WATER YEAR 2025 ANNUAL REPORT

White Wolf Subbasin

March 2026
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Water Year 2025 Annual Report

White Wolf Subbasin

March 2026

Prepared for:

White Wolf Groundwater Sustainability Agency

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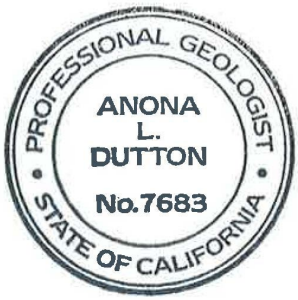

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Water Year 2025 Annual Report

White Wolf Subbasin

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ABBREVIATIONS AND ACRONYMS

AEWSD	Arvin-Edison Water Storage District
AF	Acre-Feet
AFY	Acre-Feet per Year
bgs	Below Ground Surface
CASP	California Aqueduct Subsidence Project
CCR	California Code of Regulations
cfs	Cubic Feet per Second
CIMIS	California Irrigation Management Information System
CVP	Central Valley Project
CY	Calendar Year
DCP	Delta Conveyance Project
DMS	Data Management System
DTW	Depth to Water
DWR	Department of Water Resources
EIR	Environmental Impact Report
ET	Evapotranspiration
ft	Feet
FY	Fiscal Year
GDE	Groundwater Dependent Ecosystem
GPS	Global Positioning System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWE	Groundwater Elevation
GWSC	Groundwater Service Charge
IM	Interim Milestone
JPA	Joint Powers Agreement
KCWA	Kern County Water Agency
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter
MO	Measurable Objective
msl	Mean Sea Level
MT	Minimum Threshold
NA	Not Available
NAVD88	North American Vertical Datum of 1988
ND	Non-Detect
P/MAs	Projects and Management Actions
POD	Point of Diversion
PRISM	Parameter-elevation Regressions on Independent Slopes Model
RCA	Recommended Corrective Action
RMW	Representative Monitoring Well

RMW-ISW	Representative Monitoring Well for Depletions of Interconnected Surface Water
RMW-WL	Representative Monitoring Well for Chronic Lowering of Groundwater Levels
RMW-WQ	Representative Monitoring Well for Degraded Water Quality
SAFER	Safe and Affordable Funding for Equity and Resilience
SDWIS	Safe Drinking Water Information System
SGMA	Sustainable Groundwater Management Act
SMB	Soil Moisture Budget
SMC	Sustainable Management Criteria
SOPAC	Scripps Orbit and Permanent Array Center
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TBD	To be Determined
TCWD	Tejon-Castac Water District
TRCC	Tejon Ranch Commerce Center
TT	Trigger Threshold
UNAVCO	University NAVSTAR Consortium
USBR	United States Bureau of Reclamation
WRM GSA	Wheeler Ridge-Maricopa Groundwater Sustainability Agency
WRMWSD	Wheeler Ridge-Maricopa Water Storage District
WWB	White Wolf Basin
WWF	White Wolf Fault
WWGFM	White Wolf Groundwater Flow Model
WWGSA	White Wolf Groundwater Sustainability Agency
WWTP	Wastewater Treatment Plant
WY	Water Year

EXECUTIVE SUMMARY

The San Joaquin Valley Groundwater Basin - White Wolf Subbasin (referred to herein as "the Basin"), California Department of Water Resources (DWR) Basin No. 5-022.18, is classified as a "medium priority" basin (DWR, 2019). To address the long-term reliability of groundwater within the Basin, the White Wolf Groundwater Sustainability Agency (WWGSA) developed a Groundwater Sustainability Plan (GSP), which was adopted by the White Wolf GSA Board on 25 January 2022, submitted to DWR on 28 January 2022, and approved by DWR on 26 October 2023.

This Water Year (WY) 2025 Annual Report for the Basin has been prepared in compliance with California Code of Regulations (CCR) Title 23 § 356.2 and is consistent with the DWR's October 2023 *GSP Implementation: A guide to Annual Reports, Periodic Evaluations, & Plan Amendments* (DWR, 2023b). WY 2025 includes the period from 1 October 2024 through 30 September 2025.

The WWGSA is the exclusive Groundwater Sustainability Agency (GSA) for the Basin and was formed in 2017 upon adoption of a Joint Powers Agreement (JPA). The WWGSA is governed by a seven-member Board of Directors which includes two (2) representatives of each member district: Arvin-Edison Water Storage District (AEWSD), Tejon-Castac Water District (TCWD), and Wheeler Ridge-Maricopa Water Storage District (WRMWSD). Kern County is represented as the seventh, non-voting member of the Board.

The Basin encompasses 107,532 acres in the southernmost region of the San Joaquin Valley Groundwater Basin within Kern County, California, as shown on **Figure 1**. The Basin contains one principal aquifer, inclusive of the Shallow Alluvium, Kern River Formation, and Chanac Formation. South of the Springs Fault there is a shallow water-bearing zone that is hydraulically separated from the main portion of the principal aquifer.

The WWGSA adopted the following Sustainability Goal for the Basin: *Cooperatively continue to maintain an economically-viable groundwater resource within the White Wolf Subbasin that supports the current and future beneficial uses and users of groundwater by utilizing the area's groundwater resources within the local sustainable yield and avoiding undesirable results*.

Groundwater elevation contours are shown on **Figure 2** for Fall 2024 (seasonal low) and on **Figure 3** for Spring 2025 (seasonal high). The contour maps show that groundwater generally flows from the southeast to the northwest and that the flow direction and magnitude did not vary greatly between the seasonal low to seasonal high periods in WY 2025.

The Basin currently has 14 Representative Monitoring Wells (RMWs) for Chronic Lowering of Groundwater Levels (RMW-WL). **Figure 4** presents hydrographs of groundwater elevations for the RMW-WLs. **Table 6** and **Figure 11** and **Figure 12** provide tabular comparisons of the water levels in the RMW-WLs to the Sustainable Management Criteria (SMCs) for the Fall and Spring monitoring events. Seasonal groundwater levels in all viable RMW-WLs were above their Minimum Thresholds (MTs) over the reporting period. Among the RMW-WLs that had at least one groundwater level measurement collected during WY 2025:

- Four RMW-WLs had groundwater levels above their Measurable Objectives (MOs), and thus Interim Milestones (IMs), for at least one seasonal (Spring or Fall) groundwater level measurement;
- One RMW-WL had groundwater levels between its IM and MO for both Fall 2024 and Spring 2025;

- Five RMW-WLs had groundwater levels below their IMs but above their MTs during this time; and
- One RMW-WL had a groundwater level between its MT and IM in the Fall 2024 but rose to an elevation between its IM and MO in Spring 2025.

Based on the definition in the GSP, as shown on **Figure 13**, no Undesirable Results related to Chronic Lowering of Groundwater Levels (and Reduction of Groundwater Storage by proxy) are occurring in the Basin.

Groundwater and surface water uses in the Basin during WY 2025 are summarized in **Table 1** and **Table 3**, respectively. Total groundwater extractions were determined through a combination of metered data, where available, and calculated using the Soil Moisture Budget (SMB) model developed for the Basin as described in **Section 3**. Total pumpage in WY 2025 was approximately 30,631 acre-feet (AF), of which virtually all (30,630 AF) was for the agricultural sector. General locations of groundwater extractions are shown on **Figure 6**. Groundwater and imported surface water were the major sources of water in the Basin during WY 2025; the WY 2025 water supply consisted of 30% groundwater, 70% surface water (imported 93% and stream diversions 7%), and less than 1% recycled water.

Changes in groundwater storage were estimated using the White Wolf Groundwater Flow Model (WWGFM or model), a three-dimensional numerical groundwater flow model, which was prepared to analyze water budget information for the Basin as part of the GSP. Modeled groundwater levels generally match the magnitude and trends of the measured water levels in Basin wells (**Figure 8**); thus, the Basin model is sufficiently accurate for reporting purposes. A map of the simulated water level difference and groundwater storage change in the Basin between WY 2024 and WY 2025, as calculated by the WWGFM on a per-model-cell basis, is shown on **Figure 9**. Generally, most of the Basin experienced a slight increase in groundwater storage over the WY. **Figure 10** shows water year type, groundwater use, estimated annual change in groundwater storage, and the cumulative estimated change in groundwater storage for the Basin from WY 1995 to WY 2025. **Table 5** summarizes the estimated annual change in groundwater storage from WY 2015 to WY 2025. WY 2025 was a below normal year, and the estimated change in groundwater storage for the Basin (+6,500 AF) is more positive than that observed in the last below normal year (WY 2018).

The Basin currently has four RMWs for Degraded Water Quality (RMW-WQ). Publicly available data for identified constituents of concern measured in the RMW-WQs, and their various SMCs are provided in **Table 7** and **Figure 14**. All measured concentrations in the RMW-WQs for the three defined constituents of concern (Arsenic, Nitrate as Nitrogen, and Selenium) were below the Maximum Contaminant Levels (MCLs) and therefore the MTs. Based on the definition in the GSP, no Undesirable Results related to Degraded Water Quality are occurring in the Basin.

Various sources of vertical displacement data indicate that very little land subsidence occurred in the Basin. Vertical displacement averaged around -0.02 feet over WY 2025 (see **Figure 16**), which is within the measurement error of all applicable measurement methodologies. Based on the definition in the GSP, no Undesirable Results related to Land Subsidence are occurring in the Basin.

The Basin currently has three RMWs for Depletions of Interconnected Surface Waters (RMW-ISW). **Figure 5** presents hydrographs of depth to groundwater for the RMW-ISWs. **Table 9** provides a tabular comparison of the depths to groundwater in the RMW-ISWs, and their various SMCs. Seasonal high and low groundwater levels in all the RMW-ISWs were above MTs. Based on the definition in the GSP, no Undesirable Results related to Depletions of Interconnected Surface Waters are occurring in the Basin.

Finally, Seawater Intrusion is not present within the Basin and is not anticipated to be present in the future; therefore, the Sustainability Indicator is not applicable to the Basin.

The GSP outlined 24 potential Projects and Management Actions (P/MAs) for the Basin, and the WWGSA has additional potential P/MAs since GSP adoption. Implementation of several P/MAs has proceeded during this reporting period, including purchasing more than 71,000 AF of additional surface water for in-lieu use in the White Wolf and neighboring Kern Subbasins, reuse of treated recycled water supplied to new apartments for irrigation and recharge, and retiring 2,742 acres of irrigated cropland. A brief description of each P/MA and their implementation status is listed in **Section 7.2** and on **Table 10**. Progress made towards addressing recommended DWR corrective actions is outlined in **Table 11**.

The WWGSA held a total of eleven public meetings over WY 2025 to disseminate information to stakeholders and report on the state of the Basin and progress on GSP and P/MA implementation, including eight WWGSA Board of Directors meetings and three P/MA Technical Advisory Committee (TAC) meetings. Other successful efforts by the WWGSA include replacing two representative monitoring wells, conducting ongoing monitoring and reporting, and continuing development of two water conveyance projects.

1 GENERAL INFORMATION

☑ *§ 356.2 (a)*

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.

On 16 September 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) - the primary purpose of which is to achieve and/or maintain sustainability within the state's high and medium priority groundwater basins. The San Joaquin Valley Groundwater Basin - White Wolf Subbasin (referred to herein as "the Basin"), California Department of Water Resources (DWR) Basin No. 5-022.18, is classified as a "medium priority" basin (DWR, 2019). To address the long-term reliability of groundwater within the Basin, the White Wolf Groundwater Sustainability Agency (WWGSA) developed a Groundwater Sustainability Plan (GSP), which was adopted by the WWGSA Board on 25 January 2022, submitted to DWR on 28 January 2022, and approved by DWR on 26 October 2023 with four Recommended Corrective Actions (RCAs) further discussed in **Sections 7.1** and **7.3** (WWGSA, 2021; DWR, 2023a).

This Water Year (WY) 2025 Annual Report for the Basin has been prepared in compliance with California Code of Regulations (CCR) Title 23 § 356.2 and is consistent with the DWR's October 2023 *GSP Implementation: A guide to Annual Reports, Periodic Evaluations, & Plan Amendments* guidance document (DWR, 2023,b). WY 2025 includes the period from 1 October 2024 through 30 September 2025. This Annual Report also contains available and appropriate historical information back to calendar year 2015, as required by CCR 23 §356.2 (b). The GSP Annual Report Element check list from DWR's guide is included as **Appendix A** and identifies where each Annual Report element is specifically addressed in this report.

The WWGSA is the exclusive Groundwater Sustainability Agency (GSA) for the Basin. The WWGSA was formed in 2017 upon adoption of a Joint Powers Agreement (JPA) and is governed by a seven-member Board of Directors which includes two (2) representatives of each member district: Arvin-Edison Water Storage District (AEWSD), Tejon-Castac Water District (TCWD), and Wheeler Ridge-Maricopa Water Storage District (WRMWSD). Kern County is represented as the seventh, non-voting member of the Board.

The Basin encompasses 107,532 acres at the southern end of the San Joaquin Valley Groundwater Basin (see **Figure 1**) within Kern County. The Basin is bordered on the north by the Kern County Subbasin, with no adjacent basins located to the south, east, or west.

The WWGSA adopted the following Sustainability Goal for the Basin: *Cooperatively continue to maintain an economically-viable groundwater resource within the White Wolf Subbasin that supports the current and future beneficial uses and users of groundwater by utilizing the area's groundwater resources within the local sustainable yield and avoiding undesirable results*.

Available hydrogeologic information indicates that the Basin is bounded on the north by the White Wolf Fault (WWF) system, on the east and south by a crystalline basement complex of the Tehachapi Mountains, and on the west by Tertiary-age sedimentary rocks of the San Emigdio Mountains. The Basin contains one Principal Aquifer, consisting of the deposits of Shallow Alluvium, Kern River Formation, and

Chanac Formation. The thickness of the Principal Aquifer ranges from 25 to 7,518 feet (ft) with an average thickness of 2,200 ft over the entire Basin. The Springs Fault lies subparallel to the WWF in the southeastern portion of the Basin and forms a hydraulic barrier to groundwater flow, effectively separating the Principal Aquifer from a shallow water-bearing zone that supports the local occurrence of Groundwater Dependent Ecosystems (GDEs).

Sources of water to the Basin groundwater system include recharge from infiltration of applied water[1], precipitation, leakage from distribution and conveyance channels, and leakage from streams, as well as subsurface groundwater flow up from the unpumped aquifer[2]. Outflows from the Basin include groundwater pumping, evapotranspiration (ET) of shallow groundwater in the vicinity of the GDEs, and subsurface outflow to the Kern County Subbasin across the WWF.

[1] Applied water includes groundwater and imported surface water. Imported surface water can be a combination of contracted State Water Project (SWP) water, contracted Central Valley Project (CVP) water, transfer water, exchanged water, and/or banked water managed through the individual district's service area and water supply portfolio.

[2] The Basin is underlain by four potentially water-bearing units, including the shallow alluvium, the Kern River Formation, the Chanac Formation, and the Santa Margarita Formation. For the purposes of the Groundwater Sustainability Plan (GSP) and consistent with the definition of the bottom of the Basin, the Principal Aquifer is defined as consisting of the shallow alluvium, Kern River Formation, and Chanac Formation deposits. The Santa Margarita Formation deposits are therefore defined as the deeper unpumped aquifer.

2 GROUNDWATER ELEVATION DATA

☑ *§ 356.2 (b) (1)*

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:

(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.

Groundwater elevation data were collected from eleven (11) out of fourteen (14) Representative Monitoring Wells for Chronic Lowering of Groundwater Levels (RMW-WLs). Data was additionally provided by AEWSD, TCWD, and WRMWSD from wells within their respective supplemental groundwater monitoring networks. During WY 2023, three Representative Monitoring Wells (RMWs) partially collapsed and/or were no longer viable for groundwater level monitoring (RMW-WWB-005, RMW-WWB-007, and RMW-WWB-009). Due to the continued unavailability of these wells and inconsistencies between water levels in two nearby wells previously used as surrogates, representative measurements for these wells could not be obtained. Replacements for RMW-WWB-007 and RMW-WWB-009 (referred to as RMW-WWB-007R and RMW-WWB-009R, respectively) were completed in September 2025 and will be monitored in place of RMW-WWB-007 and RMW-WWB-009 beginning in early WY 2026.

2.1 Groundwater Elevation Contour Maps

Figure 2 and **Figure 3** present groundwater elevation contours for the Principal Aquifer based on data collected in Fall 2024 and Spring 2025, respectively. For the purposes of this Annual Report, Fall 2024 measurements were those collected between 7 October and 13 December 2024, and Spring 2025 measurements were those collected between 30 January and 20 March 2025. **Figure 2** illustrates the WY 2025 seasonal low (Fall 2024), and **Figure 3** illustrates the WY 2025 seasonal high (Spring 2025) groundwater elevation contours in the Basin.

Figure 2 and **Figure 3** show that in WY 2025, groundwater elevations in the Basin generally are highest in the southeast, in areas of higher topography and generally decrease to the northwest; therefore, groundwater flow directions are generally to the northwest. The groundwater elevation contours during WY 2025 are similar to the groundwater elevation contours in previous WYs.

2.2 Groundwater Hydrographs

Long-term hydrographs showing historical groundwater elevation data through WY 2025 for the RMW-WLs are shown on **Figure 4** and are included in **Appendix B**.[3] The Sustainable Management Criteria (SMCs) including Measurable Objectives (MOs), Minimum Thresholds (MTs), and Interim Milestones (IMs) have been established for groundwater levels at the 14 RMW-WLs, based on a multi-step process that included evaluation of current and historical groundwater elevation data, projected trends, and analysis of potential impacts to existing wells (i.e., beneficial users).[4] The SMCs are depicted graphically on the hydrographs on **Figure 4** and are summarized in **Table 6**. Seasonal water levels in all monitored RMW-WLs were above their MTs over the reporting period, as shown in the hydrographs on **Figure 4**. Water levels remained generally stable over the WY, with RMW-WLs in the east exhibiting slightly increasing trends, RMW-WLs in the north exhibiting seasonal fluctuations, and RMW-WLs in the west and south exhibiting slightly decreasing trends.

Three (3) Representative Monitoring Wells for Depletions of Interconnected Surface Waters (RMW-ISWs) were installed in January 2021 to fill data gaps associated with the shallow water-bearing zone located upgradient of the Springs Fault that supports localized GDEs. Hydrographs showing the depth to groundwater data collected through WY 2025 for the RMW-ISWs are shown on **Figure 5**. Based on limited availability of shallow depth to groundwater data, preliminary MOs and MTs were established at the three RMW-ISWs using groundwater levels as proxy.[5] The preliminary MOs and MTs are depicted graphically on the hydrographs and are summarized in **Table 9**. Water levels were above their MTs over the reporting period and generally above MOs for all three RMW-ISWs. Groundwater levels declined in RMW-WWB-021, remained stable in RMW-WWB-019, and rose in RMW-WWB-020. These differences in trends may reflect differences in distance to El Paso Creek, the most significant nearby water source, variations in evapotranspiration by deep-rooted vegetation, or movement of shallow groundwater downhill in response to topographic changes. High frequency depth to groundwater measurements in the RMW-ISWs that are located near the near GDEs and modeling exercises undertaken as part of the Periodic Evaluation do not suggest depletions over time are occurring in response to pumping. Using the White Wolf Groundwater Flow Model (WWGFM or model) to simulate conditions in the Basin with and without groundwater pumping does not result in an observable difference in simulated seepage through stream beds. The disconnection between the Principal Aquifer and the shallow water-bearing zone is further supported by the fact that RMW-WWB-021, which displays the most volatility of the RMW-ISWs, is the farthest from any known pumping wells. Rather, these shallow groundwater levels appear to generally follow local patterns of precipitation (**Figure 5**). The preliminary SMCs for Depletions of Interconnected Surface Waters will be assessed and re-evaluated during the upcoming Periodic Evaluation.

[3] Hydrographs show static water levels. Erroneous groundwater elevation data or groundwater elevation data marked as questionable are excluded from the hydrographs.
[4] White Wolf GSA, 2021, Groundwater Sustainability Plan White Wolf Subbasin. Prepared by EKI Environment & Water Inc. for White Wolf Groundwater Sustainability Agency. December 2021.
[5] See note 4.

3 GROUNDWATER EXTRACTION DATA

☑ *§ 356.2 (b) (2)*

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:

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

(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.

Table 1 shows the WY 2025 groundwater extraction data by water use sector and measurement method. **Figure 6** shows the general location and volume of groundwater extractions and **Figure 7** shows the total estimated pumping since 2015 compared to the estimated sustainable yield range (i.e., 38,200 to 47,200 acre-feet per year [AFY]). Total pumping in WY 2025 was approximately 30,600 AF, of which almost all was for the agricultural sector. As shown in **Figure 7**, estimated WY 2025 pumping was within the estimated sustainable yield.

Groundwater extraction is quantified based on a combination of metered volumes at specific well locations, and estimated volumes based on the Soil Moisture Balance accounting (SMB) model developed for the Basin. The SMB estimates groundwater pumping by satisfying any unmet agricultural demand, as estimated by satellite ET data, after precipitation and applied surface water, and with consideration for irrigation efficiency.[6] There were not any new or improved groundwater extraction measurement methods available in WY 2025 compared to prior WYs.

Groundwater for agricultural irrigation is extracted from both WRMWSD-owned and privately-owned wells. WRMWSD-owned wells and wells that pump into the WRMWSD water distribution system have metered monthly pumping data and were not active in WY 2025, except for minor routine maintenance. AEWSD has five privately-owned, metered wells within the Basin. Metered data is reported in AF; reported data are assumed to have a high level of accuracy ranging from 0% to 5%, with a precision of 0.01 AF for WRMWSD meters and 0.001 AF for AEWSD meters. Other privately-owned agricultural pumping has been estimated by the SMB model. Groundwater extractions estimated by the SMB model have a lesser degree of accuracy ranging from 10% to 20%, with a precision of 100 AF to 1,000 AF, as they are estimated from other data inputs and calibrated model parameters.

Groundwater for urban use in developed areas is extracted from public water systems wells. Three public water systems were identified within the Basin: TCWD (CA1503341), Tut Brothers Farm #96 (CA1500516), and Cuyama Orchards (CA1503679). Public water system pumping was extracted from the Safe and

[6] Details about the SMB can be found in the GSP and associated Appendix L. White Wolf GSA, 2021, Groundwater Sustainability Plan White Wolf Subbasin. Prepared by EKI Environment & Water Inc. for White Wolf Groundwater Sustainability Agency. December 2021.

Affordable Funding for Equity and Resilience (SAFER) Clearinghouse. Data was reported in gallons, with a precision of 10 gallons.

There are approximately 18 to 20 households within the Basin supplied by unmetered domestic wells. Local residential (single family and multi-family) water use is approximately 84 gallons per capita per day (Arvin Community Services District, 2021). The 2024 American Community Survey estimates that the average household size in the Mettler Census Designated Place is 3.11 people (U.S. Census Bureau, n.d.). Additionally, one metered domestic well pumped 1.481 AF in WY 2025. Thus, domestic well users in the Basin are estimated to pump approximately 6 AFY.

Finally, there is evaporation that occurs directly from the groundwater system in areas of shallow groundwater conditions. This primarily occurs in areas that support localized GDEs. The WWGFM simulates evaporation from the water table based on an assumed evaporation extinction depth of 7.0 ft and a monthly pan evaporation rate based on historical data from nearby stations. Groundwater use by native vegetation as estimated by the WWGFM has a medium level of accuracy, ranging from 40% to 50%, as it is estimated from calibrated model parameters and fault representation.

Table 1. Summary of Groundwater Extraction Data by Sector

Water Year	**Pumping, Agricultural** (AF)		**Pumping, Urban/ Domestic** (AF)[c] [d]	**Pumping, Total** (AF)	**Evaporation of Shallow Groundwater/GDEs** (AF)
	Metered [a]	Groundwater Model Estimate [b]	Metered/Other		Groundwater Model Estimate [e]
2025	530	30,100	7	30,637	900

Abbreviations:
AF = acre-feet
GDEs = groundwater dependent ecosystems

Notes:
(a) Metered data provided by WRMWSD and AEWSD. Values rounded to the nearest AF.
(b) Agricultural pumping is estimated by the Basin's Soil Moisture Budget (SMB) Accounting model and input into the White Wolf Groundwater Flow Model (WWGFM) domain. Approximately 5% of the SMB-calculated private irrigation well pumping is not represented in the WWGFM due to either the proximity of the well locations to the White Wolf Fault and fault geometry or to assumptions on screened interval placement within model layers which may go dry during the model simulation period. Estimated agricultural pumping reported is after the approximately 5% reduction and is rounded to the nearest hundred AF.
(c) Metered urban data is compiled from the SAFER Clearinghouse and rounded up to the nearest AF.
(d) Domestic pumping is assumed to be 6 AF, as described above.
(e) Evaporation as estimated by the WWGFM. Value is rounded to the nearest hundred AF.

4 SURFACE WATER SUPPLY

☑ *§ 356.2 (b) (3)*

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:

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

(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.

Surface water supplies in the Basin include imported surface water[7], natural stream inflows, and recycled water. WY 2025 imported surface water data was provided by WRMWSD, AEWSD, and TCWD, as shown in **Table 2**. WY 2025 was a below normal year[8] and AEWSD and WRMWSD received imported water contractual allocations to serve surface water in-lieu of landowners using groundwater in the Basin.

WRMWSD has a total service area of 152,095 acres, of which 57,600 acres (38%) is within the Basin. WRMWSD imports State Water Project (SWP) water pursuant to its contractual agreement with the Kern County Water Agency (KCWA) for 197,088 AFY of Table A Allocation. WRMWSD delivers a combination of imported surface water and groundwater to the Basin. In WY 2025, WRMWSD delivered 43,544 AF of surface water to the Basin for agricultural use, based on metered deliveries by turnout. WRMWSD did not deliver any groundwater in WY 2025. Similarly, in WY 2025, WRMWSD delivered 2,979 AF of water for industrial use, based on metered deliveries by turnout.[9] Finally, in WY 2025, WRMWSD did not deliver any water for managed recharge. All metered data was reported in AF; reported data are assumed to have a high level of accuracy ranging between 5% and 10%, with a precision of 0.01 AF.

AEWSD has a total service area of 131,660 acres, of which 23,400 acres (17%) is within the Basin. AEWSD contracts with the United States Bureau of Reclamation (USBR) for water service from the Central Valley Project (CVP). AEWSD's USBR contract provides for 40,000 AFY of Class 1 water and up to 311,675 AFY of Class 2 water from the Friant Division of the CVP. In WY 2025, AEWSD delivered 21,727 AF of water for agricultural use within the Basin, based on metered deliveries by turnout. AEWSD did not deliver any

[7] Imported surface water is a combination of contracted SWP water, contracted CVP water, transfer water, exchanged water, and/or banked water managed through the individual district's service area and water supply portfolio.

[8] DWR-published Water Year (WY) type for the Basin's Hydrologic Unit Code (HUC) 8 watershed was not available at the time of drafting the WY 2025 Annual Report. As such, WY type for 2025 was calculated using the same methodology presented in DWR, 2021.

[9] Imported surface water delivered by WRMWSD to industrial users are not included in the Soil Moisture Balance accounting model (SMB). 94% of the industrial water was delivered to Pastoria Energy Facility. It is assumed that these industrial deliveries contributions to the groundwater system are negligible.

water for managed recharge in WY 2025. Metered data was reported in AF; reported data are assumed to have a high level of accuracy ranging between 5% and 10%, with a precision of 1.0 AF.

TCWD has a total service area of 61,400 acres, of which 20,800 acres (34%) is within the Basin. TCWD provides water and wastewater service to the Tejon Ranch Commerce Center (TRCC), the only significant commercial development in the Basin. TCWD has rights to receive up to 5,278 AFY of SWP surface water supplies (62% designated for agricultural uses and 38% designated for urban uses) under contracts with KCWA. For WY 2025, TCWD provided a total of 416 AF in-District and/or transfer deliveries of SWP water. Data was reported in AF; reported data are assumed to have a high level of accuracy ranging between 5% and 10%, with a precision of 1.0 AF.

There are stream diversions at points of diversion (PODs) on El Paso, Grapevine, Tunis, Tejon, and Pastoria Creeks and connected reservoirs that are utilized for irrigation by the overlying landowner. Diversions are reported in AF based on flowmeters that record in either AF or cubic feet per second (cfs). The flowmeters have been calibrated with a high level of accuracy ranging between 5% and 10%, estimated at 0.1 AF. In WY 2025, stream diversions totaled 13,867 AF. Of this 5,240 AF was used, as shown in **Table 2**, and the rest was diverted to storage or absorbed by the stream bed.

Finally, at the TRCC, small amounts of recycled water are used for irrigation and recharge the groundwater system from an unlined pond at their west Wastewater Treatment Plant. Recycled water used for landscape irrigation on the eastside of TRCC is recorded by TCWD based on consumer water meters that record in hundred cubic feet (ccf) and therefore have a high level of accuracy ranging between 5% and 10%, with a precision of 1.0 ccf. Similarly, recycled water inflows to the west Wastewater Treatment Plant are recorded by TCWD based on water meters at the east and west Wastewater Treatment Plants that record in gallons and therefore have a high level of accuracy ranging between 0% and 5%, with a precision of 100 gallons.

Consistent with the surface water supply categories identified by DWR, **Table 3** summarizes the surface water supply by sector based on a proportioning and combination of values from **Table 2**. These surface water supply sectors include: CVP supplies, SWP supplies, local supplies (i.e., stream diversions), local imported supplies (i.e., surface water from local sources or recovered water from AEWSD spreading works facilities imported from areas outside of the Basin), and recycled water.

Table 2. Summary of Surface Water Supply by Source

Water Year	WRMWSD Imports [a] (AF)			AEWSD Imports [a] (AF)		TCWD Imports (AF)	Stream Diversions [d] (AF)	Recycled Water [e] (AF)		Total (AF)
	Agricultural [b]	Industrial [c]	Recharge	Agricultural	Recharge	Urban	Agricultural	Urban	Recharge	
2025	43,544	2,979	0	21,727	0	416	5,240	108	41	74,055

Abbreviations:
AEWSD = Arvin-Edison Water Storage District
AF = acre-feet
TCWD = Tejon-Castac Water Storage District
WRMWSD = Wheeler Ridge-Maricopa Water Storage District

Notes:
(a) Metered data provided by WRMWSD and AEWSD. Surface water imports are based on surface water deliveries to customers. Actual imports may be greater due to conveyance system losses.
(b) Agricultural deliveries are calculated based on the total water delivered by turnout, minus the total volume of metered groundwater pumped into the WRMWSD distribution system by both District-owned and privately-owned wells (see **Table 1**).
(c) Imported surface water delivered by WRMWSD to industrial users are not included in the Soil Moisture Balance Accounting model (SMB). 94% of the industrial water was delivered to Pastoria Energy Facility. It is assumed that these industrial deliveries' contributions to the groundwater system are negligible.
(d) For WY 2025, stream diversions reported are the quantities diverted for use from Reservoir 1 (sourced from Tejon and El Paso creeks), Reservoir 2 (sourced from Liveoak, Pastoria, Tunis, El Paso, and Tejon creeks), and from Grapevine Creek at POD 9.
(e) Metered recycled water data provided by TCWD. Value is rounded to the nearest AF.

Table 3. Summary of Surface Water Supply by Sector

Surface Water Supply Sector	Water Use (AF) [a]	Methods Used to Estimate[b]
Central Valley Project	6,301	Portion of total AEWSD imports sourced from the Friant-Kern Canal
State Water Project	53,240	All WRMWSD imports, all TCWD imports, and the portion of total AEWSD imports sourced from the California Aqueduct and Cross Valley Canal
Local Supplies	5,240	All stream diversions
Local Imported Supplies	9,125	Portion of total AEWSD imports sourced from exchanges with Kern subbasin districts or recovered from AEWSD spreading works facilities in the Kern County Subbasin
Recycled Water	149	Outdoor use at TRCC and infiltrated at the West WWTP
Total	74,055	

Abbreviations:

AEWSD = Arvin-Edison Water Storage District
AF = acre-feet
WRMWSD = Wheeler Ridge Maricopa Water Storage District
TCWD = Tejon-Castac Water District
TRCC = Tejon Ranch Commerce Center
WWTP = Wastewater treatment plant

Notes:

(a) See **Table 2** for water use components. Values are rounded to the nearest AF.
(b) Portion of AEWSD imports by source determined based on relative proportions of each source of total AEWSD surface water supply (inside and outside of Basin) applied to total AEWSD surface water deliveries in the Basin.

5 TOTAL WATER SUPPLY

☑ *§ 356.2 (b) (4)*

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:

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

(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.

As described above, surface water and groundwater extraction comprise the majority of water use in the Basin. The total water use is equal to the sum of total estimated groundwater extraction (**Table 1**)**,** the total surface water supplies (**Table 2** and **Table 3**), and total applied recycled water (**Table 2**). Total water use by water use sector (i.e., agricultural, industrial, urban, managed recharge, and native vegetation) and by water use source type (i.e., groundwater, surface water, and recycled water) is tabulated in **Table 4**. Approximately 96% of the water was used for agriculture, and 30% is from groundwater extractions.

Methods of measurement and accuracy of measurements for groundwater extraction and surface water data are summarized in **Section 4** and **Section 5** respectively.

Table 4. Summary of Total Water Use by Sector and Source Type

Water Year	Agricultural (AF)			Industrial (AF)	Urban/ Domestic (AF)				Managed Recharge (AF)			Native Vegetation (AF)	Total Water Use
	Ground-water[a]	Surface Water[b]	Total	Surface Water[c]	Ground-water[a]	Surface Water[c]	Recycled Water[c]	Total	Surface Water[c]	Recycled Water[c]	Total	Ground-water[d]	
2025	30,630	70,511	101,141	2,979	7	416	108	531	0	41	41	900	105,592

Abbreviations:

AF = acre-feet

Notes:

(a) Combination of metered data when available and estimated when unavailable. See **Table 1** for details. Values rounded to the nearest AF.

(b) Surface water includes both imported water and stream diversions based on metered data. See **Table 2** and **Table 3** for details. Values rounded to the nearest AF.

(c) Metered data. See **Table 2** for details. Values rounded to the nearest AF.

(d) Native vegetation represented by evaporation from shallow groundwater/GDEs estimated from the WWGFM. See **Table 1** for details. Values rounded to the nearest hundred AF.

6 CHANGE IN GROUNDWATER STORAGE

☑ *§ 356.2 (b) (4)*

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:

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

(4) 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.

Changes in groundwater storage were estimated using the WWGFM, a three-dimensional numerical groundwater flow model based on the U.S. Geological Survey public-domain software package MODFLOW. The Basin-specific model was developed as part of the GSP to analyze water budget information and quantify the historical and current change in groundwater storage over the WY 1995-2019 time period. The WWGFM was extended through WY 2025 to support change in groundwater storage calculations for this Annual Report by extending:

- Daily precipitation data from Parameter-elevation Regressions on Independent Slopes Model (PRISM);
- Monthly satellite ET data from Land IQ;
- Daily reference ET Data from California Irrigation Management Information System (CIMIS) Arvin-Edison station #125;
- Monthly surface water imports/delivery records from AEWSD, WRMWSD, and TCWD internal operations records;
- Seasonal (Spring and Fall) land use from surveys conducted by AEWSD, WRMWSD, and TCWD;
- Monthly recycled water usage from TCWD internal operations records;
- Monthly pumping records including: (1) WRMWSD “pump in” records of privately pumped groundwater that has been added to the WRMWSD water distribution system from the District’s internal operations records; (2) WRMWSD pumping volumes from District-owned wells from the District’s internal operations records; (3) Public Water System pumping; and (4) private agricultural pumping calculated by the SMB;
- Monthly stream diversions at PODs on El Paso, Grapevine, Tunis, Tejon, and Pastoria Creeks and Reservoirs 1 and 2; and

- Boundary conditions, including: (1) water level time series from wells located in Kern County Subbasin for simulating flow across the WWF, and (2) monthly stream inflows based on a watershed analysis.

In addition to the annual extension, the WWGFM was updated and recalibrated in both WY 2024 and WY 2025 to better represent unsaturated zone processes, upland groundwater heads, distribution of surface water deliveries, and timing of stream inflows. As a result, model outputs for prior water years may differ from values previously reported using earlier version. For consistency with prior Annual Reports, previously reported groundwater storage values are retained for earlier water years. Calculated groundwater storage changes for WYs 2024 and 2025 are based on the updated models from WYs 2024 and 2025, respectively.

As a check on model performance, the groundwater elevations in wells predicted by the WWGFM during WY 2025 were compared to the groundwater elevations measured in wells during WY 2025. **Figure 8** presents a scatterplot of model-calculated vs. observed water levels. The coefficient of determination (R^2) of 0.97 indicates a strong correlation between modeled and observed groundwater elevations. These results demonstrate that the model reasonably reproduces observed groundwater levels and provides support for the reliability of simulated groundwater storage changes for WY 2025.

Figure 9 is a map of model-calculated water level difference and model-estimated changes in groundwater storage within the Basin between WY 2024 and WY 2025. Water level changes in model layer 2 (in which the water table is located) are generally modest across the Basin, with much of the central area showing increases of approximately 0 to 3 ft. Localized areas of decline (up to approximately 3 ft) are shown along the foothill portions of the Basin. The WWGFM calculates the change in groundwater storage based on the estimated change in water level and the calibrated storage properties of each model cell. **Figure 9** shows storage changes which are predominately within +/-2.5 AF per acre, with broad areas showing small positive storage changes (0 to 2.5 AF/acre) and localized areas of small storage decline. The southeastern fringe of the Basin exhibits areas of storage decrease, consistent with areas of minor water level decline.

Figure 10 shows water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater storage for the Basin from WY 1995 to WY 2025. Change in storage since WY 2015 is also tabulated in **Table 5**. WY 2025 was a below normal year[10] and the Basin experienced an increase in net groundwater storage of 6,500 AF. This is more positive than the storage change calculated for the last below normal year (WY 2018), most likely due to decreased pumping in recent water years.

[10] DWR-published Water Year type for the Basin's Hydrologic Unit Code (HUC) 8 watershed was not available at the time of drafting the WY 2025 Annual Report. As such, WY type for 2025 was calculated using the same methodology presented in DWR, 2021. This method entails summing the total average precipitation on the HUC watershed, calculating a water year type index based on a 70% current water year and 30% prior water year precipitation weighting, and ranking the index compared to the past 30-years.

Table 5. Annual Change in Storage by DWR Water Year Type

Water Year	Water Year Type	Change in Storage (AFY) [(a)]
2015	Dry	-37,900
2016	Above Normal	-34,400
2017	Wet	17,500
2018	Below Normal	-40,900
2019	Wet	-3,300
2020	Above Normal	1,300
2021	Critical	-50,900
2022	Critical	-44,500
2023	Wet	50,200
2024 [(b)]	Wet	300
2025 [(b)]	Below Normal	6,500

Abbreviations

AFY = acre-feet per year

DWR = California Department of Water Resources

Notes:

(a) Change in storage values are rounded to the nearest hundred AFY.

(b) Change in storage for WY 2024 and 2025 was calculated using the updated and recalibrated WWGFM versions for each respective year. Data for prior years are the previously reported values.

7 PLAN IMPLEMENTATION

☑ *§ 356.2 (b) (4)*

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:

(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.

The following sections provide a description of progress on GSP implementation during WY 2025 including: a comparison of current conditions to the SMCs for each Sustainability Indicator, updates on Projects and Management Actions (P/MAs), progress on addressing DWR's recommended corrective actions, and other implementation progress such as stakeholder outreach and engagement, public comments, and anticipated implementation actions for WY 2026.

7.1 Current Conditions – Sustainability Indicators

The following sections describe how current conditions compare to the SMCs established for each applicable sustainability indicator in the GSP.

7.1.1 Chronic Lowering of Groundwater Levels

Table 6 compares the WY 2025 groundwater elevations to the IMs set at the RMW-WLs established for the Chronic Lowering of Groundwater Levels Sustainability Indicator. **Figure 11** and **Figure 12** show the Fall 2024 and Spring 2025 water levels measured at the RMW-WLs relative to their SMCs, respectively. The RMW-WL locations are indicated on the map, and the groundwater levels at each RMW-WL relative to each MO and MT are indicated in the callout boxes. Four RMW-WLs had groundwater levels above their MOs, and thus IMs, for at least one seasonal (Spring or Fall) groundwater level measurement. One RMW-WL had groundwater levels between its IM and MO for both Fall 2024 and Spring 2025, five RMW-WLs had groundwater levels below their IMs but above their MTs during this time, and one RMW-WL had a groundwater level between its MT and IM in the Fall 2024 but rose above its IM in Spring 2025. Three RMW-WLs were defunct and seasonal water level measurements were unable to be collected. Two of these RMW-WLs have successfully been replaced by newly installed, dedicated RMW-WLs during WY 2025. Water level data collected from the replacement RMW-WWB-009R began in September 2025. RMW-WWB-007R data collection will begin in October 2025.

The Undesirable Result for Chronic Lowering of Groundwater Levels is defined in the GSP as follows: *Undesirable Results would be experienced if and when a chronic decline in groundwater levels in the Principal Aquifer negatively affects the reasonable and beneficial use of, and access to, groundwater for beneficial uses and users within the Basin. Significant and unreasonable effects associated with Undesirable Results would include complete dewatering of more than 25% of existing wells*. Criteria used to assess this definition is as follows: *Undesirable Results for Chronic Lowering of Groundwater Levels would be experienced in the Basin if and when groundwater levels in the Principal Aquifer decline below the established MTs in 40% or more of the RMW-WLs over four consecutive seasonal measurements (i.e., measurements spanning a total of two years, including two seasonal high groundwater level periods and two seasonal low groundwater level periods)*.

In the second RCA included in the 2023 determination letter approving the GSP, DWR recommended that the definition of an Undesirable Result for Chronic Lowering of Groundwater Levels be revised to two consecutive Fall MT exceedances. No RMW-WL exceeded an MT, and no Undesirable Results associated with the Chronic Lowering of Groundwater Levels were experienced in WY 2025 by either definition, as shown in **Figure 13**. Furthermore, no wells were reported dry to the DWR Dry Well Reporting System.

Table 6. Groundwater Elevations and Relevant Sustainable Management Criteria for Chronic Lowering of Groundwater Levels Sustainability Criteria

Well Name	Fall 2024 GWE (ft msl)	Spring 2025 GWE (ft msl)	MO (ft msl)	MT (ft msl)	IM-5 (ft msl)	IM-10 (ft msl)	IM-15 (ft msl)
RMW-WWB-001	810.44[a]	805.74[a]	800	680	800	800	800
RMW-WWB-002	206.18[a]	205.18	273	177	273	273	273
RMW-WWB-003	215.5	214.2	252	196	224	210	231
RMW-WWB-004	151.84[b]	136.05[b]	151	103	127	115	133
RMW-WWB-005	NA[c]	NA[c]	162	93	128	110	136
RMW-WWB-006	227.27	223.72	171	152	162	157	164
RMW-WWB-007	NA[c]	NA[c]	180	123	151	137	159
RMW-WWB-008	145.91[b]	146.15[b]	149	104	127	115	132
RMW-WWB-009	NA[c]	NA[c]	160	130	145	137	148
RMW-WWB-010	164.34	161.29	181	159	181	181	181
RMW-WWB-011	427.62	437.41	433	380	433	433	433
RMW-WWB-012	131.81[d]	133.81	161	123	142	133	147
RMW-WWB-013	123.5[d]	128.5	181	92	136	114	147
RMW-WWB-014	123.2[d]	125.2	151	96	124	110	130

Abbreviations:

ft msl = feet above mean sea level
GWE = groundwater elevation
IM = interim milestone
MO = measurable objective
MT = minimum threshold
NA = not available

Notes:

(a) Questionable measurement; oil or foreign substance in casing.
(b) Air or pressure gauge measurement.
(c) No measurement available; collapsed casing.
(d) Acoustical sounder.

7.1.2 Groundwater Storage

There are no groundwater storage SMCs. As explained in the GSP, groundwater levels are a reasonable proxy for groundwater storage. The Undesirable Result for Reduction of Groundwater Storage is defined in the GSP as follows: *Undesirable Results would be experienced if and when a reduction in storage in the Principal Aquifer negatively affects the long-term viable access to groundwater for the beneficial uses and users within the Basin. Significant and unreasonable effects associated with Undesirable Results would include reduction in usable groundwater storage of more than 20% relative to the Fall 2015 usable groundwater storage volume*. Criteria used to assess this definition is as follows: *Undesirable Results for Reduction of Groundwater Storage would be experienced in the Basin if and when groundwater storage in*

the Principal Aquifer was to be reduced by an amount that would cause the groundwater levels in at least 40% of the RMW-WLs to exceed their MTs for Chronic Lowering of Groundwater Levels over four consecutive seasonal measurements (i.e., measurements spanning a total of two years, including two seasonal high groundwater level periods and two seasonal low groundwater level periods).

Progress made during the reporting period is represented by the discussion of water levels in **Section 7.1.1.** No Undesirable Results associated with the Reduction of Groundwater Storage were experienced during WY 2025.

7.1.3 Seawater Intrusion

Because significant and unreasonable effects from seawater intrusion are not present in the Basin and are not likely to occur, SMCs were not set for Seawater Intrusion. The Seawater Intrusion Sustainability Indicator is therefore not discussed herein.

7.1.4 Degraded Water Quality

Public water systems are required by the State Water Resources Control Board (SWRCB) Drinking Water Program to monitor water quality and report results where they are publicly available through the Safe Drinking Water Information System (SDWIS) Drinking Water Watch website.[11] All of the RMW-WQs established in the GSP for the Degraded Water Quality Sustainability Indicator are public water system wells and therefore available data were downloaded and compiled from the SDWIS Drinking Water Watch Website. For constituents that do not require annual monitoring, samples were collected from the two RMW-WQ to which the GSA has access under direction of the WWGSA-member district staff and analyzed at an accredited laboratory following the protocols set forth in Section 17.2.2 *Protocols for Water Quality Sampling* of the GSP. During WY 2026, the GSA will work to gain access to the remaining two RMW-WQ for off-year water quality sampling.

Table 7 and **Figure 14** compare the WY 2025 water quality concentrations for Arsenic, Nitrate, and Selenium to their respective SMCs at the RMW-WQs. All measurements from the RMW-WQs had concentrations for Arsenic, Nitrate, and Selenium below the Maximum Contaminant Levels (MCLs), and therefore the MTs.

The Undesirable Result for Degraded Water Quality as defined in the GSP as follows: *Undesirable Results for Degraded Water Quality would be experienced in the Basin if and when water quality conditions of the Principal Aquifer are degraded as a result of SGMA-related groundwater level management activities such that they negatively impact the long-term viability of the groundwater resource for beneficial users and uses. Significant and unreasonable effects associated with Undesirable Results would include an increase, on a regional basis, in concentrations of identified constituents of concern above state and federal regulatory thresholds, as a result of SGMA-related groundwater level management activities.* Criteria used to assess this definition is as follows: *Undesirable Results for Degraded Water Quality are defined to occur within the Basin if and when MTs are exceeded for any of the identified constituents of concern in 25% or*

[11] https://sdwis.waterboards.ca.gov/PDWW/index.jsp

more of the RMW WQs at least two (2) consecutive years as a result of SGMA-related groundwater management activities.

No Undesirable Results associated with Degraded Water Quality were experienced during WY 2025.

Table 7. Groundwater Quality and Sustainable Management Criteria

Well Name	Arsenic (mg/L)			Nitrate as N (mg/L)			Selenium (mg/L)			Sample Date
	MO = 0.0075	MT = 0.01[a]	TT = 0.005[b]	MO = 7.5	MT = 10	TT = 5	MO = 0.0375	MT = 0.05	TT = 0.025	
RMW-WWB-015	0.001			0.38			ND			7/16/2025
RMW-WWB-016	0.004			1.68			0.017			7/16/2025
RMW-WWB-017	ND			ND			ND			7/23/2025
RMW-WWB-018	ND			ND			ND			7/23/2025

Abbreviations:

mg/L = milligrams per liter
MO = Measurable Objective
MT = Minimum Threshold
N = Nitrogen
ND = non-detect
SDWIS = Safe Drinking Water Information System
TT= Trigger Threshold
WY = Water Year

Notes:

(a) For all RMWs, MTs were set at the same level as state and federal standards.
(b) Trigger Thresholds are used in place of Interim Milestones.

7.1.5 Land Subsidence

The Undesirable Result for Land Subsidence is defined in the GSP as follows: *Undesirable Results would be experienced if and when land subsidence due to groundwater level declines in the Principal Aquifer negatively affects the ability to use existing critical infrastructure within the Basin. Significant and unreasonable effects associated with Undesirable Results would include subsidence-related damage to critical water conveyance infrastructure (i.e., the California Aqueduct and the 850 Canal), resulting in a loss of functional capacity of the infrastructure that prevents conveyance of available volumes of water that could otherwise be conveyed if the subsidence had not occurred*. As described in the GSP, land subsidence and lowering of groundwater levels are closely related; therefore, criteria used to assess this definition are based on MTs for Chronic Lowering of Groundwater Levels. Groundwater level SMCs have been set to prevent water levels from falling below historical lows near critical infrastructure, which is intended to avoid triggering new subsidence.

There has been very little historical land subsidence measured across the Basin. Since the adoption of the White Wolf GSP in 2022, vertical displacement recorded along the California Aqueduct ranged from -0.09 to +0.05 feet, with an average of -0.02 ft, which is within the reported measurement error of 0.03 to

0.07 ft (**Figure 15**).[12] In the two RMW-WLs adjacent to the California Aqueduct, groundwater levels in WY 2025 remain approximately 10 to 20 ft above their historical lows. In addition to assessing groundwater levels, the WWGSA tracks potential land subsidence occurring in the Basin and is in the process of establishing subsidence-specific SMCs, as discussed in **Section 7.3**. The results of the GSA's on-going assessment of subsidence is included herein.

The following describes the vertical displacement (i.e., subsidence) trends for WY 2025 in the Basin based on various datasets and from various collection methods (see **Figure 16**):

- Continuous vertical displacement data has been collected at two University NAVSTAR Consortium Global Positioning System (GPS) stations (WGPP and EDPP) located near the California Aqueduct since November 1999 (WGPP) and February 2000 (EDPP). Over the course of WY 2025, displacements of -0.00 ft and 0.01 ft were recorded at WGPP and EDPP, respectively.
- Continuous vertical displacement data has been collected at one Scripps Orbit and Permanent Array Center (SOPAC) GPS station (VINZ) near the California Aqueduct from December 2015 through June 2025. Between June 2024 and June 2025, the station recorded 0.00 ft of vertical displacement.
- Surveyed land surface elevation data is collected annually by DWR staff at checkpoints along the California Aqueduct. Over the 34 checkpoints, the land surface elevation change measured from WY 2024 to WY 2025 ranged from -0.12 ft to 0.04 ft, with an average of -0.02 ft (see **Figure 16**).
- TRE Altamira Interferometric Synthetic Aperture Radar (InSAR) data indicates the annual vertical displacement rate for the period 1 October 2024 through 1 October 2025 ranges from -0.07 ft to 0.01 ft throughout the Basin (see **Figure 16**).
- Two checkpoints were installed along the 850 Canal indicated 0.064 ft to 0.073 ft of displacement between WY 2024 and WY 2025.

Table 8. Checkpoints along the 850 Canal

Water Year	Elevation (ft NAVD88)	
	Checkpoint #1	Checkpoint #2
2024	856.313	854.267
2025	856.386	854.331
WY Displacement	0.073	0.064

Abbreviations:
ft msl = ft above mean sea level
WY = water year
Notes:
(a) WY displacement is calculated as the difference between 2025 and 2024 surveyed elevations. A positive number indicates accretion, and a negative number indicates subsidence.

[12] Jesse Dillion (DWR) indicated via email on November 1, 2024 that "According to all of the research, the practical limit of GPS for vertical accuracy in this case is 10-20 mm[millimeters] [0.03 to 0.07 ft]".

Progress made during the reporting period relative to SMCs is represented by the discussion of water levels in **Section 7.1.1.** WWGSA is in the process of establishing numerical SMCs for the rate and extent of land subsidence in response to DWR's third RCA, as discussed in **Section 7.3.** Given that no RMW-WLs exceeded their MTs in WY 2025 and that little to no land subsidence was observed, no Undesirable Results associated with Land Subsidence were experienced during WY 2025.

7.1.6 Depletions of Interconnected Surface Water

Groundwater levels in the three RMW-ISWs are used as a proxy to monitor the health of the GDEs identified south of the Springs Fault. **Table 9** compares the WY 2025 depth to water to the preliminary MOs and MTs set at the RMW-ISWs established for the Depletions of Interconnected Surface Water Sustainability Indicator.

The Undesirable Result for Depletions of Interconnected Surface Water is defined in the GSP as follows: *Undesirable Results would be experienced in the Basin if and when the health of the GDEs is adversely impacted by lowering of groundwater levels as a result of SGMA-related groundwater management activities in the Principal Aquifer, rather than effects of natural or climactic processes and/or unfavorable hydrologic conditions. Significant and unreasonable effects associated with Undesirable Results would include a 30% reduction of, or visual impact to, the health of GDEs based on their conditions observed during 2018 through 2020 that can be directly attributed to Principal Aquifer pumping-related lowering of groundwater levels rather than the effects of natural or climatic processes.* Criteria used to assess this definition is as follows: *Undesirable Results for Depletion of Interconnected Surface Water would be experienced in the Basin if and when groundwater levels in one or more of the RMW-ISWs exceeds (falls below) their MTs over four consecutive seasonal measurements (i.e., measurements spanning a total of two years, including two seasonal high groundwater level periods and two seasonal low groundwater level periods) as a result of SGMA-related groundwater management activities.*

The WY 2025 depth to groundwater was above the preliminary MTs for all the RMW-ISWs. Therefore, no Undesirable Results associated with the Depletions of Interconnected Surface Waters were experienced in WY 2025, as shown in **Figure 13**. **Figure 5** includes streamflow data from the El Paso Creek data logger. As part of the Periodic Evaluation, a GDE survey will be conducted in WY 2026 documenting the health of the GDEs.

Table 9. Depth to Groundwater and Relevant Sustainable Management Criteria for Depletions of Interconnected Surface Water Sustainability Criteria

Well Name	Fall 2024 DTW [a]	Spring 2025 DTW [b]	MO [c]	MT	IM-5 [d]	IM-10 [d]	IM-15 [d]
	(ft bgs)	(ft bgs)	(ft bgs)	(ft bgs)	(ft bgs)	(ft bgs)	(ft bgs)
RMW-WWB-019	18.04	18.43	19	30	n/a	n/a	n/a
RMW-WWB-020	17.78	16.01	15	30	n/a	n/a	n/a
RMW-WWB-021	24.58	25.42	36	36	n/a	n/a	n/a

Abbreviations:

DTW = depth to water
ft bgs = feet below ground surface
IM = Interim Milestone
MO = Measurable Objective
MT = minimum threshold
n/a = not applicable

Notes:

(a) Fall 2024 measurements were recorded on 10/15/2024.
(b) Spring 2025 measurements were recorded on 3/15/2025.
(c) MOs have been corrected from those reported in the GSP.
(d) Given the preliminary nature of the data in which MOs and MTs were set, IMs were not established in the GSP.

7.2 Implementation of Projects and Management Actions (P/MAs)

The White Wolf Basin GSP outlined 24 potential P/MAs. The P/MA implementation progress described below represents activities that took place during WY 2025 for these 24 P/MAs and additional P/MAs that have been initiated since the GSP was adopted. A summary of P/MA status and implementation is included in **Table 10**.

Table 10. Implementation of Projects and Management Actions

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
#1 - Recharge from Grapevine Development	☐ Active ☐ Pre planning ☒ Conceptual ☐ Inactive	None.	None	None	Not applicable as P/MA has not been initiated.	Construction of the Grapevine development is expected to begin in 2028, with initial home occupancies in 2030.	None
#2 - Oilfield Reclaimed Water from the Tejon Oil Field	☐ Active ☐ Pre planning ☒ Conceptual ☐ Inactive	In December 2022 the WWGSA applied for DWR Round 2 SGMA implementation grant funds to fund P/MA #2. The P/MA was not selected for grant funding.	None	None	Infrastructure improvement, no public noticing necessary.	Pending grant funding.	TCWD will continue to seek funding for the phase 2 pilot treatment plant.
#3 - Oilfield Reclaimed Water in AEWSD	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None.	None	None	Not applicable as P/MA has not been initiated.	To be implemented upon agreement with partnering oil field.	None
#4 - Purchase Additional Surface Water Supplies	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	WRMWSD purchased an additional 49,800 AF for surface water delivery in both the Kern County Subbasin and the White Wolf Subbasin. Approximately 34% of these additional supplies were delivered to the White Wolf Subbasin. AEWSD received an additional 22,000 AF through direct purchases and exchanges for surface water delivery in both Kern County and White Wolf Subbasins. TCWD did not purchase additional surface water supplies.	Approximately 2,400 AF of additional surface water.	None	AEWSD and WRMWSD board meetings.	Ongoing, pending surface water supply availability.	AEWSD, TCWD, and WRMWSD will continue to seek out opportunities to purchase additional surface water supplies, as available, with out-of-basin entities to offset groundwater pumping.

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
#5 - WRMWSD "Thru Delta" Facility	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	WRMWSD is actively participating in planning efforts surrounding a "Thru Delta" Facility at a level of 32% (63,100 acre-feet) of its State Water Project entitlement. This is a State-led effort to increase SWP water reliability with a projected supply benefit for WRMWSD of up to 25,000 AFY upon Cal WaterFix Project completion (anticipated 2035). In WY 2025, WRMWSD continued to fund the planning phase of the Delta Conveyance Project (DCP)	None, as P/MA #5 is still in the planning phase.	None	Prop 218.	Ongoing, pending engineering, design, and permitting.	With DWR's recent approval of the Delta Conveyance Project: Final Environmental Impact Report (EIR) Certified, engineering, design, and permitting will move forward.
#6 - WRMWSD Desalination Facility	☐ Active ☐ Pre planning ☒ Conceptual ☐ Inactive	WRMWSD continued to explore ways to utilize desalination facilities and continued to hold discussions with proponents of certain potential desalination projects.	None	None	Not applicable as P/MA has not been initiated.	To be implemented as needed to meet milestones if other P/MAs are not successful as anticipated.	WRMWSD will continue to hold discussion with proponents of potential desalination projects.
#7 – Recapture of Basin Groundwater	☐ Active ☐ Pre planning ☒ Conceptual ☐ Inactive	Interbasin discussions with Kern County Subbasin to include White Wolf Subbasin flows in the Kern County Basin Study	None	None	Not applicable as the P/MA has not been initiated.	Basin Study completion at the end of 2025	None
#8 - WRMWSD Mettler Recharge Project	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	The Mettler Groundwater Recharge Facility did not receive water in WY 2025.	None	None	WWGSA board meetings, WWGSA P/MA Committee meetings.	Ongoing, pending available water supply availability.	WRMWSD will continue to seek out opportunities to purchase and recharge additional surface water supplies, as available.
#9 - WRMWSD El Paso Creek Recharge Project	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented upon participant interest, grant funding, and permitting.	None

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
#10 - AEWSD In-Lieu Banking Program	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	In December 2022 the WWGSA applied for DWR Round 2 SGMA implementation grant funds to fund P/MA #10. The P/MA was selected for grant funding in September 2023. Grant agreement execution with DWR and contracting was initiated. Project design is complete and construction is expected to be completed in early 2026.	None as P/MA #10 is not yet complete.	None	Infrastructure improvement, no public noticing necessary. WWGSA Board meetings.	Project underway. Completion expected in early 2026.	AEWSD anticipates deliveries may begin in Calendar Year (CY) 2026.
#11 - AEWSD Private & Caltrans Basin Connections	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented upon participant interest, grant funding, and permitting.	None
#12 - AEWSD South Canal WRMWSD 850 Canal Intertie	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	In December 2022 the WWGSA applied for DWR Round 2 SGMA implementation grant funds to fund P/MA #12. The P/MA was selected for grant funding in September 2023. Grant agreement execution with DWR and contracting was completed in WY 2024. Project design is complete and construction is expected to be completed in early 2026.	None as P/MA #12 is not yet complete.	None	Infrastructure improvement, no public noticing necessary. WWGSA Board meetings.	Project underway. Completion expected in early 2026.	AEWSD and WRMWSD anticipate deliveries may begin in CY 2026.
#13 - AEWSD South Canal Balancing Reservoir Project	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented upon grant funding and South County flooding response	None
#14 - AEWSD Groundwater Subsidies for Land Conversion	☐ Active ☒ Pre planning ☐ Conceptual ☐ Inactive	The WWGSA applied for the Department of Conservation Multi-benefit Land Repurposing Program Round 2 funding. The project was not selected.	None	None	Not applicable as P/MA has not been initiated.	Ongoing, pending water supply availability.	AEWSD will continue to develop strategies for demand management, including a potential land repurposing program.
#15 - WRMWSD Land Retirement and/or Conversion	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	WRMWSD did not purchase any land for retirement in WY 2025. However, significant land retirement by existing landowners has occurred within WRMWSD, including fallowing of 2,742 acres of land with permanent crops in WY 2025.	Approximately 3,420 AF of reduced groundwater pumping, based on the estimated pumping for the fallowed fields in WY 2023-2024.	None	Not applicable as WRMWSD did not buy the land.	Ongoing, pending water supply availability.	WRMWSD will continue to submit bids to purchase irrigated property and continue to engage with sellers across the District when the opportunities arise.

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
#16 - AEWSD Groundwater Allocation per Acre	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented as needed to meet milestones if other new supplies are not developed as anticipated.	None
#17 - AEWSD Groundwater Fee Increase	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented as needed to meet milestones if other new supplies are not developed as anticipated.	None
#18 - AEWSD Groundwater Marketing & Trading	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	Contingent on P/MA #16 and P/MA #23.	None
#19 - WRMWSD Groundwater Allocation and Market	☐ Active ☒ Pre planning ☐ Conceptual ☐ Inactive	Wheeler Ridge-Maricopa GSA (WRM GSA) in the neighboring Kern County Subbasin has formed a P/MA Committee which is exploring demand reduction options, including potential groundwater allocations. WRM GSA has developed and engaged with stakeholders regarding a draft groundwater allocation policy. This draft may inform future potential policy development by the WWGSA.	None	None	WRM GSA P/MA Committee meetings and a letter to WRMWSD landowners in the Kern County Subbasin inviting review and feedback of the draft policy.	TBD	WRMWSD will continue to explore potential allocation policies in coordination with the other WWGSA members.
#20 - WRMWSD Voluntary Pumping Limitations: WRMWSD	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented as needed to meet milestones if other P/MAs are not successful as anticipated.	None
#21 - WRMWSD Mandatory Pumping Limitations	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented as needed to meet milestones if other P/MAs are not successful as anticipated.	None

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
#22 - Improved Stormwater Management and Flood Control in AEWSD	☐ Active ☐ Pre planning ☐ Conceptual ☒ Inactive	None	None	None	Not applicable as P/MA has not been initiated.	To be implemented upon securing grant funding	None
#23 - AEWSD Groundwater Extraction Quantification Method	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	AEWSD applied their completed, district-specific groundwater flow model and decision support tool. The WWGSA obtained satellite crop evapotranspiration (ET) data through LandIQ.	Approved method to quantify the individual and aggregate groundwater extractions for annual reporting purposes.	None	AEWSD board meetings	Ongoing	Continued refinements of the decision support tool. Incorporate information into WY 2026 Annual Report.
#24 - WRMWSD Acreage Assessment	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	WRMWSD approved a Groundwater Service Charge (GWSC) to be levied on each acre-foot of groundwater extracted for consumptive use within WRMWSD boundaries, with the exception of de minimis and residential use. Collection of the GWSC continued in WY 2025. Funds derived from the GWSC are used to help offset the cost of State Water Project water and other supplemental water supplies. As a secondary effect, the charge helps equalize the cost of local groundwater compared to more expensive surface water, which is expected to reduce the overall demand for groundwater.	$206.12 per acre foot of groundwater pumped within WRMWSD boundaries to support purchase of surface water supplies.	None	Prop 218; WRMWSD P/MA Committee meetings; direct letters to landowners	Ongoing	Continued implementation of the GWSC and quantification of the potential reduction in groundwater demands associated with these charges.
# 25 – AEWSD Incentives for Landowner Recharge	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	Starting in March 2023, AEWSD provided financial incentives to landowners to conduct on-farm recharge. Due to hydrologic conditions, there was no water applied for on-farm recharge in White Wolf Subbasin in WY 2025.	None	None	WWGSA board meetings, WWGSA P/MA Committee meetings, AEWSD board meetings, direct outreach to landowners via letters.	Ongoing, pending water supply availability.	Re-activate incentives, pending water supply availability.
# 26 - AEWSD Exercising Existing Water Rights	☐ Active ☒ Pre planning ☐ Conceptual ☐ Inactive	United States Bureau of Reclamation, San Luis Delta Mendota Water Authority, Friant Water Authority, and San Joaquin River Exchange Contractors discussions on collectively identify projects and potential actions aimed at improving drought resiliency south of the Delta, including AEWSD deliveries from the Friant-Kern Canal	None	None	Not applicable as P/MA has not been initiated.	Memorandum of Understanding effective March 2024.	Increased reliability of AEWSD's CVP supplies.

Project and Management Action	Status	Progress during Water Year	Observed Benefits	Observed adverse impacts to the various sustainability indicators, adjacent groundwater basins, or beneficial uses and users	Public Notice / Engagement	Anticipated Schedule	Description of Anticipated Benefits Within Next Water Year
# 27 - WRMWSD Incentives for Landowner Recharge	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	Starting in February 2023, the WRMWSD board initiated a new P/MA to provide financial incentives to landowners to conduct on-farm recharge. This program is contingent on water supply availability; no water was applied for on-farm recharge in WY 2025.	None	None	WWGSA board meetings, WWGSA P/MA Committee meetings, WRMWSD board meetings, direct outreach to landowners via letters.	Ongoing, pending water supply availability.	Re-activate incentives, pending water supply availability.
#28 - Reclaimed Water From Terra Vista Apartments	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	The Terra Vista apartments offered its first 228 units in April 2025. Approximately 100 units are currently occupied. Potable water demands are met with imported surface water, and wastewater is reclaimed for irrigation.	5.6 AF of surface water was delivered to the apartments in WY 2025, resulting in approximately 4.8 AF recycled water.	None	The apartments are part of the community's existing master plan.	Occupancy of the remaining apartments is expected in 2026. 150 additional apartment units will be offered in 2027.	Approximately 25 AF of recycled water.
#29 - TCWD Delta Conveyance Project	☒ Active ☐ Pre planning ☐ Conceptual ☐ Inactive	TCWD Board of Directors elected to participate in the planning phase of the Delta Conveyance Project at a level of 100% of its State Water Project entitlement. In WY 2025, TCWD continued to fund the planning phase of the Delta Conveyance Project.	None, as P/MA is still in the planning phase.	None	Prop 218.	Ongoing, pending engineering, design, and permitting.	With DWR's recent approval of the Delta Conveyance Project: Final EIR Certified, engineering, design, and permitting will move forward.

7.3 Progress Made on Addressing Recommended Corrective Actions in the Department's GSP Determination

The WWGSA received DWR's GSP determination on 26 October 2023. Included in the approval letter were four RCAs. **Table 11** summarizes the recommended corrective actions and identifies the relevant GSP sections.

Table 11. Recommended Corrective Actions

Corrective Action	Related GSP Section
1 - Develop and incorporate a projected water budget for the surface water system as required by the GSP Regulations.	- Section 9: *Water Budget Information* - Appendix L: *White Wolf Groundwater Flow Model Documentation*
2 - Revise the sustainable management criteria to be based on seasonal low groundwater levels to ensure potential impacts to beneficial uses and users are considered.	- Section 13.1: *Undesirable Results for the Chronic Lowering of Groundwater Levels* - Section 14.1: *Minimum Thresholds for Chronic Lowering of Groundwater Levels* - Section 15.1: *Measurable Objectives and Interim Milestones for Chronic Lowering of Groundwater Levels*
3 - Establish sustainable management criteria for land subsidence based on direct measurements of land elevation changes to assess and confirm that no significant and unreasonable land subsidence is occurring.	- Section 13.5 *Undesirable Results for Land Subsidence*
4 - Expand the land subsidence monitoring network to provide sufficient coverage of the Subbasin. The WWGSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Subbasin.	- Section 17.1.5: *Monitoring Network for Land Subsidence*

The WWGSA has discussed approaches to addressing the RCAs in multiple public meetings. Collection of relevant data and communication with applicable agencies is ongoing. Progress toward addressing each RCA is described below.

- **RCA 1** – The projected water budget has been calculated and will be presented in tabular format in the Periodic Evaluation.
- **RCA 2** – The WWGSA is collecting data on seasonal low groundwater levels and assessing potential undesirable results based on seasonal low groundwater levels.
- **RCA 3** – The WWGSA is evaluating subsidence data and corresponding with the California Aqueduct Subsidence Project (CASP) regarding subsidence monitoring in the Basin. The WWGSA has conceptualized three potential methods for establishing land subsidence SMCs. During WY 2026, the WWGSA will be reviewing potential methods against recommended methods provided in the Final DWR Best Management Practices for Land Subsidence. Land subsidence SMCs will be documented in the Periodic Evaluation.

- **RCA 4** – The WWGSA is monitoring the InSAR data published by DWR to assess conditions across the Basin, in addition to other data sources including University NAVSTAR Consortium (UNAVCO) GPS data, CASP precise survey data, and survey data from checkpoints on the 850 Canal. Consideration of how these will be incorporated into the representative monitoring network for subsidence is ongoing. It is anticipated that the Periodic Evaluation will contain updates to the representative monitoring network.

7.4 Other Information on Implementation Progress

The following section describes other information on GSP implementation progress during WY 2025.

7.4.1 Stakeholder Outreach and Engagement

The WWGSA practices stakeholder engagement through the GSA website (http://whitewolfgsa.org/), and public meetings and workshops held in a hybrid in person / online forum. Additional engagement is conducted through the P/MA Technical Advisory Committee (TAC), whose goal is to serve as a forum to receive public input from local groundwater users, landowners, non-profit organizations, and other interested parties on the initiation and implementation of P/MAs.

During WY 2025, the WWGSA held 11 public meetings as summarized below:

- 1 October 2024 – WWGSA Board meeting
- 5 November 2024 – WWGSA Board meeting
- 11 November 2024 – P/MA TAC meeting
- 7 January 2025 – WWGSA Board meeting
- 13 February 2025 – P/MA TAC meeting
- 4 March 2025 – WWGSA Board meeting
- 1 April 2025 – WWGSA Board meeting
- 22 April 2025 – P/MA TAC meeting
- 3 June 2025 – WWGSA Board meeting
- 5 August 2025 – WWGSA Board meeting
- 2 September 2025 – WWGSA Board meeting

The WWGSA will continue its stakeholder engagement and meet regularly in WY 2026.

7.4.2 Public Comments Received

In August 2025, WWGSA received a letter from CASP presenting the 2025 SWP Operations and Maintenance Precise Survey results. Additionally, in early WY 2025, the White Wolf GSA engaged in email correspondence with CASP regarding the 2024 precise survey results. No other public comments were received.

7.4.3 Additional Information or Accomplishments

The WWGSA executed a grant agreement with DWR for the Sustainable Groundwater Management Program SGMA Implementation Round 2 grant. This agreement awarded $4.8 million to the WWGSA to fill important data gaps, continue conducting stakeholder engagement, recalibrate the WWGFM, conduct ongoing monitoring and reporting, and initiate two projects. Progress made on implementing the grant in WY 2025 is described below:

- The *In-lieu Banking Program Expansion* will connect AEWSD and WRMWSD's surface water distribution facilities to approximately 3,900 acres of irrigated agriculture in their groundwater service areas. Through expansion of the In-Lieu Banking Program, AEWSD and WRMWSD will offset groundwater pumping demands in wet years with imported surface water supply. In WY 2025, the WWGSA completed design for the expanded distribution facilities and initiated construction.
- The "*South Canal" 850 Canal Intertie* involves the construction of a new intertie between AEWSD's "South Canal" and WRMWSD's 850 Canal. The "South Canal" 850 Canal Intertie facilities will allow for direct water exchanges between the districts and increase operational efficiency and flexibility. In WY 2025, the WWGSA completed design for the intertie and initiated construction.
- Additionally, the WWGSA performed the following work to fill data gaps in WY 2025:
    - The WWGSA installed replacement monitoring wells for RMW-WWB-007 and RMW-WWB-009.
    - The WWGSA initiated an updated analysis of GDEs in the Basin.
    - The WWGSA conducted data analysis of subsidence conditions and streamflow in relation to groundwater conditions to support development of the Periodic Evaluation.

7.4.4 Anticipated Implementation Activities

The WWGSA anticipates the following implementation activities and efforts to occur in WY 2026:

- Conduct monthly groundwater level monitoring, download data from transducers and stream flow meter, and update the Basin Data Management System (DMS).
- Create monthly SMC status maps and hydrographs.
- Submit Fall 2025 and Spring 2026 groundwater level data to DWR.
- Adopt Fiscal Year (FY) 2026-2027 Budget.
- Conduct ongoing stakeholder outreach including, but not limited to:
    - WWGSA website maintenance and email distributions,
    - Hold monthly WWGSA Board of Directors meetings,
    - Hold stakeholder workshop, and
    - Hold P/MA TAC meetings as needed.
- Investigate options for replacing RMW-WWB-005.

- Grant administration, reporting, and invoicing.
- Continue active P/MA implementation.
- Complete construction of the in-lieu banking program expansion and the “South Canal” 850 Canal intertie projects.
- Conduct an updated survey of potential GDEs.
- Prepare and submit the WY 2026 Annual Report.
- Continue to address DWR corrective actions.
- Complete the Periodic Evaluation.

8 REFERENCES

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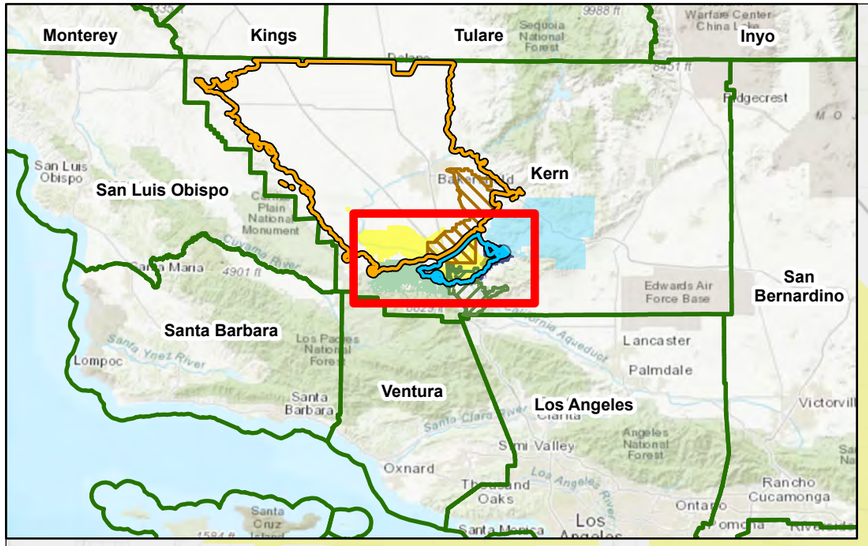

Legend

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- County Boundary
- Arvin-Edison Water Storage District
- Tejon-Castac Water District
- Wheeler Ridge-Maricopa Water Storage District
- Tehachapi - Cummings County Water District
- Federal Lands
- Conservation Easement Area
- Private Conservation

Abbreviations

CCED = California Conservation Easement Database
CPAD = California Protected Areas Database
DWR = California Department of Water Resources
GSA = Groundwater Sustainability Agency

Notes

1. All locations are approximate.
2. The entire displayed area within Kern County is covered by the Kern County General Plan.
3. The White Wolf GSA covers the entire White Wolf Subbasin and is the exclusive GSA for the Subbasin.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 10 February 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. District boundaries acquired from respective District staff.
4. Federal Lands from CPAD 2017 - www.calands.org.
5. Private Conservation Lands from CPAD 2018 - www.calands.org.
6. Conservation Easement Area Lands from CCED -www.calands.org/CCED.

N

0 3 6

(Scale in Miles)

White Wolf Subbasin and Relevant Boundaries

White Wolf GSA
Kern County, California
March 2026
C20014.04
Figure 1

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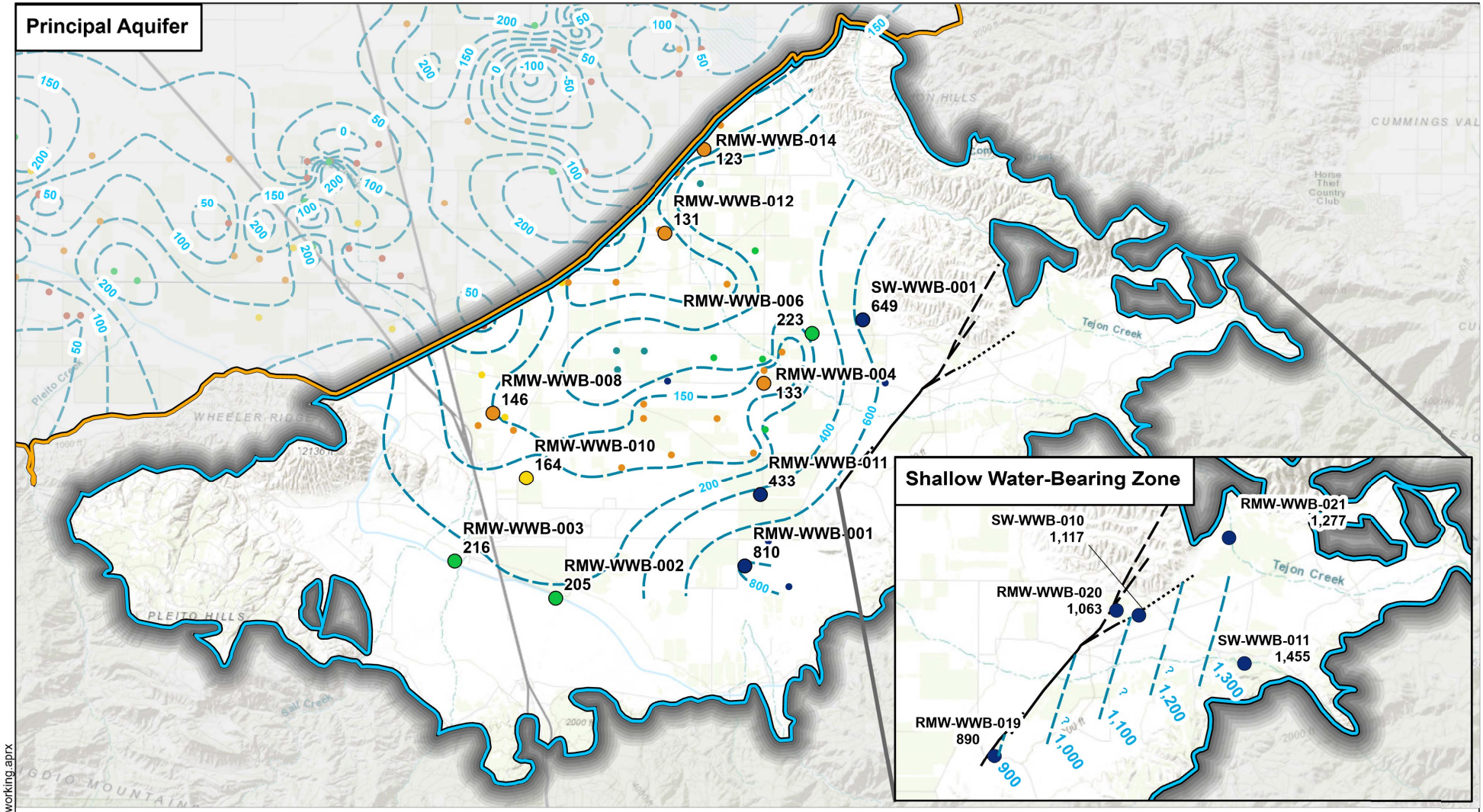

Legend

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- Springs Fault
- Fall 2024 Groundwater Elevation Contour (ft NAVD88)

Fall 2024 Groundwater Elevation (ft NAVD88)

- < 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- > 300

Abbreviations

DWR	= California Department of Water Resources
ft NAVD88	= feet above the North American Vertical Datum of 1988
GSA	= Groundwater Sustainability Agency
RMW	= Representative Monitoring Well
SW	= Supplemental Well

Notes

1. All locations are approximate.
2. Groundwater elevation contours are shown at 100 ft intervals in the Shallow Water-Bearing Zone.
3. Principal Aquifer contours placed at 50-ft intervals for elevations below 200 ft and at 200-ft intervals for elevations above 200 ft.
4. Contours are queried where uncertain.
5. Representative monitoring well water level collected between 7 October 2024 through 13 December 2024.
6. SW-WWB-010 data collected on 3 June 2024. SW-WWB-011 data collected on 2 December 2024.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 31 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. Springs Fault trace from Bartow, 1984, Geological Map and Cross Sections of the Southeastern Margin of the San Joaquin Valley, California: U.S. Geological Survey Map I-1496.
4. Groundwater elevation data provided by the White Wolf GSA member Districts.

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0 3 6

(Scale in Miles)

Groundwater Elevation Contours, Fall 2024

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 2

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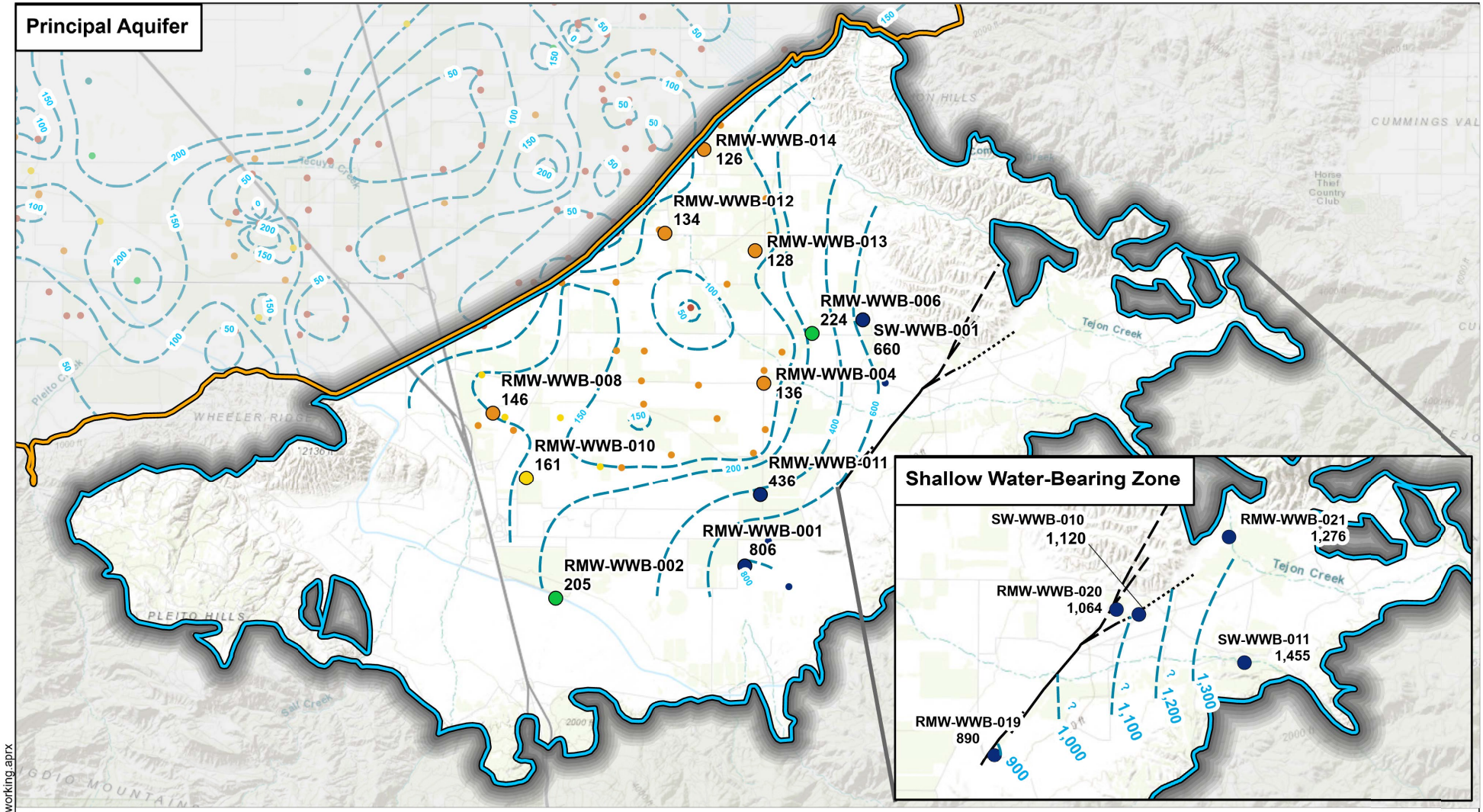


Legend

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- Springs Fault
- Spring 2025 Groundwater Elevation Contour (ft NAVD88)

Spring 2025 Groundwater Elevation (ft NAVD88)

- < 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- > 300

Abbreviations

DWR	= California Department of Water Resources
ft NAVD88	= feet above the North American Vertical Datum of 1988
GSA	= Groundwater Sustainability Agency
RMW	= Representative Monitoring Well
SW	= Supplemental Well

Notes

1. All locations are approximate.
2. Groundwater elevation contours are shown at 100 ft intervals in the Shallow Water-Bearing Zone.
3. In the Principal Aquifer, contours are placed at 50-ft intervals for elevations below 200 ft and at 200-ft intervals for elevations above 200 ft.
4. Contours are queried where uncertain.
5. Representative monitoring well water level data collected between 30 January 2025 through 20 March 2025.
6. SW-WWB-010 and SW-WWB-011 data collected 3 March 2024.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 31 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. Springs Fault trace from Bartow, 1984, Geological Map and Cross Sections of the Southeastern Margin of the San Joaquin Valley, California: U.S. Geological Survey Map I-1496.
4. Groundwater elevation data provided by the White Wolf GSA member Districts.

N

0 3 6

(Scale in Miles)

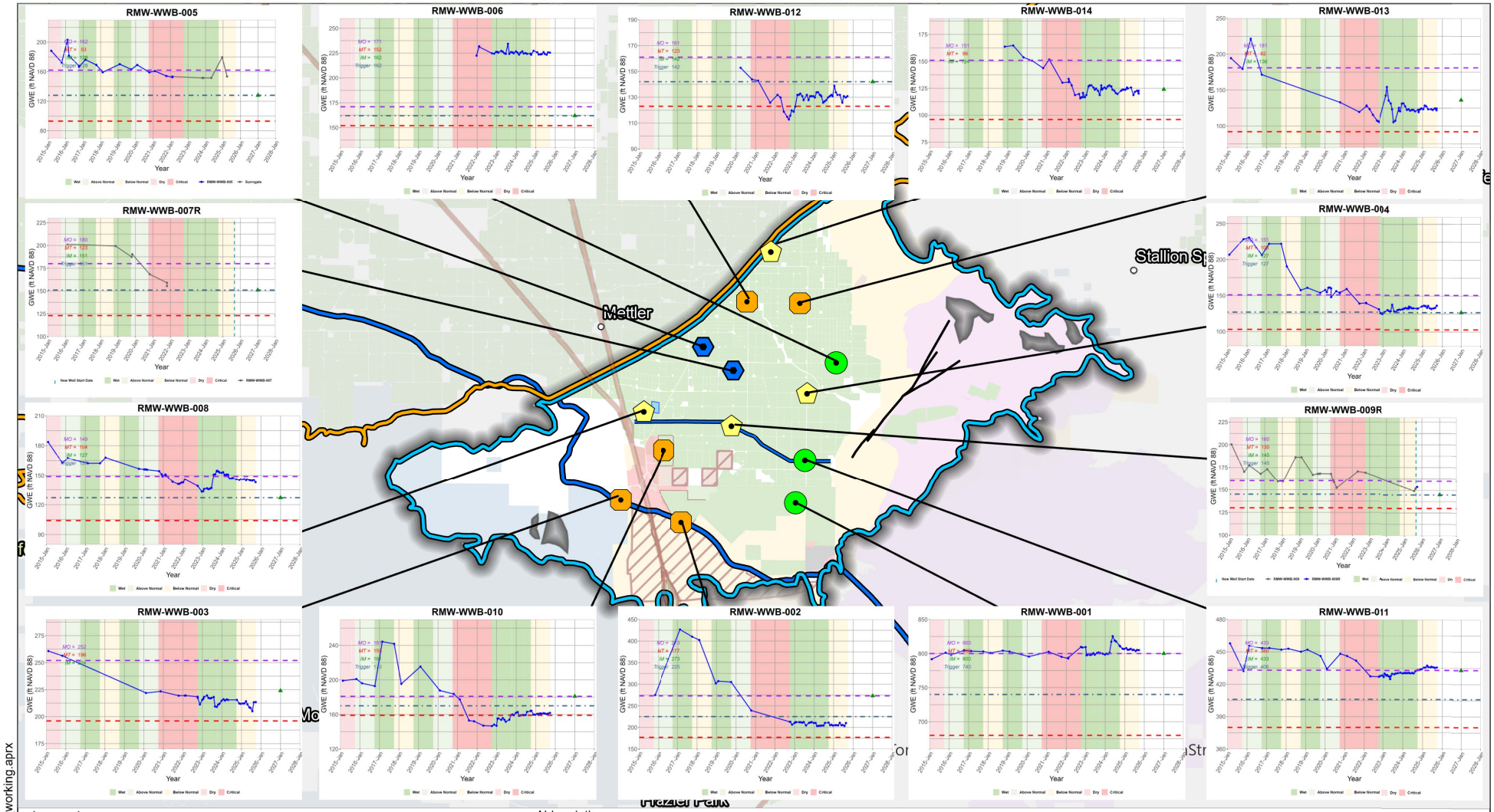
Groundwater Elevation Contours, Spring 2025

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 3

eki environment & water

Path: X:\C20014\Maps_04\2026\02\WW_2025_AR_working.aprx



Path: X:\C20014\Maps_04\2026\02\WW_2025_AR_working.aprx

Legend

Representative Monitoring Wells and Status as of September 2025

- Water Level Above MO (3 or 21%)
- Water Level Between MO and MT but above IM (4 or 29%)
- Water Level Between MO and MT but below IM (5 or 36%)
- Water Level Below MT (0)
- No Water Level Measurement (2 or 14%)

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- Springs Fault
- California Aqueduct
- 850 Canal

Land Use

- Agricultural Land
- Developed
- Grazing
- Mining
- Oil Field
- Conservation Easement Area
- California Protected Areas
- Proposed Grapevine Development
- Mettler Recharge Project

Abbreviations

DWR = California Department of Water Resources
ft msl = feet above mean sea level
GSA = Groundwater Sustainability Agency
MO = Measurable Objective
MT = Minimum Threshold
RMW-WL = Representative Monitoring Well for Water Level

Notes

1. All locations are approximate.
2. Wells RMW-WWB-005, RMW-WWB-007, and RMW-WWB-009 were non-functional during WY 2025.
3. RMW-WWB-005 measurements starting October 2022 were taken from a surrogate well.
4. Replacement wells for RMW-WWB-007 and RMW-WWB-009 (designated with the letter "R" appended to well name) were installed in September 2025. Measurements from the original wells are shown in gray, and data from the replacement wells is shown in blue.
5. Hydrographs show static water levels. Erroneous datapoints have been excluded.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 31 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Pricritization, dated February 2019.
3. Land Use simplified from Figure PA-3 and Figure PA-8 of the White Wolf Subbasin Groundwater Sustainability Plan.
4. Surface water features, watersheds, and springs from NHD (https://viewer.nationalmap.gov/basic/).
5. Springs Fault trace from Bartow, 1984, Geological Map and Cross Sections of the Southeastern Margin of the San Joaquin Valley, California: U.S. Geological Survey Map I-1496.

N

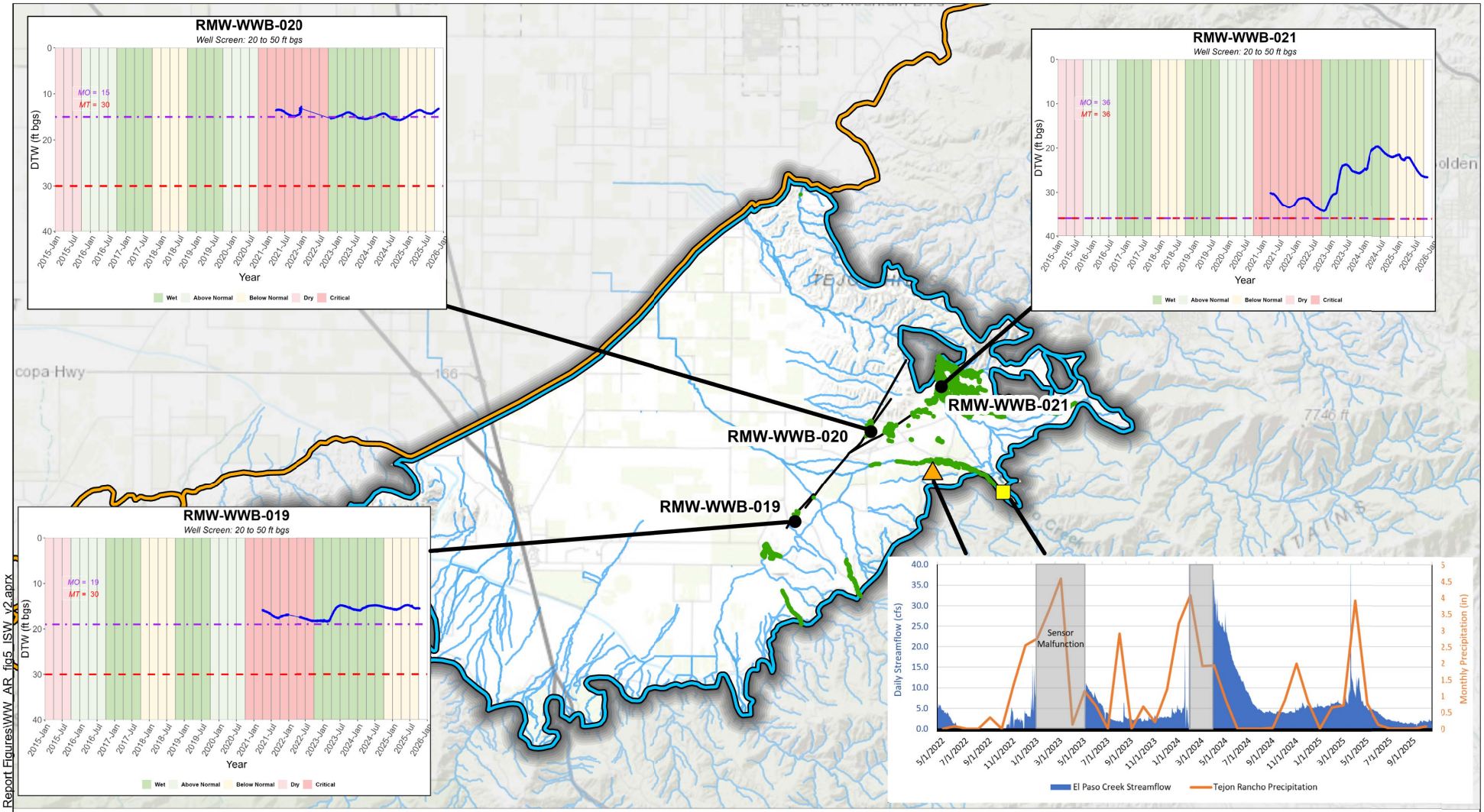
0 5 10

(Scale in Miles)

Hydrographs of Representative Monitoring Wells for Chronic Lowering of Groundwater Levels Sustainability Indicator

White Wolf GSA
Kern County, California
March 2026
C20014.04
Figure 4

eki environment & water



Legend

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- GDEs of Interest
- Stream
- Springs Fault
- Representative Monitoring Well
- El Paso Creek Streamflow Data Logger
- Tejon Rancho Climate Station
- Measurable Objective
- Minimum Threshold
- Depth to Water (ft bgs)

Abbreviations

DTW	= depth to water
DWR	= California Department of Water Resources
ft bgs	= feet below ground surface
GDE	= Groundwater Dependent Ecosystem
MO	= Measurable Objective
MT	= Minimum Threshold

Notes

1. All locations are approximate.
2. MO values for RMW-WWB-019 and RMW-WWB-020 have been corrected.
3. GDEs of interest are those supported by the shallow water-bearing zone upgradient of the Springs Fault ("B") or the Regional Aquifer ("R").

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 30 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. Surface water features from National Hydrography Dataset (https://viewer.nationalmap.gov/basic/).
4. GDEs of interest shapefile provided by GeoSystems Analysis, Inc., 7 October 2020.
6. Springs Fault trace from Bartow, 1984, Geological Map and Cross Sections of the Southeastern Margin of the San Joaquin Valley, California: U.S. Geological Survey Map I-1496.

N

0 4 8

(Scale in Miles)

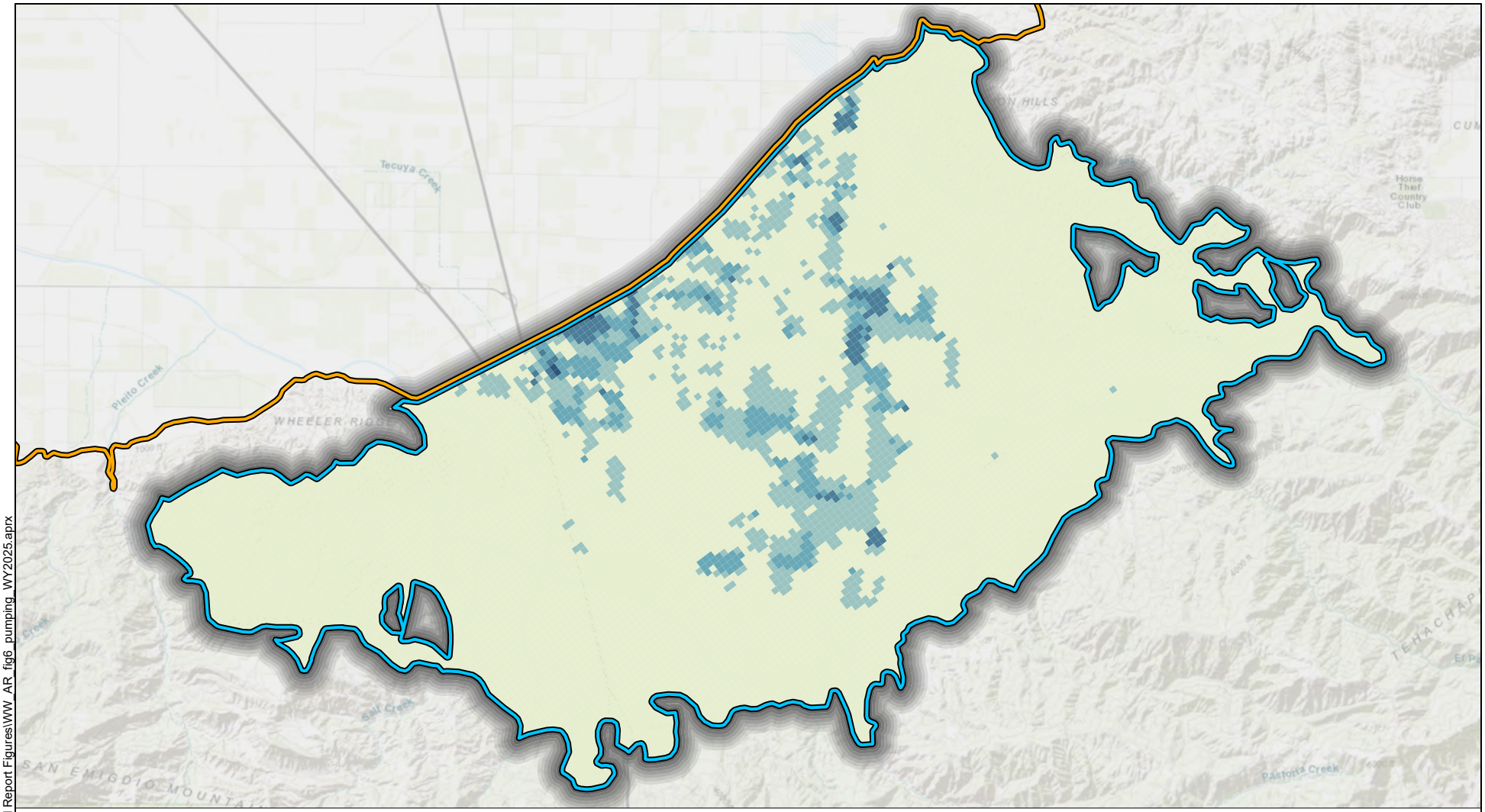
Hydrographs of Representative Monitoring Wells for Depletions of Interconnected Surface Water Sustainability Indicator

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 5

eki environment & water

Path: X:\C20014\Maps_04\2026\02\WY 2025 Annual Report Figures\WW_AR_fig5_ISW_v2.aprx



Legend

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)

Groundwater Pumping (AF/ ac)

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

Notes

1. All locations are approximate.

Abbreviations

ac	= acres
AF	= acre-feet
DWR	= California Department of Water Resources
GSA	= Groundwater Sustainability Agency
WY	= Water Year

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 24 February 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. Groundwater pumping in the White Wolf Groundwater Flow Model is a combination of metered data where available and estimated using the Soil Moisture Budget where unavailable.

N

0 3 6

(Scale in Miles)

General Location of Groundwater Extractions, WY 2025

White Wolf GSA
Kern County, California
March 2026
C20014.04

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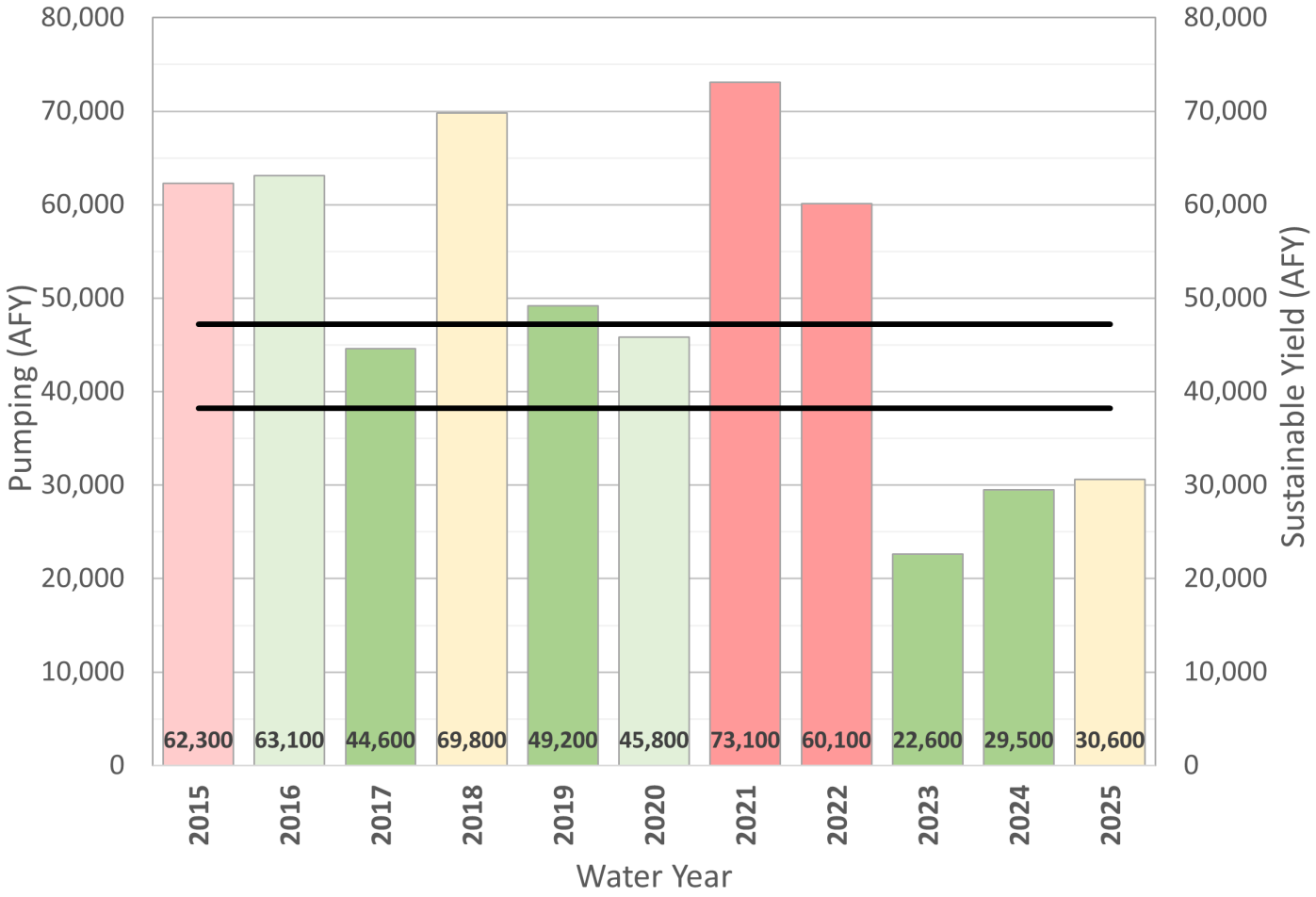
Figure 6

Path: X:\C20014\Maps_04\2026\02\WY 2025 Annual Report Figures\WW_AR_fig6_pumping_WY2025.aprx



Legend

Change in Groundwater Storage

DWR Water Year Type

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

Sustainable Yield Range:
Upper = 47,200 AFY
Lower = 38,200 AFY

Abbreviations

AF	= acre-feet
AFY	= acre-feet per year
DWR	= California Department of Water Resources
WY	= Water Year

Notes

1. Water Year is defined as the October of the previous year through September of the current year.
2. Water Year type for WY 2019, 2020, 2021, 2022, 2023, 2024, and 2025 calculated using same methodology as DWR, 2021.

Sources

1. DWR Water Year type for WY 1995-2018 from (DWR, 2021).
2. WY 2015-2023 groundwater use as estimated by the WWGFM WY 2023 extension.
3. WY 2024 and 2025 groundwater use as estimated by the re-calibrated WWGFM WY 2024 and WY 2025 extensions, respectively.

Groundwater Extraction Compared to the Sustainable Yield

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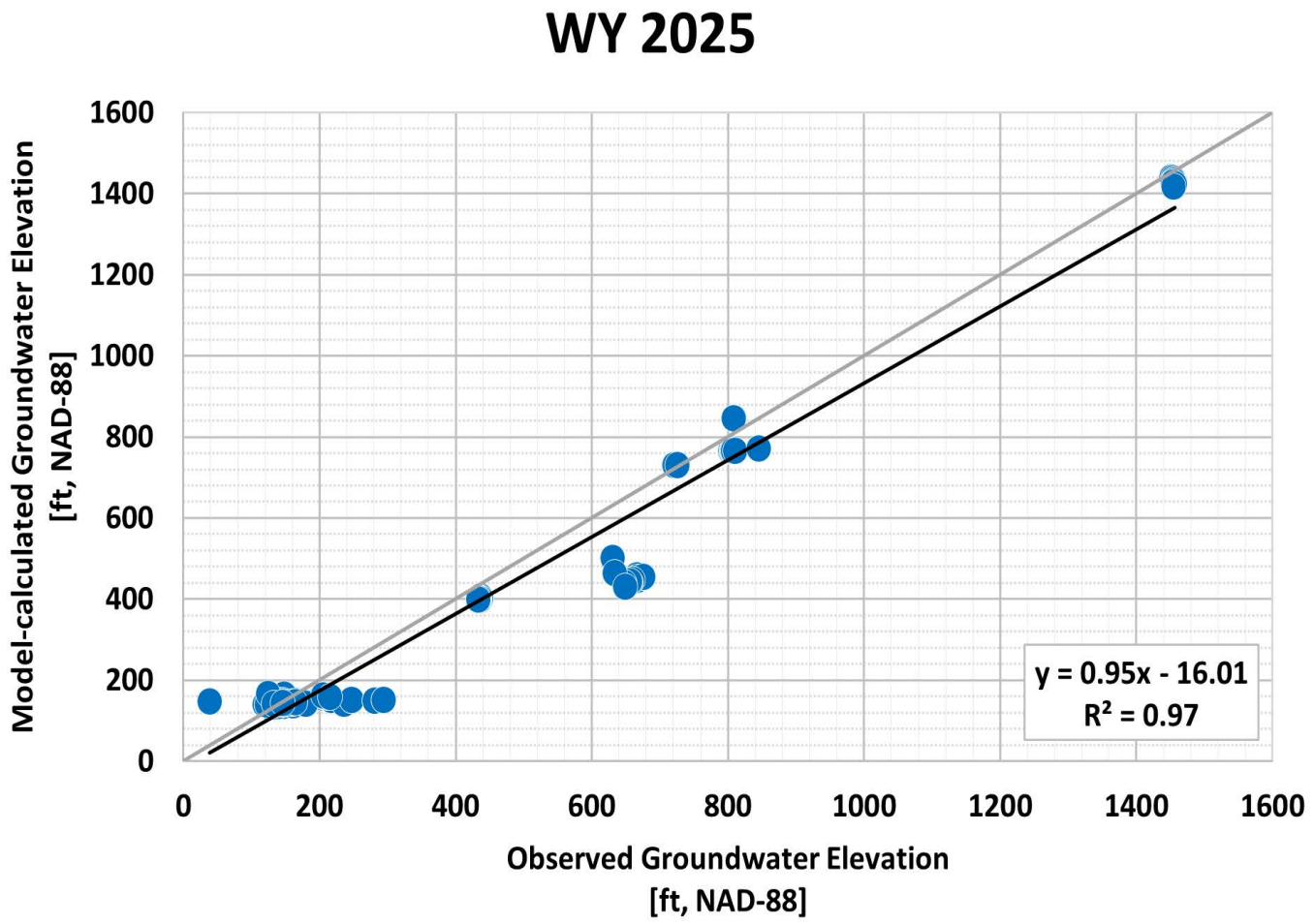
White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 7



Legend

= Observed Groundwater Elevation

= 1 : 1

= Linear (Observed)

Abbreviations

ft	= feet
NAVD-88	= North American Vertical Datum of 1988
WY	= water year

Notes

1. Wells plotted include calibration, verification, and representative monitoring wells with available water level data collected between 1 October 2024 and 30 September 2025.

Sources

1. White Wolf Groundwater Flow Model

Model-Calculated versus Observed Groundwater Elevations in Wells, WY 2025

White Wolf GSA
Kern County, California
March 2026
C20014.04

eki environment & water

Figure 8

(a) Water Level Difference (ft) between WY2024 and WY2025

(b) Storage Change (AF/ac) between WY2024 and WY2025

Legend

Water Level Difference (ft)

- <-10
- -3 - 0
- 0 - 3
- 3 - 10
- >10

Storage Change (AF/ac)

- < -2.5
- -2.5 to 0
- 0 to 2.5
- 2.5 to 5
- >5

Abbreviations

AF/ac	= Acre Feet per Acre
DWR	= California Department of Water Resources
ft	= Feet
GSA	= Groundwater Sustainability Agency
WY	= Water Year

Notes

1. All locations are approximate.
2. Water level difference and storage change are calculated as the difference between September 2025 and September 2024
3. Negative differences in water level/storage indicate receding water level/ storage between September 2025 and September 2024.
4. Water level difference calculated as the difference in modeled layer 2 heads from the White Wolf Groundwater Flow Model.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 30 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. White Wolf Groundwater Flow Model

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0 4 8

(Scale in Miles)

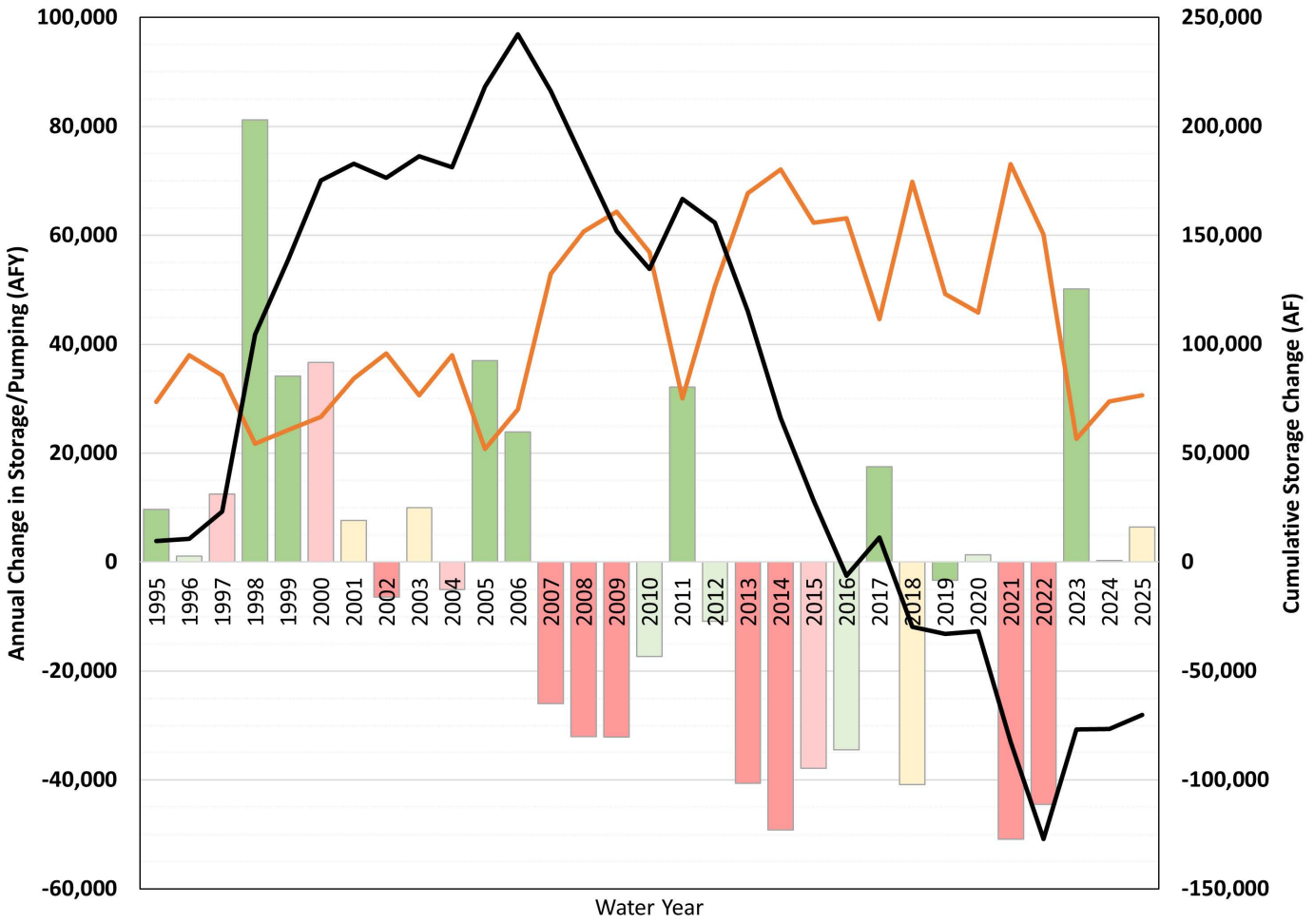
Model Estimated Groundwater Storage Change between WY 2024 and WY 2025

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 9

eki environment & water

Path: X:\C20014\Maps_04\2026\02\WY 2025 Annual Report Figures\Figure 8. Panel_StorageChange_WLDifferencel_2pane_reformat.mxd



Legend

Change in Groundwater Storage

DWR Water Year Type

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

- Groundwater Use
- Cumulative Storage Change

Abbreviations

AF	= acre-feet
AFY	= acre-feet per year
DWR	= California Department of Water Resources
WWGFM	= White Wolf Groundwater Flow Model
WY	= Water Year

Notes

1. Water Year is defined as the October of the previous year through September of the current year.
2. Water Year type for WY 2019, 2020, 2021, 2022, 2023, 2024, and 2025 calculated using same methodology as DWR, 2021.

Sources

1. DWR Water Year type for WY 1995-2018 from (DWR, 2021).
2. WY 1995-2023 change in groundwater storage and groundwater use as estimated by the WWGFM WY 2023 extension.
3. WY 2024 and 2025 change in groundwater storage and groundwater use as estimated by the re-calibrated WWGFM WY 2024 and WY 2025 extensions, respectively.

Annual Change in Groundwater Storage and DWR Water Year Type

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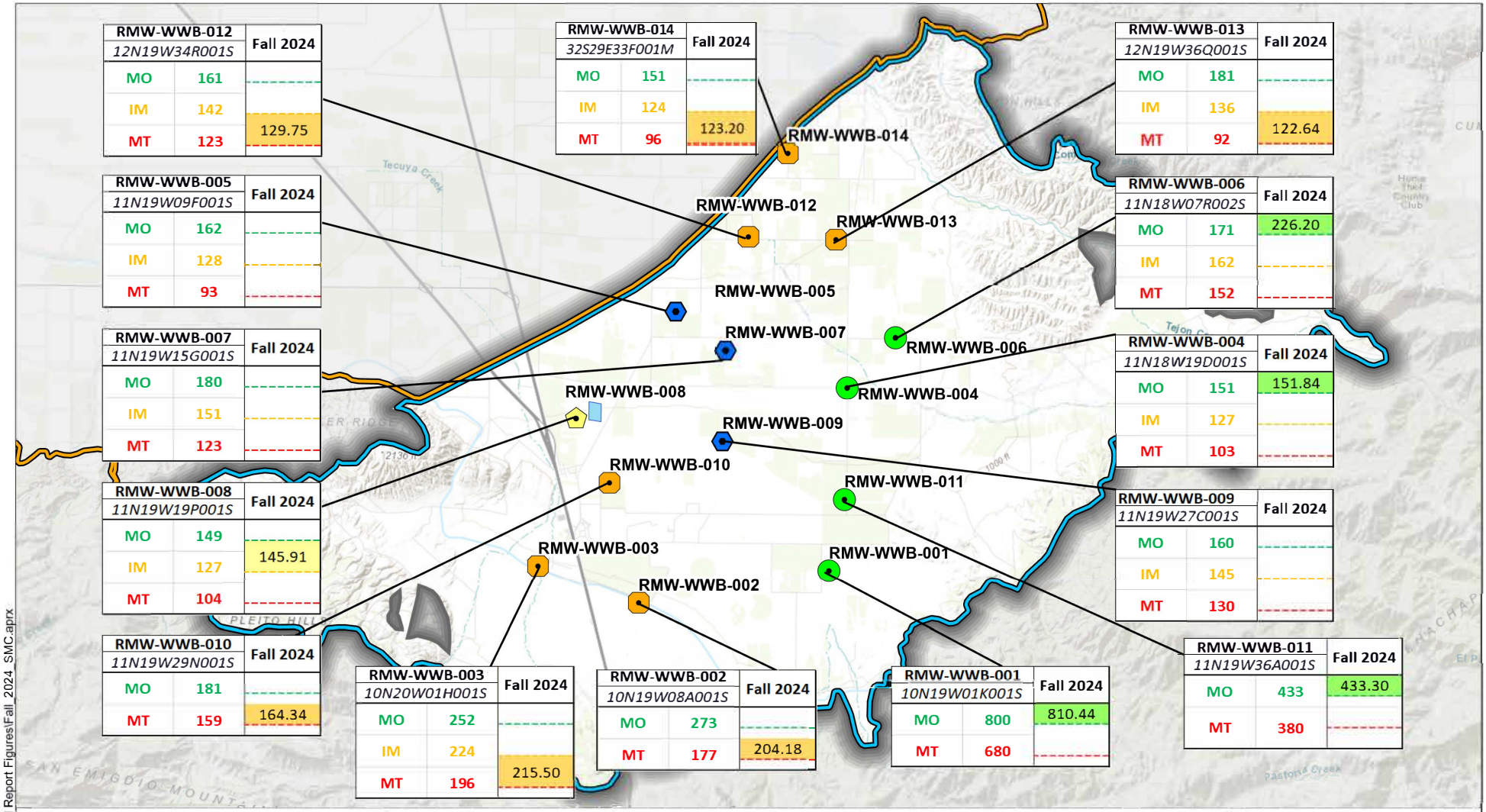
White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 10



Legend

Representative Monitoring Wells and Status as of Fall 2024

- Water Level Above MO (4 or 29%)
- Water Level Between MO and MT but above IM (1 or 7%)
- Water Level Between MO and MT but below IM (6 or 43%)
- Water Level Below MT (0)
- No Water Level Measurement (3 or 21%)

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- Mettler Recharge Project

Abbreviations

DWR = California Department of Water Resources
RMW-WL = Representative Monitoring Well for Chronic Lowering of Groundwater Levels
SGMA = Sustainable Groundwater Management Act
MO = Measurable Objective
MT = Minimum Threshold
IM = Interim Milestone

Notes

1. All locations are approximate.
2. Wells RMW-WWB-005, RMW-WWB-007, and RMW-WWB-009 were non-functional during Fall 2024 measurement.
3. RMW-WLs are designated as the SGMA Monitoring Network. Water level data from RMW-WLs will be collected and submitted to DWR per California Code of Regulations Section 354.34(c)(1)(B) and 354.40.
4. IM is equal to MO unless otherwise noted in the tables.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 30 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.

N

0 3 6

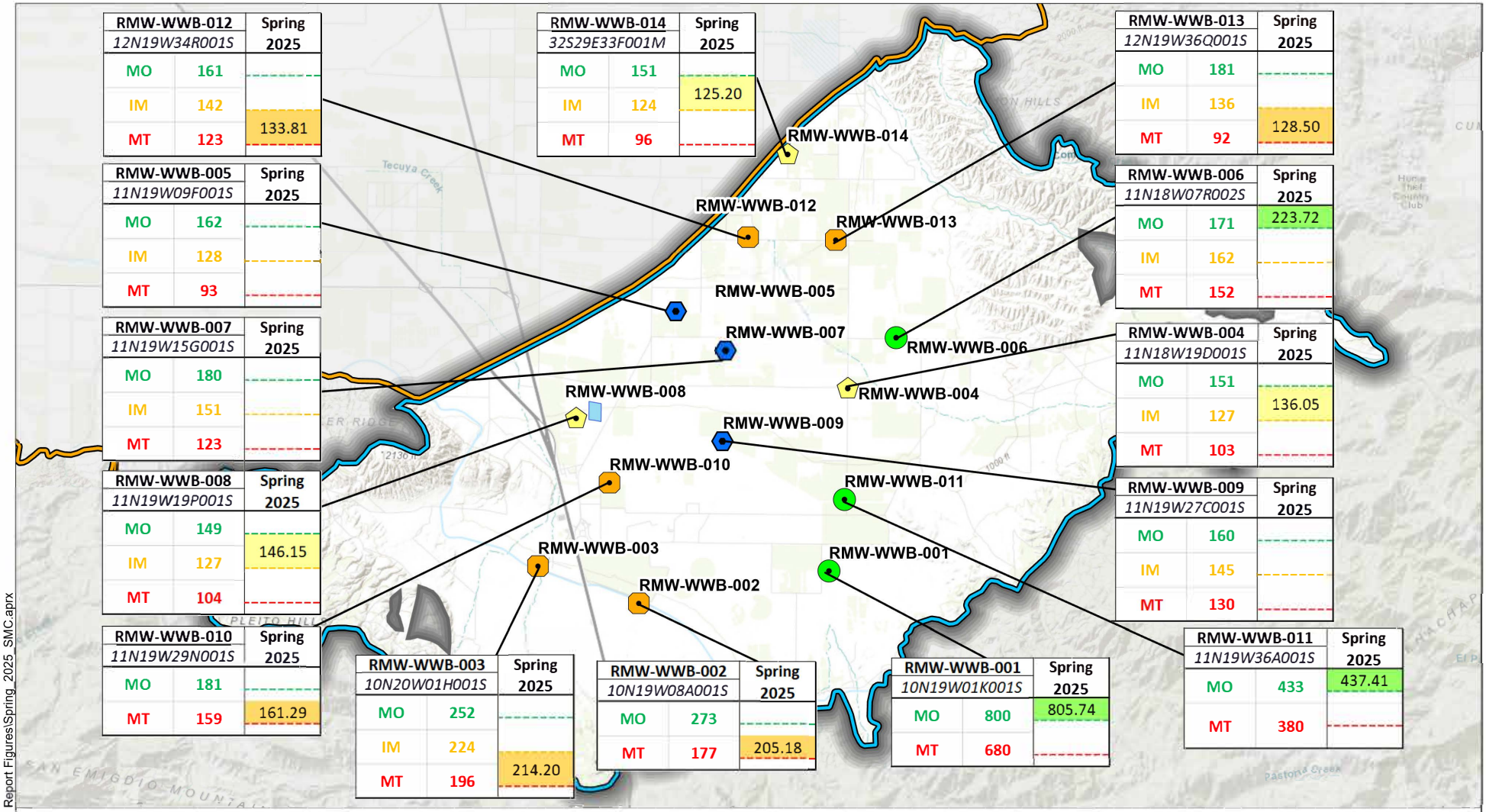
(Scale in Miles)

Fall 2024 Groundwater Levels Relative to Sustainable Management Criteria

White Wolf GSA
Kern County, California
March 2026
C20014.04
Figure 11

eki environment & water

Path: X:\C20014\Maps_04\2026\02\WY 2025 Annual Report Figures\Fall_2024_SMC.aprx



Legend

Representative Monitoring Wells and Status as of Spring 2025

- Water Level Above MO (3 or 21%)
- Water Level Between MO and MT but above IM (3 or 21%)
- Water Level Between MO and MT but below IM (5 or 36%)
- No Water Level Measurement (3 or 21%)

Groundwater Subbasin

- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- Mettler Recharge Project

Abbreviations

DWR = California Department of Water Resources
RMW-WL = Representative Monitoring Well for Chronic Lowering of Groundwater Levels
SGMA = Sustainable Groundwater Management Act
MO = Measurable Objective
MT = Minimum Threshold
IM = Interim Milestone

Notes

1. All locations are approximate.
2. Wells RMW-WWB-005, RMW-WWB-007, and RMW-WWB-009 were non-functional during Spring 2025 measurement.
3. RMW-WLs are designated as the SGMA Monitoring Network. Water level data from RMW-WLs will be collected and submitted to DWR per California Code of Regulations Section 354.34(c)(1)(B) and 354.40.
4. IM is equal to MO unless otherwise noted in the tables.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 30 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.

N

0 3 6

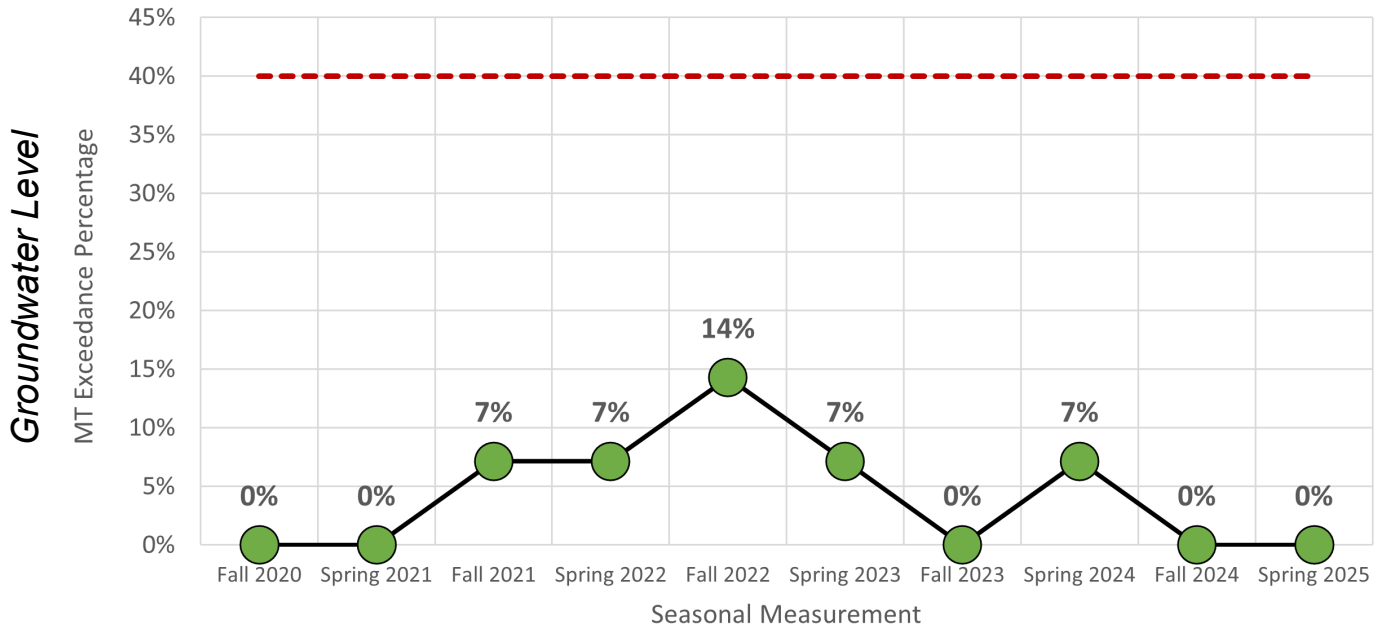
(Scale in Miles)

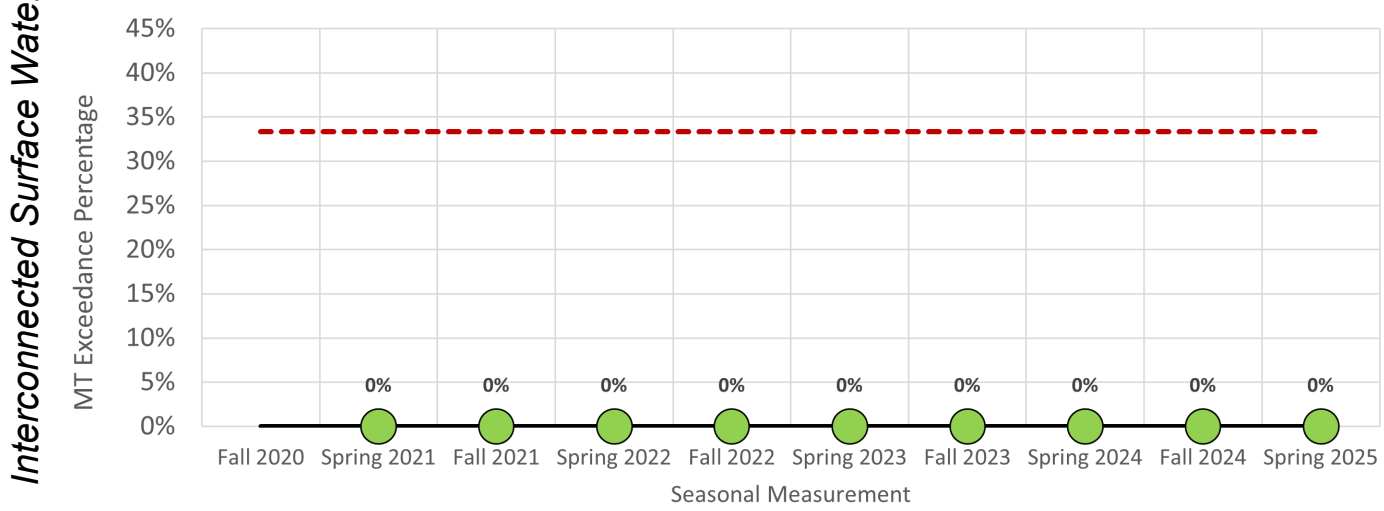
Spring 2025 Groundwater Levels Relative to Sustainable Management Criteria

White Wolf GSA
Kern County, California
March 2026
C20014.04
Figure 12

eki environment & water

Path: X:\C20014\Maps_04\2026\02\WY 2025 Annual Report Figures\Spring_2025_SMC.aprx





Legend

UR Threshold (see note #1)

RMW (see note #2)

- 0 consecutive seasonal measurements exceeding UR Threshold
- 1 - 3 consecutive seasonal measurements exceeding UR Threshold
- ≥ 4 consecutive seasonal measurements exceeding UR Threshold

Abbreviations

ISW	= Interconnected Surface Water
MT	= Minimum Threshold
RMW	= Representative Monitoring Well
UR	= Undesirable Result
WL	= Water Level

Notes

1. UR Threshold is set at greater than or equal to:
   40 % of RMW-WLs exceeding their MTs
   33 % of RMW-ISWs exceeding their MTs
2. Number shown indicates count of consecutive seasonal monitoring events above UR threshold. UR occurs after four consecutive seasonal monitoring events where MT exceedance percentage exceeds the UR threshold.
3. The RMW-ISWs were installed in January 2021 and thus do not have a Fall 2020 measurement available.

Undesirable Results Tracking

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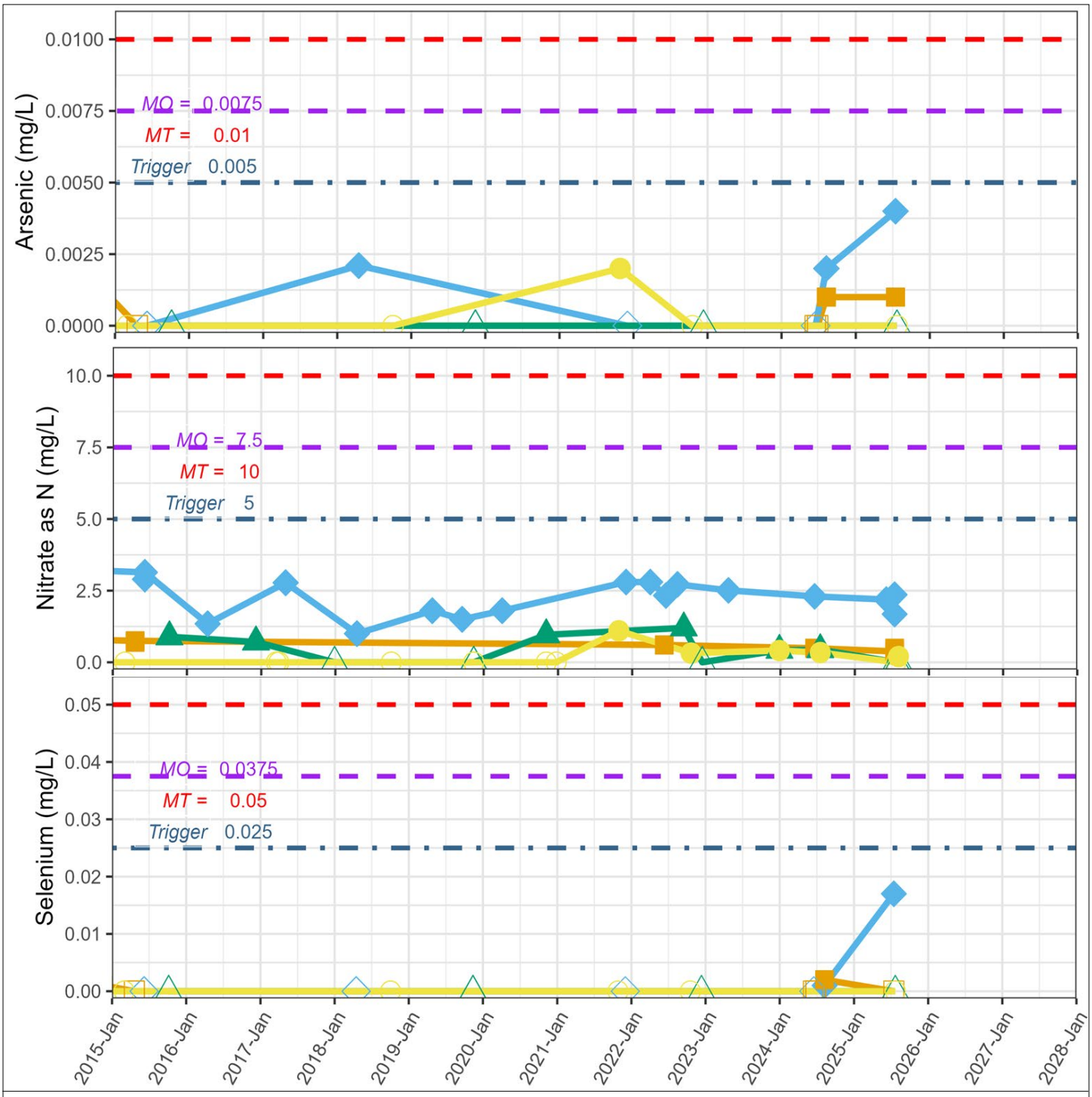
White Wolf GSA
Kern County, California
March 2026
EKI C20014.04

Figure 13



RMW-WWB-015 RMW-WWB-016 RMW-WWB-017 RMW-WWB-018

Detected

Not Detected

Minimum Threshold
Measurable Objective
Trigger Threshold

Concentrations of Constituents of Concern at Representative Monitoring Wells for Groundwater Quality

White Wolf Groundwater Sustainability Agency
Kern County, CA
March 2026
C20014.04
Figure 14

Abbreviations
mg/L = Milligrams per liter
MO = Measurable Objective
MT = Minimum Threshold
N = Nitrogen
RMW = Representative Monitoring Well
WWB = White Wolf Subbasin

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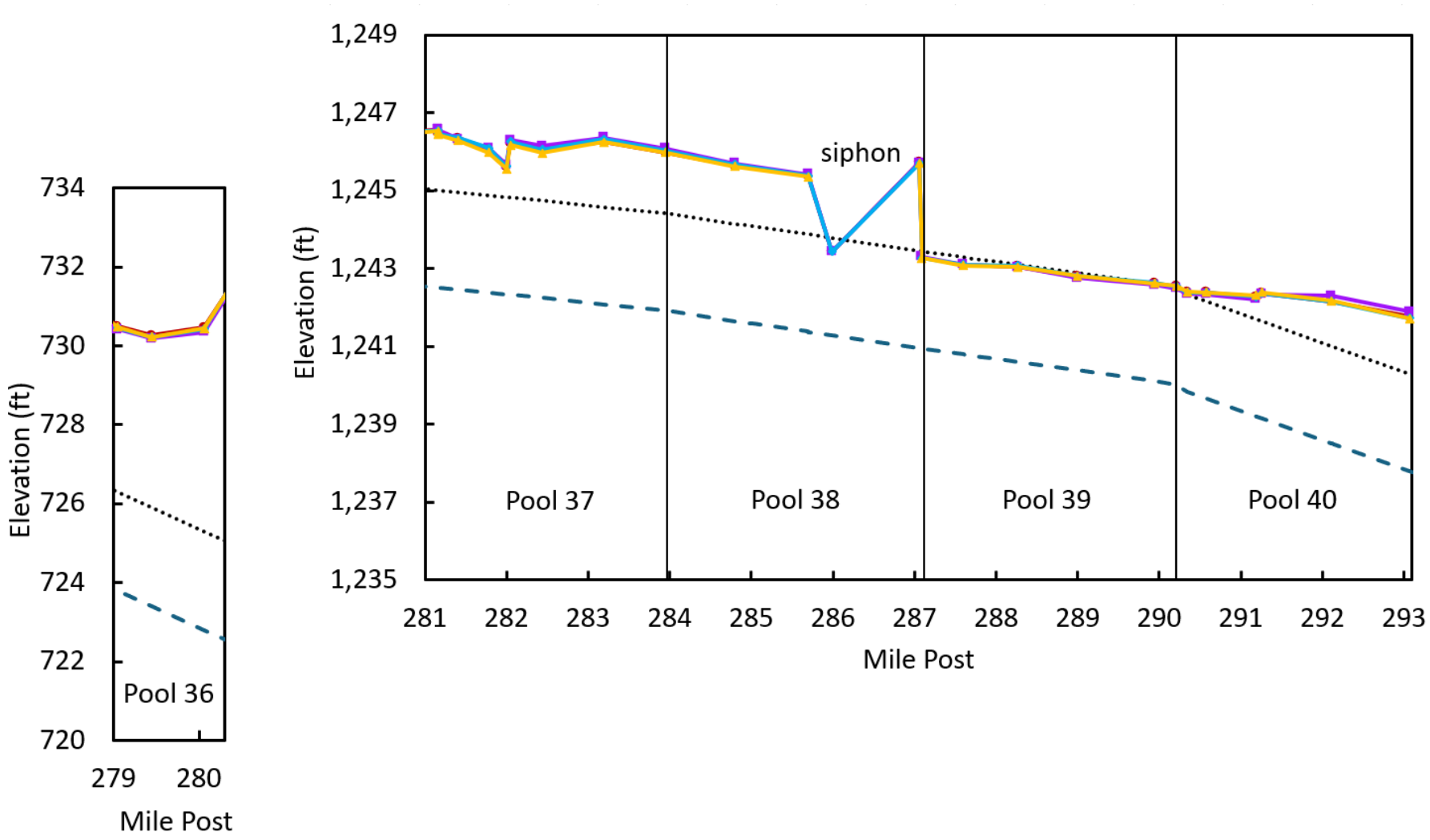


Legend

- Design Water Surface Elevation
- Minimum Top of Liner Elevation for Operating at Design Capacity and Freeboard
- 2022 Top of Liner
- 2023 Top of Liner
- 2024 Top of Liner
- 2025 Top of Liner

Abbreviations

DWR = California Department of Water Resources
ft = feet

Notes

1. Minimum top of liner elevation for design capacity and freeboard is defined as 2.5 ft above the design water surface elevation.

Sources

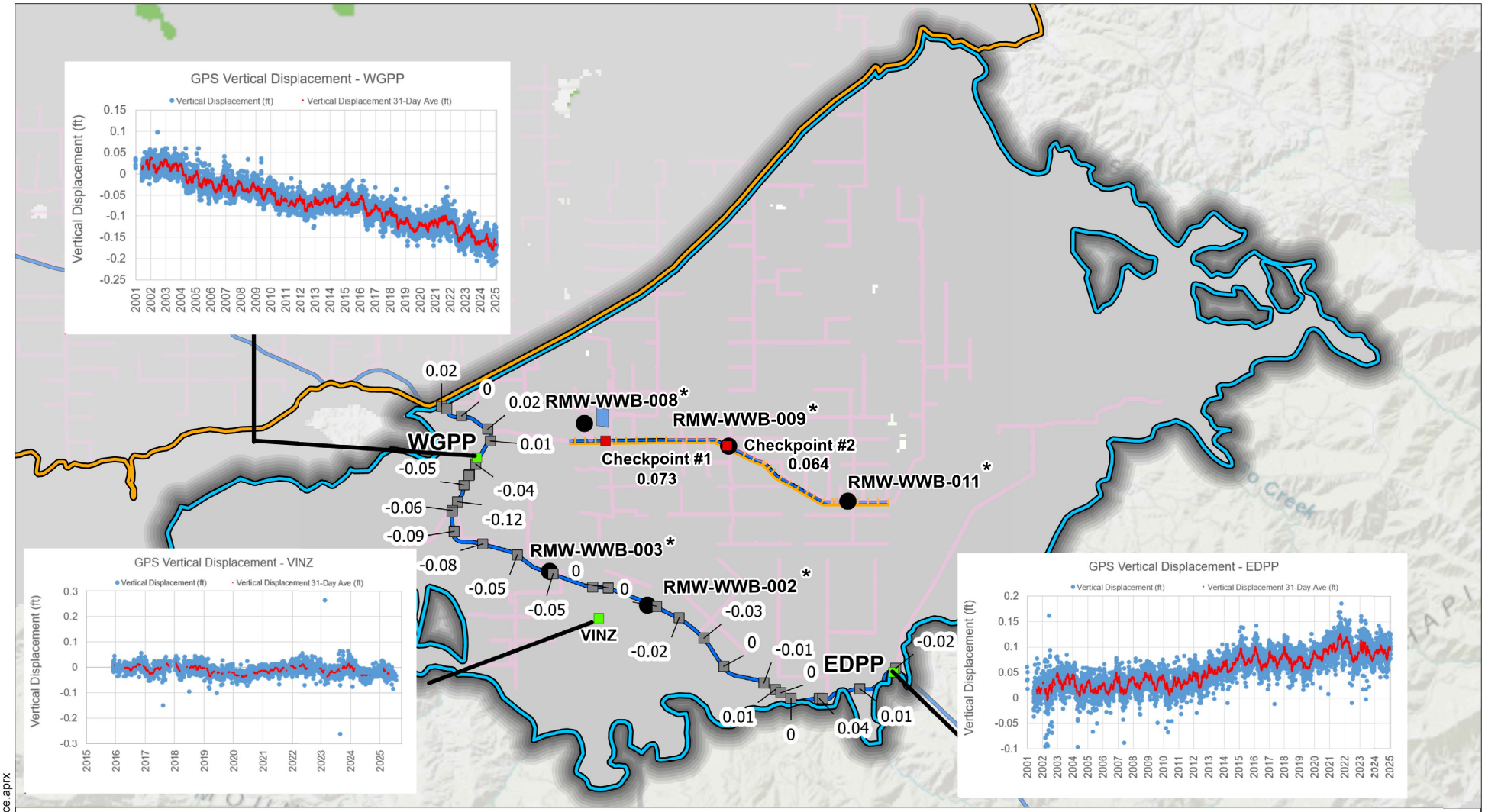
1. California Aqueduct Subsidence Study. 2025. Historic Survey Elevations in San Joaquin Field Division, in meters. https://data.cnra.ca.gov/dataset/california-aqueduct-subsidence-study.
2. DWR. 2017. California Aqueduct Subsidence Study. https://data.cnra.ca.gov/dataset/california-aqueduct-subsidence-study/resource/dbffa5d3-4a12-4bcd-a430-57a60f16014a.

Measured Elevation Changes Along the California Aqueduct Within White Wolf Subbasin

eki environment & water

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 15



Legend

Groundwater Subbasin
- White Wolf (DWR 5-022.18)
- Kern County (DWR 5-022.14)
- California Aqueduct
- 850 Canal
- Pipeline
- Representative Monitoring Well
- Checkpoint
- GPS Subsidence Monitoring Station
- DWR Checkpoints

TRE Altamira InSAR Vertical Displacement WY 2025
- < - 1 ft
- - 1.0 to - 0.8 ft
- - 0.8 to - 0.6 ft
- - 0.6 to - 0.4 ft
- - 0.4 to - 0.2 ft
- - 0.2 to - 0.1 ft
- - 0.1 to 0.1 ft
- > 0.1 ft

Abbreviations

DWR = California Department of Water Resources
ft = feet
GPS = Global Positioning System
InSAR = Interferometric Synthetic Aperture Radar
SGMA = Sustainable Groundwater Management Act
WY = Water Year

Notes

1. All locations are approximate.
2. Asterisk (*) denotes wells that are also Representative Monitoring Wells for Chronic Lowering of Groundwater Levels.
3. TRE Altamira InSAR data displayed shows October 2024 through October 2025.
4. Values displaced are the difference between WY 2024 elevation and WY 2025 elevation, where positive and negative values correlate to accretion and subsidence respectively.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 31 March 2026.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater Bulletin 118 - Final Prioritization, dated February 2019.
3. California Aqueduct location is from the National Hydrography Dataset.
4. GPS subsidence monitoring data and Vertical Displacement data downloaded 10 November 2025 from the SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions
5. Subsidence at DWR checkpoints from Historic Survey Elevations in San Joaquin Field Division, last updated 10 November 2025.

N

0 3 6
(Scale in Miles)

Subsidence Monitoring in the White Wolf Subbasin

White Wolf GSA
Kern County, California
March 2026
C20014.04

Figure 16

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Path: X:\C20014.03\Maps\2025\07\Jul2025_subsidence.aprx

APPENDIX A

Annual Report Submittal Checklist

Groundwater Sustainability Plan Annual Report Elements Guide

Basin Name	White Wolf Subbasin		
GSP Local ID			
California Code of Regulations - GSP Regulation Sections	***Groundwater Sustainability Plan Elements***	**Document *page number(s) that address the applicable GSP element.***	***Notes: Briefly describe the GSP element does not apply.***
Article 5	**Plan Contents**		
Subarticle 4	***Monitoring Networks***		
§ 354.40	**Reporting Monitoring Data to the Department**		
	Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.	15, 18, 19, 21, 24, 26, 28, 29, 31	
	Note: Authority cited: Section 10733.2, Water Code. Reference: Sections 10728, 10728.2, 10733.2 and 10733.8, Water Code.		
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.	7:9, 43	
	(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.	44:45	
	(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.	46:47, 62:76	
	(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.	14:15, 48:49	

California Code of Regulations - GSP Regulation Sections	*Groundwater Sustainability Plan Elements*	Document *page number(s) that address the applicable GSP element.*	*Notes: Briefly describe the GSP element does not apply.*
	(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.	16:19	
	(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.	20:21	
	(5) Change in groundwater in storage shall include the following:		
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	51	
	(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.	52	
	(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.	25:41	

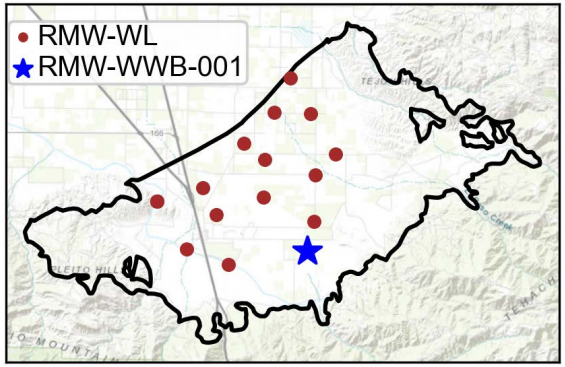
APPENDIX B

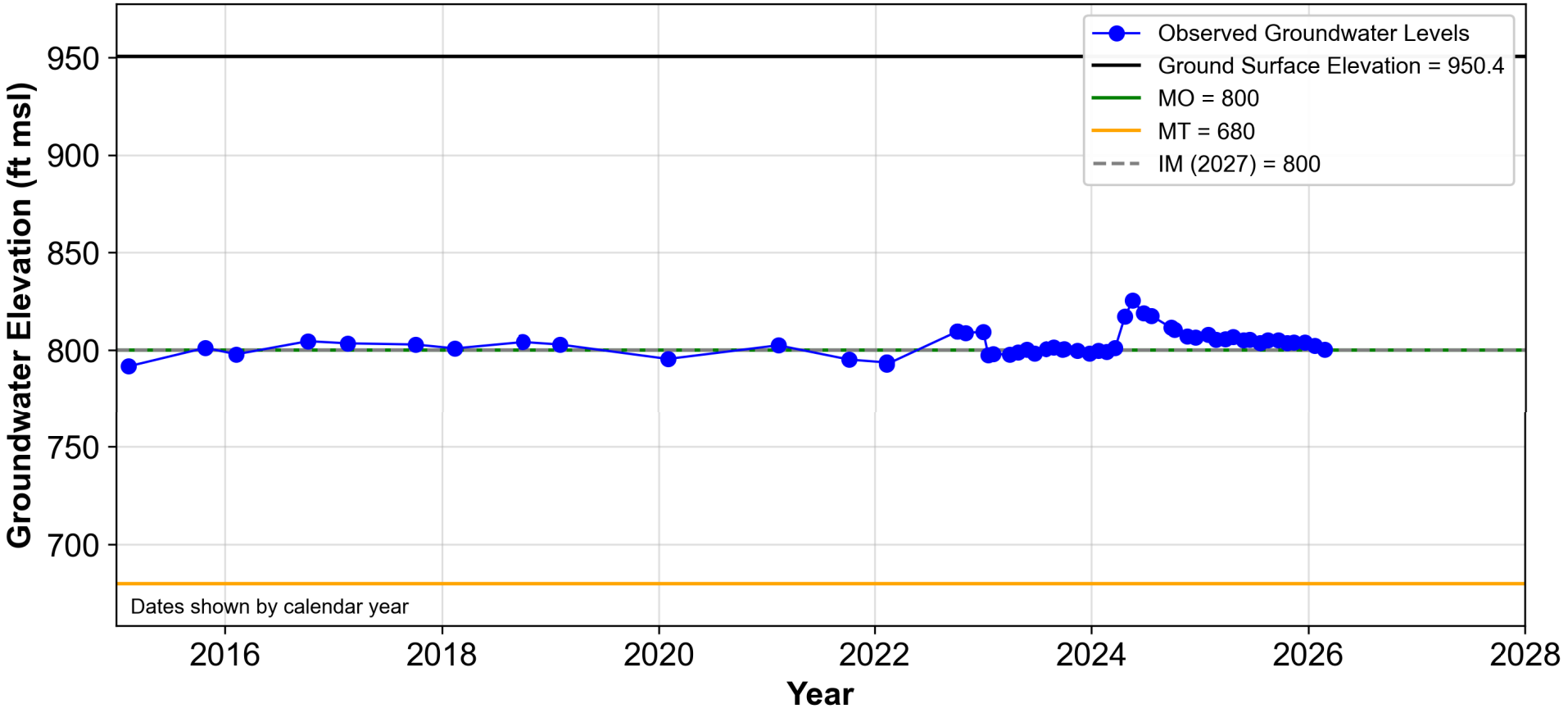
Representative Monitoring Wells Data

RMW-WWB-001

Well Information

Local Well Name	: RMW-WWB-001
State Well Name	: 10N19W01K001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 51673
X Coordinate (CA State Plane V)	: 6306158.036691355
Y Coordinate (CA State Plane V)	: 2178778.187677496
Well Depth (ft bgs)	: 460
Top Perforation (ft bgs)	: 420
Bottom Perforation (ft bgs)	: 440
Ground Surface Elevation (ft msl)	: 950.4
Reference Point Elevation (ft msl)	: 951.74
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

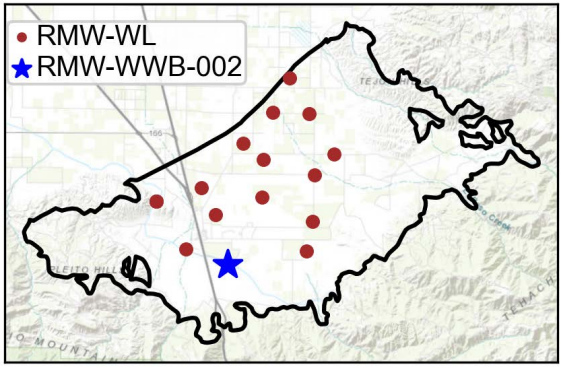


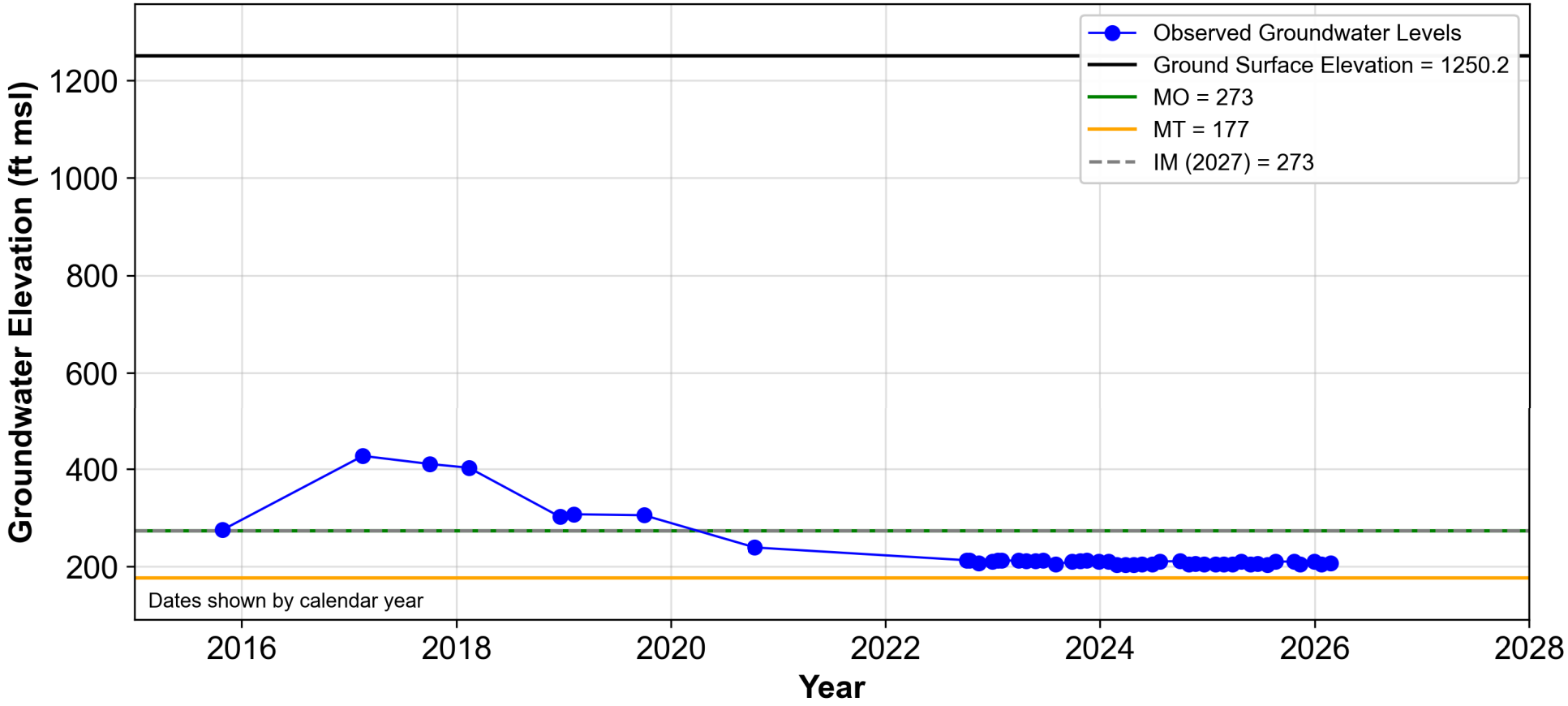


RMW-WWB-002

Well Information

Local Well Name	: RMW-WWB-002
State Well Name	: 10N19W08A001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: --
X Coordinate (CA State Plane V)	: 6285700.554786149
Y Coordinate (CA State Plane V)	: 2175288.307215995
Well Depth (ft bgs)	: 1765
Top Perforation (ft bgs)	: 1100
Bottom Perforation (ft bgs)	: 1765
Ground Surface Elevation (ft msl)	: 1250.2
Reference Point Elevation (ft msl)	: 1251.93
Sustainability Indicators	: Groundwater Levels, Groundwater Storage, Subsidence

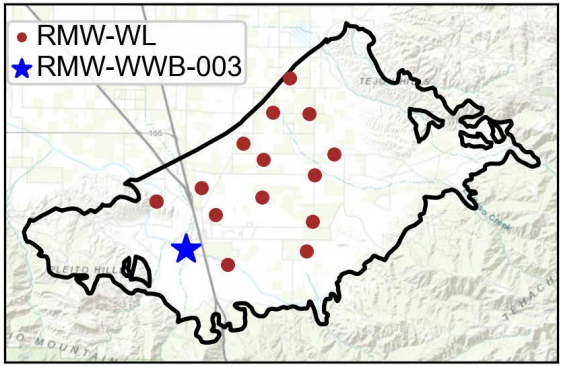


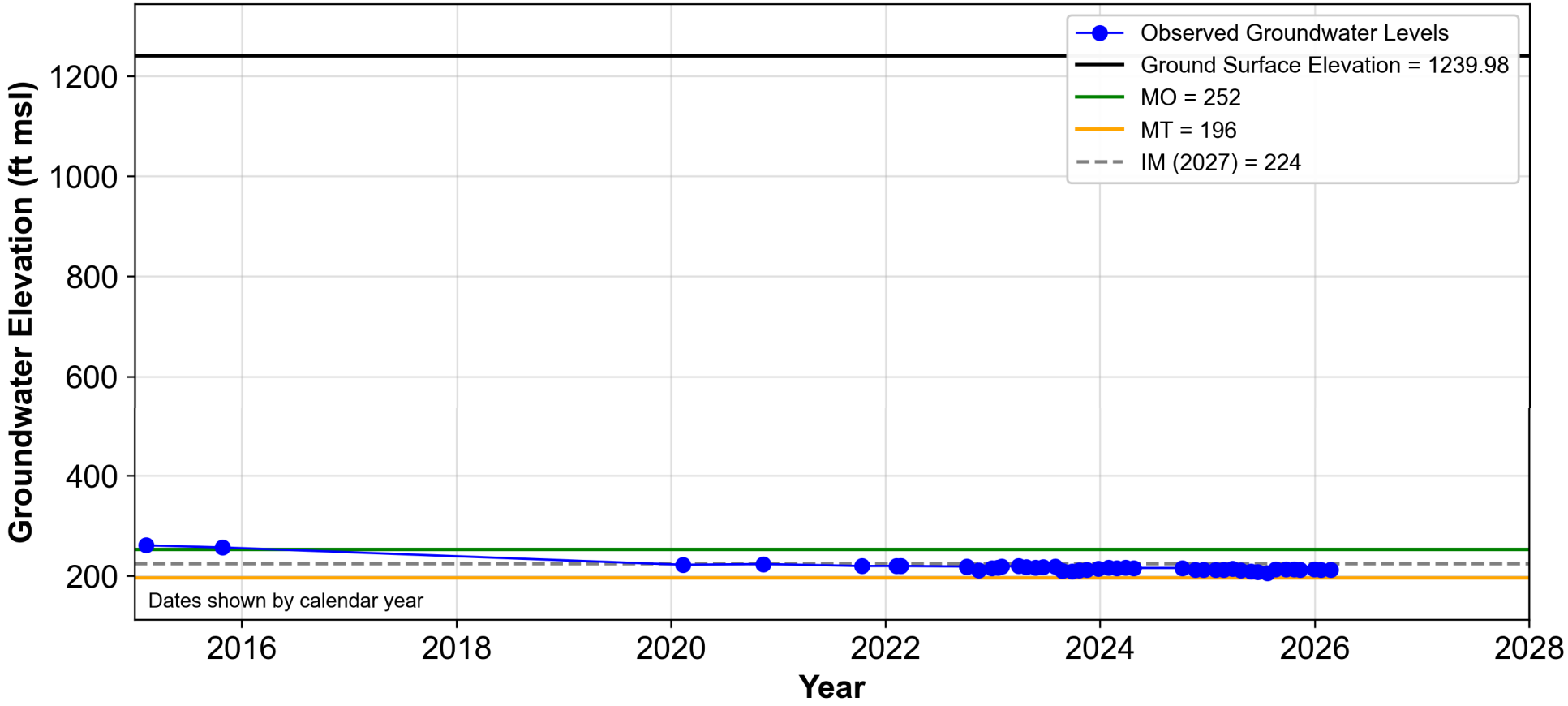


RMW-WWB-003

Well Information

Local Well Name	: RMW-WWB-003
State Well Name	: 10N20W01H001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 32402
X Coordinate (CA State Plane V)	: 6274765.324550373
Y Coordinate (CA State Plane V)	: 2179277.362112056
Well Depth (ft bgs)	: 1765
Top Perforation (ft bgs)	: 1100
Bottom Perforation (ft bgs)	: 1765
Ground Surface Elevation (ft msl)	: 1239.98
Reference Point Elevation (ft msl)	: 1240.7
Sustainability Indicators	: Groundwater Levels, Groundwater Storage, Subsidence

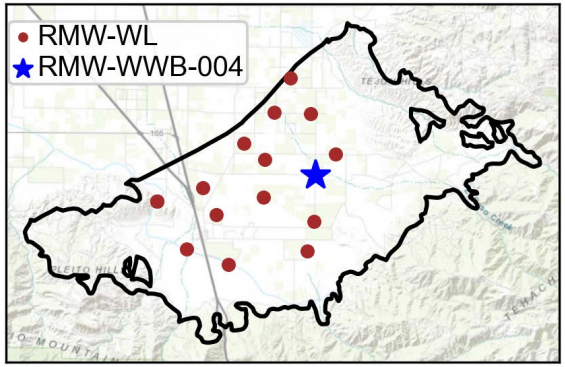


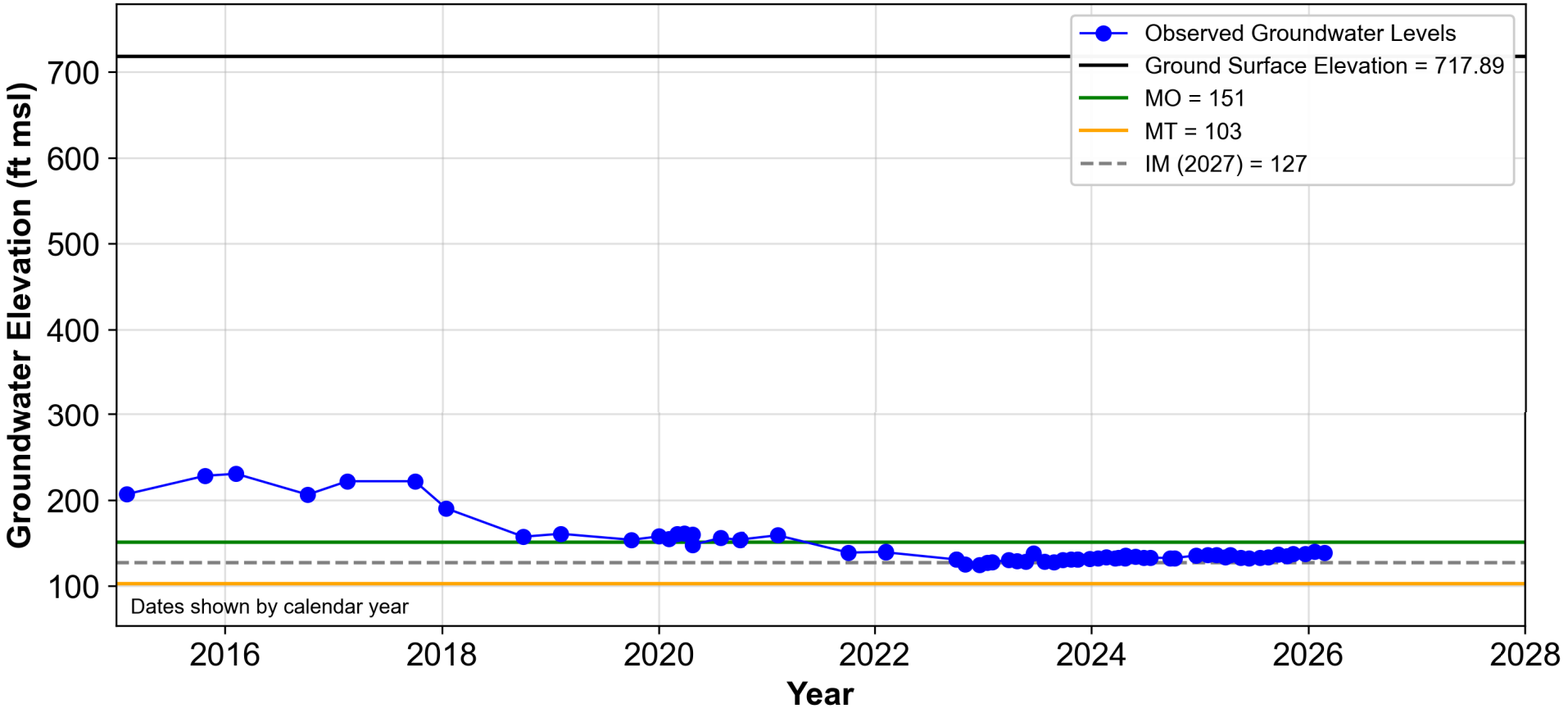


RMW-WWB-004

Well Information

Local Well Name	: RMW-WWB-004
State Well Name	: 11N18W19D001S
Well Use	: Irrigation
Aquifer	: Principal
Station ID	: 10720
X Coordinate (CA State Plane V)	: 6308271.856688529
Y Coordinate (CA State Plane V)	: 2198562.499165133
Well Depth (ft bgs)	: 984
Top Perforation (ft bgs)	: 432
Bottom Perforation (ft bgs)	: 978
Ground Surface Elevation (ft msl)	: 717.89
Reference Point Elevation (ft msl)	: 720.1
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

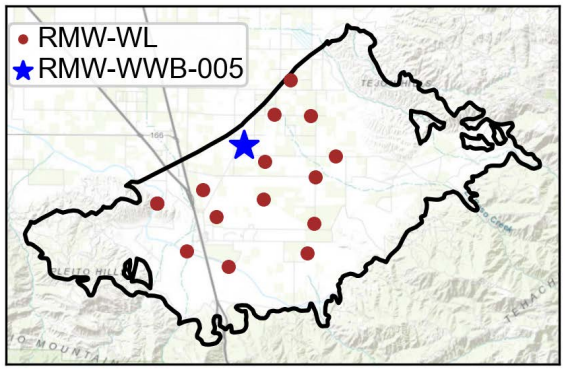


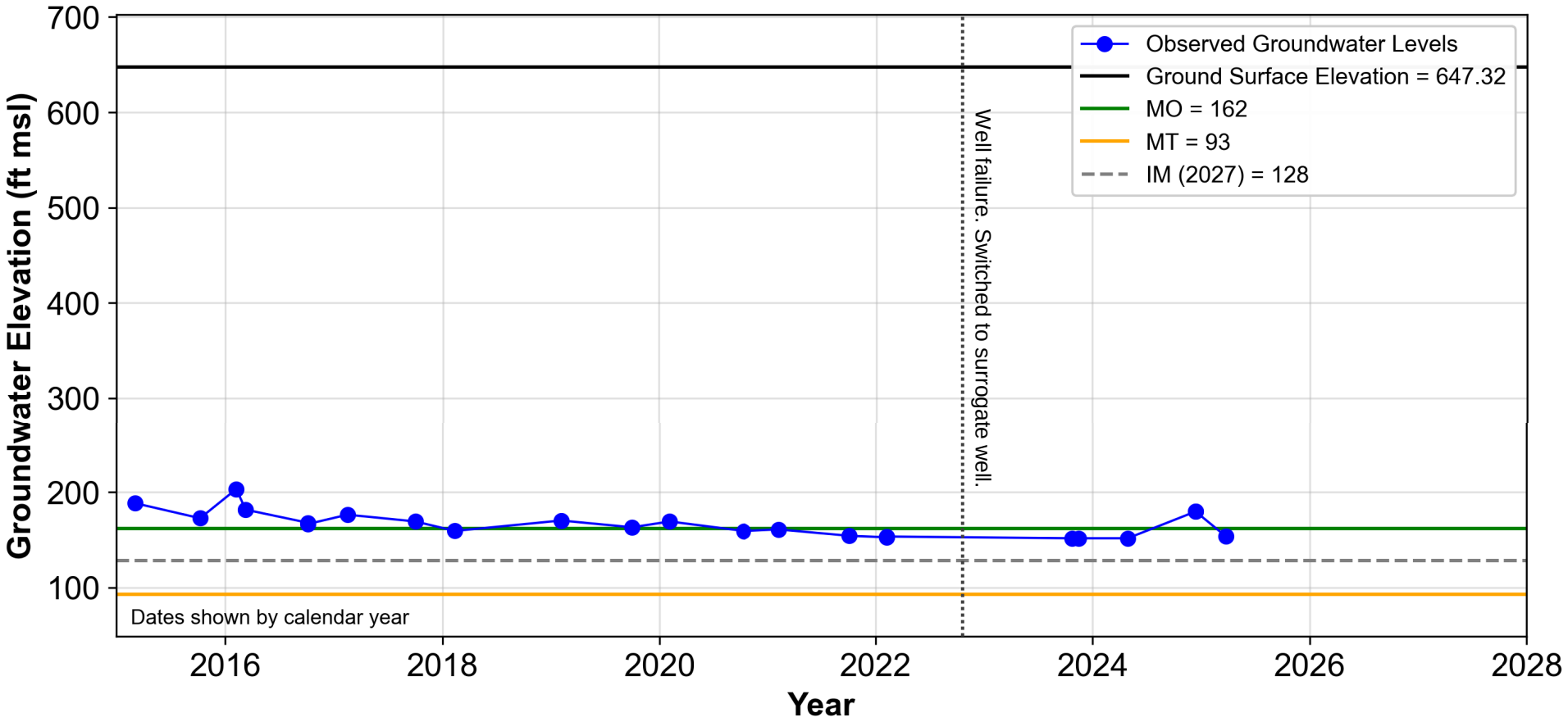


RMW-WWB-005

Well Information

Local Well Name	: RMW-WWB-005
State Well Name	: 11N19W09F001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 11412
X Coordinate (CA State Plane V)	: 6292300.516338273
Y Coordinate (CA State Plane V)	: 2205713.153722595
Well Depth (ft bgs)	: 1385
Top Perforation (ft bgs)	: 253
Bottom Perforation (ft bgs)	: 1385
Ground Surface Elevation (ft msl)	: 647.32
Reference Point Elevation (ft msl)	: 648.56
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

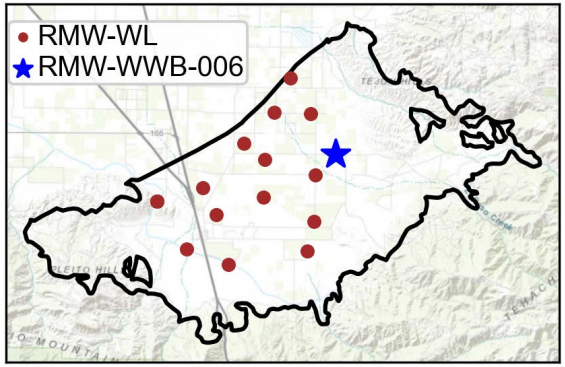


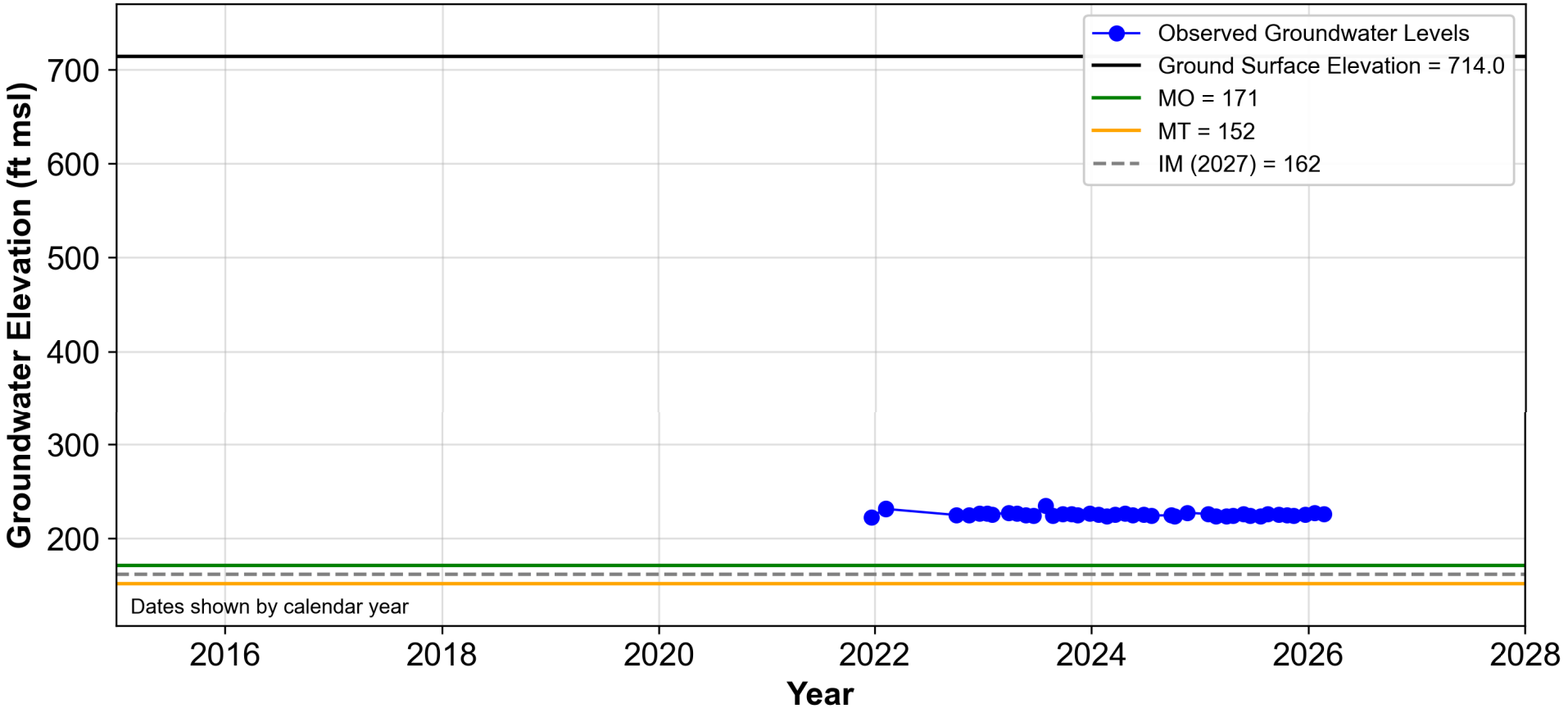


RMW-WWB-006

Well Information

Local Well Name	: RMW-WWB-006
State Well Name	: 11N18W07R002S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: --
X Coordinate (CA State Plane V)	: 6313484.197
Y Coordinate (CA State Plane V)	: 2203933.884
Well Depth (ft bgs)	: 1000
Top Perforation (ft bgs)	: 500
Bottom Perforation (ft bgs)	: 1000
Ground Surface Elevation (ft msl)	: 714.0
Reference Point Elevation (ft msl)	: 715.07
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

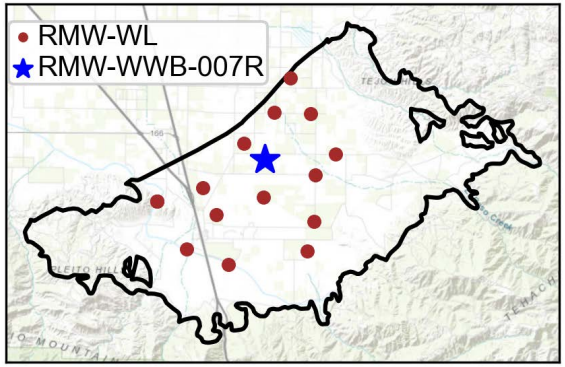


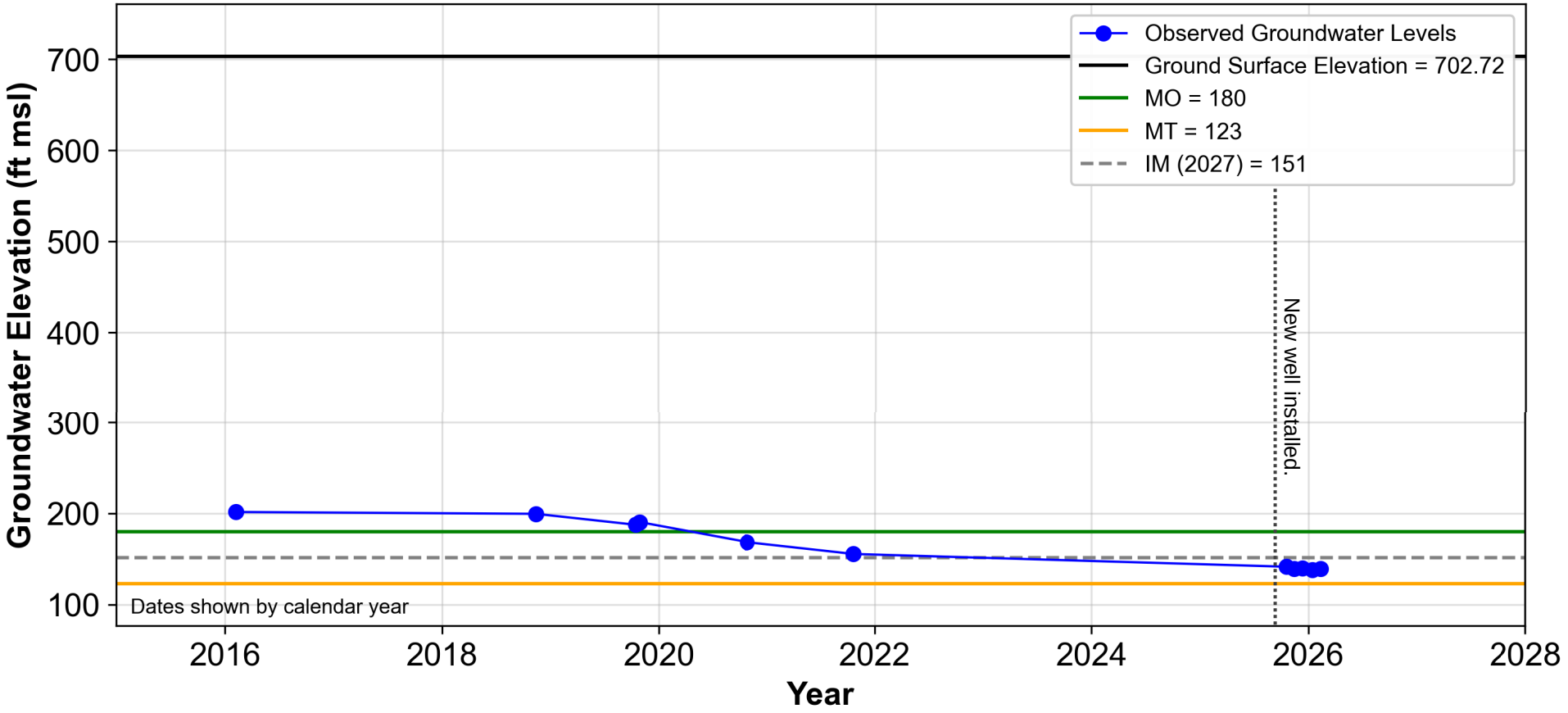


RMW-WWB-007R

Well Information

Local Well Name	: RMW-WWB-007R
State Well Name	: 11N19W15G001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 38978
X Coordinate (CA State Plane V)	: 6295068.429
Y Coordinate (CA State Plane V)	: 2202568.427
Well Depth (ft bgs)	: 695
Top Perforation (ft bgs)	: 450
Bottom Perforation (ft bgs)	: 831
Ground Surface Elevation (ft msl)	: 702.72
Reference Point Elevation (ft msl)	: 703.649
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

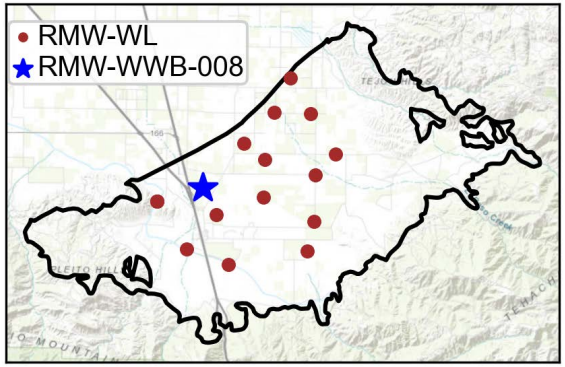


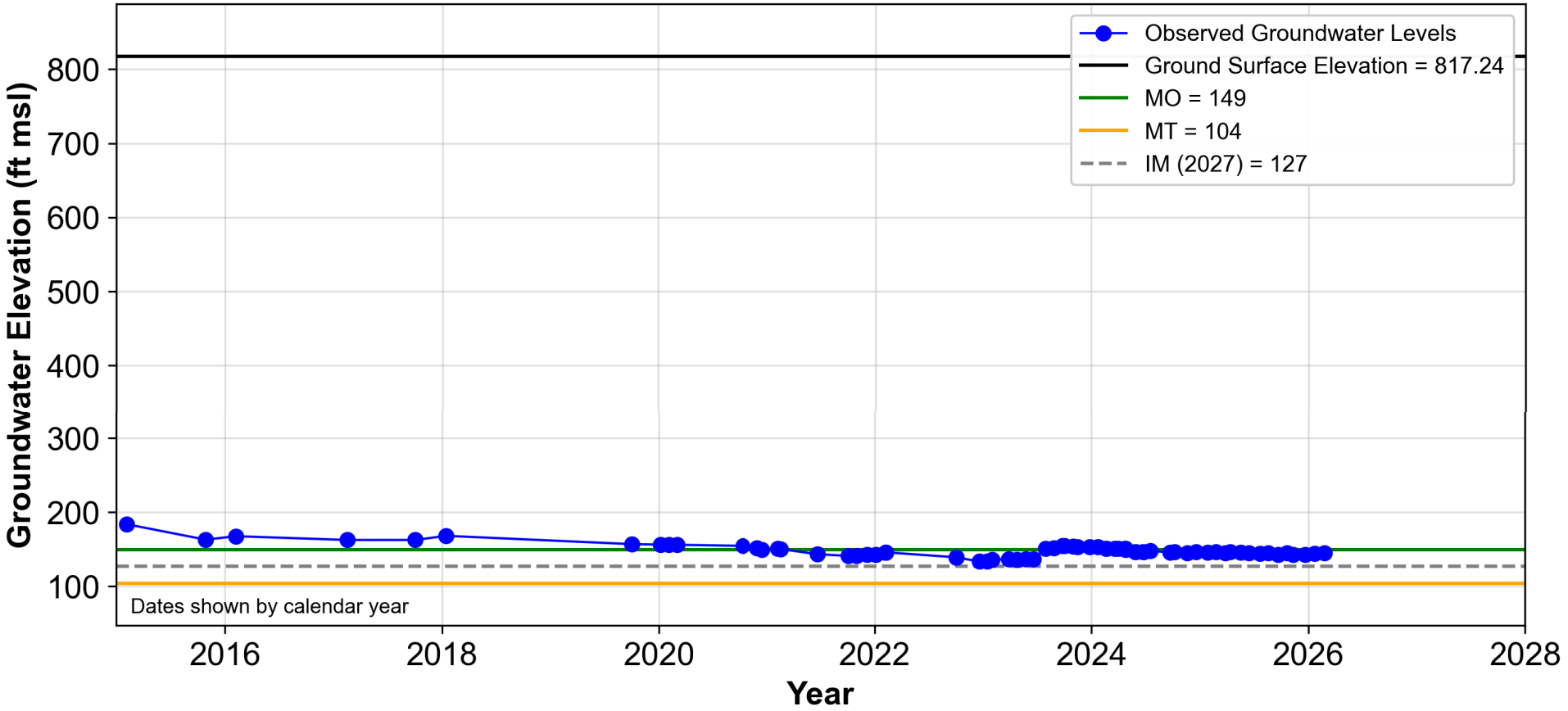


RMW-WWB-008

Well Information

Local Well Name	: RMW-WWB-008
State Well Name	: 11N19W19P001S
Well Use	: Irrigation
Aquifer	: Principal
Station ID	: 30725
X Coordinate (CA State Plane V)	: 6278930.111369699
Y Coordinate (CA State Plane V)	: 2195309.169310555
Well Depth (ft bgs)	: 1160
Top Perforation (ft bgs)	: 458
Bottom Perforation (ft bgs)	: 1160
Ground Surface Elevation (ft msl)	: 817.24
Reference Point Elevation (ft msl)	: 818.11
Sustainability Indicators	: Groundwater Levels, Groundwater Storage, Subsidence

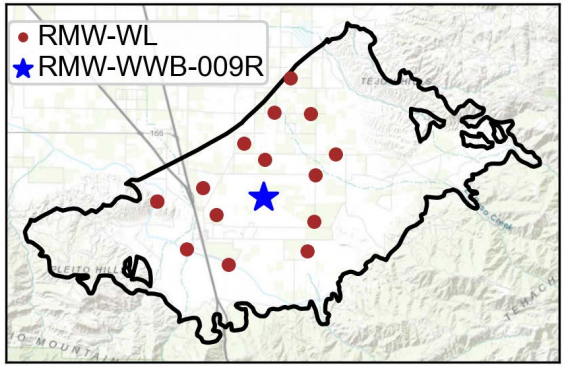


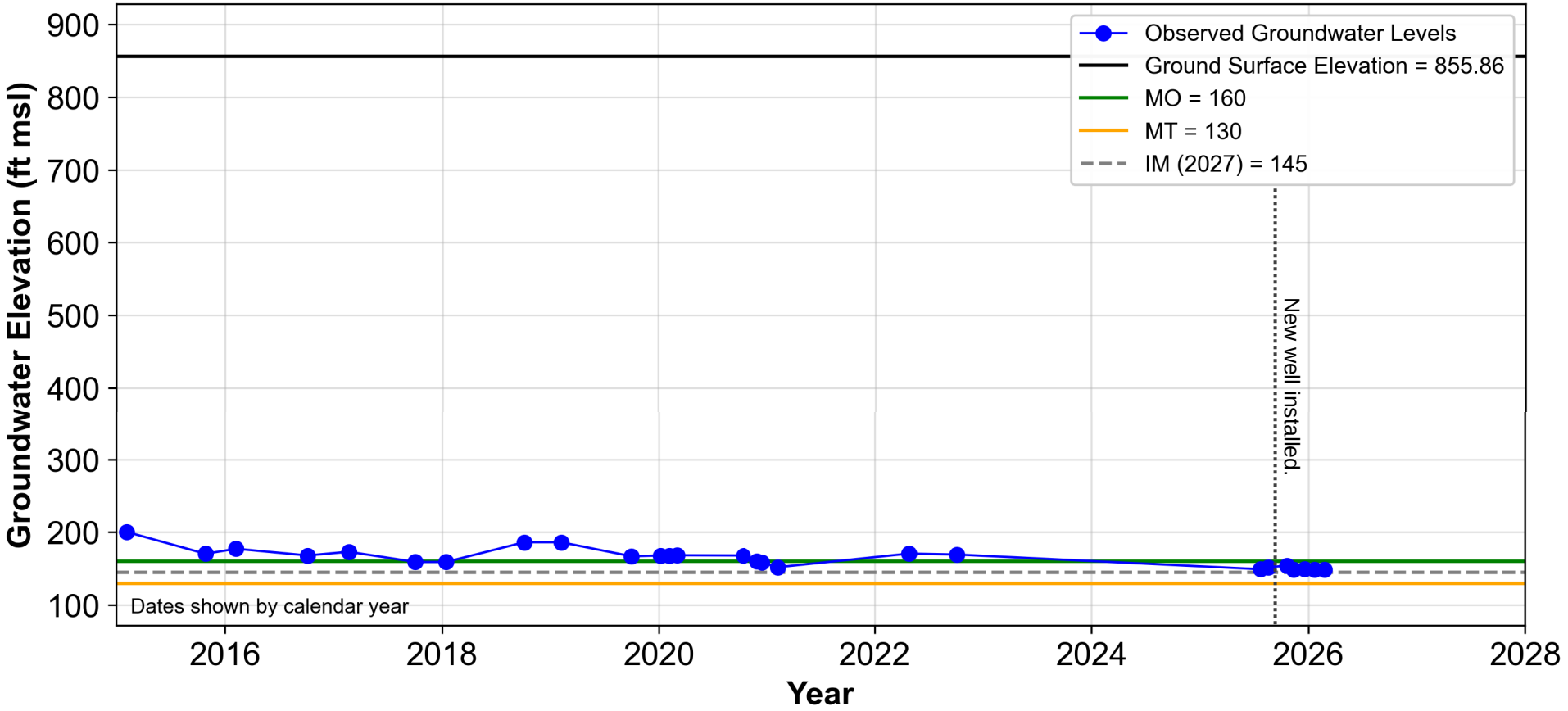


RMW-WWB-009R

Well Information

Local Well Name	: RMW-WWB-009R
State Well Name	: 11N19W27C001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 51678
X Coordinate (CA State Plane V)	: 6294738.565
Y Coordinate (CA State Plane V)	: 2192765.985
Well Depth (ft bgs)	: 895
Top Perforation (ft bgs)	: 900
Bottom Perforation (ft bgs)	: 1483
Ground Surface Elevation (ft msl)	: 855.86
Reference Point Elevation (ft msl)	: 853.569
Sustainability Indicators	: Groundwater Levels, Groundwater Storage, Subsidence

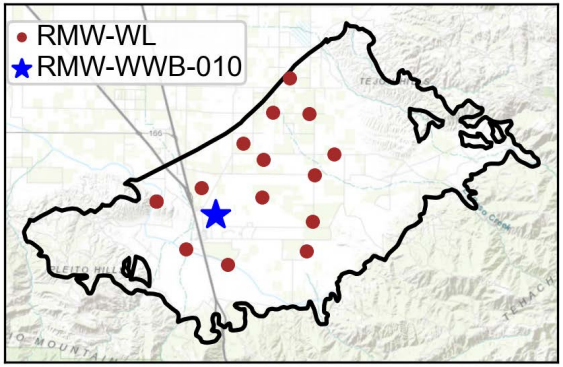


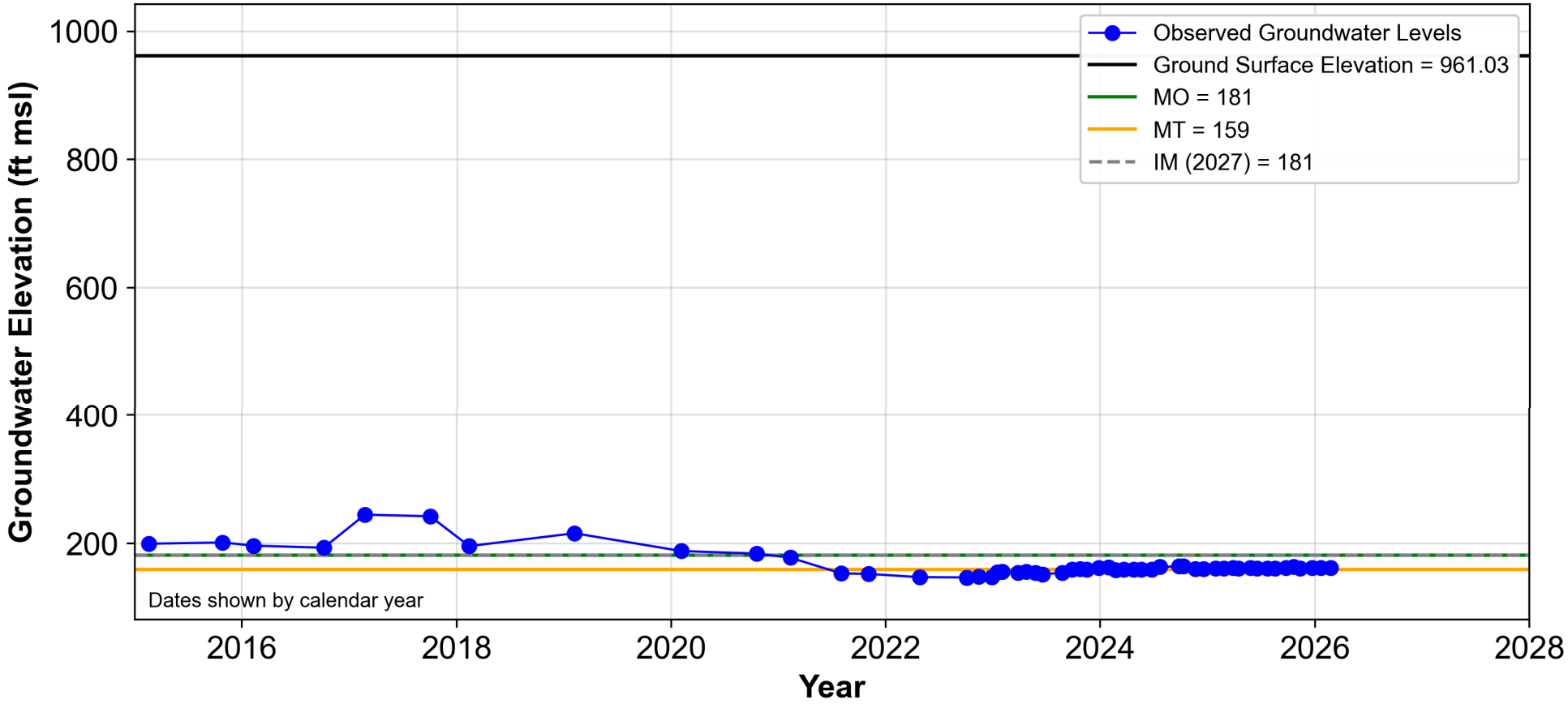


RMW-WWB-010

Well Information

Local Well Name	: RMW-WWB-010
State Well Name	: 11N19W29N001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 30732
X Coordinate (CA State Plane V)	: 6282509.590030564
Y Coordinate (CA State Plane V)	: 2188271.396335285
Well Depth (ft bgs)	: 1220
Top Perforation (ft bgs)	: 651
Bottom Perforation (ft bgs)	: 1220
Ground Surface Elevation (ft msl)	: 961.03
Reference Point Elevation (ft msl)	: 961.19
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

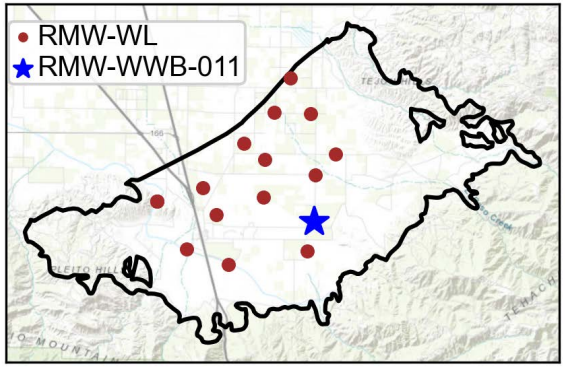


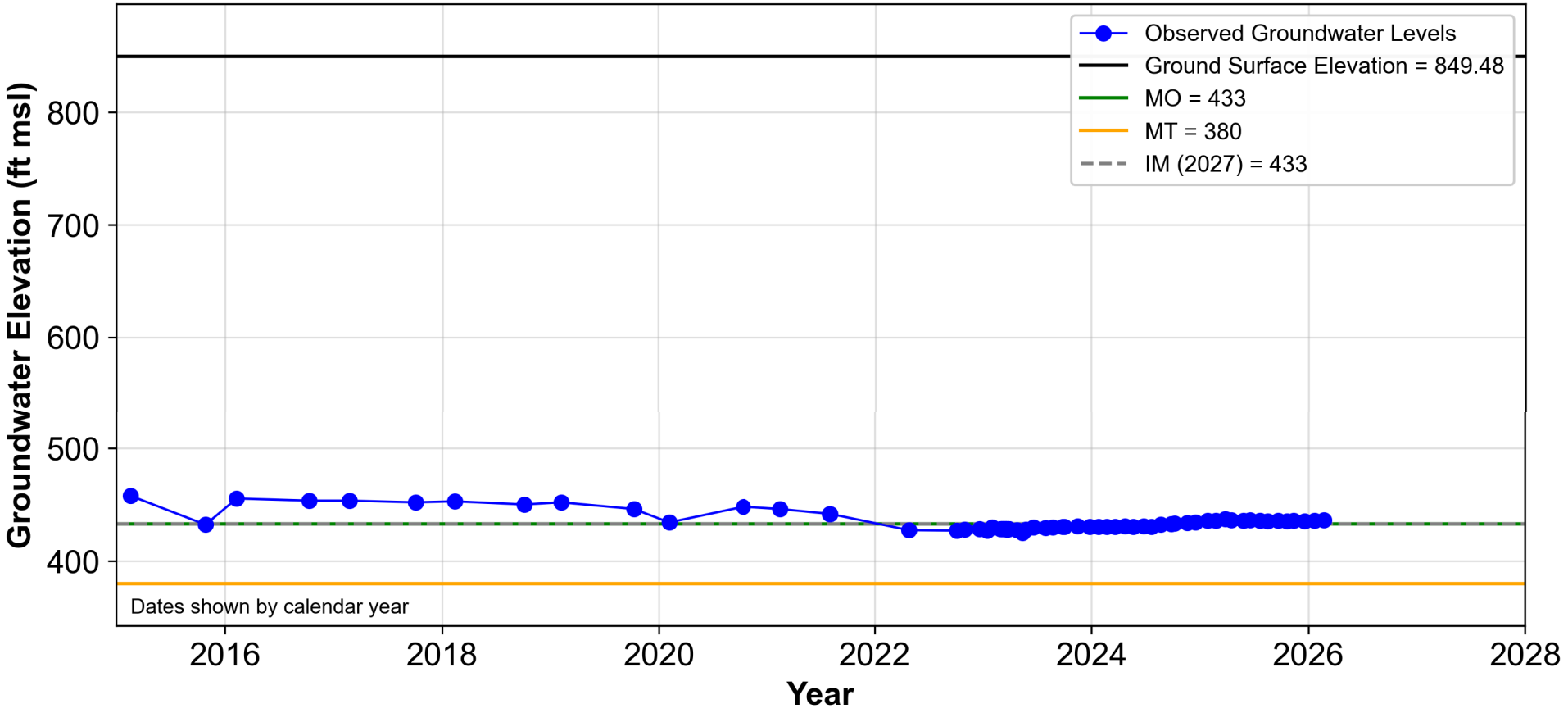


RMW-WWB-011

Well Information

Local Well Name	: RMW-WWB-011
State Well Name	: 11N19W36A001S
Well Use	: Monitoring
Aquifer	: Principal
Station ID	: 51681
X Coordinate (CA State Plane V)	: 6307904.409012625
Y Coordinate (CA State Plane V)	: 2186475.154912884
Well Depth (ft bgs)	: 1000
Top Perforation (ft bgs)	: 960
Bottom Perforation (ft bgs)	: 1000
Ground Surface Elevation (ft msl)	: 849.48
Reference Point Elevation (ft msl)	: 849.515
Sustainability Indicators	: Groundwater Levels, Groundwater Storage, Subsidence

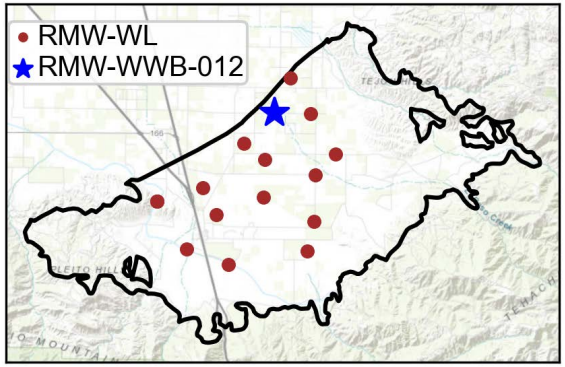


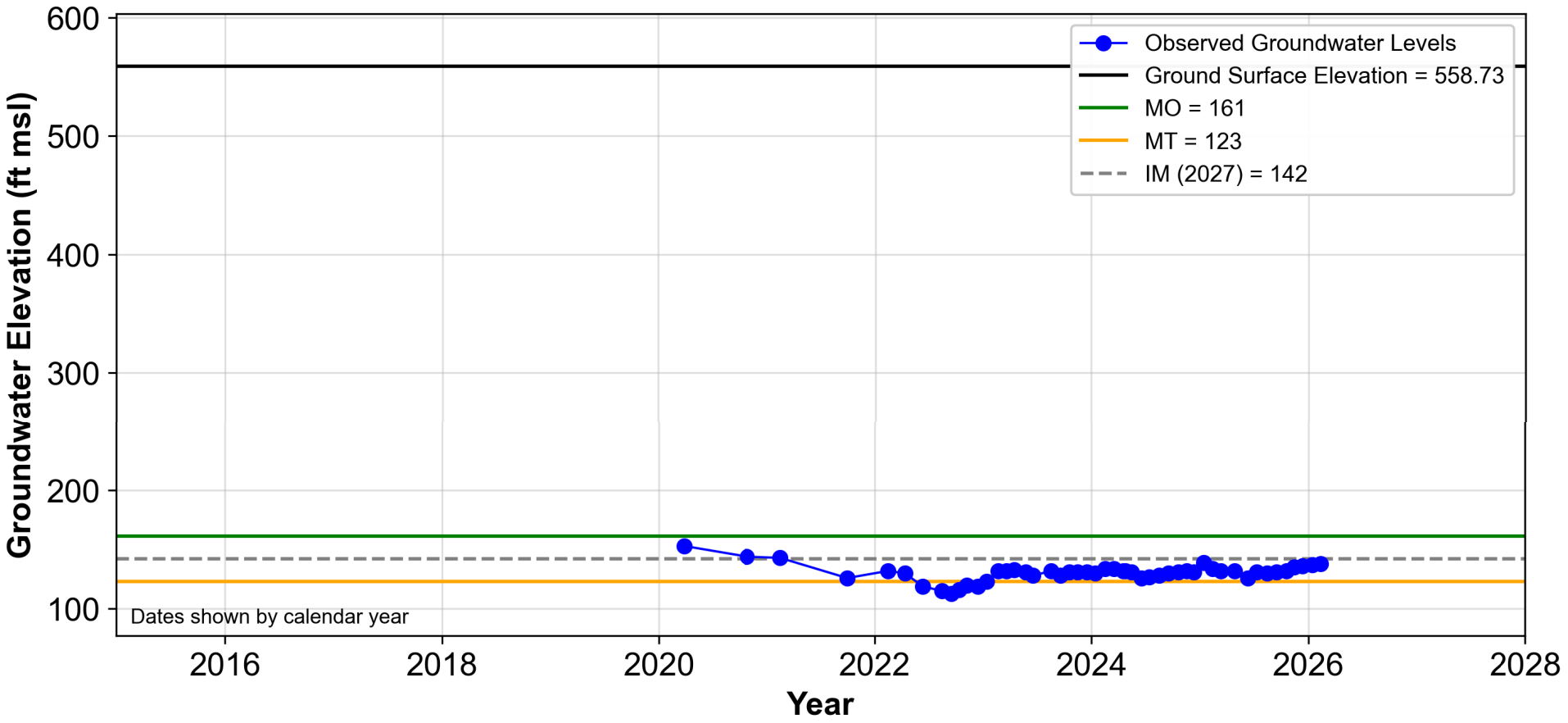


RMW-WWB-012

Well Information

Local Well Name	: RMW-WWB-012
State Well Name	: 12N19W34R001S
Well Use	: Irrigation
Aquifer	: Principal
Station ID	: 33852
X Coordinate (CA State Plane V)	: 6297579.9
Y Coordinate (CA State Plane V)	: 2214741.1
Well Depth (ft bgs)	: 1206
Top Perforation (ft bgs)	: 240
Bottom Perforation (ft bgs)	: 1206
Ground Surface Elevation (ft msl)	: 558.73
Reference Point Elevation (ft msl)	: 560.81
Sustainability Indicators	: Groundwater Levels, Groundwater Storage

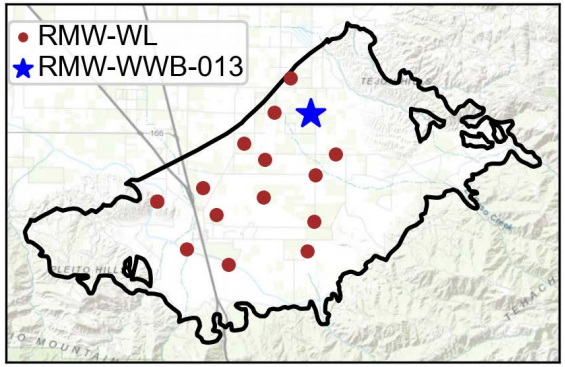


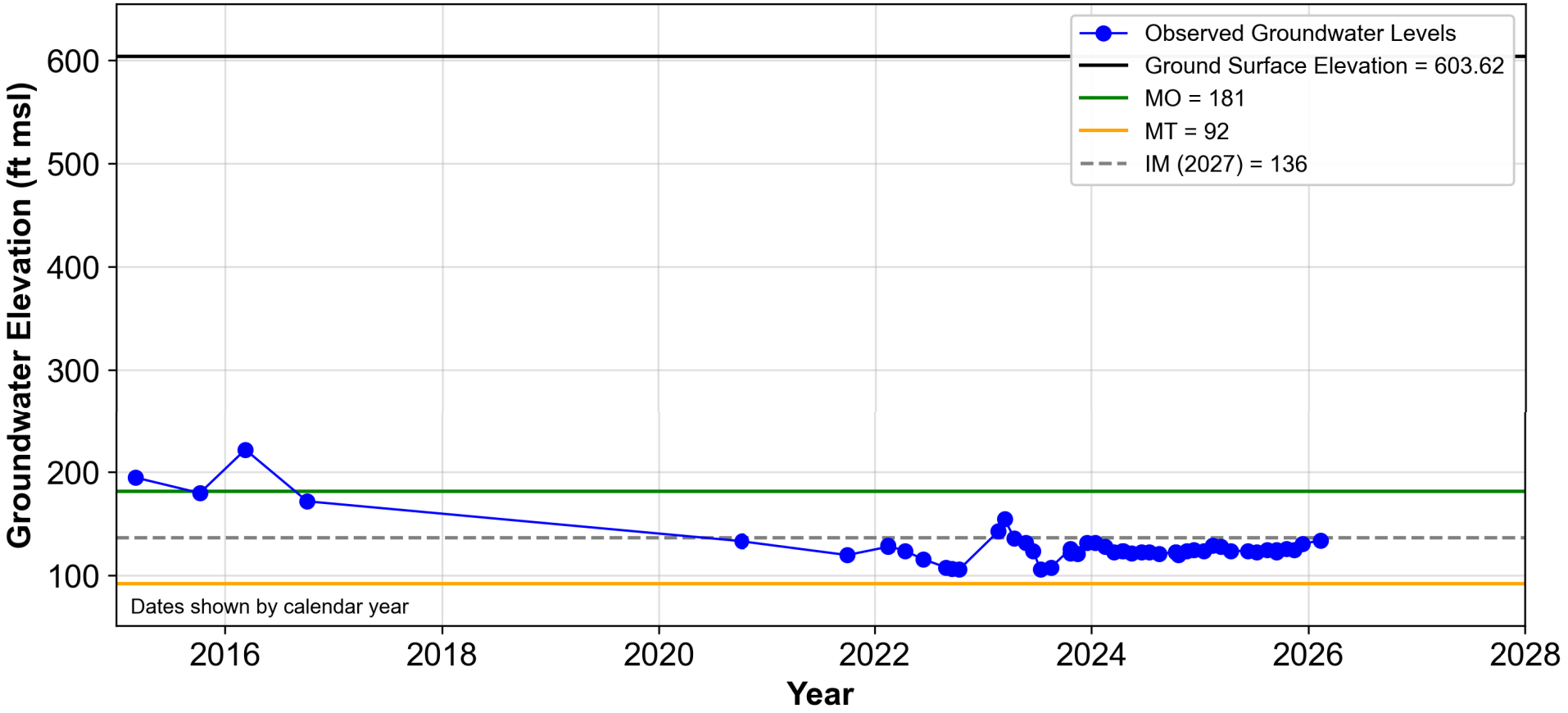


RMW-WWB-013

Well Information

Local Well Name	: RMW-WWB-013
State Well Name	: 12N19W36Q001S
Well Use	: Irrigation
Aquifer	: Principal
Station ID	: 33853
X Coordinate (CA State Plane V)	: 6307326.489302633
Y Coordinate (CA State Plane V)	: 2212861.786177462
Well Depth (ft bgs)	: 940
Top Perforation (ft bgs)	: --
Bottom Perforation (ft bgs)	: --
Ground Surface Elevation (ft msl)	: 603.62
Reference Point Elevation (ft msl)	: 604.5
Sustainability Indicators	: Groundwater Levels, Groundwater Storage





RMW-WWB-014

Well Information

Local Well Name	: RMW-WWB-014
State Well Name	: 32S29E33F001M
Well Use	: Irrigation
Aquifer	: Principal
Station ID	: 23152
X Coordinate (CA State Plane V)	: 6301800.87
Y Coordinate (CA State Plane V)	: 2223887.39
Well Depth (ft bgs)	: 1004
Top Perforation (ft bgs)	: 300
Bottom Perforation (ft bgs)	: 1000
Ground Surface Elevation (ft msl)	: 519.98
Reference Point Elevation (ft msl)	: 520.2
Sustainability Indicators	: Groundwater Levels, Groundwater Storage