FINAL

Paso Basin Cooperative Committee
and the Groundwater Sustainability Agencies

Paso Robles Subbasin
Water Year 2023 Annual Report

March 29, 2024

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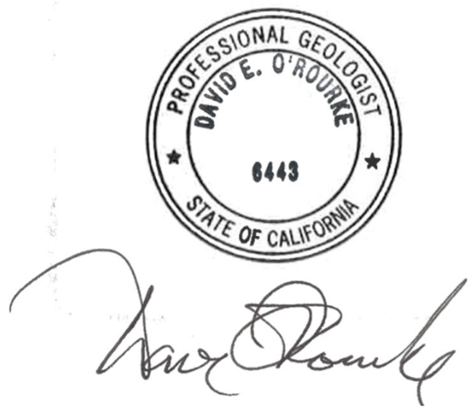
Paso Robles Subbasin
Water Year 2023 Annual Report

This report was prepared by the staff of GSI Water Solutions, Inc., under the supervision of professionals whose signatures appear below. The findings or professional opinion were prepared in accordance with generally accepted professional engineering and geologic practice.



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Abbreviations and Acronyms

AF	acre-feet
AFY	acre-feet per year
AMSL	above mean sea level
CASGEM	California Statewide Groundwater Elevation Monitoring
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
City	City of Paso Robles
City of SLO	City of San Luis Obispo
COC	constituent of concern
CSA	Community Service Area
CSD	Community Services District
DAC	Disadvantaged Community
DSOD	Division of Safety of Dams
DU	domestic unit
DWR	California Department of Water Resources
EPCWD	Estrella-El Pomar-Creston Water District
ET	evapotranspiration
ETo	reference evapotranspiration
ft/ft	feet per foot
GAMA	Groundwater Ambient Monitoring and Assessment
gpd/ft	gallons per day per foot
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HDPE	high-density polyethylene
InSAR	Interferometric Synthetic Aperture Radar
MILR	Multibenefit Irrigated Land Repurposing
MOA	memorandum of agreement
NOAA	National Oceanic and Atmospheric Administration
NWP	Nacimiento Water Project
Paso Robles Subbasin	Paso Robles Area Subbasin of the Salinas Valley Groundwater Basin
PBCC	Paso Basin Cooperative Committee
PWS	public water system
RFP	request for proposals
RMS	representative monitoring site
S	storage coefficient
SEP	Supplemental Environmental Project
SGMA	Sustainable Groundwater Management Act

SLOFCWCD	San Luis Obispo County Flood Control and Water Conservation District
SPI	Standardized Precipitation Index
SSJGSA	Shandon-San Juan Groundwater Sustainability Agency
SSJWD	Shandon-San Juan Water District
Subbasin	Paso Robles Area Subbasin of the Salinas Valley Groundwater Basin
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TDS	total dissolved solids
UCCE	University of California Cooperative Extension
USACE	United States Army Corps of Engineers
WCR	well completion report
WNND	Water Neutral New Development
WY	water year

Annual Report Elements Guide and Checklist

California Code of Regulations – GSP Regulation Sections	Annual Report Elements	Location in Annual Report
Article 7	Annual Reports and Periodic Evaluations by the Agency	
§ 356.2	Annual Reports	
	Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:	
	(a) General information, including an executive summary and a location map depicting the basin covered by the report.	Executive Summary (§356.2[a])
	(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:	Section 2.4 Monitoring Networks (§356.2[b])
	(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:	Section 3 Groundwater Elevations (§356.2[b][1])
	(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	Section 3.2 Seasonal High and Low (Spring and Fall) (§356.2[b][1][A])
	(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	Section 3.3 Hydrographs (§356.2[b][1][B], and Appendix F)
	(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	Section 4 Groundwater Extractions (§356.2[b][2])
	(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	Section 5 Surface Water Use (§356.2[b][3])

California Code of Regulations – GSP Regulation Sections	Annual Report Elements	Location in Annual Report
Article 7	Annual Reports and Periodic Evaluations by the Agency	
§ 356.2	Annual Reports	
	(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	Section 6 Total Water Use (§356.2[b][4])
	(5) Change in groundwater in storage shall include the following:	Section 7 Change in Groundwater in Storage (§356.2[b][5])
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	Section 7.1 Annual Changes in Groundwater Elevation (§356.2[b][5][A])
	(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.	Section 7.2 Annual and Cumulative Change in Groundwater in Storage Calculations (§356.2[b][5][B])
	(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	Section 8 Progress towards Basin Sustainability (§356.2[c])

Executive Summary (§ 356.2[a])

Introduction

This Water Year 2023 Annual Report for the Paso Robles Area Subbasin of the Salinas Valley Groundwater Basin (Paso Robles Subbasin or Subbasin) (see Figure 1) has been prepared in accordance with the Sustainable Groundwater Management Act (SGMA) regulations for Groundwater Sustainability Plans (GSPs). Pursuant to the SGMA regulations, a GSP Annual Report must be submitted to the California Department of Water Resources (DWR) by April 1 of each year following the adoption of the GSP.

With the submittal of the adopted Paso Robles Subbasin GSP on January 31, 2020, (M&A, 2020) the Groundwater Sustainability Agencies (GSAs) are required to submit an annual report for the preceding water year (WY) (October 1 through September 30) to DWR by April 1 of each subsequent year. These annual reports will convey monitoring and water use data to the DWR and to Subbasin stakeholders on an annual basis to gauge performance of the Subbasin relative to the sustainability goals set forth in the GSP.

Sections of the WY 2023 Annual Report include the following:

Section 1. Introduction – Paso Robles Subbasin Water Year 2023 Annual Report: A brief background of the formation and activities of the Paso Robles Subbasin GSAs and development and submittal of the GSP.

Section 2. Paso Robles Subbasin Setting and Monitoring Networks: A summary of the Subbasin setting, Subbasin monitoring networks, and ways in which data are used for groundwater management.

Section 3. Groundwater Elevations (§356.2[b][1]): A description of recent monitoring data with groundwater elevation contour maps for spring and fall monitoring events and representative hydrographs.

Section 4. Groundwater Extractions (§356.2[b][2]): A compilation of metered and estimated groundwater extractions by land use sector and location of extractions.

Section 5. Surface Water Use (§356.2[b][3]): A summary of reported surface water use.

Section 6. Total Water Use (§356.2[b][4]): A presentation of total water use by source and sector.

Section 7. Change in Groundwater in Storage (§356.2[b][5]): A description of the methodology and presentation of changes in groundwater in storage based on fall to fall groundwater elevation differences.

Section 8. Progress towards Basin Sustainability (§356.2[c]): A summary of management actions taken throughout the Subbasin by GSAs and individual entities towards sustainability of the Subbasin.

Groundwater Elevations

Groundwater elevations observed in the Subbasin during WY 2023 are generally higher than the previous year across a majority of the Subbasin, due to above-average rainfall conditions during the winter of 2022/2023. Positive and negative changes in groundwater elevations from year to year are observed in various parts of the Subbasin, as has been observed historically. Seasonal trends of slightly higher spring groundwater elevations compared with fall levels are observed annually.

Groundwater Extractions

Total groundwater extractions in the Subbasin for WY 2023 are estimated to be 63,300 acre-feet (AF). These totals include municipal and small public water systems[1] (PWSs) pumping, rural domestic pumping, and golf course and irrigated agricultural water demand. Table ES-1 summarizes the groundwater extractions by water use sector for each water year. The values for WYs 2017–2022 (grayed out) are included for reference purposes. This convention is carried throughout the report.

Table ES-1. Groundwater Extractions by Water Use Sector

Water Year	Groundwater Extractions by Water Use Sector			Total (AF)
	Municipal PWS[1] (AF)	Small PWS, Golf and Rural Domestic (AF)	Agriculture (AF)	
2017	1,626	3,313	65,300	**70,200**
2018	1,677	4,445	80,200	**86,300**
2019	1,729	3,553	68,800	**74,100**
2020	1,509	4,477	72,600	**78,600**
2021	1,553	5,052	74,800	**81,400**
2022	1,982	4,332	76,900	**83,200**
2023	1,134	3,053	59,600	**63,800**
Method of Measure:	Metered	2016 Groundwater Model, varied by water year type	OpenET	—
Level of Accuracy:	high	low-medium	medium	—

Notes

[1] These volumes include any water produced as Salinas River underflow within the Paso Robles Subbasin.
— = not applicable
AF = acre-feet
PWS = public water system

[1] A PWS is defined as a system that provides water for human consumption to 15 or more connections or regularly serves 25 or more people daily for at least 60 days out of the year (https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/waterpartnerships/what_is_a_public_water_sys.pdf).

Surface Water Use

The Subbasin currently benefits from surface water entitlements from the Nacimiento Water Project (NWP) and the State Water Project to supplement municipal groundwater demands in the City of Paso Robles and the community of Shandon, respectively. In WY 2023, the City of Paso Robles used 2,064 AF of their NWP entitlement, but 632 AF of their NWP deliveries were recharged and extracted in the Atascadero Subbasin, so those volumes do not show up in this accounting. Locations of communities dependent on groundwater and with access to surface water are shown on Figure 10. There is currently no surface water available for agricultural or recharge project use within the Subbasin. A summary of total actual surface water use by source is provided in Table ES-2.

Table ES-2. Total Surface Water Use by Source

Water Year	Nacimiento Water Project (AF)	Imported Salinas River Underflow[1] (AF)	State Water Project (AF)	Total Surface Water Use (AF)
2017	1,650	2,609	42	**4,301**
2018	1,423	3,352	55	**4,829**
2019	1,142	3,075	43	**4,259**
2020	737	3,852	0	**4,589**
2021	1,250	3,612	0	**4,861**
2022	901	3,349	0	**4,250**
2023	1,432	3,130	0	**4,562**

Notes

[1] The City of Paso Robles produces Salinas River underflow, regulated as surface water by the State Water Resources Control Board, from its Thunderbird Wells located in the adjacent Atascadero Subbasin.

AF = acre-feet

Total Water Use

For WY 2023, quantification of total water use was completed through reporting of metered water production data from municipal wells (including imported Salinas River underflow[2]) (see Section 5), from metered surface water use, and from models used to estimate agricultural crop water supply requirements. In addition, rural water use, golf course irrigation demand, and small commercial PWS use was estimated. Table ES-3 summarizes the total annual water use in the Subbasin by source and water use sector.

Table ES-3. Total Water Use in the Subbasin by Source and Water Use Sector

Water Year	Municipal PWS (AF)		Small PWS, Golf and Rural Domestic (AF)	Agriculture (AF)	Total (AF)
Source:	**Groundwater**	**Surface Water[1]**	**Groundwater**	**Groundwater**	**—**
2017	1,626	4,301	3,313	65,300	**74,500**
2018	1,677	4,829	4,445	80,200	**91,200**
2019	1,729	4,259	3,553	68,800	**78,300**
2020	1,509	4,589	4,477	72,600	**83,200**
2021	1,553	4,861	5,052	74,800	**86,300**
2022	1,982	4,250	4,332	76,900	**87,500**
2023	1,134	4,562	3,053	59,600	**68,300**
Method of Measure:	Metered	Metered	2016 Groundwater Model, varied by water year type	OpenET	—
Level of Accuracy:	high	high	low-medium	medium	—

Notes

[1] Includes imported Salinas River underflow, which is regulated as surface water by the State Water Resources Control Board.

— = not applicable

AF = acre-feet

PWS = public water system

[2] Salinas River underflow is regulated as surface water by the State Water Resources Control Board.

Change in Groundwater in Storage

The calculation of change in groundwater in storage in the Subbasin was derived from comparison of fall groundwater elevation contour maps from one year to the next, as well as taking the difference between groundwater elevations throughout the Subbasin as the aquifer becomes saturated (storage gain) or dewatered (storage loss). For this analysis, the fall 2022 groundwater elevations were subtracted from the fall 2023 groundwater elevations resulting in a map depicting the changes in groundwater elevations in the Paso Robles Formation Aquifer that occurred during WY 2023. Like last year, because of the monitoring network expansion efforts begun in 2021 by Shandon-San Juan GSA (SSJGSA) and Estrella-El Pomar-Creston Water District (EPCWD), the WY 2023 groundwater elevation change map is more data constrained than similar maps produced before WY 2022.

The groundwater elevation change map for WY 2023 (see Figure 13) shows that compared to the previous fall, water levels were generally higher over a majority of the Subbasin, particularly in the area south of Creston and upper Shell Canyon and upper San Juan Creek valley.

The annual change of groundwater in storage calculated for WY 2023 is presented in Table ES-4. Increases of groundwater in storage are presented as positive numbers and decreases of groundwater in storage are presented as negative numbers.

Table ES-4. Annual Change of Groundwater in Storage

Water Year	Annual Change (AF)
2017	60,100
2018	6,400
2019	59,700
2020	-80,800
2021	-41,500
2022	-117,100
2023	120,700

Note
AF = acre-feet

DWR Acceptance of Revised GSP

On January 21, 2022, DWR released an official 'incomplete' determination for the Paso Robles Subbasin GSP. The Paso Robles Subbasin GSAs retained a consultant to address the deficiencies identified in the GSP and resubmitted the revised GSP to DWR before the July 20, 2022, deadline. On June 20, 2023, DWR released a determination letter approving the revised GSP. Included with the June 20, 2023, determination letter is a Statement of Findings and Staff Report. Several recommended corrective actions are presented in the Staff Report that should be considered by the GSAs for the first periodic evaluation of the GSP.

Progress towards Meeting Basin Sustainability

Several projects and management actions are in process or have been recently implemented in the Subbasin to attain sustainability. These projects and actions include capital projects as well as non-structural basin-wide initiatives intended to reduce or optimize local groundwater use. Some of these projects were described in concept in the GSP; some of the actions described herein are new initiatives designed to make new water supplies available to the Subbasin that may be implemented by project participants to reduce pumping and partially mitigate the degree to which the management actions would be needed. Some of the ongoing efforts include:

- Synoptic Streamflow Survey and Surface Water Flow Gaging
- Expansion of Monitoring Well Network
- Multibenefit Irrigated Land Repurposing Program
- City of Paso Robles Recycled Water Program
- San Miguel Community Services District Recycled Water Project
- Blended Water Project
- Diversion of Flood Flows to Recharge Groundwater
- Expansion of Salinas Dam and Ownership Transfer

Since the publication of the GSP in 2020, there has been a mix of wet years, average years, and drought. The Subbasin in WY 2023 has returned to the same level of cumulative change in groundwater in storage estimated in the GSP. Historical groundwater pumping in excess of the sustainable yield has created challenging conditions for sustainable management. Of particular concern are communities and rural residential areas that rely solely on groundwater for their water supply[3] (see Figure 10). During WY 2023, several dry wells were replaced, a direct result of declining water levels. The distribution of these dry well replacements that occurred during WY 2023 is shown on Figure 10.

Actions are underway to collect data, improve the monitoring and data collection networks, and coordinate with affected agencies and entities throughout the Subbasin to develop solutions that address the shared mutual interest in the Subbasin's overall sustainability goal.

Groundwater elevations observed in the Subbasin during WY 2023 are generally higher than the previous year across a majority of the Subbasin, due to above-average rainfall conditions during the winter of 2022/2023. However, three of the 22 Paso Robles Formation Aquifer RMS wells in the Subbasin groundwater monitoring network exhibit groundwater elevations below the minimum threshold established in the GSP (M&A, 2020). One of the wells exhibiting groundwater elevations below the minimum threshold has occurred for the first time in WY 2023, while two of the wells exhibiting groundwater elevations below the minimum threshold have occurred for two or more consecutive years (see Section 3.3). Although groundwater elevations in a few of the Paso Robles Formation Aquifer RMS wells are stable to slightly increasing during the past few years, groundwater elevations in several of the RMS wells are continuing to trend downward. Five of the 22 Paso Robles Formation Aquifer RMS wells have average WY 2023 groundwater elevations greater than the measurable objective for that RMS well.

Updated Interferometric Synthetic Aperture Radar (InSAR) data has been provided by DWR through October 2023. As discussed in the GSP (M&A, 2020), to minimize the influence of elastic subsidence, changes in ground level should be measured annually from June of one year to June of the following year (M&A, 2020). For this WY 2023 Annual Report, the single-year land subsidence was measured using InSAR from June 2022 through June 2023 and the 5-year land subsidence land subsidence was measured from June 2018 through June 2023. Considering the range of potential error in the InSAR method (see Section 8.5.2), examination of the single-year change InSAR data from June 2022 to June 2023 show that zero land

[3] Affected communities may include Disadvantaged Communities (DACs), which are defined as: "the areas throughout California which most suffer from a combination of economic, health, and environmental burdens. These burdens include poverty, high unemployment, air and water pollution, presence of hazardous wastes as well as high incidence of asthma and heart disease" (https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities). DACs occurring within the Subbasin as identified by San Luis Obispo Council of Governments are included on Figure 10.

subsidence has occurred (Figure 16). Considering the same potential error for the 5-year cumulative change InSAR data from June 2018 to June 2023, it is apparent that as much as 0.14 feet of subsidence has occurred during this period (Figure 17). Although minor land subsidence is documented during the 5-year period of June 2018 to June 2023, neither of these results indicate an undesirable result as specified by the land subsidence minimum thresholds. The GSAs will continue to monitor and report annual subsidence as more data become available.

At this time, there are insufficient data available to adequately assess the interconnectivity of surface water and groundwater and the potential depletion of interconnected surface water. There is at present only a single Alluvial Aquifer RMS well in the Subbasin. Additional Alluvial Aquifer wells will need to be established in the monitoring network before groundwater/surface water interaction can be more robustly analyzed. The Recommended Expanded Groundwater Level Monitoring Network for the Paso Basin produced by the Expanded Monitoring Network Technical Advisory Committee (TAC) (see Section 8.3.5) includes a plan to install new alluvial monitoring wells and address these data gaps.

Additional time will be necessary to judge the effectiveness and quantitative impacts of the projects and management actions either now underway or in the planning and implementation stage. However, it is clear that the actions in place and as described in this WY 2023 Annual Report are a good start towards reaching the sustainability goals laid out in the GSP (M&A, 2020). It is too soon to judge the observed changes in basin conditions against the interim goals outlined in the GSP (M&A, 2020), but the anticipated effects of the projects and management actions now underway are expected to significantly affect the ability of the Subbasin to reach the necessary sustainability goals.

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SECTION 1: **Introduction – Paso Robles Subbasin Water Year 2023 Annual Report**

The Water Year 2023 Annual Report for the Paso Robles Area Subbasin of the Salinas Valley Groundwater Basin (Paso Robles Subbasin or Subbasin) has been prepared for the Paso Basin Cooperative Committee (PBCC) and the Groundwater Sustainability Agencies (GSAs) in accordance with the Sustainable Groundwater Management Act (SGMA) regulations for Groundwater Sustainability Plans (GSPs) (§ 356.2. Annual Reports) (see Appendix A, SGMA Regulations for Annual Reports). Pursuant to the SGMA regulations, a GSP Annual Report must be submitted to the California Department of Water Resources (DWR) by April 1 of each year following the adoption of the GSP. Submittal of the adopted Paso Robles Subbasin GSP occurred on January 31, 2020. The GSAs are required to submit an annual report for the preceding water year (WY) (October 1 through September 30) to DWR by April 1 of each subsequent year. This WY 2023 Annual Report for the Paso Robles Subbasin documents groundwater production, water use data and water level data from October 1, 2022, through October 31, 2023.[4]

1.1 Setting and Background

The Paso Robles Subbasin GSP was prepared by Montgomery & Associates, Inc. (M&A, 2020), on behalf of and in cooperation with the PBCC and the Subbasin GSAs. The GSP, and subsequent annual reports including this WY 2023 Annual Report, covers the entire Paso Robles Subbasin (see Figure 1). The Subbasin lies in the northern portion of San Luis Obispo County. The majority of the Subbasin comprises gentle rolling topography and flatlands near the Salinas River Valley, ranging in elevation from approximately 450 to 2,400 feet above mean sea level (AMSL). The Subbasin is drained by the Salinas River and its tributaries, including the Estrella River, Huer Huero Creek, and San Juan Creek. Communities in the Subbasin are the City of Paso Robles (City) and the communities of San Miguel, Creston, and Shandon. Highway 101 is the most significant north-south highway in the Subbasin, with Highways 41 and 46 running east-west across the Subbasin.

The GSP was jointly developed by four GSAs:

- City of Paso Robles GSA
- Paso Basin – County of San Luis Obispo GSA
- San Miguel Community Services District (CSD) GSA
- Shandon-San Juan GSA

The Estrella-El Pomar-Creston Water District (EPCWD) was formed in 2017 and was indirectly involved in development of the GSP through participation in public comment. On June 6, 2023, the EPCWD officially became a GSA in the Paso Robles Subbasin.

The Paso Basin GSAs overlying the Subbasin entered into a Memorandum of Agreement (MOA) in September 2017. The purpose of the MOA was to establish a PBCC to develop a single GSP for the entire Subbasin to be considered for adoption by each GSA and subsequently submitted to DWR for approval. Under the framework of the original MOA, the GSAs engaged the public and coordinated to jointly develop the Paso Robles Subbasin GSP. At its November 20, 2019, meeting, in accordance with the MOA, the PBCC voted

[4] The required timeframe of the annual reports, pursuant to the SGMA regulations, is by water year, which is October 1 through September 30 of any year. However, because the County of San Luis Obispo Groundwater Level Monitoring Program measures water levels in October, the October 2022 measurements, for instance, are used to reflect conditions at the end of WY 2022.

unanimously to recommend that the GSAs adopt the GSP and submit it to DWR by the SGMA deadline. Subsequent actions by each GSA resulted in unanimous approval of the GSP and a joint submittal of the GSP to DWR.

The original MOA included provisions for automatic termination upon approval of the GSP by DWR. Resolutions adopted by each GSA during the GSP approval process included an amendment to the MOA that removed automatic termination language because the GSAs will continue cooperating on the GSP and its implementation until such time as the long-term governance structure for implementation of the GSP is developed. As of June 6, 2023, the EPCWD GSA is now also party to the MOA.

Each of the GSAs appointed a representative Member and Alternate to the PBCC to coordinate activities among the GSAs during the development of the GSP and the development and submittal of this WY 2023 Annual Report. The GSAs also agreed to designate the County of San Luis Obispo Director of Public Works as the Plan Manager with the authority to submit the GSP and annual reports and serve as the point of contact with DWR. However, on November 2, 2021, the County of San Luis Obispo filled a newly created position of Groundwater Sustainability Director, which reports directly to the County Administrative Officer, and operates independently of the Public Works Department. The new Groundwater Sustainability Director position has supplanted the Director of Public Works as the designated GSP Plan Manager.

1.2 Organization of This Report

The required contents of an annual report are provided in the SGMA Regulations (§ 356.2), included as Appendix A. Organization of the report is meant to follow the regulations where possible to assist in the review of the document. The sections are briefly described as follows:

Section 1. Introduction – Paso Robles Subbasin Water Year 2023 Annual Report: A brief background of the formation and activities of the Paso Robles Subbasin GSAs and development and submittal of the GSP.

Section 2. Paso Robles Subbasin Setting and Monitoring Networks: A summary of the Subbasin setting, Subbasin monitoring networks, and the ways in which data are used for groundwater management.

Section 3. Groundwater Elevations (§356.2[b][1]): A description of recent monitoring data with groundwater elevation contours for spring and fall monitoring events and representative hydrographs.

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Section 8. Progress towards Basin Sustainability (§356.2[c]): A summary of management actions taken throughout the Subbasin by the GSAs and individual entities towards sustainability of the Subbasin.

SECTION 2: Paso Robles Subbasin Setting and Monitoring Networks

2.1 Introduction

This section provides a brief description of the basin setting and the groundwater management monitoring programs described in the GSP, as well as any notable events affecting monitoring activities or the quality of monitoring results in the reported WY 2023. Much of the background information reported on in this WY 2023 Annual Report was taken from the GSP prepared by Montgomery & Associates, Inc. (M&A, 2020).

2.2 Subbasin Setting

The Subbasin is a structural trough trending to the northwest filled with terrestrially derived sediments sourced from the surrounding mountains. The Subbasin is surrounded by relatively impermeable geologic formations, sediments with poor water quality, and structural faults. Land surface elevation ranges from approximately 2,000 feet AMSL in the southeast extent of the Subbasin to about 600 feet AMSL in the northwest extent, where the Salinas River exits the Subbasin. Agriculture is the dominant land use. The Subbasin includes the incorporated City of Paso Robles and unincorporated communities of San Miguel, Creston, and Shandon.

The Subbasin is the southernmost portion of the Salinas Valley Groundwater Basin. As originally defined by DWR (2003), the Subbasin was in both San Luis Obispo and Monterey counties. The 2019 DWR basin boundary modification process resulted in a revision of the northern boundary of the Paso Robles Subbasin to be coincident with the San Luis Obispo/Monterey county line, thereby placing the Subbasin entirely within San Luis Obispo County.

The top of the Subbasin is defined by land surface. The bottom of the Subbasin is defined by the base of the Paso Robles Formation. Sediments below the base of the Paso Robles Formation are typically much less permeable than the overlying sediments. Although the bedrock sediments often produce usable quantities of groundwater, the water is generally of poor quality, so they are not considered part of the Subbasin. As described in the GSP (M&A, 2020), the lateral boundaries of the Subbasin include the following:

- The western boundary is defined by the contact between the sediments in the Subbasin and the sediments of the Santa Lucia Range. A portion of the western boundary is defined by the Rinconada fault system, which separates the Paso Robles Subbasin from the Atascadero Subbasin.
- The eastern boundary of the Subbasin is defined by the contact between the sediments in the Subbasin and the sediments of the Temblor Range. The San Andreas Fault generally forms the eastern Subbasin boundary.
- The southern boundary of the Subbasin is defined by the contact between the sediments in the Subbasin and the sediments of the La Panza Range. To the southeast, a watershed and groundwater divide separates the Subbasin from the adjacent Carrizo Plain Basin; sedimentary layers are likely continuous across this divide.
- The northern boundary of the Subbasin is defined by the San Luis Obispo/Monterey county line.

Two principal aquifers exist in the Subbasin, including the Alluvial Aquifer and the Paso Robles Formation Aquifer. The Alluvial Aquifer is the youngest aquifer. It is unconfined and consists of predominantly coarse-grained sediments (sand and gravel) deposited along the Salinas River, Estrella River, Huer Huero Creek, and San Juan Creek. The Alluvial Aquifer varies in thickness but may be up to 100 feet thick along the channels. Much of the Alluvial Aquifer is characterized by relatively high transmissivity that may exceed

100,000 gallons per day per foot (gpd/ft). Wells screened in the Alluvial Aquifer can be very productive and may yield more than 1,000 gallons per minute (gpm).

The Paso Robles Formation Aquifer underlies the Alluvial Aquifer and outcrops in the Subbasin everywhere outside of the Holocene stream channels. The Paso Robles Formation represents the largest volume of sediments in the Subbasin, with a total thickness up to 3,000 feet in the northern Estrella area and up to 2,000 feet in the Shandon area. The Paso Robles Formation has a thickness of 700 to 1,200 feet throughout most of the Subbasin. It is generally characterized by interbedded, discontinuous lenses of sand and gravel that comprise the most productive strata within the aquifer, separated vertically by comparatively thick zones of fine-grained sediments (silts and clays). Well depths generally range from approximately 200 to 1,000 feet or more. As described in the GSP (M&A, 2020), reported aquifer transmissivity estimates in the Paso Robles Formation range from approximately 1,000 to 9,000 gpd/ft, and well yields generally range from approximately 150 to 850 gpm. Wells in certain parts of the Subbasin have been reported to be more productive (yielding upwards of 3,000 gpm).

The primary components of recharge to the Subbasin aquifers are percolation of precipitation and infiltration of surface water from rivers and streams. Natural discharge from the Subbasin aquifers occurs through springs and seeps, evapotranspiration (ET), and discharge to surface water bodies. The most significant component of discharge is pumping of groundwater from wells. The regional direction of groundwater flow is from the southeast to the northwest. As there is no hydrogeologic barrier to flow along the northern boundary of the Subbasin, groundwater exits the Subbasin along that boundary to the adjacent Salinas Valley Basin to the north.

2.3 Precipitation and Climatic Periods

Annual precipitation recorded at the Paso Robles weather station (National Oceanic and Atmospheric Administration [NOAA] station 46730) is presented by water year in Figure 2. The total annual precipitation recorded at the Paso Robles weather station for WY 2023 is 28.59 inches. The long-term average annual precipitation for the period 1925 through 2023 is 14.7 inches per water year, as recorded at the Paso Robles weather station. Climatic periods in the Subbasin have been determined based on analysis of data from the Paso Robles weather station using the Standardized Precipitation Index (SPI), which quantifies deviations from normal precipitation patterns. The WY 2023 SPI analysis uses a 24-month period instead of the 60-month period used in the GSP.[5] Climatic periods are categorized according to the following designations: wet, dry, and average/alternating wet and dry (see Figure 2). It is generally recognized that the eastern portion of the Subbasin receives less annual rainfall than the rest of the Subbasin. Recently, the University of California Cooperative Extension (UCCE) installed a series of sophisticated weather stations across San Luis Obispo County and nine of these are now located in the Subbasin. Two new California Irrigation Management Information System (CIMIS) stations were installed in the Subbasin during WY 2022. These new CIMIS stations include Paso Robles #265, located near the intersection of Wellsona and Airport Road at an elevation of 764 feet, and Shandon #266, located near the intersection of Starkey Road and Highway 41 at an elevation of 1,105 feet. CIMIS stations #265 and #266 began collecting data on March 1 and August 1, 2022, respectively. Station locations and rainfall totals for WY 2023 are presented in Figure 3, along with the spatial distribution of long-term average annual precipitation in the Paso Robles Subbasin.[6] Historical precipitation records for the Paso Robles weather station and monthly UCCE station records for WY 2023 are provided in Appendix B.

[5] The 24-month period SPI analysis is considered an improvement over the 60-month period analysis because of its enhanced sensitivity to short-term climatic variations. The 24-month period SPI analysis provides insight into the relationship between water year type and groundwater elevation response (WMO, 2012).
[6] Average distribution of annual precipitation based on 30-year normal PRISM data calibrated to the Paso Robles Station (NOAA 46730).

2.4 Monitoring Networks

This section provides a brief description of the monitoring programs currently in place and any notable events affecting monitoring activities or the quality of monitoring results. Monitoring networks are developed for each of the five sustainability indicators relevant to the Paso Robles Subbasin:

- Chronic lowering of groundwater levels
- Reduction of groundwater in storage
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water

Monitoring for the first two sustainability indicators (chronic lowering of water levels and reduction of groundwater in storage) is implemented using the representative monitoring sites (RMS), discussed in Section 2.4.1. Monitoring for the remaining three sustainability indicators (degraded water quality, land subsidence, and depletion of interconnected surface water) is discussed in Section 2.4.2.

2.4.1 Groundwater Elevation Monitoring Network (§ 356.2[b])

The GSP provided a summary of existing groundwater monitoring efforts currently promulgated under various existing local, state, and federal programs (M&A, 2020). SGMA requires that monitoring networks be developed in the Subbasin to provide sufficient data quality, frequency, and spatial distribution to evaluate changing aquifer conditions in response to GSP implementation.

The GSP identifies an existing network of 23 RMS wells for water level monitoring (M&A, 2020). Of these 23 wells, 22 are wells that screen the Paso Robles Formation[7], and one is an Alluvial Aquifer well. These RMS wells have been monitored biannually, in April and October, for various periods of record. The RMS groundwater monitoring network developed in the GSP is intended to support efforts to do the following:

- Monitor changes in groundwater conditions and demonstrate progress towards achieving measurable objectives and minimum thresholds documented in the GSP.
- Quantify annual changes in water use.
- Monitor impacts to the beneficial uses and users of groundwater.

The RMS wells are displayed in Figure 4, and a summary of information for each of the wells is included in Appendix C.

2.4.1.1 Monitoring Data Gaps

The GSP noted numerous data gaps in the current RMS network (M&A, 2020). Efforts are continuing during the implementation phase of the GSP to identify existing wells that can be added to the network, or to construct new wells for the network. As a start to this effort, the GSP identified nine additional wells that may be incorporated into the RMS network after the depth and screened aquifer are established. These wells are displayed in Figure 4, and a summary of available well information is included in Appendix D.

[7] Since initial establishment of the monitoring well network, two of the 22 Paso Robles Formation Aquifer RMS wells (27S/13E-30N01 and 26S/12E-2607) have become either inactive or inaccessible.

2.4.2 Additional Monitoring Networks

Evaluation of the water quality sustainability indicator is achieved through monitoring of an existing network of supply wells in the Subbasin. Constituents of concern (COCs) identified in the GSP that have the potential to impact suitability of water for public supply or agricultural use include salinity (as indicated by electrical conductivity), total dissolved solids (TDS), sodium, chloride, nitrate, sulfate, boron, and gross alpha.

COCs for drinking water are monitored at public water systems (PWSs),[8] including municipal and small PWSs. There are 41 PWSs in the Subbasin that serve potable water to small communities, schools, and rural businesses such as restaurants and wineries. PWSs constitute part of the monitoring network for water quality in the Subbasin. In addition, the GSP identified 28 agricultural supply wells that are monitored for COCs under the Irrigated Lands Regulatory Program (see GSP Figure 7-4 [M&A, 2020]).

Land subsidence in the Subbasin is monitored using Interferometric Synthetic Aperture Radar (InSAR) data collected using microwave satellite imagery provided by DWR. Available data to date indicate no significant subsidence in the Subbasin that impacts infrastructure. The GSAs will annually assess subsidence using the InSAR data provided by DWR.

A monitoring network to assess the sustainability indicator of groundwater/surface water interconnection is a current data gap that will be addressed during GSP implementation. There is at present only a single Alluvial Aquifer RMS well in the Subbasin. However, the City of Paso Robles installed two new Alluvial Aquifer wells using Supplemental Environmental Project (SEP) funding during WY 2021.[9] Additional Alluvial Aquifer wells will need to be established in the monitoring network before groundwater/surface water interaction can be more robustly analyzed. The revised GSP submitted to DWR in July 2022 includes an improved groundwater/surface water interaction discussion and identifies key data gaps that need to be filled before a sufficiently robust annual assessment of interconnected surface water can occur.

[8] A PWS is defined as a system that provides water for human consumption to 15 or more connections or regularly serves 25 or more people daily for at least 60 days out of the year (https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/waterpartnerships/what_is_a_public_water_sys.pdf).

[9] The City of Paso Robles GSA and the State Water Resources Control Board (SWRCB) agreed to the use of SEP funds that are available as a result of a settlement agreement between the SWRCB and the City of Paso Robles for violations of the City's National Pollutant Discharge Elimination System permit related to wastewater treatment releases.

SECTION 3: Groundwater Elevations (§ 356.2[b][1])

3.1 Introduction

This section provides a detailed report on groundwater elevations in the Subbasin measured during spring and fall of 2023. These maps present the most up-to-date seasonal conditions in the Basin. Most of the data presented characterizes conditions in the Paso Robles Formation Aquifer. Data for the Alluvial Aquifer are too sparse for regional analysis. Monitoring data is reviewed for quality and an appropriate time frame is chosen to provide the highest consistency in the wells used for each reporting period. Data quality is often difficult to ascertain when measurements are taken by other agencies or private well owners, and well construction information may be incomplete or unavailable. This means that a careful review of the data is required before uploading it to DWR's Monitoring Network Module[10] to verify whether measurements are trending consistent with trends of previous years and with the current year's hydrology and level of extractions.

It was discovered in spring 2023 that the depth to water data reported in the SLOFCWCD database is presented as a calculated depth to water from the ground surface elevation rather than as measured from the reference point elevation of each well, as was previously understood. This misunderstanding has resulted in prior reporting of groundwater elevations (GWEs) that are slightly off from their true value. This same misunderstanding also affected the setting of measurable objectives and minimum thresholds in the GSP. However, all GWEs presented in this Annual Report have been corrected and represent true groundwater elevations, including both current water year (2023) and historical values. The measurable objectives and minimum thresholds for each well have been corrected using the same approach. The resolution of this issue is essentially clerical. Because both the GWEs and the measurable objectives and minimum thresholds have been moved by the same amount in each well there is no change in status, regarding sustainable management criteria for each well. A more detailed explanation is provided in Appendix E.

3.1.1 Principal Aquifers

As discussed in Section 2, there are two principal aquifers in the Subbasin. The Paso Robles Formation Aquifer is several hundreds of feet thick, represents the greatest volume of saturated sediments in the Subbasin, and is the aquifer that is most utilized for supply. The Alluvial Aquifer is limited in extent to the active channels of the streams in the Subbasin and is generally less than 100 feet thick.

3.2 Seasonal High and Low Groundwater Elevations (Spring and Fall) (§ 356.2[b][1][A])

The assessment of groundwater elevation conditions in the Subbasin as described in the GSP (M&A, 2020) is largely based on data from the San Luis Obispo County Flood Control and Water Conservation District (SLOFCWCD) groundwater monitoring program. Groundwater levels are measured by the SLOFCWCD through a network of public and private wells in the Subbasin. Data from many of the wells in the monitoring program are collected subject to confidentiality agreements between the SLOFCWCD and well owners. Consistent with the terms of such agreements, the well owner information and specific locations for these wells are not

[10] The Paso Robles Subbasin is no longer in the California Statewide Groundwater Elevation Monitoring (CASGEM) program since implementation of the GSP. The GSAs are now responsible for monitoring and reporting of groundwater elevation data.

published in the GSP and that convention is continued in this WY 2023 Annual Report. Beginning in 2021, monitoring network expansion efforts by Shandon-San Juan GSA (SSJGSA) and EPCWD have resulted in water level data being available from several additional wells, located strategically in previous data gap areas. Groundwater level data from 60 wells were used to create the spring and fall 2023 groundwater elevation contour maps. The well locations and data points are not shown on the maps to preserve confidentiality of the data between the well owner and the SLOFCWD. Of these wells, owners of 23 of the wells have agreed to allow public use of the well data and are therefore used as RMS wells for the purpose of monitoring sustainability indicators. As implementation of the GSP progresses, it is anticipated that additional wells will be added to the data set and that many of the wells with current confidentiality agreements will be modified to allow for public use of the data.

In accordance with the SGMA regulations, the following information is presented based on available data:

- Groundwater elevation contour maps for the seasonal high and seasonal low groundwater conditions for the previous water year. Groundwater elevation contour maps are presented for spring 2023 and fall 2023.
- A map depicting the change in groundwater elevation for the preceding water year. A change in groundwater elevation map is shown here for the period fall 2022 to fall 2023 (see Section 7.1).
- Hydrographs for wells with publicly available data (Appendix F).

3.2.1 Alluvial Aquifer Groundwater Elevation Contours

Groundwater elevation data for the Alluvial Aquifer are too limited to prepare representative contour maps of the seasonal high and seasonal low groundwater elevations. Figure 5 shows the current (as of 2017) groundwater elevation contours for the Alluvial Aquifer, as shown in the GSP. This map, however, was developed using 2017 data (when available) as well as the most recent data before 2017. A reasonable data set of Alluvial Aquifer groundwater elevations specific to 2023 is not available, so the map as presented in the GSP is the most recent map available. This same map was also presented in previous annual reports (GSI, 2020, 2021, 2022, and 2023). Work is currently underway to identify existing alluvial wells that along with the two newly constructed SEP funded wells (see Section 2.4.2) can be added to the RMS network.

Groundwater elevations range from approximately 1,400 feet AMSL in the southeastern portion of the Subbasin to approximately 600 feet AMSL near San Miguel. Groundwater flow direction in the Alluvial Aquifer generally follows the alignment of the creeks and rivers. Overall, groundwater in the Alluvial Aquifer flows from southeast to northwest across the Subbasin. On a basin-wide scale, the average horizontal hydraulic gradient in the alluvium is about 0.004 feet per foot (ft/ft) from the southeastern portion of the Subbasin to San Miguel.

3.2.2 Paso Robles Formation Aquifer Groundwater Elevation Contours

Spring and fall 2023 (high and low) groundwater elevation data for the Paso Robles Formation Aquifer in the Subbasin were contoured to assess spatial variations, yearly fluctuations, trends in groundwater conditions, groundwater flow directions, and horizontal groundwater gradients. Contour maps were prepared for the seasonal high groundwater levels, which typically occur in the spring, and the seasonal low groundwater levels, which typically occur in the fall. In general, the spring groundwater data are for April and the fall groundwater data are for October. Information identifying the owner or detailed location of private wells is not shown on the maps to preserve confidentiality.

Figures 6 and 7 show contours of groundwater elevations in the Paso Robles Formation Aquifer for spring 2023 and fall 2023, respectively. Overall, groundwater conditions in the Subbasin in the spring and fall of 2023 were similar, with groundwater elevations in the fall generally lower than in the spring, a typical seasonal trend for the Subbasin. Groundwater flow direction is generally to the northwest and west over most of the Subbasin. In general, groundwater flow in the western portion of the Subbasin tends to converge toward areas of low groundwater elevations. These areas of low groundwater elevation are in the area between the City of Paso Robles and the communities of San Miguel and Whitley Gardens. Horizontal groundwater gradients range from approximately 0.002 ft/ft in the southeast portion of the Subbasin to approximately 0.02 ft/ft in the area southeast of Paso Robles.

Groundwater elevations observed in the Subbasin during WY 2023 are generally higher than the previous year across a majority of the Subbasin, due to above-average rainfall conditions during the winter of 2022/2023. Positive and negative changes in groundwater elevations from year to year are observed in various parts of the Subbasin, as has been observed historically. Seasonal trends of slightly higher spring groundwater elevations compared with fall levels are observed annually.

3.3 Hydrographs (§ 356.2[b][1][B])

Groundwater elevation hydrographs are used to evaluate aquifer behavior over time. Changes in groundwater elevation at a given point in the Subbasin can result from many influencing factors, with all or some occurring at any given time. Factors can include changing climatic trends, seasonal variations in precipitation, varying Subbasin extractions, changing inflows and outflows along boundaries, availability of recharge from surface water sources, and influence from localized pumping conditions. Climatic variation can be one of the most significant factors affecting groundwater elevations over time. For this reason, the hydrographs also display periods of climatic variation categorized as wet, dry, or average/alternating wet and dry (see Figure 2).

3.3.1 Hydrographs

Groundwater elevation hydrographs and associated location maps for the 22 RMS wells that are constructed in and extract groundwater from the Paso Robles Formation Aquifer and the single Alluvial Aquifer RMS well are presented in Appendix F. These hydrographs also include information on well screen interval (if available), reference point elevation, as well as measurable objectives and minimum thresholds for each well that were developed during the preparation of the GSP. Many of the hydrographs illustrate a condition of declining water levels since the late 1990s, although some indicate relative water level stability during the same period.

As described in the GSP for the Paso Robles Formation Aquifer RMS wells[11], an average of the 2017 non-pumping groundwater levels was selected as the measurable objectives and minimum thresholds are set below those levels (M&A, 2020). Going forward from 2017, the average of the spring and fall measurements in any one water year will be the benchmark against which trends will be assessed.

Five of the 22 Paso Robles Formation Aquifer RMS wells have average WY 2023 groundwater elevations greater than the measurable objective for that RMS well. Although groundwater elevations in a few of the Paso Robles Formation Aquifer RMS wells are stable to slightly increasing during the past few years, groundwater elevations in several of the RMS wells are continuing to trend downward. Three of the 22 Paso Robles Formation Aquifer RMS wells in the Subbasin groundwater monitoring network exhibit groundwater elevations below the minimum threshold established in the GSP. One of the wells exhibiting groundwater

[11] A measurable objective and minimum threshold were not set for the single Alluvial Aquifer monitoring network well because of a lack of available historical groundwater elevation data at the time of GSP submittal (M&A, 2020).

elevations below the minimum threshold has occurred for the first time in WY 2023, while two of the wells exhibiting groundwater elevations below the minimum threshold have occurred for two or more consecutive years (27S/13E-28F01 for the fourth consecutive year and 27S/13E-30J01 for the second consecutive year). The condition exhibited in the two wells with groundwater elevations below the minimum threshold for two or more consecutive years constitutes a chronic lowering of groundwater elevation undesirable result as defined in the GSP. Based on initial observation this appears to be an isolated local issue. However, according to Section 8.4.5.1 of the GSP,[12] the GSAs must initiate an investigation to determine if local or Subbasin-wide actions are required to address this undesirable result. Work continued on this investigation as part of monitoring network expansion efforts during 2023 (see Section 8.3.5) and will continue into 2024.

[12] Section 8.4.5.1 of the GSP – Criteria for Defining Undesirable Results includes the text: "*A single monitoring well in exceedance for two consecutive years also represents an undesirable result for the area of the Basin represented by the monitoring well. Geographically isolated exceedances will require investigation to determine if local or Basin wide actions are required in response*."

SECTION 4: **Groundwater Extractions (§ 356.2[b][2])**

4.1 Introduction

This section presents the metered and estimated groundwater extractions from the Subbasin for WY 2023. The types of groundwater extraction described in this section include municipal (Table 1), agricultural (Table 3), rural domestic (Table 4), and golf courses and small PWSs[13] (Table 5). Each following subsection includes a description of the method of measurement and a qualitative level of accuracy for each estimate. The level of accuracy is rated on a qualitative scale of low, medium, and high. The annual groundwater extraction volumes for all water use sectors are shown in Table 6.

4.2 Municipal Metered Well Production Data

The municipal groundwater extractions documented in this report are metered data. Metered groundwater pumping extraction data are from the City of Paso Robles, San Miguel CSD, and the County of San Luis Obispo for Community Service Area (CSA) 16, providing service to the community of Shandon. The data shown in Table 1 reflect metered data reported by the respective agencies. The accuracy level rating of these metered data is high.

Table 1. Municipal PWS Groundwater Extractions

Water Year	Metered Groundwater Extractions			Total (AF)
	City of Paso Robles[1] (AF)	San Miguel CSD (AF)	CSA 16 (AF)	
2017	1,261	295	70	1,626
2018	1,302	325	50	1,677
2019	1,392	289	48	1,729
2020	1,121	297	91	1,509
2021	1,157	300	96	1,553
2022	1,617	279	86	1,982
2023	778	278	77	1,134

Notes

[1] The City of Paso Robles produces water from wells located in both the Paso Robles Subbasin and the Atascadero Subbasin. Only the portion produced from within the Paso Robles Subbasin is included here. These volumes include any water produced as Salinas River underflow within the Paso Robles Subbasin.

AF = acre-feet

CSA = Community Service Area

CSD = Community Services District

PWS = public water system

4.3 Estimate of Agricultural Extraction

Agricultural water use constituted 93 percent of the total anthropogenic groundwater use in the Subbasin in WY 2023. Groundwater extraction for agricultural irrigation was estimated using a satellite-based method that measures actual ET at the field level as well as an estimation of evaporative losses associated with

[13] Golf courses and small PWSs in the Subbasin generally serve water produced from their own private wells.

agricultural storage ponds. The method of irrigated agricultural water demand estimation uses a WY 2023-specific land use dataset purchased from Land IQ, which represents actual planted acreage verified on the ground. Although not a significant factor in the Subbasin, the Land IQ dataset documents multi-cropping that occurs throughout the growing season.

Note that a 4-acre vineyard is irrigated with water supplied by the City of Paso Robles. The produced water associated with this vineyard is included in the total reported above in Section 4.2 and is omitted from the estimated agricultural irrigation analysis described here.

To estimate agricultural groundwater extraction, WY 2023 specific land use data from Land IQ was used in conjunction with the OpenET ensemble model.[14] OpenET provides satellite-based estimates of the total amount of water that is transferred from the land surface to the atmosphere through the process of ET. The OpenET ensemble model uses Landsat satellite data to produce ET data at a spatial resolution of 30 meters by 30 meters (0.22 acres per pixel). Additional inputs include gridded weather variables such as solar radiation, air temperature, humidity, wind speed, and precipitation (OpenET, 2024). OpenET provides estimates of ET for the entire land surface, or in other words, “wall to wall”. To produce an estimate of ET specific to the irrigated crop acreage in the Subbasin the OpenET ensemble model results are screened by the Land IQ land use data set, thereby removing any potential estimated ET volumes associated with bare ground, non-irrigated crops, or native vegetation. A total of 17 irrigated crop types were identified in the WY 2023 Land IQ spatial dataset. These 17 crop types have been grouped into five basic crop groups: orchard, pasture, alfalfa, vegetable, and vineyard which are shown on Figure 8. A summary of acreage by crop type is presented in Table 2. Irrigated agricultural crop types were identified by inspection of monthly ET for each mapped crop type versus monthly ET for fallow ground. Essentially, crop types were considered irrigated if monthly ET remained high throughout the latter part of the growing season as opposed to the diminishing monthly ET following the rainy season on fallow ground. ET resulting from effective precipitation[15], rather than applied irrigation water, were removed from the analysis. Applied irrigation volumes are estimated by scaling up the estimated irrigated crop ET volumes using assumed crop specific irrigation efficiency factors.[16] The resulting volumes are summed by water year, which then represent estimated annual agricultural groundwater extraction. Deficit irrigation is captured in the satellite-based method through the measurement of actual ET. Groundwater extractions for frost protection are captured to the extent that the produced water results in increased ET. It is assumed that the remainder of the water produced for frost protection remains within the Subbasin and percolates back to groundwater. The results of this analysis are presented in Table 2, broken out by basic crop group.

The soil-water balance model that was developed for the Paso Robles Groundwater Basin Model Update (GSSI, 2014) was used to estimate agricultural water demands in the GSP and in several of the prior annual reports. In the WY 2022 Annual Report (GSI, 2023) agricultural water demand was estimated using both the

[14] OpenET uses reference ET data calculated using the American Society of Civil Engineers (ASCE) Standardized Penman-Monteith equation for a grass reference surface, and usually notated as ‘ETo’. For California, OpenET uses Spatial CIMIS meteorological datasets generated by the California DWR to compute ASCE grass reference ET. OpenET provides ET data from multiple satellite-driven models, and also calculates a single “ensemble value” from those models. The models currently included are ALEXI/DisALEXI, eeMETRIC, geeSEBAL, PT-JPL, SIMS, and SSEBop. More information about these models can be found at: https://openetdata.org/methodologies/. All of the models included in the OpenET ensemble have been used by government agencies with responsibility for water use reporting and management in the western U.S., and some models are widely used internationally (OpenET, 2024).

[15] Effective precipitation (the portion of rainfall that remains available to crops after runoff, evaporation, and deep percolation are removed) was calculated monthly for each field based on gridded precipitation values from gridMET using analytical formulas presented in FAO (1986). gridMET is a public domain dataset of daily high-spatial resolution (~4-km, 1/24th degree) surface meteorological data covering the contiguous United States from 1979-yesterday. The dataset is available through OpenET. The methodology behind gridMET is described in Abatzoglou (2013).

[16] Irrigation efficiencies were assigned based on FAO (1989) and Martin (2011). Vineyard, the dominant crop in the Subbasin was assigned an irrigation efficiency of 90 percent.

soil-water balance model and the satellite-based method. As documented in the WY 2022 Annual Report, the satellite-based method is considered more accurate as it directly measures actual ET as it varies spatially and temporally throughout the Subbasin and throughout the year, thereby capturing nuances in crop irrigation practices, such as deficit irrigation. The soil-water balance method uses a more rigid approach to capturing ET variability in the basin that does not fully capture the actual climatic variability or nuanced crop irrigation practices that may occur each year. Based on the benefits of the satellite-based method, the decision was made by the GSAs to retire the soil-water balance model method and use the satellite-based method exclusively going forward.

In addition to performing the satellite-based method of estimating agricultural irrigation for WY 2023, the satellite-based method was also used to re-evaluate estimate agricultural irrigation for WY's 2017 through 2022. Although satellite-based estimation of agricultural irrigation was already completed for WY 2022 during preparation of the WY 2022 Annual Report (GSI, 2023) it has been re-evaluated using a refined method for estimation of effective precipitation (see above). The re-evaluation of WY 2022 estimated agricultural irrigation results in a value approximately 3,800 AF less than was reported in last year's annual report. A comparison of the previously reported soil-water balance model-based results versus the re-evaluated satellite-based method results is presented in Table 3. Total irrigated acreage and water year type for each year are included for reference.

Evaporative losses associated with agricultural storage ponds was estimated based on the following assumptions: 1) the ponds are assumed to be full for April and May, and ¼ full from June through March, 2) the wetted area of the ponds at ¼ full is approximately 50 percent of the wetted area when the ponds are full. A review of recent aerial photography was completed to identify agricultural storage ponds in the Subbasin (see Figure 8). From this review it was determined that approximately 200 acres of wetted area is present in the Subbasin when the ponds are full (April and May) and approximately 100 acres of wetted area is present when the ponds are ¼ full (June through March). The total annual evaporative loss from agricultural storage ponds was calculated based on pan evaporation data from the Nacimiento Dam Station and the variable wetted acreage on a monthly time step. The estimated total evaporative loss from agricultural storage ponds is 470 AFY. This total is incorporated into the total estimated agricultural groundwater extraction numbers presented in Table 3.

Table 2. WY 2023 Irrigated Acreage, Estimated Agricultural Groundwater Extraction and Calculated Water Duty Factor by Basic Crop Group

Basic Crop Group	Irrigated Acreage	Agricultural Groundwater Extraction (AF)	Water Duty Factor (AF/acre)
Orchard	1,263	1,297	1.0
Pasture	682	1,455	2.1
Alfalfa	1,544	4,678	3.0
Vegetable	1,068	1,586	1.5
Vineyard	34,347	50,556 [1]	1.5
Total	**38,904**	**59,600**	**Average: 1.8**

Notes

[1] This total include 470 AFY of estimated evaporative losses from agricultural storage ponds

AF = acre-feet

Table 3. Estimated Annual Agricultural Groundwater Extractions

Water Year	Agricultural Groundwater Extraction (AF)		Irrigated Acres	Water Year Type[2]
	Soil-Water Balance Model	Satellite-Based Method[1]		
2017	64,100	65,300	42,510 [4]	Wet
2018	75,500	80,200	42,510 [4]	Wet
2019	55,800	68,800	39,014 [5]	Avg
2020	59,200	72,600	39,014 [5]	Avg
2021	75,500	74,800	37,569 [6]	Dry
2022	78,700	76,900	37,569 [6]	Dry
2023	—	59,600	38,904 [7]	Wet

Notes
[1] These totals include 470 AFY of estimated evaporative losses from agricultural storage ponds
[2] The types are based on 24-month period SPI analysis (see Section 2.3).
[3] re-evaluated using a refined method for estimation of effective precipitation
[4] based on Land IQ land use data from 2018
[5] based on Land IQ land use data from 2019
[6] based on Land IQ land use data from 2022
[7] based on Land IQ land use data from 2023
— = not applicable
AF = acre-feet
Avg = Average
SPI = Standardized Precipitation Index

4.4 Rural Domestic and Small Public Water System Extraction

Rural domestic and small PWS groundwater extractions in the Subbasin were estimated using the methods described here.

4.4.1 Rural Domestic Demand

As documented in the Paso Robles Groundwater Basin Model Update (GSSI, 2014), the rural domestic water demand was originally estimated as the product of County estimates of rural domestic units (DUs) and a water demand factor of 1.7 acre-feet per year (AFY) per DU, which included small PWS water demand (Fugro, 2002). This factor was subsequently modified to 1.0 AFY/DU in the San Luis Obispo County Master Water Report, not including small PWS demand (Carollo et al., 2012). Based on further investigation completed for the 2014 groundwater model update, the rural domestic water use factor was refined to 0.75 AFY/DU (GSSI, 2014). To simulate rural water demand over time in the groundwater model, an annual growth rate of 2.25 percent for the rural population was assumed, based on recommendation from the San Luis Obispo County Planning Department (GSSI, 2014). The groundwater model update completed for the GSP (M&A, 2020) used a linear regression projection based on the 2014 model update to estimate rural domestic demand through WY 2016.

The projected future water budget presented in the GSP (M&A, 2020) assumes water neutral growth in rural domestic water demand from WY 2016 going forward. Therefore, the rural domestic demand has been held constant at the estimated WY 2016 volume (3,530 AF) for all prior annual reports (GSI, 2020, 2021, 2022, and 2023). For this WY 2023 Annual Report, rural domestic pumping has been re-evaluated based on the assumption of water neutral growth since 2016, but with the modification of annual fluctuations based on water year type. GSSI (2014) assumed that 62 percent of rural domestic demand is used outdoors in the Subbasin. An estimation of effective precipitation (see Section 4.3) for each water year was used to account for fluctuations in outdoor water use. These totals were then summed with the non-fluctuating assumed 38 percent indoor use for each year. The resulting groundwater extractions for rural domestic demands are summarized in Table 4. The accuracy level rating of these estimated volumes is low-medium, but they are considered to be more accurate than the previously reported, unchanging volumes.

Table 4. Estimated Rural Domestic Groundwater Extractions

Water Year	Rural Domestic (AF)
2017	2,108
2018	3,025
2019	2,280
2020	3,054
2021	3,574
2022	2,925
2023	1,934

Note

AF = acre-feet

4.4.2 Golf Course and Small Public Water System Extractions

The category of small PWSs includes a wide variety of establishments and facilities including small mutual water companies, golf courses, wineries, rural schools, and rural businesses. Various studies over the years used a mix of pumping data and estimates for type-specific water demand rates to estimate small PWS groundwater demand (Fugro, 2002; Todd Engineers, 2009). The 2012 San Luis Obispo County Master Water Report used the County of San Luis Obispo geographic information services mapping to define the distribution and number of commercial systems at the time and applied a single annual factor of 1.5 AFY per system (Carollo et al., 2012).

For the 2014 model update, actual pumping data were used as available to provide a monthly record over the study period (GSSI, 2014). Groundwater demand for four major golf courses (at the time) in the Subbasin (The Links, Hunter Ranch, Paso Robles, and River Oaks) was estimated using the following factors: reference evapotranspiration (ETo) data measured in Paso Robles, the crop coefficient for turf grass, monthly rainfall data, and golf course acreage (GSSI, 2014). Water use for wineries was estimated by identifying each winery and its permitted capacity and applying a water use rate of 5 gallons of water per gallon of wine produced. Minor landscaping, wine tasting/restaurant functions, and return flows were also accounted for (GSSI, 2014). Water use for several small commercial/institutional water systems was estimated using water duty factors specific to the water system type (i.e., camp, school, restaurant, and other uses) (GSSI, 2014).

The groundwater model update completed for the GSP (M&A, 2020) used a linear regression projection for the 2014 model update to estimate small PWS demand through WY 2016. The projected future water budget presented in the GSP (M&A, 2020) assumes water neutral growth in small PWS water demand from WY 2016 going forward. Therefore, the golf course and small PWS demand has been held constant at the estimated WY 2016 volume (1,530 AF) for all prior annual reports (GSI, 2020, 2021, 2022, and 2023). For this WY 2023 Annual Report, golf course and small PWS demand has been re-evaluated based on the assumption of water neutral growth since 2016, but with the modification of annual fluctuations based on water year type.

For the re-evaluation of golf course irrigation demand, annually estimated effective precipitation (see Section 4.3) was used to discount the volume of applied water. It is assumed that 25 percent of small PWS water use is used outdoors to irrigate minor landscaping. For the re-evaluation of small PWS water demand an estimation of effective precipitation for each water year was used to account for fluctuations in outdoor water use. These totals were then summed with the non-fluctuating assumed 75 percent indoor water use for each year. The resulting groundwater extractions for golf course irrigation and small PWS demands are summarized in Table 5. The accuracy level rating of these estimated volumes is low-medium, but they are considered to be more accurate than the previously reported, unchanging volumes.

The total irrigated golf course acreage in the Subbasin is estimated to be 401 acres and the base water demand is assumed to be 4.0 AF/acre (Lyman, 2012). Each golf course is assumed to be deficit irrigated based on inspection of historical aerial photography and best management practices for water conservation on golf courses in California (Gross, 2012). The River Oaks Golf Course produces water from shallow alluvial wells accessing Salinas River underflow and likely also City of Paso Robles wastewater treatment plant effluent. River Oaks Golf Course pumping accounts for approximately 6 percent of the total annual golf course water demand.

Table 5. Estimated Golf Course and Small Public Water System Groundwater Extractions

Water Year	Small PWS (AF)	Golf Courses (AF)	Total Water Use (AF)
2017	291	914	1,206
2018	328	1,092	1,420
2019	298	974	1,273
2020	329	1,094	1,424
2021	350	1,129	1,478
2022	324	1,083	1,407
2023	285	835	1,119

Note

AF = acre-feet

PWS = public water system

4.5 Total Groundwater Extraction Summary

Total groundwater extractions in the Subbasin for WY 2023 are estimated to be 63,800 AF. Table 6 summarizes the total groundwater use by sector and indicates the method of measure and associated level of accuracy. The values for WYs 2017–2022 (grayed out) are included for reference purposes. This convention is carried throughout the report. Approximate points of extraction were spatially distributed and colored according to a grid system to represent the relative pumping across the basin in terms of AF per acre (see Figure 9).

Table 6. Total Groundwater Extractions

Water Year	Groundwater Extractions by Water Use Sector			Total (AF)
	Municipal PWS (AF)	Small PWS, Golf and Rural Domestic (AF)	Agriculture (AF)	
2017	1,626	3,313	65,300	70,200
2018	1,677	4,445	80,200	86,300
2019	1,729	3,553	68,800	74,100
2020	1,509	4,477	72,600	78,600
2021	1,553	5,052	74,800	81,400
2022	1,982	4,332	76,900	83,200
2023	1,134	3,053	59,600	63,800
Method of Measure:	Metered	2016 Groundwater Model, varied by water year type	OpenET	—
Level of Accuracy:	high	low-medium	medium	—

Notes

— = not applicable

AF = acre-feet

PWS = public water system

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SECTION 5: Surface Water Use (§ 356.2[b][3])

5.1 Introduction

This section addresses the reporting requirement of providing surface water supplies used, or available for use, and describes the annual volume and sources for WY 2023. This section also reports quantities of Salinas River underflow, regulated as surface water by the SWRCB, produced and imported into the Subbasin by the City of Paso Robles from the adjacent Atascadero Subbasin. The method of measurement and level of accuracy is rated on a qualitative scale. The Subbasin currently benefits from surface water entitlements from the Nacimiento Water Project (NWP) and the State Water Project to supplement municipal groundwater demands in the City of Paso Robles and the community of Shandon, respectively. Locations of communities dependent on groundwater and with access to surface water are shown in Figure 10.

5.2 Surface Water Available for Use

Table 7 provides a breakdown of surface water available for municipal use in the Subbasin based on contract annual entitlements. There is no guarantee that the full contract entitlement amount will be available to individual NWP or SWP subcontractors in any given year. There is currently no surface water available for agricultural or recharge project use within the Subbasin.

Table 7. Surface Water Available for Use

Water Year	Nacimiento Water Project[1] (AF)	State Water Project[2] (AF)	Total Available Surface Water (AF)
2017	6,488	100	6,588
2018	6,488	100	6,588
2019	6,488	100	6,588
2020	6,488	100	6,588
2021	6,488	100	6,588
2022	6,488	100	6,588
2023	6,488	100	6,588

Notes

[1] Contract annual entitlement to the City of Paso Robles

[2] Contract annual entitlement to CSA 16

AF = acre-feet

CSA = Community Service Area

5.3 Imported Salinas River Underflow

Salinas River underflow, which is regulated as surface water by the SWRCB, is produced by the City of Paso Robles from the adjacent Atascadero Subbasin and imported into the Subbasin. These imported underflow volumes are integrated into the City of Paso Robles water distribution system and served to municipal customers located predominantly within the Subbasin.[17] The annual volumes of imported Salinas River underflow production are presented in Table 8. The accuracy level rating of these metered data is high.

Table 8. Imported Salinas River Underflow

Water Year	Imported Salinas River Underflow[1] (AF)
2017	2,609
2018	3,352
2019	3,075
2020	3,852
2021	3,612
2022	3,349
2023	3,130

Notes

[1] The City of Paso Robles produces Salinas River underflow, regulated as surface water by the State Water Resources Control Board, from wells located in both the Paso Robles Subbasin and the Atascadero Subbasin. Only the portion produced from within the Atascadero Subbasin is included here.

AF = acre-feet

[17] A minor portion of the City of Paso Robles municipal water supply is used by customers located outside of the Subbasin.

5.4 Total Surface Water Use

A summary of total actual surface water use by source is provided in Table 9. The accuracy level rating of these metered data is high.

Environmental uses of surface water are also recognized but not estimated due to insufficient data to make an estimate of surface water use. It is expected that environmental uses will be quantified in future annual reports as more data become available.

Table 9. Surface Water Use

Water Year	Nacimiento Water Project (AF)	Imported Salinas River Underflow[1] (AF)	State Water Project (AF)	Total Surface Water Use (AF)
2017	1,650	2,609	42	4,301
2018	1,423	3,352	55	4,829
2019	1,142	3,075	43	4,259
2020	737	3,852	0	4,589
2021	1,250	3,612	0	4,861
2022	901	3,349	0	4,250
2023	1,432	3,130	0	4,562

Notes

[1] The City of Paso Robles produces Salinas River underflow, regulated as surface water by the State Water Resources Control Board, from its Thunderbird Wells located in the adjacent Atascadero Subbasin

AF = acre-feet

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SECTION 6: **Total Water Use (§ 356.2[b][4])**

This section summarizes the total annual groundwater and imported surface water used to meet municipal, agricultural, and rural demands within the Subbasin. For WY 2023, the quantification of total water use was completed from reported metered municipal water production and metered surface water delivery, and from models used to estimate agricultural and rural water demand. Table 10 summarizes the total water use in the Subbasin by source and water use sector for WY 2023. Figure 11 and Figure 12 represent the WY 2023 total annual water use by water use sector and water source, respectively. The method of measurement and a qualitative level of accuracy for each estimate is rated on a qualitative scale of low, medium, and high.

Table 10. Total Water Use by Source and Water Use Sector, Water Year 2023

Water Year	Municipal PWS (AF)		Small PWS, Golf and Rural Domestic (AF)	Agriculture (AF)	Total (AF)
Source:	**Groundwater**	**Surface Water[1]**	**Groundwater**	**Groundwater**	**—**
2017	1,626	4,301	3,313	65,300	74,500
2018	1,677	4,829	4,445	80,200	91,200
2019	1,729	4,259	3,553	68,800	78,300
2020	1,509	4,589	4,477	72,600	83,200
2021	1,553	4,861	5,052	74,800	86,300
2022	1,982	4,250	4,332	76,900	87,500
2023	1,134	4,562	3,053	59,600	68,300
Method of Measure:	Metered	Metered	2016 Groundwater Model, varied by water year type	OpenET	—
Level of Accuracy:	high	high	low-medium	medium	—

Notes

[1] Includes imported Salinas River underflow, which is regulated as surface water by the State Water Resources Control Board.

— = not applicable

AF = acre-feet

PWS = public water system

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SECTION 7: **Change in Groundwater in Storage (§ 356.2[b][5])**

7.1 Annual Changes in Groundwater Elevation (§ 356.2[b][5][A])

Annual changes in groundwater elevation in the Paso Robles Formation Aquifer for WY 2023 are derived from a comparison of fall groundwater elevation contour maps from one year to the next. For this analysis, fall 2022 groundwater elevations were subtracted from the fall 2023 groundwater elevations resulting in a map depicting the changes in groundwater elevations in the Paso Robles Formation Aquifer that occurred during WY 2023 (see Figure 13). Beginning in 2021, monitoring network expansion efforts by SSJGSA and EPCWD have resulted in water level data being available from several additional wells, located strategically in previous data gap areas. Like last year, because of the monitoring network expansion efforts begun in 2021 the WY 2023 groundwater elevation change map is more data constrained than similar maps produced before WY 2022. The WY 2023 map is based on data from 58 wells (vs only 40 wells in WY 2021). As stated in Section 3, groundwater elevation data for the Alluvial Aquifer are too limited to prepare annual groundwater elevation contour maps. Therefore, the change in groundwater in storage analysis is limited to the Paso Robles Formation Aquifer for this WY 2023 Annual Report.

The groundwater elevation change map for WY 2023 (see Figure 13) shows that compared to the previous fall, water levels were generally higher over a majority of the basin, particularly in the area south of Creston and upper Shell Canyon and upper San Juan Creek valley. The groundwater elevation change map represents the difference in groundwater elevations between two snapshots in time, made approximately one year apart. Considering that groundwater elevations may fluctuate dynamically throughout each year in response to changing climatic conditions and groundwater pumping patterns, the specific patterns of 'higher' versus 'lower' water level areas shown on Figure 13 may not necessarily be representative of conditions occurring throughout the entire water year.

7.2 Annual and Cumulative Change in Groundwater in Storage Calculation (§ 356.2[b][5][B])

The groundwater elevation change map presented above represents a volume change within the Paso Robles Formation Aquifer for WY 2023. The volume change inferred from the groundwater elevation change map (see Figure 13) represents a total volume, including the volume displaced by the aquifer material and the volume of groundwater stored within the void space of the aquifer. The portion of void space in the aquifer that can be used for groundwater storage is represented by the aquifer storage coefficient (S), a unitless factor, which is multiplied by the total volume change to derive the change in groundwater in storage. Based on work completed for the GSP, S is estimated to be 7 percent.[18] The annual change of groundwater in storage calculated for WY 2023 is presented in Table 11 and the annual and cumulative change in groundwater in storage since 1981 are presented on Figure 14.

[18] Appendix G includes derivation of the S from the GSP groundwater model files and a sensitivity analysis.

Table 11. Annual Change in Groundwater in Storage - Paso Robles Formation Aquifer

Water Year	Annual Change (AF)
2017	60,100
2018	6,400
2019	59,700
2020	-80,800
2021	-41,500
2022	-117,100
2023	120,700

Note
AF = acre-feet

The 120,700 AF increase of groundwater in storage in WY 2023 shown in Table 11 is coincident with well above average precipitation in 2023 (28.59 inches). Historical comparison of annually tabulated precipitation, total groundwater extractions, and annual change in groundwater in storage reveals a close correlation between annual total precipitation and change in groundwater in storage (see Figure 15). Specifically, years with well above average precipitation (i.e., 1983, 1993, 1995, 1998, 2005, 2017, and 2023) are all associated with years of large increases in groundwater in storage. Conversely, nearly all[19] below average precipitation years are associated with years of decline in groundwater in storage. The influence of total annual groundwater extractions on annual change in groundwater in storage is also apparent, although to a lesser degree. The influence of groundwater extractions on annual changes in groundwater in storage is most apparent during the drought of the mid-1980s through the early 1990s, when below average precipitation prevailed, but a trend of decreasing groundwater extractions resulted in decreasing amounts of negative annual change of groundwater in storage.

Annual Change in Groundwater in Storage was calculated using the groundwater model for WYs 1981 through 2016 and by groundwater elevation change maps for WYs 2017 through present. The groundwater elevation method has been calibrated to groundwater model results (see Appendix G), however, some noteworthy differences between the methods remain. While the estimated value of S, used in the groundwater elevation change method, is based on sound science and using the best readily available information, it is necessary to acknowledge that the true value of S in the Paso Robles Formation Aquifer is spatially variable (as indicated in the GSP groundwater model) and ranges in value both above and below the estimated value of 7 percent. This, coupled with the necessity to rely on interpolated groundwater elevations through data gap areas in the groundwater level monitoring network (see Section 2.4.1), contributes to a moderate amount of method uncertainty. In addition, the groundwater elevation change method is susceptible to potential over- or under-estimation as a result of the method's inability to account for groundwater in transit.[20] Regardless, the groundwater elevation change method is considered the best available tool for estimating annual change in groundwater in storage until the GSP groundwater model can be updated. Additionally, inclusion of newly available water level data from monitoring network expansion efforts begun in 2021 has significantly improved the accuracy of the groundwater elevation change method.

[19] The exception to this is WY 2018, which was a below average precipitation year associated with a minor increase in groundwater in storage. It should be noted that this change in groundwater in storage was calculated independently from the groundwater model using the groundwater elevation change map method described above.
[20] Groundwater in transit refers to recharged groundwater that is in the process of percolating downward through the unsaturated zone and is not yet contributing to a measurable change in groundwater elevation. The amount of groundwater in transit is assumed to be highly spatially and temporally variable in the Subbasin.

SECTION 8: Progress towards Basin Sustainability (§ 356.2[c])

8.1 Introduction

This section describes several projects and management actions that are in process, have been initiated, or have been recently implemented in the Subbasin as a means to improve groundwater conditions, avoid potential undesirable results, attain subbasin sustainability, and improve understanding of the Subbasin groundwater dynamics as well as implications of GSP implementation. These projects and actions include capital projects and non-structural policies intended to reduce or optimize local groundwater use. Some of these projects were described in concept in the GSP; some of the actions described herein are new initiatives designed to make new water supplies available to the Subbasin that may be implemented by the GSAs to reduce pumping and partially mitigate the degree to which the management actions would be needed.

As described in the GSP (M&A, 2020), the need for projects and management actions is based on emerging Subbasin conditions, including the following:

- Groundwater levels are declining in some parts of the Subbasin, indicating that the amount of groundwater pumping is more than the natural recharge.
- The calculated water budget of the Paso Robles Formation aquifer indicates that the amount of groundwater in storage is in decline and will continue to decline if there is no net decrease in groundwater extractions.

To mitigate declines in groundwater levels in some parts of the Subbasin, achieve the Subbasin sustainability goal by 2040, and avoid undesirable results as required by SMGA regulations, new water supplies must be imported into the Subbasin [i.e., project(s)] and groundwater pumping must be reduced through management action(s).

In addition to project and management actions that address chronic declines in groundwater levels and depletion of groundwater in storage, this section also provides a brief discussion of land subsidence, potential depletion of interconnected surface waters, and groundwater quality trends that occurred during WY 2023.

The projects and management actions described in this section are all intended to help achieve groundwater sustainability in the Subbasin and avoid undesirable results.

8.2 Implementation Approach

As described in the GSP, the volume of annual groundwater pumping in the Subbasin is almost always greater than the estimated sustainable yield[21] (WY 2023 being the exception) and, as a result, groundwater levels are persistently declining in some parts of the Subbasin. In response, the GSAs have initiated several projects and management actions designed to address the impacts of the decline in groundwater levels and reductions of groundwater in storage. It is anticipated that additional new projects and management actions, some of which are described herein, will be implemented in the future to continue progress towards avoiding or mitigating undesirable results.

[21] The GSP states that the future estimated long-term sustainable yield of the Subbasin under reasonable climate change assumptions is 61,100 AFY (M&A, 2020).

Some of the projects and management actions described in this section are Subbasin-wide initiatives and some are area-specific. Generally, the basin-wide management actions apply to all areas of the Subbasin. Area-specific projects have been designed to aid in mitigating persistent water level declines in certain parts of the Subbasin.

8.3 Basin-Wide Management Actions and Projects

8.3.1 Sustainable Groundwater Management Grant Program – Sustainable Groundwater Management Implementation Round 1

In February 2022, the County of San Luis Obispo Groundwater Sustainability Director submitted an application for DWR Sustainable Groundwater Management (SGM) Grant Program – Implementation Round 1 grant funding on behalf of the PBCC. The application was for $10 million, of which $7.6 million was awarded by DWR in July 2022.

In 2023, SGM Grant Program implementation included general grant oversight and management, ensuring invoicing, reporting, and deliverables were turned in on time and in final format. Work during 2023 also included identifying and retaining consultants who will provide ongoing administrative support and legal services during the grant term.

8.3.2 Paso Basin Land Use Ordinance

On February 7, 2023, the San Luis Obispo County Board of Supervisors adopted Ordinance No. 3484, amending Title 8 and Title 22 of the San Luis Obispo County Code, the Health and Sanitation Ordinance and the Land Use Ordinance, rescinding Ordinance No. 3483[22] and re-enacting and extending the previously adopted agricultural offset requirements ordinance for new or expanded irrigated crop production using water from the Paso Robles Groundwater Basin through January 1, 2028. This action effectively extends the existing Water Neutral New Development (WNND) amendments to Title 22.[23] A copy of Ordinance No. 3484 is included in Appendix H.

8.3.3 Synoptic Streamflow Survey

Following the wet winter of 2022/2023 Shandon-San Juan Water District (SSJWD) retained the services of a consultant to perform a synoptic streamflow survey on several tributary streams to the Salinas River in the Subbasin. The opportunity to collect data of this nature presents itself infrequently in the Subbasin, where flashy, short-lived ephemeral stream flows are the norm. The survey included measurements of stream flow and stream depth at regularly spaced intervals collected along 19 transects located on Huer Huero Creek, Shell Creek, San Juan Creek, and the Estrella River. Discharge in cubic feet per second was calculated for each transect using the mean section equation. The results of this survey have identified gaining and losing reaches and greatly enhanced the understanding of surface water-groundwater interactions within the

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[22] Ordinance 3483, passed in November 2022, among other things allowed a 25 AFY exemption per site for new or expanded irrigated crop production in the Paso Basin. This was rescinded with the passing of Ordinance 3484 in February 2023.
[23] In October 2015, the County Board of Supervisors adopted the WNND amendments to the County Land Use Ordinance (Title 22) and Building and Construction Ordinance (Title 19). The amendments require a 1:1 water offset for new non-agricultural development and new or expanded irrigated commercial crop production while providing a 5 AFY exemption for irrigated properties outside of an “area of severe decline” defined based on changes in groundwater elevation measurements from spring 1997 to spring 2013. The action to amend the ordinances was taken in response to declining groundwater levels to minimize further depletion of the groundwater resource. The 1:1 water offset requirement was originally intended to be a stopgap measure to avoid further depletion of the groundwater basin until SGMA implementation and included a termination clause to expire upon the effective date of a final and adopted GSP. On November 5, 2019, the County Board of Supervisors extended the termination date of the WNND ordinances to January 1, 2022 and removed “off-site” agricultural water offsets.

Subbasin. This synoptic streamflow survey dataset will be used to improve the GSP groundwater model and more highly constrain predictive surface water-groundwater interaction simulations. The results from the synoptic streamflow survey is included in Appendix I.

8.3.4 Supplemental Environmental Project Stream Gage Data

The City of Paso Robles GSA installed three radar-based stream flow gage stations (using SEP funds) during WY 2021. These stations are bridge-mounted at the following locations:

- Geneseo Road at Huer Huero Creek,
- River Grove Drive at Estrella Creek, and
- North River Road at Salinas River

These stations have been collecting continuous data since their installation in WY 2021. The dataloggers were downloaded during preparation of this WY 2023 Annual Report. Graphs depicting time-series stage data for each station are included in Appendix I.

8.3.5 Expansion of Monitoring Well Network

As described in the GSP, SGMA regulations require a sufficient density of monitoring wells to characterize the groundwater elevation in each principal aquifer. The GSP concluded that a significant data gap existed in the number of monitoring wells in both the Alluvial Aquifer and Paso Robles Formation Aquifer within the Subbasin. The City of Paso Robles GSA project (using SEP funds) has partially addressed this data gap by drilling new monitoring wells, as described in the WY 2021 Annual Report (GSI, 2022).

The 22 wells in the Paso Robles Formation Aquifer monitoring network are insufficient to develop representative and sufficiently detailed groundwater contour maps. The lack of publicly available data for the aquifer is identified as a data gap that must be addressed in GSP implementation. This section describes ongoing and new projects and initiatives undertaken by SSJGSA, EPCWD, and the Groundwater Sustainability Director to expand the collection of water level data in the Subbasin.

8.3.5.1 SSJGSA Program to Expand the Monitoring Well Network

The SSJGSA initiated a program in WY 2020 to enlist many well owners that are members of the SSJWD to join a pilot study to measure water levels in wells throughout the District. Beginning in March 2021 water levels have been measured approximately monthly in nearly 70 wells. This initial effort is being undertaken to gain a better understanding of the time of year of the seasonal high and low water levels and to identify key representative wells in each area throughout the District. Data collection is continuing into WY 2024.

As this groundwater elevation dataset grows the data are being analyzed with the intent to reduce the number of measuring points as key wells are identified. The eventual goal of the program is to develop a network of 20 to 30 new wells to incorporate into the expanded RMS groundwater level monitoring network (see below). The water level data from this expanded monitoring network has been incorporated into the groundwater elevation and change in groundwater in storage analyses for WY 2023. These data points infilled several prior data gaps and have had the effect of substantially reducing the uncertainty in the WY 2023 analyses.

8.3.5.2 EPCWD Program to Expand the Monitoring Well Network

The EPCWD initiated a program in WY 2020 similar to the SSJGSA program. Beginning in April 2021 water levels have been measured quarterly in approximately 30 wells throughout the EPCWD membership area.

Data collection is continuing into WY 2023. Like the SSJGSA program, the eventual goal of the EPCWD initiative is to develop a network of 20 to 30 new wells to incorporate into the expanded RMS groundwater level monitoring network (see below). The water level data from this expanded monitoring network has been incorporated into the groundwater elevation and change in groundwater in storage analyses for WY 2023. These data points infilled several prior data gaps and have had the effect of substantially reducing the uncertainty in the WY 2023 analyses.

8.3.5.3 Paso Robles Basin Groundwater Level Monitoring Network Expansion and Refinement and Investigation of the El Pomar Junction Area

An Expanded Monitoring Network Technical Advisory Committee (Expanded Monitoring Network TAC) was formed by the PBCC in 2023 to spearhead the effort of expanding and refining the existing RMS groundwater level monitoring network. The purpose of expanding the monitoring network is to identify and address potential groundwater level impacts to domestic users, refine the hydrogeologic conceptual model, improve the GSP groundwater model which will allow the GSAs to improve tracking progress towards achieving sustainability, and to address several of the DWR recommended corrective actions presented in their June 20, 2023 GSP determination letter (see Section 8.5.1). The Expanded Monitoring Network TAC met on the following dates in WY 2023 to develop a recommended expanded monitoring network for the Paso Basin:

- July 13, 2023,
- August 30, 2023, and
- September 19, 2023

Work that was completed by the Expanded Monitoring Network TAC during WY 2023 includes:

- Selection of consultant to develop an expanded monitoring network recommendation based on previously developed scope of work.
- Review and feedback on the draft expanded monitoring network recommendation developed by consultant.
- Prioritization of a list of shallow alluvial wells to be constructed.
- Discussion of the strategy for installation of continuous monitoring equipment in select wells.
- Review and confirmation of the final draft expanded monitoring network recommendation for PBCC consideration.

The Expanded Monitoring Network TAC continued working into October 2023 (WY 2024), culminating in adoption of the Recommended Expanded Groundwater Level Monitoring Network for the Paso Basin by the PBCC at the October 25, 2023, board meeting. The adopted document details the recommendation to expand the existing 23-well RMS groundwater level monitoring network to 151 wells in the Subbasin. The work product of the Expanded Monitoring Network TAC is a recommended list of existing and new wells which constitutes a 'wish list'[24] for the Expanded Groundwater Level Monitoring Network in the Subbasin. Also included in the work product are selections of up to two backup wells for each well in the 'wish list' to resort to if the preferred well is not available.

[24] A majority of the wells in the recommended list are privately owned. A next step will be to approach the well owners and present the opportunity to have their well(s) included in the expanded monitoring network. It is expected that some portion of the well owners will opt out.

To implement this recommendation the GSAs will need to determine monitoring network responsibilities and cost share (e.g. each GSA, or coordinated GSA effort), identify current well owners, develop an access and data sharing agreement, drill new wells, contact existing well owners to determine participation, ensure the well is adequate for monitoring, determine what wells can be instrumented with a continuous monitoring device, develop monitoring protocols, and develop a data management system to host the data. This work will continue into 2024.

In parallel, and in coordination with the Expanded Monitoring Network TAC, the DWR Technical Support Services (TSS) was engaged by the GSAs to install three sets of paired monitoring wells in the Subbasin. Initial well siting for each of the TSS well locations was completed in WY 2023.

El Pomar Junction Area

In 2022 the Groundwater Sustainability Director retained the services of a consultant to prepare a draft work plan for expansion and refinement of the Subbasin groundwater level monitoring network and to investigate the hydrogeology in the El Pomar Junction area in response to the chronic lowering of groundwater elevation undesirable result recorded in RMS well 27S/13E-28F01 (see Section 3.3.1). The chronic lowering of groundwater elevation undesirable result identified in RMS well 27S/13E-28F01 in the WY 2021, WY 2022, and this year's Annual Reports and the chronic lowering of groundwater elevation undesirable result identified in RMS well 27S/13E-30J01 in this year's Annual Report requires an investigation to determine if this undesirable result is a localized or basin-wide issue. The draft work plan details a hydrogeologic investigation of the El Pomar Junction area to satisfy this requirement and to generally improve upon the hydrogeologic understanding of the area. Details from this investigation shall be incorporated into the expansion and refinement of the groundwater monitoring network.

Based on preliminary review of well completion reports (WCRs) provided by San Luis Obispo County Environmental Health Services, lithologic evidence was discovered indicating that several wells located in the El Pomar Junction area, including active irrigation wells, are completed below the Paso Robles Formation either partially or completely within the Santa Margarita Formation, a non-Basin aquifer. Among these wells are three of the existing RMS wells (27S/12E-13N01, 27S/13E-30J01, and 27S/13E-30N01), which each appear to be completed entirely within the Santa Margarita Formation. The investigation of the El Pomar Junction area continued during WY 2023 as part of the Expanded Monitoring Network TAC efforts. It is anticipated that further review of El Pomar Junction area WCRs and any other discoverable hydrogeologic information shall be undertaken during WY 2024.

8.3.6 Multibenefit Irrigated Land Repurposing Program

A Multibenefit Irrigated Land Repurposing (MILR) Program TAC (MILR Program TAC) was formed by the PBCC in 2023. The combined impacts to groundwater resources from the multi-year drought and lack of available and reliable supplemental surface water supplies may increase the likelihood of requiring some irrigated agriculture in the Subbasin to temporarily come out of production. Statewide, extreme recent drought conditions have created momentum for new voluntary incentivized programs for growers facing the difficult decision of taking land out of production and to support some amount of continued farming even if in a smaller irrigated footprint. Typically called repurposing, these programs can provide a strategically designed way to approach fallowing decisions and potentially find new uses for areas taken out of production. As one of the high priority management actions funded by the SGM Grant Program – Implementation Round 1 (see Section 8.3.1) the MILR Program is expected to be a critical component in achieving long-term groundwater sustainability in the Subbasin.

The MILR Program TAC met on the following dates to develop the framework for the MILR Program:

- July 11, 2023
- September 19, 2023

Work completed by the MILR Program TAC in WY 2023 includes:

- Review and comment on conceptual pricing model.
- Development and presentation of a summary of lessons learned from successfully awarded agencies for the Department of Conservation Multi-benefit Land Repurposing Program Regional Block Grant Solicitation.
- Development and presentation of an overview of Pajaro Valley Groundwater Management Agency Strategies regarding land repurposing.
- Continued discussions on program funding requirements and recommendation to the PBCC to develop a rate study.
- Development of a draft MILR project categories and discussion of potential demonstration projects.

8.4 Area-Specific Projects

8.4.1 City of Paso Robles Recycled Water Program

In 2016, the City of Paso Robles completed a major upgrade of its Wastewater Treatment Plant to remove all harmful pollutants efficiently and effectively from the wastewater. The City's master plan is to produce tertiary-quality recycled water and distribute it to various locations within the City as well as east Paso Robles, where it may be used for irrigation of city parks, golf courses, and vineyards. The City of Paso Robles Recycled Water Program will reduce the need to pump groundwater from the Subbasin and will further improve the sustainability of the City's water supply. In 2019, the City completed an upgrade to full tertiary treatment and began producing high-quality recycled water. Design and environmental permitting of the recycled water distribution system are complete.

In 2022, the City received $3.5 million in SGM Grant Program – Implementation Round 1 grant funding, via the County of San Luis Obispo (see Section 8.3.1), for construction of a difficult 1,900 lineal foot segment of the distribution system under the Salinas River. The City of Paso Robles Recycled Water Program will have the capacity to use up to 2,200 AFY of tertiary quality recycled water for in-lieu recharge inside the City of Paso Robles and in the central portion of the Subbasin (see Section 8.4.3). Water that is not used for recycled water purposes may be discharged to surface infiltration facilities, such as Huer Huero Creek, with the possibility for additional recharge benefits.

The primary benefit from the City's Recycled Water Program is higher groundwater elevations in the central portion of the Subbasin due to in lieu recharge from the direct use of the recycled water and potential surface recharge opportunities.

Work completed on the City of Paso Robles Recycled Water Program in WY 2023 includes:

- Continued review of technical submittals and procuring materials;
- Completed environmental training for construction personnel;
- Continued regular construction progress meetings; and
- Contractor excavated entrance and exit pits for horizontal directional drilling operation; dewatered groundwater from entrance pit; installed 48-inch-diameter casings on both sides of river; bored under Salinas River; reamed out borehole to a diameter of 40 inches; fused together a 700-foot-long string of

26-inch-diameter high-density polyethylene (HDPE) pipe; pressure tested the pipe string; pulled the pipe string in under the river; and then pressure-tested the installed pipeline again. Contractor then turned their attention to installation of 24-inch-diameter ductile iron pipe via open cut construction in North River Road. This work required hard closure of North River Road for 4 weeks.

8.4.2 San Miguel Community Services District Recycled Water Project

The San Miguel CSD Recycled Water Project will upgrade the CSD wastewater treatment plant to meet California Code of Regulations Title 22 criteria for disinfected tertiary recycled water for irrigation use by vineyards. Potential customers include a group of agricultural irrigators on the east side of the Salinas River, and a group of agricultural customers northwest of the wastewater treatment plant. The project could provide between 200 AFY and 450 AFY of additional water supplies. The primary benefit from the CSD's Recycled Water project is higher groundwater elevations in the vicinity of the community of San Miguel due to in lieu recharge from the direct use of the recycled water.

Work completed on the San Miguel CSD Recycled Water Project in WY 2023 includes:

- Continued meetings with nearby wineries and vineyards regarding interest in purchasing recycled water and recycled water pipeline easement needs.
- Continued outreach to the Union Pacific Railroad for a crossing easement and potential purchase of adjacent property.
- Survey pipeline alignment for design.
- Prepare California Environmental Quality Act (CEQA) Project description and begin developing the Initial Study / Mitigated Negative Declaration.

8.4.3 Blended Water Project

Private entities and individuals are working actively with the City of Paso Robles and numerous agricultural irrigators to develop a project that can bring recycled water to the central portion of the Subbasin. As described above, the City estimates that as much as 2,200 AFY of recycled water will be available, and the volume will likely increase in the future as the City grows. The wastewater treatment plant is designed to process and deliver up to 4,000 AFY.

The goal of the Blended Water Project is to design and construct a pipeline system to connect to the City's Recycled Water Program and convey recycled water into the agricultural areas east of the City. Although there are many ways to use the Recycled Water Program water directly, certain challenges exist to make the water quality of the recycled water attractive to some agricultural users. Blending the recycled water with surplus NWP water, when available, may mitigate these challenges. The primary benefit from the Blended Water Project is higher groundwater elevations in the central portion of the Subbasin east of the City of Paso Robles due to reductions in groundwater pumping for irrigation and in-lieu recharge from the direct use of the blended water. Associated benefits may include improved groundwater quality from the use and recharge of high-quality irrigation water.

Key developments in 2023 include progress on the City of Paso Robles Recycled Water Program (see Section 8.4.1) and successful removal of the limitations on place of use for NWP water on irrigated agricultural lands within San Luis Obispo County—a constraint originally included in the existing water right held by the Monterey County Water Resources Agency.

The Blended Irrigation Water Supply Project TAC (Blended Water TAC) was formed by the PBCC in 2023. The Blended Water TAC met on July 13, 2023, to develop a scope of work for feasibility and preliminary engineering study request for proposals (RFP) for the Blended Water Project. The Blended Water TAC issued an RFP for the Paso Robles Groundwater Basin Blended Water Supply Project Water Supply Feasibility and Engineering Study.

8.4.4 Diversion of Flood Flows to Recharge Groundwater

In 2023 two temporary flood flow diversion projects were completed under the authority of California State Executive Order N-4-23. Between the two projects carried out by J. Lohr Vineyards Inc. and Kylix Vineyards California LP there is estimated to have been up to 47 AF of diverted flood water recharged to underlying aquifers during March and April 2023. The flood diversion reports submitted to the State are included in Appendix J.

8.4.5 Expansion of Salinas Dam and Ownership Transfer

One of the conceptual projects discussed in the GSP (Section 9.5.2.7 of the GSP) is expansion of the Salinas Dam. The dam is owned by the United States Army Corps of Engineers (USACE), which jointly holds Santa Margarita Reservoir water rights permits with the City of San Luis Obispo (City of SLO). The USACE leases the dam to the SLOFCWCD, who oversees its operation and maintenance, including water delivery to the City of SLO.

The original dam design included the installation of spillway gates that would raise the reservoir elevation, however they were not installed due to seismic safety concerns. The storage capacity of Santa Margarita Reservoir could be expanded by installing the spillway gates, potentially increasing the maximum volume in the reservoir from 23,843 AF to 41,792 AF.

As described in the GSP, expanded reservoir storage might benefit the Subbasin by scheduling summer releases from reservoir storage to the Salinas River, which would benefit the Subbasin by increasing streamflow recharge through augmented flows in the Salinas River. Another way the project might indirectly benefit the Subbasin is if the City of SLO could increase their Santa Margarita Reservoir deliveries, thereby freeing up a portion of their NWP water allocation for purchase by the GSAs.

In 2018, the USACE initiated a Disposition Study to evaluate options to dispose of the Salinas Dam, including transferring ownership to a local agency. An option under investigation is to transfer the dam to a local agency such as the SLOFCWCD, thus the USACE has requested that the County Board of Supervisors, acting in their role as the SLOFCWCD, submit a letter expressing interest in potentially moving forward with the ownership transfer process. Such an ownership transfer would help facilitate the dam expansion, should it prove to be a cost-effective and worthwhile project.

Some of the known issues with transferring ownership of the dam include:

- The USACE has indicated that the Salinas Dam has some deficiencies but is considered low risk. As such, the USACE has indicated that the dam would need to be transferred “as-is”, with the USACE only willing to consider providing minimal funding to support retrofit.
- The State, as the DWR Division of Safety of Dams (DSOD), has indicated that seismic rehabilitation of Salinas Dam would be required. Any retrofit or structural improvements, including expanding the dam’s capacity, will require coordination with and approval by the DSOD following acquisition of the dam by the SLOFCWCD.
- Because the USACE has indicated they are unlikely to install the gates, ownership of the dam would need to be transferred from the federal government to a local agency to pursue the opportunity. This transfer would result in the Salinas Dam oversight responsibilities transferring from federal to state

jurisdiction and require the dam retrofit and expansion to meet any additional requirements from the State.

In WY 2023 the County Groundwater Sustainability Director made a request to DWR to reappropriate resources from the Expansion of Salinas Dam and Ownership Transfer effort to the ongoing work with the MILR Program rate study.

8.5 Summary of Progress towards Meeting Subbasin Sustainability

Since the publication of the GSP in 2020 there has been a mix of wet years, average years, and drought. The Subbasin in WY 2023 has returned to the same level of cumulative change in groundwater in storage estimated in the GSP. Historical groundwater pumping in excess of the sustainable yield has created challenging conditions for sustainable management. Of particular concern are communities and rural residential areas that rely solely on groundwater for their water supply[3] (see Figure 10). During WY 2023, several dry wells were replaced, a direct result of declining water levels. The distribution of these dry well replacements that occurred during WY 2023 is shown on Figure 10.

Actions are underway to collect data, improve the monitoring and data collection networks, and coordinate with affected agencies and entities throughout the Subbasin to develop solutions that address the shared mutual interest in the Subbasin's overall sustainability goal.

8.5.1 DWR Acceptance of Revised GSP

On January 21, 2022, DWR released an official 'incomplete' determination for the Paso Robles Subbasin GSP. The Paso Robles Subbasin GSAs retained a consultant to address the deficiencies identified in the GSP and resubmitted the revised GSP to DWR before the July 20, 2022, deadline. On June 20, 2023 DWR released a determination letter approving the revised GSP. Included with the June 20, 2023, determination letter is a Statement of Findings and Staff Report. Several recommended corrective actions are presented in the Staff Report that should be considered by the GSAs for the first periodic evaluation of the GSP. The June 20, 2023, determination letter with attachments is included in Appendix K.

8.5.2 Subsidence

Land subsidence is the lowering of the land surface. As described in the GSP, several human-induced and natural causes of subsidence exist, but the only process applicable to SGMA are those due to permanently lowered ground surface elevations caused by groundwater pumping (M&A, 2020). Historical subsidence can be estimated using InSAR data provided by DWR. InSAR measures ground elevation using microwave satellite imagery data. The GSP documents minor subsidence in the Subbasin using data provided by DWR depicting the difference in InSAR measured ground surface elevations between June 2015 and June 2018. These data show that subsidence of up to 0.025 feet may have occurred during this 3-year period in a few small, isolated areas of the Subbasin (M&A, 2020). The GSP established minimum thresholds for InSAR measured land subsidence as "no more than 0.1 foot in any single year and a cumulative 0.5 foot in any five-year period", as measured using InSAR between June of one year and June of the following year (M&A, 2020).

Updated InSAR data has been provided by DWR through October 2023. As discussed in the GSP, to minimize the influence of elastic subsidence, changes in ground level should be measured annually from June of one year to June of the following year (M&A, 2020). For this WY 2023 Annual Report, the single-year land subsidence was measured using InSAR from June 2022 through June 2023 and the 5-year land subsidence land subsidence was measured from June 2018 through June 2023. According to Towill, Inc. (2023) there is a potential error of +/- 18 millimeters, or 0.059 feet associated with the InSAR measurement and reporting methods. Therefore, an InSAR measured land surface change of less than 0.059 feet is within the noise of the data and is equivalent to no evidence of subsidence. Considering this range of potential error, examination of the single-year change InSAR data from June 2022 to June 2023 show that zero land subsidence has occurred (see Figure 16). Considering the same potential error for the 5-year cumulative change InSAR data from June 2018 to June 2023 it is apparent that as much as 0.14 feet of subsidence has occurred during this period (see Figure 17). Although minor land subsidence is documented during the 5-year period of June 2018 to June 2023, neither of these results indicate an undesirable result as specified by the land subsidence minimum thresholds. The GSAs will continue to monitor and report annual subsidence as more data become available.

8.5.3 Interconnected Surface Water

Ephemeral surface water flows in the Subbasin make it difficult to assess the interconnectivity of surface water and groundwater and to quantify the degree to which surface water depletion has occurred. The revised GSP submitted to DWR in July 2022 identifies potential surface water/alluvial groundwater connection along certain sections of the Salinas River, along the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and along San Juan Creek upstream of Spring Creek (Paso Robles Subbasin GSAs, 2022). There is no evidence that the Salinas River surface water flows are connected to the underlying Paso Robles Formation Aquifer (Paso Robles Subbasin GSAs, 2022). The potential connection between the surface water system along the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and along San Juan Creek upstream of Spring Creek, and the underlying Paso Robles Formation Aquifer is unknown but sufficient evidence exists that there could potentially be a connection, and therefore further investigation in these areas is recommended (Paso Robles Subbasin GSAs, 2022). At this time, there are insufficient data available to adequately assess the interconnectivity of surface water and groundwater and the potential depletion of interconnected surface water. Although there is at present only a single Alluvial Aquifer RMS well in the Subbasin, seven existing alluvial wells are monitored including three wells along the Salinas River, one well next to the Estrella River near Jardine Road and one well next to San Juan Creek about 7 miles above Shandon (Paso Robles Subbasin GSAs, 2022). Additional Alluvial Aquifer wells will need to be established in the monitoring network before groundwater/surface water interaction can be more robustly analyzed. The Recommended Expanded Groundwater Level Monitoring Network for the Paso Basin produced by the Expanded Monitoring Network TAC (see Section 8.3.5) includes a plan to install new alluvial monitoring wells and address these data gaps.

8.5.4 Groundwater Quality

Although groundwater quality is not a primary focus of SGMA, actions or projects undertaken by GSAs to achieve sustainability cannot degrade water quality to the extent that they would cause undesirable results. As stated in the GSP, groundwater quality in the Subbasin is generally suitable for both drinking water and agricultural purposes (M&A, 2020). Eight COCs were identified and discussed in the GSP that have the potential to be impacted by groundwater management activities. These COCs identified in the GSP are salinity (as indicated by electrical conductivity), TDS, sodium, chloride, nitrate, sulfate, boron, and gross alpha. For this WY 2023 Annual Report, trends of concentrations of these eight COCs were analyzed through WY 2023 using data from the GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) database (GAMA, 2024). All COCs reviewed show a steady concentration trend since 2016.

Overall, there are no significant changes to groundwater quality since 2016, as documented in the GSP, preceding annual reports, and this WY 2023 Annual Report. Implementation of sustainability projects and/or management actions, as presented in the GSP, in this WY 2023 Annual Report, or in future reports or GSP updates, are not anticipated to result in degraded groundwater quality in the Subbasin. Any potential changes in groundwater quality will be documented in future annual reports and GSP updates.

8.5.5 Summary of Changes in Basin Conditions

Groundwater elevations observed in the Subbasin during WY 2023 are generally higher than the previous year across a majority of the Subbasin, due to above-average rainfall conditions during the winter of 2022/2023. Although groundwater elevations in a few of the Paso Robles Formation Aquifer RMS wells are stable to slightly increasing during the past few years, groundwater elevations in several of the RMS wells are continuing to trend downward. In most years (WY 2023 being the exception) groundwater pumping continues to exceed the estimated future sustainable yield and the projects and management actions described in the GSP and in this WY 2023 Annual Report will be necessary to bring the Subbasin into sustainability.

8.5.6 Summary of Impacts of Projects and Management Actions

Additional time will be necessary to judge the effectiveness and quantitative impacts of the projects and management actions either now underway or in the planning and implementation stage. However, it is clear that the actions in place and as described in this WY 2023 Annual Report are a good start towards reaching the sustainability goals laid out in the GSP. It is too soon to judge the observed changes in basin conditions against the interim goals outlined in the GSP, but the anticipated effects of the projects and management actions now underway are expected to significantly affect the ability of the Subbasin to reach the necessary sustainability goals.

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Figures

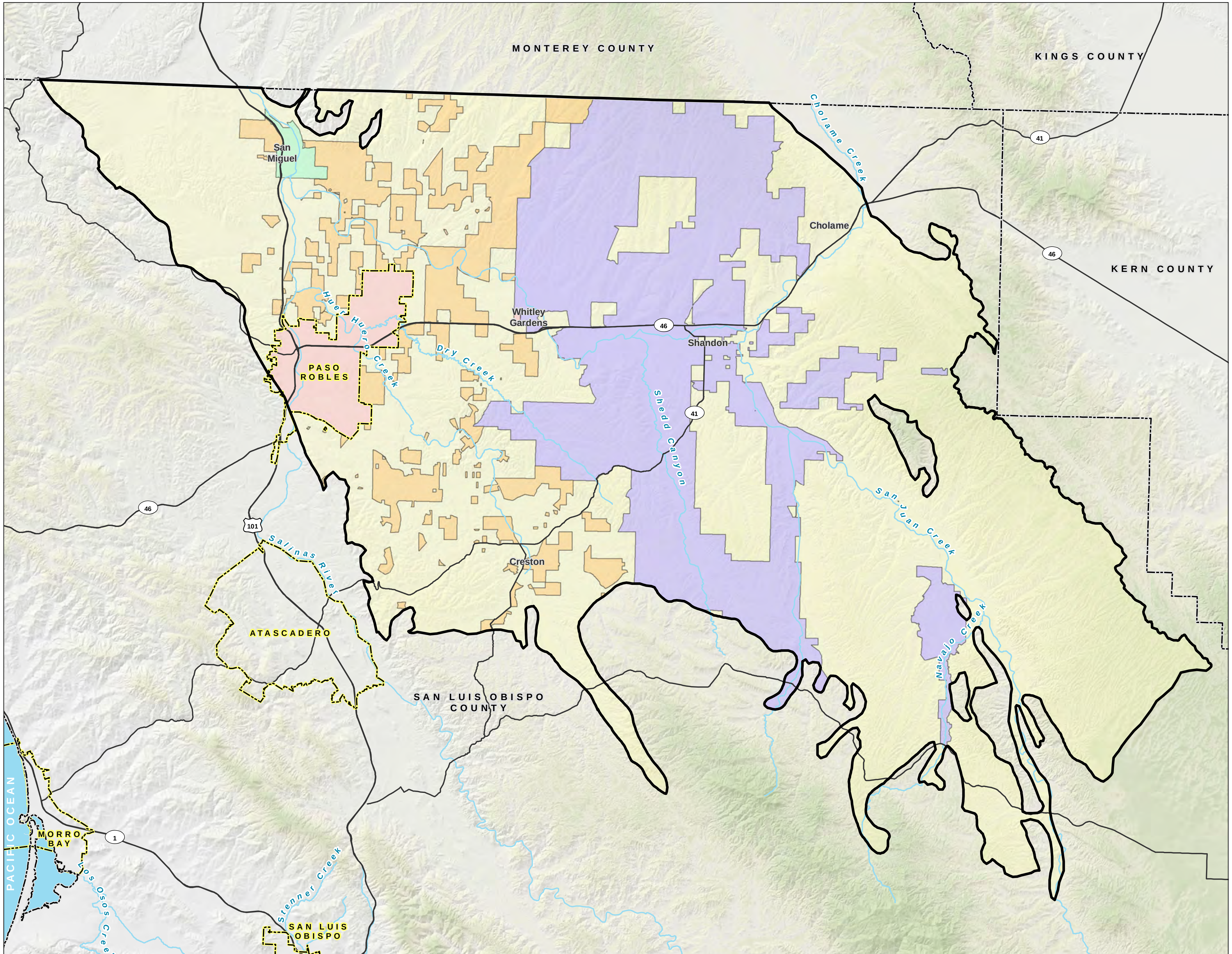


FIGURE 1

Extent of the Paso Robles Subbasin and Exclusive Groundwater Sustainability Agencies

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

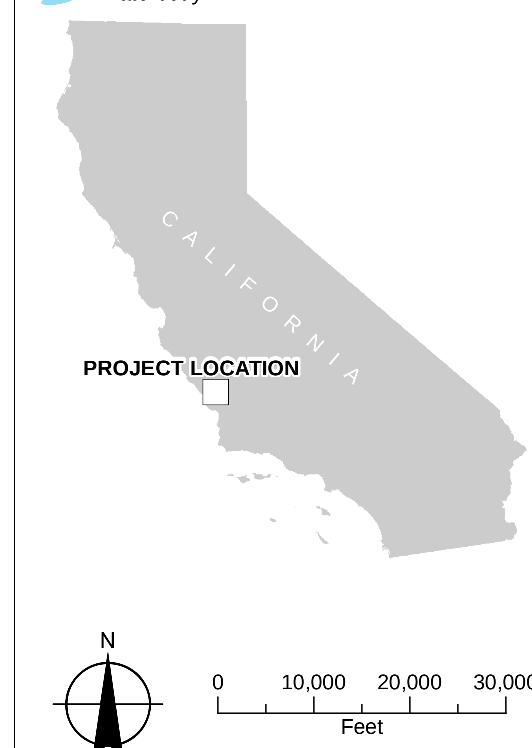
- Paso Robles Subbasin

Exclusive Groundwater Sustainability Agencies

- San Miguel Community Services District
- City of Paso Robles
- Shandon- San Juan Water District
- Estrella-El Pomar-Creston Water District
- County of San Luis Obispo - Paso Robles Area

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody



Date: March 20, 2024
Data Sources: CA DWR, SLO Co., USGS

GSI Water Solutions, Inc.

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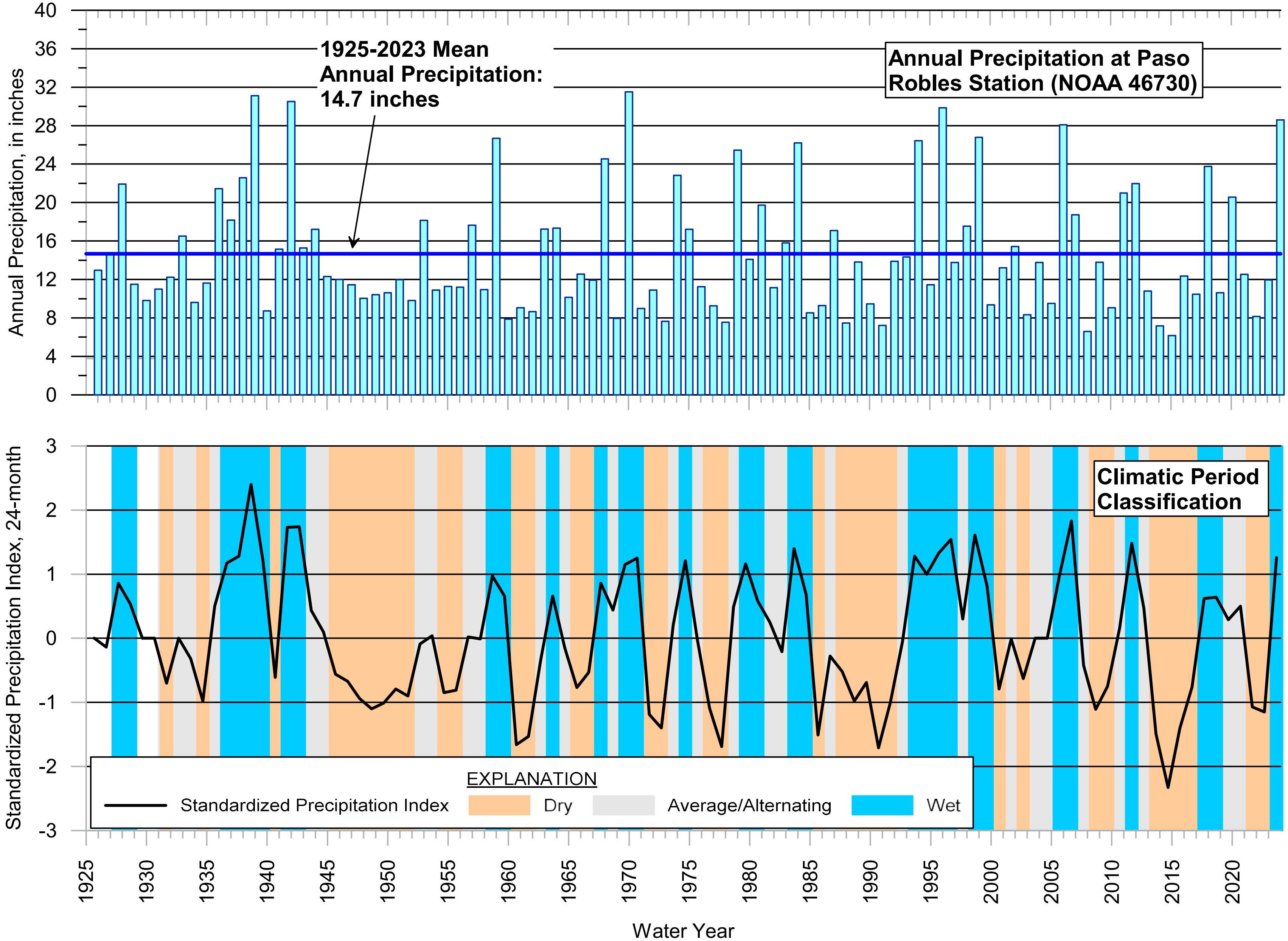

Water Solutions, Inc.

FIGURE 2
Annual Precipitation and Climatic Periods in the Paso Robles Subbasin
Paso Robles Subbasin Water Year 2023 Annual Report

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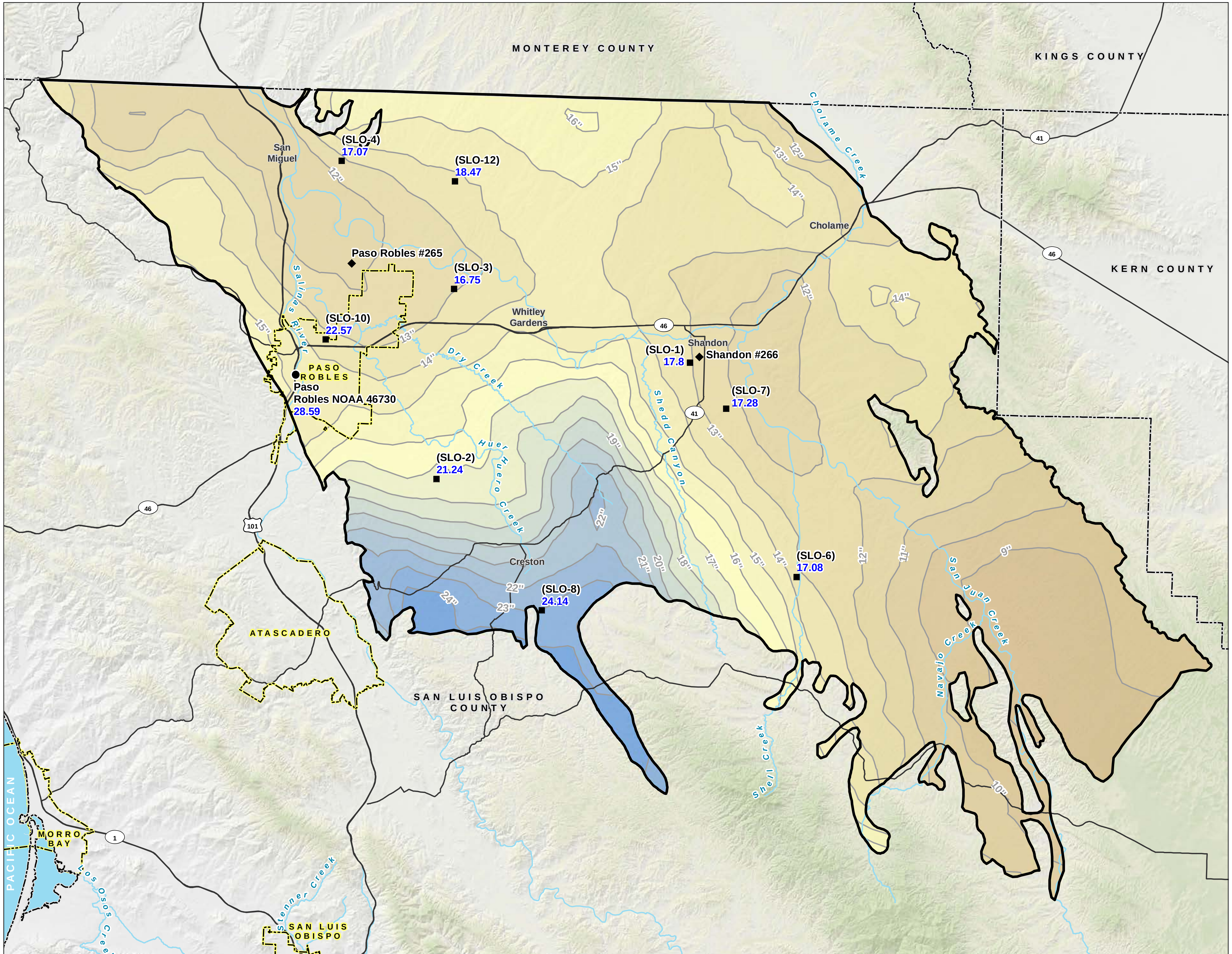

FIGURE 3

Water Year 2023 Precipitation Totals and Average Distribution of Annual Precipitation in the Paso Robles Subbasin

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

- ● *Paso Robles NOAA Precipitation Station* — *WY 2023 Precipitation Total (inches)*
- ■ *UCCE Precipitation Station* — *WY 2023 Precipitation Total (inches)*
- ◆ CIMIS stations installed during WY 2022
- Paso Robles Subbasin
- 1 in. Precipitation Contour

Annual Precipitation (in.)

8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
13 - 14
14 - 15
15 - 16
16 - 17
17 - 18
18 - 19
19 - 20
20 - 21
21 - 22
22 - 23
23 - 24
24 - 25

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTES

Average distribution of annual precipitation based on 30-year normal PRISM data calibrated to the Paso Robles Station (NOAA 46730).

CIMIS: California Irrigation Management Information System
UCCE: University of California Cooperative Extension

N

0 10,000 20,000 30,000
Feet

Date: January 30, 2024
Data Sources: CA DWR, SLO Co., USGS, PRISM (OregonState), NOAA, UCCE

GSI Water Solutions, Inc.

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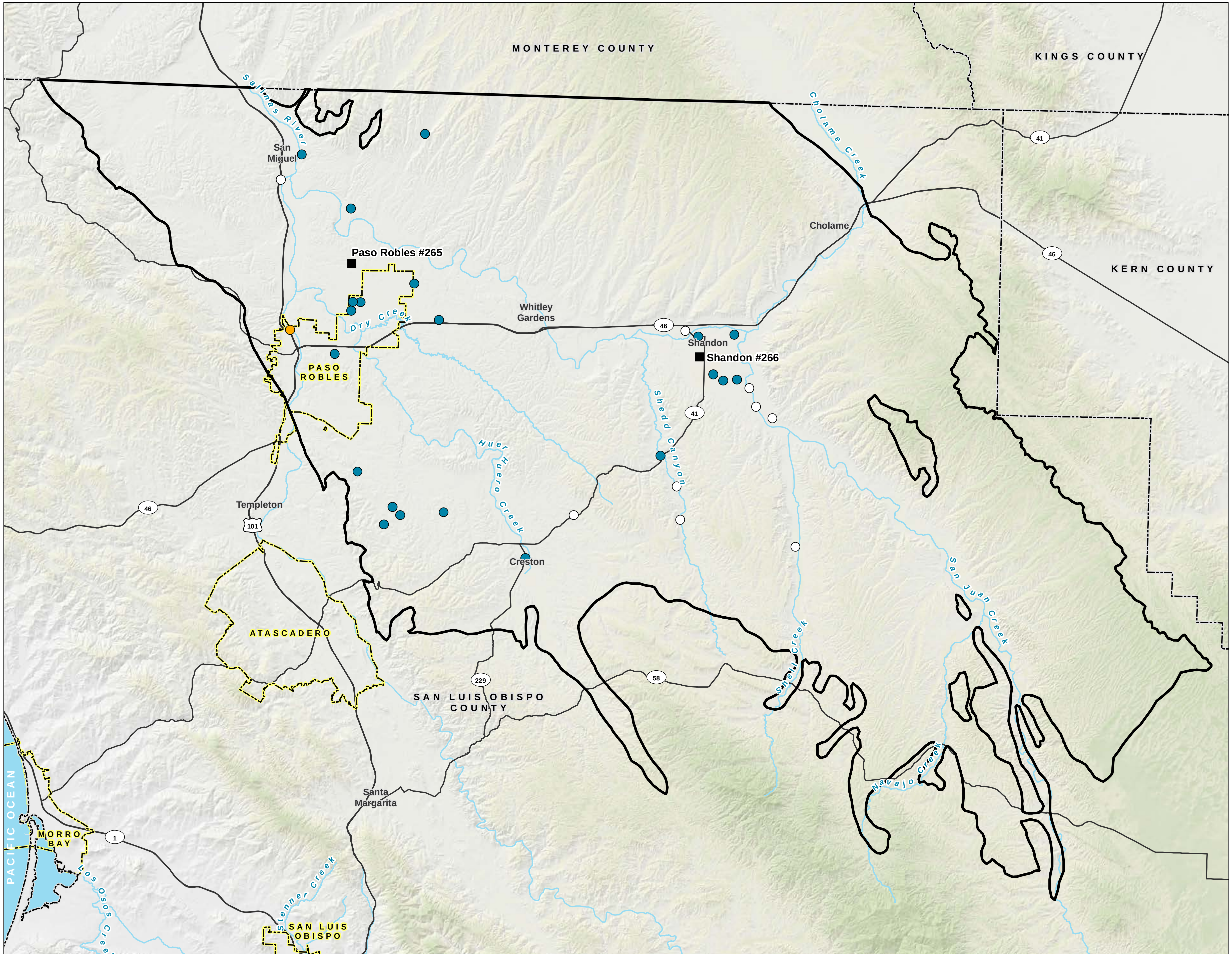

FIGURE 4

Groundwater Elevation Monitoring Well Network in the Paso Robles Subbasin

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

- Paso Robles Subbasin
- CIMIS stations installed during WY 2022

Wells

- Paso Robles Formation
- Alluvial Aquifer
- Potential Future Monitoring Well

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

CIMIS: California Irrigation Management Information System

N

0 10,000 20,000 30,000
Feet

Date: January 29, 2024
Data Sources: CA DWR, SLO Co., City of Paso Robles, USGS

GSI Water Solutions, Inc.

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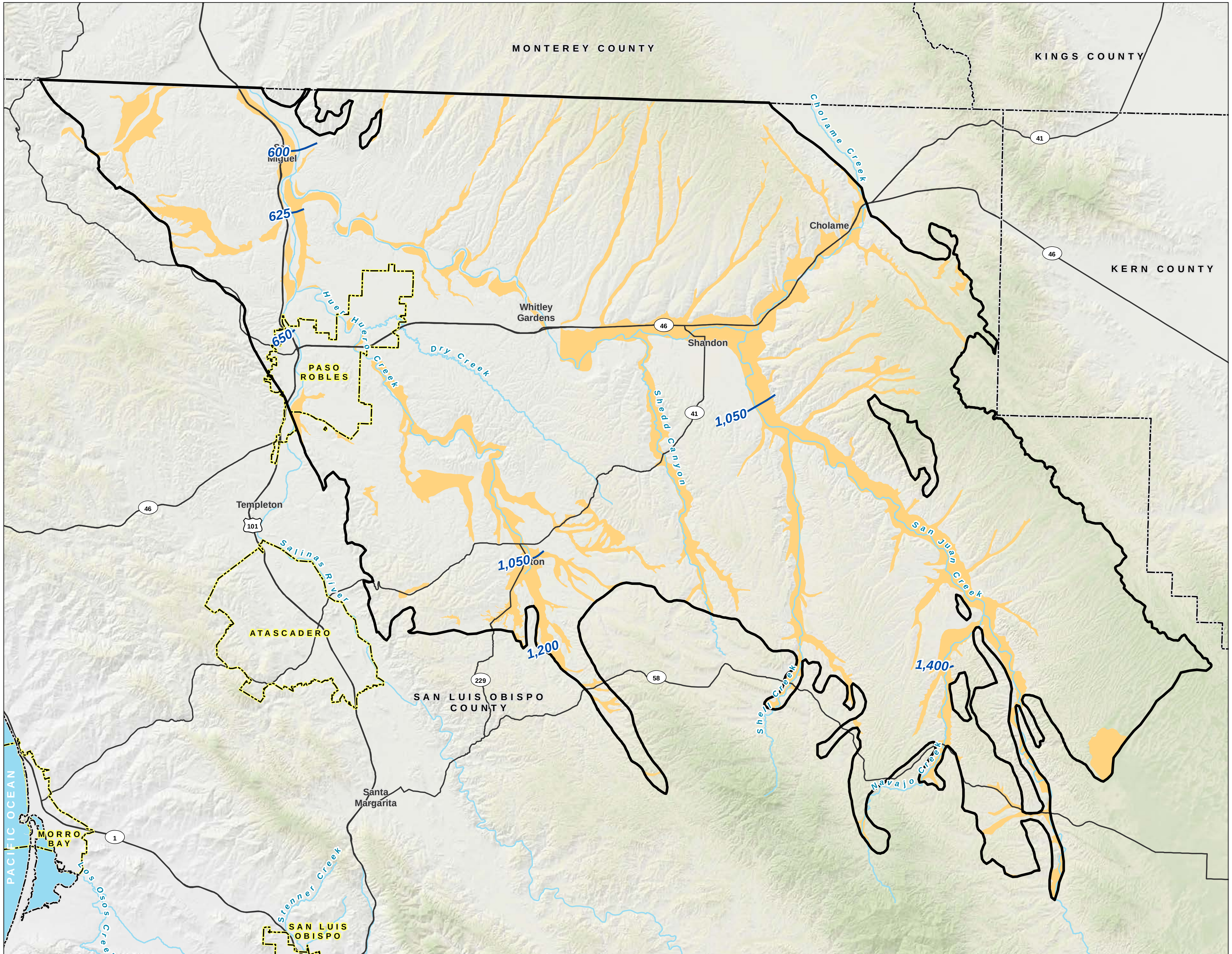
FIGURE 5

Alluvial Aquifer Groundwater Elevation Contours

Paso Robles Subbasin
Water Year 2023 Annual Report



LEGEND

- Alluvial Groundwater Elevation Contour, in feet above mean sea level
- Paso Robles Subbasin

Geologic Alluvial Units

- Qal: Alluvial Deposits

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

N

0 10,000 20,000 30,000
Feet

Date: January 29, 2024
Data Sources: CA DWR, SLO Co., Montgomery, USGS

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure5_Alluvial_Aquifer_GW_Elev_Contours.mxd

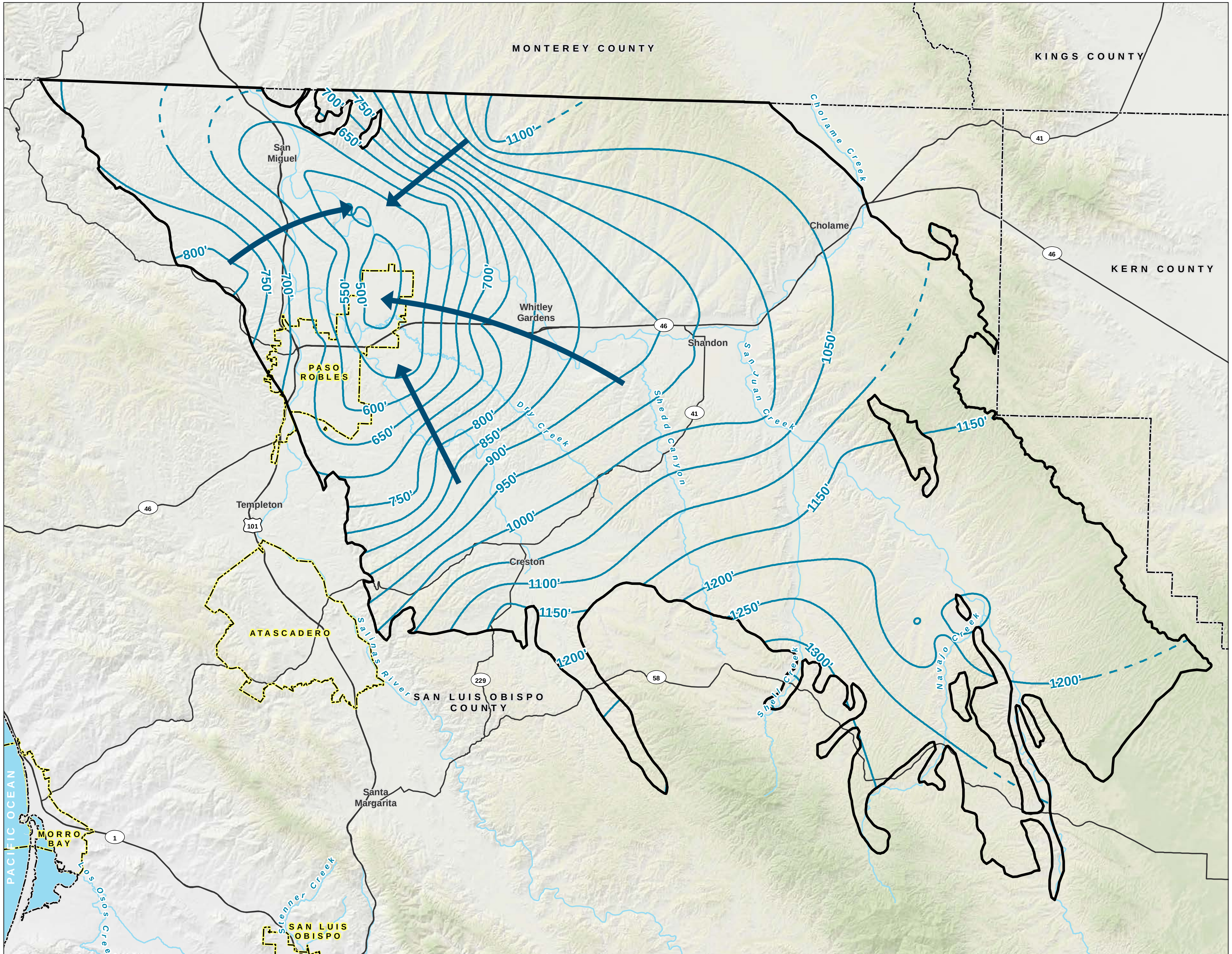


FIGURE 6

Paso Robles Formation Aquifer Spring 2023 Groundwater Elevation Contours

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

- Spring 2023 Groundwater Elevation Contour in feet above mean sea level; dashed where inferred
- Inferred Groundwater Flow Direction
- Paso Robles Subbasin

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

N

0 10,000 20,000 30,000
Feet

Date: January 16, 2024
Data Sources: CA DWR, SLO Co., USGS

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure6_Spring_2023_GW_Contours.mxd

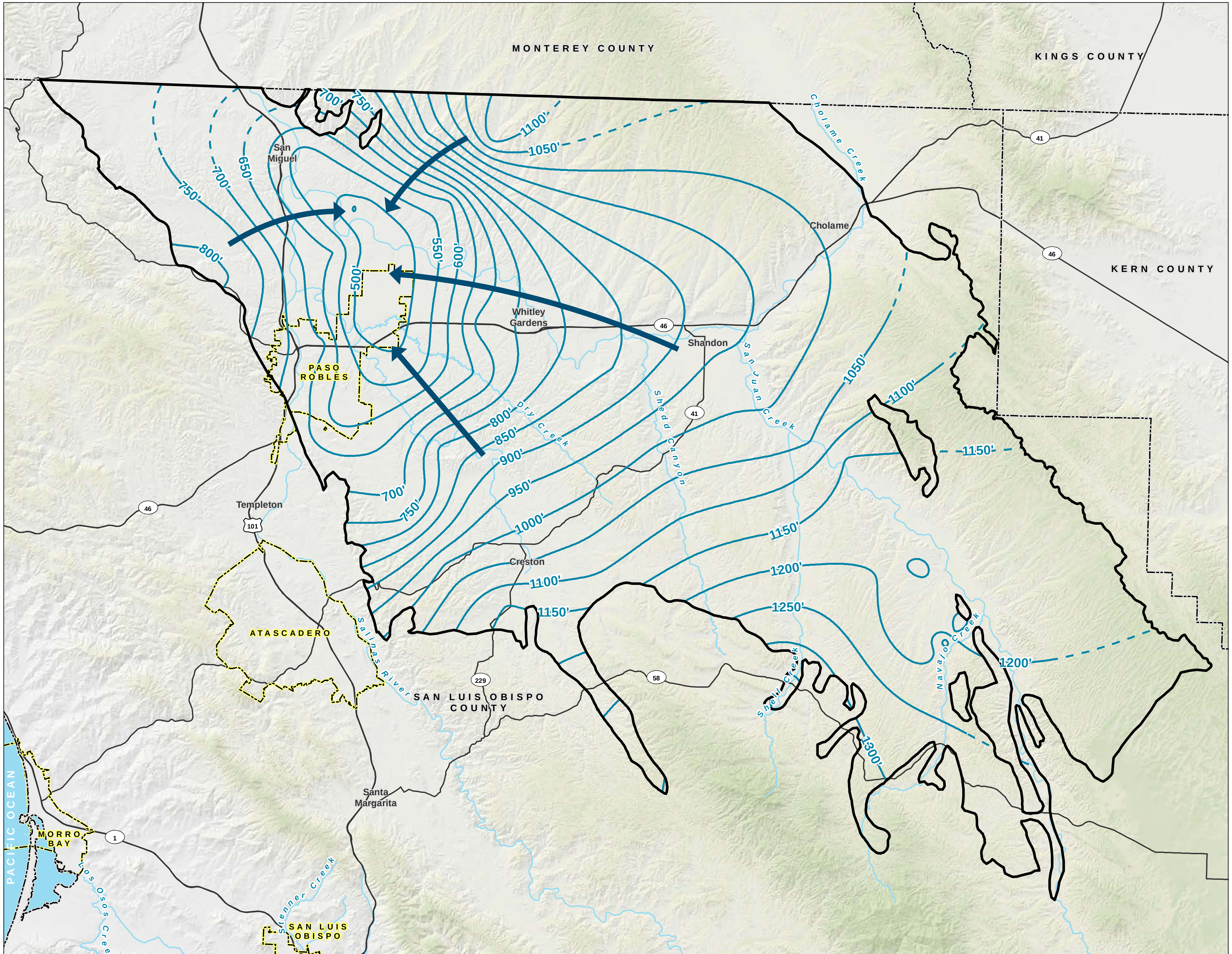


FIGURE 7

Paso Robles Formation Aquifer Fall 2023 Groundwater Elevation Contours

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

- Fall 2023 Groundwater Elevation Contour in feet above mean sea level; dashed where inferred
- Inferred Groundwater Flow Direction
- Paso Robles Subbasin

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

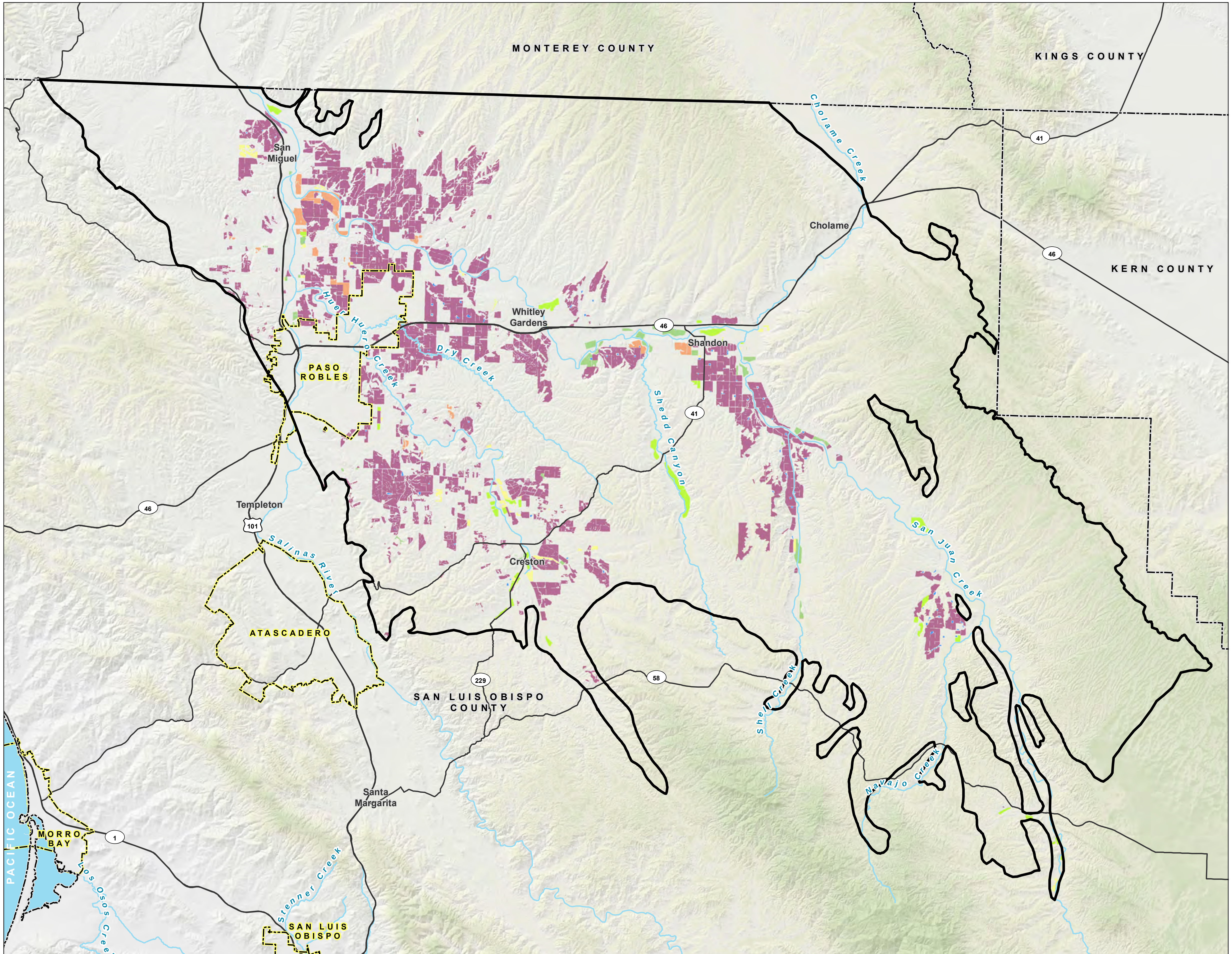
N

0 10,000 20,000 30,000
Feet

Date: January 16, 2024
Data Sources: CA DWR, SLO Co., USGS

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure7_Fall_2023_GW_Contours.mxd



Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure8_Irrigated_Ag.mxd

FIGURE 8

Irrigated Agriculture – Water Year 2023

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

Paso Robles Subbasin

2023 Irrigated Agriculture by Crop Type

Orchard
Pasture
Alfalfa
Vegetable
Vineyard

All Other Features

County Boundary
City Boundary
Major Road
Watercourse
Agricultural Storage Ponds
Waterbody

N

0 10,000 20,000 30,000
Feet

Date: March 20, 2024
Data Sources: CA DWR, SLO Co., LandIQ (2022), USGS

GSI Water Solutions, Inc.

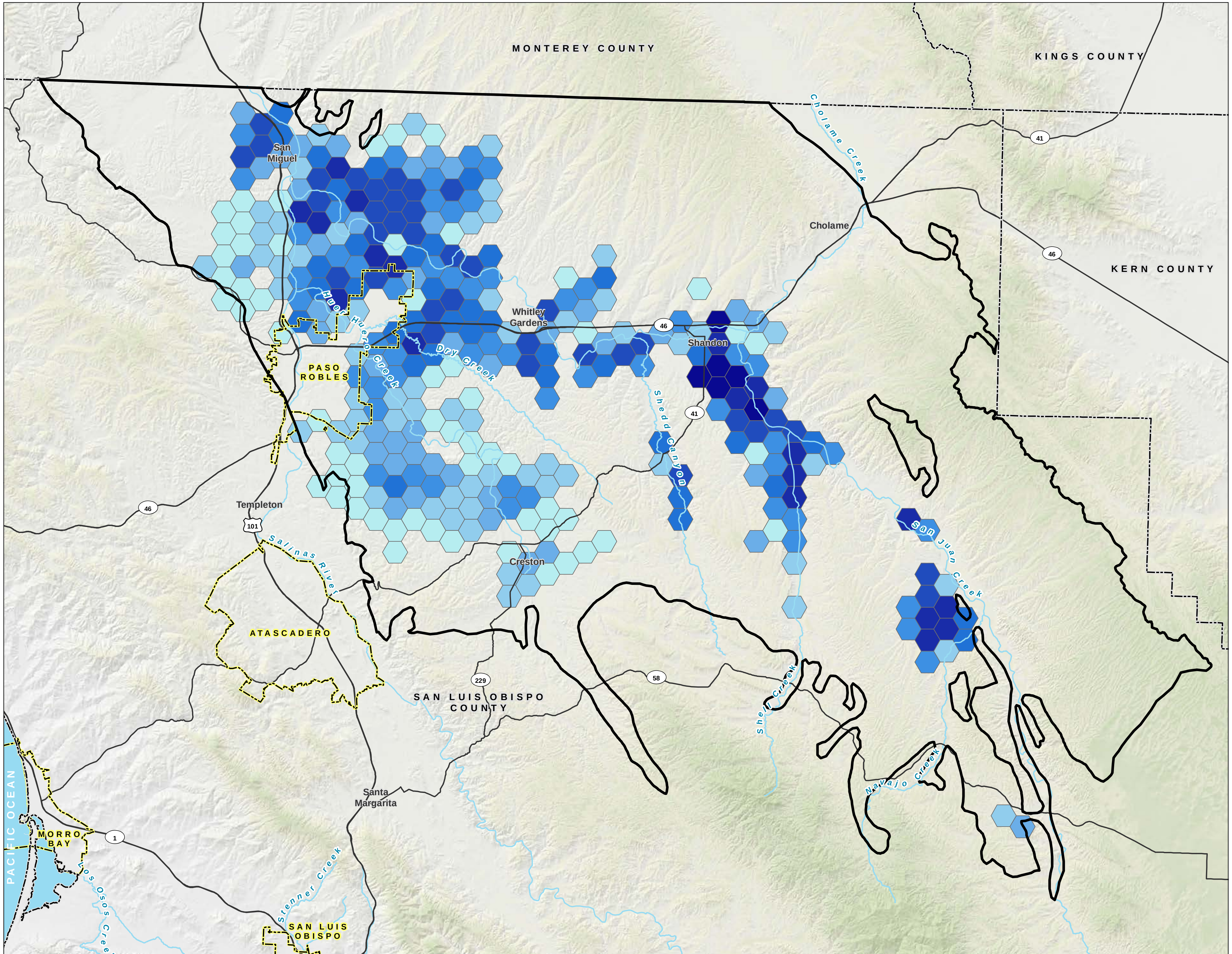


FIGURE 9

General Locations and Volumes of Groundwater Extraction

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

Paso Robles Subbasin

Water Year 2023 Groundwater Extraction (AFY)

- 1 - 13
- 14 - 50
- 51 - 102
- 103 - 183
- 184 - 276
- 277 - 382
- 383 - 544
- 545 - 755

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

AFY: Acre-Feet per Year

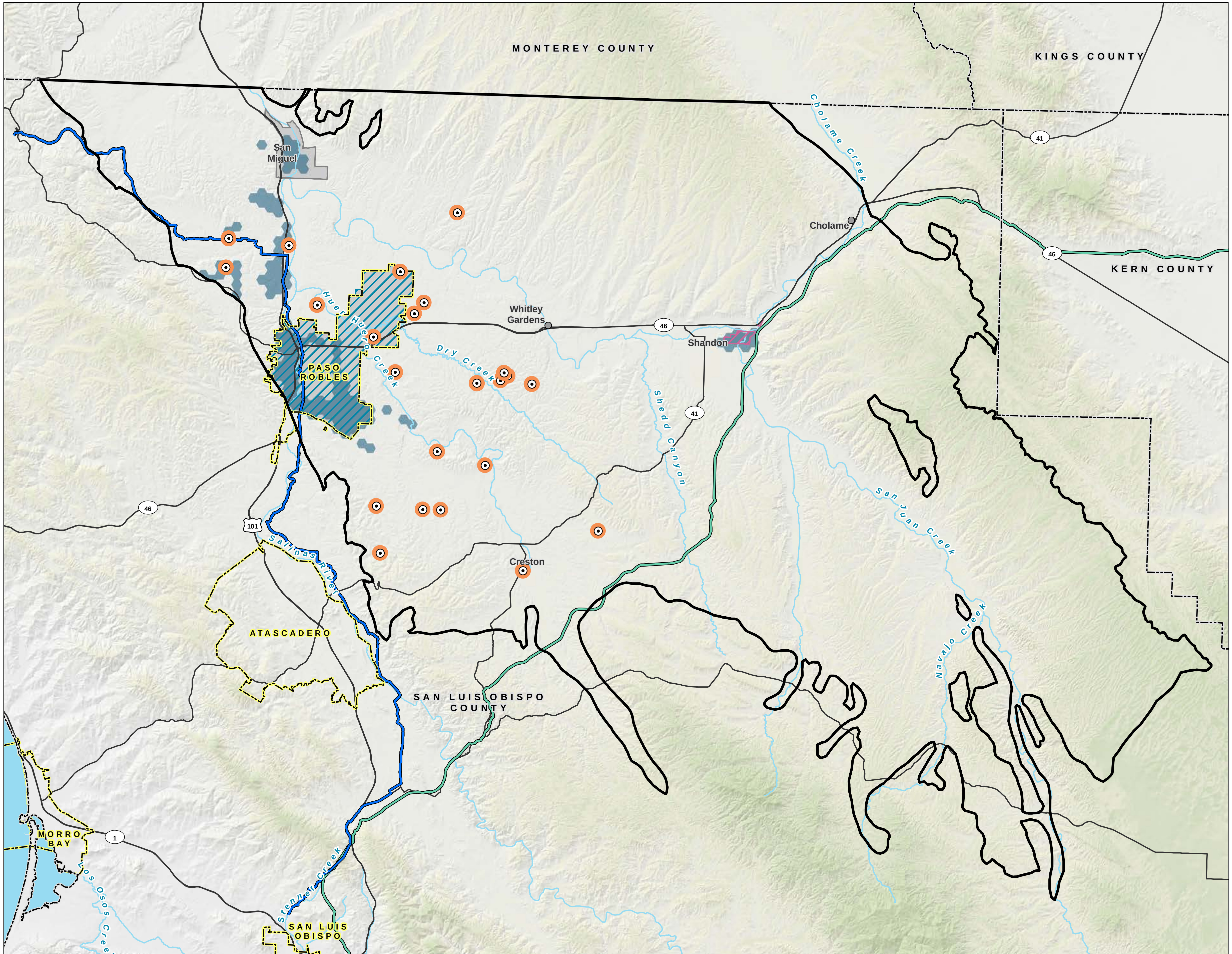
N

0 10,000 20,000 30,000
Feet

Date: January 31, 2024
Data Sources: CA DWR, SLO Co., Soil Water Balance Model, USGS

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure9_General_Locs_and_Volumes_of_GW_Extractions.mxd



Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure10_Comms_Dependent_GW.mxd

FIGURE 10

Communities Dependent on Groundwater and with Access to Surface Water

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

- Disadvantaged Communities (DACs)
- Dry Well Replacements Completed in WY 2023
- Nacimiento Water Project Pipeline
- State Water Project Pipeline
- Community Dependent Solely on Groundwater
- Community Served by Groundwater and Nacimiento Water Project
- Community Served by Groundwater and State Water Project
- Paso Robles Subbasin

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

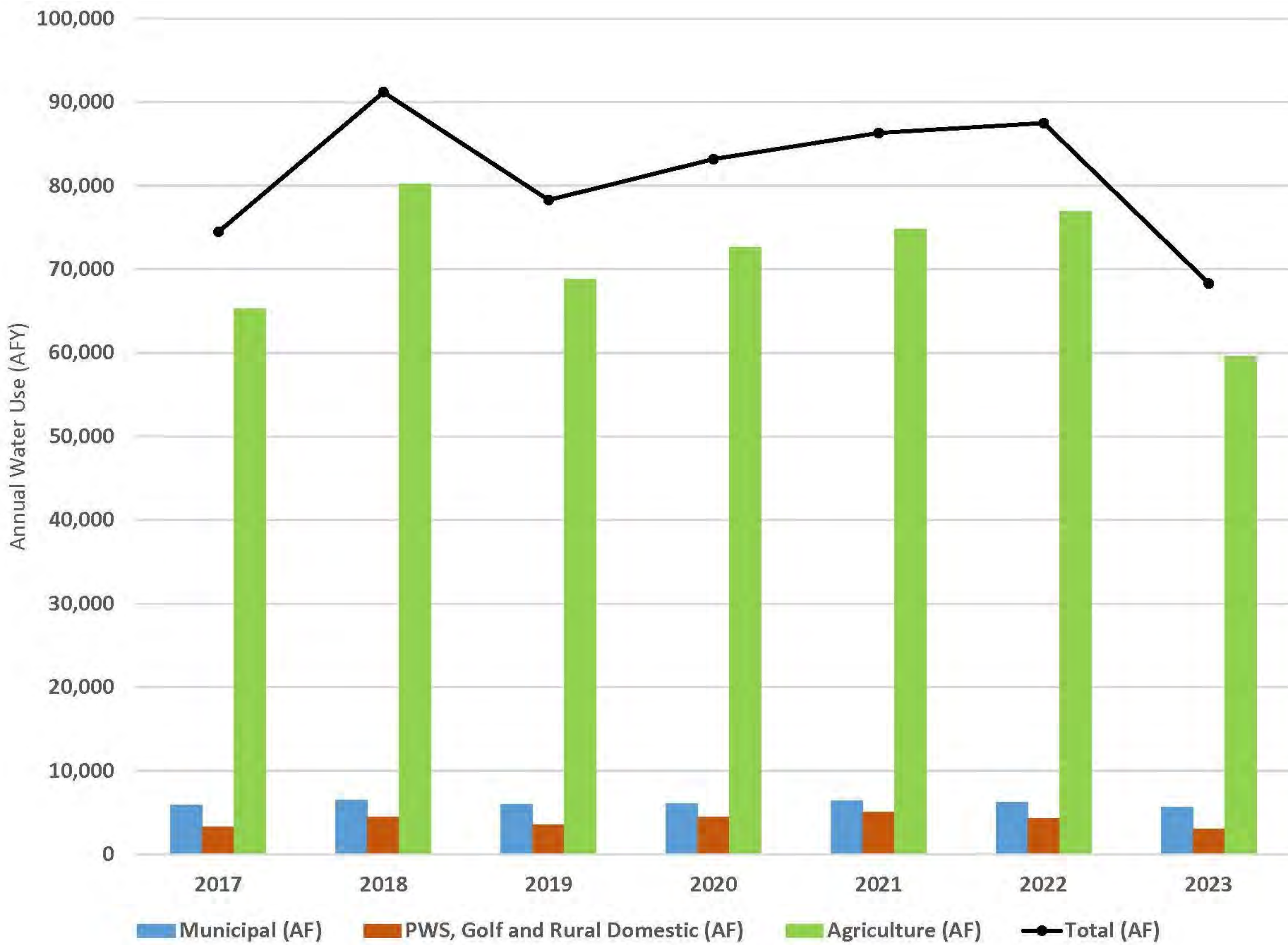
DWR: California Department of Water Resources

N

0 10,000 20,000 30,000
Feet

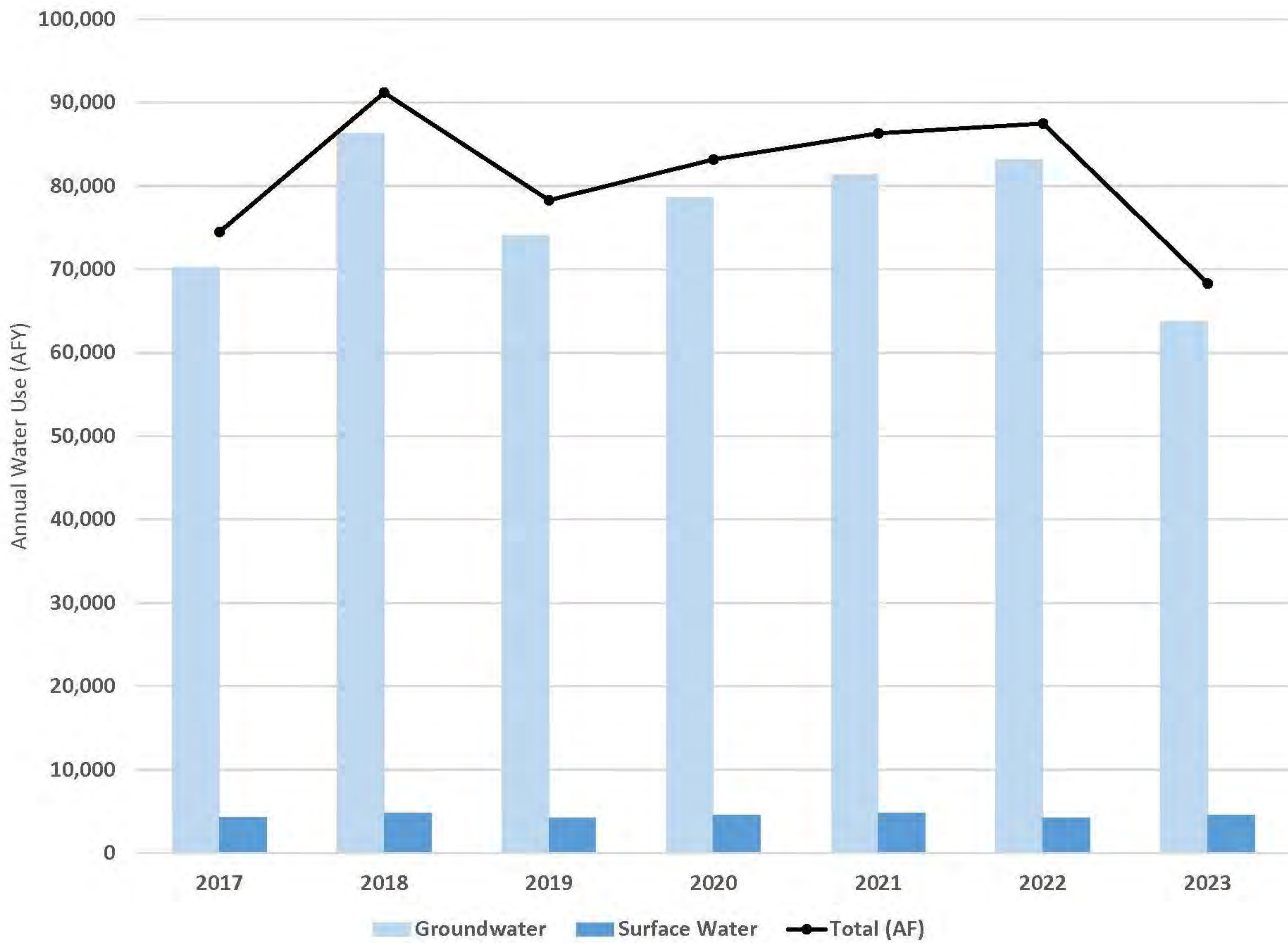
Date: January 31, 2024
Data Sources: CA DWR, SLO Co., USGS, SLOCOG (2022)

GSI Water Solutions, Inc.



GSI Water Solutions, Inc.

FIGURE 11
Total Annual Water Use
by Water Use Sector
Paso Robles Subbasin Water Year 2023 Annual Report



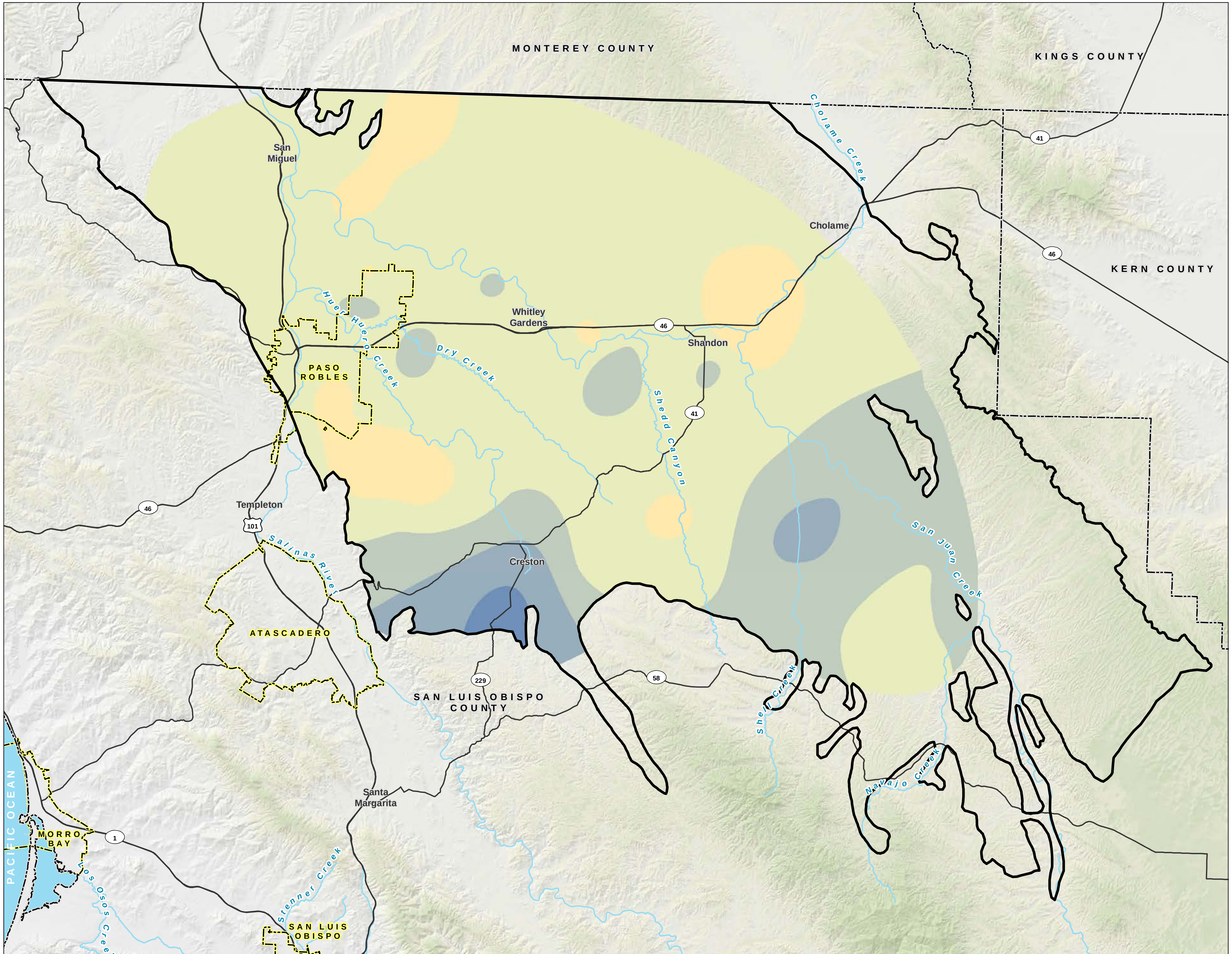
GSI Water Solutions, Inc.

FIGURE 12
Total Annual Water Use
by Source
Paso Robles Subbasin Water Year 2023 Annual Report

FIGURE 13

Paso Robles Formation Aquifer Change in Groundwater Elevation Fall 2022 to Fall 2023

Paso Robles Subbasin
Water Year 2023 Annual Report



LEGEND

- Paso Robles Subbasin

Fall 2022 to Fall 2023

- < -40 feet
- -40 to -30 feet
- -30 to -20 feet
- -20 to -10 feet
- -10 to 0 feet
- 0 to 10 feet
- 10 to 20 feet
- 20 to 30 feet
- 30 to 40 feet
- > 40 feet

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

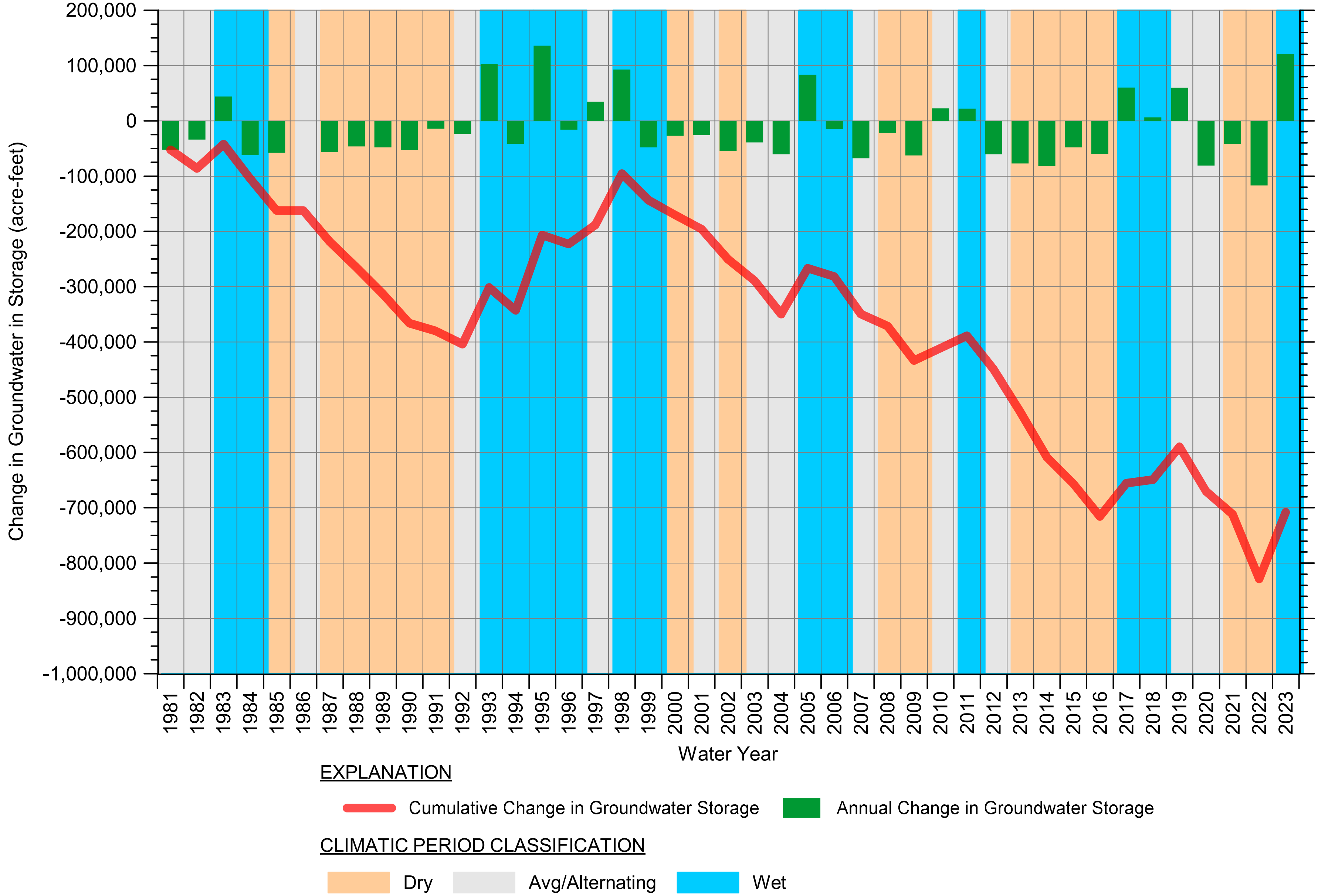
N

0 10,000 20,000 30,000
Feet

Date: January 31, 2024
Data Sources: CA DWR, SLO Co., USGS

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure13_Change_in_GW_Elev_Fall2021_2022.mxd



GSI Water Solutions, Inc.

FIGURE 14

Estimated Annual and Cumulative Change in Groundwater in Storage in the Paso Robles Subbasin

Paso Robles Subbasin Water Year 2023 Annual Report

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\ChangeInStorage\Grapher\GW_CumulativeChangeGWStoragePRannual_wTitle.gpj

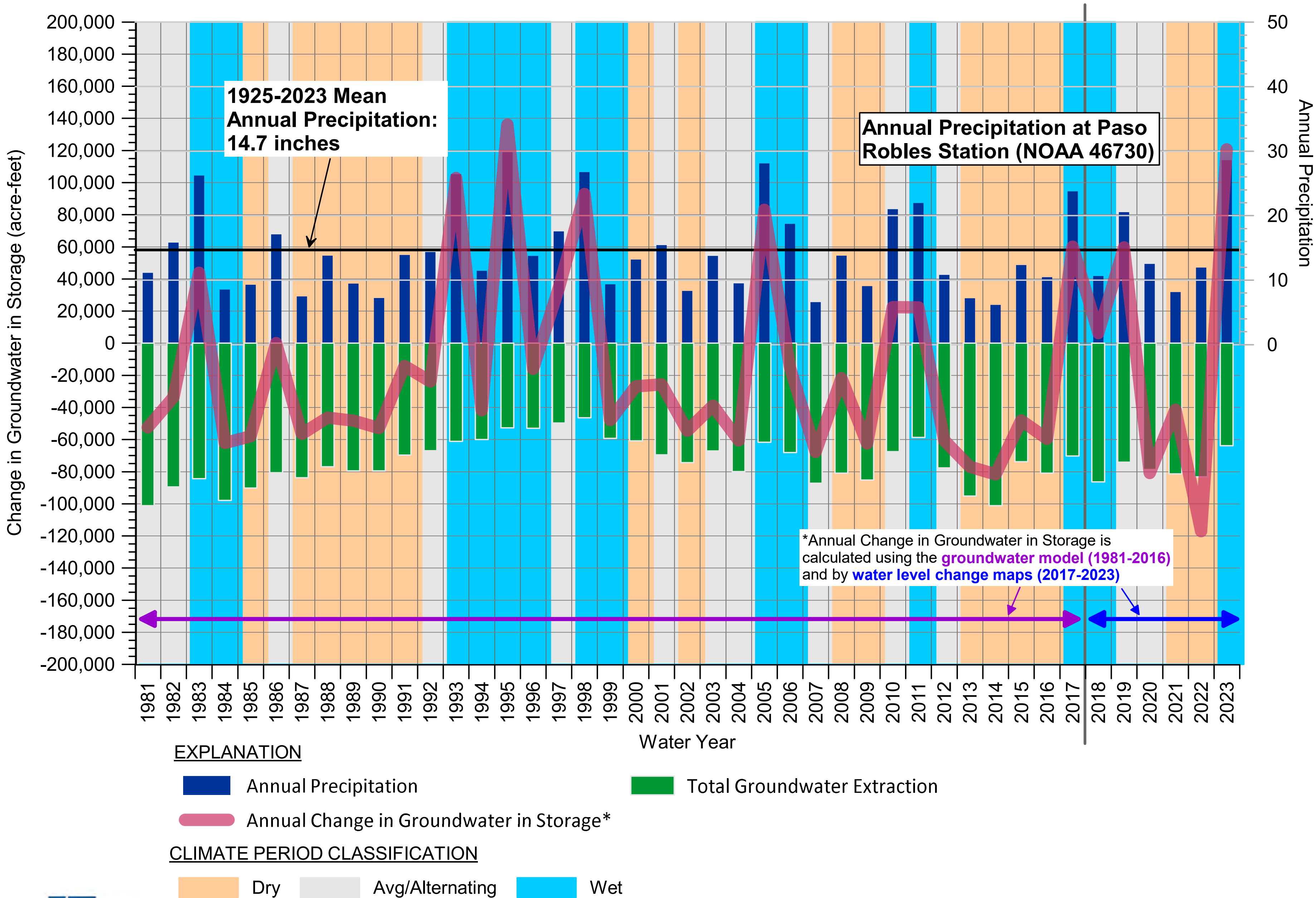


FIGURE 15

Annual Precipitation and Groundwater Extraction vs Annual Change in Groundwater in Storage

Paso Robles Subbasin Water Year 2023 Annual Report

GSI Water Solutions, Inc.

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\ChangeInStorage\Grapher\Annual Precipitation and Groundwater Extraction vs Annual Change in Groundwater in Storage.gpj

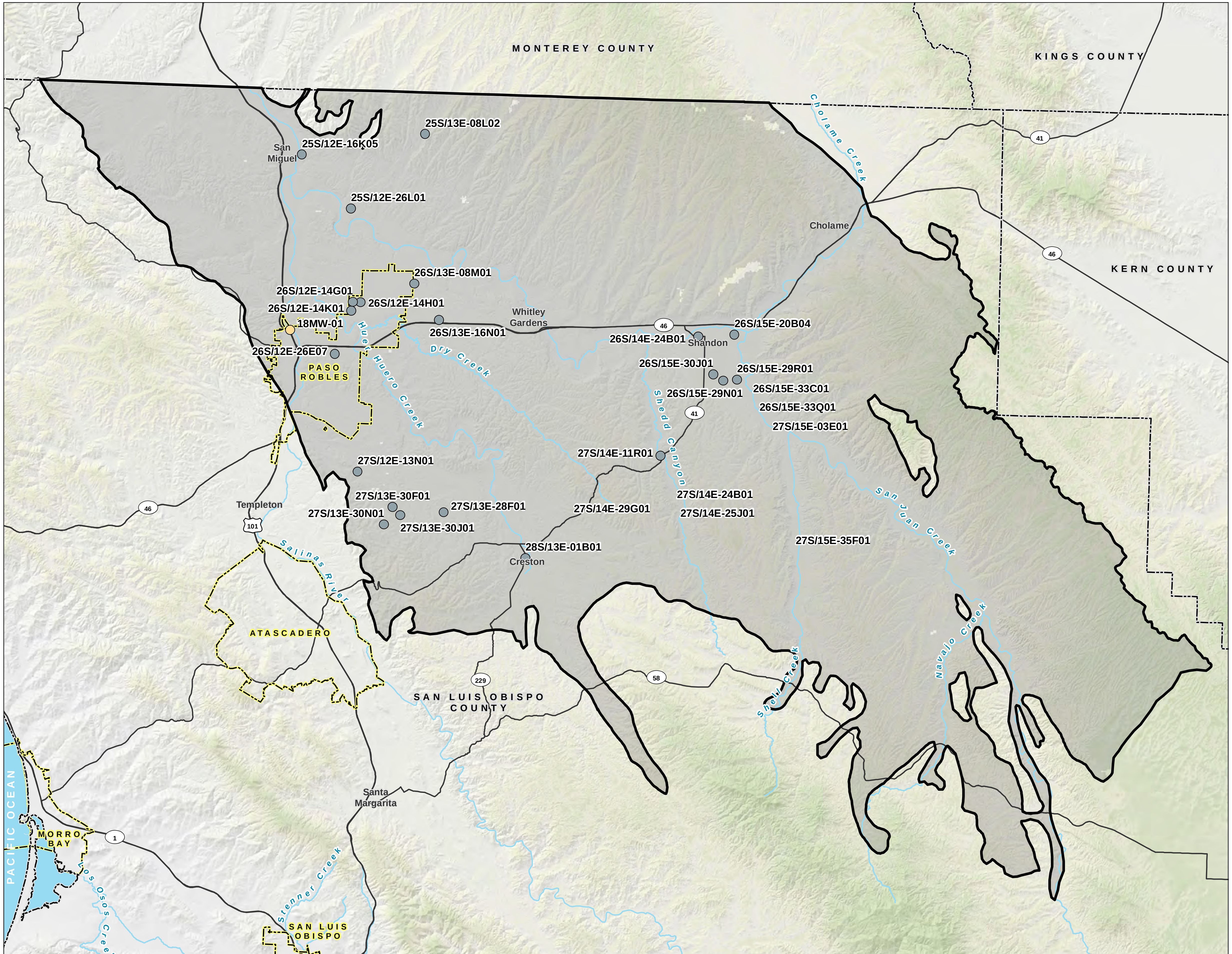


FIGURE 16

Single-Year Land Subsidence Measured by InSAR (June 2022 - June 2023)

Paso Robles Subbasin
Water Year 2023 Annual Report

LEGEND

Paso Robles Subbasin

Wells

Paso Robles Formation

Alluvial Aquifer

Estimated Subsidence (decimal ft)

June 2022 - June 2023

Measurement within method error bars (+/- 0.059 feet)

All Other Features

County Boundary

City Boundary

Major Road

Watercourse

Waterbody

NOTE

InSAR: Interferometric Synthetic Aperture Radar

N

0 10,000 20,000 30,000
Feet

Date: February 1, 2024
Data Sources: CA DWR, SLO Co., City of Paso Robles, USGS, TRE Altamira InSAR dataset

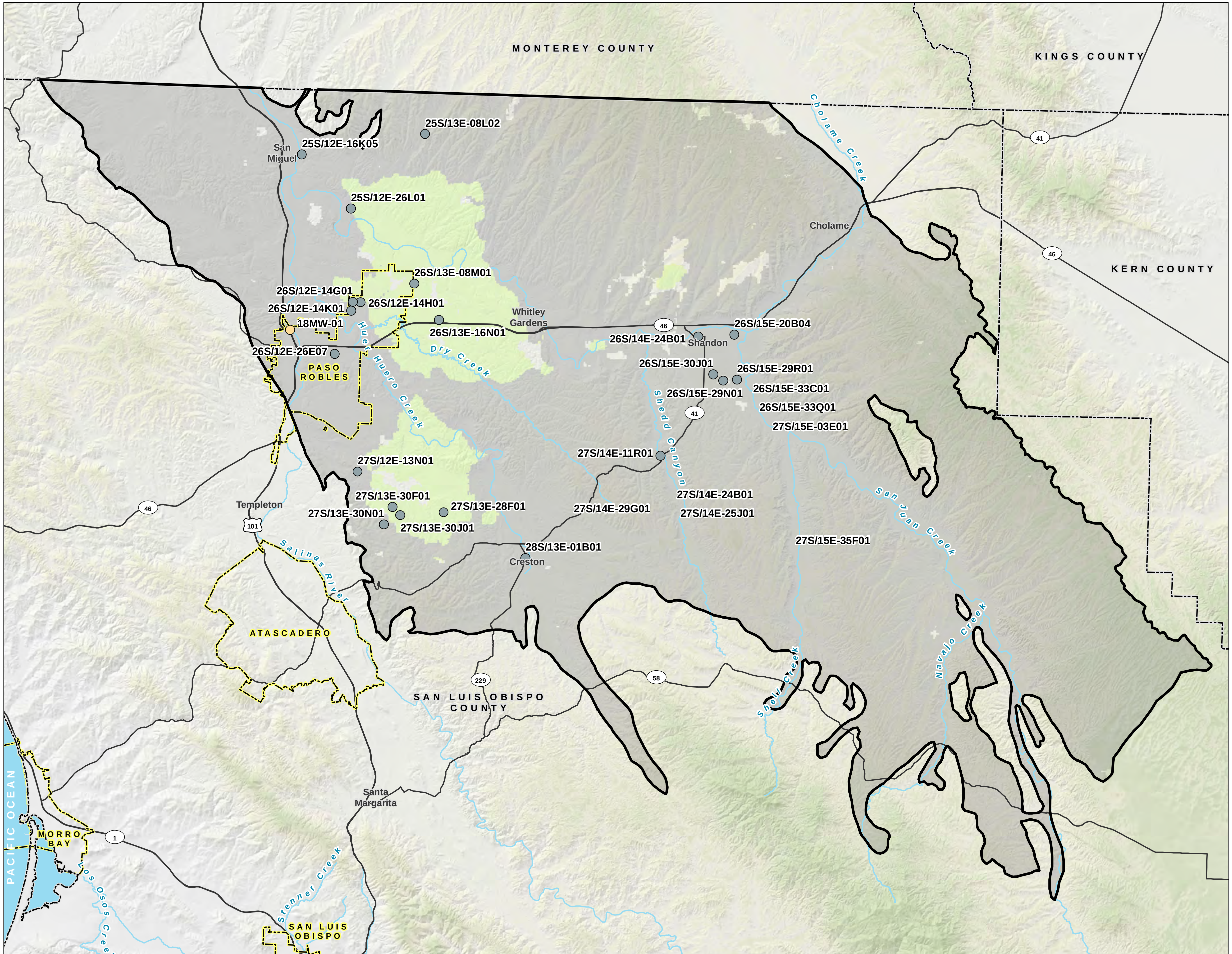
GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure16_Land_Subsidence_InSAR_June22_23.mxd

FIGURE 17

Five-Year Land Subsidence Measured by InSAR (June 2018 - June 2023)

Paso Robles Subbasin
Water Year 2023 Annual Report



LEGEND

Paso Robles Subbasin

Wells

- Paso Robles Formation
- Alluvial Aquifer

Estimated Subsidence (decimal ft)

June 2018 - June 2023

- Measurement within method error bars (+/- 0.059 feet)
- Land Subsidence of less than 0.2 feet

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

InSAR: Interferometric Synthetic Aperture Radar

N

0 10,000 20,000 30,000
Feet

Date: February 1, 2024
Data Sources: CA DWR, SLO Co., City of Paso Robles, USGS, TRE Altamira InSAR dataset

GSI Water Solutions, Inc.

Document Path: Y:\0667_County_of_San_Luis_Obisbo\Source_Figures\029_PasoBasin23_24\Annual_Report_2023\Figure17_Land_Subsidence_InSAR_June18_23.mxd

Appendices

APPENDIX A

GSP Regulations for Annual Reports

§ 356.2. Annual Reports

Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

(a) General information, including an executive summary and a location map depicting the basin covered by the report.

(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:

(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

Note: Authority cited: Section 10733.2, Water Code.

Reference: Sections 10727.2, 10728, and 10733.2, Water Code.

Appendix B

Precipitation Data

Monthly Precipitation at the Paso Robles Station (NOAA 46730)

(inches)

Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6730

Source: https://www.prcity.com/462/Rainfall-Totals

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	WY Total
1925	0.34	2.44	2.57	2.01	2.41	0.08	0.09	0.12	0.02	0.17	0.21	1.98	**12.95**
1926	2.13	6.26	0.27	3.52	0.00	0.02	0.00	0.00	0.00	0.25	7.14	0.90	**14.56**
1927	1.84	9.04	1.45	1.27	0.00	0.02	0.00	0.00	0.00	1.33	2.02	1.63	**21.91**
1928	0.23	2.87	2.76	0.37	0.29	0.00	0.00	0.00	0.00	0.01	1.82	2.87	**11.50**
1929	1.27	1.65	1.22	0.49	0.00	0.49	0.00	0.00	-----	0.00	0.00	0.24	**9.82**
1930	4.32	1.80	3.00	0.54	1.01	0.04	0.00	0.00	0.04	0.00	1.64	0.16	**10.99**
1931	4.58	1.87	0.39	0.56	2.01	0.93	0.00	0.09	0.00	0.01	1.89	7.04	**12.23**
1932	2.74	3.89	0.50	0.30	0.13	0.00	0.00	0.00	0.00	0.04	0.11	1.28	**16.50**
1933	6.05	0.08	0.84	0.22	0.32	0.68	0.00	0.00	0.00	0.64	0.00	4.26	**9.62**
1934	2.06	3.75	0.04	0.00	0.12	0.75	0.00	0.00	0.00	1.56	2.61	2.66	**11.62**
1935	6.23	0.65	4.08	3.41	0.02	0.00	0.00	0.16	0.07	0.18	1.58	1.66	**21.45**
1936	0.61	11.07	1.24	1.52	0.01	0.04	0.25	0.00	0.00	1.93	0.00	6.10	**18.16**
1937	4.59	4.54	5.25	0.16	0.00	0.00	0.00	0.00	0.00	0.16	0.66	7.40	**22.57**
1938	1.73	12.74	6.77	0.93	0.30	0.00	0.00	0.00	0.41	0.23	0.33	1.45	**31.10**
1939	3.11	1.45	1.58	0.05	0.09	0.00	0.00	0.00	0.43	0.55	0.78	1.29	**8.72**
1940	5.28	5.57	1.13	0.54	0.00	0.00	0.00	0.00	0.00	0.19	0.13	8.18	**15.14**
1941	4.73	8.16	6.14	2.76	0.19	0.00	0.00	0.02	0.00	1.34	0.70	5.15	**30.50**
1942	2.40	0.76	1.77	3.01	0.15	0.00	0.00	0.00	0.00	0.58	1.01	1.64	**15.28**
1943	8.00	1.68	3.63	0.72	0.00	0.00	0.00	0.00	0.00	0.34	0.12	3.38	**17.26**
1944	0.94	5.96	0.64	0.65	0.13	0.00	0.00	0.00	0.00	0.26	2.64	1.38	**12.16**
1945	0.80	4.17	2.76	0.26	0.04	0.00	0.00	0.00	0.00	1.09	0.49	1.72	**12.31**
1946	0.31	1.64	3.01	0.05	0.72	0.00	0.26	0.00	0.10	0.00	4.57	2.17	**9.39**
1947	0.56	0.97	1.14	0.13	0.28	0.00	0.00	0.00	0.04	0.32	0.18	0.62	**9.86**
1948	0.00	1.85	3.51	3.50	0.45	0.00	0.00	0.00	0.00	0.06	0.00	3.04	**10.43**
1949	1.09	1.95	3.73	0.36	0.38	0.00	0.00	0.00	0.00	0.78	0.78	2.33	**10.61**
1950	2.39	2.43	1.65	0.89	0.05	0.00	0.68	0.00	0.00	1.24	1.18	2.50	**11.98**
1951	2.50	0.68	0.58	1.11	0.00	0.00	0.00	0.00	0.03	0.33	1.94	4.64	**9.82**
1952	5.54	0.20	3.92	1.50	0.03	0.00	0.07	0.00	0.02	0.02	1.76	4.78	**18.19**
1953	1.71	0.00	0.66	1.90	0.06	0.01	0.00	0.00	0.00	0.00	2.46	0.00	**10.90**
1954	3.06	1.89	3.12	0.64	0.10	0.00	0.00	0.00	0.00	0.00	1.29	1.51	**11.27**
1955	3.57	1.85	0.37	1.16	1.31	0.00	0.00	0.13	0.00	0.00	1.36	8.14	**11.19**
1956	3.82	1.00	0.01	1.87	1.45	0.00	0.00	0.00	0.00	1.07	0.00	0.17	**17.65**
1957	4.77	1.90	0.31	1.63	0.71	0.47	0.00	0.00	0.02	0.62	0.30	3.30	**11.05**
1958	2.93	6.02	6.35	5.22	0.37	0.00	0.00	0.38	1.20	0.00	0.13	0.48	**26.69**
1959	1.69	4.53	0.03	0.44	0.05	0.00	0.00	0.00	0.52	0.00	0.00	0.31	**7.87**
1960	2.42	4.20	0.70	1.40	0.04	0.00	0.00	0.00	0.00	0.10	3.63	1.17	**9.07**
1961	1.72	0.20	0.88	0.22	0.74	0.00	0.00	0.00	0.00	0.01	1.99	2.59	**8.66**
1962	2.05	8.49	1.98	0.00	0.12	0.00	0.00	0.00	0.00	0.79	0.01	2.52	**17.23**
1963	4.41	3.79	2.10	3.32	0.17	0.01	0.00	0.00	0.24	1.00	4.25	0.01	**17.36**
1964	1.87	0.15	1.46	0.68	0.55	0.06	0.00	0.08	0.03	1.05	2.27	2.37	**10.14**
1965	2.50	0.51	1.16	2.48	0.00	0.00	0.04	0.03	0.15	0.00	6.43	3.24	**12.56**
1966	1.17	0.68	0.08	0.00	0.01	0.14	0.08	0.00	0.11	0.00	2.43	8.60	**11.94**
1967	3.93	0.35	3.99	4.41	0.03	0.02	0.00	0.00	0.79	0.14	1.74	1.70	**24.55**
1968	1.19	0.68	1.76	0.70	0.04	0.00	0.00	0.00	0.00	1.83	1.14	3.13	**7.95**
1969	13.93	9.12	0.35	1.68	0.06	0.01	0.25	0.00	0.00	0.24	0.44	0.68	**31.50**
1970	3.71	1.66	1.83	0.37	0.00	0.04	0.00	0.00	0.00	0.08	3.14	4.56	**8.97**
1971	1.08	0.24	0.85	0.69	0.21	0.00	0.00	0.00	0.05	0.29	0.88	4.27	**10.90**
1972	1.35	0.30	0.00	0.53	0.00	0.00	0.00	0.00	0.03	1.68	4.14	0.85	**7.65**
1973	6.54	6.95	2.60	0.01	0.06	0.00	0.00	0.00	0.00	0.68	3.09	1.61	**22.83**
1974	6.39	0.05	4.56	0.91	0.00	0.00	0.00	0.00	0.00	0.64	0.43	2.33	**17.29**
1975	0.01	4.12	2.81	0.89	0.00	0.00	0.00	0.01	0.00	0.76	0.03	0.10	**11.24**

Monthly Precipitation at the Paso Robles Station (NOAA 46730)

(inches)

Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6730

Source: https://www.prcity.com/462/Rainfall-Totals

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	WY Total
1976	0.00	2.61	1.09	0.66	0.00	0.08	0.00	1.02	2.90	0.58	0.55	1.80	**9.25**
1977	1.47	0.03	1.41	0.00	1.71	0.00	0.00	0.00	0.00	0.08	0.25	5.25	**7.55**
1978	5.77	7.31	3.10	2.77	0.00	0.00	0.00	0.00	0.92	0.00	2.47	1.04	**25.45**
1979	4.70	3.52	2.30	0.00	0.00	0.00	0.00	0.00	0.06	0.93	0.85	2.31	**14.09**
1980	4.47	8.05	1.88	0.65	0.24	0.00	0.35	0.00	0.00	0.00	0.02	0.44	**19.73**
1981	4.00	1.60	4.52	0.56	0.00	0.00	0.00	0.00	0.00	1.01	1.44	0.62	**11.14**
1982	2.65	0.88	5.10	3.05	0.00	0.02	0.00	0.00	1.04	0.90	3.98	1.96	**15.81**
1983	5.86	4.53	4.69	3.35	0.05	0.00	0.00	0.52	0.37	1.34	2.07	3.68	**26.21**
1984	0.20	0.24	0.66	0.35	0.00	0.00	0.00	0.00	0.00	0.38	2.10	3.01	**8.54**
1985	0.52	0.92	2.11	0.19	0.00	0.00	0.02	0.00	0.04	0.40	1.07	0.97	**9.29**
1986	2.11	6.73	4.64	0.32	0.00	0.00	0.03	0.00	0.62	0.02	0.15	0.64	**16.89**
1987	0.88	2.01	3.40	0.14	0.06	0.07	0.00	0.00	0.00	1.50	2.63	2.73	**7.37**
1988	1.94	2.54	0.10	2.02	0.21	0.14	0.00	0.00	0.00	0.00	1.16	2.87	**13.81**
1989	0.98	1.59	0.71	0.37	0.07	0.00	0.00	0.00	1.59	0.97	0.22	0.00	**9.34**
1990	3.02	1.48	0.24	0.12	0.66	0.00	0.00	0.00	0.51	0.00	0.14	0.20	**7.22**
1991	0.63	2.17	10.25	0.08	0.03	0.20	0.00	0.10	0.10	0.50	0.16	3.00	**13.90**
1992	1.44	6.09	2.99	0.10	0.00	0.03	0.03	0.00	0.01	0.79	0.00	3.59	**14.35**
1993	9.63	6.96	3.43	0.06	0.01	0.14	0.00	0.00	0.00	0.17	0.86	1.28	**24.61**
1994	1.90	3.37	1.16	0.49	1.05	0.00	0.00	0.00	1.17	0.70	2.32	0.93	**11.45**
1995	11.51	1.42	12.31	0.09	0.44	0.14	0.00	0.00	0.00	0.00	0.12	1.92	**29.86**
1996	1.84	6.52	2.03	0.72	0.55	0.00	0.00	0.00	0.00	1.78	1.52	5.78	**13.70**
1997	7.93	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.07	4.05	3.93	**17.17**
1998	2.99	9.06	2.71	1.96	2.05	0.11	0.00	0.00	0.08	0.21	0.99	0.73	**27.01**
1999	1.84	1.26	2.68	1.19	0.00	0.00	0.00	0.00	0.47	0.00	0.71	0.22	**9.37**
2000	3.16	5.89	1.55	1.56	0.05	0.04	0.00	0.00	0.03	1.34	0.05	0.16	**13.21**
2001	4.43	5.14	3.59	1.08	0.00	0.00	0.04	0.00	0.00	0.24	2.81	2.19	**15.83**
2002	0.87	0.33	1.40	0.23	0.25	0.00	0.00	0.00	0.00	0.00	2.54	4.52	**8.32**
2003	0.13	2.10	1.86	1.70	1.18	0.00	0.16	0.03	0.00	0.00	1.36	2.31	**14.22**
2004	0.91	4.31	0.30	0.32	0.00	0.00	0.00	0.00	0.00	5.11	1.39	6.75	**9.51**
2005	4.81	5.02	3.07	0.76	1.10	0.01	0.00	0.08	0.00	0.02	0.46	2.54	**28.10**
2006	5.78	1.23	4.50	2.92	1.48	0.00	0.00	0.00	0.00	0.61	0.28	1.13	**18.93**
2007	0.74	2.98	0.13	0.37	0.00	0.00	0.00	0.31	0.04	0.96	0.00	2.23	**6.59**
2008	8.44	1.83	0.00	0.33	0.01	0.00	0.00	0.00	0.00	0.14	1.26	1.13	**13.80**
2009	0.91	3.89	1.37	0.17	0.12	0.02	0.00	0.00	0.05	4.04	0.02	3.96	**9.06**
2010	6.09	3.38	0.64	2.75	0.12	0.00	0.03	0.00	0.00	1.06	1.57	7.14	**21.03**
2011	2.07	3.05	5.29	0.28	0.95	0.53	0.00	0.00	0.03	0.90	1.93	0.12	**21.97**
2012	2.38	0.25	2.44	2.60	0.18	0.00	0.00	0.00	0.00	0.28	0.75	3.94	**10.80**
2013	1.02	0.28	0.69	0.07	0.15	0.00	0.00	0.00	0.00	0.01	0.26	0.30	**7.18**
2014	0.00	2.75	1.96	0.85	0.00	0.00	0.03	0.00	0.00	0.00	1.00	5.48	**6.16**
2015	0.32	2.16	0.10	0.37	0.05	0.00	2.82	0.00	0.05	0.07	1.45	0.89	**12.35**
2016	4.13	0.85	2.92	0.15	0.00	0.00	0.00	0.00	0.00	1.61	1.46	1.80	**10.46**
2017	9.50	6.44	0.92	1.45	0.24	0.00	0.00	0.00	0.16	0.08	0.22	0.04	**23.58**
2018	2.08	0.25	7.74	0.21	0.00	0.00	0.00	0.00	0.00	0.28	3.23	1.12	**10.62**
2019	5.30	6.72	3.01	0.08	0.82	0.00	0.00	0.00	0.00	0.00	1.40	5.22	**20.56**
2020	0.65	0.00	3.53	1.59	0.03	0.00	0.00	0.11	0.00	0.00	0.29	0.89	**12.53**
2021	6.07	0.01	0.90	0.00	0.00	0.00	0.00	0.00	0.00	2.02	0.05	7.70	**8.16**
2022	0.11	0.11	1.25	0.42	0.00	0.00	0.00	0.00	0.29	0.00	0.89	6.77	**11.95**
2023	10.46	3.13	7.17	0.00	0.15	0.00	0.00	0.02	0.00	0.00	1.97	4.82	**28.59**
												Water Year Average (1925 - 2023):	**14.64**

University of California Cooperative Extension Weather Stations in Paso Robles Subbasin
Total Monthly Precipitation for Water Year 2023

(inches) Source: https://ucce-slo.westernweathergroup.com/

WY 2023	Shandon (SLO-1)	Creston Rd (SLO-2)	NE Paso Robles (SLO-3)	Cross Canyon Rd (SLO-4)	Shell Creek Rd (SLO-6)	South Shandon (SLO-7)	South Creston (SLO-8)	Experimental Station (SLO-10)	Von Dollen Road (SLO-12)
OCT	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
NOV	1.03	0.91	0.63	0.64	0.78	0.93	1.07	0.65	0.85
DEC	4.21	5.18	4.44	4.52	3.91	4.03	5.28	6.27	4.80
JAN	5.42	6.89	5.10	5.37	4.71	4.87	8.00	7.32	5.48
FEB	3.36	3.21	2.62	2.24	4.22	3.44	3.94	2.88	2.32
MAR	3.50	4.84	3.63	4.06	3.13	3.66	5.56	5.24	4.45
APR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAY	0.20	0.17	0.32	0.22	0.15	0.22	0.23	0.14	0.45
JUN	0.01	0.00	0.00	0.00	0.13	0.02	0.03	0.00	0.00
JUL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AUG	0.06	0.04	0.01	0.01	0.04	0.11	0.02	0.06	0.12
SEP	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00
WY Total	**17.80**	**21.24**	**16.75**	**17.07**	**17.08**	**17.28**	**24.14**	**22.57**	**18.47**

APPENDIX C

Groundwater Level and Groundwater Storage Monitoring Well Network

Table C-1 – Groundwater Level and Groundwater Storage Monitoring Well Network

Well ID (alt ID)	Well Depth (feet)	Screen Interval(s) (feet bls)	Reference Point Elevation (feet AMSL)	First Year of Data	Last Year of Data	Years Measured	Number of Measurement	Aquifer
18MW-0191[1]	50	10-50	672 (LSE)	2018	2018	<1	1	Qa
25S/12E-16K05 (PASO-0345)	350	300-310, 330-340	669.8	1992	2019	27	56	PR
25S/12E-26L01 (PASO-0205)	400	200-400	719.72	1970	2019	49	107	PR
25S/13E-08L02 (PASO-0195)	270	110-270	1,033.81	2012	2019	7	15	PR
26S/12E-14G01 (PASO-0048)	740	---	789.3	1969	2019	50	121	PR
26S/12E-14G02 (PASO-0017)	840	640-840	787	1993	2019	26	28	PR
26S/12E-14H01 (PASO-0184)	1230	180-?	790	1969	2019	50	48	PR
26S/12E-14K01 (PASO-0238)	1100	---	786	1979	2019	40	84	PR
26S/12E-26E07 (PASO-0124)	400	---	835	1958	2018	60	131	PR
26S/13E-08M01 (PASO-0164)	400	260-400	827.92	2013	2019	6	16	PR
26S/13E-16N01 (PASO-0282)	400	200-400	890.17	2012	2019	7	16	PR
26S/15E-19E01 (PASO-0073)	512	223-512	1,020	1987	2019	32	56	PR
26S/15E-20B04 (PASO-0401)	461	297-461	1,036.36	1984	2019	35	71	PR
26S/15E-29N01 (PASO-0226)	350	---	1,135	1958	2019	61	127	PR
26S/15E-29R01 (PASO-0406)	600	180-600	1,109.5	2012	2019	7	12	PR
26S/15E-30J01 (PASO-0393)	605	195-605	1,123.3	1970	2019	49	83	PR
27S/12E-13N01 (PASO-0223)	295	195-295	972.42	2012	2019	7	15	PR
27S/13E-28F01 (PASO-0243)	230	118-212	1,072	1969	2019	50	108	PR
27S/13E-30F01 (PASO-0355)	310	200-310	1,043.2	2012	2019	7	14	PR
27S/13E-30J01 (PASO-0423)	685	225-685	1,095	2012	2019	7	10	PR
27S/13E-30N01 (PASO-0086)	355	215-235, 275-355	1,086.73	2012	2016	4	6	PR
27S/14E-11R01 (PASO-0392)	630	180-630	1,160.5	1974	2019	45	75	PR
28S/13E-01B01 (PASO-0066)	254	154-254	1,099.93	2012	2019	7	17	PR

NOTES: New alluvial monitoring well information provided by City of Paso Robles; well not included in County database.

"—" = unknown; AMSL – above mean sea level; PR Paso Robles Formation Aquifer; Qa Alluvial Aquifer

APPENDIX D

Potential Future Groundwater Monitoring Wells

Table D-1 – Potential Future Groundwater Monitoring Wells

Well ID (alt ID)	Well Depth (feet)	Screen Interval(s) (feet bls)	Reference Point Elevation (feet AMSL)	First Year of Data	Last Year of Data	Years Measured (years)	Number of Measurements	Aquifer
25S/12E-20K03 (PASO-0304)	---	---	625	1974	2019	45	86	---
26S/14E-24B01 (PASO-0302)	---	---	1001	1962	2019	57	99	---
26S/15E-33C01 (PASO-0314)	---	---	1095	1973	2019	46	80	---
26S/15E-33Q01 (PASO-0381)	---	---	1102	1973	2019	46	82	---
27S/15E-03E01 (PASO-0277)	---	---	1120.8	1968	2019	51	109	---
27S/14E-24B01 (PASO-0391)	---	---	1180.5	1973	2019	46	74	---
27S/14E-25J01 (PASO-0074)	---	---	1,225.5	1972	2019	47	72	--
27S/14E-29G01 (PASO-0041)	---	---	1201.5	1974	2019	45	78	---
27S/15E-35F01 (PASO-0053)	---	---	1230	1965	2019	54	82	---

NOTES: “—“ = unknown

APPENDIX E

Discovery and Resolution of RMS Groundwater Level Monitoring Network Wells Reference Point Elevations Discrepancies

GSI Water Solutions, Inc.

TECHNICAL MEMORANDUM

Discovery and Resolution of RMS Groundwater Level Monitoring Network Wells Reference Point Elevations Discrepancies

To: Blaine Reely, San Luis Obispo County Groundwater Sustainability Director

From: Nate Page, GSI Water Solutions, Inc.

Date: February 16, 2024

1. Introduction

It was discovered during the San Luis Obispo Flood Control and Water Conservation District (SLOFCWCD) groundwater monitoring program spring 2023 groundwater level monitoring event that groundwater elevation data exported from the SLOFCWCD water level database was being, and had previously been, misinterpreted by interested parties in the Paso Robles Groundwater Basin (Basin). Beginning with preparation of the Groundwater Sustainability Plan (GSP), depth to water (DTW) data[1] received from SLOFCWCD database was interpreted to be reported from the reference point elevation (RPE) of each well. This understanding has been carried forward consistently through all subsequent annual reporting. However, in spring 2023 it was discovered that the DTW data is actually presented as a calculated depth to water from the ground surface elevation (GSE). The ramifications of this discovery and the resolution of the issue are discussed below.

2. Discussion

Most of the 22 Paso Robles Formation representative monitoring site (RMS) wells in the Basin have RPEs that are not equivalent to their respective GSEs (see Table 1). The SLOFCWCD includes a field labeled as “Ft Above”, indicating the amount of ‘stickup’, or distance between the GSE and RPE at each well location. Because the DTWs reported in the SLOFCWCD database were misinterpreted as measured from the RPEs of each well, the resulting groundwater elevation (GWE) calculations are off from their true value by an amount equivalent to the distance reported in the “Ft Above” field for each well. For most of the RMS wells in the Basin the RPE is above the GSE, therefore most GWEs have been reported above the true groundwater elevation. The Measurable Objectives (MOs) and Minimum Thresholds (MTs) established in the GSP are based on the average of spring and fall 2017 GWEs and are therefore subject to this same “Ft Above” issue (*Ft Above Issue*).

All GWEs presented in the Paso Robles Basin Water Year 2023 Annual Report have been corrected for the *Ft Above Issue* to represent true groundwater elevations, including both current water year (2023) and historical values. In most cases this correction involved moving GWEs downward, however, GWEs were moved up in one well that has an RPE below the GSE (26S/12E-14G02) and did not have to be moved in 3 wells that have RPEs equal to their GSEs (see Table 1). The MOs and MTs for each well have also been corrected using the same approach. The resolution to the *Ft Above Issue* is essentially clerical. Because both the GWEs and the MOs/MTs have been moved by the same amount in each well there is no change in

[1] The SLOFCWCD database uses the field description “Depth (Distance to Water)”

status, regarding sustainable management criteria for each well. The RPE, GSE, FT Above, and amount of change applied to GWEs and MOs/MTs for each well is shown in Table 1.

Table 1. Table Name

RMS Well ID	RPE (feet NAVD 88)	GSE (feet NAVD 88)	"Ft Above" (feet)	Change applied to GWEs and MOs/MTs (feet)
25S/12E-16K05	669.80	668.20	1.60	-1.60
25S/12E-26L01	719.72	719.32	0.40	-0.40
25S/13E-08L02	1,033.81	1,032.58	1.23	-1.23
26S/12E-14G01	789.30	787.95	1.35	-1.35
26S/12E-14G02	787.00	788.00	-1.00	1.00
26S/12E-14H01	790.00	790.00	0.00	0.00
26S/12E-14K01	786.00	785.00	1.00	-1.00
26S/12E-26E07	835.00	834.00	1.00	-1.00
26S/13E-08M01	827.92	826.72	1.20	-1.20
26S/13E-16N01	890.17	888.87	1.30	-1.30
26S/15E-19E01	1,020.00	1,018.10	1.90	-1.90
26S/15E-20B04	1,036.36	1,034.26	2.10	-2.10
26S/15E-29N01	1,135.00	1,134.65	0.35	-0.35
26S/15E-29R01	1,109.50	1,109.50	0.00	0.00
26S/15E-30J01	1,123.30	1,122.40	0.90	-0.90
27S/12E-13N01	972.42	970.90	1.52	-1.52
27S/13E-28F01	1,072.00	1,070.40	1.60	-1.60
27S/13E-30F01	1,043.20	1,041.80	1.40	-1.40
27S/13E-30J01	1,095.00	1,092.40	2.60	-2.60
27S/13E-30N01	1,086.73	1,086.73	0.00	0.00
27S/14E-11R01	1,160.50	1,160.00	0.50	-0.50
28S/13E-01B01	1,099.93	1,099.53	0.40	-0.40

Notes

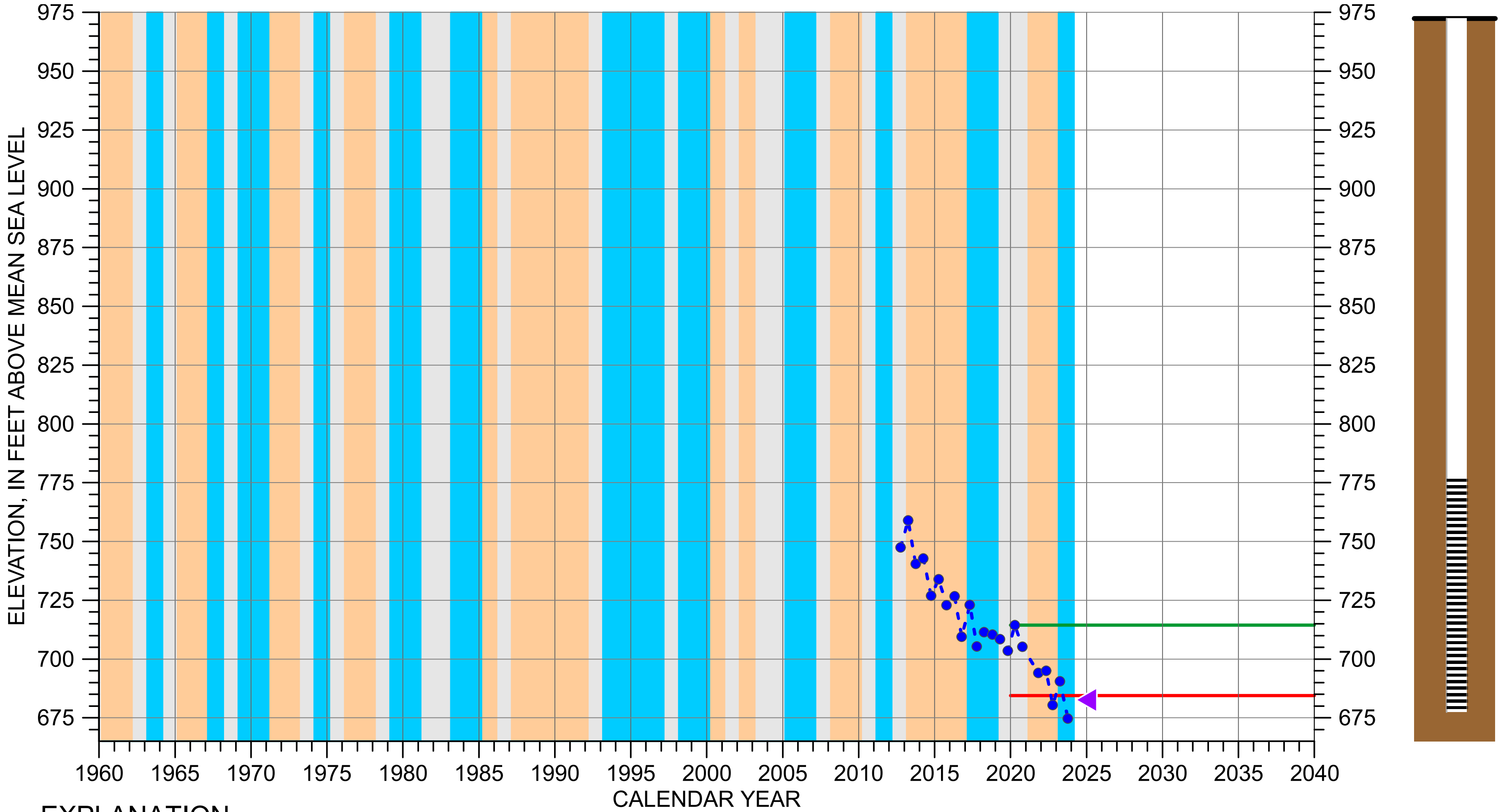
NAVD 88 = North American Vertical Datum of 1988.

3. Summary

It was discovered in spring 2023 that the DTW data reported in the SLOFCWCD database is presented as a calculated depth to water from the ground surface elevation (GSE) rather than as measured from the RPE of each well, as was previously understood. This misunderstanding has resulted in reporting of GWEs that are off from their true value by an amount equivalent to the distance reported in the "Ft Above" field for each well. This same misunderstanding also affected the setting of MOs and MTs in the GSP. However, all GWEs presented in the Paso Robles Basin Water Year 2023 Annual Report have been corrected for the *Ft Above Issue* to represent true groundwater elevations, including both current water year (2023) and historical values. The MOs and MTs for each well have been corrected using the same approach. The resolution to the *Ft Above Issue* is essentially clerical. Because both the GWEs and the MOs/MTs have been moved by the same amount in each well there is no change in status, regarding sustainable management criteria for each well.

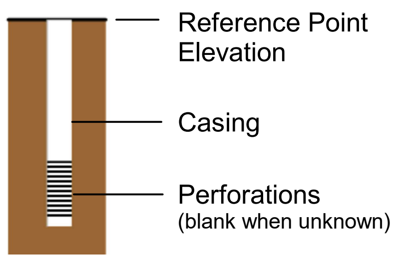
APPENDIX F
Hydrographs

Paso Robles Formation Aquifer Hydrographs



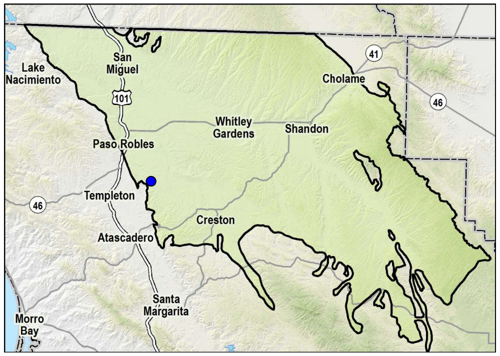
EXPLANATION

- Groundwater Elevation
- Measurement Not Verified*
- Measurable Objective
- Minimum Threshold
- Average of spring and fall 2023 water elevations



CLIMATE PERIOD CLASSIFICATION

- Dry
- Avg/Alternating
- Wet

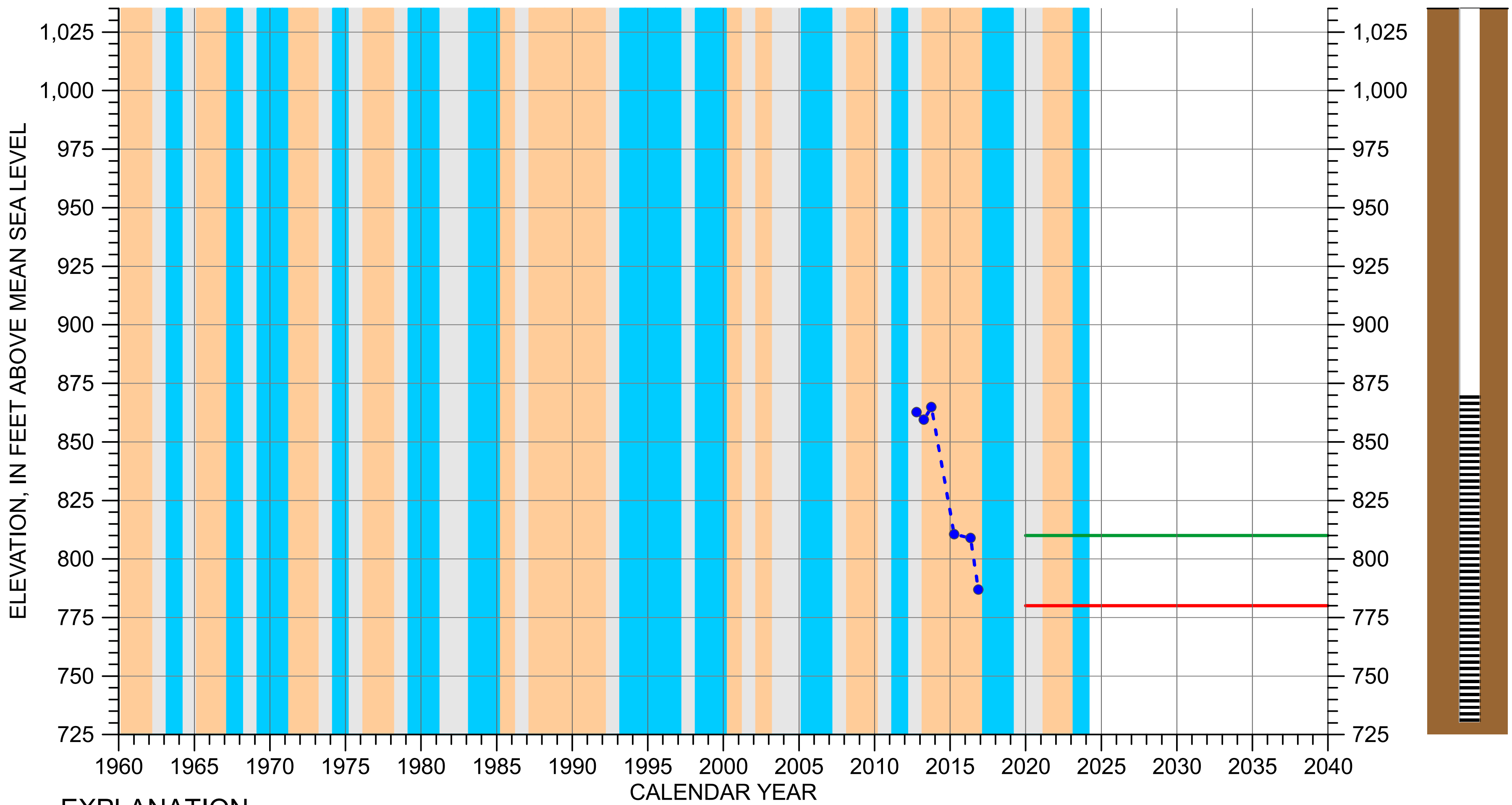


Well Depth: 295 feet
Screened Interval: 195-295 feet below ground surface
Reference Point Elevation: 972.4 feet above mean sea level

* Measurement reported as not static

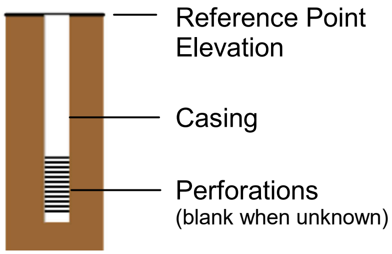
HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/12E-13N01

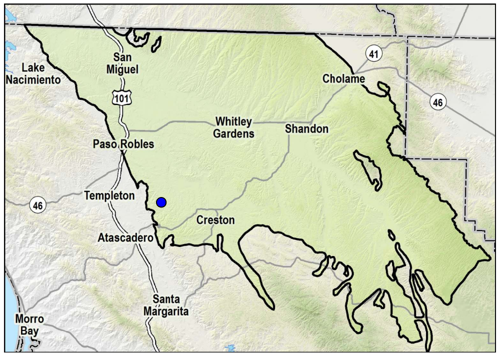
P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\01_Hydr_27S_12E-13N01.gpj



EXPLANATION

CLIMATE PERIOD CLASSIFICATION



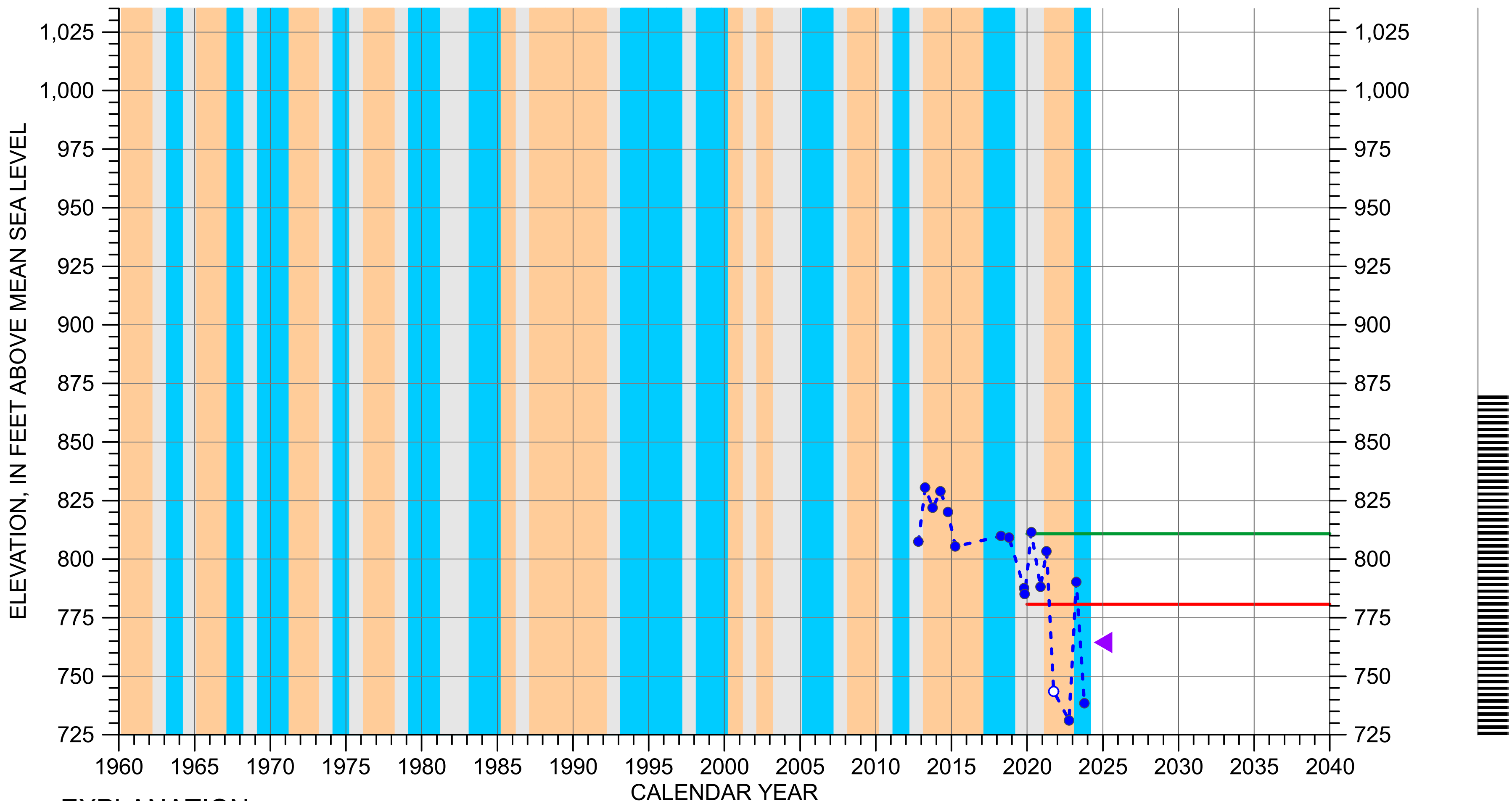


Well Depth: 355 feet
Screened Interval: 215-235, 275-355 feet below ground surface
Reference Point Elevation: 1086.7 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/13E-30N01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\02_Hydr_27S_13E-30N01.gpj



EXPLANATION

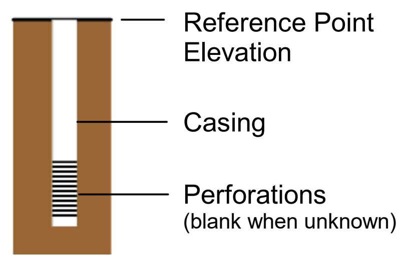
Groundwater Elevation

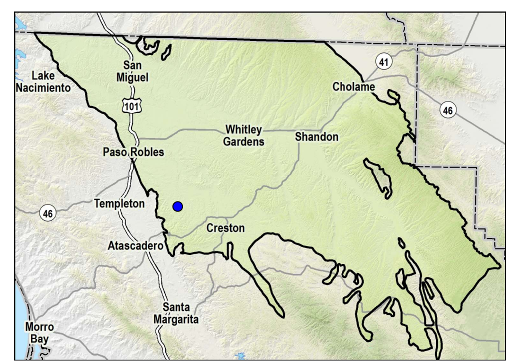
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

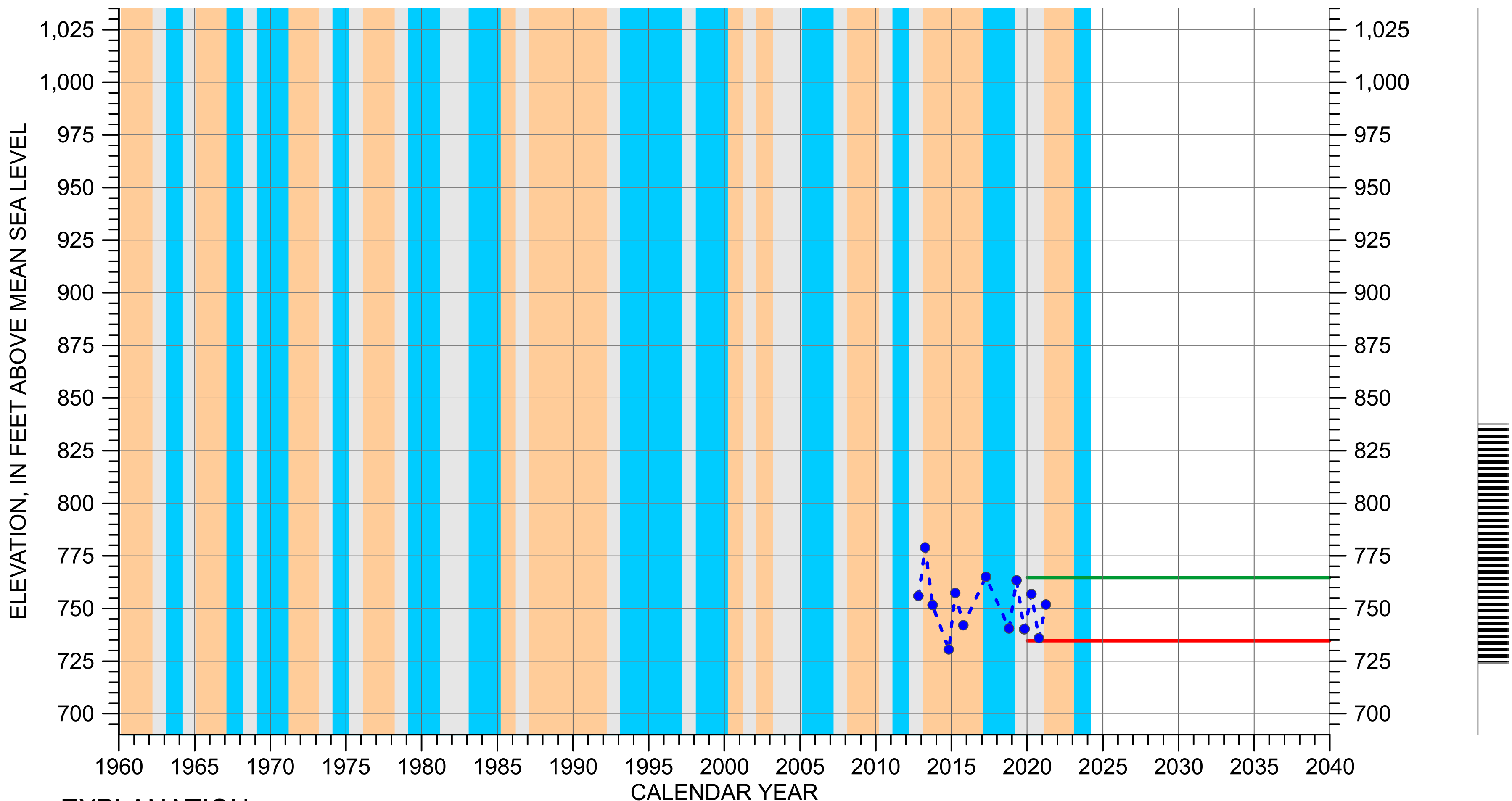
Dry
Avg/Alternating
Wet

Well Depth: 685 feet
Screened Interval: 225-685 feet below ground surface
Reference Point Elevation: 1095 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/13E-30J01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\03_Hydr_27S_13E-30J01.gpj



EXPLANATION

Groundwater Elevation

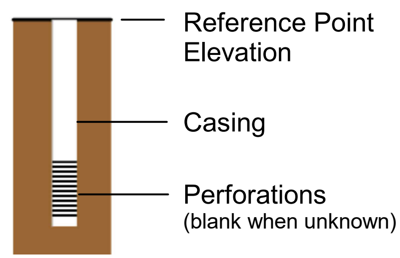
Measurement Not Verified*

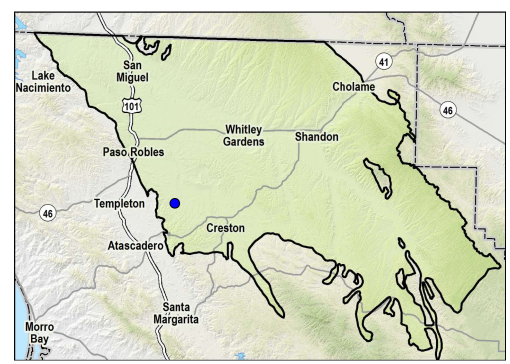
Measurable Objective

Minimum Threshold

CLIMATE PERIOD CLASSIFICATION

Dry | Avg/Alternating | Wet



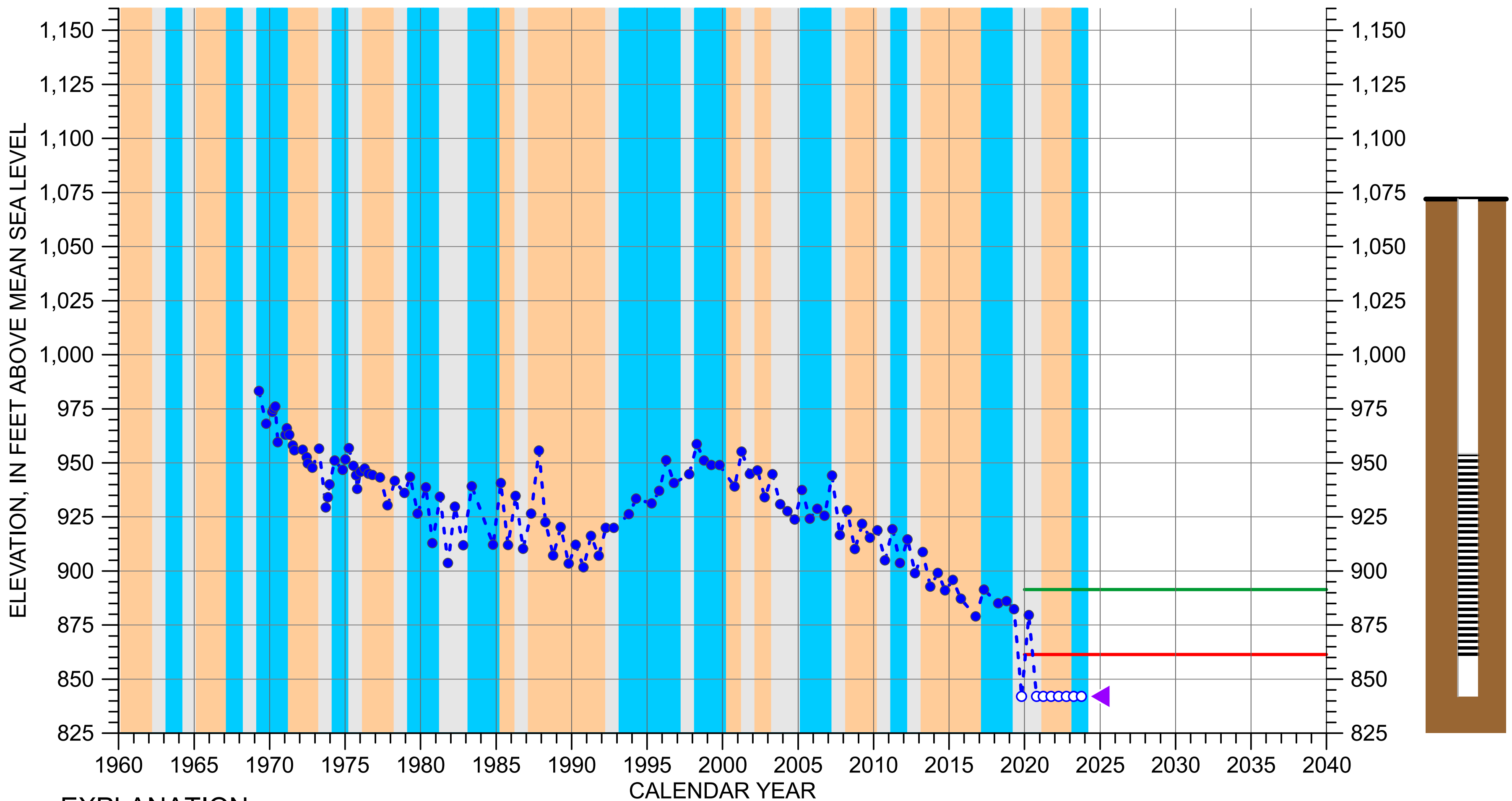


Well Depth: 310 feet
Screened Interval: 200-310 feet below ground surface
Reference Point Elevation: 1043.2 feet above mean sea level

* Measurement recorded at elevation below reported bottom of well.

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/13E-30F01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\04_Hydr_27S_13E-30F01.gpj



EXPLANATION

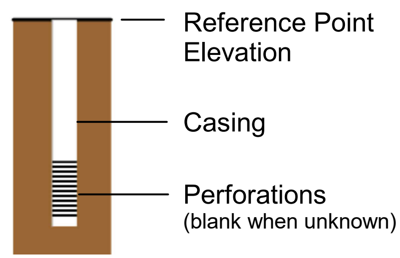
Groundwater Elevation

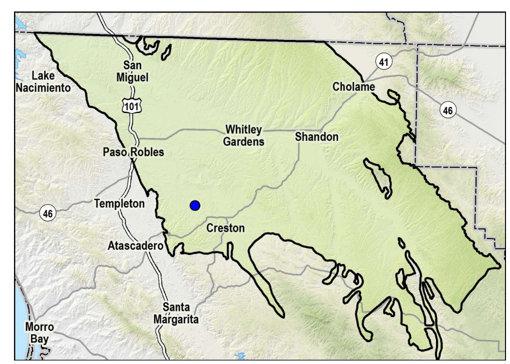
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

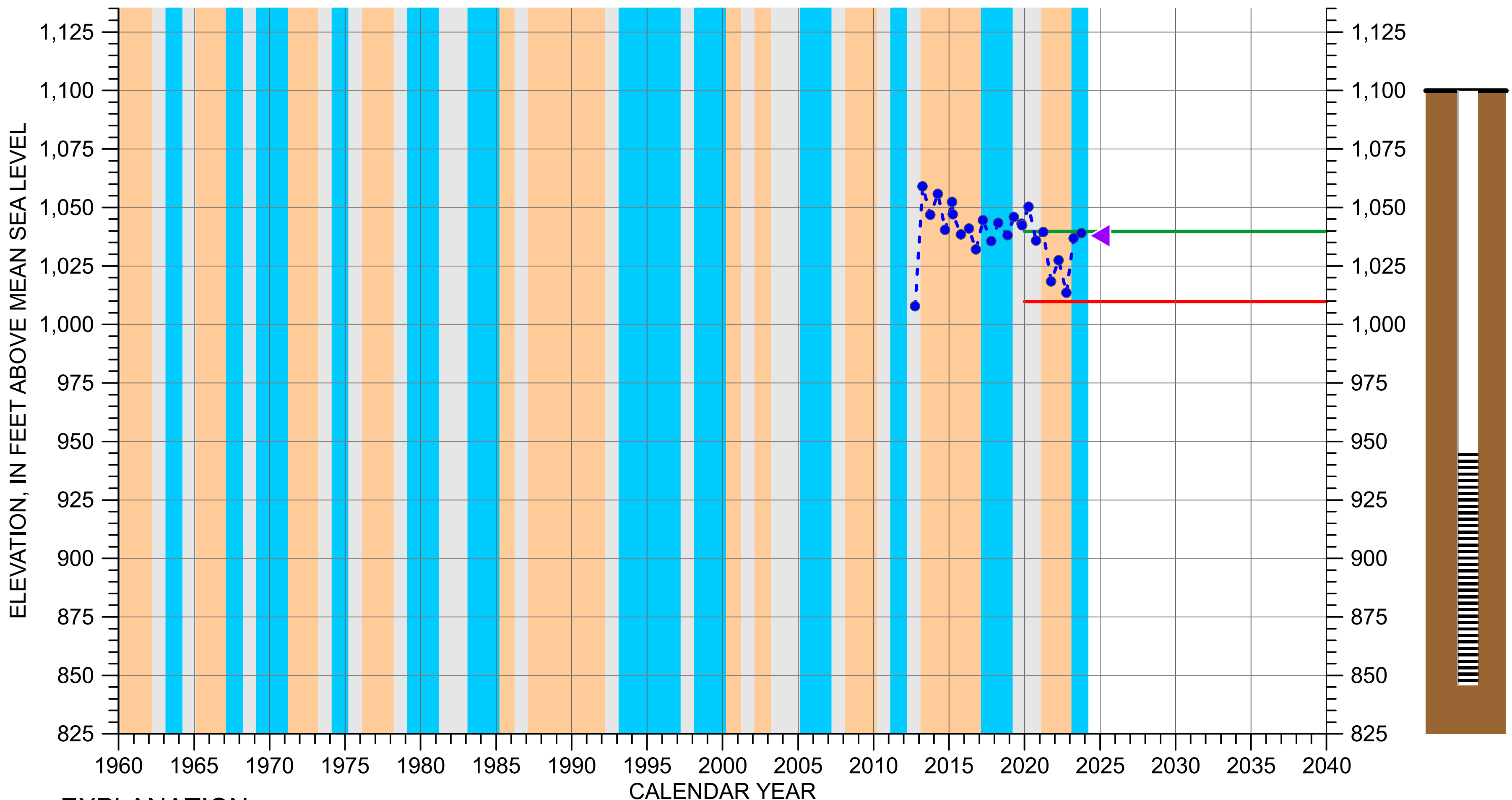
Dry | Avg/Alternating | Wet

Well Depth: 212 feet
Screened Interval: 118-212 feet below ground surface
Reference Point Elevation: 1072 feet above mean sea level

* Measurement recorded at bottom of well (dry well). Actual elevation may be lower.

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/13E-28F01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\05_Hydr_27S_13E-28F01.gpj



EXPLANATION

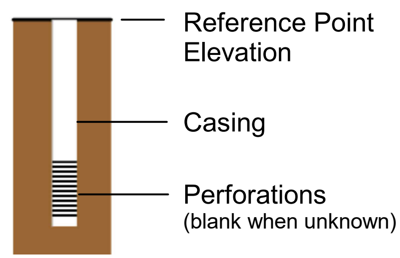
Groundwater Elevation

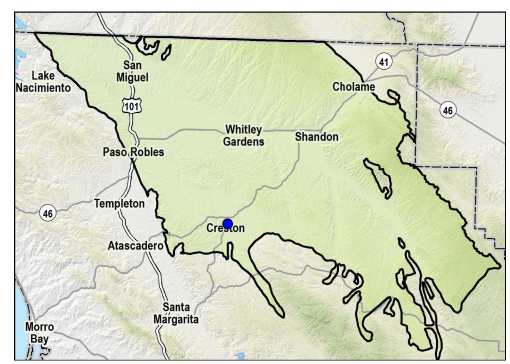
Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

Dry

Avg/Alternating

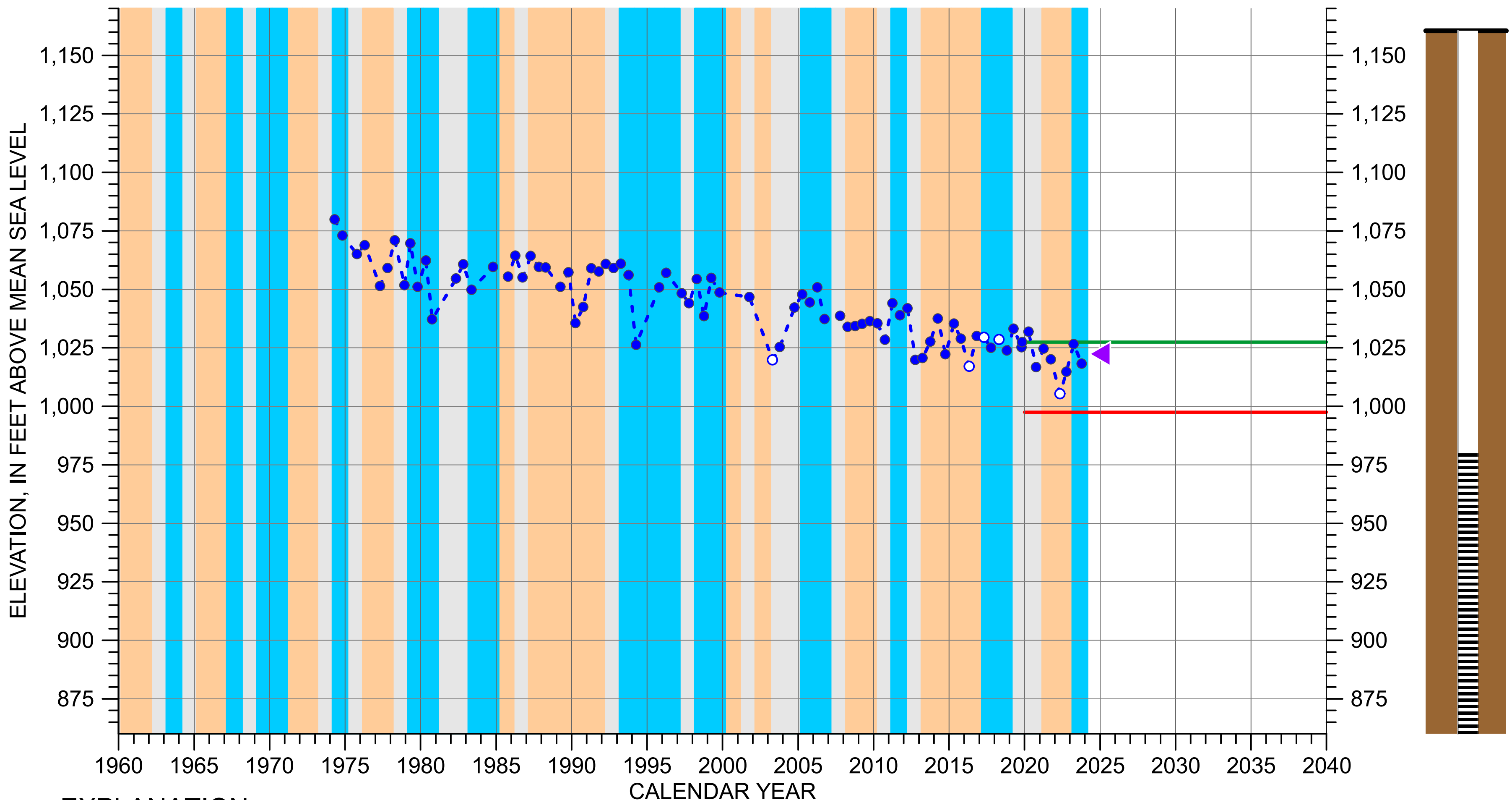
Wet

Well Depth: 254 feet
Screened Interval: 154-254 feet below ground surface
Reference Point Elevation: 1099.9 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 28S/13E-01B01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\06_Hydr_28S_13E-01B01.gpj



EXPLANATION

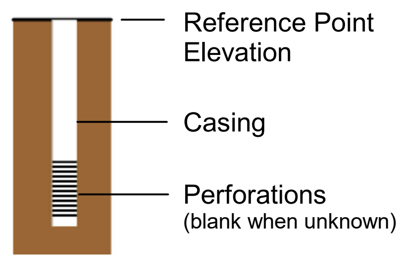
Groundwater Elevation

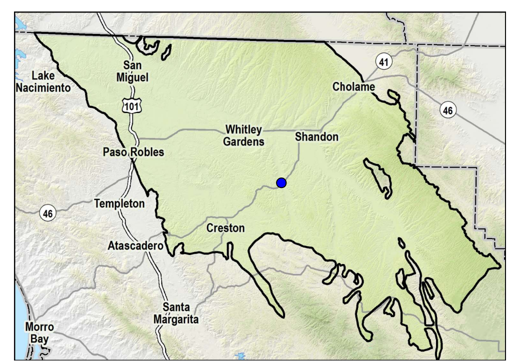
Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

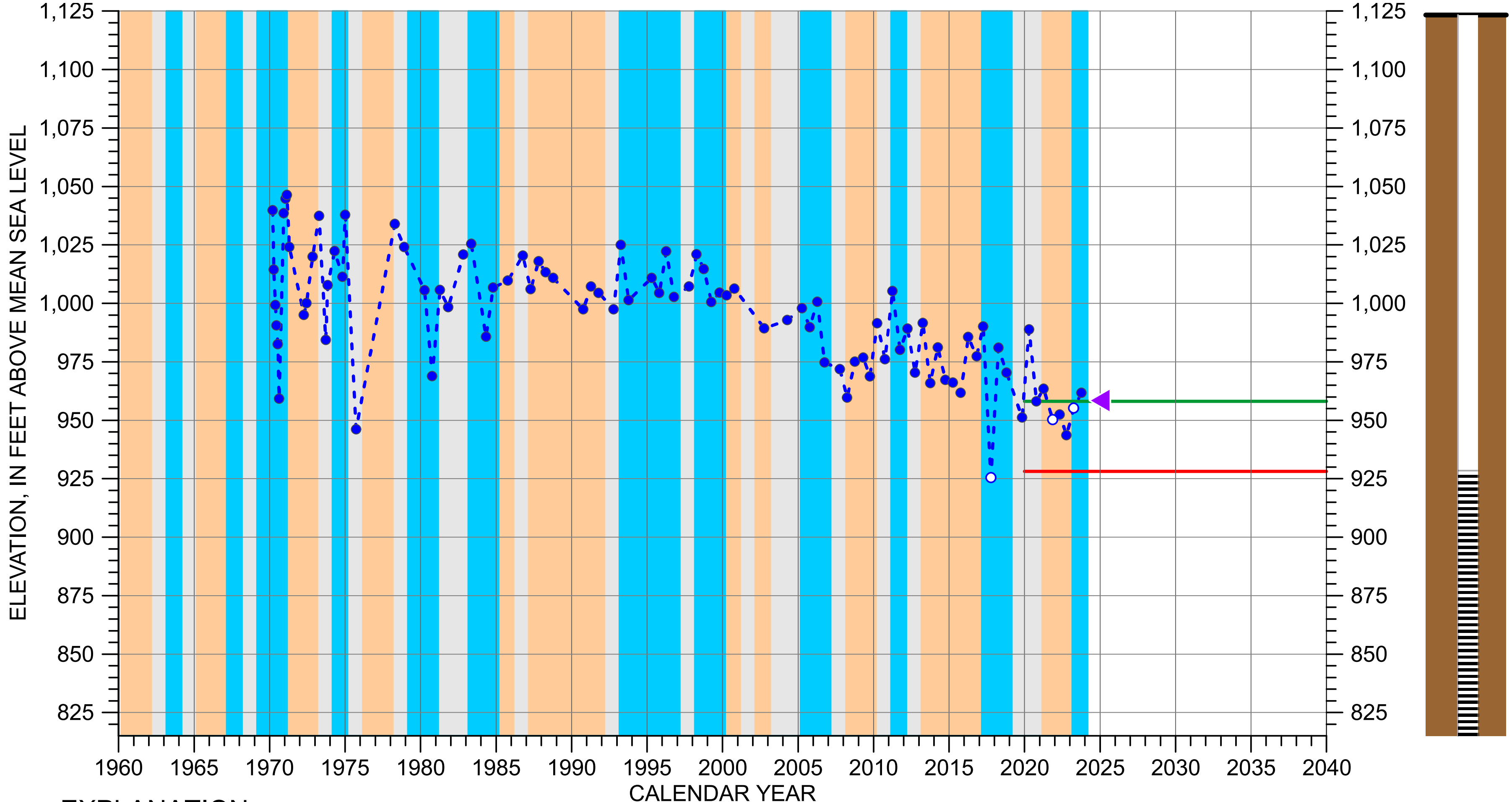
Dry | Avg/Alternating | Wet

Well Depth: 630 feet
Screened Interval: 180-630 feet below ground surface
Reference Point Elevation: 1160.5 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 27S/14E-11R01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\07_Hydr_27S_14E-11R01.gpj



EXPLANATION

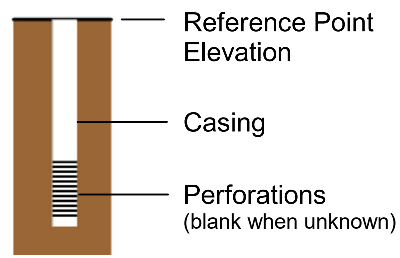
Groundwater Elevation

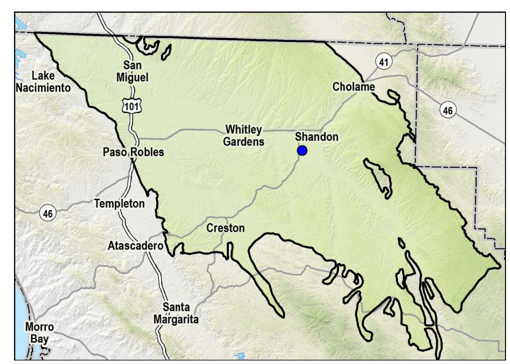
Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

Dry

Avg/Alternating

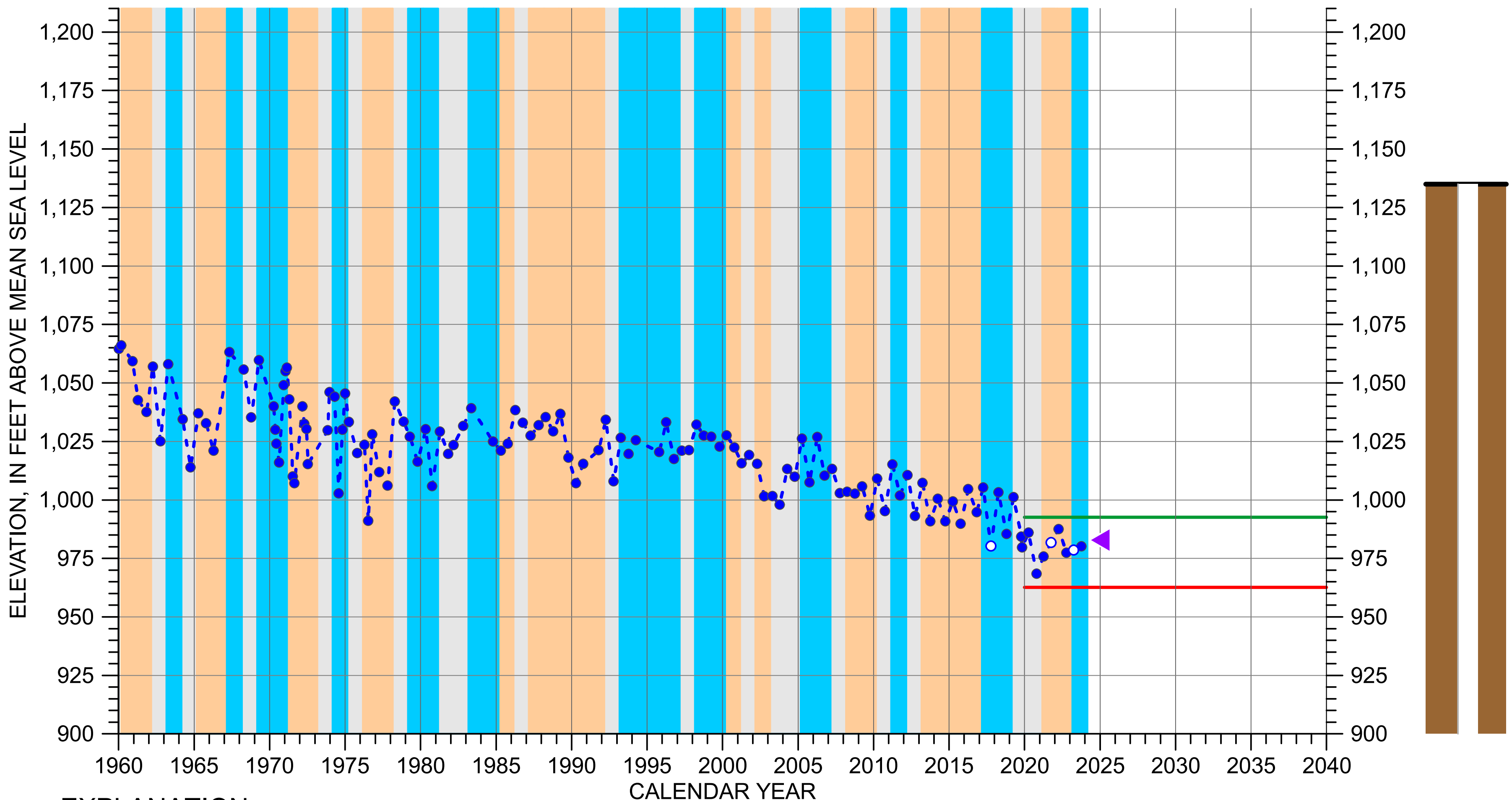
Wet

Well Depth: 605 feet
Screened Interval: 195-605 feet below ground surface
Reference Point Elevation: 1123.3 feet above mean sea level

* Measurement reported as not static

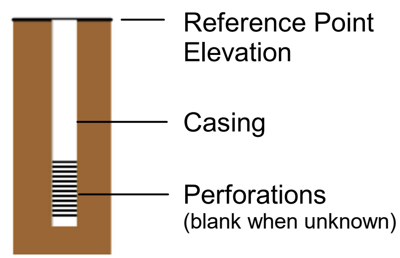
HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/15E-30J01

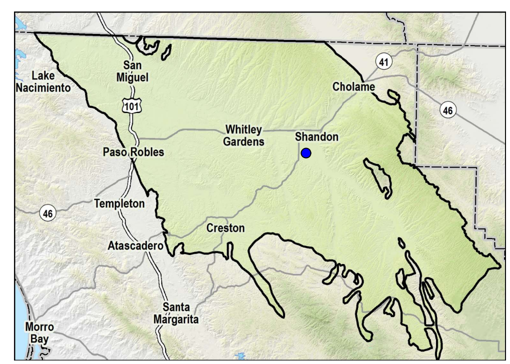
P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\08_Hydr_26S_15E-30J01.gpj



EXPLANATION

- Groundwater Elevation
- Measurement Not Verified*
- Measurable Objective
- Minimum Threshold
- Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

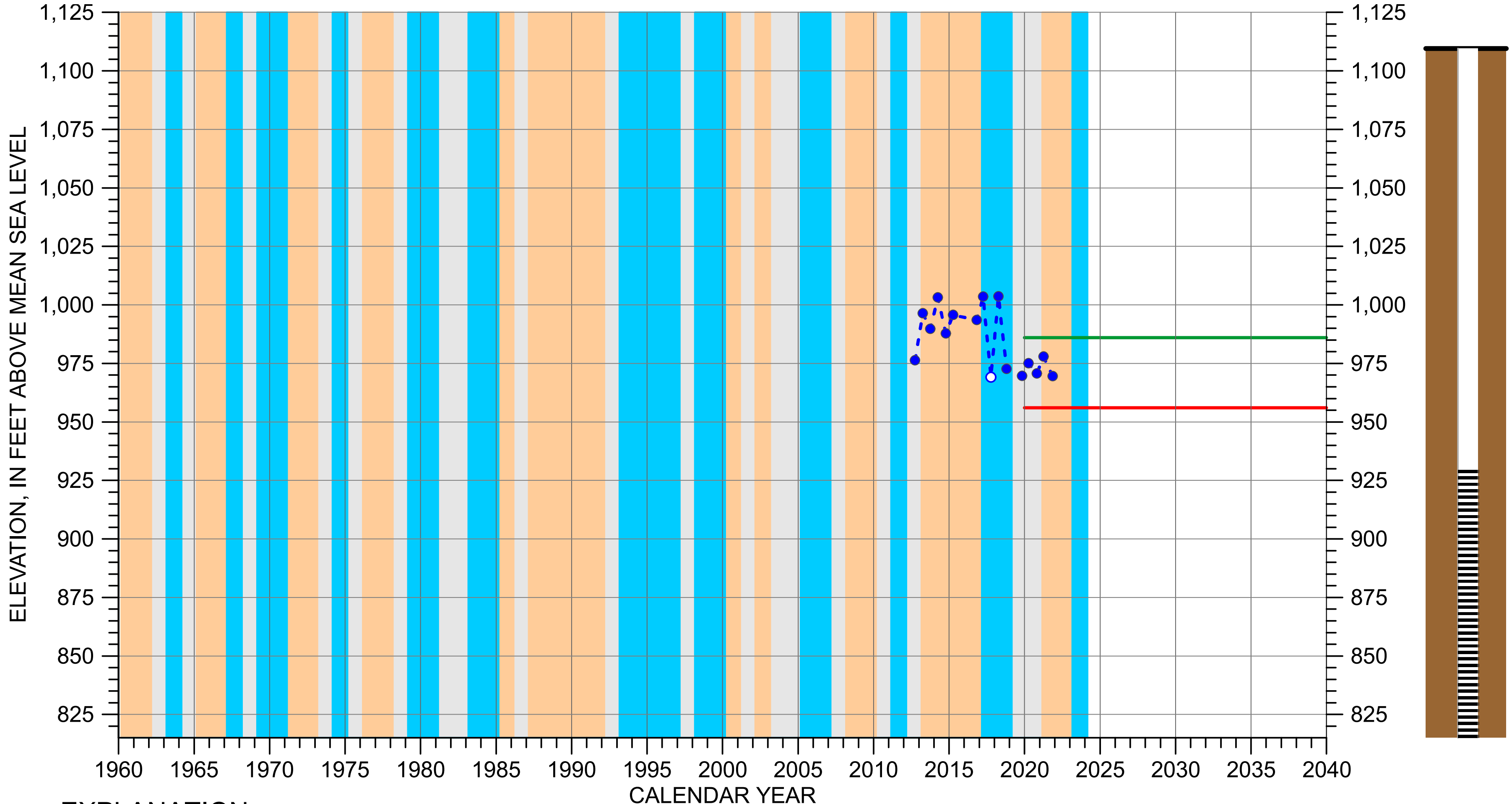
Dry | Avg/Alternating | Wet

Well Depth: 350 feet
Screened Interval: unknown
Reference Point Elevation: 1135 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/15E-29N01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\09_Hydr_26S_15E-29N01.gpj



EXPLANATION

Groundwater Elevation

Measurable Objective

Measurement Not Verified*

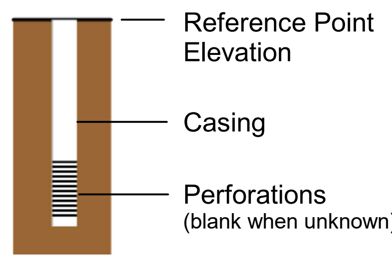
Minimum Threshold

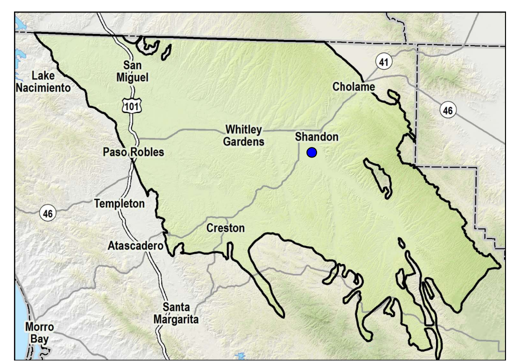
CLIMATE PERIOD CLASSIFICATION

Dry Avg/Alternating Wet

Well Depth: 600 feet
Screened Interval: 180-600 feet below ground surface
Reference Point Elevation: 1109.5 feet above mean sea level

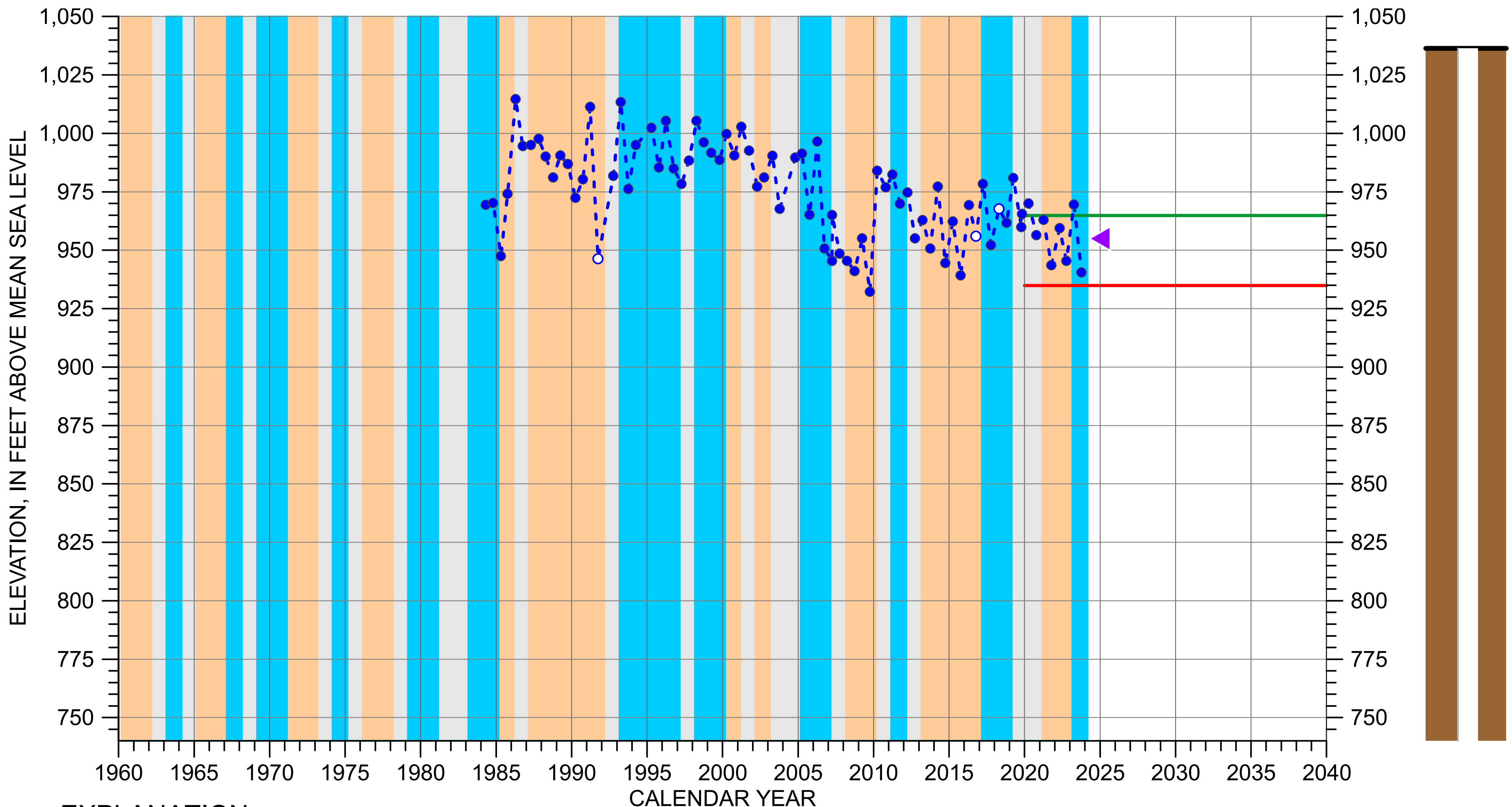
* Measurement reported as not static





HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/15E-29R01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\10_Hydr_26S_15E-29R01.gpj



EXPLANATION

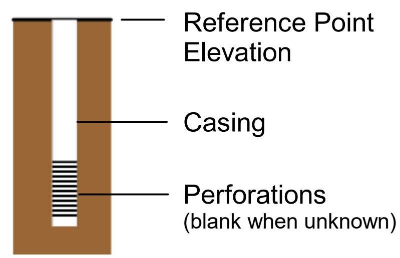
Groundwater Elevation

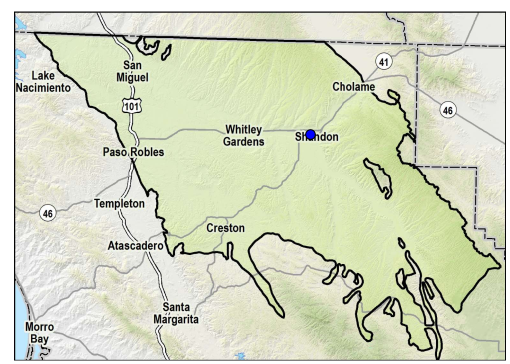
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

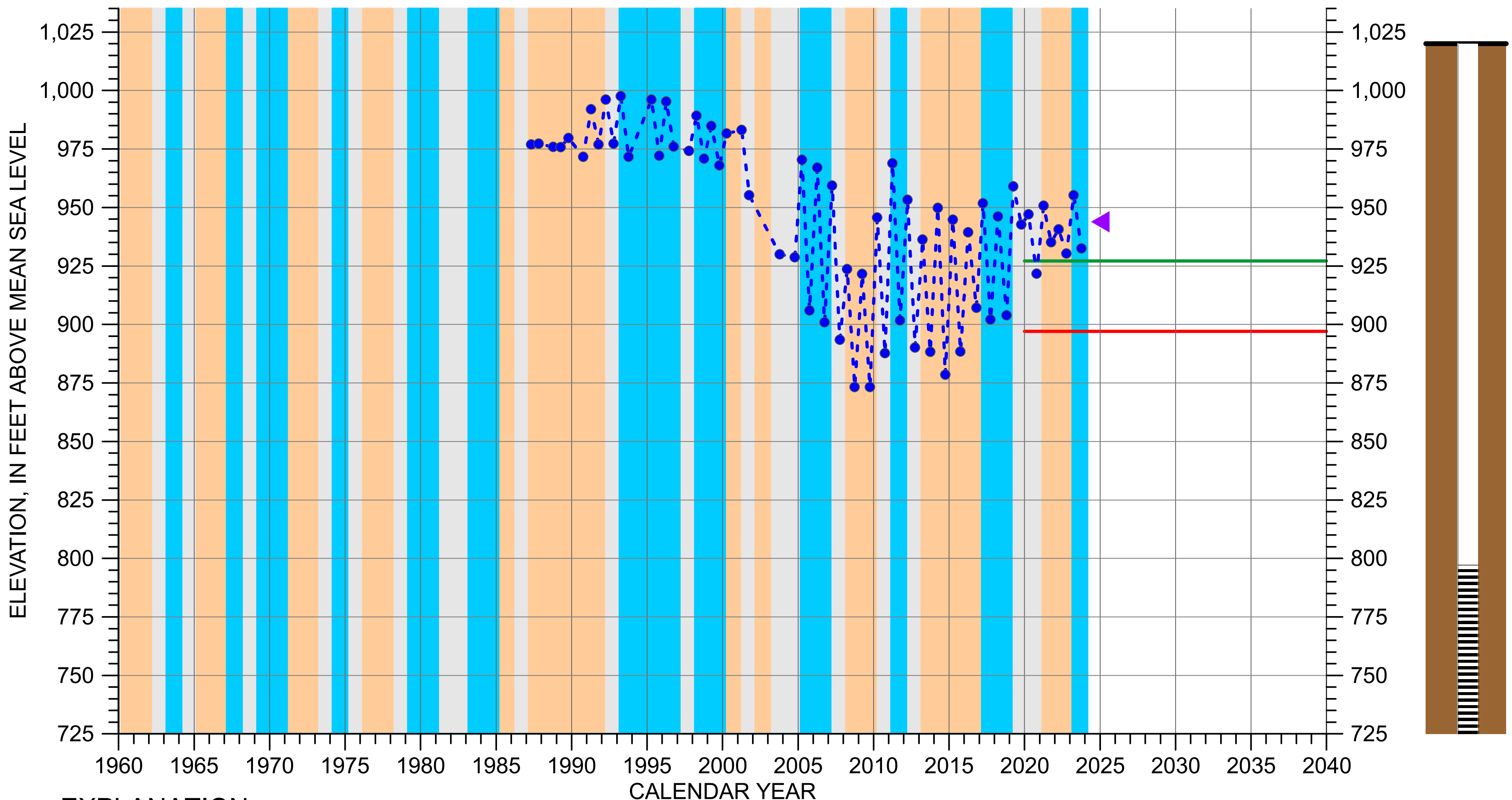
Dry | Avg/Alternating | Wet

Well Depth: 461 feet
Screened Interval: 297-461 feet below ground surface
Reference Point Elevation: 1036.36 feet above mean sea level

* Measurement reported as not static

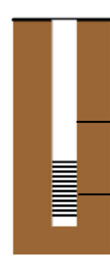
HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/15E-20B04

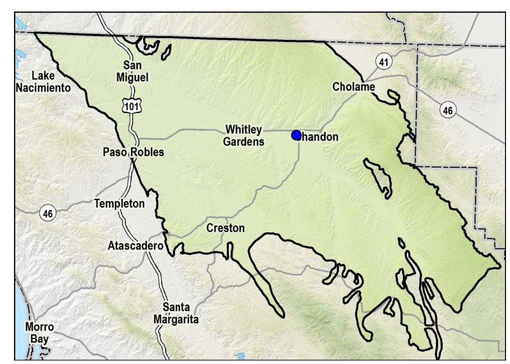
P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\11_Hydr_26S_15E-20B04.gpj



EXPLANATION

- Groundwater Elevation
- Measurement Not Verified*
- Measurable Objective
- Minimum Threshold
- Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

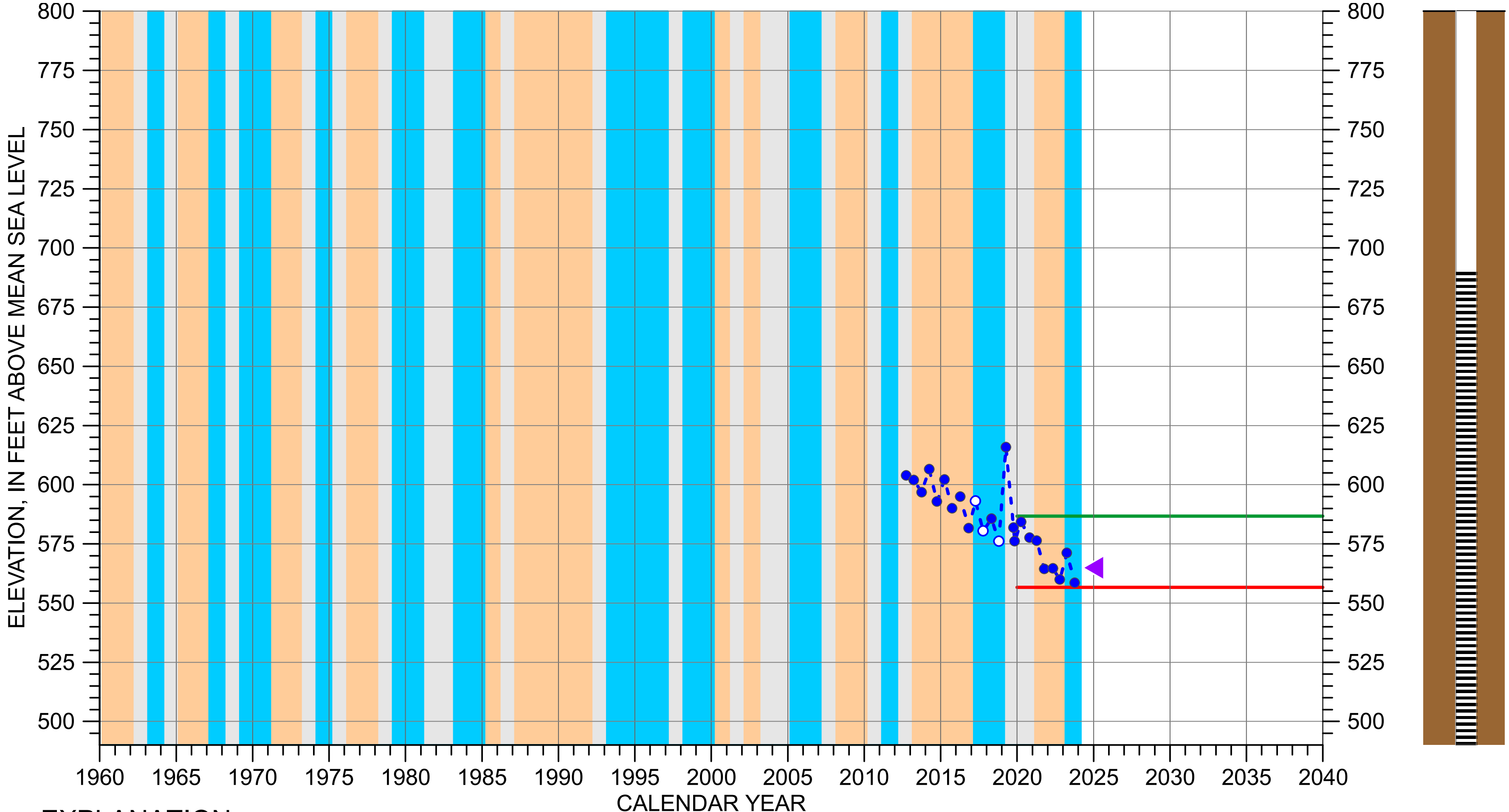
- Dry
- Avg/Alternating
- Wet

Well Depth: 512 feet
Screened Interval: 223-512 feet below ground surface
Reference Point Elevation: 1020 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/15E-19E01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\12_Hydr_26S_15E-19E01.gpj



EXPLANATION

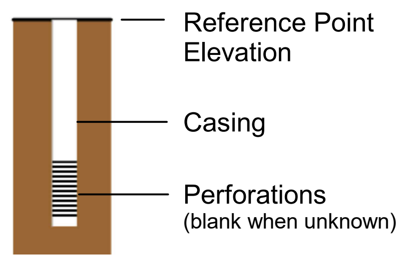
Groundwater Elevation

Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations

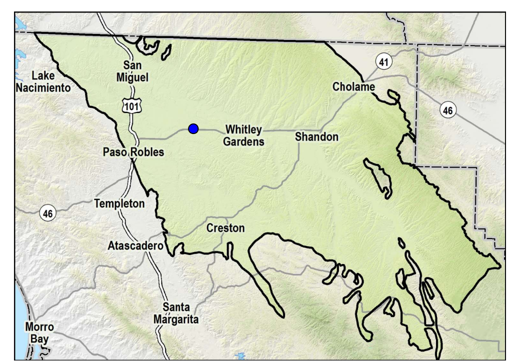


CLIMATE PERIOD CLASSIFICATION

Dry | Avg/Alternating | Wet

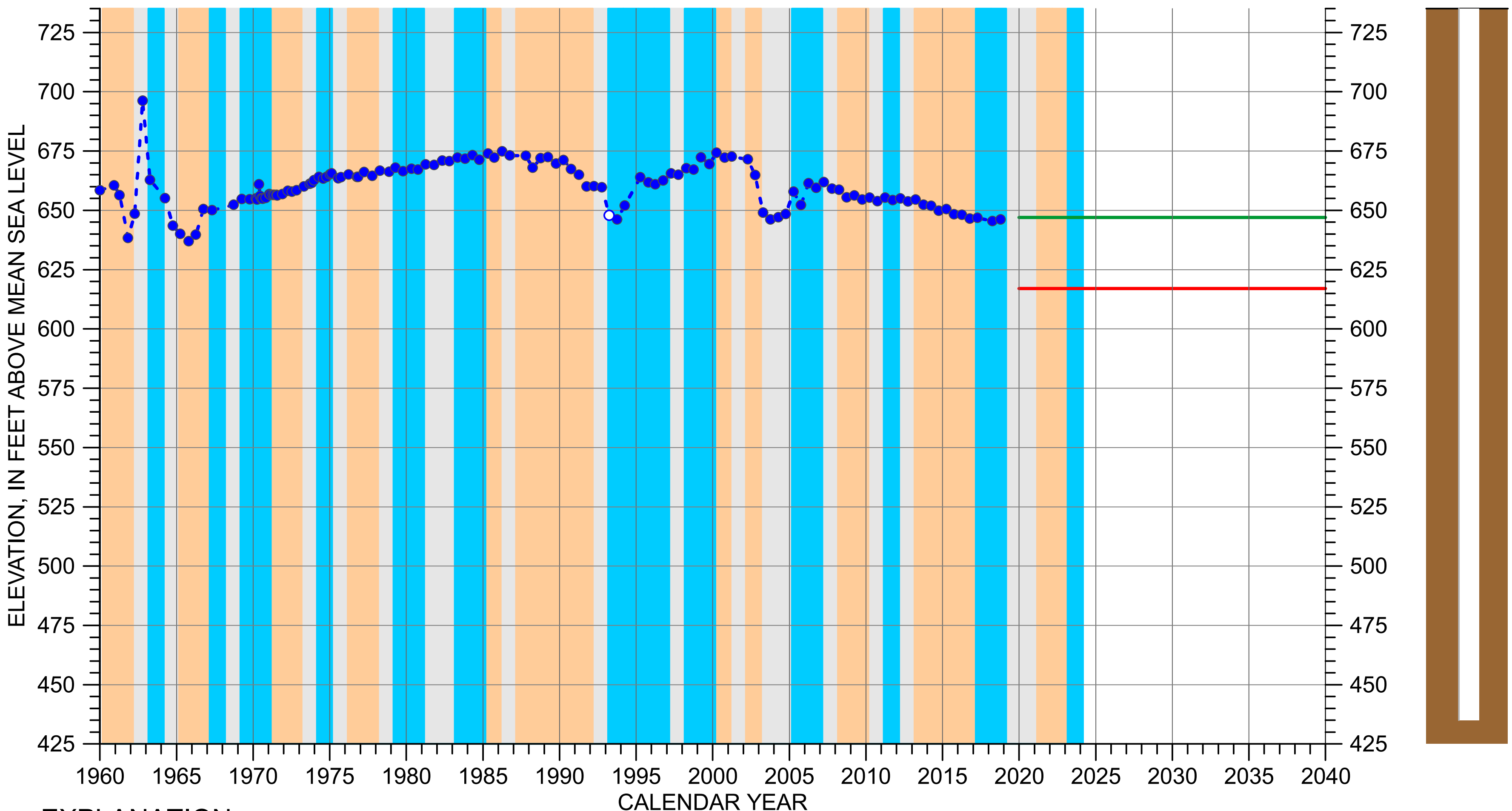
Well Depth: 400 feet
Screened Interval: 200-400 feet below ground surface
Reference Point Elevation: 890.2 feet above mean sea level

* Measurement reported as not static



HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/13E-16N01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\13_Hydr_26S_13E-16N01.gpj



EXPLANATION

Groundwater Elevation

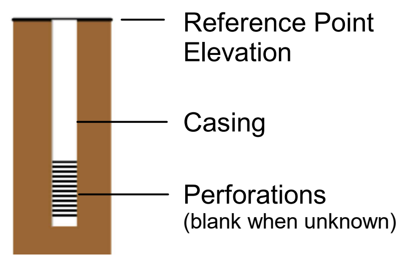
Measurement Not Verified*

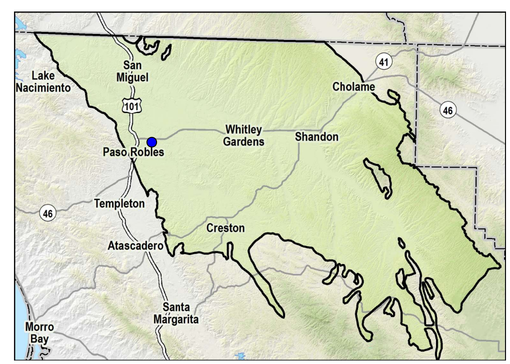
Measurable Objective

Minimum Threshold

CLIMATE PERIOD CLASSIFICATION

Dry | Avg/Alternating | Wet



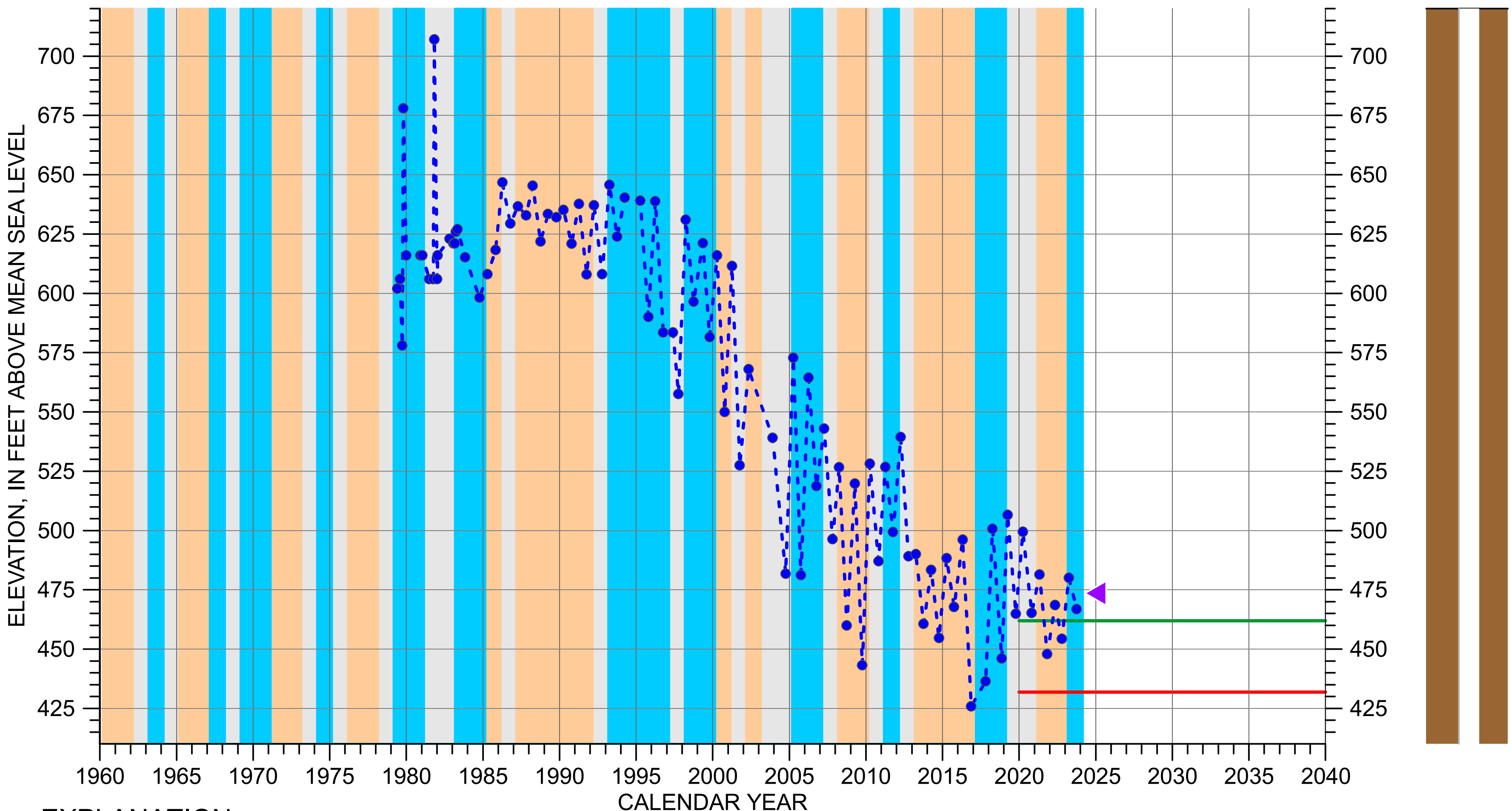


Well Depth: 400 feet
Screened Interval: unknown
Reference Point Elevation: 835 feet above mean sea level

* Measurement reported as not static

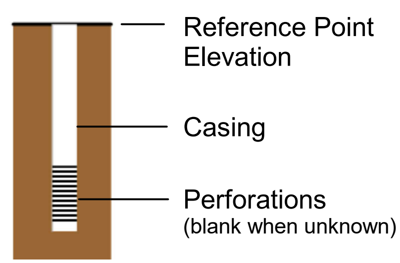
HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/12E-26E07

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\14_Hydr_26S_12E-26E07.gpj



EXPLANATION

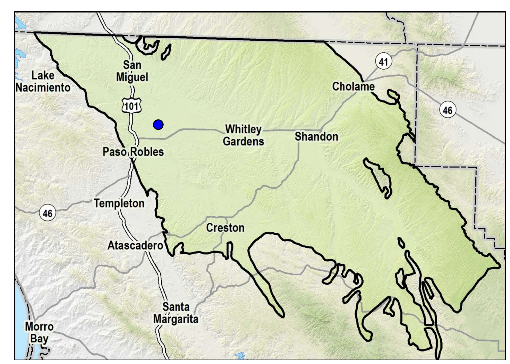
- Groundwater Elevation
- Measurement Not Verified*
- Measurable Objective
- Minimum Threshold
- Average of spring and fall 2023 water elevations



CLIMATE PERIOD CLASSIFICATION

Dry Avg/Alternating Wet

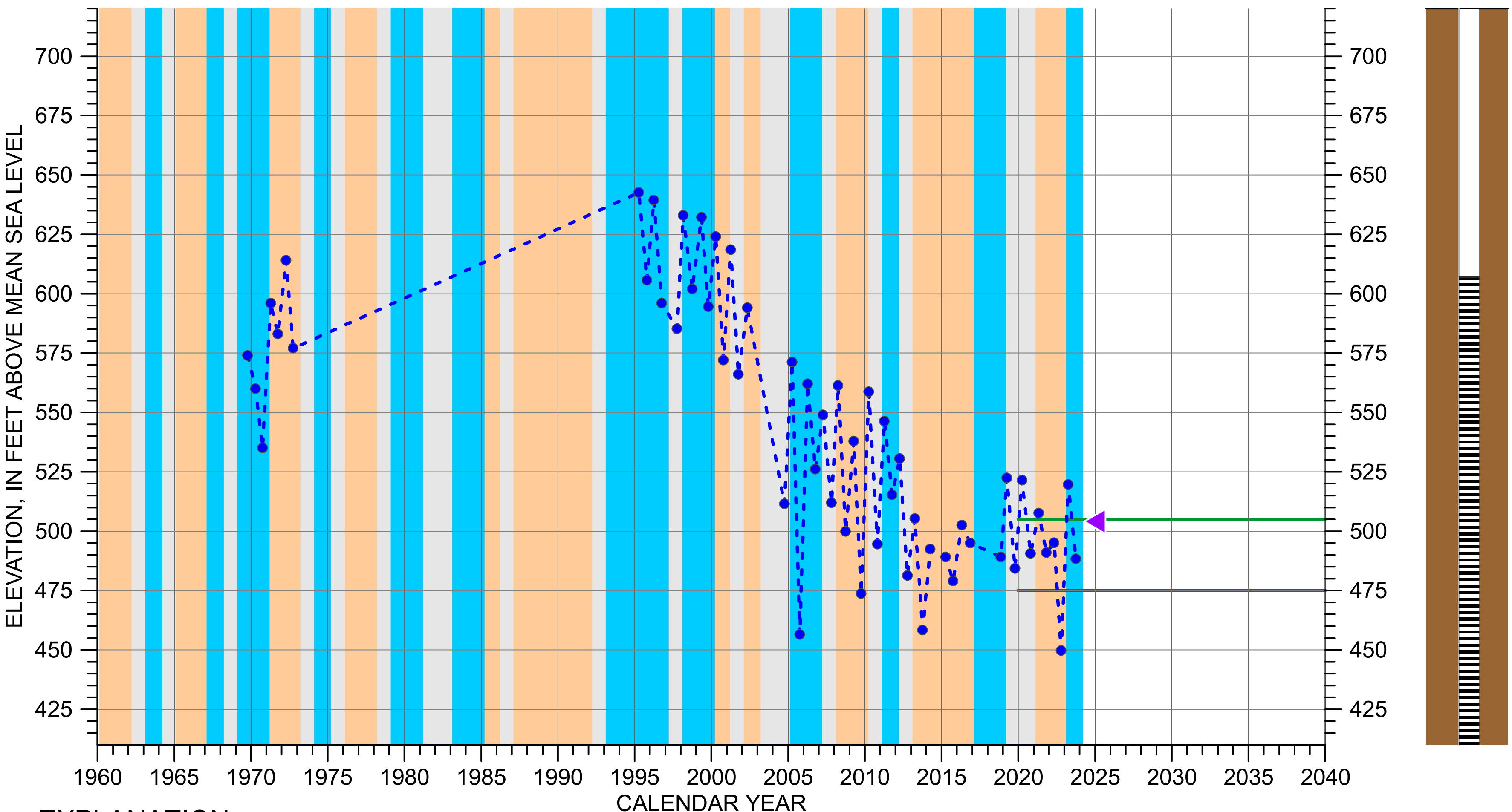
Well Depth: 1100 feet
Screened Interval: unknown
Reference Point Elevation: 786 feet above mean sea level



* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/12E-14K01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\15_Hydr_26S_12E-14K01.gpj



EXPLANATION

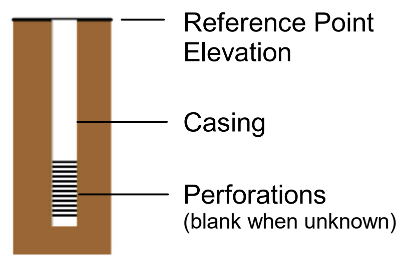
Groundwater Elevation

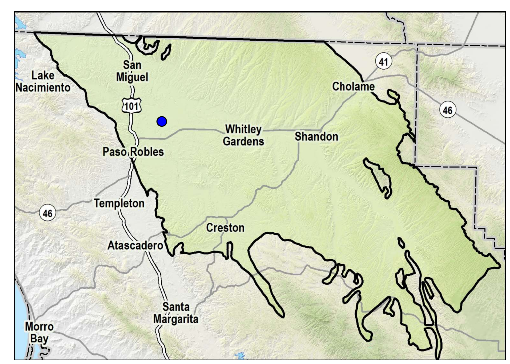
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

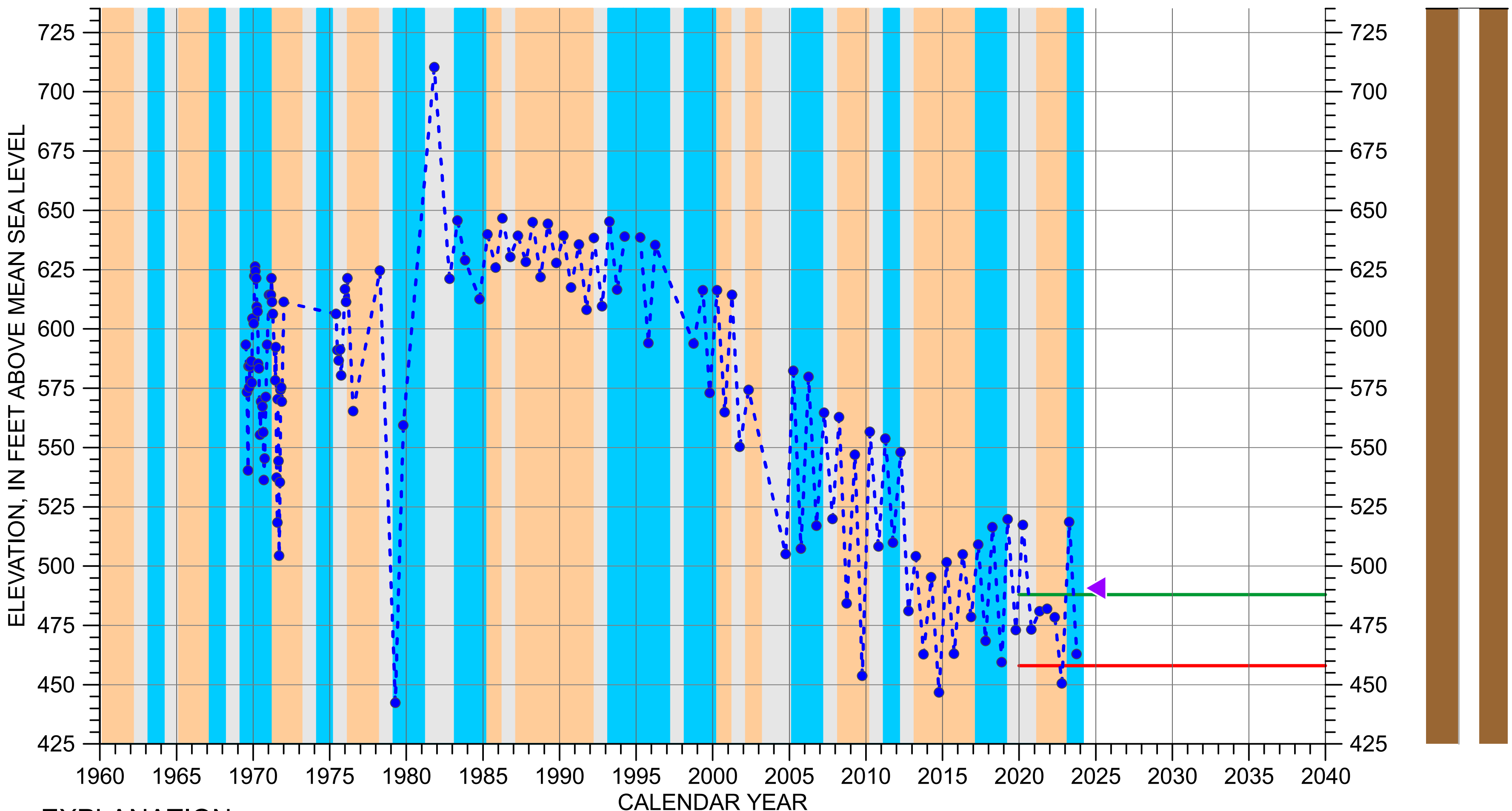
Dry Avg/Alternating Wet

Well Depth: 1230 feet
Screened Interval: 180-1230 feet below ground surface
Reference Point Elevation: 790 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/12E-14H01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\16_Hydr_26S_12E-14H01.gpj



EXPLANATION

Groundwater Elevation

Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

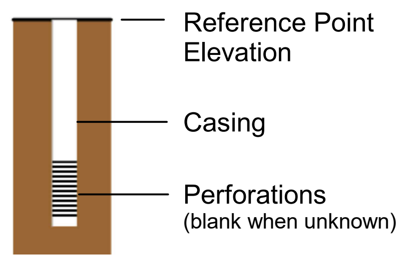
Minimum Threshold

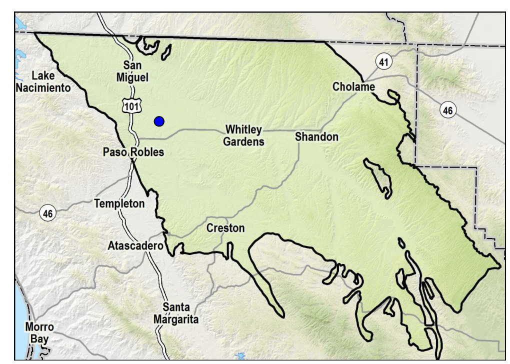
CLIMATE PERIOD CLASSIFICATION

Dry — Avg/Alternating — Wet

Well Depth: 740 feet
Screened Interval: unknown
Reference Point Elevation: 789.3 feet above mean sea level

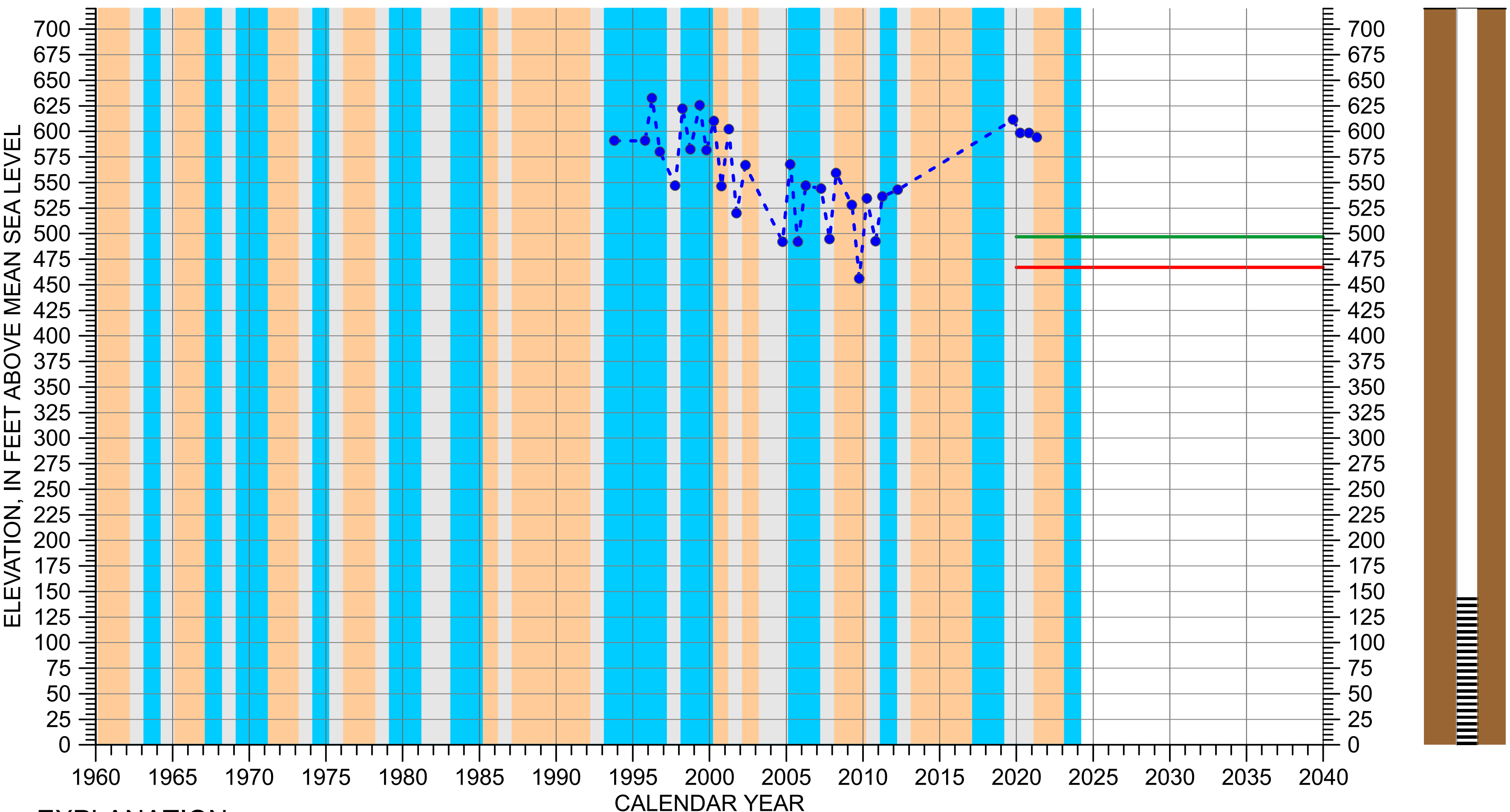
* Measurement reported as not static





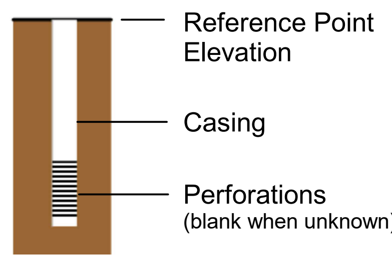
HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/12E-14G01

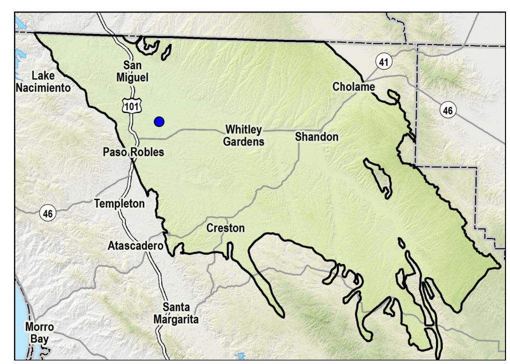
P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\17_Hydr_26S_12E-14G01.gpj



EXPLANATION

- Groundwater Elevation
- Measurement Not Verified*
- Measurable Objective
- Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

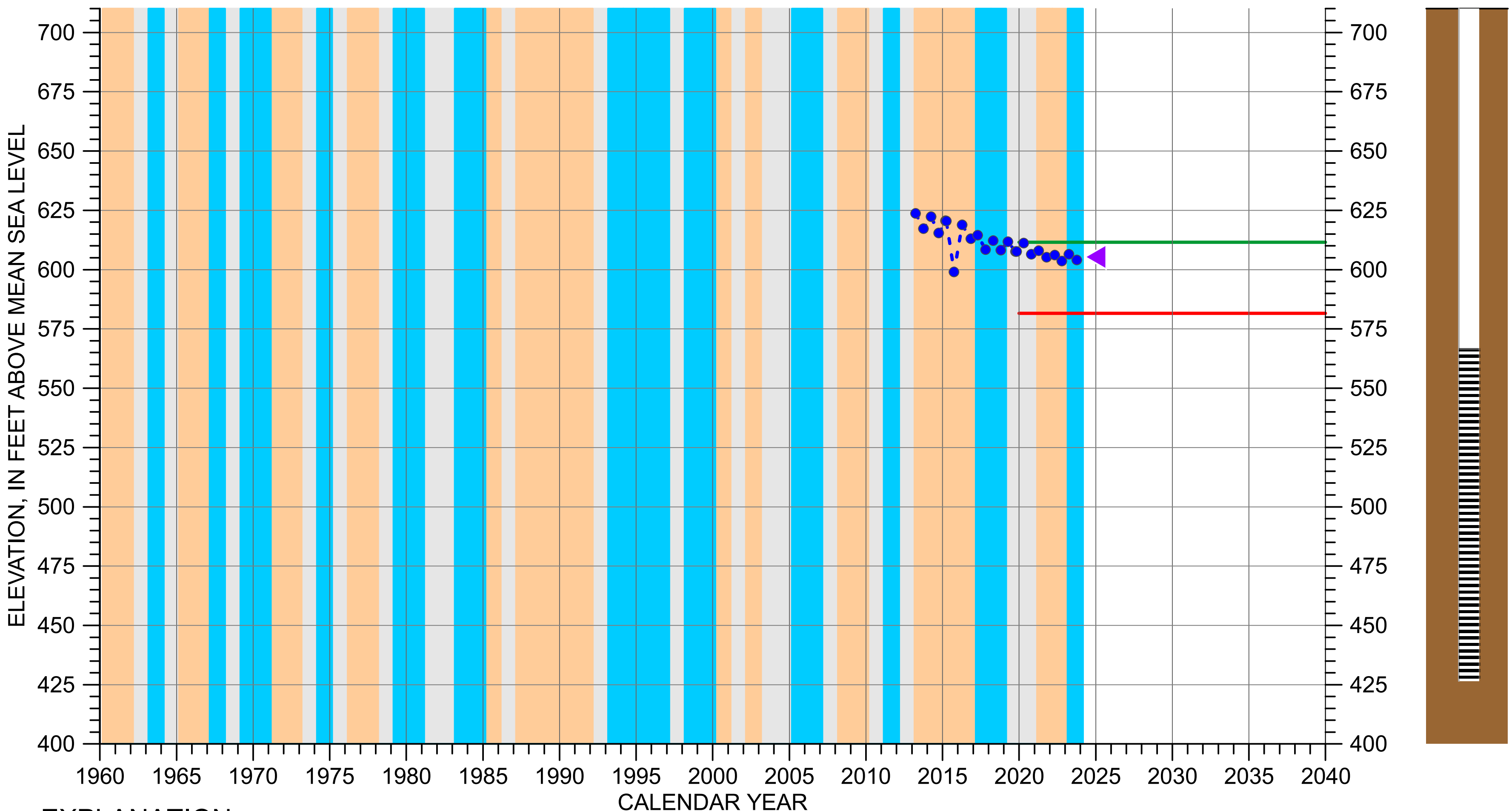
- Dry
- Avg/Alternating
- Wet

Well Depth: 840 feet
Screened Interval: 640-840 feet below ground surface
Reference Point Elevation: 787 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/12E-14G02

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\18_Hydr_26S_12E-14G02.gpj



EXPLANATION

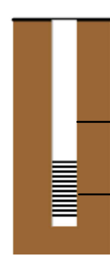
Groundwater Elevation

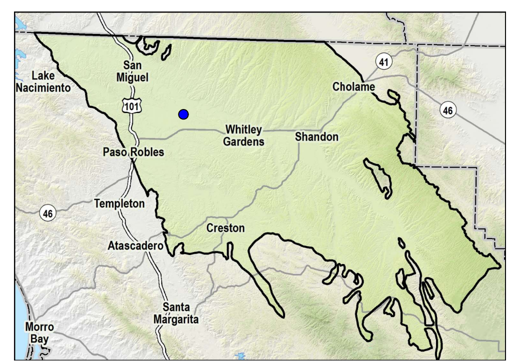
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

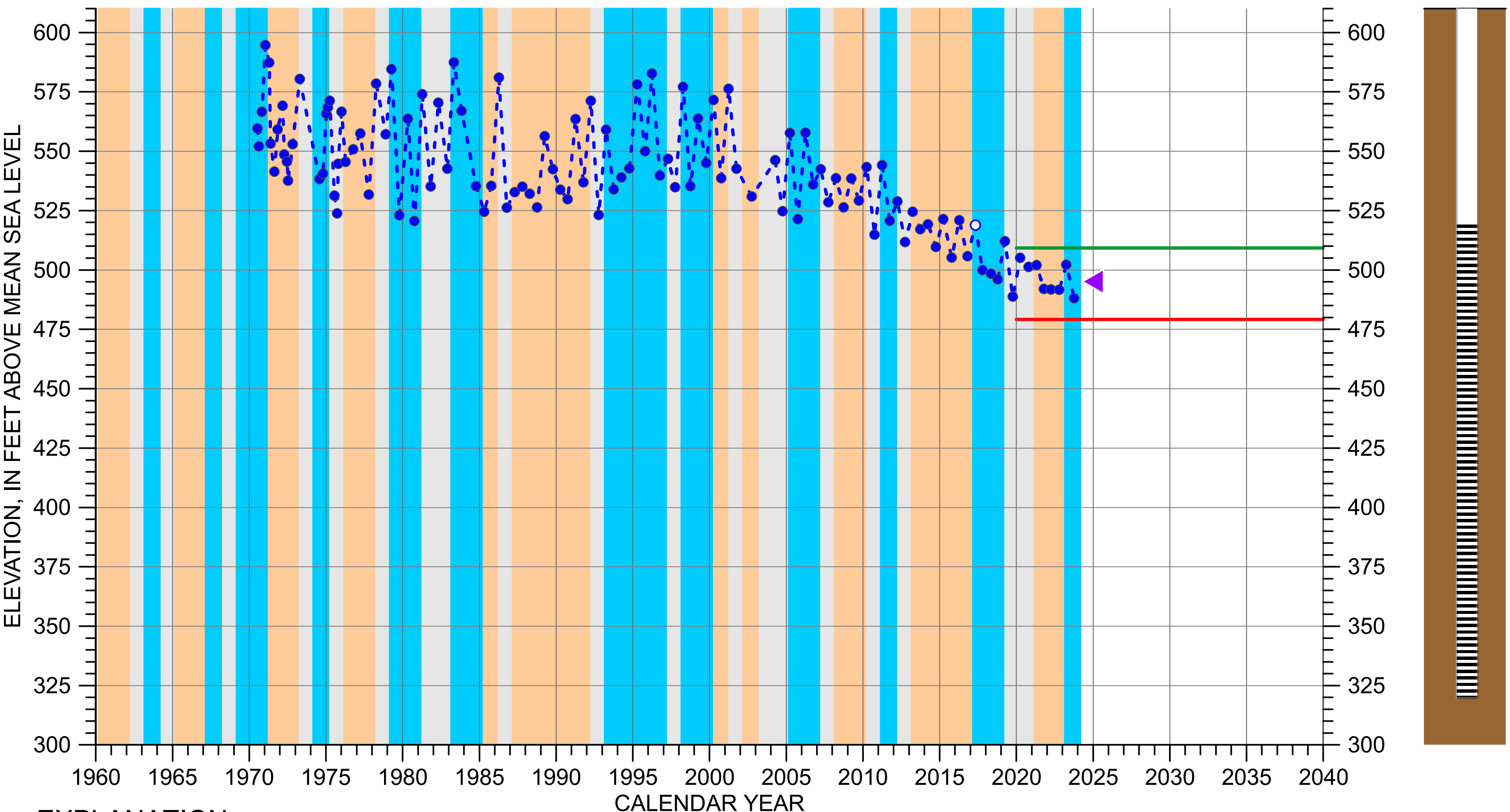
Dry
Avg/Alternating
Wet

Well Depth: 400 feet
Screened Interval: 260-400 feet below ground surface
Reference Point Elevation: 827.9 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 26S/13E-08M01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\19_Hydr_26S_13E-08M01.gpj



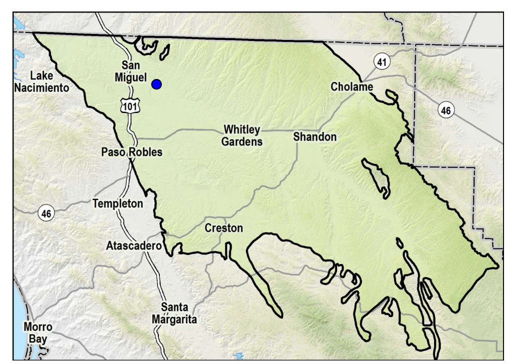
EXPLANATION

- Groundwater Elevation
- Measurable Objective
- Average of spring and fall 2023 water elevations
- Measurement Not Verified*
- Minimum Threshold

Reference Point Elevation

Casing

Perforations
(blank when unknown)



CLIMATE PERIOD CLASSIFICATION

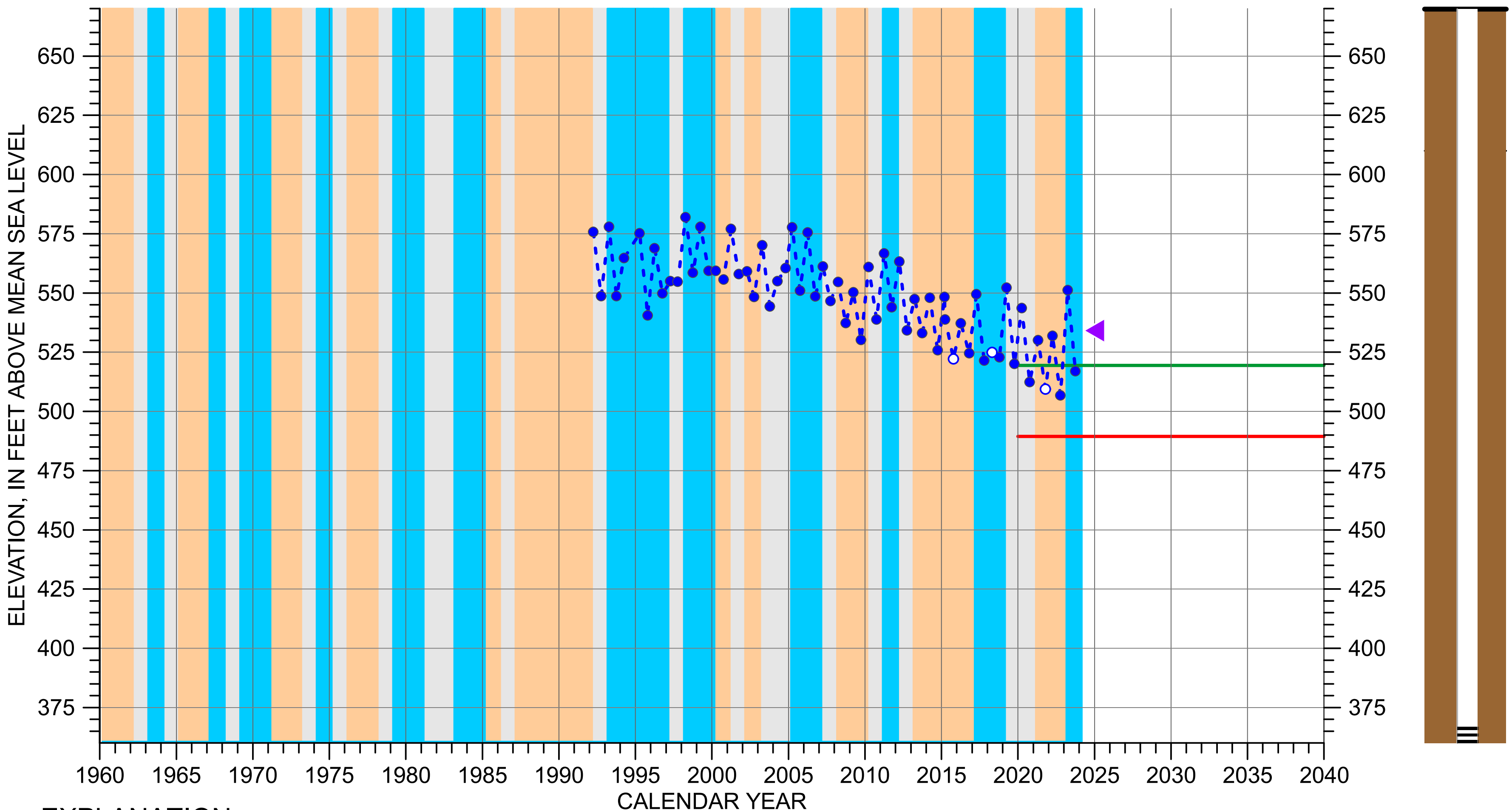
Dry | Avg/Alternating | Wet

Well Depth: 400 feet
Screened Interval: 200-400 feet below ground surface
Reference Point Elevation: 719.7 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 25S/12E-26L01

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\20_Hydr_25S_12E-26L01.gpj



EXPLANATION

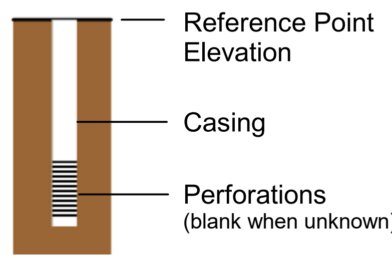
Groundwater Elevation

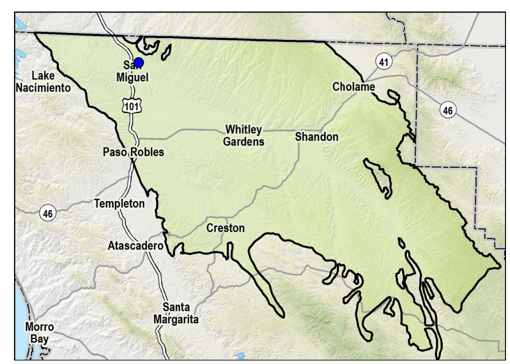
Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

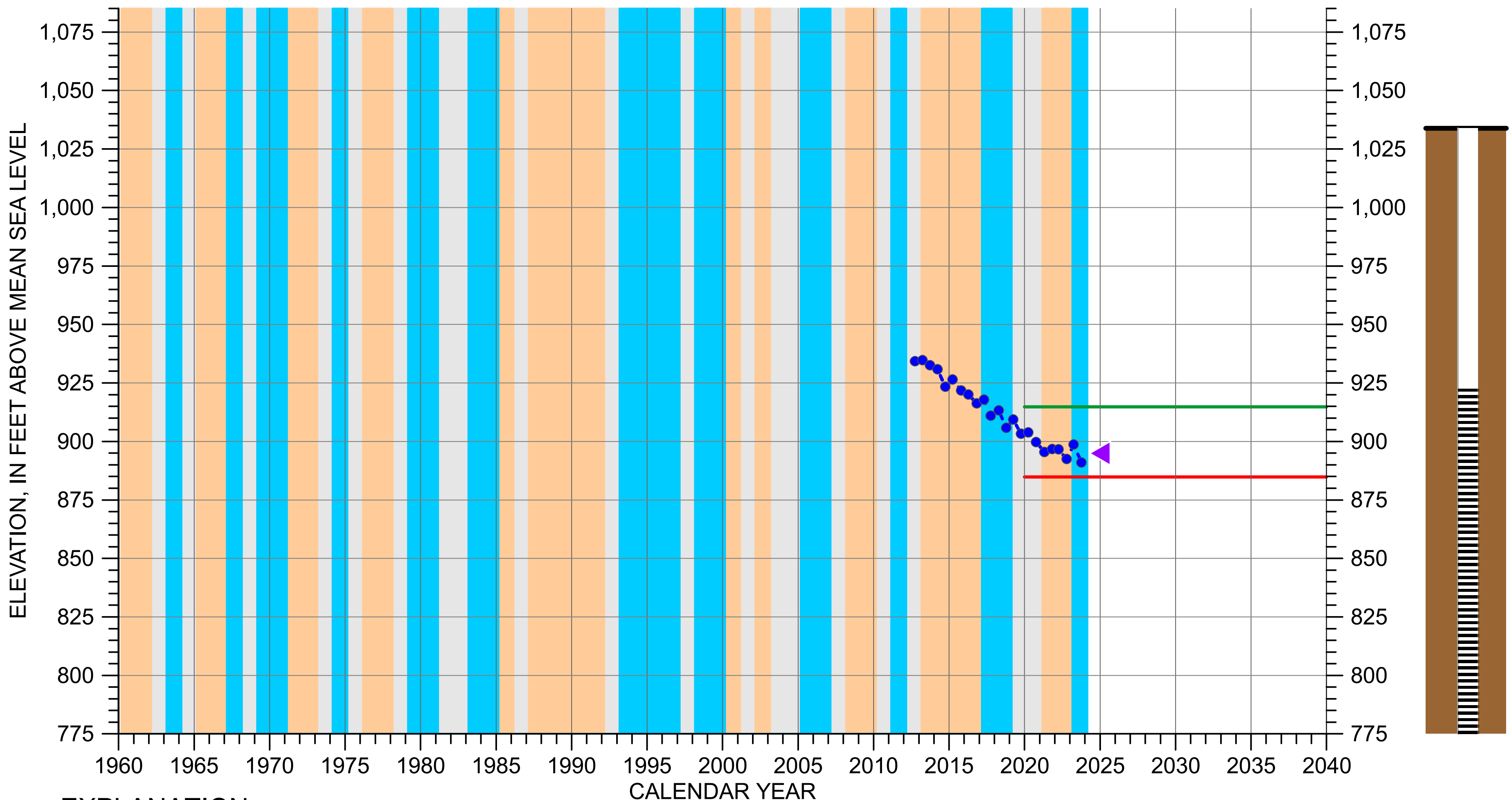
Dry | Avg/Alternating | Wet

Well Depth: 350 feet
Screened Interval: 300-310, 330-340 feet below ground surface
Reference Point Elevation: 669.8 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 25S/12E-16K05

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\Gpj\21_Hydr_25S_12E-16K05.gpj



EXPLANATION

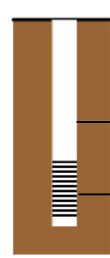
Groundwater Elevation

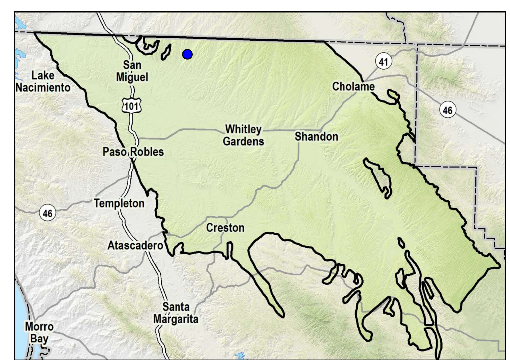
Measurement Not Verified*

Measurable Objective

Minimum Threshold

Average of spring and fall 2023 water elevations





CLIMATE PERIOD CLASSIFICATION

Dry | Avg/Alternating | Wet

Well Depth: 270 feet
Screened Interval: 110-270 feet below ground surface
Reference Point Elevation: 1033.8 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 25S/13E-08L02

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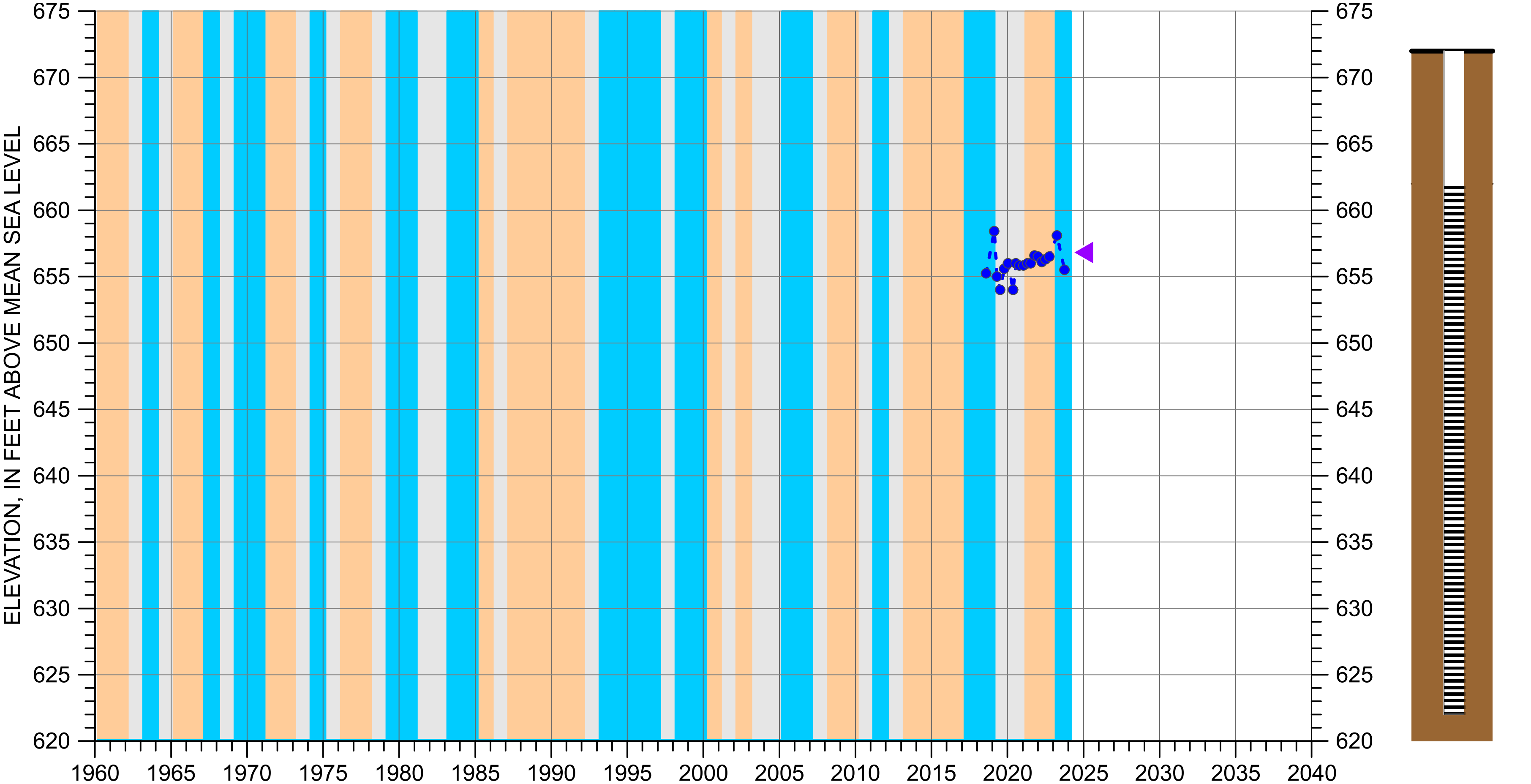
Alluvial Aquifer Hydrographs



EXPLANATION

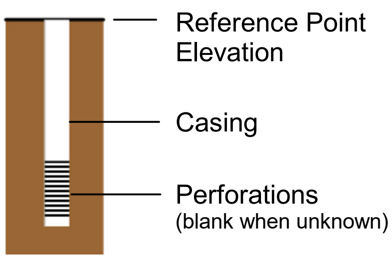
Groundwater Elevation

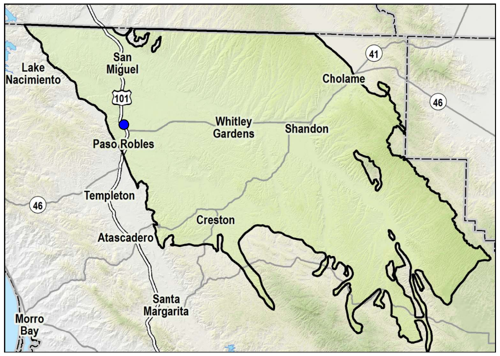
Measurable Objective

Average of spring and fall 2023 water elevations

Measurement Not Verified*

Minimum Threshold





CLIMATE PERIOD CLASSIFICATION

Dry
Avg/Alternating
Wet

Well Depth: 50 feet
Screened Interval: 10-50 feet below ground surface
Reference Point Elevation: 672 feet above mean sea level

* Measurement reported as not static

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 18MW-0191

P:\Portland\667-County of San Luis Obispo\029 - PasoBasinAR_WYs23-24\Analysis\Hydrographs\Grapher\23_18MW-0191.gpj

Appendix G

Paso Robles Formation Aquifer Storage Coefficient Derivation and Sensitivity Analysis (GSI, 2020)

Paso Robles Formation Aquifer Storage Coefficient Derivation and Sensitivity Analysis

The annual changes in groundwater in storage calculated for water years 2017, 2018, and 2019 in the Paso Robles Formation Aquifer presented in this first annual report are based on a fixed storage coefficient (S) value derived from groundwater modeling and groundwater elevation data presented in the Groundwater Sustainability Plan (GSP) for water year 2016. The derivation of S for the Paso Robles Formation Aquifer and a sensitivity analysis are presented below. It should be noted that while the GSP groundwater model utilizes a spatially variable S (both laterally and vertically) the S value derived here and used in this first annual report is a single average value representing the Paso Robles Formation Aquifer within the Subbasin.

1.1 Derivation of the Storage Coefficient Term

Derivation of S was accomplished through a back calculation using the change in groundwater in storage in the Paso Robles Formation Aquifer determined from the GSP groundwater model for water year 2016 and the total volume change represented by a Paso Robles Formation Aquifer groundwater elevation change map prepared for water year 2016. The change in groundwater in storage for water year 2016 in the Paso Robles Formation Aquifer is -59,459 acre-feet (AF) based on the GSP groundwater model.

The Paso Robles Formation Aquifer groundwater elevation change map for water year 2016 was prepared for this annual report by comparing the fall 2015 groundwater elevation contour map to the fall 2016 groundwater elevation contour map. The fall 2015 groundwater elevations were subtracted from the fall 2016 groundwater elevations resulting in a map depicting the changes in groundwater elevations in the Paso Robles Formation Aquifer that occurred during the 2016 water year (not pictured, but similar to Figures 12, 13, and 14 in this first annual report).

The groundwater elevation change map for water year 2016 represents a total volume change within the Paso Robles Formation Aquifer of -807,490 AF. As described in Section 7.2 of this annual report, this total volume change includes the volume displaced by the aquifer material and the volume of groundwater stored within the void space of the aquifer. The portion of void space in the aquifer that can be utilized for groundwater storage is represented by S. The change in groundwater in storage is equivalent to the product of S and the total volume change, as shown here:

$$Change\ of\ Groundwater\ in\ Storage = S \times Total\ Volume\ Change$$

This equation can be re-arranged and solved for S:

$$S = \frac{Change\ of\ Groundwater\ in\ Storage}{Total\ Volume\ Change} = \frac{-59{,}459\ AF}{-807{,}490\ AF} = 0.07$$

Therefore, based on analysis of data for water year 2016, an average S value for the Paso Robles Formation Aquifer in the Paso Robles Subbasin is 0.07.

1.2 Sensitivity Analysis

The annual changes in groundwater in storage in the Paso Robles Formation Aquifer calculated for water years 2017, 2018, and 2019 presented in this first annual report are 60,106, 6,398, and 59,682 AF, respectively. These values, calculated using an S value of 0.07, appear reasonable when compared to historical changes in groundwater in storage (see Figure 15 in this first annual report). While the calculated value of S, presented above, is based on sound science and using the best readily available information, it is necessary to acknowledge that the true value of S in the Paso Robles Formation Aquifer is spatially variable (as indicated in the GSP groundwater model) and ranges in value both above and below the calculated value of 0.07. A sensitivity analysis was performed to demonstrate the range of annual changes in groundwater in storage that result from using a range of S values. Table F1 shows that the annual change in groundwater in storage volumes can range from 27 percent less to 27 percent more than presented in this first annual report based on S values ranging from 0.05 to 0.09. This shows the sensitivity of the S value to determination of annual change in groundwater in storage. However, neither the 27 percent lower nor the 27 percent higher annual change in groundwater in storage volumes seem reasonable when compared to historical changes in groundwater in storage (as shown in Figure 15 in this first annual report). Based on this sensitivity analysis, GSI believes that the calculated value of S (0.07) is reasonable and defensible for the purposes of this first annual report.

Table F 1. Change in Groundwater in Storage Sensitivity Analysis

Water Year	Total Volume of Change (AF)	Change in Groundwater in Storage (AF), based on:								
		S = 0.05		S = 0.06		Calculated S [0.07]	S = 0.08		S = 0.09	
		(AF)	% Diff	(AF)	% Diff	(AF)	(AF)	% Diff	(AF)	% Diff
2017	816,274	43,781		51,943		60,106	68,269		76,432	
2018	86,885	4,660	-27%	5,529	-14%	6,398	7,267	14%	8,135	27%
2019	810,508	43,471		51,577		59,682	67,787		75,892	

notes:

AF = acre-feet, S = storage coefficient, % Diff = percent difference from calculated S

APPENDIX H

San Luis Obispo County Ordinance 3484

ORDINANCE NO. **3484**

AN ORDINANCE AMENDING TITLE 8 AND TITLE 22 OF THE SAN LUIS OBISPO COUNTY CODE, THE HEALTH AND SANITATION ORDINANCE AND THE LAND USE ORDINANCE, RESCINDING ORDINANCE NO. 3483 AND RE-ENACTING AND EXTENDING THE PREVIOUSLY ADOPTED AGRICULTURAL OFFSET REQUIREMENTS ORDINANCE FOR NEW OR EXPANDED IRRIGATED CROP PRODUCTION USING WATER FROM THE PASO ROBLES GROUNDWATER BASIN

The Board of Supervisors of the County of San Luis Obispo, State of California, does ordain as follows:

SECTION I: The purpose and intent of this Ordinance is to rescind Ordinance No. 3483 and to restore the previous regulatory framework of Sections 8.40.030, 8.40.040 and 22.06.030 of Title 22 of the County Code related to new or expanded irrigated crop production within the Paso Robles Groundwater Basis. Any interpretation of this Ordinance shall be consistent with that purpose and intent.

SECTION II: That Section 8.40.030 of Title 8 of the San Luis Obispo County Code be amended as follows:

8.40.030 – Acts Prohibited, permit required.

c. No person shall construct, repair, modify or destroy any well bore hole, well casing, or well packing or conduct any site grading or fill activities in conjunction with the construction, repair, modification or destruction of any well bore hole, well casing, or well packing without first satisfying all applicable provisions of Section 22.30~~. 205~~204 of this code (~~Crop Production Irrigated from Groundwater Wells within the Paso Basin Land Use Management Area~~ New or Expanded Irrigated Crop Production Overlying the Paso Robles Groundwater Basin, excluding the Atascadero Sub-basin), where applicable, and Sections 22.05.030 et seq. or Sections 23.05.020 et seq. of this code (grading), which may include the necessity of obtaining ~~a planting permit~~ an Agricultural Offset Clearance or a grading permit from the county department of planning and building in addition to the permit required by this chapter. ~~Without limiting the foregoing, no person shall be issued a permit to construct a groundwater well located within the Paso Basin Land Use Management Area to irrigate new or expanded plantings where said plantings do not meet the requirements of Section 22.30.205 and where the necessary planting permit~~

~~or exemption has not first been approved.~~

SECTION III: That Section 8.40.040 of Title 8 of the San Luis Obispo County Code be amended as follows:

8.40.040 – Permits.

a. Applications. Applications for permits shall be made to the health officer and shall include the following:

2. Evidence of compliance with Section 22.30.~~205~~204 of this code (~~Crop Production Irrigated from Groundwater Wells within the Paso Basin Land Use Management Area~~ New or Expanded Irrigated Crop Production Overlying the Paso Robles Groundwater Basin, excluding the Atascadero Sub-basin), where applicable;

SECTION IV: That Section 22.06.030 of Title 22 of the San Luis Obispo County Code be amended as follows:

22.06.030 – Allowable Land Uses and Permit Requirements

TABLE 2-2 – ALLOWABLE LAND USES AND PERMIT REQUIREMENTS

LAND USE (1)(2)(10)	**PERMIT REQUIREMENT BY L.U.C. (3)**						**Specific Use Standards**
	AG(8)	**RL**	**RR**	**RS**	**RSF**	**RMF**	
AGRICULTURE, RESOURCE, AND OPEN SPACE USES							
Crop Production and Grazing	A2	A2	A2	A2	A2	A2	22.30.200, 22.30.~~205~~ 204, 22.30.244
Nursery Specialties	A2	A2	A2	A2			~~22.30.205,~~ 22.30.204, 22.30.310

LAND USE (1)(2)(10)	PERMIT REQUIREMENT BY L.U.C. (3)							Specific Use Standards
	OP	CR	CS	IND	OS	REC	PF	
AGRICULTURE, RESOURCE, AND OPEN SPACE USES								
Crop Production and Grazing	A2	A2	A2	A2	A2	A2	A2	22.30.200, 22.30.~~205~~204, 22.30.244
Nursery Specialties		A2	A2	A2				~~22.30.205,~~ 22.30.204, 22.30.310

SECTION V: That Section 22.06.040 of Title 22 of the San Luis Obispo County Code be amended as follows:

22.06.040 – Exemptions from Land Use Permit Requirements

E. Agricultural uses:

3. Crop production and grazing. No land use permit is required for crop production, provided that industrial hemp cultivation is subject to the standards of Section 22.30.244, and ~~new and expanded crop production irrigated from groundwater wells within the Paso Basin Land Use Management Area is subject to the standards of Section 22.30.205~~ where an Agricultural Offset Clearance is required for New or Expanded Irrigated Crop Production using water from the Paso Robles Groundwater Basin (excluding the Atascadero Sub-basin), as shown in Figure 6-1. No land use permit is required for grazing activities where allowable, provided that feedlots are subject to the standards of Section 22.30.100 (Livestock Specialties – Intensive).

SECTION VI: That Section 22.30.200 of Title 22 of the San Luis Obispo County Code be amended as follows:

22.30.200 – Crop Production and Grazing within Urban or Village Areas.

This Section applies to crop production and grazing activities when located within an urban or village reserve line. This Section does not apply to the keeping of animals for personal use, which is included under Section 22.30.090 (Animal

Keeping).

A. Crop production. The continuance or establishment of crop production activities on land within an urban or village reserve line is not limited by this Title except as provided in Section 22.30.~~205~~204.

B. Grazing. Grazing operations shall not be established within an urban or village area after the effective date of this Title except in an Agriculture category, or a Residential category where the keeping of animals is in compliance with Section 22.30.090 (Animal Keeping), or is on a site of 20 acres or larger.

SECTION VII: That Section 22.30.204 of Title 22 be restored and added back to the County Code as follows:

22.30.204 New or expanded irrigated crop production using water from the Paso Robles Groundwater Basin, excluding the Atascadero Sub-basin.

Prior to new or expanded irrigated crop production using water from the Paso Robles Groundwater Basin (PRGWB), excluding the Atascadero Sub-basin, the following requirements apply where designated by Section 22.06.030 (Allowable Land Uses and Permit Requirements) as being subject to the provisions of this section. The provisions of this chapter must be complied with prior to initiation or the establishment of new or expanded irrigated crop production and prior to the issuance of a permit pursuant to Title 8 of the County Code to construct, repair, or modify a water well (bore hole, casing, or packing) or water system proposed to serve any new or expanded irrigated crop production on land using water from the PRGWB (excluding the Atascadero Sub-basin). All new or expanded irrigated crop production using water from the PRGWB (excluding the Atascadero Sub-basin) shall be required to obtain an agricultural offset clearance. The offset clearance shall be the equivalent of a zoning clearance. The agricultural offset clearance is subject to the provisions of Chapter 22.64 that are applicable to zoning clearances except for land use permit time limits (Section 22.64.060) and extensions of time (Section 22.64.070). The purpose of the agricultural offset clearance is to allow for new or conversion of existing irrigated crop production using water from the PRGWB (excluding the Atascadero Sub-basin) while protecting the critical resource of groundwater by requiring water use to be offset at a 1:1 ratio for qualifying crops.

A. Where Applicable. The provisions of this chapter apply to sites using water from the PRGWB, excluding the Atascadero sub-basin, as defined by Figure 30-1. All sites shall overlie the PRGWB (excluding the Atascadero sub-basin), as shown in Figure 30-1. In no case shall a request for an agricultural offset clearance be granted for a site not using water from the PRGWB (excluding the Atascadero Sub-basin).

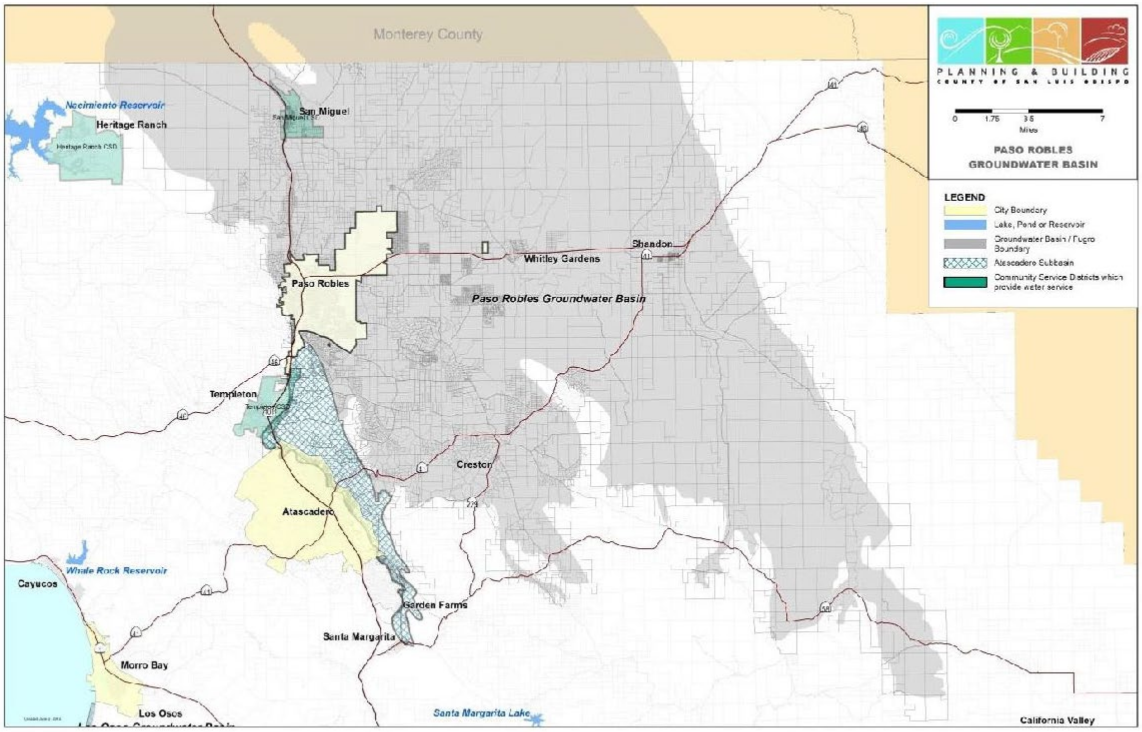


Figure 30-1: Paso Robles Groundwater Basin (Excluding the Atascadero Sub-basin)

B. Exemptions. Consideration of an exemption is subject to section 22.30.204 F (Application Contents). The agricultural offset clearance requirements as outlined in this section do not apply to the following activities, unless specified below:

1. Sites with existing irrigated annual or rotational crop production, where satisfactory evidence is shown that those crops have been planted within the last five years.

2. Replanting of a site with the same crop type, as identified in Tables 2 and 3 below, where satisfactory evidence is shown that those crops have been planted within the last five years. Replanting must not exceed the acreage of the crop production being replaced.

3. Expanded irrigated crop production on sites with crop types that involve implementation of new water efficiency technologies, where satisfactory evidence, as defined by resolution adopted by board of supervisors, is shown that crops have been planted within the last five years, and shall not exceed the average water use of the existing crop production, as identified in Tables 2 and 3.

4. Sites that were granted a vested right to plant new or expanded irrigated crop production under the provisions of the Paso Robles Groundwater Basin Urgency Ordinance, where satisfactory evidence is shown that the vested crops have been planted within 2 years from the date of the expiration of the

Paso Robles Groundwater Basin Urgency Ordinance (Ordinance Nos. 3246 and 3247).

5. For the purpose of new crop production irrigated with water from the Paso Robles Groundwater Basin (excluding the Atascadero Sub-basin), as defined by Figure 30-1, sites that do not have any existing crop production and are not served by wells located within the area of severe decline (50 feet or greater Spring Groundwater Elevation Change 1997-2013 AND 1997-2017) as shown in Figure 30-2, may be eligible for a one-time only exemption. The one-time only exemption is limited to the establishment of crop production representing a new total of no more than 5.0 AF per year per site. If a one-time only exemption is granted, the resulting crop production cannot be used as a source of Agricultural Offset Clearance credits in any future application.

C. **Agricultural Offset Clearance Fees.** Fees for an agricultural offset clearance are set forth in the county fee ordinance.

D. **Permit Requirements.**

1. An Agricultural offset clearance shall be issued upon satisfactory compliance with section 22.30.204 F, and G.
2. Metering and Monitoring. All new or existing wells that serve sites associated with an agricultural offset clearance application must have a well meter installed and verified prior to final inspection. No new or expanded irrigated agriculture shall occur until final inspection has been completed. The following requirements apply to all issued agricultural offset clearances:
   a. Within 30 days of installation of a well for which a permit has been issued pursuant to Chapter 8.40 of the County Code, or prior to final inspection, whichever is applicable, meter installation must be verified by the county public works department. The configuration of the installation shall conform to the water well metering standards and installation guidelines set forth by the department of public works and incorporated into the public improvement standards.
   b. Property owners or a person designated by the property owner must read the water meter and record the water usage on or near the first day of the month. These records must be maintained by the property owner and may be subject to inspection only by code enforcement pursuant to a violation investigation.

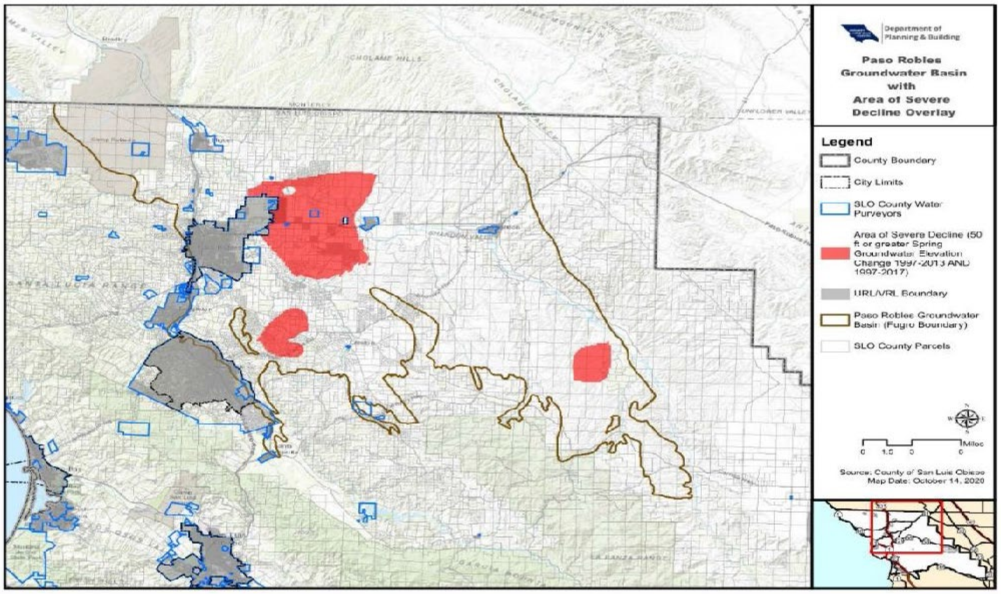


Figure 30-2

E. Eligible Sites for Participation. For the purpose of an agricultural offset clearance, a site is as defined in section 22.80.030 (Definitions of Land Use). Owners of sites that use water from the PRGWB (excluding the Atascadero Sub-basin) may be granted an agricultural offset clearance, as described below and referenced in Table 1:

1. On-site offset clearance means conversion of existing irrigated crop production on the same site. An expansion to the definition of a "site" under Section 22.80.030 may be granted where contiguous parcels are commonly owned or collectively operated.

Table 1 - Agricultural Offset Clearance Requirements

Agricultural Offset Clearance Requirements
• New crop production on site of crop being replaced • New crop production cannot exceed water demand of previous crop(s) • New crop production may exceed acreage of previous crop • Existing and proposed commodities of crop production must be declared • Recorded Disclosure Form • Site inspections • Well meter installation prior to final inspection

F. Application Contents. In addition to meeting the application contents of section 22.62.030 (Zoning Clearance), a request for an agricultural offset clearance shall include all of the following:

1. Vicinity of site(s) participating in the requested agricultural offset clearance, including all parcels currently under crop production, and adjacent parcels with same ownership.

2. Identification of specific locations and acreage of current crop type(s).

3. Identification of specific locations and acreage of proposed crop type(s). The applicant may indicate that they are voluntarily fallowing the land or not planting irrigated crops to receive conditional approval to submit a proposed planting plan at a later date. The conditional approval expires with the termination of this ordinance.

4. A current title report or lot book guarantee for all parcels participating in the requested agricultural offset clearance.

G. **Agricultural Offset Clearance Review and Approval.** The criteria of this subsection shall be used in determining if a site is eligible for participation in an agricultural offset clearance. An agricultural offset clearance may be granted only when the following criteria have been met:

1. Proposed sites included in the request for an agricultural offset clearance use water from the PRGWB (excluding the Atascadero Sub-basin).

2. Proposed sites will maintain an eligible use in compliance with the provisions of any existing Williamson Act contract for the property and County of San Luis Obispo Rules of Procedure to Implement the California Land Conservation Act of 1965.

3. Water demand shall be determined based on the crop type as follows:

   a. Crops shown in Table 2 and Table 3. Water demand for the proposed irrigated crop production is equal to or less than the crop production it is replacing, such that an offset at a 1:1 ratio is achieved. Water demand shall be derived from the crop-specific applied water figures as specified in Table 2 and Table 3 below.

   b. Crops not shown in Table 2 and Table 3. Water duty factors for existing and new irrigated crops that do not fall into one of the crop groups listed in Table 2 and Table 3 will be assigned a water duty factor by a joint committee of representatives from the department of planning and building, department of public works, and the department of agriculture/weights and measures, in consultation with UC Cooperative Extension.

   c. Supplementally Irrigated Dry Cropland. The following criteria shall be used to determine a water duty factor:

      (1) A minimum water duty factor of 0.1 AF/Ac/Yr will be granted upon validation of the use of supplemental irrigation of an

average of 0.1 AF/Ac/Yr over the five-year period preceding the application date. To qualify for a water duty factor of 0.1 AF/Ac/Yr, the applicant shall validate the practice of supplemental irrigation of dry cropland by providing aerial imagery showing planting and irrigation patterns and provide proof of the presence of infrastructure capable of supporting regular supplemental irrigation, and provide annual estimates of water usage with substantiating and verifiable water usage data including, but not limited to, monthly utility bills for irrigation wells during the irrigation period and pump test reports for each agricultural well for the 5 years preceding the application date.

(2) Applications claiming greater historic supplemental irrigation of dry cropland will be evaluated on a case-by-case basis for a water duty factor greater than 0.1 AF/Ac/Yr. This factor will be established based on the 5-year average water use for the 5 years preceding the application date. The applicant shall submit annual estimates of water usage with substantiating and verifiable water usage data including, but not limited to, monthly utility bills for irrigation wells during the irrigation period and pump test reports for each agricultural well. Based on review and confirmation of the submitted information and other sources of available information such as aerial imagery, dry cropland water duty factors will be assigned a water duty factor by a joint committee of representatives from the department of planning and building, department of public works, and the department of agriculture/weights and measures, in consultation with UC Cooperative Extension.

4. A disclosure notice has been recorded in the office of the county clerk recorder on all parcels associated with an agricultural offset clearance prior to any planting authorized under an Ag Offset Clearance.

5. Any plantings approved under an agricultural offset clearance will be completed prior to the termination of this ordinance.

Table 2 - Crop Group and Commodities Used for the Agricultural Demand Analysis

Crop Group	**Primary Commodities**
Alfalfa	Alfalfa
Nursery	Christmas trees, miscellaneous nursery plants, flowers
Pasture	Miscellaneous grasses, mixed pastures

Citrus	Avocados, grapefruits, lemons, oranges, olives, kiwis, pomegranates (non-deciduous)
Deciduous	Apples, apricots, berries, peaches, nectarines, plums, figs, pistachios, persimmons, pears, quinces
Strawberries	Strawberries
Vegetables	Artichokes, beans, miscellaneous vegetables, mushrooms, onions, peas, peppers, tomatoes
CBD Hemp	Field Grown CBD Hemp
Wine grapes	Wine grapes
Table grapes	Table grapes
Supplementally Irrigated Dry Cropland*	Barley, wheat, oat, grain/forage hay, safflower

Source: Table 3 of the Agricultural Water Offset Program, Paso Robles Groundwater Basin, October 2014.

*San Luis Obispo County General Plan Agriculture Element

Table 3 - Existing Crop-Specific Applied Water by Crop Type

Crop Group	**Applied Water (AF/Ac/Yr)**
Alfalfa	4.5
Citrus	2.3
Deciduous	3.5
Strawberries	2.3(1)
Nursery	2.5
Pasture	4.8
Vegetables	1.9
CBD Hemp	1.5(2)
Wine grapes	1.25(1)
Table grapes	3.0(4)
Supplementally Irrigated Dry Cropland	0.1(3)

1. Information obtained from RCD Program, UCCE, UC Davis (Strawberries 2011 data)
2. Information obtained from UCCE, San Luis Obispo County Cooperative Extension, April 2019
3. Supplementally irrigated dry cropland application requirements outlined per Section G.3.C above.

4. Information obtained from UCCE, San Luis Obispo County Cooperative Extension, April 2021.

Source: Table 9 of the Agricultural Water Offset Program, Paso Robles Groundwater Basin, October 2014.

H. Termination. The provisions of this section for the Paso Robles Groundwater Basin (excluding the Atascadero Sub-basin) shall expire on January 1, 2028, unless extended or sooner terminated.

SECTION VIII: That Section 22.30.205 of Title 22 of the San Luis Obispo County Code which was added by Ordinance 3483 be deleted in its entirety.

SECTION IX: That Section 22.30.310 of Title 22 of the San Luis Obispo County Code be amended as follows:

22.30.310 – Nursery Specialties

F. Establishment or Expansion of Nurseries ~~using Groundwater Wells within the Paso Basin Land Use Management Area~~ Overlying the Paso Robles Groundwater Basin, Excluding the Atascadero Sub-Basin. The establishment or expansion of any nursery use ~~using Groundwater Wells within the Paso Basin Land Use Management Area~~ overlying the Paso Robles Groundwater Basin (excluding the Atascadero Sub-basin) is subject to the standards set forth in section 22.30.~~205~~204.

SECTION X: That Section 22.62.030 of Title 22 of the San Luis Obispo County Code be amended as follows:

22.62.030 – Zoning Clearance

A. Zoning Clearance application.

1. Zoning Clearance content.

h. Additional information

(10) New or expanded irrigated crop production overlying the Paso Robles Groundwater Basin (excluding the Atascadero Sub-basin). As required by Section 22.30.204.

SECTION XI: That Section 22.80.030 of Title 22 of the San Luis Obispo

County Code be amended as follows:

Chapter 22.80.030 – Definitions of Land Uses, and Specialized Terms and Phrases

Agricultural Offset Clearance means a ministerial permit, equivalent to a Zoning Clearance, that may be granted pursuant to Section 22.30.204 (New or Expanded Crop Production Overlying the Paso Robles Groundwater Basin, Excluding the Atascadero Sub-Basin).

Crop Production. Encompasses the following overall crop types and activities (included in the Land Use Element under the definition of "Crop Production and Grazing"), and further defined as indicated:

New or Expanded Irrigated Crop Production means the development, new plantings, or other improvements that utilize ground water of a property for the purposes of farming irrigated crops as defined in Tables 2 and 3 of Section 22.030.204.

SECTION XII: If any section, subsection, clause, phrase or portion of this ordinance is for any reason held to be invalid or unconstitutional by the decision of a court of competent jurisdiction, such decision shall not affect the validity or constitutionality of the remaining portion of this ordinance. The Board of Supervisors hereby declares that it would have passed this ordinance and each section, subsection, clause, phrase or portion thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases or portions be declared invalid or unconstitutional.

SECTION XIII: This ordinance shall take effect and be in full force on and after 30 days from the date of its passage hereof. Before the expiration of 15 days after the adoption of this ordinance, a summary shall be published once in a newspaper of general circulation in the County of San Luis Obispo, State of California, together with the names of the members of the Board of Supervisors voting for and against the ordinance.

SECTION XIV: The Board of Supervisors hereby finds that the adoption of this ordinance is exempt from review under the California Environmental Quality Act (CEQA), pursuant to CEQA Guidelines Section 15061(b)(3), in that it can be seen with certainty that the adoption of the ordinance is not a project that may have a significant effect on the environment. This ordinance merely rescinds the provisions of Ordinance No. 3483 and restores the previous regulatory scheme governing new or expanded irrigated crop within the Paso Robles Groundwater Basin. Accordingly, this action would maintain the status quo. Further, the Environmental Impact Report that was prepared for Ordinance No. 3483 determined that there would be class I, significant and unavoidable environmental impacts, specifically with respect to additional pumping of water from the Paso Robles Groundwater Basin. Because this ordinance rescinds Ordinance No. 3483 and restores the previous regulatory framework around new or expanded irrigated agriculture within the Paso Robles Groundwater Basin, the Board further finds that this ordinance is exempt from CEQA per California Code of Regulations, title 14, Section 15307 and 15308 (actions to protect natural resources and the environment).

SECTION XV: In accordance with Government Code Section 25131, after reading the title of this Ordinance, further reading of the Ordinance in full is waived.

INTRODUCED at a regular meeting of the Board of Supervisors held on the 29th day of January, 2023, and PASSED and ADOPTED by the Board of Supervisors of the County of San Luis Obispo, State of California, on the 7th day of February, 2023, by the following roll call vote, to wit:

AYES: Supervisors Bruce S. Gibson, Dawn Ortiz-Legg and Jimmy Paulding

NOES: Supervisor Debbie Arnold and Chairperson John Peschong

ABSENT: None

ABSTAINING: None

John Peschong
Chairperson of the Board of Supervisors
of the County of San Luis Obispo
State of California

ATTEST:

WADE HORTON
Ex-Officio Clerk of the Board of Supervisors

By: Niki Martin
Deputy Clerk

[SEAL]

Approved as to Legal Form and Effect:

RITA L. NEAL
County Counsel

By: /s/ Benjamin Dore
Deputy County Counsel

Dated: January 25, 2023

APPENDIX I

Synoptic Streamflow Survey and SEP Stream Gage Data

Synoptic Streamflow Survey

April 2023 Paso Basin Synoptic Streamflow Survey - Summary

Huer Huero Creek

4/4/2023

Site	Discharge (cfs)	Gain/Loss
Middle Fork HWY 58 Bridge	14.761	
East Fork HWY 58 Bridge	2.14	
East Fork O'Donovan Rd slab	2.71275	gain
Middle Fork O'Donovan Rd Bridge	14.3885	slight loss
HWY 41 Bridge (main stem)	22.146375	gain [1]
West Fork HWY 41 Bridge	2.680875	
Creston Rd Bridge	16.81025	loss
Geneseo Rd Bridge	16.9775	no change
Linne Rd Bridge	16.5465	no change
d/s of Water Park	12.489375	loss

Shell Creek

4/3/2023

Site	Discharge (cfs)	Gain/Loss
HWY 58 Bridge	14.818875	
Sinton slab	13.37175	loss

NOTE: Shell Creek DRY just north of the Shell Creek Rd slab

San Juan Creek

4/3/2023

Site	Discharge (cfs)	Gain/Loss
slab crossing near Shell Creek confluence	82.9342	
Centre St Bridge	47.0645	loss

Estrella River

4/3/2023

Site	Discharge (cfs)	Gain/Loss
San Juan + Cholame	52.356	
HWY 41 Bridge	49.9105	loss
Grove Rd Bridge	42.736	loss [2]
Jardine Rd Bridge	57.31125	gain [3]
Airport Rd slab	59.03897727	gain

Notes:

[1] assume there was unmeasured contributing flow from La Panza Creek (along La Panza Rd)

[2] even despite potential unmeasured contribution from Shedd Canyon (Indian Creek)

[3] gains assumed to be due to upwelling of underflow at Whitley Gardens and unmeasured inflows from large contributing watersheds in the Gabilan Hills

Notes for Analysis tabs:

RL = River Left

RR = River Right

EOW = Edge of Water

Depth to water = depth from tape to the water surface

Total depth = depth from tape to river bed

water depth = depth of water column, or Total depth minus Depth to water

Discharge is calcuated using the mean section equation

Q = discharge

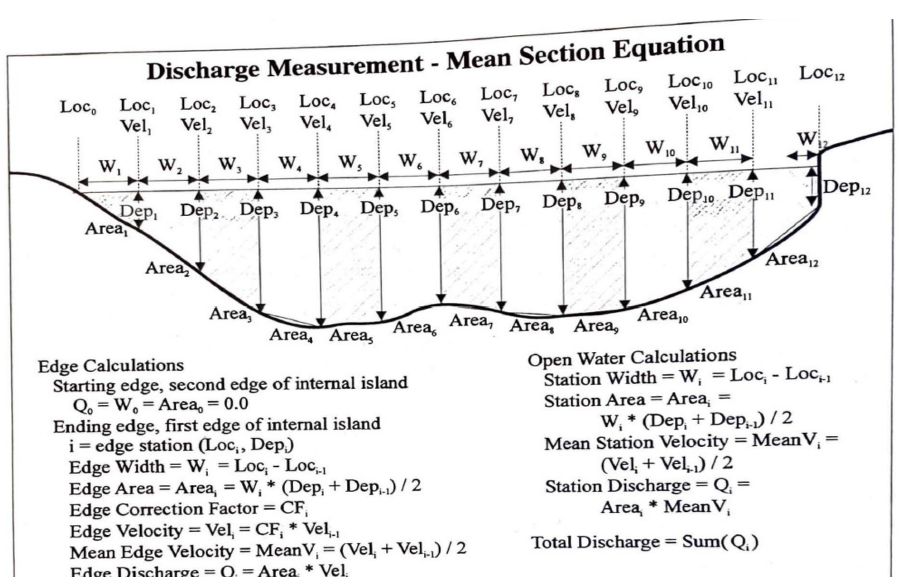
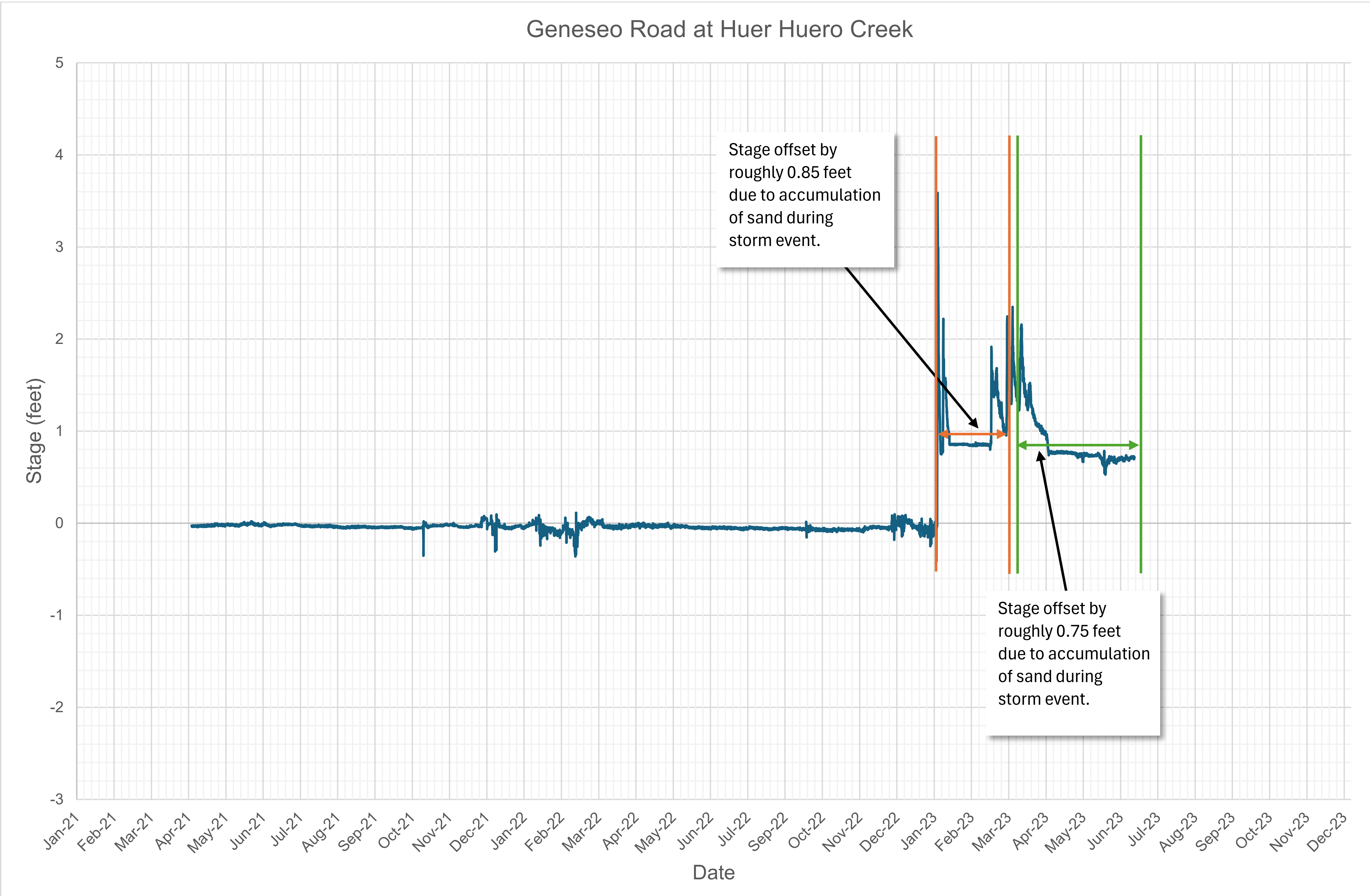


Figure 8 – Discharge Measurement - Mean Section Equation

Estrella River
Estrella Airport Rd slab
1.73 cfs
Estrella Jardine Rd bridge
14.57 cfs
Cholame Creek
Estrella Hwy 41 bridge
-2.45 cfs
Estrella River Grove Dr bridge
-7.17 cfs
San Juan Centre St bridge
Cholame Creek HWY 46 Bridge
Huer Huero Creek
Huer Huero ds water park
-4.06 cfs
Dry Creek
-35.87 cfs
San Juan slab
Huer Huero Linne Rd Bridge
0 cfs
0 cfs
Huer Huero Geneseo Rd bridge
Huer Huero West Fork HWY 41 Bridge
-8.01 cfs
Huer Huero Hwy 41 bridge
Huer Huero O'Donovan bridge
5.05 cfs
Huer Huero East Fork O'Donovan slab
-0.37 cfs
San Juan Creek
Shell Crk Sinton's slab
0.57 cfs
Huer Huero East Fork HWY 58 Bridge
Shell Crk Hwy 58 bridge
-1.45 cfs
Huer Huero Middle Fork HWY 58 Bridge
Salinas River
Shell Creek
Navajo Creek
Gaining and Losing Reach Key
Losing Big
Losing
Slight Loss
No Change
Gaining
Gaining Big
Yellow highlighted = amount of gain/loss

SEP Stream Gage Data


Geneseo Road at Huer Huero Creek
Stage (feet)
Date
Stage offset by roughly 0.85 feet due to accumulation of sand during storm event.
Stage offset by roughly 0.75 feet due to accumulation of sand during storm event.
5
4
3
2
1
0
-1
-2
-3
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
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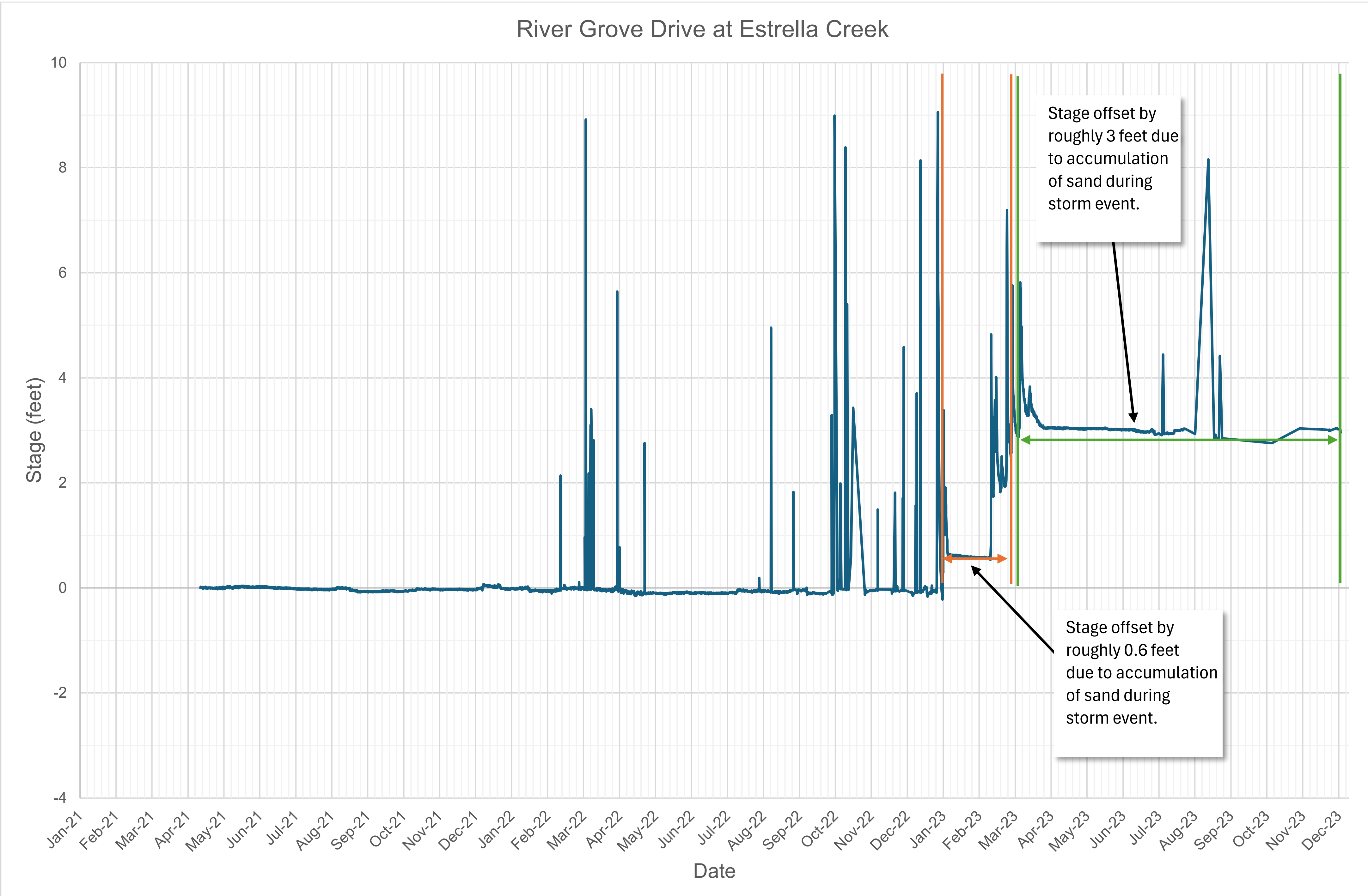
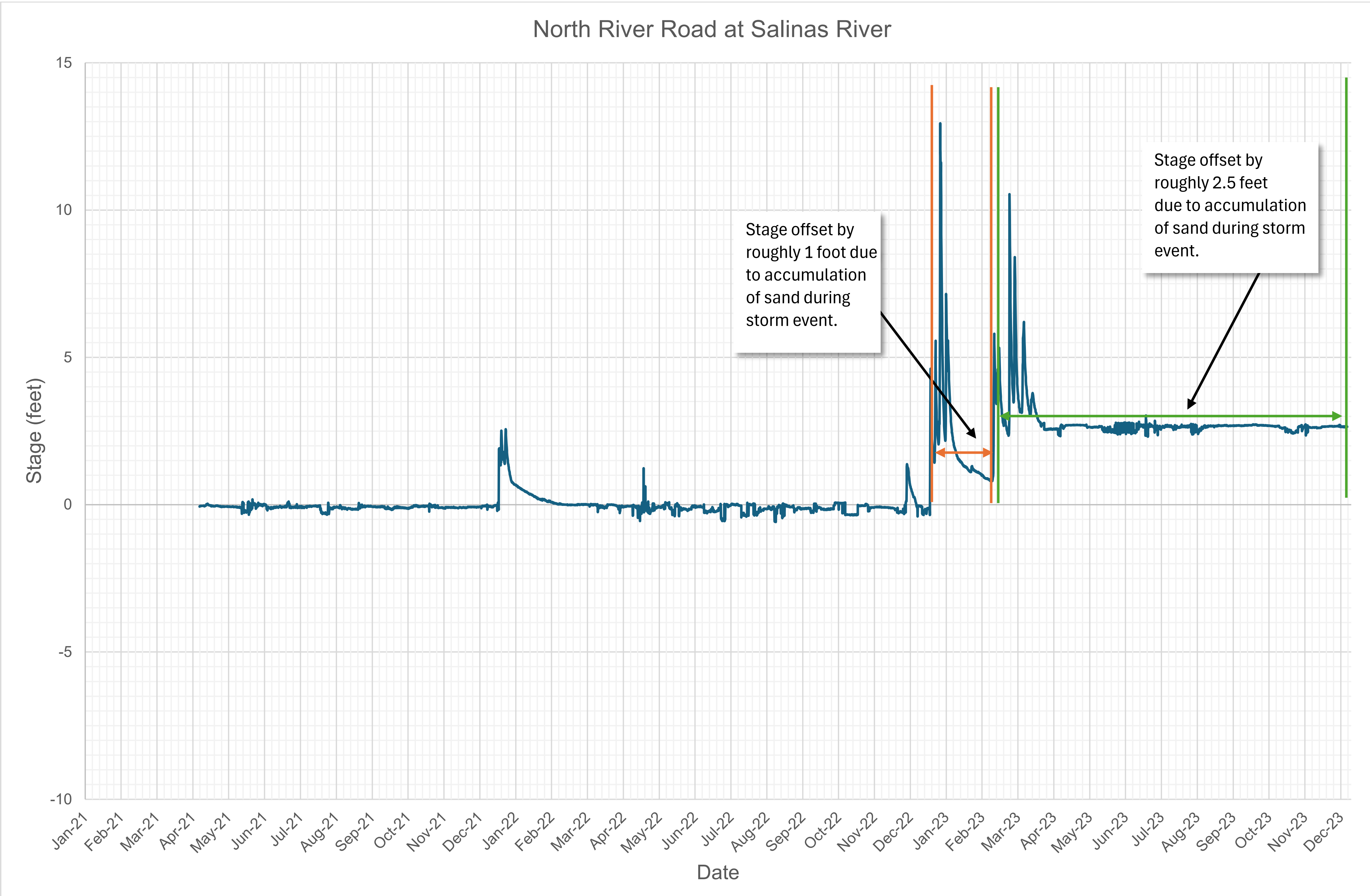
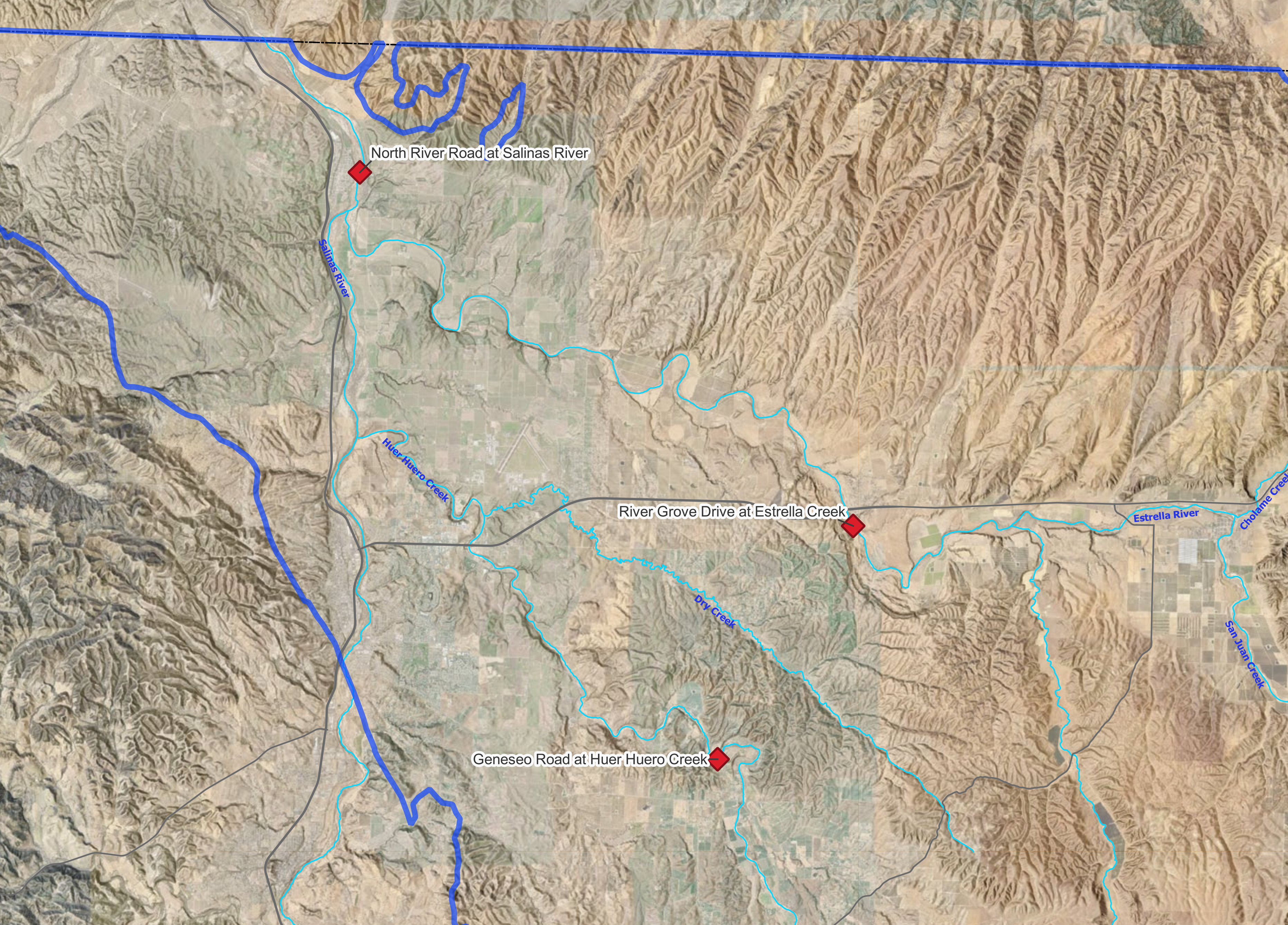
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23


River Grove Drive at Estrella Creek
Stage (feet)
Date
10
8
6
4
2
0
-2
-4
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
May-23
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Stage offset by roughly 3 feet due to accumulation of sand during storm event.
Stage offset by roughly 0.6 feet due to accumulation of sand during storm event.


North River Road at Salinas River
Stage (feet)
15
10
5
0
-5
-10
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
May-23
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Date
Stage offset by roughly 1 foot due to accumulation of sand during storm event.
Stage offset by roughly 2.5 feet due to accumulation of sand during storm event.


North River Road at Salinas River
Salinas River
Huer Huero Creek
River Grove Drive at Estrella Creek
Estrella River
Cholame Creek
Dry Creek
San Juan Creek
Geneseo Road at Huer Huero Creek

APPENDIX J
Flood Diversion Reports Submitted to the State

Flood Diversion Reporting Form: Executive Order N-4-23

Use this form to report information regarding [Executive Order N-4-23](#)
If you have questions, email FloodDiversion@waterboards.ca.gov

Please attach verification of information provided to email submittal, as necessary.

1 Please indicate initial or final report:

☑ Initial Report ☐ Final Report Date This Report was prepared: **4/7/23**

2 Diverter information:

Name:	Matthew Newhall
Email Address:	newhall@grapevinecap.com
Job Title:	Authorized Agent
Entity Name:	Kylix Vineyards California LP

3 Name of local entity (flood control agency, city or county) identifying risk of flooding downstream:

San Luis Obispo County; - City of Gonzalez

Identify the imminent risks triggering diversions under sub-paragraph b

Risk of flooding - City of Gonzalez

Where local entity provided public notice: Websites & press releases

4 Provide an estimate, as of the report's date, of the amount of flood flows diverted (in acre-feet) utilizing Executive Order N-4-23: 35.4

5 Date diversion commenced (begin): 3/22/23

Date diversion ceased (end): (For Preliminary: Leave blank)

6 **Please provide locations of all points of diversion (latitude /longitude), associated inundation areas (acres), and associated assessor parcel numbers (APNs).**

The Department of Water Resources maintains a Groundwater Recharge website with tutorials, webinars and a site for general questions. There is also an online application that can be used to help identify coordinates, APNs, acres, GSA information, and develop a map.

Please visit this link for more information:

https://data.cnra.ca.gov/dataset/california-groundwater-recharge-information

GPS Coordinates

	Latitude		Longitude
POD #1	35.59742	POD #1	-120.32394
POD #2	35.59577	POD #2	-120.32236
POD #3		POD #3	
POD #4		POD #4	
POD #5		POD #5	

*(*Please list additional PODs here as necessary).*

Please list APNs that could be/were inundated by the intentional flooding activity:

APN 037-291-039, APN 037-291-037

Please provide an estimate of the maximum area of inundation (acres): 76.51

7 **Attach map showing associated inundation areas.**

8 **You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin receiving recharge.**

Identify GSAs you will notify: Shandon-San Juan GSA

Date will notify: 4/7/23

(You may choose to provide GSAs notification as cc's on your submittal email)

Dairy Land Certification:

All diverters must answer this question

9 **Please certify that water diverted is not diverted to and not applied to:**

(please check ALL that apply)

- ☑ dairy land application areas;
- ☑ any agricultural field where pesticide or fertilizer application has occurred in the prior 30 days;
- ☑ any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns;
- ☑ any agricultural field where pesticide or fertilizer application has occurred in the prior 30 days; cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Instructions for submittal:

Save this report with title of Entity Name (abbreviation ok) and date prepared (e.g. MMWD_03252023)

Prepare an email addressed to: FloodDiversion@waterboards.ca.gov

Attach this excel file and your map to email and submit.

Reports received will be web posted here:

https://www.waterboards.ca.gov/waterrights/water_issues/programs/groundwater-recharge/

Flood Diversion Reporting Form: Executive Order N-4-23

Use this form to report information regarding Executive Order N-4-23
If you have questions, email FloodDiversion@waterboards.ca.gov

Please attach verification of information provided to email submittal, as necessary.

1 Please indicate initial or final report:

☐ Initial Report ☑ Final Report Date This Report was prepared: **4/17/23**

2 Diverter information:

Name:	Zachary Merkel
Email Address:	zmerkel@jlohr.com
Job Title:	Vineyard Manager
Entity Name:	J. Lohr Vineyards Inc.

3 Name of local entity (flood control agency, city or county) identifying risk of flooding downstream:

City of Gonzales

Identify the imminent risks triggering diversions under sub-paragraph b

Proclamation of Existence of Local Emergency with concern to flooding issued on March 13th, 2023.

Where local entity provided public notice: Website

4 Provide an estimate, as of the report's date, of the amount of flood flows diverted (in acre-feet) utilizing Executive Order N-4-23: 12

5 Date diversion commenced (begin): 4/1/23

Date diversion ceased (end): 4/15/23 (For Preliminary: Leave blank)

6 Please provide locations of all points of diversion (latitude /longitude), associated inundation areas (acres), and associated assessor parcel numbers (APNs).

The Department of Water Resources maintains a Groundwater Recharge website with tutorials, webinars and a site for general questions. There is also an online application that can be used to help identify coordinates, APNs, acres, GSA information, and develop a map.

Please visit this link for more information:

https://data.cnra.ca.gov/dataset/california-groundwater-recharge-information

GPS Coordinates

	Latitude		Longitude
POD #1	35.705832	POD #1	120.627632
POD #2		POD #2	
POD #3		POD #3	
POD #4		POD #4	
POD #5		POD #5	

*(*Please list additional PODs here as necessary).*

Please list APNs that could be/were inundated by the intentional flooding activity:

027-191-019

Please provide an estimate of the maximum area of inundation (acres): 245

7 Attach map showing associated inundation areas.

8 You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin receiving recharge.

Identify GSAs you will notify: County of San Luis Obispo

Date will notify: 4/14/23

(You may choose to provide GSAs notification as cc's on your submittal email)

Dairy Land Certification:

All diverters must answer this question

9 Please certify that water diverted is not diverted to and not applied to:

(please check ALL that apply)

- ☑ dairy land application areas;
- ☑ any agricultural field where pesticide or fertilizer application has occurred in the prior 30 days;
- ☑ any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns;
- ☑ any agricultural field where pesticide or fertilizer application has occurred in the prior 30 days; cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Instructions for submittal:

Save this report with title of Entity Name (abbreviation ok) and date prepared (e.g. MMWD_03252023)

Prepare an email addressed to: FloodDiversion@waterboards.ca.gov

Attach this excel file and your map to email and submit.

Reports received will be web posted here:

https://www.waterboards.ca.gov/waterrights/water_issues/programs/groundwater-recharge/

Appendix K

June 20, 2023, DWR Determination Letter with Attachments

CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

June 20, 2023

Blaine Reely
County of San Luis Obispo GSA - San Luis Obispo Valley
1055 Monterey Street, Suite D430
San Luis Obispo, CA 93408
805-781-4206
breely@co.slo.ca.us

RE: Approved Determination of the Revised Groundwater Sustainability Plan Submitted for the Salinas Valley – Paso Robles Area Subbasin

Dear Blaine Reely,

The Department of Water Resources (Department) has evaluated the revised groundwater sustainability plan (GSP) for the Salinas Valley - Paso Robles Area Subbasin in response to the Department's incomplete determination on January 21, 2022 and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Paso Robles Area Subbasin GSP has taken sufficient action to correct deficiencies identified by the department and satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the Paso Robles Area Subbasin GSP no later than January 30, 2025.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Determination of Approval of the Salinas Valley - Paso Robles Area Subbasin Groundwater Sustainability Plan (June 20, 2023)

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE SALINAS VALLEY – PASO ROBLES AREA SUBBASIN GROUNDWATER SUSTAINABILITY PLAN

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the basin covered by the Plan, and whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the Plan within two years of its submission. (Water Code § 10733.4.) If a Plan is determined to be Incomplete, the Department identifies deficiencies that preclude approval of the Plan and identifies corrective actions required to make the Plan compliant with SGMA and the GSP Regulations. The GSA has up to 180 days from the date the Department issues its assessment to make the necessary corrections and submit a revised Plan. (23 CCR § 355.2(e)(2)). This Statement of Findings explains the Department's decision regarding the revised June 2022 Plan submitted by the City of Paso Robles Groundwater Sustainability Agency, Paso Basin - County of San Luis Obispo Groundwater Sustainability Agency, San Miguel Community Services District Groundwater Sustainability Agency, Shandon - San Juan Groundwater Sustainability Agency (GSA(s) or Agencies) for the Salinas Valley – Paso Robles Area Subbasin (Basin No. 3-004.06).

Department management has discussed the Plan with staff and has reviewed the Department Staff Report, entitled Sustainable Groundwater Management Program Groundwater Sustainability Plan Assessment Staff Report, attached as Exhibit A, recommending approval of the GSP. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with staff's recommendation and all the recommended corrective actions. The Department therefore **APPROVES** the Plan and makes the following findings:

A. The initial Plan for the basin submitted by the GSA for the Department's evaluation satisfied the required conditions as outlined in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.), and Department Staff therefore evaluated the initial Plan.

B. On January 21, 2022, the Department issued a Staff Report and Statement of Findings determining the initial GSP submitted by the Agencies for the basin to be incomplete, because the GSP did not satisfy the requirements of SGMA, nor did it substantially comply with the GSP Regulations. At that time, the Department provided corrective actions in the Staff Report that were intended to address the deficiencies that precluded approval. Consistent with the GSP Regulations, the Department provided the Agencies with up to 180 days to address the deficiencies detailed in the Staff Report. On July 19, 2022, within 180 days of the Staff Report related to the Department's initial incomplete determination, the Agencies submitted a revised 2022 GSP to the Department for evaluation. When evaluating a revised GSP that was initially determined to be incomplete, the Department reviews the materials (e.g., revised or amended GSP) that were submitted within the 180-day deadline and does not review or rely on materials that were submitted to the Department by the GSA after the resubmission deadline. Part of the Department's review, focuses on how the Agency has addressed the previously identified deficiencies that precluded approval of the initially submitted Plan. The Department shall find a Plan previously determined to be incomplete to be inadequate if, after consultation with the State Water Resources Control Board, the Department determines that the Agency has not taken sufficient actions to correct the deficiencies previously identified by the Department. (23 CCR § 355.2(e)(3)(C).) The Department shall approve a Plan previously found to be incomplete if the Department determines the Agency has sufficiently addressed the deficiencies that precluded approval. The Department may evaluate other components of the Plan, particularly to assess whether revisions to address deficiencies may have affected other components of a Plan or its likelihood of achieving sustainable groundwater management and may offer recommended corrective actions to deal with any issues of concern.

C. The Department's Staff Report, dated January 21, 2022, identified the deficiencies that precluded approval of the initially submitted Plan. After thorough evaluation of the revised Plan, the Department makes the following findings regarding the sufficiency of the actions taken by the Agencies to correct those deficiencies:

    1. <u>Deficiency 1</u>: The corrective action advised the Agencies to address several aspects of the Plan's disclosure, discussion, and analyses of groundwater level sustainable management criteria and potential impacts to groundwater users and uses. The initially submitted GSP did not provide detailed information explaining or justifying groundwater level sustainable management criteria, specifically undesirable results and minimum thresholds and the impacts of these on beneficial uses and users of groundwater.

       The 2023 Staff Report associated with the revised 2022 Plan indicates that the Agencies have taken sufficient actions to correct this deficiency such that, at this time, although the Staff Report includes recommended corrective actions to further align this aspect of the Plan with the GSP Regulations, the Department finds Plan approval is not precluded, and further finds that the Agencies have the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

Deficiency 2: The corrective action advised the Agencies to address several aspects of the Plan's disclosure, discussion, and analyses of interconnected surface water sustainable management criteria and potential impacts to groundwater users and uses. The initially submitted GSP did not sufficiently demonstrate that depletions of interconnected surface water were present or not likely to occur in the Subbasin. As a result, the GSP did not establish sustainable management criteria for interconnected surface water.

The 2023 Staff Report indicates that the Agencies have taken sufficient actions to correct this deficiency such that, at this time, although the Staff Report includes recommended corrective actions to further align this aspect of the Plan with the GSP Regulations, the Department finds Plan approval is not precluded, that the Agencies have the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

D. The Plan satisfies the relevant conditions in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.):

1. The Plan was complete, meaning it generally appeared to include the information required by the Act and the GSP Regulations sufficient to warrant a thorough evaluation and issuance of an assessment by the Department. (23 CCR § 355.4(a)(2).)

2. The Plan, either on its own or in coordination with other Plans, appears to cover the entire Basin sufficient to warrant a thorough evaluation. (23 CCR § 355.4(a)(3).)

E. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2) "substantial compliance" with the GSP Regulations, (3) whether the Plan is likely to achieve the sustainability goal for the Basin within 20 years of the implementation of the Plan, and (4) whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) Application of these standards requires exercise of the Department's expertise, judgment, and discretion when making its determination of whether a Plan should be deemed "approved," "incomplete," or "inadequate."

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA's numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above, the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113), and the Legislature's express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.1(h).) The Department's final determination of a Plan's status is made based on the entirety of the Plan's contents on a case-by-case basis, considering and weighing factors relevant to the particular Plan and Basin under review.

F. In making these findings and Plan determination, the Department also recognized that: (1) it maintains continuing oversight and jurisdiction to ensure the Plan is adequately implemented; (2) the Legislature intended SGMA to be implemented over many years; (3) SGMA provides Plans 20 years of implementation to achieve the sustainability goal in a Subbasin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)

G. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with 23 CCR § 355.4, and appears likely to achieve the sustainability goal for the Subbasin.

   1. The sustainable management criteria and goal to maintain groundwater conditions at elevations that allow for reasonable operation flexibility are sufficiently justified and explained. The Plan relies on credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Subbasin

is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)

2. The Plan demonstrates a thorough understanding of where data gaps exist and demonstrates a commitment to eliminate those data gaps. The GSP establishes a monitoring network and data collection methods to fill data gaps related to adequately characterizing groundwater levels and identifying interconnected surface water bodies. Filling these known data gaps, and others described in the Plan, should lead to the refinement of the GSAs' monitoring networks, the Subbasin's GSP model, and sustainable management criteria and help inform and guide future adaptive management strategies (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed are designed to provide new water supplies, improve groundwater monitoring, and reduce groundwater use. The projects and management actions are reasonable and commensurate with the level of understanding of the Subbasin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Subbasin's sustainability goal and should provide the GSAs with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

4. The Plan provides a detailed explanation of how the various interests of groundwater uses and users in the Subbasin were considered in developing the sustainable management criteria and how those interests, including domestic wells, would be impacted by the chosen minimum thresholds. (23 CCR § 355.4(b)(4).)

5. The Plan's projects and management actions appear feasible at this time and appear likely to prevent undesirable results and ensure that the Subbasin is operated within its sustainable yield within 20 years. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are not implemented or appear unlikely to prevent undesirable results or achieve sustainability within SGMA timeframes. (23 CCR § 355.4(b)(5).)

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft, if present. (23 CCR § 355.4(b)(6).)

7. At this time, it does not appear that the Plan will adversely affect the ability of an adjacent basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. The Plan states that GSP implementation will be coordinated with the neighboring groundwater

sustainability agencies in the Salina Valley Basin and Atascadero Subbasin. The Plan includes an analysis of potential impacts to adjacent basins related to the established minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan. (23 CCR § 355.4(b)(7).)

8. If required, a satisfactory coordination agreement has been adopted by all relevant parties. (23 CCR § 355.4(b)(8).)

9. The GSAs' member agencies, the City of Paso Robles, County of San Luis Obispo, San Miguel Community Services District, and the Shandon-San Juan Water District have historically taken action to address problematic groundwater conditions in the Subbasin, such as offsetting water demand by regulating land use dependent on groundwater, monitoring and managing water quality, and preventing groundwater export from the Subbasin. The GSAs' member agencies and their history of groundwater management provide a reasonable level of confidence that the GSAs has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9).)

10. Through review of the Plan and consideration of public comments, the Department determines that the GSAs adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

H. In addition to the grounds listed above, DWR also finds that:

1. The Plan considers potential impacts on existing well users in establishing minimum thresholds for chronic lowering of groundwater levels that take into consideration the sustainable groundwater supply needed for the well users. Minimum thresholds were established through analyses of historical groundwater level data that allow reasonable operational flexibility while accounting for seasonal and anticipated climatic variations. The Plan's compliance with the requirements of SGMA and substantial compliance with the GSP Regulations supports the state policy regarding the human right to water (Water Code § 106.3). The Department developed its GSP Regulations consistent with and intending to further the policy through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring

substantial compliance with the GSP Regulations, the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (23 CCR § 350.4(g).)

2. The Plan acknowledges and identifies interconnected surface waters within the Subbasin. The GSAs proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve understanding and management of interconnected surface water. The GSAs acknowledge, and the Department agrees, data gaps related to interconnected surface water exist. The GSAs should continue filling data gaps, collecting additional monitoring data, and coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future updates to the Plan should aim to improve the initial sustainable management criteria as more information and improved methodology becomes available.

3. The California Environmental Quality Act (Public Resources Code § 21000 *et seq*.) does not apply to the Department's evaluation and assessment of the Plan.

Accordingly, the revised GSP submitted by the Agencies for the Salinas Valley – Paso Robles Area Subbasin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agencies address them by the time of the Department's first periodic review, which is set to begin on January 30, 2025, as required by Water Code § 10733.8. Failure to address the Department's Recommended Corrective Actions before future, subsequent plan evaluations, may lead to a Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth
Karla Nemeth, Director
Date: June 20, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Salinas Valley – Paso Robles Area Subbasin (June 20, 2023)

State of California
Department of Water Resources
Sustainable Groundwater Management Program
Groundwater Sustainability Plan Assessment
Staff Report

Groundwater Basin Name:	Salinas Valley - Paso Robles Area Subbasin (No. 3-004.06)
Submitting Agencies:	City of Paso Robles Groundwater Sustainability Agency; Paso Basin - County of San Luis Obispo Groundwater Sustainability Agency; San Miguel Community Services District Groundwater Sustainability Agency; Shandon - San Juan Groundwater Sustainability Agency
Submittal Type:	Revised Plan in Response to Incomplete Determination
Submittal Date:	July 20, 2022
Recommendation:	Approve
Date:	June 20, 2023

On July 20, 2022, the City of Paso Robles Groundwater Sustainability Agency (GSA), the Paso Basin - County of San Luis Obispo GSA, the San Miguel Community Services District GSA, and the Shandon - San Juan GSA (collectively, the GSAs or Agencies) submitted the revised Paso Robles Area Subbasin Groundwater Sustainability Plan – June 2022 (Paso Robles GSP, GSP, or Plan) for the Salinas Valley Groundwater Basin Paso Robles Area Subbasin (Paso Robles Subbasin or Subbasin) to the Department of Water Resources (Department) in response to the Department's incomplete determination on January 21, 2022,[1] for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)[2] and GSP Regulations.[3] After evaluation and assessment, Department staff conclude the GSAs have taken sufficient actions to correct deficiencies identified by the Department and recommend approval of the Plan; however, Department staff have recommended additional corrective actions, which staff recommend the GSAs address by the Plan's first periodic evaluation.

Overall, Department staff believe the Plan contains the required components of a GSP, demonstrates a thorough understanding of the Subbasin based on what appears to be the best available science and information, sets well explained, supported, and reasonable sustainable management criteria to prevent undesirable results as defined in the Plan, and proposes a set of projects and management actions that, if successfully

[1] Water Code § 10733.4(b); 23 CCR § 355.4(a)(4); https://sgma.water.ca.gov/portal/gsp/assessments/35.
[2] Water Code § 10720 *et seq*.
[3] 23 CCR § 350 *et seq*.

implemented, are likely to achieve the sustainability goal defined for the Subbasin.[4] Department staff will continue to monitor and evaluate the Subbasin's progress toward achieving the sustainability goal through annual reporting, periodic evaluations of the GSP, and GSP implementation.

This assessment includes six sections:

- **Section 1 – Summary**: Provides an overview of the Department Staff's assessment and recommendations.
- **Section 2 – Evaluation Criteria**: Describes the legislative requirements and the Department's evaluation criteria.
- **Section 3 – Required Conditions**: Describes the submission requirements of a response to an incomplete determination to be evaluated by the Department.
- **Section 4 – Deficiency Evaluation**: Provides an assessment of whether and how the contents included in the GSP submittal addressed the deficiencies identified by the Department in the initial incomplete determination.
- **Section 5 – Plan Evaluation:** Provides a detailed assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- **Section 6 – Staff Recommendation:** Includes the staff recommendation for the Plan and any recommended corrective actions.

[4] 23 CCR § 354.24.

1 SUMMARY

Department staff conclude the GSA took sufficient action to correct the deficiencies previously identified. Accordingly, Department staff recommend **approval** of the Groundwater Sustainability Plan for the Salinas Valley – Paso Robles Area Subbasin, along with recommended corrective actions described in this Staff Report which Department staff recommend be addressed by the next periodic evaluation to further improve Plan implementation and achievement of basin sustainability in accordance with SGMA timelines.

The GSAs have identified areas for improvement of its Plan (e.g., addressing data gaps, expanding monitoring networks, refining the groundwater model, developing the structure for area specific mandatory pumping limitations). Department staff concur those items are important and recommend the GSAs address them as soon as possible. Department staff have also identified additional recommended corrective actions that the GSAs should consider for the first periodic evaluation of the Plan (see Section 6). Addressing these recommended corrective actions will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal. The recommended corrective actions generally focus on the following:

(1) elaborating on the definition of undesirable results;

(2) re-evaluating the well impact analysis and filling related data gaps;

(3) considering mitigation strategies;

(4) further explaining connections with the Alluvial Aquifer, Estrella River, and San Juan Creek;

(5) continuing to fill data gaps, collect additional monitoring data, and coordinate with agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping;

(6) explaining the monitoring network for interconnected surface water;

(7) refining sustainable management criteria to include the Alluvial Aquifer; and

(8) reconciling Monitoring Network Module and the GSP monitoring network.

Addressing the recommended corrective actions identified in Section 6 of this Staff Report will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal.

2 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA[5] and is likely to achieve the basin's sustainability goal,[6] whether evaluating a basin's first Plan,[7] a Plan previously determined incomplete,[8] an amended Plan,[9] or a GSA's periodic evaluation to an approved Plan.[10] To achieve the sustainability goal, each version of the Plan must demonstrate that implementation will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.[11] The Department is also required to evaluate, on an ongoing basis, whether the Plan will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.[12]

The Plan evaluated in this Staff Report was previously determined to be incomplete. An incomplete Plan is one which Department staff identified one or more deficiencies that preclude its initial approval. Deficiencies may include a lack of supporting information that is sufficiently detailed or analyses that are sufficiently thorough and reasonable, or where Department staff determine it is unlikely the GSA(s) in the basin/subbasin could achieve the sustainability goal under the proposed Plan. After GSAs have been afforded up to 180 days to address the deficiencies and based on the GSAs' efforts, the Department can either approve[13] the Plan or determine the Plan inadequate.[14]

The Department's evaluation and assessment of a Plan previously determined to be incomplete, as presented in this Staff Report, continues to follow Article 6 of the GSP Regulations[15] to determine whether the Plan, with revisions or additions prepared by the GSA, complies with SGMA and substantially complies with the GSP Regulations.[16] As stated in the GSP Regulations, "substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal."[17]

[5] Water Code §§ 10727.2, 10727.4, 10727.6.
[6] Water Code § 10733; 23 CCR § 354.24.
[7] Water Code § 10720.7.
[8] 23 CCR § 355.2(e)(2).
[9] 23 CCR § 355.10.
[10] 23 CCR § 355.6.
[11] Water Code § 10721(v).
[12] Water Code § 10733(c).
[13] 23 CCR §§ 355.2(e)(1).
[14] 23 CCR §§ 355.2(e)(3).
[15] 23 CCR § 355 *et seq*.
[16] 23 CCR § 350 *et seq*.
[17] 23 CCR § 355.4(b).

When reviewing a Plan that has previously been determined to be incomplete, Department staff primarily assess whether the GSA(s) have taken sufficient actions to correct any deficiencies identified by the Department.[18] A Plan approval does not signify that Department staff, were they to exercise the professional judgment required to develop a Plan for the basin, would make the same assumptions and interpretations as those contained in the revised Plan, but simply that Department staff have determined that the modified assumptions and interpretations relied upon by the submitting GSA(s) are supported by adequate, credible evidence, and are scientifically reasonable. The reassessment of a Plan previously determined to be incomplete may involve the review of new information presented by the GSA(s), including models and assumptions, and a reevaluation of that information based on scientific reasonableness. In conducting its reassessment, Department staff does not recalculate or reevaluate technical information or perform its own geologic or engineering analysis of that information.

The recommendation to approve a Plan previously determined to be incomplete is based on a determination that the GSA(s) have taken sufficient actions (e.g., amended or revised the Plan) to correct the deficiencies previously identified by the Department that precluded earlier approval.

3 Required Conditions

For a Plan that the Department determined to be incomplete, the Department identifies corrective actions to address those deficiencies that preclude approval of the Plan as initially submitted. The GSAs in a basin, whether developing a single GSP covering the basin or multiple GSPs, must attempt to sufficiently address those corrective actions within the time provided, not to exceed 180 days, for the Plan to be evaluated by the Department.

3.1 Incomplete Resubmittal

GSP Regulations specify that the Department shall evaluate a revised GSP in which the GSAs have taken corrective actions within 180 days from the date the Department issued an incomplete determination to address deficiencies.[19]

The Department issued the incomplete determination on January 21, 2022. The GSAs submitted a revised GSP on July 19, 2022, in compliance with the 180-day deadline.

[18] 23 CCR §§ 355.2(e)(3)(C).
[19] 23 CCR § 355.4(a)(4).

4 DEFICIENCY EVALUATION

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.

In its initial incomplete determination, the Department identified two deficiencies in the Plan related to chronic lowering of groundwater levels and interconnected surface water, which precluded the Plan's approval in January 2022.[20] The GSAs were given 180 days to take corrective actions to remedy the identified deficiencies. Consistent with the GSP Regulations, Department staff are providing a reevaluation of the resubmitted Plan to determine if the GSAs have taken sufficient actions to correct the deficiencies.

This section describes the corrective actions recommended by the Department related to each deficiency, followed by Department staff's evaluation on the actions taken by the GSAs to address the deficiency.

4.1 DEFICIENCY 1. THE GSP LACKS JUSTIFICATION FOR, AND EFFECTS ASSOCIATED WITH, THE SUSTAINABLE MANAGEMENT CRITERIA FOR GROUNDWATER LEVELS.

4.1.1 Corrective Action

To address Deficiency 1—as identified in the January 21, 2022, Incomplete Determination—staff stated "the GSAs must provide more detailed explanation and justification regarding the selection of the sustainable management criteria for groundwater levels, particularly the undesirable results and minimum thresholds, and the effects of those criteria on the interests of beneficial uses and users of groundwater. Department staff recommend the GSAs consider and address the following:

1. The GSAs should describe the specific undesirable results they aim to avoid through implementing the Plan. If, for example, significant and unreasonable impacts to domestic wells of average depth are a primary management concern for the Subbasin, then the GSAs should sufficiently explain why that effect was selected and what they consider to be a significant and unreasonable level of impact for those average wells. In support of its explanation, the Paso Robles GSP should also clearly discuss and disclose the anticipated impact of operating the

[20] *Incomplete Determination of the 2020 Groundwater Sustainability Plans Submitted for the Salinas Valley – Paso Robles Area Subbasin*, California Department of Water Resources, January 21, 2022. https://sgma.water.ca.gov/portal/gsp/assessments/35.

Subbasin at conditions protective against those effects on users of domestic wells with less-than-average depth and all other beneficial uses and users of groundwater in the Subbasin. The discussion should be supported using best available information such as using State or county information on well completion reports to analyze the locations and quantities of domestic wells and other types of well infrastructure that could be impacted by groundwater management when implementing the Plan.

2. The GSAs should either explain how the existing minimum threshold groundwater levels are consistent with avoiding undesirable results or they should establish minimum thresholds at the representative monitoring wells that account for the specific undesirable results the GSAs aim to avoid.

   Information from DWR's Household Water Supply Shortage Reporting System[21] indicates some domestic groundwater wells in the Subbasin have reported impacts from lowering of groundwater levels. If, after considering the deficiency described above, the GSAs retain minimum thresholds that allow for continued lowering of groundwater levels, then it is reasonable to assume that additional wells may be impacted during implementation of the Plan. While SGMA does not require all impacts to groundwater uses and users be mitigated, the GSAs should consider including mitigation strategies describing how drinking water impacts that may occur due to continued overdraft during the period between the start of Plan implementation and achievement of the Subbasin's sustainability goal will be addressed. If mitigation strategies are not included, the Paso Robles GSP should contain a thorough discussion, with supporting facts and rationale, explaining how and why the GSAs determined not to include specific actions or programs to monitor and mitigate drinking water impacts from continued groundwater lowering below 2015 levels.

Information is available to the GSAs to support their explanation and justification for the criteria established in their Plan. For example, the Department's well completion report dataset,[22] or other similar data, can be used to estimate the number and kinds of wells expected to be impacted at the proposed minimum thresholds. Additionally, public water system well locations and water quality data can currently be obtained using the State Water Board's Geotracker website.[23] Administrative contact information for public water systems, and well locations and contacts for state small water systems and domestic wells, can be obtained by contacting the State Water Board's Needs Analysis staff. The

[21] Department of Water Resources, *California Household Water Shortage Data* [website], https://mydrywatersupply.water.ca.gov/report/publicpage, (accessed 21 May 2021).
[22] Department of Water Resources, *Well Completion Reports* [website], https://water.ca.gov/Programs/Groundwater-Management/Wells/Well-Completion-Reports, (accessed 21 May 2021).
[23] State Water Resources Control Board, *GeoTracker* [website], https://geotracker.waterboards.ca.gov/, (accessed 21 May 2021).

State Water Board is currently developing a database to allow for more streamlined access to this data in the future.

Based on the above information and other local information, and by the first periodic evaluation, the GSAs should continue to better define the location of active wells in the Subbasin. The GSAs should document known impacts to drinking water users caused by groundwater management, should they occur, in annual reports and subsequent periodic [evaluations]."[24]

4.1.2 Evaluation

The preceding GSP for the Paso Robles Area Subbasin, submitted in 2020 to the Department, defined "significant and unreasonable groundwater levels in the Subbasin" as those that:

1. Impact the ability of existing domestic wells of average depth to produce adequate water for domestic purposes.
2. Cause significant financial burden to those who rely on the groundwater basin.
3. Interfere with other SGMA sustainability indicators.[25]

The description was not supported with additional detail describing, for example, what is defined as "average depth" or "adequate water". Similarly in the 2020 submission of the GSP, minimum thresholds descriptions were insufficiently detailed and largely qualitative in explaining effects to beneficial users such as domestic wells. For example, in selecting minimum thresholds, the GSP had stated that the "groundwater elevation minimum thresholds for each monitoring well were set to an elevation 30 feet below the measurable objective" without sufficient detail discussing how selected thresholds are consistent with avoiding undesirable results.

To address the identified deficiency, the GSAs have supplemented portions of the Plan related to the sustainable management criteria for chronic lowering of groundwater levels. Specifically, descriptions supporting the undesirable result and minimum threshold definitions have been further detailed and/or revised, and an evaluation of existing well records (as of 2021) is incorporated to describe effects on beneficial uses and users of groundwater from management criteria.

4.1.2.1 Undesirable Results for Chronic Lowering of Groundwater Levels

In the revised Plan, the GSAs modified the 2020 GSP's definition of significant and unreasonable effects from chronic lowering of groundwater to include evaluations of all wells with known total depth information, and by no longer evaluating financial burdens[26]

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[24] *Incomplete Determination of the 2020 Groundwater Sustainability Plans Submitted for the Salinas Valley – Paso Robles Area Subbasin*, California Department of Water Resources, January 21, 2022. https://sgma.water.ca.gov/portal/gsp/assessments/35.

[25] 2022 Redlined Paso Robles GSP, Table 7-4, pp. 219-222.

[26] Note: The GSP states that the issue is more appropriately addressed as part of the projects and management actions and implementation plan; staff do not see changes made to those sections of the GSP.

to establish management criteria. The Plan added specificity in defining significant and unreasonable effects from groundwater levels as:

1. A significant number (defined by GSAs as 10 percent[27]) of all wells going dry (defined as when the total depth of the well is unsaturated[28]) throughout the Subbasin
2. Chronic groundwater level declines that interfere with other SGMA sustainability indicators.

In updating the definition of significant and unreasonable effects, as required by the corrective action, the GSAs no longer use average well depth which eliminates the vague aspect of the original definition. Overall, the GSAs have sufficiently explained how significant and unreasonable impacts were identified. The analysis of management criteria effects on wells is conducted using available well construction information from the Departments Online System of Well Completion Reports, Paso Robles Subbasin Data Management System, and information from model development. While these datasets include substantial information, the Plan states there are limitations such as absence of information on pumping equipment, limited screen interval information, and potential inclusion of older (typically shallower) wells that have since been replaced or destroyed. Therefore, due to the incompleteness of available well construction information, the GSP established management criteria in terms of a well "going dry" which means the entire length to the bottom of the well is unsaturated.[29]

The Plan explains there is a range of increasingly severe conditions that may affect wells (e.g., groundwater level declines that may be resolved by lowering the pump, declines that drop below the top of the well screen, declines that leave the entire well depth unsaturated, and reduced capacity of a well causing it to not meet the intended water supply purpose). The Plan also emphasizes that a "reasonable expectation exists for well owners to construct, maintain, and operate a well to provide expected yield" and so the range of potential impacts of groundwater decline on wells includes effects that "are noticed and reasonably handled by the well owner".[30] Though not plainly stated in the revised GSP, this approach effectively shifts financial burden due to declining groundwater levels from the realm of consideration of GSAs, to the responsibility of the well owner; as evident in the updated definition of significant and unreasonable effects.

The GSP describes the specific level of impact they consider significant and unreasonable (i.e., 10 percent of all wells of all wells in the Subbasin going dry); however, the GSP does not explain how the 10 percent value was selected. As discussed below (section 4.1.2.2), minimum thresholds are established at elevations 30 feet below 2017 levels and are calculated to cause only 3.9 percent of all analyzed wells in the Subbasin

[27] Represented by wells of known location and construction information, and wells that did not already go dry prior to 2017. 2020 Redlined Paso Robles GSP, pp. 270-271.
[28] 2022 Redlined Paso Robles GSP, Section 8.4.2, p. 268.
[29] 2022 Redlined Paso Robles GSP, Section 8.4.2.1, p. 268.
[30] 2022 Redlined Paso Robles GSP, Section 8.4.2.3, pp. 269-270.

to go dry when all minimum thresholds are encountered. The GSP explains generally that the process for establishing sustainable management criteria included public input received in public surveys, public meetings, and comment forms.[31] Initial minimum thresholds were presented at public meetings where they received additional public input before being finalized. While not precluding approval, Department staff recommend the GSAs explain why 10 percent was selected in the upcoming periodic evaluation (see Recommended Corrective Action 1).

4.1.2.2 Minimum Thresholds for Chronic Lowering of Groundwater Levels

To explain how the minimum thresholds for groundwater levels are consistent with avoiding undesirable results, in the revised Plan, the GSAs have supplemented the discussion to include a well impact analysis of the originally established minimum thresholds on wells with known well construction information.

The analysis conducted to track all wells that would go dry when groundwater levels are at minimum thresholds simultaneously throughout the Subbasin, utilizes 1,593 wells with total depth information[32] to represent "5,164 wells documented in the Subbasin, most [of which] are domestic wells." [33] The revised GSP details the sources of the datasets used to conduct the analysis and the limitations of the dataset (e.g., lack of total well depth) which resulted in the use of the subset of wells.[34] The analysis grouped the 1,593 wells to the nearest of 22 representative monitoring sites (RMS) and evaluated the effect of groundwater elevations reaching minimum thresholds at RMS in terms of the well going dry (i.e., the entire length of the well depth is unsaturated). As discussed in Section 4.1.2.1 of this Staff Report, the analysis focused on dewatering of the entire well depth instead of the increasingly severe potential effects on wells prior to "going dry" due to the unavailability of complete well construction information. Based on available data, the analysis indicates 62 (or 3.9 percent)[35] wells would go dry if minimum thresholds were reached simultaneously at all RMS throughout the Subbasin. The GSP notes that the undesirable result quantitative criteria include geographic and temporal components that prevent all monitoring sites reaching minimum thresholds simultaneously in the entire Subbasin.[36]

Department staff believe the GSA has taken meaningful steps to identify and describe the impacts at this time; however, there is a data gap in the analysis which the GSAs need to fill. There is concern that the wells not included in the analysis could go dry and cause significant and unreasonable effects in the Subbasin as defined by the GSAs. For this reason, by the next periodic evaluation (due in January 2025), staff recommend the GSAs pursue activities so that limitations of accurate and complete well construction information are overcome, and further refine the GSP's criteria, assumptions, analysis, and objectives

[31] 2020 Redlined Paso Robles GSP, Section 8.3, p. 266.
[32] 2022 Redlined Paso Robles GSP, Section 8.4.4.1.1, p. 278.
[33] 2022 Redlined Paso Robles GSP, Section 3.5, p. 62.
[34] 2022 Redlined Paso Robles GSP, Section 8.4.4.1.1, pp. 278-279.
[35] Note: Percent of wells dry at minimum thresholds are not dry at average 2017 levels.
[36] 2022 Redlined Paso Robles GSP, Section 8.4.6.1, p. 291.

in defining significant and unreasonable effects based on best available information (Recommended Corrective Action 2).

A component of the corrective action stated "SGMA does not require all impacts to groundwater uses and users be mitigated, the GSAs should consider including mitigation strategies describing how drinking water impacts that may occur due to continued overdraft during the period between the start of Plan implementation and achievement of the Subbasin's sustainability goal will be addressed. If mitigation strategies are not included, the Paso Robles GSP should contain a thorough discussion, with supporting facts and rationale, explaining how and why the GSAs determined not to include specific actions or programs to monitor and mitigate drinking water impacts from continued groundwater lowering below 2015 levels." The revised GSP does not include mitigation strategies and does not explicitly provide a discussion, with supporting facts and rationale, explaining how and why the GSAs determined not to include specific actions or programs to monitor and potentially mitigate drinking water impacts from continued groundwater lowering below 2015 levels as indicated by the corrective action. The revised GSP maintains the same, unchanged, discussion stating that three public meetings were held to discuss minimum thresholds and measurable objectives and claims to have received public input.[37] The GSP provides the general assumption that the "[r]esponsibility for wells in a SGMA managed groundwater basin is shared between GSAs that manage groundwater levels to protect against significant and unreasonable conditions and well owners who have responsibility for their respective wells," and the states it is "reasonable expectation exists that a well owner would construct, maintain, and operate the well to provide its expected yield over the well's life span, including droughts, and with some anticipation that neighbors also might construct wells (consistent with land use and well permitting policies)."[38]

While this does not preclude approval of the Plan at this time, Department staff believe the GSA should respond to this component of the corrective action by the next periodic evaluation. The GSA may wish to review the Department's April 2023 guidance document titled *Considerations for Identifying and Addressing Drinking Water Well Impacts* guidance to assist its adaptive management efforts.[39] (See Recommended Corrective Action 3)

4.1.3 Conclusion

Overall, Department staff believe the GSAs have taken significant action to address deficiencies identified. Staff conclude that the sustainable management criteria for groundwater levels is commensurate with the understanding of current conditions, responsive to interested party feedback. The Plan provides a credible and sufficient assessment of the effects the minimum thresholds would have on all wells—including domestic wells—by evaluating wells with known construction information and the established minimum thresholds at monitoring sites. However, as highlighted in the

[37] 2022 Redlined Paso Robles GSP, Section 8.3, p. 266.
[38] 2022 Redlined Paso Robles GSP, Section 8.4.2.2, p. 269.
[39] https://water.ca.gov/Programs/Groundwater-Management/Drinking-Water-Well

recommended corrective actions, the GSP should include additional supporting technical details and clarifications by the next periodic evaluation.

4.2 Deficiency 2. The GSP does not develop sustainable management criteria for the depletions of interconnected surface water based on best available information and science

4.2.1 Corrective Action

To address Deficiency 2—as identified in the 2020 Incomplete Determination—staff stated "the GSAs must provide more detailed information, as required in the GSP Regulations, regarding interconnected surface waters and depletions associated with groundwater use. Department staff provided the following corrective actions for the GSAs to consider and address:

1. Clarify and address the currently conflicting information in the Paso Robles GSP regarding what is known, qualified by the level of associated uncertainty, about the existence of interconnected surface water and, if applicable, the depletion of that interconnected surface water by groundwater use, including quantities, timing, and locations.[40]
2. If the GSAs cannot provide a sufficient, evidence-based justification for the absence of interconnected surface water, then they should develop sustainable management criteria, as required in the GSP Regulations,[41] based on best available information and science. Evaluate and disclose, sufficiently and thoroughly, the potential effects of the Plan's sustainable management criteria for depletion of interconnected surface water on beneficial uses of the interconnected surface water and on groundwater uses and users."

4.2.2 Evaluation

The preceding GSP for the Paso Robles Area Subbasin, submitted in 2020 to the Department, asserted that there was "no available data that establish whether or not the groundwater and surface water are connected" in the Subbasin.[42] Therefore, the 2020 Plan did not develop sustainable management criteria for the depletion of interconnected surface water citing "…insufficient data to determine if there is an interconnection between surface water and groundwater in the Subbasin at this time."[43] However, Department staff found the GSP to present conflicting information on the presence of interconnected surface water in the Subbasin. The conflicting Information undermines any argument that undesirable results related to depletions of interconnected surface water are not present and are not likely to occur in the Subbasin. The GSA needed to either develop persuasive evidence showing that interconnected surface waters are

[40] 23 CCR §§ 354.28(c)(6)(A), 354.28(c)(6)(B).
[41] 23 CCR §§ 354.26, 354.28, 354.30.
[42] 2022 Redlined Paso Robles GSP, Section 5.5, p. 149.
[43] 2022 Redlined Paso Robles GSP, Section 8.9.3, p. 317.

absent or develop sustainable management criteria in response to the incomplete determination.

To address Deficiency 2 identified in the Plan, the GSAs have modified portions of the Plan related to the interconnected surface water aspects of the basin setting, sustainable management criteria, and monitoring network.

4.2.2.1 Basin Setting Related to Interconnected Surface Water

The revised Plan has updated the Basin Setting to clarify the existence of interconnected surface water within the Subbasin. The GSAs have re-investigated interconnected surface and groundwater using the National Hydrology Dataset (NHD), high-resolution aerial imagery, historical groundwater levels, stream flow measurements, Natural Communities Commonly Associated with Groundwater (NCCAG), and information from modeling. The GSP explains that in the Paso Robles Subbasin, major streams all overlie alluvial deposits, and interconnection is with alluvial groundwater.[44] In some parts of the Subbasin—predominantly in the west near the Salinas River—extensive clay layers exist between the alluvium underlying the streams (i.e., the Alluvial Aquifer) and the deeper Paso Robles Formation Aquifer. These clays are noted to extend eastward to the community of Estrella along the Estrella River and the community of Creston along Huer Huero Creek. The hydrogeological conceptual model suggests that groundwater pumping, which predominantly occurs in the Paso Robles Formation, could potentially lower alluvial groundwater levels and deplete stream flows upstream of the clay layers but have only a negligible effect on alluvial water levels and stream flows overlying the clay layers.

Two categories of interconnection are described in the GSP: interconnection with surface water in streams and interconnection with the root zone of riparian vegetation (about 25 feet below ground surface).[45] Areas classified as interconnected for both categories are found along the Salinas River, the Estrella River, and San Juan Creek.[46] Specifically, the GSP states that the Salinas River surface water is interconnected with the Alluvial Aquifer; with no evidence of connection to the Paso Robles Formation Aquifer.[47] Sufficient evidence exists that there could potentially be a surface water connection between Estrella River and San Juan Creek to the underlying Paso Robles Formation Aquifer.[48] A potential connection to the vegetation zone is also identified along segments of the Salinas River (Paso Robles to the Subbasin boundary below San Miguel), Estrella River (Jardine Road up to Shedd Canyon), and San Juan Creek (upstream of Spring Creek).[49]

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[44] 2020 Redlined Paso Robles GSP, Section 5.5, pp. 149-151.
[45] 2022 Redlined Paso Robles GSP, Section 5.5.5, p. 162.
[46] 2022 Redlined Paso Robles GSP, Figure 5-18, p. 164.
[47] 2022 Redlined Paso Robles GSP, Section 5.5.5, p. 162 and Section 7.10, p. 254.
[48] 2022 Redlined Paso Robles GSP, Section 5.5.5, p. 162.
[49] 2022 Redlined Paso Robles GSP, Section 5.5.5, p. 163 and Section 8.9.7.2, p. 321.

The GSP provides a map, Figure 1 below, depicting locations of interconnection between groundwater and surface water.[50]

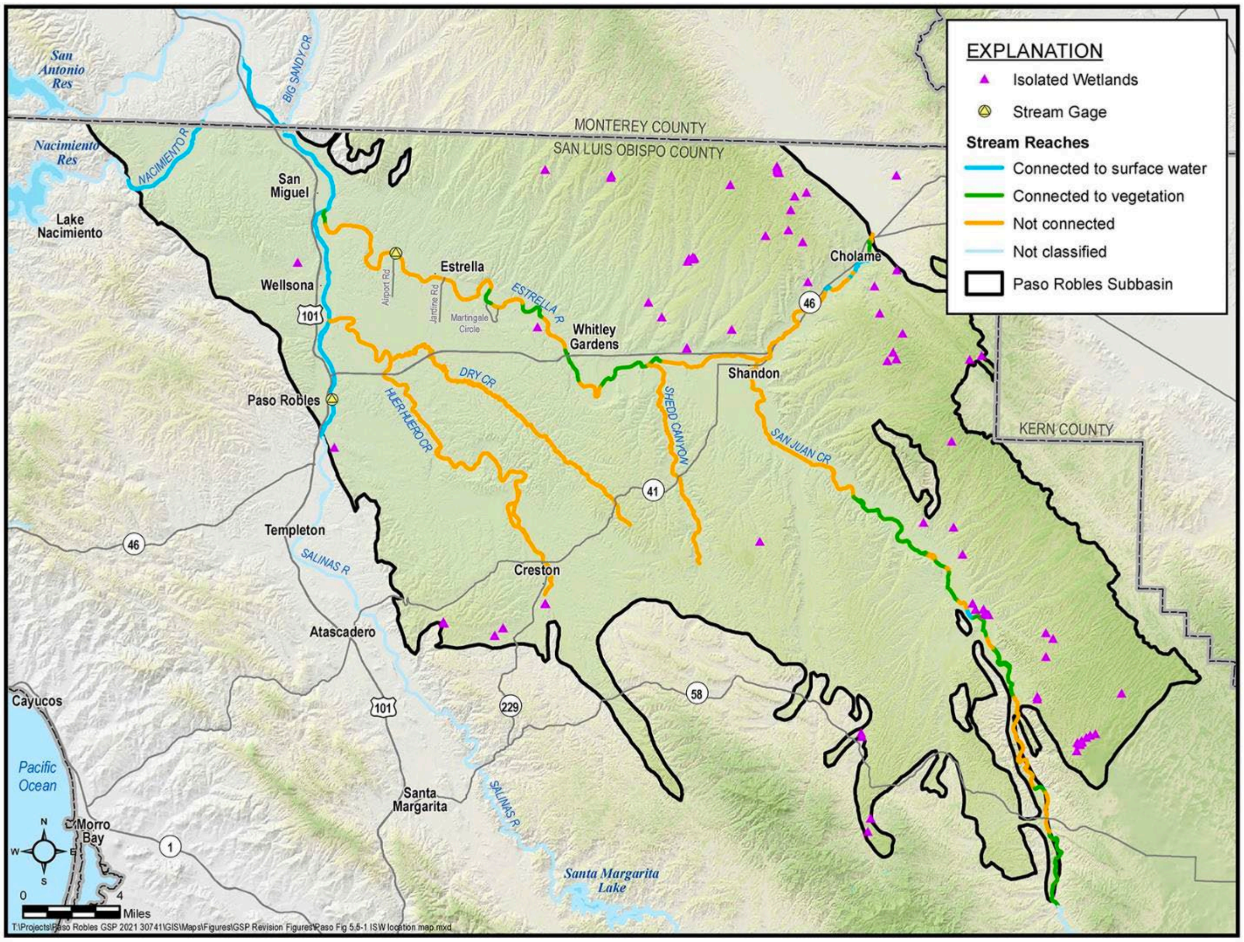

Figure 1: Locations of interconnection between groundwater and surface water.

Staff consider the revised Plan to be generally improved but still missing information that should be included to improve clarity and completeness in addressing the GSP Regulations and facilitate staff evaluations of GSP and subsequent periodic evaluations. The Plan notes that pumping from the Alluvial Aquifer is “rare”, generally occurs to meet domestic and limited livestock water demands, and large-scale irrigation pumping does not typically occur.[51] However, the GSP also states that the agricultural water use sector—which is the largest by volume[52] with production wells located along the Salinas and Estrella Rivers[53]—also pumps from the Alluvial Aquifer[54] without quantifying that volume. The GSP should provide specific volumetric quantities of estimated pumping that

[50] 2022 Redlined Paso Robles GSP, Table 5-18, p. 164.
[51] 2022 Redlined Paso Robles GSP, Section 5.5, p. 150.
[52] 2022 Redlined Paso Robles GSP, Table 6-10, p. 199.
[53] 2022 Redlined Paso Robles GSP, Figure 3-8, p.64.
[54] 2022 Redlined Paso Robles GSP, Section 4.5, p. 114.

occurs from the Alluvial Aquifer to detail the comparison of pumping from the Subbasin's two principal aquifers. Staff require this supporting information to assess whether the establishment of management criteria, which relies heavily on the claim that most groundwater pumping is from the Paso Robles Formation Aquifer, is a reasonable assumption. Additionally, while the GSP states analysis from *Methodology for Identifying Groundwater Dependent Ecosystems* indicates that groundwater pumping from the Paso Robles Formation Aquifer does not materially impact relevant groundwater dependent animals in Salinas River flows, the GSP does not discuss potential impacts of pumping from the Alluvial Aquifer on southern steelhead which migrate up and down the Salinas River in winter and spring. Department staff recommend the GSAs provide clear explanation of the usage of the Alluvial Aquifer and provide specific volumetric quantities of estimated pumping that occurs from the Alluvial Aquifer to detail the comparison of pumping from the Subbasin's two principal aquifers. (see Recommend Corrective Action 4a).

Lastly, the potential connection between Estrella River and San Juan Creek and the underlying Paso Robles Formation Aquifer should, as the GSP states, be further investigated. Department staff believe this investigation should be further explained (i.e., scope, schedule, budget) and conducted by the periodic evaluation to confirm this potential connection.[55] (Recommend Corrective Action 4b).

4.2.2.2 Sustainable Management Criteria for Depletions of Interconnected Surface Water

In the revised Plan, initial sustainable management criteria are developed based on the updated information in the basin setting which classified areas of interconnection with the alluvial water table along the Salinas River, the Estrella River, and San Juan Creek.[56] While the GSP does not quantify the rate or volume of depletions of interconnected surface water due to groundwater pumping, the GSP proposes initial sustainable management criteria using shallow near stream groundwater levels (measured at Alluvial Aquifer RMS wells) as a proxy for the rate and volume of depletions. The Plan acknowledges that currently, there are too few Alluvial Aquifer monitoring wells along the Estrella River and San Juan Creek and the GSAs plan to install new monitoring wells during the first five years of implementation (see Section 4.2.2.3).[57] Therefore, initially only the Salinas River and the interconnected Alluvial Aquifer will be evaluated.

Potential effects of depletion are described in the GSP as reduction in Salinas River outflow that decreases groundwater recharge in the Salinas Valley, reduction in passage opportunity for steelhead trout, and reduction in the extent, density, and health of riparian vegetation and animal species that use riparian habitat. Accordingly, the Plan defines significant and unreasonable effects of depletions of interconnected surface water in

[55] 2022 Redlined Paso Robles GSP, Section 5.5.1, p. 152 and Section 7.10, p. 254.
[56] 2022 Redlined Paso Robles GSP, Section 8.9.2, p. 316.
[57] 2022 Redlined Paso Robles GSP, Section 8.9.3, p. 317.

terms of decreased groundwater recharge from surface water and reduction in groundwater dependent ecosystems. Specifically, the GSP states:

- Decreased groundwater discharge to the Salinas River would be significant and unreasonable if it prevented groundwater users in the Salinas Valley—where groundwater is primarily recharged by Salinas River percolation—from continuing their existing, economically viable agricultural or urban uses of land.[58]
- The undesirable result for steelhead trout—which uses surface flow in the Salinas River for migration—is a long-term decrease in population as a result of flow depletion caused by groundwater pumping.[59]
- An undesirable result for groundwater dependent vegetation would be water levels along more than 15 percent of the length of any of the three stream reaches with abundant riparian vegetation exceeding the minimum threshold as a result of groundwater pumping in the Paso Robles Formation Aquifer.[60]

The GSP lacks specificity regarding conditions that would be considered significant and unreasonable and as a result is not consistent with requirements of the GSP Regulations. For example, the GSA does not explain how it would determine that the "economically viable agricultural or urban uses of land" had been hindered, or how the contribution of surface flow depletion due to groundwater pumping would be quantified. The GSP Regulations require undesirable results to be described by "a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin" and include a description of the potential effects of undesirable results occurring, but this information is not provided in the GSP.[61] These additional supporting details would allow staff to understand the specific significant and unreasonable effects the Subbasin is trying to avoid and assess if established minimum thresholds are likely to attain that goal. As a result, Department staff conclude that the GSP's description of significant and unreasonable conditions and definition of undesirable results was not prepared in accord with the GSP Regulations and suggest measures the GSAs should consider taking to improve this aspect of the Plan.

Minimum thresholds for depletions of interconnected surface water are defined as a decline in the alluvial water table elevation as measured in the spring at Alluvial Aquifer wells along the Salinas River, the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and San Juan Creek upstream of Spring Creek that:[62]

- Is likely caused by groundwater pumping in the Paso Robles Formation Aquifer,
- Is more than 10 feet below the spring 2017 elevation,

58 2022 Redlined Paso Robles GSP, Section 8.9.7.1, p. 320.
59 2022 Redlined Paso Robles GSP, Section 8.9.7.3, p. 321.
60 2022 Redlined Paso Robles GSP, Section 8.9.7.2, p. 321.
61 23 CCR §§ 354.26(b)(2) and 354.26(b)3)
62 2022 Redlined Paso Robles GSP, Section 8.9.2, p. 316.

- Persists for more than two consecutive years, and
- Occurs along more than 15 percent of the length of any of the three stream reaches.

GSP Regulations require quantification of minimum thresholds as a “numeric value … that, if exceeded, may cause undesirable results.”[63] The GSP defines minimum thresholds in a manner that includes quantitative elements, but whose application remains subjective and incomplete. The GSP does not explain how surface water depletion caused by pumping in the Paso Robles Formation Aquifer will be quantified, and the definition altogether ignores potential depletion caused by pumping from the Alluvial aquifer. As for the other elements of the definition, although these are couched in quantitative terms, because the GSP has not clearly defined undesirable results that identify conditions the GSA considers significant and unreasonable, the GSP is unable to show how the proposed minimum thresholds are designed to avoid undesirable results.

The GSP has identified interconnection to the alluvial water table while also identifying limited or inconclusive data regarding groundwater flow between the two principal aquifers (Alluvial Aquifer and Paso Robles Formation Aquifer), yet the description of minimum thresholds includes the requirement of being caused by pumping from the Paso Robles Formation Aquifer. For example, with the current definition, water levels in the Alluvial Aquifer monitoring well can decline more than 10 feet below 2017 levels, persist for more than two consecutive years, impact more than 15 percent of vegetation along the Salinas River, and yet not be identified as exceeding minimum thresholds if they are not found to be caused by groundwater pumping in the Paso Robles Formation Aquifer; a likely scenario given that limited data exist to assess vertical gradients and vertical flows between the two principal aquifers in the Subbasin.[64] Given the uncertainty in understanding the vertical groundwater interaction in the Subbasin and the lack of supporting scientific information describing the extent of groundwater use from each aquifer, staff do not believe the definition of minimum thresholds should require a causal nexus to pumping from the Paso Robles Formation Aquifer. It’s also unclear how the GSAs will determine when declines occur along 15 percent of the river reaches since the GSP does not detail this when describing the monitoring network. Overall, Department staff are unclear if the minimum threshold, as currently defined, will avoid significant and unreasonable effects.

Measurable objectives are defined as a five-year moving average of spring groundwater elevations that are no more than five feet below the spring 2017 groundwater elevations in Alluvial Aquifer wells along the Salinas River, the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and San Juan Creek upstream of Spring Creek.[65] The objective is to help maintain the extent and density of riparian vegetation to 2017 levels and maintain Salinas River outflow and steelhead passage opportunity at

[63] 23 CCR § 354.28(a).
[64] 2022 Redlined Paso Robles GSP, Section 4.9.3, p. 123 and Section 5.1.3, p. 141.
[65] 2022 Redlined Paso Robles GSP, Section 8.9.3, pp. 317-318.

existing levels. Again, for the first five years of GSP implementation only the Salinas River and the interconnected Alluvial Aquifer will be evaluated.

However, having measurable objects defined as range is not consistent with the GSP Regulations. The current definition allows for exceedances beyond five feet below 2017 levels in a single year as long as the five-year average is above that limit, potentially causing undesirable results. Department staff recommend the measurable objectives be redefined to be consistent with the GSP Regulations which require a measurable objective to be established using the same metrics and monitoring sites as are used to define the minimum thresholds.

Department staff understand that quantifying depletions of interconnected surface water from groundwater extractions is a complex task that likely requires developing new, specialized tools, models, and methods to understand local hydrogeologic conditions, interactions, and responses. During the initial review of GSPs, Department staff have observed that most GSAs have struggled with this requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several years of Plan implementation that includes projects and management actions to address the data gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Department staff further advise that at this stage in SGMA implementation GSAs address deficiencies related to interconnected surface water depletion where GSAs are still working to fill data gaps related to interconnected surface water and where these data will be used to inform and establish sustainable management criteria based on timing, volume, and depletion as required by the GSP Regulations. (see Recommended Corrective Action 5a)

The Department will continue to support GSAs in this regard by providing, as appropriate, financial and technical assistance to GSAs, including the development of guidance describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, GSAs, where applicable, should consider incorporating appropriate guidance approaches into their future periodic evaluations to the GSP (see Recommended Corrective Action 5a). GSAs should consider availing themselves of the Department's financial or technical assistance, but in any event must continue to fill data gaps, collect additional monitoring data, and implement strategies to better understand and manage depletions of interconnected surface water caused by groundwater extractions and define segments of interconnectivity and timing within their jurisdictional area (Recommended Corrective Action 5b). Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion (Recommended Corrective Action 5c).

4.2.2.3 Monitoring Network for Depletions of Interconnected Surface Water

The Plan recognizes that the current monitoring wells do not adequately cover the three stream reaches where interconnection of groundwater with surface water and/or the riparian vegetation root zone occurs.[66] The GSP states there are seven existing groundwater monitoring wells within 2,000 feet of those stream reaches and three stream gages on the Salinas River, Heur Huero Creek, and Estrella River; it is unclear to staff how the stream gage data are utilized in the Plan. Of the seven existing wells, four are described to be along the Salinas River; the sole area where depletions of interconnected surface water to the Alluvial Aquifer will be evaluated for the first five years of GSP implementation. The Plan acknowledges that separation between Alluvial Aquifer groundwater levels and Paso Robles Formation Aquifer is poorly known in the eastern part of the Subbasin. A map and table are provided of recommended locations for additional wells and stream gages to verify and monitor interconnection in the Subbasin. The GSP also provides a table briefly describing a $400,000 plan to fill interconnected surface water monitoring network data gaps between 2020 and 2024, including the potential installation of five new wells.[67]

As the GSAs continue to expand the monitoring network, Department staff note some clarity needs to be provided as it relates to the description of the current monitoring network. For example, though seven monitoring wells are described, the location of only two is shown on the map provided due to confidentiality agreements limiting staff's ability to evaluate the monitoring network. Furthermore, of the two wells shown, only one is along the Salinas River where management criteria will be assessed for the first five years of GSP implementation. It is not clear to staff why only the Salinas River is being evaluated given that there are three known monitoring wells along the Estrella River, another location of identified interconnection. Additionally, it is unclear why monitoring wells from the Paso Robles Formation Aquifer are not included for a potential analysis to understand if deeper groundwater pumping is causing the shallow groundwater table to decline, which is required to monitor and evaluate minimum threshold exceedances as defined. Also, though current and potential monitoring sites are described for Huer Huero Creek and Cholame Creek, these creeks are not included in the management criteria developed for the Subbasin—though, Cholame Creek is identified as having interconnection to riparian vegetation. Huer Huero Creek is identified as not connected so the significance of discussing monitoring of the creek for depletions is not clear. Lastly, and most significantly, the Plan does not explain how stream gages described in the monitoring network will be utilized to evaluate depletions of interconnected surface water or how the use of groundwater levels serves as a suitable proxy for this sustainability indicator. Department staff recommend GSAs provide a clear explanation of the monitoring network for interconnected surface water, including how each aquifer is going

[66] 2022 Redlined Paso Robles GSP, Section. 7.6.1, p. 228.
[67] 2022 Redlined Paso Robles GSP, Table 10-1, p. 376.

to be monitored and how stream gages will be utilized to evaluate depletions of interconnected surface water. (See Recommended Corrective Action 6)

4.2.3 Conclusion

At this time, Department staff conclude sufficient action has been taken on this deficiency and believe the GSAs can work with the Department to further efforts on interconnected surface water. Department staff also recognize efforts from GSAs to identify monitoring data gaps and plan actions to expand the monitoring network and collect hydrologic, geologic, and hydrogeologic data to better characterize interconnectivity. However, Department staff have provided recommended corrective actions in which the GSAs should address within the periodic evaluation.

5 Plan Evaluation

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the Subbasin. The Department staff's evaluation of the likelihood of the Plan to attain the sustainability goal for the Subbasin is provided below.

5.1 Administrative Information

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, a description of the Plan area, and a demonstration of the legal authority and ability of the submitting Agency to develop and implement a Plan for that area.[68]

The GSP has been jointly developed and adopted by four GSAs, which include: City of Paso Robles GSA; County of San Luis Obispo GSA; San Miguel Community Services District GSA; and Shandon-San Juan GSA.[69] A Memorandum of Agreement, wherein the framework for governance and decision-making is described, established a Cooperative Committee made up of representatives from each of the five original GSAs.[70] The Cooperative Committee developed the GSP, which was then considered for adoption by each individual GSA. With respect to decisions related to GSP development, each of the GSAs has a weighted vote: County of San Luis Obispo (61 percent), City of Paso Robles (15 percent), Shandon-San Juan Water District (20 percent), San Miguel CSD (three

[68] 23 CCR § 354.2 *et seq*.
[69] 2020 Paso Robles GSP, Section 2, p. 41.
[70] Note: Heritage Ranch CSD is no longer a part of the GSAs that submitted this GSP

percent), and Heritage Ranch CSD (one percent).[71] The County of San Luis Obispo Director of Groundwater Sustainability has been designated as the Plan Manager.

The Paso Robles Subbasin is part of the Salinas Valley Groundwater Basin and located in the northern portion of San Luis Obispo County which is in the Central Coast region of California. The Subbasin is drained by the Salinas River and its tributaries - including the Estrella River, Huer Huero Creek, and San Juan Creek. The Subbasin is 436,240-acres (681 square miles) and the majority of the Subbasin is comprised of gentle flatlands near the Salinas River Valley, ranging in elevation from approximately 445 to 2,387 feet above mean sea level.[72] The Subbasin includes the incorporated City of Paso Robles and the unincorporated census-designated places of Shandon, San Miguel, Creston, Cholame, and Whitley Gardens. The Subbasin also includes disadvantaged communities (DACs) and severely disadvantaged communities (SDACs).[73] Bounded by four adjacent groundwater basins, the Subbasin has the Upper Valley Aquifer Subbasin to the north, the Cholame Valley Basin to the east, the Carrizo Plain Basin to the southeast, and the Atascadero Area Subbasin to the southwest.[74] The Upper Valley Aquifer Subbasin is a medium-priority basin with a GSP deadline of January 2022, while the other basins are very-low priority and not required to submit a GSP for evaluation and assessment.[75]

The Subbasin currently utilizes two water sources - groundwater, surface water - and soon plans to utilize recycled water. Prior to 2015, all water demands in the Subbasin were met with groundwater. Water management authority lies with federal agencies (Los Padres National Forest and the Bureau of Land Management), state agencies (California National Guard and California Department of Fish and Wildlife), county agencies (County of San Luis Obispo), and local entities (City of Paso Robles, San Miguel CSD, Shandon-San Juan Water District, and the Estrella-El Pomar-Creston Water District).[76] Significant water users include agricultural (the largest by water use), native vegetation (largest by land area), urban, and industrial (limited use).[77] Land use planning authority lies with the City of Paso Robles and the County of San Luis Obispo.[78] Existing land uses are 387,435 acres of native vegetation, 40,228 acres of agricultural land, and 8,577 acres of urban areas.[79]

The Communication and Engagement Plan provided in the GSP details the effort to involve diverse social, cultural, and economic elements of the Subbasin population. Beneficial users identified in the Subbasin include disadvantaged communities, various agencies, agriculture, water corporations, domestic wells owners, municipal well

[71] 2020 Paso Robles GSP, Section 2, pp. 44-48.
[72] 2020 Paso Robles GSP Section 1.2, pp. 42-44 and Section 3, p. 47.
[73] 2020 Paso Robles GSP, Figure 1, p. 700.
[74] 2020 Paso Robles GSP, Figure 1-1, p. 40.
[75] The Atascadero Area Subbasin, though a designated under SGMA as low-priority and not required to submit a GSP, is planning to develop and adopt a GSP.
[76] 2020 Paso Robles GSP, Figures 3-2, p. 51, and Figure 3-3, p. 52.
[77] 2020 Paso Robles GSP, Section 3.4.2, p. 57 and Figure 3-6, p. 58.
[78] 2020 Paso Robles GSP, Section 3.4, p. 53 and Figure 3-4, p. 54.
[79] 2020 Paso Robles GSP, Figure 3-4, p. 54 and Table 3-1, p. 53.

operators, public water systems, land use planning agencies, environmental users, surface water users, native American tribes, and the federal government.[80] As stated in the Plan, beneficial groundwater uses in the Subbasin include "various irrigated and non-irrigated agricultural activities; rural domestic/residential wells; municipal and industrial supply; and aquatic ecosystems associated with rivers and streams, some of which provide habitat for threatened or endangered species."[81] As stated in the Communication and Engagement Plan, interested parties can participate in public meetings, hearings, workshops, and communicate with Cooperative Committee members to provide input, obtain information, and review and comment on future GSP documents.[82]

The Plan describes in sufficient detail the GSAs' authority to manage groundwater in the Subbasin, which was generally presented in an understandable format using appropriate data. The Plan contains sufficient detail regarding the beneficial uses and users of groundwater, water use types, existing water monitoring and resource programs, and types and distribution of land use and land use plans for the Subbasin. The Agency provides a list of public meetings, materials, and notifications on its website, and lists of meetings and public comments and how they were addressed by the GSA are included in the appendices of the GSP.

The GSP's discussion and presentation of administrative information covers the specific items listed in the GSP Regulations in an understandable format using appropriate data. Department staff are aware of no significant inconsistencies or contrary information to that presented in the GSP and therefore have no significant concerns regarding the quality, data, and discussion of this subject in the GSP. The administrative information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

5.2 Basin Setting

GSP Regulations require information about the physical setting and characteristics of the Subbasin and current conditions of the Subbasin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the Subbasin, including historical, current, and projected water budget conditions.[83]

5.2.1 Hydrogeologic Conceptual Model

The GSP Regulations require a descriptive hydrogeologic conceptual model of the Subbasin that includes a written description supported by cross sections and maps.[84] The hydrogeologic conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, and

[80] 2020 Paso Robles GSP, Appendix M, Appendix D, pp. 701-703.
[81] 2020 Paso Robles GSP, Appendix M, Section 3, p. 680.
[82] 2020 Paso Robles GSP, Table 11-2, p. 313, Appendix M, p. 691, Appendix N, pp. 719-1174.
[83] 23 CCR § 354.12 *et seq*.
[84] 23 CCR § 354.12 *et seq*.

represents a local agency's understanding of the geology and hydrology of the basin that support the geologic assumptions used in developing mathematical models, such as those that allow for quantification of the water budget.[85]

The hydrogeologic conceptual model is based primarily upon two published studies (hydrogeologic and geologic investigations by Fugro Consultants Inc. completed for San Luis Obispo County Flood Control and Water Conservation District (SLOFCWCD) in 2002 and 2005).[86] The Plan graphically represents the hydrogeologic conceptual model with a combination of scaled cross-sections. The physical characteristics of the Subbasin are represented by maps depicting the geologic formations within and surrounding the Subbasin, topography, soil characteristics, potential recharge and discharge areas, surface water bodies, and imported supplies as required.

The Plan identifies and describes two principal aquifers in the Subbasin:

- **The Alluvial Aquifer** — A relatively continuous and unconfined aquifer comprising of Quaternary-age alluvial deposits that underlie streams. It is generally composed of saturated coarse-grained sediments and occurs along Huer Huero Creek, the Salinas River, and the Estrella River. The highly permeable aquifer varies in thickness, but is generally about 100 feet thick. Hydraulic conductivity may be over 500 feet per day and wells screened in the Alluvial Aquifer can yield up to a 1,000 gallons per minute.[87]
- **The Paso Robles Formation Aquifer**—An interbedded and discontinuous aquifer, comprising of Tertiary-age sand and gravel lenses that underlie the Alluvial Aquifer. Groundwater occurs under unconfined, semi-confined, and confined conditions. The aquifer is generally thin and discontinuous sand and gravel zones usually separated vertically by relatively thick zones of silts and clays. Sediments have a thickness of 700-1,200 feet. Hydraulic conductivity ranges from about 1-20 feet per day and well yields range from approximately 150-850 gallons per minute.[88]

Primary groundwater users include municipal, agricultural, rural residential, small community water systems, small commercial entities, and environmental users.[89] The municipal sector pumps primarily from the Paso Robles Formation Aquifer in the Subbasin and also utilizes imported surface water. The agriculture sector, which is reliant solely on groundwater, pumps from both principal aquifers. The Plan notes that pumping

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[85] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[86] 2020 Paso Robles GSP, Section 4, p. 83.
[87] 2020 Paso Robles GSP, Figure 4-4, p. 91, Section 4.3.2.1, p. 89, Section 4.4, pp. 102-109.
[88] 2020 Paso Robles GSP, Section 4.3.2.2 p. 101, Section 4.4, p. 102, Section 5.1.2, p. 124, Paso Robles Subbasin First Annual Report (2017-2019).
[89] 2020 Paso Robles GSP, Section 4.5, p. 110.

from the Alluvial Aquifer is “rare”, generally occurs to meet domestic and limited livestock water demands, and large-scale irrigation pumping does not typically occur.[90] The Plan concludes that groundwater in the Subbasin is generally suitable for drinking and agricultural uses; having defined the depth where water is generally of poor quality as the bottom (though flow is continuous across this depth).[91]

The Plan acknowledges current data gaps in the hydrogeologic conceptual model related to the characterization of the Alluvial Aquifer, inconclusive understanding of the vertical groundwater flow between the two principal aquifers, limited information on the continuity of stratigraphic features that limit groundwater flow, understanding the influence of faults on groundwater flow, and very limited data available to estimate specific yield. These gaps “could be improved with certain additional data and analyses” and, therefore, the GSAs include management actions — with a budget of $300,000 to be spent between 2020 and 2024 — to fill data gaps and refine the hydrogeologic conceptual model with the findings.[92] Department staff will be reviewing the progress of those efforts and recommend the GSAs provide the Department updates via annual reports and periodic evaluations.

The discussion of the hydrogeologic conceptual model related to interconnected surface water in the 2020 Plan was corrected based on deficiencies identified by the Department. An assessment of the corrected information, and corrective actions taken by the GSAs is provided in Section 4.2.2.1 of this Staff Report. Overall, the hydrogeologic conceptual model information provided in the GSP substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan’s descriptions of the regional geologic setting, the Subbasin’s physical characteristics, the principal aquifer, and hydrogeologic conceptual model appear to utilize the best available science. Department staff are aware of no significant inconsistencies or contrary technical information to that presented in the Plan.

5.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the applicable sustainability indicators and groundwater dependent ecosystems.[93]

The Plan describes groundwater conditions in the Subbasin, though, the discussion is largely based on findings from the Paso Robles Formation Aquifer. The GSP uses a total of 55 wells from the SLOFCWCD monitoring network for the assessment, with only seven of those wells being located in the Alluvial Aquifer.[94]

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[90] 2022 Redlined Paso Robles GSP, Section 5.5, p. 144.
[91] 2020 Paso Robles GSP, Section 4.1, p. 83, Figure 4-2, p. 86, Section 4.6, p. 110.
[92] 2020 Paso Robles GSP, Section 4.9, p. 118 and Table 10-1, p. 309.
[93] 23 CCR § 354.16 (a-f).
[94] 23 CCR § 354.16 et seq. and 2020 Paso Robles GSP, Section 5.1, pp. 119-120.

For the Alluvial Aquifer, the Plan states groundwater elevation data are "too limited to prepare representative contour maps of the seasonal high and seasonal low groundwater elevations, or to prepare maps of historical [1997] groundwater elevations." A groundwater elevation contour map for 2017 depicts groundwater flow direction generally following the alignment of the creeks and rivers, flowing southeast to northwest across the Subbasin.[95] Hydrographs for the Alluvial Aquifer are not included because the data was collected under confidentiality agreements. As a result, no long-term groundwater elevations change assessment is provided. Previous hydrologic studies indicate that groundwater elevations are generally higher in the Alluvial Aquifer than the underlying Paso Robles Formation Aquifer, resulting in groundwater flow from the Alluvial Aquifer to the underlying Paso Robles Formation Aquifer.[96] As stated in the Plan, "[t]he lack of publicly available groundwater level data for the Alluvial Aquifer [and the Paso Robles Formation Aquifer] is a significant data gap."[97]

For the Paso Robles Formation Aquifer, a comparison of groundwater elevation data for historical (1997) and current (2017) groundwater conditions is presented. Over the course of the 20-year period, groundwater elevations have fallen by as much as 80 feet in some areas.[98] The GSP states groundwater flow direction is generally to the northwest and west over most of the Subbasin, except in the area north of the City of Paso Robles where groundwater flow is to the northeast.[99] The GSP states "[l]imited data exist to assess vertical groundwater gradients" but "there is an assumed upward vertical groundwater gradient within the Paso Robles Formation near the northern portion of the Subbasin, although data were not provided to verify this assumption".[100] The GSP provides hydrographs depicting long-term groundwater elevation trends from 22 monitoring wells with publicly available well information.[101]

Change in groundwater storage, estimated annual groundwater pumping (derived from the GSP Model), and water year type for the Alluvial and Paso Robles Formation Aquifers are summarized for the historical (1981) and current (2016) periods as required.[102] A total estimated decrease in groundwater storage of 70,000 acre-feet and 646,000 acre-feet occurred in the Alluvial and the Paso Robles Formation Aquifers, respectively, within the 35-year time period. However, the Plan states the period from 1981 through 2011 is considered representative of long-term hydrologic conditions prior to the drought period of 2012 through 2016.[103] Therefore, the Plan also provides the estimated decrease in groundwater storage from 1981 through 2011 which was 20,000 acre-feet in the Alluvial

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[95] 2020 Paso Robles GSP, Section 5.1.1.1, p. 122 and Figure 5-2, p. 123.
[96] 2020 Paso Robles GSP, Section 5.1.3, p. 136.
[97] 2020 Paso Robles GSP, Section 5.1.1.2, p. 122 and Section 5.1.2.2, p. 134.
[98] 2020 Paso Robles GSP, Figure 5-7, p. 132 and Figure 5-8, p. 133.
[99] 2020 Paso Robles GSP, Section 5.1.2.1, p. 124 and Section 5.1.3, p. 136.
[100] 2020 Paso Robles GSP, Section 5.1.3, p. 136.
[101] 2020 Paso Robles GSP, Section 5.1.2.2, p. 138.
[102] 23 CCR § 354.18 et seq., 2020 Paso Robles GSP, Section 5.2, pp. 138-141, Figure 5-11, p. 139, Figure 5-12, p. 141.
[103] 2020 Paso Robles GSP, Section 5.2.1, p. 138.

Aquifer and 369,000 acre-feet in the Paso Robles Formation Aquifer. Department staff note that the Plan identifies “[e]xtensive, unanticipated drought” as a potential cause of undesirable results. SGMA allows for periods of drought if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.[104] Therefore, Department staff suggest not discounting years of drought when considering change in groundwater storage.[105]

Groundwater quality has been analyzed throughout the basin for various studies (conducted by Fugro and most recently by the USGS), the Salt and Nutrient Management Plan, and compliance with regulatory programs.[106] The GSP focuses only on constituents if they have a drinking water standard, have a known effect on crops, or concentrations of these constituents of concern were above the standards for drinking water or the level that affects crops. For drinking water, total dissolved solids (TDS) exceeded the Secondary MCL in 14 of 74 samples, and Nitrate exceeded the MCL in 4 of the 74 samples.[107] For agriculture, of 74 samples, only 13 had severe restrictions for irrigation use due to high sodium, chloride or boron toxicity.[108]

The Plan states the historical rate of subsidence is “relatively insignificant and not a major concern for the Subbasin. However, ongoing subsidence over many years could add up to a more significant ground surface drop and the GSAs will continue to monitor annual subsidence”.[109] From 2015 to 2018, a region on the Estrella River and a region northwest of Creston experienced up to 1.5 inches of subsidence while the majority of the Subbasin experienced a rise or drop of less than 1.2 inches—a rate of subsidence in the range of 0.4-0.5 inches per year.

The discussion of groundwater conditions related to interconnected surface water in the 2020 Plan was corrected based on deficiencies identified by the Department. An assessment of the corrected information, and corrective actions taken by the GSAs is provided in Section 4.2.2.1 of this staff report. The Plan sufficiently describes the historical and current groundwater conditions throughout the Subbasin, and the information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

5.2.3 Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and

[104] Water Code § 10721(x)(1).
[105] 2020 Paso Robles GSP, Section 8.4.2, pp. 223.
[106] 2020 Paso Robles GSP, Section 5.6, p. 144.
[107] 2020 Paso Robles GSP, Section 5.6.1, pp. 144-145.
[108] 2020 Paso Robles GSP, Section 5.6.2, p. 145.
[109] 2020 Paso Robles GSP, Section 5.4, p. 142.

leaving the basin, including historical; current; and projected water budget conditions, and the change in the volume of water stored, as applicable.[110]

Water budgets were developed using an integrated system of three hydrologic models, including a watershed model, a soil water balance spreadsheet model, and a numerical groundwater flow model. Though the models were originally developed by Fugro and Geoscience Support Services, Inc. for the SLOFCWCD, the models were updated for GSP purposes and are collectively referred to as the "GSP model."[111] As stated by the GSP, the GSP model has uncertainty due to limitations in available data and assumptions.[112]

The GSP selects the period from 1981 to 2011 for historical water budget condition accounting and assessments. Over the 31-year period, a net loss of groundwater storage of approximately 390,000 acre-feet occurred and the annual average groundwater storage loss was approximately 12,600 acre-feet.[113] The estimated sustainable yield for the historical period is 59,800 acre-feet per year.[114] Years 2012 to 2016 are selected for current water budget estimates and over the five-year period, an estimated net loss of groundwater in storage of approximately 327,000 acre-feet occurred, equating to an annual average groundwater storage loss of approximately 65,400 acre-feet per year.[115] Estimated sustainable yield for current groundwater conditions is 20,400 acre-feet per year. The period from 2020 to 2040 was selected for projected (referred to as "future" in the GSP) water budget estimates using the Department's climate change factors for 2030. The Plan estimated future sustainable yield to be approximately 61,100 acre-feet per year.

Department staff conclude the historical, current, and projected water budgets included in the Plan substantially comply with the requirements outlined in the GSP Regulations. The GSP provides the required historical, current, and future accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Subbasin including an estimate of the sustainable yield of the Subbasin and projected future water demands.

5.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable

[110] 23 CCR § 354.18.
[111] 2020 Paso Robles GSP, Section 6.2, pp. 159-160.
[112] 2020 Paso Robles GSP, Section 6.2.1, pp. 160-161.
[113] 2020 Paso Robles GSP, Section 6.3.2.3, p. 167.
[114] 2020 Paso Robles GSP, Section 6.3.2.4, pp. 170-171.
[115] 2020 Paso Robles GSP, Section 6.4.2.3, p. 170.

results are defined consistently throughout the basin.[116] The Paso Robles GSP does not utilize management areas for the Subbasin.

5.3 Sustainable Management Criteria

GSP Regulations require each Plan to include a sustainability goal for the Subbasin and to characterize and establish undesirable results, minimum thresholds, and measurable objectives for each applicable sustainability indicator, as appropriate. The GSP Regulations require each Plan to define conditions that constitute sustainable groundwater management for the Subbasin including the process by which the GSA characterizes undesirable results and establishes minimum thresholds and measurable objectives for each applicable sustainability indicator.[117]

5.3.1 Sustainability Goal

The information provided in the Plan for the sustainability goal reasonably sets forth how sustainable groundwater management for the Subbasin will be achieved and substantially complies with the GSP Regulations. The sustainability goal for the Subbasin, as defined in the Plan, is "…to sustainably manage the groundwater resources of the Paso Robles Subbasin for long-term community, financial, and environmental benefit of Subbasin users." The Plan further states the GSAs will "balance the needs of all groundwater users in the Subbasin within the sustainable limits of the Subbasin's resources." The GSP states that a "combination of the management actions and conceptual projects will be implemented to ensure the Subbasin operates within its sustainable yield and achieves sustainability" within 20 years.

5.3.2 Sustainability Indicators

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.[118] Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon, significant and unreasonable reduction of groundwater storage, significant and unreasonable seawater intrusion, significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies, land subsidence that substantially interferes with surface land uses, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water[119] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form

[116] 23 CCR § 354.20.
[117] 23 CCR § 354.22 *et seq*.
[118] 23 CCR § 351(ah).
[119] Water Code § 10721(x).

of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

The following subsections thus consolidate three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives. Information, as presented in the Plan, pertaining to the processes and criteria relied upon to define undesirable results applicable to the basin, as quantified through the establishment of minimum thresholds, are addressed for each sustainability indicator. However, a submitting agency is not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[120]

5.3.2.1 Chronic Lowering of Groundwater Levels

The GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.[121] Undesirable results and minimum thresholds for chronic lowering of groundwater levels in the 2020 Plan were corrected based on deficiencies identified by the Department. An assessment of the corrected information and corrective actions taken by the GSAs is provided in Section 4.1.2 of this Staff Report.

The GSP states sustainable management criteria were developed in response to a variety of input (e.g., public outreach efforts, survey results, hydrogeologic information, evaluation of historical groundwater levels, and well construction information). The quantitative criteria for defining undesirable results have not been modified and are: "Over the course of two years, no more than two exceedances for the groundwater elevation minimum thresholds within a 5-mile radius or within a defined area of the Basin for any single aquifer. A single monitoring well in exceedance for two consecutive years also represents an undesirable result for the area of the Basin represented by the monitoring well. Geographically isolated exceedances will require investigation to determine if local or Basin wide actions are required in response."[122] Average 2017 non-pumping groundwater levels have been selected as measurable objectives, with minimum thresholds set 30 feet below those levels since "analysis of historical groundwater elevation data suggested that 30 feet allows for reasonable operational flexibility that accounts for seasonal and anticipated climatic variations on groundwater elevation."

The GSP provides qualitative descriptions of how the selected minimum thresholds could impact other applicable sustainability indicators (i.e., change in groundwater storage, change in groundwater quality, and subsidence). For instance, the description for groundwater storage impacts states that because groundwater elevation minimum thresholds are set to maintain a constant elevation--consistent with pumping at or below the sustainable yield—the groundwater elevation minimum thresholds should not be a negative impact to groundwater storage. The discussion related to the depletions of

[120] 23 CCR § 354.26(d).
[121] 23 CCR § 354.28(c)(1).
[122] 2022 Redlined Paso Robles GSP, Section 8.4.6.1, p. 290.

interconnected surface water sustainability indicator has been modified based on better understanding of the basin setting (see Section 4.2 of this Staff Report).

A well impact analysis was conducted for the Paso Robles Formation Aquifer only. The Alluvial Aquifer is currently monitored by one well installed in June 2018 and did not have sufficient historical data for the 2020 GSP submittal Plan to establish initial sustainable management criteria for groundwater levels. The Plan states criteria for the Alluvial Aquifer will be established early after GSP adoption and the monitoring network will expand by locating new candidate monitoring wells, modifying confidentiality agreements at known wells so that groundwater level data can be used, or by installing new monitoring wells.[123] Staff recommend the GSAs include sustainable management criteria for groundwater levels in the Alluvial Aquifer based on available monitoring data as part of the next periodic evaluation (see Recommended Corrective Action 7).

Department staff conclude that the sustainable management criteria for groundwater levels is commensurate with the understanding of current conditions, responsive to interested party feedback, and reasonably protective of the groundwater uses and users in the Subbasin. The Plan provides a credible and sufficient assessment of the impacts the minimum thresholds would have on all wells by evaluating the well depth and established minimum thresholds at individual representative monitoring points. However, as highlighted in the recommended corrective actions, the GSP should include some additional supporting technical details, clarifications, and Alluvial Aquifer management criteria in the next periodic evaluation.

5.3.2.2 Reduction of Groundwater Storage

The GSP regulations require the minimum threshold for the reduction of groundwater storage to be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[124]

The Plan describes significant and unreasonable groundwater storage conditions as those conditions that lead to long-term reduction in storage or interfere with the other sustainability indicators. Conditions that may lead to an undesirable result include expansion of non-de minimis pumping, expansion of de minimis pumping, and extensive, unanticipated drought. The Plan states prolonged reductions in the amount of groundwater in storage could lead to undesirable results affecting beneficial users and uses of groundwater. Groundwater pumpers that rely on water from shallow wells may be temporarily impacted by temporary reductions if the amount of groundwater in storage drops and lower water levels in their wells.

[123] 2022 Redlined Paso Robles GSP, Section 8.4.3.3, p. 272.
[124] 23 CCR § 354.28(c)(2).

This GSP adopts changes in groundwater level as a proxy for changes in groundwater storage and, therefore, the “minimum threshold is that the groundwater surface elevation averaged across all the wells in the groundwater level monitoring network will remain stable above the minimum threshold for chronic lowering of groundwater levels”. The GSP states using the same measurable objectives as groundwater elevation protects against significant and unreasonable reduction in groundwater storage as it does protecting against chronic lowering of groundwater levels; the measurable objective, using the groundwater level proxy, is stable average groundwater levels. The reduction of groundwater in storage measurable objective and minimum threshold is established as a whole for the Subbasin rather than for each principal aquifer. Thus, this results in groundwater storage minimum thresholds being monitored without direct measured input from the Alluvial Aquifer, which does not have established sustainable management criteria for groundwater levels. In addressing Recommended Corrective Action 7, the GSAs should also update the discussion of reduction of groundwater storage to include the Alluvial Aquifer.

Based on review of the materials referenced in the GSP, staff find that the GSP’s discussion and presentation of information related to significant and unreasonable reduction of groundwater storage, including the rationale that maintaining stable groundwater levels indicates groundwater storage is not being reduced, covers the specific items listed in the GSP Regulations in an understandable format using appropriate data.

5.3.2.3 Seawater Intrusion

The GSP Regulations require the minimum threshold for seawater intrusion to be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.[125]

The GSP states seawater intrusion is not an applicable sustainability indicator as the “Subbasin is not adjacent to the Pacific Ocean, a bay, or inlet.” Department staff concur with the rationale for not setting sustainable management criteria for seawater intrusion.

5.3.2.4 Degraded Water Quality

The GSP Regulations require the minimum threshold for degraded water quality to be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.[126]

[125] 23 CCR § 354.28(c)(3).
[126] 23 CCR § 354.28(c)(4).

The Plan identifies significant and unreasonable degraded water quality conditions as any increase in a chemical constituent that results in groundwater concentrations in a public supply well above an established primary or secondary maximum contaminant level (MCL), or that lead to reduced crop production. The minimum thresholds are based on a number of supply wells, specifically limiting future primary and secondary MCL exceedances to existing exceedances plus 10 percent (with a minimum of one additional exceedance) for constituents of concern in public supply wells (for total dissolved solids, chloride, sulfate, nitrate, gross alpha radiation) and agricultural supply wells (for chloride, boron). The Plan leverages existing water quality regulatory programs operating in the Subbasin to assess degraded water quality.

Based on review of the GSP's discussion of the establish sustainable management criteria, Department staff find that the GSP's discussion and presentation of information on degradation of water quality covers the specific items listed in the regulations in an understandable format using appropriate data.

5.3.2.5 Land Subsidence

The GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.[127] Minimum thresholds for land subsidence shall be supported by identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for establishing minimum thresholds in light of those effects and maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum threshold and measurable objectives.[128]

The Plan defines an undesirable result as "pumping induced subsidence of greater than 0.1 foot in any single year and a cumulative 0.5 foot in any five-year period …" The Plan states that based on InSAR data provided by the Department, meaningful land subsidence did not occur during the period between June 2015 and June 2018 in the Paso Robles Subbasin and continuing to avoid undesirable results "will protect the beneficial uses and users from impacts to infrastructure and interference with surface land uses." The subsidence minimum threshold is, therefore, having "the InSAR measured subsidence between June of one year and June of the subsequent year be no more than 0.1 foot in any single year and a cumulative 0.5 foot in any five-year period, resulting in no long-term permanent subsidence." The measurable objective is the "maintenance of current ground surface elevations" and avoid "permanent subsidence." This represents a rate of subsidence that is three times the average rate observed between 2015 and 2018. The Plan states that possible shifts in pumping locations that lead to declines groundwater levels could trigger excessive subsidence. However, since data indicates that no infrastructure is currently affected by subsidence and future

[127] 23 CCR § 354.28(c)(4).
[128] 23 CCR § 354.28(c)(4)(A-B).

pumping will be reduced from current pumping levels, impacts to beneficial uses and users are not anticipated.

Department staff find that the GSP adequately describes the sustainable management criteria and approach to managing land subsidence. Department staff also believe the Agency used the best information and science available at the time of Plan development.

5.3.2.6 Depletions of Interconnected Surface Water

SGMA defines undesirable results for the depletion of interconnected surface water as those that have significant and unreasonable adverse impacts on beneficial uses of surface water and are caused by groundwater conditions occurring throughout the Subbasin.[129] The GSP Regulations require that a Plan identify the presence of interconnected surface water systems in the basin and estimate the quantity and timing of depletions of those systems.[130] The GSP Regulations further require that minimum thresholds be set based on the rate or volume of surface water depletions caused by groundwater use, supported by information including the location, quantity, and timing of depletions, that adversely impact beneficial uses of the surface water and may lead to undesirable results.[131]

The sustainable management criteria for depletions of interconnected surface water in the 2020 Plan was corrected based on deficiencies identified by the Department. An assessment of the corrected information, and corrective actions taken by the GSAs is provided in Section 4.2.2.2 of this staff report.

5.4 MONITORING NETWORK

The GSP Regulations describe the monitoring network that must be developed for each basin including monitoring objectives, monitoring protocols, and data reporting requirements. Collecting monitoring data of a sufficient quality and quantity is necessary for the successful implementation of a groundwater sustainability plan. The GSP Regulations require a monitoring network of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.[132] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[133] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[134] capture seasonal low and high conditions,[135] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[136] Department staff

[129] Water Code § 10721(x)(6).
[130] 23 CCR § 354.16 (f).
[131] 23 CCR § 354.28 (c)(6).
[132] 23 CCR § 354.32.
[133] 23 CCR § 354.34(b)(2).
[134] 23 CCR § 354.34(b)(3).
[135] 23 CCR § 354.34(c)(1)(B).
[136] 23 CCR §§ 354.34(g)-(h).

encourage GSAs to collect monitoring data as specified in the GSP, fill data gaps identified in the GSP prior to the first periodic evaluation,[137] update monitoring network information as needed, follow monitoring best management practices,[138] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The Plan's approach for establishing the monitoring networks is to leverage existing monitoring programs and incorporate additional monitoring locations that have been made available by cooperating entities. Currently the monitoring networks are limited to locations with data that are publicly available and not collected under confidentiality agreements. As stated in the GSP, "the availability of well data and restrictions of existing confidentiality agreements results in a monitoring network with relatively few wells.[139] The Plan provides estimated planning-level costs for the first five years for the verification and expansion of monitoring networks ($670,000) and conducting groundwater investigations ($750,000).[140]

There are currently 23 wells in the groundwater level monitoring network, with 22 wells that are part of SLOFCWCD monitoring network for the Paso Robles Formation Aquifer, and one City of Paso Robles-owned monitoring well in the Alluvial Aquifer.[141] The Plan acknowledges that the current number of monitoring wells for both aquifers are "insufficient."[142] As such, data gaps for groundwater level monitoring are identified in the Plan, including a list of nine potential future groundwater monitoring wells (which currently have unknown well information) and a reference to approximately 90 additional wells that are currently not included due to confidentiality agreements which SLOFCWD will attempt to amend with well owners.[143] The Plan allocates a budget of $600,000, anticipated to be spent in the first half of 2020, for installation and inspection of monitoring wells in key data gap areas. GSAs have identified 10 sites for monitoring well installation (along with stream gage installation where needed). GSAs are planning construction of monitoring wells at two sites with existing stream gages using Supplemental Environmental Project funds in 2021.[144] Department staff concur there is a significant data gap in monitoring groundwater levels, especially in the Alluvial Aquifer, and recommend GSAs take action to address the gaps early in Plan implementation as planned.

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137 23 CCR § 354.38(d).
138 Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
139 2020 Paso Robles GSP, Section 7.1, p. 188.
140 2020 Paso Robles GSP, Table 10-1, p. 309.
141 2020 Paso Robles GSP, Table 7-1, pp. 194.
142 2020 Paso Robles GSP, Section 7.2.1, p. 197.
143 2020 Paso Robles GSP, Table 7-2, pp. 195, Section 7.2.1, p. 197, Table 7-3, p. 199.
144 Paso Robles First Annual Report (2017-2019) and Paso Robles Water Year 2020 Annual Report.

The GSP adopts groundwater levels as a proxy for assessing reduction in groundwater storage.[145] As such, the network of wells providing groundwater level data (and the associated data gaps) are the same as for the reduction in groundwater storage sustainability indicator. The relationship between change in groundwater levels, amount of groundwater pumping, and change in groundwater storage will be developed after GSP adoption and when additional data are available.

The monitoring network for groundwater quality is comprised of public water supply wells to monitor constituents of concern for drinking water, and agricultural supply wells to monitor constituents of concern for crop production. Public water supply well data are from the State Water Resources Control Board (SWRCB) Division of Drinking Water and includes 31 wells in the Paso Robles Formation Aquifer and 7 in the Alluvial Aquifer. Twenty-eight agricultural supply wells were identified by reviewing data from the Irrigated Lands Regulatory Program and stored in the SWRCB's Groundwater Ambient Monitoring and Assessment Program database.

Land subsidence is evaluated by monitoring land subsidence using Interferometric synthetic aperture radar (InSAR) data. Currently this data is provided by the Department and covers the Subbasin. The GSAs will continue to annually assess subsidence using the Department-provided InSAR data. Currently, there are no data gaps identified with the subsidence network; however, GSAs will consider subsidence surveys published by the United States Geological Survey (USGS) in assessing land subsidence across the Subbasin if they become available in the future.

The discussion of the monitoring network related to depletions of interconnected surface water in the 2020 Plan was corrected based on deficiencies identified by the Department. An assessment of the corrected information, and corrective actions taken by the GSAs is provided in Section 4.2.2.3 of this staff report.

The description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the Plan describes in sufficient detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Subbasin and evaluate changing conditions that occur through Plan implementation. The GSP provides a good explanation for the conclusion that the monitoring network is supported by the best available information and data and is designed to ensure adequate coverage of sustainability indicators. The Plan also describes existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network prior to the first periodic evaluation. Department staff consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations regarding monitoring network.

The GSP provides a monitoring network that will monitor the sustainability indicators and assist in achieving the sustainability goal; however, there are data gaps and

[145] 2020 Paso Robles GSP, Section 7.3, p. 202.

recommended corrective actions identified by both the GSAs and Department staff which will improve upon the monitoring network. The GSP Regulations require GSPs to provide specific information about each monitoring site per the data and reporting standards.[146] As Plan implementation progresses, it is imperative the GSA work to ensure the information defining the monitoring network is consistent within the GSP, consistent with the Department's Monitoring Network Module, and follow the data and reporting standards. Department staff recommend there be a reconciliation between the details of the monitoring network provided in the GSP with the requirements of the data and reporting standards in the GSP Regulations (see Recommended Corrective Action 8).

5.5 Projects and Management Actions

GSP Regulations require a description of the projects and management actions the submitting agency has determined will achieve the susta7inability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[147]

The Plan includes a suite of projects (in progress and conceptual) and management actions that appear to be reasonable and feasible, and, if implemented, will likely lead to the Subbasin achieving its sustainability goal.[148] While projects involve new or improved infrastructure to make new water supplies available, management actions are programs or policies that will improve groundwater monitoring, promote groundwater use reduction, develop a mandatory pumping limitation program, and reduce uncertainty. As stated in the Plan, "[t]o stop persistent declines in groundwater levels … reducing groundwater pumping will be needed."[149] Current levels of groundwater pumping in the Subbasin exceed the estimated sustainable yield of 61,100 acre-feet per year (by 13,700 acre-feet per year) and, in certain areas of the Subbasin, groundwater levels are persistently declining.[150] The Plan explains that the implementation of projects may offset pumping and lessen the degree to which management actions would be needed to operate the Subbasin within its sustainability yield.[151]

The GSAs provide general timelines for expected initiation of projects and management actions and cursory identifications of sustainable management criteria that would be affected by implementation. Largely, qualitative descriptions are provided for the evaluation of benefits to the Subbasin from management actions. Maps of projected groundwater level benefit are provided for the projects' benefits evaluation; however,

146 23 CCR §§ 352.4, 354.34(g)(2).
147 23 CCR § 354.44 et seq.
148 2020 Paso Robles GSP, Section 9.1, p. 259.
149 2020 Paso Robles GSP, Section 9.1, p. 260.
150 2020 Paso Robles GSP, Section 9.2, pp. 260-261.
151 2020 Paso Robles GSP, Section 9.5, pp. 274-275.

implementation of most projects depend on willing participants, and successful funding votes.[152]

The Plan divides management actions into basin-wide management actions that will apply to all Subbasin areas and reflect basic GSP implementation requirements, and an area-specific management action that requires adoption of regulations, environmental review, and legal risks. Basin-wide management actions include monitoring, reporting and outreach, promoting best water use practices, promoting stormwater capture, and promoting voluntary fallowing of irrigated crop land. The area-specific management action consists of mandatory pumping limitations in specific areas. It will take an up to five years to establish a regulatory program for area-specific pumping limitations. In the interim, the GSAs plan basin-wide management actions for certifying de minimis users and developing a metering and reporting program for non-de minimis users. Additional basin-wide management actions to increase the level of understanding of the basin include expanding groundwater level monitoring, investigating surface water-groundwater interconnectivity, refining the hydrogeologic conceptual model, and updating the groundwater model. The basin-wide management actions, if successfully and timely implemented, could increase the level of understanding in the Subbasin and allow for the successful implementation of an area specific mandatory pumping limitation regulatory program.

The six projects included in the GSP have been identified after many public meetings and studies over the last decade; however not all projects described in the Plan will necessarily be implemented.[153] The projects focus on new supply of up to 9,200 acre-feet per year, by developing recycled water (2,400 acre-feet per year) and water imports from the Nacimiento Water Project (5,800 acre-feet per year) and Salinas Dam (1,000 acre-feet per year). Only one project, City Recycled Water Delivery, is currently underway as of GSP submittal. This project will use up to 2,200 acre-feet per year of disinfected tertiary effluent for in-lieu recharge near and inside the City of Paso Robles and water not used for recycled water purposes will be discharged to Huer Huero Creek with the potential for additional recharge benefits.

The Plan adequately describes proposed projects and management actions in a manner that is generally consistent and substantially complies with the GSP Regulations. The projects and management actions, which focus largely on conservation and efficiency; stormwater efforts; increasing groundwater in storage through recharge; and increasing non-groundwater water supply, are directly related to the sustainable management criteria and present a generally feasible approach to achieving the sustainability goal of the Subbasin.

[152] 2020 Paso Robles GSP, Section 9.5, p. 275.
[153] 2020 Paso Robles GSP, Section 9.5.2, p. 276.

5.6 Consideration of Adjacent Basins/Subbasins

SGMA requires the Department to "…evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin." Furthermore, the GSP Regulations state that minimum thresholds defined in each GSP should be designed to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.

The Paso Robles Subbasin is bound by four adjacent groundwater basins: the Upper Valley Aquifer Subbasin to the north, the Cholame Valley Basin to the east, the Carrizo Plain Basin to the southeast, and the Atascadero Area Subbasin to the southwest. The Upper Valley Aquifer Subbasin is a medium-priority basin with a GSP deadline of January 2022, while the other basins are very-low priority and not required to submit a GSP for evaluation and assessment. The Plan includes an analysis of potential impacts to adjacent basins with the defined minimum thresholds for each applicable sustainability indicator. The Plan does not anticipate any impacts to adjacent basins developing GSPs from the minimum thresholds defined in the Plan and, if impacts are ultimately observed, thresholds would be adjusted. The GSP states the Paso Robles Subbasin GSAs have developed a cooperating working relationship with the Salinas Valley Basin GSA and the Agencies managing the Atascadero Subbasin. Specific details regarding the strategy or plan to closely coordinate with the GSA in the neighboring basins are not provided.

5.7 Consideration of Climate Change and Future Conditions

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.[154]

Since the GSP was adopted and submitted, climate change conditions have advanced faster and more dramatically. It is anticipated that the hotter, dryer conditions will result in a loss of 10% of California's water supply. As California adapts to a hotter, drier climate, GSAs should be preparing for these changing conditions as they work to sustainably manage groundwater within their jurisdictional areas. Specifically, the Department encourages the GSA to explore how the proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the Subbasin based on current and future drought conditions. The Department encourages the GSA to also explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the Subbasin given increasing aridification and effects of climate change, such as prolonged drought. Lastly, the Department encourages the GSA to continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces[155] to evaluate how the Agency's

[154] 23 CCR § 354.18.
[155] Water Code § 10609.50.

groundwater management strategy aligns with drought planning, response, and mitigation efforts within the Subbasin.

6 STAFF RECOMMENDATION

Department staff recommend approval of the Plan with the recommended corrective actions listed below. The Plan conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the Plan will likely achieve the sustainability goal for the Paso Robles Area Subbasin. The GSAs have identified several areas for improvement of its Plan and Department staff concur that those items are important and should be addressed as soon as possible. Department staff have also identified additional recommended corrective actions that should be considered by the GSAs for the first periodic evaluation of its GSP. Addressing these recommended corrective actions will be important to demonstrate that implementation of the Plan is likely to achieve the sustainability goal. The recommended corrective actions include:

RECOMMENDED CORRECTIVE ACTION 1

Department staff recommend the GSAs explain the selection of ten percent of all wells going dry as considered undesirable. The GSAs should provide details describing groundwater conditions when ten percent of all wells in the Subbasin go dry and, if appropriate, justify how those groundwater conditions constitute a significant and unreasonable effect to beneficial users and uses.

RECOMMENDED CORRECTIVE ACTION 2

Staff recommend the GSAs continue to re-evaluate the well impact analysis by pursuing activities to fill data gaps so that limitations of accurate and complete well construction information are overcome, and further refine the GSP’s criteria, assumptions, analysis, and objectives in defining significant and unreasonable effects based on best available information.

RECOMMENDED CORRECTIVE ACTION 3

The GSAs should consider including mitigation strategies describing how drinking water impacts that may occur due to continued overdraft during the period between the start of Plan implementation and achievement of the Subbasin’s sustainability goal will be addressed, or provide a thorough discussion, with supporting facts and rationale, explaining how and why the GSAs determined not to include specific actions or programs to monitor and mitigate drinking water impacts from continued groundwater lowering below 2015 levels. Department staff recommend that the GSAs review the Department’s April 2023 guidance document titled Considerations for Identifying and Addressing Drinking Water Well Impacts guidance to assist its adaptive management efforts.

Recommended Corrective Action 4

a. Department staff recommend the GSAs provide clear explanation of the usage of the Alluvial Aquifer and provide specific volumetric quantities of estimated pumping that occurs from the Alluvial Aquifer to detail the comparison of pumping from the Subbasin’s two principal aquifers.

b. Define the scope, schedule, and budget of the plan to investigate the potential connection between Estrella River and San Juan Creek to the underlying Paso Robles Formation Aquifer. Provide the Department with an update of work that has been conducted by the periodic evaluation.

Recommended Corrective Action 5

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, Subbasin-wide pumping is a complex task and that developing suitable tools may take additional time; however, it is critical for the Department’s ongoing and future evaluations of whether GSP implementation is on track to achieve sustainable groundwater management. The Department plans to provide guidance on methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water and support for establishing specific sustainable management criteria in the near future. This guidance is intended to assist GSAs to sustainably manage depletions of interconnected surface water.

In addition, the GSA should work to address the following items by the first periodic evaluation:

a. Work to establish undesirable results, minimum thresholds, and measurable objectives consistent with the GSP Regulations. Measurable objectives are to use the same metric used for minimum thresholds, including quantifying the location, quantity, and timing of depletions of interconnected surface water due to groundwater extraction. Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department.

b. Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.

c. Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA’s jurisdictional area.

Recommended Corrective Action 6

Department staff recommend the GSAs provide a clear explanation of the monitoring network for interconnected surface water, including how each aquifer is going to be monitored and how stream gages will be utilized to evaluate depletions of interconnected surface water.

Recommended Corrective Action 7

Staff recommends the GSAs include sustainable management criteria for groundwater levels in the Alluvial Aquifer based on available monitoring data as part of the next periodic evaluation. Additionally, the GSAs should increase the publicly available information to describe the monitoring network of the Alluvia Aquifer, including reviewing confidentiality agreements, installing new monitoring wells where needed, and filling data gaps in well information of known wells. As groundwater levels are used as a proxy for reduction of groundwater storage, GSAs may need to update the related discussion for the Alluvia Aquifer.

Recommended Corrective Action 8

Department staff recommend the GSAs conduct a reconciliation between the details of the monitoring network provided in the GSP with the requirements of the data and reporting standards in the GSP Regulations. Where requirements of the data and reporting standards are not provided, the GSA should include this information in the periodic evaluation of the GSP. As a reminder, updates to the monitoring network must be reflected in the SGMA Portal's Monitoring Network Module.

APPENDIX L

Paso Robles Subbasin Water Year 2023 Annual Report – Comments and Responses

Paso Robles Subbasin Water Year 2023 Annual Report – Comments and Responses

Commenter	Section	Page/ Figure/ Table	Comment	Response
Greg Grewal	Sec. 5	Pages 39-41	1) "Available surface water table should also have the usage table on the same page so it can be shown how much water wasn't put to beneficial use and was not stored in lieu of pumping." 2) "It should also be noted that Paso Robles gets the majority of it's water from the Atascadero sub basin for its population not the Paso Basin."	Comments noted. 1) Comparison of available surface water to surface water use is already readily available to the reader. Text added to clarify definition of 'available' surface water. 2) The text in Section 5.3 Imported Salinas River Underflow already makes this point clearly. No changes made.
Greg Grewal	Ex Summary	Page 18	"projects- 7 are listed and the most important one for recharge (storm water capture) is not on the list. Why? Less expensive and more beneficial to the people who live over the basin."	GSA staff agree with the comment. This project, detailed in Section 8.4.4 and Appendix J, should be included in this list on page 18. Text modified accordingly.
Greg Grewal	Sec. 4.4.2	Pages 35-37	"golf courses. 4 are listed, how many total acres? What is the water duty factor being used for irrigation? 4.9 per acre?"	Additional information added to the text.
Greg Grewal	Sec. 4.3	Page 33	1) "crop groups. Should also list water duty factor for each group." 2) "Ag ponds- how many? What are their sizes? AF stored? What is the total surface area of these ponds. The ponds are never empty." 3) "Is vineyard irrigation June to harvest in October?" 4) "What about frost protection?"	1) Table 2 modified accordingly. 2) The total wetted area and evaporative rate assessed on a monthly time step are the only two required factors, which are both referenced in the report. It is noted that while individual farmer's practices may vary many of the ponds may indeed never be empty, to avoid damaging the liner. To accommodate this, the analysis has been re-run with a new assumption: the ponds are assumed to be full for April and May, and ¼ full from June through March (i.e. they are never empty). The re-run estimated evaporative losses are exactly the same as before because long-term average precipitation offsets average evaporation rates for the months in question. 3) Yes, vineyard irrigation typically occurs from June through October. 4) Groundwater extraction for frost protection is already addressed in Section 4.3 of the report.
Greg Grewal	Sec. 4.3	Page 33	"ET is applied water from crop not pumped water from ground."	We assume what is meant by this comment is that ET is a measure of the volume of water consumed by the crop and lost to evaporation, and it is not equivalent to the amount of water pumped from the ground for the purpose of irrigating the crop. This is correct and this distinction is already explained in Section 4.3 of the report.
Greg Grewal	Sec. 8.3.3	Page 48	"no info on 5 plus months of water flow from the water shed of the West fork of the Huer Huero Creek. It does not start in Creston. It starts in the water shed."	This observation does not fall into the category of items that need to be included in an annual report (according to SGMA regulations). This kind of information should be included in an updated water budget that would accompany an update to the Subbasin groundwater model. The addition of a permanent stream flow gage on the West Fork of the Huer Huero will be considered by GSA staff.
Greg Grewal	n/a	n/a	"Report shows no information on the Naci pipeline repairs, problems, and reduced capacity."	All Nacimiento Pipeline problems in WY 2023 were downstream from Subbasin entitlement holders (City of Paso Robles). No changes made.
Greg Grewal	Sec. 8.5.3	Page 56	"Salinas River. Water going to SLO causing reduced recharge of the interconnectivity of surface water to ground water."	Comment noted. Existing water rights are regulated by the SWRCB. No changes made.
Greg Grewal	Sec. 4.3	Figure 8	"Irritated Ag.- should also show Ag. Pond locations and circles of the Ag.cluster homes with shallow well issues in and amongst the irrigated Ag."	The locations of the Ag ponds have been added to Figure 8. The locations of reported dry wells for WY 2023 are already included on Figure 10.