2. Atascadero Basin Setting and Monitoring Networks

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 2025. Information provided for WYs 2017-2024 is included for reference purposes. Much of the background information reported on in this WY 2024 Annual Report was taken from the Atascadero GSP prepared by GEI Consultants Inc, and GSI Water Solutions, Inc. (GEI/GSI 2022).

2.1 Basin Setting

The Basin is a narrow structural northwest-trending trough that extends from the Santa Margarita area at its southern end to the city of Paso Robles in the north. The Basin is bounded by the Santa Lucia Range on the west. The ground surface elevation of the Basin ranges from approximately 1,300 feet above mean sea level (ft/msl) in the highlands at the northern tip of the Basin to approximately 700 ft/msl where the Salinas River exits the Basin to the north. The southern tip of the Basin is approximately 1,000 ft/msl. The middle part of the Basin forms an elongate narrow valley along the Salinas River, flanked by areas of variable topographic relief. The Basin encompasses an area of approximately 19,735 acres. It is generally bounded by geologic units with low permeability, sediments with poor groundwater quality, rock, and structural faults. Along a portion of the northeast boundary, sediments of the Basin are continuous with the adjacent Paso Robles Area Groundwater Subbasin of the Salinas Valley Basin (Paso Robles Basin).

Specific Basin lateral boundaries include the following:[1]

- The northwestern, western, and southern boundaries of the Atascadero Basin are defined by the contact of Basin sediments with older, relatively impermeable geologic units, including Tertiary-age consolidated sedimentary beds, Cretaceous-age metamorphic rocks, and granitic rock.
- Along the northern portion of the eastern boundary, north of Templeton, the Rinconada Fault defines the eastern boundary of the Basin and is assumed to form a leaky hydraulic barrier between the Paso Robles Subbasin and the Atascadero Basin.
- Along the southern portion of the eastern boundary, south of Templeton, between Atascadero and Creston (a census-designated place in San Luis Obispo County), the Rinconada Fault juxtaposes Monterey Formation rocks and other bedrock units with the Paso Robles Formation basin sediments.

The bottom of the Atascadero Basin and the Paso Robles Subbasin are generally defined as the base of the Paso Robles Formation, which is an irregular surface formed as the result of folding, faulting, and erosion (Fugro and Cleath 2002). The exception to this is the Santa Margarita area at the southern end of the Basin. In this area, the bottom of the Basin is defined as the base of the Alluvium. The Basin boundary

[1] Minor discrepancies between these boundary descriptions and the Bulletin 118 boundary are discussed in Section 4.3.2

and bottom are not considered absolute barriers to flow because some of the geologic units underlying the Paso Robles Formation produce sufficient quantities of water, but the water is generally of poor quality, and it is, therefore, not considered part of the Basin.

There are two principal aquifers in the Basin: the Alluvial Aquifer and the Paso Robles Formation Aquifer. There are no formally defined or laterally continuous aquitards within the Basin. However, the upper portions of the Paso Robles Formation often contain thin, discontinuous clay layers interbedded with sand and "shale gravels" that can act as a leaky confining layer. These upper clay layers are generally pervasive throughout the Basin. In the Templeton area from Graves Creek to approximately Highway 46, the contact between the Alluvial Aquifer and the Paso Robles Formation Aquifer is characterized by a thick (60 feet) clay-rich aquitard that forms a hydraulic barrier to vertical groundwater flow, effectively separating the Alluvial Aquifer from the Paso Robles Formation Aquifer (Torres 1979).

Water wells penetrating and extracting groundwater from the Alluvial Aquifer are located along the Salinas River and its tributaries, including within the Santa Margarita area. The unit, consisting almost entirely of sand and gravel, is everywhere unconfined with high to very high transmissivity values. The thickness of the Alluvium ranges widely, with an estimated maximum thickness of 75 to 90 feet. Specific capacity values for wells in the Alluvium range from 20 to 60 gallons per minute per foot (gpm/ft) at production rates as high as 1,000 gpm (Fugro and Cleath 2002). Overall, within the Basin, the geometric mean hydraulic conductivity of the Alluvial Aquifer is estimated at 481 feet per day (Fugro and Cleath 2002).

In the Atascadero area and the area north of Templeton, the Paso Robles Formation Aquifer underlies and is in direct hydraulic contact with the Alluvial Aquifer along the Salinas River channel. Wells in the Paso Robles Formation Aquifer in hydraulic communication with the overlying Alluvium tend to have higher transmissivity values than wells that penetrate the portions of the Paso Robles Formation not in contact with the Alluvium. Constant discharge aquifer pumping tests for wells in Atascadero on the west side of the Salinas River showed production rates up to 1,300 gpm, with an average specific capacity of 15 gpm/ft (Fugro and Cleath 2002).

Elsewhere in the Basin the upper 300 feet or so of the Paso Robles Formation is characterized by thin (5-15 feet thick) interbedded brown or yellow clays with sand and "shale gravel," as described above. The beds tend to be thicker below 300 feet, with an increasing proportion of sand and gravel. The results of several controlled aquifer pumping tests were reviewed for wells in the Paso Robles Formation Aquifer, including wells in both the Templeton and Atascadero areas. None of these wells were in direct hydraulic communication with the Alluvial Aquifer. The specific capacity in these wells ranged from 0.9 to 5.7 gpm/ft at pumping rates of 110 to 810 gpm. Overall, within the Basin, the geometric mean hydraulic conductivity of the Paso Robles Formation Aquifer is estimated at 8.6 feet per day and the storativity ranges from 0.04 to 0.0001 (Fugro and Cleath 2002).

2.2 Precipitation and Climatic Period

Annual precipitation recorded at the Atascadero Mutual Water Company (AMWC) Station #34 is presented by water year in Figure 2. The average annual precipitation for the period 1968 through 2025 is 18.0 inches per water year. Climatic periods in the Subbasin have been determined based on analysis of data from AMWC Station #34 using the Standardized Precipitation Index (SPI), which quantifies deviations from normal precipitation patterns, using a 24-month period for analysis. The 24-month period SPI analysis provides insight into the relationship between water year type and groundwater elevation response (WMO, 2012). Climatic periods are categorized according to the following designations: wet, dry, and average/alternating wet and dry (Figure 2). Historical precipitation records are provided in Attachment D.

2.3 Monitoring Network

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 Basin:

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

Monitoring for the chronic lowering of groundwater levels, reduction of groundwater in storage, and depletion of interconnected surface water is implemented using the representative monitoring sites (RMS), is discussed in the next section, Section 2.3.1 – Groundwater Elevation Monitoring Network. Monitoring for degraded water quality and land subsidence is discussed in Section 2.3.2 – Additional Monitoring Networks.

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

The GWE monitoring network is used to assess Basin health against the chronic lowering of groundwater levels sustainability indicator outlined in the GSP. As groundwater levels are used as a proxy for the reduction in groundwater storage and depletion of interconnected surface water monitoring, this network is used for those sustainability indicators as well. Routine monitoring of groundwater levels is conducted by the San Luis Obispo County Flood Control and Water Conservation District. The GWE monitoring network RMS locations are shown on **Figure 3** and a summary of information for each of the wells is included in **Attachment F**. The monitoring network also includes other wells in the GSP area designated as private that are not shown on this map.

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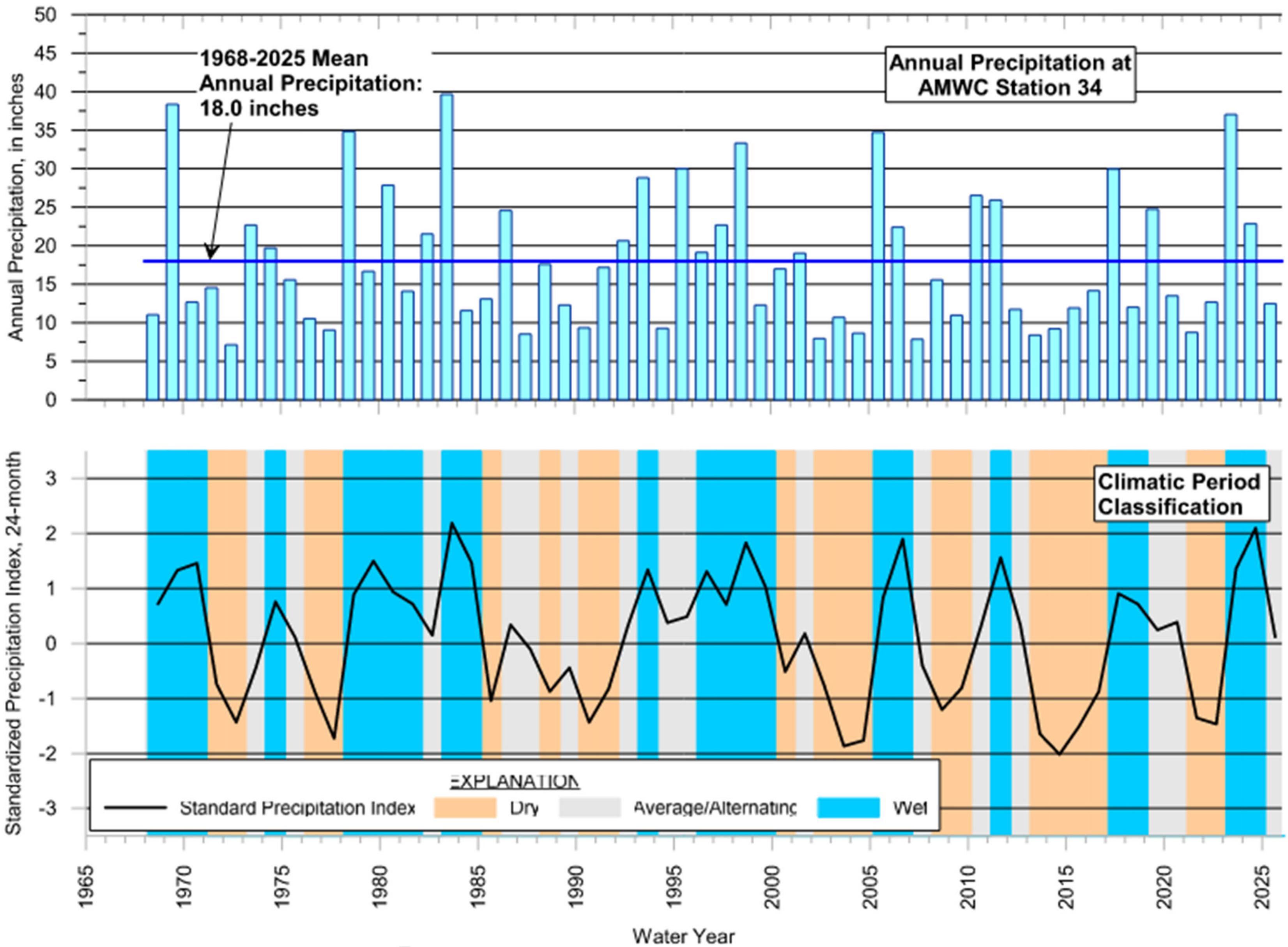

Figure 2: Annual Precipitation and Climatic Periods in the Atascadero Basin

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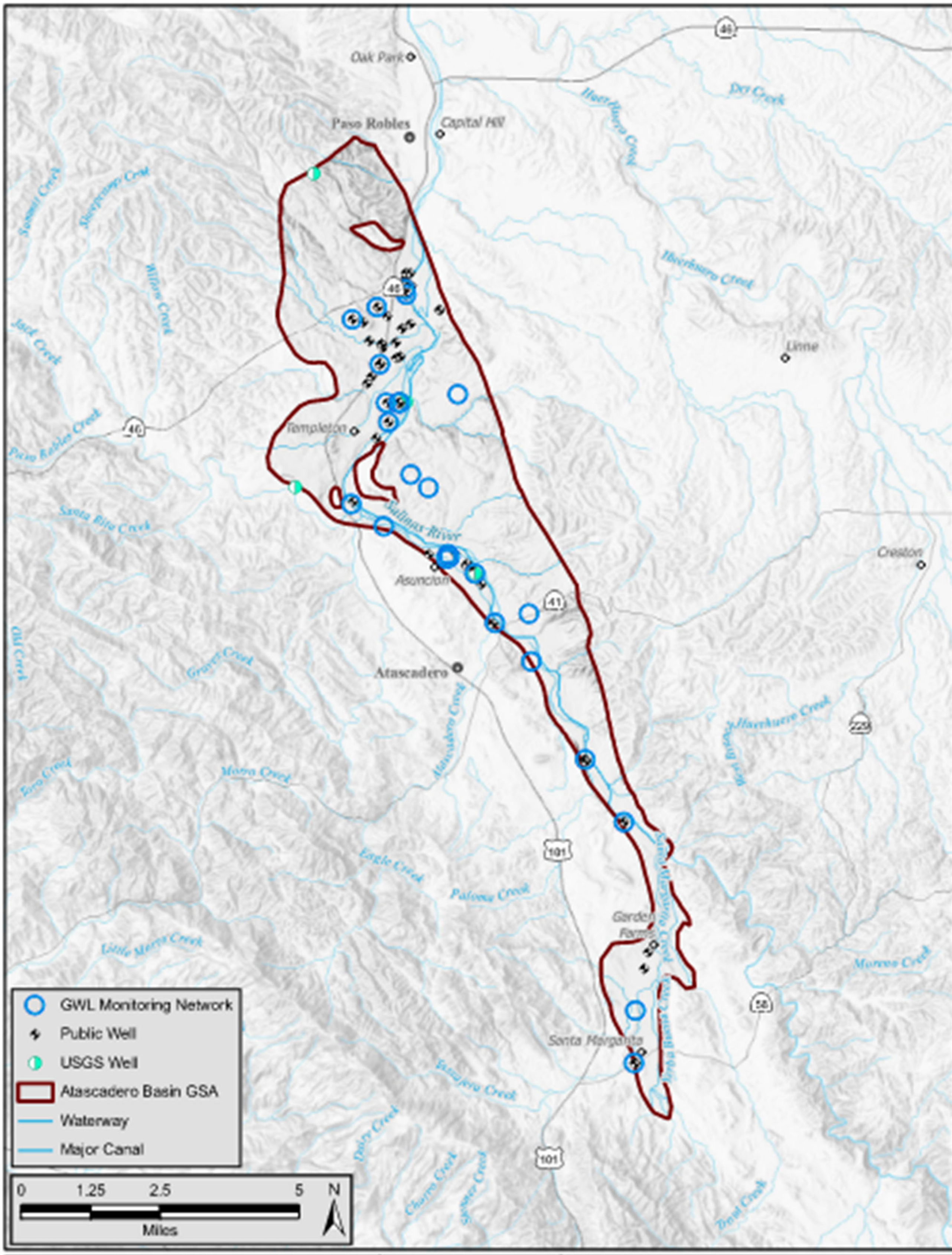

Figure 3: Atascadero Basin Groundwater Elevation Monitoring Network

The GSP provided a summary of existing groundwater monitoring efforts currently promulgated under various existing local, state, and federal programs. SGMA requires that monitoring networks be developed in the Basin to provide sufficient data quality, frequency, and spatial distribution to evaluate changing aquifer conditions in response to GSP implementation. To this purpose, the GSP identifies an existing network of 23 RMS wells for water level monitoring. Of these 24 wells, 13 are wells that screen the Paso Robles Formation, and 11 are Alluvial Aquifer wells[2]. The RMS 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 toward achieving measurable objectives (MOs) and minimum thresholds (MTs) documented in the GSP
- Quantify annual changes in water use
- Monitor impacts to the beneficial uses and users of groundwater

2.3.1.1 Monitoring Data Gaps

GSP identified data gaps in the current RMS network based on professional judgement. These data gaps are shown by the absence of monitoring wells in the northwest portion of the Basin and eastern portion of the Basin (*refer to* **Figure 3**). Potential wells were identified to fill said data gaps and efforts to bring the wells into the RMS network are continuing during the implementation phase of the GSP. This includes possible construction of new wells. Additionally, a program to increase monitoring frequency may be considered during the implementation phase if deemed necessary to better determine seasonal high and low GWE and measure response to recharge and other activities.

2.3.2 Additional Monitoring Networks

Evaluation of the water quality sustainability indicator is achieved through monitoring of an existing network of supply wells in the Basin. There are no known plumes in the Basin and therefore monitoring is only for non-point source constituents of concern (COCs) and naturally occurring water quality impacts. COCs identified in the GSP that have the potential to impact suitability of water for public supply or agricultural based on Title 22 drinking water regulations and Water Quality Control Plan (WQCP) water quality objectives (WQOs). These include:

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

Title 22 Drinking Water Regulations

- Arsenic
- Gross Alpha
- Nitrate (as N)
- Selenium
- Chloride (SMCL)
- Sulfate (SMCL)
- Iron (SMCL)
- Manganese (SMCL)
- Total Dissolved Solids (TDS)
- (SMCL) Constituent regulated under a secondary MCL

WQCP Water Quality Objectives

- Boron
- Chloride
- Nitrate (as N)
- Sulfate
- Sodium
- TDS

As COCs assigned different MTs for drinking water standards and agricultural standards, outlined in the Title 22 drinking water requirements and WQOs from the Basin's WQCP and Irrigated Lands Program, different RMS wells are assessed for different constituents. At PWS wells, domestic wells, and monitoring wells associate with the State Water Resources Control Board GeoTracker contamination sites, COCs for Title 22 drinking water requirements are assessed. At agricultural supply wells, WQO COCs for crop health are assessed.

The water quality monitoring network consists of 54 PWS wells, 74 agricultural and domestic supply wells, and 55 monitoring wells. There are 41 PWSs in the Subbasin. Agricultural and domestic supply wells are monitored for COCs under the Irrigated Lands Regulatory Program.

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 that impacts infrastructure. The GSAs will annually assess subsidence using the InSAR data provided by DWR.

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