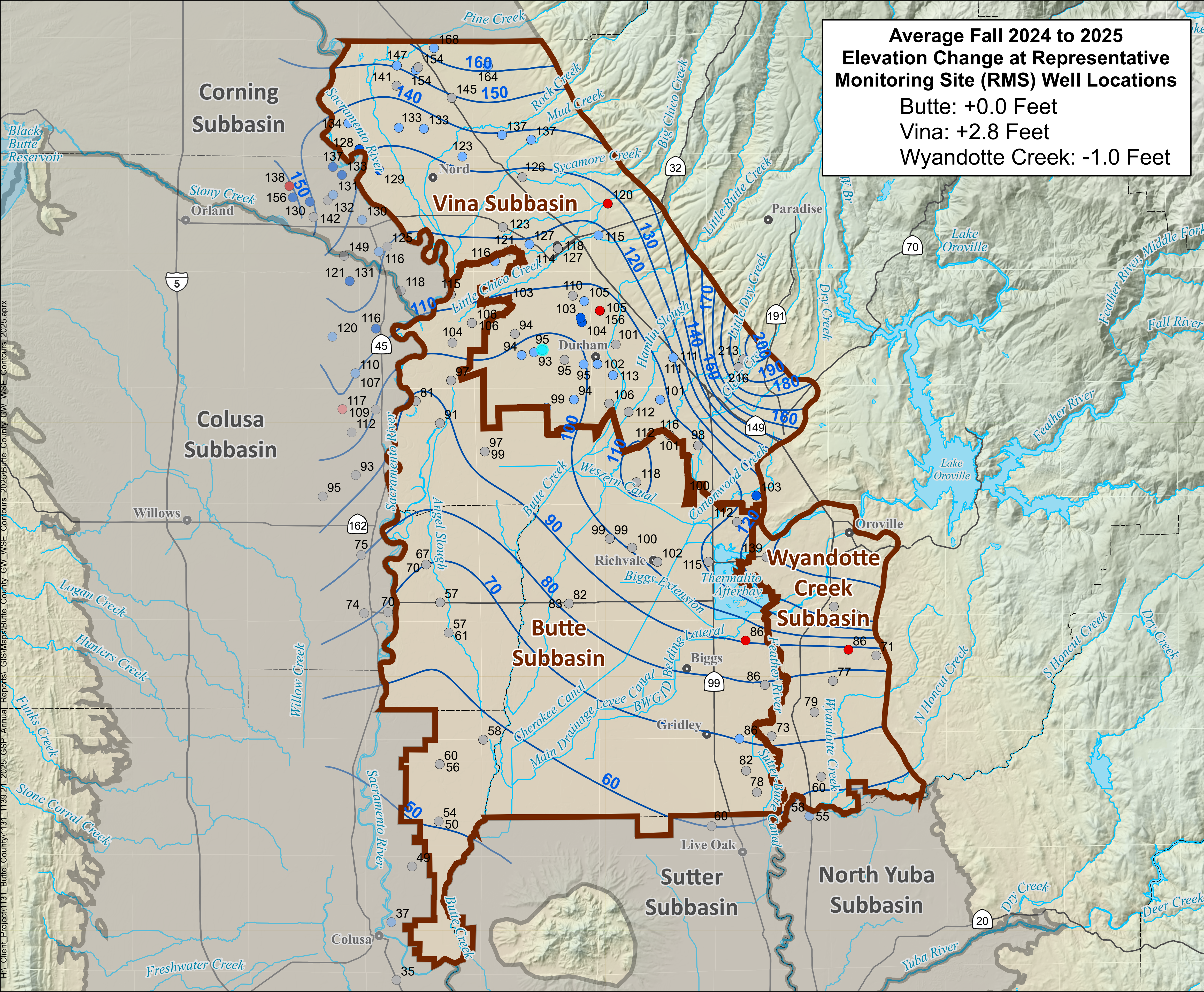
Water Year 2025 Annual Report

Appendix A

Characteristics and Hydrographs of Representative Monitoring Site (RMS) Wells



FALL 2025 GROUNDWATER ELEVATION CONTOURS FOR PRIMARY AQUIFER IN BUTTE COUNTY SUBBASINS

All Other Features

- Cities and Towns
- Highway
- Butte, Vina, and Wyandotte Creek Subbasins
- Neighboring Subbasin

Contouring Wells*

- Greater than 5 ft decline
- Between 2 and 5 ft decline
- Less than 2 ft decline/increase
- Between 2 and 5 ft increase
- Greater than 5 ft increase

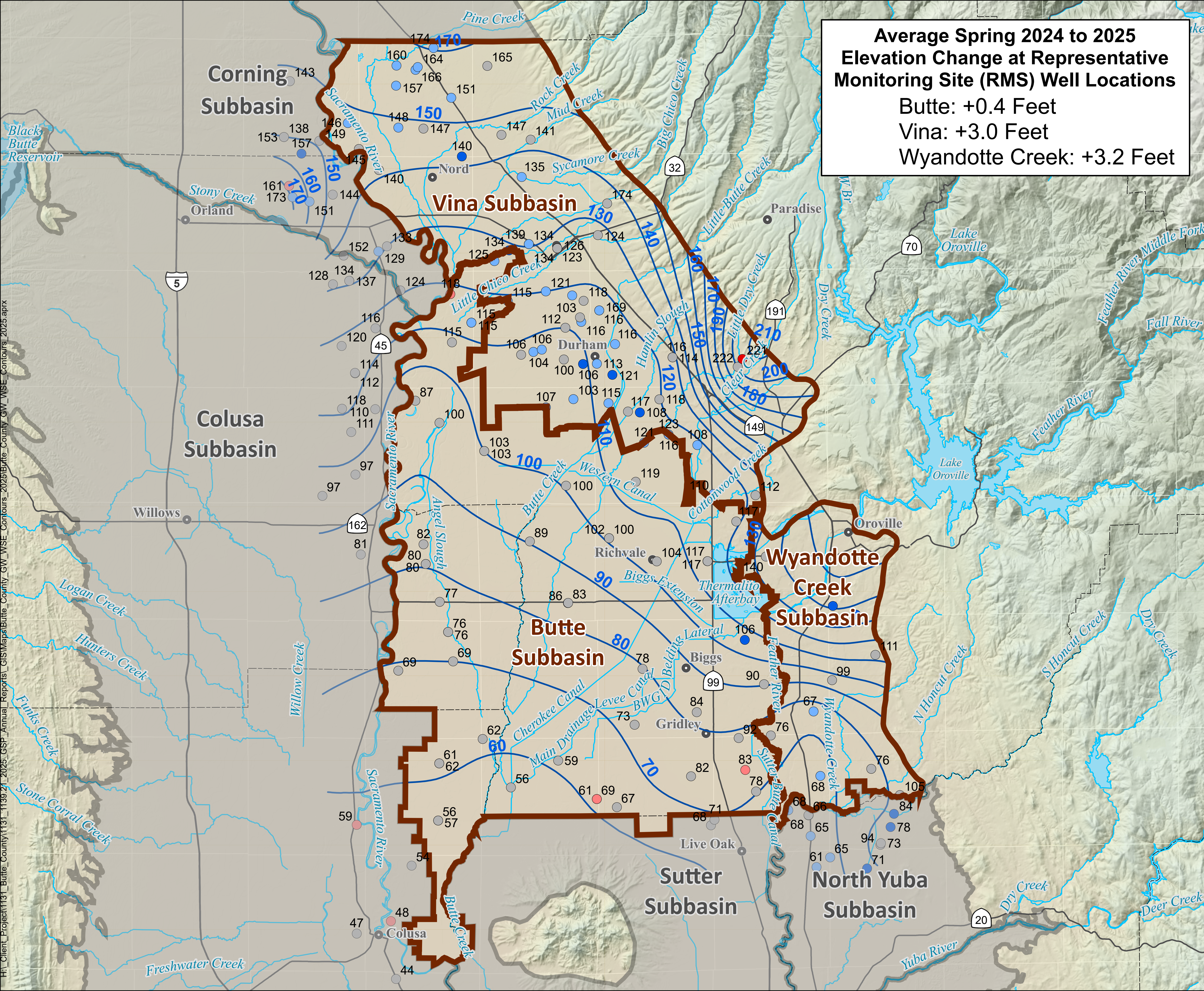
Contour Lines

- Fall 2025 Water Surface Elevation Contour (feet above mean sea level)

*Note: Elevation shown for contouring wells is in feet above mean sea level and changes are relative to the same period of the prior year.

0 4 8
Miles

N



SPRING 2025 GROUNDWATER ELEVATION CONTOURS FOR PRIMARY AQUIFER IN BUTTE COUNTY SUBBASINS

All Other Features

- Cities and Towns
- Highway
- Butte, Vina, and Wyandotte Creek Subbasins
- Neighboring Subbasin

Contouring Wells*

- Greater than 5 ft decline
- Between 2 and 5 ft decline
- Less than 2 ft decline/increase
- Between 2 and 5 ft increase
- Greater than 5 ft increase

Contouring Lines

- Spring 2025 Water Surface Elevation Contour (feet above mean sea level)

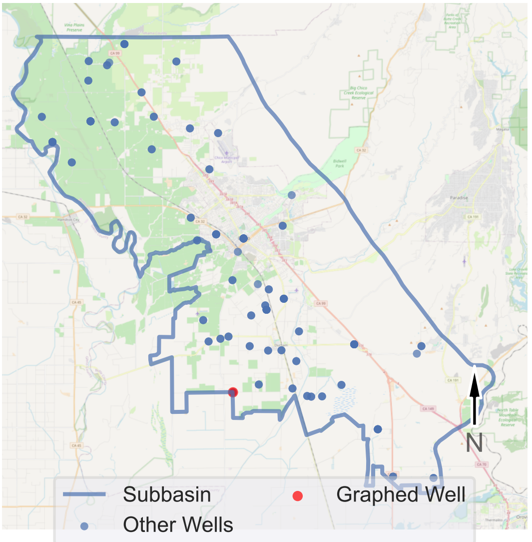
*Note: Elevation shown for contouring wells is in feet above mean sea level and changes are relative to the same period of the prior year.

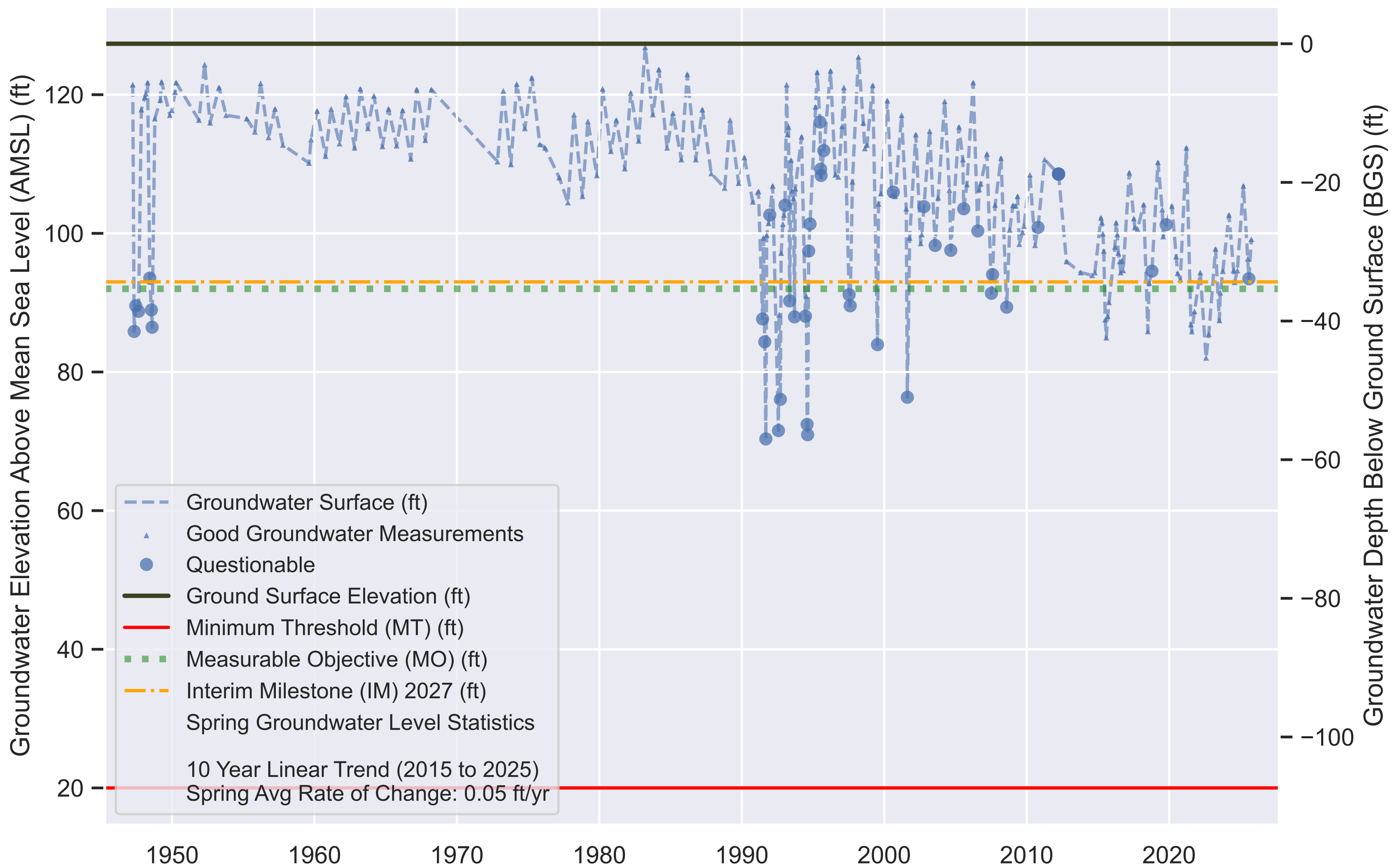
0 4 8
Miles

N

VINA Subbasin - State Well Number (SWN): 20N01E10C002M

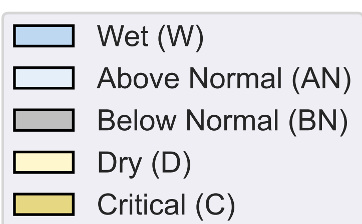
Well Location Map

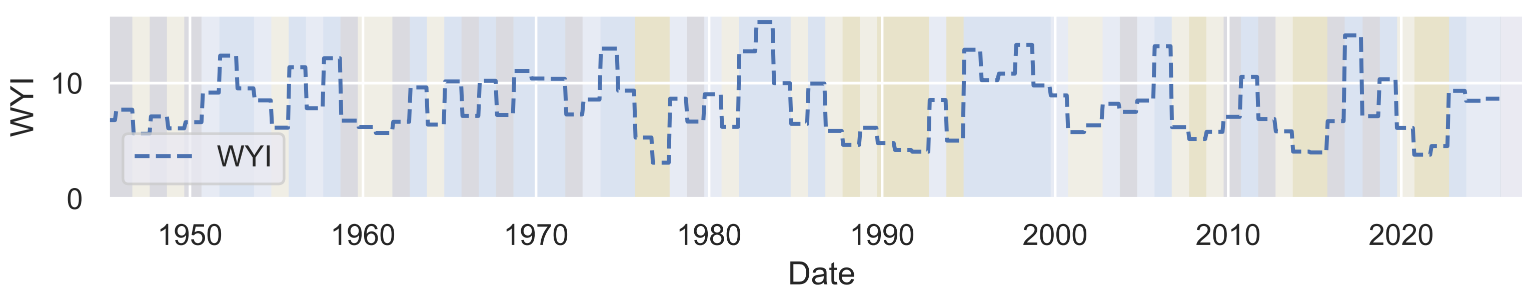




Sustainable Management Criteria:
IM (2027) = 93.0 ft AMSL
MO = 92.0 ft AMSL
MT = 20.0 ft AMSL

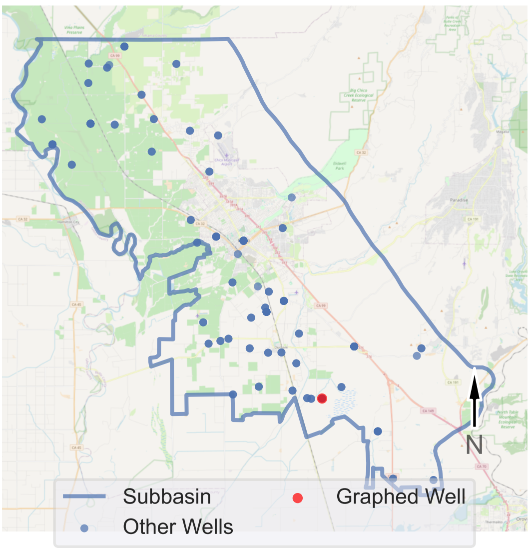
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.





VINA Subbasin - State Well Number (SWN): 20N02E09L001M

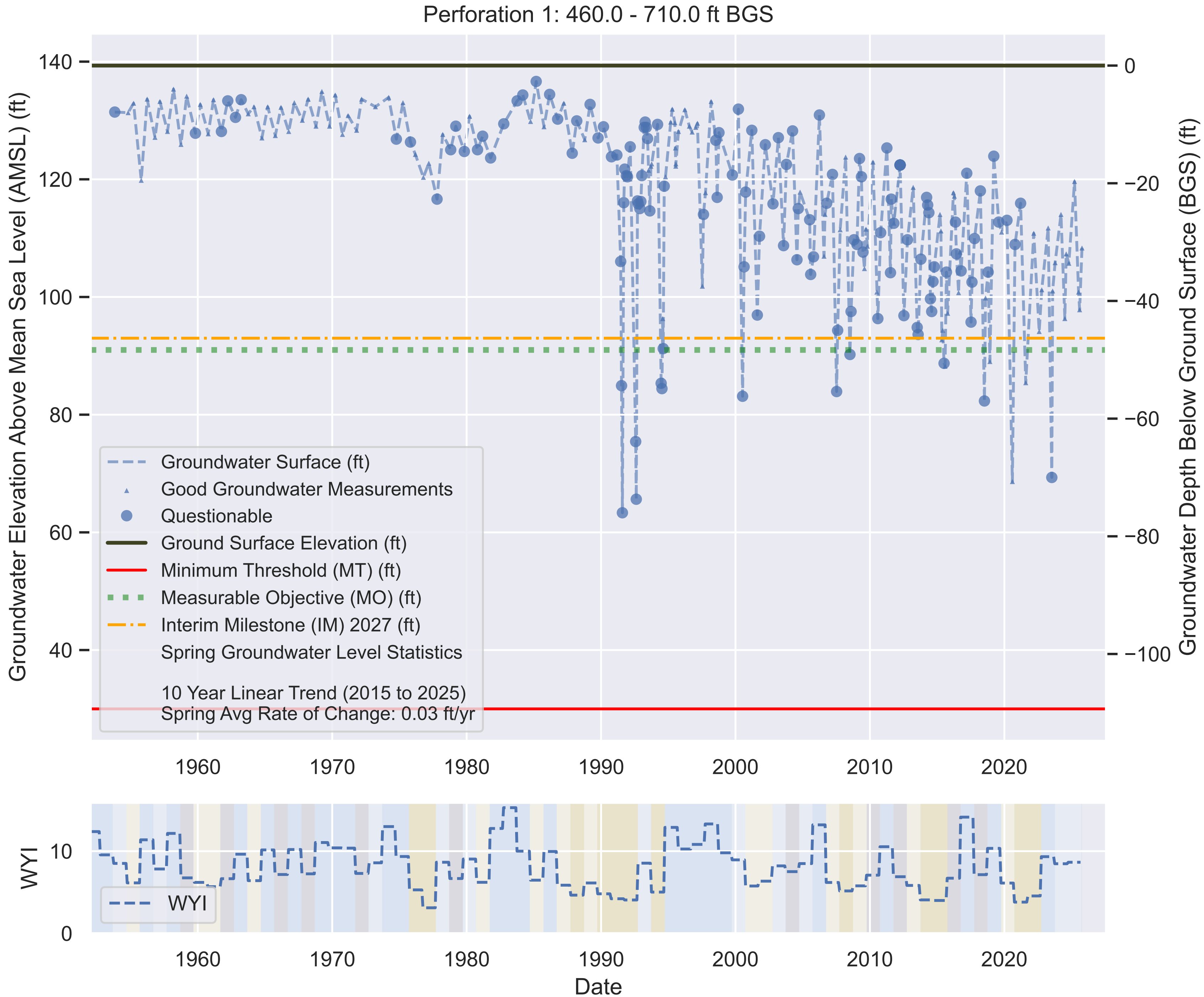
Well Location Map



Sustainable Management Criteria:
IM (2027) = 93.0 ft AMSL
MO = 91.0 ft AMSL
MT = 30.0 ft AMSL

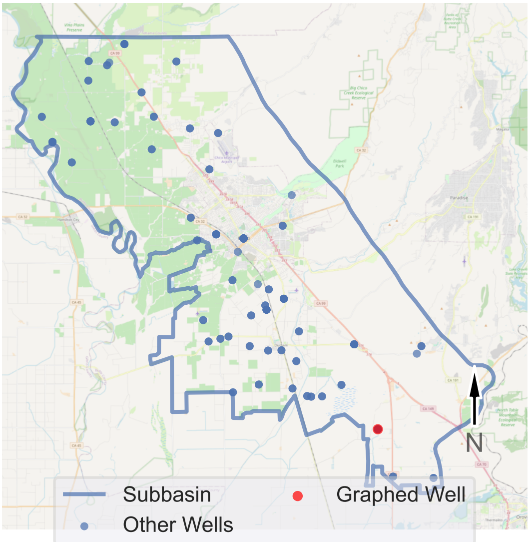
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)



VINA Subbasin - State Well Number (SWN): 20N02E24C001M

Well Location Map

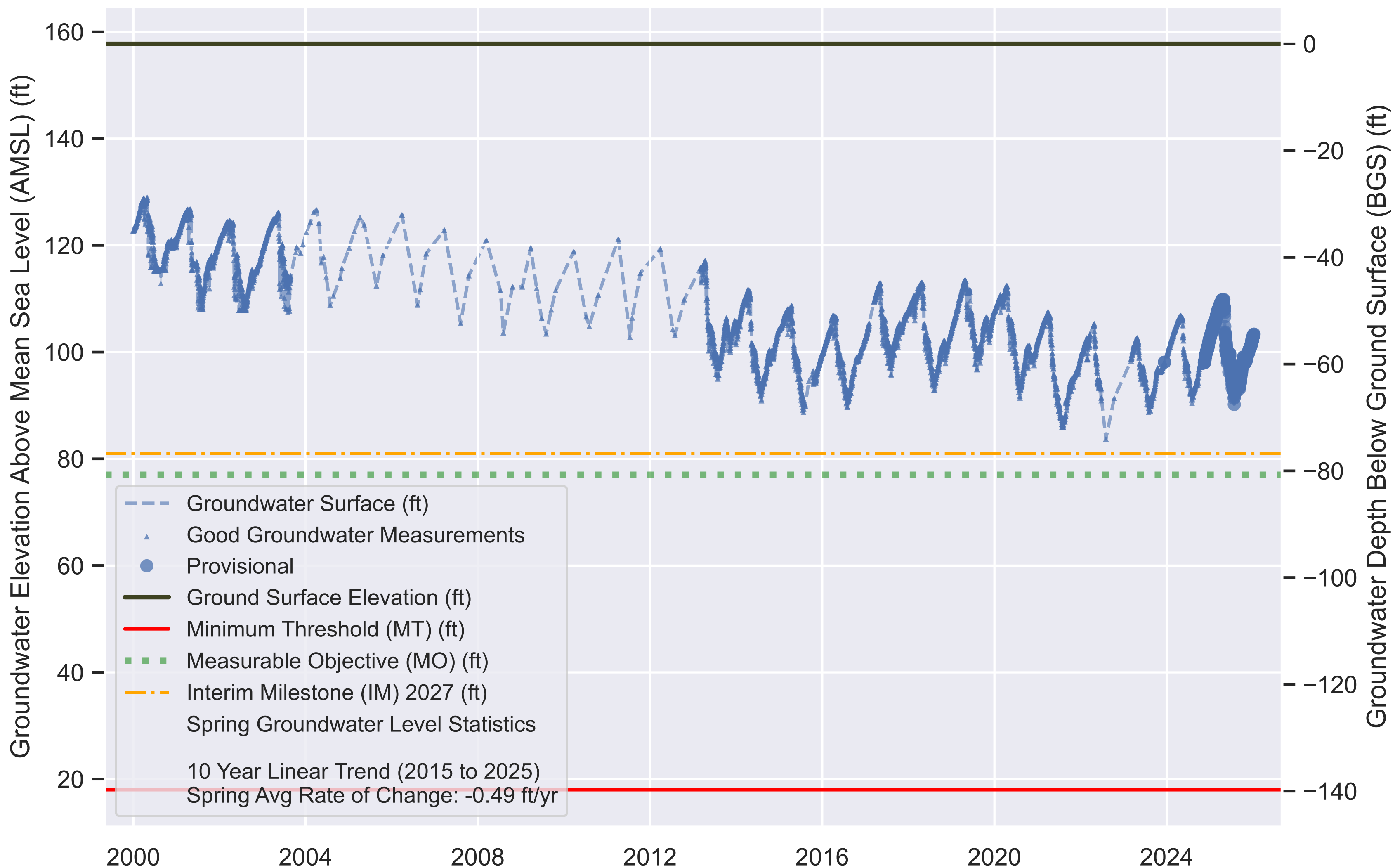


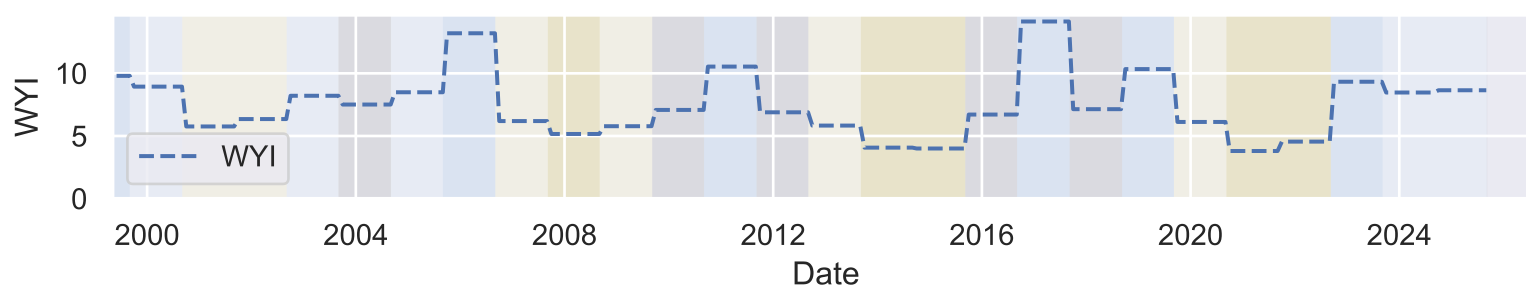
Sustainable Management Criteria:
IM (2027) = 81.0 ft AMSL
MO = 77.0 ft AMSL
MT = 18.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

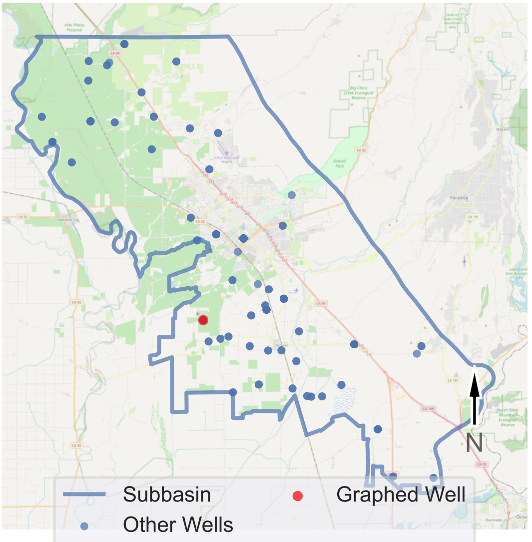
Perforation 1: 124.0 - 134.0 ft BGS



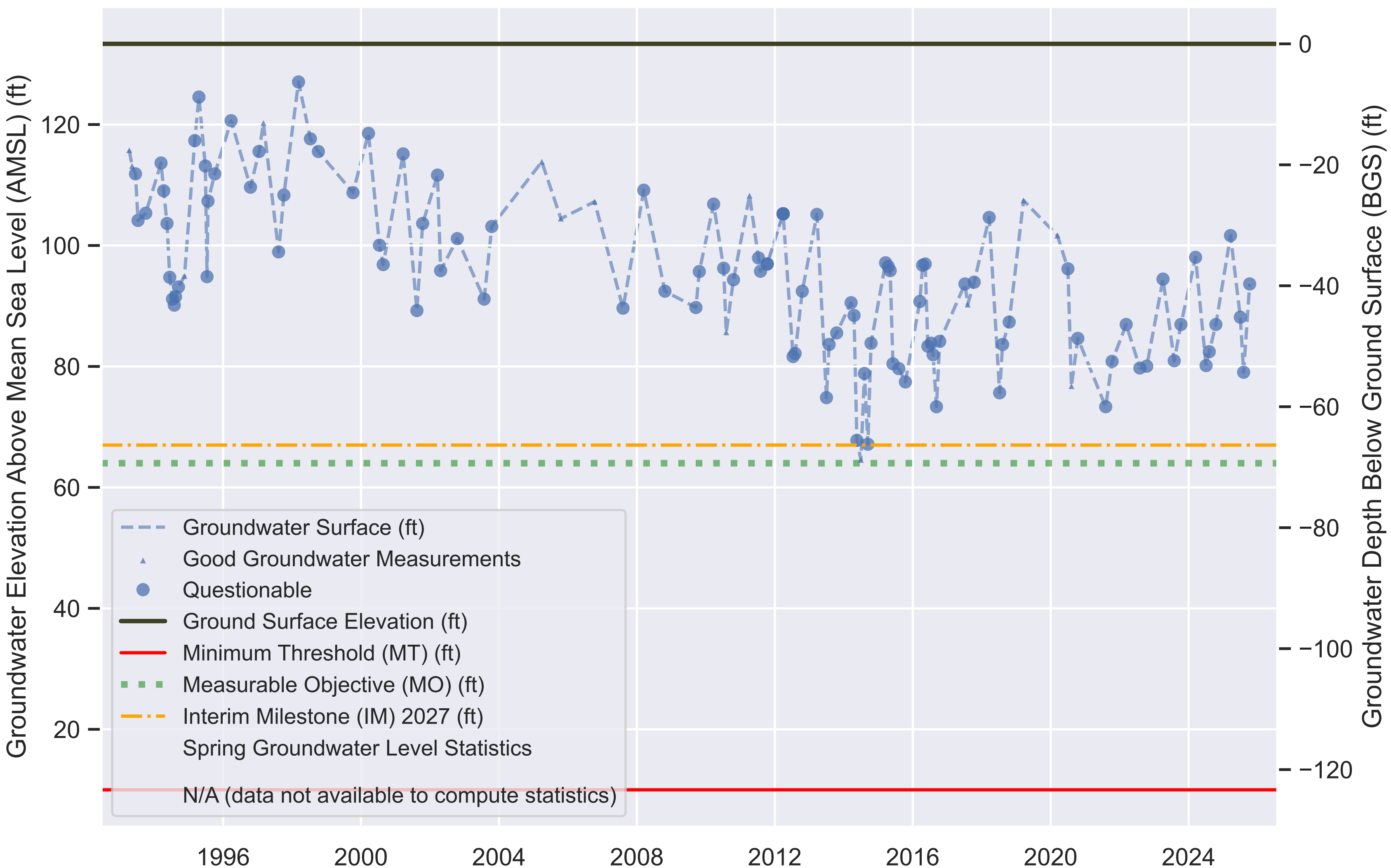


VINA Subbasin - State Well Number (SWN): 21N01E21C001M

Well Location Map



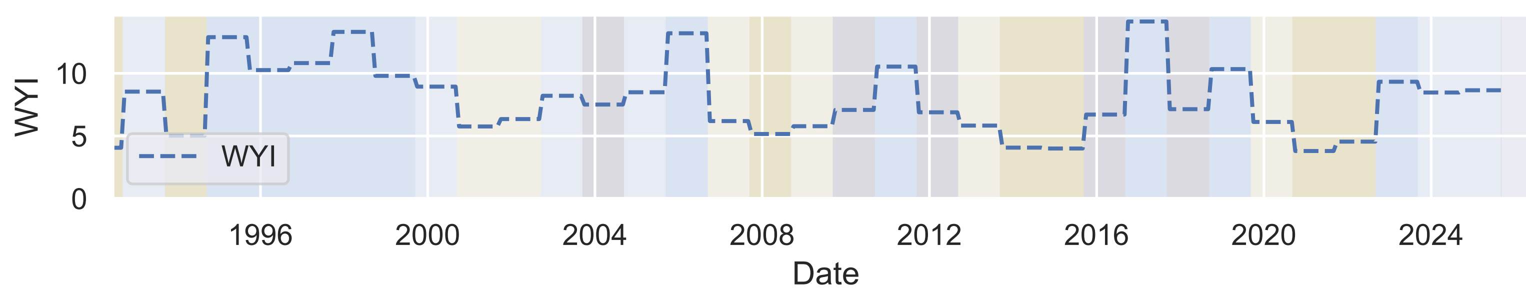
Perforation 1 (P1): 240.0 - 300.0; P2: 448.0 - 508.0 ft BGS



Sustainable Management Criteria:
IM (2027) = 67.0 ft AMSL
MO = 64.0 ft AMSL
MT = 10.0 ft AMSL

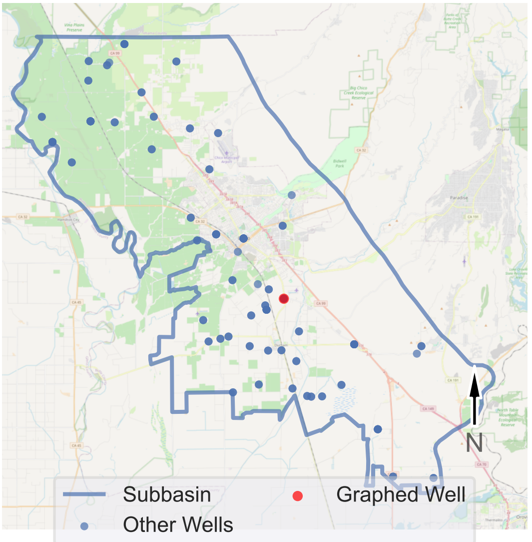
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

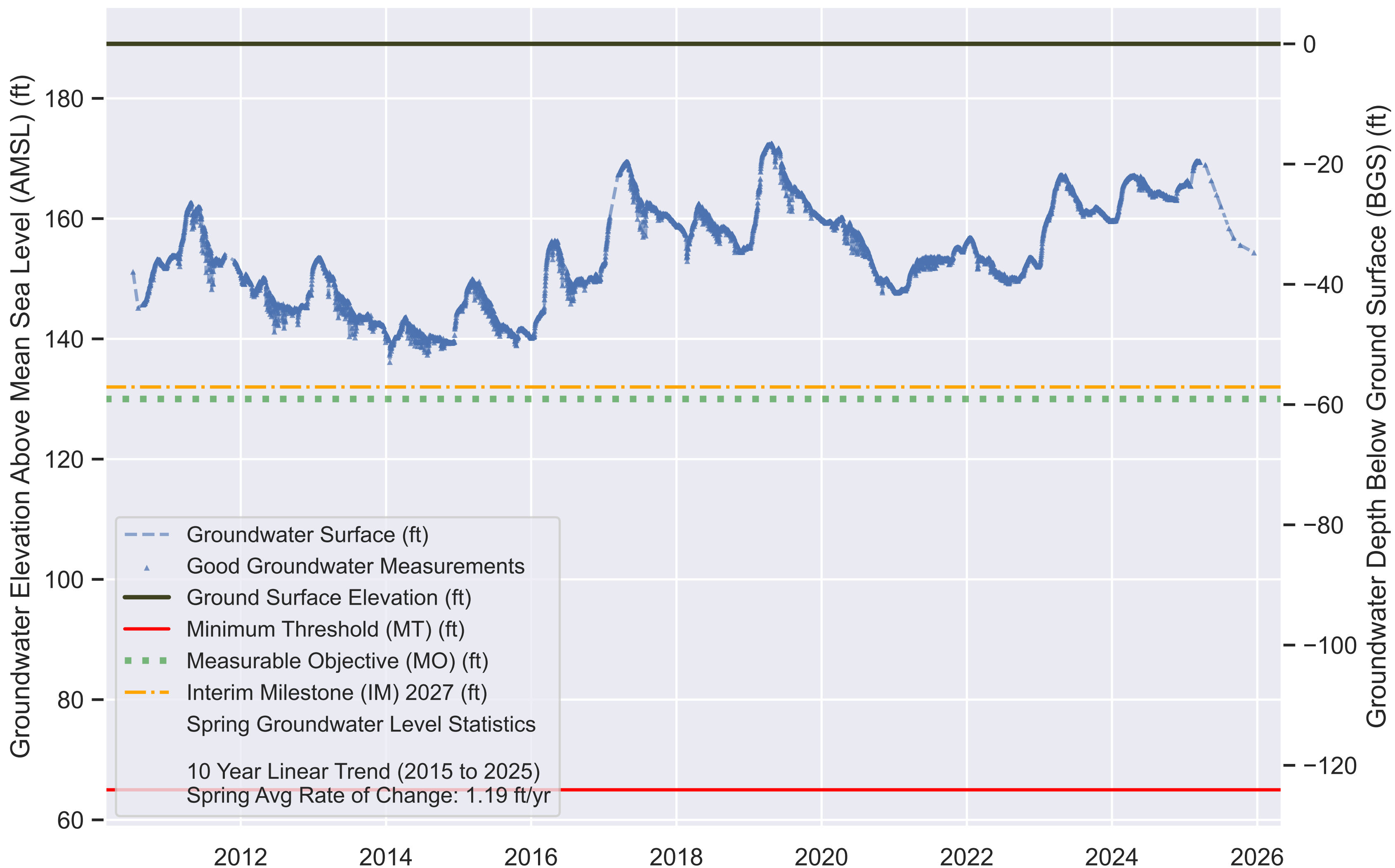


VINA Subbasin - State Well Number (SWN): 21N02E18C003M

Well Location Map



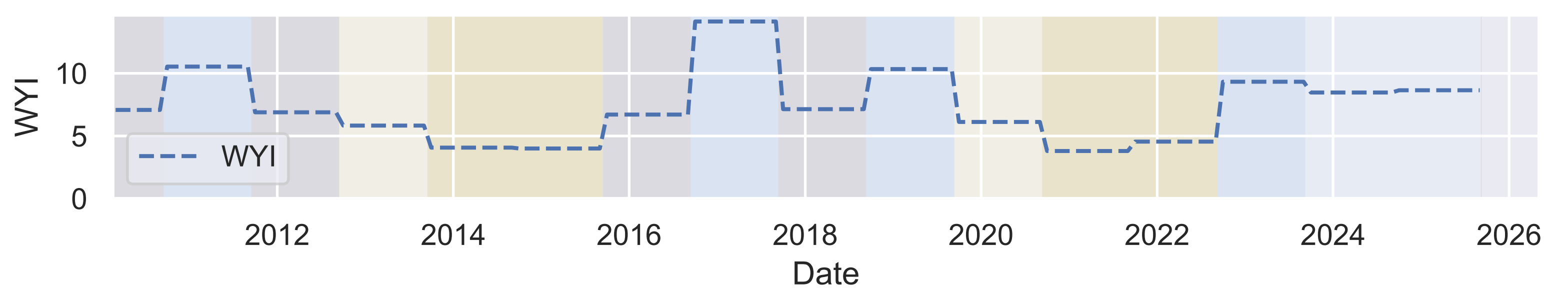
Perforation 1 (P1): 130.0 - 140.0; P2: 160.0 - 170.0; P3: 190.0 - 200.0 ft BGS



Sustainable Management Criteria:
IM (2027) = 132.0 ft AMSL
MO = 130.0 ft AMSL
MT = 65.0 ft AMSL

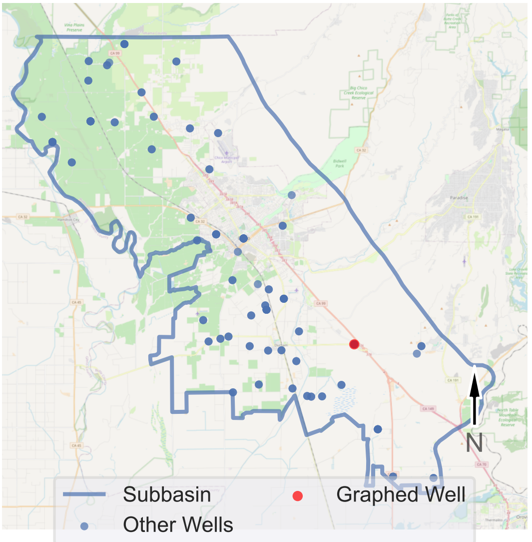
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

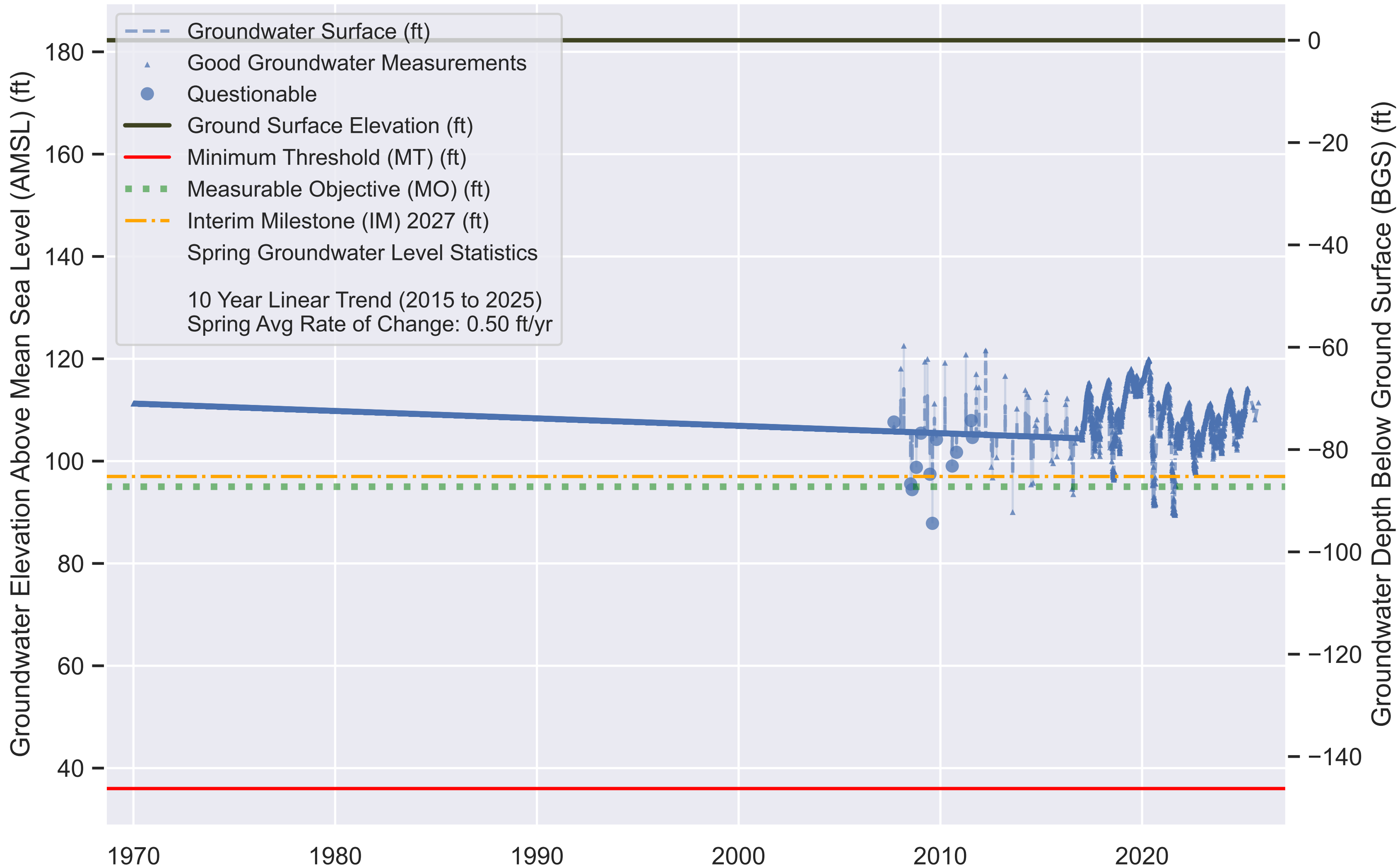


VINA Subbasin - State Well Number (SWN): 21N02E26E005M

Well Location Map

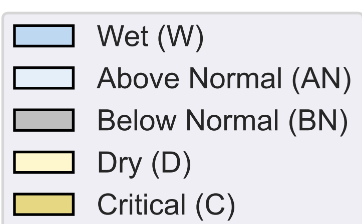


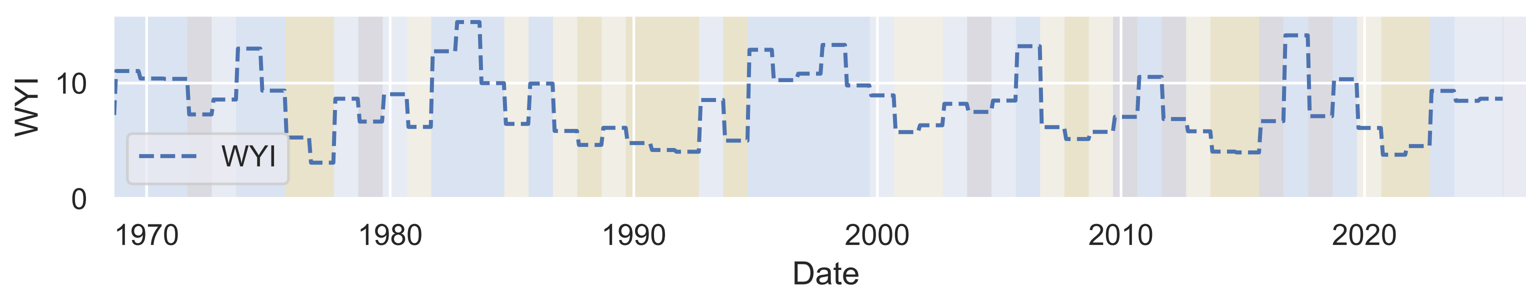
Perforation 1 (P1): 265.0 - 275.0; P2: 280.0 - 290.0 ft BGS



Sustainable Management Criteria:
IM (2027) = 97.0 ft AMSL
MO = 95.0 ft AMSL
MT = 36.0 ft AMSL

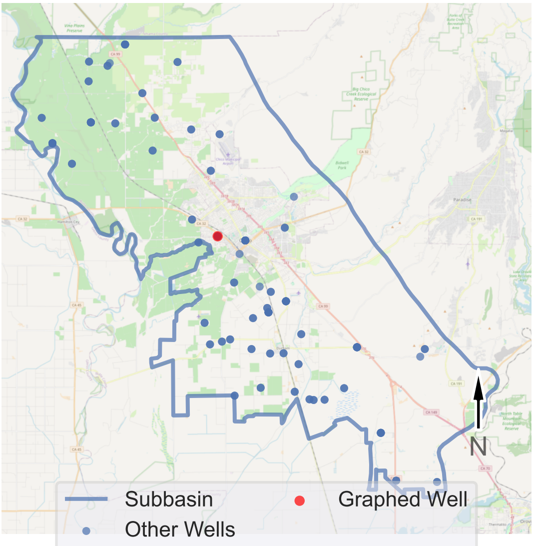
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.



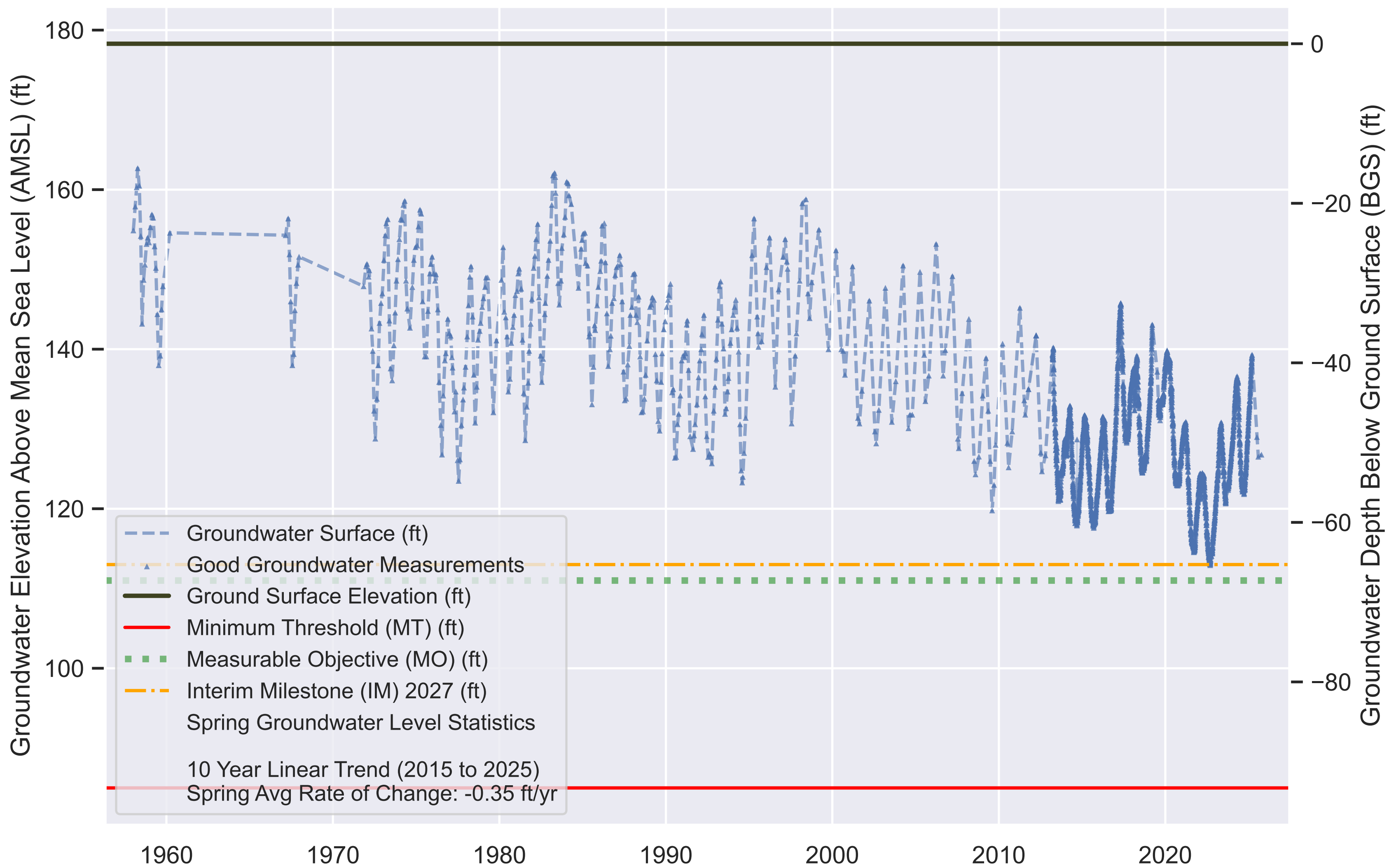


VINA Subbasin - State Well Number (SWN): 22N01E28J003M

Well Location Map

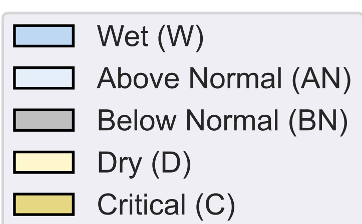


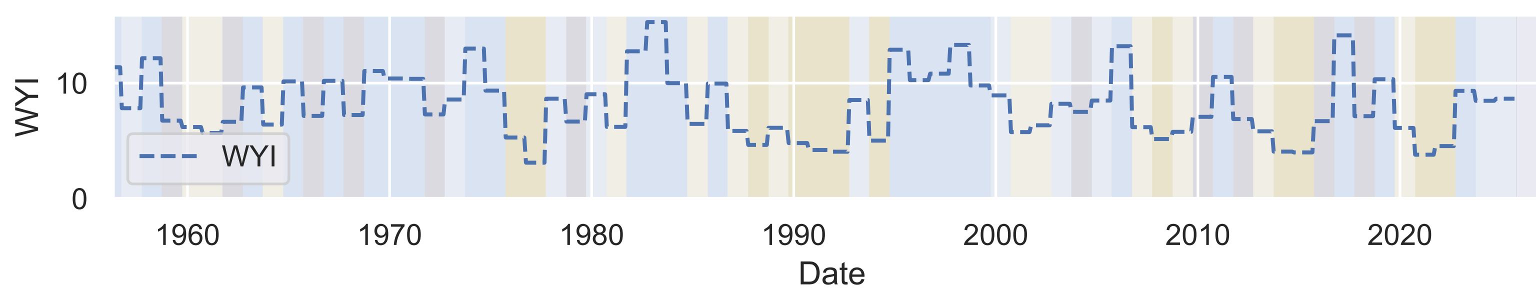
Perforation 1: 200.0 - 279.0 ft BGS



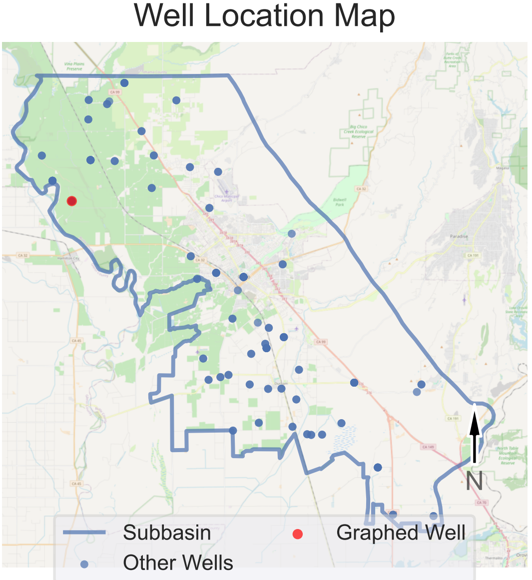
Sustainable Management Criteria:
IM (2027) = 113.0 ft AMSL
MO = 111.0 ft AMSL
MT = 85.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.





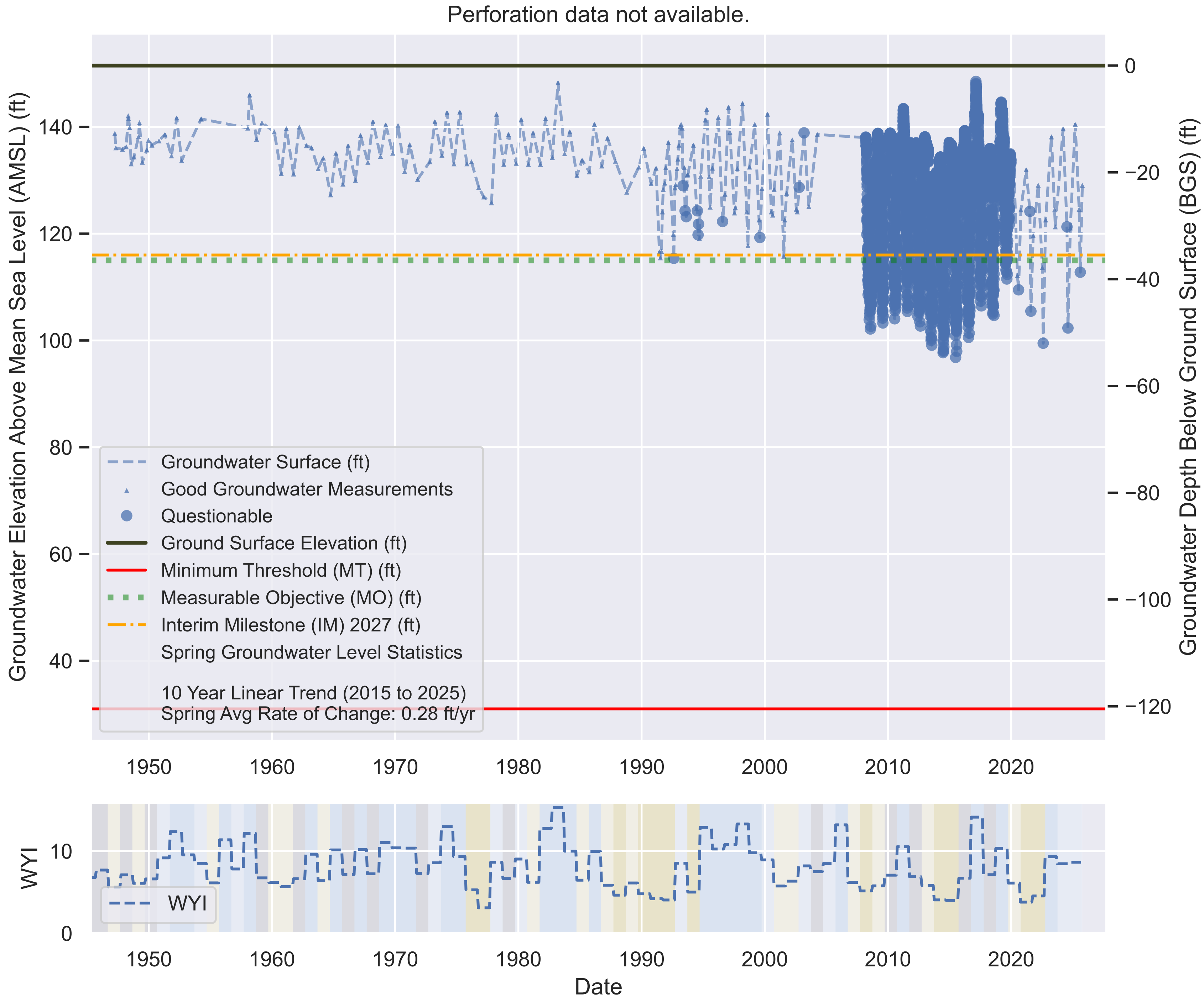
VINA Subbasin - State Well Number (SWN): 22N01W05M001M



Sustainable Management Criteria:
IM (2027) = 116.0 ft AMSL
MO = 115.0 ft AMSL
MT = 31.0 ft AMSL

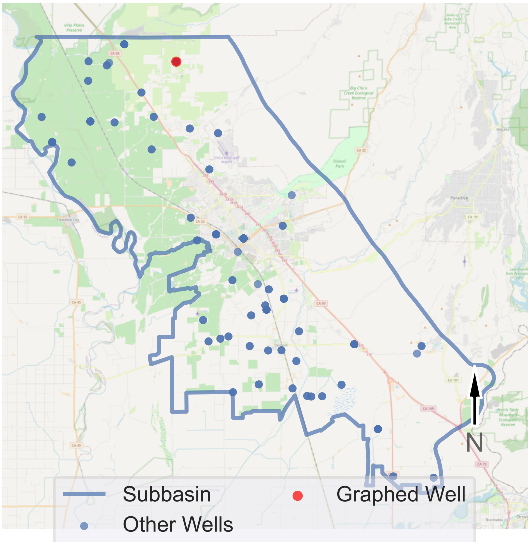
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

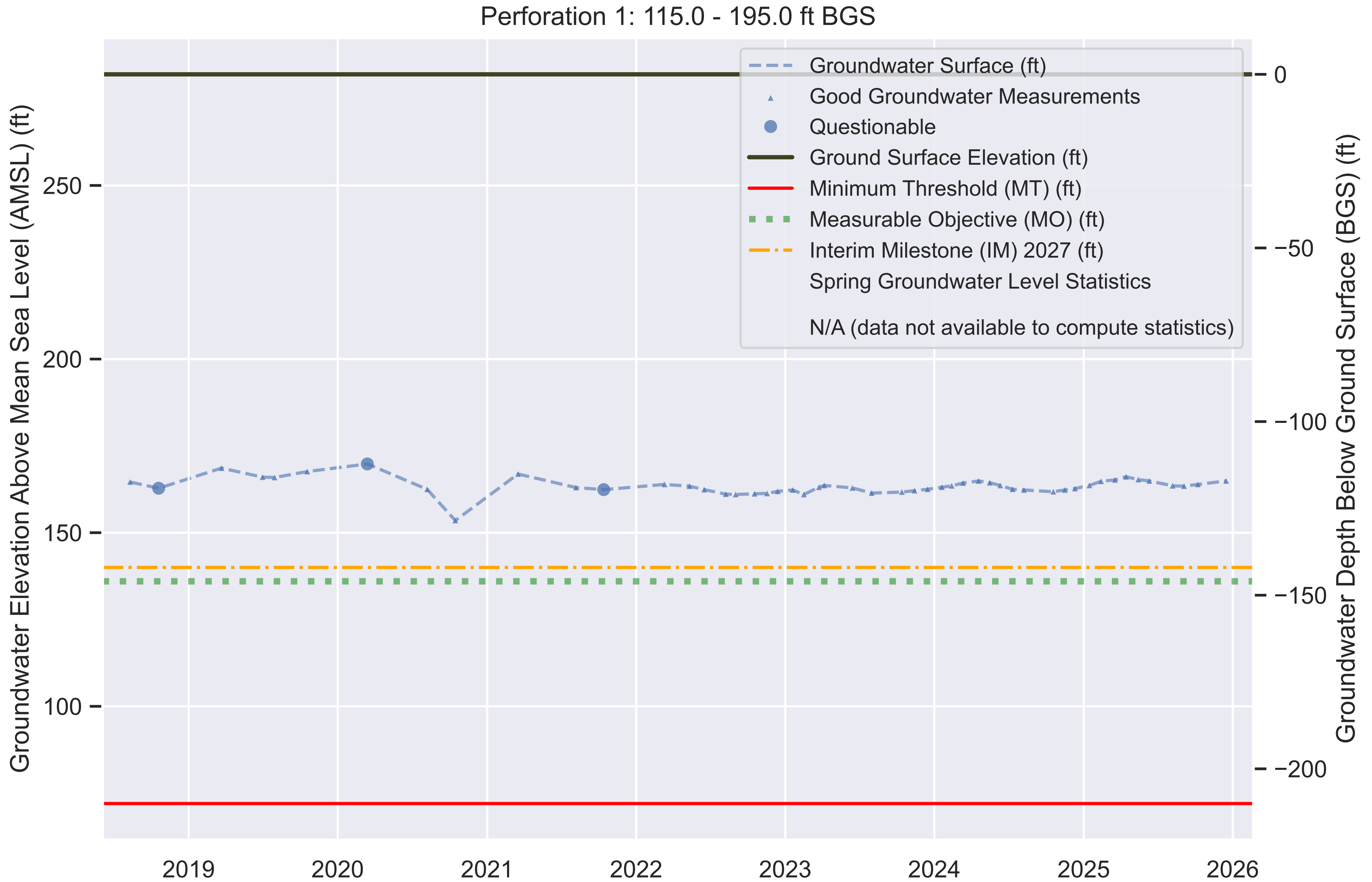
- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)



VINA Subbasin - State Well Number (SWN): 23N01E07H001M

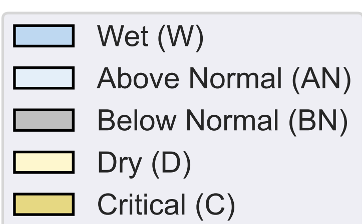
Well Location Map

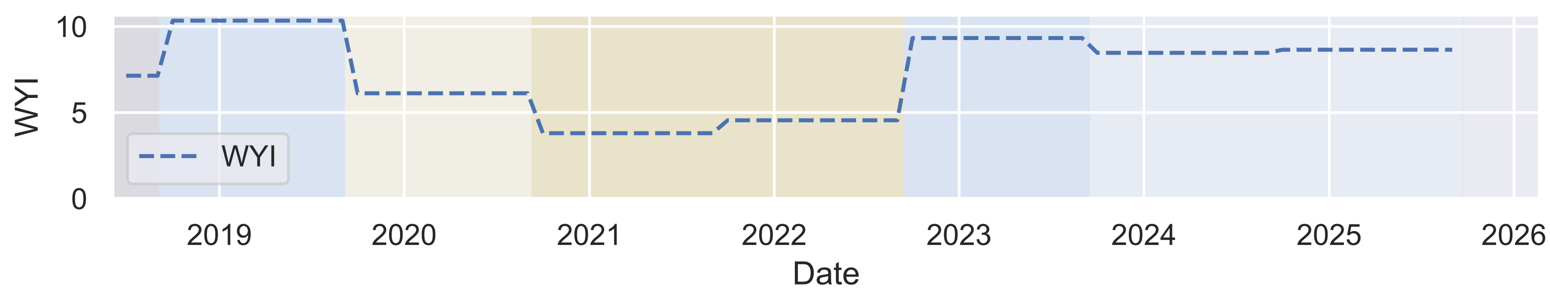




Sustainable Management Criteria:
IM (2027) = 140.0 ft AMSL
MO = 136.0 ft AMSL
MT = 72.0 ft AMSL

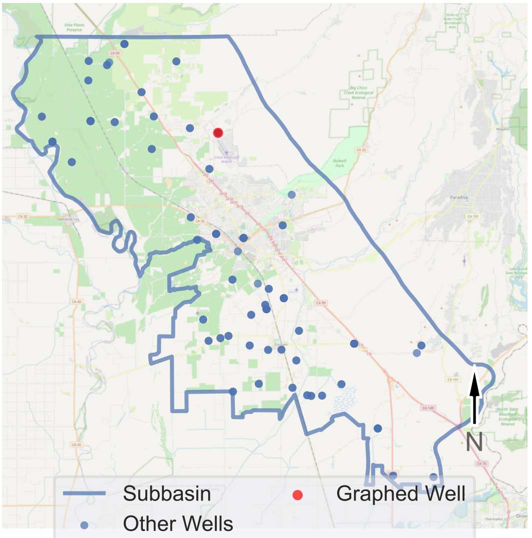
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

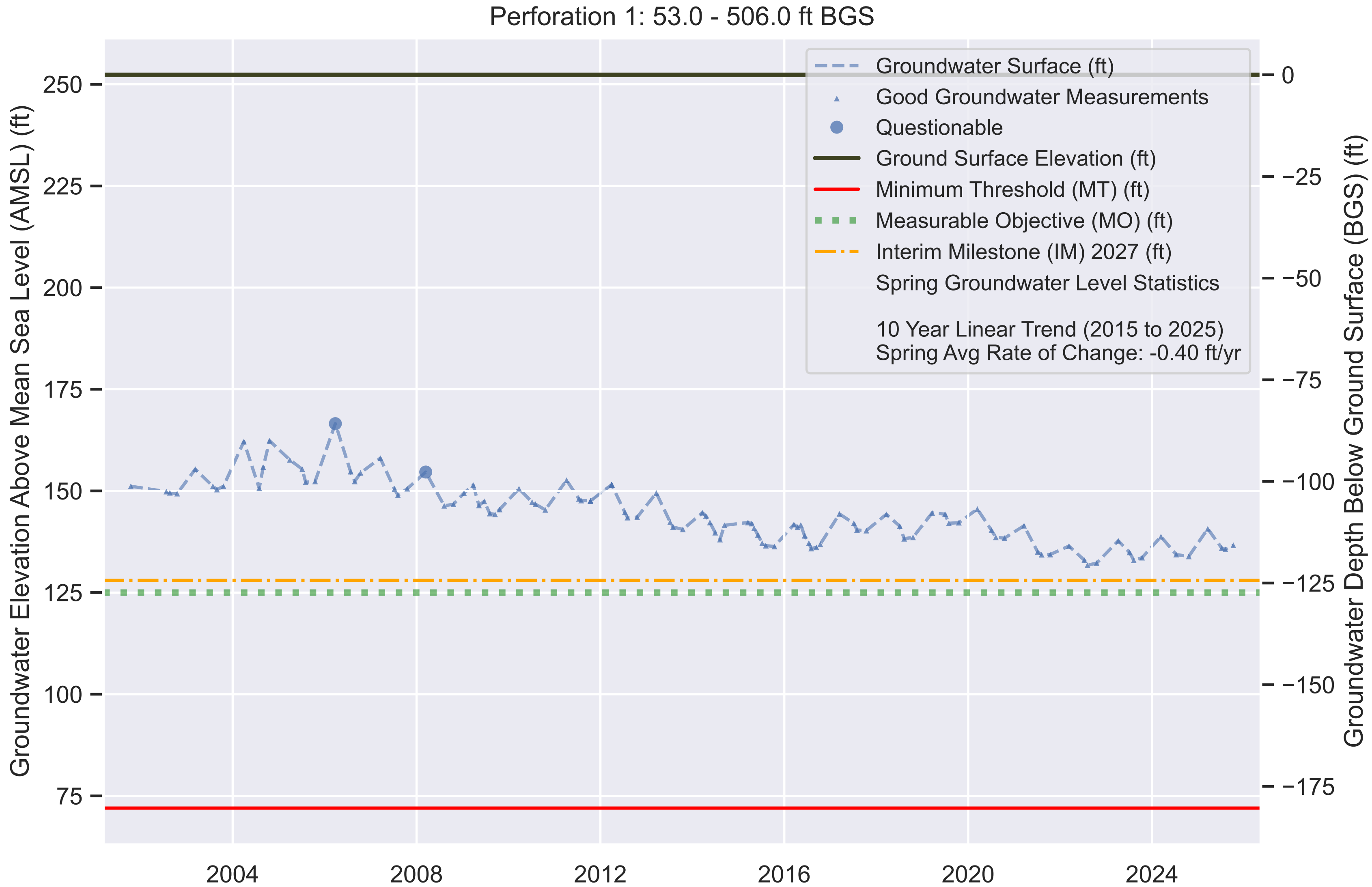




VINA Subbasin - State Well Number (SWN): 23N01E33A001M

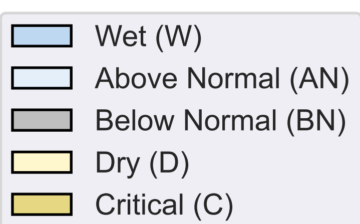
Well Location Map

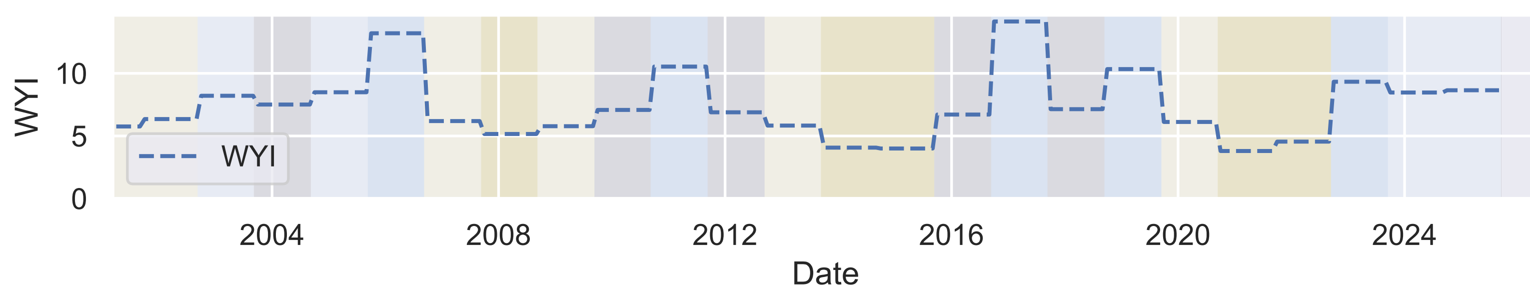




Sustainable Management Criteria:
IM (2027) = 128.0 ft AMSL
MO = 125.0 ft AMSL
MT = 72.0 ft AMSL

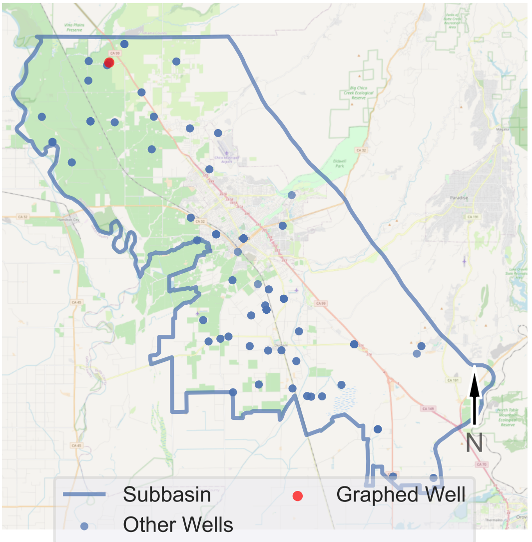
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.





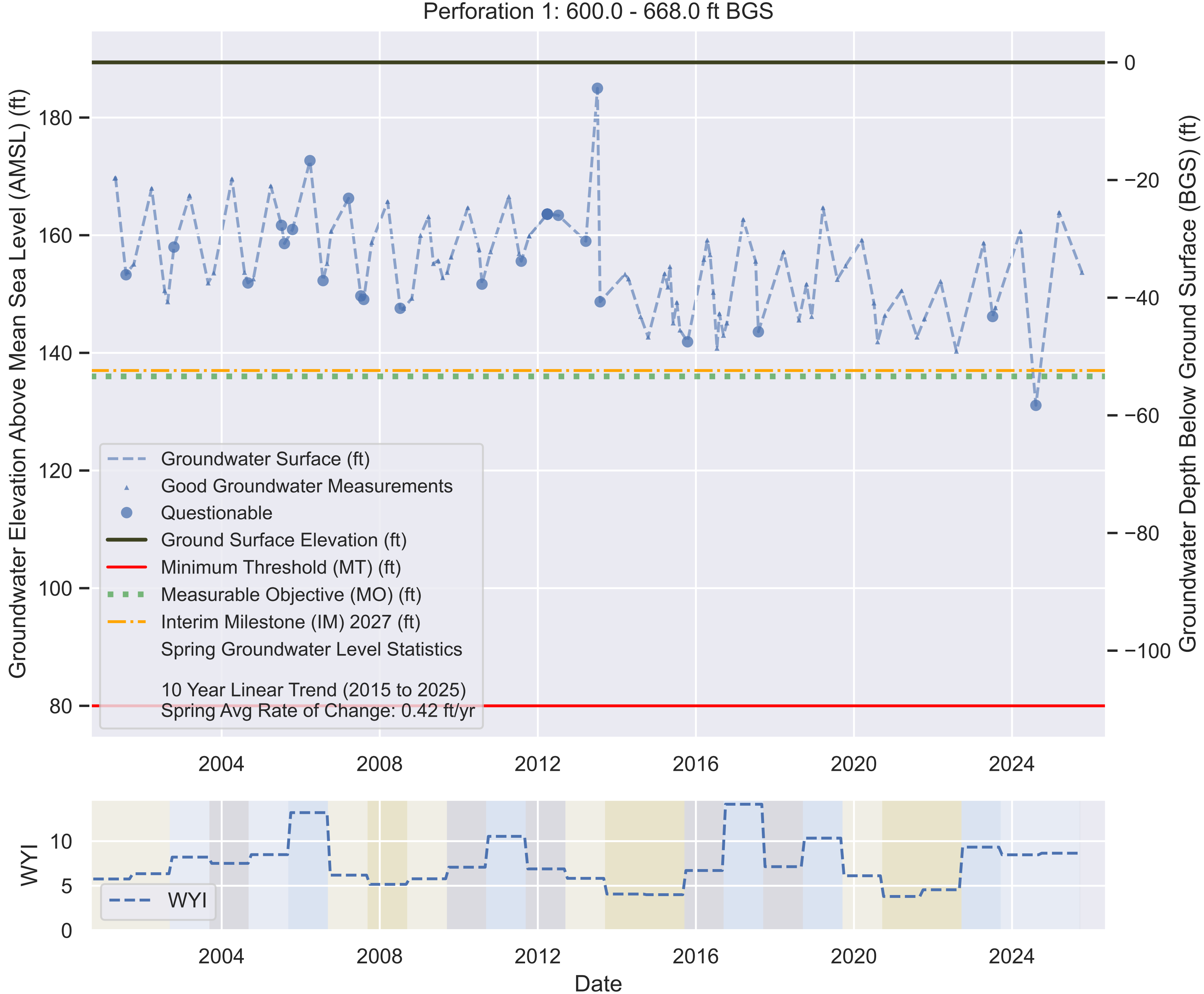
VINA Subbasin - State Well Number (SWN): 23N01W10E001M

Well Location Map



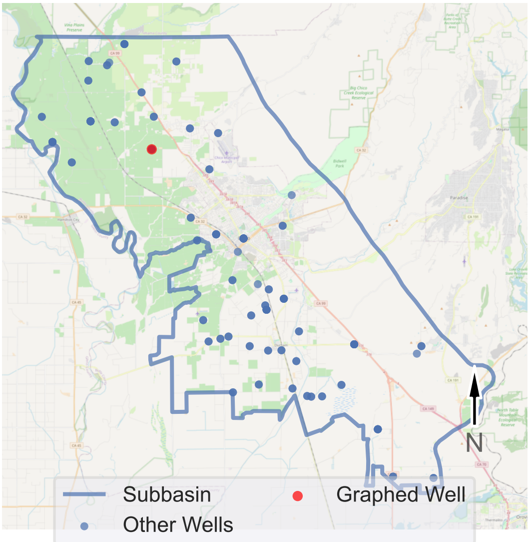
Sustainable Management Criteria:
IM (2027) = 137.0 ft AMSL
MO = 136.0 ft AMSL
MT = 80.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.



VINA Subbasin - State Well Number (SWN): 23N01W36P001M

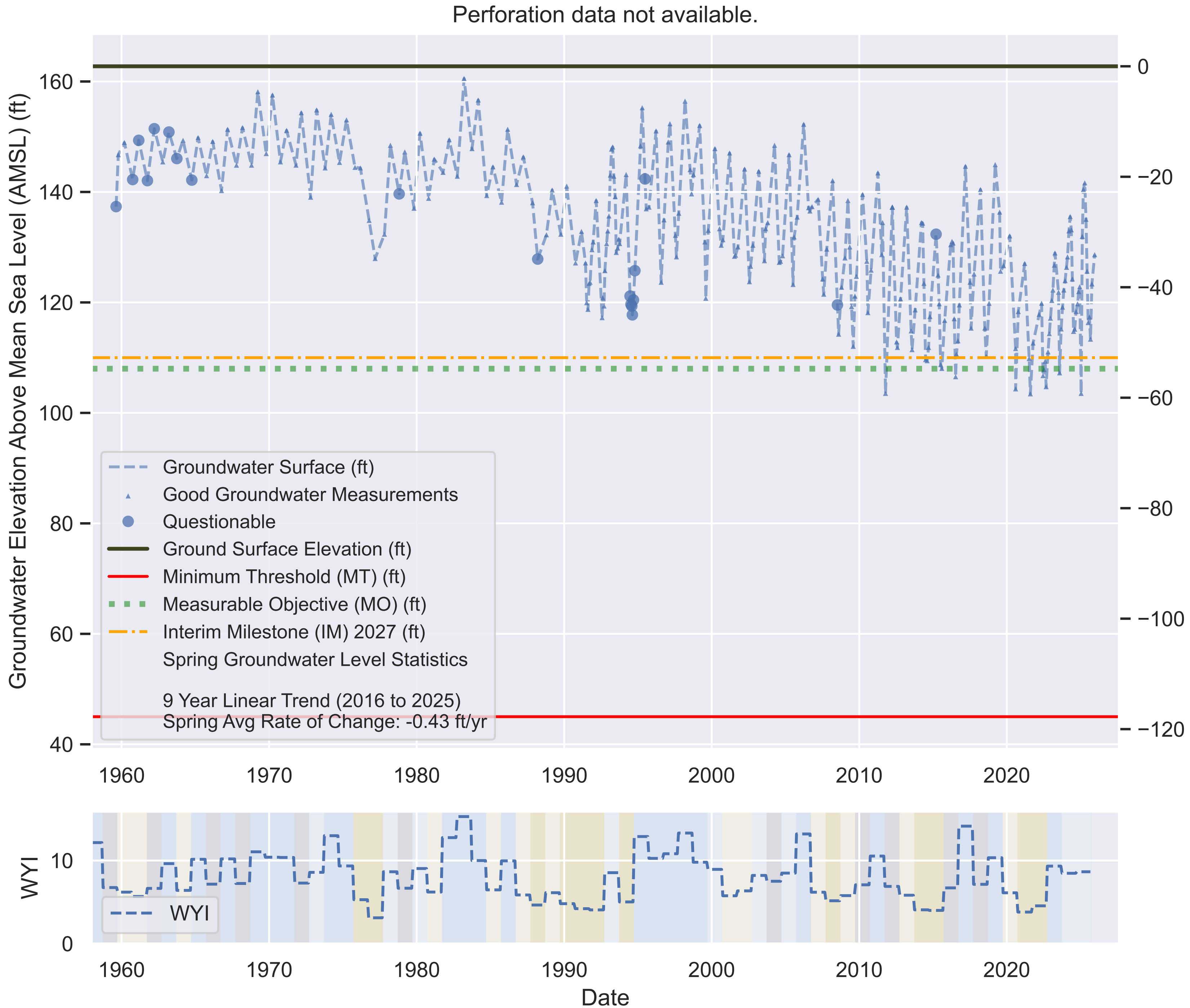
Well Location Map



Sustainable Management Criteria:
IM (2027) = 110.0 ft AMSL
MO = 108.0 ft AMSL
MT = 45.0 ft AMSL

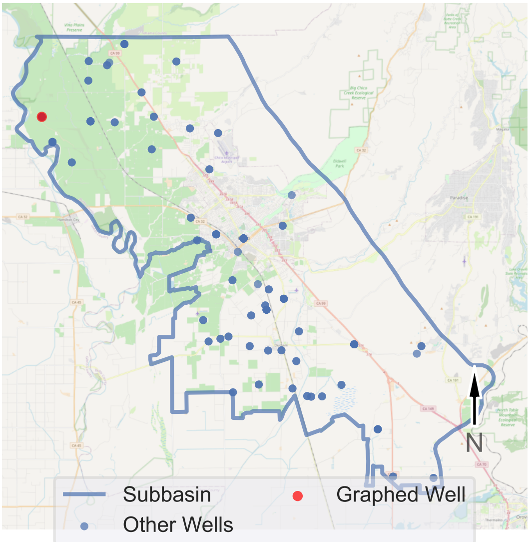
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)



VINA Subbasin - State Well Number (SWN): 23N02W25C001M

Well Location Map

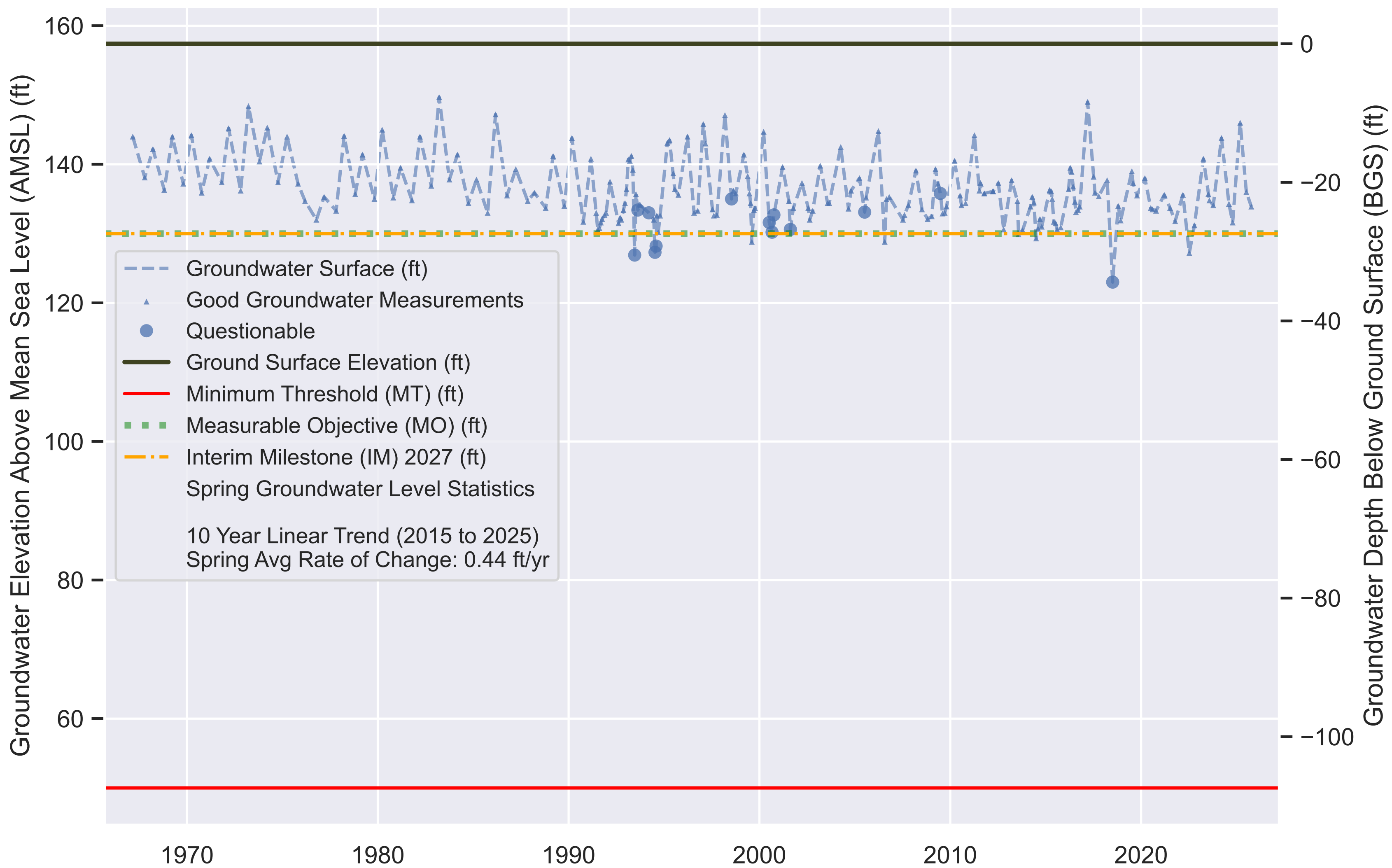


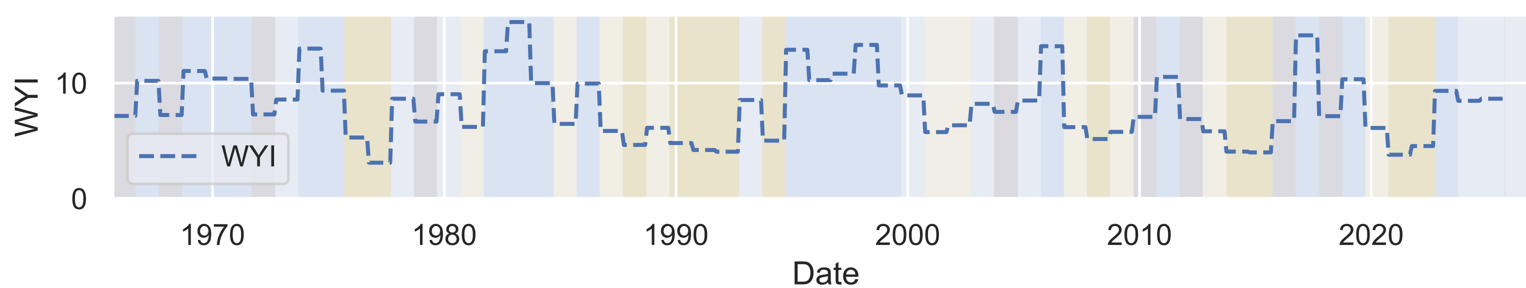
Sustainable Management Criteria:
IM (2027) = 130.0 ft AMSL
MO = 130.0 ft AMSL
MT = 50.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

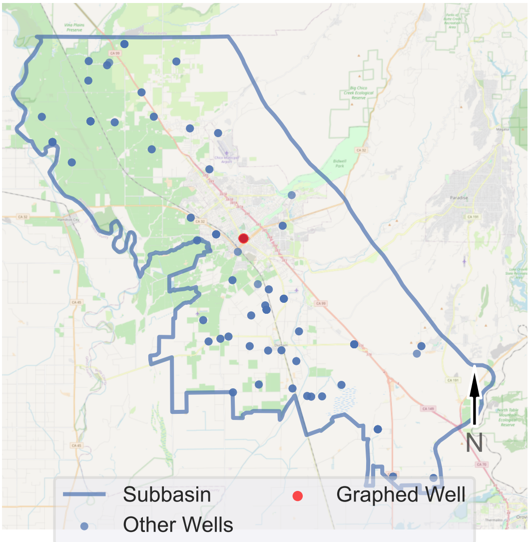
Perforation data not available.





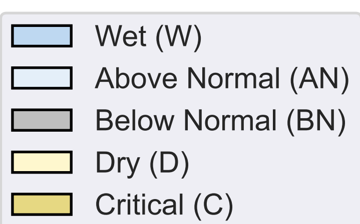
VINA Subbasin - State Well Number (SWN): CWSCH01b

Well Location Map

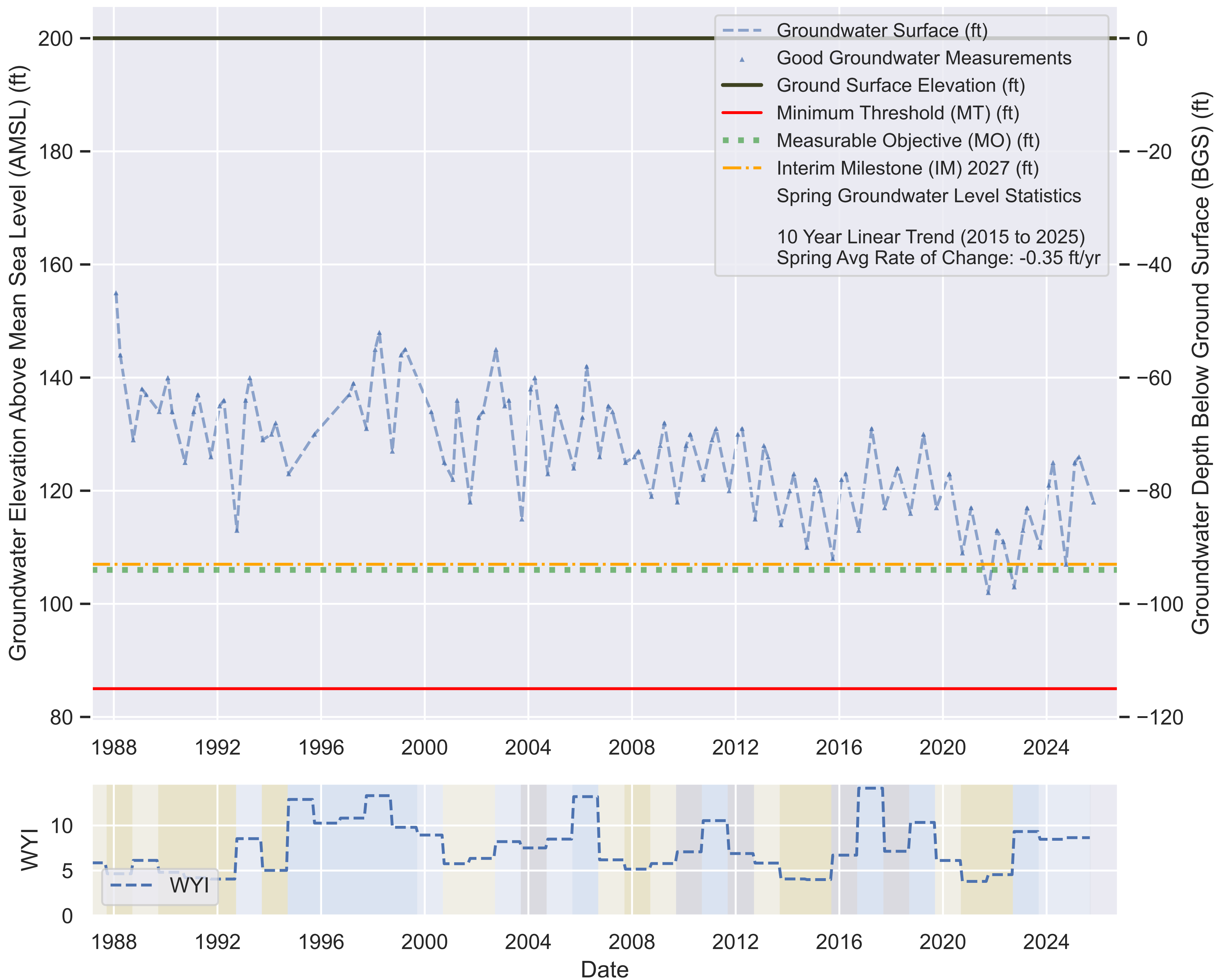


Sustainable Management Criteria:
IM (2027) = 107.0 ft AMSL
MO = 106.0 ft AMSL
MT = 85.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

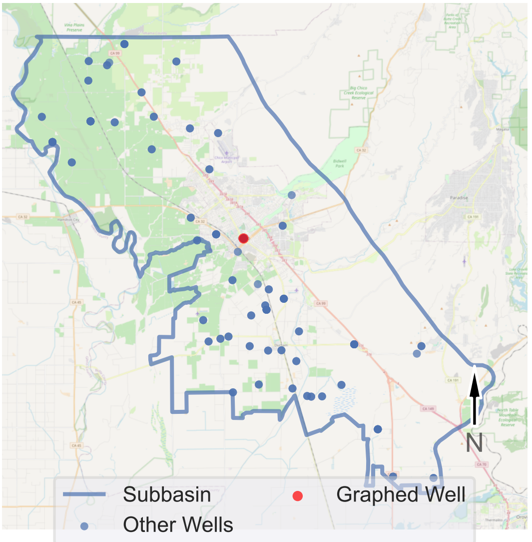


Perforation data not available.



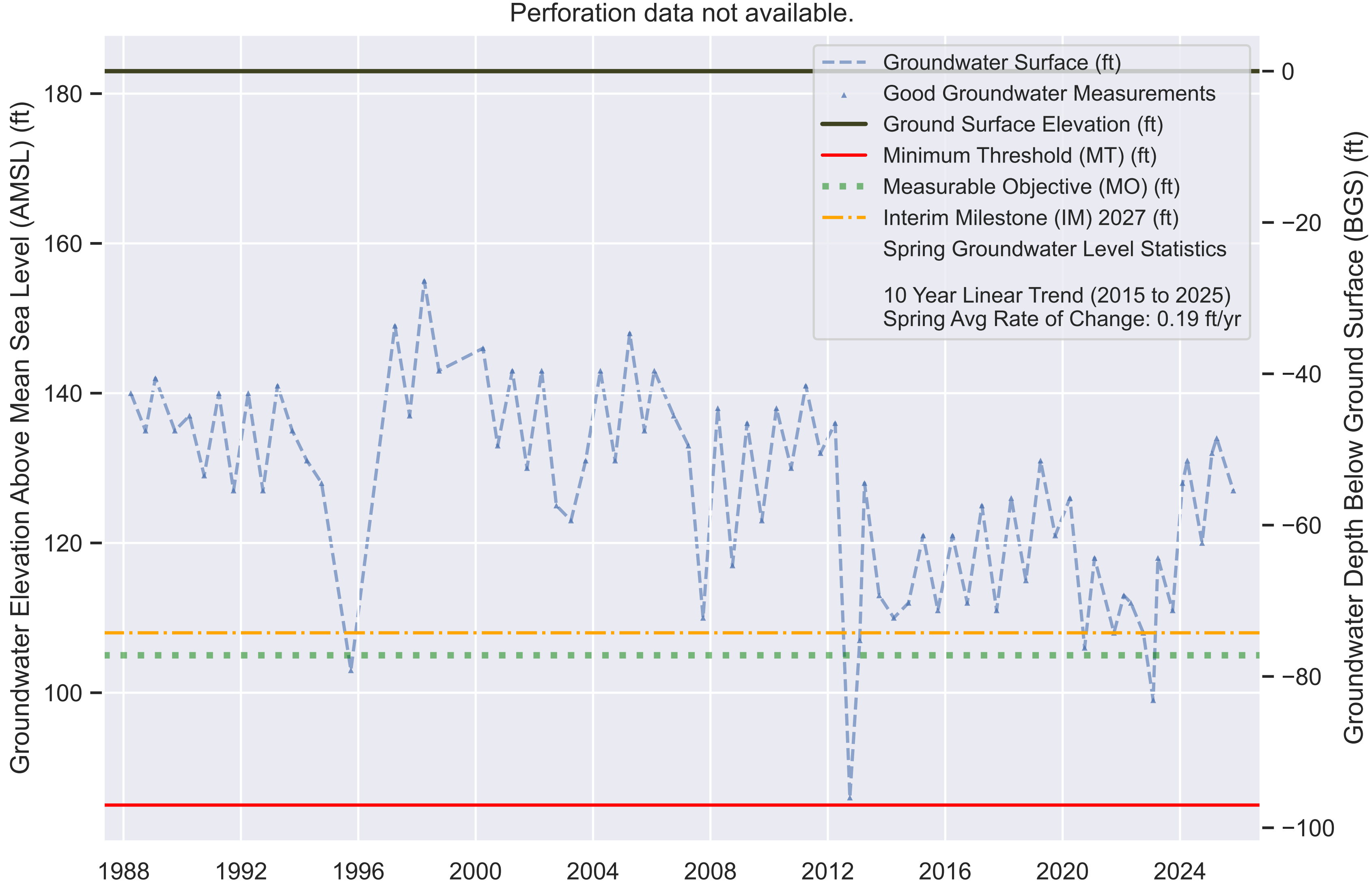
VINA Subbasin - State Well Number (SWN): CWSCH02

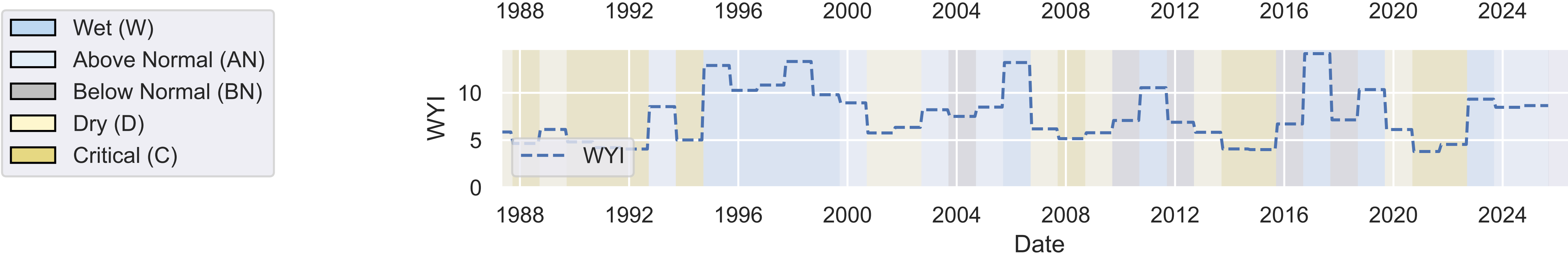
Well Location Map



Sustainable Management Criteria:
IM (2027) = 108.0 ft AMSL
MO = 105.0 ft AMSL
MT = 85.0 ft AMSL

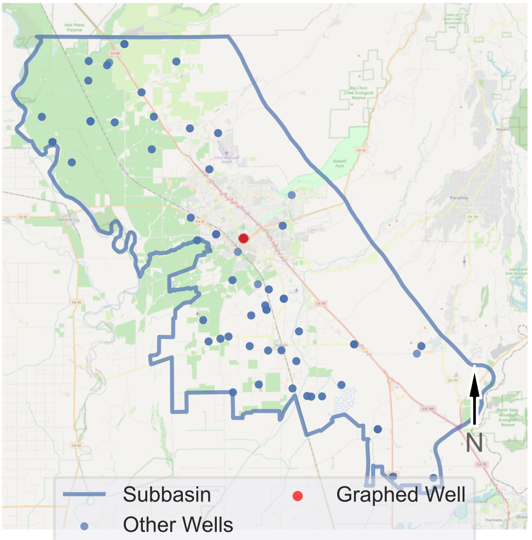
Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.





VINA Subbasin - State Well Number (SWN): CWSCH03

Well Location Map

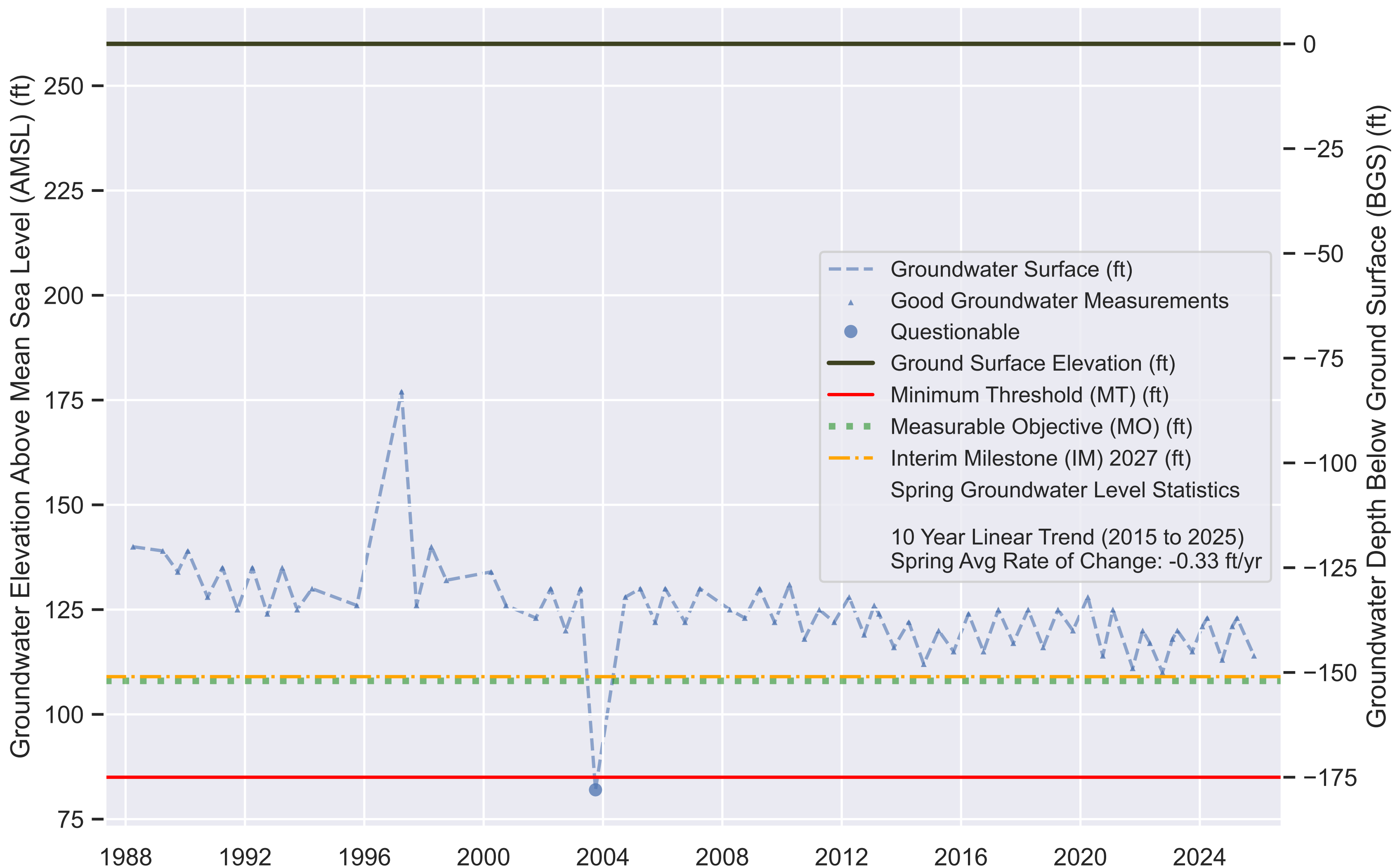


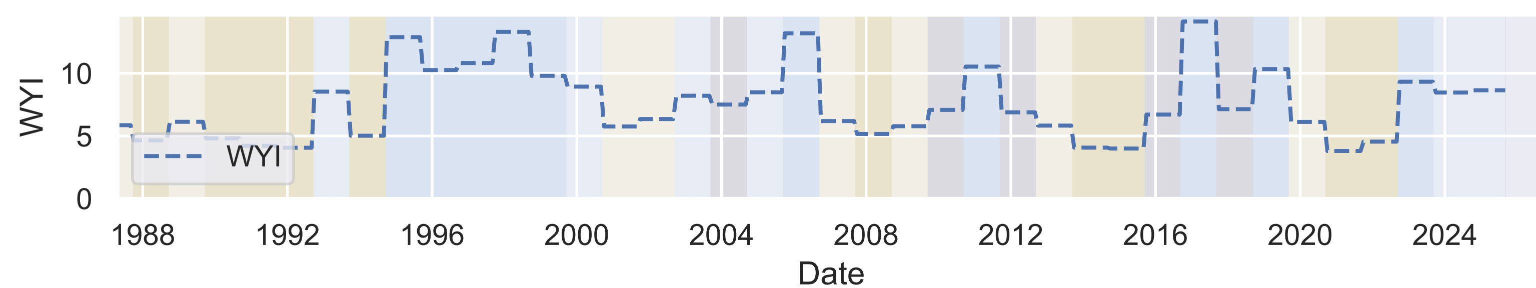
Sustainable Management Criteria:
IM (2027) = 109.0 ft AMSL
MO = 108.0 ft AMSL
MT = 85.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

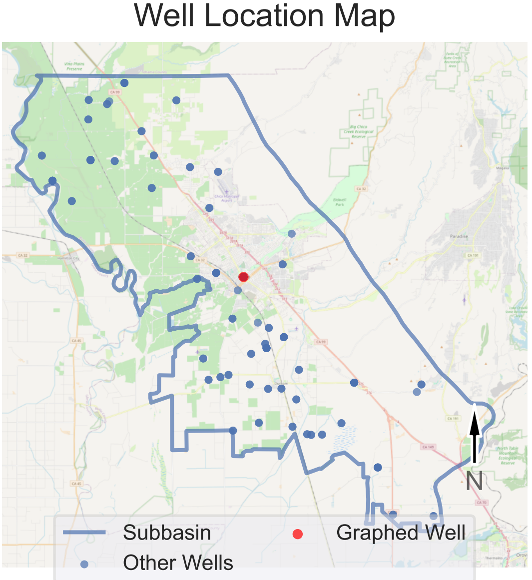
- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

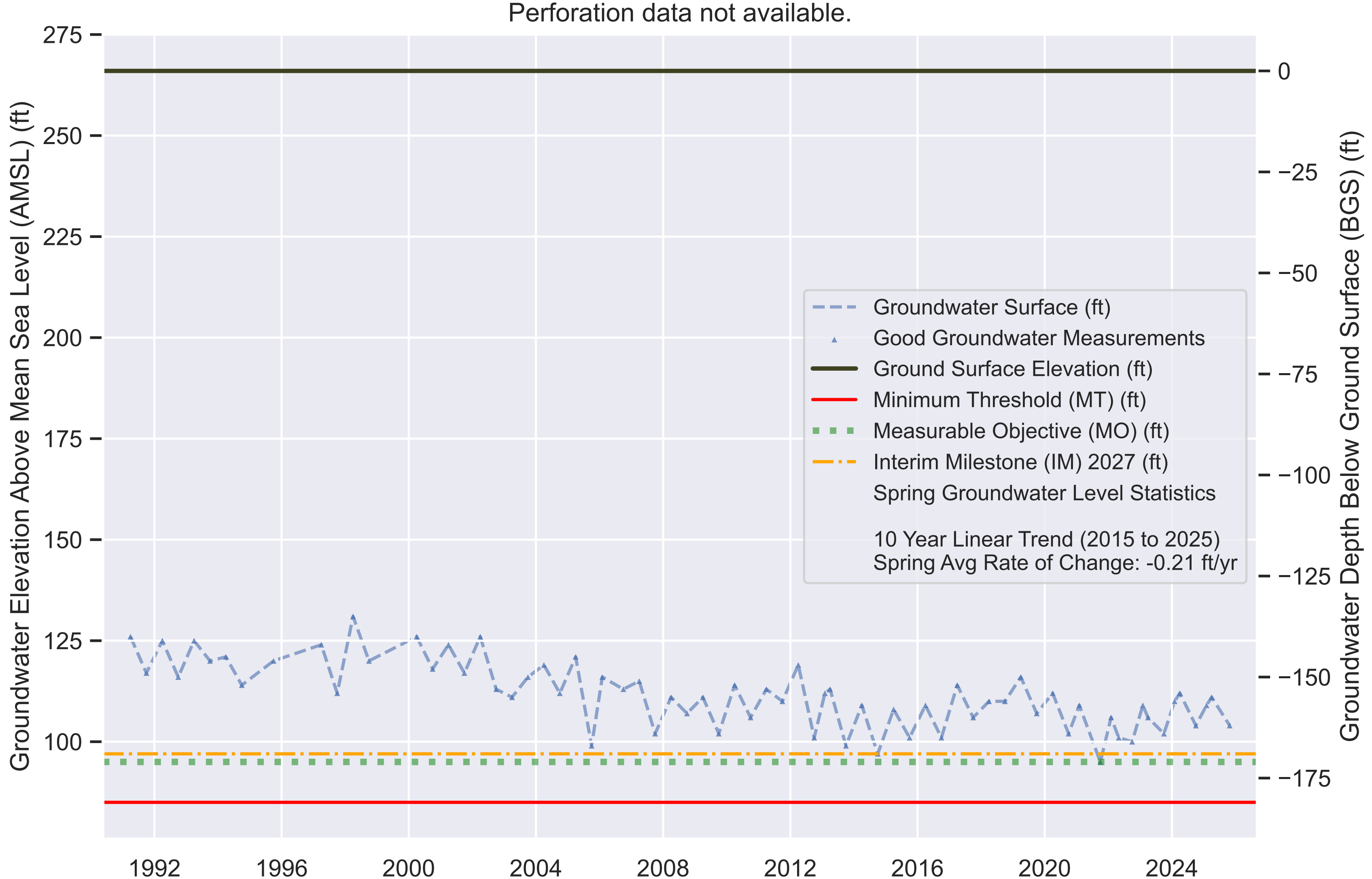
Perforation data not available.





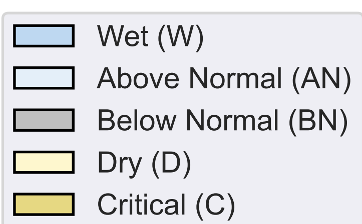
VINA Subbasin - State Well Number (SWN): CWSCH07

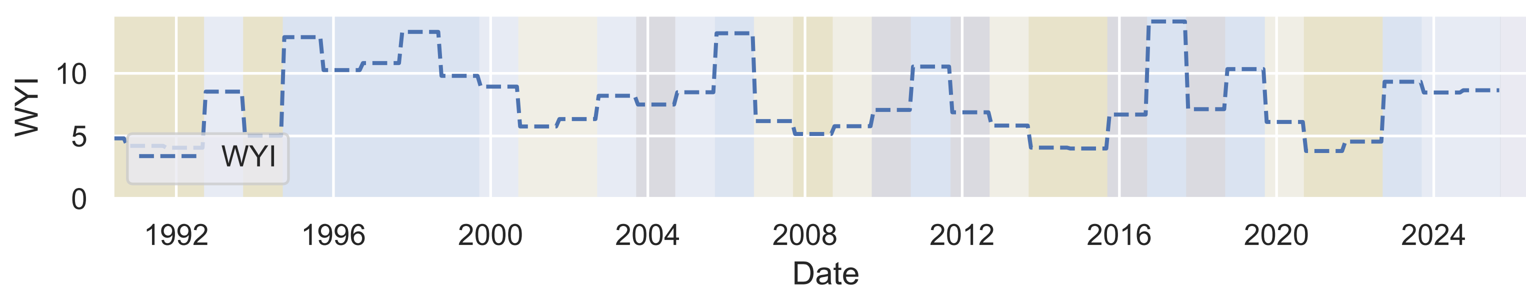




Sustainable Management Criteria:
IM (2027) = 97.0 ft AMSL
MO = 95.0 ft AMSL
MT = 85.0 ft AMSL

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.





Water Year 2025 Annual Report

Appendix B

Explanation of Sustainable Management Criteria

Appendix B: Explanation of Sustainable Management Criteria

The Sustainable Groundwater Management Act (SGMA) requires a Groundwater Sustainability Plan (GSP) to define Sustainable Management Criteria (SMC) for the groundwater subbasin. The SMC offer guideposts and guardrails for groundwater managers seeking to achieve sustainable groundwater management. SGMA defines sustainable groundwater management as "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results," where the planning and implementation horizon is 50 years with the first 20 years spent working toward achieving sustainable groundwater management and the following 30 years (and beyond) spent maintaining it (California Water Code §10721).

"Undesirable Results" are associated with up to six Sustainability Indicators (SI), including groundwater levels, groundwater storage, water quality, seawater intrusion, land subsidence, and interconnected surface water. SGMA defines undesirable results as those having significant and unreasonable negative impacts. Failure to avoid undesirable results on the part of the GSAs may lead to intervention by the State. Once the sustainability goal and undesirable results have been locally identified, projects and management actions are formulated to achieve the sustainability goal and avoid undesirable results.

SI and associated undesirable results, if significant and unreasonable

The associated undesirable results for each SI have been defined similarly across the Butte Subbasin. In turn, the rationale and approach for determining Minimum Thresholds and Measurable Objectives for each SI are the same across the Butte Subbasin.

The terminology for describing SMC is defined as follows:

Undesirable Results – Significant and unreasonable negative impacts associated with each SI.

Minimum Threshold (MT) – Quantitative threshold for each SI used to define the point at which undesirable results may begin to occur.

Measurable Objective (MO) – Quantitative target that establishes a point above the MT that allows for a range of active management to prevent undesirable results.

Margin of Operational Flexibility – The range of active management between the MT and the MO.

Interim Milestones (IMs) – Targets set in increments of five years over the implementation period of the GSP offering a path to sustainability.

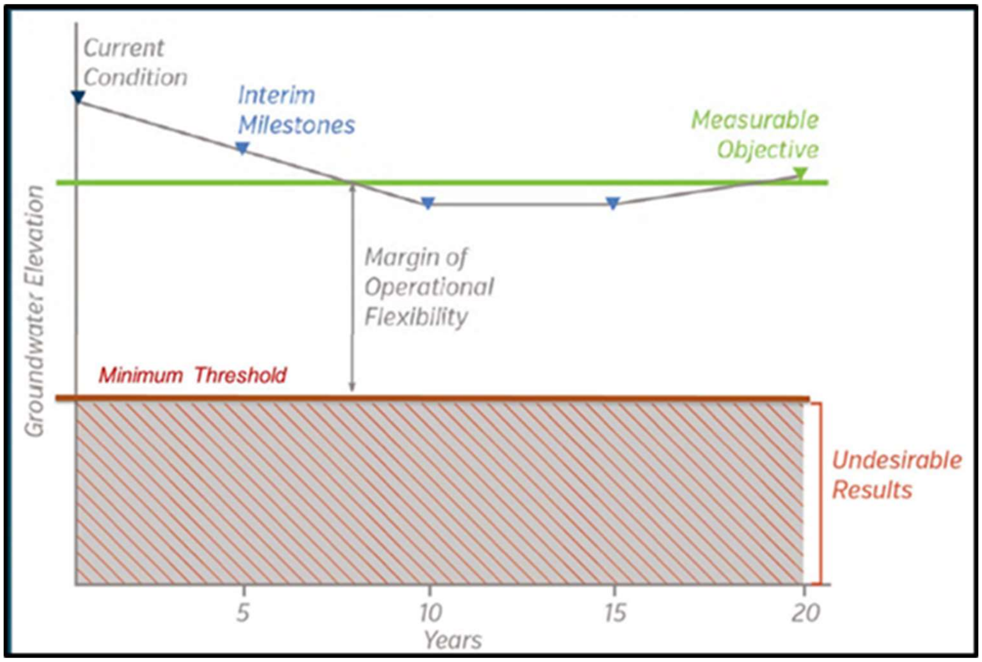


Illustration of Terms Used for Describing Sustainable Management Criteria Using the Groundwater Level SI

The Figure above illustrates these terms for the groundwater level SI.

SI are intended to be measured and compared against quantifiable SMC throughout a monitoring framework of Representative Monitoring Site (RMS) wells. Ongoing monitoring of SI can:

Determine compliance with the adopted GSP

Offer a means to evaluate the effectiveness of projects and management actions over time

Allow for course correction and adaptation in five-year updates

Facilitate understanding among diverse stakeholders

Support decision-making on the part of the GSAs into the future

The SMC for the Butte Subbasin is fully explained and defined in Section 3 of the GSP

available here: https://sgma.water.ca.gov/portal/gsp/preview/98

Water Year 2025 Annual Report

Appendix C

GSP Annual Reporting Elements Guide

Groundwater Sustainability Plan Annual Report Elements Guide			
Basin Name			
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.	37-39	
	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.	5-16	
	(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.	17-20	
	(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.	21; 45-65	
	(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.	21-24	
	(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.	25	
	(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.	25-26	
	(5) Change in groundwater in storage shall include the following:		
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	26-31	
	(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.	28	
	(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.	32-43	

Water Year 2025 Annual Report

Appendix D

DWR Upload Tables

A. Groundwater Extractions

Total Groundwater Extractions (AF)	Water Use Sector Urban (AF)	Water Use Sector Industrial (AF)	Water Use Sector Agricultural (AF)	Water Use Sector Managed Wetlands (AF)	Water Use Sector Managed Recharge (AF)	Water Use Sector Native Vegetation (AF)	Water Use Sector Other (AF)	Water Use Sector Other Description
261,600	18,400	0	240,200	0	0	0	3,000	Rural Residential

B. Groundwater Extraction Methods

Meters Volume (AF)	Meters Description	Meters Type	Meters Accuracy (%)	Meters Accuracy Description	Electrical Records Volume (AF)	Electrical Records Description	Electrical Records Type	Electrical Records Accuracy (%)	Electrical Records Accuracy Description	Land Use Volume (AF)	Land Use Description	Land Use Type	Land Use Accuracy (%)	Land Use Accuracy Description	Groundwater Model Volume (AF)	Groundwater Model Description	Groundwater Model Type	Groundwater Model Accuracy (%)	Groundwater Model Accuracy Description	Other Method(s) Volume (AF)	Other Method(s) Description	Other Method(s) Type	Other Method(s) Accuracy (%)	Other Method(s) Accuracy Description
22,000	Metered Municipal Wells	Direct	5-10 %	Metered connection maintained by California Water Service and Durham Irrigation District.	0					240,200	Land use estimates were derived from crop mapping and CropScape survey results	Estimate	20-30 %	Typical uncertainty for water balance calculation	0					3,000	Rural residential groundwater extraction is estimated based on California Water Service Company's 2020 Urban Water Management Plan 2020 usage of an average per capita water use of 181 gallons per capita per day. Population data from the 2020 census was coupled with water district boundary data to identify total population not serviced by municipal supplies	Estimate	10-20 %	Uncertainties are from population estimates and gallon per capita per day estimates

C. Surface Water Supply

Total Surface Water Supply (AF)	Methods Used To Determine	Water Source Type Central Valley Project (AF)	Water Source Type State Water Project (AF)	Water Source Type Colorado River Project (AF)	Water Source Type Local Supplies (AF)	Water Source Type Local Imported Supplies (AF)	Water Source Type Recycled Water (AF)	Water Source Type Desalination (AF)	Water Source Type Other (AF)	Water Source Type Other Description
25,800	Diversions for local supplies are estimated based on historic State Water Resource Control Board eWRIMS (Electronic Water Rights Information Management System) data for total diversions. Surface water delivery estimates are based on historic deliveries in the area that have occurred in dry and critical years	0	0	0	25,800	0	0	0	0	

D. Total Water Use

Total Water Use (AF)	Methods Used To Determine	Water Source Type Groundwater (AF)	Water Source Type Surface Water (AF)	Water Source Type Recycled Water (AF)	Water Source Type Reused Water (AF)	Water Source Type Other (AF)	Water Source Type Other Description	Water Use Sector Urban (AF)	Water Use Sector Industrial (AF)	Water Use Sector Agricultural (AF)	Water Use Sector Managed Wetlands (AF)	Water Use Sector Managed Recharge (AF)	Water Use Sector Native Vegetation (AF)	Water Use Sector Other (AF)	Water Use Sector Other Description
287,400	Methods used are a combination of estimates based on land use and population/ per capita water use, metered municipal water use, and estimates based on historic water rights data for dry and critical years	261,600	25,800	0	0	0		18,400	0	266,000	0	0	-	3,000	Rural Residential

Water Year 2025 Annual Report

Appendix E

Water Use Analysis Methodology

TECHNICAL MEMORANDUM

To: Luhdorff and Scalmanini Consulting Engineers

From: Davids Engineering, Inc.

Date: March 3, 2025

Subject: **Water Use Analysis Methodology**

1 Introduction

Pursuant to the Groundwater Sustainability Plan (GSP) regulations (23 CCR[1] Section 356.2), the GSP Annual Report for the Butte Subbasin (Subbasin) includes quantification of water supplies and water uses in the reporting year, including groundwater extraction by water use sector[2]. Water supplies and water uses in the Subbasin have been quantified based on the best available data sources and information, either collected from measured records or estimated where necessary.

While some groundwater extraction in the Subbasin is measured, most groundwater extraction is unmeasured, including extraction from privately owned wells. For the Butte Subbasin Annual Report (Annual Report), the approach used to estimate unmeasured groundwater extraction for the agricultural water use sector is referred to as the Groundwater Extraction Estimates from Earth Observations (GEEEO) process. In this approach, a spatial water use analysis is computed on a monthly basis using current land use data, climate conditions (e.g., precipitation and evapotranspiration), crop water demands, and other local information, allowing for estimation of total water use and estimated groundwater extraction, after accounting for the use of other available water supplies.

This approach differs from the water budget methodology used in GSP development, where the Butte Basin Groundwater Model (BBGM) was used to generate historical, current, and projected water budgets for the Subbasin. The shift toward the GEEEO process is due to the time and cost constraints associated with updating the GSP groundwater model annually. Despite this change, key inputs and results from the GEEEO process have been compared with those of the GSP groundwater model to ensure consistency in the water use analyses.

This technical memorandum (TM) describes the methodology and data sources used in the GEEEO process. Results of the GEEEO process are documented in the Annual Report.

[1] California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2. Groundwater Sustainability Plans.
[2] Water use sectors are identified in the GSP Regulations as "categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation" (23 CCR Section 351(al)).

2 GEEEO Process and Computational Approach

2.1 Computational Approach

The GEEEO process utilizes available geospatial data and information to quantify water use, including groundwater extraction volumes, spatially across the Subbasin:

1. First, geospatial evapotranspiration (ET) information at a pixel-scale is used to quantify the total consumptive water use and total applied water requirements during a given time period in a given area of the Subbasin, and geospatial land use information is used to help identify where irrigation water may have been applied (i.e., whether the area in question features irrigated agricultural land, versus idled land or undeveloped vegetation).
2. After quantifying total applied water requirements, available surface water supply and groundwater extraction data is incorporated into the GEEEO process by distributing that water out to specific regions where that water is applied (e.g., irrigated lands in surface water supplier service areas).
3. The remaining groundwater extraction needed to meet applied water demands is then calculated based on the difference between total applied water requirements and available water supply information, with consideration for effective precipitation.
4. Finally, the pixel-scale results can then be aggregated to the desired spatial or temporal domains of interest.

The result is a spatially distributed water use analysis calculated with a finer spatial resolution than was possible in the GSP water budgets. The pixel-scale water budget results provide greater insight into where water use occurs in the Subbasin and are configurable to create water use summaries for any region of the Subbasin. Additional details about the GEEEO computational approach are provided in Attachment A, generally following the process described in Hessels et al. (2022).

2.2 Spatial Resolution

GEEEO quantifies water use and groundwater extraction volumes with pixel-scale resolution (30 meters (m) x 30 m), corresponding to the spatial resolution of satellite imagery used in developing many of the GEEEO inputs. For those inputs that are not available at the 30 m x 30 m resolution, available data and information is distributed as averages over the area where that information is applicable (e.g., district-reported surface water deliveries are distributed as an average acre-feet per acre (AF/ac) over irrigated lands in that district's service area[3]). Additional information about the spatial resolution of specific data sources is provided in Section 3.

The fine spatial resolution of the GEEEO inputs and computations allows for highly configurable GEEEO results summaries. For the Annual Report, results are summarized by subregions that are defined to roughly correspond with the boundaries of the water budget regions in the GSP groundwater model, with distinction between water districts, managed wetlands and refuge areas, and out-of-district lands.

[3] Future refinements to the GEEEO process could potentially incorporate field-scale surface water delivery records to improve spatial detail of results rather than equally distributing surface water deliveries across the irrigated lands within the district's service area.

2.3 Period and Timestep

For each Annual Report, the GEEEO process operates from 2016 through the current reporting year[4] on a monthly timestep, although only the results from the current reporting year are included in the Annual Report. The period and timestep are set according to data availability and reporting needs. However, the GEEEO process is configurable to operate on different timescales (e.g., daily or weekly). The start year is currently limited by the availability of geospatial ET information from OpenET, although further historical ET information is expected to be available in the near future.

3 Data Sources

The GEEEO process uses data sources and information that capture the unique, local conditions within the Subbasin to the extent available. Details about the data and information used in the GEEEO process are described below.

3.1 Evapotranspiration

ET, or consumptive water use, is the major driver of water use in the Subbasin, particularly agricultural use. In this context, consumptive water use is defined as "*the part of water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment*" (ASCE, 2016). Unlike surface runoff or infiltration of water into the groundwater system (through seepage, deep percolation, managed recharge, or other means), ET is water that cannot be recovered or directly reused in the Subbasin.

In the GEEEO process, ET is quantified from satellite-based remote sensing analyses available from OpenET. OpenET is a multi-agency web-based geospatial information system (GIS) utility that quantifies ET over time with a spatial resolution of 30 m x 30 m (approximately 0.22 acres). OpenET information is available in raster coverages of the Subbasin on both a daily and monthly timestep from 2016 through present.[5] The GEEEO process utilizes monthly rasters of the ensemble ET from OpenET to calculate total water use for the Annual Report.

While OpenET is a new utility, the underlying methodologies to quantify ET apply a variety of well-established modeling approaches that are widely used in government and research applications. The OpenET modeling approaches are also similar to the approaches used to quantify ET in the GSP groundwater model. Additional information about the OpenET team, data sources, and methodologies are available at: https://openetdata.org/.

3.2 Land Use

Areas in each water use sector in the Subbasin were identified using the most recent and reliable spatial land use data in the region, including:

1. Statewide crop mapping, available from the California Department of Water Resources (DWR) (DWR, 2024)

---

[4] Annual Reports are required to be submitted by April 1 each year following the adoption of the GSP. The current reporting year for each Annual Report is the preceding water year (i.e., October 1 through September 30)

[5] OpenET raster information is typically available within about one month after the period has ended.

2. CropScape Cropland Data Layer coverage, available from the United States Department of Agriculture (USDA, 2024).

Land use data from these sources were compiled into 30 m x 30 m raster coverages of the Subbasin. To prepare the GEEEO process inputs, DWR data, which includes extensive ground-truthing review of results, is preferentially used to identify agricultural land (including irrigated and non-irrigated lands) and urban areas, and then USDA data is utilized to back-fill gaps of non-irrigated, idled, and non-developed land in the Subbasin. Local refinements are also applied, as needed, to account for local land use information.

These land use data sources and applications were similar to those used in development of the GSP water budgets. Comparisons were made to evaluate the consistency of the datasets and with earlier land use analyses; good correspondence was found for the major land use classes found in the Subbasin.

DWR data is typically available in provisional form approximately two years after a given year has passed. USDA data is typically available for the prior year in early- to mid-February. When data for the current reporting year is not yet available, raster coverages of the Subbasin are generally assembled utilizing land use data from the most recent, hydrologically similar year (i.e., similar water supply conditions and similar cropping patterns, to the extent possible). Idling of annual and ponded crops in a given year may also be locally refined through comparison with USDA data for the current reporting year or through an analysis of vegetation coverage in the current reporting year. However, it is noted that land use data is only used in the GEEEO process to identify areas in each water use sector where water is applied. The total water use for lands in the agricultural and managed wetlands water use sectors are determined through an analysis of OpenET data, regardless of the precise land use classification.

3.3 Precipitation

Spatial precipitation estimates were extracted from the Parameter-elevation Regressions on Independent Slopes Model (PRISM), developed by the PRISM Climate Group at Oregon State University. PRISM quantifies spatial precipitation estimates, among other climate parameters, based on available weather station data and modeled spatial relationships with topography and other factors influencing weather and climate.

PRISM data is available in raster coverages of the Subbasin on both a daily and monthly timestep, with a spatial resolution of 4 kilometer (km) x 4 km. The GEEEO process utilizes monthly rasters for the Annual Report analysis, and the precipitation results for each 4 km pixel are applied to each of the 30 m pixels within it (i.e., downscaled) for which ET and land use data are available. Additional information about the PRISM data and methodologies are available at: https://prism.oregonstate.edu. PRISM precipitation data is consistent with the historical precipitation inputs to the GSP groundwater model.

To calculate effective precipitation and, subsequently, evapotranspiration from precipitation (ETPR), PRISM precipitation data, estimated crop rooting depths, and soil property information are used as inputs. Estimated rooting depths are taken from the ranges listed in Appendix B of ASCE 70 (2016). For crops not listed in ASCE 70, rooting depths are based on the rooting depths of similar crops and professional judgement. Relevant soil properties include total soil depth, depth to restrictive layer, and available water holding capacity. Estimated soil properties are aggregated from the USDA soil survey geographic database (SSURGO) (Soil Survey Staff, 2025). ETPR is computed using the input parameters (soil, precipitation, and rooting depth) and either the U.S. Bureau of Reclamation (USBR) method (Stamm, 1967) or the National Engineering Handbook Part 623 method (USDA, 1993), depending on local data availability, results, and conditions. For the USBR method, the effective precipitation bins have been modified from the original bins outlined in the USBR method documentation to match regional hydrology patterns..

3.4 Local Water Supply Data

As described in Section 2, available surface water supply and groundwater extraction data is incorporated into the GEEEO process to quantify the amount of known water supply available, prior to estimating the remaining groundwater extraction needed to meet demand. Where field-scale delivery measurements are available, the water supply volume delivered was distributed evenly across all irrigated areas of that field. Where field-scale delivery measurements are not available and only diversion volumes or aggregated delivery volumes for a larger area are available, water supply data is distributed evenly over the area where that water can be delivered for irrigation (e.g., average AF/ac over lands where that water is available for use).

Surface water supply and groundwater extraction data are collected from both publicly available and local sources. Information gathered may include, where applicable:

1. Water supply contract delivery records, from the United States Bureau of Reclamation (USBR), State Water Project (SWP), or other publicly available sources as applicable.
2. Water rights diversions records, from the State Water Resources Control Board (SWRCB) through the Electronic Water Rights Information Management System (eWRIMS)
3. Data requests to local water agencies and water users, requesting surface water diversions, surface water deliveries, surface water outflows, groundwater pumping records, or other available water use data. At the most detailed possible level, these include field-scale volumetric delivery measurements taken by Water or Irrigation District water operators, as required per the Water Conservation Act of 2009.

In cases where current surface water data is not available, general information on surface water inflows and outflows may be gathered from other local sources as available (e.g., Agricultural Water Management Plan water budgets). More information about surface water data sources is described in the Annual Report.

While groundwater extraction data is not available in many parts of the Subbasin, local data is requested each year so that new data can be incorporated into the GEEEO process as it becomes available. It is noted that while groundwater extraction for municipal water supply systems is generally reported for urban areas in the Annual Report based on SWRCB and locally provided data, groundwater extraction for municipal areas is not directly included in the GEEEO process due to underlying differences in how the majority of water is used in urban areas. This also applies to estimates of rural residential groundwater use (e.g., domestic water use pumped through private domestic wells) outside of urban areas. The data sources and approaches used to quantify municipal and rural residential groundwater extraction are described in the Annual Report.

3.5 Other Agronomic Data

Other agronomic and climate-related data that is incorporated into the GEEEO process includes:

1. Representative consumptive use fractions for crops (i.e., fraction of total applied water that is consumed through ET). Values are based on typical irrigation methods and efficiencies for crops.
2. Conveyance system fractions for subregions (i.e., fraction of diverted water that is delivered, accounting for losses).
3. Reuse fractions for subregions (i.e., fraction of delivered water that is reused).

Information gathered from local sources is used where available, otherwise representative values for agronomic practices in the region are used.

4 References

American Society of Civil Engineers (ASCE). 2016. ASCE Manuals and Reports on Engineering Practice No. 70, Evaporation, Evapotranspiration, and Irrigation Water Requirements (Second Edition).

California Department of Water Resources (DWR). 2024. Provisional 2022 Statewide Crop Mapping GIS Data, Updated January 2024. Available at: https://data.cnra.ca.gov/dataset/statewide-crop-mapping.

Hessels, T., Davids J. C., and Bastiaanssen W. 2022. Scalable Water Balances from Earth Observations (SWEO): Results from 50 Years of Remote Sensing in Hydrology. Water International, 47(6), 866-886.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for California. Available online. Accessed January 15, 2025.

Stamm, G.G. (1967). Problems and Procedures in Determining Water Supply Requirements for Irrigation Projects. In Irrigation of Agricultural Lands (eds R.M. Hagan, H.R. Haise and T.W. Edminster). https://doi.org/10.2134/agronmonogr11.c45

United States Department of Agriculture (USDA). 2024. CropScape – 2023 Cropland Data Layer, Released January 2024. Available at: https://nassgeodata.gmu.edu/CropScape/.

United States Department of Agriculture (USDA); National Agricultural Statistics Service (NASS). 2024. 2023 Nationwide Crop Mapping GIS Data, Released January 31, 2024. Available at: https://croplandcros.scinet.usda.gov/.

United States Department of Agriculture (USDA). 1993. National Engineering Handbook (NEH). Chapter 2, part 623, Irrigation water requirements. Washington, D.C.: U.S. Dept. Of Agriculture, Soil Conservation Service.

Attachment A. GEEEO Computational Approach Details

Figures A-1 and A-2, below, present a schematic of the GEEEO computational approach as it has been developed and is being generally applied to support Annual Report Development.

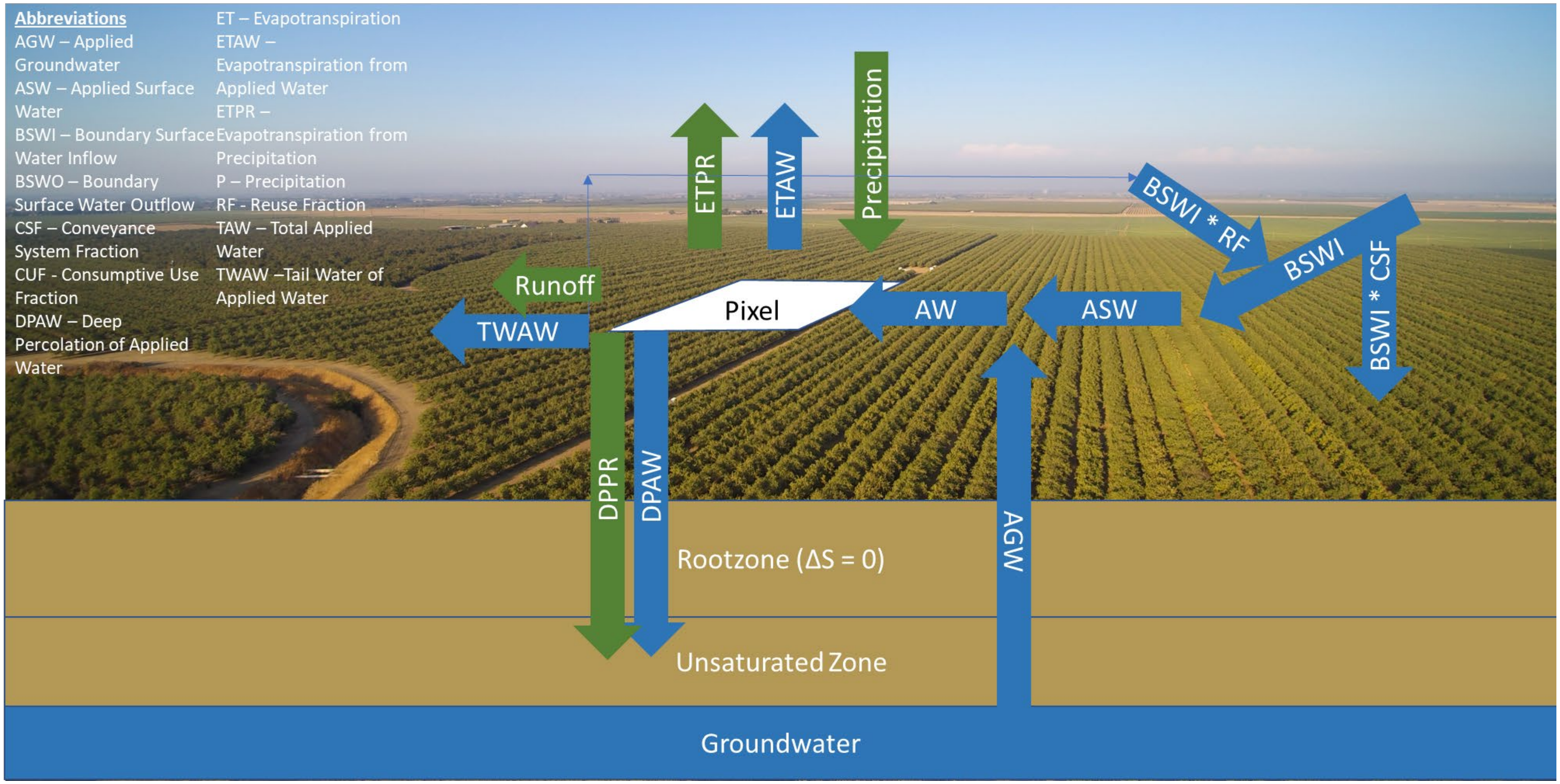


Figure A-1. Inflows and Outflows to Each 30 m x 30 m Pixel in the GEEEO Process.

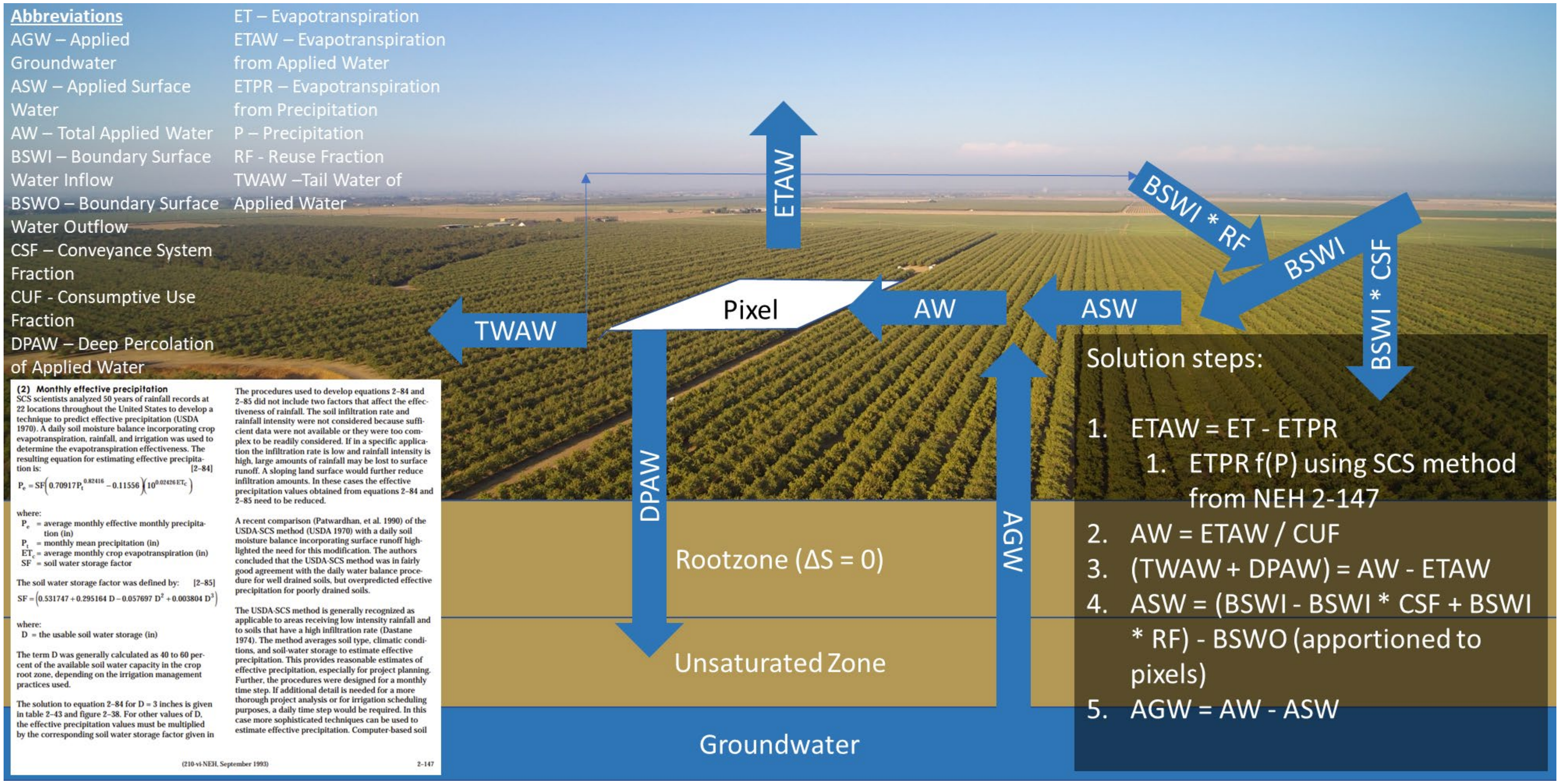


Figure A-2. Solution Steps for Calculating Applied Groundwater (AGW) in Each 30 m x 30 m Pixel in the GEEEO Process.

Water Year 2025 Annual Report

Appendix F

Water Quality

Water and Resource Conservation Kamela Loeser, Director

308 Nelson Avenue
Oroville, California 95965

T: 530.552.3595
F: 530.538.3807

buttecounty.net/waterresourceconservation
bcwater@buttecounty.net

TECHNICAL MEMORANDUM

2025 Groundwater Quality Trend Monitoring Program Results

Prepared by: Kelly Peterson, Water Resources Scientist, Department of Water and Resource Conservation

Background and Purpose

The Butte County Department of Water and Resource Conservation (WRC) continued its groundwater quality trend monitoring within the County in August of 2025to provide information on groundwater quality conditions for salinity, measured as specific conductivity (SC). Conductivity is a basic groundwater quality characteristic to evaluate a subbasin for evidence of saline intrusion: as conductivity increases, salinity increases. Conductivity measures the ability of water to pass an electrical current, such as those from dissolved ions i.e. salts and other inorganic chemicals. Overtime with regular measurements, comparisons to baseline conditions can show trends in changing conditions.

Originally required by Chapter 33A, the Basin Management Objective Program, ran by the County has been monitoring wells for evidence of saline intrusion since 2001. In 2014, SGMA required Groundwater Sustainability Agencies (GSAs) to develop and submit Groundwater Sustainability Plans (GSPs) to the California Department of Water Resources (DWR) by 2022. The Butte, Vina and Wyandotte Creek Subbasin GSPs include a conductivity monitoring plan to avoid groundwater quality degradation (Davids, 2021; Geosyntec Consultants, Inc., 2021a; Geosyntec Consultants, Inc., 2021b). With the onset of SGMA, Chapter 33A was sunset in 2019, however the Department continues to conduct the Groundwater Quality Trend Monitoring Program to support the GSAs with their monitoring needs and to fulfill the program's original objectives of:

- Establishing a baseline of information to reveal trends over time of Butte County groundwater quality. Measurements taken serve as initial indicators of changes in water quality that may warrant further investigation or testing.

- Ensuring that groundwater resources are well managed by documenting the quality of local groundwater. Availability and distribution of this information will be a useful educational tool.

The purpose of this memo is to summarize the groundwater quality conditions for salinity, measured as specific conductance in the Butte, Vina and Wyandotte Creek Subbasins during the fourth year (2025) of groundwater quality monitoring related to their respective Groundwater Sustainability Plans (GSPs) per the Sustainable Groundwater Management Act (SGMA) of 2014.

The network of wells changed significantly in 2022 as a result of the GSPs. The redefined network targeted inclusion of deep wells (where available) within each subbasin to track the migration of connate water upwelling from deep portions of the aquifer.

Conductivity is affected by temperature and increases as water temperatures increase. The terms "specific" and "electrical" conductivity are often used interchangeably in the literature to report the same measurement, however; specific conductivity refers to conductivity measured with a temperature compensation factor and standardized to 25°C. Electrical conductivity (EC) however, generally refers to measurements that are not standardized to a specific temperature, unless specified. The equipment that has been used to measure groundwater conductivity measurements by the WRC since 2022 reports values as SC.

Salinity is the only water quality constituent for which sustainable management criteria (SMC) goals were set in all three subbasins and is measured in the field as SC. Each subbasin specifically defines how conductivity measurements are reported as related to the SMC in each respective GSP. In the Vina, and Wyandotte Creek Subbasins, specific conductivity is identified for the SMC, while in the Butte Subbasin GSP electrical conductivity is identified for the SMC. For the Butte Subbasin, these measurements can therefore be reported as EC @ 25°C for comparison to their SMC.

Methodology

Conductivity measurements are taken at each monitoring well once per year. The wells are typically measured within the month of August during the peak of the irrigation season.

In 2021, the Department purchased a Solinst 107 temperature, level and conductivity (TLC) meter which includes a probe that measures SC in microsiemens (µs) / centimeter (cm), as well as temperature and water level (similar to an electric sounder) on a 1,000-foot-long laser-marked flat tape with markings every 1/100th ft. This meter has been used since 2022 to conduct conductivity monitoring at various depths within the monitoring wells. The Solinst SC meter is only lowered in wells without pumping equipment i.e. observation wells, in order to avoid potential damage to the equipment through entanglement in the wiring or pumps.

At the beginning of each monitoring day the meter was calibrated with known standard solutions according to the manufacturer's specifications. At each site, the probe is lowered to the water surface and a depth to water measurement is recorded. It is then lowered to the midpoint of each screened interval(s) within the well to record the conductivity of the water entering the well from that portion of the aquifer. In prior reports (2022 and 2023), conductivity measurements from each screened interval were depicted in the graphs. Since 2024, the average of the conductivity measurements collected at the midpoint of every screened interval within each well is displayed in the graphs, unless there are variances in where measurements were recorded. For example, if one of the measurements was not taken within a screened interval due to limits of the equipment (i.e the length of the tape the SC probe is attached to was too short to reach a screened interval) the data taken outside of the screened interval was not included in reported average and is noted as such in the graphs. If not all measurements were able to be taken within the screened intervals for other reasons such as obstructions within the well preventing the equipment from reaching the screened depths, the measurements were deemed as questionable measurements and depicted as such in the graphs.

For most of the remaining wells in the monitoring network with pumps, the Solinst probe was used in the field to measure a water sample collected from a spigot or sprinkler after the well was purged of standing water by pumping it for at least 20 minutes. One exception, well 19N01W28A001M located in the Glenn County portion of the Butte Subbasin was measured with a Hach Sension 156 meter by Glenn County staff after being purged; however it was only pumped for 10 minutes before the sample was collected to measure.

Some water quality monitoring sites do have intermittent conductivity data collected by other entities, however most sites do not. Data in the graphs referred to as "Other Data" or "Historic SC" reflects any other SC data located for the well and is sourced from a variety of entities including DWR's 2020 Northern Sacramento Valley Groundwater Quality Assessment (DWR, 2020), data retrieved from DWR's Water Data Library (WDL) website (DWR, 2025) and data provided by DWR's Northern Region Office Water Quality Section where available. Methodologies of how these measurements were collected vary; however in cases where data included both field and lab conductance values on the same date, the average of the two is reported; most variance of the two values is minimal (under 50 µs/cm) with only one well reporting a variance of about 225 µs/cm.

Monitoring Network

The GSPs define the groundwater quality monitoring Representative Monitoring Site (RMS) well networks to include wells distributed spatially throughout the Subbasins, focusing on the inclusion of wells screened deep enough to capture changes in conductivity in the deeper portions of the aquifer, where any changes in conductivity would be expected to be detected first. There are however a few shallower wells within the network, due to a lack of deeper wells available. Modifications to the networks have been made including the removal and addition of wells for various reasons as described in more detail below and in **Table 1.**

In 2025, the overall revised monitoring network in the Vina Subbasin included seven RMS wells as identified in the GSP. One RMS well, 28J005 was removed from the network in 2024 due to an obstruction preventing the equipment from reaching the mid-point of the screening interval to measure conductivity. Based on field observations, and a video logging survey conducted by DWR in 2025, well 28J005, drilled in 1955, has filled in with sediment approximately 600 feet above the first screened interval.

In 2025, the overall revised monitoring network in the Butte Subbasin included seven RMS wells as identified in the GSP and one additional new well added to the network in 2024. One deep multicompletion well, 20N01E18L001M, an extensometer site used to monitor potential inelastic subsidence was removed from the network in 2024 due to obstructions from the extensometer elements preventing the equipment from reaching the mid-point of the deepest screening interval to measure conductivity. This obstruction was confirmed from a video logging survey conducted by DWR in 2023. Another multi-completion well at the same location, 20N01E18L002M measuring the intermediate zones of the aquifer, was added to the network in 2024 and measured without issue; however in 2025, this well had sediment preventing the equipment from reaching the deepest screened interval in the well. The sediment obstruction was confirmed from a video logging survey conducted by DWR in 2025.

In 2025, the overall revised monitoring network in Wyandotte Creek Subbasin included two RMS wells as identified in the GSP; 18N04E08M001M and 18N04E19D001-3M. As depicted in **Table 1.** four RMS wells identified in the GSP were removed from the monitoring network for the following reasons:

- Two RMS wells were removed from the network per the request of the landowners, 28L001M in 2022 and 16Q001M in 2023.
- RMS well 13B002M was removed from the monitoring network in 2022 due to an inoperable pump.
- Well CWS-02 was removed from the monitoring network in 2023 due to water quality issues at the well which have persisted.

Well 06E002M was added to the network in 2022. This well was historically measured for groundwater quality as part of the Butte County Basin Management Objective (BMO) program. One more additional well, 09N002M was added into the monitoring network in 2023.

A map of each subbasin and the revised network of 2025 groundwater quality sites is shown in **Figure 1.** As part of their GSP Periodic Evaluations (due in January 2027), the GSAs will continue to consider modifications to the groundwater quality RMS network.

The monitoring network details including well type, monitoring equipment, total well depth, depth of the screened zones(s) in each well and notes are provided in **Table 1.** The portion of the state well number in bold indicates the RMS well identification numbers for each well, where applicable.

Most wells in the network are located with Butte County with the exception of two wells; 17N01W10A001M located in Colusa County and 19N01W28A001M located in Glenn County. The RMS wells within the Butte Subbasin are predominantly multi-completion wells (multiple wells at a single location screened at different depths below the ground surface) with the exception of 18N01E35L001M, a single observation well and 19N01W28A001M, a shallow irrigation well. One RMS well in the Butte Subbasin 19N01E35B002M is also an extensometer site which continuously monitors for potential inelastic land subsidence. The RMS wells within the Vina Subbasin are all multi-completion wells sampling from the deepest completion at each location. In the Wyandotte Creek subbasin, there are a variety of well use types in the monitoring network including irrigation, municipal and observation wells.

Sustainable Management Criteria

In these three subbasins, the groundwater quality SMC are established to address degraded groundwater quality caused by groundwater pumping where the potential exists for movement of underlying brackish water from greater depths, upward into the freshwater aquifer where groundwater pumping for beneficial uses occurs. One objective of the groundwater quality monitoring program is to measure conductivity levels in the RMS wells and compare those to the Measurable Objectives (MO) and Minimum Thresholds (MT) set for each RMS well as identified in the GSPs, as a way to gauge whether undesirable results are occurring in the subbasin. In each subbasin's GSP, MTs were established to be protective of water uses and users. When considering MTs, it is important to note that in the case of groundwater levels, exceedance of a MT is caused by groundwater levels dropping below the threshold. However, for groundwater quality, exceedance of a MT is counterintuitively caused by measuring levels higher than the threshold. The MT for groundwater quality is a highest allowable value, rather than lowest.

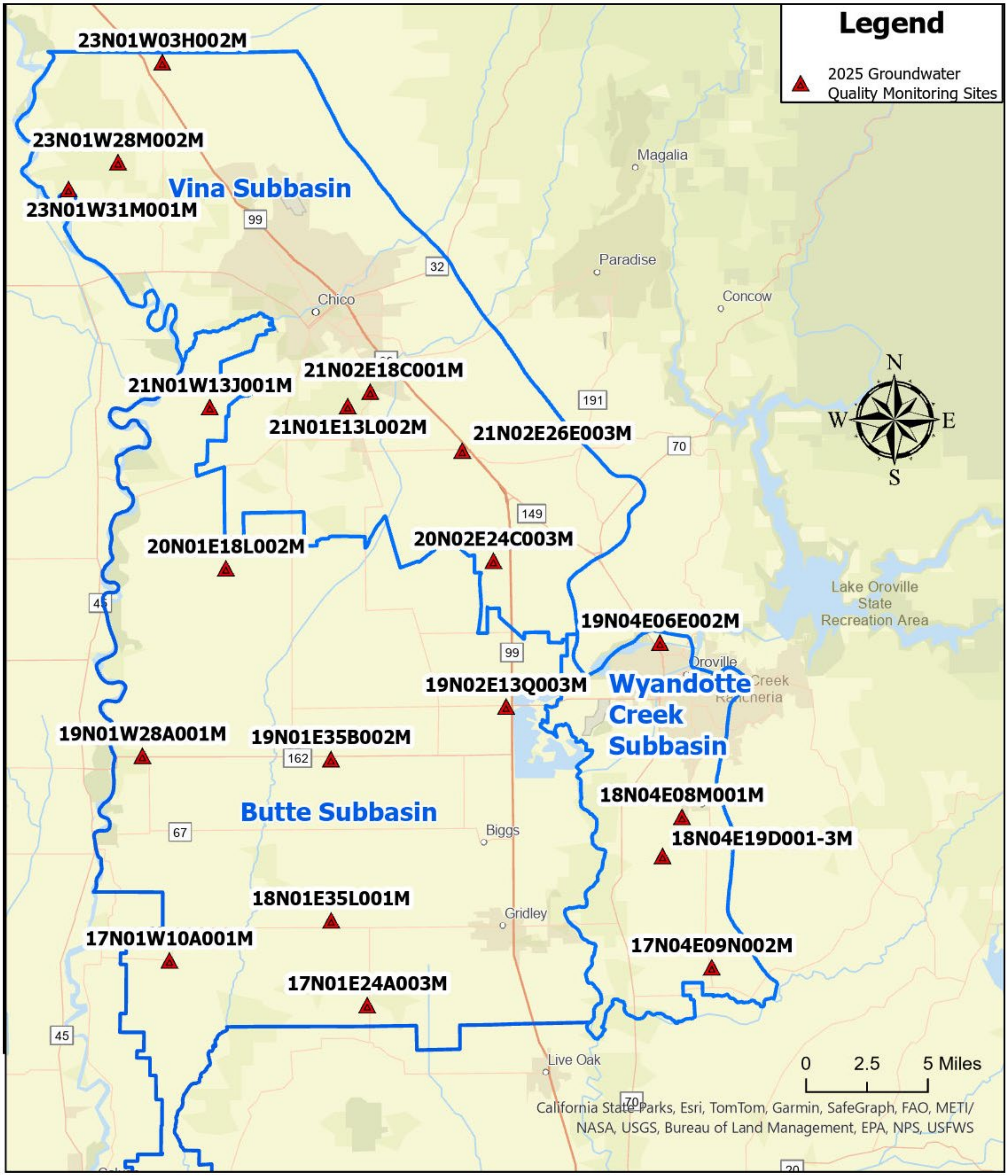
As shown in **Table 2**., in the Bute Subbasin the MO for each RMS well for salinity is set at 700 µs/cm for agricultural use, consistent with the historic Butte County BMO program. The MTs at the RMS wells are set as either the higher of 900 µs/cm or the measured historical high, whichever was greater in the Butte Subbasin. This MT was set based on best available data, the 19-year dataset of the Butte County BMO program, and maximum contamination levels established by the State. The occurrence of an Undesirable Result occurs in the Butte Subbasin if 25% of RMS wells exceed their MTs for 24 consecutive months.

As shown in **Table 2**., in the Vina and Wyandotte Creek Subbasins, the MOs for salinity are set at 900 µs/cm and the MTs are 1,600 µs/cm, which is the upper limit of the Secondary Maximum Contaminant Level (SMCL) based on State Secondary Drinking Water Standards. Secondary Drinking Water Standards are set on the basis of aesthetic concerns, values exceeding this number are typically unacceptable for drinking water. The occurrence of an Undesirable Result occurs in the Vina and Wyandotte Creek Subbasins when two RMS wells within each Subbasin exceeds their MTs for two consecutive non-dry years.

Table 1. 2025 Groundwater Quality Trend Monitoring Network Information

Subbasin	State Well Number	RMS well?	Well Type	Monitoring Equipment	Total Well Depth (feet)	Depth of Screened Zone(s) (feet)	Notes
Butte	**17N01E24A003M**	Yes	Observation	Solinst 107	833	770 - 790	
	17N01W10A001M	Yes	Observation	Solinst 107	820	770 – 780, 790-800	
	18N01E35L001M*	Yes	Observation	Solinst 107	899	816 – 836	
	19N01E35B002M*	Yes	Observation	Solinst 107	980	930 – 950	
	19N01W28A001M	Yes	Irrigation	Hach Sension156	140	120 – 140	
	19N02E13Q003M	Yes	Observation	Solinst 107	690	670 – 680	
	20N01E18L001M	Yes	Observation	Solinst 107	1,000	767 – 810, 873–894	Removed from the network due to obstruction.
	20N01E18L002M	No	Observation	Solinst 107	581	510 – 530, 550-560	Added in 2024 to supplement network
	21N01W13J001M	Yes	Observation	Solinst 107	830	780 – 820	
Vina	20N02E**24C003M**	Yes	Observation	Solinst 107	520	484 – 505	
	21N01E**13L002M**	Yes	Observation	Solinst 107	771	735 - 760	
	21N02E**18C001M**	Yes	Observation	Solinst 107	914	770 – 780, 830–840,	
	21N02E**26E003M**	Yes	Observation	Solinst 107	660	610 – 620	
	22N01E**28J005M**	Yes	Observation	Solinst 107	948	740 - 800	Removed from the network due to obstruction.
	23N01W**03H002M**	Yes	Observation	Solinst 107	553	510 – 540	
	23N01W**28M002M**	Yes	Observation	Solinst 107	1,031	791–801, 881–891, 951–961, 1011–1021	
	23N01W**31M001M**	Yes	Observation	Solinst 107	1,055	969–979, 1,020-1,030	
Wyandotte Creek	17N03E**13B002M**	Yes	Irrigation	Solinst 107	320	120 – 320	Removed from the network due to inoperable pump.
	17N04E**09N002M**	No	Irrigation	Solinst 107	325	100 – 112	Added in 2023 to supplement network
	18N04E**08M001M**	Yes	Irrigation	Solinst 107	~350	168–204, 208 - 244	
	18N04E**19D001M**	Yes	Observation	Solinst 107	744	700 – 720	
	18N04E**19D002M**				594	430–450, 550–570	
	18N04E**19D003M**				220	120 – 130,	
	18N04E**28L001M**	Yes	Irrigation	Solinst 107	190	n/a	Removed from the network due to landowner request.
	19N03E**16Q001M**	Yes	Residential	Solinst 107	120	100 – 120	Removed from the network due to landowner request.
	19N04**E06E002M**	No	Municipal	Solinst 107	196	110–130, 164–174	Added in 2022 to supplement network
	CWS-02	Yes	Municipal	Solinst 107	340	60 – 190, 300-322	Removed from the network due to water quality issues.

** Extensometer sites that measure inelastic land subsidence.*



Legend
2025 Groundwater Quality Monitoring Sites
Vina Subbasin
Butte Subbasin
Wyandotte Creek Subbasin
23N01W03H002M
23N01W28M002M
23N01W31M001M
21N01W13J001M
21N02E18C001M
21N01E13L002M
21N02E26E003M
20N01E18L002M
20N02E24C003M
19N04E06E002M
19N02E13Q003M
19N01W28A001M
19N01E35B002M
18N04E08M001M
18N04E19D001-3M
18N01E35L001M
17N01W10A001M
17N04E09N002M
17N01E24A003M
Magalia
Paradise
Concow
Chico
Lake Oroville State Recreation Area
Oroville
Biggs
Gridley
Live Oak
N
S
E
W
0 2.5 5 Miles
California State Parks, Esri, TomTom, Garmin, SafeGraph, FAO, METI/ NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

Figure 1. Groundwater Quality Trend Monitoring well locations in the Vina, Butte and Wyandotte Creek Subbasins in 2025

Table 2. 2022 GSP Measurable Objectives, Minimum Thresholds for Conductivity [microsiemens (µs) / centimeter (cm)] and definition of Undesirable Results in each Subbasin

Subbasin	Measurable Objective	Minimum Thresholds	Undesirable Result
Butte	700 µS/cm	The greater of 900 µS/cm or the measured historical high	25% of RMS wells exceed MTs for 24 consecutive months
Vina	900 µS/cm	1,600 µS/cm	2 RMS wells exceed their MT for two consecutive non-dry years
Wyandotte Creek	900 µS/cm	1,600 µS/cm	2 RMS wells exceed their MT for two consecutive non-dry years

Results

In 2025, the third non-dry water year type in a row, the majority of all wells monitored within each subbasin had groundwater quality conditions, measured as SC, that fell within the acceptable range of groundwater quality values set forth by the GSPs as summarized in Table 2. No major shifts occurred in the conductivity measurements in the sampled wells. Details of the monitoring results for each Subbasin are described below.

Butte Subbasin

In the Butte Subbasin the majority of RMS wells measured in 2025 had conductivity values that were lower than the MO of 700 µS/cm and therefore lower than each well's MT. The MTs vary per well since they are based on historic data, if available. **Figure 2.** displays the overall results for the 2025 water quality wells within the Butte Subbasin. Graphs of historic data for individual wells for previous years can be found in **Appendix A.** Results from one RMS well, 17N01W10A001M, a deep multi-completion well located in Colusa County, has had conductivity measurements slightly higher than the MT in 2023, 2024 and again in 2025. Historic (DWR, 2020, DWR 2023a) and recent data for this well are shown in **Figure 3.** This well is near the Sutter Buttes mountain range in an area known for high concentrations of conductivity (Davids, 2021). Future plans of the GSAs may include the formation of the Sutter Buttes Water Quality Interbasin Working Group as described in more detail in section 6.1.2.2 of the Butte Subbasin GSP (Davids, 2021) to focus on collaborative discussions, consensus building and planning to address groundwater quality matters associated with the unique geology of the Sutter Buttes area.

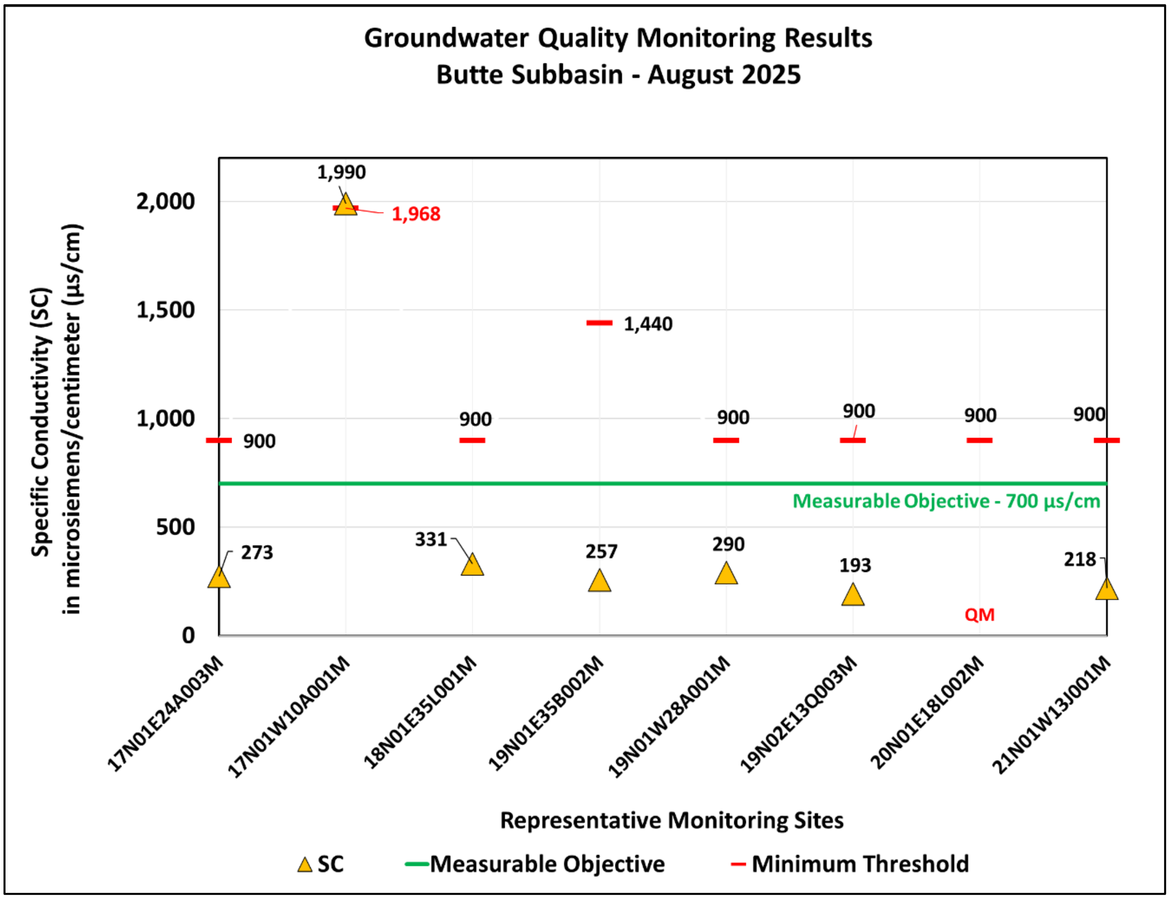


Figure 2. Groundwater quality monitoring results in the Butte Subbasin for the 2025 water year

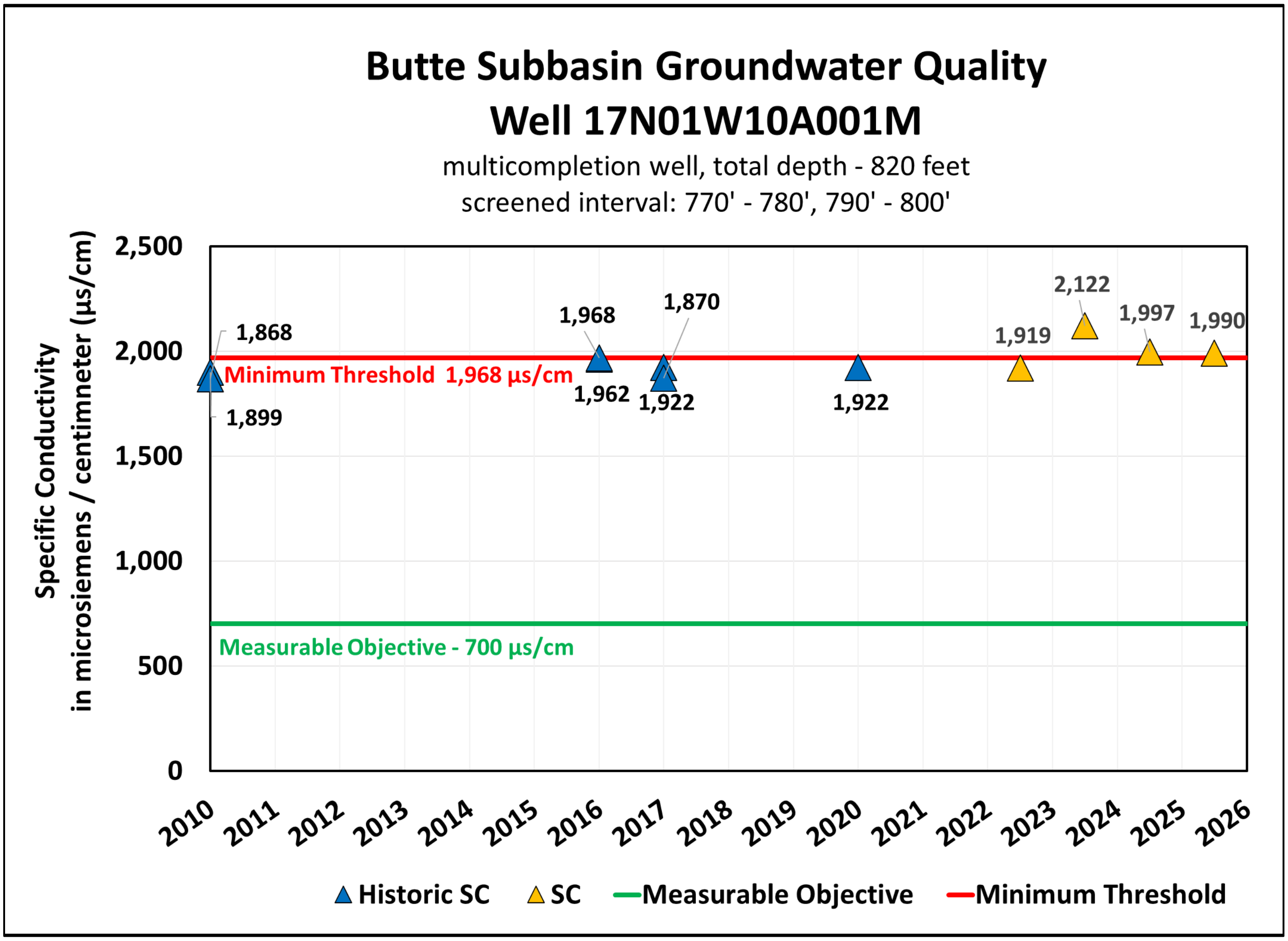


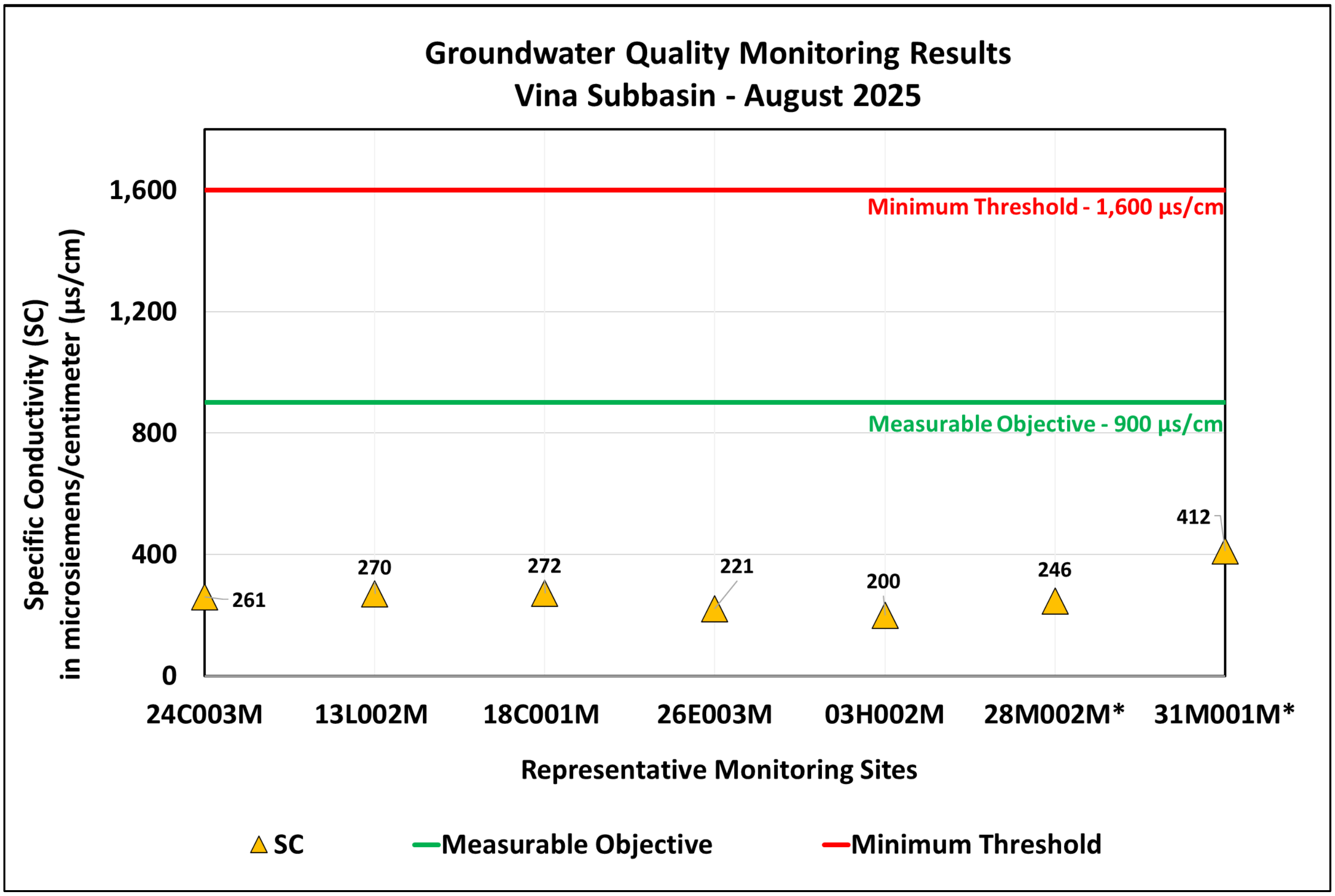
Figure 3. Current and historic groundwater quality data for well 17N01W10A001M in the Butte Subbasin.

Vina Subbasin

In the Vina Subbasin all RMS wells measured in 2025 had conductivity values that were lower than the MO of 900 µS/cm and therefore lower than the MT of 1,600 µS/cm as shown in **Figure 4.** Two wells, 28M002M, and 31M001M the length of the tape the SC probe is attached to was too short to reach the last screened intervals of the wells. The graphs reflect an average of the SC measurements recorded at the other screened intervals.

Wyandotte Creek Subbasin

In the Wyandotte Creek Subbasin the majority of RMS wells measured in 2025 had conductivity values that were lower than the MO of 900 µS/cm and therefore lower than the MT of 1,600 µS/cm as shown in **Figures 5. and 6.**



* *Indicates a measurement was not taken within a screened interval due to limits of the equipment. Data taken outside of the screened interval is not included in the average.*

Figure 4. Groundwater quality monitoring results in the Vina Subbasin for the 2025 water year

In the multi-completion well drilled in 2021 by DWR through the Technical Support Services program to measure three distinct zones of the aquifer in one location, there were two zones, intermediate (19D002M) and deep (19D001M), which exhibited high conductivity levels in 2025, exceeding the MT depicted in **Figure 6**. This multicompletion well was constructed after the GSA set the sustainable management criteria for water quality. Both zones of this well had high levels of conductivity, greater than the MT when initially developed, prior to the adoption of the GSP and again when the wells were re-tested months after their initial development. ss shown in **Figure 6**. as 'Other Data'. Anecdotally, this general area of the subbasin is known to have geologic formations bearing groundwater with high concentrations of salinity and natural gas. Better characterization of naturally occurring salinity is needed to help improve appropriate monitoring and management of groundwater with respect to water quality in this Subbasin. The Butte County Technical Advisory Committee may consider making recommendations to the GSA regarding changes to the monitoring network of wells and collection of additional long-term data in the future. DWR has recently collected groundwater quality measurements at 19D002M (intermediate zone of the multicompletion well in the Wyandotte Creek Subbasin) as depicted in **Figure 6.** DWR has also indicated that there are plans to deploy continuous data loggers to record hourly conductivity data in the wells in the future which will highlight any changes during the peak irrigation season as compared to baseline conditions throughout the water year.

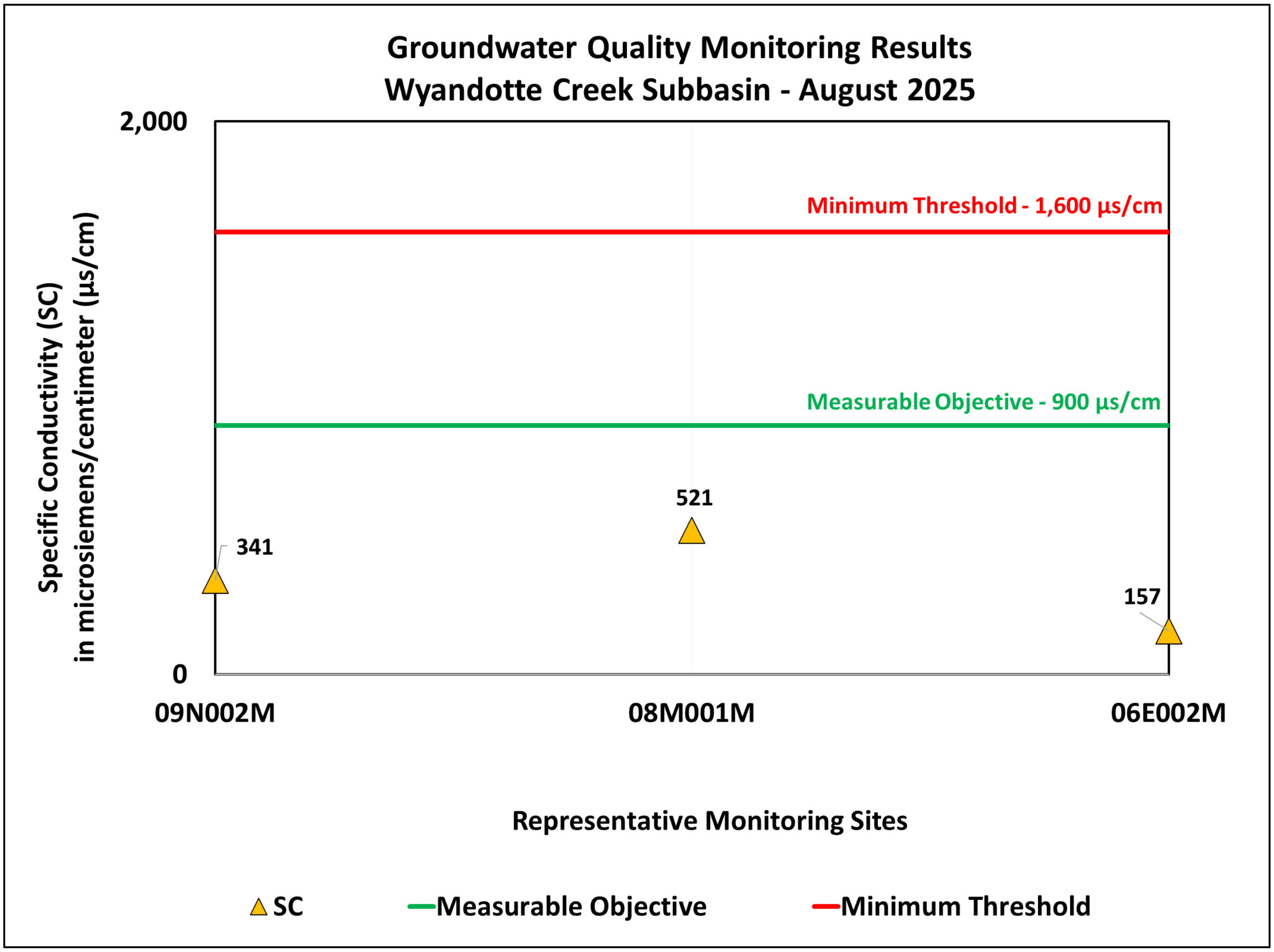


Figure 5. Groundwater quality monitoring results in the Wyandotte Creek Subbasin excluding 19D001-3M for the 2025 water year

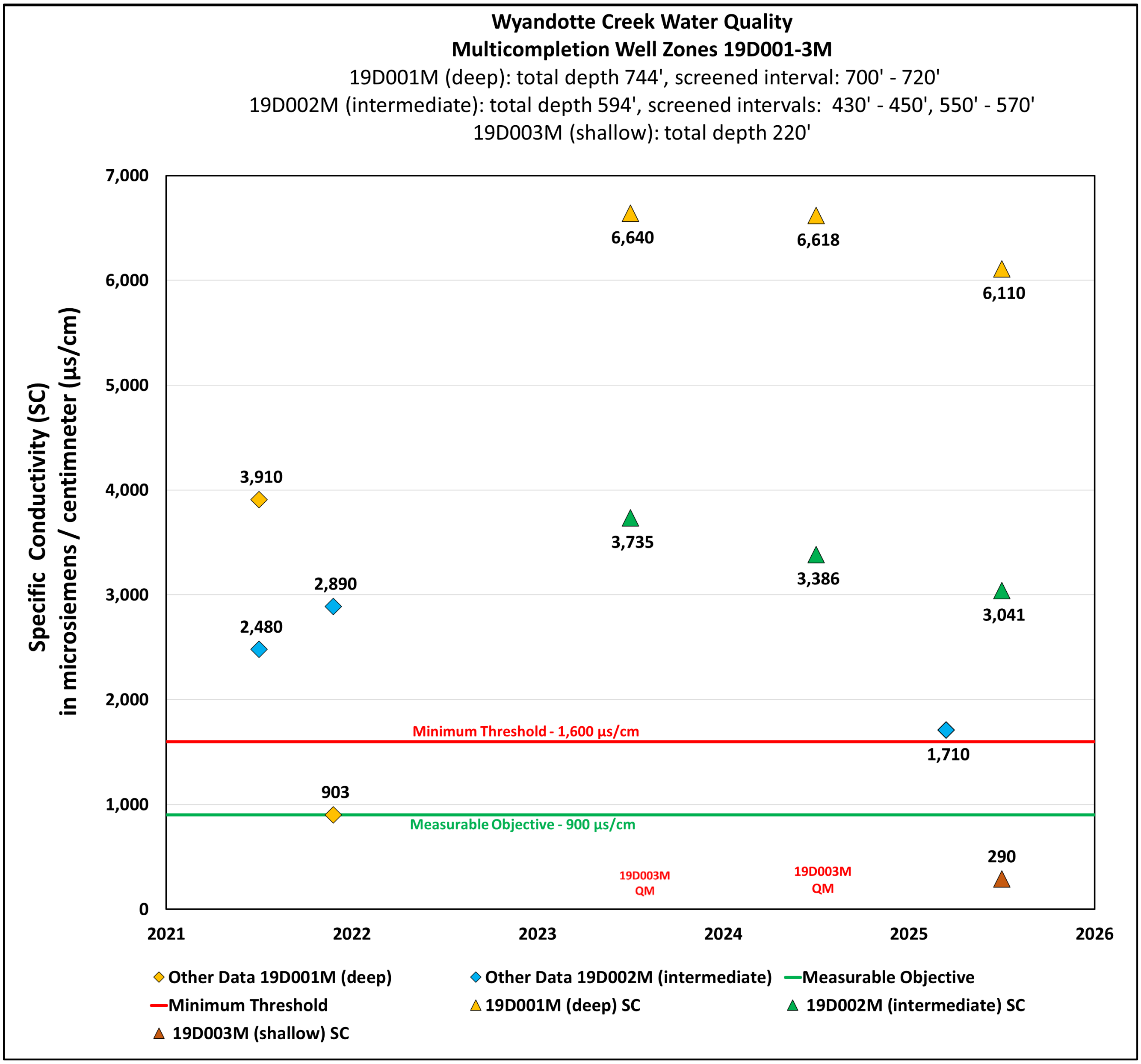


Figure 6. Current and historic groundwater quality data for zones in RMS well 19D001-3M in the Wyandotte Creek Subbasin.

Discussion

Groundwater quality monitoring serves to establish baseline levels for salinity (via conductivity) throughout the Subbasins so that any future changes may be identified and further investigation and or additional monitoring can subsequently be developed. **Table 3.** below summarizes the status of monitoring results in relation to exceedances of MTs and whether or not Undesirable Results occurred based on the SMC established for each subbasin. While there was one RMS well in exceedance of a MT for conductivity within the Butte Subbasin over the past 24 months, this does not indicate the presence of Undesirable Results in the Subbasin for degraded water quality, as only one well exceeded the MT over 24 months, not two, as described in the GSP. Importantly, the observed conductivity in the well is in the range of previously observed historical levels and does not indicate a changed condition or upward trend. The WRC may consider adding another

Table 3. Conductivity monitoring results and the presence of Undesirable Results since 2022 in relation to each well's Minimum Thresholds in the Butte, Vina and Wyandotte Creek Subbasins.

Subbasin	State Well Number	2022 Dry Year	2023 Non-Dry Year	2024 Non-Dry Year	2025 Non-Dry Year	Undesirable Result Identification	Indication of Undesirable Results?
		Was measurement above the Minimum Threshold?					
Butte	**17N01E24A003M**	No	No	No	No	When 25% of RMS wells (2 of 8) exceed their MT for 24 consecutive months	No
	17N01W10A001M	No	**Yes**	**Yes**	**Yes**		
	18N01E35L001M	No	No	QM	No		
	19N01E35B002M	No	No	No	No		
	19N01W28A001M	n/a	No	No	No		
	19N02E13Q003M	No	No	No	No		
	20N01E18L001M	Removed from the network in 2022					
	21N01W13J001M	n/a	No	No	No		
Vina	20N02E**24C003M**	No	No	QM	No	When 2 RMS wells exceed their MT for two consecutive non-dry years.	No
	21N01E**13L002M**	No	No	No	No		
	21N02E**18C001M**	No	No	No	No		
	21N02E**26E003M**	No	No	No	No		
	22N01E**28J005M**	Removed from the network in 2022					
	23N01W**03H002M**	No	No	No	No		
	23N01W**28M002M**	No	No	No	No		
	23N01W**31M001M**	No	No	No	No		
Wyandotte Creek	**CWS-02**	No	Removed from the network in 2022				
	17N03E**13B002M**	Removed from the network in 2022					
	18N04E**08M001M**	QM	QM	No	No	When 2 RMS wells exceed their MT for two consecutive non-dry years.	No
	18N04E**19D001-3M**	QM	QM	QM	**Yes**		
	18N04E**28L001M**	Removed from the network in 2022					
	19N03E**16Q001M**	No	Removed from the network in 2023				

Note: The portion of the State Well number in bold is the RMS well identification number. QM indicates a questionable measurement and n/a indicates the well was not measured. Multicompletion well 18N04E19D001-3M is reported as an average of all three zones

well to the monitoring network given the obstructions observed in 20N01E18L001-2M over the past few years.

DWR has indicated there are plans to install continuous data loggers in all four multicompletion wells at the 17N01W10A001-4M well and to conduct monthly water quality monitoring at the shallow-intermediate zoned portion of multicompletion well 17N01E24A004M. WRC may include any data available from this effort in future reports.

There were no RMS wells in exceedance of any MTs in the Vina Subbasin in 2025 and therefore no indication of Undesirable Results as defined in the GSP. The WRC may consider adding another well to the monitoring network given the obstructions observed in 28J005M over the past few years. DWR has indicated there are plans to conduct monthly water quality monitoring at the shallow-intermediate zoned portion of multicompletion well 28M004M. WRC will include any data available from this effort in future reports.

There were two zones within the multicompletion well 18N04E19D001-3M in the Wyandotte Creek Subbasin in exceedance of the MTs in 2025; however, this does not indicate the presence of Undesirable Results in the subbasin for degraded water quality, as only one well exceeded the Minimum Threshold for one year, not two, as described in the SMC. These completions monitor the deep and intermediate zones in this multi-completion well drilled in 2021 by DWR through their Technical Support Services program. When the well was first developed, the baseline conductivity was 3,910 µs/cm and 2,480 µs/cm respectively, roughly 1.5 and 2.5 times higher than the MT for these wells as shown in **Figure 6**. Approximately four months after initial development, DWR conducted additional water quality sampling after the well had time to settle. Results indicated a drop in conductivity to 903 µs/cm for 19D001M (deep zone) but an increase in 19D002M (intermediate zone) to 2,890 µs/cm. Baseline conditions at these wells are not well understood, but clearly exhibit naturally occurring high levels of conductivity. Revisiting the sustainable management criteria of this well seems appropriate. Additional characterization through additional data collection of naturally occurring salinity is needed to help improve appropriate monitoring and management of groundwater with respect to groundwater quality in this Subbasin. The WRC may consider adding other wells to the monitoring network given the low number of wells currently in the monitoring network. DWR has indicated there are plans to install continuous data loggers in all three multicompletion wells at the 19D001-3M well. WRC may include any data available from this effort in future reports.

Additional monitoring will continue to be conducted by DWR and other agencies to track constituents not managed under the current GSPs, or WRC's Groundwater Quality Trend Monitoring Program, including a variety of minerals, metals, pesticides and herbicides. Data from ongoing monitoring by various state and federal agencies will be available to the GSAs to augment local datasets and their understanding of groundwater quality and can be found on the State Board's Groundwater Ambient Monitoring and Assessment (GAMA) program at https://www.waterboards.ca.gov/gama.

The County will continue to work with the GSAs within the Butte, Vina and Wyandotte Creek Subbasins as available, to recommend modifications to the monitoring networks, to conduct monitoring to support data collection that compliments the GSAs SGMA requirements, and to ensure that conductivity data is shared with the GSAs.

References

California Department of Water Resources (DWR), Northern Regional Office. 2020. Northern Sacramento Valley Dedicated Monitoring Well Groundwater Quality Assessment Technical Information Record (TIR) NRO-2019-01. Red Bluff, CA

California Department of Water Resources (DWR). 2025. Available at: https://wdl.water.ca.gov/waterdatalibrary/Map.aspx

Davids Engineering (Davids). 2021. Butte Subbasin Groundwater Sustainability Plan. Available at: https://sgma.water.ca.gov/portal/gsp/preview/98

Geosyntec Consultants, Inc. 2021a. Vina Groundwater Sustainability Plan. Available at: https://sgma.water.ca.gov/portal/gsp/preview/86.

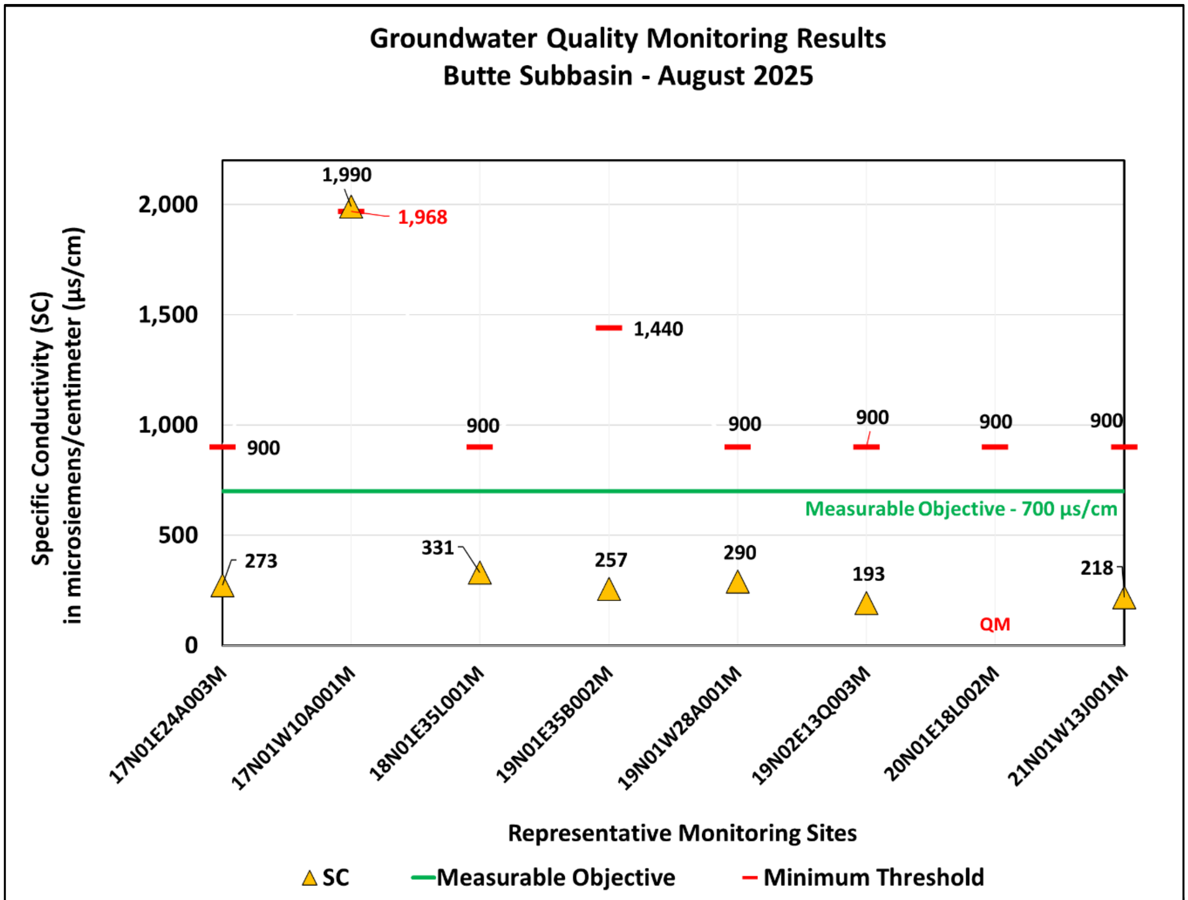
Geosyntec Consultants, Inc. 2021b. Wyandotte Creek Groundwater Sustainability Plan. Available at: https://sgma.water.ca.gov/portal/gsp/preview/99.

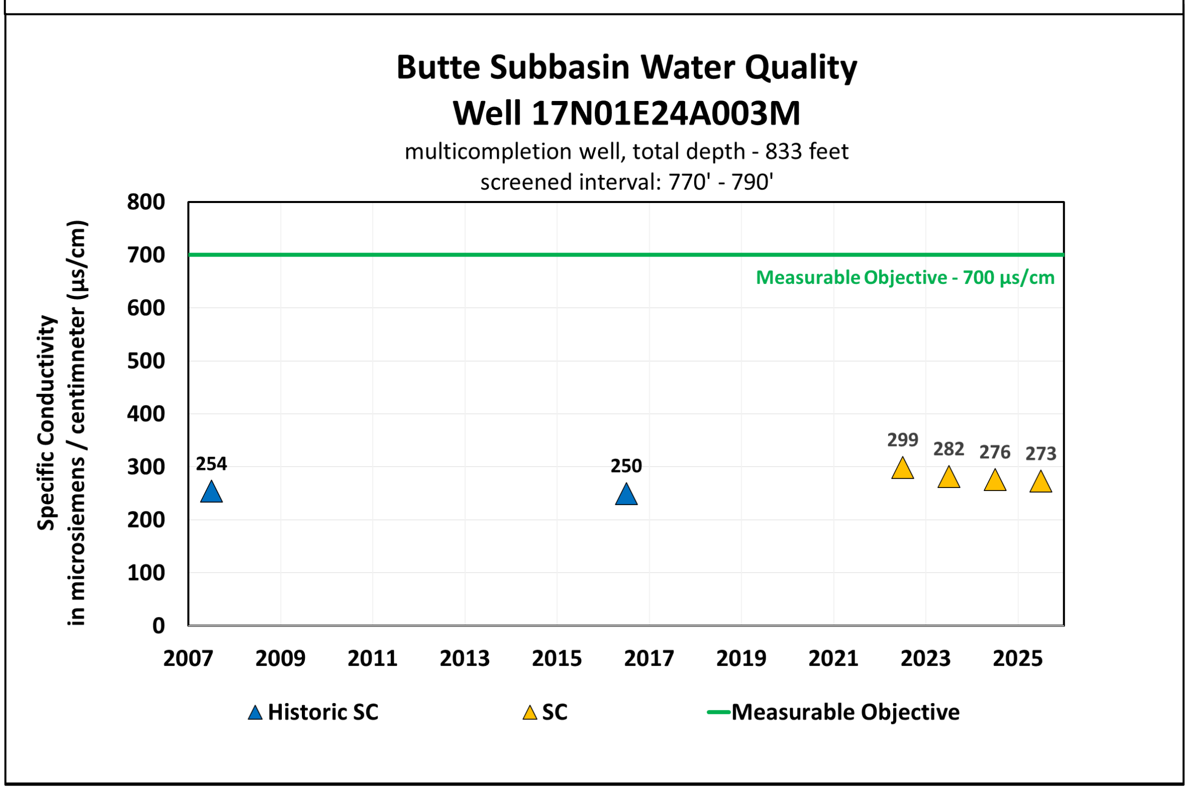
Appendix A

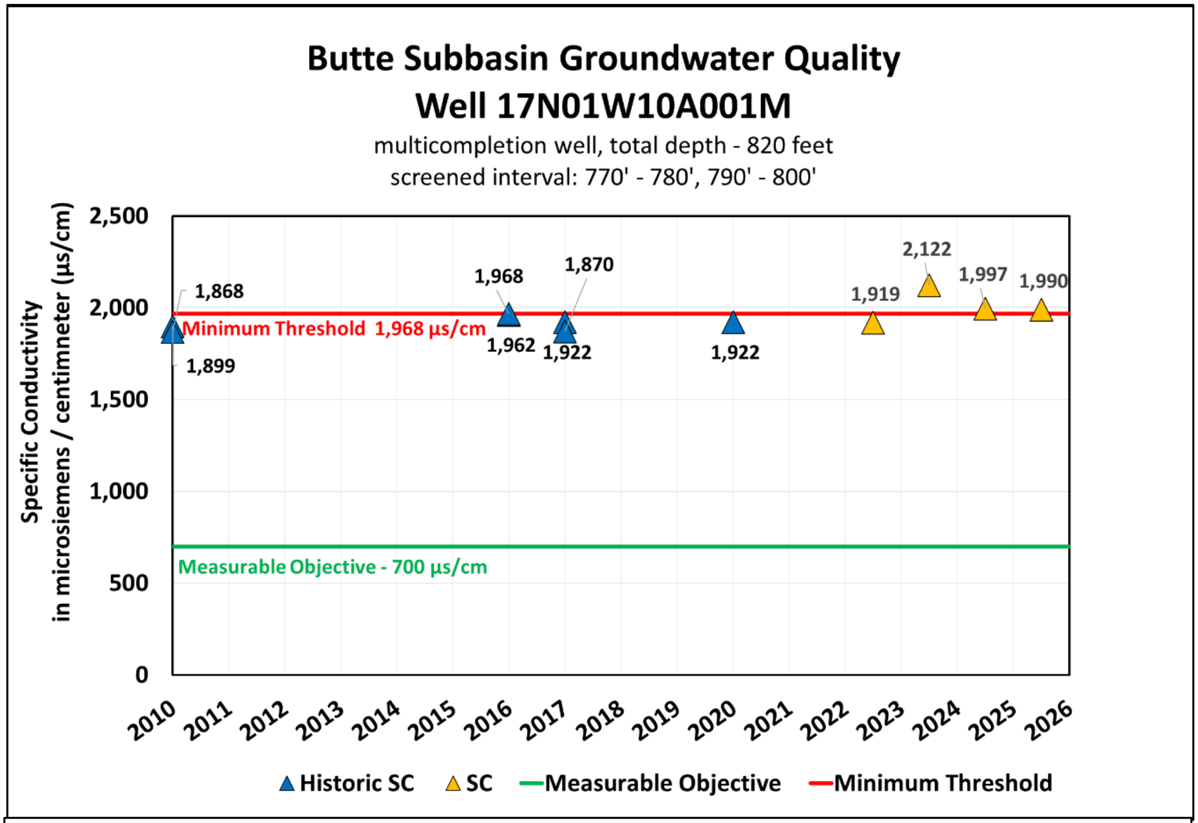
2025 Butte, Vina and Wyandotte Creek Subbasin Groundwater Quality Monitoring Results

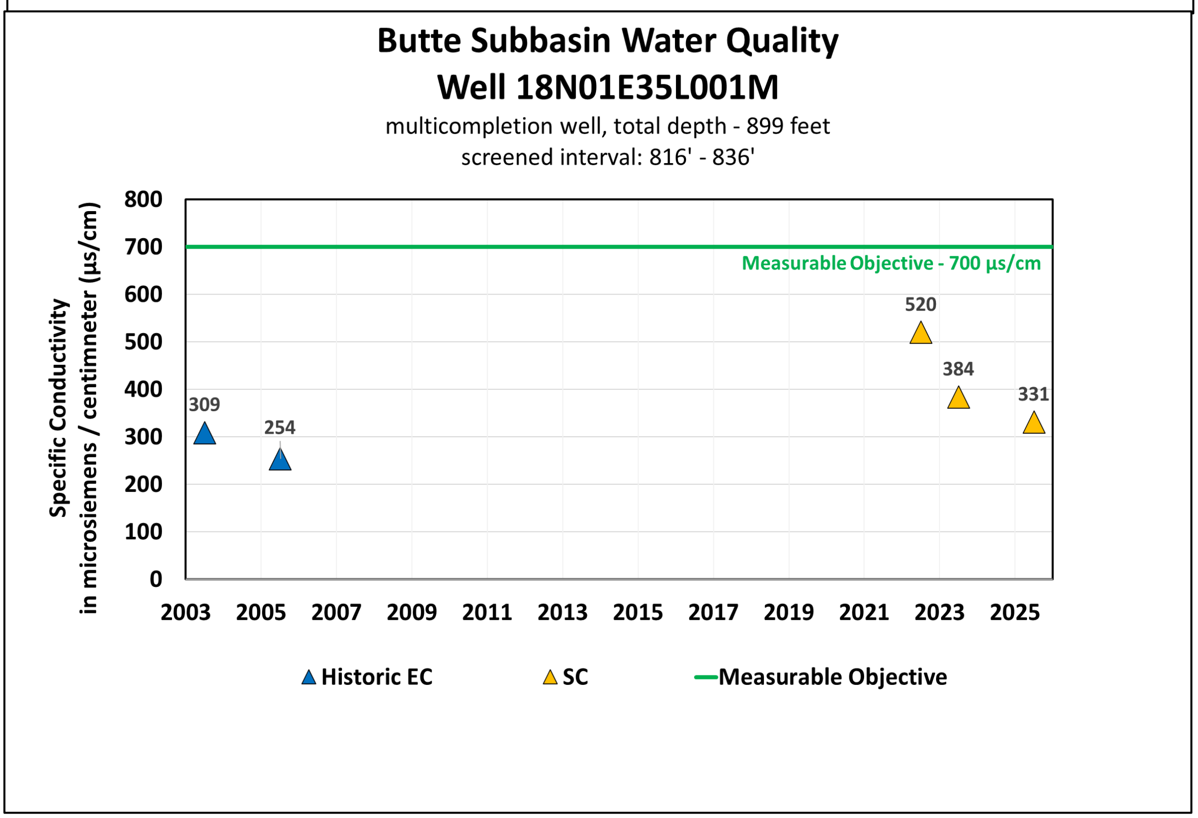
Appendix A. Historical and current conductivity data for individual wells in the Butte, Vina and Wyandotte Creek Subbasin's 2025 water quality monitoring network.

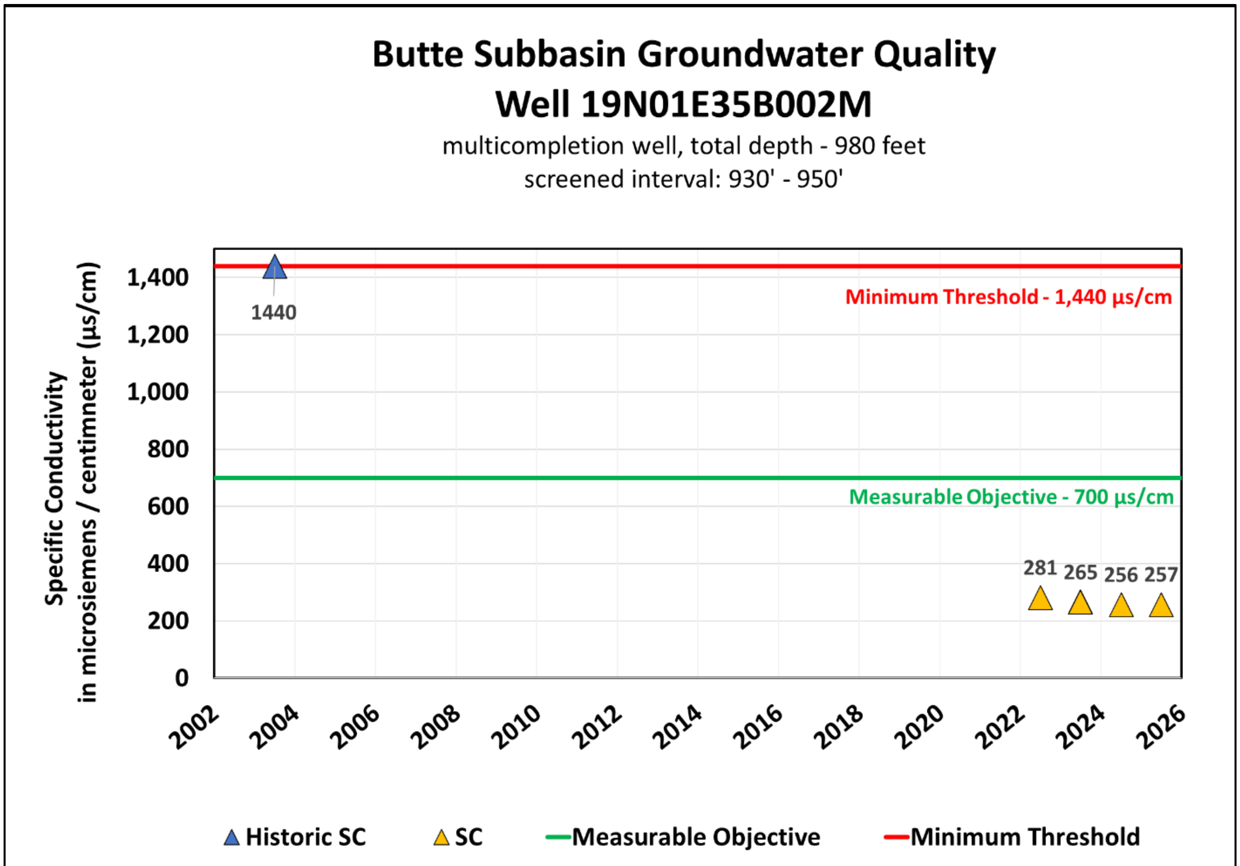
Butte Subbasin

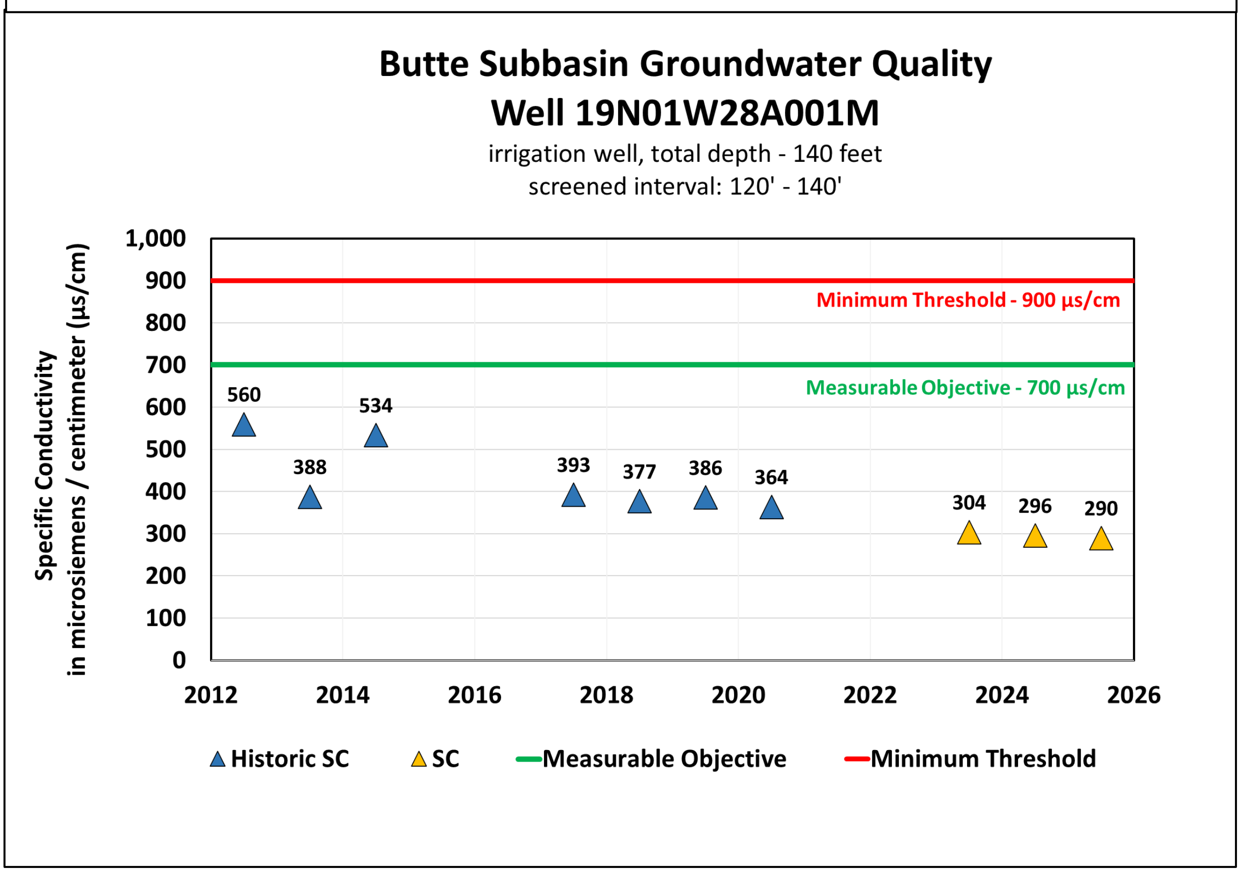


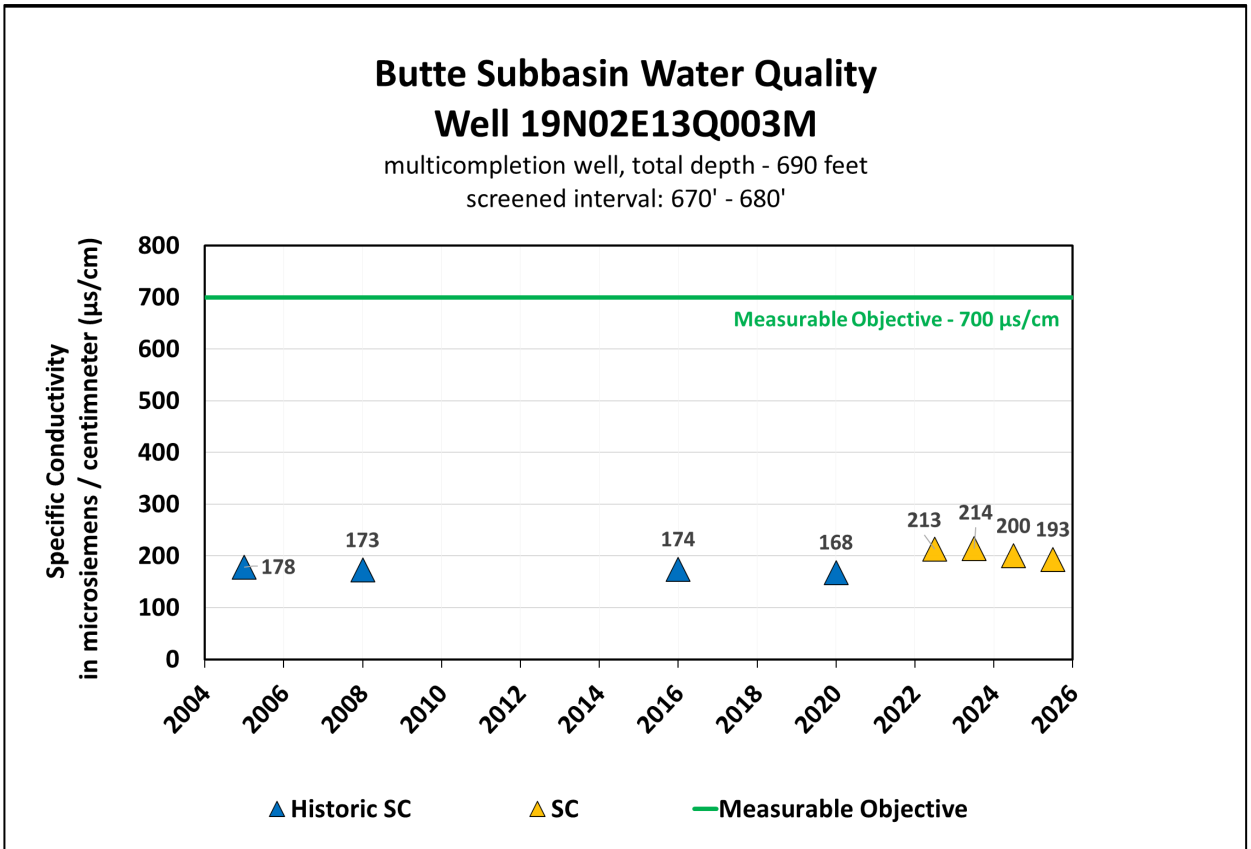


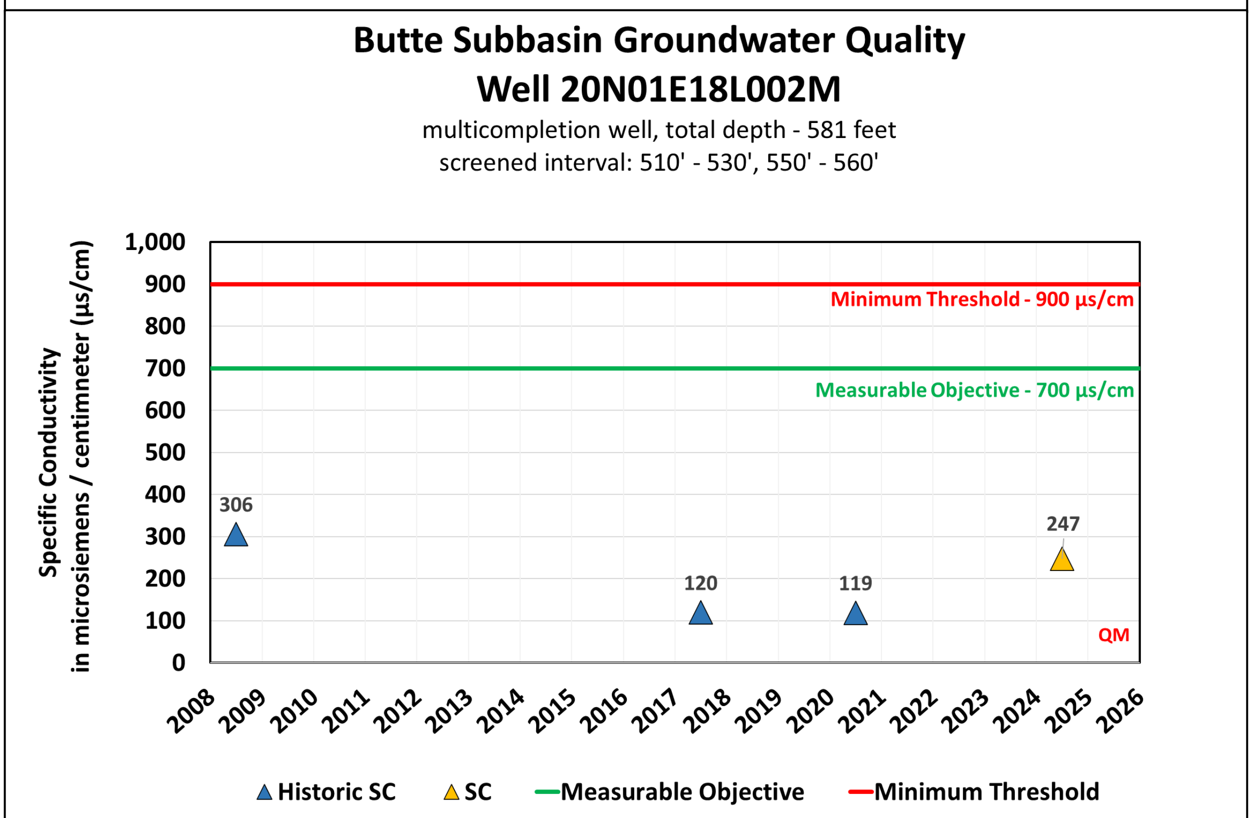

Butte Subbasin Groundwater Quality
Well 17N01W10A001M
multicompletion well, total depth - 820 feet
screened interval: 770' - 780', 790' - 800'
Specific Conductivity in microsiemens / centimeter (µs/cm)
2,500
2,000
1,500
1,000
500
0
1,868
1,899
Minimum Threshold 1,968 µs/cm
1,968
1,962
1,870
1,922
1,922
1,919
2,122
1,997
1,990
Measurable Objective - 700 µs/cm
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026
Historic SC
SC
Measurable Objective
Minimum Threshold

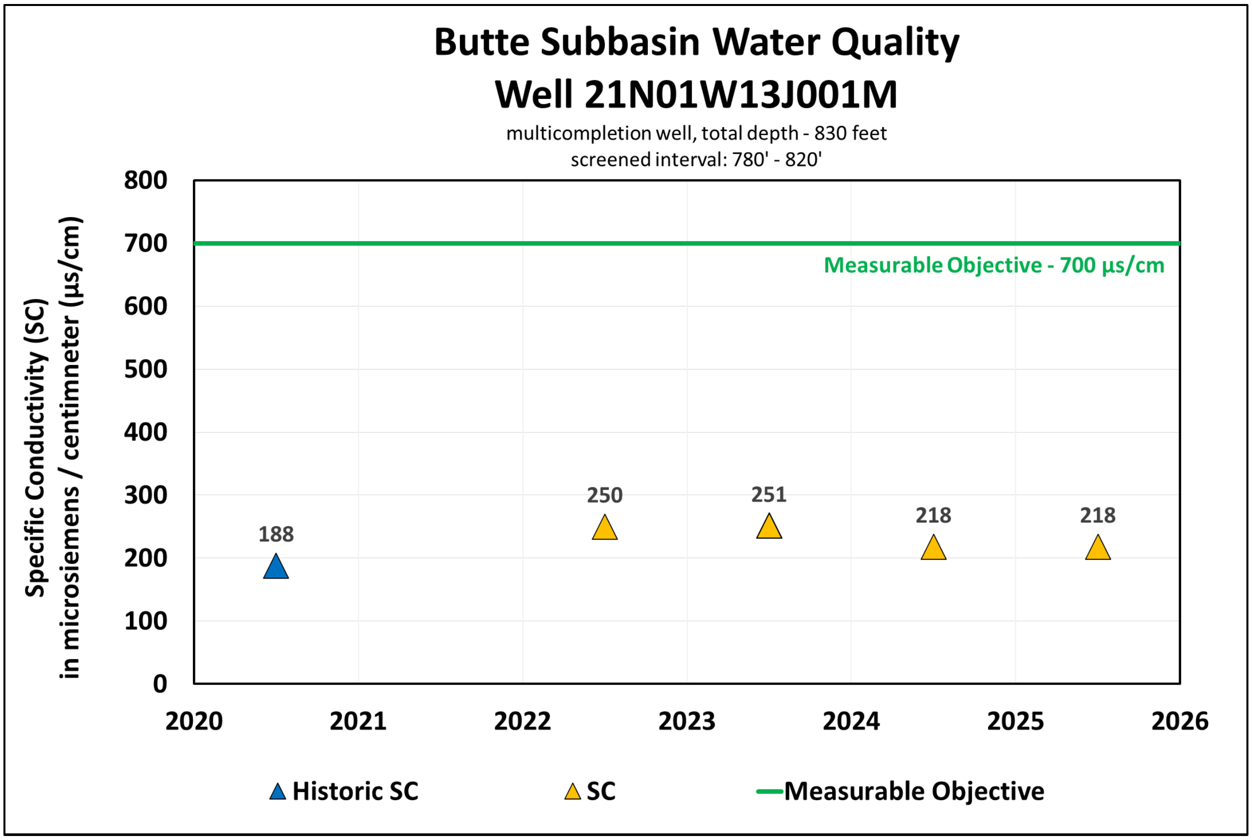

Butte Subbasin Water Quality
Well 18N01E35L001M
multicompletion well, total depth - 899 feet
screened interval: 816' - 836'
Specific Conductivity in microsiemens / centimeter (µs/cm)
800
700
600
500
400
300
200
100
0
Measurable Objective - 700 µs/cm
309
254
520
384
331
2003 2005 2007 2009 2011 2013 2015 2017 2019 2021 2023 2025
Historic EC
SC
Measurable Objective


Butte Subbasin Groundwater Quality
Well 19N01E35B002M
multicompletion well, total depth - 980 feet
screened interval: 930' - 950'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1440
Minimum Threshold - 1,440 µs/cm
Measurable Objective - 700 µs/cm
281
265
256
257
Historic SC
SC
Measurable Objective
Minimum Threshold


Butte Subbasin Groundwater Quality
Well 19N01W28A001M
irrigation well, total depth - 140 feet
screened interval: 120' - 140'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
Minimum Threshold - 900 µs/cm
Measurable Objective - 700 µs/cm
560
388
534
393
377
386
364
304
296
290
Historic SC
SC
Measurable Objective
Minimum Threshold

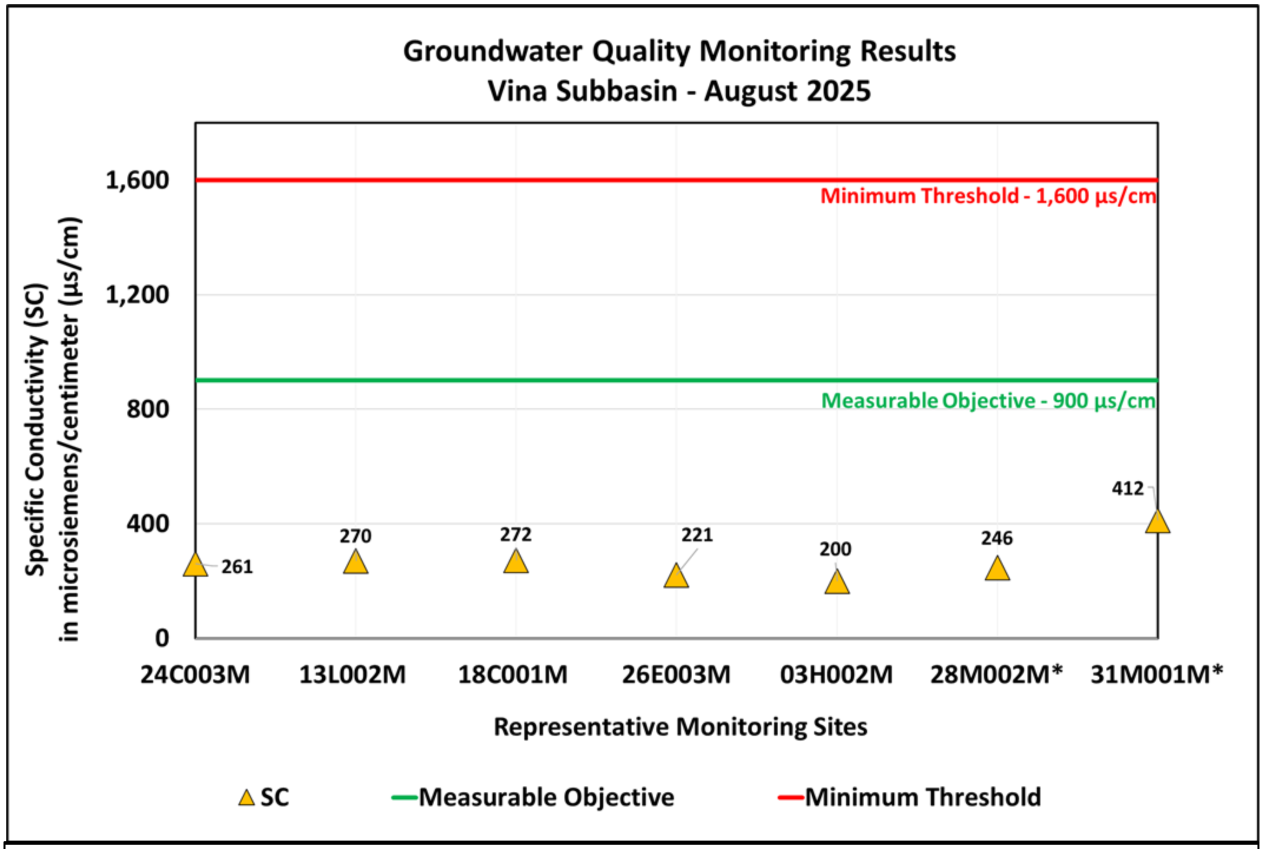

Butte Subbasin Water Quality
Well 19N02E13Q003M
multicompletion well, total depth - 690 feet
screened interval: 670' - 680'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
800
700
600
500
400
300
200
100
0
Measurable Objective - 700 µs/cm
178
173
174
168
213
214
200
193
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historic SC
SC
Measurable Objective

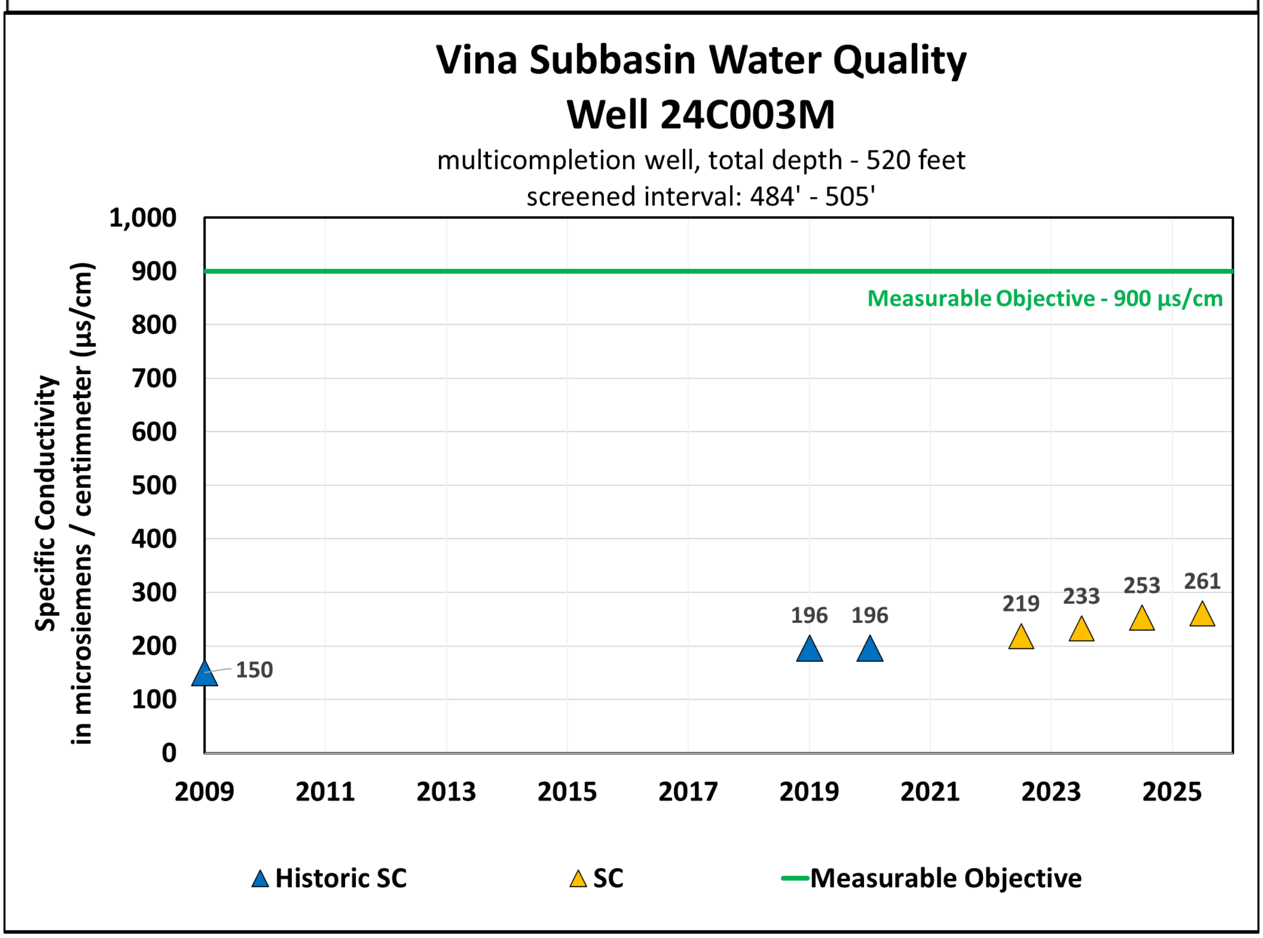

Butte Subbasin Groundwater Quality
Well 20N01E18L002M
multicompletion well, total depth - 581 feet
screened interval: 510' - 530', 550' - 560'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Minimum Threshold - 900 µs/cm
Measurable Objective - 700 µs/cm
306
120
119
247
QM
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Historic SC
SC
Measurable Objective
Minimum Threshold

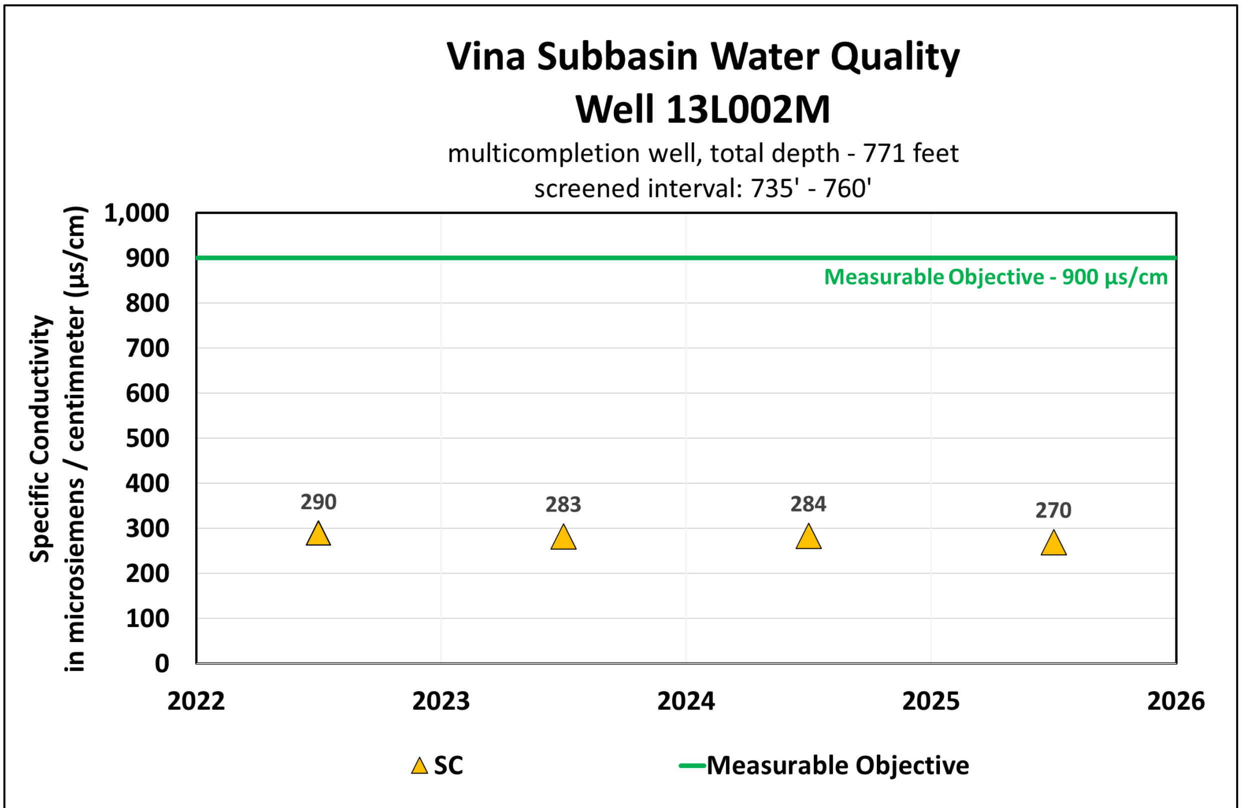


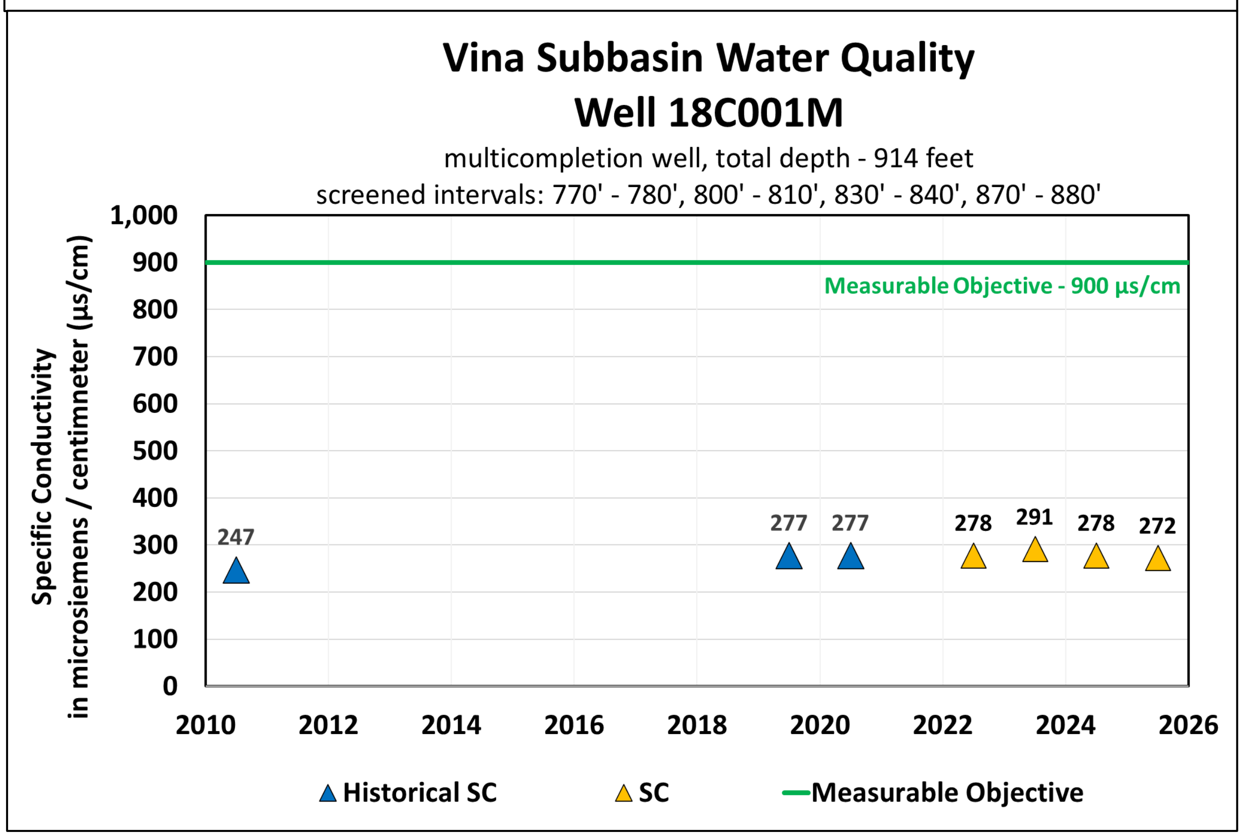
Butte Subbasin Water Quality
Well 21N01W13J001M
multicompletion well, total depth - 830 feet
screened interval: 780' - 820'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
800
700
600
500
400
300
200
100
0
2020
2021
2022
2023
2024
2025
2026
Measurable Objective - 700 µs/cm
188
250
251
218
218
Historic SC
SC
Measurable Objective

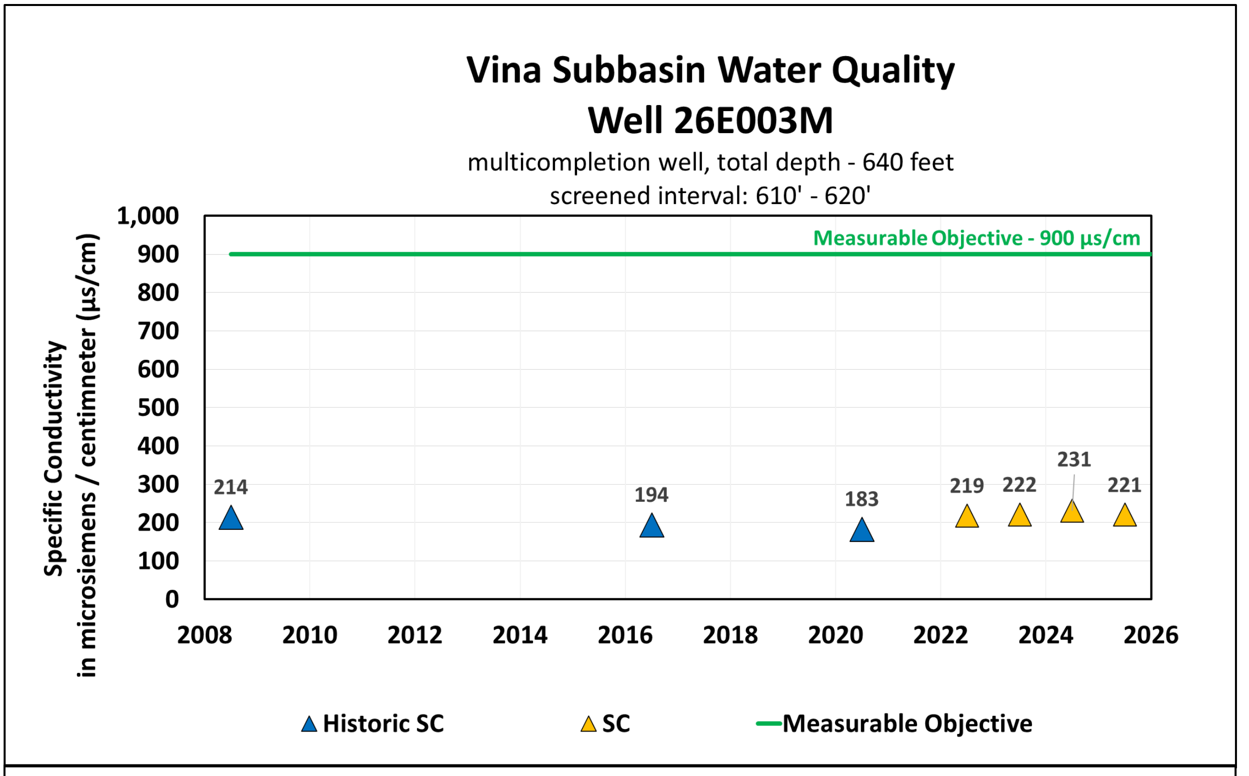
Vina Subbasin

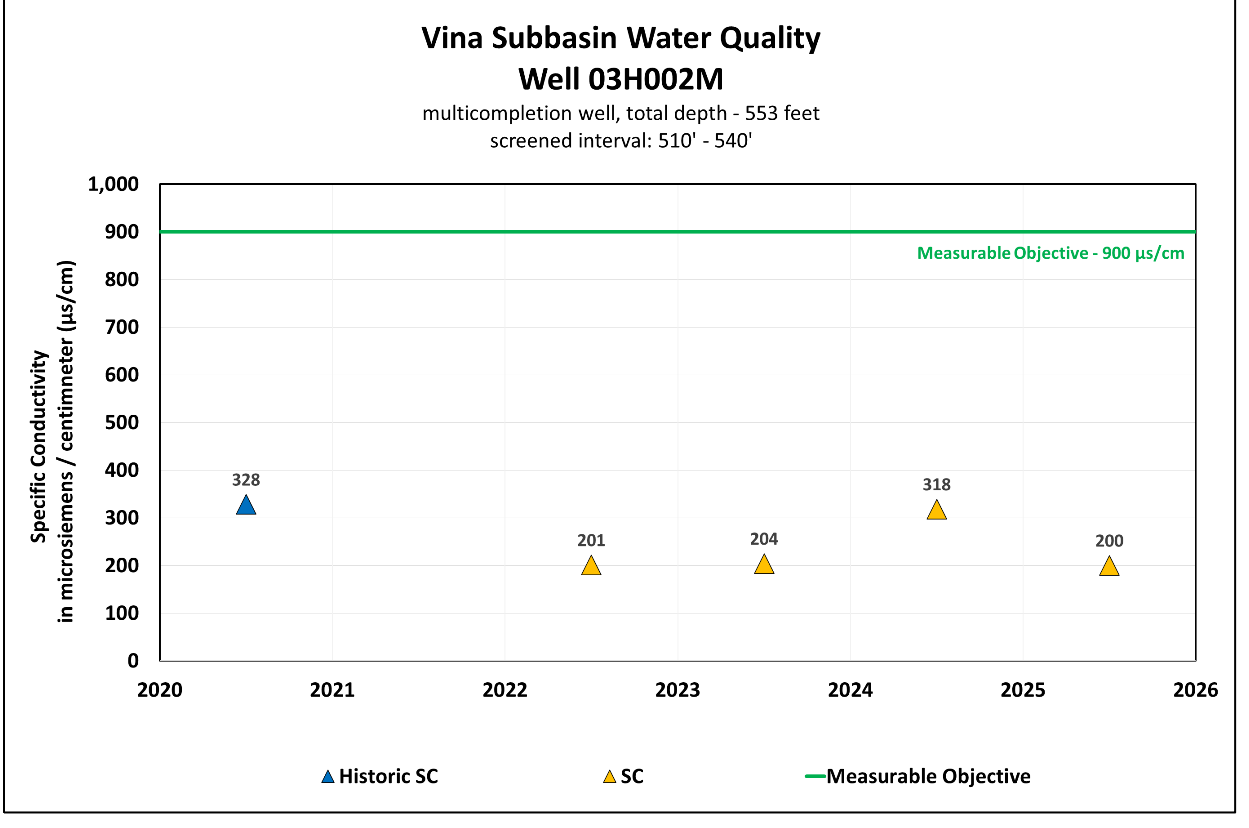


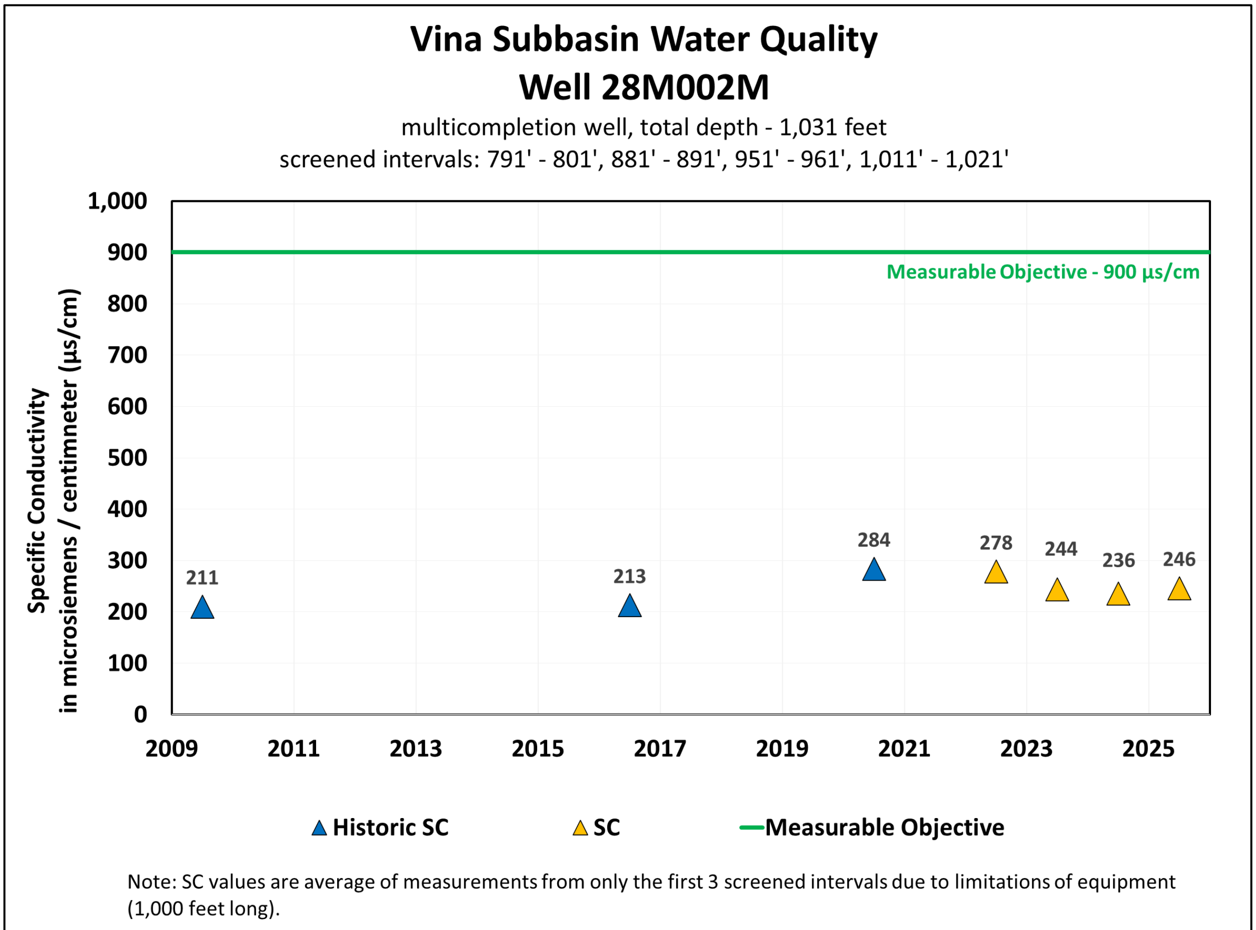


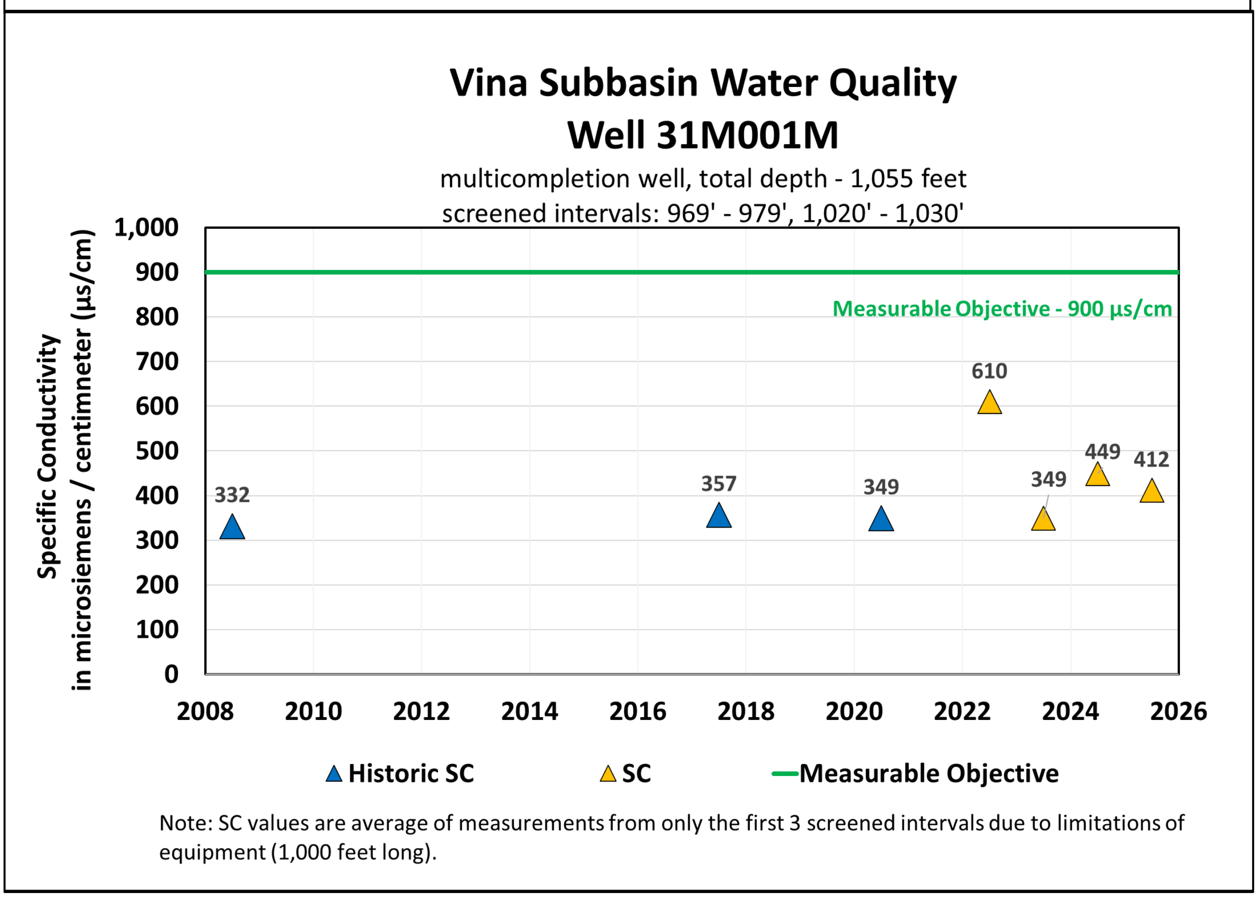

Vina Subbasin Water Quality
Well 13L002M
multicompletion well, total depth - 771 feet
screened interval: 735' - 760'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
290
283
284
270
2022
2023
2024
2025
2026
SC
Measurable Objective


Vina Subbasin Water Quality
Well 18C001M
multicompletion well, total depth - 914 feet
screened intervals: 770' - 780', 800' - 810', 830' - 840', 870' - 880'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
247
277
277
278
291
278
272
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historical SC
SC
Measurable Objective

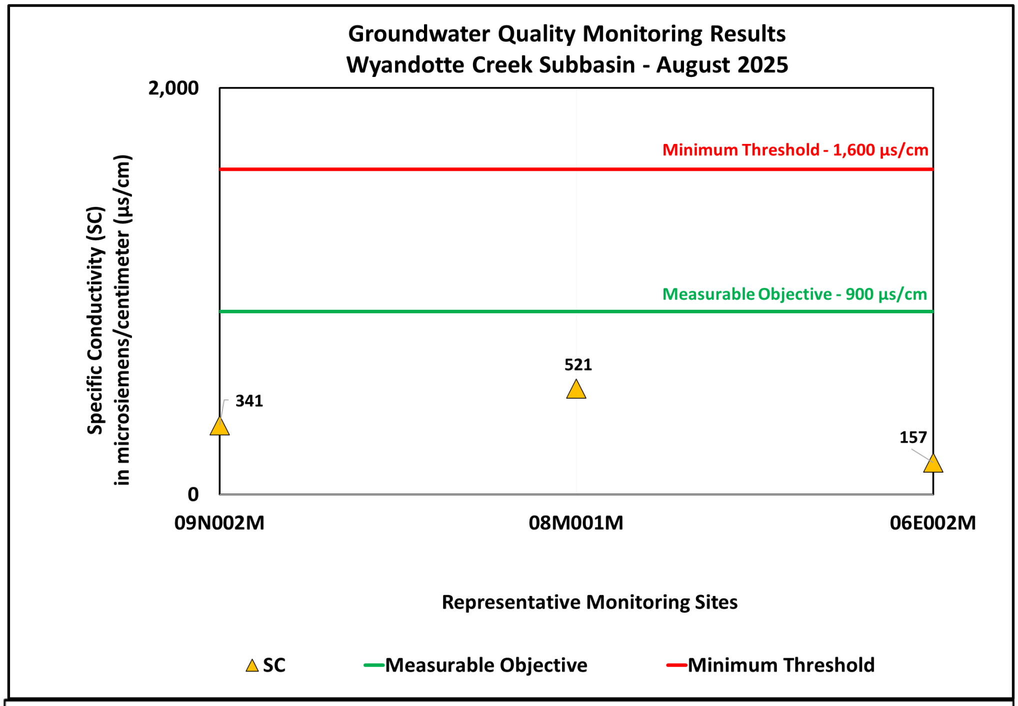

Vina Subbasin Water Quality
Well 26E003M
multicompletion well, total depth - 640 feet
screened interval: 610' - 620'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Measurable Objective - 900 µs/cm
214
194
183
219
222
231
221
Historic SC
SC
Measurable Objective

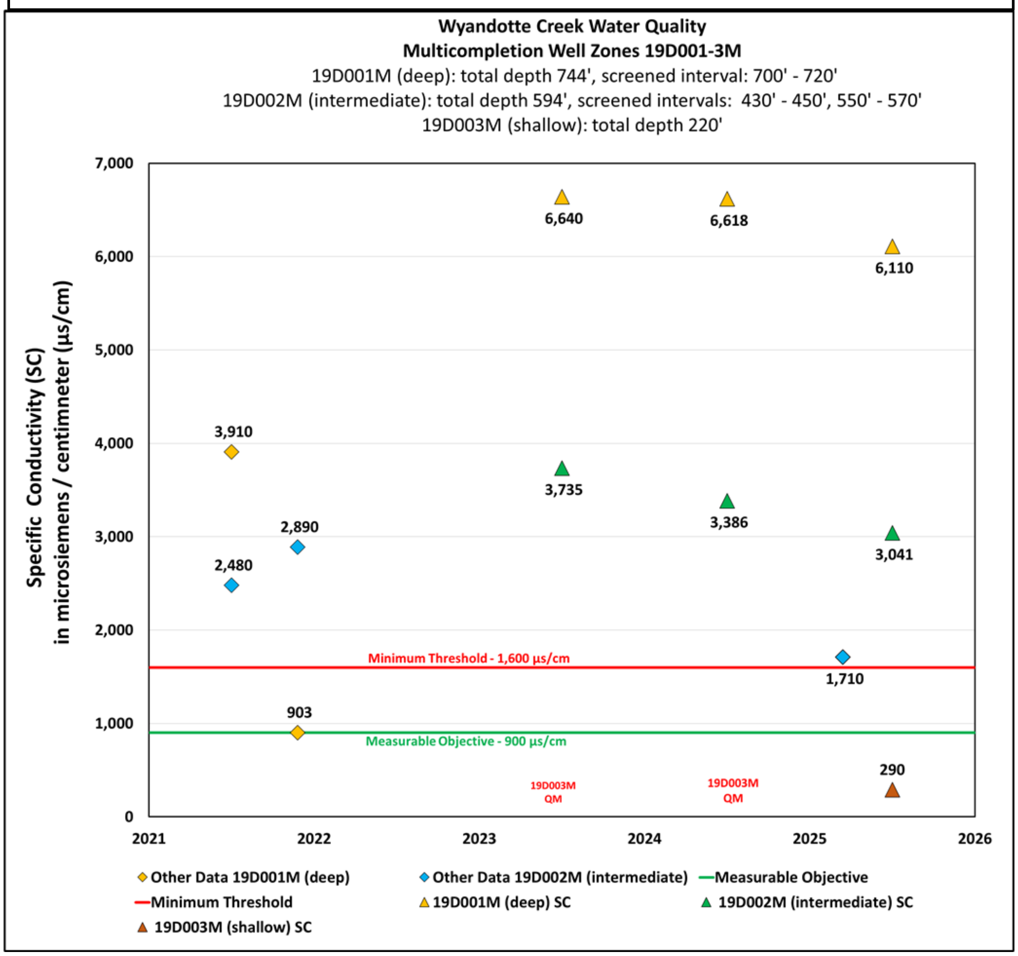

Vina Subbasin Water Quality
Well 03H002M
multicompletion well, total depth - 553 feet
screened interval: 510' - 540'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
2020
2021
2022
2023
2024
2025
2026
Measurable Objective - 900 µs/cm
328
201
204
318
200
Historic SC
SC
Measurable Objective

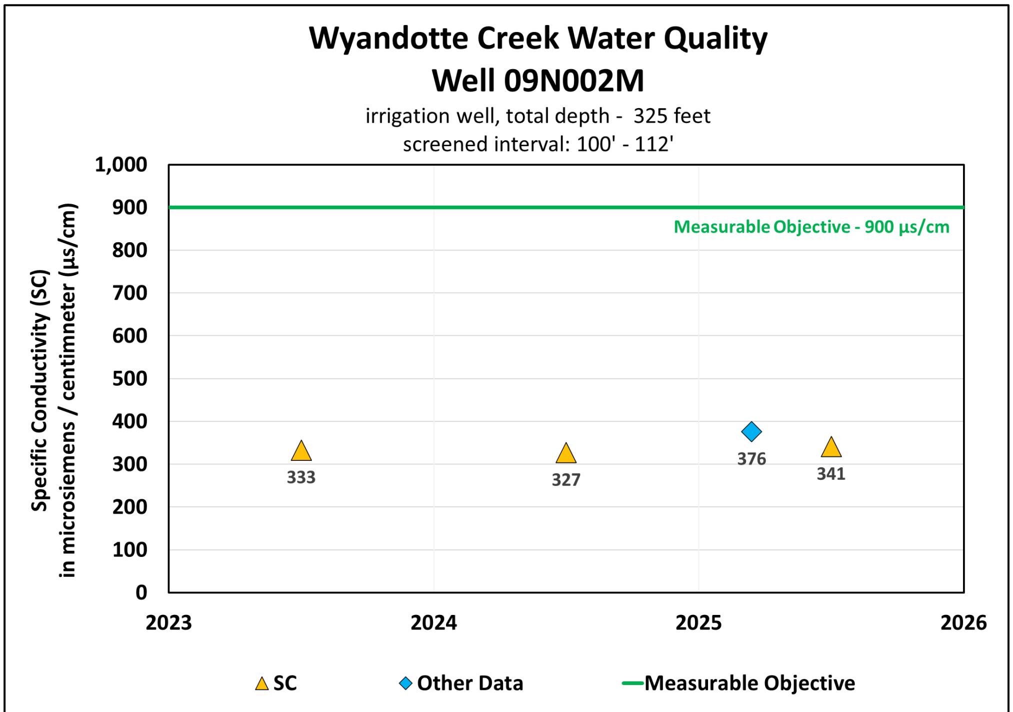

Vina Subbasin Water Quality
Well 28M002M
multicompletion well, total depth - 1,031 feet
screened intervals: 791' - 801', 881' - 891', 951' - 961', 1,011' - 1,021'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
Measurable Objective - 900 µs/cm
211
213
284
278
244
236
246
Historic SC
SC
Measurable Objective
Note: SC values are average of measurements from only the first 3 screened intervals due to limitations of equipment (1,000 feet long).

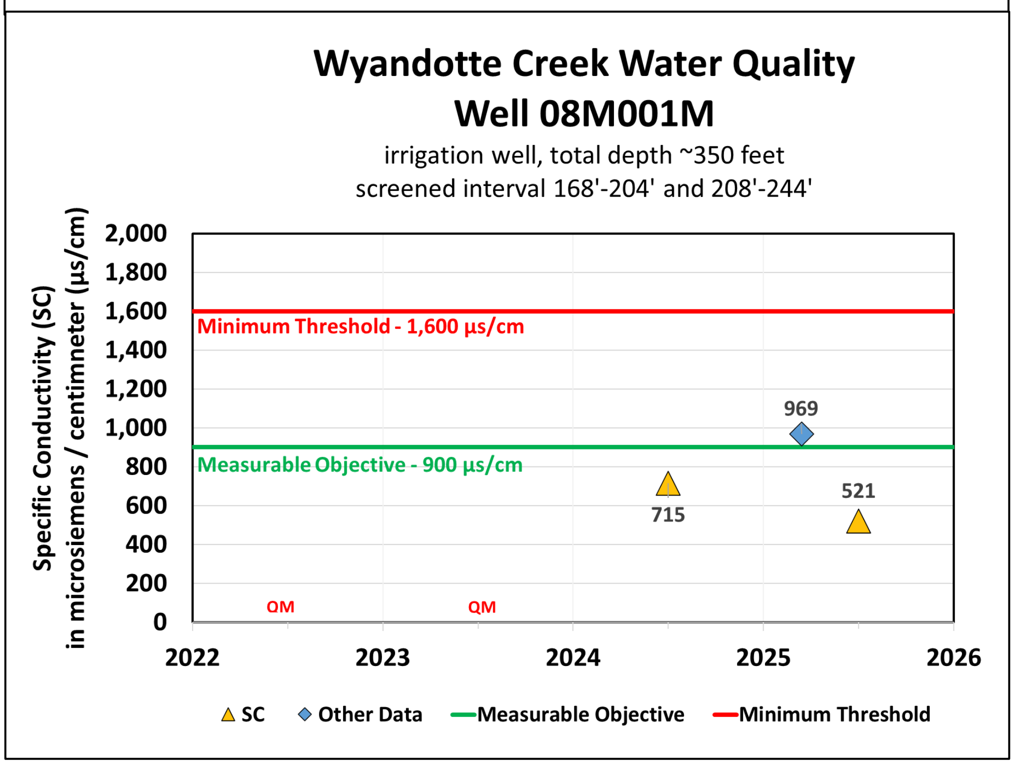

Vina Subbasin Water Quality
Well 31M001M
multicompletion well, total depth - 1,055 feet
screened intervals: 969' - 979', 1,020' - 1,030'
Specific Conductivity
in microsiemens / centimneter (µs/cm)
Measurable Objective - 900 µs/cm
332
357
349
610
349
449
412
Historic SC
SC
Measurable Objective
Note: SC values are average of measurements from only the first 3 screened intervals due to limitations of equipment (1,000 feet long).

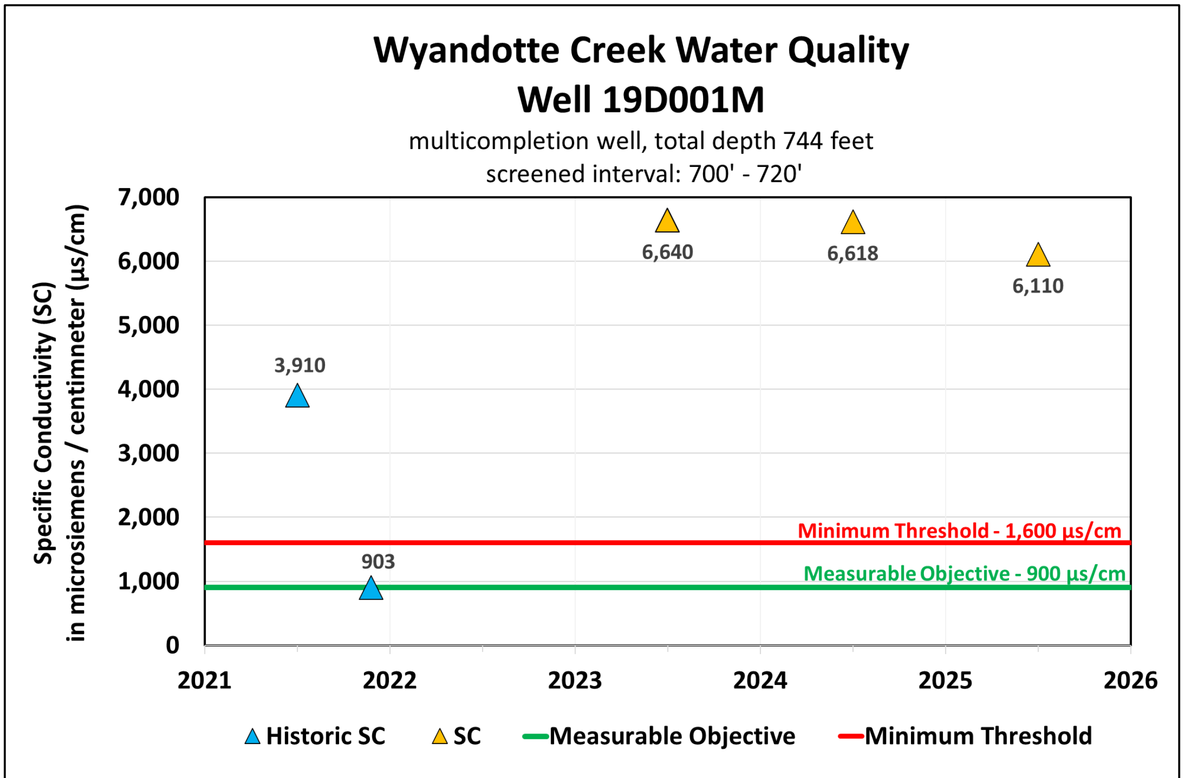
Wyandotte Creek Subbasin



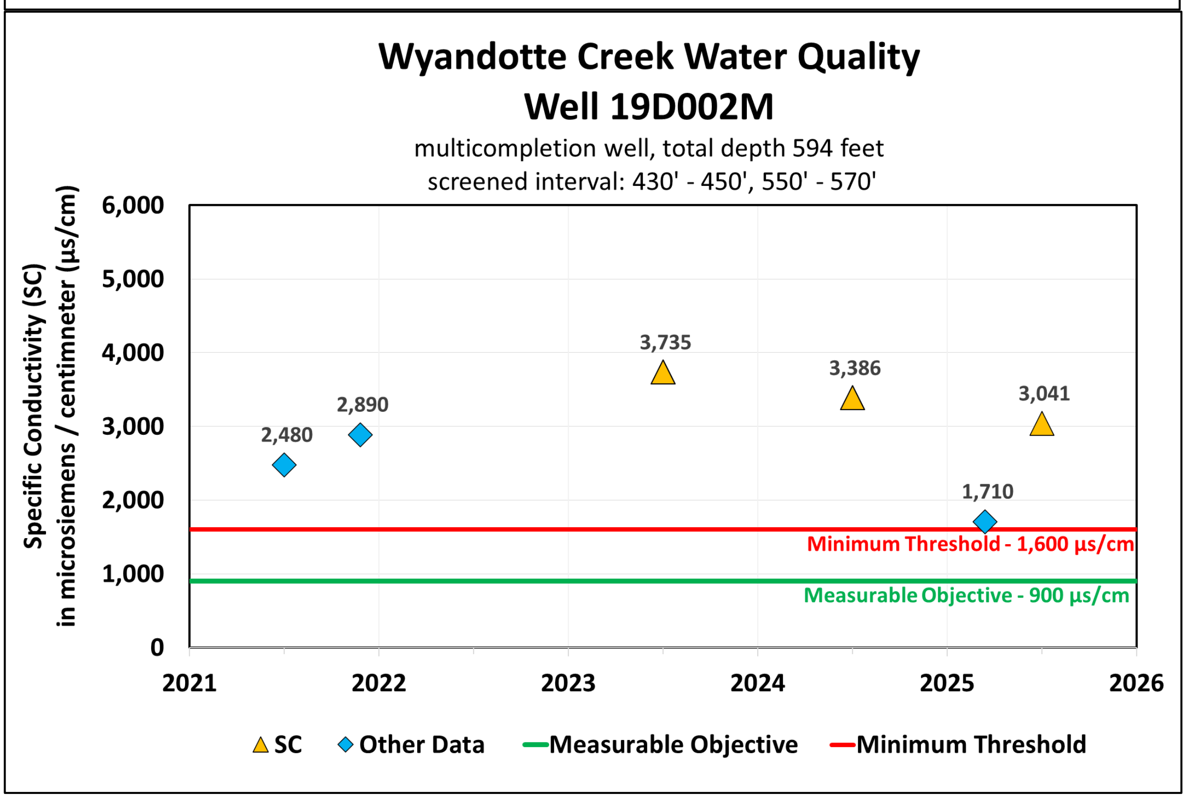



Wyandotte Creek Water Quality
Well 09N002M
irrigation well, total depth - 325 feet
screened interval: 100' - 112'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
333
327
376
341
2023
2024
2025
2026
SC
Other Data
Measurable Objective

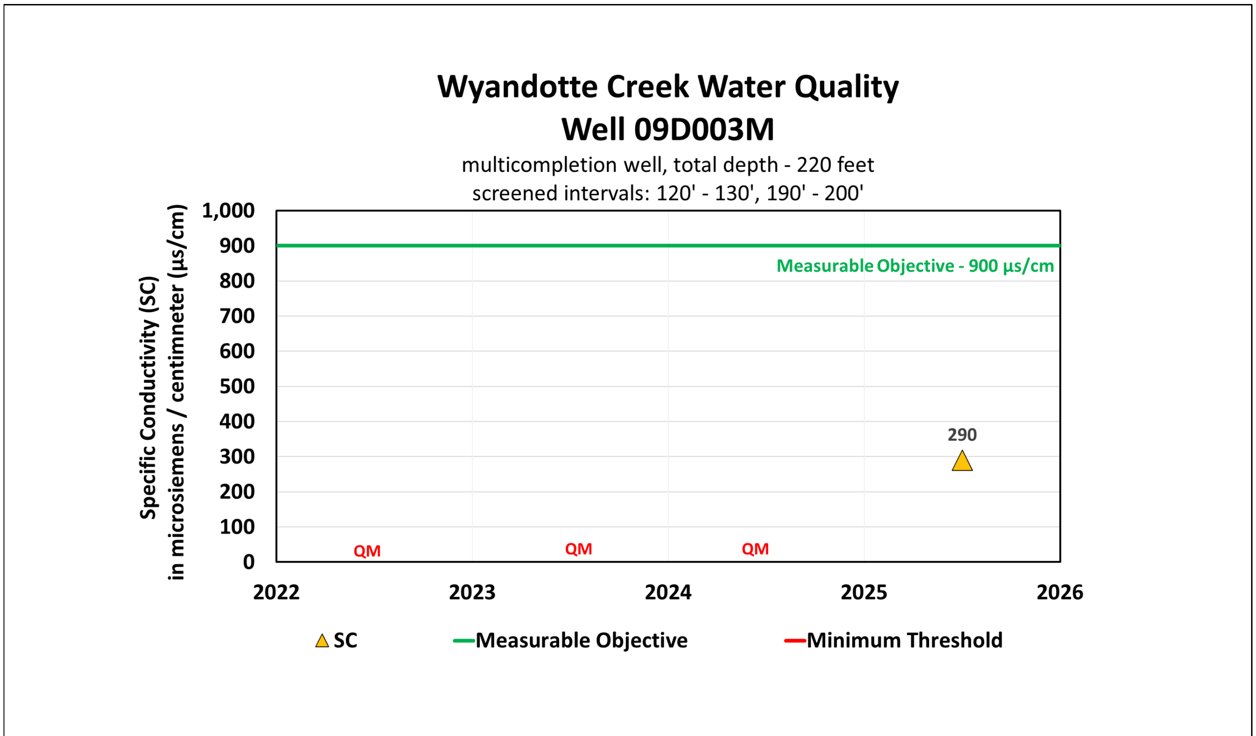

Wyandotte Creek Water Quality
Well 08M001M
irrigation well, total depth ~350 feet
screened interval 168'-204' and 208'-244'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Minimum Threshold - 1,600 µs/cm
969
Measurable Objective - 900 µs/cm
715
521
QM
QM
2022
2023
2024
2025
2026
SC
Other Data
Measurable Objective
Minimum Threshold

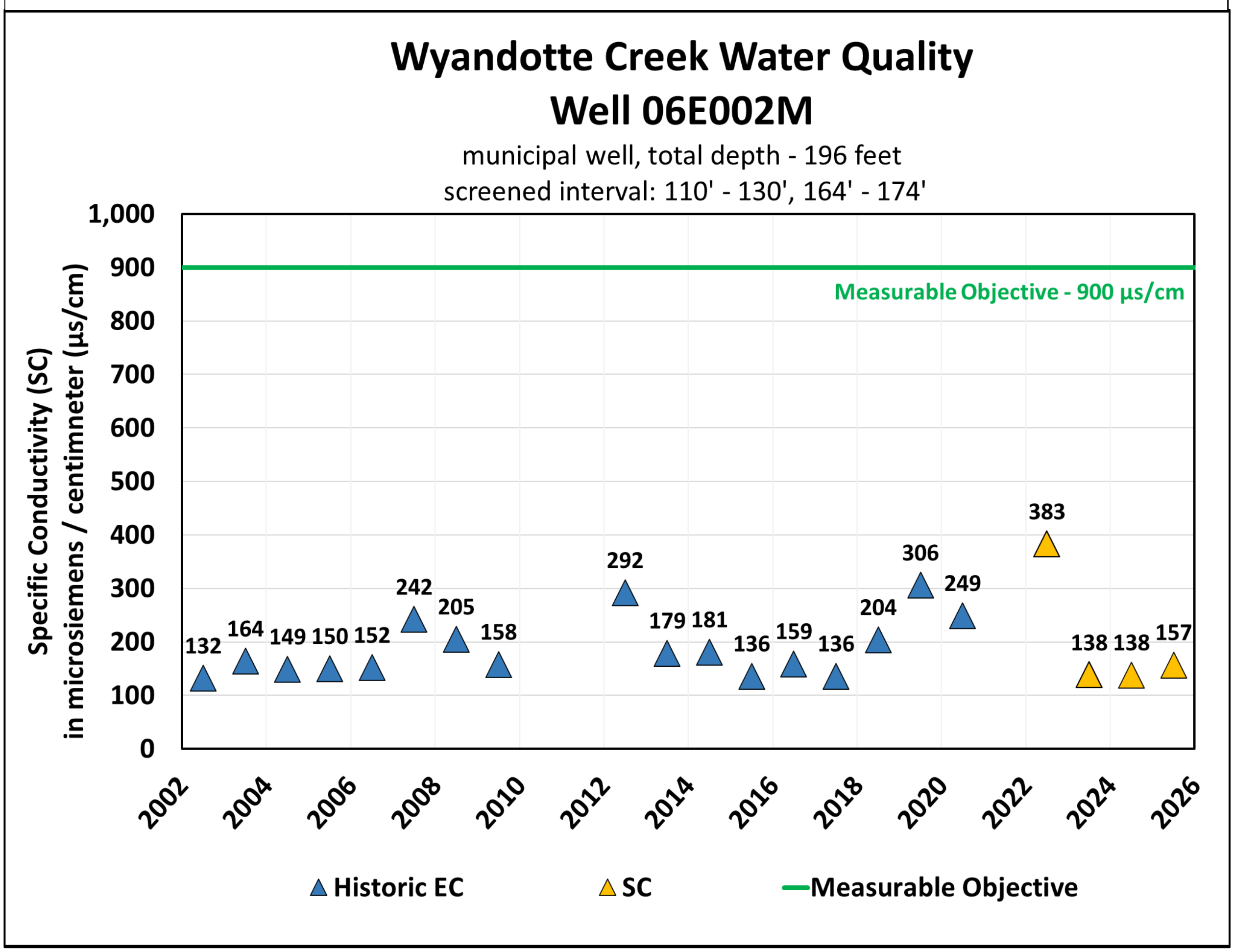


Wyandotte Creek Water Quality
Well 19D001M
multicompletion well, total depth 744 feet
screened interval: 700' - 720'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2021
2022
2023
2024
2025
2026
3,910
903
6,640
6,618
6,110
Minimum Threshold - 1,600 µs/cm
Measurable Objective - 900 µs/cm
Historic SC
SC
Measurable Objective
Minimum Threshold



Wyandotte Creek Water Quality
Well 19D002M
multicompletion well, total depth 594 feet
screened interval: 430' - 450', 550' - 570'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
6,000
5,000
4,000
3,000
2,000
1,000
0
2021
2022
2023
2024
2025
2026
2,480
2,890
3,735
3,386
3,041
1,710
Minimum Threshold - 1,600 µs/cm
Measurable Objective - 900 µs/cm
SC
Other Data
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 09D003M
multicompletion well, total depth - 220 feet
screened intervals: 120' - 130', 190' - 200'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
290
QM
QM
QM
2022
2023
2024
2025
2026
SC
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 06E002M
municipal well, total depth - 196 feet
screened interval: 110' - 130', 164' - 174'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
132
164
149
150
152
242
205
158
292
179
181
136
159
136
204
306
249
383
138
138
157
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historic EC
SC
Measurable Objective

Water Year 2025 Annual Report

Appendix G

PMA Progress

PMA DB ID	PMA ID	PMA Name	Lead GSA(s)	Basin	GSP	Implementation Date	Water Year *	Status *	Describe the project or management action's progress towards implementing the plan since the previous annual report. **	No Update - Provide an explanation.	Provide an explanation for withdrawing the PMA. **	Were new sources of funding acquired? **	Select Funding Sources **	Funding Source(s) Description **	Were quantifiable water supply benefits obtained from this PMA? **	Benefits (AF) **	Were other benefits obtained from this PMA? **	Describe the other benefits. **
279	5-021.57_PMA_1	Agricultural Irrigation Efficiency	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Planning phase in progress	A Precision Irrigation Pilot program is underway as part of the Demand Reduction Strategies project funded by the SGM Grant Program. A group of representative orchards in the subbasin were identified for participation in the pilot to explore whether changes to irrigation can reduce non-beneficial ET without affecting yield. The planning study, led by Subject Matter Experts with extensive experience in irrigation technology and agronomy, is on schedule for completion by March 2026.			SGM Grant Program			NA	NA	NA	NA
280	5-021.57_PMA_2	Project: Residential Conservation	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Active	Continued funding and customer outreach for CWS conservation programs			No			Yes	8	Yes	Customer education on water use efficiency
281	5-021.57_PMA_3	Project: Scoping for Flood MAR/Surface Water Supply and Recharge	Vina GSA;Rock Creek Reclamation District GSA	5-021.57 VINA	5-021.57 VINA		2025	Planning phase in progress	Project identification and feasibility analysis underway and funded by SGM Grant Program for recharge and water supply projects. Surface Water Supply feasibility study underway, to be completed by the end of 2025. Project identification and field investigation activities (i.e. tTEM) occurred for FloodMAR recharge concepts throughout the Vina subbasin at locations with willing landowners. Groundwater Recharge Investigation and Preliminary Design report expected to be complete by June 2026.			No			N/A	N/A	N/A	N/A
282	5-021.57_PMA_4	Project: Community Water Education Initiative	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		No status provided at this time								
283	5-021.57_PMA_5	Project: Fuel Management for Watershed Health	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		Not being pursued at this time								
284	5-021.57_PMA_6	Project: Paradise Irrigation District Intertie	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		The GSAs nor PID are pursing this project at this time.								
285	5-021.57_PMA_7	Project: Agricultural Surface Water Supplies	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Planning phase in progress	Surface Water Supply Feasibility Study underway, to be completed by the end of 2025. Work funded by SGM Grant Program. The study evaluates the feasibility of two specific projects: South Vina Extension, which would bring Feather River water through Western Canal Water District to the southern portion of the subbasin; and Ridge to Valley which would bring Paradise Irrigation District water to agricultural users along Comanche Creek.			No			N/A	N/A	N/A	N/A
286	5-021.57_PMA_8	Project: Streamflow Augmentation	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	On hold	Waiting on CDFW access approval									
287	5-021.57_PMA_9	Community Monitoring Program	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Implementation	The Community Monitoring Program is underway. Outreach completed in June 2025 to recruit domestic well owners for participation in the monitoring network. Of 18 landowners who responded, 13 wells were inspected, and 8 have been prioritized for equipment installation based on geographic distribution, proximity to RMS wells, and vulnerability to going dry. Consultant team is coordinating directly with selected participants to schedule site visits and begin installations. Funded by the DWR Sustainable Groundwater Management Grant. Project is on schedule for completion by December 2026.			No			N/A	N/A	Yes	Addressing data gaps identified in the 2022 GSP
288	5-021.57_PMA_10	Project: Wastewater Recycling	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	In Progress	The City of Chico has funded and initiated a Recycled Water Feasibility Study (RWFS). The RWFS is scheduled to be complete by Spring 2026.			Yes, City of Chico			None to date	N/A	Increased understanding of recycled water opportunities within the subbasin.	Identification of a long list of recycled water project alternatives, completion of an alternatives analysis, identification of fatal flaws, and ultimately a recommendation for 1-2 recycled water projects. Completion of a RWFS is often a requirement of grant funding as well.
289	5-021.57_PMA_11	Project: Rangeland Management and Water Retention	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Active	All cattle leases were suspended during the 2025 season for infrastructure (fencing and water) repair. Cattle will return in November 2025.			No			No		N/A	N/A
290	5-021.57_PMA_12	Project: Removal of Invasive Species	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Active	Two springs enclosures were developed at just over ~10 acres and invasive species removal within those inclosures occurred			No			No		Yes	An increase in cover native species as invasive species are reduced.
291	5-021.57_PMA_13	Project: Surface Water Supply and Recharge	Vina GSA;Rock Creek Reclamation District GSA	5-021.57 VINA	5-021.57 VINA		2025	Planning phase in progress	Feasibility study underway to assess recharge potential along Lindo Channel. Fieldwork began in early 2025 with infiltration testing, stilling well installations, and domestic well monitoring setup. Modeling efforts have analyzed historical streamflow and weather data, evaluated environmental constraints, and developed a flow model for Big Chico Creek and Lindo Channel. Consultants are now running scenarios to estimate potential recharge under different flow conditions, including storm events and altered channel velocities. Recharge alternatives are under evaluation. Funded by the DWR Sustainable Groundwater Management Grant. Project is on schedule for completion by March 2026.			No			N/A	N/A	N/A	N/A
292	5-021.57_PMA_14	Extend Orchard Replacement	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Planning Phase underway	A Pilot program is underway as part of the Demand Reduction Strategies project funded by the SGM Grant Program. The pilot will analyze water savings from historical fallowing practices. The feasibility study includes an economic analysis to evaluate the project's benefits/costs over the next 25-30 years if the program were to be implemented.			Planning funded by SGM Grant Program			NA	NA	NA	NA
293	5-021.57_PMA_15	Recharge from the Miocene Canal	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		The Miocene Canal will not be rebuilt (after destruction from the 2018 Camp Fire).								
294	5-021.57_PMA_16	General Plan Updates	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	Ongoing	The County is in the process of preparing the Annual Update for the General Plan.			N/A			N/A	0	N/A	N/A
295	5-021.57_PMA_17	Domestic Well Mitigation	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		not being pursued at this time								
296	5-021.57_PMA_18	Well Permitting Ordinance	Vina GSA	5-021.57 VINA	5-021.57 VINA		2025	In Progress	Grant funds have been awarded and RFP process is in progress. Projected kick-off for Well Ordiannce review is January, 2026.			Yes			N/A		N/A	N/A
297	5-021.57_PMA_19	Landscape Ordinance	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		No changes to the Lanscape Ordinance has been made. The current Ordinance complies with DWR's Model Water Efficient Landscaping Ordiance.								
298	5-021.57_PMA_20	Prohibition of Groundwater Use for Ski (Recreational) Lakes	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		No status provided at this time								
299	5-021.57_PMA_21	Expansion of Water Purveyors' Service Area	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		No status provided at this time								
300	5-021.57_PMA_22	Groundwater Allocation	Vina GSA	5-021.57 VINA	5-021.57 VINA			No Update		No status provided at this time								