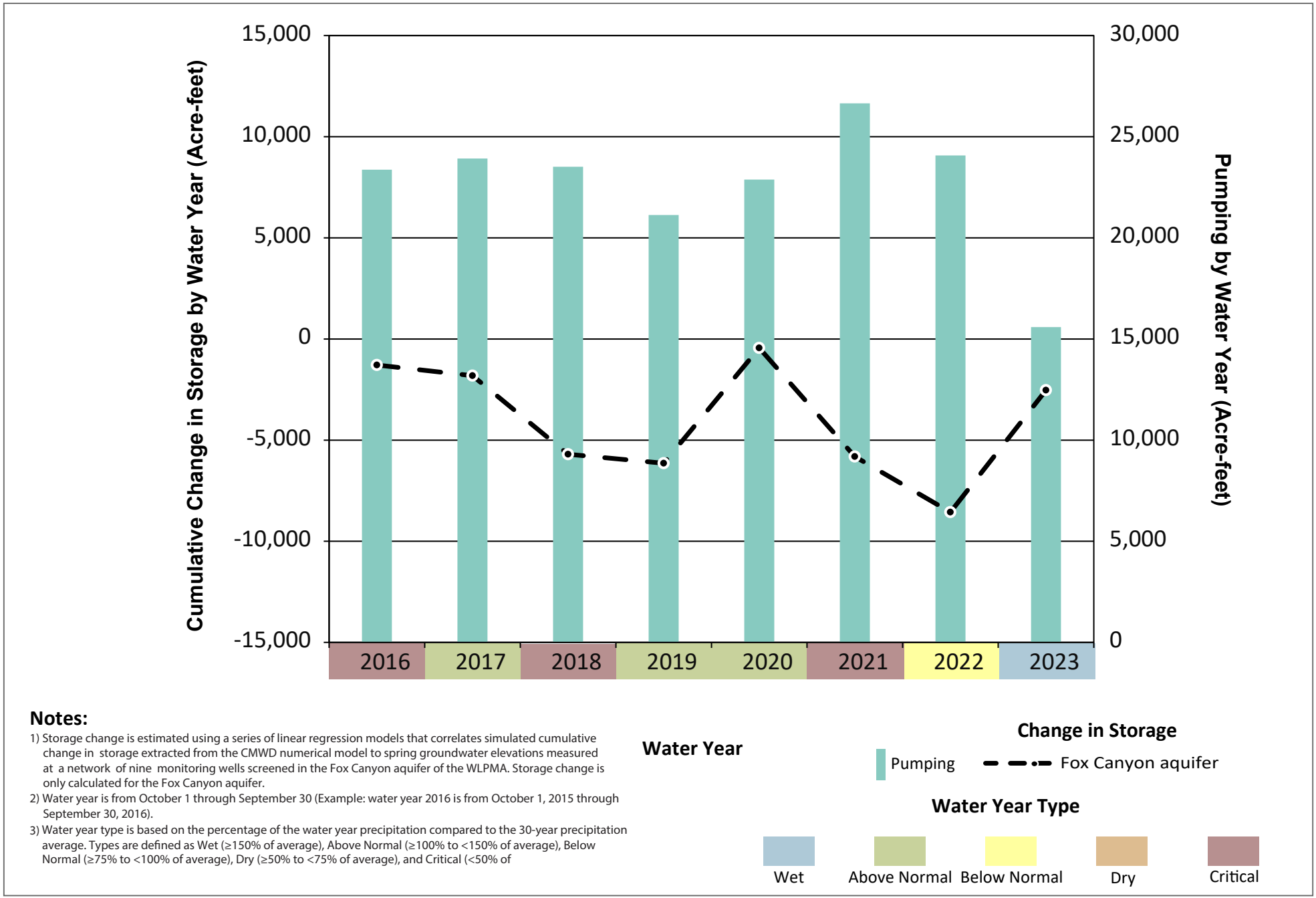

FIGURE 2-19

Water Year Type, Groundwater Use, and Cumulative Change in Storage in the East Las Posas Management Area