



**Cuyama Basin
Groundwater Sustainability Plan—
Draft Annual Report for 2023-2024 Water Year**

Prepared by:



March 2025

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Appendix A: Updated Hydrographs for Representative Wells

Abbreviations and Acronyms

AF	acre-feet
CBGSA	Cuyama Basin Groundwater Sustainability Agency
CBWD	Cuyama Basin Water District
CBWRM	Cuyama Basin Water Resources Model
CCSD	Cuyama Community Services District
DMS	Data Management System
DWR	California Department of Water Resources
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
SAC	Standing Advisory Committee
SBCWA	Santa Barbara County Water Agency
SGMA	Sustainability Groundwater Management Act
SR	State Route
TSS	Technical Support Services
USGS	United States Geological Survey

Executive Summary

§356.2 (a)	General information, including an executive summary and a location map depicting the basin covered by the report.
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ES-1 Introduction

In 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to continued overdraft of California’s groundwater resources. The Cuyama Groundwater Basin (Basin) is one of 21 basins and subbasins identified by the California Department of Water Resources (DWR) as being in a state of critical overdraft. SGMA requires that a Groundwater Sustainability Plan (GSP) be prepared to address the measures necessary to attain sustainable conditions in the Cuyama Groundwater Basin. Within the framework of SGMA, sustainability is generally defined as the conditions that result in long-term reliability of groundwater supply and the absence of undesirable results.

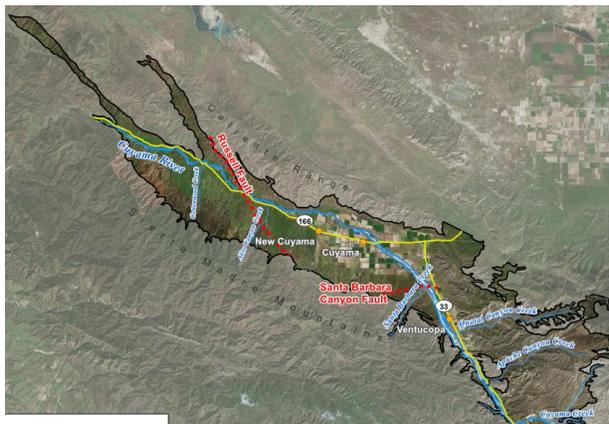
In response to SGMA, the Cuyama Basin Groundwater Sustainability Agency (CBGSA) was formed in 2017. The CBGSA is a joint-powers agency that is comprised of Kern, Santa Barbara, San Luis Obispo and Ventura Counties, plus the Cuyama Community Services District and the Cuyama Basin Water District. The CBGSA is governed by an 11-member Board of Directors, with one representative from Kern, San Luis Obispo and Ventura counties, two representatives from Santa Barbara County, one member from the Cuyama Community Services District, and five members from the Cuyama Basin Water District.

The Draft Cuyama Basin GSP was adopted on December 4, 2019 by the CBGSA and submitted to DWR on January 28, 2020. SGMA requires that the CBGSA develop a GSP that achieves groundwater sustainability in the Basin by the year 2040.

On January 21, 2021, DWR determined that the GSP was “incomplete” and recommended CBGSA to amend the GSP to address four corrective actions. To address these corrective actions, CBGSA developed supplemental sections to the GSP and resubmitted to DWR on July 18, 2022. On March 2, 2023, DWR announced that the Revised GSP had been Approved.

In compliance with SGMA Regulations the 2025 GSP Update was developed and approved by the CBGSA in November of 2024. The 2025 GSP update incorporated recent monitoring data, an updated groundwater model, new information and studies, and updated monitoring networks and sustainable management criteria (SMC). The updated GSP was submitted to DWR on January 29, 2025. The jurisdictional area of the CBGSA is defined by DWR’s Bulletin 118, 2013, the 2016 Interim Update, and the latest 2020 update. The Cuyama Groundwater Basin generally underlies the Cuyama Valley, as shown in **Figure ES-1**.

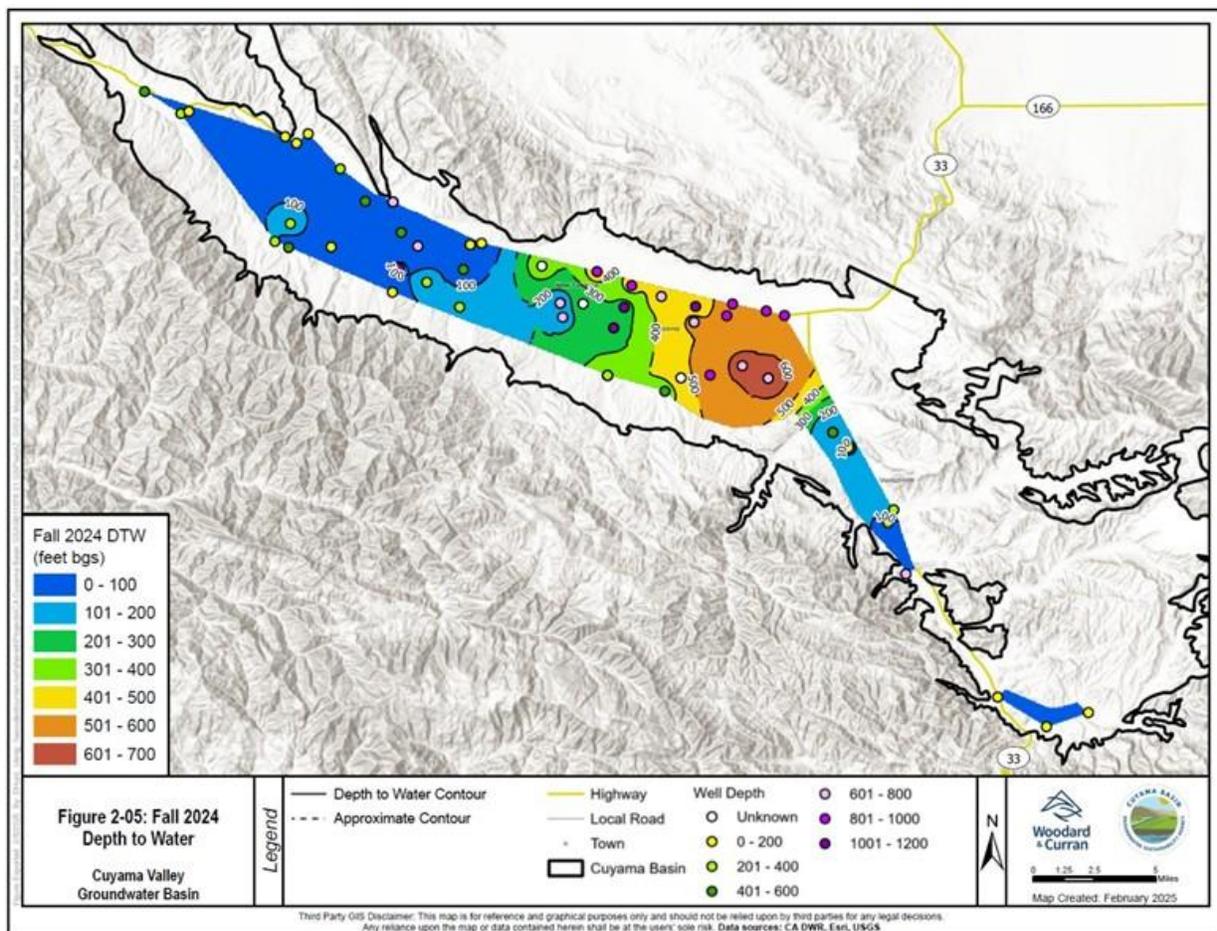
Figure ES-1: GSP Plan Area



ES-2 Groundwater Levels

The Annual Report for the 2024 water year includes groundwater contours for Spring and Fall of 2024, and updated hydrographs for the groundwater level monitoring network identified in the Cuyama Basin GSP. The Cuyama Basin consists of a single principal aquifer, and water levels in Basin monitoring wells are considered representative of conditions in that aquifer. Groundwater levels in some portions of the Basin have been declining for many years while other areas of the Basin have experienced no significant change in groundwater levels. Groundwater levels vary across the Basin, with the highest depth to water occurring in the central portion of the Basin (**Figure ES-2**). The western and eastern portions of the Basin have generally shallower depth to water. Generally, depth to water and groundwater elevation in 2024 have changed a small amount in the central basin compared to 2023 levels with little change in other parts of the basin.

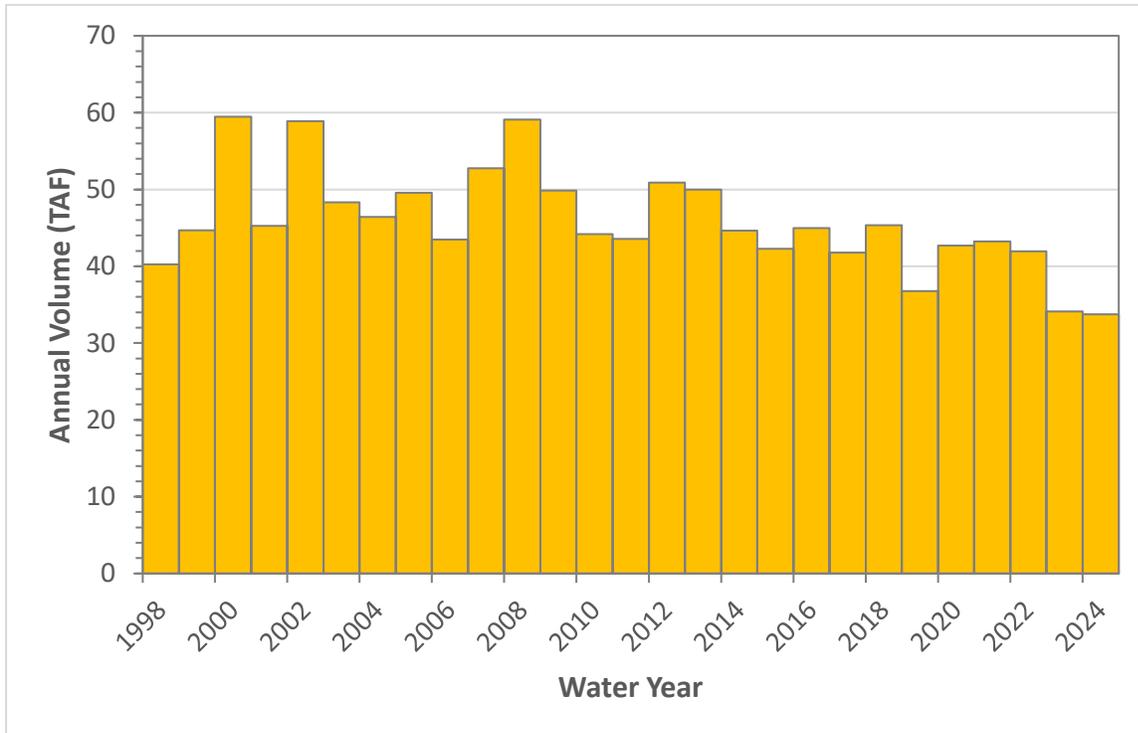
Figure ES-2: Cuyama Basin Depth to Water Contour Map (Fall 2024)



ES-3 Water Use

The Cuyama Groundwater Basin is supplied entirely by groundwater, with virtually no surface water use. Groundwater pumping in the Basin is estimated to have been about 33,700 AF in 2024. This reflects a decrease of about 16,200 AF as compared to 2023. (See **Figure ES-3**).

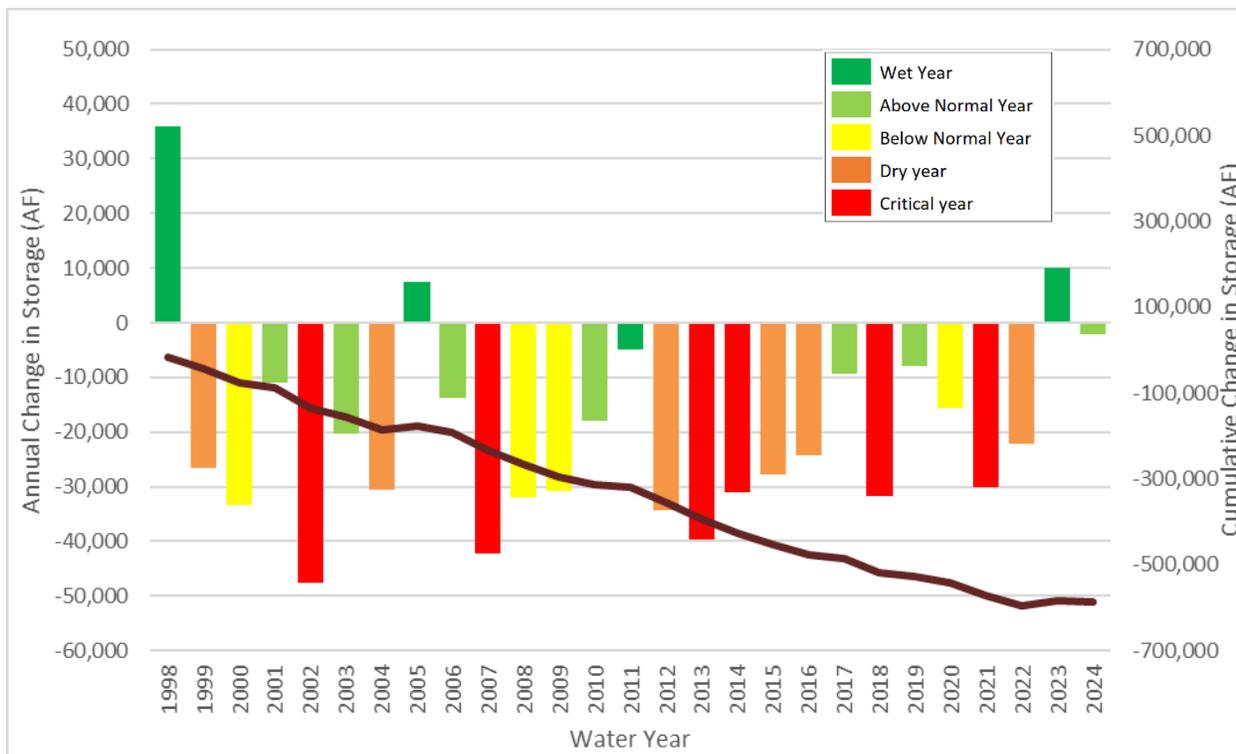
Figure ES-3: Annual Groundwater Extraction in the Cuyama Basin in Water Years 1998-2024



ES-4 Change in Groundwater Storage

It is estimated that there was a decrease in Basin groundwater storage of 2,100 AF in 2024. There continues to be a long-term trend in groundwater storage reduction in the Basin since 1999. **Figure ES-4** shows the historical change in groundwater storage by year, water year type,¹ and cumulative water volume in each year for the period from 1998 through 2024.

Figure ES-4: Change in Groundwater Storage by Year, Water Year Type, and Cumulative Water Volume



¹ Water year types are customized for the Basin watershed based on annual precipitation as follows:

- Wet year = more than 19.6 inches
- Above normal year = 13.1 to 19.6 inches
- Below normal year = 9.85 to 13.1 inches
- Dry year = 6.6 to 9.85 inches
- Critical year = less than 6.6 inches.

ES-5 Groundwater Quality

Only 76% (19 of 25) of monitoring wells were sampled for total dissolved solids (TDS) in 2024. Approximately 68% (17 wells) of representative wells were lower (i.e. better) than their measurable objective and only 4% (one well) exceeded its minimum threshold for TDS.

ES-6 Land Subsidence

Observed subsidence rates in the Basin are well below the minimum threshold, and thus undesirable results for subsidence are not occurring in the Basin.

ES-7 Plan Implementation

The following plan implementation activities were accomplished in 2024:

- Implementation of a groundwater extraction fee and supplemental fee, which is expected to generate revenue to cover the administrative costs of the CBGSA for the period from January 1, 2025, through December 31, 2025.
- A total of eleven public meetings were conducted at which GSP development and implementation was discussed.
- The Cuyama Basin Groundwater Sustainability Agency (CBGSA) Board continued implementation of the groundwater levels monitoring network, includes quarterly monitoring at each monitoring well.
- The CBGSA continued to utilize the COD SGMA Implementation Grant for \$7.6 million in funding for implementation activities.
- The CBGSA and Cuyama Basin Water District (CBWD) continued implementation of management actions in the Central management area.

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Section 1. Introduction

§356.2 (a)	General information, including an executive summary and a location map depicting the basin covered by the report.
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1.1 Introduction and Agency Information

This section describes the Cuyama Basin Groundwater Sustainability Agency (CBGSA), its authority in relation to the Sustainable Groundwater Management Act (SGMA), and the purpose of this Annual Report.

This Annual Report meets regulatory requirements established by the California Department of Water Resources (DWR) as provided in Article 7 of the California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2.

The CBGSA was created by a Joint Exercise of Powers Agreement among the following agencies:

- Counties of Kern, San Luis Obispo, and Ventura
- Santa Barbara County Water Agency (SBCWA), representing the County of Santa Barbara
- Cuyama Basin Water District (CBWD)
- Cuyama Community Services District (CCSD)

The CBGSA Board of Directors includes the following individuals:

- Cory Bantilan – Chairperson, SBCWA
- Derek Yurosek – Vice Chair –CBWD
- Deborah Williams –CCSD
- Byron Albano – CBWD
- Jimmy Paulding – County of San Luis Obispo
- Arne Anselm – County of Ventura
- Rick Burnes – CBWD
- Jane Wooster – CBWD
- Katelyn Zenger – County of Kern
- Matthew Young – Santa Barbara County Water Agency
- Steve Jackson – Cuyama Basin Water District

The CBGSA’s established boundary corresponds to DWR’s California’s Groundwater Bulletin 118 – Update 2003 (Bulletin 118) groundwater basin boundary for the Cuyama Valley Groundwater Basin (Basin) (DWR, 2003). No additional areas were incorporated.

1.1.1 Management Structure

The CBGSA is governed by an 11-member Board of Directors that meets bi-monthly (i.e. six-times a year). A General Manager manages day-to-day operations of the CBWD, while Board Members vote on actions of the CBGSA; the Board is the CBGSA’s decision-making body. The Board also formed a Standing Advisory Committee comprised of nine stakeholders to provide recommendations to the Board on key technical issues which also meets regularly.

1.1.2 Legal Authority

Per Section 10723.8(a) of the California Water Code, the Santa Barbara County Water Agency (SBCWA) gave notice to DWR on behalf of the CBGSA of its decision to form a GSA, which is Basin 3-013, per DWR’s Bulletin 118.

1.1.3 Groundwater Sustainability Plan

The CBGSA Board of Directors approved the first iteration of the Cuyama Groundwater Sustainability Plan (GSP) on December 4, 2019. The GSP was submitted to DWR for approval on January 28, 2020.

On January 21, 2021, DWR determined that the GSP was “incomplete” and recommended CBGSA amend the GSP to address the following four corrective actions:

- Provide justification for, and effects associated with, the sustainable management criteria;
- Use of groundwater levels as a proxy for depletion of interconnected surface water;
- Further address degraded water quality; and
- Provide explanation for how overdraft will be mitigated in the basin.

To address these corrective actions, the CBGSA developed the following supplement sections to the GSP and resubmitted to DWR on July 18, 2022:

- Supplemental Section 2.2.7: Basin Settings, Groundwater Conditions, Groundwater Quality performed additional data collection efforts for nitrate and arsenic measurements.
- Supplemental Section 3.3: Undesirable Results, Evaluation of the Presence of Undesirable Results provided additional information regarding the rationale for the criteria used in the GSP to define the point at which Basin conditions cause significant and unreasonable effects to occur.
- Supplemental Section 4.10: Monitoring Networks, Depletions of Interconnected Surface Water Monitoring Network identifies a subset of groundwater level representative monitoring wells for use in ISW monitoring and provides a rationale for their selection and adequate data collection and monitoring for ISWs.
- Supplemental Section 5.2: Minimum Thresholds, Measurable Objectives, and Interim Milestones, Chronic Lowering of Groundwater Levels performed two technical analyses to provide additional information related to the effects of the GSP’s groundwater levels minimum thresholds and undesirable results on well infrastructure and on environmental uses of groundwater.
- Supplemental Section 5.5: Minimum Thresholds, Measurable Objectives, and Interim Milestones, Degraded Water Quality provides information on why groundwater management is unlikely to affect nitrate and arsenic concentrations.
- Supplemental Section 7.2: Projects and Management Actions, Management Areas provide additional information regarding the Ventucopa management area and the northwestern region of the Basin.
- Supplemental Section 7.6: Projects and Management Actions, Adaptive Management explains the circumstances of when adaptive management strategies may be also triggered for other reasons.

On March 2, 2023, DWR announced that the Revised GSP had been Approved.

The CBGSA prepared an updated GSP, which was approved in November 2024 and submitted to DWR in January 2025. The updated GSP incorporates newly collected data and updated groundwater model, updated sustainable management criteria, and updates to projects and management actions. The resubmitted and Updated 2025 GSP is available for viewing online at <http://cuyamabasin.org/>.

1.2 Plan Area

Figure 1-1 shows the Basin and its key geographic features. The Basin encompasses an area of about 378 square miles² and includes the communities of New Cuyama and Cuyama, which are located along State Route (SR) 166, and Ventucopa, which is located along SR 33. The Basin encompasses an approximately 55-mile stretch of the Cuyama River, which runs through the Basin for much of its extent before leaving the Basin to the northwest and flowing toward the Pacific Ocean. The Basin also encompasses stretches of Wells Creek in its north-central area, Santa Barbara Creek in the south-central area, the Quatal Canyon drainage and Cuyama Creek in the southern area of the Basin. Most of the agriculture in the Basin occurs in the central portion east of New Cuyama, and along the Cuyama River near SR 33 through Ventucopa.

Figure 1-2 shows the CBGSA boundary. The CBGSA boundary covers all of the Cuyama Valley Groundwater Basin.

² The 2003 version of Bulletin 118 section on the Cuyama Valley Groundwater Basin incorrectly stated that the Basin area is 230 square miles. The estimate of 378 square miles shown here and in the GSP is consistent with the mapping shown on DWR's GSA Map Viewer.

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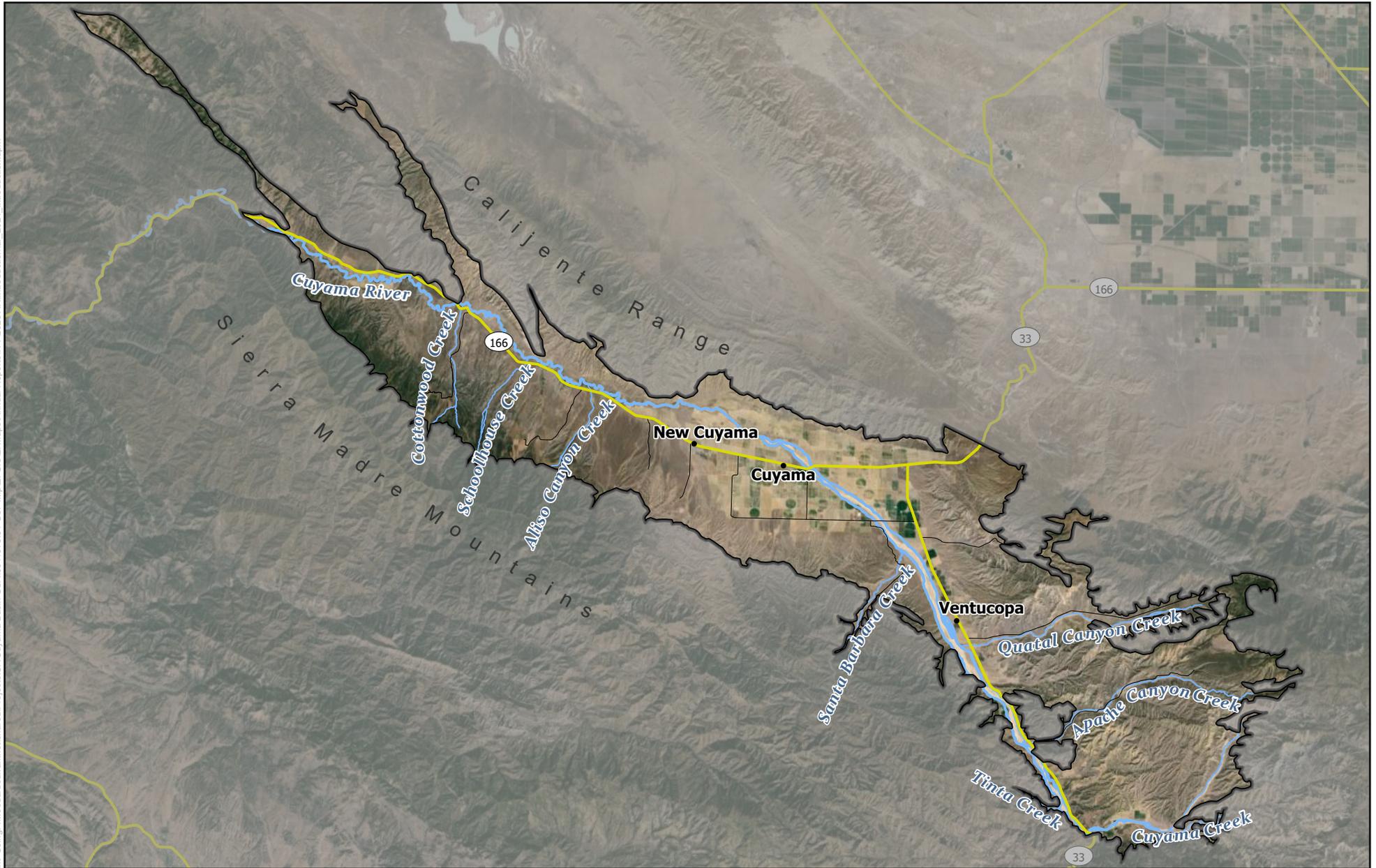


Figure 1-1: Groundwater Sustainability Plan Area

Cuyama Valley Groundwater Basin

Legend

- Cuyama Basin
- Creek
- Local Road
- Cuyama River
- Highway
- Town





Woodard & Curran



0 1.75 3.5 7 Miles

Map Created: February 2024

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Figure 1-2: Groundwater Sustainability Agency Boundary

**Cuyama Valley
Groundwater Basin**

Legend

- | | | |
|--|--|--|
|  Cuyama Basin |  Highway |  Cuyama Basin GSA |
|  Cuyama River |  Local Road | |
|  Creek |  Town | |



0 1.75 3.5 7 Miles

Map Created: February 2024

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Section 2. Groundwater Levels

§356.2 (b)(1)	Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:
§356.2 (b)(1)(A)	Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.
§356.2 (b)(1)(B)	Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

2.1 Groundwater Levels Representative Monitoring Network

As required by DWR’s SGMA regulations, a monitoring network and representative monitoring network were identified in the Cuyama Basin GSP utilizing existing wells. The current groundwater levels representative monitoring network that was approved by the CBGSA Board is shown on **Figure 2-1**. The Cuyama Basin consists of a single principal aquifer, and water levels in monitoring network wells are considered representative of conditions in that aquifer. The objective of the representative monitoring network is to detect undesirable results in the Basin related to groundwater levels using the sustainability thresholds described in the GSP. Other related objectives of the monitoring network are defined via the SGMA regulations as follows:

- Demonstrate progress toward achieving measurable objectives described in the GSP.
- Monitor impacts to the beneficial uses or users of groundwater.
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.
- Quantify annual changes in water budget components.
- Monitoring that has occurred on the groundwater level monitoring network since the development of the Cuyama Basin GSP is included in this Annual Report. Collected groundwater level data has been analyzed to prepare contour maps and updated hydrographs, which are presented in the following sections.

In advance of the 2025 GSP Update, the CBGSA Board voted to modify the representative monitoring network to remove two wells for which the CBGSA has not been able to get a landowner agreement. In addition, CBGSA Board approved updated minimum thresholds and measurable objectives that take into consideration beneficial uses and users of groundwater and data collected over the last several years of Basin implementation. These changes have been reflected in the 2025 GSP update and in this Annual Report.

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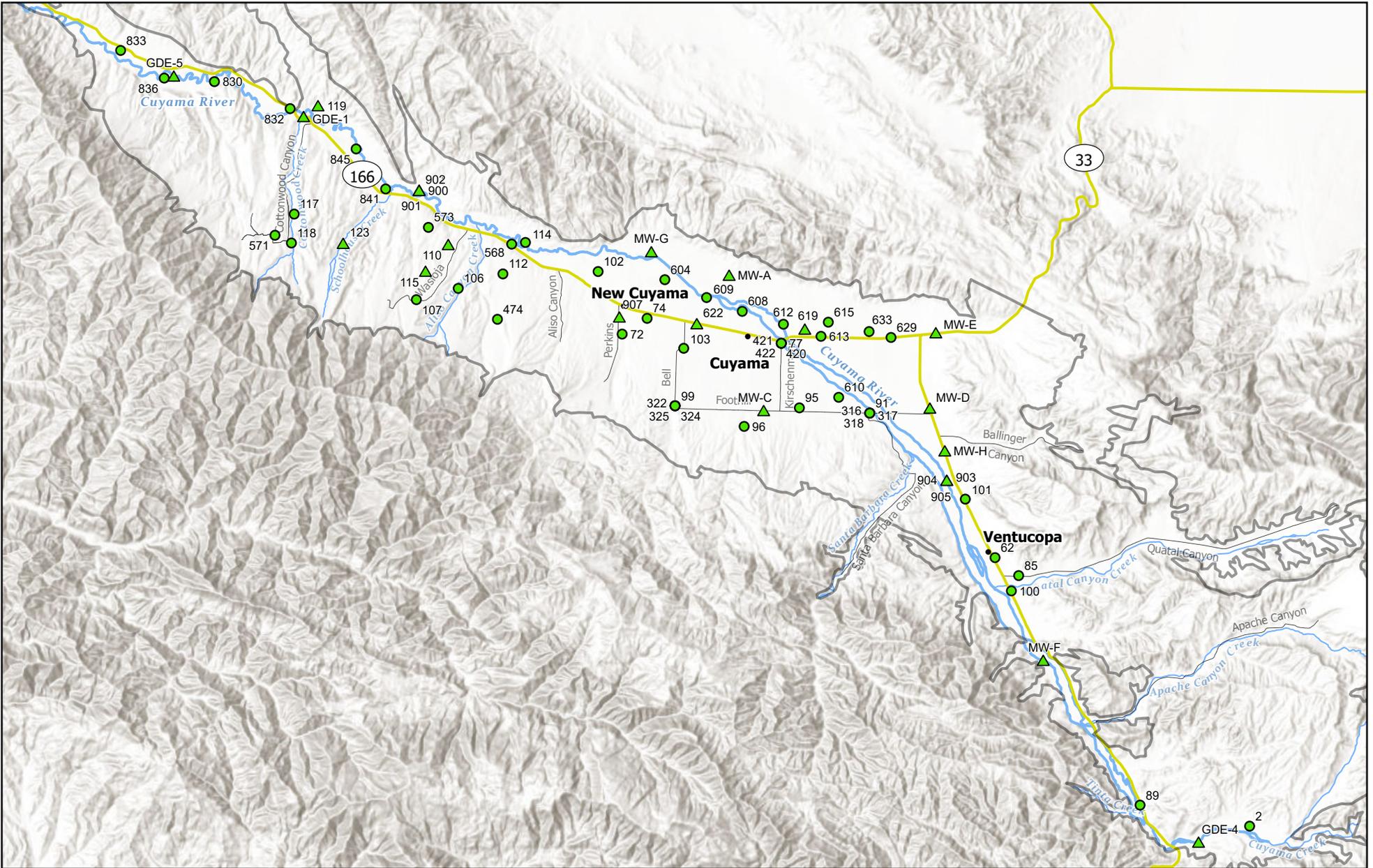


Figure 2-1: Updated Groundwater Level Monitoring Network

Cuyama Valley Groundwater Basin

Legend	
	Representative Monitoring
	Non-representative Monitoring
	Highway
	Local Road
	Town
	Cuyama River
	Creek
	Cuyama Basin







0 1.25 2.5 5 Miles

Map Created: December 2023

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2.2 Groundwater Contour Maps

The Updated 2025 GSP submitted in January, 2025, included contour maps up through the spring of 2024. The previous Annual Reports included contour maps for spring and fall of 2019 through 2023. For this Annual Report, analysis was conducted to incorporate data through October 2024 that was collected by the CBGSA and local landowners. Data was then added to the Data Management System (DMS) and processed to analyze the current groundwater conditions by creating seasonal groundwater contour/raster maps for the spring and fall of 2024 and hydrographs of Basin monitoring wells.

A contour map shows changes in groundwater elevations by interpolating groundwater elevations between monitoring sites. The elevations are shown on the map with the use of a contour line, which indicates that at all locations that line is drawn, the line represents groundwater at the elevation indicated. There are two versions of contour maps used in this section: one that shows the elevation of groundwater above mean sea level, which is useful because it can be used to identify the horizontal gradients of groundwater, and one that shows contours of depth to water, the distance from the ground surface to groundwater, which is useful because it can identify areas of shallow or deep groundwater.

Analysts prepared groundwater contour maps under the supervision of a Certified Hydrogeologist in the State of California for both groundwater elevation and depth to water for both spring and fall of 2024.

Each contour map is contoured at a 50-foot contour interval, with contour elevations indicated in white numeric label. The groundwater contours were also based on assumptions in order to accumulate enough data points to generate useful contour maps. Assumptions are as follows:

- Measurements from wells of different depths are representative of conditions at that location and there are no significant known vertical gradients. Due to the limited spatial amount of monitoring points, data from wells of a wide variety of depths were used to generate the contours.
- Measurements collected by the CBGSA monitoring program in April 2024 were used to develop the spring contours and in October 2024 to develop the fall contours. It is assumed that these measurements are representative of conditions during the spring or fall season, and conditions have not changed substantially from the time of the earliest measurement used to the latest.

These assumptions generate contours that are useful at the planning level for understanding groundwater levels across the Basin, and to identify general horizontal gradients and regional groundwater level trends. The contour maps are not indicative of exact values across the Basin because groundwater contour maps approximate conditions between measurement points, and do not account for topography. Therefore, a well on a ridge may be farther from groundwater than one in a canyon, and the contour map will not reflect that level of detail.

Figure 2-2 shows groundwater elevation contours for Spring of 2024. Based on data that was collected by local landowners and the CBGSA. The contours developed using the available data show two general trends in the Basin. First, in most of the Basin, groundwater generally reflects the topography of the Basin. For example, groundwater elevations decrease moving from the highest portions of the Valley in the Southeastern portion of the Basin towards the central portion, and groundwater also travels down slope in a northern direction off of the southern foothills towards the Cuyama River. The second trend and potential exception to the first, is the central portion of the Basin where there is a clear depression and deviation from the topography (more clearly seen in the following figure). Groundwater levels near the town of Cuyama and slightly towards the east are much deeper and do not match the surface topography. There is also a greater decline in groundwater elevations between the Ventucopa area and the central portion of the Basin.

Figure 2-3 shows the depth to groundwater contours for Spring 2024 and more clearly shows a depression in the central portion of the Basin greater than 600 ft below ground surface. Groundwater levels then increase toward the west reaching depths of less than 100 ft in the western portion of the Basin. These levels align with trends seen in previous contour maps provided in previous Annual Reports.

Figure 2-4 shows the groundwater elevation contours for Fall of 2024. Groundwater elevations show a depression in the central portion of the Basin and a steep gradient between the central portion of the Basin and the Ventucopa area, which is consistent with contour maps for 2015 through 2023 conditions and previous Annual Reports. Contours indicate a groundwater flow down the Basin from east to west, with a decrease in gradient through the central portion of the Basin.

Figure 2-5 shows the depth to groundwater contours for the Fall of 2024. Depth to water contours indicate a depression in the central portion of the Basin, and a steep gradient between the central portion of the Basin and the Ventucopa area, which is consistent with contour maps for 2015 through 2023 conditions and previous Annual Reports.

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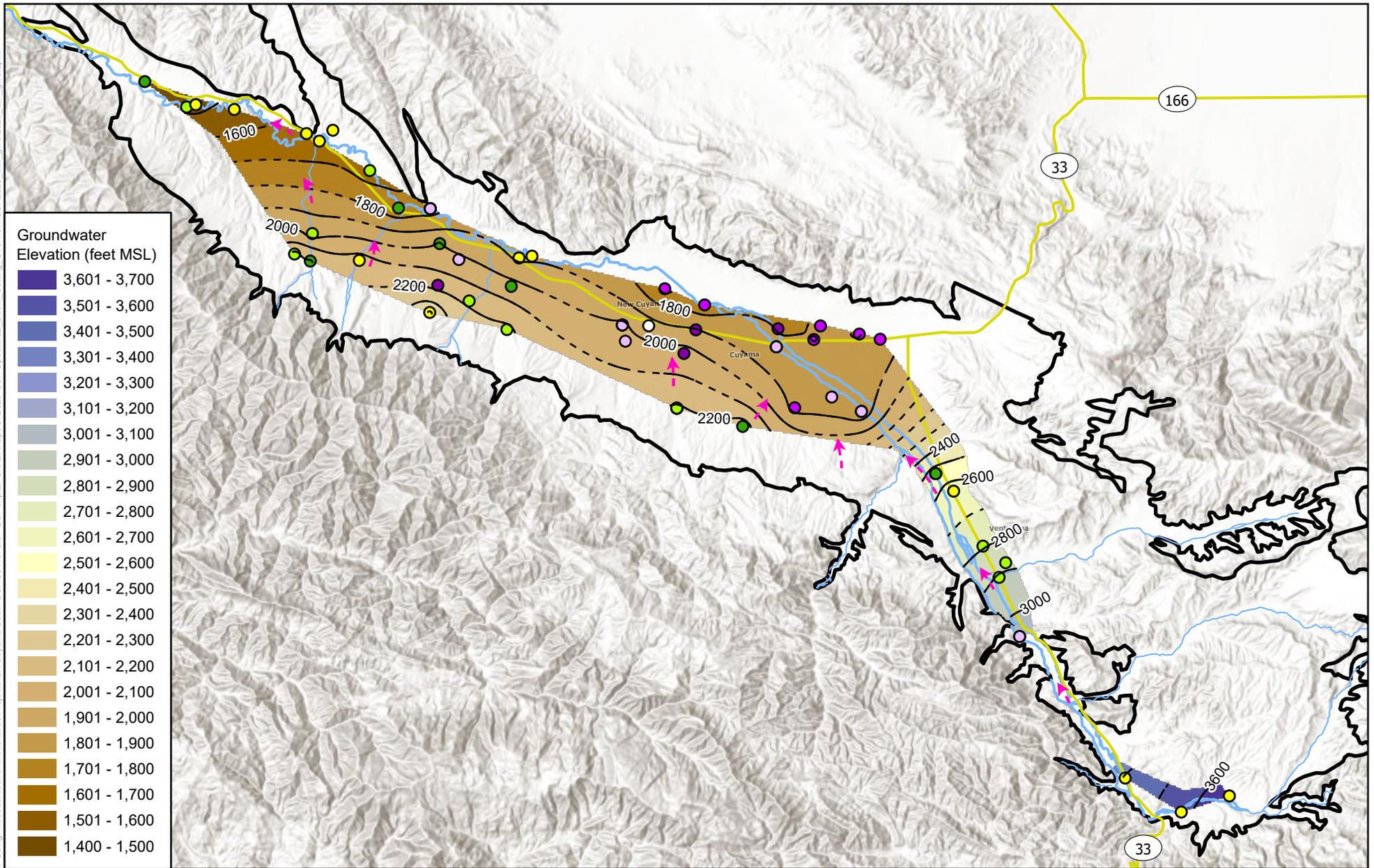


Figure 2-2: Spring 2024 Groundwater Elevation

Cuyama Valley Groundwater Basin

Legend

- | | | | |
|---------------------------------|----------------|-------------------|---------------|
| — Groundwater Elevation Contour | — Highway | Well Depth (feet) | ○ 601 - 800 |
| - - - Approximate Contour | — Creek | ○ Unknown | ● 801 - 1000 |
| - -> Conceptual Flowline | — Cuyama River | ● 0 - 200 | ● 1001 - 1200 |
| | □ Cuyama Basin | ● 201 - 400 | |
| | | ● 401 - 600 | |

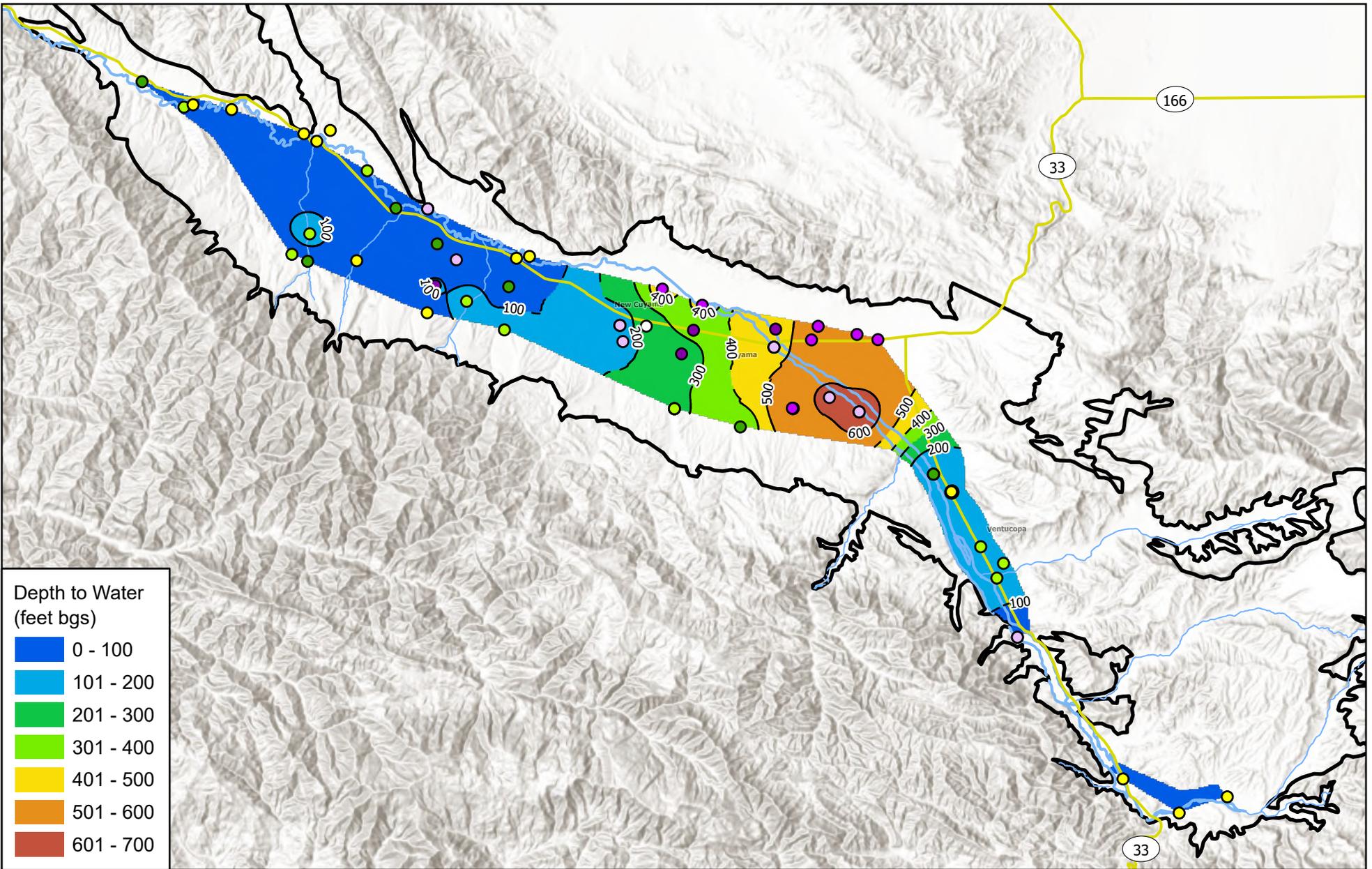


0 1.25 2.5 5 Miles

Map Created: March 2025

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Depth to Water (feet bgs)

- 0 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 601 - 700

**Figure 2-3: Spring 2024
Depth to Water**

Cuyama Valley
Groundwater Basin

Legend	— Depth to Water Contour	— Highway	Well Depth (feet)	○ 601 - 800
	- - - Approximate Contour	— Creek	○ Unknown	○ 801 - 1000
		— Cuyama River	● 0 - 200	● 1001 - 1200
		□ Cuyama Basin	● 201 - 400	
			● 401 - 600	

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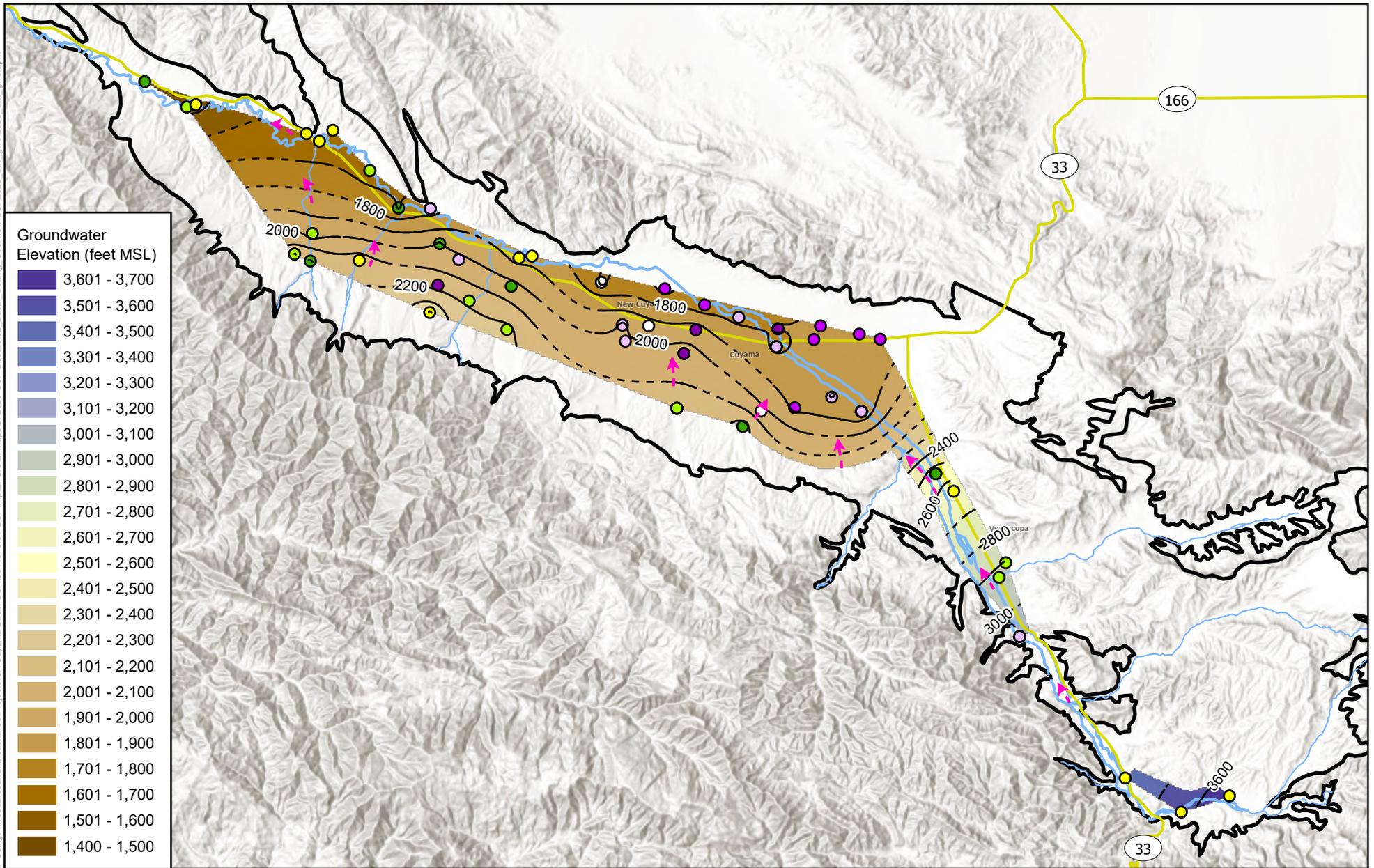
Woodard
& Curran

0 1.25 2.5 5 Miles

Map Created: March 2025

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**Figure 2-4: Fall 2024
Groundwater Elevation**

**Cuyama Valley
Groundwater Basin**

Legend

- | | | | |
|---------------------------------|----------------|-------------------|---------------|
| — Groundwater Elevation Contour | — Highway | Well Depth (feet) | ○ 601 - 800 |
| - - - Approximate Contour | — Creek | ○ Unknown | ● 801 - 1000 |
| - -> Conceptual Flowline | — Cuyama River | ● 0 - 200 | ● 1001 - 1200 |
| | □ Cuyama Basin | ● 201 - 400 | |
| | | ● 401 - 600 | |

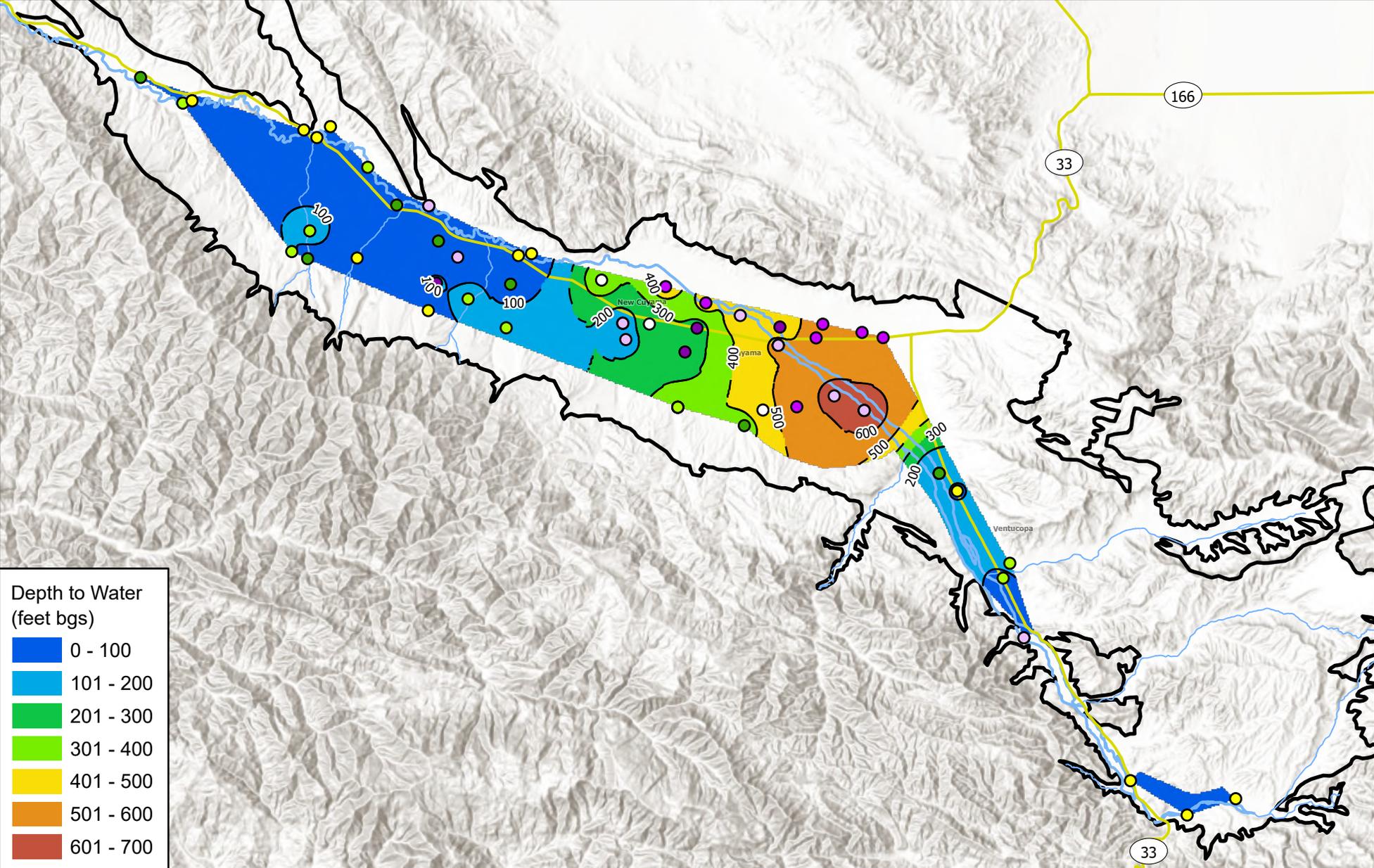


0 1.25 2.5 5 Miles

Map Created: March 2025

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Depth to Water (feet bgs)

- 0 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 601 - 700

**Figure 2-5: Fall 2024
Depth to Water**

Cuyama Valley
Groundwater Basin

Legend

— Depth to Water Contour	— Highway	Well Depth (feet)	○ 601 - 800
- - - Approximate Contour	— Creek	○ Unknown	○ 801 - 1000
	— Cuyama River	● 0 - 200	● 1001 - 1200
	□ Cuyama Basin	● 201 - 400	
		● 401 - 600	



Woodard & Curran

CUYAMA BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 1.25 2.5 5 Miles

Map Created: March 2025

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2.3 Hydrographs

Groundwater hydrographs were developed for each representative monitoring network well to provide indicators of groundwater trends throughout the Basin. Measurements from each well with historical monitoring data were compiled into one hydrograph for each well. A selection of wells from each threshold region are provided below, while hydrographs for every groundwater level representative network well are presented in Appendix A.

In many cases, changes in historical groundwater conditions at particular wells have been influenced by climactic patterns in the Basin. Historical precipitation is highly variable, with several relatively wet years and some multi-year droughts.

Groundwater conditions generally vary in different parts of the Basin. To provide a comparative analysis general groundwater trends are provided in **Table 2-1** and are accompanied by hydrographs for an example well in each threshold region. A map of threshold regions is provided in **Figure 2-6**, which also shows the locations of example wells used in each threshold region.

Table 2-1: Groundwater Trends by Threshold Regions

Threshold Region	Groundwater Trend	Example Well(s)
Northwestern Region	An upward trend influenced by seasonal fluctuations. This is expected as a wet winter brought recharge to this area. Although there are recent changes in land use that have begun to pump groundwater, levels have risen over the past water year. Levels are approximately 100 ft above the Measurable Objective.	841 (Figure 2-7)
Western Region	Levels in this region showed a significant recovery due to previous wet water years to within 40 feet of ground surface. Current levels are approximately 10 ft above the Measurable Objective.	571 (Figure 2-8)
Central Region	Levels have historically had a steady downward trend with some seasonal fluctuations. This pattern remains for some wells but with slight bumps correlated with the wet year (Well 91) with trends continuing downward and, in some cases, levels surpassing minimum thresholds. There is some indication of recovery in some wells such as Well 74 where groundwater levels improved and then continued the downward trend again.	74 and 91 (Figure 2-9 & Figure 2-10)
Eastern Region	This region has seen an overall decline over several decades. However, with the wet conditions, groundwater trends appear to be improving consistently and are far above the MO.	62 (Figure 2-11)
Southeastern Region	Levels in this relatively small region decreased slightly during the last drought but have recovered over the past few years and are well above the Measurable Objective.	89 (Figure 2-12)

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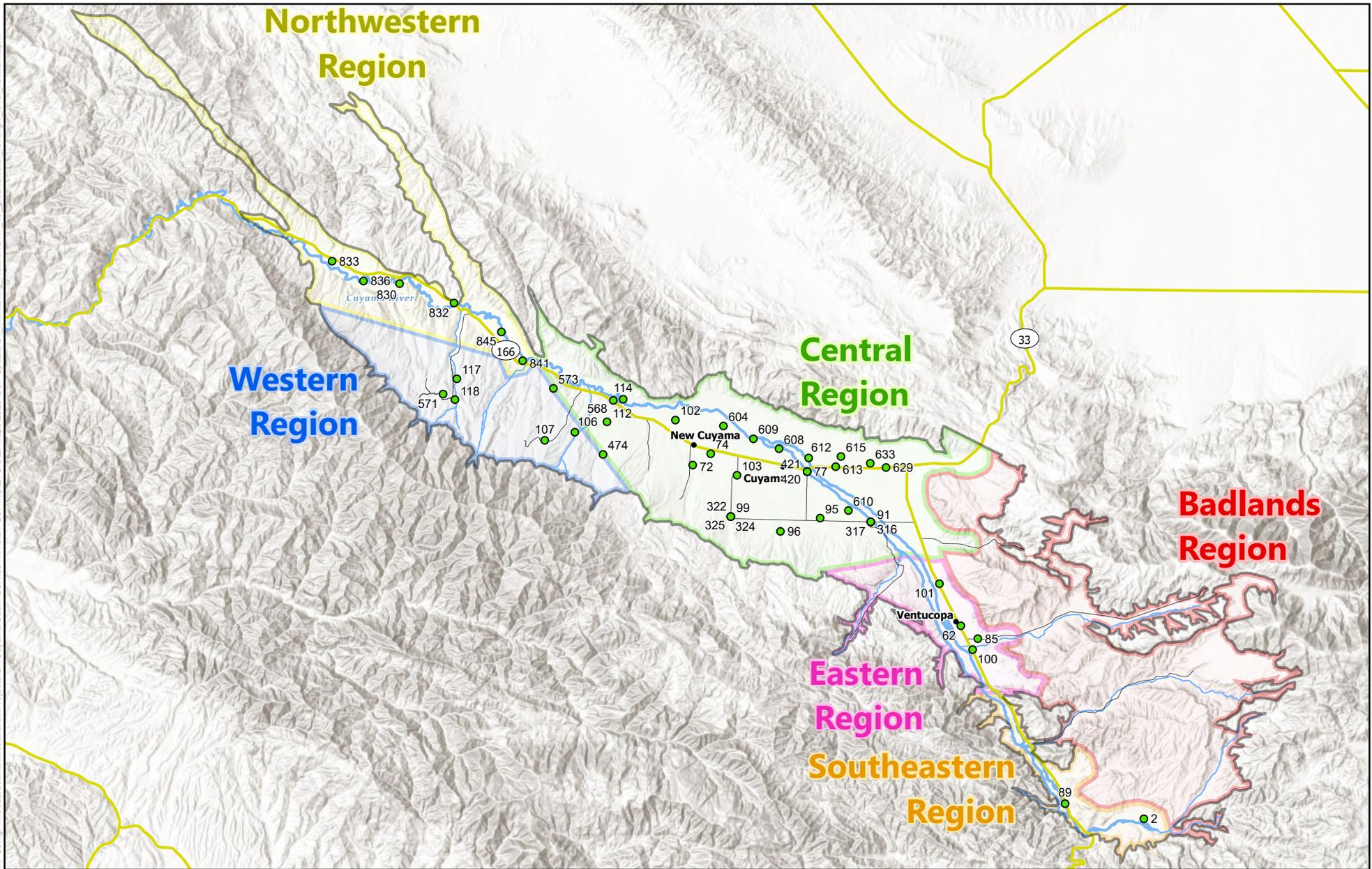


Figure 2-6: Representative Groundwater Monitoring Network and Threshold Regions

Cuyama Valley Groundwater Basin

Legend

- | | | | |
|---|---|---|--|
| ● Representative Well | Eastern Region | Highway | Creek |
| Badlands Region | Northwestern Region | Local Road | Cuyama River |
| Central Region | Southeastern Region | Town | Cuyama Basin |
| Western Region | | | |



0 1.75 3.5 7 Miles

Map Created: February 2024

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Figure 2-7: Example Well Hydrographs – Northwestern Region

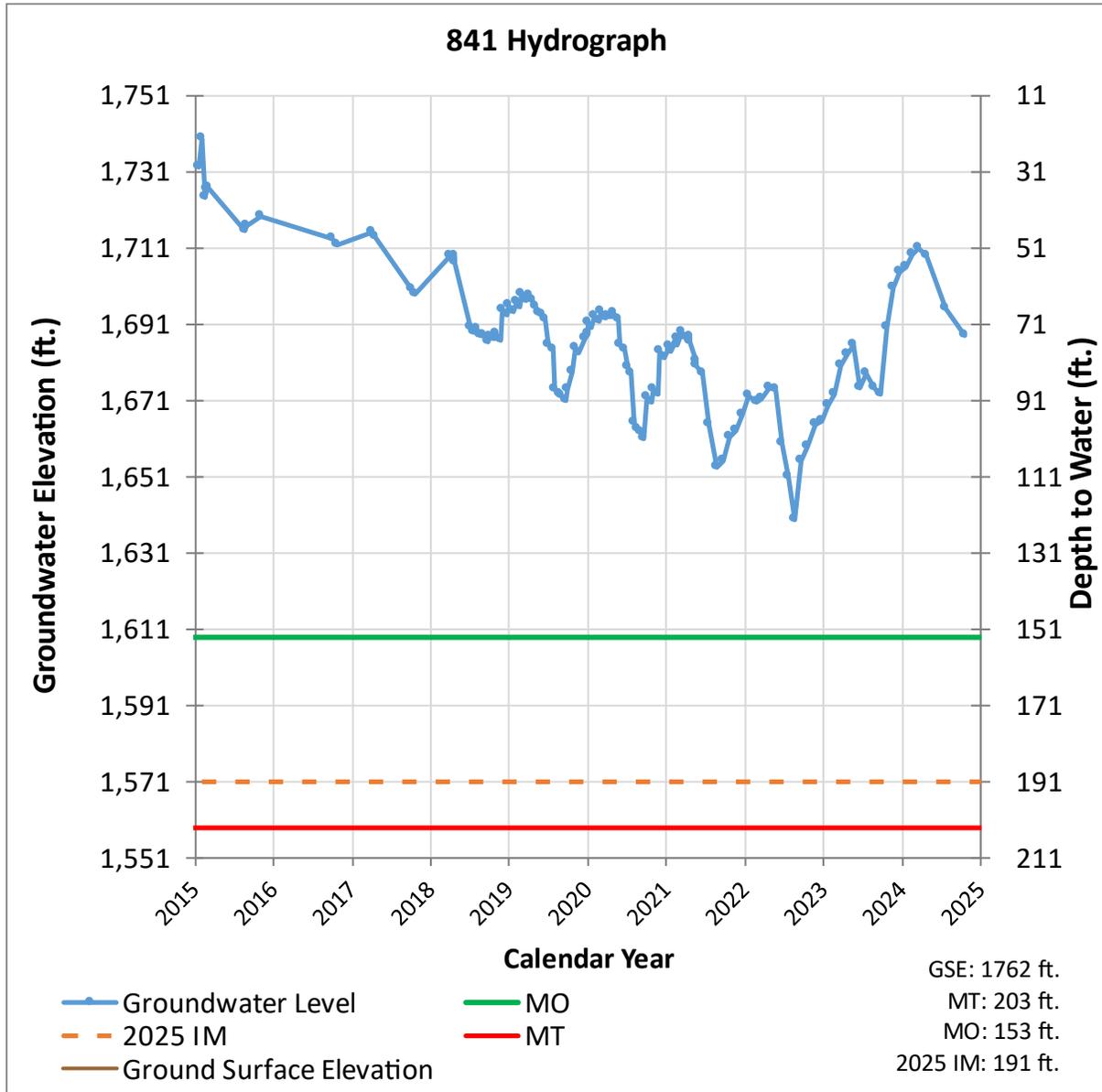


Figure 2-8: Example Well Hydrographs – Western Region

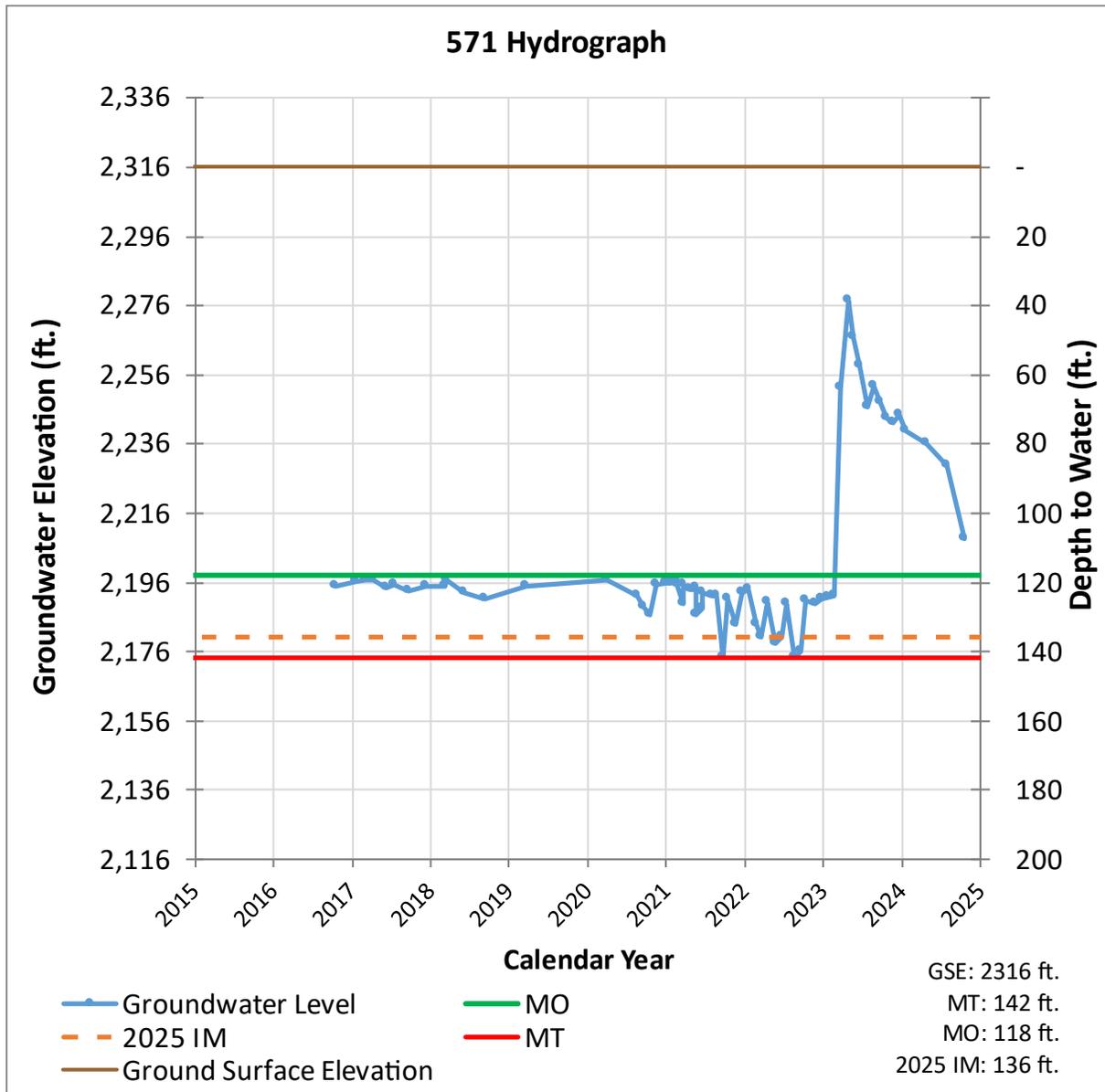


Figure 2-9: Example Well Hydrographs – Central Region

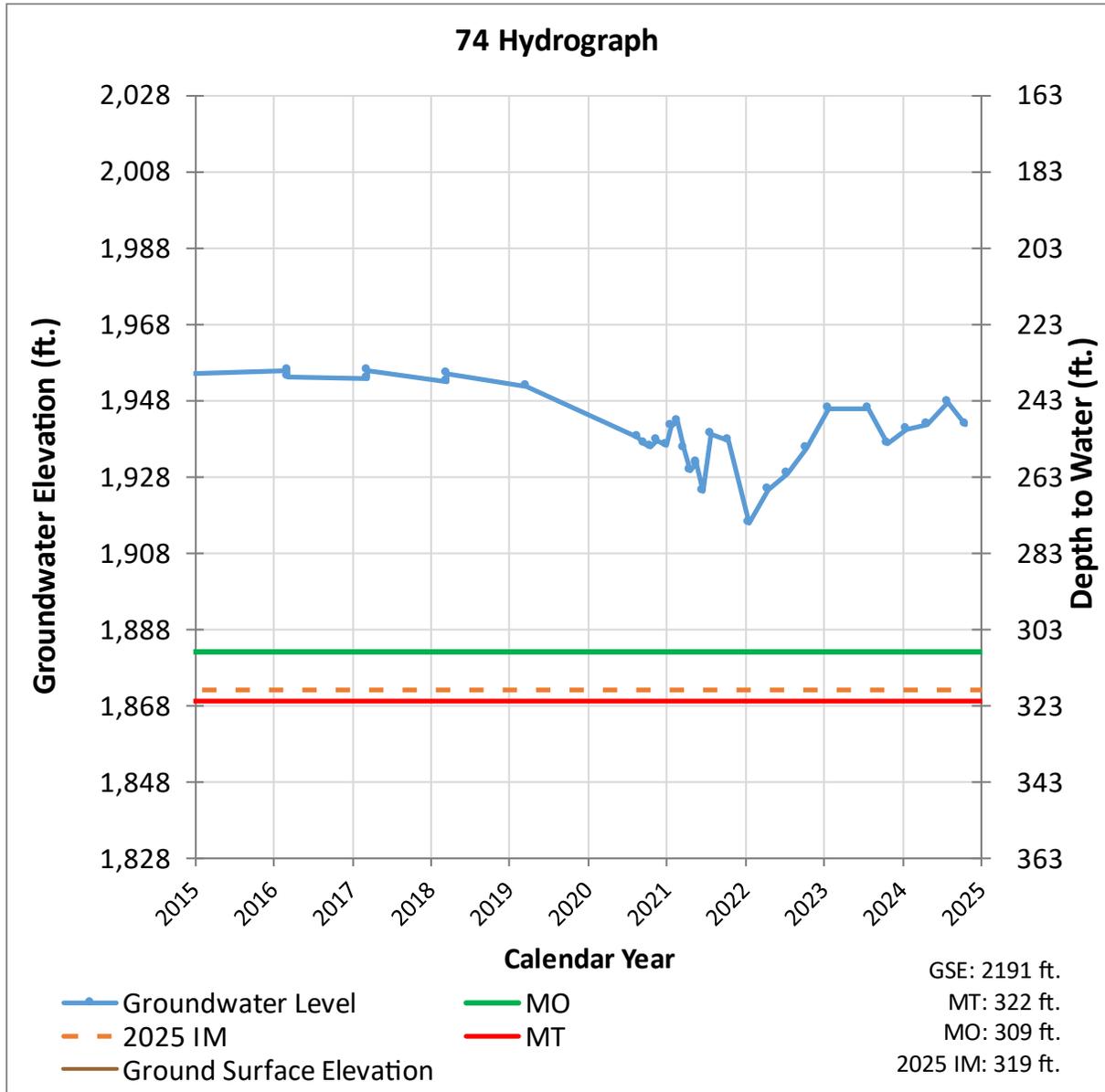


Figure 2-10: Example Well Hydrographs – Central Region

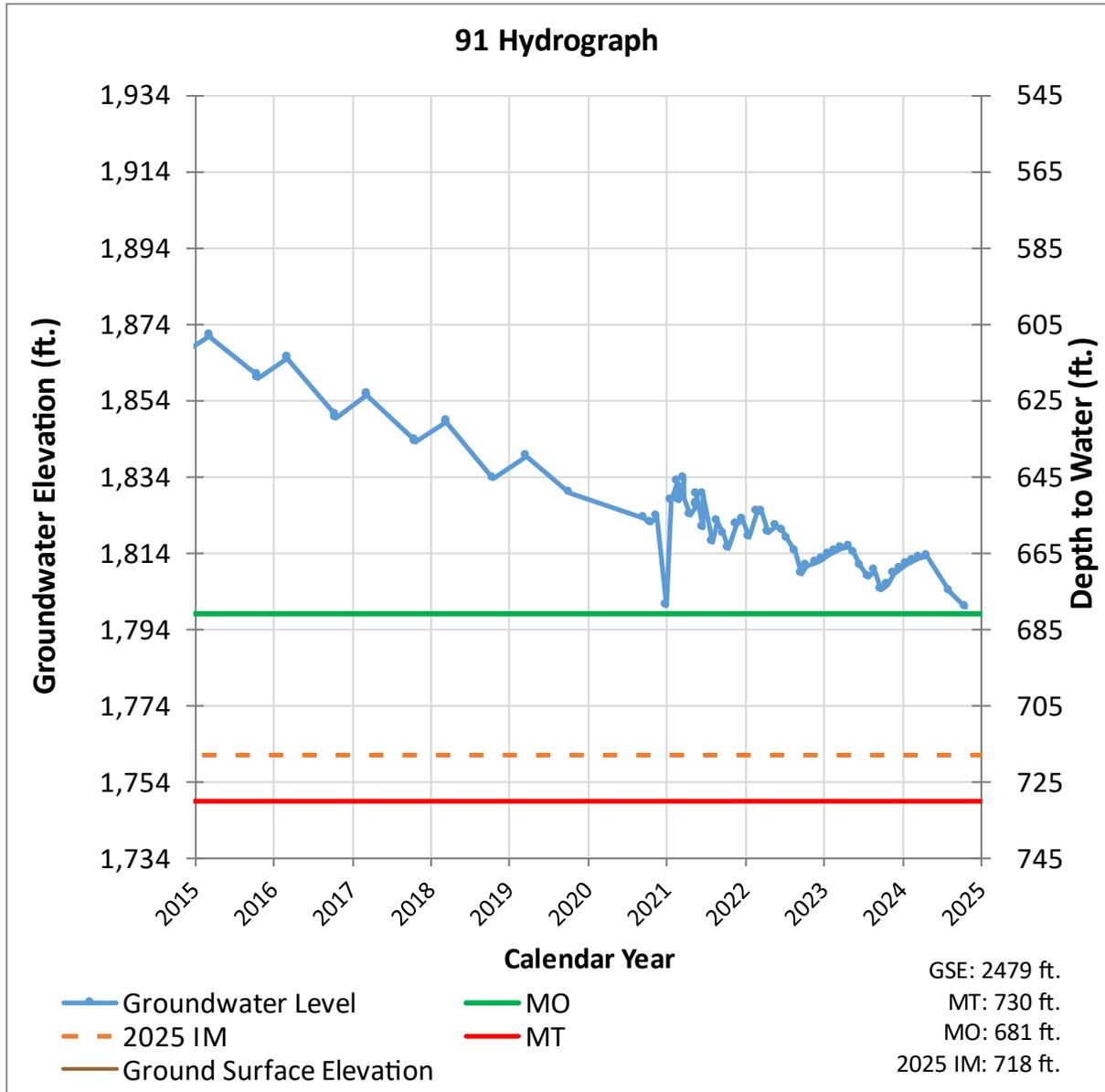


Figure 2-11: Example Well Hydrographs – Eastern Region

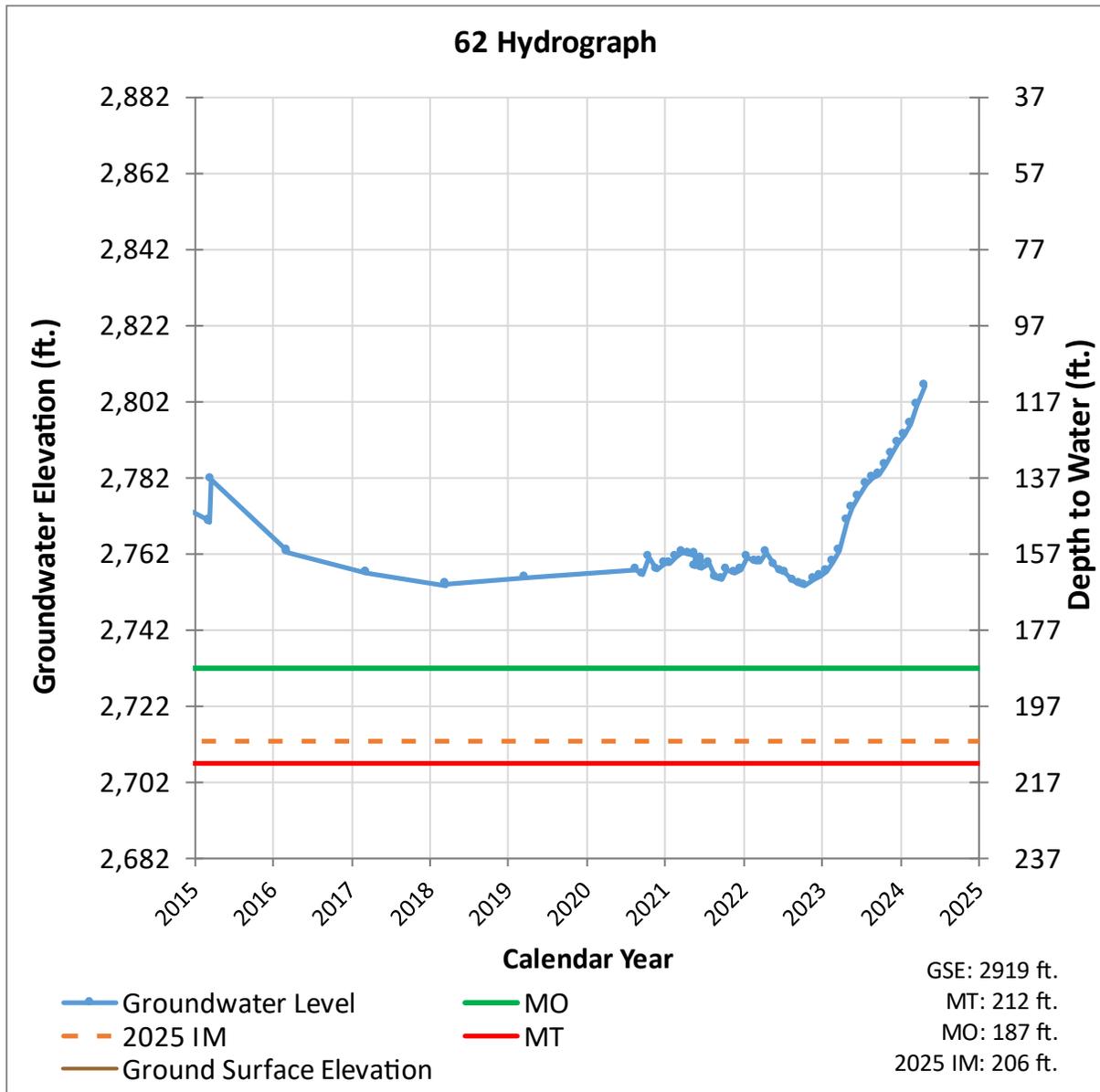
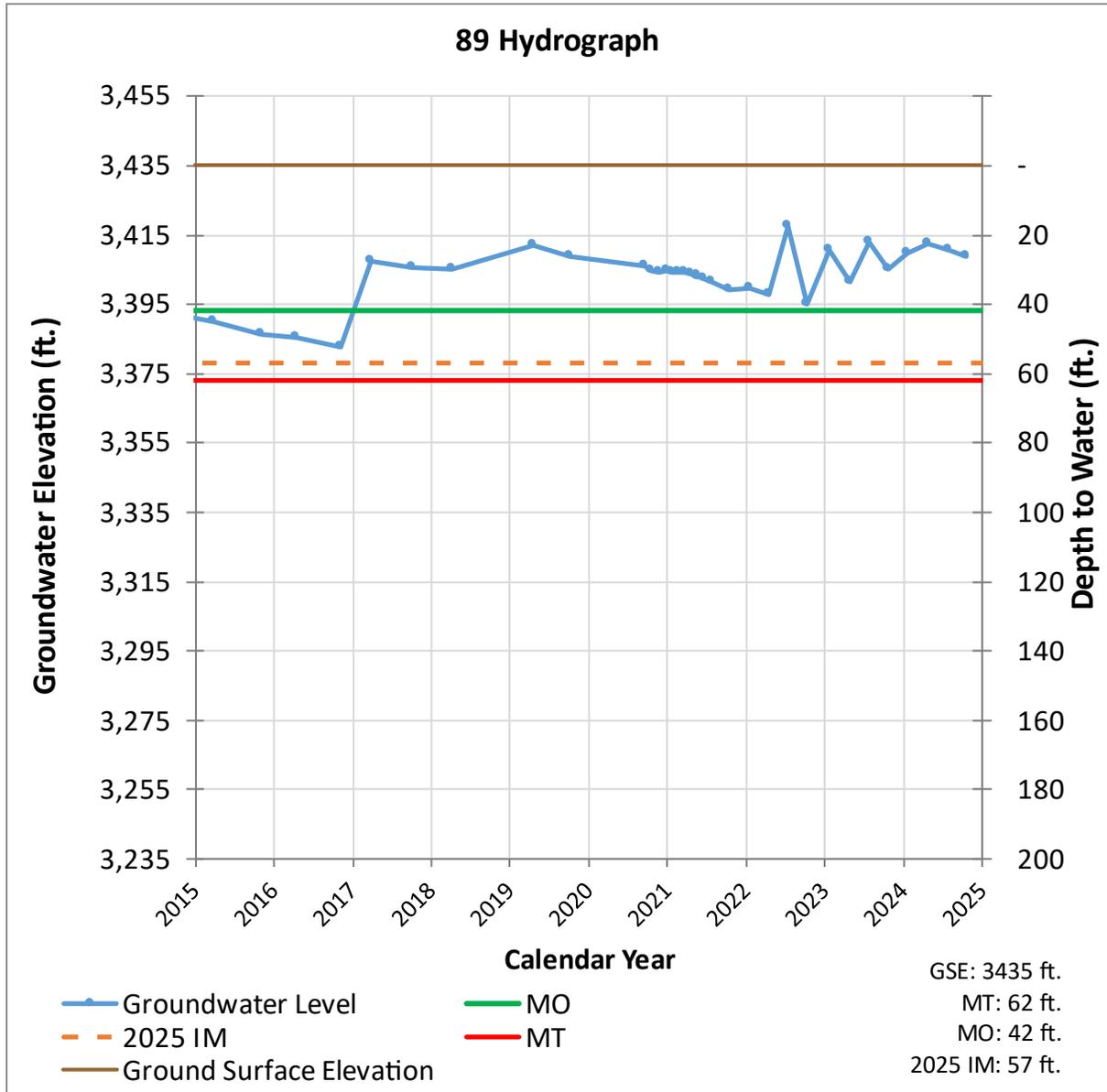


Figure 2-12: Example Well Hydrographs – Southeastern Region



Section 3. Water Use

§356.2 (b) (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.
§356.2 (b) (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.
§356.2 (b) (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.

3.1 Groundwater Extraction

Water budgets in the Cuyama Basin GSP were developed using the Cuyama Basin Water Resources Model (CBWRM) model, which is a fully integrated surface and groundwater flow model covering the Basin. The CBWRM was used to develop a historical water budget that evaluated the availability and reliability of past surface water supply deliveries, aquifer response to water supply, and demand trends relative to water year type. For the 2020 GSP, the CBWRM was used to develop water budget estimates for the hydrologic period of 1998 through 2017. An update of the model, including re-calibration based on recently available data, was completed for the 2025 GSP Update and is based on the best available data and information as of September 2023. An assessment of model uncertainty included in the GSP estimated an error range in overall model results of about +/- 10%. It is expected that the model will be refined in the future as improved and updated monitoring information becomes available for the Basin. For the current Annual Report, the CBWRM model was extended to include the 2024 water year, utilizing updated land use, temperature, and precipitation³ data from those years.

Figure 3-1 shows the annual time series of groundwater pumping for the water years 1998 through 2024.⁴ The CBWRM estimates a total groundwater extraction amount of 33,700 AF in the Cuyama Basin in the 2024 water year. This reflects a decrease of about 400 AF as compared to 2023. Almost all groundwater extraction in the Basin is for agriculture use. There is approximately 300 AF of domestic use in each year, with the remainder in each year being for agricultural use.

The total pumping volume in the basin in water year 2024 was significantly higher than the sustainable yield of 16,800 AF estimated in the GSP. The GSP included a pumping allocations management action to reduce pumping levels to sustainable levels by 2040. See section 7.5.2 for an update on progress made to implement this management action.

³ Precipitation data provided by PRISM was updated and there are minor changes to some historical (pre-2020) data reflected in the water budget results when compared to previous reports.

⁴ Groundwater extraction estimates for years 1998 through 2022 differ from estimates reported in previous Cuyama Basin Annual Reports due to the model update and re-calibration that was performed for the 2025 GSP Update.

Figure 3-1: Annual Groundwater Extraction in the Cuyama Basin in Water Years 1998-2024

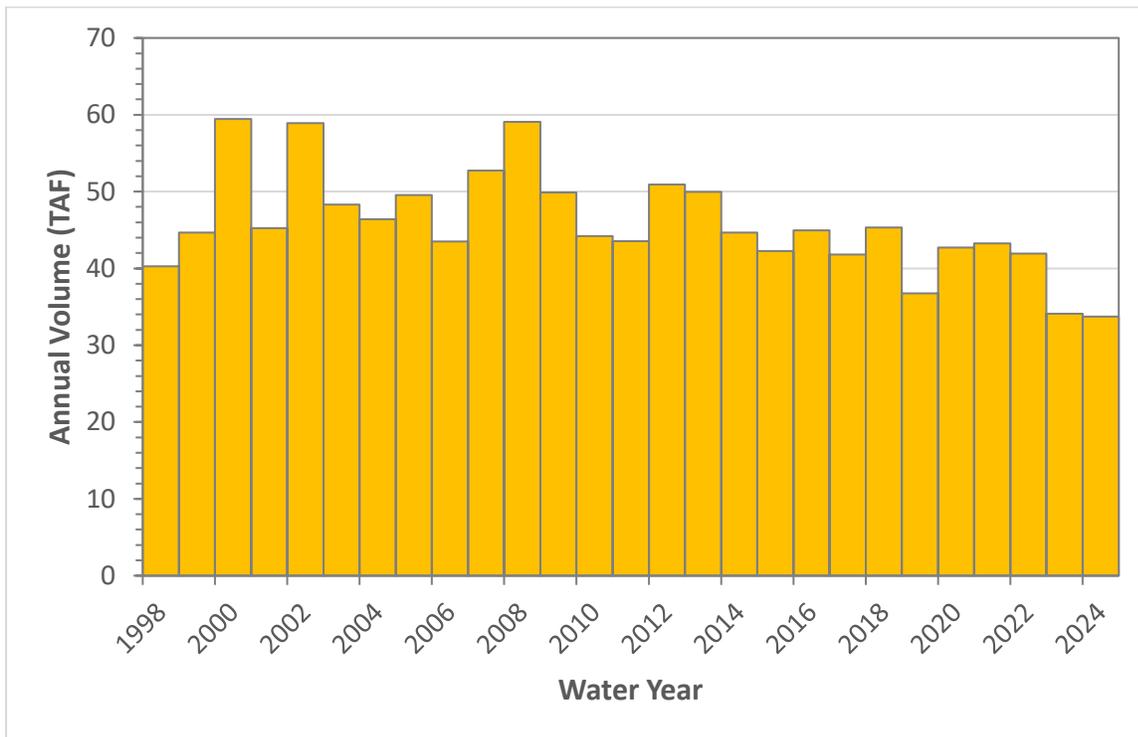


Figure 3-2 shows the locations where groundwater is applied in the Basin. The locations of groundwater use have not changed significantly since completion of the GSP.

Figure 3-3: Shows the active pumping wells within the Cuyama Basin Boundary.

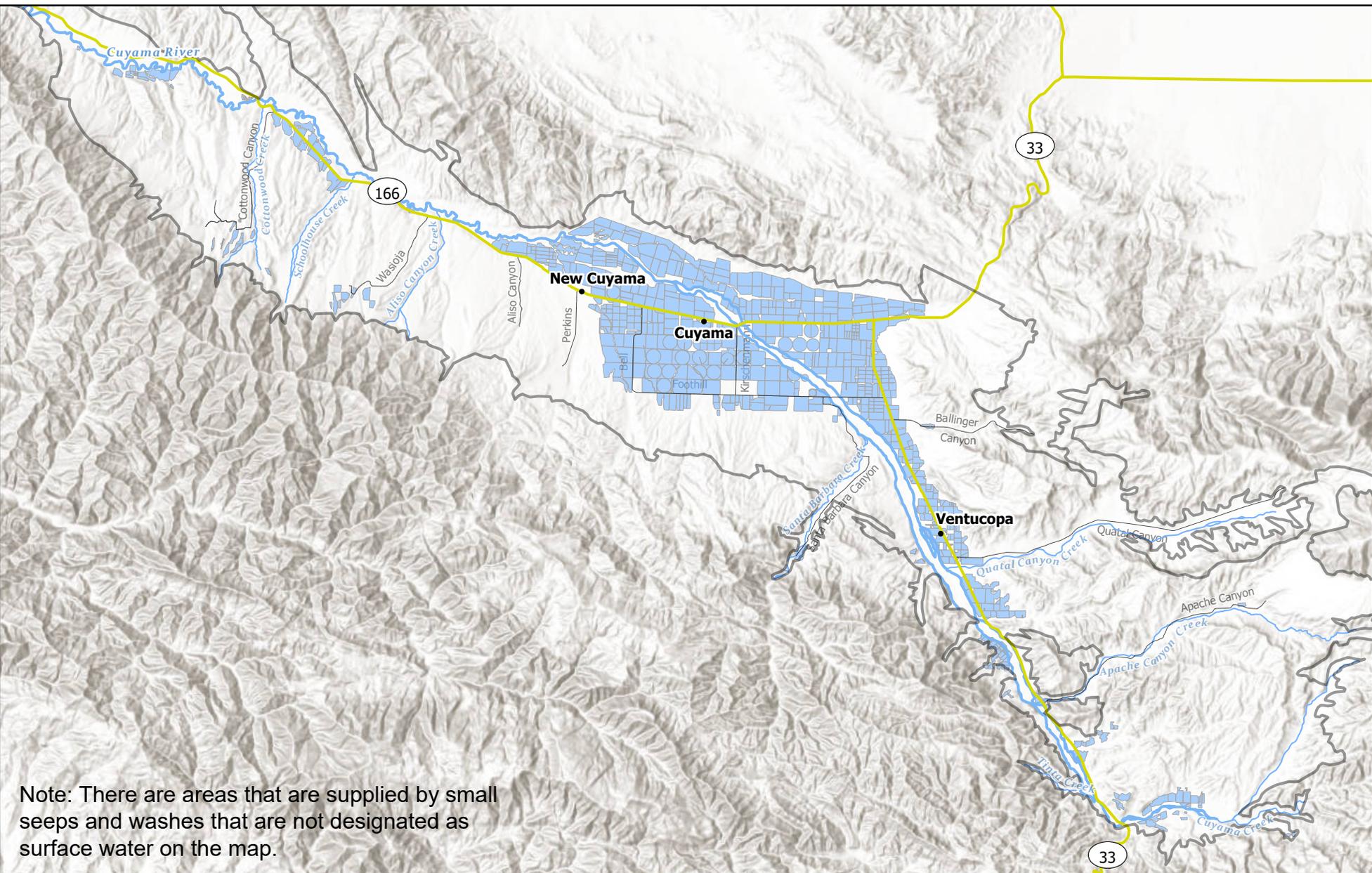
3.2 Surface Water Use

Surface water use in the Cuyama Basin was minimal during the reporting period.

3.3 Total Water Use

Since there is minimal surface water use in the Cuyama Basin, the total water use equals the groundwater extraction in each year, as shown in Section 3.1.

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Note: There are areas that are supplied by small seeps and washes that are not designated as surface water on the map.

Figure 3-2: Water Source for Land Use
Cuyama Valley Groundwater Basin

Legend	Water Source	Highway	Cuyama River
	Irrigated by Surface Water	Local Road	Creek
	irrigated by Surface and Groundwater	Town	Cuyama Basin
Irrigated by Groundwater			

0 1.25 2.5 5 Miles

Map Created: December 2023

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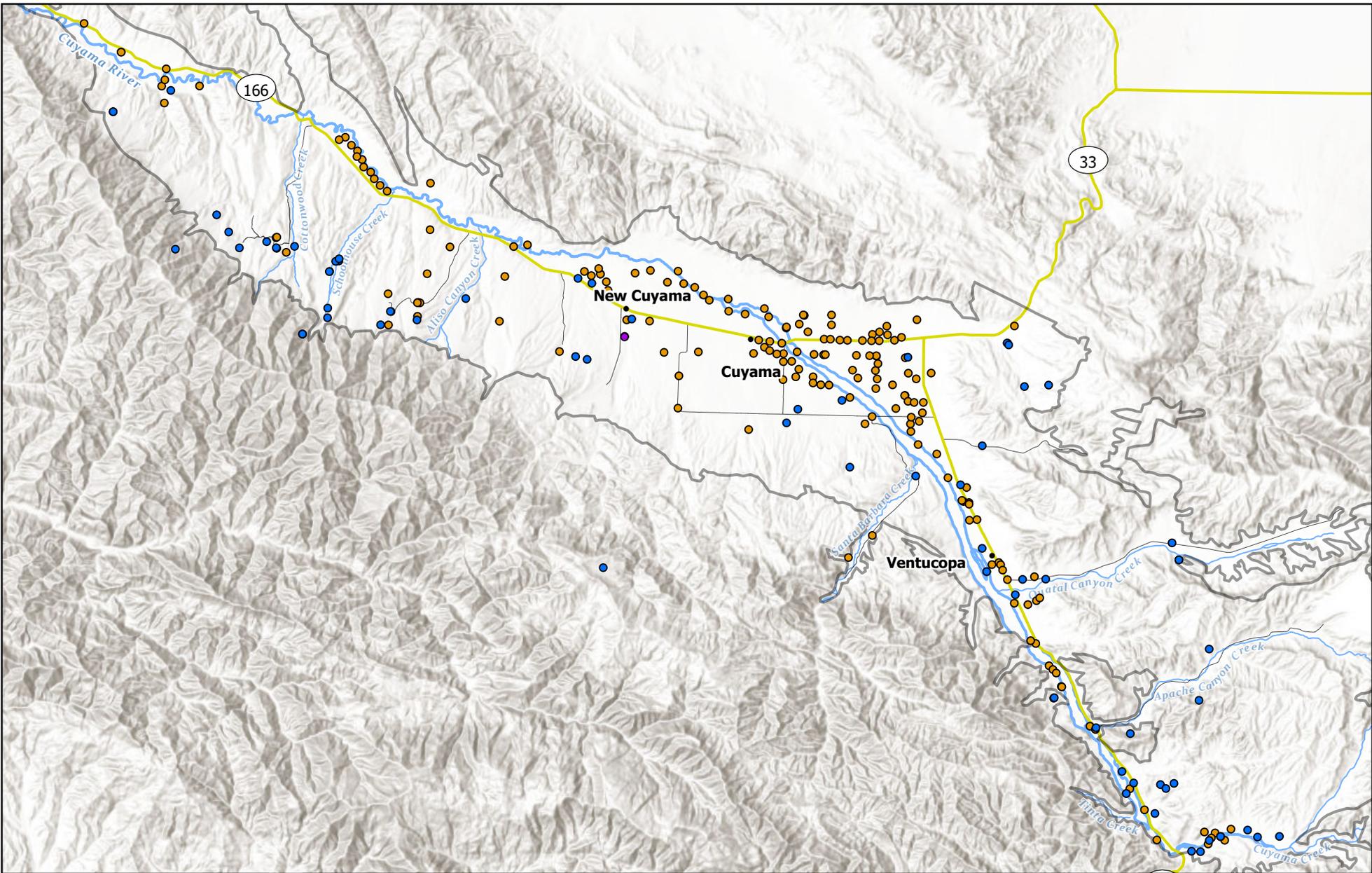


Figure 3-3: Active Wells in Network

Cuyama Valley Groundwater Basin

Legend

- | | | |
|--------------|--------------|----------------|
| Well Type | — Highway | — Cuyama River |
| ● Domestic | — Local Road | — Creek |
| ● Production | ● Town | □ Cuyama Basin |
| ● Public | | |



0 1.25 2.5 5 Miles

Map Created: December 2023

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Section 4. Change in Groundwater Storage

§356.2 (b) (5)	Change in groundwater in storage shall include the following:
§356.2 (b) (5) (A)	Change in groundwater in storage maps for each principal aquifer in the basin.
§356.2 (b) (5) (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.

Figure 4-1 shows contours of the estimated change in groundwater levels in the Cuyama Basin between fall 2023 and fall 2024. The changes shown are based on historical measurements of groundwater elevations in Cuyama Basin representative wells that have recorded measurements in the fall period of each year. These contours are useful at the planning level for understanding groundwater levels across the Basin, and to identify general horizontal gradients and regional groundwater level trends. The contour map is not indicative of exact values across the Basin because groundwater contour maps approximate conditions between measurement points, and do not account for topography.

A quantitative estimate of the annual change in groundwater storage was estimated using the CBWRM model, which was extended to include the 2024 water year as described in the groundwater extraction section above. The CBWRM was used to estimate the full groundwater budget for each year in the Cuyama Basin, which consists of a single principal aquifer. The estimated values for each water budget component in each of the past four years are shown in **Table 4-1**. The CBWRM estimates a reduction in groundwater storage of 22,200 AF in 2022, an increase of 9,900 AF in 2023, and a reduction of 2,100 AF in 2024.

Table 4-1: Groundwater Budget Estimates for Water Years 2022, 2023, and 2024

Component	Water Year 2022 (AFY)	Water Year 2023 (AFY)	Water Year 2024 (AFY)
Inflows			
Deep percolation	13,800	26,900	21,300
Stream seepage	4,500	11,800	8,100
Subsurface inflow	1,400	5,300	2,300
Total Inflow	19,700	44,000	31,700
Outflow			
Groundwater pumping	41,900	34,100	33,800
Total Outflow	41,900	34,100	33,800
Change in Storage	-22,200	+9,900	-2,100

Table 4-2 shows groundwater extractions by water use sector. The primary use of groundwater extractions in the basin is agricultural, accounting for 99% of the groundwater utilized. Urban water use is primarily in Cuyama and New Cuyama for drinking water supply. Groundwater use for other sectors in the Cuyama Basin is minimal.

As shown in **Table 4-3**, the groundwater extraction estimates were developed using the CBWRM model developed by the CBGSA. The model uses crop acreage from local landowners and LandIQ to estimate crop demands.

Table 4-2: Groundwater Extraction By Water Use Sector (2024)

Groundwater Extraction Sector	Total Water Use (Acre-feet)
Agricultural	33,600
Urban	200
Industrial	0
Managed Wetlands	0
Managed Recharge	0
Native Vegetation	0
Other	0
Total	33,800

Table 4-3: Groundwater Extraction Measurement Volume Methods and Accuracy Table

Groundwater Extraction Volume	Measurement Type	Method Description	Accuracy	Accuracy Description
33,800	CBWRM	Indirect estimate of groundwater extraction based upon a calculated demand. Crop demand is estimated using locally reported crops per field with the spatial support of LandIQ.	+/-10%	CBWRM utilizes available land use, precipitation, evapotranspiration, soil survey, geological survey, population and per-capita water use data in the subbasin. Since the primary water use sector is agriculture, LandIQ was correlated with local survey data to better estimate crop demand.

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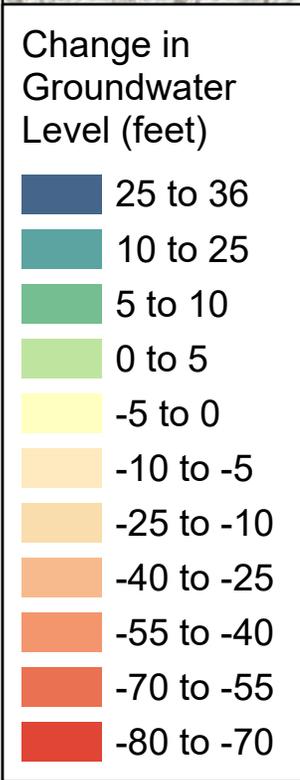
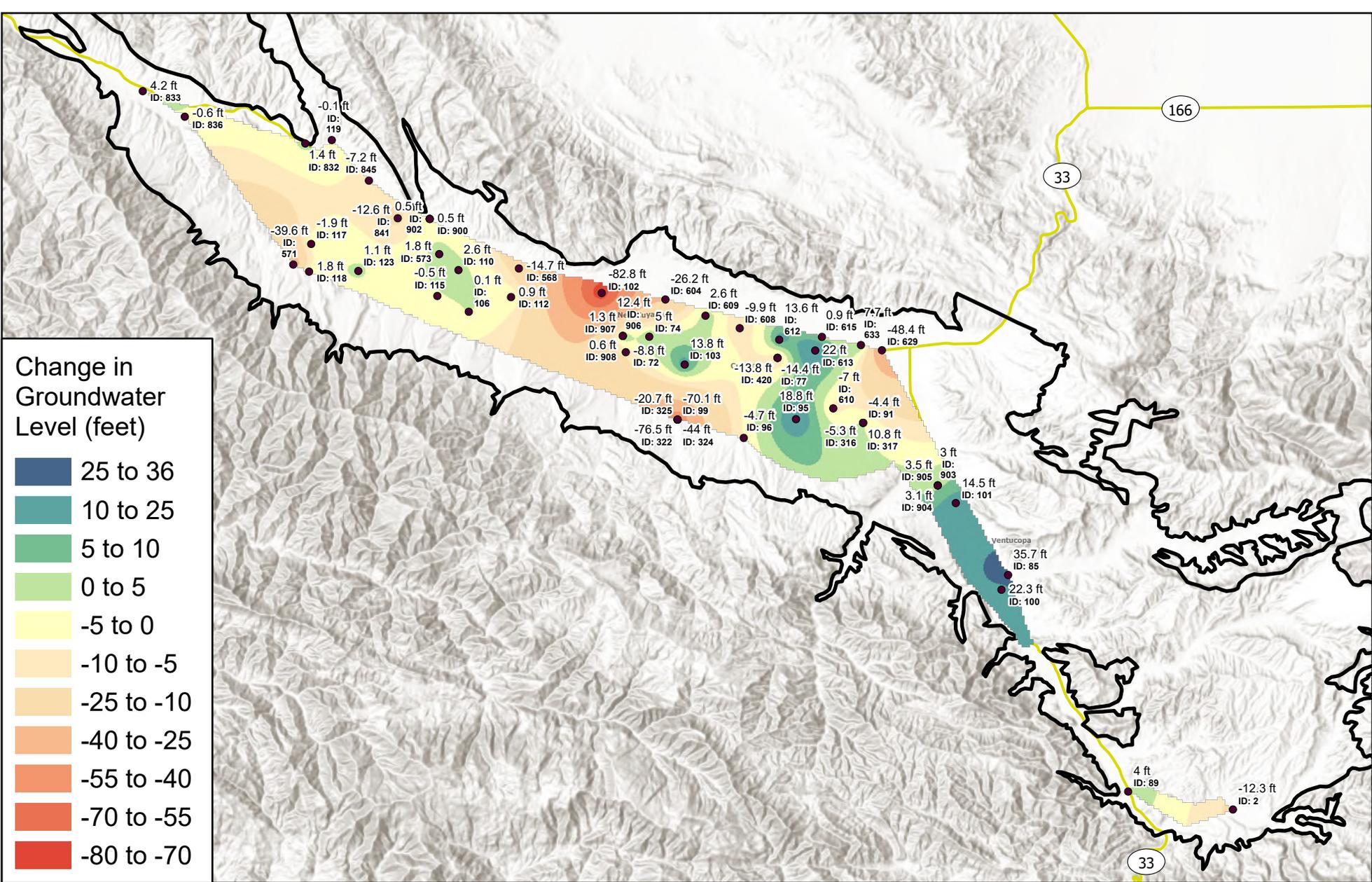


Figure 4-01: Groundwater Level Change - Fall 2023 to Fall 2024

Cuyama Valley Groundwater Basin

Legend

- Measurement Well
- ▭ Cuyama Basin
- Highway

GWL difference was calculated from wells with measurements collected in both October 2023 and 2024. "ID" labels correspond to Opti ID numbers - refer to individual well hydrographs for a more informative view of GWL change.

N

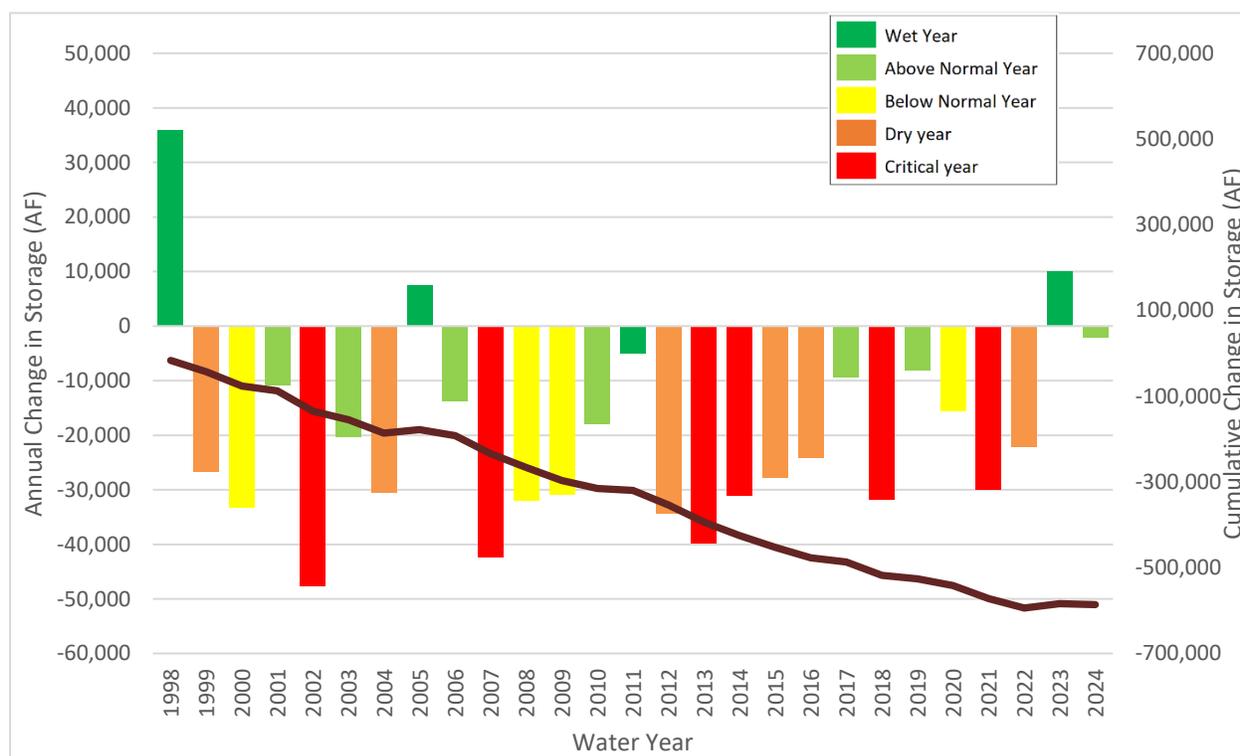
0 1.25 2.5 5 Miles

Map Created: February 2025

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Figure 4-2 shows the historical change in groundwater storage by year, water year type,⁵ and cumulative water volume in each year for the period from 1998 through 2024.⁶ The change in groundwater storage in each year was estimated by the CBWRM model. The color of bar for each year of change in storage correlates a water year type defined by Basin precipitation.

Figure 4-2: Change in Groundwater Storage by Year, Water Year Type, and Cumulative Water Volume



⁵ Water year types are customized for the Basin watershed based on annual precipitation as follows:

- Wet year = more than 19.6 inches
- Above normal year = 13.1 to 19.6 inches
- Below normal year = 9.85 to 13.1 inches
- Dry year = 6.6 to 9.85 inches
- Critical year = less than 6.6 inches.

⁶ Groundwater storage change estimates for years 1998 through 2021 differ from estimates reported in previous Cuyama Basin Annual Reports due to model updates using the most recent land use data.

Section 5. Groundwater Quality

As discussed in Section 4.8 of the Cuyama GSP, the CBGSA’s groundwater quality network is designed to monitor salinity levels (as total dissolved solids (TDS)). The groundwater quality network prior to the 2025 GSP Update was composed of 64 wells representative wells and 13 non-representative wells, for a total of 77 wells, as shown in **Figure 5-1**.

In 2023 a comprehensive review of the groundwater quality network was conducted after three years of annual sampling for TDS had been performed. Wells were evaluated with respect to the following issues: lack of landowner agreements for monitoring, access issues at well sites, access issues due to weather. Based on this analysis, the CBGSA board approved a revised water quality network in November 2023, which includes 29 representative wells and 12 non-representative wells, is shown in **Figure 5-2**. This revised network will take effect when the 2025 GSP Update is complete and will provide adequate coverage in the Basin while ensuring continued and consistent monitoring during the GSP implementation period.

In 2024, the CBGSA collected TDS measurements at 25 of the 29 representative wells (86%) in the groundwater quality monitoring network. The results are listed in **Table 5-1** and shown on **Figure 5-3**. Of the 25 representative wells measured in water year 2024, nine wells were lower (i.e. better) than their measurable objective, 16 wells were between the measurable objective and minimum threshold, and no wells exceeded the minimum threshold. 14% of wells were not sampled due to limitations in gaining access to well sites. Water quality results (as compared to minimum thresholds) can be found in **Table 5-1** and **Figure 5-4**. The CBGSA will continue to sample for TDS and will assess the appropriateness of sustainability criteria for TDS in the future.

The CBGSA conducts its own sampling for nitrate and arsenic once every five years. In the interim years the CBGSA leverages existing monitoring programs for nitrate and arsenic through California State Water Resource Control Board Groundwater Ambient Monitoring and Assessment (GAMA) Database, which includes in particular data from the Central Coast Regional Water Board’s Irrigated Lands Program for nitrates as part of its database. Nitrate and arsenic data are shown on **Figure 5-5** for nitrate **Figure 5-6** for arsenic. The table on the **Figure 5-6** shows arsenic results from a multi -completion well. As you can see arsenic varies with depth so results for all depths are shown.

These maps include data downloaded from GAMA and the sampling results from the CBGSA’s sampling for these constituents conducted in 2022 and reported in the WY 2022 Annual Report. Because few measurements were available for WY 2023 and WY 2024, these maps include data for water years 2022, 2023 and 2024 in the Cuyama Basin. The CBGSA will continue to rely on these third-party sources as described in the 2022 GSP update Supplemental Section 2.2.7.

Table 5-1: Groundwater Quality Network Wells and TDS Measurements

Opti ID	TDS						
	Date	Measurement (mg/L)	MO (mg/L)	MT (mg/L)	MT Status	2025 Interim Milestone (mg/L)	Interim Milestone Status
61	-	-	585	1000	-	896	-
72	8/21/2024	894	900	1106	Below MO	1055	Below IM
74	8/22/2024	1360	1310	1872	Below MT	1732	Below IM
77	7/20/2024	1165	1120	1682	Below MT	1542	Below IM
79	8/22/2024	1,630	1500	2318	Below MT	2114	Below IM
83	8/21/2024	1110	1120	1816	Below MO	1642	Below IM
88	8/22/2024	337	320	1000	Below MT	830	Below IM
90	8/22/2024	1120	1400	1596	Below MO	1547	Below IM
91	7/20/2024	1059	1020	1558	Below MT	1424	Below IM
95	8/21/2024	1310	1340	1950	Below MO	1798	Below IM
96	8/21/2024	1220	1100	1676	Below MT	1532	Below IM
99	8/22/2024	1060	1140	1658	Below MO	1529	Below IM
101	8/21/2024	1230	1210	1735	Below MT	1604	Below IM
102	8/21/2024	1640	1500	2551	Below MT	2288	Below IM
157	-	-	1360	2468	-	2191	-
205	8/22/2024	348	380	1000	Below MO	845	Below IM
242	8/22/2024	883	780	1656	Below MT	1437	Below IM
316	7/20/2024	1105	1060	1524	Below MT	1408	Below IM
317	7/20/2024	1068	692	1444	Below MT	1256	Below IM
322	8/22/2024	1170	1140	1504	Below MT	1413	Below IM
324	8/22/2024	700	740	1000	Below MO	935	Below IM
325	8/22/2024	1040	1070	1687	Below MO	1533	Below IM
420	7/20/2024	1121	1080	1560	Below MT	1440	Below IM
421	7/20/2024	1390	1280	1761	Below MT	1640	Below IM
424	8/22/2024	1270	1260	1658	Below MT	1559	Below IM
467	8/22/2024	1080	1070	1846	Below MT	1652	Below IM
568	8/21/2024	841	860	1118	Below MO	1054	Below IM
841	-	-	561	1000	-	890	-
845	-	-	1250	1250	-	1250	-

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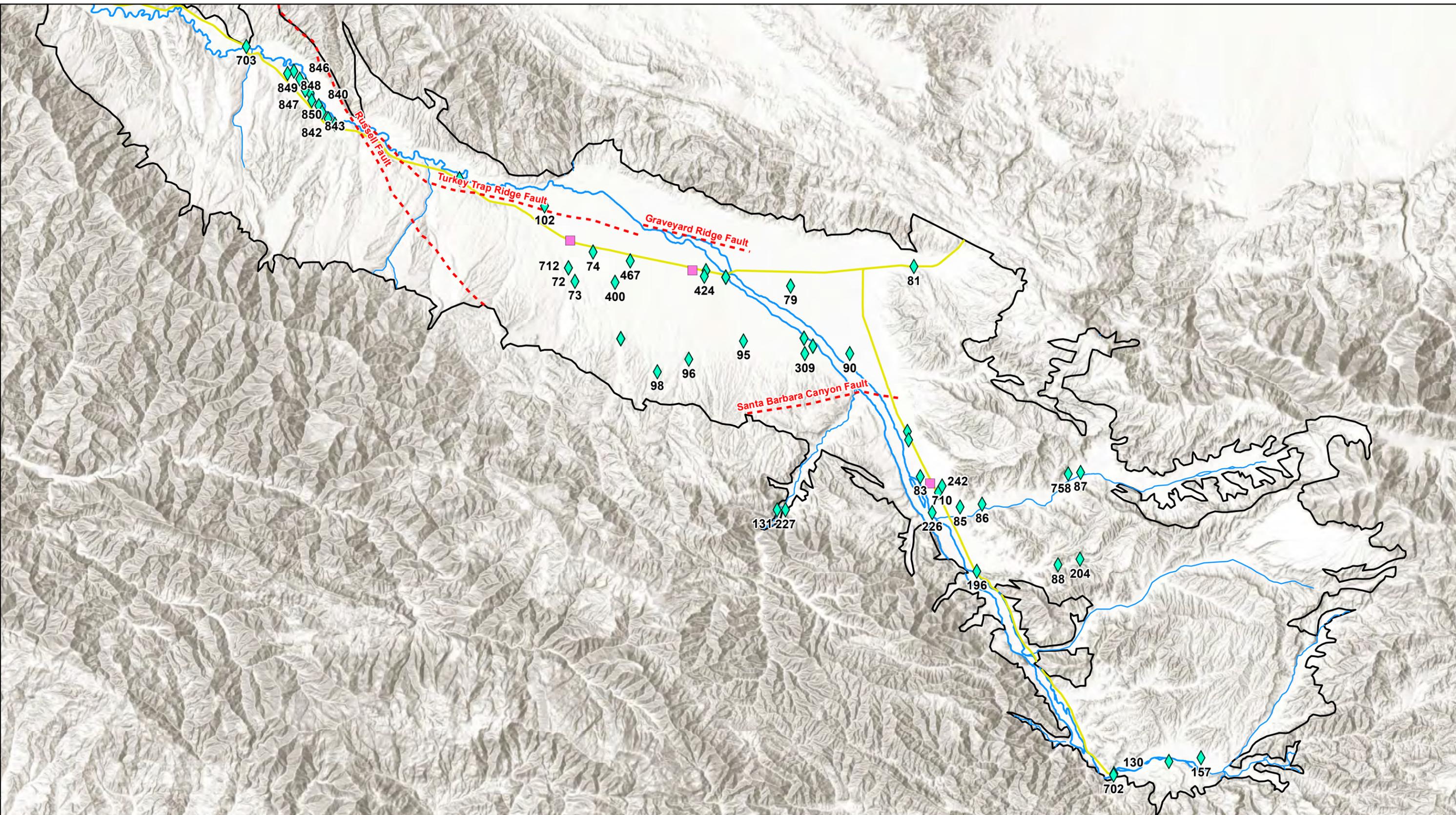


Figure 5-1: Cuyama GW Basin Groundwater Quality Representative Wells

Cuyama Basin Groundwater Sustainability Agency

Cuyama Valley Groundwater Basin Groundwater Sustainability Plan

December 2019

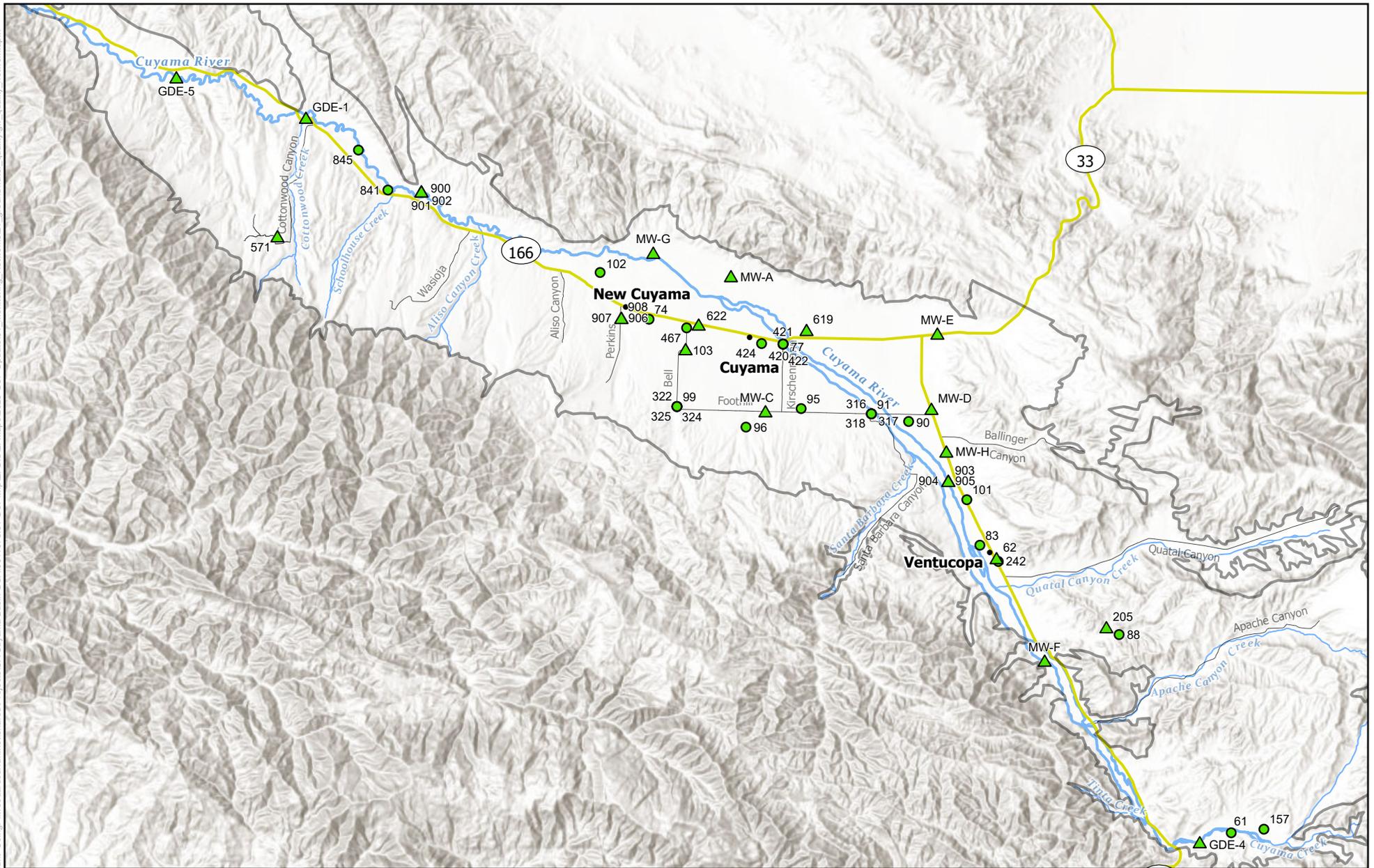


Legend

- Cuyama Basin
- Towns
- Faults
- Highways
- Cuyama River
- Streams
- Representative Groundwater Quality Wells



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<p>Figure 5-2: Updated Groundwater Quality Monitoring Network</p> <p>Cuyama Valley Groundwater Basin</p>	<p>Legend</p>	<p>● Network Well</p> <p>● Representative Monitoring</p> <p>▲ Non-representative Monitoring</p>	<p>— Highway</p> <p>— Local Road</p> <p>• Town</p>	<p>— Cuyama River</p> <p>— Creek</p> <p>□ Cuyama Basin</p>		<p>0 1.25 2.5 5 Miles</p> <p>Map Created: December 2023</p>
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Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data sources: CA DWR, Esri, USGS. Monitoring well data available in the Opti data catalog: <https://opti.woodardcurran.com/cuyama/login.php>

Figure Exported: 2/17/2025, By: D:\h\int... \kingsp\woodardcurran.net\shared\Projects\CA\Cuyama Basin_GSA0011078.01_GSEP\wp37_GIS\2_Maps\2_Annual Reports\WY2024_APR\groundwater_quality\groundwater_quality.aprx

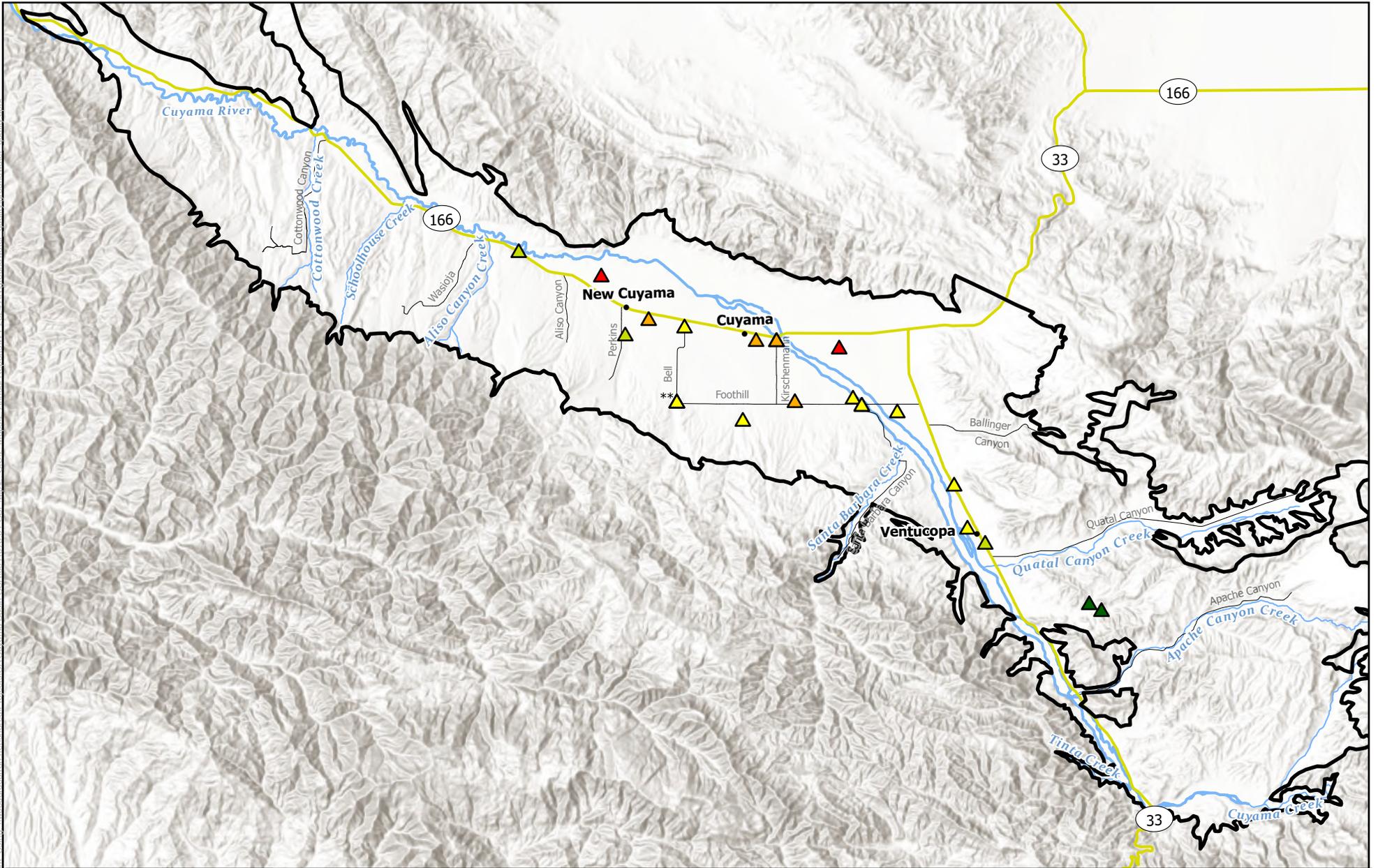


Figure 5-3: Groundwater Quality Measurements - TDS

October 2024 Data

Cuyama Valley Groundwater Basin

Legend

- | | | | |
|----------------------|----------------------|---------------------------------|----------------|
| ▲ < 500 mg/L | ▲ 1,251 - 1,500 mg/L | — Highway | — Creek |
| ▲ 501 - 750 mg/L | ▲ 1,501 - 1,750 mg/L | — Local Road | — Cuyama River |
| ▲ 751 - 1,000 mg/L | ▲ 1,751 - 2,000 mg/L | • Town | ▭ Cuyama Basin |
| ▲ 1,001 - 1,250 mg/L | ▲ 2,000 - 2,500 mg/L | **Nested well at this location. | |



0 1.25 2.5 5 Miles

Map Created: February 2025

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data sources: CA DWR, Esri, USGS

Figure Exported: 2/28/2025, By: Dhlunt, Using: WoodardCurran netshared\Projects\CA\Cuyama Basin_GSA0011078.01_GSP\wpiz_GIS2_Maps\1_Regular_Reporting\RegularReportingPro.aprx

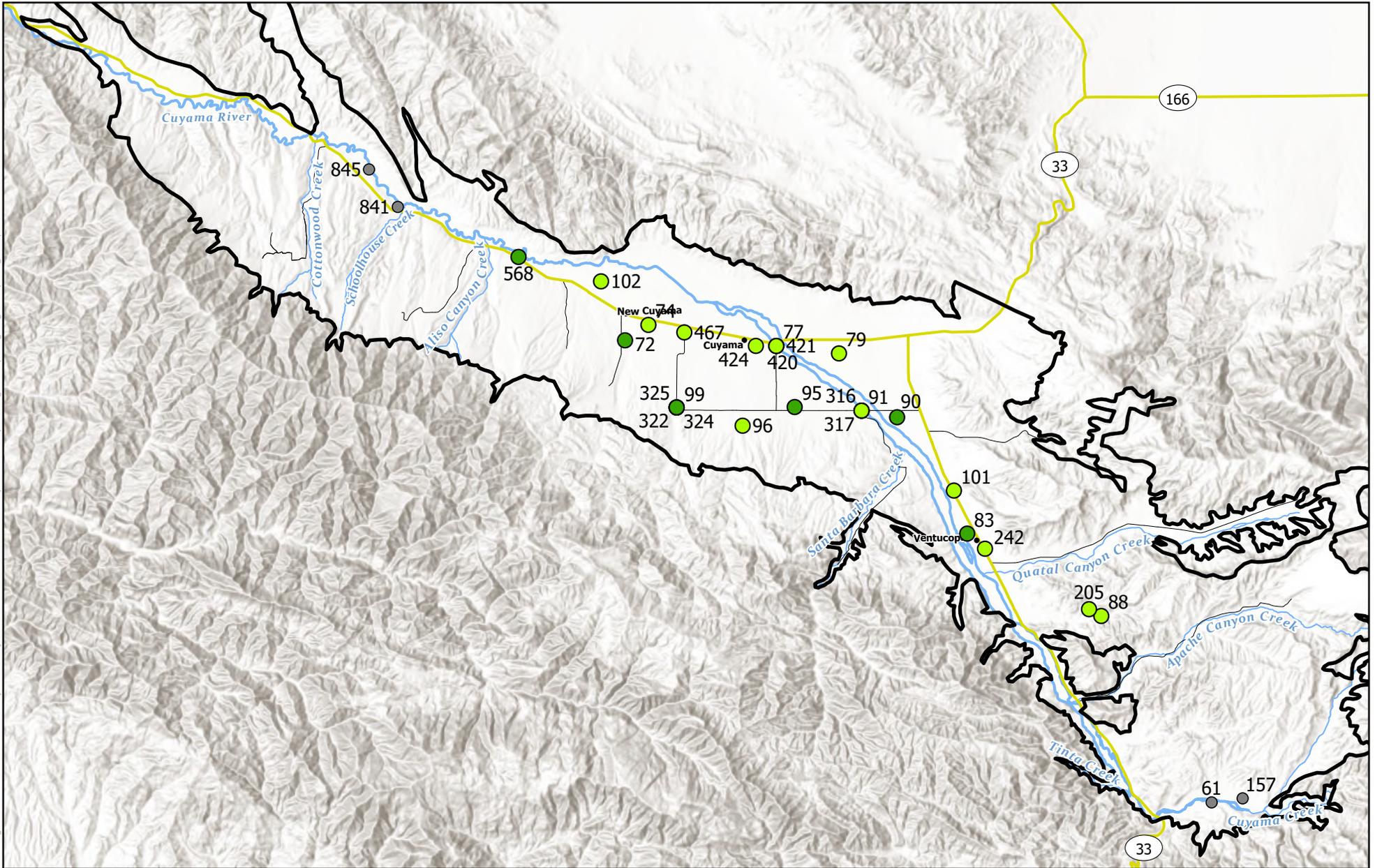


Figure 5-4: Groundwater Quality Status - TDS

Years 2022 to 2024

Cuyama Valley Groundwater Basin

Legend

- | | | |
|---|---|--|
| ● Below Measurable Objective | Cuyama Basin | ● Town |
| ● Below Minimum Threshold | Highway | — Creek |
| ● Exceeds Minimum Threshold | Local Road | — Cuyama River |
| ● No available data this period | Status determined using 2025 sustainable management criteria. | |





Woodard & Curran





0 1.25 2.5 5 Miles

Map Created: February 2025

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data sources: CA DWR, Esri, USGS**

Figure Exported: 2/19/2025, By: Dhlunt, Using: Woodardcurran.net\shared\Projects\CA\Cuyama Basin_GSA0011078.01_GSP\wp\Z_GIS\2_Maps\2_Annual Reports\WY 2024 AR\groundwater_quality\groundwater_quality.aprx

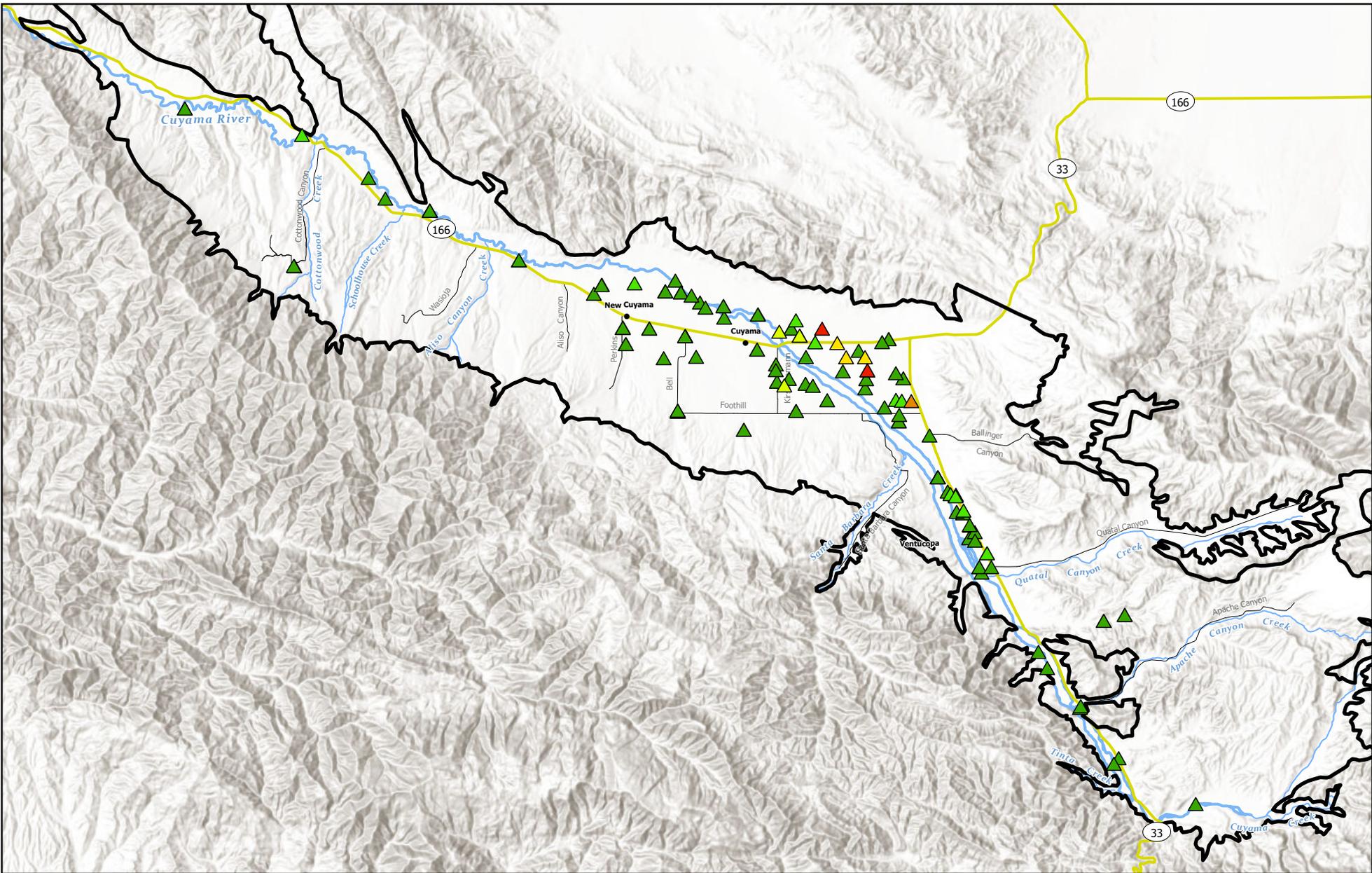


Figure 5-5: Groundwater Quality Measurements - Nitrate as NO₃-N

Years 2022 to 2024

Cuyama Valley Groundwater Basin

Legend

- | | | | |
|---------------|----------------|--------------|----------------|
| ▲ < 5 mg/L | ▲ 10 - 15 mg/L | — Highway | — Creek |
| ▲ 5 - 8 mg/L | ▲ 15 - 20 mg/L | — Local Road | — Cuyama River |
| ▲ 8 - 10 mg/L | ▲ > 20 mg/L | • Town | ▭ Cuyama Basin |

*Most recent values from monitoring wells with multiple observations are shown.



0 1.25 2.5 5 Miles

Map Created: February 2025

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data sources: CA DWR, Esri, USGS**

Figure Exported: 2/20/2025, By: Dhlunt, Using: Woodardcurran.net\shared\Projects\CA\Cuyama Basin_GSA0011078.01_GSP\wp\Z_GIS\2_Maps\2_Annual Reports\WY 2024 AR\groundwater_quality\groundwater_quality.aprx

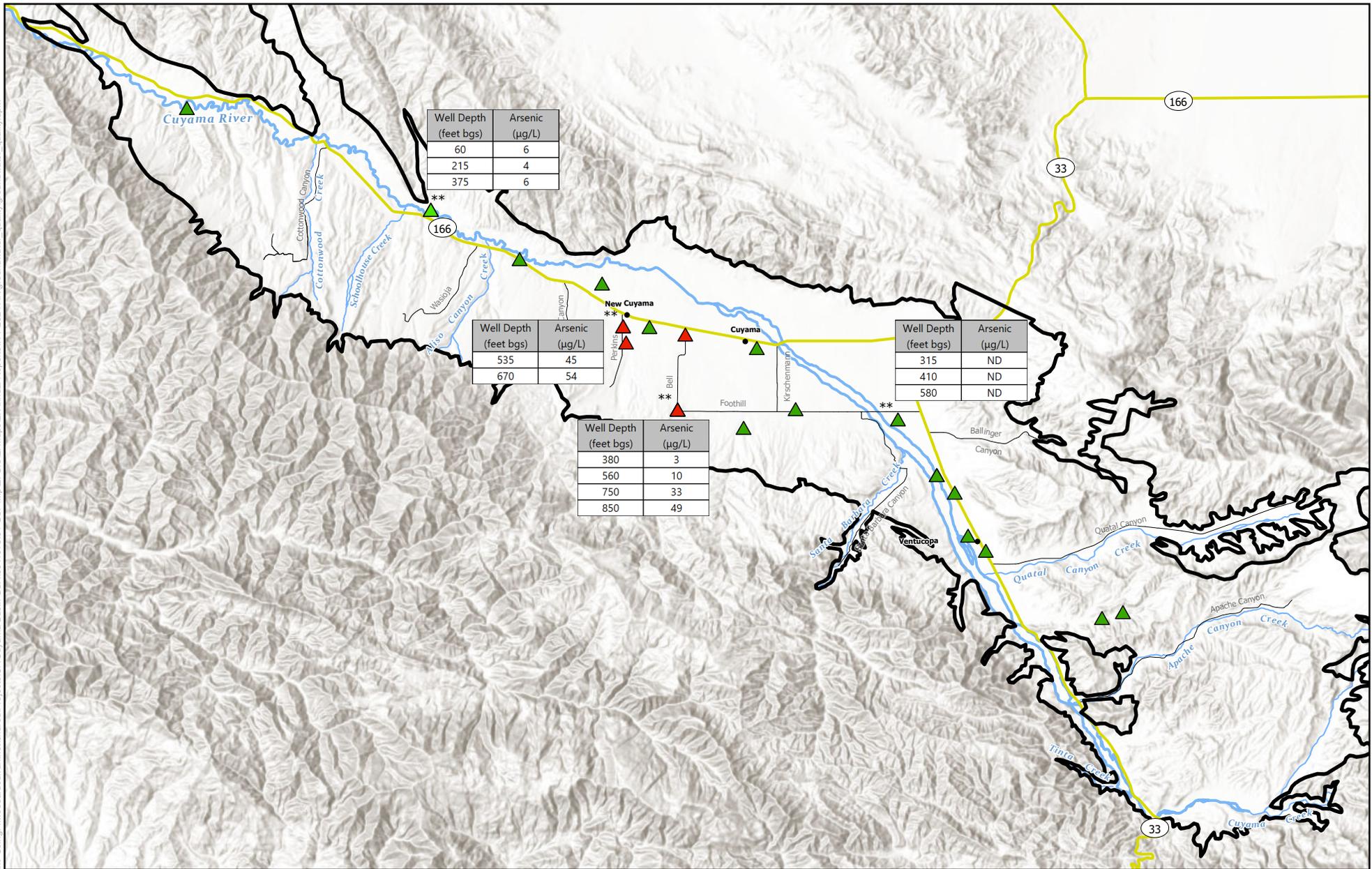


Figure 5-6: Groundwater Quality Measurements - Arsenic

Years 2022 to 2024

Cuyama Valley Groundwater Basin

Legend

- ▲ < 5 µg/L ▲ 10 - 15 µg/L — Highway — Creek
- ▲ 5 - 8 µg/L ▲ 15 - 20 µg/L — Local Road — Cuyama River
- ▲ 8 - 10 µg/L ▲ > 20 µg/L • Town □ Cuyama Basin

*Most recent values from monitoring wells with multiple observations are shown. **Nested well at this location.



0 1.25 2.5 5 Miles

Map Created: February 2025

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data sources: CA DWR, Esri, USGS**

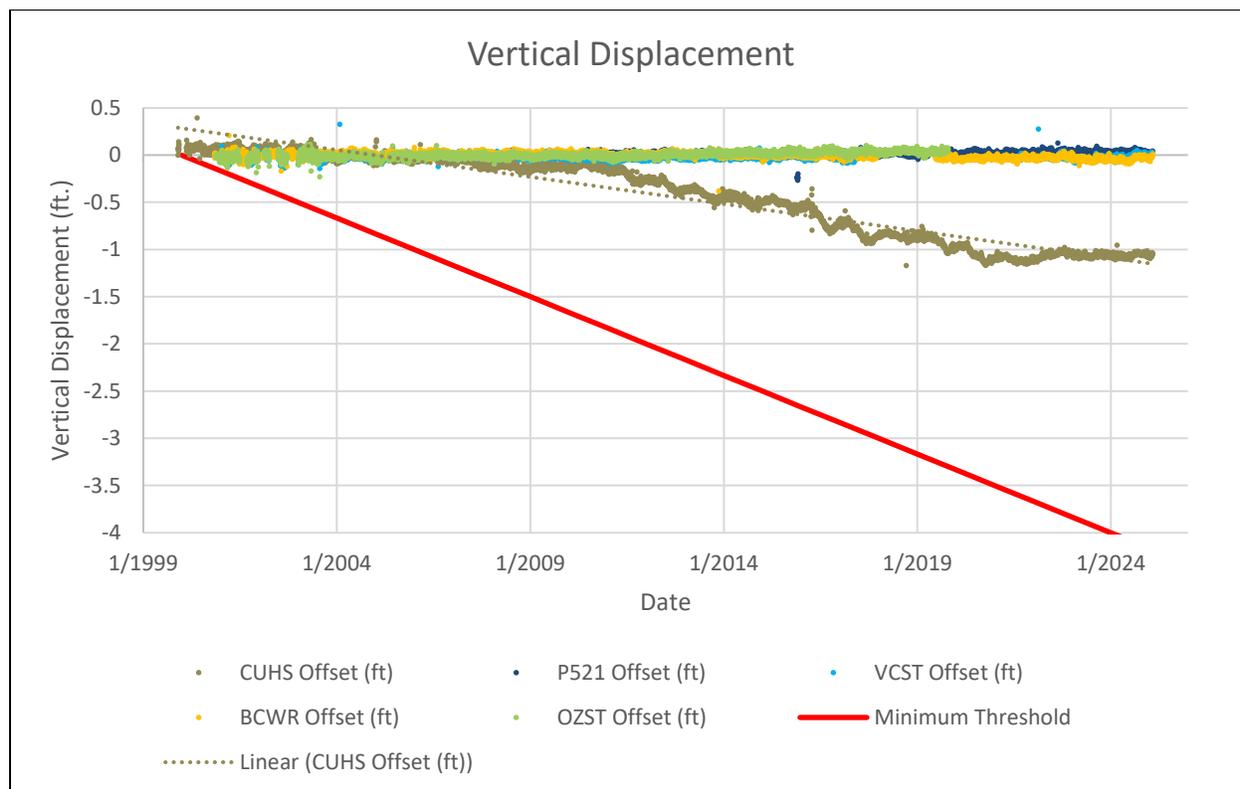
Section 6. Land Subsidence

Section 4.9 of the Cuyama Basin GSP describes the monitoring network for land subsidence in the Basin, which is composed of five continuous geographic positioning system (CGPS) stations in and around the Basin to monitor lateral and vertical ground movements. Two of the five stations, the Cuyama Valley High School (CUHS) and the Ventucopa (VCST) stations, are within the Basin boundary. The other three stations are outside of the Basin and provide data comparative data for vertical movements that are more likely related to tectonic displacement rather than land subsidence.

The undesirable result for subsidence, as described in Section 3.2.5, is detected when 30 percent of representative subsidence monitoring sites (i.e. 1 of 2 sites) exceed the minimum threshold for subsidence over two years. The minimum threshold for subsidence, as defined in GSP Section 5.6.3, is 2 inches per year.

At the time the GSP was submitted in 2020, subsidence rates for the CUHS station were -0.56 inches per year. As shown in **Figure 6-1** data through 2025 was downloaded from UNAVCO⁷ and the subsidence trend for CUHS was recalculated. Subsidence rates during 2021 and 2022 actually reflected a positive change in ground surface elevation, and current subsidence rates in the central portion of the Basin are 1.5 mm per year or 0.06 inches per year (for WY 2024) in an upwards direction. This rate is below the minimum threshold, and thus undesirable results for subsidence are not occurring in the Basin.

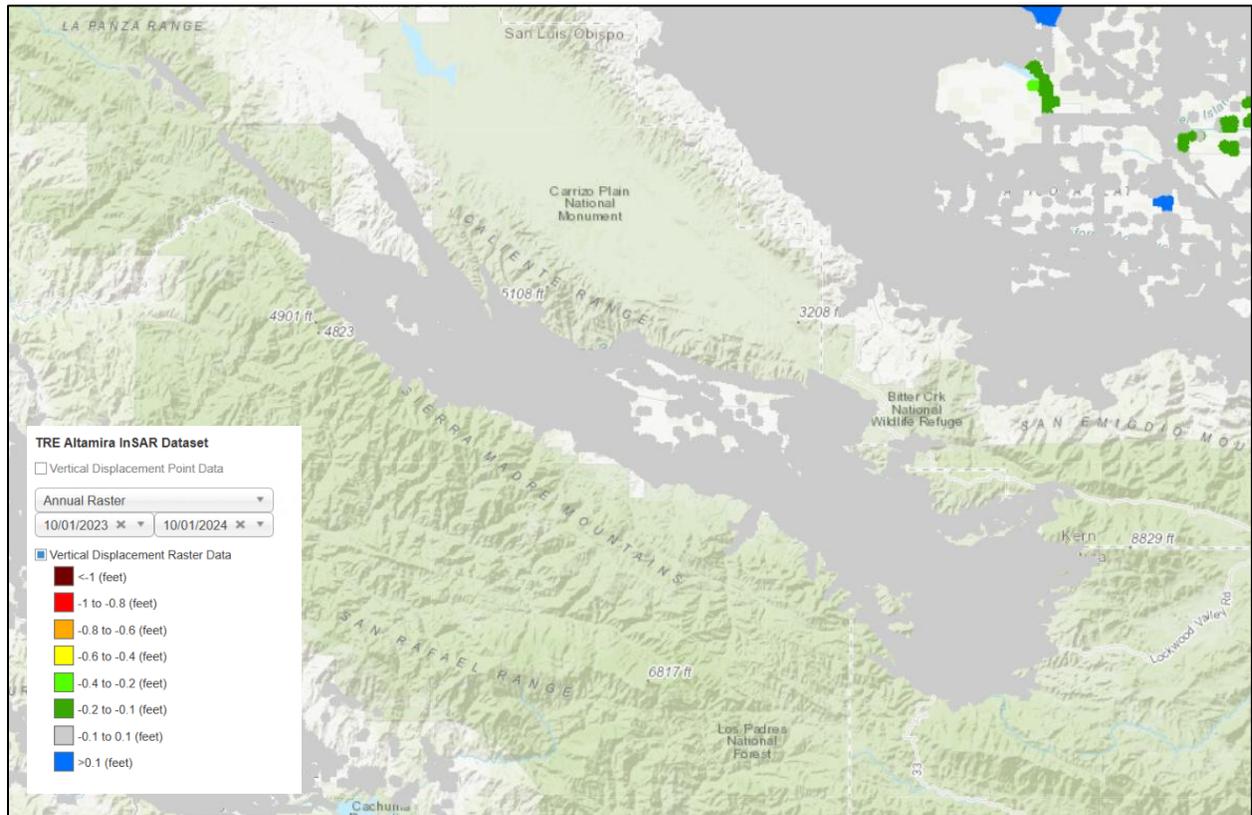
Figure 6-1: Subsidence Monitoring Data



⁷ <https://www.unavco.org/data/web-services/documentation/documentation.html#!/GNSS47GPS/getPositionByStationId>

Additional subsidence data is available through TRE Altamira InSAR Dataset from DWR and was used to verify no detrimental or drastic changes had occurred. Raster results are presented in **Figure 6-2** and show no discernable change (between -0.1 and +0.1 feet) over that period.

Figure 6-2: Cuyama Subsidence Raster from SGMA Data Viewer – TRE Altamira InSAR Data – WY2024



Section 7. Plan Implementation

§356.2 (c)	A description of progress toward implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.
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This section describes management activities taken by the CBGSA to implement the Cuyama Basin GSP from adoption of the GSP through preparation of this Annual Report.

7.1 Progress Toward Achieving Interim Milestones

Since the original GSP was adopted by the CBGSA Board recently and CBGSA data collection efforts began in the second half of 2020, progress toward achieving interim milestones is in its early stages.

To track changes in groundwater conditions and the Basins progress towards sustainability, the GSA compiles a quarterly groundwater condition reports based on the data collected to monitoring groundwater levels. Current data collection occurs quarterly with corresponding reports. Data collection prior to 2022 was conducted monthly, but the CBGSA determined quarterly data collection was sufficient after a full year of monthly monitoring had been performed.

The Updated 2025 GSP included a reevaluation of thresholds for the groundwater level sustainability indicator, as described in Section 5 (Minimum Thresholds, Measurable Objectives, and Interim Milestones). As described in the 2025 GSP Update, the minimum threshold calculation now uses a stepwise function that takes a conservative approach to protect wells (production and domestic) across the Basin while providing flexibility, when possible, to accommodate the CBGSA planned pumping allocations and reductions strategy. The stepwise function has four potential calculation outcomes:

1. **Combined Well protection and GDE protection depth:** The well protection depth and GDE protection depth were merged together in a GIS analysis process that interpolated the data into a 3-dimensional coverage across the Basin, in the same process elevation points make a topographic map of the surface elevation. For each RMW's location, the interpolated protection depth was then extracted to get the final Well Protection / GDE protection depth value.
 - a. **Well Protection Depth:** The well protection depth is used to ensure that active production and domestic wells within the Basin are protected from harm to their beneficial uses. The well protection depth is a numerical value representing the approximate depth at which, if exceeded, beneficial uses could be impacted in a well. This value is unique and calculated for each active production and domestic well within the Basin where there is available data. Where data is not available, generalized or regional proxy data is utilized. Some wells are screened from this analysis either because they are too far removed from the representative well network (and therefore conditions at the nearest RWM are not indicative of conditions at the active well because of distance and/or other conditions such as geology or topology) or wells were already dry in 2015. The well protection depth is calculated for each pumping well as a four-part stepwise function, with a slight difference in the fourth step between domestic and production wells (Figure 7-1).
 - b. **GDE Protection Depth:** All potential GDE locations in the Basin were assigned a protection depth of 30 ft bgs via a dense spatial point-cloud within each GDE polygon in

GIS. The point-clouds allow GIS to utilize the same data type (points instead of polygons) in the processing required for the protection depth calculation.

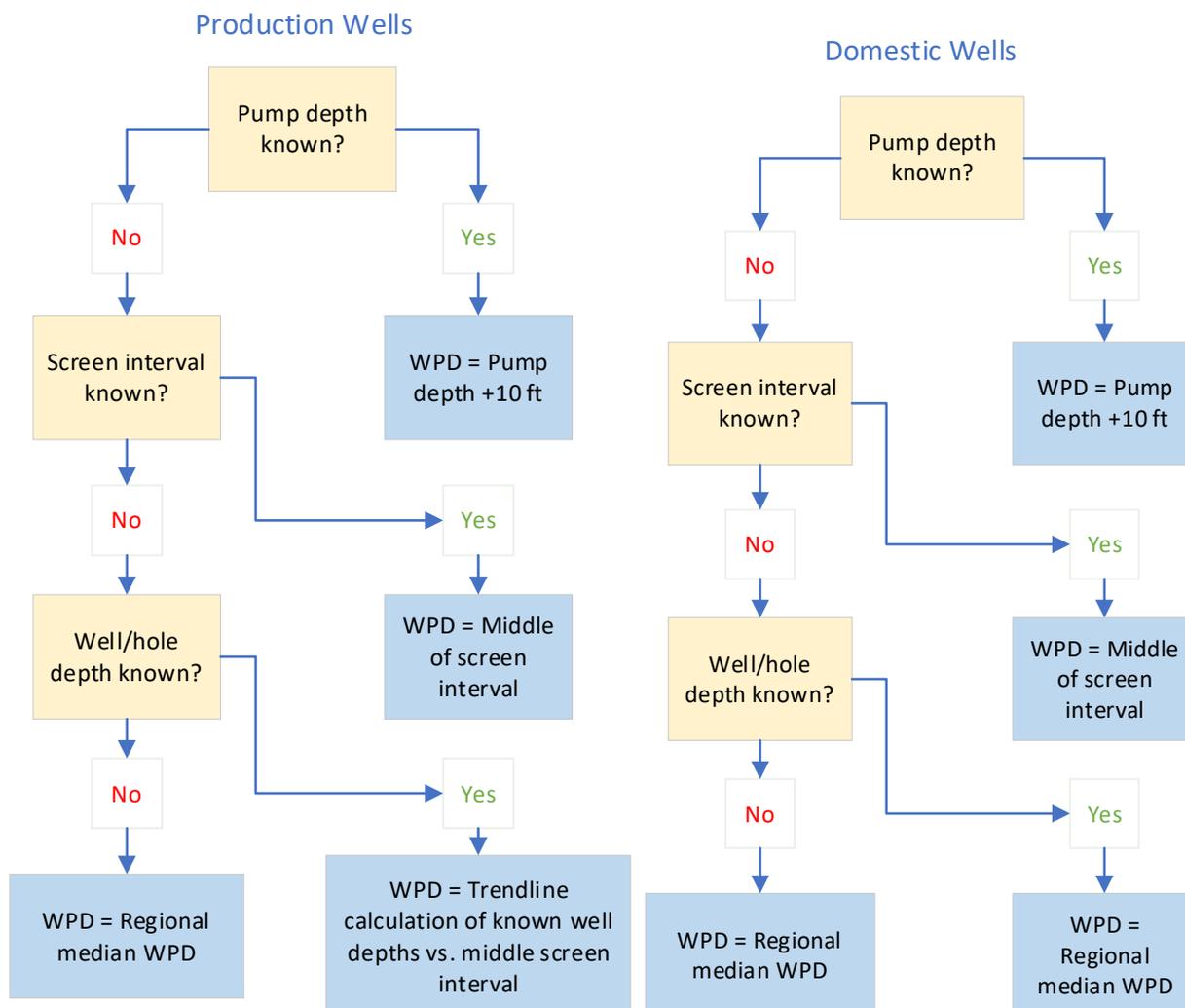


Figure 7-1: Well Protection Depth Stepwise Diagram for Production and Domestic Wells

2. **Recent deepest measurement plus 10 ft or 5% buffer (whichever is greater):** Historical data for the last ten years (2013-2023 based on the timing of the development of this methodology) was analyzed to find the deepest depth to water during that period. A buffer of the greater of either 10 ft or 5% of the depth to water value was then added to the max depth. This methodology helps utilize, where appropriate, historical and recently collected data that captures both wet and dry periods. This criteria allows for the flexibility for regions of the Basin that experience significant drawdown and recovery during dry and wet hydrologic cycles to manage those variations in groundwater elevation.
3. **Projected depth of water in 2040 based on modeled glidepath:** The Cuyama Basing Groundwater Model (updated in 2024) was used to project the depth of water in 2040 based on

the CBGSA’s planned allocation and glidepath pumping reductions. In regions of the Basin where there is significant pumping, this allows for groundwater levels to decline to where the model predicts they will be in 2040 given the anticipated schedule for pumping reductions.

4. **Saturated thickness in areas of greater geologic understanding:** The calculation for this strategy uses the localized region’s total average saturated thickness for the primary storage area and calculating 15 percent of that depth. Because there is an area in the northwestern portion of the Basin with greater geological research and understanding, the saturated thickness provides a measurable and defined direct relationship between available water in the aquifer, storage capacity, and undesirable conditions. As discussed in the following section, additional analysis has also been conducted to ensure that the calculated MTs in this area do not impact beneficial uses or uses at any nearby active wells or potential GDEs.

Using these four options above, the stepwise function to determine the appropriate MT for each RMW is as follows:

1. For RMWs that used the saturated thickness approach in the approved 2020 GSP, utilize that same approach.
2. For RMWs that did not utilize the saturated thickness approach in the approved 2020 GSP,
 - a. First find the deeper of these two values:
 - i. Deepest depth to water (DTW) from 2013-2023 + buffer
 - ii. Cuyama Basin groundwater model projected DTW in 2040
3. Then find the shallower value between Step 2a, the WPD and the GDE protection depth

As outlined in the GSP, undesirable results for the chronic lowering of groundwater levels occurs, “when 30 percent of representative monitoring wells... fall below their minimum groundwater elevation threshold for two consecutive years.” (Cuyama GSP, pg. 3-2). As of October 2024, 11% of representative wells (5 of 47) were below the minimum threshold. ([Cuyama Groundwater Conditions Report](#), pg. 1). Undesirable results conditions have therefore not been met.

Table 7-1: Measured Depths to Groundwater Compared to 2025 Minimum Thresholds

Well	Region	Depth to Water (feet)	Measurement Month	Minimum Threshold (feet)	Status
72	Central	161	October 2024	373	Above Measurable Objective
74	Central	246	October 2024	322	Above Measurable Objective
77	Central	518	October 2024	514	Below Minimum Threshold (4 months)
91	Central	681	October 2024	730	Above Measurable Objective
95	Central	589	October 2024	597	More than 10% above Minimum Threshold
96	Central	340	October 2024	369	Above Measurable Objective
99	Central	361	October 2024	379	Above Measurable Objective
102	Central	370	October 2024	470	Above Measurable Objective
103	Central	233	October 2024	379	Above Measurable Objective
112	Central	83	October 2024	102	Above Measurable Objective
114	Central	47	October 2024	58	Above Measurable Objective
316	Central	681	October 2024	731	Above Measurable Objective
317	Central	679	October 2024	700	More than 10% above Minimum Threshold
322	Central	368	October 2024	387	Above Measurable Objective
324	Central	337	October 2024	365	Above Measurable Objective
325	Central	312	October 2024	331	Above Measurable Objective
420	Central	519	October 2024	514	Below Minimum Threshold (4 months)
421	Central	503	October 2024	514	More than 10% above Minimum Threshold
474	Central	128	October 2024	197	Above Measurable Objective
568	Central	50	October 2024	47	Below Minimum Threshold (1 month)
604	Central	466	October 2024	544	Above Measurable Objective
608	Central	441	October 2024	504	Above Measurable Objective
609	Central	436	October 2024	499	Above Measurable Objective
610	Central	642	October 2024	557	Below Minimum Threshold (51 months)
612	Central	464	October 2024	513	Above Measurable Objective
613	Central	506	October 2024	578	Above Measurable Objective
615	Central	516	October 2024	588	Above Measurable Objective
629	Central	578	October 2024	613	Above Measurable Objective
633	Central	558	October 2024	605	More than 10% above Minimum Threshold
62	Eastern	-	-	212	No available data this period (above MO in April 2024)
85	Eastern	140	October 2024	200	Above Measurable Objective

Well	Region	Depth to Water (feet)	Measurement Month	Minimum Threshold (feet)	Status
100	Eastern	72	October 2024	186	Above Measurable Objective
101	Eastern	91	October 2024	138	Above Measurable Objective
841	Northwestern	71	October 2024	203	Above Measurable Objective
845	Northwestern	78	October 2024	203	Above Measurable Objective
2	Southeastern	34	October 2024	52	Above Measurable Objective
89	Southeastern	25	October 2024	62	Above Measurable Objective
106	Western	141	October 2024	164	Above Measurable Objective
107	Western	72	October 2024	122	Above Measurable Objective
117	Western	154	October 2024	163	Above Measurable Objective
118	Western	50	October 2024	40	Below Minimum Threshold (49 months)
571	Western	106	October 2024	142	Above Measurable Objective
573	Western	66	October 2024	93	More than 10% above Minimum Threshold
830	Far-West Northwestern	-	-	63	No available data this period (above MO in July 2024)
832	Far-West Northwestern	32	October 2024	50	Above Measurable Objective
833	Far-West Northwestern	18	October 2024	48	More than 10% above Minimum Threshold
836	Far-West Northwestern	29	October 2024	49	More than 10% above Minimum Threshold

*Well 608 is now confirmed to be “destroyed” and is no longer available for monitoring. The landowner and monitoring staff have identified a well within 100 ft that is suitable to continue monitoring in this location, which is where the measurement shown was taken. The groundwater level representative network will be modified to remove well 608 and add in this new well. The new well is in the process of being incorporated into Opti and being assigned an ID number.

7.2 Funding to Support GSP Implementation

On May 1, 2024, the CBGSA Board held a rate hearing and set a groundwater extraction fee of \$5 per acre-foot for FY 24-25.

Additionally, the CBGSA has been awarded a \$7.6 million in grant fund under the Critically Overdrafted Basin (COD) SGMA Implementation Round 1 grant opportunity, with funding awarded for the following activities through April, 2025:

- Ongoing Monitoring and Enhancements
 - Installation of Piezometers
 - installation of dedicated monitoring wells
 - DMS maintenance and enhancements
 - Groundwater level and quality monitoring
 - USGS stream gage maintenance

- Project and Management Action Implementation
 - CBWRM model update and re-calibration
 - Develop and implement framework for pumping allocations
 - Analysis of management actions implementation options
 - Adaptive management support
 - Precipitation enhancement technical analysis
 - Flood and stormwater capture technical analysis
- GSP Implementation and Outreach Activities
 - GSP implementation program management
 - Stakeholder engagement and community outreach
 - Prepare annual reports
 - Modify GSP in response to DWR determination
 - 5-year GSP update
- Improving Understanding of Basin Water Use
 - Perform updated land use survey
 - Perform river channel survey
 - Enhance existing CIMIS station and implement new stations

The CBGSA has also submitted a proposal to DWR for approximately \$2 million under the SGMA Implementation Round 2 grant opportunity with funding to do additional implementation tasks. The CBGSA however did not get funding through that grant opportunity.

7.3 Stakeholder Outreach Activities in Support of GSP Implementation

The following is a list of public meetings where GSP development and implementation was discussed during the 2023-2024 water year.

- [CBGSA Board meetings](#)⁸: October 12, November 1, December 22, January 2, January 10, March 6, May 1, May 23, July 10, July 31, and September 4
- [Standing Advisory Committee \(SAC\) meetings](#)⁹: October 12, October 26, January 4, February 29, April 25, July 1, July 25, and August 29

⁸ <https://cuyamabasin.org/board-of-directors>

⁹ <https://cuyamabasin.org/standing-advisory-committee>

7.4 Progress on Implementation of GSP Projects

Table 7-2 shows the projects and management actions that were included in the GSP. The following subsections describe the progress of implementation of each GSP project.

Table 7-2: Summary of Projects and Management Actions included in the GSP

Activity	Current Status	Anticipated Timing	Estimated Cost ^a
Project 1: Flood and Stormwater Capture	Water rights analysis of potential water supplies currently underway	<ul style="list-style-type: none"> Feasibility study: 0 to 5 years Design/Construction: 5 to 15 years 	<ul style="list-style-type: none"> Study: \$1,000,000 Flood and Stormwater Capture Project: \$600-\$800 per AF (\$2,600,000 – 3,400,000 per year)
Project 2: Precipitation Enhancement	Study currently underway by Desert Research Institute	<ul style="list-style-type: none"> Refined project study: 0 to 2 years Implementation of Precipitation Enhancement: 0 to 5 years 	<ul style="list-style-type: none"> Study: \$200,000 Precipitation Enhancement Project: \$25 per AF (\$150,000 per year)
Project 3: Water Supply Transfers/Exchanges	Not yet begun	<ul style="list-style-type: none"> Feasibility study/planning: 0 to 5 years Implementation in 5 to 15 years 	<ul style="list-style-type: none"> Study: \$200,000 Transfers/Exchanges: \$600-\$2,800 per AF (total cost TBD)
Project 4: Improve Reliability of Water Supplies for Local Communities	In progress for CCSD; not yet begun for other communities	<ul style="list-style-type: none"> Feasibility studies: 0 to 2 years Design/Construction: 1 to 5 years 	<ul style="list-style-type: none"> Study: \$100,000 Design/Construction: \$1,800,000
Management Action 1: Basin-Wide Economic Analysis	Completed	<ul style="list-style-type: none"> December 2020 	<ul style="list-style-type: none"> \$60,000
Management Action 2: Pumping Allocations in Central Basin Management Area	Allocations developed for 2025 through 2029	<ul style="list-style-type: none"> Allocations implemented: 2023 through 2040 	<ul style="list-style-type: none"> Plan: \$300,000 Implementation: \$150,000 per year
Adaptive Management	Board ad-hoc committee has been formed and is considering potential actions	Only implemented if triggered; timing would vary	TBD

^a Estimated cost based on planning documents and professional judgment
AF = acre-feet

7.4.1 Project 1: Flood and Stormwater Capture

The CBGSA application for COD SGMA Implementation Grant funding from DWR includes a task to understand the feasibility of future flood and stormwater capture. Specifically, funding was sought to perform a water rights analysis on flood and stormwater capture flows in the Basin to understand the feasibility of further developing a stormwater capture project in the Basin given water availability and existing water rights. Initial work has been done to look at reservoir operations data to see during what windows during Twitchell Reservoir there were managed released and to assess the possibility of capturing this excess water upstream in the Cuyama Basin. Our current data suggests that this occurs 11% of the time.

The CBGSA also looked at USGS stream flow gages in the area to correlate time periods when reservoirs were releasing water to see how much stormwater may be available for capture. Additional analysis will be done in the coming year to assess the feasibility of implementation of a flood and stormwater capture project. This water rights analysis has not yet been completed but is expected to be completed in 2025.

7.4.2 Project 2: Precipitation Enhancement

The CBGSA application for COD SGMA Implementation Grant funding from DWR, which includes a task to understand the feasibility of precipitation enhancements efforts. Specifically, funding was sought to perform a study of the precipitation enhancement action identified in the GSP to determine if this action should be pursued and implemented in the Basin. The CBGSA contracted with the Desert Research Institute (DRI) to assess cloud seeding effects on Santa Barbara County and the Cuyama Valley. A proposal was submitted in September 2023 and work was initiated in October. A final report which will provide additional acre feet potential of precipitation from cloud seeding is expected in 2025.

7.4.3 Project 3: Water Supply Transfers or Exchanges

No progress was made toward implementation of this project since completion of the GSP in January 2020. This project will be explored if Project 1 mentioned above: flood and stormwater capture was feasible but greater volumes of water are desired.

7.4.4 Project 4: Improve Reliability of Water Supplies for Local Communities

This management action includes consideration of opportunities to improve water supply reliability for Ventucopa within CCSD service area. Potential projects include a replacement well for CCSD and improvement of Ventucopa Water Supply Company (VWSC's) existing well. Since the 2020 GSP adoption DWR's IRWM program awarded CCSD a grant to install a new production well. Work by the CCSD to install the new well is ongoing.

7.5 Management Actions

Table 7-2 shows the projects and management actions that were included in the GSP. The following subsections describe the progress of implementation of each GSP management action.

7.5.1 Management Action 1: Basin-Wide Economic Analysis

A Basin-wide direct economic analysis of proposed GSP actions was completed. The results of this analysis were presented to the GSP Board on December 4, 2019, and the final report was completed in December 2019. The final Basin-wide economic analysis report was provided in the 2020 Annual Report. This management action is 100% complete.

7.5.2 Management Action 2: Pumping Allocations in Central Basin Management Area

CBGSA staff has worked and continues to work with the Board and stakeholders to implement pumping allocations in the Central Management Area which began in the 2023 calendar year. As directed by the Board, in July 2022, CBGSA staff developed pumping allocations for 2023 and 2024 for each parcel located within the Central Management Area. These allocations reflect a 5% reduction in 2023 and a 10% reduction in 2024 relative to baseline levels. Actual pumping was reported for most water users in the Central Management Area in 2023, with all users at or below their pumping allocation amount for 2023.

Allocations for 2025 through 2029 were developed in conjunction with the development of the 2025 GSP Update and were approved by the Board in January 2025. These new allocations take into consideration a new management area boundary developed using the same methodology as the previous management area,

but utilizing the updated model and recent monitoring data. These allocations are available for review on the CBGSA website.

7.5.3 Consideration of Pumping Allocations Outside of Central Management Area

The 2025 GSP Update included a Ventucopa Management Area but did not include a management action to implement pumping allocations outside the Central Management Area. Instead the CBGSA plans to develop a management plan for the Ventucopa Management Area in the future. Since the 2025 GSP Update was just recently submitted, no new information has been collected that would indicate that pumping allocations should be implemented outside the Central Management Area at this time. This will be re-considered in future Annual Reports.

7.6 Adaptive Management

As discussed in the previous annual report, because several wells in the Basin are trending towards undesirable results, the CBGSA Board has undertaken efforts to review wells that have exceeded minimum thresholds, investigate potential causes of the exceedances, and identify if any domestic or production wells are affected by declining groundwater levels. During WY 2024, several wells with groundwater levels that previously exceeded minimum thresholds recovered to above these threshold levels.

The Board continues to consider potential actions to address minimum threshold exceedances, including restricting pumping in individual wells, adjusting minimum thresholds or the undesirable result criteria identified in the GSP, and accelerating basin-wide pumping reductions. Potential options for implementing these actions will continue to be discussed by the Board during the upcoming water year.

7.7 Progress Toward Implementation of Monitoring Networks

This section provides updates about implementation of the monitoring networks identified during GSP development.

7.7.1 Groundwater Levels Monitoring Network

In October 2021 the CBGSA transitioned to quarterly groundwater monitoring from its groundwater levels network. The CBGSA goes out in the field and collects Depth to Water measurements quarterly and attempts to take measurements from each of the representative and non-representative wells in the monitoring network. The results of this groundwater level monitoring are shown in Table 7-1. In September 2023, the CBGSA board voted to revise the monitoring network; the revised monitoring network has been included in the 2025 GSP Update and reflected in this Annual Report.

7.7.2 Surface Water Monitoring Network

Under a Category 1 grant from DWR, two new surface flow gages were installed on the Cuyama River during 2021. These gages are managed by the United States Geologic Survey (USGS), and data collected at the gage locations are available on the USGS website at the following links:

https://waterdata.usgs.gov/nwis/uv?site_no=11136500

https://waterdata.usgs.gov/ca/nwis/uv?site_no=11136710

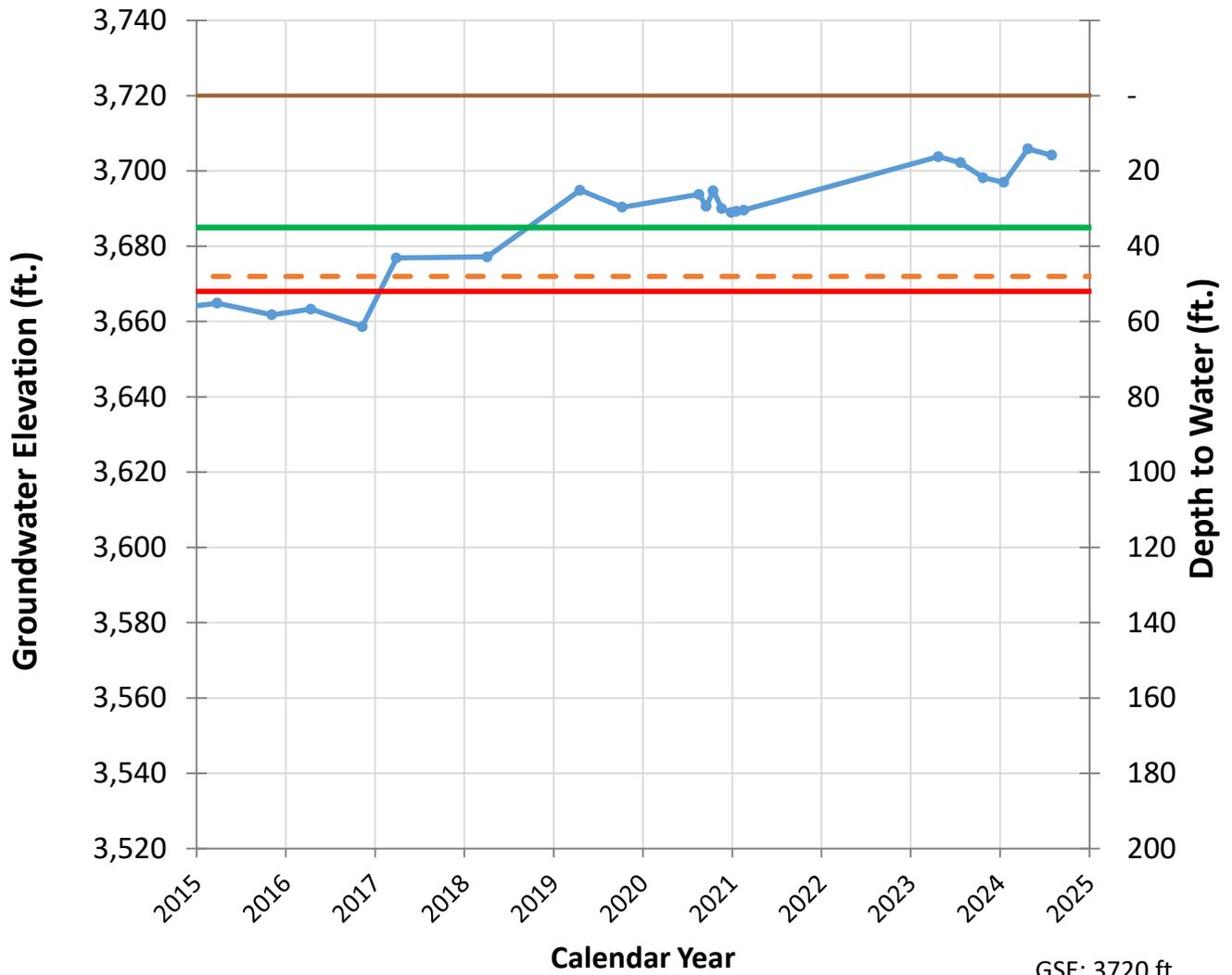
Section 8. References

California Department of Water Resources (DWR). 2003. *California's Groundwater Bulletin 118—
Update 2003*. [https://water.ca.gov/LegacyFiles/groundwater/
bulletin118/basindescriptions/3-13.pdf](https://water.ca.gov/LegacyFiles/groundwater/bulletin118/basindescriptions/3-13.pdf)

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Appendix A
Updated Hydrographs for Representative Wells

2 Hydrograph

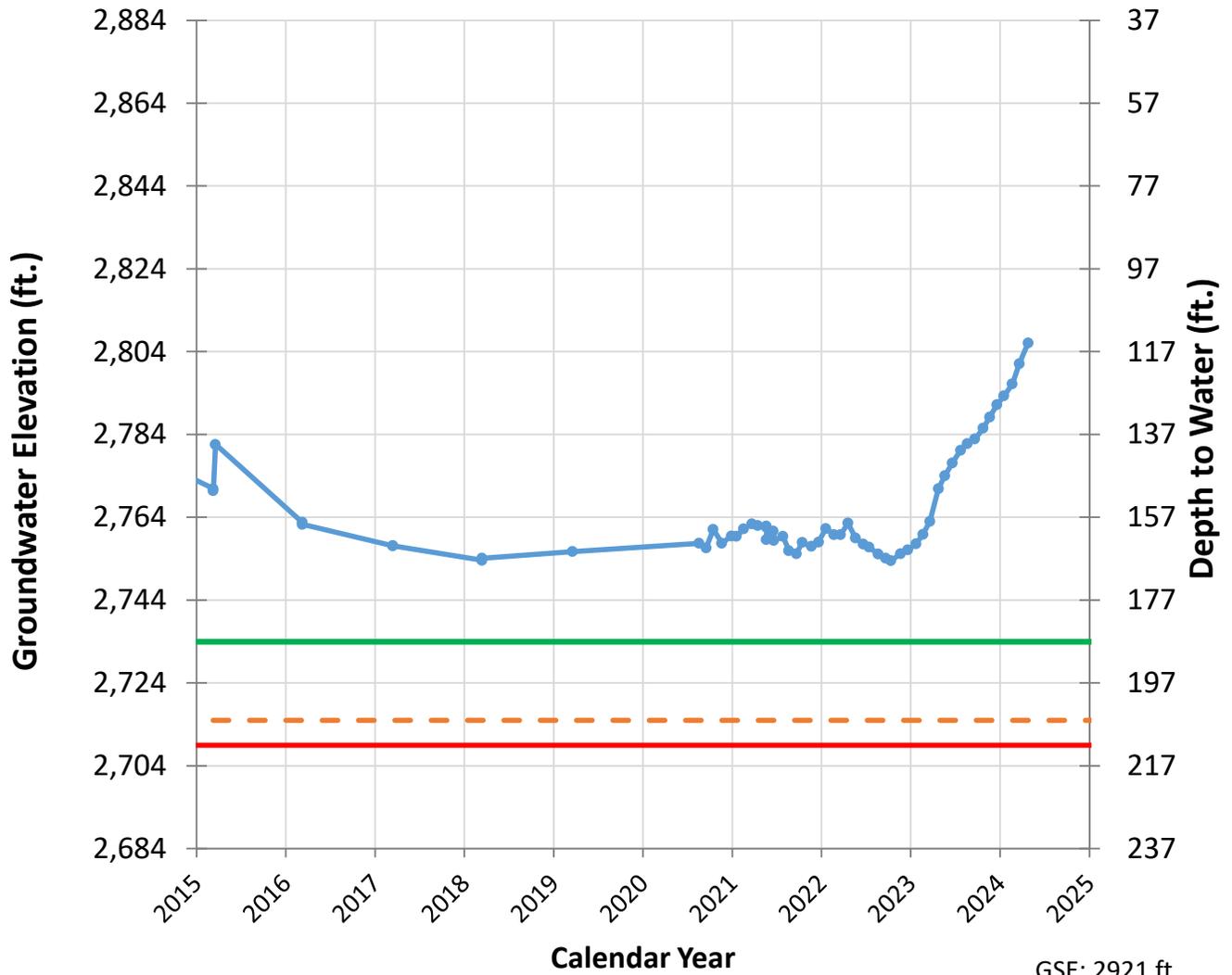


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 3720 ft.
 MT: 52 ft.
 MO: 35 ft.
 2025 IM: 48 ft.

62 Hydrograph

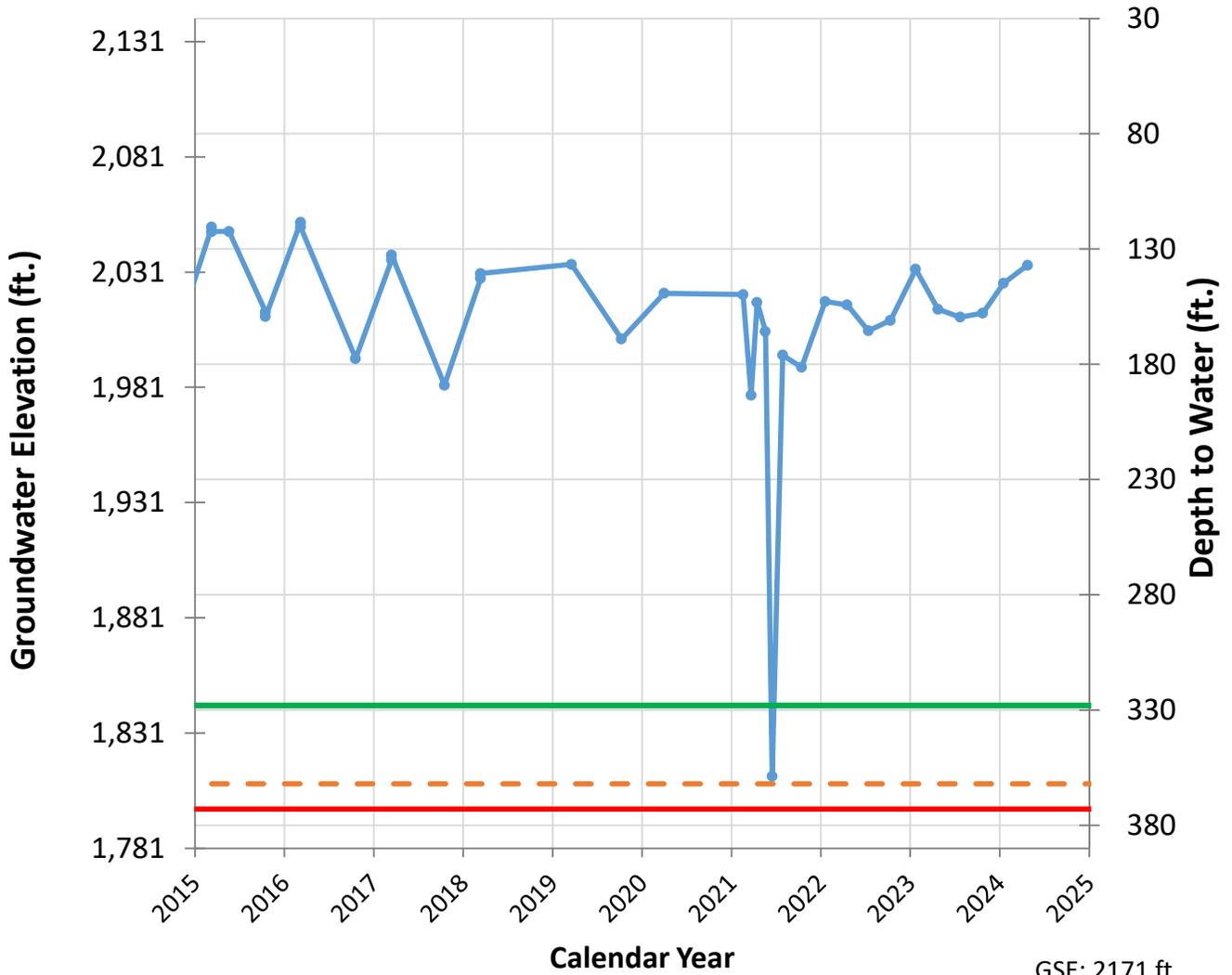


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2921 ft.
 MT: 212 ft.
 MO: 187 ft.
 2025 IM: 206 ft.

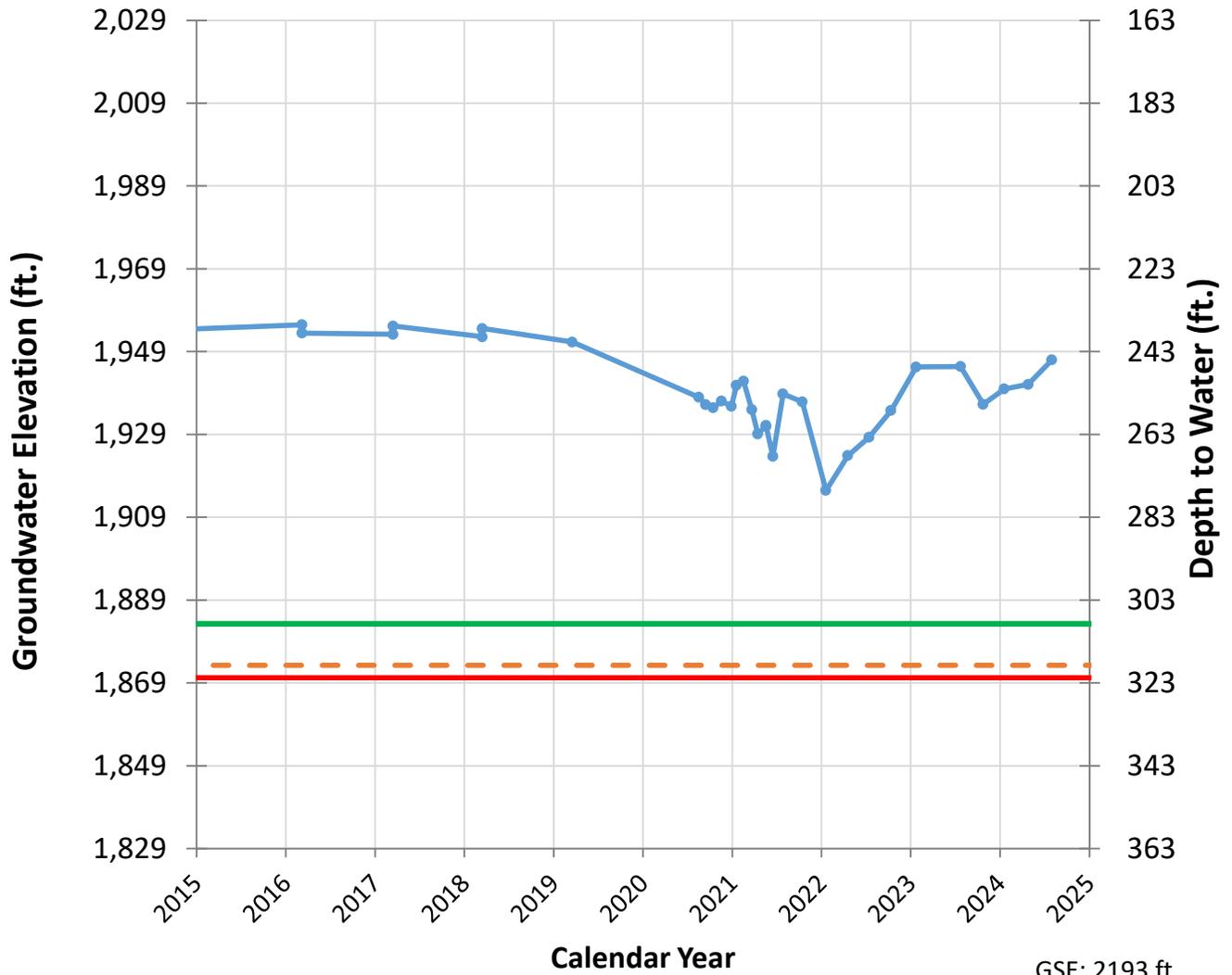
72 Hydrograph



GSE: 2171 ft.
 MT: 373 ft.
 MO: 328 ft.
 2025 IM: 362 ft.

- Groundwater Level
- 2025 IM
- Ground Surface Elevation
- MO
- MT

74 Hydrograph

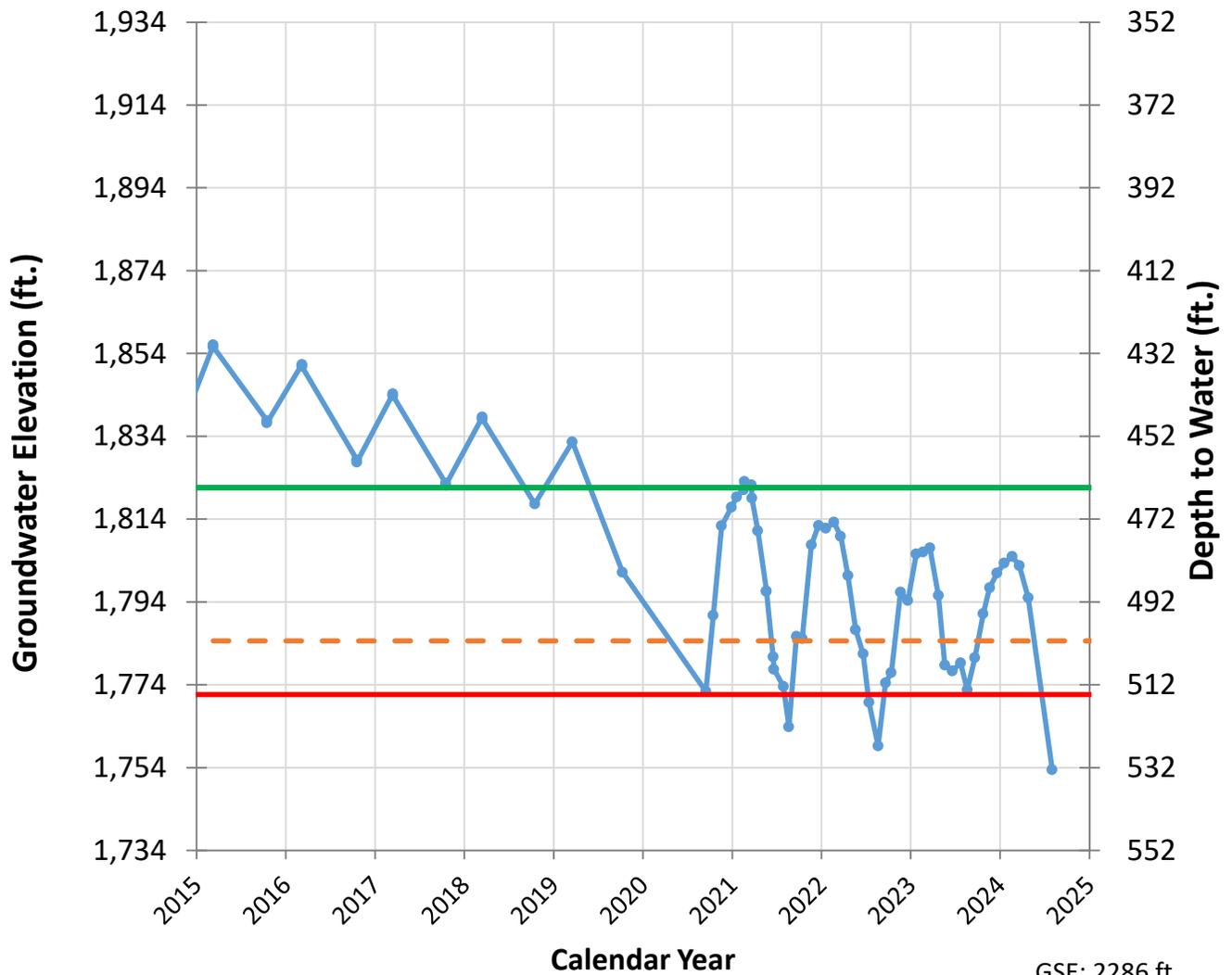


● Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2193 ft.
 MT: 322 ft.
 MO: 309 ft.
 2025 IM: 319 ft.

77 Hydrograph

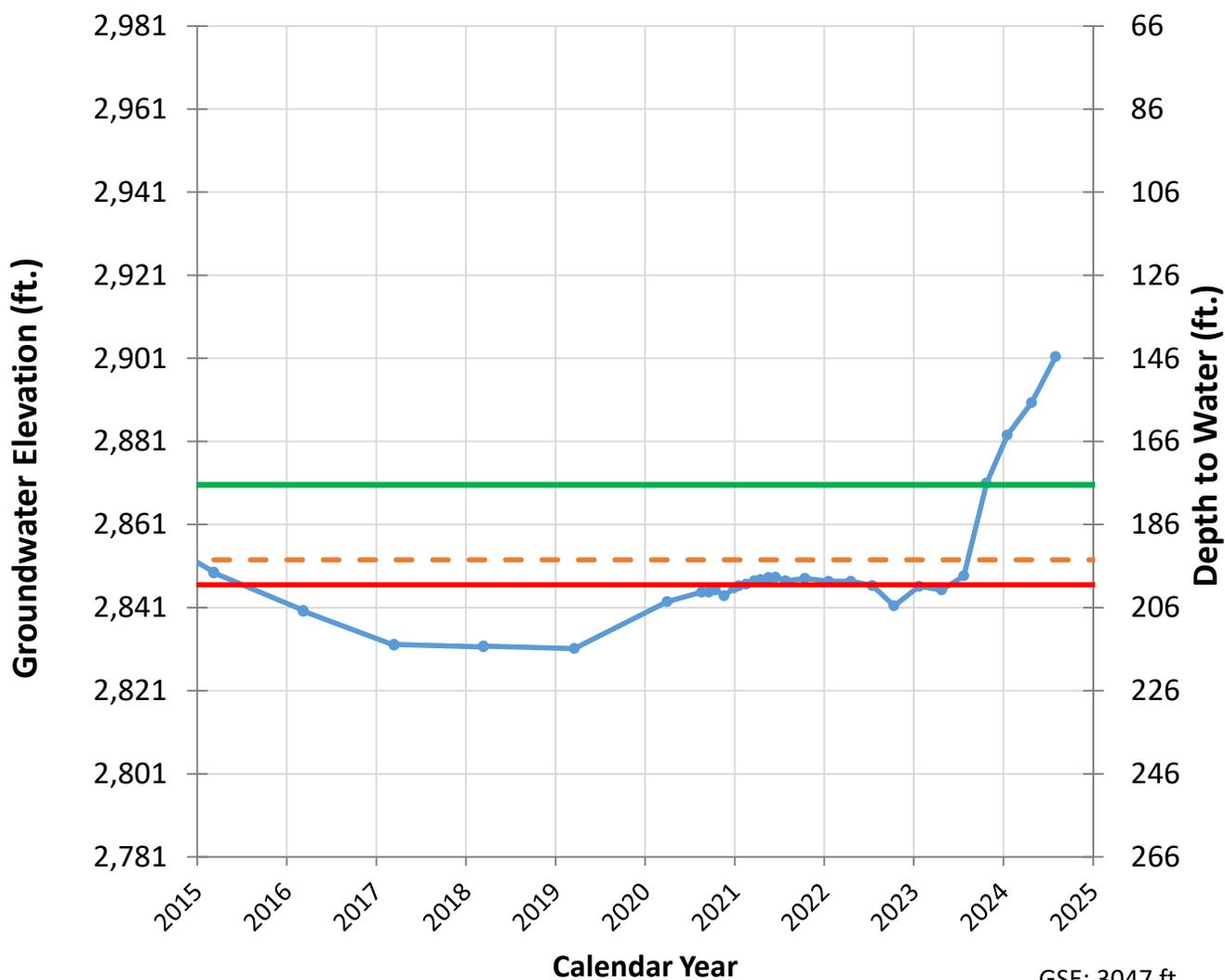


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2286 ft.
 MT: 514 ft.
 MO: 464 ft.
 2025 IM: 501 ft.

85 Hydrograph

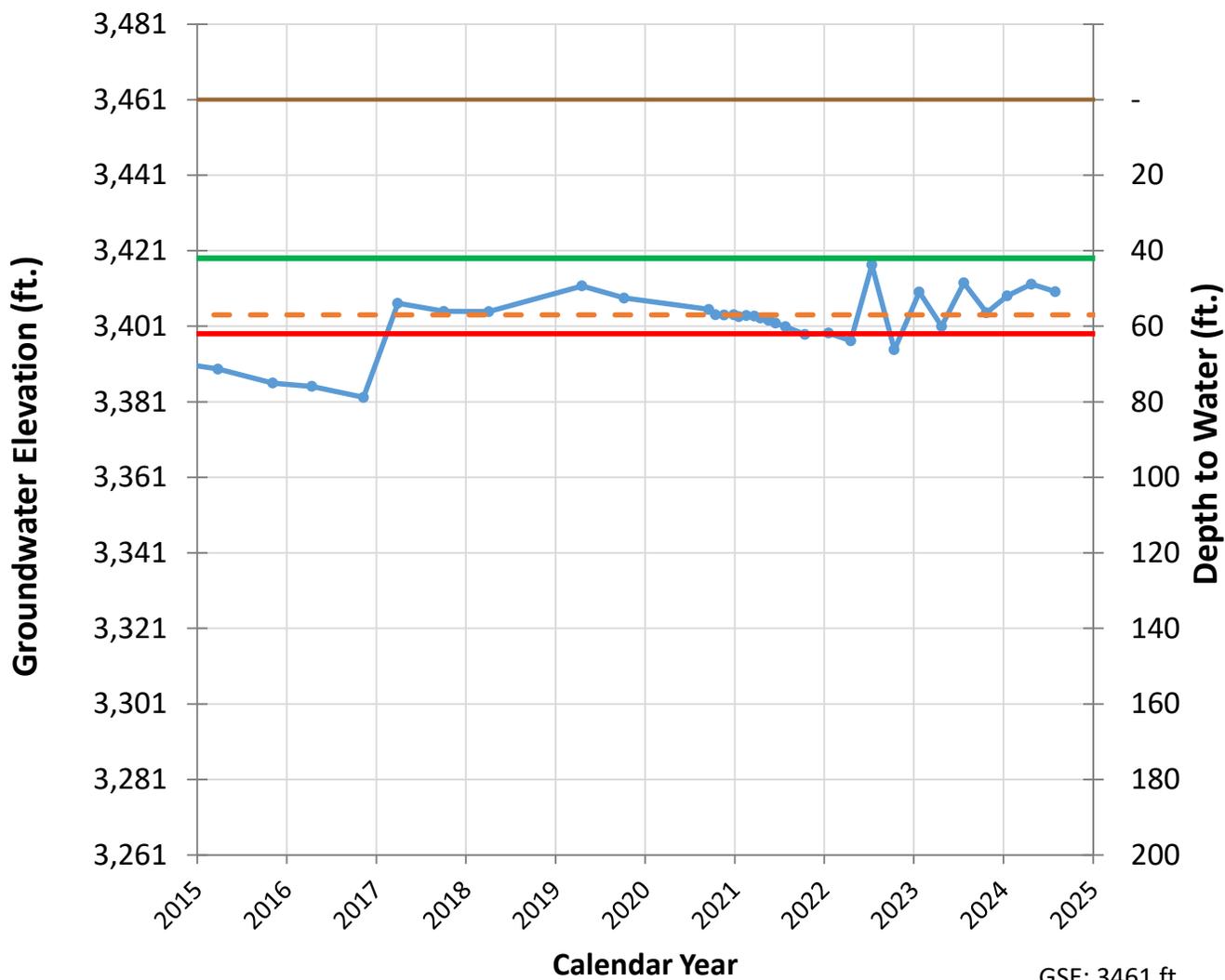


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 3047 ft.
 MT: 200 ft.
 MO: 176 ft.
 2025 IM: 194 ft.

89 Hydrograph

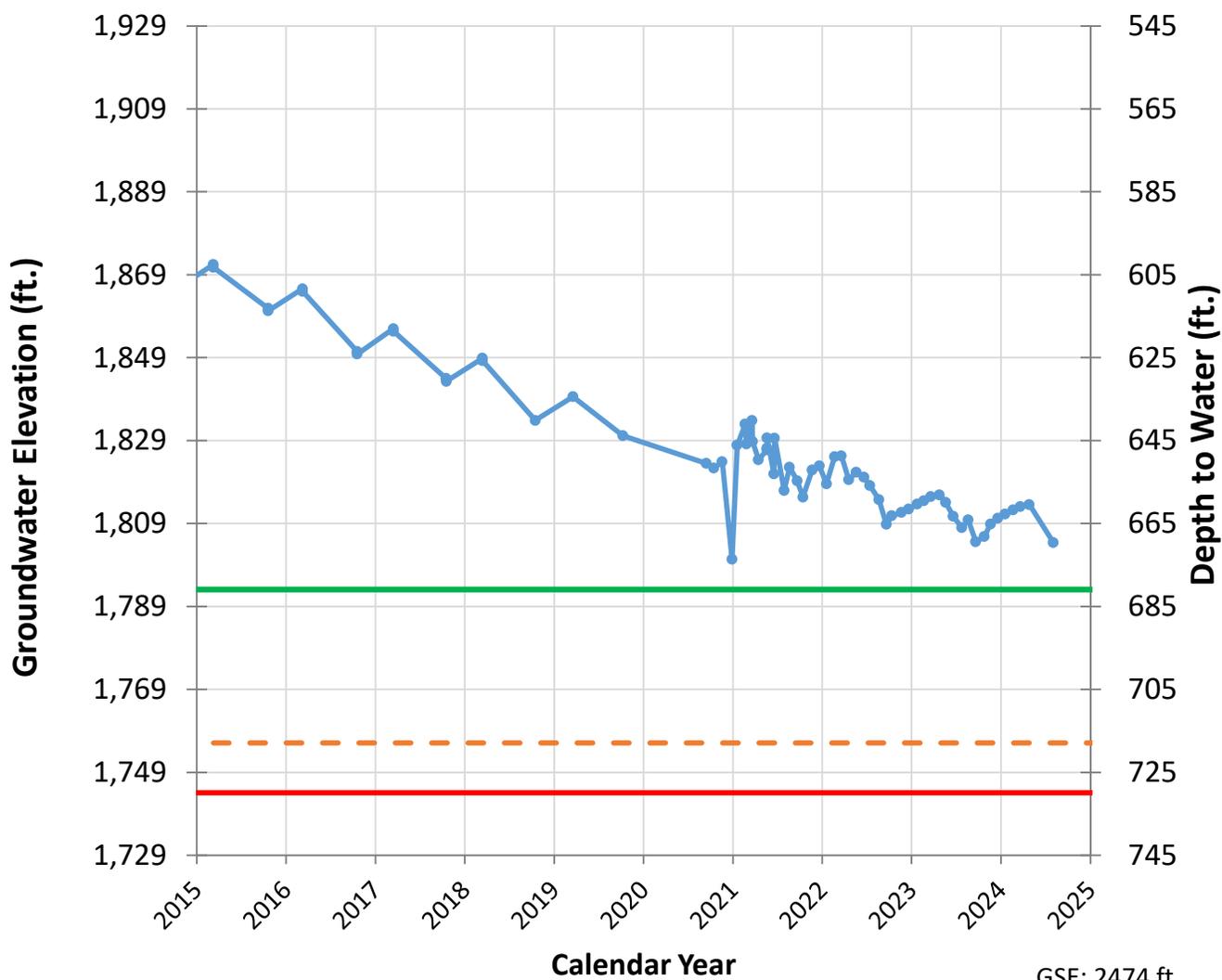


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 3461 ft.
 MT: 62 ft.
 MO: 42 ft.
 2025 IM: 57 ft.

91 Hydrograph

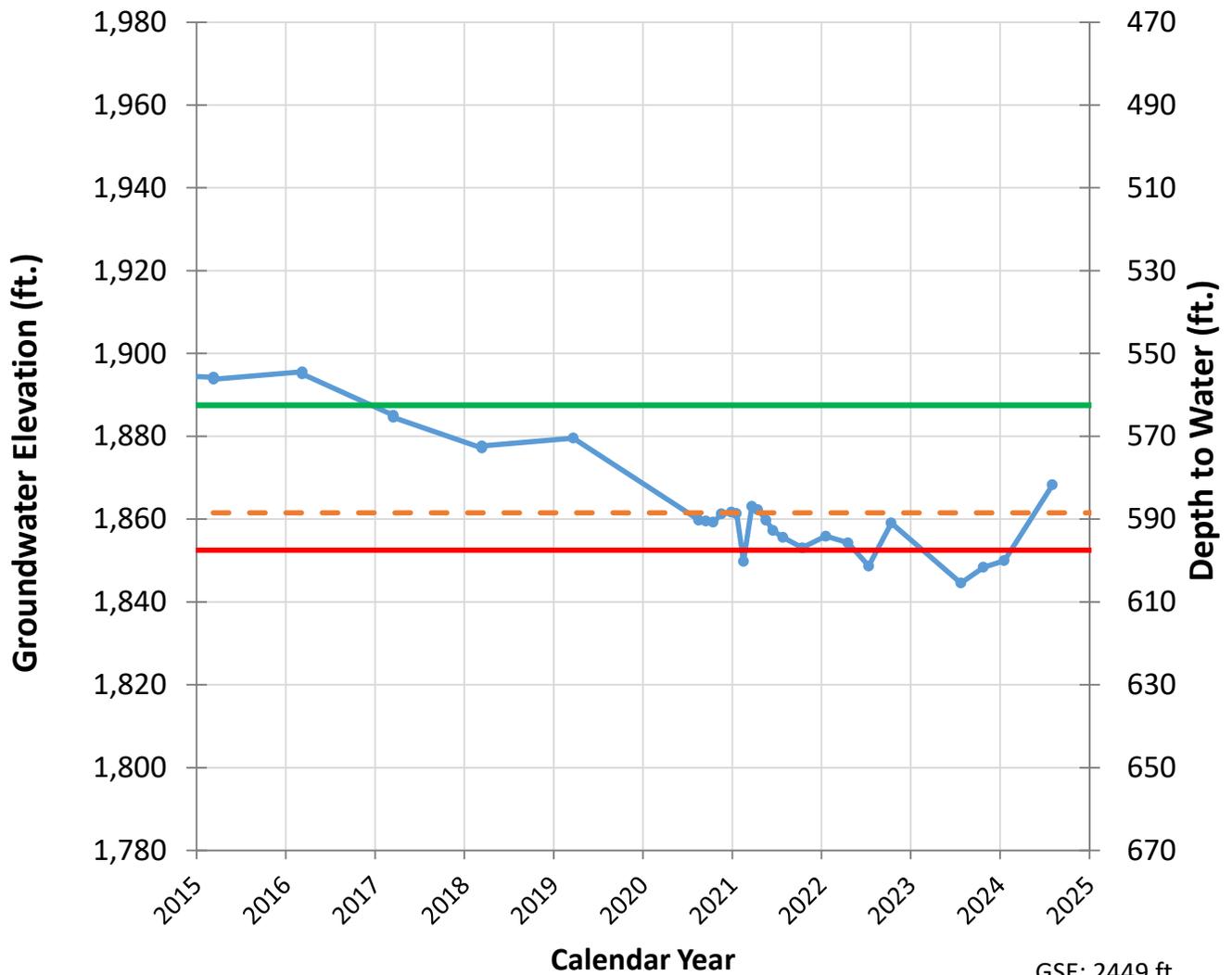


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2474 ft.
 MT: 730 ft.
 MO: 681 ft.
 2025 IM: 718 ft.

95 Hydrograph

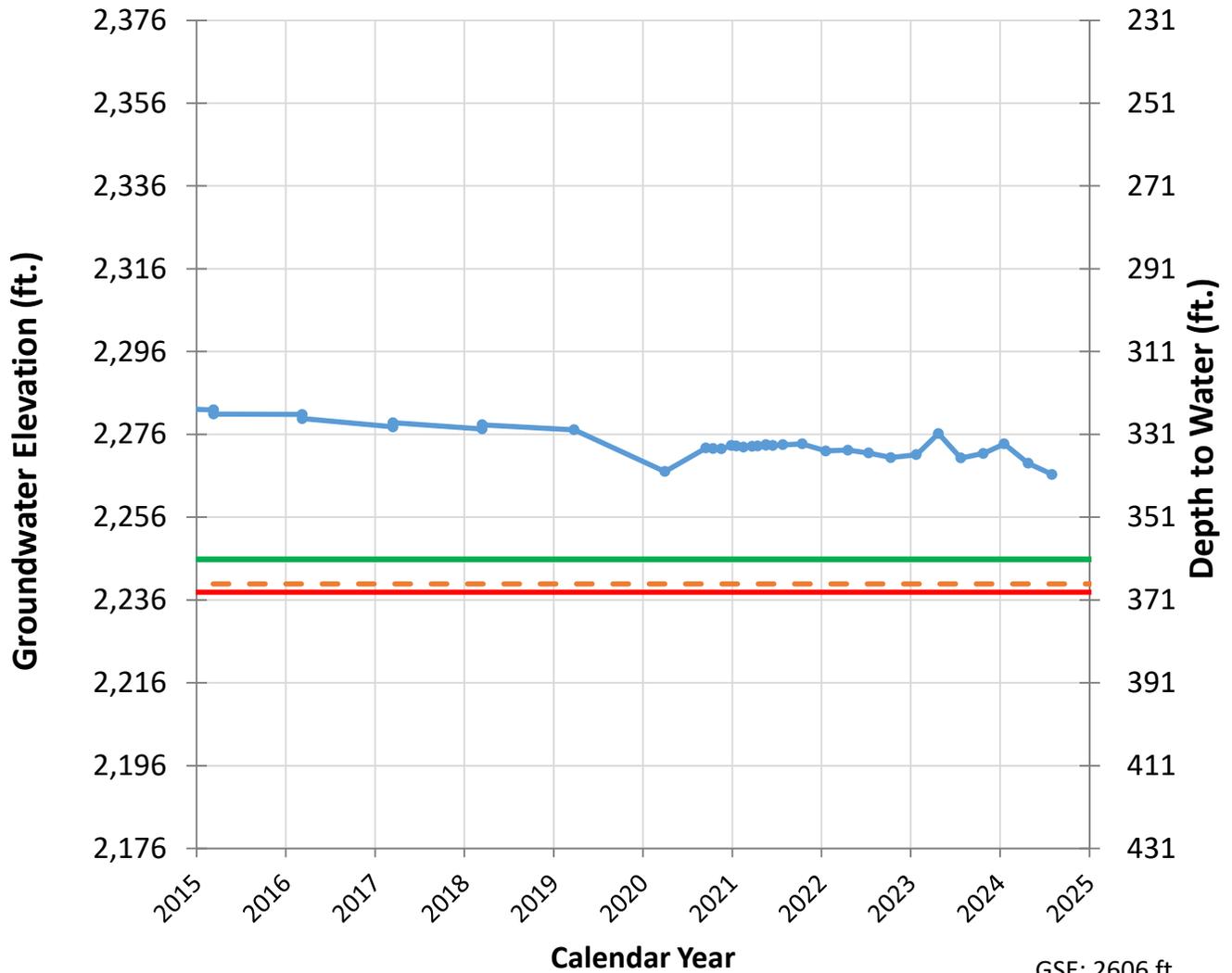


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2449 ft.
 MT: 597 ft.
 MO: 562 ft.
 2025 IM: 588 ft.

96 Hydrograph

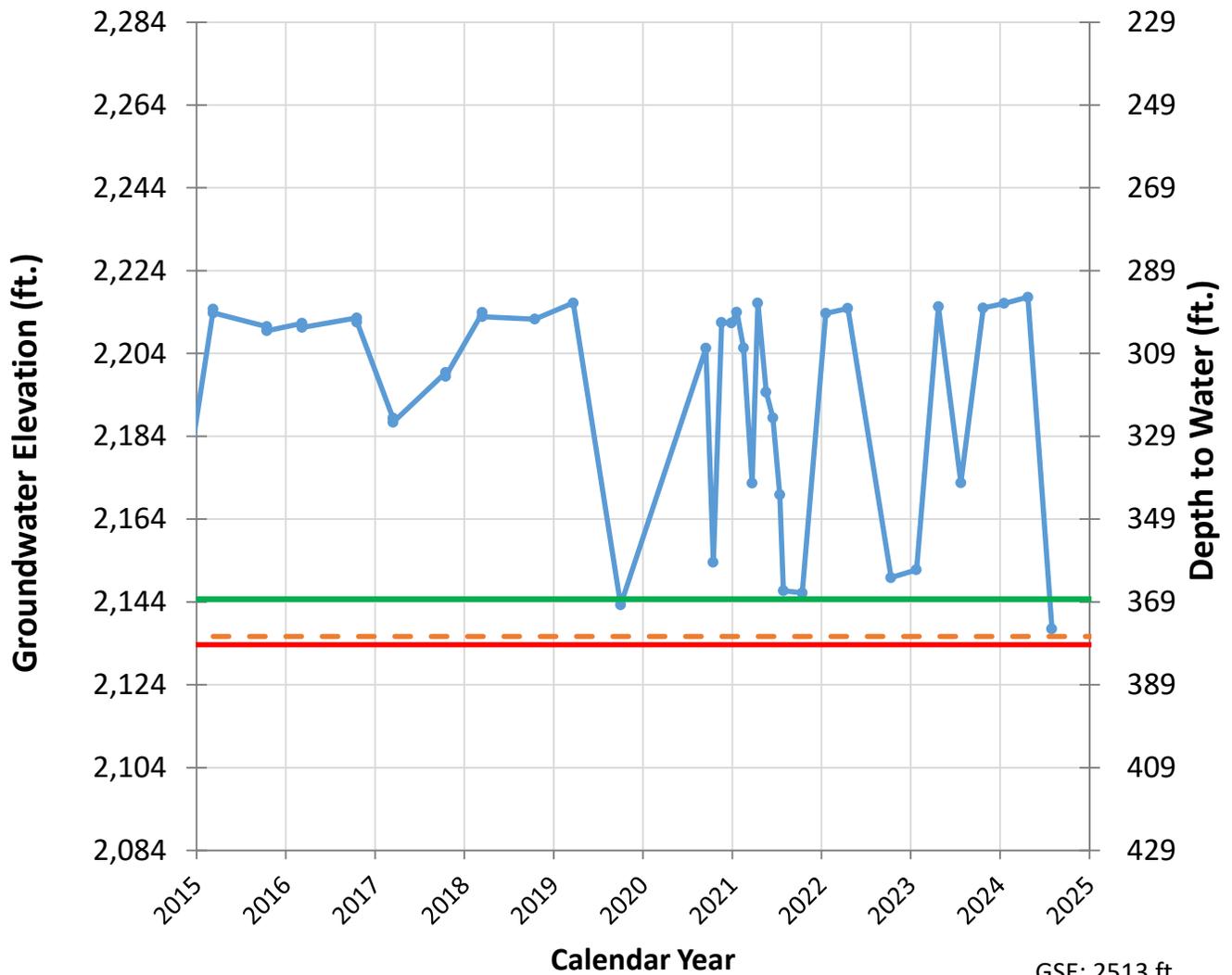


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2606 ft.
 MT: 369 ft.
 MO: 361 ft.
 2025 IM: 367 ft.

99 Hydrograph

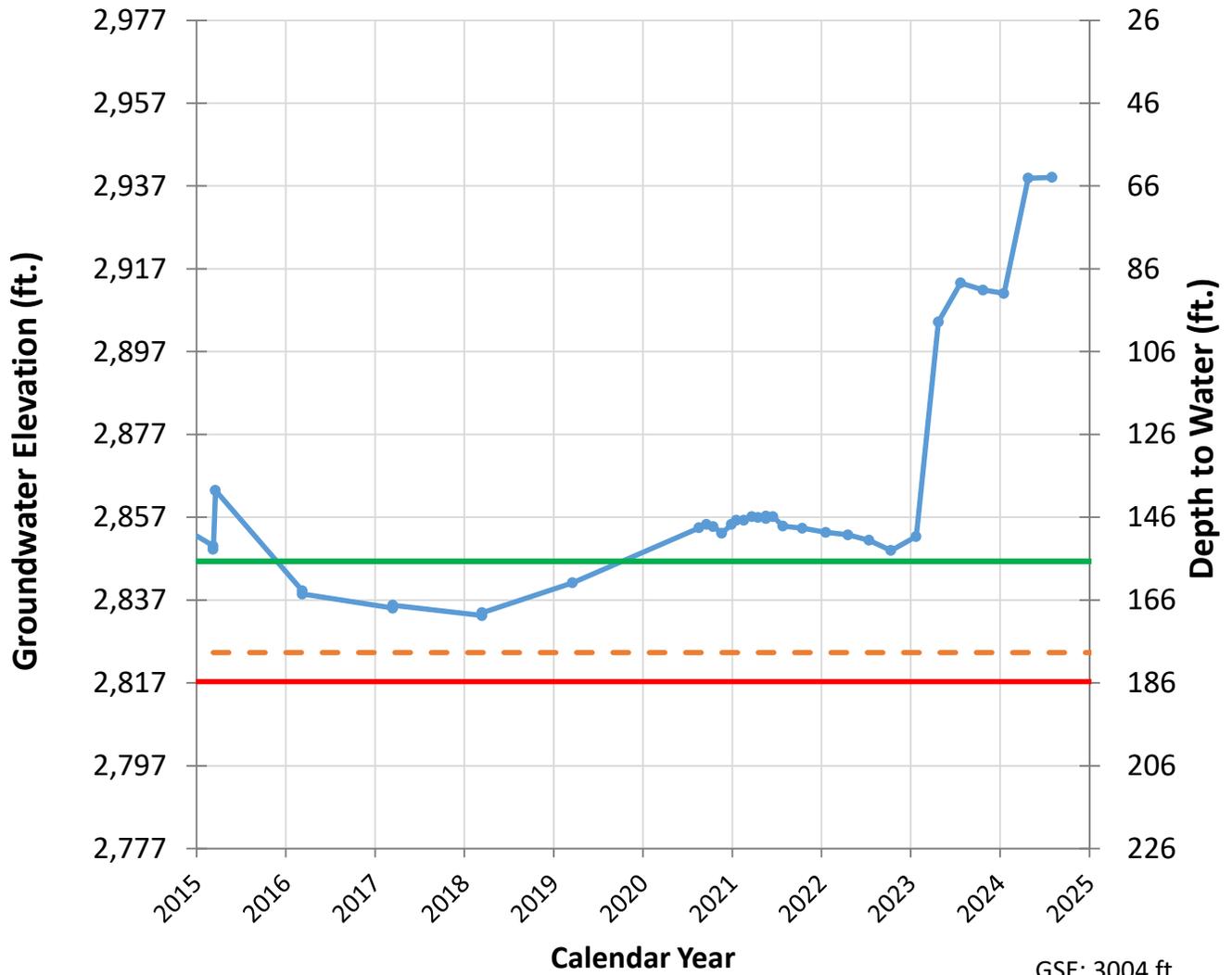


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2513 ft.
 MT: 379 ft.
 MO: 368 ft.
 2025 IM: 377 ft.

100 Hydrograph

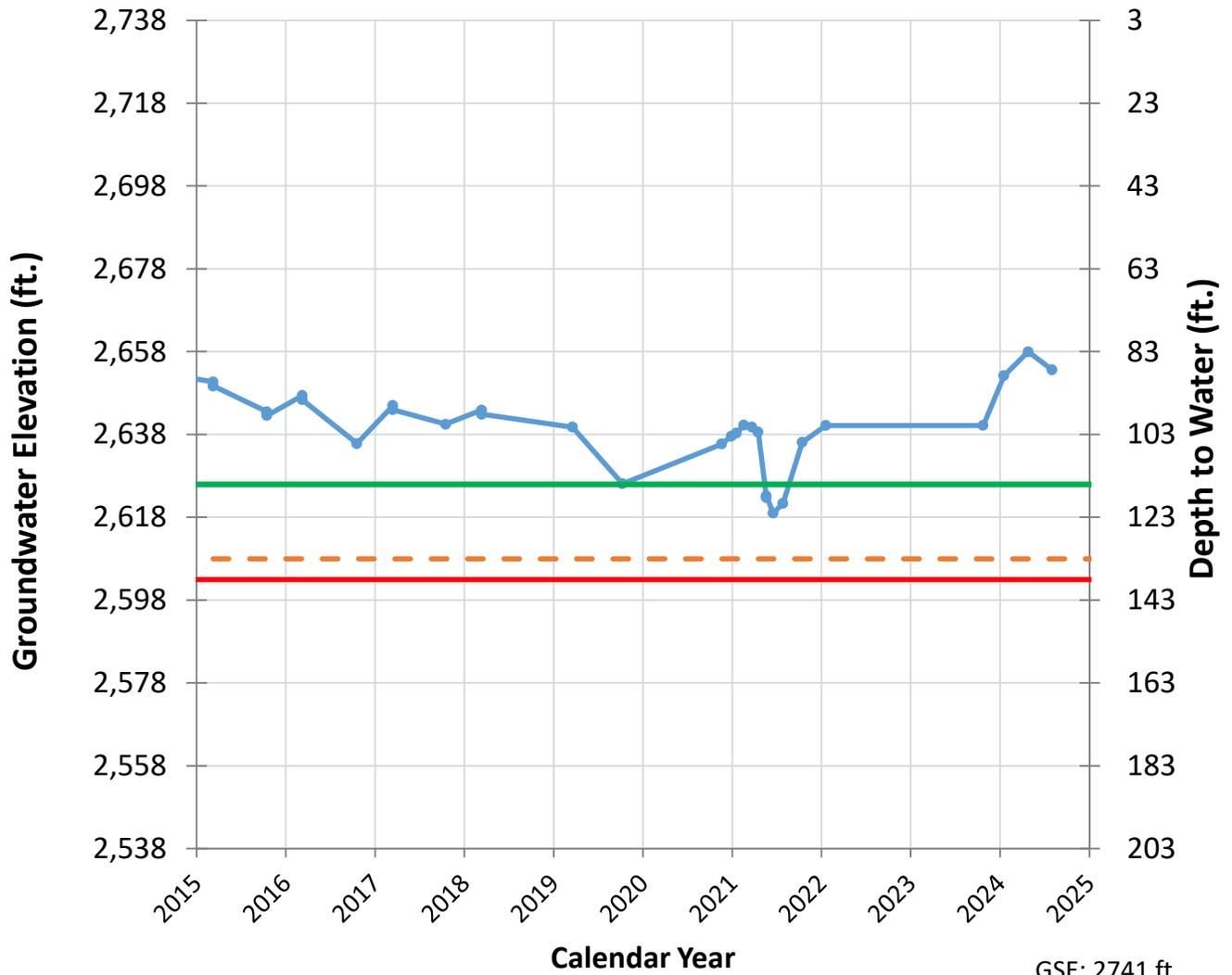


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 3004 ft.
 MT: 186 ft.
 MO: 157 ft.
 2025 IM: 179 ft.

101 Hydrograph

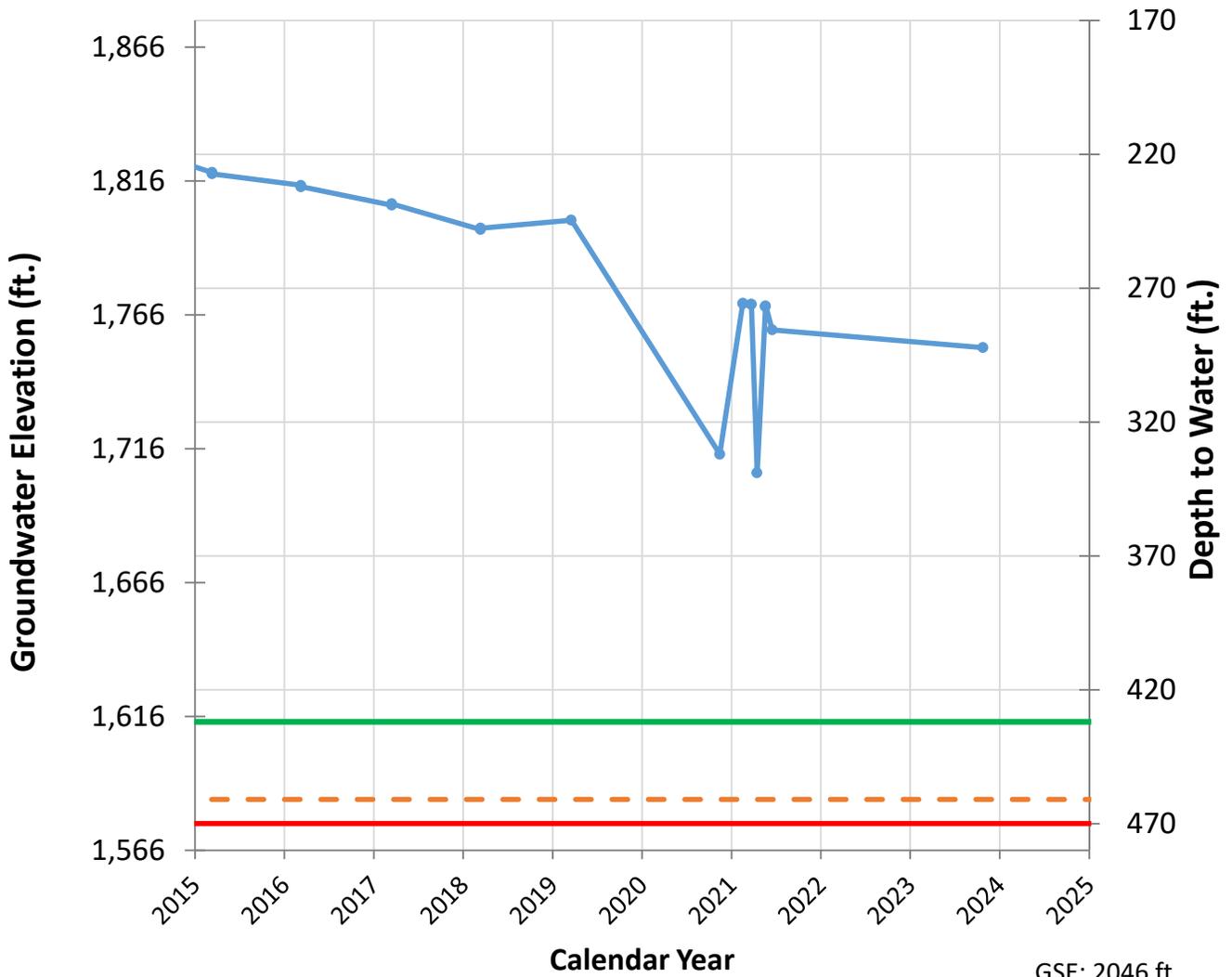


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2741 ft.
 MT: 138 ft.
 MO: 115 ft.
 2025 IM: 133 ft.

102 Hydrograph

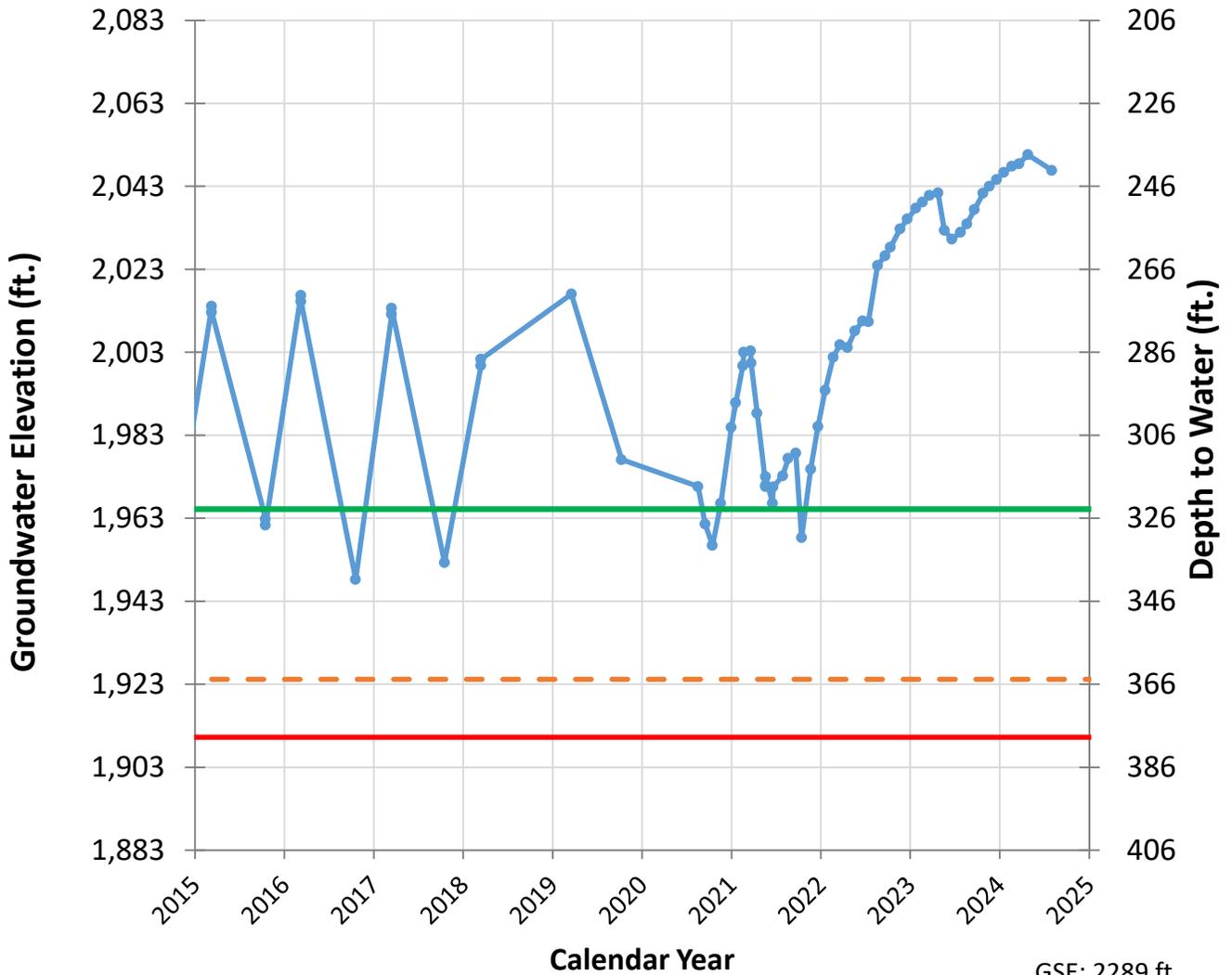


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2046 ft.
 MT: 470 ft.
 MO: 432 ft.
 2025 IM: 461 ft.

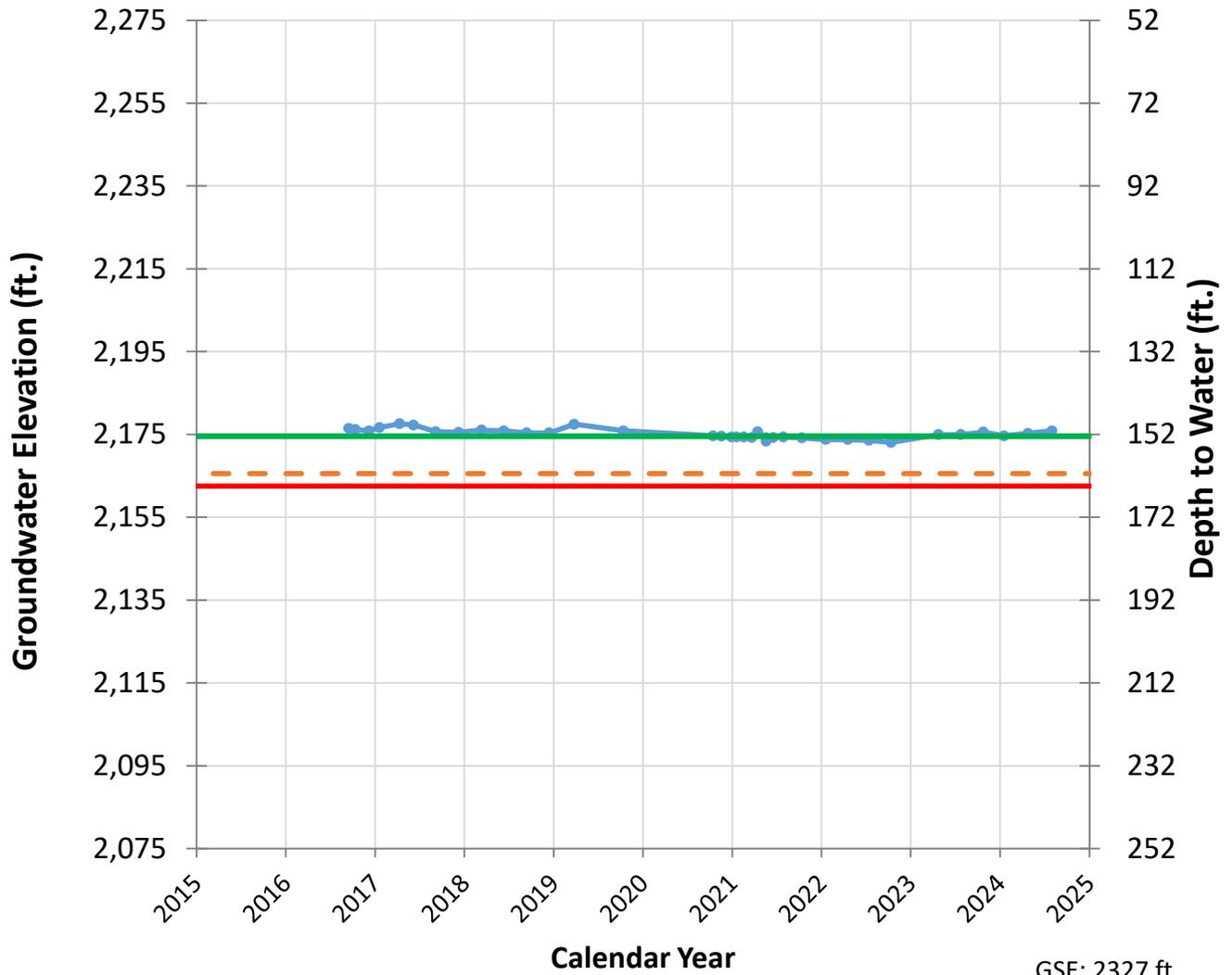
103 Hydrograph



GSE: 2289 ft.
 MT: 379 ft.
 MO: 324 ft.
 2025 IM: 365 ft.

- Groundwater Level
- MO
- - - 2025 IM
- MT
- Ground Surface Elevation

106 Hydrograph

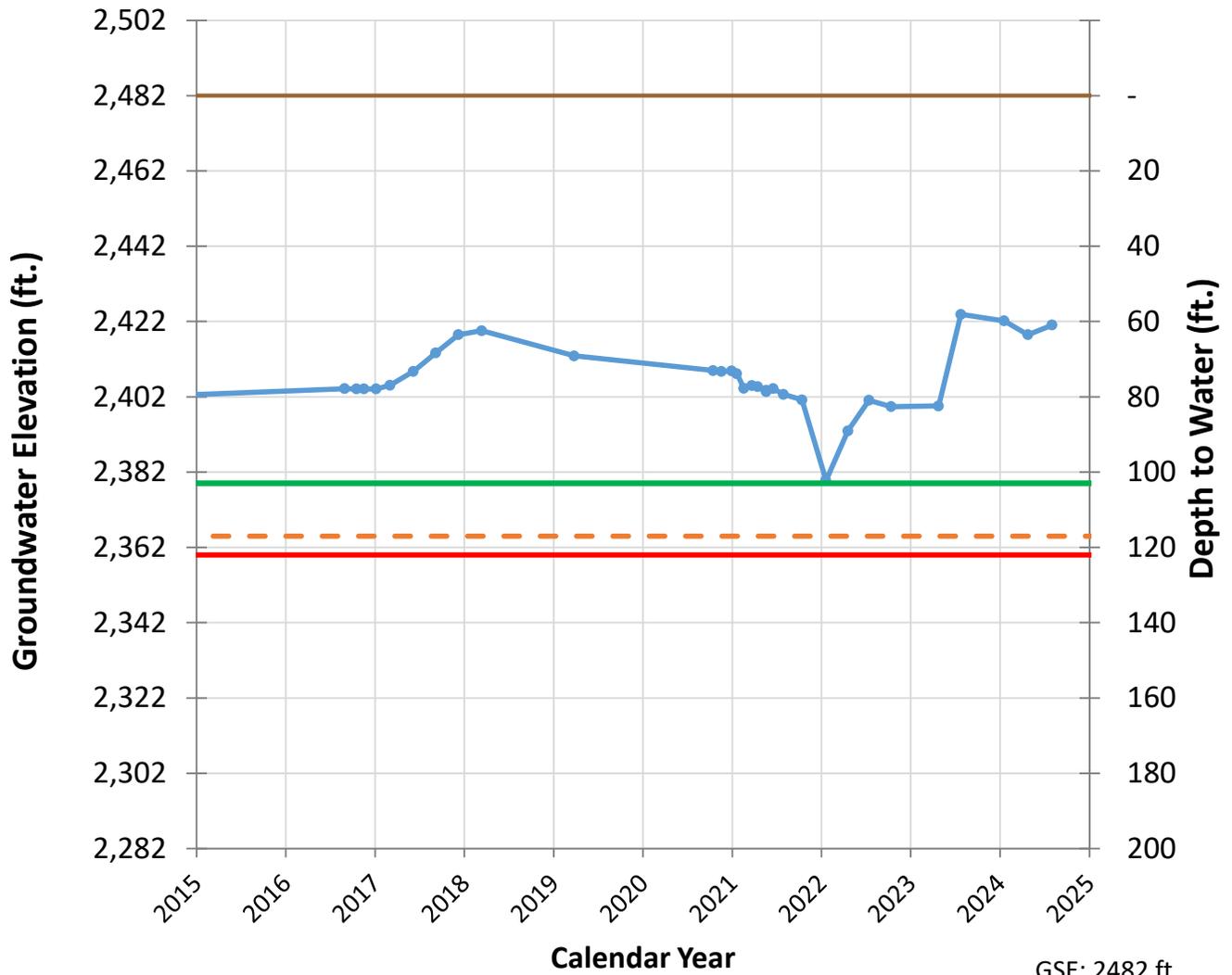


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2327 ft.
 MT: 164 ft.
 MO: 152 ft.
 2025 IM: 161 ft.

107 Hydrograph

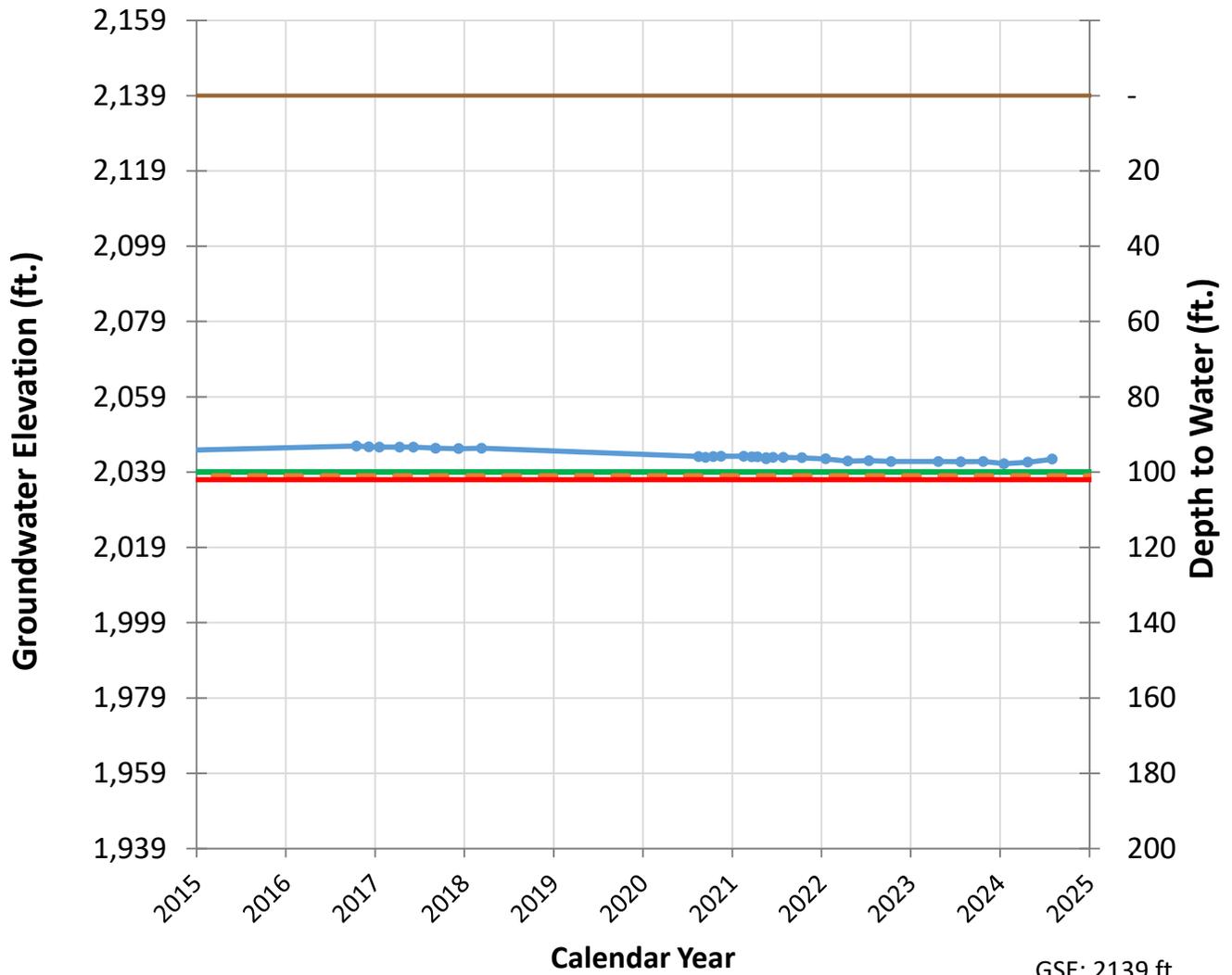


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2482 ft.
 MT: 122 ft.
 MO: 103 ft.
 2025 IM: 117 ft.

112 Hydrograph

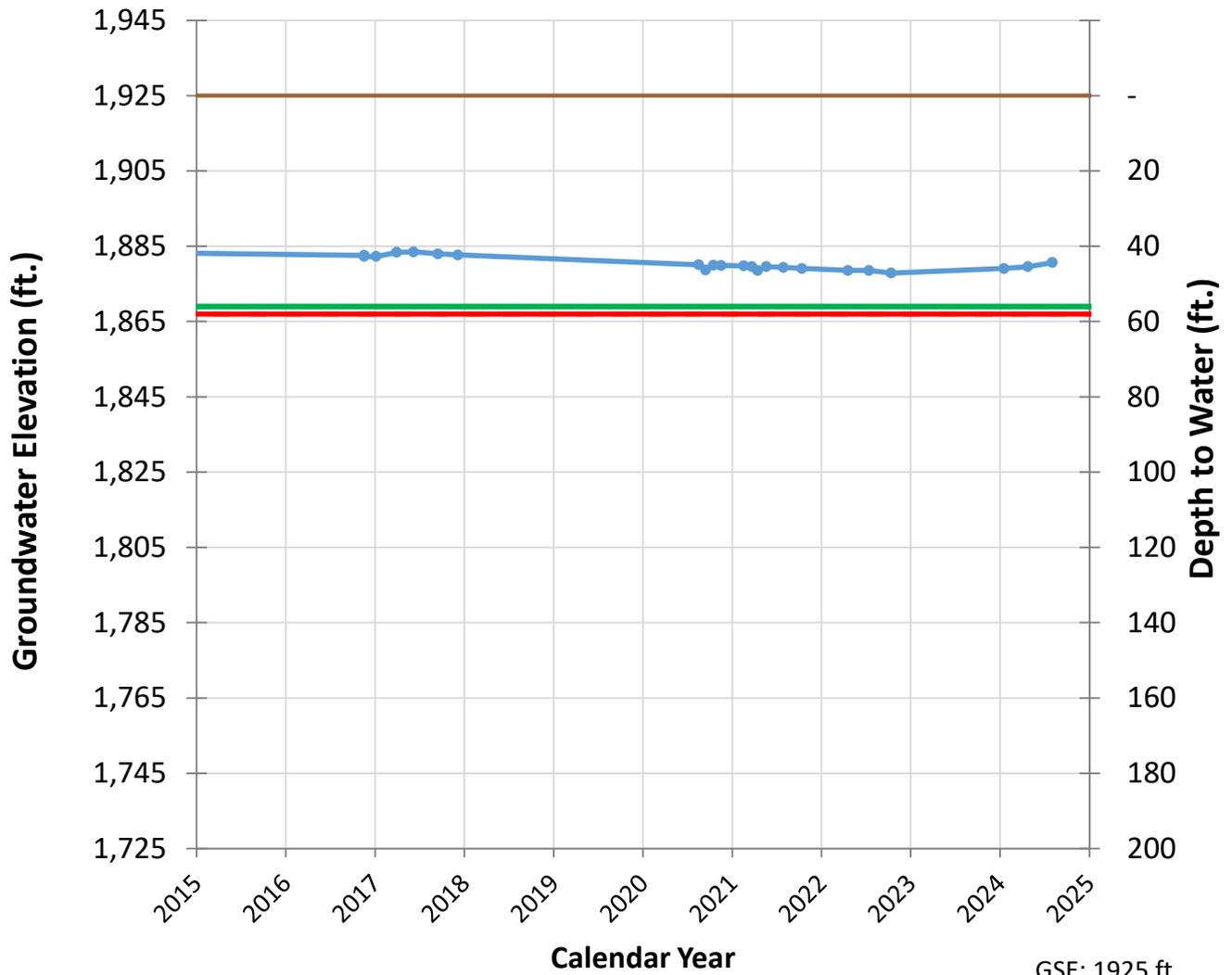


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2139 ft.
 MT: 102 ft.
 MO: 100 ft.
 2025 IM: 101 ft.

114 Hydrograph

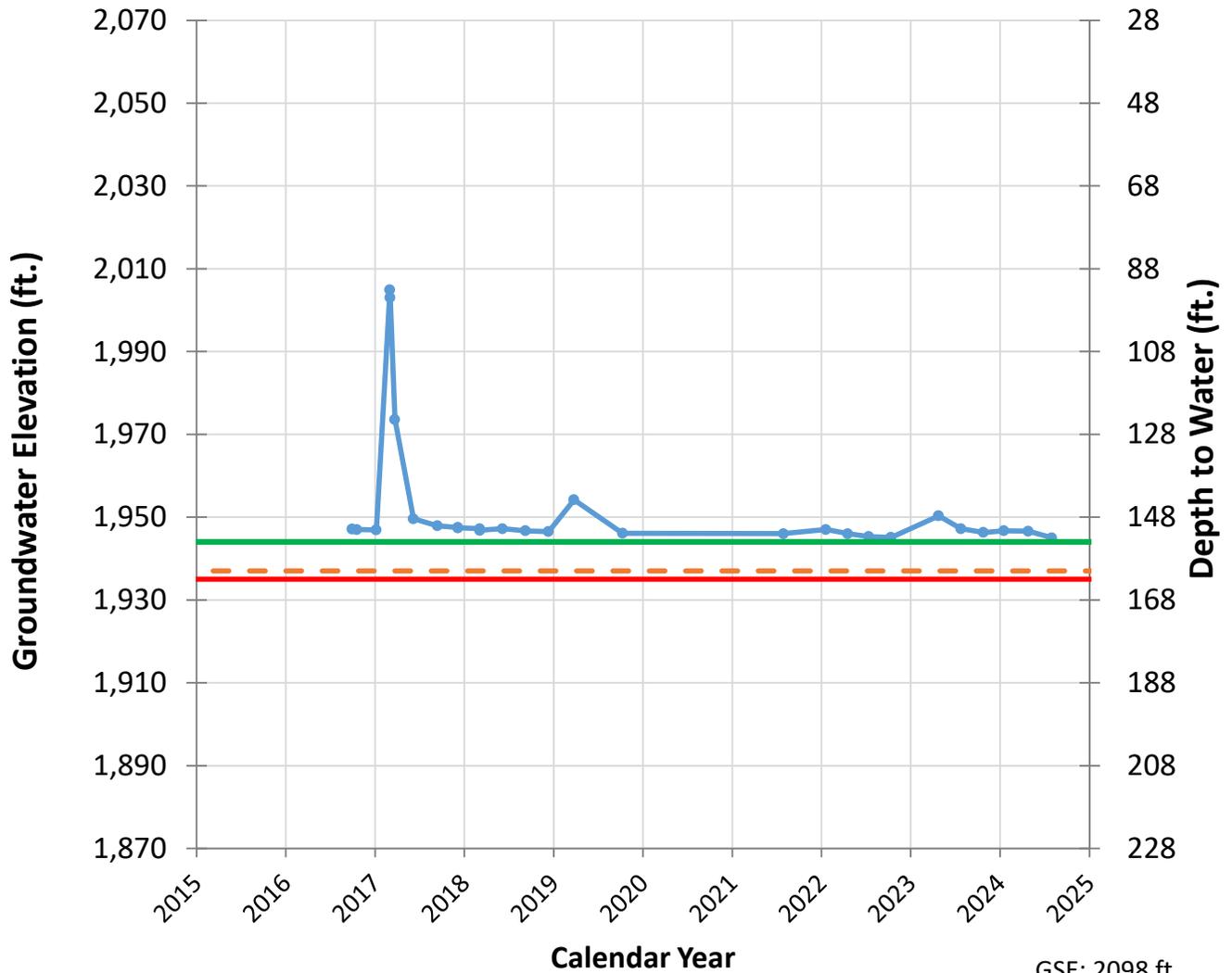


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1925 ft.
MT: 58 ft.
MO: 56 ft.
2025 IM: 58 ft.

117 Hydrograph

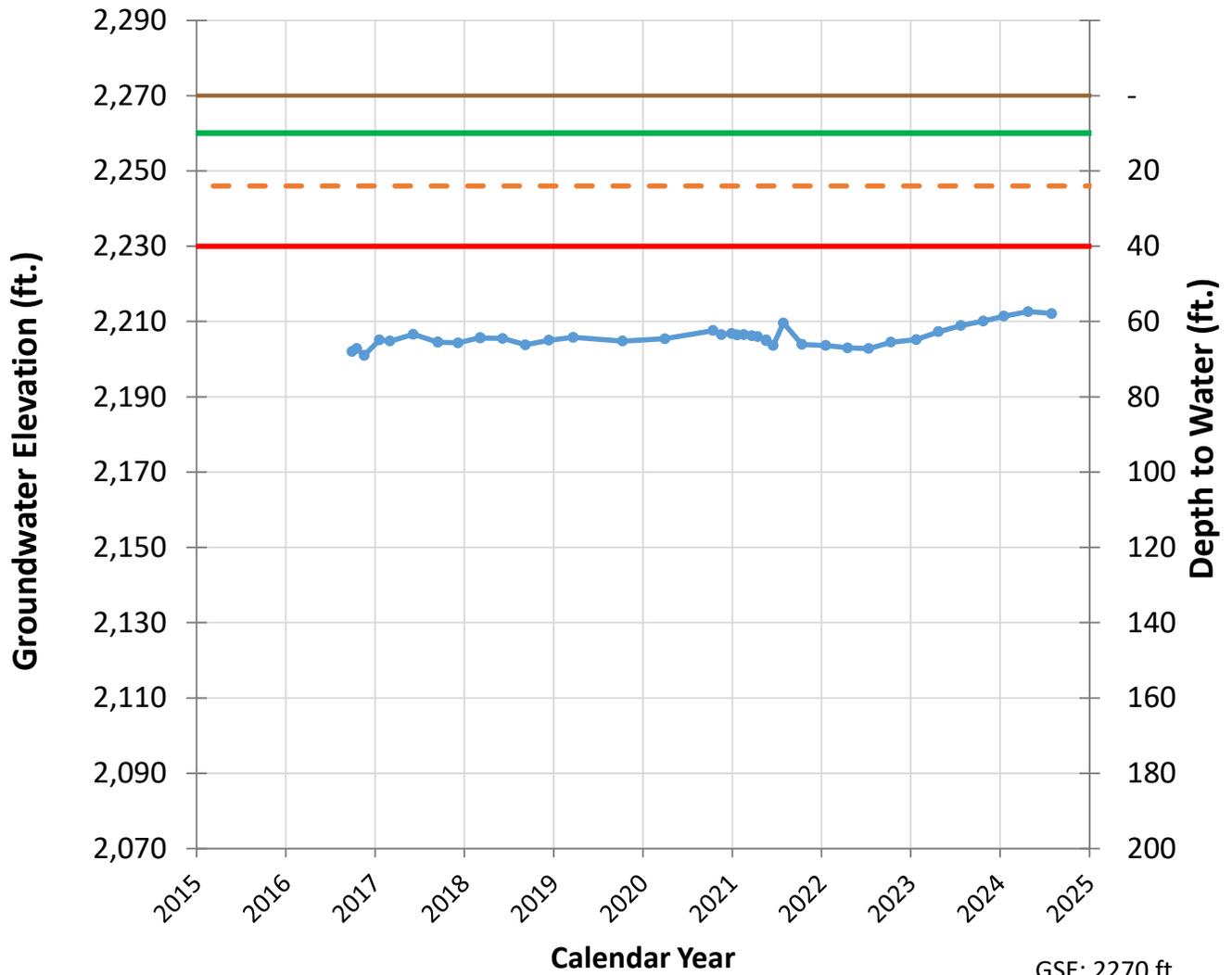


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2098 ft.
 MT: 163 ft.
 MO: 154 ft.
 2025 IM: 161 ft.

118 Hydrograph

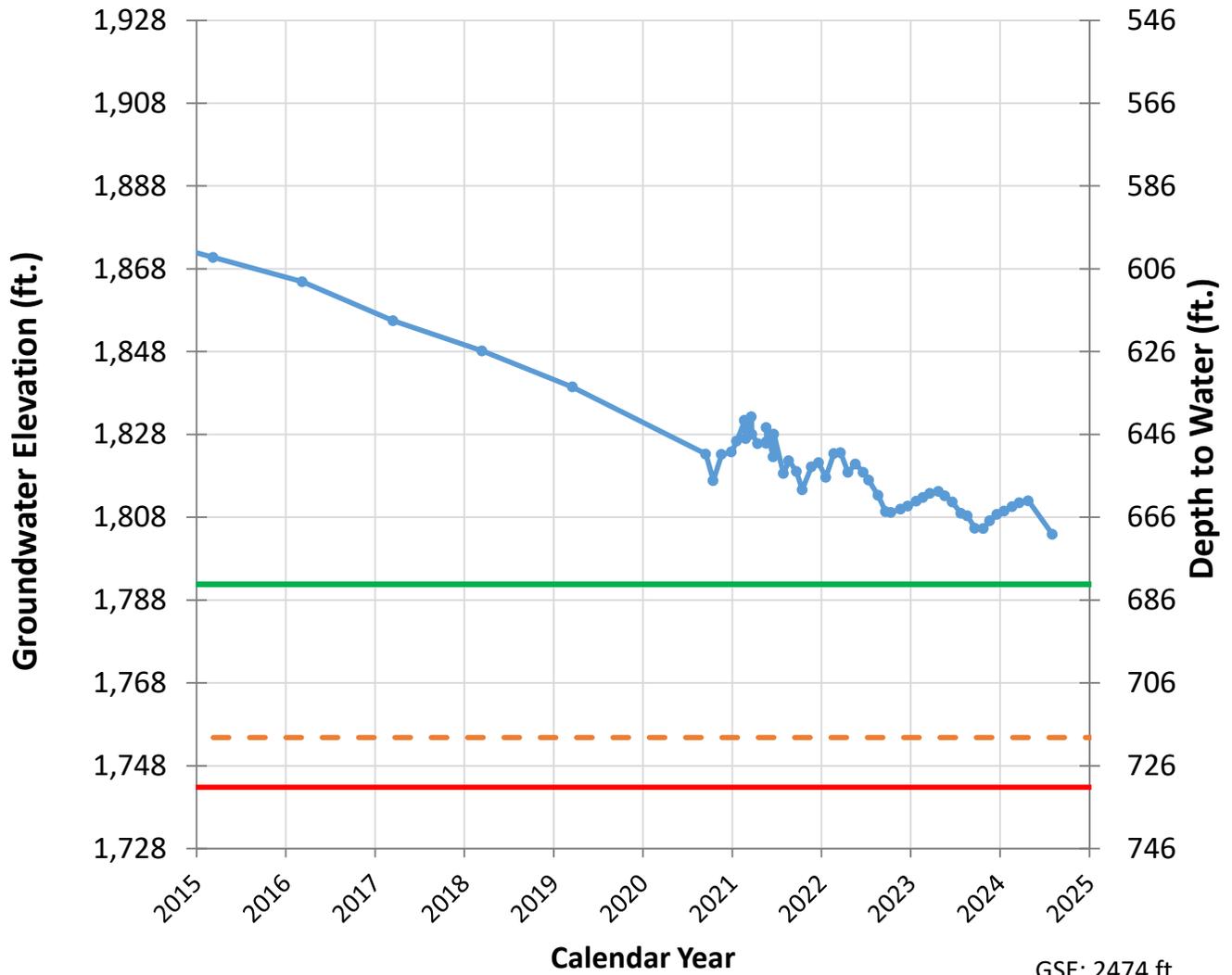


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2270 ft.
 MT: 40 ft.
 MO: 10 ft.
 2025 IM: 24 ft.

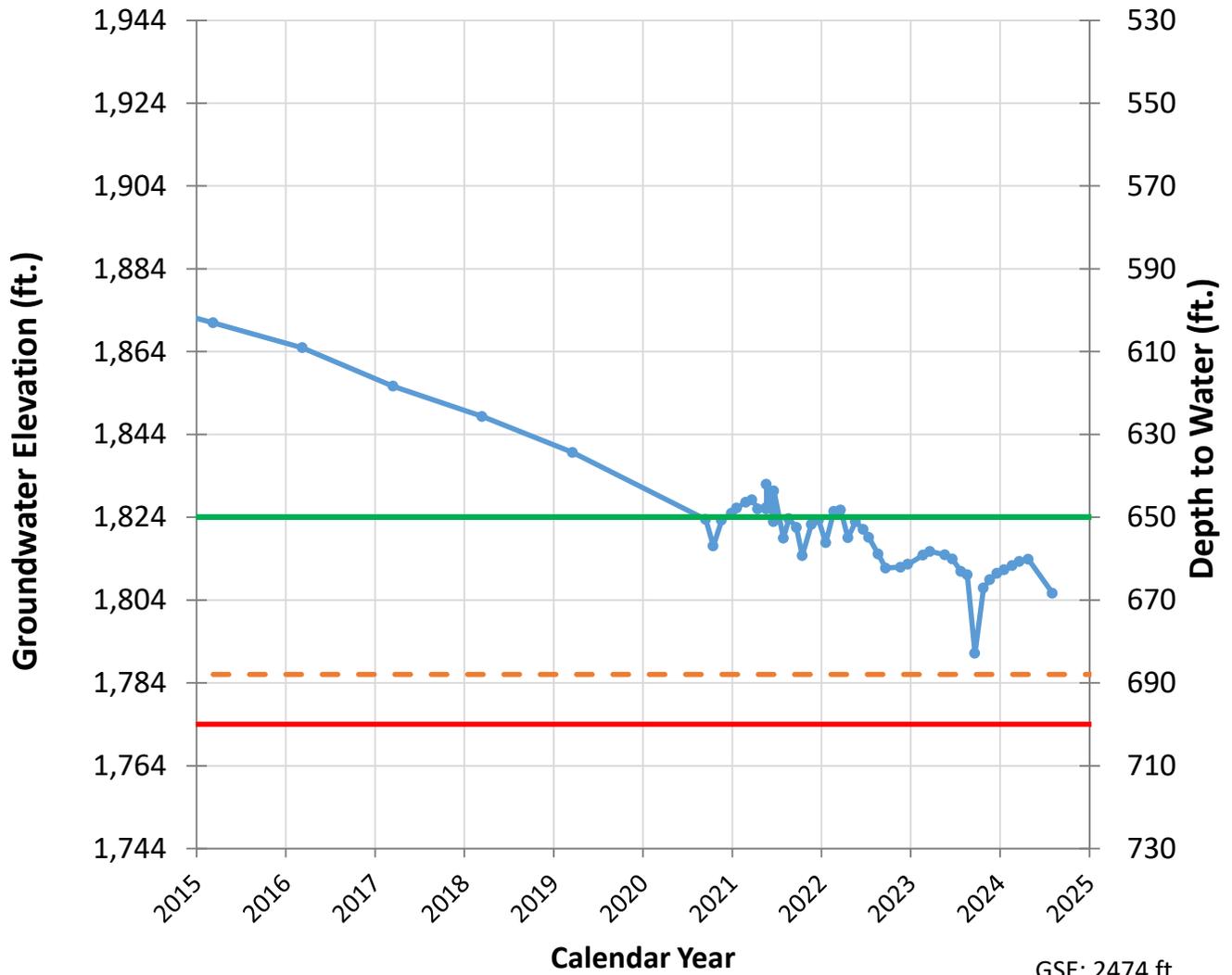
316 Hydrograph



GSE: 2474 ft.
 MT: 731 ft.
 MO: 682 ft.
 2025 IM: 719 ft.

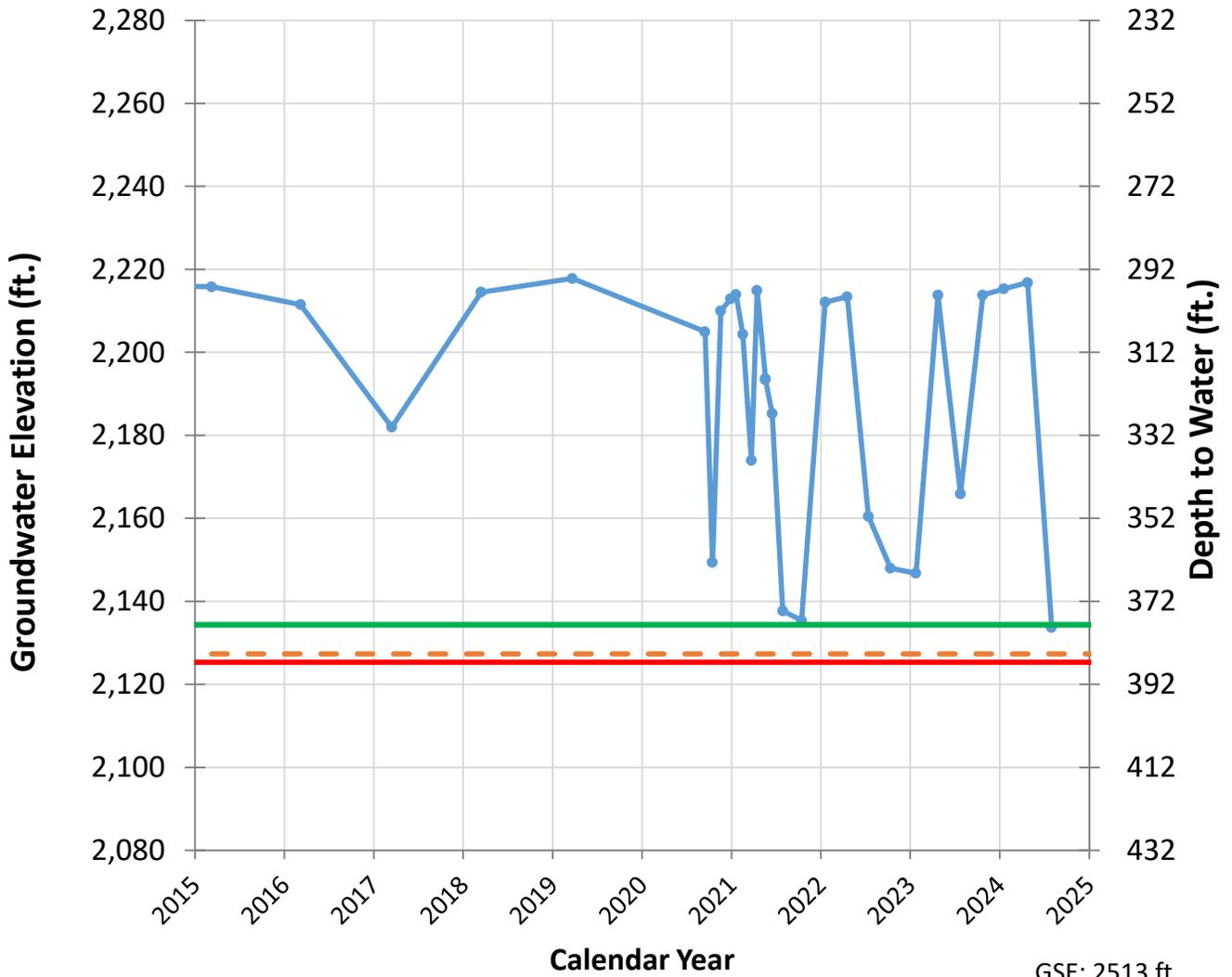
- Groundwater Level
- MO
- - - 2025 IM
- MT
- Ground Surface Elevation

317 Hydrograph



GSE: 2474 ft.
MT: 700 ft.
MO: 650 ft.
2025 IM: 688 ft.

322 Hydrograph

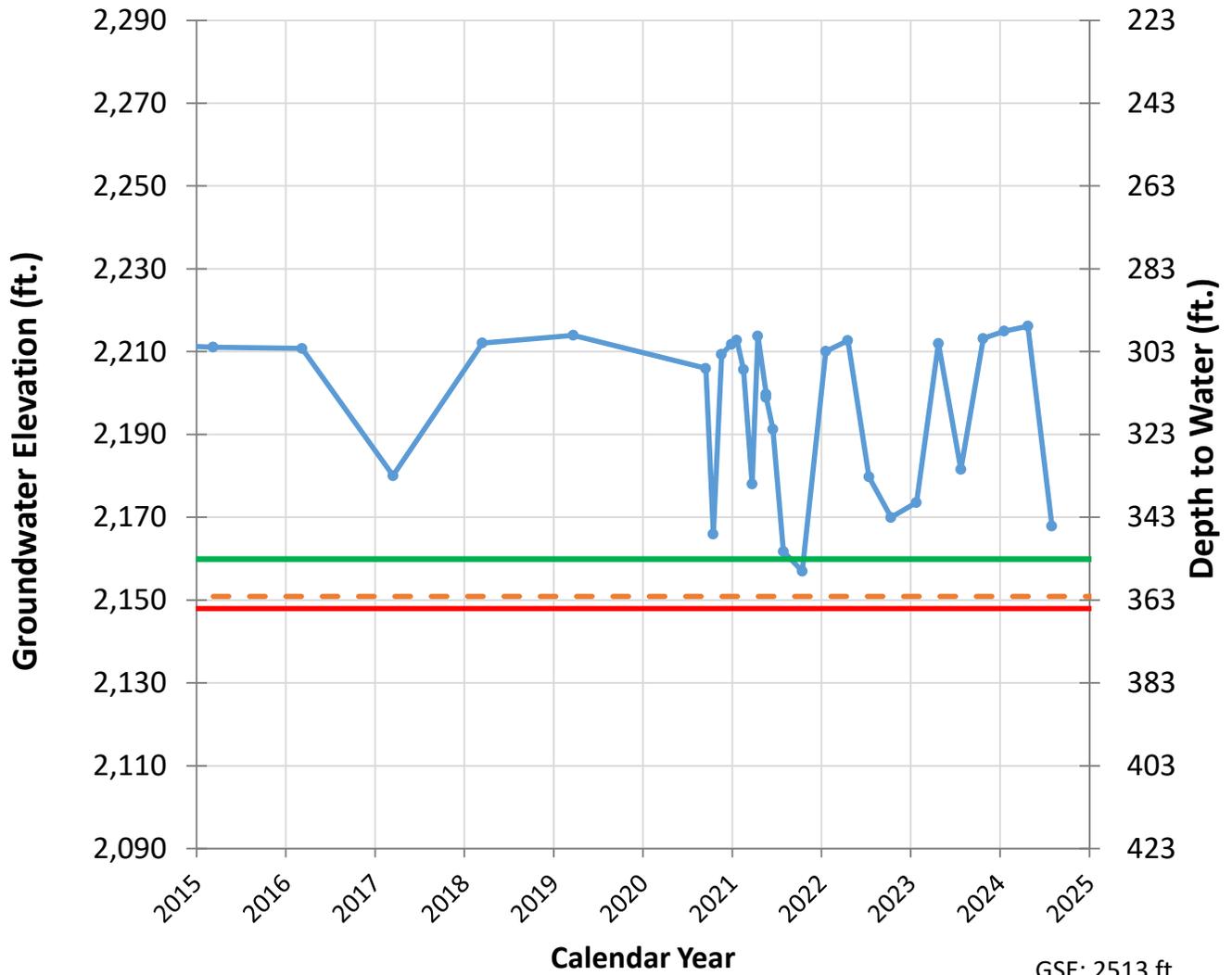


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2513 ft.
 MT: 387 ft.
 MO: 378 ft.
 2025 IM: 385 ft.

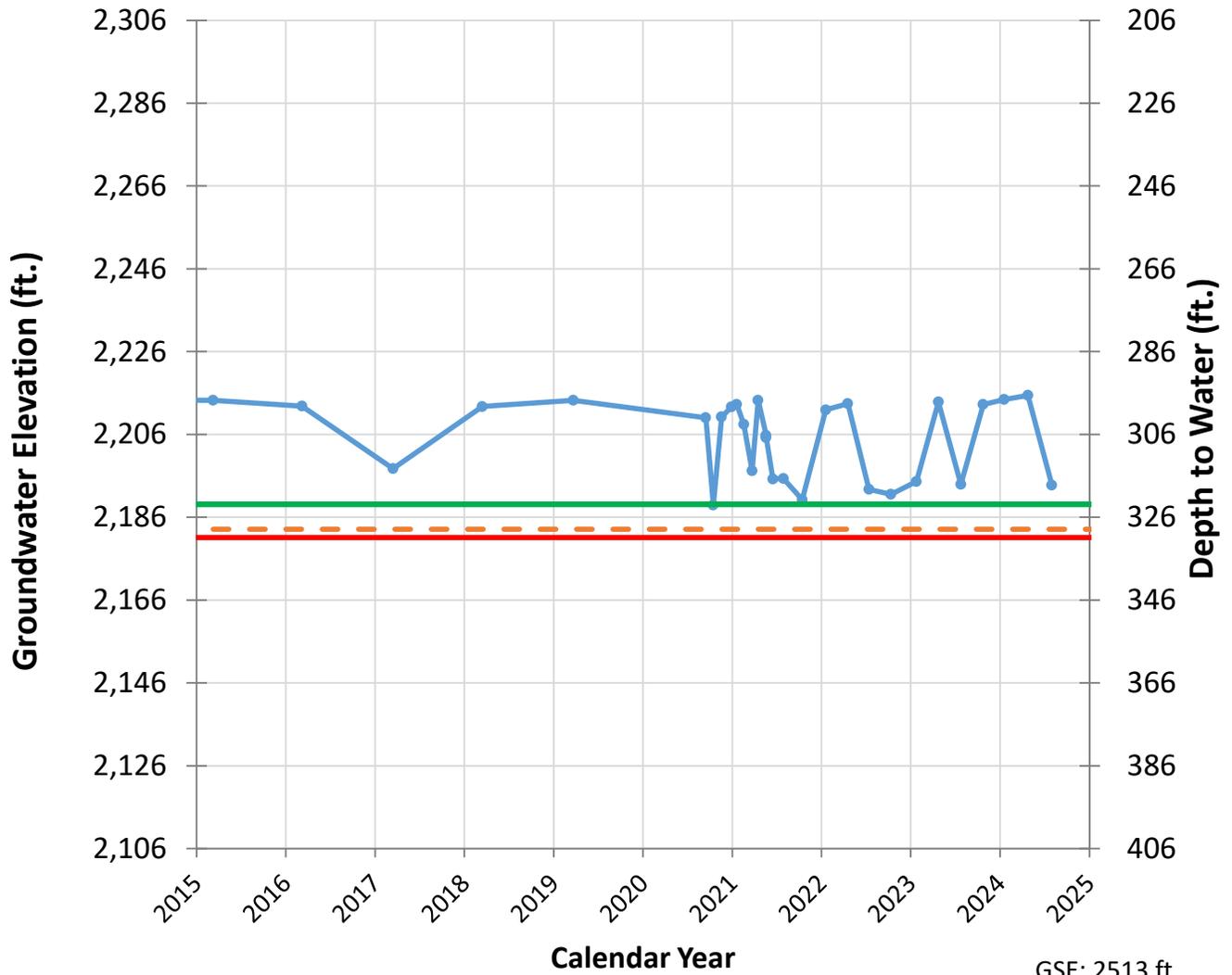
324 Hydrograph



GSE: 2513 ft.
 MT: 365 ft.
 MO: 353 ft.
 2025 IM: 362 ft.

- Groundwater Level
- 2025 IM
- Ground Surface Elevation
- MO
- MT

325 Hydrograph

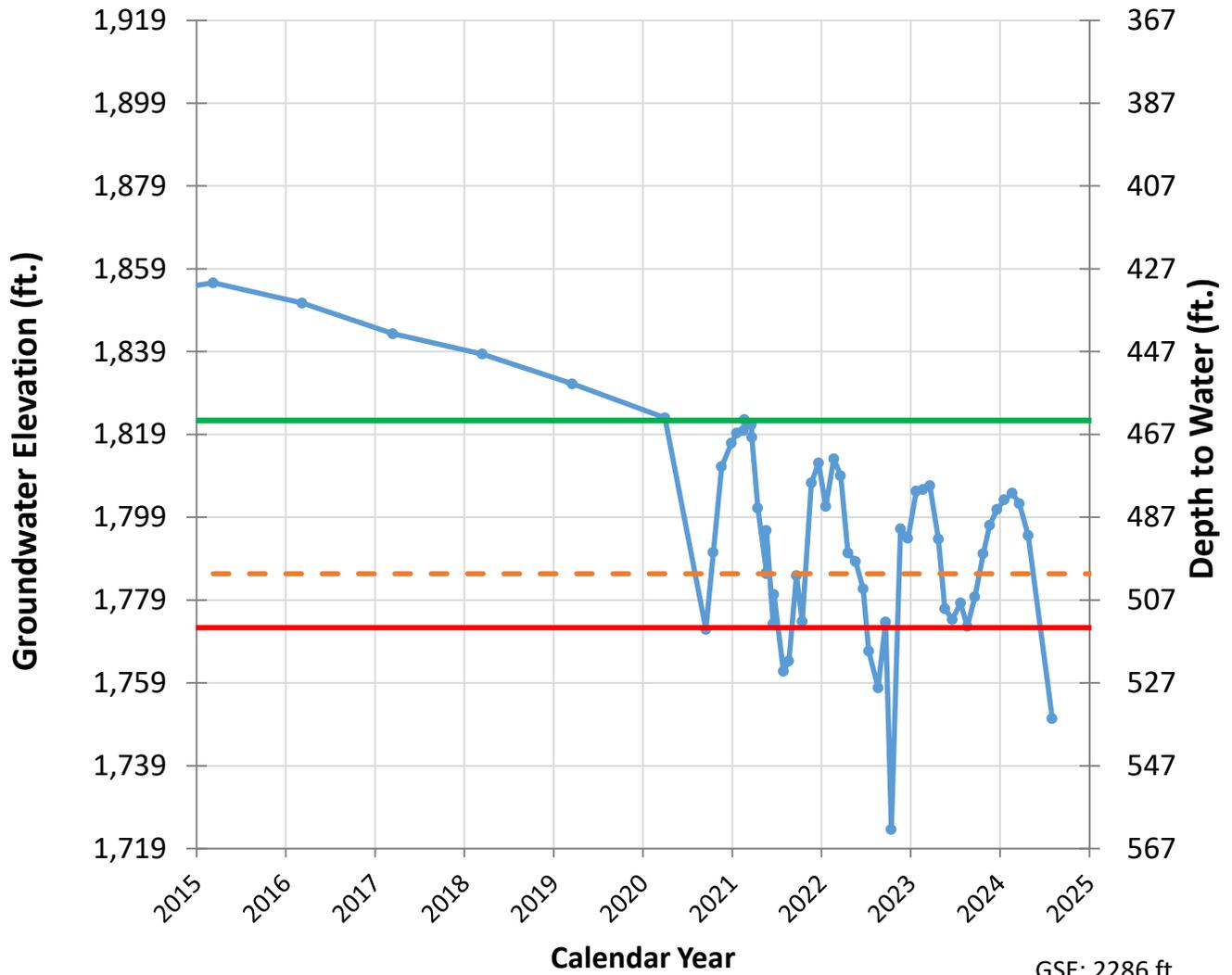


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2513 ft.
 MT: 331 ft.
 MO: 323 ft.
 2025 IM: 329 ft.

420 Hydrograph

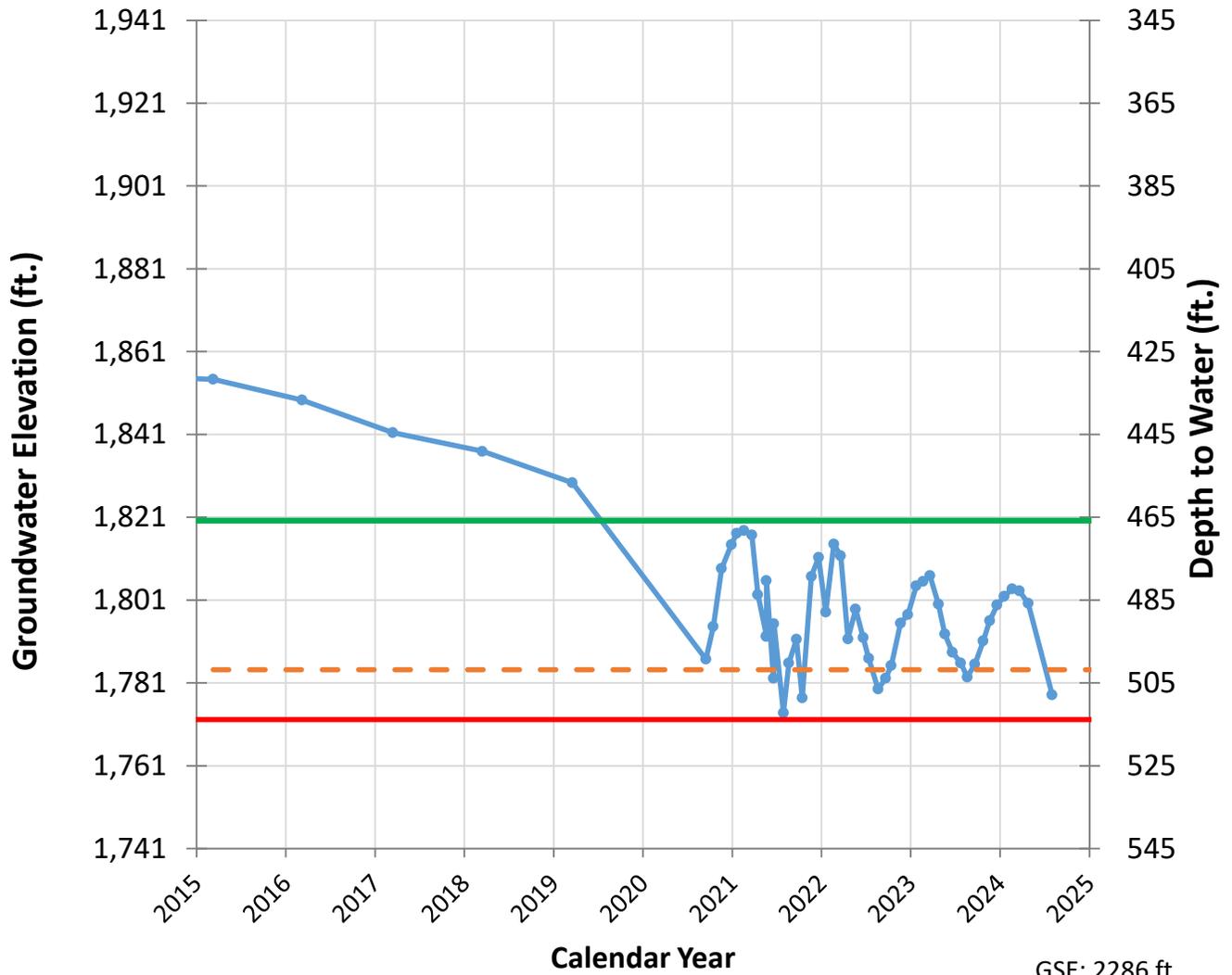


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2286 ft.
 MT: 514 ft.
 MO: 464 ft.
 2025 IM: 501 ft.

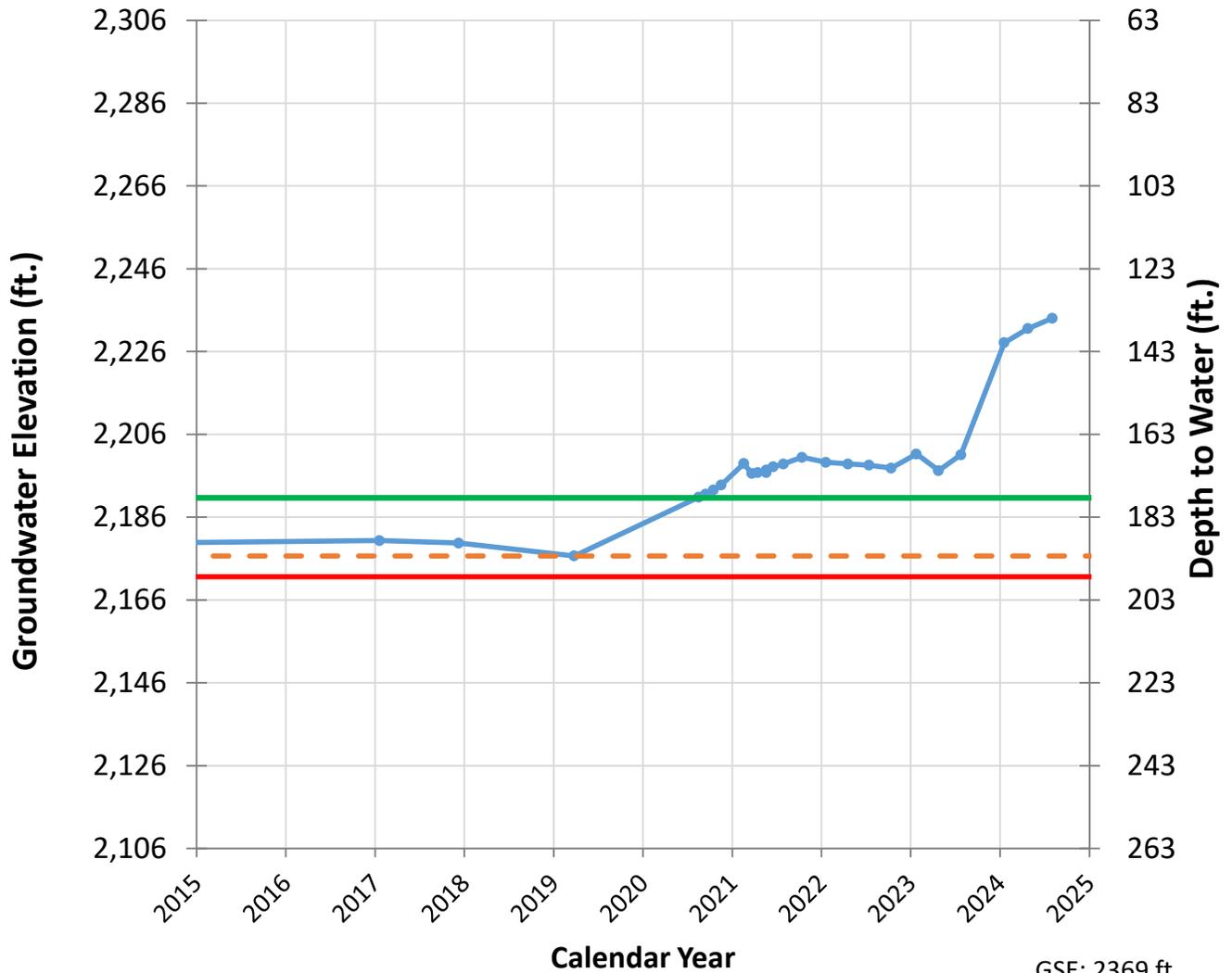
421 Hydrograph



GSE: 2286 ft.
 MT: 514 ft.
 MO: 466 ft.
 2025 IM: 502 ft.

- Groundwater Level
- MO
- - - 2025 IM
- MT
- Ground Surface Elevation

474 Hydrograph

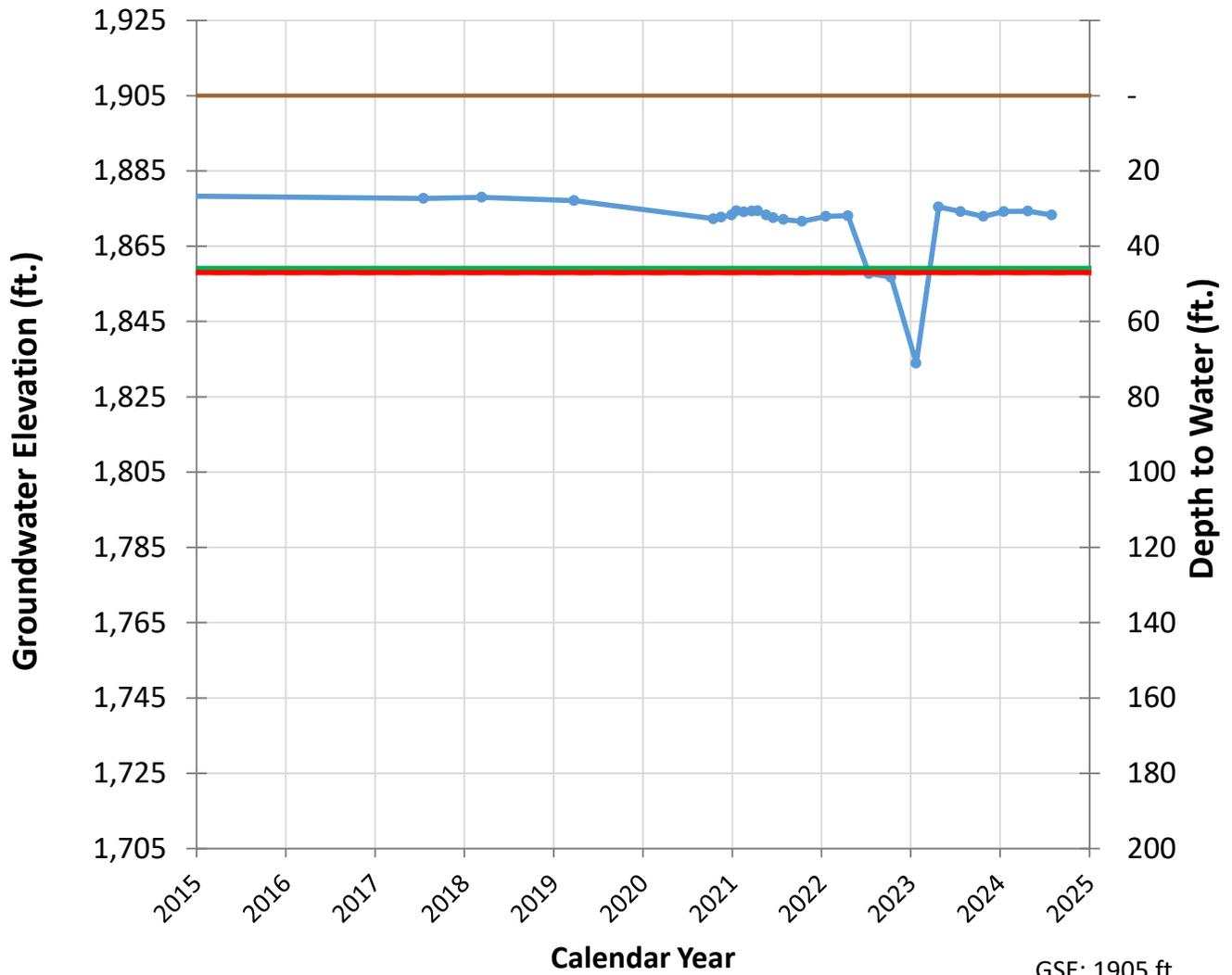


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2369 ft.
 MT: 197 ft.
 MO: 178 ft.
 2025 IM: 192 ft.

568 Hydrograph

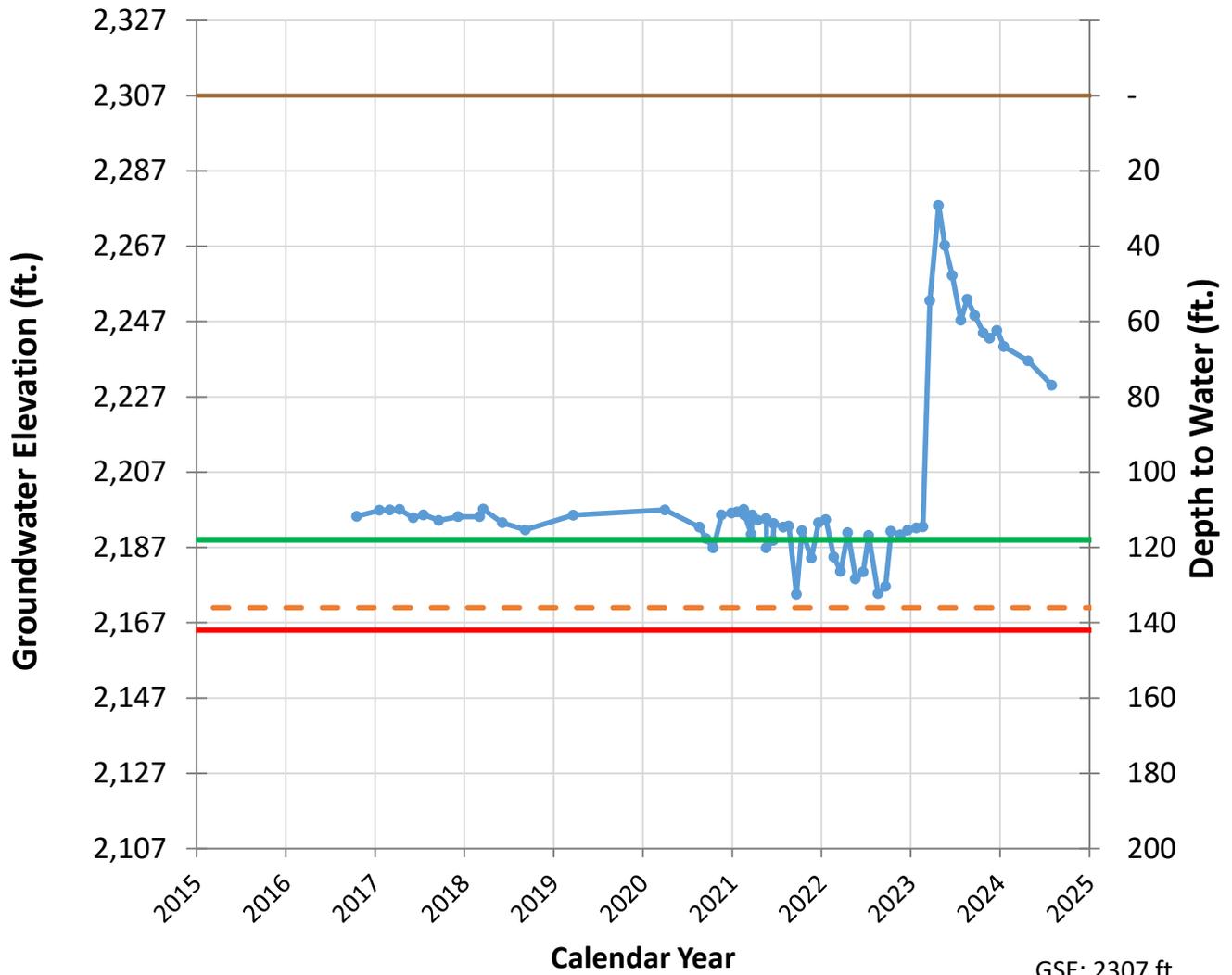


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1905 ft.
MT: 47 ft.
MO: 46 ft.
2025 IM: 47 ft.

571 Hydrograph

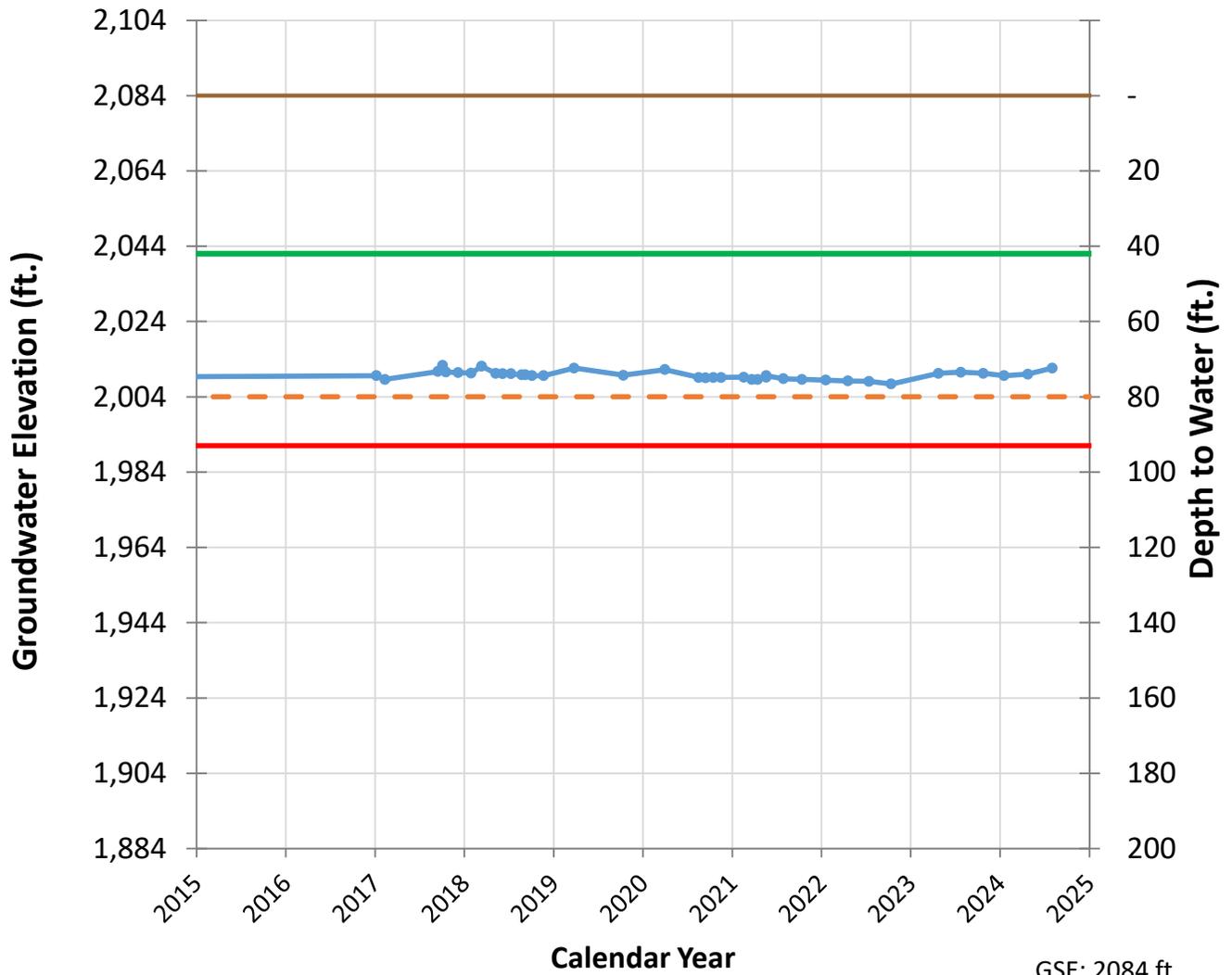


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2307 ft.
 MT: 142 ft.
 MO: 118 ft.
 2025 IM: 136 ft.

573 Hydrograph

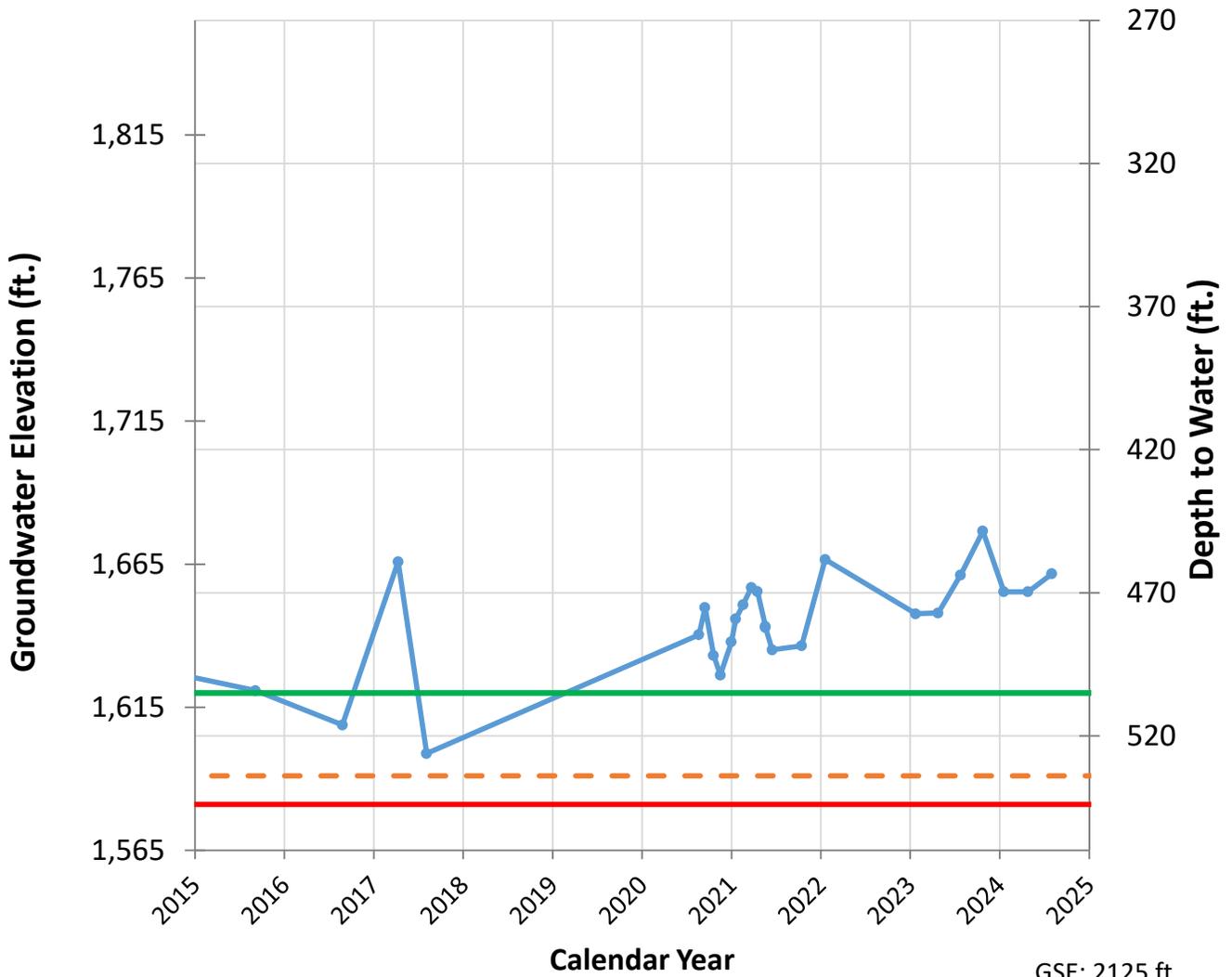


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2084 ft.
 MT: 93 ft.
 MO: 42 ft.
 2025 IM: 80 ft.

604 Hydrograph

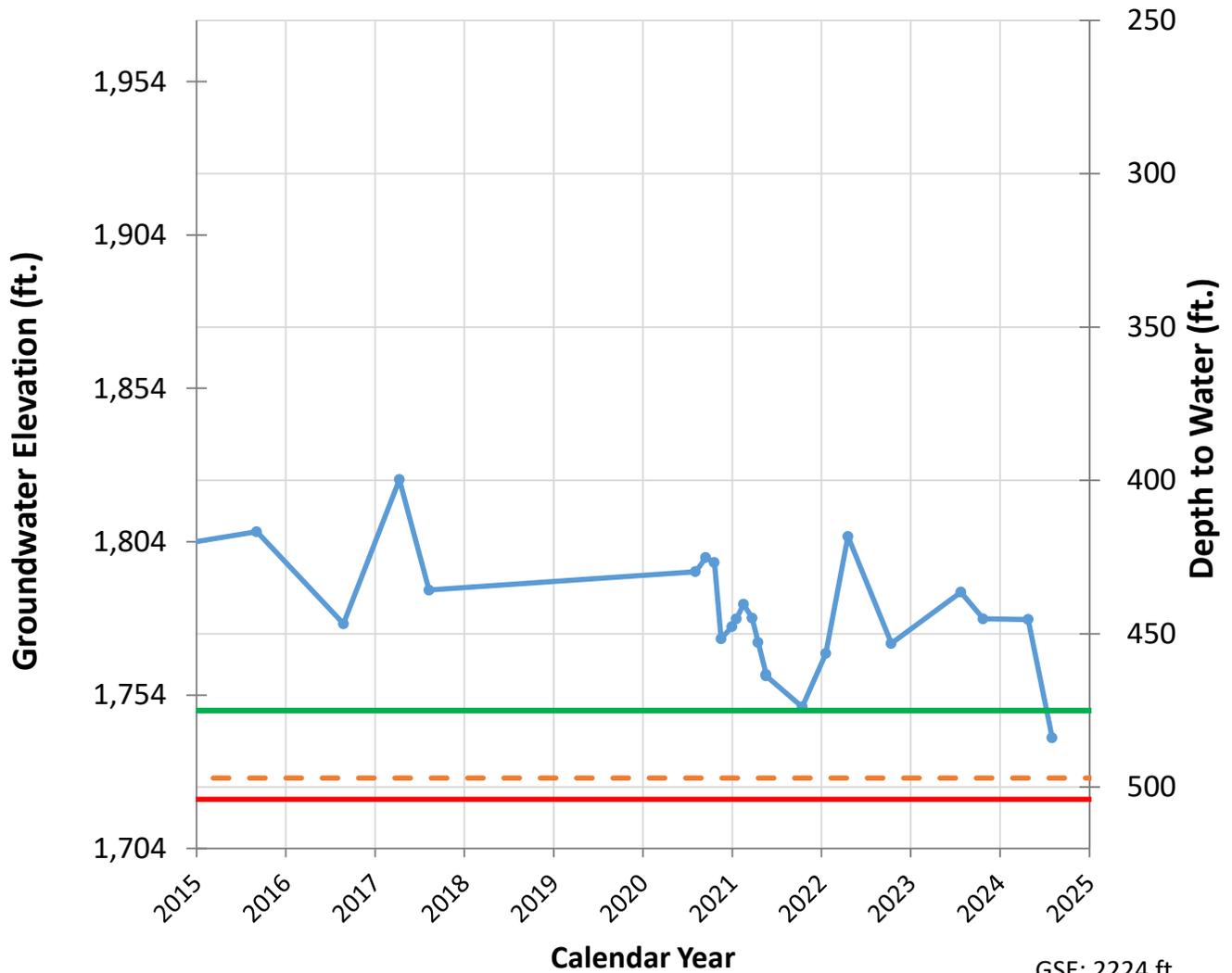


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2125 ft.
 MT: 544 ft.
 MO: 505 ft.
 2025 IM: 534 ft.

608 Hydrograph

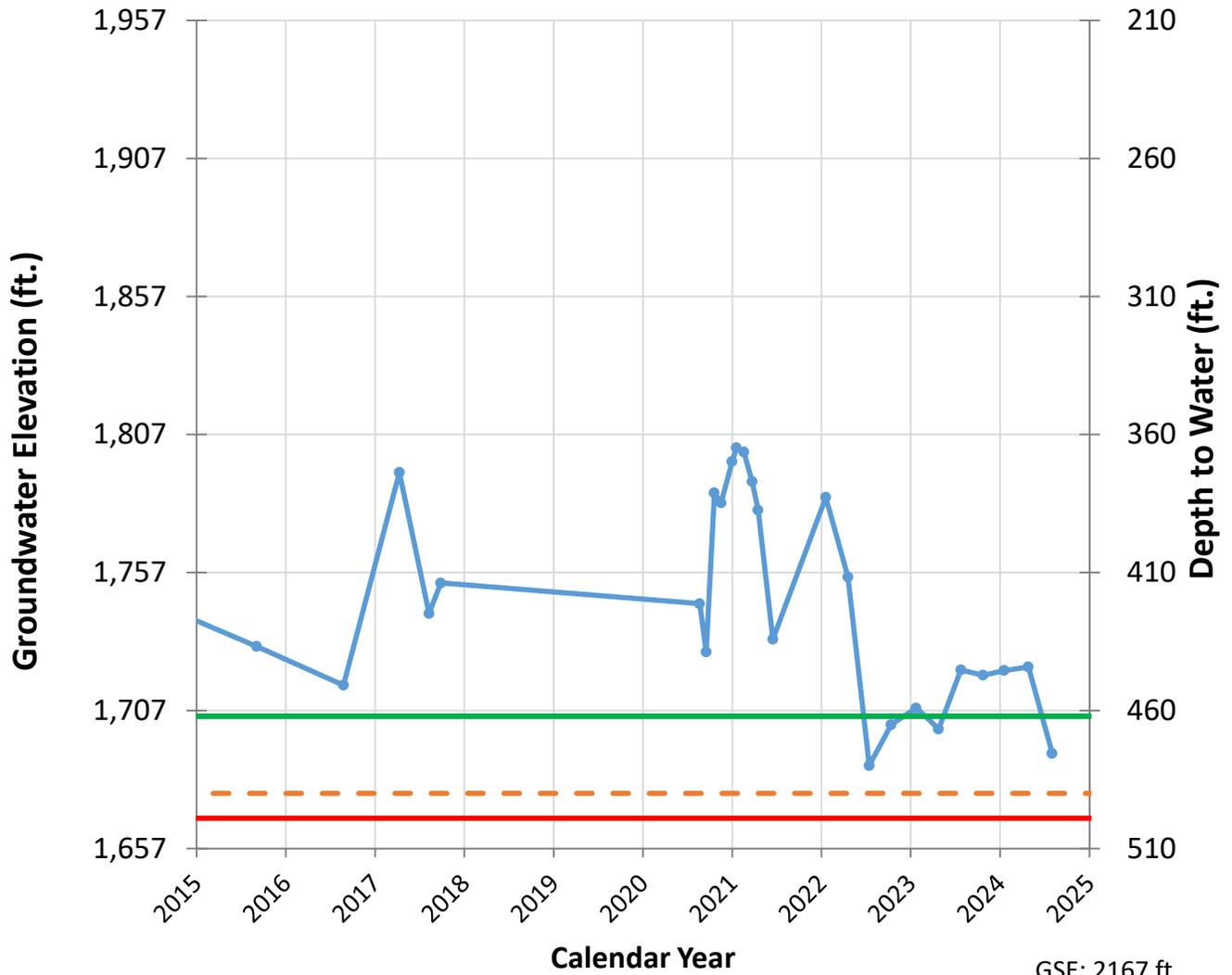


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2224 ft.
 MT: 504 ft.
 MO: 475 ft.
 2025 IM: 497 ft.

609 Hydrograph

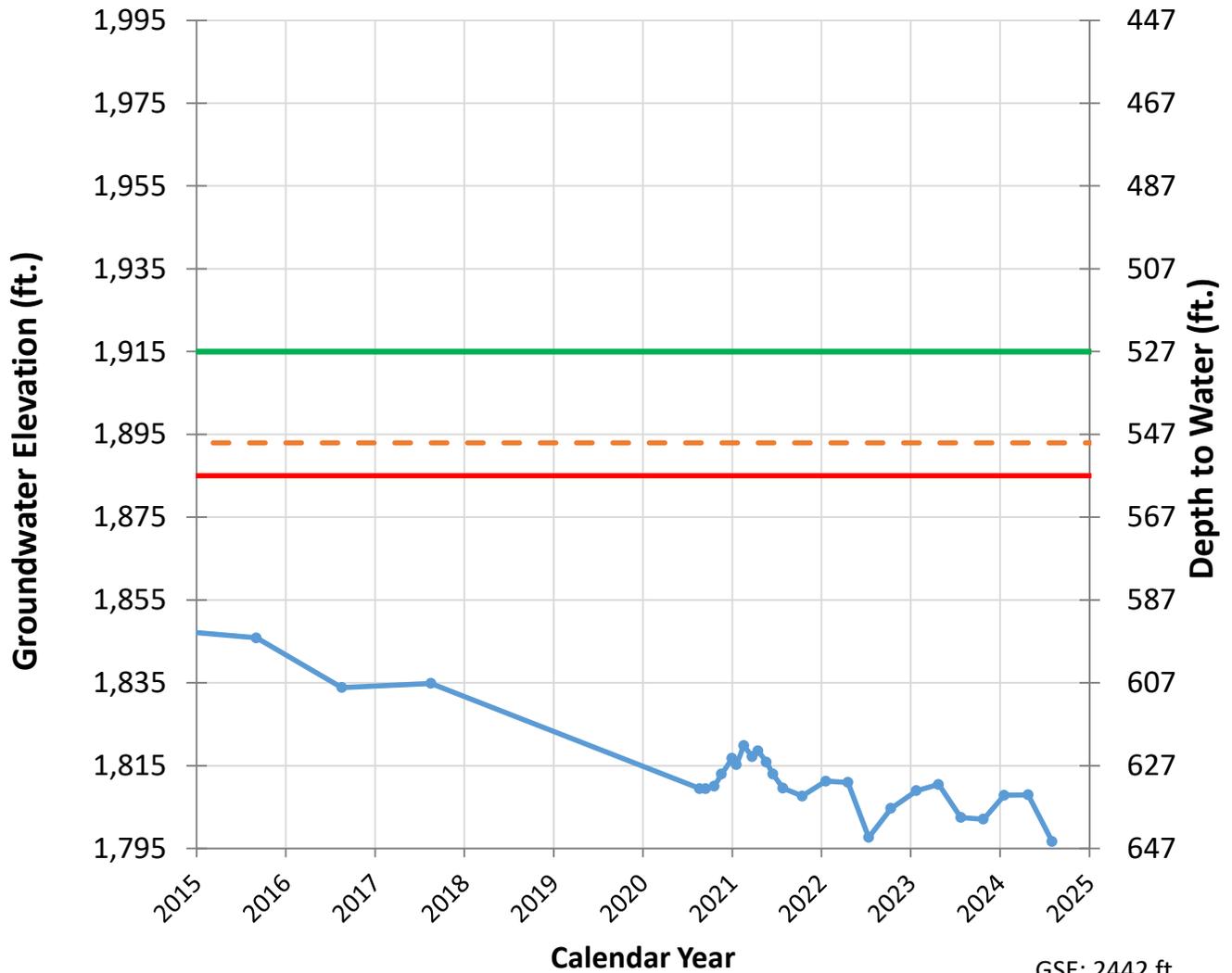


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2167 ft.
 MT: 499 ft.
 MO: 462 ft.
 2025 IM: 490 ft.

610 Hydrograph

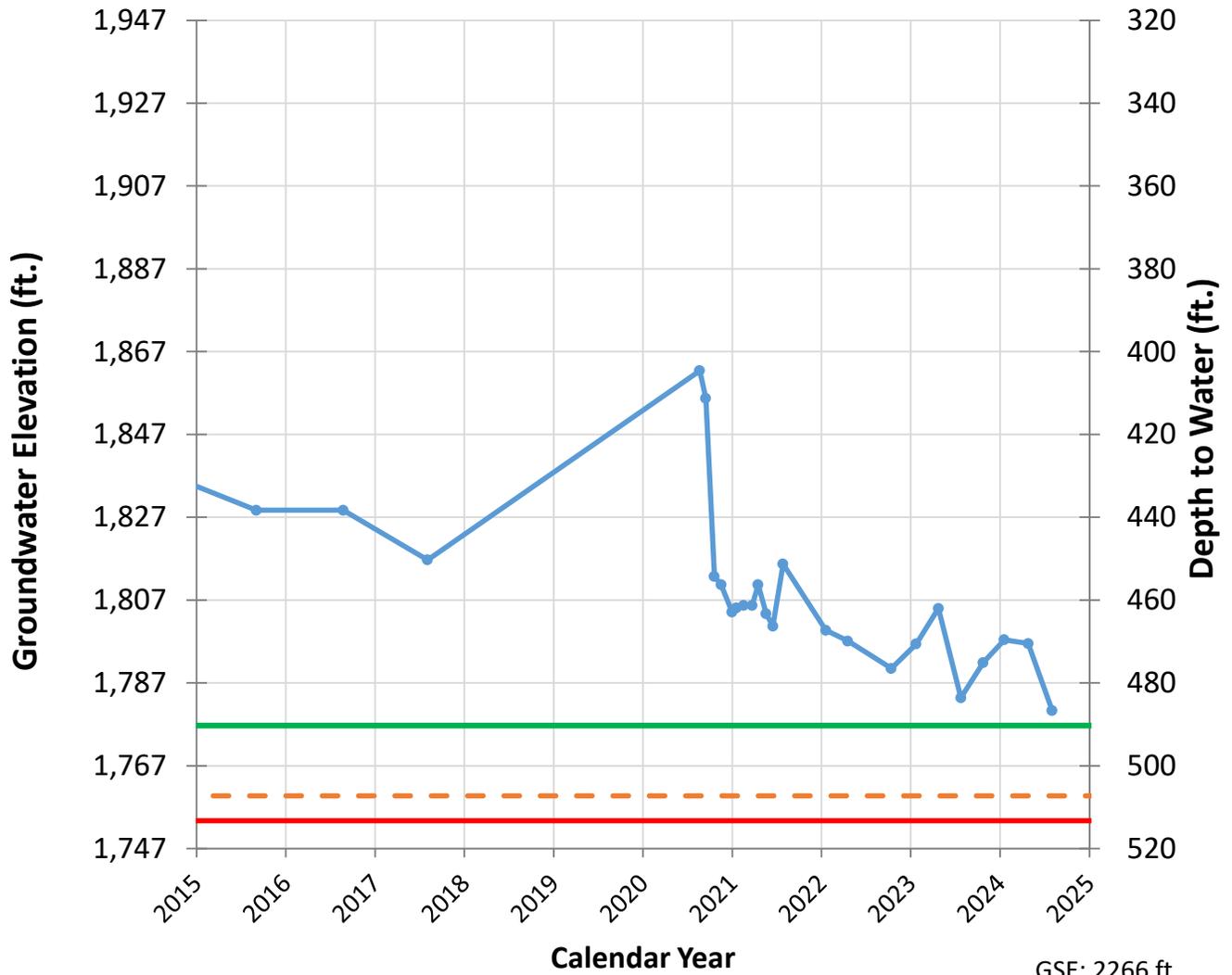


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2442 ft.
MT: 557 ft.
MO: 527 ft.
2025 IM: 549 ft.

612 Hydrograph

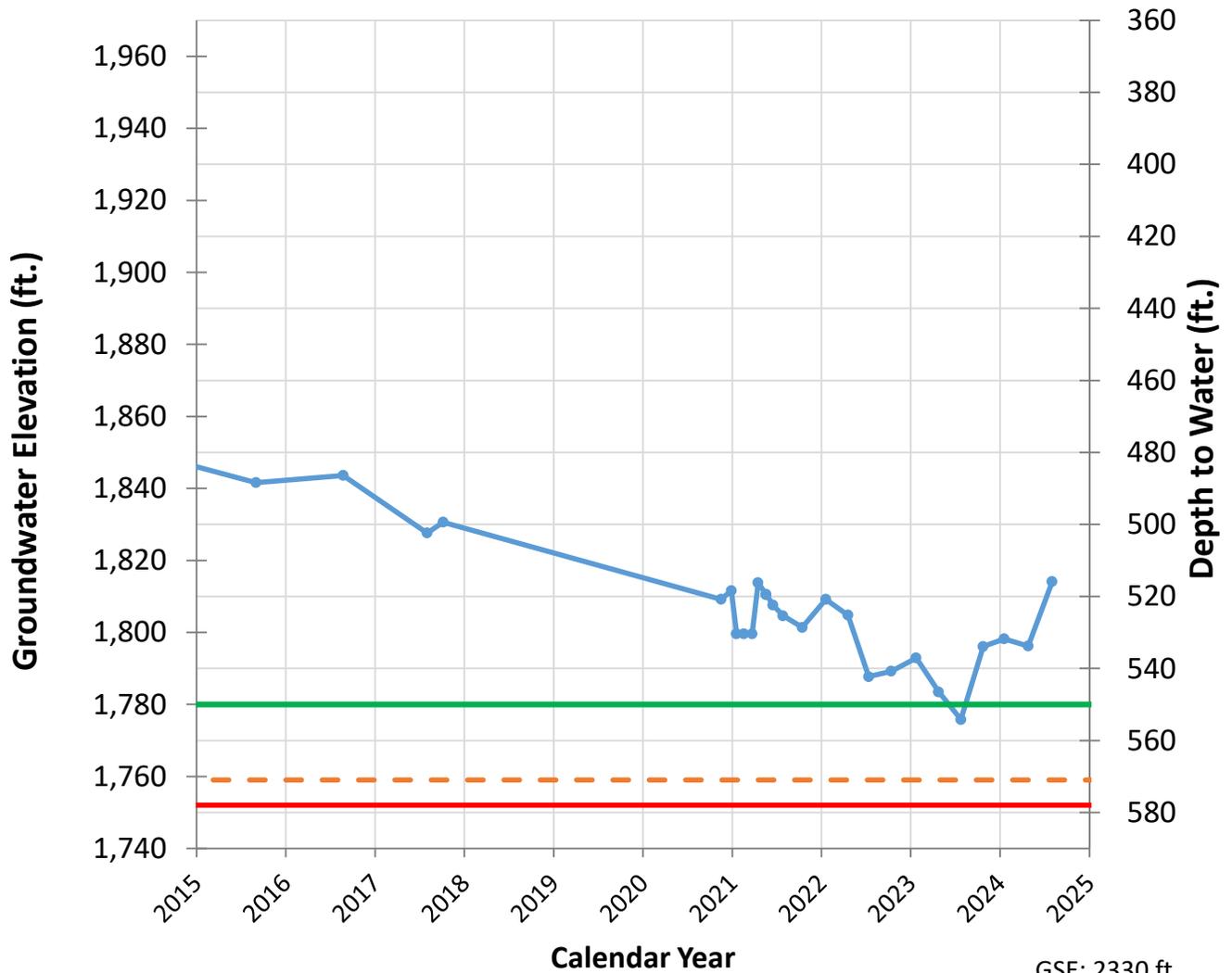


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2266 ft.
 MT: 513 ft.
 MO: 490 ft.
 2025 IM: 507 ft.

613 Hydrograph

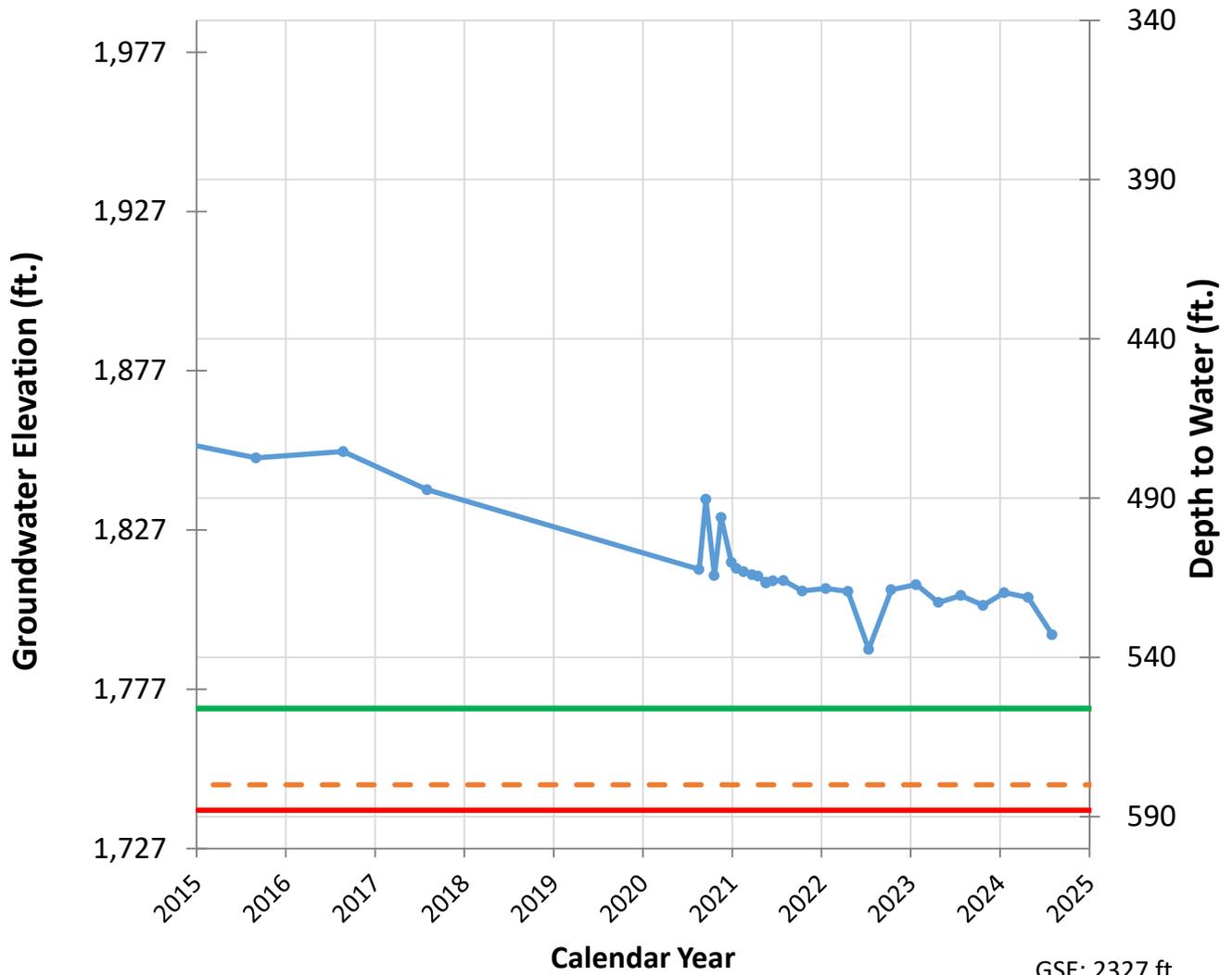


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2330 ft.
 MT: 578 ft.
 MO: 550 ft.
 2025 IM: 571 ft.

615 Hydrograph

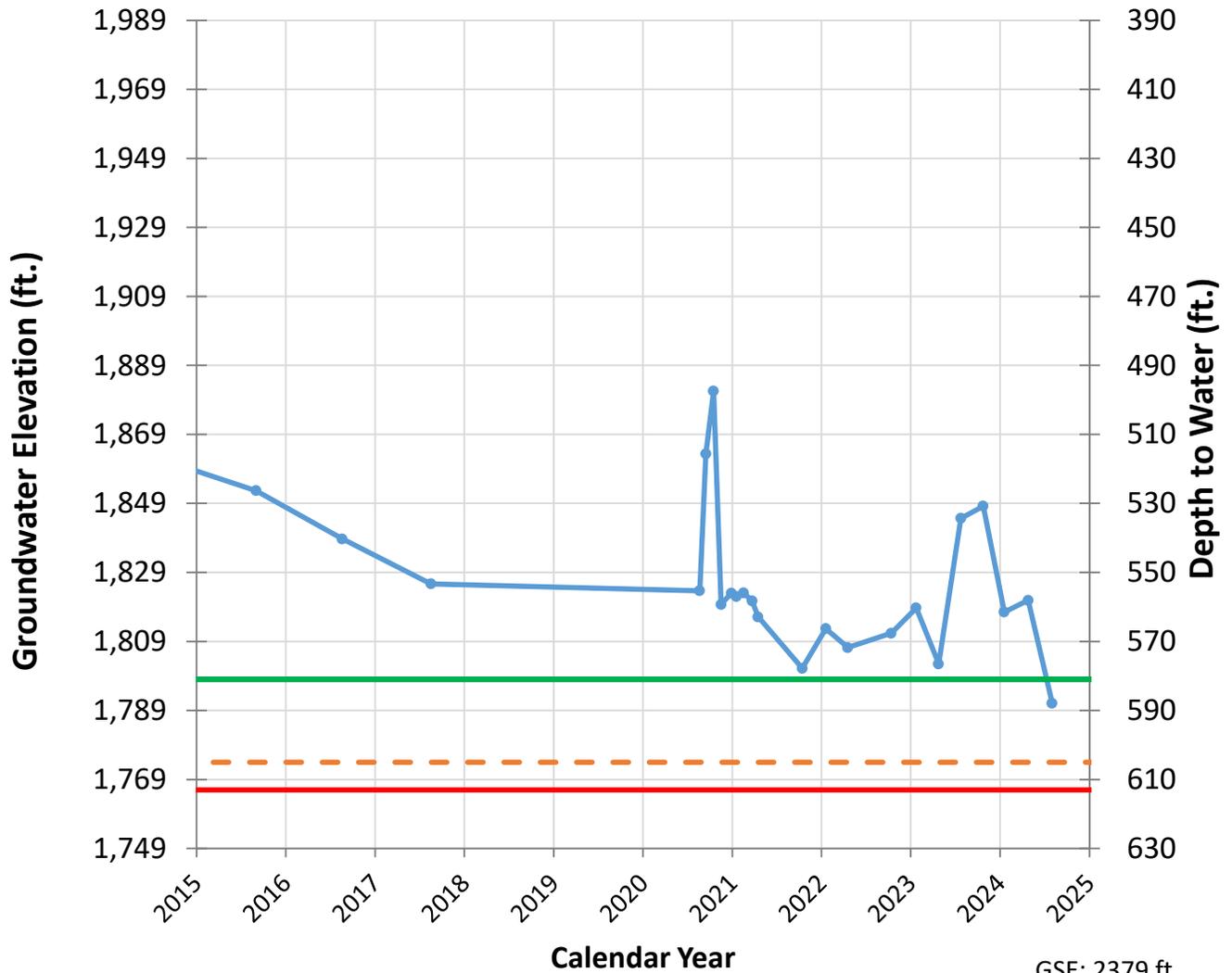


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2327 ft.
 MT: 588 ft.
 MO: 556 ft.
 2025 IM: 580 ft.

629 Hydrograph

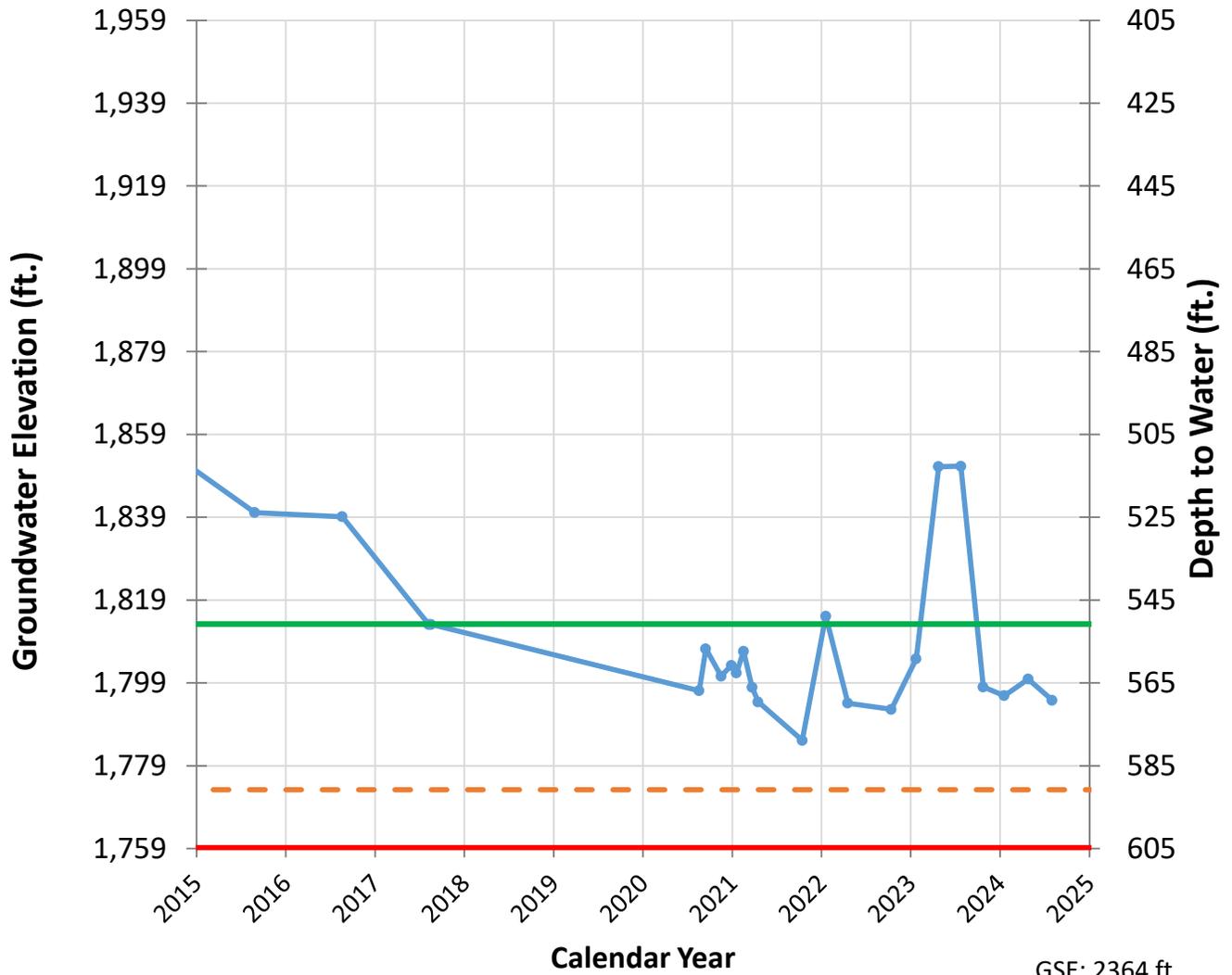


—●— Groundwater Level
- - - 2025 IM
— Ground Surface Elevation

— MO
— MT

GSE: 2379 ft.
 MT: 613 ft.
 MO: 581 ft.
 2025 IM: 605 ft.

633 Hydrograph

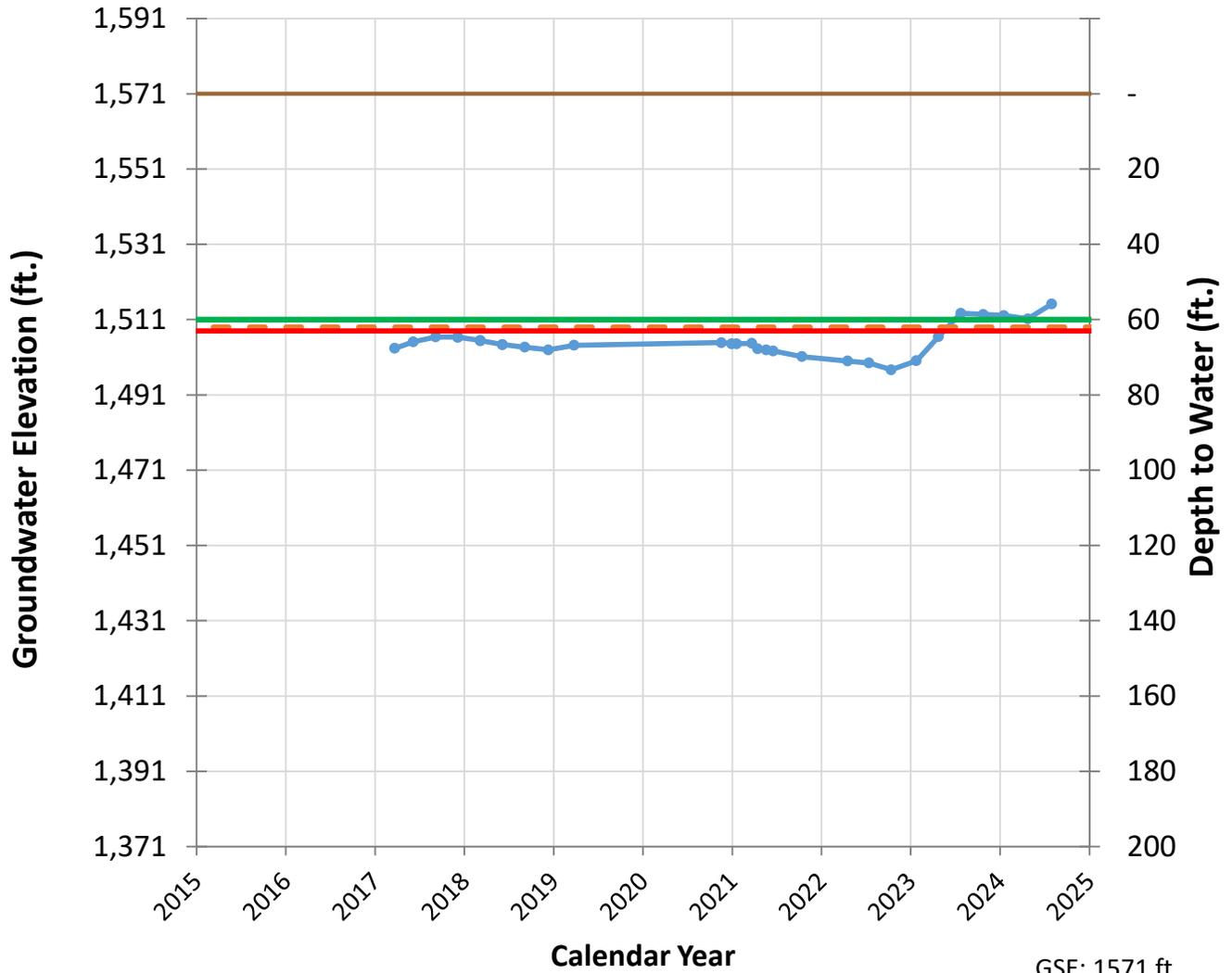


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 2364 ft.
 MT: 605 ft.
 MO: 551 ft.
 2025 IM: 591 ft.

830 Hydrograph

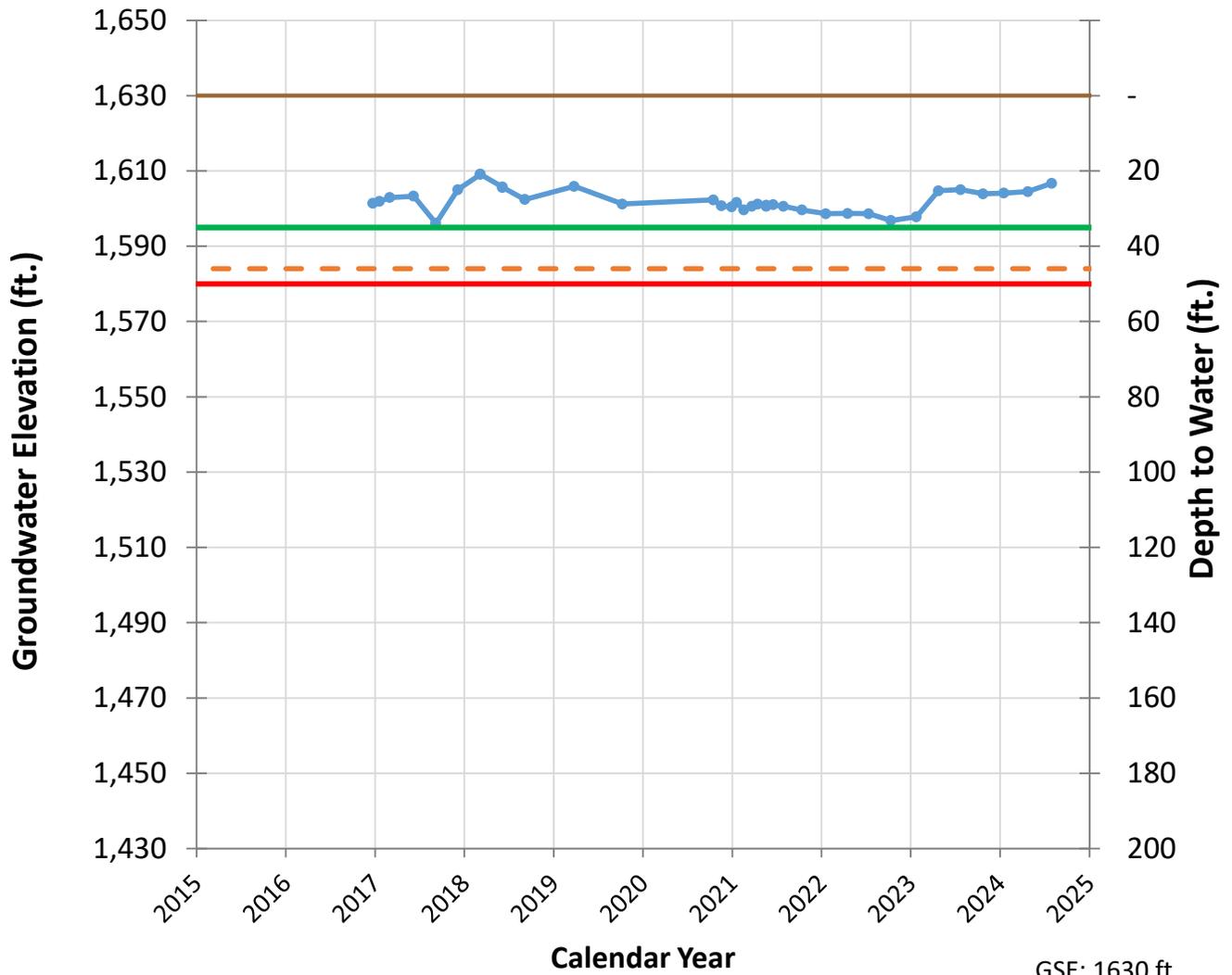


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1571 ft.
 MT: 63 ft.
 MO: 60 ft.
 2025 IM: 62 ft.

832 Hydrograph

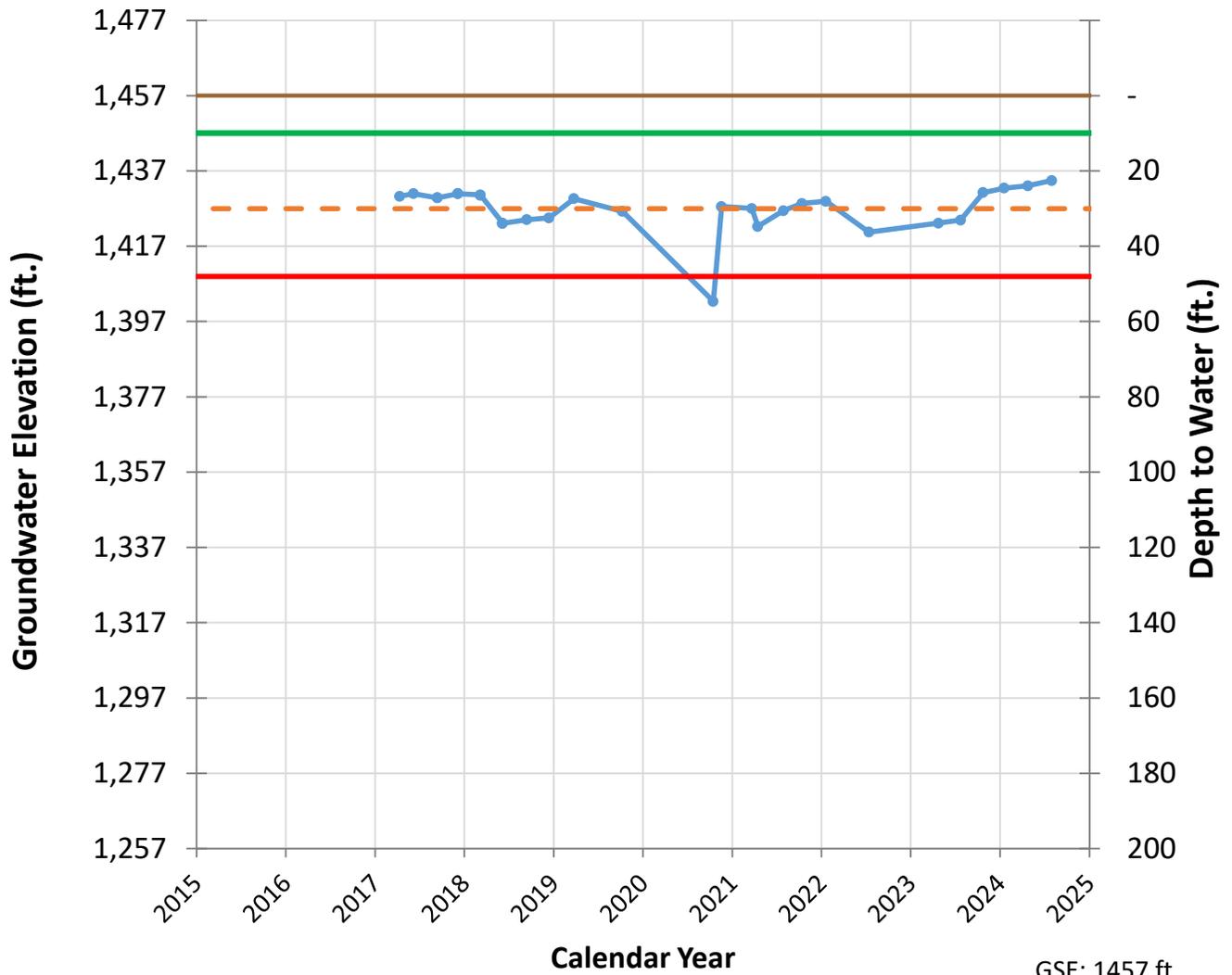


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1630 ft.
 MT: 50 ft.
 MO: 35 ft.
 2025 IM: 46 ft.

833 Hydrograph

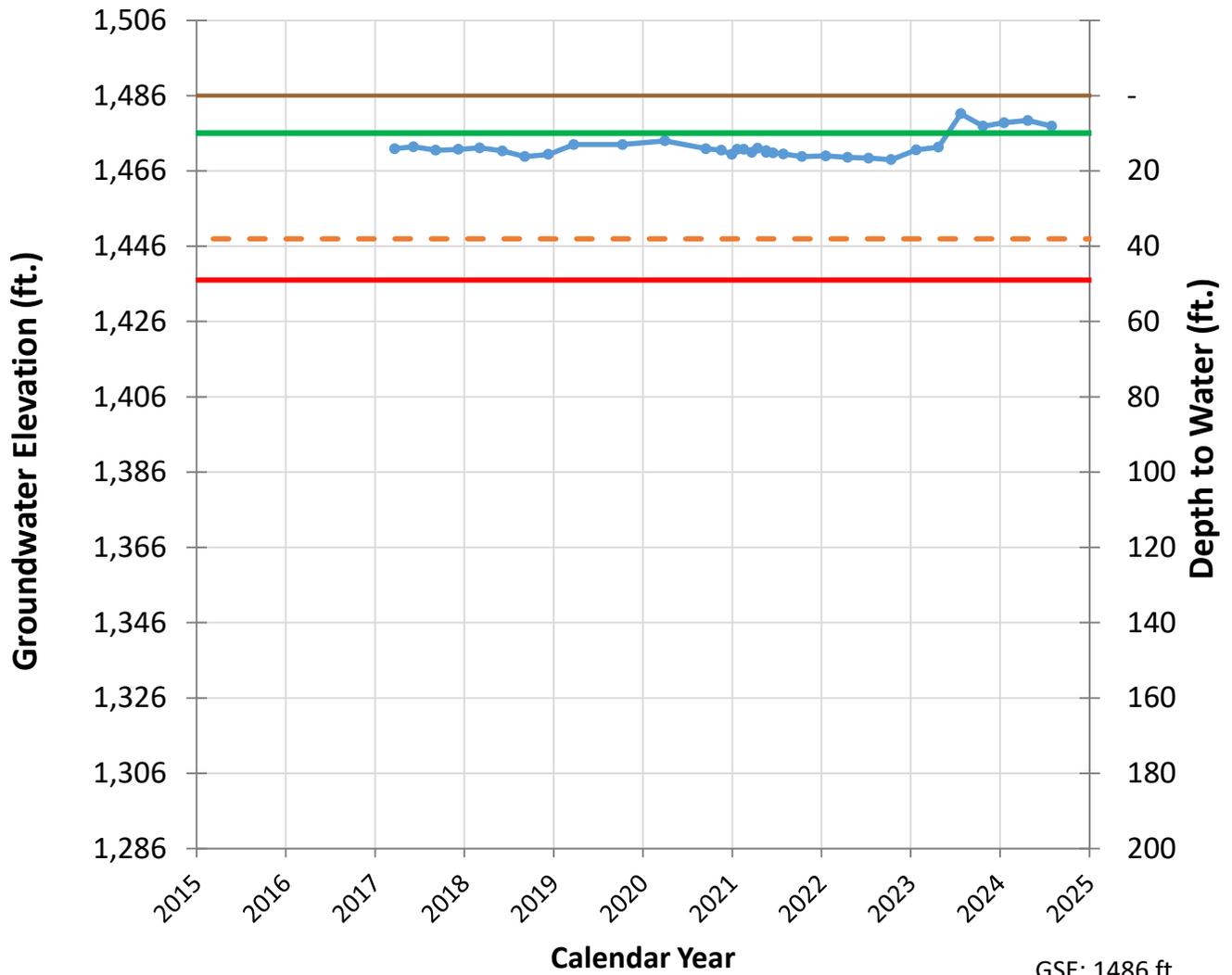


- Groundwater Level
- 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1457 ft.
 MT: 48 ft.
 MO: 10 ft.
 2025 IM: 30 ft.

836 Hydrograph

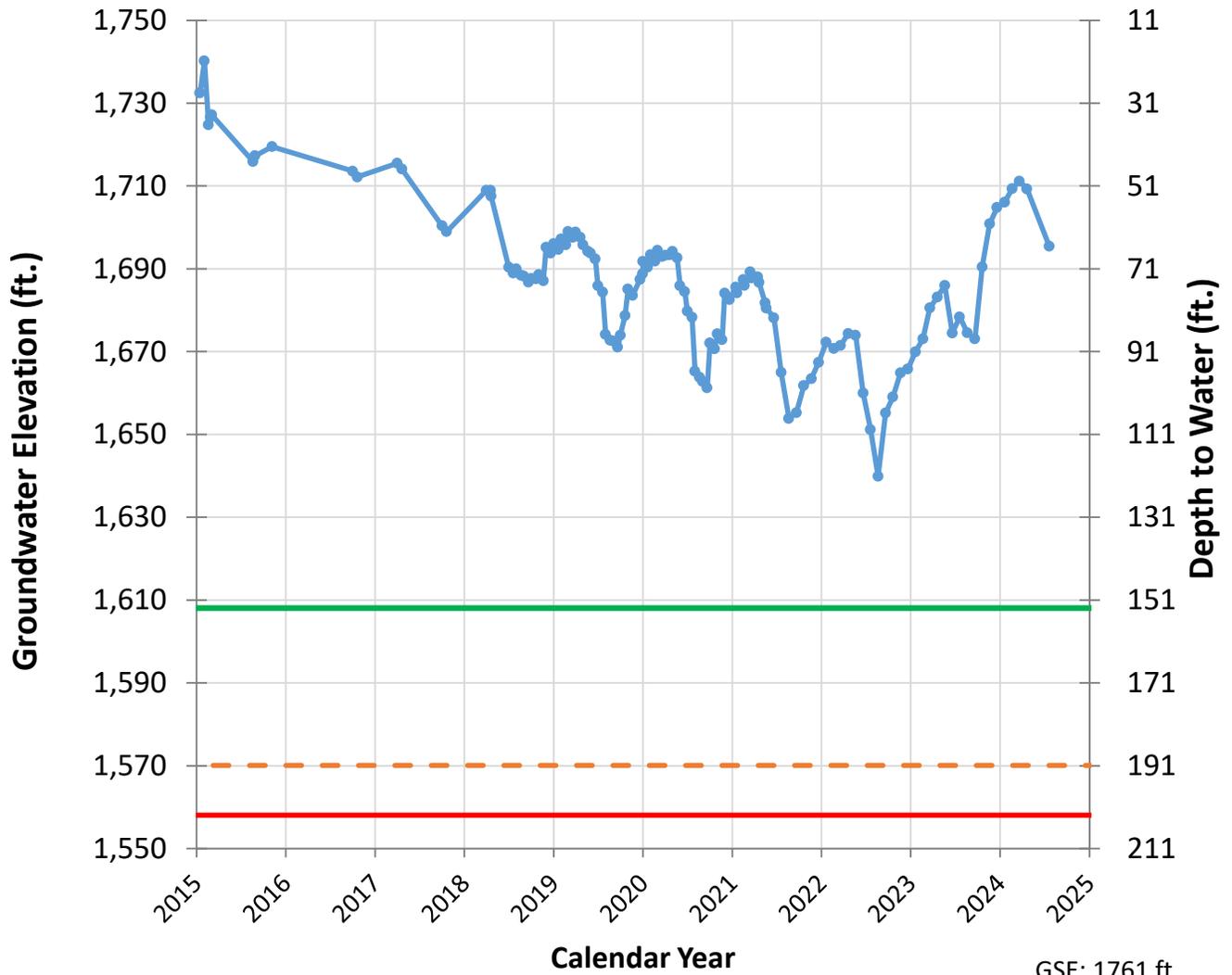


- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation

- MO
- MT

GSE: 1486 ft.
 MT: 49 ft.
 MO: 10 ft.
 2025 IM: 38 ft.

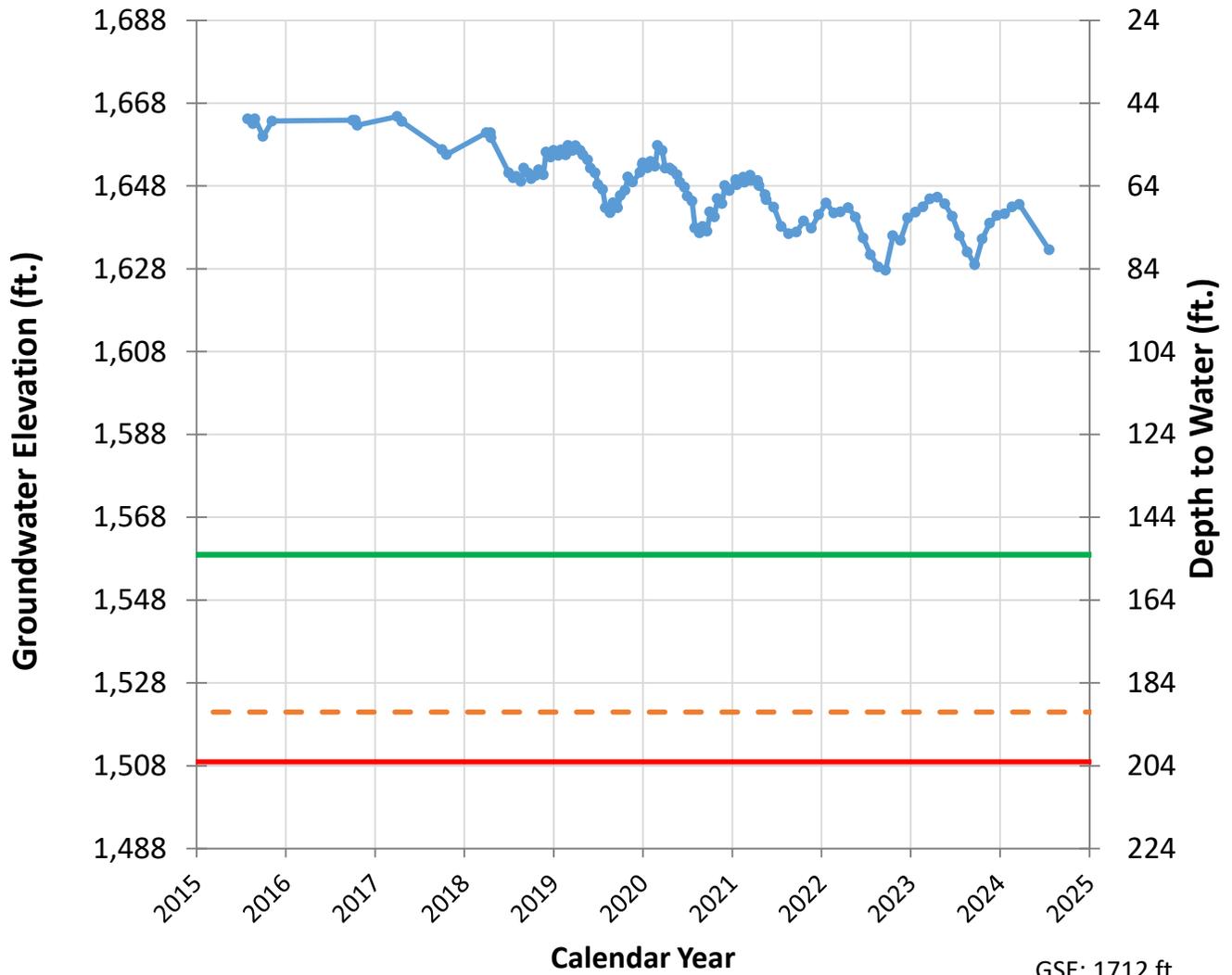
841 Hydrograph



- Groundwater Level
- - - 2025 IM
- Ground Surface Elevation
- MO
- MT

GSE: 1761 ft.
 MT: 203 ft.
 MO: 153 ft.
 2025 IM: 191 ft.

845 Hydrograph



GSE: 1712 ft.
 MT: 203 ft.
 MO: 153 ft.
 2025 IM: 191 ft.

- Groundwater Level
- MO
- - - 2025 IM
- MT
- Ground Surface Elevation

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