Annual Report

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report: Covering Water Year 2024

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Executive Summary

The Fox Canyon Groundwater Management Agency (FCGMA), the Groundwater Sustainability Agency (GSA) for the portion of the Oxnard Subbasin (Subbasin) within its jurisdictional boundaries, in coordination with the other two GSAs in the Subbasin, has prepared this sixth annual report for the Oxnard Subbasin 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 Subbasin. The GSP for the Oxnard Subbasin was submitted to the Department of Water Resources (DWR) on January 13, 2020, and approved by DWR on November 18, 2021. SGMA regulations require that an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP. This annual report provides an update on the groundwater conditions for water year 2024 (October 1, 2023, through September 30, 2024).

Water year 2024 was a wet water year, in which precipitation was approximately 160% of the historical average precipitation within the Subbasin. In response to the wetter-than-average precipitation received, groundwater elevations measured in spring 2024 were higher than those measured in spring 2023 in the Oxnard, Mugu, Hueneme, Fox Canyon, and Grimes Canyon aquifers. Similarly, spring 2023 groundwater elevations were higher than spring 2015 conditions. Notably, in spring 2024, groundwater elevations were above the 2025 interim milestones at all 27 key wells with available measurements and were higher than minimum thresholds in 21 key wells.

In the Upper Aquifer System (UAS), the groundwater elevation increases between spring 2023 and 2024 resulted in a net increase in groundwater in storage of approximately 62,000 acre-feet (AF). In the Lower Aquifer System (LAS), there was a net increase in groundwater storage of approximately 4,600 AF. These are the largest estimated increases in storage for both aquifer systems since 2015. Since 2015, groundwater in storage in the UAS has increased by a cumulative volume of approximately 54,700 AF. This increase in storage largely reflects groundwater elevation changes in the Forebay Management Area that have resulted from United Water Conservation District's (UWCD) recharge operations. Since 2015, groundwater storage in the LAS has increased by approximately 9,200 AF.

Implementation of the GSP has begun to fill data gaps identified in the GSP. Some of the critical data gaps include the timing and number of groundwater elevation measurements available for preparing spring and fall contour maps, and the availability of data on surface water diversions from agencies reporting to FCGMA. Spatial data gaps are being filled with groundwater elevation measurements collected from nested groundwater monitoring wells located adjacent to Revolon Slough, within the Oxnard Pumping Depression Management Area. In 2024, FCGMA constructed two new nested monitoring wells to address a data gap identified at the boundary between the Oxnard Subbasin and LPVB and provide additional constraint on groundwater conditions within Oxnard Pumping Depression Management Area. Over this same period, FCGMA constructed three single completion shallow monitoring wells to improve characterization of surface water-groundwater interactions in the Subbasin.

FCGMA prepared its first Periodic Evaluation of the GSP, which provides an assessment of progress towards sustainability in the Oxnard Subbasin. The Periodic Evaluation was submitted to DWR on January 13, 2025. The information presented in the Periodic Evaluation demonstrates that the Oxnard Subbasin is on track to meet the sustainability goal set forth in the GSP. This has been accomplished through the development of policy that allocates groundwater extractions in a manner consistent with the GSP; diversification of water supplies and reduction in groundwater production from the Subbasin; implementation of projects that address data gaps;

development, evaluation, and implementation of projects that increase the sustainable yield; and recharge via United Water Conservation District's spreading basins in the Forebay during the wet 2023 and 2024 water years.

1 Background and Plan Area

1.1 Background

FCGMA, the GSA for the portion of the Subbasin within its jurisdictional boundaries, in coordination with the other two GSAs in the Subbasin, has prepared this annual report for the Oxnard Subbasin 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 Oxnard Subbasin in December 2019 and submitted the GSP to DWR on January 13, 2020, for the entire Subbasin. DWR approved the GSP on November 18, 2021. FCGMA submitted its first Periodic Evaluation of the Oxnard Subbasin GSP to DWR on January 13, 2025.

FCGMA is one of three Groundwater Sustainability Agencies (GSAs) in the Subbasin. The other two GSAs are the Camrosa Water District (CWD)–Oxnard GSA and the Oxnard Outlying Areas GSA (County of Ventura). This annual report applies to the entirety of the Subbasin, including those portions of the Subbasin that lie outside FCGMA's boundary. To coordinate management and reporting in the Subbasin, 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). The FCA underlies a majority of the Oxnard Subbasin (DWR Basin No. 4-004.02), the Las Posas Valley Basin (LPVB) (DWR Basin No. 4-008), the Pleasant Valley Basin (PVB) (DWR Basin No. 4-006), and a portion of the Arroyo Santa Rosa Valley Basin (ASRVB) (DWR Basin No. 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.

1 The seven mutual water companies and water districts are: Alta Mutual Water Company, Pleasant Valley County Water District (PVCWD), Berylwood Heights Mutual Water Company, Calleguas Municipal Water District (CMWD), CWD, Zone Mutual Water Company, and Del Norte Mutual Water Company.

2 The five incorporated cities which are all or in part within the FCGMA jurisdictional area are: Ventura, Oxnard, Camarillo, Port Hueneme, and Moorpark.

1.1.2 Oxnard Subbasin Groundwater Sustainability Plan

The GSP for the Oxnard Subbasin defined the conditions under which the groundwater resources of the entire Oxnard Subbasin will be managed sustainably in the future (FCGMA 2019a), with periodic evaluation of the GSP to assess changing conditions (California Water Code, Section 10728.2). Groundwater conditions were evaluated in five primary aquifers in the Subbasin. These aquifers are commonly grouped into an upper and lower aquifer system. The Oxnard and Mugu aquifers compose the Upper Aquifer System (UAS), and the Hueneme aquifer, Fox Canyon aquifer (FCA), and Grimes Canyon aquifer (GCA) compose the Lower Aquifer System (LAS). The primary sustainability goal for the Oxnard Subbasin, set forth in the GSP, is "to increase groundwater elevations inland of the Pacific coast in the aquifers that compose the Upper Aquifer System and the Lower Aquifer System to elevations that will prevent the long-term, or climatic cycle net (net), landward migration of the 2015 saline water impact front; prevent net seawater intrusion in the UAS; and prevent net seawater intrusion in the LAS." (FCGMA 2019a). This goal was established based on both historical and potential future undesirable results to the groundwater resources of the Subbasin 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 GSP established minimum threshold groundwater elevations, defined for the Oxnard Subbasin, as groundwater levels that: (1) limit seawater intrusion, and (2) allow declines in groundwater elevations during periods of future drought to be offset by recoveries during future periods of above-average rainfall (FCGMA 2019a). The GSP also established measurable objective groundwater elevations, which were defined as "the groundwater levels throughout the Subbasin at which there is neither seawater flow into, nor freshwater flow out of the UAS or LAS." (FCGMA 2019a). Minimum threshold and measurable objective groundwater elevations were established at 34 representative monitoring points (or "key wells") in the Oxnard Subbasin (Table 2-1). Collectively, these wells are screened in each of the five primary aquifers and are located in four of the five management areas established for the Subbasin (FCGMA 2019a).

The GSP documented conditions throughout the Oxnard Subbasin 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 2023[3]. This annual report documents the conditions in the Oxnard Subbasin and the progress toward sustainability for water year 2024.

1.2 Plan Area

The Oxnard Subbasin of the Santa Clara River Valley Groundwater Basin (DWR Bulletin 118 Groundwater Basin 4-004.02) is a coastal alluvial groundwater subbasin, underlying the Oxnard Plain in Ventura County, California (Figure 1-1). The Oxnard Subbasin is in hydrologic communication, to varying degrees, with the LPVB and PVB to the east, the Mound and Santa Paula Groundwater Subbasins of the Santa Clara River Valley Basin to the north, and with the Pacific Ocean to the west and southwest (FCGMA 2019a). The contact between permeable alluvium and semi-permeable rocks of the Santa Monica Mountains defines the southeastern boundary of the Oxnard Subbasin, and the Oak Ridge and McGrath faults form the northern boundary of the Oxnard Subbasin (DWR 2018). A

[3] 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 2023 water year begins on October 1, 2022, and ends on September 30, 2023.

facies change between the predominantly coarser-grained sand and gravel deposits that compose the UAS to the west and the finer-grained clay and silt-rich deposits of the UAS to the east defines the boundary between the Oxnard Subbasin and PVB. The boundary between the Las Posas Valley Basin to the northeast and Oxnard Subbasin to the southwest is a jurisdictional boundary that follows parcel lines (DWR 2018).

The Oxnard Subbasin is divided into five management areas in anticipation of future management strategies and to reflect the current understanding of the hydrogeologic characteristics of the Subbasin (FCGMA 2019a). These management areas are the Forebay Management Area, the West Oxnard Plain Management Area, the Oxnard Pumping Depression Management Area, the Saline Intrusion Management Area, and the East Oxnard Plain Management Area (Figure 1-2). These management areas are separated by hydrogeologic and/or water quality characteristics (FCGMA 2019a).

1.2.1 Climate

The climate of the Oxnard Subbasin is typical of coastal Southern California, with average daily temperatures ranging generally from 50°F to 78°F in summer and from 40°F to 75°F in the winter (FCGMA 2019a). The majority of the precipitation in the Ventura County region falls between November and April. Precipitation is measured at several stations in the Oxnard Subbasin (Figure 1-3). Water year precipitation, measured at Station 168, in the northwestern portion of the Subbasin is highly variable, ranging from 2.8 inches in 2021 to 38.1 inches in 1998 (Figure 1-4). Between water year 1957 and 2023, the mean water-year precipitation in the Subbasin was approximately 14.2 inches. The Subbasin received approximately 22.5 inches of precipitation in water year 2024, which is approximately 160% of the 1957 to 2024 mean annual precipitation measured at Station 168 (Figure 1-4). The 2024 water year was the second wettest water year on record since 2005. Since 2015, average annual water year precipitation has been approximately 5% lower than the mean annual water year precipitation measured between 1957 and 2015.

The GSP characterized water year types[4] for the Oxnard Subbasin for precipitation measured between 1957 and 2015 (FCGMA 2019a). Since 2015, the Subbasin experienced two wet water year (2023 and 2024), two above normal water years (2017 and 2019), two below normal water years (2020 and 2022), and three critical water years (2016, 2018, and 2021).

1.2.2 Surface Water Bodies and Gauging Stations

The Santa Clara River, Revolon Slough, and Calleguas Creek are the predominant surface water bodies in the Oxnard Subbasin (FCGMA 2019a). All three surface water bodies drain watersheds that extend beyond the boundaries of the Subbasin. Neither the Revolon Slough nor Calleguas Creek are in direct contact with the primary aquifers in the Subbasin. These surface water bodies are separated from the underlying groundwater aquifers by extensive clay layers. In contrast, flow in the Santa Clara River, which parallels the northern boundary of the Subbasin, infiltrates into sediments overlying the Forebay Management Area (Figure 1-2) and is a critical source of recharge to the primary groundwater aquifers in the Subbasin. In addition to recharge provided by flow in the river channel, UWCD, under permit, diverts surface water from the Santa Clara River at the Freeman Diversion (Figure 1-3) and discharges

4 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.

the diverted Santa Clara River flows to infiltration basins overlying the Forebay Management Area (Figure 1-2). West of the Forebay Management Area, the Santa Clara River channel overlies a confining clay layer and does not communicate directly with the confined aquifers of the UAS and the LAS.

Streamflow on the Santa Clara River has been measured at gauge 723, maintained by the Ventura County Public Works Agency - Watershed Protection District (VCWPD), between water years 2010 and 2024 (Table 1-1; Figure 1-5). Average daily flows for water years 2018 through 2020 were not available during preparation of the 2025 Annual Report. In addition, flow on the Revolon Slough has been measured at VCWPD gauge 776 (Table 1-1; Figure 1-5). Average daily flows measured at gauge 776 for water years 2021, 2023, and 2024 were not available during preparation of the 2025 Annual Report.

Table 1-1. Cumulative Daily Average Flows at VCWPD Gauges 723 and 776A in the Oxnard Subbasin

Water Year	Average Flow (cfs) at Gauge 723	Average Flow (cfs) at Gauge 776A
2010	102.5	12.6
2011	167.5	19.3
2012	13.0	10.1
2013	0.6	11.2
2014	40.3	6.1
2015	5.0	7.0
2016	97.5	5.5
2017	1,049.5	5.7
2018	-Data Not Available-	12.2
2019	-Data Not Available-	9.0
2020	-Data Not Available-	11.9
2021	0.0*	4.2
2022	9.03*	8.4
2023	782.7*	17.1
2024	600.5	13.4

Notes: cfs = cubic feet per second
*VCWPD notes that these data are preliminary and subject to revision

1.3 Annual Report Organization

This is the sixth Annual Report prepared since the GSP for the Oxnard Subbasin was submitted to DWR. This report is organized according to the GSP Emergency Regulations. Chapter 1 provides the background information regarding the GSP, the Oxnard Subbasin, and the Fox Canyon Groundwater Management Agency. Chapter 2 provides information on the groundwater conditions in the Subbasin since 2015, including groundwater elevations, groundwater extractions, surface water supply, total water availability, and change in groundwater storage. Chapter 3 provides an update on the GSP implementation process.

2 Groundwater Conditions

This chapter presents the groundwater conditions in the Subbasin during water year 2024 and a comparison to water year 2023. Comparison of water year 2024 conditions to water year 2023 conditions characterizes the impact that water year type, groundwater production, surface and recycled water availability, and surface water spreading in water year 2024 have had on groundwater conditions in the Subbasin. Data from water years 2016 through 2023 are discussed in the first five annual reports (FCGMA 2020a, FCGMA 2021, FCGMA 2022, FCGMA 2023, FCGMA 2024a).

2.1 Groundwater Elevations

2.1.1 Groundwater Elevation Contour Maps

Groundwater elevation contour maps for each aquifer in the Oxnard Subbasin are presented in Figures 2-1 through 2-10: the Oxnard aquifer in Figures 2-1 and 2-2, the Mugu aquifer in Figures 2-3 and 2-4, the Hueneme aquifer in Figures 2-5 and 2-6, the FCA in Figures 2-7 and 2-8, and the GCA in Figures 2-9 and 2-10. These maps show the seasonal low (fall 2023) and high (spring 2024) groundwater elevations. Fall groundwater elevations were defined as any groundwater elevation measured between October 1 and October 31 of each year. Spring groundwater elevations were defined as any groundwater elevation measured within a four-week window between March 1 to March 31 of each year.

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. It is important to note, however, that throughout the Oxnard Subbasin, production wells are typically screened across multiple aquifers. Therefore, using wells only screened within an individual aquifer limits the spatial coverage for each contour map. This limitation is particularly apparent in an area of high groundwater production in the Oxnard Subbasin and adjoining PVB that extends south from Highway 101 (FCGMA 2019a). This area was identified as being impacted by groundwater production based on groundwater elevations measured in wells screened in multiple aquifers and was identified in the GSP as the Oxnard Pumping Depression Management Area (FCGMA 2019a). By using wells screened only within an individual aquifer, the lateral extent of the pumping depression is not well characterized.

In 2019 through 2020, DWR installed a nested monitoring well cluster at FCGMA's request through its Technical Support Services (TSS) program. The nested well cluster, which has two separate completions, is located adjacent to the Revolon Slough within the Pumping Depression Management Area. The shallow well cluster, which was completed on November 22, 2019, contains three monitoring wells individually screened in the Oxnard, Mugu, and Hueneme aquifers. The deep well cluster, which was completed on March 19, 2020, includes three monitoring wells individually screened within the upper FCA, basal FCA, and GCA. Groundwater elevations measured at the shallow and deep well clusters were used to help constrain groundwater conditions in the Oxnard Pumping Depression Management Area.

FCGMA constructed two new nested monitoring wells and two single completion shallow monitoring wells in the Subbasin in 2024 with majority funding through DWR's Sustainable Groundwater Management Grant Program:

- In September 2024, FCGMA completed a nested monitoring well located near the boundary with the LPVB that includes separate completions in the Oxnard aquifer, the Mugu aquifer, the Hueneme aquifer, and the FCA. Groundwater elevations measured at this nested monitoring well will provide additional characterization of groundwater elevation gradients and underflows between the Oxnard Subbasin and LPVB.
- In October 2024, FCGMA completed nested monitoring well in the southeastern part of the Oxnard Pumping Depression Management Area that includes separate completions in the Oxnard aquifer, Mugu aquifer, and FCA. Groundwater elevations measured at this nested monitoring well will provide additional characterization of the lateral extent of the pumping depression that spans the Oxnard-Pleasant Valley boundary.
- Between July and September 2024, FCGMA completed shallow monitoring wells located near Santa Clara River, Revolon Slough, and Calleguas Creek. These wells were constructed to provide additional characterization of groundwater-surface water interactions in the Subbasin.

The first water level measurements from these wells will be reported in the 2025 annual report.

2.1.1.1 Oxnard Aquifer

Fall 2023 groundwater elevations ranged from a high of approximately 134 feet msl (ft. msl) at well 02N21W12A01S, located in the Forebay Management Area, to a low of approximately -24 ft. msl at well 02N23W36C04S, located along the northern coastline of the West Oxnard Plain Management Area (Figure 2-1). Between fall 2022 and 2023, groundwater elevations in the Oxnard aquifer increased across the Subbasin. The largest increases occurred in the Forebay Management Area, where fall 2023 groundwater elevations were approximately 80 to 98 feet higher than fall 2022 (measured at wells 02N22W23H06S and 02N21W14G07S). Downgradient of this and within the Oxnard Pumping Depression Management Area, fall 2023 groundwater elevations were approximately 15 to 28 feet higher than fall 2022 (measured at wells 01N21W16P07S and 01N21W07H01S), with the noted exception of well 01N21W17D02S, where the fall 2023 groundwater elevation was approximately 22 feet lower than fall 2022. Within the Saline Intrusion Management Area, fall 2023 groundwater elevations were approximately 4 to 19 feet higher than fall 2022 (measured at wells 01N21W27R05S and 01N22W28G04S).

Fall 2023 groundwater elevations in the Oxnard aquifer were higher than fall 2015 across the Subbasin. Over this period in the Forebay Management Area, the fall groundwater elevations increased by approximately 45 to 114 feet (measured at wells 02N22W16R02S and 02N22W12J02S). Within the Oxnard Pumping Depression Management Area, the fall 2023 groundwater elevations were approximately 19 to 37 feet higher than fall 2015 (measured at wells 01N21W19C01S and 01N21W06L04S). In the Saline Intrusion Management Area, fall 2023 groundwater elevations were approximately 7 to 22 feet higher than 2015 (measured at wells 01S21W08L04S and 01N22W26J04S).

Spring 2024 groundwater elevations ranged from a high of approximately 126 ft. msl at well 02N21W12A01S in the Forebay Management Area to a low of approximately -3 ft. msl at well 01S21W08L04S near Point Mugu in the Saline Intrusion Management Area (Figure 2-2). Like the change in seasonal low groundwater elevations, seasonal high groundwater elevations increased across the Subbasin between spring 2023 and 2024. In the Forebay Management Area, groundwater elevations increased by approximately 2 to 69 feet between 2023 and 2024 (measured at wells 02N22W12G03S and 02N22W14G06S). Within the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were approximately 17 to 56 ft. msl between 2023 and 2024 (measured at wells 01N21W16P07S and 01N21W06L04S). Within the Saline Intrusion Management Area, spring 2024 groundwater elevations were approximately 5 to 28 feet higher than spring 2023 (measured at wells 01S21W08L04S and 01N22W20J08S).

Spring 2024 groundwater elevations were higher than spring 2015 across the Subbasin. Over this period in the Forebay Management Area, groundwater elevations increased by approximately 78 to 100 feet (measured at wells 02N22W12A02S and 02N22W12J02). In the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were approximately 30 to 49 feet higher than spring 2015 (measured at wells 01N21W19L13S and 01N21W06L04S). Within the Saline Intrusion Management Area, spring 2024 groundwater elevations were approximately 5 to 25 feet higher than 2015 (measured at wells 01S21W08L04S and 01N22W20J08S).

2.1.1.2 Mugu Aquifer

Fall 2023 groundwater elevations in the Mugu aquifer ranged from a high of 126 ft. msl at well 02N21W07L06S, in the Forebay Management Area, to a low of -54 ft. msl at well 01N21W21N01, in the southeastern part of the Oxnard Pumping Depression Management Area (Figure 2-3). Between fall 2022 and 2023, groundwater elevations increased across the Mugu aquifer. The largest groundwater elevation increases occurred in the Forebay Management Area, where fall 2023 groundwater elevations were approximately 84 to 90 feet higher than fall 2022 (measured at wells 02N22W23B07S and 02N22W14G04S). Within the Oxnard Pumping Depression Management Area, fall 2023 groundwater elevations were approximately 5 to 50 feet higher than fall 2022 (measured at wells 01N21W20C05S and 01N21W16P06S). Within the Saline Intrusion Management Area, fall 2023 groundwater elevations were approximately 20 to 48 feet higher than fall 2022 (measured at wells 01N22W20M04S and 01N21W32Q05S).

Like the Oxnard aquifer, fall 2023 groundwater elevations were higher than fall 2015 across the Mugu aquifer. Groundwater elevation increases were largest in the Forebay Management Area, where the fall 2023 groundwater elevations were approximately 77 to 140 feet higher than fall 2015 (measured at wells 02N22W23B07S and 02N21W07L06S). Within the Oxnard Pumping Depression Management Area, the fall 2023 groundwater elevations were approximately 16 to 42 feet higher than fall 2015 (measured at wells 01N21W20C05S and 01N21W21N01S). In the Saline Intrusion Management Area, fall 2023 groundwater elevations were approximately 16 to 50 feet higher than 2015 (measured at wells 01N22W29D04S and 01N21W32Q05S).

Spring 2024 groundwater elevations in the Mugu aquifer ranged from a high of approximately 126 ft. msl at well 02N21W07L06S in the Forebay Management Area to a low of approximately -18 ft. msl at well 01N21W32Q05S in the Saline Intrusion Management Area, near Point Mugu. Between spring 2023 and 2024, groundwater elevations increased across the Mugu aquifer. The largest increases occurred in the Forebay Management Area, where spring 2024 groundwater elevations were approximately 14 to 68 feet higher than spring 2023 (measured at wells 02N21W07L06S and 02N22W13N05S). In the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were 6 to 41 feet higher than spring 2023 (measured at wells 01N21W20C05S and 01N21W21N01S). In the Saline Intrusion Management Area, the spring 2024 groundwater elevations near Point Mugu were approximately 24 to 32 feet higher than spring 2023 (measured at wells 01N22W36K08S and 01N21W31A07S). Near Port Hueneme, the spring 2024 groundwater elevations were approximately 22 to 29 feet higher than spring 2023 (measured at wells 01N22W29D04S and 01N22W20J07S).

Spring 2024 groundwater elevations in the Mugu aquifer were higher than spring 2015. In the Forebay Management Area, groundwater levels were approximately 84 to 118 feet higher than spring 2015 (measured at wells 02N22W23B07S and 02N21W07L06S). Over this same period, groundwater elevations in the Oxnard Pumping Depression Management Area increased by approximately 22 to 49 feet (measured at wells 01N21W20C05S and 01N21W21N01S). Along the coast, near Point Mugu, spring 2024 groundwater elevations were approximately 30 to 43 feet higher than spring 2015 (as measured at wells 01N22W36K08S and 01N21W32Q05S). Near Port Hueneme, spring 2024 groundwater elevations were approximately 19 to 27 feet higher than spring 2015 (measured at wells 01N22W29D04S and 01N22W20J07S).

2.1.1.3 Hueneme Aquifer

Fall 2023 groundwater elevations in the Hueneme aquifer ranged from a high of 102 ft. msl at well 02N22W12N03S in the Forebay Management Area to a low of -59 ft. msl at well 01N21W16P05S in the Oxnard Pumping Depression Management Area (Figure 2-5). Between fall 2022 and 2023, groundwater elevations increased in the Hueneme aquifer. These increases were largest in the Forebay Management Area, where the fall 2023 groundwater elevations were approximately 47 to 107 feet higher than fall 2022 (measured at wells 02N22W26B03S and 02N22W12N03S). In the Oxnard Pumping Depression Management Area, fall 2023 groundwater elevations were approximately 60 to 70 feet higher than fall 2022 (measured at wells 02N21W31P03S and 01N21W16P05S). Near Port Hueneme, fall 2023 groundwater elevations were approximately 24 to 30 feet higher than fall 2022 (measured at wells 01N22W29D03S and 01N22W20J05S).

Fall 2023 groundwater elevations were higher than fall 2015 groundwater elevations across the Hueneme Aquifer. Over this period in the Forebay Management Area, fall 2023 groundwater elevations were approximately 50 to 100 feet higher than fall 2015 (measured at wells 02N22W23B04S and 02N22W12N03S). In the Oxnard Pumping Depression Management Area, the only well with complete measurements in fall 2015 and 2023 was 02N21W31P03S. The groundwater elevation measured at this well increased by approximately 69 feet over this period. Near Port Hueneme, fall 2023 groundwater elevations were approximately 21 to 27 ft higher than fall 2015 (as measured at wells 01N22W29D03S and 01N22W20J05S).

Spring 2024 groundwater elevations in the Hueneme aquifer ranged from a high of approximately 103 ft. msl at well 02N21W12N03S in the Forebay Management Area to a low of -33 ft. msl at well 02N21W31P06S in the Oxnard Pumping Depression Management Area (Figure 2-6). Between spring 2023 and 2024, groundwater elevations increased across the Hueneme aquifer. The largest groundwater elevation increases occurred in the Forebay Management Area, where the spring 2024 groundwater elevations were approximately 14 to 59 feet higher than spring 2023 (measured at wells 02N22W12N03S and 02N22W26B03S). In the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were 28 to 48 feet higher than spring 2023 (measured at wells 01N21W16P05S and 02N21W31P06S). Farther south, near Port Hueneme, spring 2024 groundwater elevations were approximately 30 to 40 feet higher than spring 2023 (measured at wells 01N22W29D03S and 01N22W19A01S).

In the Forebay Management Area, spring 2024 groundwater elevations were 60 to 93 feet higher than spring 2015 elevations (measured at wells 02N22W23B04S and 02N22W12N03S). In the northern part of the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were approximately 57 to 77 feet higher than spring 2015 (measured at 02N21W31P06S and 02N21W31P03S). Near Port Hueneme, spring 2024 groundwater elevations were 26 to 33 feet higher than spring 2015 (measured at wells 01N22W29D03S and 01N22W20J05S). Along the northern coastline in the West Oxnard Plain Management Area, spring 2024 groundwater elevations were 34 to 41 feet higher than spring 2015 (measured at wells 01N23W01C03S and 01N23W01C04S).

2.1.1.4 Fox Canyon Aquifer

Fall 2023 groundwater elevations in the FCA ranged from a high of approximately 52 ft. msl at well 02N21W07L04S in the Forebay Management Area to a low of -64 ft. msl at well 01N22W36K06S in the Saline Intrusion Management Area near Point Mugu (Figure 2-7). Between fall 2022 and 2023 groundwater elevations increased across the FCA. In the Forebay Management Area, fall 2023 groundwater elevations were 45 to 80 feet higher than fall 2022 (measured at wells 02N22W23B03S and 02N21W07L04S). In the Oxnard Pumping Depression Management Area, the fall 2023 groundwater elevations were 40 to 77 feet higher than fall 2022 (measured at wells 01N21W19L10S and 02N21W32E01S). In the Saline Intrusion Management Area, near Point Mugu, fall 2023 groundwater elevations were 32 to 52 feet higher than fall 2022 (measured at wells 01N22W36K06S and 01N21W32Q04S). Lastly, near Port Hueneme, fall 2023 groundwater elevations were approximately 26 to 31 feet higher than fall 2022 (measured at wells 01N22W29D01S and 01N22W20J04S).

Fall 2023 groundwater elevations were higher than fall 2015 across the FCA. Over this period, the largest groundwater elevation increases occurred in the Oxnard Pumping Depression Management Area, where the fall 2023 groundwater elevations were approximately 50 to 113 feet higher than fall 2015 (measured at wells 01N21W19L10S and 01N21W09C04S). In the Forebay Management Area, groundwater elevations increased by approximately 48 to 84 feet between fall 2015 and fall 2023 (measured at wells 02N22W23B03S and 02N21W07L04S, respectively). The fall 2023 groundwater elevation measured at well 01N21W32Q04S, the only well with complete measurements near Point Mugu, was approximately 53 feet higher than fall 2015. Near Port Hueneme, the fall 2023 groundwater elevations were approximately 25 to 28 feet higher than fall 2015 (measured at wells 01N22W29D01S and 02N22W20J04S).

Spring 2024 groundwater elevations in the FCA ranged from a high of 61 ft. msl at well 02N21W07L04S in the Forebay Management Area to a low of -31 ft. msl at well 01N21W16P09S in the Oxnard Pumping Depression Management Area (Figure 2-8). Within the Saline Intrusion Management Area, spring 2024 groundwater elevations ranged from a high of 12 ft. msl at well 01N22W29D01S near Port Hueneme to a low of -22 ft. msl at well 01N21W32Q04S near Point Mugu (Figure 2-8). Between spring 2023 and 2024, groundwater elevations increased across the FCA. In the Forebay Management Area, spring 2024 groundwater elevations were approximately 12 to 47 feet higher than spring 2023 (measured at wells 02N21W07L04S and 02N22W23B03S). In the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were approximately 11 to 35 feet higher than spring 2023 (measured at wells 01N21W09C04S and 01N21W19L10S). Near Point Mugu and Port Hueneme, spring 2024 groundwater elevations were approximately 31 feet higher than spring 2023 (measured at well 01N21W32Q04S) and 30 to 35 feet higher than spring 2023 (measured at 01N22W29D01S and 01N22W20J04S). The one exception to the general increase in groundwater elevations across the FCA was at well 02N21W32E01S, located in the northern part of the Oxnard Pumping Depression Management Area, where the spring 2024 groundwater elevation was approximately 6 feet lower than spring 2023.

Spring 2024 groundwater elevations were higher than spring 2015 across the FCA. Over this period, groundwater elevations in the Forebay Management Area increased by approximately 47 to 62 feet (as measured at wells 02N21W07L03S and 02N22W23B03S). In the Oxnard Pumping Depression Management Area, spring 2024 groundwater elevations were approximately 56 to 74 feet higher than 2015 (as measured at wells 01N21W19L10S and 01N21W09C04S). Farther south, near Point Mugu, spring 2024 groundwater elevations were approximately 44 feet higher than spring 2015 (as measured at well 01N21W32Q04S). Near Port Hueneme, spring 2024 groundwater elevations were approximately 30 to 34 feet higher than spring 2015 (as measured at wells 01N22W29D01S and 01N22W20J04S).

2.1.1.5 Grimes Canyon Aquifer

There are seven wells screened solely in the GCA in the Oxnard Subbasin. Six of these wells are located in the southwestern part of the Subbasin, within the Saline Intrusion Management Area (Figure 2-9 and 2-10). In March 2020, DWR installed a nested monitoring well cluster through its TSS Program at FCGMA's request. The construction of this well cluster provides additional characterization of groundwater elevations in the GCA north of the Saline Intrusion Management Area, within the Oxnard Pumping Depression Management Area (Figure 2-9 and 2-10).

Fall 2023 groundwater elevations in the GCA ranged from approximately -66 ft. msl to approximately -19 ft. msl (measured at wells 01N22W36K05S and 01N22W28G01S; Figure 2-9). The measurements from the network of seven wells indicate that groundwater elevations in the GCA generally decline from Port Hueneme east and southeast towards Point Mugu and northeast into the Oxnard Pumping Depression Management Area. The fall 2023 groundwater elevations were approximately 20 to 67 feet higher than fall 2024 groundwater elevations (measured at wells 01N22W28G01S and 01N21W16P08S). Compared to fall 2015, groundwater elevations increased by approximately 19 to 53 feet (measured at wells 01N22W28G01S and 01N21W32Q03S).

Spring 2024 groundwater elevations in the GCA ranged from approximately -7 ft. msl to -31 ft. msl (measured at wells 01N22W35E01S and 01N21W32Q03S; Figure 2-10). Groundwater elevations increased by 23 to 32 feet in the GCA between spring 2023 and spring 2024 (measured at wells 01N22W28G01S and 01N21W32Q03S). Compared to 2015, spring groundwater elevations increased by approximately 21 to 46 feet (measured at wells 01N22W28G01S and 01N21W32Q02S).

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 2-15. These key wells are the designated representative monitoring sites for the Subbasin (FCGMA 2019a). The fall 2023 and spring 2024 water levels measured at each of these representative monitoring sites are presented in Table 2-1, which also provides a comparison to: (i) water year 2024 and 2015 conditions, (ii) the established minimum threshold groundwater elevations, (iii) the established measurable objective groundwater elevations, and (iv) the interim milestones for average climate conditions. The average climate interim milestone is used for comparison in this annual report because the precipitation measured in the Subbasin between water years 2016 and 2024 is similar to the long-term historical average.

2.1.2.1.1 Measurable Objectives

In 2015, the end of the GSP reporting period, groundwater elevations in the Subbasin were lower than the measurable objective groundwater elevations. Under average climate conditions, the GSP established the goal of increasing groundwater elevations to the measurable objectives by 2040. Fall 2023 groundwater elevations were above the measurable objectives at 4 of 34 key wells in the Subbasin (Table 2-1; Figures 2-11 through 2-15). Spring 2024 groundwater elevations were above the measurable objective groundwater elevations at 8 of the 34 key wells in the Subbasin (Table 2-1; Figures 2-11 through 2-15).

Groundwater elevations the Subbasin are influenced by water year type, the availability of surface water for recharge, and use in lieu of groundwater. Because of this, there may be periods of declining groundwater elevations during dry water years. Despite this, FCGMA anticipates that the general trend of rising groundwater elevations will continue through 2040 with continued implementation of projects and management actions.

2.1.2.1.2 Minimum Thresholds

In 2015, groundwater elevations in the Subbasin were lower than the minimum threshold groundwater elevations. Fall 2023 groundwater elevations were above the minimum thresholds at 7 of the key wells in the Subbasin (Table 2-1; Figures 2-11 through 2-15). Spring 2024 groundwater elevations were above the minimum thresholds at 21 of the key wells in the Subbasin (Table 2-1; Figures 2-11 through 2-15). Of the six wells with spring groundwater elevations below the minimum threshold, two are screened in the UAS, and four are screened in the LAS. Geographically, these wells are distributed in the Saline Intrusion Management Area (three wells), the Forebay Management Area (two wells), and the West Oxnard Plain Management Area (one well) (Table 2-1).

2.1.2.1.3 Interim Milestones

Fall 2023 groundwater elevations were above the 2025 interim milestones in all but one of the 27 key wells with available measurements in the Subbasin (Table 2-1; Figures 2-11 through 2-15). Spring 2024 groundwater elevations were above the 2025 interim milestones at all 27 key wells with available measurements in the Subbasin (Table 2-1; Figures 2-11 through 2-15).

Table 2-1. Water Year 2024 Groundwater Elevations at Key Wells in the Oxnard Subbasin

State Well Number	Aquifer	Management Area	Fall Groundwater Elevations			Spring Groundwater Elevations			Minimum Threshold (ft. msl)	Measurable Objective (ft. msl)	2025 Interim Milestone - Average Climate (ft. msl)
			2023 (ft. msl)	Change from 2022 to 2023[a] (feet)	Change from 2015 to 2023[a] (feet)	2024 (ft. msl)	Change from 2023 to 2024[a] (feet)	Change from 2015 to 2024[a] (feet)			
01N21W32Q06S	Oxnard	Saline Intrusion	-5.79	13.49	14.45	4.86	14.09	17.59	2	17	-15
01N22W20J08S	Oxnard	Saline Intrusion	6.22	21.32	20.41	18.13	28.16	25.7	7	17	-7
01N22W26J04S	Oxnard	Saline Intrusion	-1.09	17.60	22.22	12.94	25.53	27.28	2	17	-15
01N22W27C03S	Oxnard	Saline Intrusion	4.76	20.07	19.59	16.78[b]	25.09	25.81	7	17	-7
01N23W01C05S	Oxnard	West Oxnard Plain	7.16	9.11	8.08	12.24	11.49	11.06	7	17	4
02N22W36E06S	Oxnard	West Oxnard Plain	NM	—	—	NM	—	—	12	37	-10
01N21W32Q05S	Mugu	Saline Intrusion	-47.63	41.10	50.11	-17.87	31.01	42.86	2	17	-78
01N21W32Q07S	Mugu	Saline Intrusion	-31.15	33.44	33.87	-10.21	24.45	31.00	2	17	-52
01N22W20J07S	Mugu	Saline Intrusion	5.30		20.26	17.55	27.16	26.64	7	17	-7
01N22W26J03S	Mugu	Saline Intrusion	NM	—	—	NM	—	—	2	17	-30
01N22W27C02S	Mugu	Saline Intrusion	-0.65	22.61	21.92	14.47	27.52	28.79	7	17	-15
02N21W07L06S	Mugu	Forebay	126.12	-	138.2	125.85	13.97	117.65	27	62	8
02N22W23B07S	Mugu	Forebay	45.72	83.70	76.53	62.85	65.34	83.57	17	47	-11
02N22W36E05S	Mugu	West Oxnard Plain	NM	—	—	NM	—	—	12	37	-6
01N22W20J05S	Hueneme	Saline Intrusion	-0.40	29.66	27.28	13.51	35.74	33.42	2	17	-18
01N23W01C03S	Hueneme	West Oxnard Plain	-1.71	31.16	28.24	11.20	36.29	34.44	7	22	-17
01N23W01C04S	Hueneme	West Oxnard Plain	5.15	35.93	31.67	21.09	41.51	41.12	7	22	-17
02N22W23B04S	Hueneme	Forebay	-36.85	62.69	49.92	-15.79	45.91	59.80	-3	17	-67
02N22W23B05S	Hueneme	Forebay	-19.34	63.94	56.50	1.91	50.19	67.44	-3	17	-60
02N22W23B06S	Hueneme	Forebay	41.78	80.90	78.21	57.35	65.82	80.55	17	47	-15
02N22W36E03S	Hueneme	West Oxnard Plain	NM	—	—	NM	—	—	12	37	-28
02N22W36E04S	Hueneme	West Oxnard Plain	NM	—	—	NM	—	—	12	37	-13
01N21W32Q04S	FCA	Saline Intrusion	-51.95	52.16	53.43	-22.21	30.98	44.09	-23	2	-86

State Well Number	Aquifer	Management Area	Fall Groundwater Elevations			Spring Groundwater Elevations			Minimum Threshold (ft. msl)	Measurable Objective (ft. msl)	2025 Interim Milestone - Average Climate (ft. msl)
			2023 (ft. msl)	Change from 2022 to 2023[a] (feet)	Change from 2015 to 2023[a] (feet)	2024 (ft. msl)	Change from 2023 to 2024[a] (feet)	Change from 2015 to 2024[a] (feet)			
01N22W20J04S	FCA	Saline Intrusion	-9.13	30.52	28.0	5.96	35.88	34.08	2	17	-26[c]
01N22W26K03S	FCA	Saline Intrusion	-59.60	25.75	-	-6.82	32.96	58.81	-18	2	-52
01N23W01C02S	FCA	West Oxnard Plain	-12.67	22.97	21.67	-2.20	29.73	27.11	7	22	-25
02N21W07L04S	FCA	Forebay	52.33	79.70	84.35	61.64	12.00	57.76	17	42	-12
02N22W23B03S	FCA	Forebay	-35.13	45.67	48.42	-15.46	47.30	61.54	-3	17	-67
01N21W32Q02S	GCA	Saline Intrusion	-50.33	51.43	52.87	-18.91	32.20	45.79	-23	2	-86
01N21W32Q03S	GCA	Saline Intrusion	-61.09	51.25	53.08	-31.61	30.78	43.95	-23	2	-93
01N21W07J02S	Multiple[d]	Oxnard Pumping Depression	NM	—	—	NM	—	—	-38	2	-105
01N21W21H02S	Multiple[d]	Oxnard Pumping Depression	NM	—	—	NM	—	—	-68	-8	-103
02N21W07L03S	Multiple[d]	Forebay	42.19	68.89	66.78	48.66	20.87	46.82	17	37	-10
02N21W07L05S	Multiple[e]	Forebay	117.77	117.80	119.17	118.53	9.14	118.53	27	57	11

Notes: NM = Not Measured; "-" indicates that one or more measurements during the analysis window were not collected.
[a] Positive values indicate that groundwater elevations at the key well have increased. Negative values indicate that groundwater elevations at the key well have declined.
[b] The spring 2024 water level at this well has been updated based on revised reporting by UWCD.
[c] The Interim Milestone for this well was erroneously reported in the GSP as 42 ft. mean sea level, which is higher than the measurable objective. The interim milestone for this well was corrected as part of the 2025 GSP Periodic Evaluation.
[d] Wells 02N21W07L03, 01N21W07J02, and 01N21W07L03 are screened in multiple aquifers. These wells were assigned to the LAS in the GSP for the purpose of defining undesirable results.
[e] Well 02N21W07L05 is screened in multiple aquifers and has been assigned to the UAS for the purpose of defining undesirable result.

2.2 Groundwater Extraction

The water year 2024 extractions presented in Table 2-2 represent the extractions reported to FCGMA as of January 23, 2025, and do not include estimates of extractions for the non-reporting wells. Because of this, the water year 2024 extraction data is considered preliminary and will be updated in the Water Year 2025 GSP annual report for the Oxnard Subbasin. As of January 23, 2025, FCGMA had received reporting from approximately 90% of the operators in the Subbasin for water year 2023 and the first half of water year 2024. FCGMA had received reporting from approximately 30% of the operators for the second half of water year 2024.

The available data characterizing groundwater extractions between 2016 and 2023 do not exhibit any long-term trends, with the groundwater extractions in water year 2023 falling within the range of groundwater extractions reported between 2016 and 2022. In contrast, groundwater extractions from the LAS decreased between 2016 and 2020, and remained similar to the 2019 and 2020 volumes in water years 2021, 2022, and 2023 (Table 2-2). In the UAS, agricultural production decreased while M&I production increased. However, both agricultural and M&I production decreased in the LAS (Table 2-2). Based on the available data, the total groundwater production in the Subbasin has decreased over the 2016 to 2023 period (Table 2-2).

2.3 Surface Water Supply

The primary source of surface water in the Oxnard Subbasin is the Santa Clara River. UWCD operates the Freeman Diversion, which allows UWCD to divert surface water from the Santa Clara River for delivery in the Oxnard Subbasin and PVB. Diverted surface water is also used to recharge groundwater aquifers in the Oxnard Subbasin via the UWCD spreading basins located in the Forebay Management Area. In addition to diversions from the Santa Clara River, a portion of the surface water diverted from Conejo Creek by CWD is supplied to Pleasant Valley County Water District (PVCWD) for agricultural irrigation in the Oxnard Subbasin[5]. Surface water deliveries to the Oxnard Subbasin for water years 2016 through 2024 are reported in Table 2-3.

5 56% of the total CWD deliveries to PVCWD, and 56% of the total PVP surface water deliveries from UWCD, were assigned to the Oxnard Subbasin based on an analysis of the size of PVCWD's service area (FCGMA 2019a).

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Table 2-2. Groundwater Extractions in the Oxnard Subbasin by Aquifer System and Water Use Sector

Year	Extraction Reporting Complete / Estimated Percentage Complete (%)[a]	Upper Aquifer System (Acre-Feet)				Lower Aquifer System (Acre-Feet)				Wells in multiple or unassigned aquifer systems (Acre-Feet)				TOTAL (Acre-Feet)
		AG	Dom	M&I	Sub-Total	AG	Dom	M&I	Sub-Total	AG	Dom	M&I	Sub-Total	
CY 2016[b]	Yes	15,710	65	12,681	28,455	31,366	24	10,623	42,013	8,315	110	584	9,009	79,477
CY 2017	Yes	15,841	59	14,785	30,685	29,248	27	8,613	37,888	9,922	45	418	10,385	78,959
CY 2018	Yes	15,097	58	16,936	32,091	26,596	24	6,601	33,222	9,735	20	309	10,064	75,376
CY 2019	Yes	13,112	58	17,820	30,990	22,473	27	6,413	28,913	9,394	36	544	9,974	69,877
2020[c]	Yes	9,333	48	14,782	24,163	14,389	9	5,079	19,478	7,183	46	529	7,758	51,399
WY 2021	Yes	13,782	66	20,981	34,829	23,407	6	7,782	31,196	8,980	29	754	9,763	75,788
WY 2022	Yes	12,398	52	18,966	31,416	23,250	14	7,148	30,412	9,452	27	2,898	12,377	74,205
WY 2023[d]	Yes	7,576	35	17,578	25,189	15,472	12	7,086	22,570	4,365	11	575	4,950	52,709
WY 2024[e]	No/70%	4,563	649	11,977	17,189	8,511	436	4,792	13,740	2,844	6	330	3,180	34,108

Notes: CY = Calendar Year; WY = Water Year; AG = Agriculture; Dom = domestic; M&I = Municipal and Industrial

[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 as of January 26, 2024.

[b] Total pumping in 2016 includes 4 acre-feet of groundwater production from the semi-perched aquifer that were used by the M&I sector.

[c] Groundwater extraction reporting is from January 1, 2020, through September 30, 2020, due to transition to water year reporting.

[d] Groundwater extractions updated upon receipt of additional reporting.

[e] Groundwater extractions are preliminary and will be updated during preparation of the 2026 GSP Annual report based on receipt of additional reporting.

Table 2-3. Summary of Surface Water Deliveries to the Oxnard Subbasin

Water Year	PVCWD	United Water Conservation District			TOTAL (acre-Feet)
		Diversions of Santa Clara River Water			
	Conejo Creek Flows Delivered by CWD to PVCWD for Agriculture (acre-feet)	Total delivered to PTP and used in the Oxnard Subbasin (acre-feet)	Total delivered to PVP and used for agriculture in the Oxnard Subbasin (acre-feet)	Recharge to UWCD Spreading Basins (acre-feet)	
2016	1,038	0	0	2,209	3,247
2017	1,774	0	0	10,297	12,071
2018	1,854	0	0	3,126	4,980
2019	2,795	1,059	309	36,768	40,931
2020	2,310	2,494	944	28,327	34,097
2021	2,035	3,823	1,049	12,820	19,727
2022	2,392	1,905	425	11,448	16,170
2023	2,225	3,558	2,285	111,245	119,322
2024	2,714	4,367	2,965	80,533	90,579

Notes: PVCWD = Pleasant Valley County Water District; CWD = Camrosa Water District; PTP = Pumping Trough Pipeline; PVP = Pleasant Valley Pipeline

2.4 Total Water Available

Total water available was tabulated from the groundwater extractions reported in Table 2-2, the surface water supply reported in Table 2-3, Calleguas Municipal Water District imported water supply, and recycled water used in the Subbasin. Recycled water used in the Subbasin originates from three sources: the City of Oxnard's Advanced Water Purification Facility, the Camarillo Sanitary District Water Reclamation Plant, and CWD's Water Reclamation Facility.

The total water available is reported in Table 2-4 by water year. In order to convert the reported groundwater production from calendar year to water year prior to water year 2020, 25% of the groundwater production from a given calendar year was assigned to the following water year, and the 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. Because the reported 2020 groundwater extractions covered the period from January 1 through September 30, total water year extractions for 2020 were estimated by adding 25% of the 2019 calendar year extractions to the reported 2020 water year extractions.

Similar to Table 2-2, the groundwater extractions for water year 2024 presented in Table 2-4 represent extractions reported to FCGMA as of January 23, 2025. The reported extraction volumes are preliminary and anticipated to change based on receipt of additional data.

Table 2-4. Total Water Available in the Oxnard Subbasin

Water Year	Extraction Reporting Complete / Estimated Percentage Complete (%)[a]	Groundwater[b] (acre-feet)			Surface Water (acre-feet)				Imported Water (acre-feet)	Recycled Water[c, d] (acre-feet)	TOTAL (acre-feet)
		Ag	Dom	M&I	Ag	Dom	M&I	Recharge	M&I	Ag	
2016	Yes	55,527	197	24,078	1,038	0	0	2,209	11,313	136	94,498
2017	Yes	55,107	148	23,834	1,774	0	0	10,297	10,740	1,135	103,035
2018	Yes	52,324	109	23,838	1,854	0	0	3,126	12,171	2,194	95,616
2019	Yes	46,591	116	24,545	4,163	0	0	36,768	9,998	0	122,181
2020	Yes	42,150	133	26,585	5,770	0	0	28,327	9,712	0	112,677
2021	Yes	46,169	101	29,517	6,907	0	0	12,820	10,089	1,206	106,809
2022	Yes	45,101	92	29,012	4,722	0	0	11,448	8,505	1,265	100,145
2023[e]	Yes	27,413	58	25,238	8,068	0	0	111,254	6,615	1,718	180,364
2024[f]	No/60	15,918	1,091	17,099	10,046	0	0	80,533	7,052	1,804	133,543

Notes: NR – 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 as of January 26, 2024.

[b] Groundwater production by water year is estimated from groundwater production by calendar year for 2016 through 2020. Water Year 2021 extractions represent reported and estimated extractions for the period from October 1, 2020, through September 30, 2021.

[c] Recycled water is from: City of Oxnard's GREAT program reporting, PVCWD's reported use of Camrosa Water Reclamation Facility (CWRF), and City of Camarillo's Water Reclamation Plan (CamSan). 56% of the recycled water served by PVCWD was assigned to the Oxnard Subbasin based on an analysis of the size of PVCWD's service area (FCGMA 2019a).

[d] Water year 2022 updated to reflect usage of CWRF and CamSan recycled water within PVCWD's service area.

[e] Water year 2023 groundwater extractions were updated based on additional reporting received subsequent to the submittal of the 2024 GSP Annual Report.

[f] Groundwater extraction reporting for 2024 is preliminary and expected to change. Additional extraction reporting is anticipated.

2.5 Change in Groundwater Storage

Since adoption of the GSP, FCGMA has estimated the change in groundwater in storage in the Subbasin annually using a series of linear regressions that relate measured groundwater elevations to simulated values of change in storage extracted from the Ventura Regional Groundwater Flow Model (VRGWFM; UWCD 2018). As part of the 2025 Periodic Evaluation of the Oxnard Subbasin GSP, UWCD updated the VRGWFM to improve the hydrogeologic conceptual model of the Oxnard Subbasin and simulate groundwater conditions in the Oxnard Subbasin, Pleasant Valley Basin, and WLPMA through September 30, 2022 (FCGMA 2024b). Accordingly, the estimates of change in groundwater in storage in the Oxnard Subbasin have been updated through water year 2022 using the updated modeling results (Tables 2-5a and 2-5b; Figures 2-19 through 2-24).

Because neither model simulates water years 2023 and 2024, the change in storage for those two water years was calculated using the series of linear regressions used in previous annual reports (FCGMA 2022, 2023, 2024a). The estimated change in storage calculated using this method differs from the estimates presented in the Periodic Evaluation, which were based on measured groundwater elevation changes from a smaller subset of wells. The series of linear regressions employed here better capture the spatial variability in storage change (Tables 2-5a and 2-5b; Figures 2-19 through 2-24).

2.5.1 Oxnard Aquifer

Groundwater in storage in the Oxnard aquifer increased between spring 2023 and spring 2024 by approximately 59,200 AF (Table 2-5a). The majority of this occurred in the Forebay and Oxnard Pumping Depression management areas, where groundwater in storage increased by an estimated 58,200 AF (Figure 2-18). The water year 2024 increase in groundwater in storage was the largest estimated increase since 2015 and reflects the higher-than-average recharge of Santa Clara River water into the Subbasin by UWCD through their spreading basins in the Forebay Management Area.

2.5.2 Mugu Aquifer

Groundwater in storage within the Mugu aquifer increased by approximately 2,700 AF between spring 2023 and spring 2024 (Table 2-5a). Approximately 50% of this occurred in the Forebay Management Area, (Figure 2-19). The largest increases in storage occurred in the West Oxnard Plain Management Area and near Port Hueneme.

2.5.3 Hueneme Aquifer

The volume of groundwater in storage in the Hueneme aquifer increased by approximately 1,350 AF between spring 2023 and spring 2024 (Table 2-5a). Groundwater in storage increased across the entirety of the Hueneme aquifer, with the largest increase occurring along the northern coastline of the Oxnard Subbasin. In the Forebay Management Area, groundwater in storage increased by approximately 180 AF.

2.5.4 Fox Canyon Aquifer

Between spring 2023 and spring 2024, groundwater in storage in the FCA increased by a total of approximately 2,800 AF (Table 2-5a). The largest increases in storage occurred in the Forebay and West Oxnard Plain management areas, where groundwater in storage increased by approximately 2,060 AF (Figure 2-21). In the Oxnard Pumping

Depression Management Area and Saline Intrusion Management Area, groundwater in storage was estimated to have increased by approximately 430 AF and 350 AF, respectively (Figure 2-21).

2.5.5 Grimes Canyon Aquifer

The GCA is limited to the southern and eastern parts of the Oxnard Subbasin (Turner 1975). Between spring 2023 and spring 2024, groundwater in storage in the GCA increased by approximately 430 AF. This groundwater in storage increase was estimated using a single well, 01N21W32Q02S, located in the southeastern part of the Subbasin (Figure 2-22).

2.5.6 Total Change in Storage in the Subbasin

The change in groundwater in storage was calculated for each aquifer in the Subbasin and summed by aquifer system (Tables 2-5a and 2-5b; Figures 2-23 and 2-24). Between spring 2023 and spring 2024, groundwater in storage increased by approximately 66,600 AF, which resulted in a cumulative increase in storage in the Subbasin since spring 2015 of approximately 63,800 AF (Table 2-5b).

Annual and cumulative change in storage from 1985 through 2015 and 2016 through 2022 were reported in the GSP and Periodic Evaluation, respectively (FCGMA 2019a, FCGMA 2024b). The change in storage volumes reported in these two reports were extracted from the VRGWFM and incorporated local responses to changing recharge and pumping conditions. The results presented here for water years 2023 and 2024 provide an estimate of storage change based on a subset of wells screened solely within individual aquifers across the Subbasin and therefore do not capture local variations in storage change simulated by the VRGWFM. In general, however, the trends shown in the GSP, Periodic Evaluation, and Annual Report are in good agreement (FCGMA 2022).

Additionally, the change in storage reported for water years 2023 and 2024 does not account for seawater intrusion that is known to occur in the Subbasin when groundwater elevations are below the minimum thresholds described in the GSP (FCGMA 2019). As groundwater elevations decline, seawater intrudes the Subbasin, which slows the decline of the groundwater elevations, but replaces fresh water in storage with saltwater. Therefore, the change in storage calculated for this annual report using groundwater elevations that are influenced by potential seawater intrusion may be an underestimate of the total change of fresh water in storage experienced by the Subbasin between water years 2016 and 2024.

Table 2-5a. Annual Change in Groundwater Storage in the Oxnard Subbasin

Water Year	Water Year Type	Method	Oxnard Subbasin (Acre-Feet)[a]							
			Oxnard Aquifer	Mugu Aquifer	UAS Annual	Hueneme Aquifer	FCA	GCA	LAS Annual	Combined Annual
2016	Critical	VRGWFM	-10,349		-10,349	-752			-752	-11,101
2017	Above Normal	VRGWFM	2,470		2,470	321			321	2,791
2018	Critical	VRGWFM	-17,356		-17,356	602			602	-16,754
2019	Above Normal	VRGWFM	32,457		32,457	1,395			1,395	33,852
2020	Below Normal	VRGWFM	10,023		10,023	2,531			2,531	12,554
2021	Critical	VRGWFM	-18,456		-18,456	-1,220			-1,220	-19,676
2022	Below Normal	VRGWFM	-10,197		-10,197	-888			-888	-11,085
2023	Wet	System of Linear Regressions	3,310	819	4,129	133	2,021	417	2,571	6,700
2024	Wet	System of Linear Regressions	59,205	2,746	61,951	1,348	2,838	431	4,617	66,568

Notes: FCA = Fox Canyon aquifer; GCA = Grimes Canyon aquifer; UAS = Upper Aquifer System; LAS = Lower Aquifer System; VRGWFM = Ventura Regional Groundwater Flow Model.
[a] Change in storage for water years 2016 through 2022 were updated based on numerical modeling results from the VRGWFM.

Table 2-5b. Cumulative Change in Groundwater Storage in the Oxnard Subbasin

Water Year	Water Year Type	Method	Oxnard Subbasin (Acre-Feet)[a]		
			UAS Cumulative	LAS Cumulative	Combined Cumulative Change in Storage
2016	Critical	VRGWFM	-10,349	-752	-11,101
2017	Above Normal	VRGWFM	-7,879	-431	-8,310
2018	Critical	VRGWFM	-25,235	171	-25,064
2019	Above Normal	VRGWFM	7,222	1,566	8,788
2020	Below Normal	VRGWFM	17,245	4,097	21,342
2021	Critical	VRGWFM	-1,211	2,877	1,666
2022	Below Normal	VRGWFM	-11,408	1,989	-9,419
2023	Wet	System of Linear Regressions	-7,279	4,560	-2,719
2024	Wet	System of Linear Regressions	54,672	9,177	63,849

Notes: FCA = Fox Canyon aquifer; GCA = Grimes Canyon aquifer; UAS = Upper Aquifer System; LAS = Lower Aquifer System; VRGWFM = Ventura Regional Groundwater Flow Model.
[a] Change in storage for water years 2016 through 2022 were updated based on numerical modeling results from the VRGWFM.

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3 GSP Implementation Progress

The GSP for the Oxnard Subbasin was submitted to DWR in January 2020. This is the sixth annual report prepared since the GSP was submitted. The GSP implementation progress reported in this report covers work that began during development of the GSP as well as development of projects and management actions over the 5 years since the GSP was submitted.

3.1 2025 Periodic Evaluation of the LPV Basin GSP

On December 13, 2024, the FCGMA Board of Directors approved the first GSP Periodic Evaluation, which provides an assessment of progress towards sustainability in the Subbasin, discusses new significant information since adoption of the GSP, includes recommendations that support project implementation and ongoing coordination with stakeholders, and summarizes key actions taken by FCGMA to support implementation of the GSP. The key findings from the Periodic Evaluation are summarized below.

3.1.1 Progress Towards Sustainability

The primary sustainability goal for the Subbasin is to "to increase groundwater elevations inland of the Pacific coast in the aquifers that compose the UAS [Upper Aquifer System] and the LAS [Lower Aquifer System] to elevations that will prevent the long-term, or climatic cycle net (net), landward migration of the 2015 saline water impact front; prevent net seawater intrusion in the UAS; and prevent net seawater intrusion in the LAS" (FCGMA 2019). GSP implementation, thus far, is on track to meet the sustainability goal set forth in the GSP. This has been accomplished through:

- Development of policy that allocates groundwater extractions in a manner consistent with the GSP and SGMA.
- Diversification of water supplies and reduction in groundwater production from the Subbasin.
- Ongoing groundwater elevation and quality monitoring.
- Implementation of projects that address data gaps,
- Development, evaluation, and implementation of projects that increase water supplies and the sustainable yield of the Subbasin.
- Recharge to the groundwater aquifers from two consecutive water years (2023 and 2024) with above average precipitation

The information collected through the implementation of projects to address data gaps and ongoing groundwater elevation and quality monitoring has resulted in improved estimates of the sustainable yield of the Subbasin and potential improvements to the sustainable management criteria that will guide management over the next five years. Significantly, adjudication proceedings have been undertaken in the Subbasin. At this time, it is unclear what legal effect the adjudication action will have on FCGMA's continued ability to implement the GSP and sustainably manage the Subbasin. Over the next five-years, FCGMA will continue to work towards sustainability and will re-evaluate the impacts of climate, water usage, project implementation, and legal actions on groundwater conditions and groundwater management in the Subbasin in accordance with the ongoing GSP evaluation process and adaptive management approach outlined in SGMA.

3.1.2 Significant New Information

Since adoption of the GSP, FCGMA and stakeholders in the Subbasin have coordinated to improve understanding of future water supplies, expand the suite of projects that may increase the sustainable yield of the Subbasin, and improve groundwater monitoring. These improvements have resulted in:

- Expanded project suite to include: projects that increase the availability and use of recycled water in lieu of groundwater; projects that evaluate opportunities to implement aquifer storage and recovery projects in the Subbasin; projects that increase the availability Santa Clara River water for delivery on pipeline and recharge in the Forebay; and a project that would directly address seawater intrusion in the Subbasin via the construction and operation of an extraction barrier and brackish water treatment facility.
- Revised projections of future water supplies to the Subbasin, which were incorporated into updated numerical modeling and used to update estimates of the sustainable yield of the Subbasin.
- The construction of new monitoring wells to improve aquifer-specific and shallow groundwater monitoring in the Subbasin.
- Incorporation of DWR's InSAR data into the GSP monitoring network to improve land subsidence monitoring in the Subbasin.

3.1.3 Recommendations

The Periodic Evaluation process, which included input from stakeholders, resulted in the development of several planning recommendations that should be implemented or investigated before the next periodic evaluation. These recommendations are:

- Continue coordination and collaboration with agencies and stakeholders in the Subbasin to support project implementation and effective management of the Subbasin.
- Conduct additional technical studies to further quantify the relationship between pumping in different management areas on seawater intrusion.
- Develop a long-term master plan, including infrastructure development, to guide the timing and manage accountability and progress in advancing projects in the Subbasin.
- Formalize agreements between FCGMA and partner agencies that collect groundwater elevation and groundwater quality data from the GSP monitoring network in each basin. The intent of these agreements is to ensure that data are collected at the intervals required in the GSPs and avoid data gaps that limit FCGMAs understanding of basin conditions.
- Continue improvements to the monitoring well network.
- Conduct additional modeling analyses to quantify the impact of inland pumping on seawater intrusion and investigate the impacts of projects and management actions on boundary flows between basins.
- Convene a project implementation task force to assist FCGMA with understanding the project options available in the basins and act as a centralized project planning and implementation advisory body.
- Develop a storage accounting framework or other mechanism to protect the investments that entities make in creating new water supplies that improve basin sustainability.
- Discuss notable changes in the spatial distribution of pumping in the management areas in the annual reports.

- Investigate injecting water produced from the EBB project in the Port Hueneme area to limit seawater intrusion in this area, instead of piping EBB water to the Oxnard Forebay.

3.1.4 Actions Taken by FCGMA

FCGMA took multiple actions to address data gaps identified in the GSP and improve the agency's ability to sustainably manage the groundwater resources of the Subbasin. These include:

- Adoption of resolutions to impose, and adjust, groundwater extraction fees and surcharge rates.
- Adoption of ordinances that allocate groundwater extractions in a manner consistent with the GSP and SGMA that went into effect on October 1, 2020.
- Pursuit of grant funding through DWR's Sustainable Groundwater Management Grant Program to support construction of additional monitoring wells and procurement of additional groundwater monitoring equipment.
- Evaluation of a replenishment fee that could be used to purchase water for recharge in the Subbasin or to help fund a voluntary temporary fallowing program to reduce groundwater demand.
- Adoption of a resolution modifying an existing in-lieu program that provides a "recycled water pumping allocation" to the City of Oxnard for delivery of recycled water from its Advanced Water Purification Facility to agricultural operators in the Subbasin for irrigation in lieu of groundwater.
- Adoption of a formal process for evaluating and prioritizing projects in the Subbasin.

3.2 Project Implementation Progress

During development of the GSP, FCGMA identified the Oxnard Pumping Depression Management Area, adjacent to the boundary between the Oxnard Subbasin and the PVB, as a critical area in which aquifer specific groundwater elevations were not available due to a lack of monitoring wells. This is an area of known groundwater production, with wells in the area typically screened in multiple aquifers in the LAS. At the FCGMA's request, DWR, under its Technical Services Support program, installed two nested monitoring well clusters to monitor water levels in the individual principal aquifers in the Oxnard Subbasin Pumping Depression Management Area based on FCGMA's design. These nested monitoring wells were installed specifically to address the spatial data gap identified in the GSP. Groundwater elevation data from these wells has been included GSP Annual Reports since 2022 to better represent groundwater conditions in the Oxnard Subbasin and adjacent PVB.

Since completing the GSP, FCGMA was awarded grant funds through DWR's Sustainable Groundwater Management Grant Program to support implementation of projects developed during the GSP and subsequent stakeholder discussions. The final contract agreement between DWR and FCGMA was signed on September 23, 2022, and FCGMA, acting as the grant administrator, has coordinated activities with the various agencies that are overseeing project component implementation. These projects support increased water supply availability in the Subbasin through expansion of existing managed aquifer recharge infrastructure, construction of a recycled water pipeline interconnection, construction of monitoring well clusters to support evaluation of the United Water Conservation District's Extraction Barrier and Brackish Water Treatment project.

In addition to administering the grant funds for these projects, FCGMA used a portion of the awarded funds to construct two new nested monitoring well clusters and three new shallow single completion wells in the Subbasin.

These new monitoring wells, which were completed between August and October of 2024, were constructed to provide additional characterization of:

- Groundwater elevation gradients and underflows between the Subbasin and the LPVB
- Groundwater elevations, and the lateral extent, of the pumping depression that spans the boundary between the Subbasin and the Pleasant Valley Basin.
- Groundwater-surface water interactions in the Subbasin.

The first groundwater level measurements from these wells will be reported in the 2026 annual report.

4 References

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Turner, J.M. 1975. "Aquifer Delineation in the Oxnard–Calleguas Area, Ventura County." In *Compilation of Technical Information Records for the Ventura County Cooperative Investigation: Volume I,* 1–45. Prepared by the Ventura County Public Works Agency Flood Control and Drainage Department for the California Department of Water Resources.

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5 Figures

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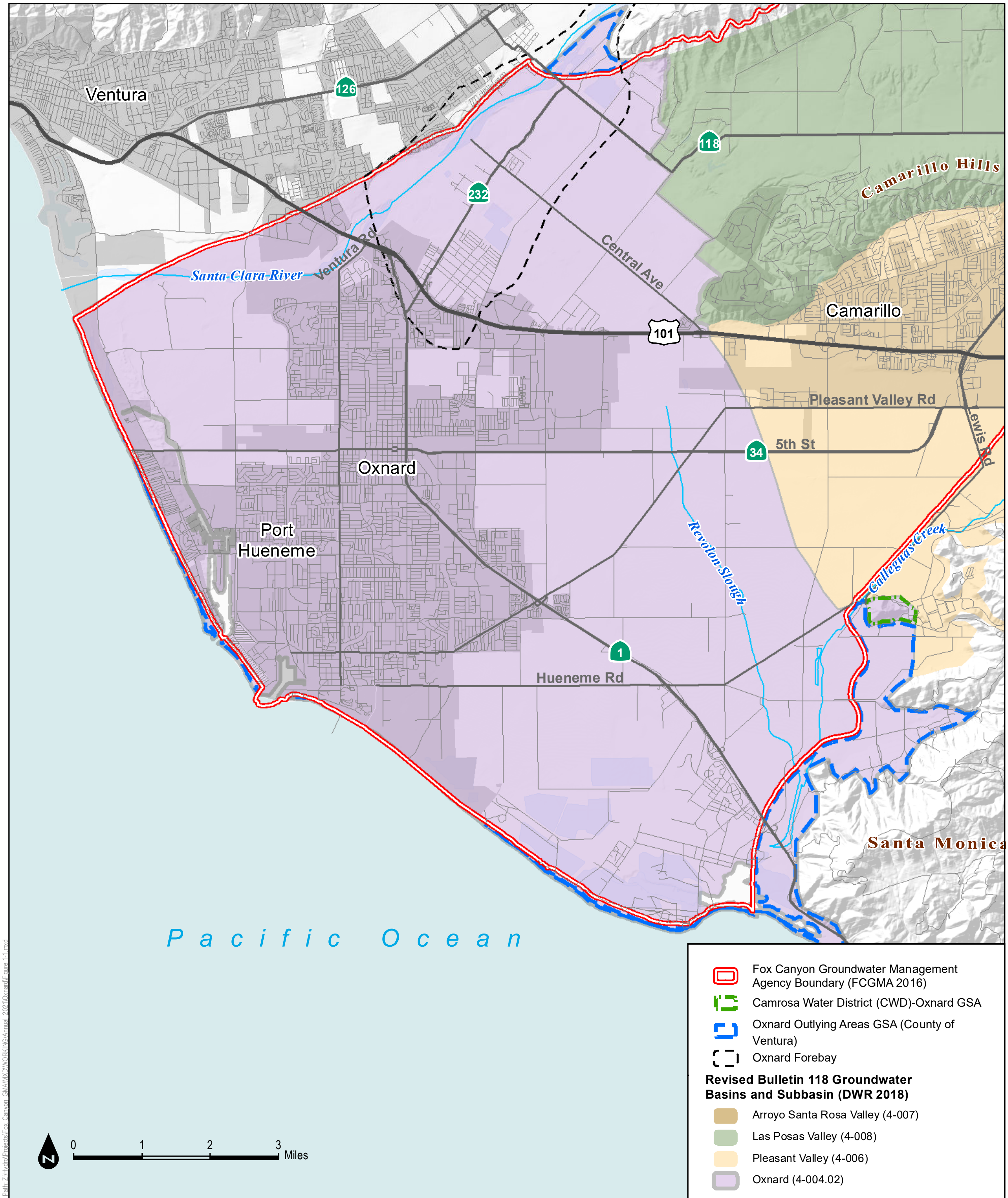

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SOURCE: DWR; Santa Barbara County; FCGMA

FIGURE 1-1

Vicinity Map for the Oxnard Subbasin

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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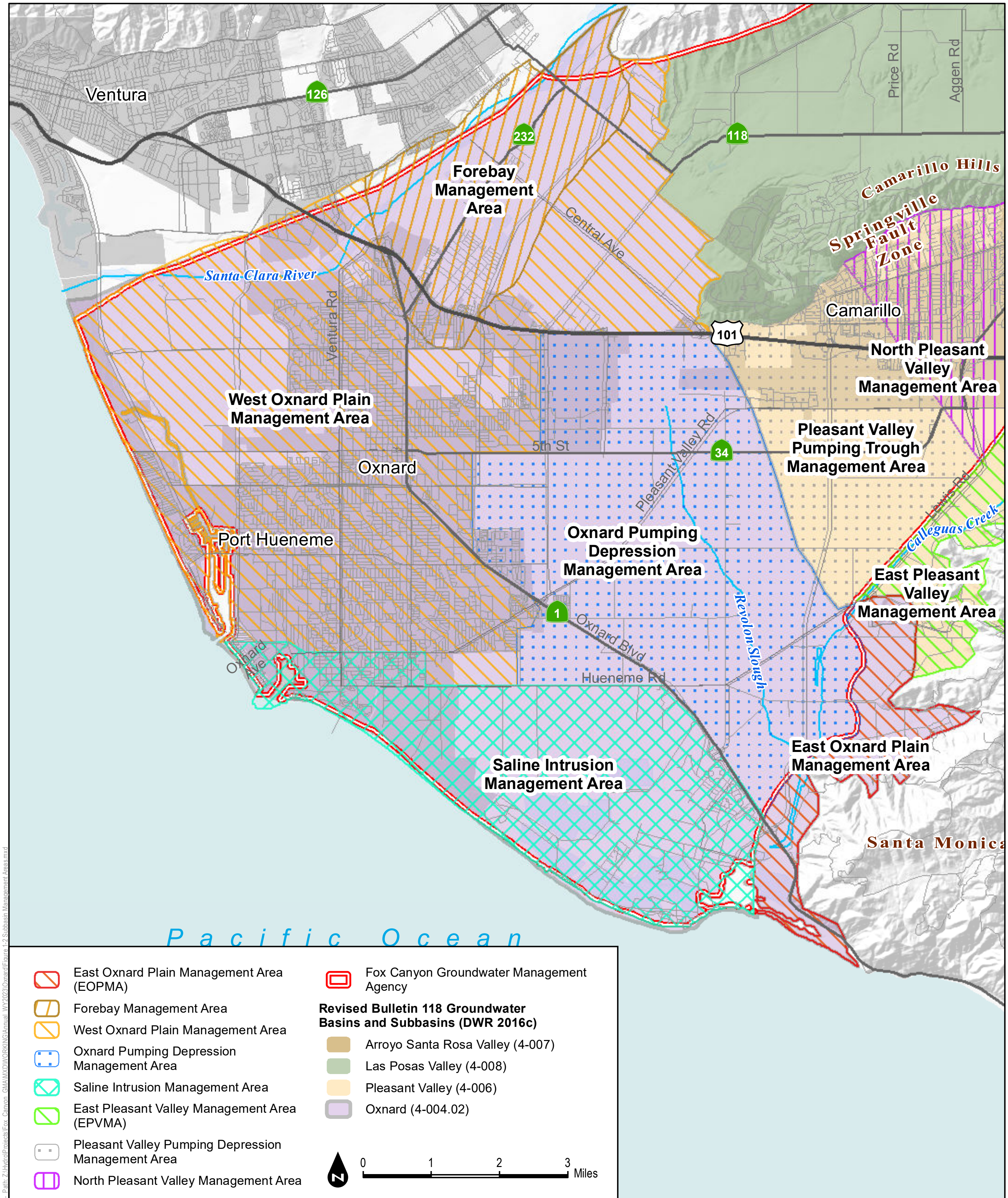

SOURCE: DWR; County of Ventura; FCGMA

FIGURE 1-2

Oxnard Subbasin Management Areas

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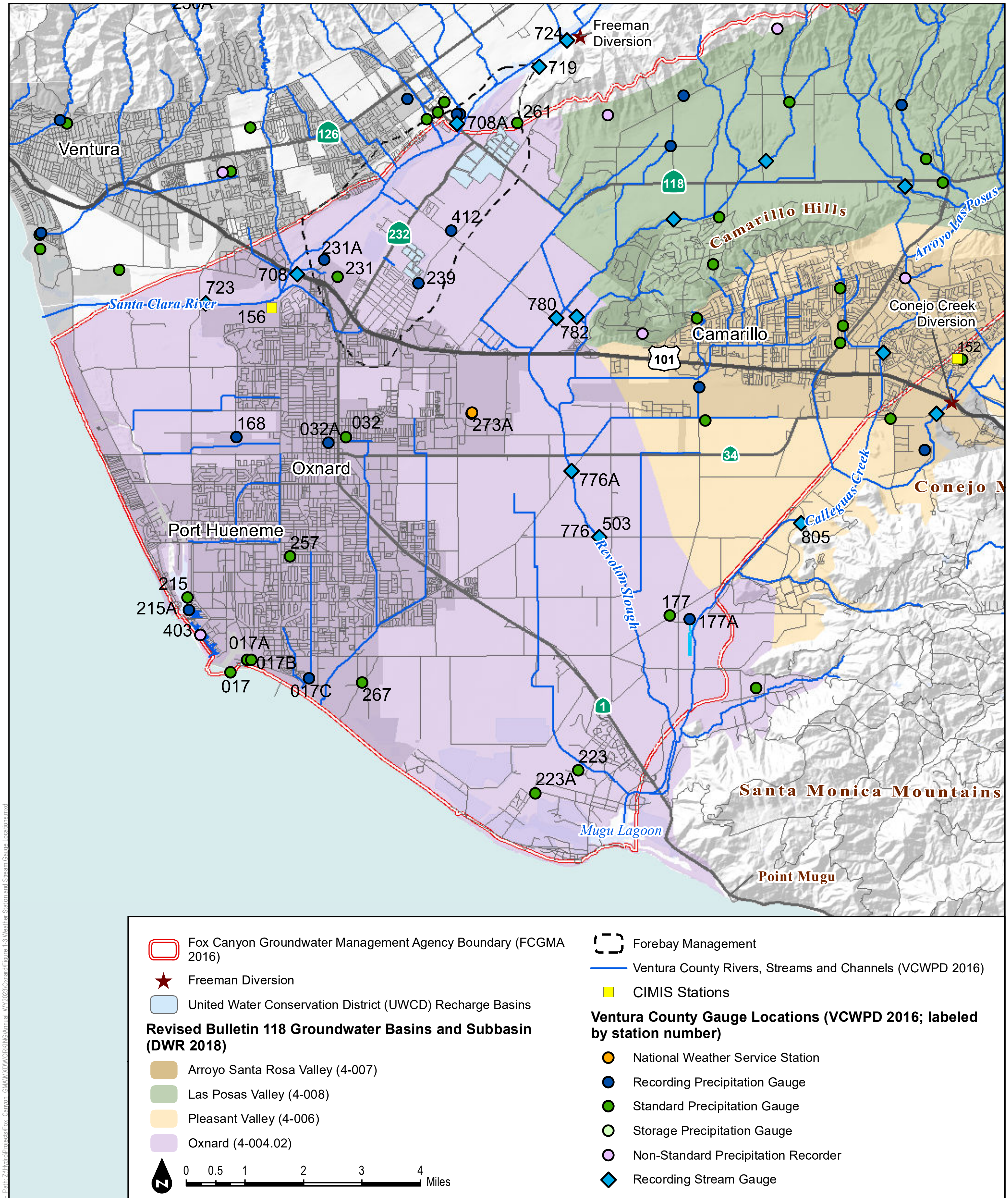

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SOURCE: DWR; Santa Barbara County; VCWPD; USGS NHD

FIGURE 1-3

Weather Station and Stream Gauge Locations

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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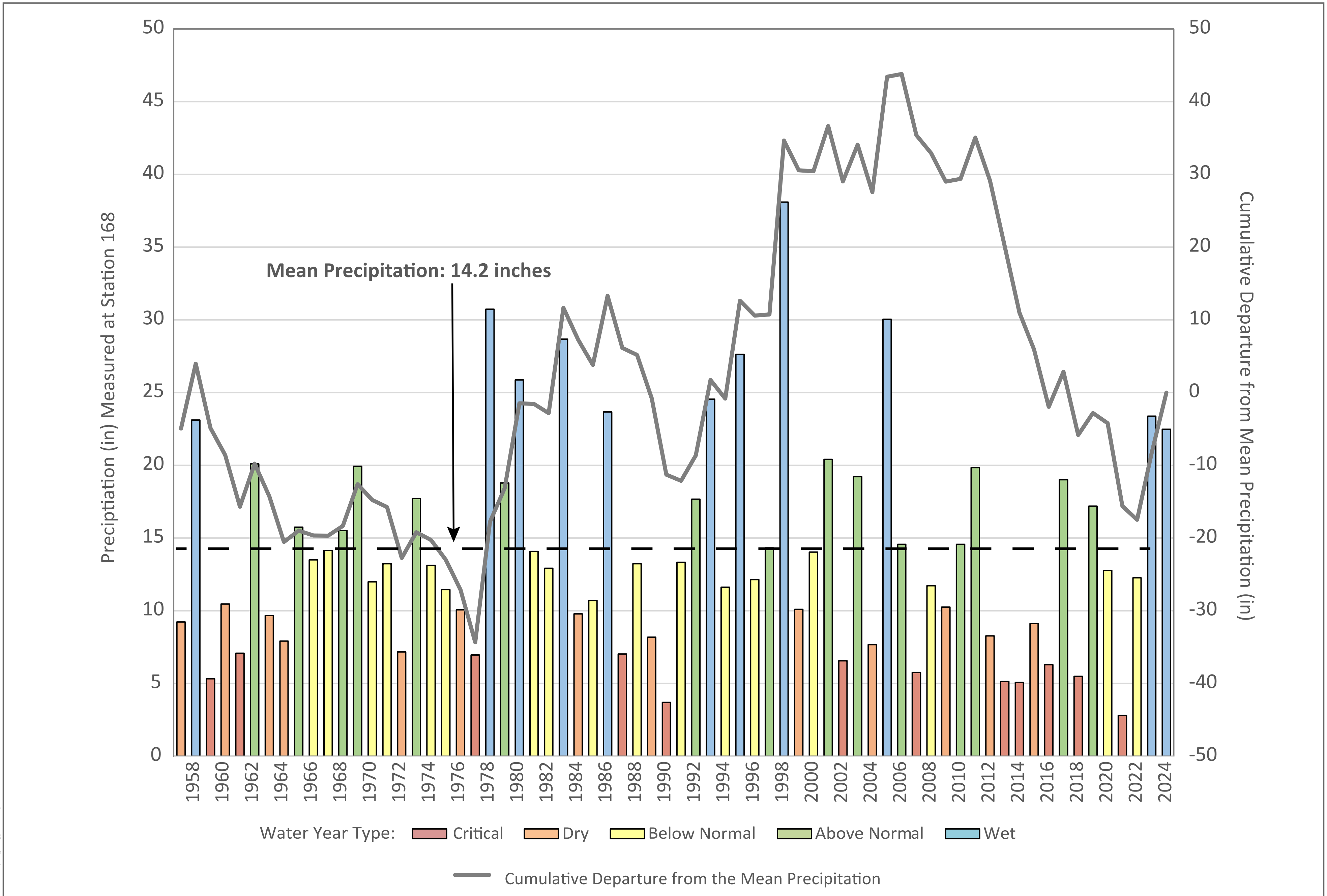

Note: Water year is from October 1 through September 30. Water year type is based on the percentage of the water year precipitation compared to the mean precipitation. Types are defined as: Wet (≥150% of mean), Above Normal (≥100% to <150% of mean), Below Normal (≥75% to <100% of mean), Dry (≥50% to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

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FIGURE 1-4
Oxnard Subbasin Historical Water Year Precipitation
Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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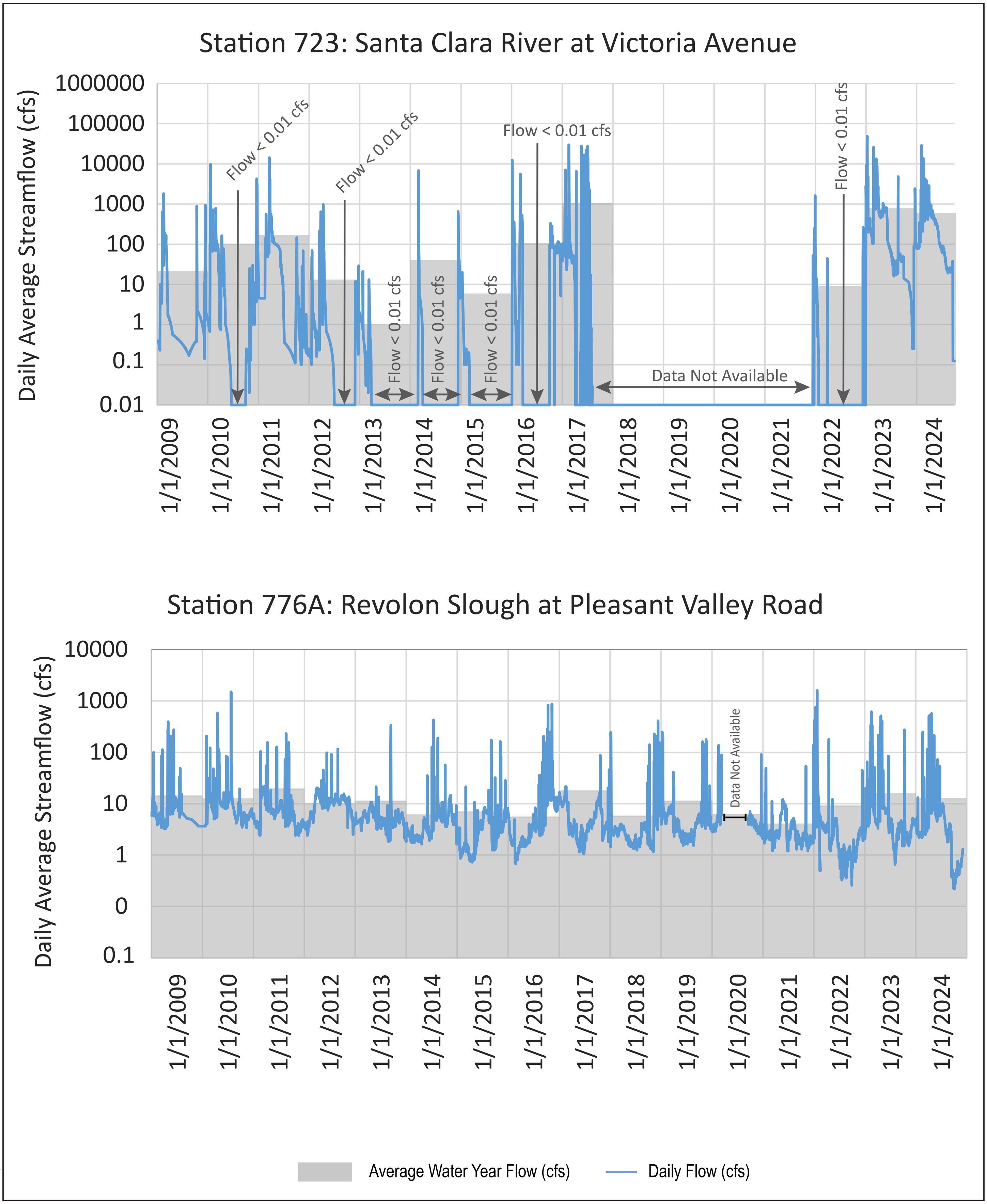

SOURCE: Ventura County Watershed Protection District (VCWPD) Hydrologic Data Server (https://www.vcwatershed.net/hydrodata/)

FIGURE 1-5

Oxnard Subbasin Stream Gauge Data

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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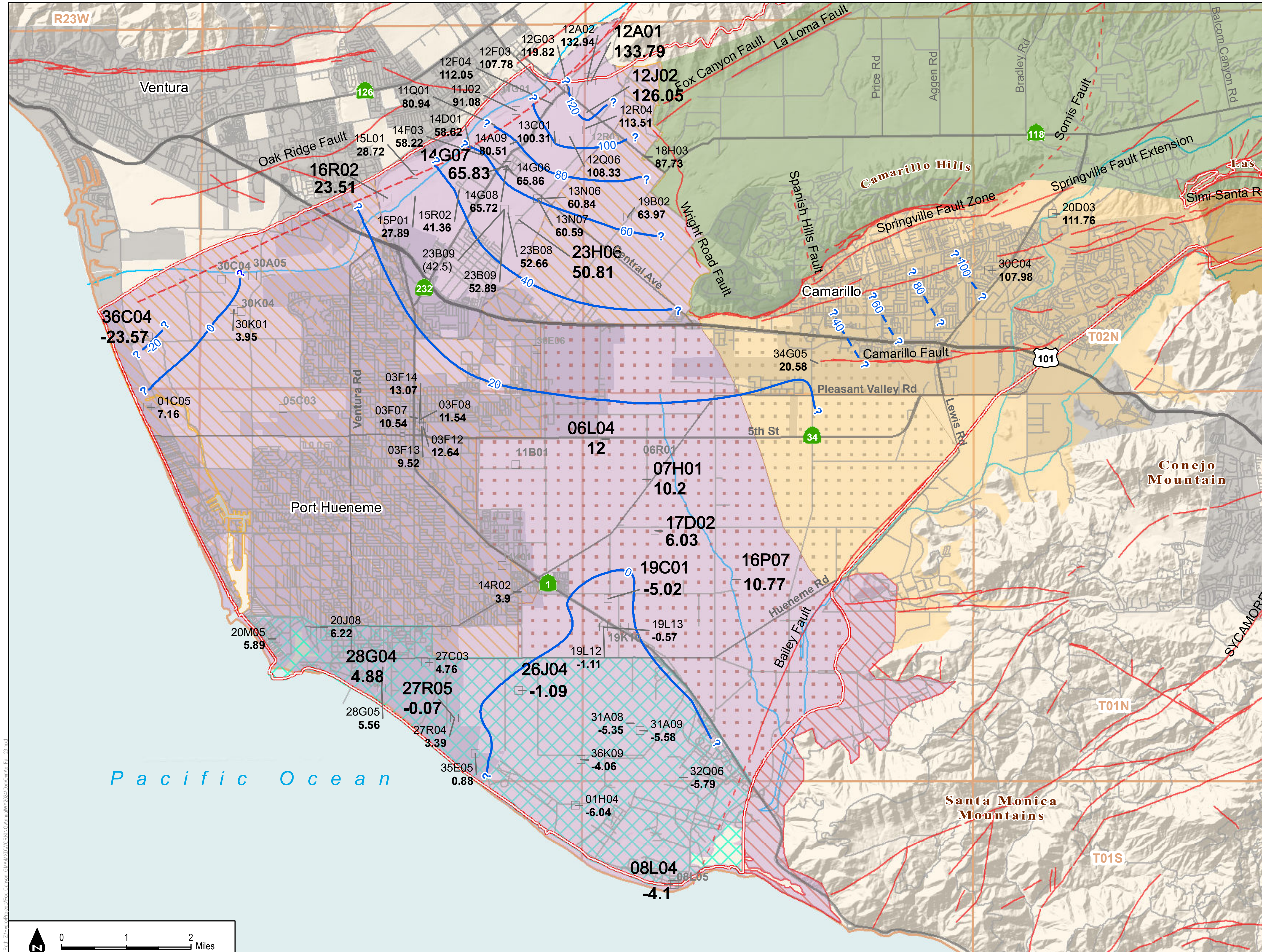

Legend

Contour of equal groundwater elevation (feet). Dashed where approximate; queried where inferred. See Note 3.

Wells screened in the Oxnard Aquifer 15P01 Abbreviated State Well Number (see notes); Large font - discussed in text

14.7 Groundwater Elevations (ft msl); Large font - discussed in text

(-14.7) Groundwater elevations not used for contouring

Fox Canyon Groundwater Management Agency Boundary

Faults (Dashed Where Inferred)

Forebay Management Area

East Oxnard Plain Management Area (EOPMA)

West Oxnard Plain Management Area (WOPMA)

Oxnard Pumping Depression Management Area

Saline Intrusion Management

Pleasant Valley Pumping Depression Management Area

Township (North-South) and Range (East-West)

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) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-1

Groundwater Elevation Contours in the Oxnard Aquifer, October 1 to October 31, 2023

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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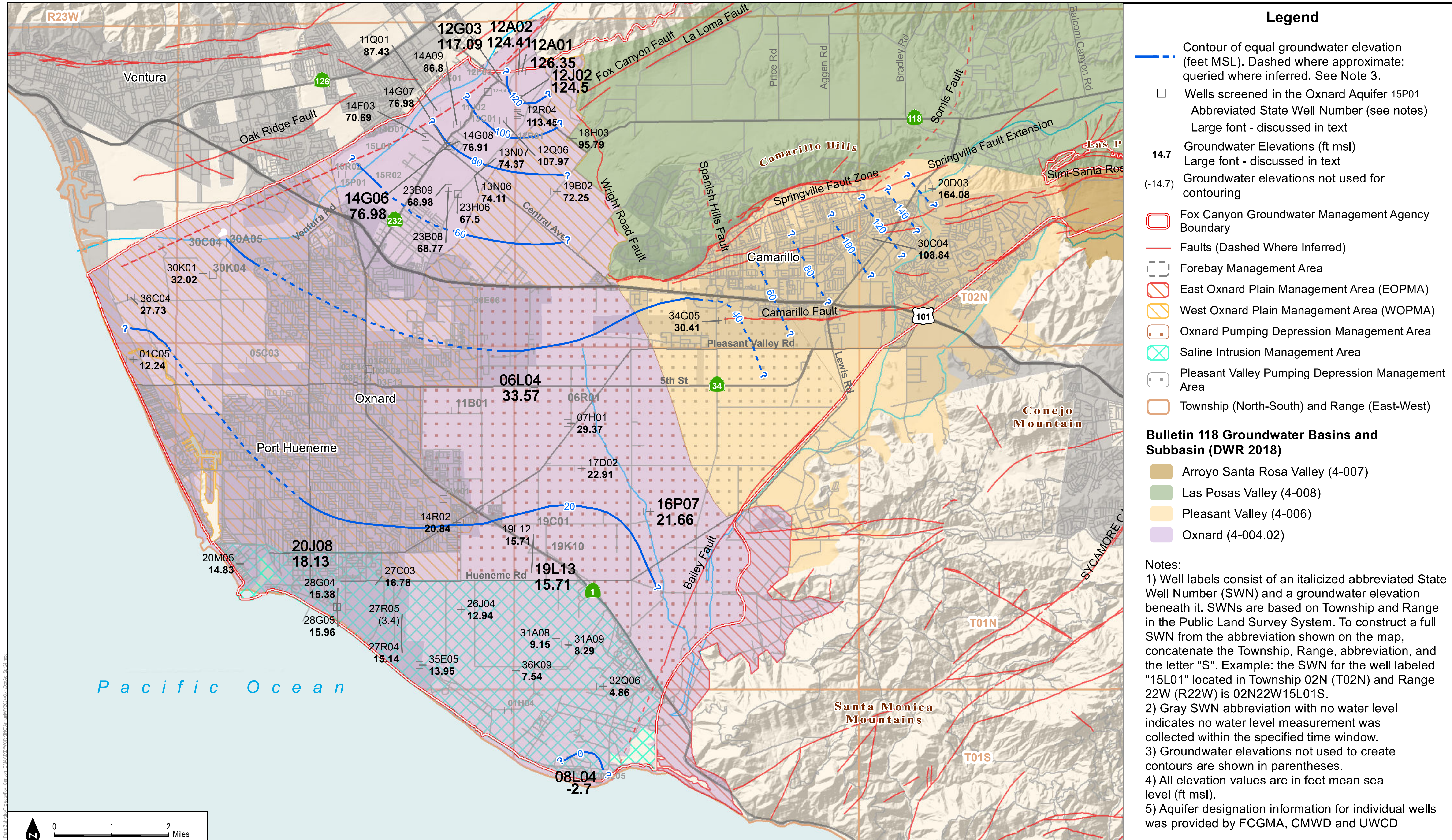
Legend
Contour of equal groundwater elevation (feet MSL). Dashed where approximate; queried where inferred. See Note 3.
Wells screened in the Oxnard Aquifer 15P01
Abbreviated State Well Number (see notes)
Large font - discussed in text
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4) All elevation values are in feet mean sea level (ft msl).
5) Aquifer designation information for individual wells was provided by FCGMA, CMWD and UWCD
Ventura
Oxnard
Port Hueneme
Camarillo
Pacific Ocean
Camarillo Hills
Conejo Mountain
Santa Monica Mountains
Oak Ridge Fault
Fox Canyon Fault
La Loma Fault
Somis Fault
Springville Fault Extension
Springville Fault Zone
Simi-Santa Rosa
Wright Road Fault
Spanish Hills Fault
Camarillo Fault
Bailey Fault
Central Ave
Ventura Rd
Pleasant Valley Rd
5th St
Hueneme Rd
Lewis Rd
Price Rd
Aggen Rd
Bradley Rd
Balcom Canyon Rd
R23W
T02N
T01N
T01S
12G03 117.09
12A02 124.41
12A01 126.35
12J02 124.5
11Q01 87.43
14A09 86.8
14G07 76.98
14F03 70.69
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14G08 76.91
13N07 74.37
12Q06 107.97
13N06 74.11
19B02 72.25
23B09 68.98
23H06 67.5
14G06 76.98
23B08 68.77
30C04
30A05
30K01 32.02
30K04
36C04 27.73
01C05 12.24
05C03
06L04 33.57
11B01
06R01
07H01 29.37
17D02 22.91
34G05 30.41
20D03 164.08
30C04 108.84
16P07 21.66
14R02 20.84
19L12 15.71
19C01
19K10
19L13 15.71
20J08 18.13
20M05 14.83
27C03 16.78
28G04 15.38
28G05 15.96
27R05 (3.4)
27R04 15.14
26J04 12.94
35E05 13.95
31A08 9.15
31A09 8.29
36K09 7.54
32Q06 4.86
01H04
08L04 -2.7
0
20
40
60
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140
0 1 2 Miles

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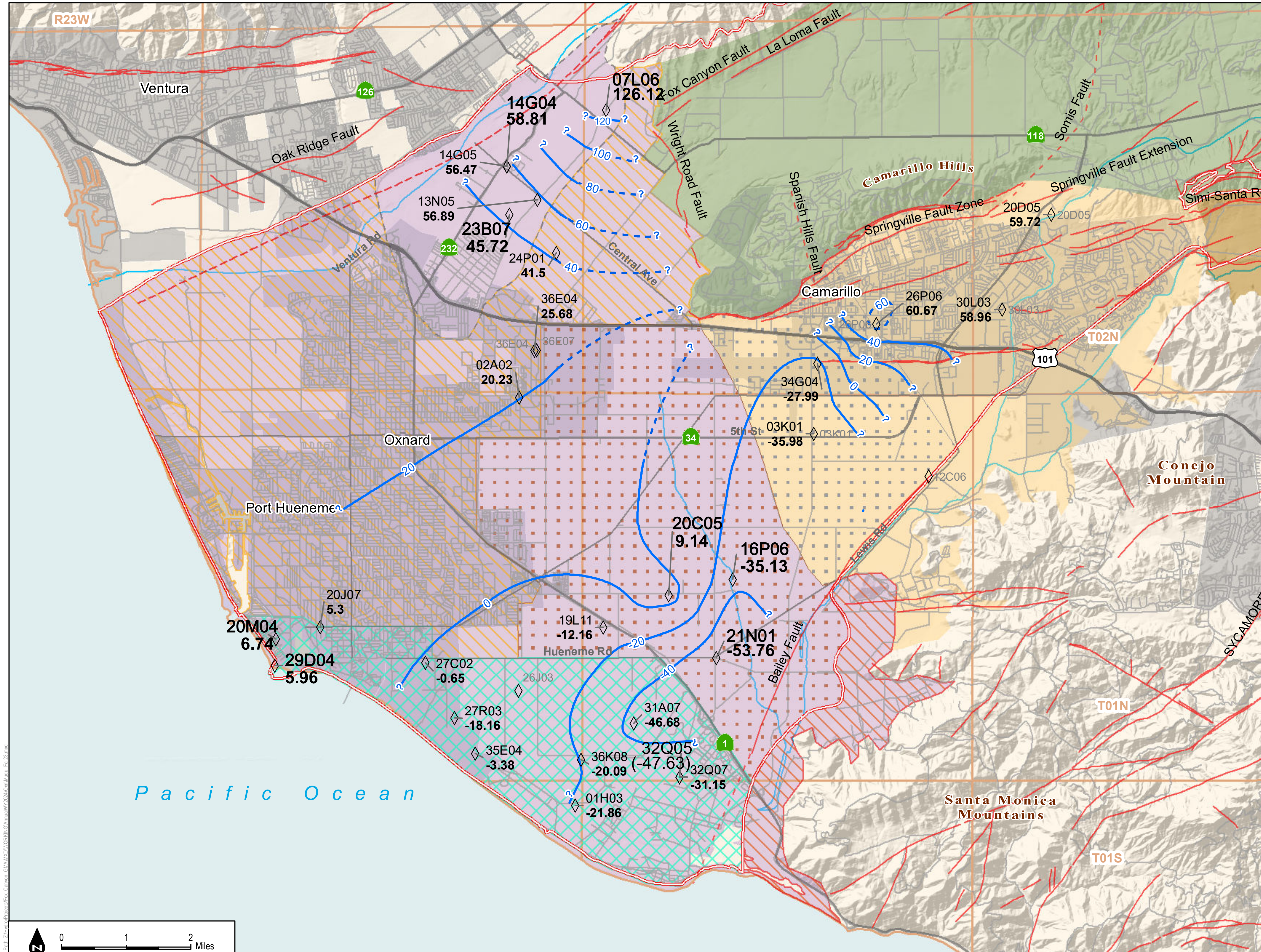

Legend

- Contour of equal groundwater elevation (feet MSL). Dashed where approximate; queried where inferred. See Note 3.
- ◊ Wells screened in the Mugu Aquifer
- 15P01 Abbreviated State Well Number (see notes) Large font - discussed in text
- **14.7** Groundwater elevation (feet msl) Large font - discussed in text
- (14.7) Groundwater elevation not used to create contours
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Bulletin 118 Groundwater Basins and Subbasin (DWR 2018)

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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) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-3

Groundwater Elevation Contours in the Mugu Aquifer, October 1 to October 31, 2023

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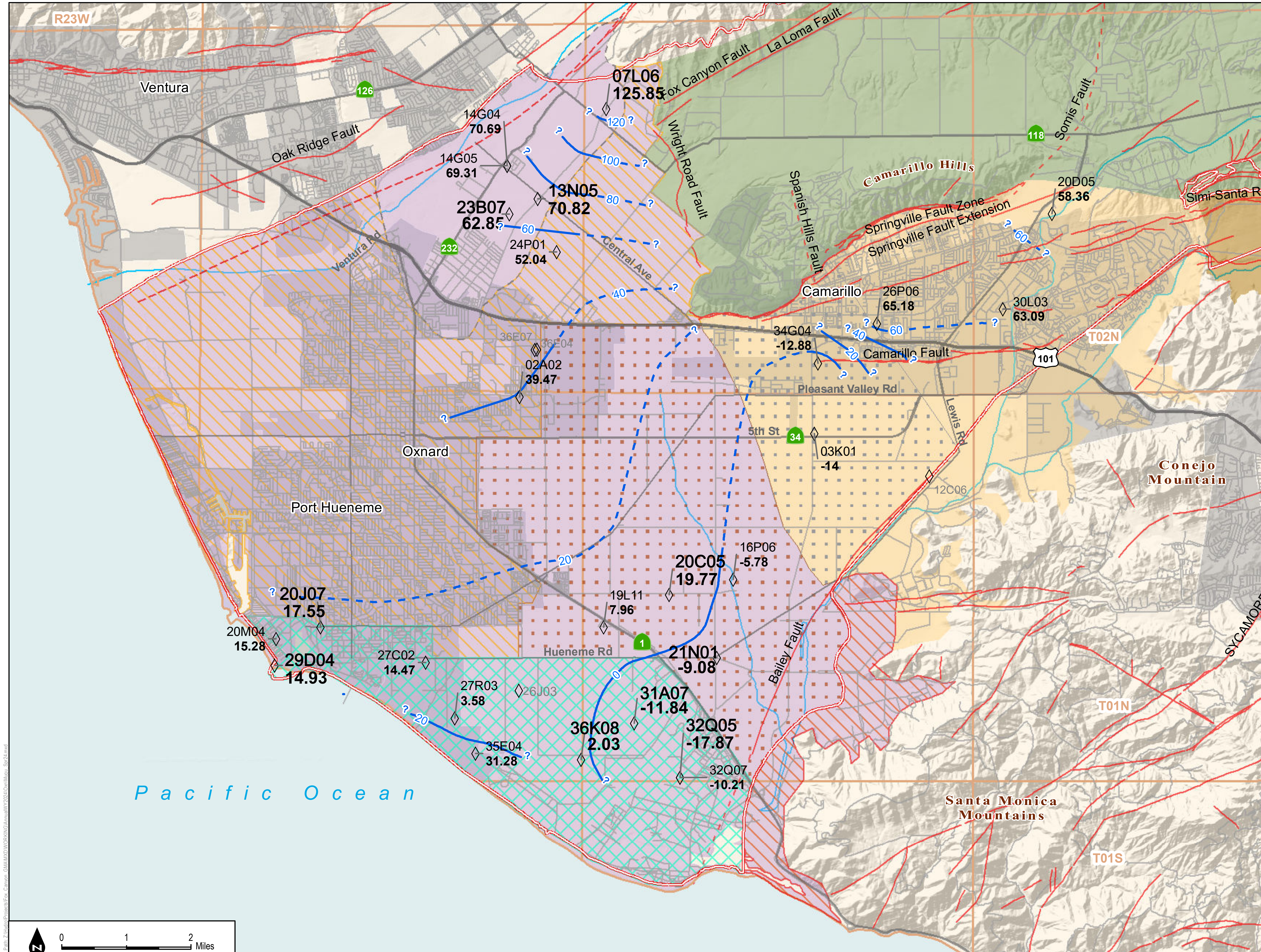

Legend

Contour of equal groundwater elevation (feet MSL). Dashed where approximate; queried where inferred. See Note 3.

◊ Wells screened in the Mugu Aquifer

15P01 Abbreviated State Well Number (see notes)
Large font - discussed in text

14.7 Groundwater Elevation (ft MSL)
Large font - discussed in text

Faults (Dashed Where Inferred)

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2) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-4

Groundwater Elevation Contours in the Mugu Aquifer, March 1 to March 31, 2024

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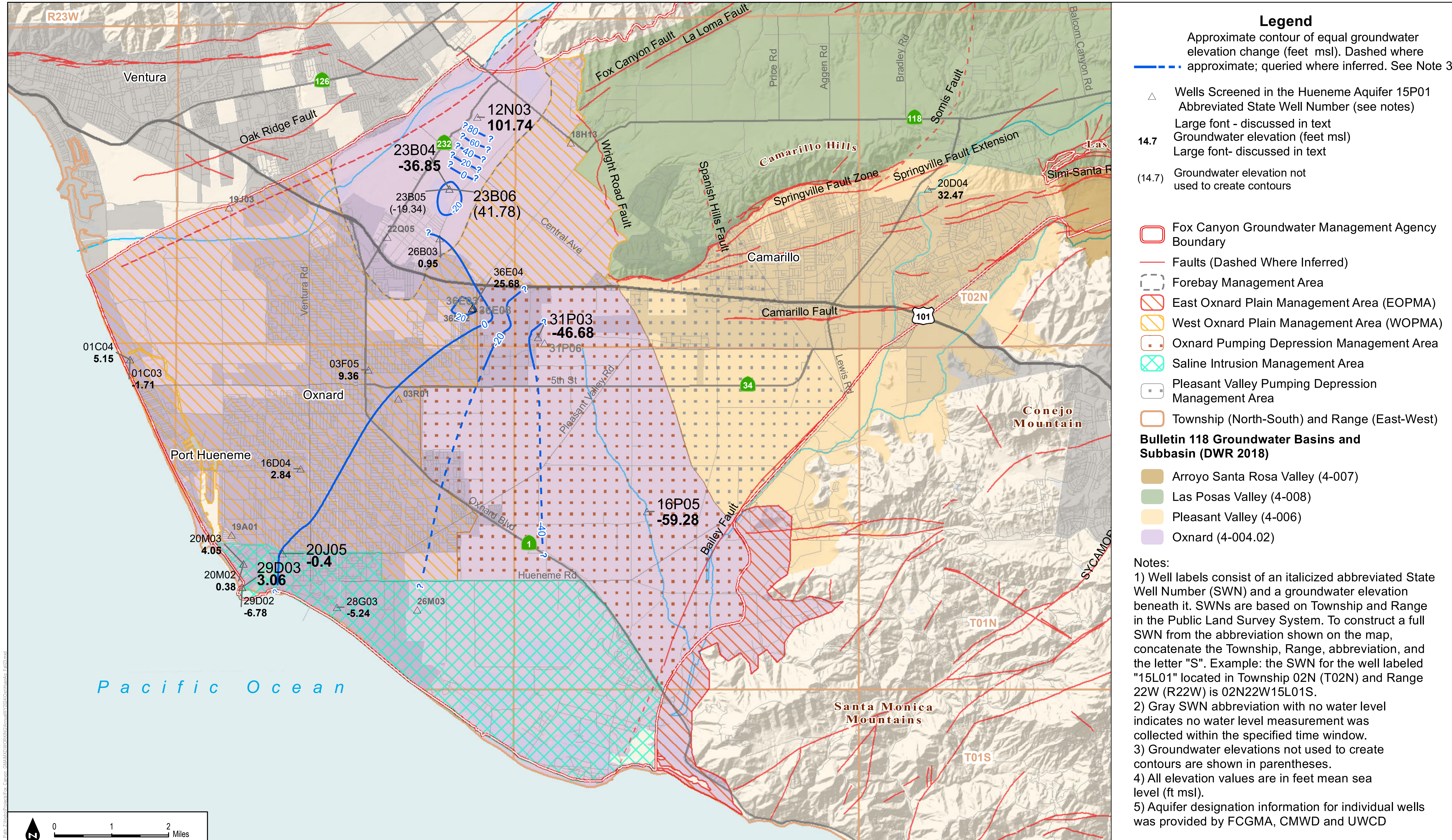

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-5

Groundwater Elevation Contours in the Hueneme Aquifer, October 1 to October 31, 2023

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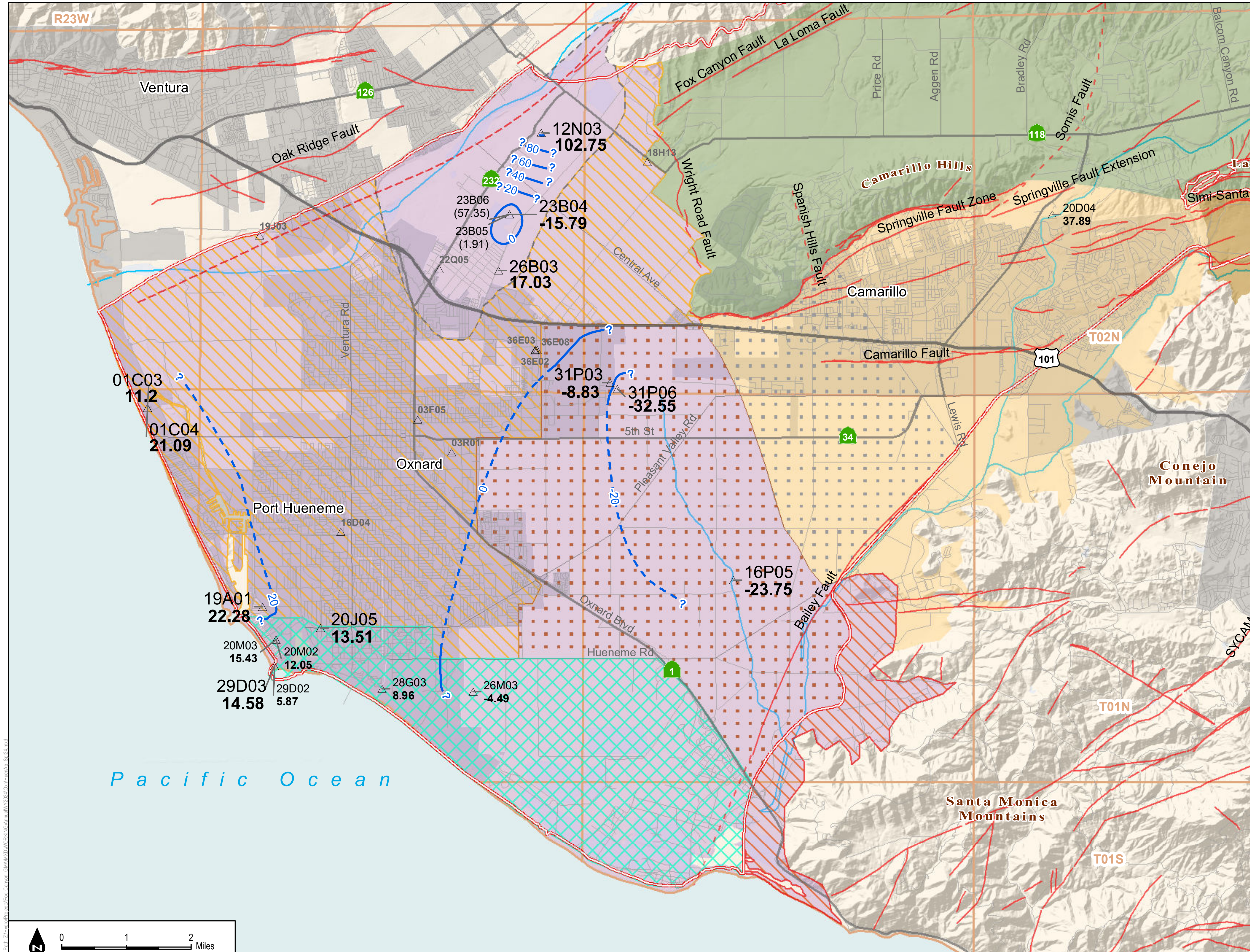

Legend

- Contour of equal groundwater elevation (feet MSL). Dashed where approximate; queried where inferred. See Note 3.
- △ Wells Screened in the Hueneme Aquifer
- 15P01 Abbreviated State Well Number (see notes) Large font - discussed in text
- 14.7 Groundwater elevation (feet msl) Large font - discussed in text
- (14.7) Groundwater elevation not used to create contours
- Fox Canyon Groundwater Management Agency Boundary
- Faults (Dashed Where Inferred)
- Forebay Management Area
- East Oxnard Plain Management Area (EOPMA)
- West Oxnard Plain Management Area (WOPMA)
- Oxnard Pumping Depression Management Area
- Saline Intrusion Management
- Pleasant Valley Pumping Depression Management Area
- Township (North-South) and Range (East-West)

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) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-6

Groundwater Elevation in the Hueneme Aquifer, March 1 to March 31, 2024

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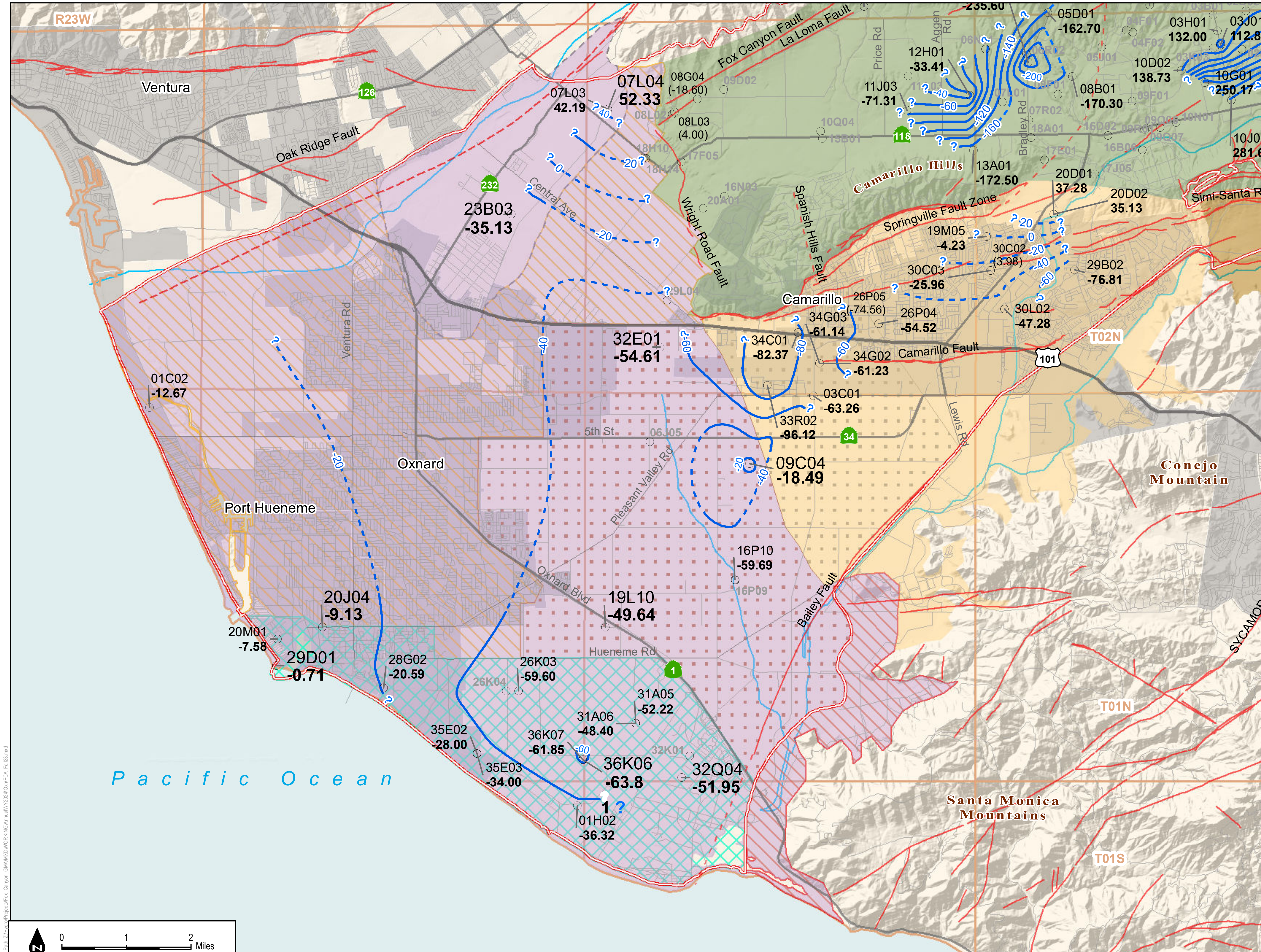

Legend

- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
- Wells Screened in the Fox Canyon Aquifer
- 19M05 — Abbreviated State Well Number (see notes). Large font - discussed in text
- -19.20 — Groundwater elevation (feet MSL). Large font - discussed in text
- (-14.71) — Groundwater elevation not used to generate contours
- Fox Canyon Groundwater Management Agency Boundary
- Faults (Dashed Where Inferred)
- Forebay Management Area
- East Oxnard Plain Management Area (EOPMA)
- West Oxnard Plain Management Area (WOPMA)
- Oxnard Pumping Depression Management Area
- Saline Intrusion Management Area
- Pleasant Valley Pumping Depression Management Area
- 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) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-7

Groundwater Elevation Contours in the Fox Canyon Aquifer, October 1 to October 31, 2023

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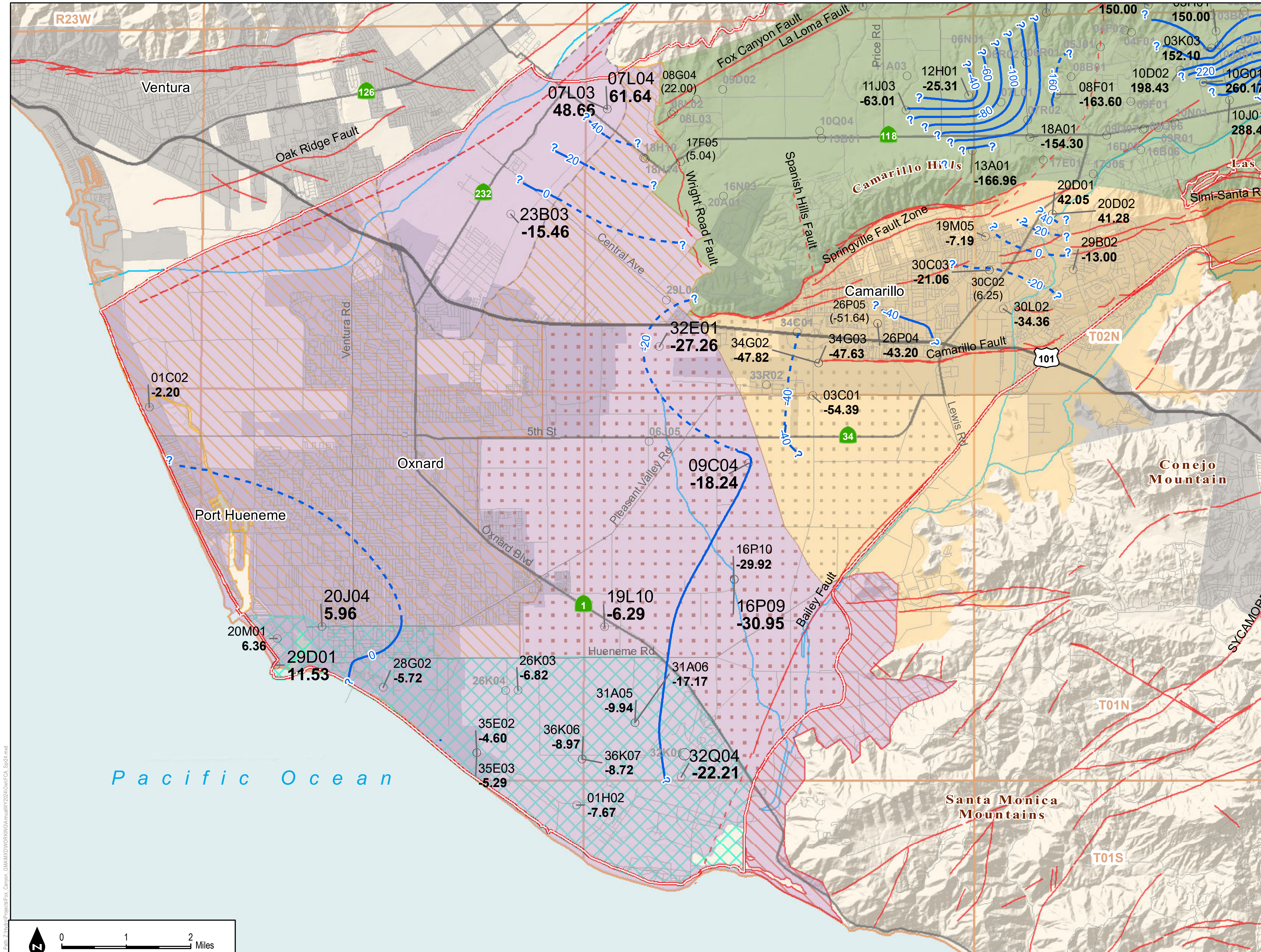

Legend

- Approximate contour of equal elevation (feet msl) of groundwater. Dashed where approximate; queried where inferred.
- Wells Screened in the Fox Canyon Aquifer
- 19M05 — Abbreviated State Well Number (see notes); Large font - discussed in text
- -19.20 — Groundwater elevation (feet MSL); Large font - discussed in text
- (-14.71) — Groundwater elevation not used to generate contours
- Fox Canyon Groundwater Management Agency Boundary
- Faults (Dashed Where Inferred)
- Forebay Management Area
- East Oxnard Plain Management Area (EOPMA)
- West Oxnard Plain Management Area (WOPMA)
- Oxnard Pumping Depression Management Area
- Saline Intrusion Management Area
- Pleasant Valley Pumping Depression Management Area
- Township (North-South) and Range (East-West)

Revised Bulletin 118 Groundwater Basins and Subbasins (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) Gray SWN abbreviation with no water level 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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-8

Groundwater Elevation Contours in the Fox Canyon Aquifer, March 1 to March 31, 2024

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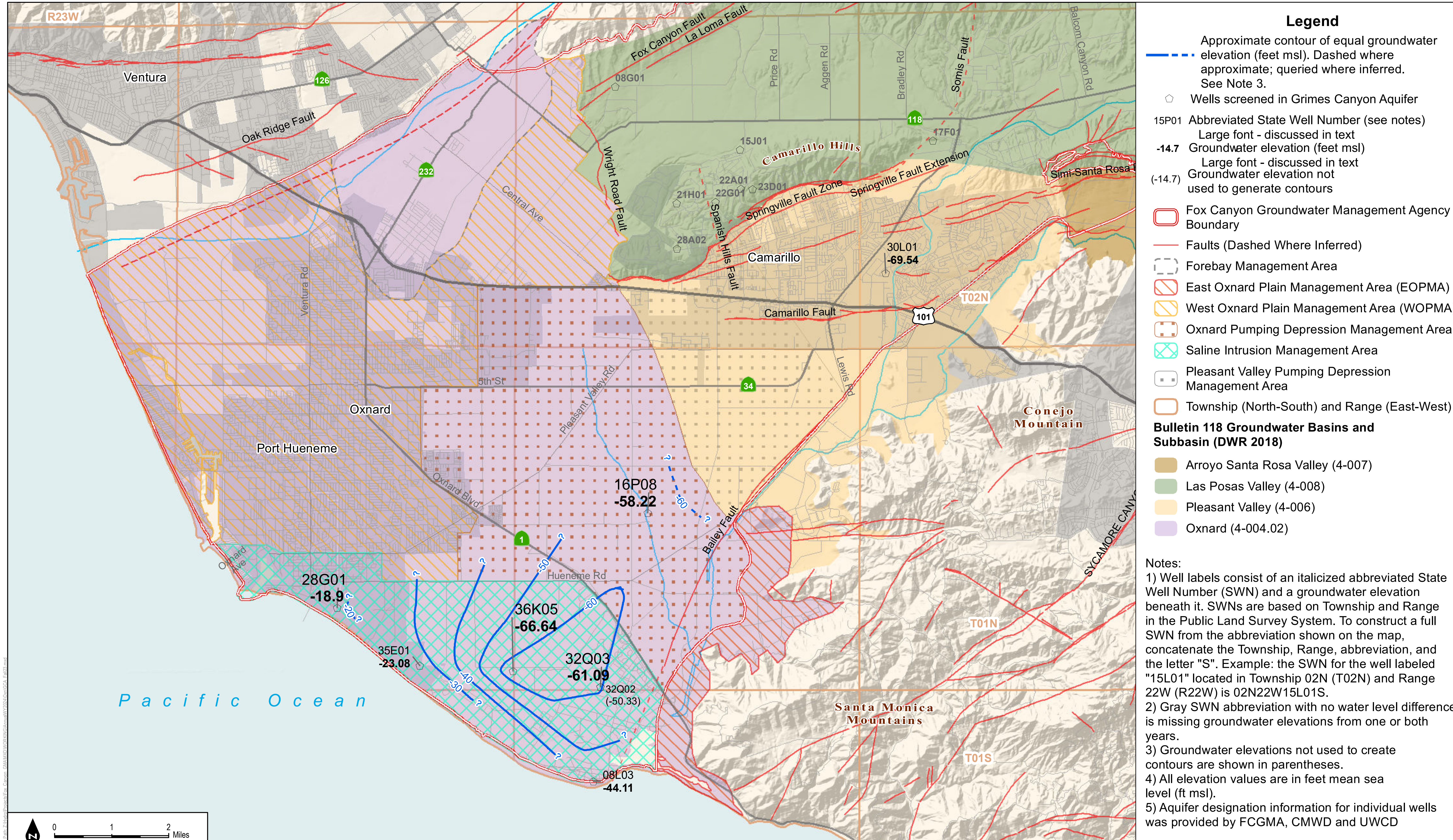

Notes:
1) Well labels consist of an italicized abbreviated State Well Number (SWN) and a groundwater elevation beneath it. SWNs are based on Township and Range in the Public Land Survey System. To construct a full SWN from the abbreviation shown on the map, concatenate the Township, Range, abbreviation, and the letter "S". Example: the SWN for the well labeled "15L01" located in Township 02N (T02N) and Range 22W (R22W) is 02N22W15L01S.
2) Gray SWN abbreviation with no water level difference is missing groundwater elevations from one or both years.
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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-9

Groundwater Elevation Contours in the Grimes Canyon Aquifer, October 1 to October 31, 2023

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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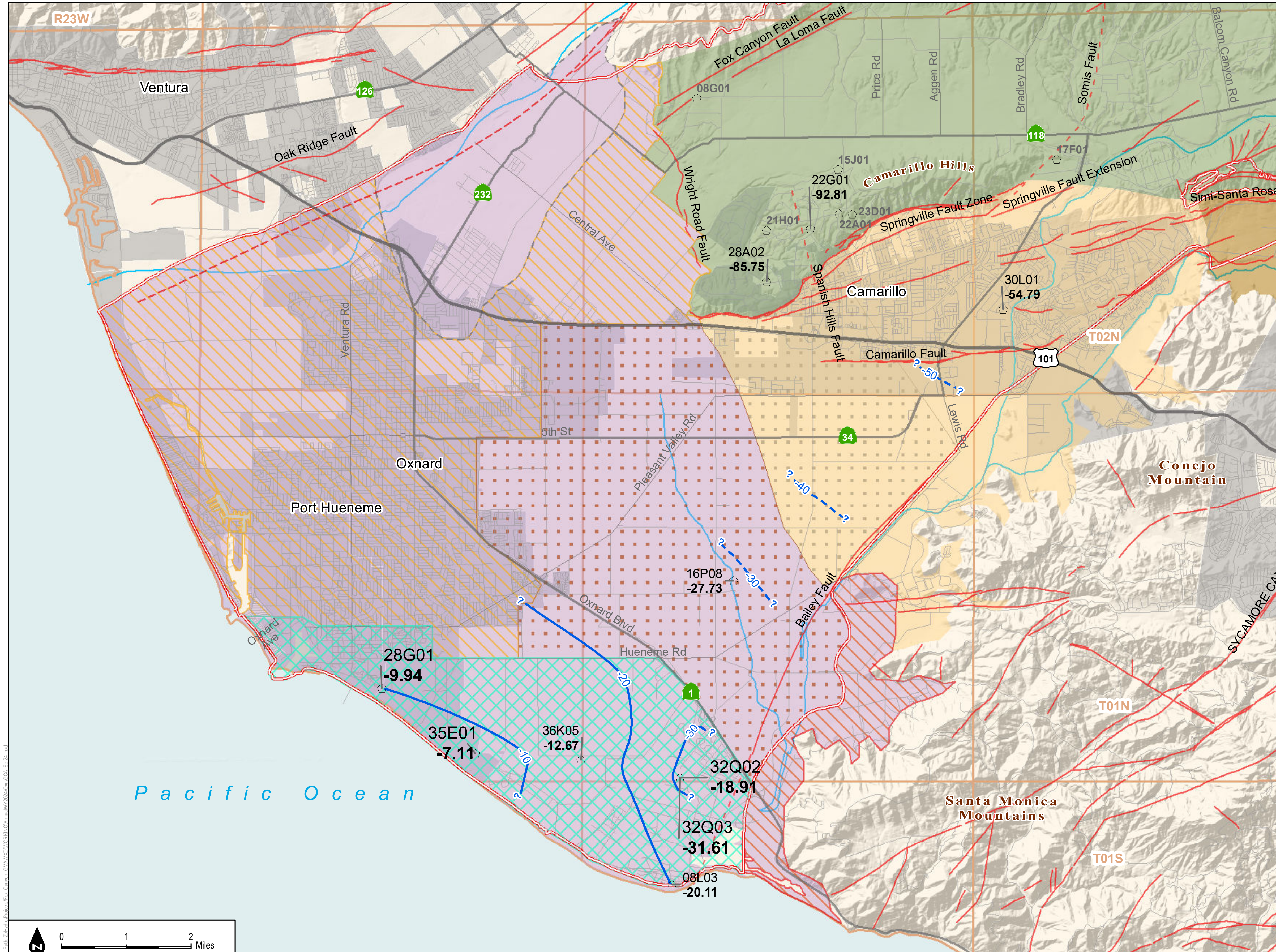

Legend

- Approximate contour of equal groundwater elevation (feet msl). Dashed where approximate; queried where inferred. See Note 3.
- Wells screened in Grimes Canyon Aquifer
- 15P01 Abbreviated State Well Number (see notes) Large font - discussed in text
- 14.7 Groundwater elevation (feet msl) Large font - discussed in text
- Fox Canyon Groundwater Management Agency Boundary
- Faults (Dashed Where Inferred)
- Forebay Management Area
- East Oxnard Plain Management Area (EOPMA)
- West Oxnard Plain Management Area (WOPMA)
- Oxnard Pumping Depression Management Area
- Saline Intrusion Management
- Pleasant Valley Pumping Depression Management Area
- Township (North-South) and Range (East-

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) Gray SWN abbreviation with no water level difference is missing groundwater elevations from one or both years.
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

DUDEK

SOURCE: DWR; Ventura County; UWCD; CMWD

FIGURE 2-10

Groundwater Elevation Contours for the Grimes Canyon Aquifer, March 1 to March 31, 2024

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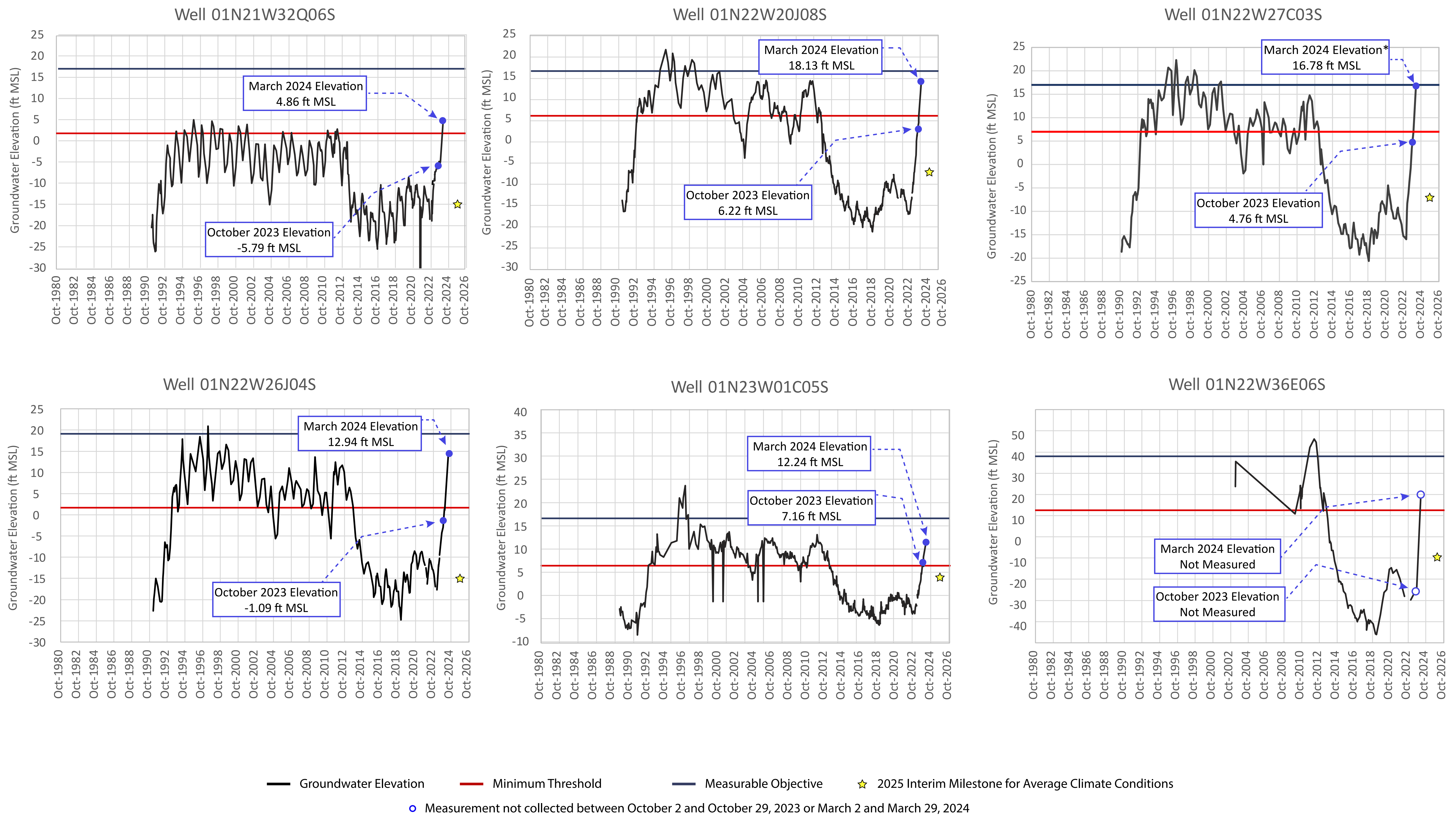

*Value differs from what was presented in the Oxnard Subbasin GSP: First Periodic Evaluation. The reported groundwater elevation has been updated based on receipt of additional data from UWCD.

SOURCE: UWCD, VCWPD

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FIGURE 2-11

Groundwater Elevation Hydrographs for Representative Monitoring Points in the Oxnard Aquifer

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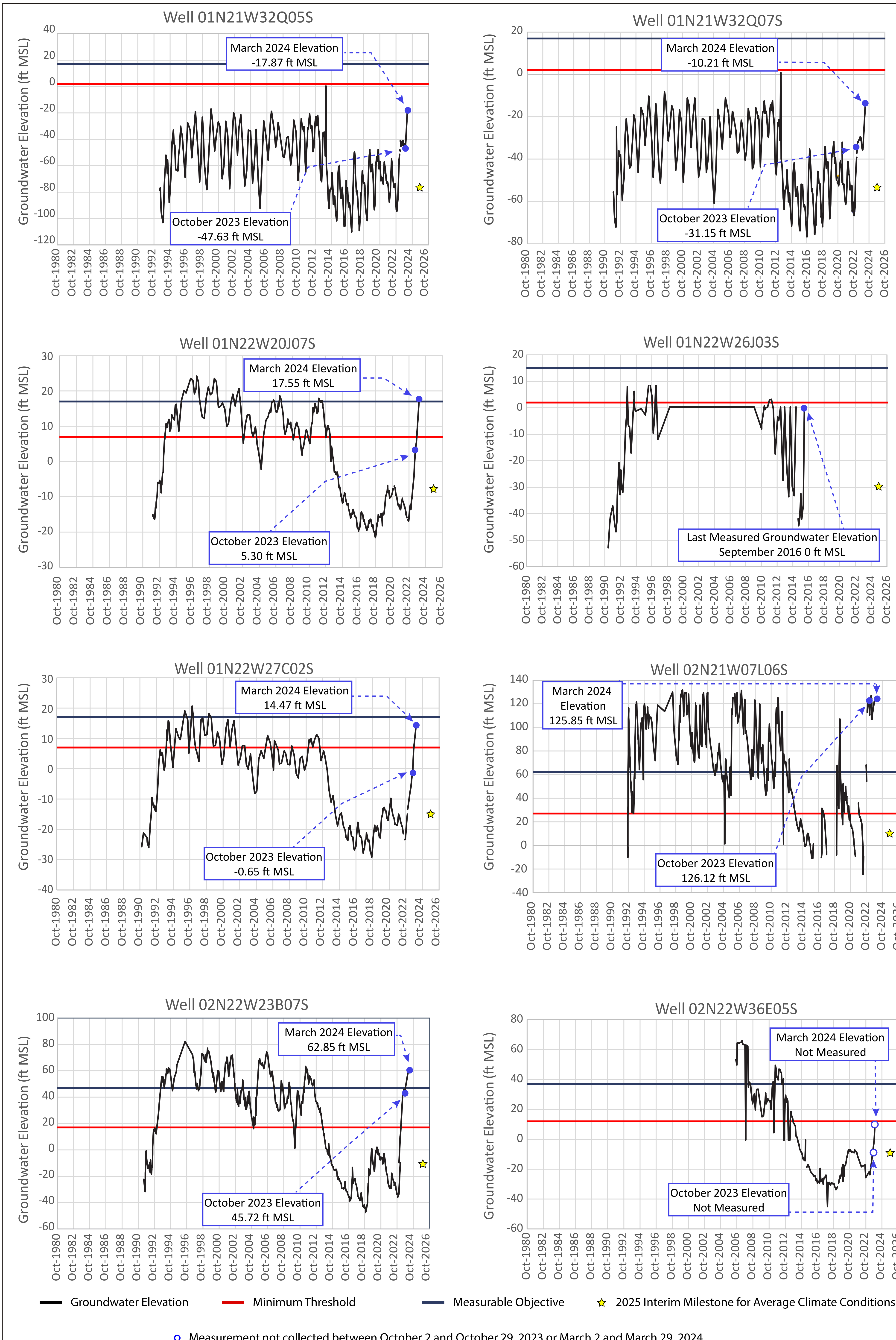

SOURCE: UWCD, VCWPD

FIGURE 2-12

Groundwater Elevation Hydrographs for Representative Monitoring Points in the Mugu Aquifer

Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report

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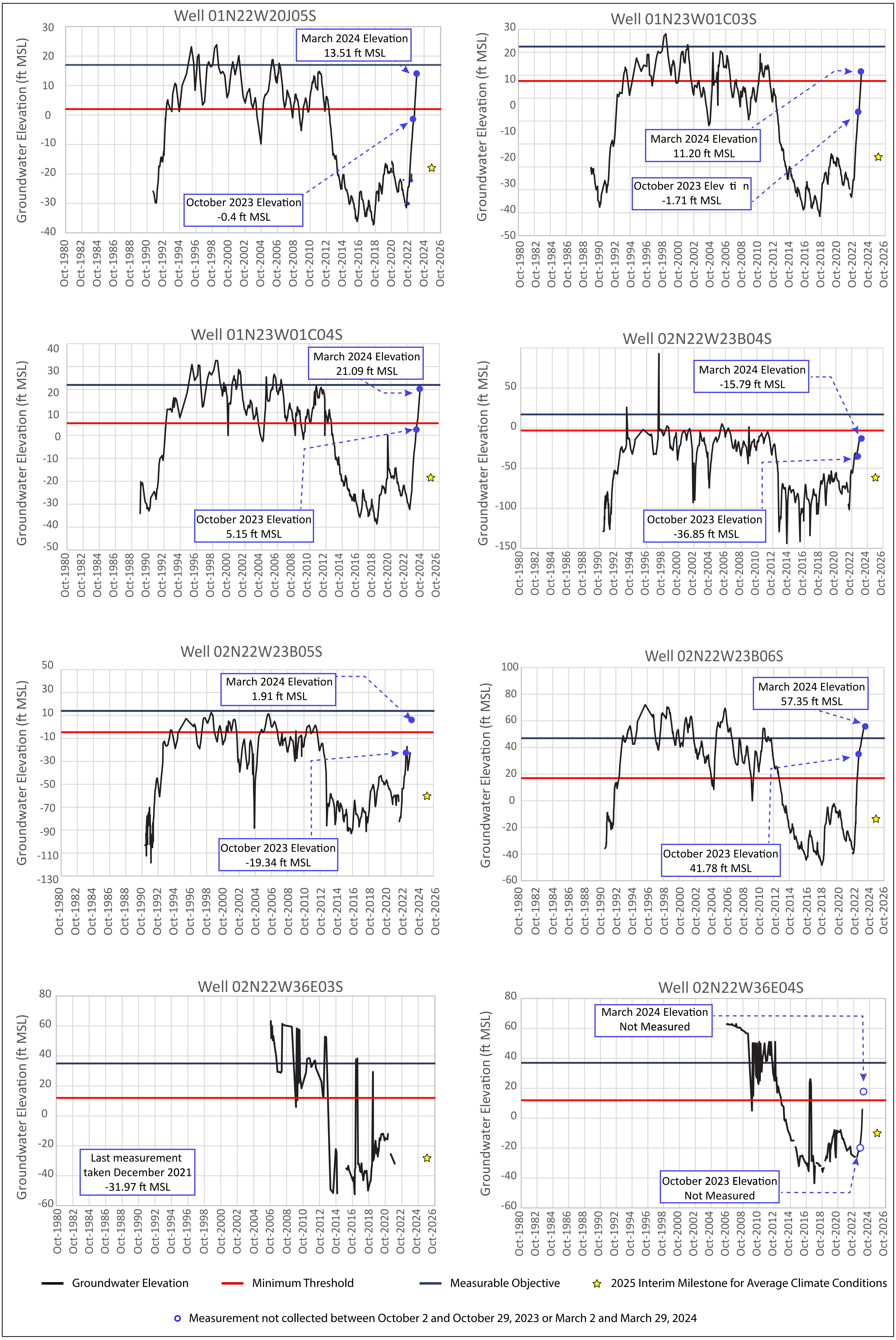

SOURCE: UWCD, VCWPD

FIGURE 2-13

Groundwater Elevation Hydrographs for Representative Monitoring Points in the Hueneme Aquifer

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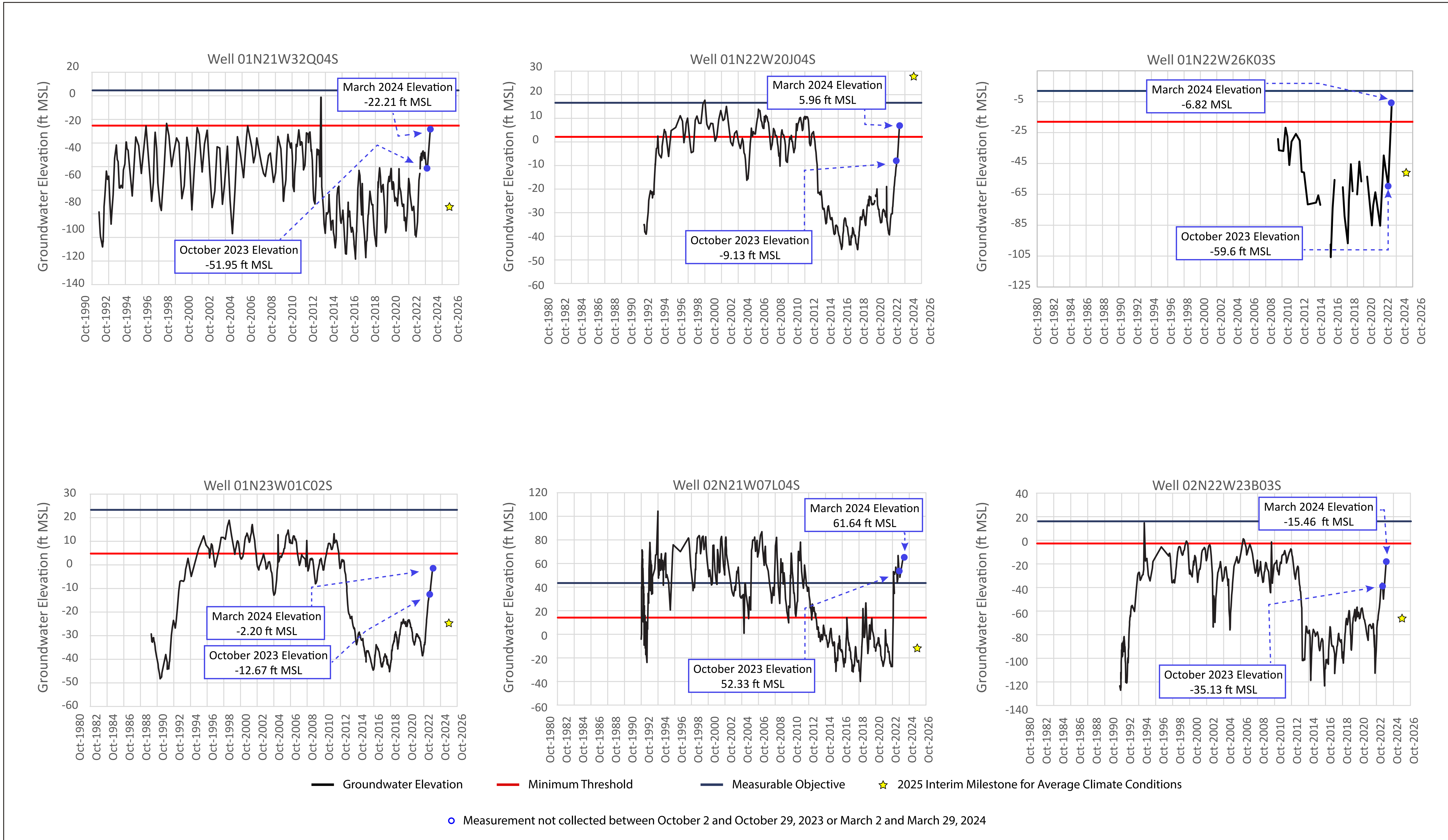

SOURCE: UWCD, VCWPD

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FIGURE 2-14

Groundwater Elevation Hydrographs for Representative Monitoring Points in the Fox Canyon Aquifer

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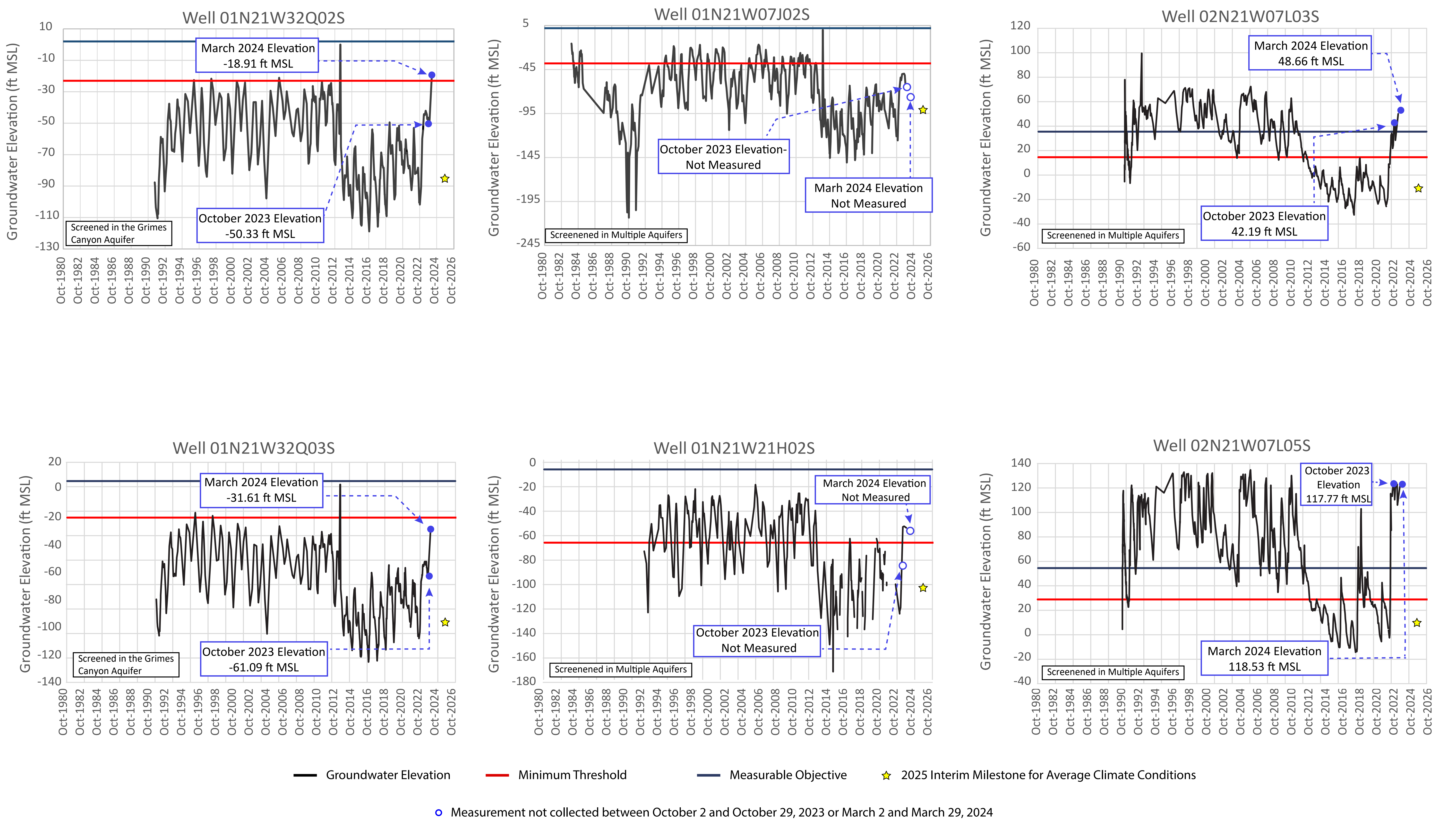

SOURCE: UWCD, VCWPD

FIGURE 2-15

Groundwater Elevation Hydrographs for Representative Monitoring Points in the Grimes Canyon Aquifer

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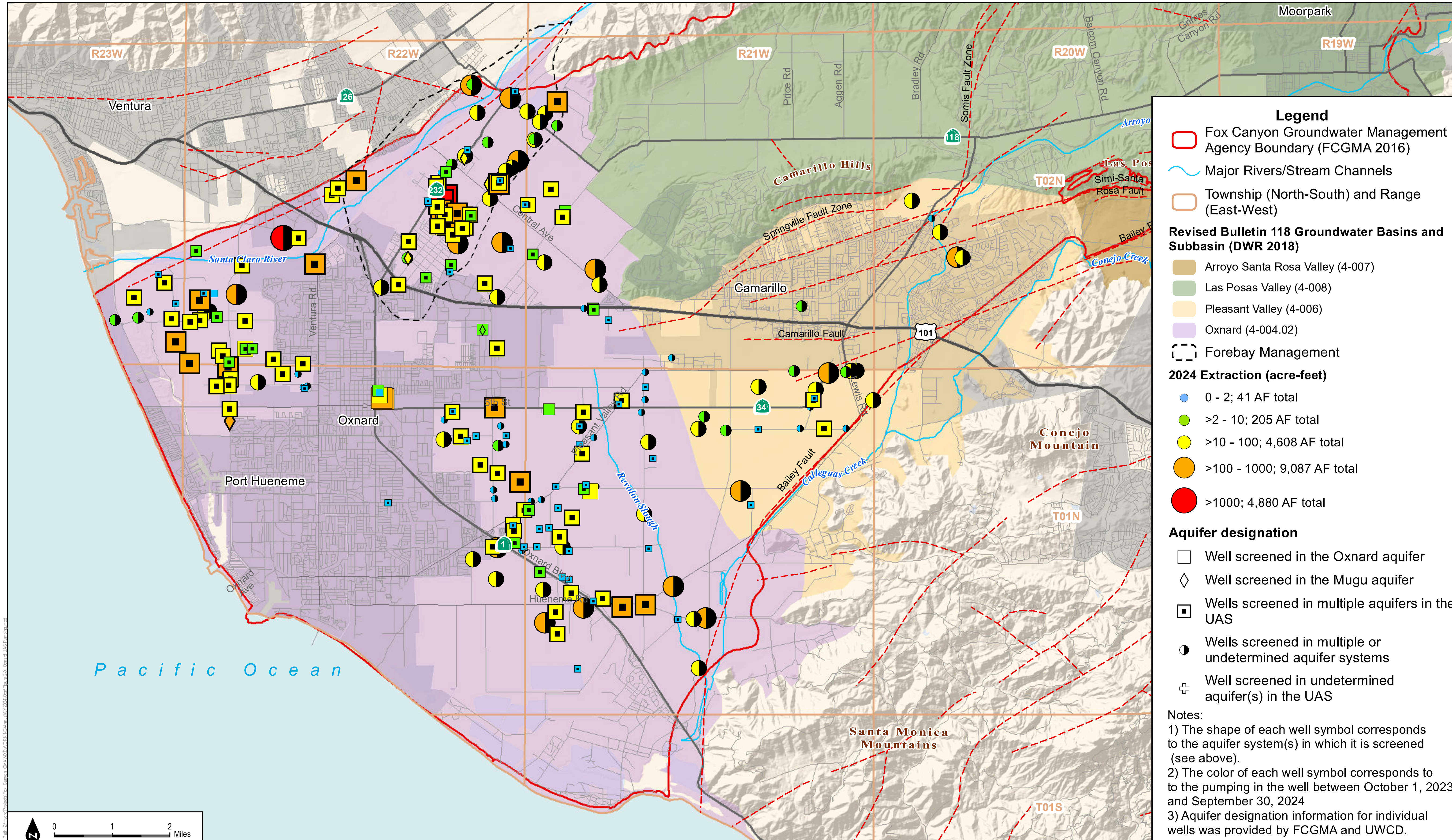

SOURCE: DWR, FCGMA, VCWPD, UWCD

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FIGURE 2-16
Groundwater Production from the UAS between October 1, 2023 and September 30, 2024

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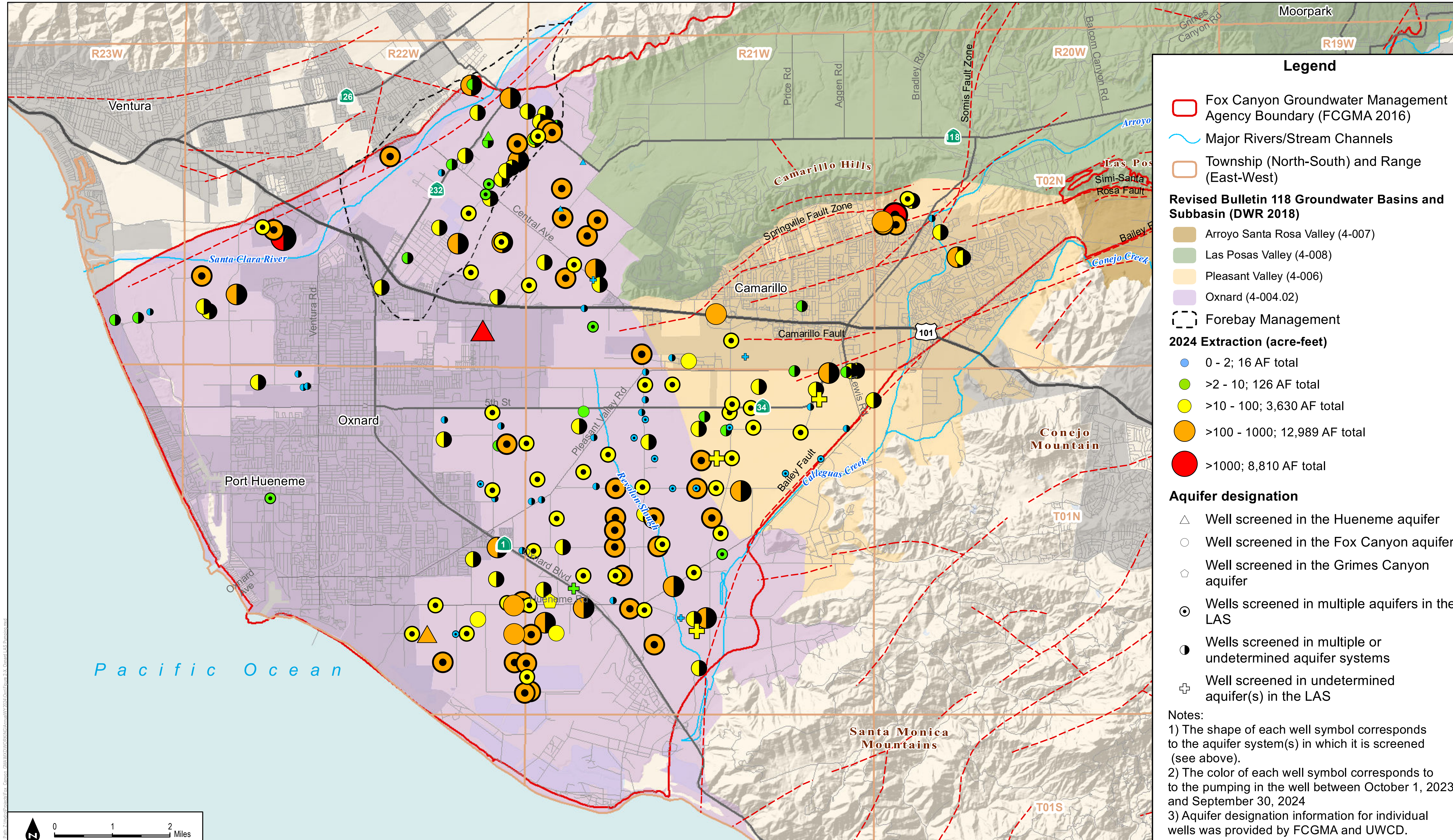

SOURCE: DWR, FCGMA, VCWPD, UWCD

FIGURE 2-17
Groundwater Production from the LAS between October 1, 2023 and September 30, 2024

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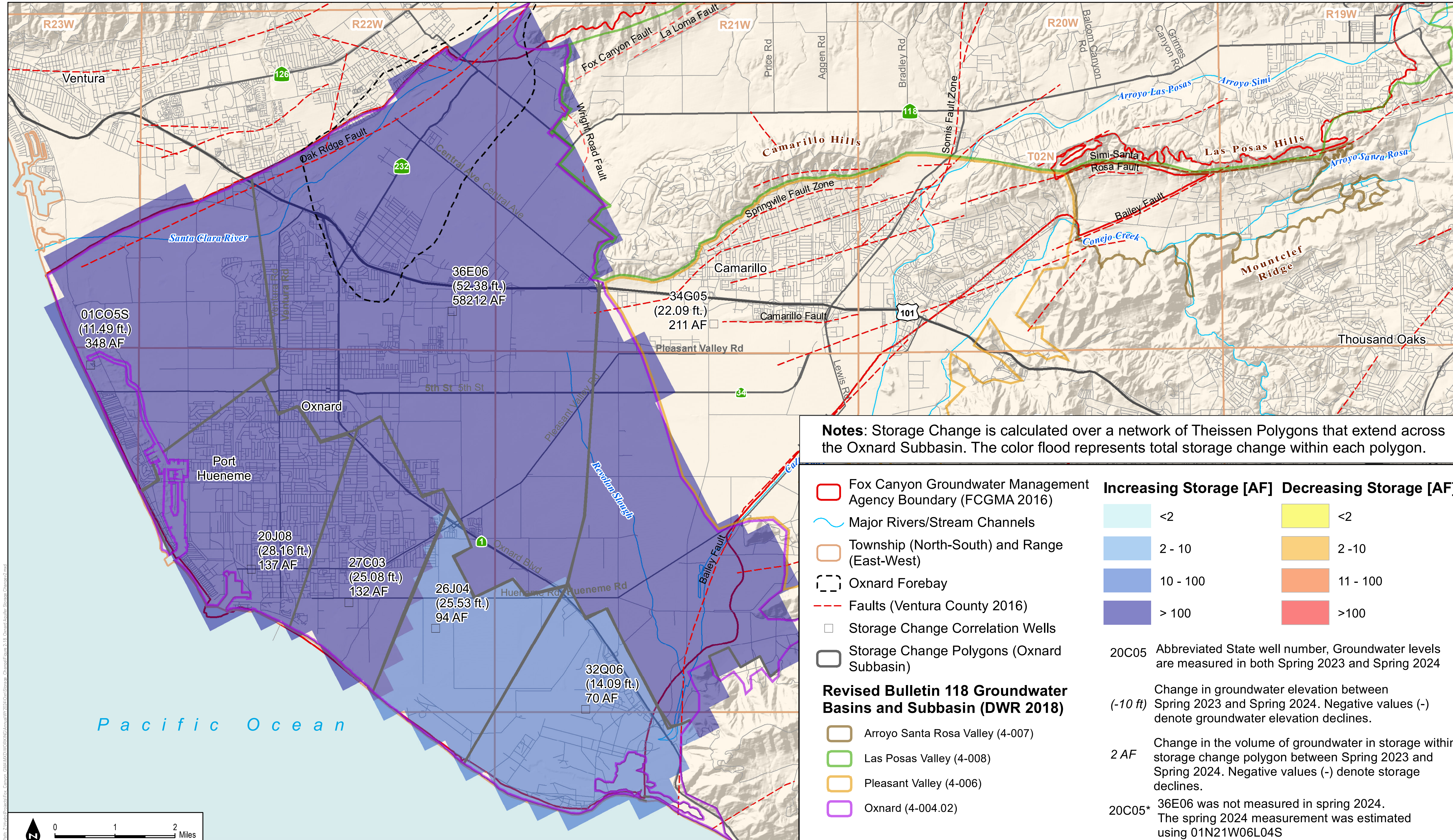

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SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

FIGURE 2-18

Change in Storage in the Oxnard Aquifer: Spring 2023 to Spring 2024

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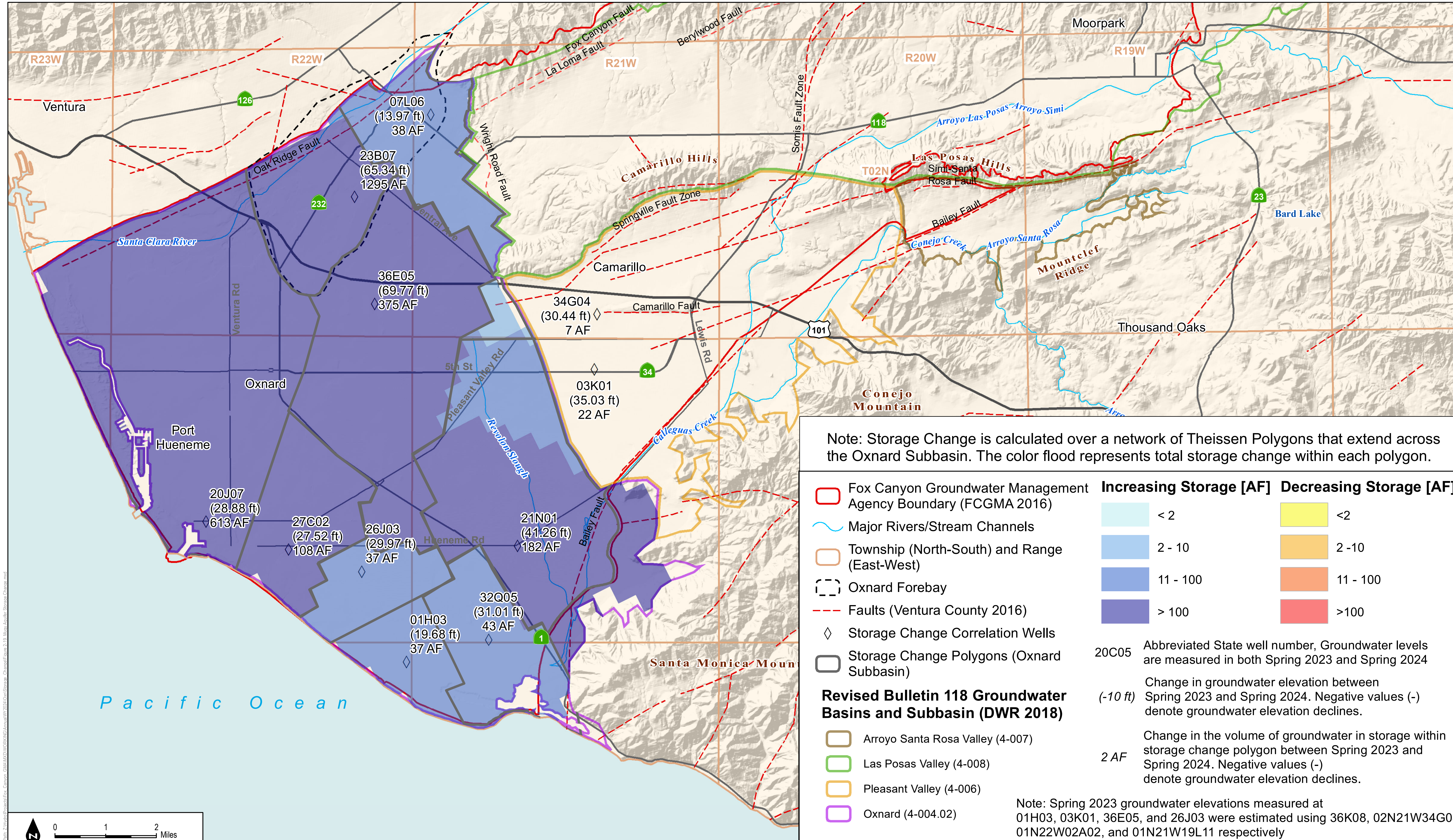

SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

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FIGURE 2-19

Change in Storage in the Mugu Aquifer: Spring 2023 to Spring 2024

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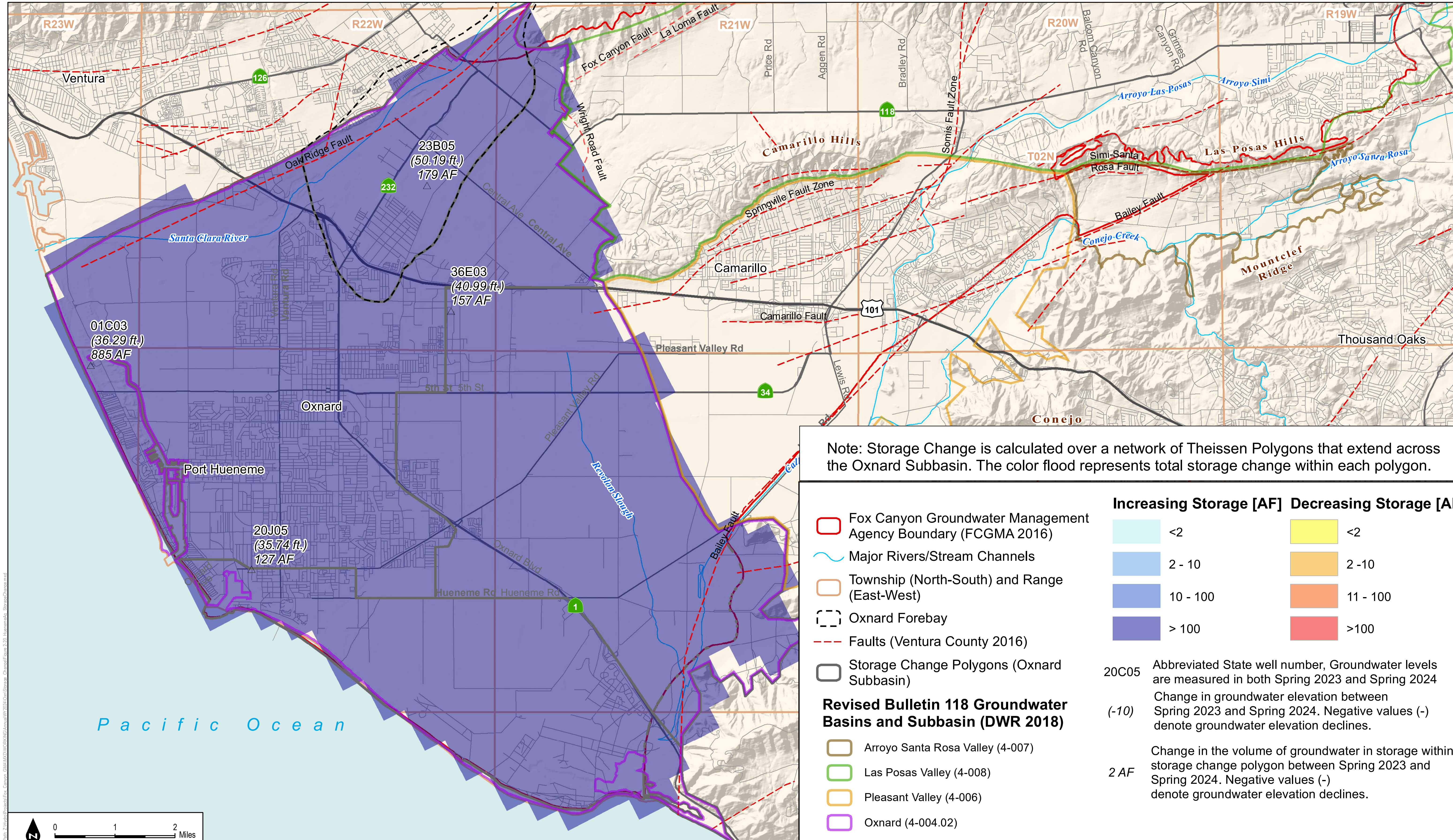

DUDEK

SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

FIGURE 2-20

Change in Storage in the Hueneme Aquifer: Spring 2023 to Spring 2024

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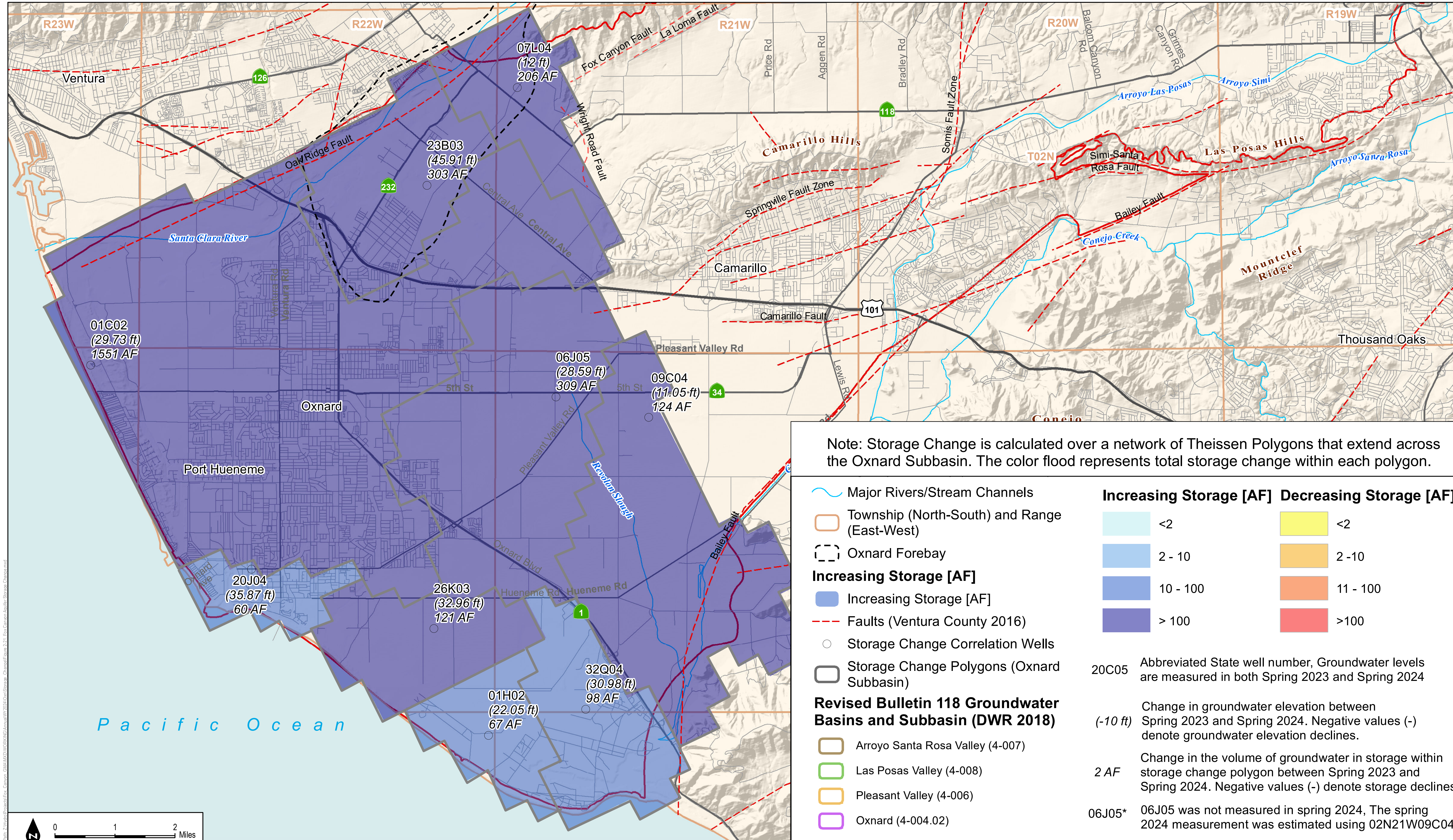

DUDEK

SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

FIGURE 2-21

Change in Storage in the Fox Canyon Aquifer: Spring 2023 to Spring 2024

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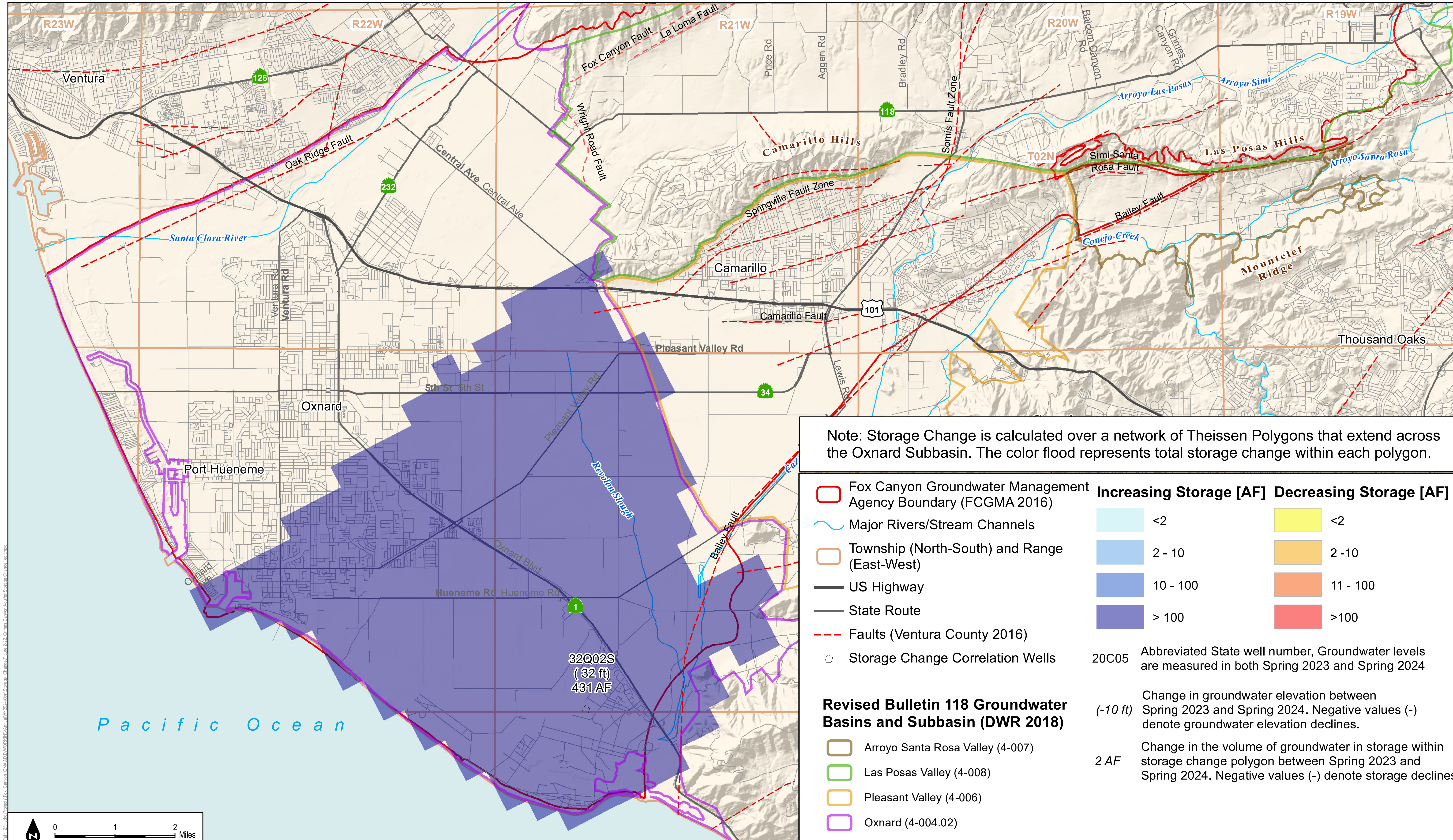

DUDEK

SOURCE: DWR, FCGMA, VCWPD, CMWD, UWCD

FIGURE 2-22

Change in Storage in the Grimes Canyon Aquifer: Spring 2023 to Spring 2024

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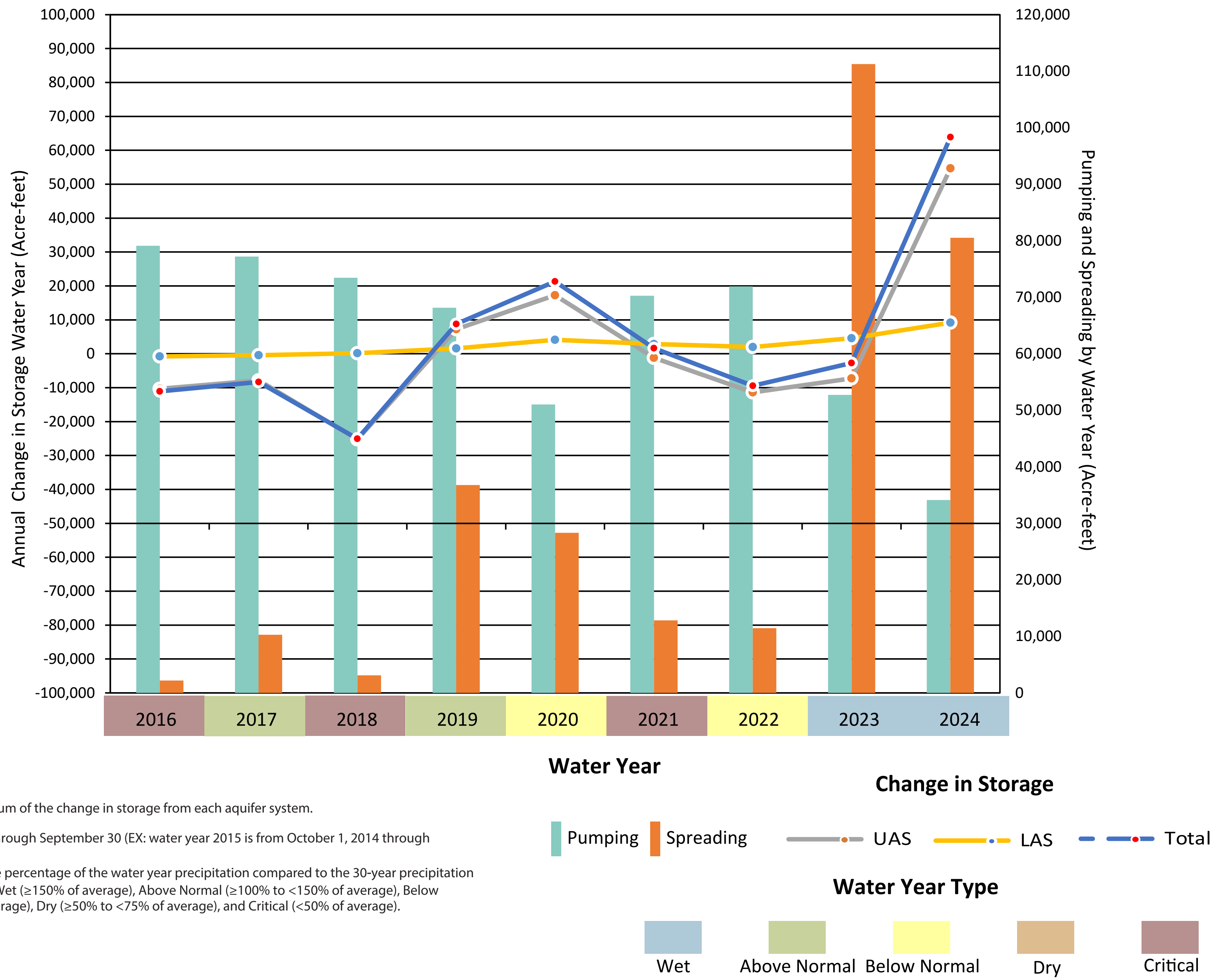

Notes:

1) Total change in storage is the sum of the change in storage from each aquifer system.
2) Water year is from October 1 through September 30 (EX: water year 2015 is from October 1, 2014 through September 30, 2015).
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 2-23
Water Year Type, Groundwater Use, and Annual Change in Storage in the Oxnard Subbasin

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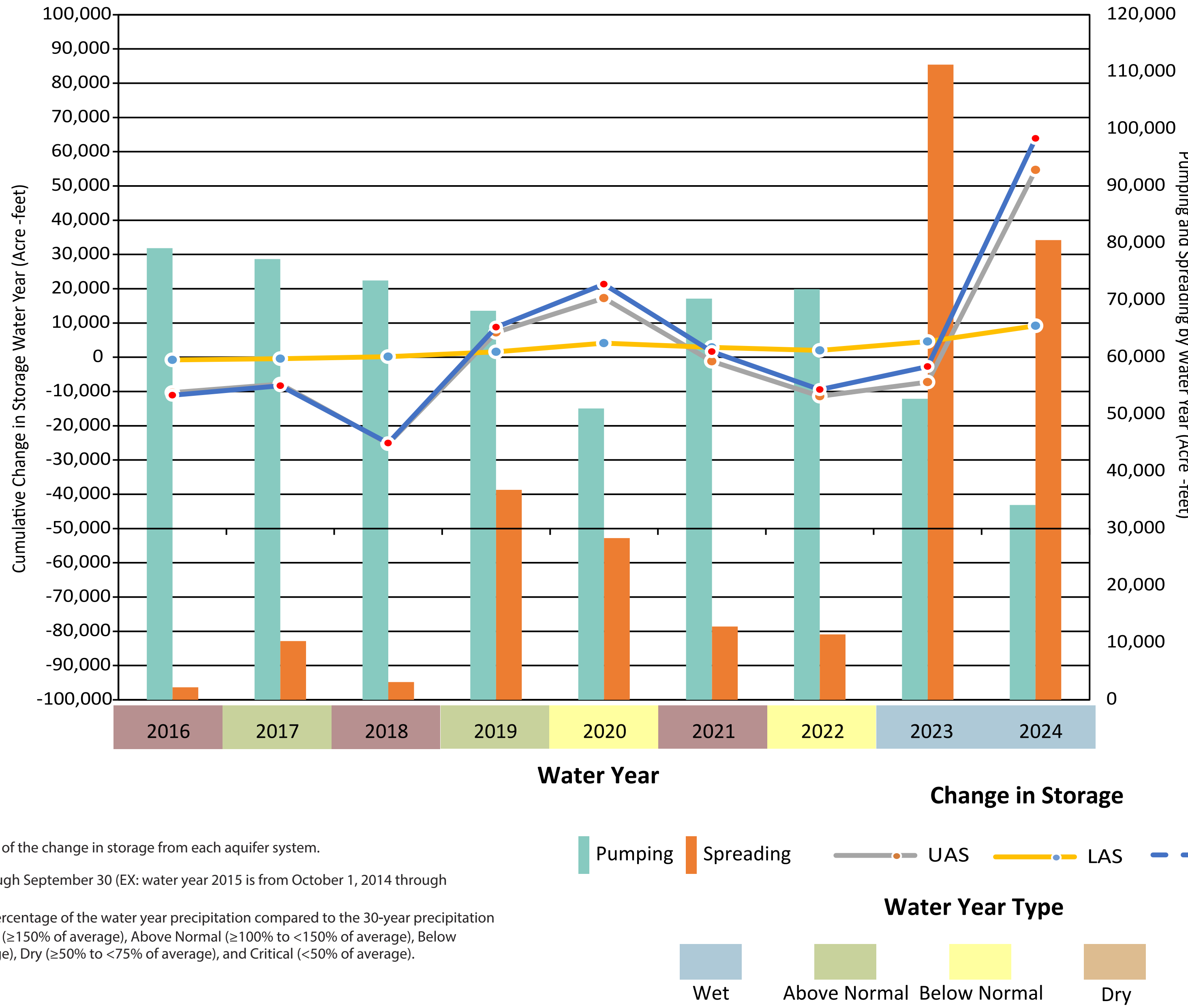

Notes:

1) Total change in storage is the sum of the change in storage from each aquifer system.
2) Water year is from October 1 through September 30 (EX: water year 2015 is from October 1, 2014 through September 30, 2015).
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 2-24
Water Year Type, Groundwater Use, and Cumulative Change in Storage in the Oxnard Subbasin

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