

**ROOT CREEK WATER DISTRICT GROUNDWATER
SUSTAINABILITY AGENCY**

GROUNDWATER SUSTAINABILITY ANNUAL REPORT (2015-2025)

Supplemental Annual Report to the Madera Subbasin Annual Report

MADERA COUNTY, CALIFORNIA
APRIL 2026

PREPARED FOR:

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Abbreviations

| | |
|---------------|---|
| AF | Acre-feet |
| AF/YR..... | Acre-feet per Year |
| District..... | Root Creek Water District |
| DWR | California Department of Water Resources |
| ET..... | Evapotranspiration |
| GIS | Geographical Information Systems |
| GSP | Groundwater Sustainability Plan |
| ITRC | Cal Poly Irrigation Training and Research Center |
| KDSA..... | Kenneth D. Schmidt and Associates |
| MID..... | Madera Irrigation District |
| MSL..... | Mean Sea Level |
| RCWD | Root Creek Water District |
| RCWDGSA | Root Creek Water District Groundwater Sustainability Agency |
| Subbasin..... | Madera Subbasin |
| USBR..... | United States Bureau of Reclamation |

Executive Summary

Annual reports are a part of the Sustainable Groundwater Management Act (SGMA) legislation, intended to provide updated groundwater condition data to monitor the progress of a groundwater basin toward their sustainability goals set in a Groundwater Sustainability Plan (GSP). In December 2023, the Madera Subbasin GSPs were approved by the Department of Water Resources (DWR). The approval was accompanied by a series of recommended corrective actions to be addressed by January 2025. The RCWDGSA amended their GSP in coordination with all Madera Subbasin GSAs to respond to DWR's corrective actions. On December 9, 2024, the RCWDGSA adopted the amended GSP. This annual report is the Root Creek Water District Groundwater Sustainability Agency's (RCWDGSA) sixth annual report under SGMA and first annual report following the 2024 amended GSP. Groundwater conditions within the boundaries of RCWDGSA in 2024 are summarized in this report, including summaries dating back to 2015.

The RCWDGSA is located within the southeastern corner of the Madera Groundwater Subbasin north of the banks of the San Joaquin River. While the Madera Subbasin is required to be sustainable as a whole, it should be noted that some areas within the Subbasin, especially the southeast portion, can and should be evaluated separately. While RCWDGSA continues to implement its plan, it will be imperative that the neighboring Madera County GSAs be active in this local region in project implementation and demand management activities. It is the responsibility of all agencies within the Subbasin to coordinate and ensure sustainable management practices of surface and groundwater use in order to reach the sustainability goal.

The RCWDGSA GSP developed Sustainable Management Criteria (SMC) for the sustainability indicators in coordination with the Madera Subbasin and following the requirements set forth in the California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 5, Subarticle 3. The annual reports serve to provide progress updates towards meeting the developed SMCs. The interconnected surface water sustainability indicator is identified as a data gap in the Madera Subbasin and neighboring subbasins, and the GSA listed an Interconnected Surface Water-Groundwater Data Gap Analysis as a high priority project in the GSP; Madera Subbasin GSAs, along with neighboring Kings Subbasin GSAs along the San Joaquin River, have established the framework of an Interconnected Surface Water Working Group outlined in a Memorandum of Understanding (MOU) included in the GSP. The Madera Subbasin does not need to account for the seawater intrusion sustainability indicator.

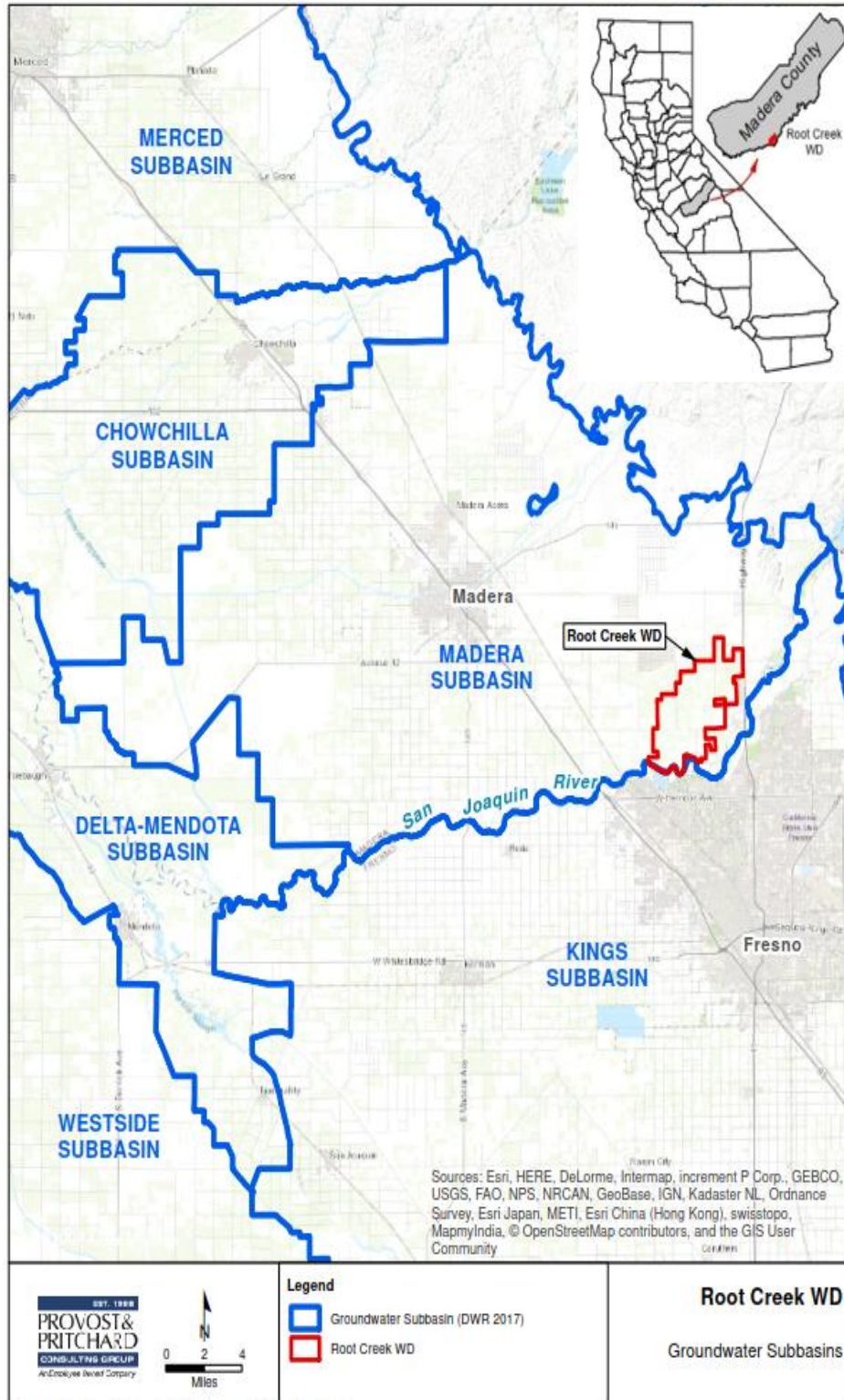


Figure ES-1. Root Creek Water District Location Map

Groundwater Levels

The hydrographs associated with each of the representative monitor wells are included in **Chapter 2 – Groundwater**. The hydrographs include historical groundwater elevation trends along with recent data compared to the interim milestones, measurable objectives, and minimum thresholds set by RCWDGSA. Within the RCWDGSA, water levels have generally stabilized or improved since 2016. In Fall 2025, five of the six RMS wells were at or above the 2025 Interim Milestone, with Well 22 0.5 feet below its interim milestone, indicating that RCWDGSA has largely met the 2025 interim milestones and continues to trend towards meeting the sustainability goals. During this period, and due to implementation of projects and management actions, one well is above its measurable objective and four wells were above the 2040 minimum threshold line.

Groundwater Extraction Data

Groundwater extraction data is provided and discussed in **Chapter 3 – Groundwater Extraction Data**. Groundwater is primarily used for agricultural and urban beneficial uses within the RCWDGSA. On aggregate, there was 13,066 AF of groundwater extracted in Water Year 2025.

Surface Water Supply

Surface water supply information is provided and discussed in **Chapter 4 – Surface Water Supplies**. Root Creek Water District (RCWD or District), which lies wholly within the GSA has contracted for surface water supplies from the Madera Irrigation District (MID) and the Wonderful Nut Orchards LLC. for up to 17,000 acre-feet (AF) of surface water in a given year and has constructed infrastructure to allow for importation and delivery of surface supplies. The purchase and delivery of surface water supplies are crucial to the immediate objective of groundwater sustainability of not only the District and the GSA but also the region and the subbasin. In addition, landowners within the District have entered into Holding Contracts with the United States Bureau of Reclamation allowing them the right to use San Joaquin River water. Surface water was not delivered through the Madera ID Lateral 6.2 under the existing agreements in 2025; a total of 6,823 AF of surface water was supplied via the sources from recycled water and surface water diverted under Holding Contracts in 2025.

Total Water Use

The total water use within the RCWDGSA is summarized in **Chapter 5 – Total Water Use**. Generally, the total water use is the sum of the groundwater extraction and surface water deliveries within the RCWD. The total water use for 2025 within the RCWDGSA is 19,889 AF.

Groundwater Storage Change

The change in groundwater storage within RCWDGSA is summarized in **Chapter 6 – Change in Groundwater Storage**. A summary of Water Year 2025 change in storage is presented in **Table ES- 1**.

Table ES- 1 WY2025 Change in Groundwater Storage

| Principal Aquifer Name | Change in Storage (acre-feet) | Calculation Method |
|------------------------|-------------------------------|---|
| Upper (Unconfined) | 3,302 | Difference in Spring to Spring contours per Subbasin methodology. |
| TOTAL | 3,302 | |

Chapter 1 – Introduction

The purpose of this report is to fulfill the requirements of the California Code of Regulations Article 7 Section 356.2 by providing an annual update on the current conditions of groundwater sustainability within the RCWDGSA. This document provides a brief summary of background information for RCWDGSA, updated data for the latest water year including groundwater elevations, contours, and extraction, surface water use, and total water use by water use sector. Water supply and groundwater data from the latest water year will span from Spring 2015 to Fall 2025. Lastly, progress towards sustainability will be analyzed by taking into consideration the most recent water year data along with any planned or implemented projects or management actions.

RCWDGSA is located in the southeast corner of the Madera Groundwater Subbasin as defined by the California Department of Water Resources (DWR) Bulletin 118 as Subbasin No. 5-22.06. It is also located fully within the boundaries of Madera County. The Madera Subbasin is the southernmost subbasin in the San Joaquin Valley Basin, just north of the San Joaquin River. The Sierra Nevada foothills and three groundwater subbasins border the Madera Subbasin north of the San Joaquin River, including the Merced, Chowchilla, and the Delta-Mendota Subbasins. The Kings Subbasin adjoins the Madera Subbasin south of the San Joaquin River.

RCWD covers 9,674 acres and is coterminous with RCWDGSA. Historically, RCWD has been almost exclusively agricultural land irrigated with surface water from the San Joaquin River and groundwater pumping. In 2014, an in-lieu pipeline was built to deliver surface water, when available, to the north side of RCWD. In 2017, construction began on a 2,000-acre community development on the northeast side of the District called the Riverstone Development (“Riverstone”). At build out, Riverstone is projected to have commercial and retail zones, parks, and approximately 6,578 housing units on approximately 2,000 acres. In 2025, Riverstone built 957 homes. This changes the landscape of water use within RCWD from agricultural groundwater pumping to conjunctive programs to serve the variety of water use sectors. Beneficial users within the RCWDGSA include growers, commercial users or industry, domestic users, and groundwater dependent ecosystems.

RCWD relies on a mixture of surface water and groundwater to meet the demands within the District. The majority of surface water in the subbasin, when available, is supplied from the Fresno and San Joaquin Rivers for agricultural use. RCWD receives most of its surface water from the San Joaquin River via surface water contracts with the United States Bureau of Reclamation (USBR). Private landowners along the San Joaquin River divert surface water supplies from the San Joaquin River through contracts with the United States Bureau of Reclamation termed “Holding Contracts”. Those landowners actively exercise their holding contract rights, and the volume of water extracted is currently being estimated. More recently with the construction of the In-Lieu Pipeline and execution of water supply contracts with Madera Irrigation District (MID), Wonderful, and the USBR for Section 215 water, when available, the District has annually been importing additional surface water supplies to lessen groundwater pumping.

The remaining agricultural water demand and all municipal water demand is supplied by groundwater. RCWDGSA plans to minimize the impact to groundwater levels by implementing strategies such as percolating treated wastewater effluent, using stormwater detention basins for recharge, and water conservation techniques.

Chapter 2 – Groundwater Conditions

Groundwater Levels

The RCWDGSA Monitoring Network is described in the 2025 RCWDGSA GSP. There are six wells that serve as dedicated monitoring wells for groundwater levels, that are consistent with the wells used to develop the Sustainable Management Criteria (SMC) for the RCWDGSA. The locations of these six dedicated monitoring wells are shown in **Figure 2**. The most recent groundwater elevation data for the representative monitor wells is presented in **Table 1** along with the minimum thresholds and measurable objectives. In Fall 2025, five of the six RMS wells remained at or above the 2025 Interim Milestone, indicating that RCWDGSA continues to be on track to meet interim milestones and sustainability goals. One well remained above the identified measurable objective while four wells were above the 2040 minimum threshold line.

The District has experienced challenges with obtaining groundwater level readings in well 130 and proposes to replace well 130 with well 169 in the monitoring network. Well 169 has historic depth-to-water measurements, is located approximately one half mile to the east of well 130, and has been recently converted to a monitoring well fitted with a level transducer, similar to well 65. The historic well readings of both wells are included as **Figure 13** to show the similarity in the data sets and assure confidence that the data expected to be gathered continues to enable the District to evaluate groundwater trends in the northern portion of the District. **Figure 13** includes SMC information for well 130. Should well 169 replace well 130, new SMCs would be developed based on historical data and model outputs, specific to well 169.

Table 1. 2025 Groundwater Level Elevations Compared to Sustainability Management Criteria

| | Well | Fall 2024 | Fall 2025 | 2025 Interim Milestone | Minimum Threshold | Measurable Objective |
|---|------|-----------|-----------|------------------------|-------------------|----------------------|
| Southern | 83 | 181 | 175 | 162 | 164 | 179 |
| | 22 | 216 | 215 | 216 | 218 | 221 |
| Central | 85 | 32 | 82 | 28 | 66 | 95 |
| Northern | 113 | 62 | 66 | 42 | 56 | 68 |
| | 65 | 99 | 96 | 74 | 71 | 79 |
| | 130 | -14 | 31 | 1 | 38 | 64 |
| Water Surface Elevation (WSE) measured in feet above mean sea level | | | | | | |

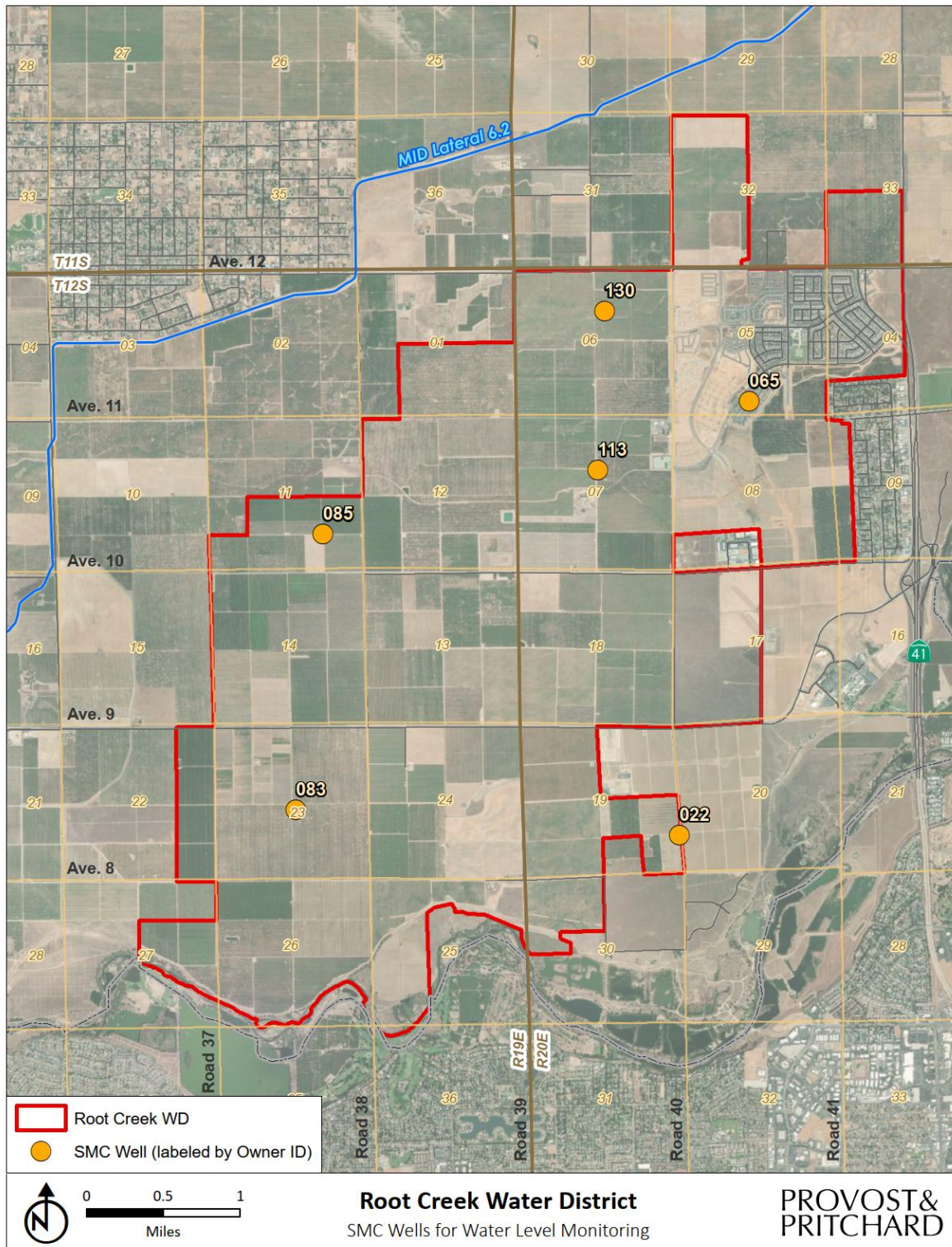


Figure 2. Location of Water Level SMC Wells in RCWDGSA

Groundwater Elevation Contour Maps

Seasonal groundwater elevation contour maps for the 2025 calendar year are presented as **Figure 3** and **Figure 4**. Historical groundwater contour maps for Spring 2015 – Spring 2025 are shown in **Appendix A**. Generally, groundwater continues to flow away from the San Joaquin River, flowing in the northerly direction with a slight westerly component. Groundwater elevations in the RCWDGSA ranged from about 220 feet to about 50 feet above mean sea level (msl) in Spring 2025 and from about 210 feet to 0 feet above msl in Fall 2025. The difference in groundwater elevations between the seasons is due to groundwater pumping during the summer months to irrigate crops.

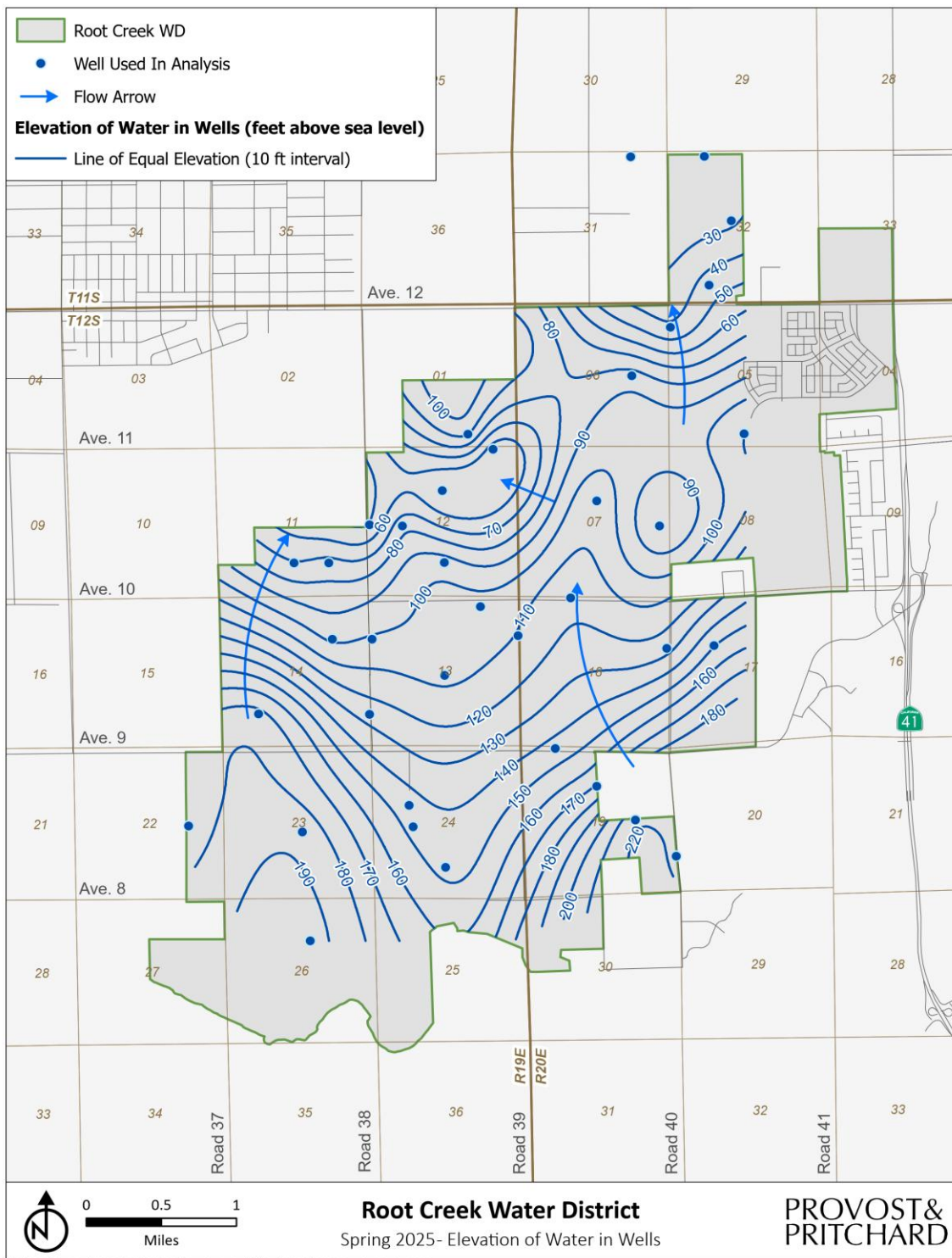


Figure 3. Groundwater Elevation Contours for RCWDGSA – Spring 2025

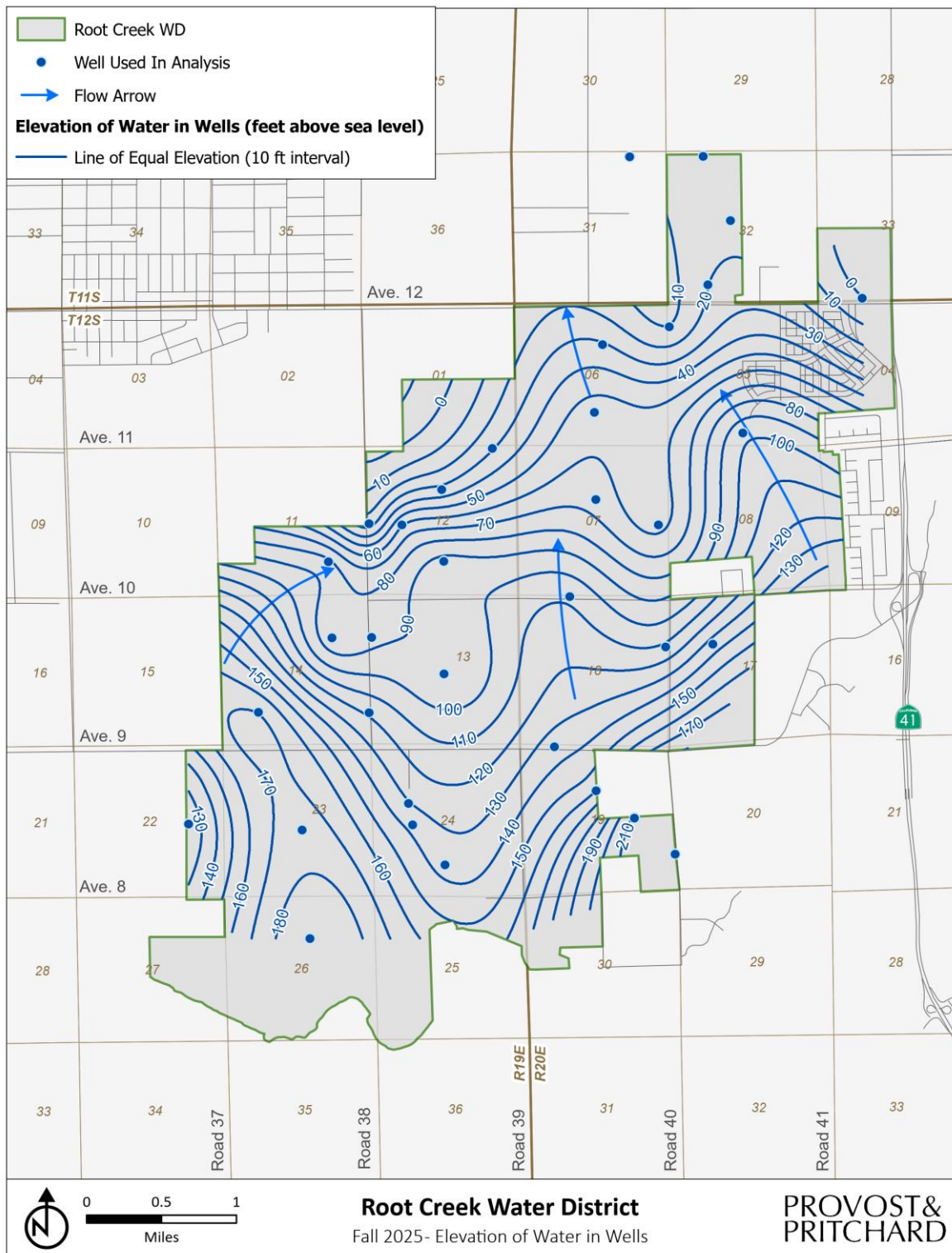


Figure 4. Groundwater Elevation Contours for RCWDGSA = Fall 2025

Hydrographs of Groundwater Elevation

The hydrographs for the water level SMC monitoring wells are included as **Figure 5** through **Figure 10**. The hydrographs include historical groundwater elevation trends along with recent data compared to the interim milestones, measurable objectives, and minimum thresholds. In addition to the SMC monitoring wells, the RCWDGSA monitors additional wells throughout the District. Well 65 is a former agricultural production well that has since been discontinued in its use. The District installed a transducer to collect daily water level data. This well is located in the center of the Riverstone development and demonstrates the benefits of the actions implemented by the GSA. A hydrograph for Well 65, from transducer data is provided as **Figure 11**. Water levels in this well were also collected manually since 1979. **Figure 12** shows the transducer water level data over the historic record to demonstrate the long-term trend of groundwater level rebound since before the adoption of the first GSP in 2020.

The RCWDGSA’s efforts to increase the conjunctive use of surface water and groundwater have resulted in water level stabilization in the region. Water year type, presented in **Table 2**, can be related to groundwater elevation trends seen in the hydrographs. Additionally, in order to continue monitoring groundwater pumping throughout the District, the Board adopted the Agricultural Water Flow Meter and Water Level Measurement Policy in January of 2018. Those data will assist in filling known data gaps and will enhance groundwater contouring efforts, thus strengthening annual reporting.

Table 2. DWR Water Year Type Classification for San Joaquin Valley

| Year | WY Type | Year | WY Type | Year | WY Type |
|------|---------|------|---------|------|---------|
| 1975 | W | 1992 | C | 2009 | BN |
| 1976 | C | 1993 | W | 2010 | AN |
| 1977 | C | 1994 | C | 2011 | W |
| 1978 | W | 1995 | W | 2012 | D |
| 1979 | AN | 1996 | W | 2013 | C |
| 1980 | W | 1997 | W | 2014 | C |
| 1981 | D | 1998 | W | 2015 | C |
| 1982 | W | 1999 | AN | 2016 | D |
| 1983 | W | 2000 | AN | 2017 | W |
| 1984 | AN | 2001 | D | 2018 | BN |
| 1985 | D | 2002 | D | 2019 | W |
| 1986 | W | 2003 | BN | 2020 | BN |
| 1987 | C | 2004 | D | 2021 | BN |
| 1988 | C | 2005 | W | 2022 | D |
| 1989 | C | 2006 | W | 2023 | W |
| 1990 | C | 2007 | C | 2024 | AN |
| 1991 | C | 2008 | C | 2025 | BN |

Note: C = critical, D = dry, BN = below normal, AN = above normal, W = wet

Figure 11 is a hydrograph that is developed from information gained from the use of a data logger. Well 65 used to be an agricultural well that was used to supply water for agricultural production but was

discontinued as an irrigation well. A transducer was installed to collect daily water level data. The well is in the center of the Riverstone development and has been converted into a monitor well. Thus, it demonstrates how the conjunctive use management actions have supported the GSA to trend sustainably through groundwater rebound. From 2019 to 2021, water levels rebounded to roughly the same levels. In 2024, water levels rose approximately 6 ft compared to 2019. This well and the information generated will give an excellent representation on the effectiveness of the project and management actions of the District and GSA. Though Well 65 only has transducer data going back to 2019, the well has been manually measured since 1979, as shown in **Figure 12**. The figure demonstrates that efforts of the District and GSA contributed to stabilizing water levels in this well even before the adoption of the GSA's first GSP in 2020.

More recent information has been recorded at the municipal wells that serve the Riverstone development. Since these new wells have been constructed, data loggers installed in the wells take measurements frequently. At times the readings reflect the dynamic or pumping condition as indicated by the lower readings in the chart and the higher readings reflect a condition where the well is not operating. These charts show the dynamic nature of the change in levels of the groundwater and indicate that in general the highest levels are observed in the March and April months and the lowest levels correlate to July and August.

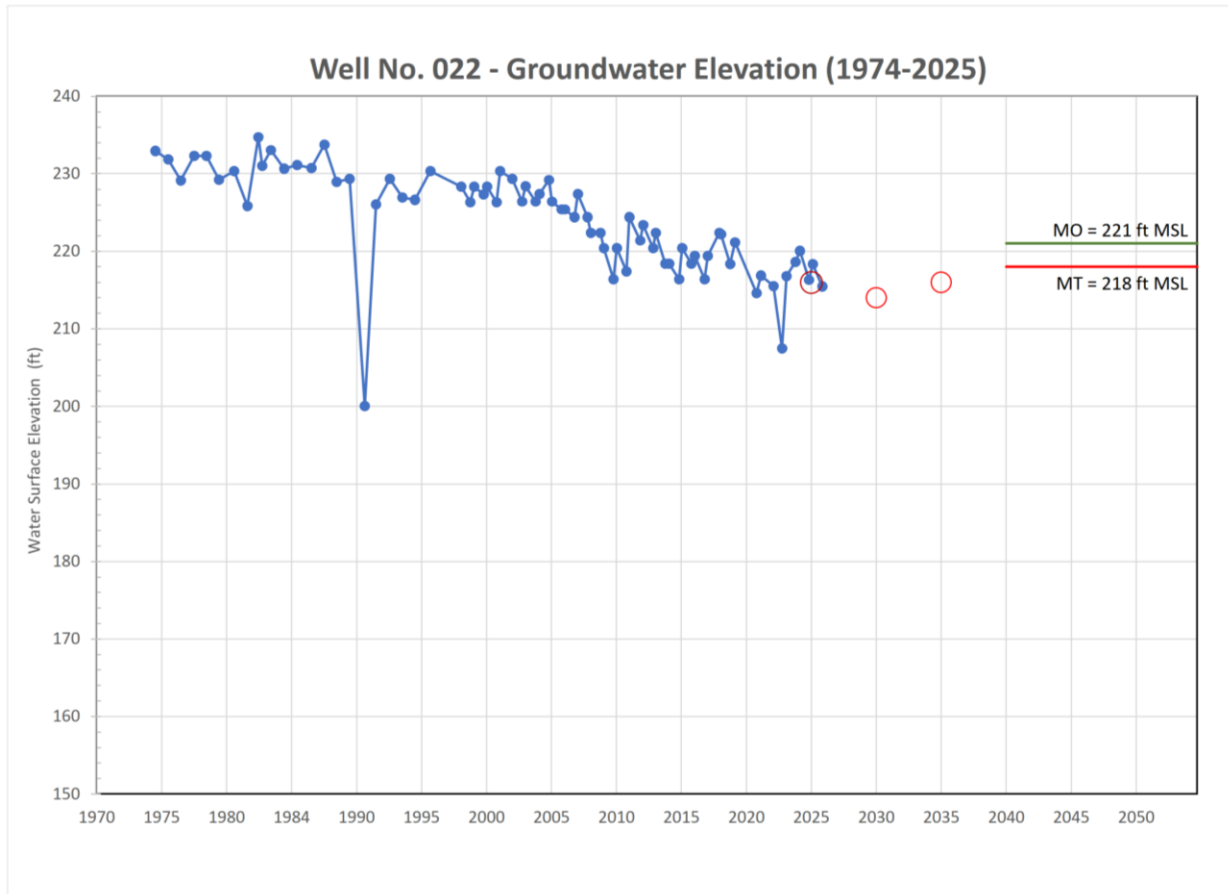


Figure 5. Well 22 Hydrograph (1979-2025)

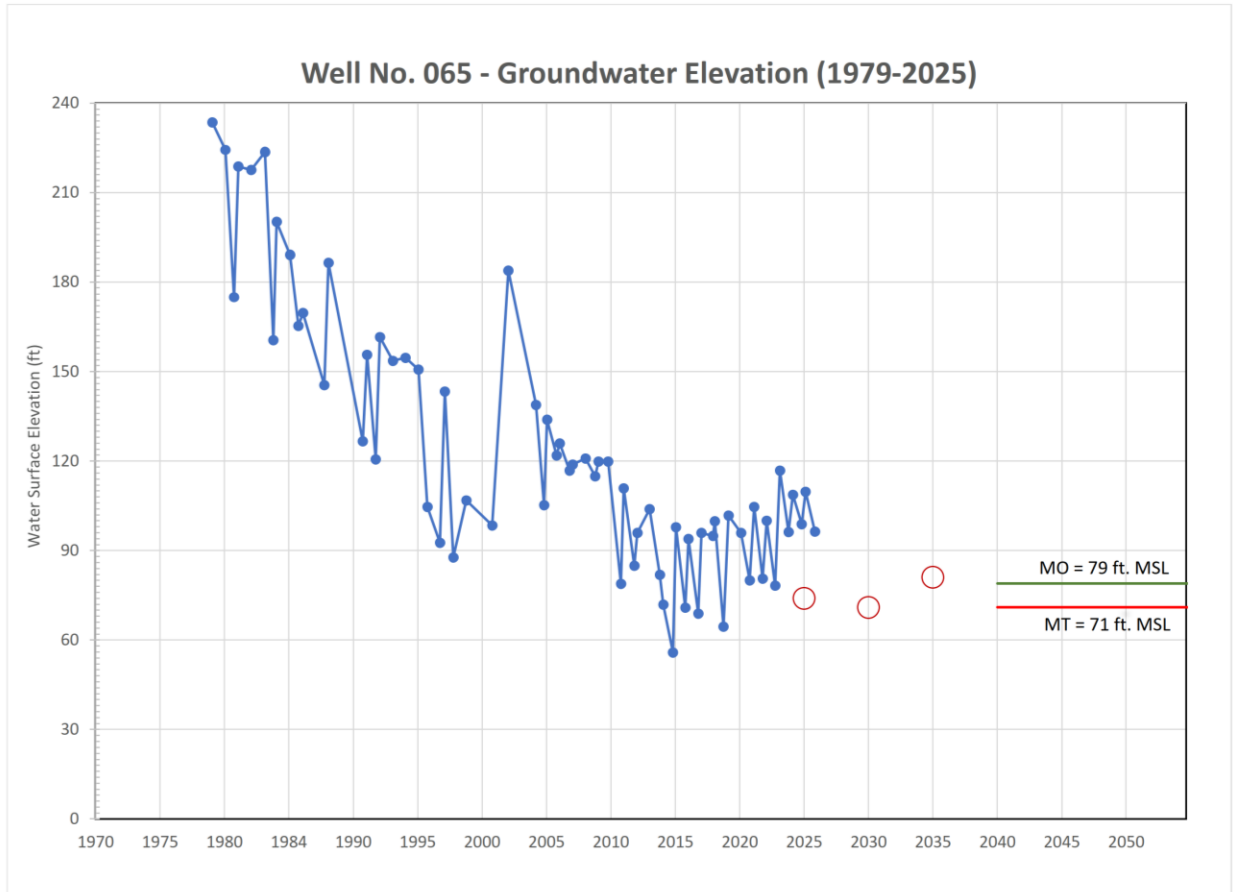


Figure 6. Well 65 Hydrograph (1979-2025)

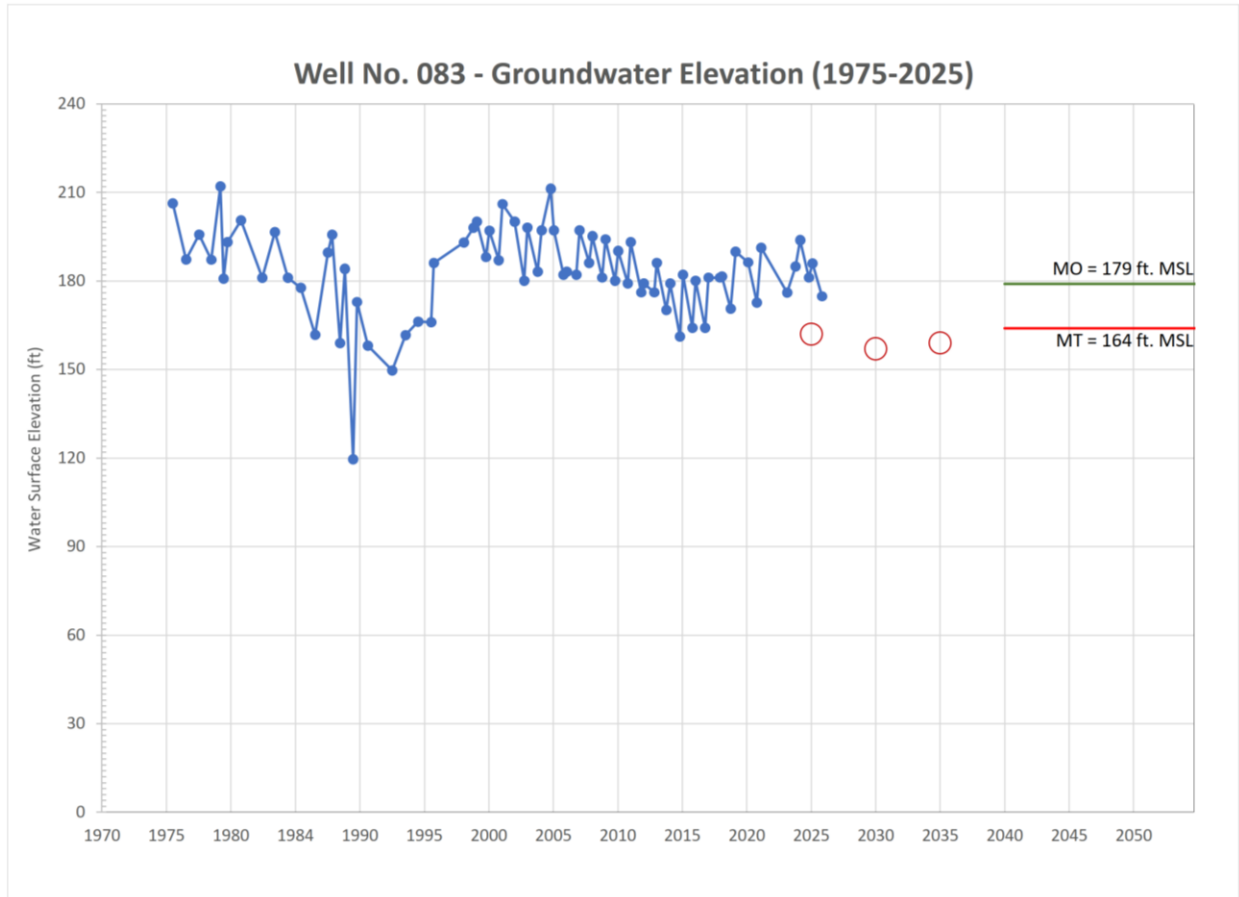


Figure 7. Well 83 Hydrograph (1979-2025)

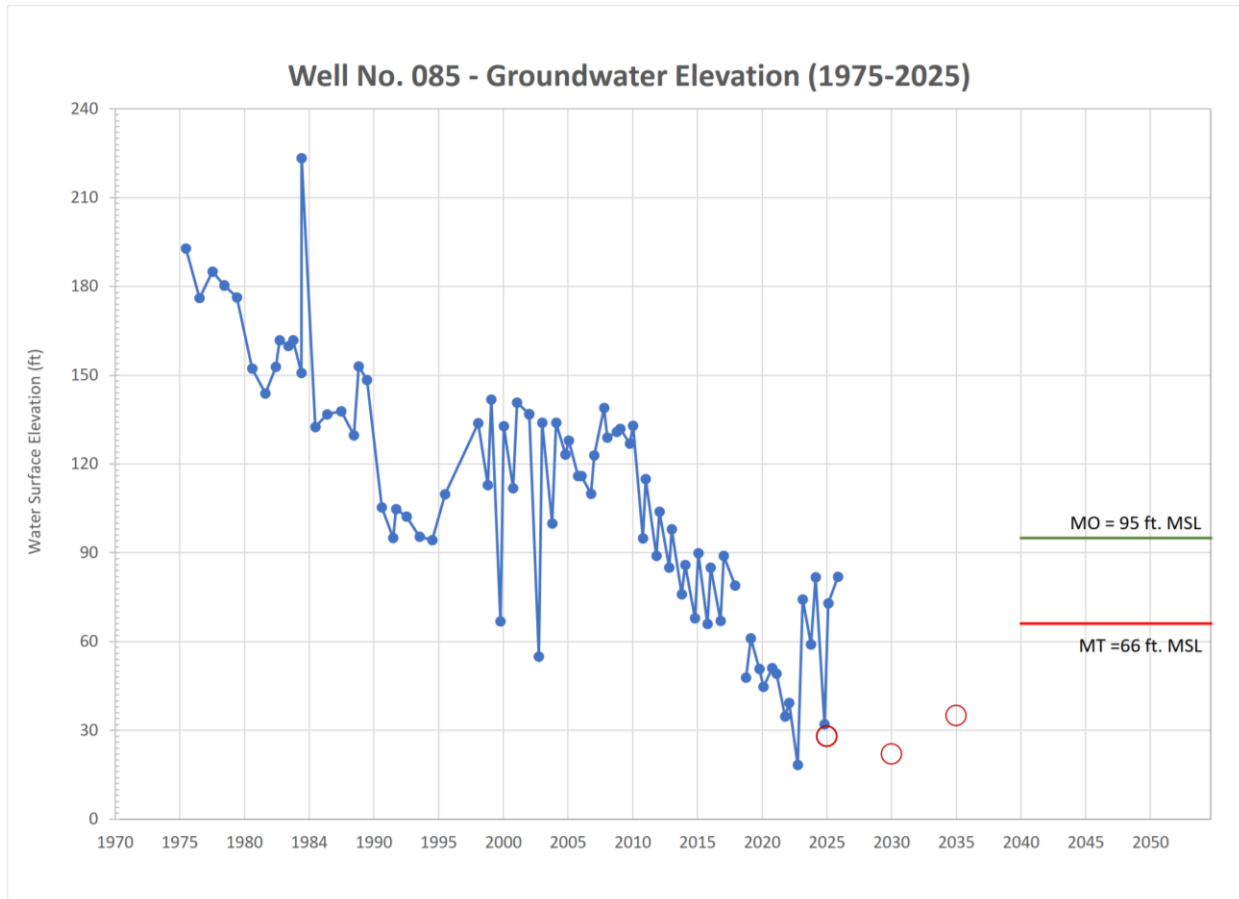


Figure 8. Well 85 Hydrograph (1979-2025)

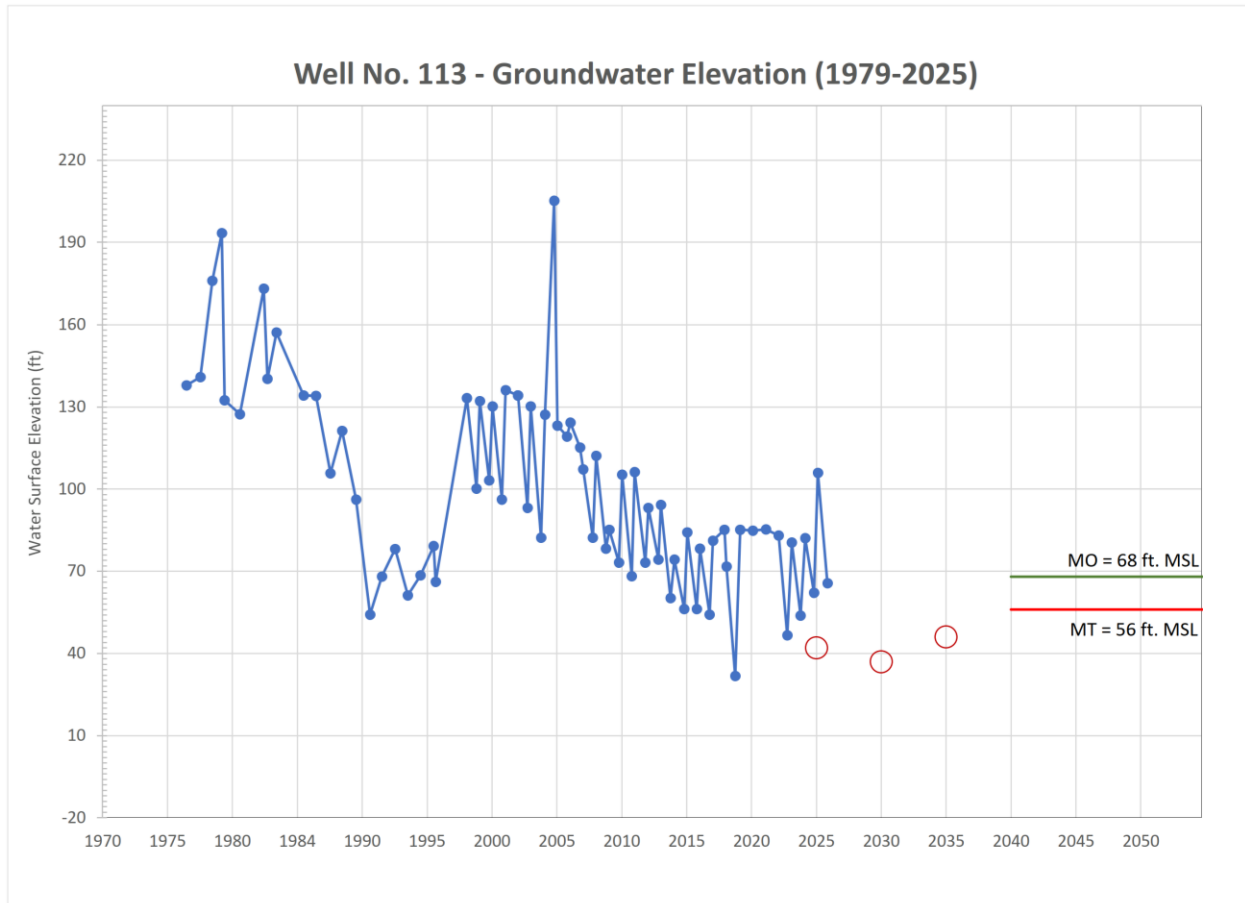


Figure 9. Well 113 Hydrograph (1979-2025)

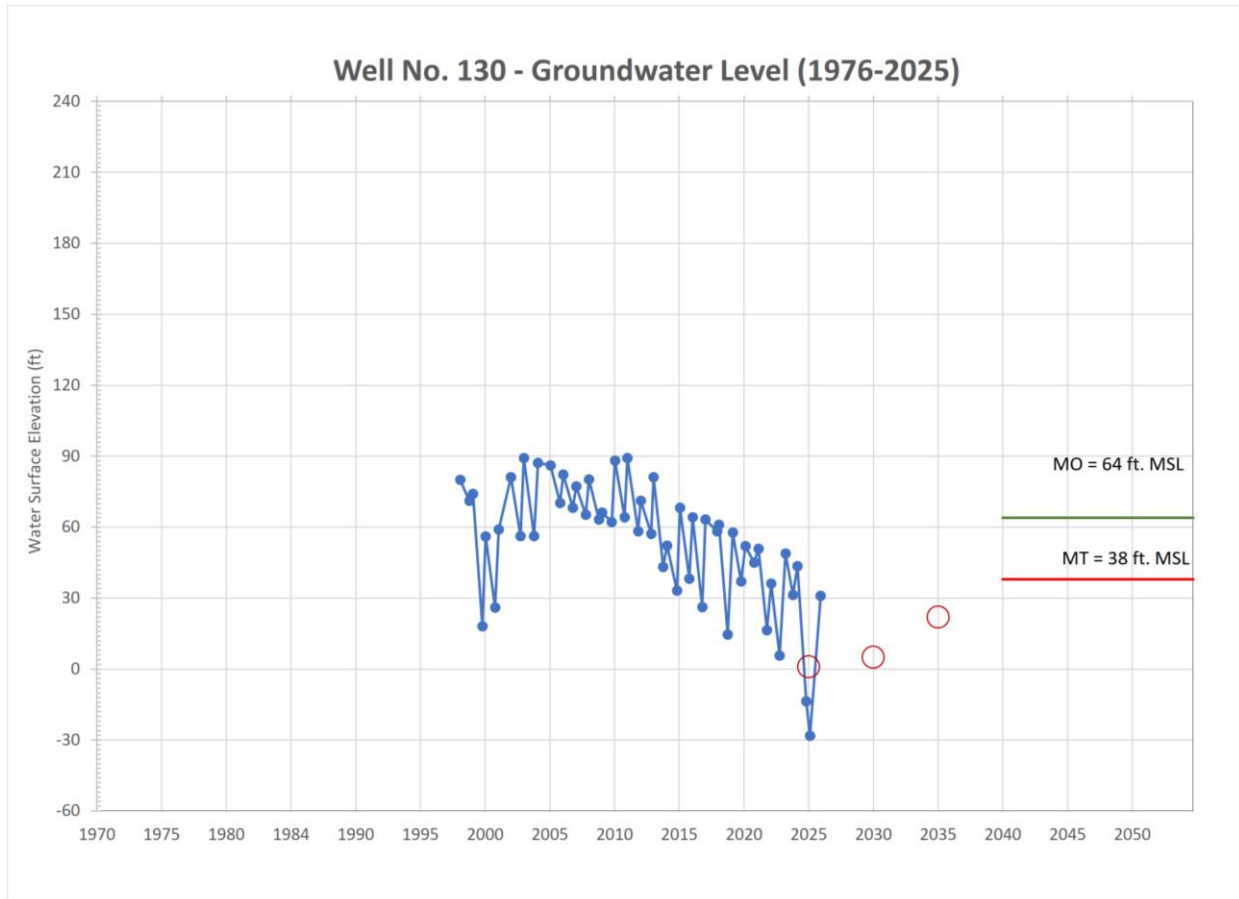
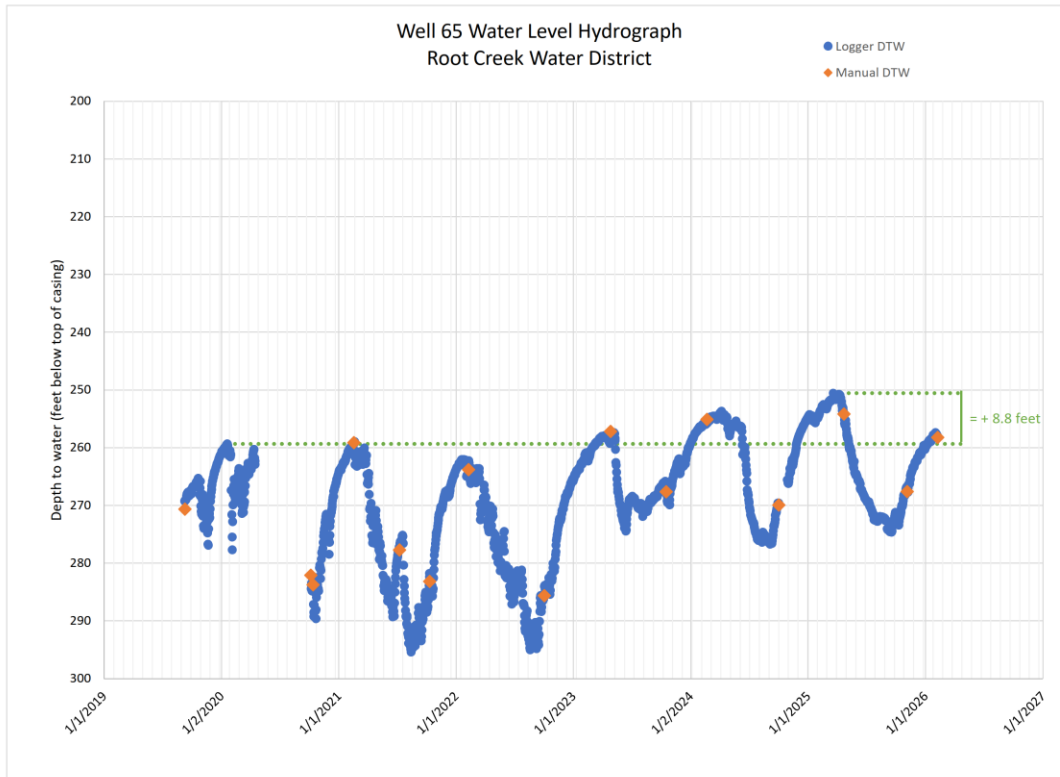
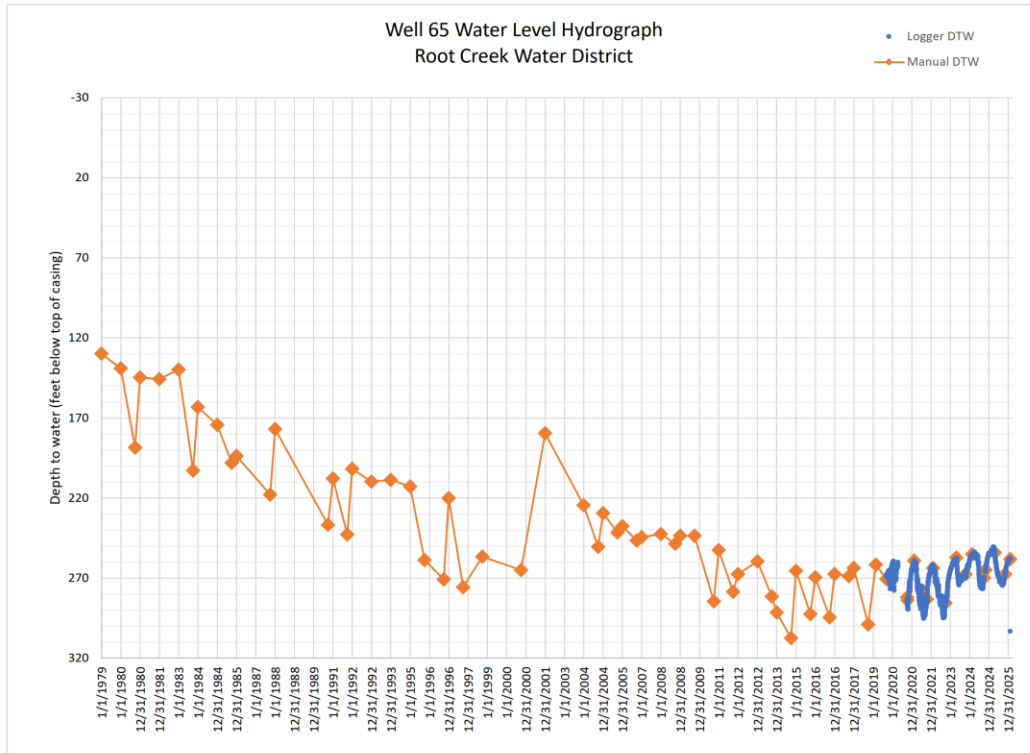


Figure 10. Well 130 Hydrograph (1979-2025)



https://us-partner-integrations.egnyte.com/msoffice/wopi/files/b095bdc0-62fb-42ad-ad6c-bd90993ca7dc/WOPIServiceId_TP_EGNYTE_PLUS/WOPIDUserid_/Well 65, 68, 169 Hydrographs.xlsx

Figure 11. Well 65 Hydrograph from Transducer Data



https://us-partner-integrations.egnyte.com/msoffice/wopi/files/b095bdc0-62fb-42ad-ad6c-bd90993ca7dc/WOPIServicelid_TP_EGNYTE_PLUS/WOPIUserid_/Well 65, 68, 169 Hydrographs.xlsx

Figure 12. Well 65 Transducer Data with Historic Data

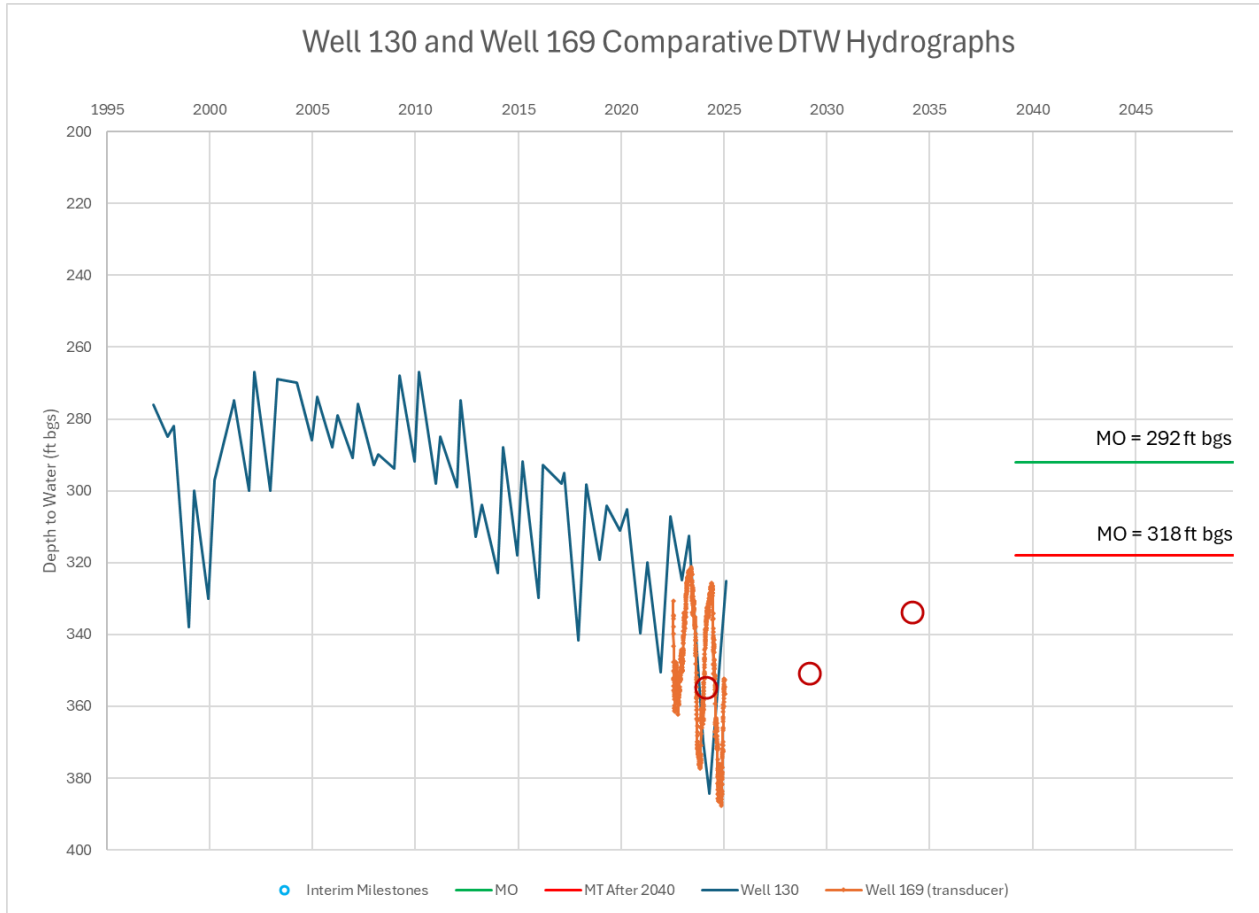


Figure 13: Well 130 and Well 169 Comparative Depth-to-Water Hydrograph

Groundwater Outflow

Quantification of inflows and outflows is an on-going effort for estimating the average annual overdraft in the District and to maintain District sustainability. Prior to major development, groundwater in the subbasin flowed from the northeast to the southwest. In recent years, steepening declines in groundwater elevation towards the northern edge of the District has caused a north to northwesterly groundwater outflow direction. This outflow is influenced by activities adjacent to the District. To better quantify the outflow to the north leaving the District, Kenneth D. Schmidt and Associates (KDSA) estimated average transmissivity in the north part of the District to evaluate the outflow in acre-feet per year. The following is a summary of two outflow analyses performed by Dr. Schmidt in 2022 and 2024.

An average transmissivity value of 77,000 gallons per day per foot was determined by analyzing data from several pump tests in the area. Using the average transmissivity value and average hydraulic gradients near the north edge of the District, the 2022 analysis estimated outflow to the north for the periods of Spring 2014 to Spring 2017 and Fall 2017 to Spring 2022. The 2024 analysis incorporated Fall 2023 and Spring 2024 groundwater elevation maps, expanding on the 2022 analysis. The results of the evaluation are summarized in **Table 3**. Using Spring water surface elevation contour maps, the hydraulic gradient on the northern boundary of the District has generally increased overtime to approximately 80 ft/mi in Spring 2025.

Table 3. Change in Groundwater Outflow from RCWD to the North

| Period | Hydraulic Gradient [Ft/Mile] | Outflow [Acre-Feet/Year] |
|----------------------------|------------------------------|--------------------------|
| Analysis 1 (2022) | | |
| Spring 2014 – Spring 2017 | 42 | 15,200 |
| Fall 2017 – Spring 2022 | 52 | 18,800 |
| Change in Outflow | | 3,600 |
| Analysis 2 (2024) | | |
| Fall 2023 | | 18,600 |
| Spring 2024 | | 27,900 |
| Change in Outflow | | 9,300 |
| Increase in Outflow | | +5,700 |

Since the Riverstone development began construction in 2017, agricultural land decreased about -1,881 acres (**Table 4**). This reduction in demand, coupled with increased surface supplies has stabilized the groundwater water levels throughout much of the District. Along the Northern boundaries of the District, groundwater levels are influenced by the activities adjacent to the District. These activities include agricultural pumping, which tends to have a large effect on water levels. This pumping can change the water slope within an aquifer, which is evidenced in the District. Even with the influence of the surrounding area on the aquifer, the District is trending towards sustainability with the actions it is taking and Figure 3 and Figure 4 shows seasonal groundwater elevation contour maps for the 2025 calendar year.

Chapter 3 – Groundwater Extraction Data

This chapter details the groundwater extraction in the RCWDGSA for water year 2025. The volume of total water use is largely dependent upon the land use categories, and water use sectors. Other factors influencing total water use include precipitation, evapotranspiration rates, groundwater outflow, water conservation strategies and property development. Groundwater extraction is dependent upon total water use and surface water supply available to fulfill demand.

Land Use Categories/Water Use Sectors

As mentioned, RCWDGSA is made up of agricultural, residential, and commercial land, the majority of which remains agricultural. According to a Geographic Information Systems (GIS) estimate, the RCWDGSA is approximately 9,674 acres after the annexation of about 355 acres in 2017. In 2014, approximately 8,474 acres of the District were covered by a crop as shown in **Table 4**. Since then, some land has been taken out of production and in 2017, construction on the Riverstone Development began. 2017 was the first year residents began living in the Riverstone Development and by the end of the year there were 100 homes connected to the water and sewer system. By the end of 2025, Riverstone Development has retired a cumulative total of about 1,900 acres of farmland and completed the construction of about 3,200 houses, growing the residential and commercial water use sectors.

The Madera County Agricultural Commissioner provides annual data for cropping within the County and was used through 2019 for RCWD cropping patterns, presented in **Table 4**. From 2020 to present, the District performed its own crop review. The values shown in **Table 4** and depicted in **Figure 14** represent this new source of information. Agricultural land still makes up the majority of RCWDGSA reaching about 6,250 acres, representing about two-thirds of the District. This amount included the annexation of approximately 315 acres of developed agricultural land in 2017. There was a reduction in crop acreage by about 32% from 2014 to 2024, which is a 5% reduction in crop acreage from last year. Reduction in crop acreage has averaged over 200 acres per year since 2014. Major crops include pistachios, almonds, and citrus.

Table 4. RCWD Cropping from 2014 - 2025

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|----------------|----------------|
| Crop | Acreage*** | | | | | | | | | | | |
| Alfalfa | | | | | | 93.01 | 93.01 | 93 | | | | |
| Almonds | 1,740.20 | 2,133.20 | 2,143.20 | 2,133.70 | 2,394.90 | 2,369.20 | 2,364.90 | 2165.9 | 2,012.8 | 2,010.1 | 1,871.6 | 1,871.6 |
| Cherries | 8.5 | 8.5 | 8.5 | 9 | 10.5 | 10.5 | 10.5 | 10.4 | 10.5 | 10.5 | 11.6 | 11.6 |
| Citrus | 2,959.10 | 2,959.10 | 2,959.50 | 2,959.10 | 2,938.40 | 2,887.10 | 2,849.90 | 2,654 | 2,418.2 | 2,378.9 | 2,379.4 | 2,379.4 |
| Dates | 1 | 1 | 1 | 1 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | | |
| Grapes | 383.5 | 261.5 | 261.5 | 219.5 | 218.2 | 220 | 220 | 196.9 | 196.9 | 187.4 | 187.5 | 169.6 |
| Nursery Plants | 22.4 | 22.4 | 22.4 | 22.4 | 15.8 | 13.9 | 13.9 | 13.6 | | | | |
| Olives | 214 | 93 | 93 | 93 | 70 | 57.1 | 31.9 | 35.7 | 35.7 | 28.5 | 28.5 | 27.0 |
| Persimmons | 1 | 1 | 1 | 1 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 |
| Pistachios | 2,673.00 | 2,674.00 | 2,674.00 | 2,674.00 | 2,410.90 | 2,390.90 | 2,292.60 | 2,145.4 | 2,106.3 | 1,914.4 | 1,760.6 | 1,754.3 |
| Plums | 4.5 | 4.5 | 7.5 | 6.5 | 8.1 | 3.8 | 3.8 | 4.3 | 4.3 | 4.3 | 4.4 | 4.4 |
| Pomegranates | 6.5 | 6.5 | 6.5 | 7 | 6.9 | 6.9 | 6.9 | 8.3 | 8.3 | 8.3 | 9.1 | 9.0 |
| Wheat* | 460 | 118 | 100 | 100 | 104.2 | 100 | 100 | | 167.2 | | | |
| Summary Agriculture | 8,473.70 | 8,282.70 | 8,278.10 | 8,226.20 | 8,179.40 | 8,153.8 | 7,988.8 | 7,328.9 | 6,961.60 | 6,543.80 | 6,247.0 | 6,227.6 |
| Uncultivated | 605.9 | 454.9 | 118.5 | 344.5 | 172.7 | 414.20 | 414 | 1,104.2 | 916.1 | 1,091.4 | 1,282.7 | 1,300.6 |
| Urban/Residential* | 3.6 | 3.6 | 3.6 | 3.6 | 127 | 254 | 400 | 411 | 505.7 | 747.7 | 766.7 | 939.7 |
| Other Non Ag** | 230.8 | 572.8 | 913.8 | 739.7 | 1,195.20 | 945.00 | 964.20 | 922.90 | 1,290.60 | 1,291.10 | 1,377.6 | 1,206.2 |
| Summary Non-Ag | 840.0 | 1,031.0 | 1,036.0 | 1,088.0 | 1,495.0 | 1,613.0 | 1,778.0 | 2,438.0 | 2,712.0 | 3,130.20 | 3,427.0 | 3,446.4 |
| TOTAL | 9,314 | 9,314 | 9,314 | 9,314 | 9,674 | 9,674 | 9,674 | 9,674 | 9,674 | 9,674 | 9,674 | 9,674 |

Notes:

- *2014-2017 Estimated from DWR land use survey 2011, from Annual Review.
- **Difference from the sum of the land use and the total area within the RCWD GIS boundary
- ***Acreage values rounded to the nearest whole number
- RCWD GIS boundary acreage corrected to aerial: 9,314
- ****RCWD GIS boundary acreage corrected to annexed areas in 2018: 9,674
- ***** Ag land reduction from 2014 to 2023 approximately 27.0%

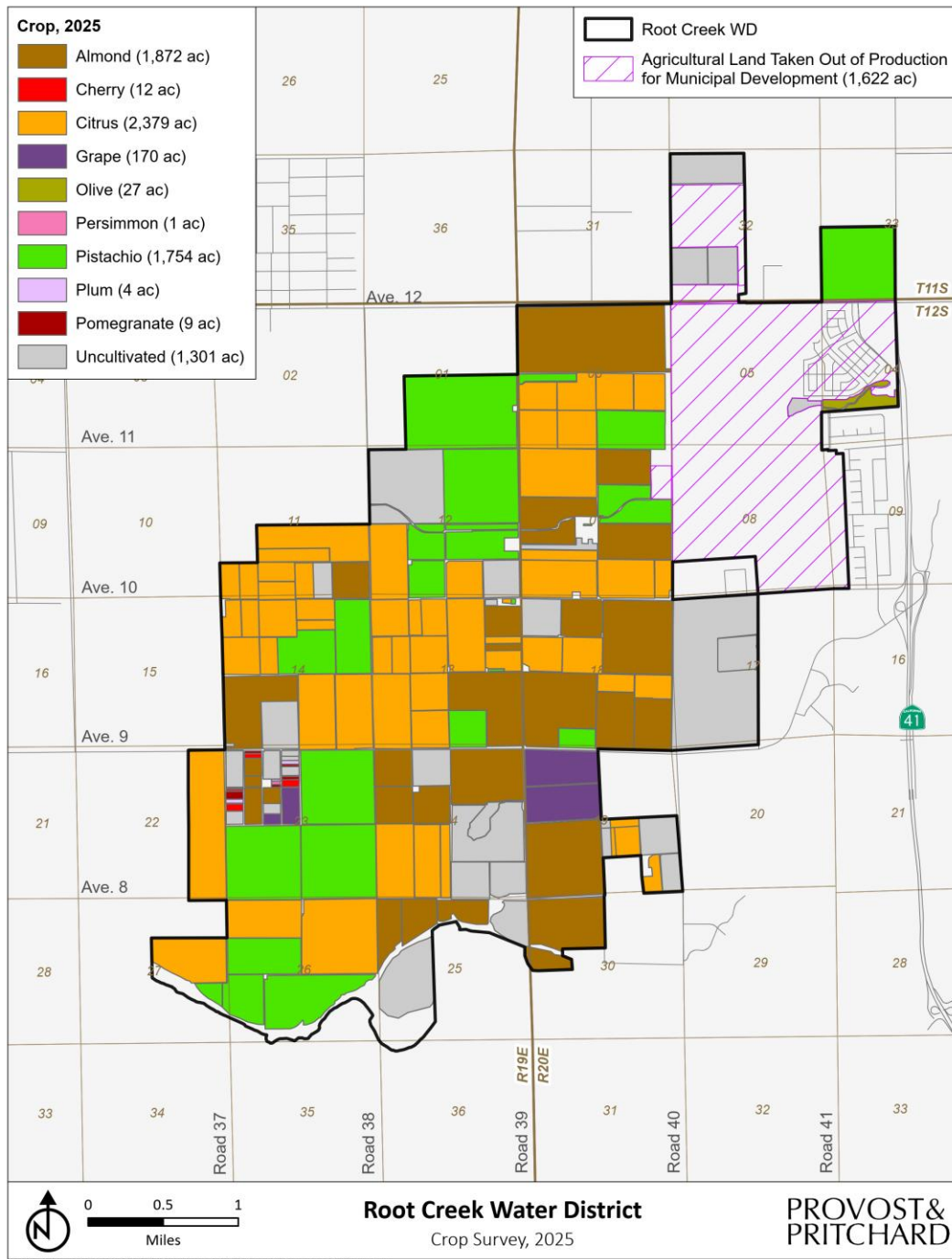


Figure 14. RCWD Crop Survey 2025

Municipal

The municipal water demand at Riverstone, in RCWDGSA, is currently met solely by groundwater. Residential and commercial water use data was directly measured as the volume of water produced by the municipal wells serving the development. Since Riverstone is in the middle of development, new connections are being made monthly as homes, parks, and retail areas are being built. Subsequently, water used in association with these construction efforts, is also a significant source of water consumption. A summary of the water system connections and water use data is presented in **Table 5**.

Table 5. Summary of end-of-year Municipal Water Statistics for Riverstone from 2018 to 2025

| Services: | Year | | | | | | | | | | | | | | | |
|----------------------------------|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|---------|----|
| | 2018 | | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | | 2025 | |
| Residential Connections | 236 | | 436 | | 663 | | 945 | | 1301 | | 1,827 | | 2,245 | | 3,202 | |
| Landscape Irrigation Connections | 19 | | 27 | | 39 | | 56 | | 59 | | 76 | | 95 | | 132 | |
| Commercial Connections | 3 | | 4 | | 3 | | 15 | | 15 | | 15 | | 15 | | 15 | |
| | | | | | | | | | | | | | | | | |
| Water Deliveries: | | | | | | | | | | | | | | | | |
| Total (AF) | 134.41 | AF | 213.38 | AF | 289.61 | AF | 389.19 | AF | 482.59 | AF | 608.93 | AF | 813.49 | AF | 1223.85 | AF |
| | | | | | | | | | | | | | | | | |
| Waste Water: | | | | | | | | | | | | | | | | |
| Total (AF) | 21.78 | AF | 46.25 | AF | 85.00 | AF | 118.59 | AF | 176.11 | AF | 231.52 | AF | 316.64 | AF | 424.12 | AF |

Agricultural

Agricultural water use is measured wherever possible and many landowners have been installing meters in RCWDGSA. Prior to 2018, the District estimated total water use using cropping data from the Agricultural Commissioners Crop Survey, evapotranspiration (ET) data, and precipitation data. When needed, the District uses GIS-generated crop acreages and crop ET estimates developed by the Cal Poly Irrigation Training and Research Center (ITRC, see www.itrc.org) for “Irrigation District Water Balances” to estimate total water use. ITRC ET estimates vary based on water year type (wet, typical, or dry) and irrigation method. An irrigation method was assumed for each crop type as shown in **Table 6**.

Table 6. Assumed Irrigation Methods for RCWDGSA (prior to 2018)

| Crop | Presumed Irrigation Method |
|----------------|----------------------------|
| Almonds | Drip/Micro |
| Cherries | Sprinkler |
| Citrus | Sprinkler |
| Dates | Drip/Micro |
| Grapes | Drip/Micro |
| Nursery Plants | Drip/Micro |
| Olives | Sprinkler |
| Persimmons | Sprinkler |
| Pistachios | Drip/Micro |
| Plums | Sprinkler |
| Pomegranates | Drip/Micro |
| Wheat | Surface |

The ITRC classifies the ET data by irrigation method, as well as water year type (wet, typical or dry). DWR classifies and publishes a hydrologic classification index each year for the San Joaquin Valley water year based on measured unimpaired runoff from the tributaries feeding the San Joaquin River. The DWR classifications are used to estimate ET values for the year where above normal and below normal equate to a typical year.

After ET data were compiled for each crop and water year, effective precipitation was accounted for. Effective precipitation was calculated for a hydrologically wet year, typical year, and dry year using the following set of equations:

Effective Precipitation

$$\text{Nov – Feb} = -0.54 + (0.94 \times \text{Gross Rainfall})$$

$$\text{Mar} = -1.07 + (0.837 \times \text{Gross Rainfall})$$

$$\text{Oct} = -0.06 + (0.635 \times \text{Gross Rainfall})$$

The calculated value of effective precipitation on an annual basis was subtracted from the ET values for the respective water year type to obtain the crop applied water demands shown in **Table 7**.

Table 7. Crop Water Consumptive Use After Effective Precipitation- (Applied Water)- (ET_{aw}) for Crops in RCWDGSA

| Crop | Water Year Type | | |
|----------------|-----------------|----------------|------------|
| | Wet (feet) | Typical (feet) | Dry (feet) |
| Almonds | 2.72 | 3.07 | 3.06 |
| Cherries | 2.73 | 3.00 | 3.03 |
| Citrus | 2.48 | 3.02 | 2.85 |
| Dates | 2.65 | 2.89 | 2.92 |
| Grapes | 2.01 | 2.10 | 2.11 |
| Nursery Plants | 2.65 | 2.89 | 2.92 |
| Olives* | 0.67 | 0.67 | 0.67 |
| Persimmons | 2.73 | 3.00 | 3.03 |
| Pistachios | 2.69 | 2.77 | 2.75 |
| Plums | 2.73 | 3.00 | 3.03 |
| Pomegranates | 2.65 | 2.89 | 2.92 |
| Wheat | 0.85 | 1.35 | 1.07 |

Notes: No data in ITRC tables for "Typical year" for pistachios. However, for other crops, Typical is about 1% more than a Dry year. *Olives are non-irrigated crops within RCWDGSA; therefore, lower estimates of crop water consumptive use after effective precipitation are used.

Finally, the annual crop water demands, in feet, were multiplied by the acres of the respective crop type to estimate total applied water demand in acre-feet (AF), shown in **Table 8**. The total applied water demand for the agricultural sector in 2025 was approximately 18,300 AF for RCWDGSA.

In 2018, the District adopted a policy that mandates that as wells are modified and replaced, meters will be required. This policy will improve the water use estimates.

Table 8. Applied Crop Water Use for the RCWDGSA from 2015 to 2025

| Crop | 2015 Critical | | | 2016 Dry | | | 2017 Wet | | | 2018 Below Normal | | | 2019 Wet | | | 2020 Dry | | | 2021 Dry | | | 2022 Dry | | | 2023 Wet | | | 2024 Typical | | | 2025 Typical | | |
|-----------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-------------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|--------------------------|-----------------|------|---------------|
| | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | Acres | Etc | Estimated demand (AF/yr) | | | |
| Almonds | 2,133.20 | 3.06 | 6,527.59 | 2,143.00 | 3.06 | 6,557.58 | 2,134.00 | 2.72 | 5,804.48 | 2,395.00 | 2.82 | 6,753.90 | 2,334.00 | 2.72 | 6,348.48 | 2,365.00 | 3.06 | 7,236.90 | 2,165.90 | 3.06 | 6,627.65 | 2,012.80 | 3.06 | 6,159.17 | 2,010.10 | 2.72 | 5,467.47 | 1,871.60 | 3.07 | 5,745.81 | 1,871.59 | 3.07 | 5,745.78 |
| Cherries | 8.50 | 3.03 | 25.76 | 9.00 | 3.03 | 27.27 | 9.00 | 2.73 | 24.57 | 11.00 | 2.74 | 30.14 | 10.00 | 2.73 | 27.30 | 11.00 | 3.03 | 33.33 | 10.40 | 3.03 | 31.51 | 10.50 | 3.03 | 31.82 | 10.50 | 2.73 | 28.67 | 11.56 | 3.00 | 34.68 | 11.56 | 3.00 | 34.68 |
| Citrus | 2,959.10 | 2.85 | 8,433.44 | 2,960.00 | 2.85 | 8,436.00 | 2,959.00 | 2.48 | 7,338.32 | 2,938.00 | 2.77 | 8,138.26 | 2,887.00 | 2.48 | 7,159.76 | 2,850.00 | 2.85 | 8,122.50 | 2,654.00 | 2.85 | 7,563.90 | 2,418.20 | 2.85 | 6,891.87 | 2,378.90 | 2.48 | 5,899.67 | 2,379.40 | 3.02 | 7,185.79 | 2,379.42 | 3.02 | 7,185.85 |
| Dates | 1.00 | 2.92 | 2.92 | 1.00 | 2.92 | 2.92 | 1.00 | 2.65 | 2.65 | 1.00 | 2.50 | 2.50 | 1.00 | 2.65 | 2.65 | 1.00 | 2.92 | 2.92 | 0.70 | 2.92 | 2.04 | 0.70 | 2.92 | 2.04 | 0.70 | 2.65 | 1.86 | | 2.89 | | 2.89 | | |
| Grapes | 261.50 | 2.11 | 551.77 | 262.00 | 2.11 | 552.82 | 220.00 | 2.01 | 442.20 | 218.00 | 1.86 | 405.48 | 220.00 | 2.01 | 442.20 | 220.00 | 2.11 | 464.20 | 196.90 | 2.11 | 415.46 | 196.90 | 2.11 | 415.46 | 187.40 | 2.01 | 376.67 | 187.49 | 2.10 | 393.73 | 169.59 | 2.10 | 356.14 |
| Nursery Plants | 22.40 | 2.92 | 65.41 | 22.00 | 2.92 | 64.24 | 22.00 | 2.65 | 58.30 | 16.00 | 2.64 | 42.24 | 14.00 | 2.65 | 37.10 | 14.00 | 2.92 | 40.88 | 13.60 | 2.92 | 39.71 | | | | 2.65 | | | 2.89 | | 2.89 | | 2.89 | |
| Olives | 93.00 | 3.00 | 279.00 | 93.00 | 3.00 | 279.00 | 93.00 | 2.80 | 260.40 | 70.00 | 0.67 | 46.90 | 57.00 | 2.80 | 159.60 | 32.00 | 3.00 | 96.00 | 35.70 | 3.00 | 107.10 | 35.70 | 3.00 | 107.10 | 28.50 | 2.80 | 79.80 | 28.51 | 0.67 | 19.10 | 26.99 | 0.67 | 18.08 |
| Persimmons | 1.00 | 3.03 | 3.03 | 1.00 | 3.03 | 3.03 | 1.00 | 2.73 | 2.73 | 1.00 | 2.64 | 2.64 | 1.00 | 2.73 | 2.73 | 1.00 | 3.03 | 3.03 | 0.70 | 3.03 | 2.12 | 0.70 | 3.03 | 2.12 | 0.70 | 2.73 | 1.91 | 0.75 | 3.00 | 2.25 | 0.75 | 3.00 | 2.25 |
| Pistachios | 2,674.00 | 2.75 | 7,353.50 | 2,674.00 | 2.75 | 7,353.50 | 2,674.00 | 2.69 | 7,193.06 | 2,411.00 | 2.47 | 5,955.17 | 2,217.00 | 2.69 | 5,963.73 | 2,292.00 | 2.75 | 6,303.00 | 2,145.40 | 2.75 | 5,899.85 | 2,106.30 | 2.75 | 5,792.33 | 1,914.40 | 2.69 | 5,149.74 | 1,754.29 | 2.77 | 4,859.38 | 1,754.29 | 2.77 | 4,859.38 |
| Plums | 4.50 | 3.03 | 13.64 | 8.00 | 3.03 | 24.24 | 7.00 | 2.73 | 19.11 | 8.00 | 2.64 | 21.12 | 4.00 | 2.73 | 10.92 | 4.00 | 3.03 | 12.12 | 4.30 | 3.03 | 13.03 | 4.30 | 3.03 | 13.03 | 4.30 | 2.73 | 11.74 | 4.35 | 3.00 | 13.05 | 4.35 | 3.00 | 13.05 |
| Pomegranates | 6.50 | 2.92 | 18.98 | 7.00 | 2.92 | 20.44 | 7.00 | 2.65 | 18.55 | 7.00 | 2.64 | 18.48 | 7.00 | 2.65 | 18.55 | 7.00 | 2.92 | 20.44 | 8.30 | 2.92 | 24.24 | 8.30 | 2.92 | 24.24 | 8.30 | 2.65 | 22.00 | 9.05 | 2.89 | 26.15 | 9.04 | 2.89 | 26.13 |
| Wheat | 118.00 | 1.07 | 126.26 | 100.00 | 1.07 | 107.00 | 100.00 | 0.85 | 85.00 | 104.00 | 0.03 | 3.12 | 100.00 | 0.85 | 85.00 | 100.00 | 1.07 | 107.00 | 118.00 | 1.07 | 126.26 | 167.20 | 1.07 | 178.90 | | | | 1.35 | | | 1.35 | | |
| Alfalfa | | | | | | | | | | | | | | | | 93.00 | 3.00 | 279.00 | 93.00 | 3.00 | 279.00 | | | | | | | | | | | | |
| | 8,282.70 | | 23,401 | 8,280.00 | | 23,428 | 8,227.00 | | 21,249 | 8,180.00 | | 21,420 | 7,852.00 | | 20,258 | 7,990.00 | | 22,721 | 7,446.90 | | 21,132 | 6,961.60 | | 19,618 | 6,543.80 | | 17,040 | 6,247.00 | | 18,280 | 6,227.58 | | 18,241 |

*Crop demands includes computation included in the holding contract.

Groundwater Extraction

Groundwater extraction for RCWDGSA is estimated by the total applied water demand minus the volume of water supplied by surface water sources. Surface water sources are described in **Chapter 4 – Surface Water Supplies**. The estimates for groundwater extraction, for the years 2015 to 2025, are included in **Table 10**. This table includes the volume of surface water used for intentional recharge. Groundwater demand is the sum of both agricultural and municipal groundwater demand. Groundwater demand for agricultural use is estimated by taking the difference of crop consumptive use after effective precipitation and total surface water use. In 2025, the total groundwater extraction is approximately 13,066 AF, of which 1,224 AF is metered extractions to meet municipal demand and approximately 11,842 AF to meet the remaining crop consumptive use after applied surface water. A summary of groundwater extraction for Water Year 2025 is included as **Table 9**.

Water demand for agricultural use from groundwater pumping was estimated as discussed previously and has an approximate accuracy of about $\pm 20\%$. Municipal water use was directly measured by electromagnetic flow meters at each of the wells and have an accuracy of about $\pm 0.5\%$. Lastly, surface water deliveries were measured by propeller flow meter at the diversion point into RCWD on Lateral 6.2 and has an associated accuracy of about $\pm 2\%$ and estimates of supply from the San Joaquin River are thought to be similar to the estimates of agricultural demand at $\pm 20\%$.

Table 9. Summary of Groundwater Extraction

| Groundwater Extraction Sector | Water Use (Acre-Feet) | Measurement Type | Method Description | Accuracy |
|-------------------------------|-----------------------|------------------|---|----------|
| Urban | 1,224 | Metered | | 5% |
| Industrial | | | | |
| Agricultural | 11,842 | Estimated | Estimated using observed cropping patterns and crop demand estimates. | Unknown |
| Managed Wetland | | | | |
| Managed Recharge | | | | |
| Native Vegetation | | | | |
| Other | | | | |
| TOTAL | 13,066 | | | |

Table 10. Groundwater Demand in RCWDGSA from 2015 to 2025

| Summary of RCWD Groundwater Demand (AF) | | | | | | | | | | | |
|--|---------------|---------------|--------------|---------------|--------------|---------------|---------------|---------------|--------------|---------------|---------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| Agriculture | | | | | | | | | | | |
| Crop Consumptive Use After Effective Precipitation | 23,401 | 23,423 | 21,247 | 21,418 | 20,604 | 21,039 | 19,571 | 19,618 | 17,040 | 18,280 | 18,241 |
| Total Surface Water Supply for Agricultural Use | 5,802 | 5,802 | 12,438 | 7,163 | 13,409 | 5,802 | 7,322 | 6,972 | 9,918 | 8,186 | 6,399 |
| Total Crop Consumptive Use After Applied Surface Water | 17,599 | 17,621 | 8,809 | 14,255 | 7,195 | 15,237 | 12,249 | 12,646 | 7,122 | 10,094 | 11,842 |
| Municipal | | | | | | | | | | | |
| Metered Municipal Groundwater Extraction | 0 | 0 | 70 | 186 | 238 | 290 | 390 | 483 | 609 | 813 | 1,224 |
| Total Groundwater Extraction | 17,599 | 17,621 | 8,879 | 14,441 | 7,433 | 15,527 | 12,639 | 13,129 | 7,731 | 10,907 | 13,066 |

Chapter 4 – Surface Water Supplies

Surface Water

Lateral 6.2

RCWD completed the construction of an in-lieu pipeline in 2014 to serve surface water to the Northern part of the district with a service area of approximately 2,500 acres. Imported surface water supplies brought into RCWD is directed through the MID Lateral 6.2 which distributes water from the Madera Canal and ultimately the San Joaquin River. As mentioned, RCWD has surface water contracts with MID, Wonderful, and USBR. The contract with MID allows RCWD to buy excess surface water at a contracted price, while the surface water from the contract with Wonderful is always available at a higher cost. The contract with USBR only allows RCWD to purchase section 215 flow which is classified as flood flow, and only occurs once every few years on average. In 2025, RCWD was unable to purchase surface water from MID. **Table 11** shows the amount of water into the District as measured at the turnout on MID Lateral 6.2.

Table 11. Surface Water Supply through Lateral 6.2 for RCWD from 2015-2025

| Year | Agricultural Use (AF) | Municipal Use (AF) | Intentional Recharge (AF) | Total (AF) |
|------|-----------------------|--------------------|---------------------------|------------|
| 2014 | 502 | - | - | 502 |
| 2015 | - | - | - | - |
| 2016 | - | - | - | - |
| 2017 | 6,636 | - | 178 | 6,814 |
| 2018 | 1,361 | - | - | 1,361 |
| 2019 | 7,607 | - | 601 | 8,208 |
| 2020 | 0 | - | 0 | - |
| 2021 | 1,250 | - | 0 | 1,250 |
| 2022 | 900 | - | 0 | 900 |
| 2023 | 3,874 | - | 1,190 | 5,064 |
| 2024 | 1,452 | - | 411 | 1,862 |
| 2025 | - | - | - | - |

Surface water diverted by Root Creek Water District is also intentionally recharged outside of the RCWDGSA boundary within the neighboring Madera County GSA. Unlike RCWDGSA, which has access to both surface water and groundwater, Madera County GSA relies only on groundwater. Making water available for recharge in the Madera County GSA provides groundwater storage benefits for the Madera County GSA which also extend to the RCWDGSA by improving adjacent water levels and reducing groundwater outflow from the RCWDGSA boundary. Included as **Table 12** is District purchased or contracted surface water lost or percolated in the canal system included within the County GSA area that the RCWD has intentionally recharged. Approximately 3% of surface water diverted for RCWDGSA is estimated to recharge within the Madera County GSA.

Table 12 Root Creek Surface Water Recharged in Madera County GSA

| Year | Recharged Amt (AF) |
|--------------|--------------------|
| 2014 | 15 |
| 2015 | 0 |
| 2016 | 0 |
| 2017 | 199 |
| 2018 | 41 |
| 2019 | 228 |
| 2020 | 0 |
| 2021 | 34 |
| 2022 | 27 |
| 2023 | 152 |
| 2024 | 56 |
| 2025 | - |
| TOTAL | 752 |

San Joaquin River

The RCWD does not directly divert surface water from the San Joaquin River. However, a number of other landowners adjacent to the river entered into Holding Contracts with the United States Bureau of Reclamation for diversion of surface supplies in place of their right to pump. Those landowners actively exercise their holding contract rights, but these supplies are currently not measured in their totality and estimates of the total diversions are found in **Table 14**.

Total Surface Water Use

A summary of surface water use within the RCWDGSA, for Water Year 2025, is included as **Table 13**.

Table 13. Summary of Surface Water Supply

| Surface Water Supply Sector | Water Use (Acre-Feet) | Methods Used to Determine |
|-----------------------------|-----------------------|---|
| Central Valley Project | | Metered |
| State Water Project | | |
| Colorado River Project | | |
| Managed Local Supplies | | |
| Local Imported Supplies | | |
| Recycled Water | 424 | Metered |
| Desalination | | |
| Other | 6,399 | Estimated using observed cropping patterns and crop demand estimates. |
| TOTAL | 6,823 | |

Table 14. Surface Water Supplies in RCWDGSA from 2015 to 2025

| Summary of RCWD Surface Water Supply (AF) | | | | | | | | | | | |
|---|--------------|--------------|---------------|--------------|---------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| Agriculture | | | | | | | | | | | |
| Lateral 6.2 | 0 | 0 | 6,636 | 1,361 | 7,607 | 0 | 1,250 | 900 | 3,874 | 1,452 | 0 |
| San Joaquin River – Holding Contracts | 5,802 | 5,802 | 5,802 | 5,802 | 5,802 | 5,802 | 6,072 | 6,072 | 6,044 | 6,734 | 6,399 |
| Total Surface Water for Agricultural Use | 5,802 | 5,802 | 12,438 | 7,163 | 13,409 | 5,802 | 7,322 | 6,972 | 9,918 | 8,186 | 6,399 |
| Recharge | | | | | | | | | | | |
| Reclaimed Water | 0 | 0 | 1 | 22 | 46 | 85 | 119 | 176 | 232 | 317 | 424 |
| Lateral 6.2 | 0 | 0 | 178 | 0 | 601 | 0 | 0 | 0 | 1,190 | 411 | 0 |
| Total Surface Water for Recharge | 0 | 0 | 179 | 22 | 647 | 85 | 119 | 176 | 1,422 | 728 | 424 |
| Total Surface Water Supply for RCWD | 5,802 | 5,802 | 12,617 | 7,185 | 14,056 | 5,887 | 7,441 | 7,148 | 11,339 | 8,914 | 6,823 |

Chapter 5 – Total Water Use

Total Water Use

Total water use within the RCWDGSA is composed of municipal, agricultural, and rural residential demand; however rural residential is minimal and can be considered negligible. As more farmland is taken out of production for the Riverstone development, agricultural water use declines and municipal demand grows. Total water use within RCWDGSA is decreasing since the measured municipal demand is less than the water demand of the land that has been taken out of agricultural production, as shown by the data presented in this section. The total water use within RCWDGSA is summarized in **Table 15**. A summary of total water use from 2015 to 2025 is included as **Table 17**.

Table 15. Summary of Total Water Use

| Water Use Sector | Groundwater | Surface Water | Recycled Water | Reused Water | Other | Total |
|------------------|---------------|---------------|----------------|--------------|-------|---------------|
| | Acre-Feet | | | | | |
| Urban | 1,224 | | | | | 1,224 |
| Industrial | | | | | | |
| Agricultural | 11,842 | 6,399 | | | | 18,241 |
| Managed Wetland | | | | | | |
| Managed Recharge | | | 424 | | | 424 |
| TOTAL | 13,066 | 6,399 | 424 | | | 19,889 |

Change in Water Demand - Riverstone

Total water use in RCWDGSA is changing on an annual basis due to the land use conversion of farmland to residential development in the Riverstone Development area. As mentioned, at build out, Riverstone will consist of approximately 2,000 acres of residential space including houses, parks, and commercial zones. Municipal water use is generally lower than agricultural water use on a per acre basis. Furthermore, municipal wastewater is treated, and a portion of this water then reenters the groundwater system through percolation ponds. **Table 16** documents the estimated change to the water budget for Riverstone based on actual municipal demand and estimated agricultural reduction in demand from fallowed land. From 2014-2025, an average of about 2,062 acre-feet per year less water was used, associated with Riverstone.

Table 16. Water Use Changes for Riverstone

| Year | Reclaimed Water | | Change in Land Use | | | | | Change in Water Budget |
|------|-----------------|---------------|----------------------------|--------------------------|-------------------------------------|---------------------------|--------------------------|------------------------|
| | Ponds (AF) | Reuse (AF) | Irrigated Lands (acres) | Fallowed Land (acres) | Change in Irrigation Demand (AF) | Municipal Area (acres) | Municipal Demand (AF) | (AF) |
| 2014 | - | - | 1,885 | 1 | (27) | - | - | (27) |
| 2015 | - | - | 1,798 | 88 | (252) | - | - | (252) |
| 2016 | - | - | 1,638 | 248 | (562) | - | - | (562) |
| 2017 | 1 | - | 1,538 | 348 | (936) | 30 | 70 | (867) |
| 2018 | 22 | - | 1,490 | 396 | (1,115) | 82 | 186 | (951) |
| 2019 | 46 | - | 1,421 | 465 | (1,288) | 254 | 238 | (1,096) |
| 2020 | 85 | - | 1,176 | 510 | (1,412) | 400 | 290 | (1,208) |
| 2021 | 119 | - | 1,176 | 690 | (1,910) | 411 | 389 | (1,640) |
| 2022 | 176 | - | 557 | 1,074 | (3,854) | 431 | 483 | (3,547) |
| 2023 | 232 | - | 359 | 1,703 | (4,383) | 748 | 609 | (4,005) |
| 2024 | 317 | - | 181 | 1,881 | (4,926) | 767 | 813 | (4,429) |
| 2025 | 424 | - | 180 | 1,882 | (4,927) | 940 | 1,224 | (4,128) |
| | | | | | | | Average: | (2,062) |

Approximately 315 acres annexed into the RCWD and Riverstone Development in 2018

Table 17. Summary of Total Water Use in RCWDGSA from 2015 to 2025

| Summary of RCWD Water Demands(AF) | | | | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| Surface Water | - | - | - | - | - | - | - | - | - | - | - |
| Total of Agricultural Irrigation and Recharge | 5,802 | 5,802 | 12,617 | 7,185 | 14,056 | 5,887 | 7,441 | 7,148 | 11,339 | 8,913 | 6,823 |
| Groundwater Extraction | - | - | - | - | - | - | - | - | - | - | - |
| Total of Estimated Agricultural Demand and Metered Municipal Demand | 17,599 | 17,621 | 8,879 | 14,441 | 7,433 | 15,527 | 12,639 | 13,129 | 7,731 | 10,907 | 13,066 |
| Total Water Demand | 23,401 | 23,423 | 21,496 | 21,626 | 21,489 | 21,414 | 20,080 | 20,277 | 19,070 | 19,821 | 19,889 |

Chapter 6 – Change in Groundwater Storage

The change in groundwater storage is generally equal to the volume of groundwater extracted minus the volume of water that enters the groundwater system through recharge. Change in groundwater storage is calculated by using the weighted average method on a GIS-generated surface with the assistance of hydrogeological interpretation. Included in this analysis are the six representative monitor sites for groundwater storage. Change in groundwater storage is caused by extracting more groundwater than recharged or vice versa. RCWDGSA has two main sources of groundwater extraction as discussed in preceding sections: residential water use and agricultural irrigation. More recently, practices such as intentional recharge, stormwater detention, and treated wastewater effluent percolation have been implemented which help to balance the volume of groundwater extracted. Additionally, recharge occurs through seepage from the San Joaquin River. Due to the listed water management strategies by RCWDGSA and others discussed in the preceding sections, groundwater storage change over the last 5 years has been relatively balanced as shown in **Table 18**.

The data presented in **Table 18** shows that the average change in groundwater surface elevation over the period of record from 2014 to 2025 was close to zero, resulting in an average change in storage of negative 19.3 acre-feet per year. Spring data indicate an average change in groundwater surface elevation from 2014 to 2025 of zero, resulting in an average change in storage of negative 154.3 acre-feet per year. The District's efforts in implementing projects has resulted in an average reduction of pumping of approximately 4,225 AF/yr, which is the summation of the surface water imports (**Table 11**) and demand reduction within Riverstone (**Table 16**). Adding the Spring estimated change in groundwater storage from 2014 to 2025 of -154.3 AF/yr (to get to a zero change in storage) yields an estimated 4,379.3 AF/yr as the reduction in pumping that would need to be accomplished to reach long-term sustainability with the existing conditions.

As noted on the hydrographs, there is a cyclic nature to the measurements at differing times of the year and that the Interim milestones, and thus the storage change, will reflect these changing measurements. Recognizing these variations, it could be suggested that these last four years indicate that the operations have resulted in potentially sustainable operations going forward. As the County GSA establishes policies on pumping and implements programs for recharge the resulting change in storage is expected to provide positive results throughout the Subbasin. This data strongly indicates that RCWDGSA is on track to meet its interim milestones and overall sustainability goal set in the GSP.

It should be recognized that as the RCWDGSA has implemented SGMA projects and lessened the rate of drop of groundwater levels as evidenced by the preceding hydrographs, the rate of groundwater outflow at the northern and western boundaries has increased due to both levels within the RCWDGSA becoming more stabilized and pumping levels in well adjacent becoming deeper. Should these conditions continue to prevail, the water levels within the RCWDGSA will continue to decline.

Table 18. Groundwater Storage Change from 2015-2025

| Time Period | Average Change (ft) | Surface Area of Analysis (ac) | Assumed Specific Yield | Annual Change (AF) | Cumulative Storage Change (AF) |
|-------------------------|---------------------|-------------------------------|------------------------|--------------------|--------------------------------|
| Fall 2014-Fall 2015 | 10.5 | 7,569 | 0.12 | 9,500 | 9,500 |
| Fall 2015-Fall 2016 | -13.2 | 7,601 | 0.12 | -12,000 | -2,500 |
| Fall 2016-Fall 2017 | 18.8 | 7,601 | 0.12 | 17,100 | 14,600 |
| Fall 2017-Fall 2018 | -25.0 | 7,598 | 0.12 | -22,800 | -8,200 |
| Fall 2018-Fall 2019 | 10.9 | 7,598 | 0.12 | 10,000 | 1,700 |
| Fall 2019-Fall 2020 | 0.7 | 7,728 | 0.12 | 600 | 2,300 |
| Fall 2020-Fall 2021 | -8.4 | 7,732 | 0.12 | -7,800 | -5,500 |
| Fall 2021-Fall 2022 | -8.4 | 8,145 | 0.12 | -8,200 | -13,700 |
| Fall 2022-Fall 2023 | 15.9 | 8,111 | 0.12 | 15,500 | 1,800 |
| Fall 2023-Fall 2024 | -10.1 | 7,313 | 0.12 | -8,900 | -7,100 |
| Fall 2024-Fall 2025 | 7.7 | 7,344 | 0.12 | 6,786 | -214 |
| Average | -0.1 | | | -19.3 | |
| Spring 2014-Spring 2015 | 7.8 | 7,596 | 0.12 | 7,100 | 7,100 |
| Spring 2015-Spring 2016 | -4.8 | 7,596 | 0.12 | -4,300 | 2,700 |
| Spring 2016-Spring 2017 | -4.5 | 7,598 | 0.12 | -4,100 | -1,400 |
| Spring 2017-Spring 2018 | 10.2 | 7,598 | 0.12 | 9,300 | 7,900 |
| Spring 2018-Spring 2019 | -10 | 7,598 | 0.12 | -9,100 | -1,200 |
| Spring 2019-Spring 2020 | -5.7 | 8,860 | 0.12 | -6,000 | -7,300 |
| Spring 2020-Spring 2021 | 2.1 | 8,852 | 0.12 | 2,200 | -5,100 |
| Spring 2021-Spring 2022 | -4.2 | 8,831 | 0.12 | -4,500 | -9,600 |
| Spring 2022-Spring 2023 | 5.4 | 8,853 | 0.12 | 5,700 | -3,900 |
| Spring 2023-Spring 2024 | -1.2 | 8,828 | 0.12 | -1,300 | -5,200 |
| Spring 2024-Spring 2025 | 3.5 | 7,863 | 0.12 | 3,302 | -1,698 |
| | 0.0 | | | -154.3 | |

Figure 15 shows the cumulative change in groundwater storage next to surface water supply as a bar graph along with crop demand within RCWDGSA boundaries since the 2015 water year. The corresponding water year type is shown below the year. Figure 16 displays the groundwater storage change throughout the area between Spring 2024 and 2025, while Figure 17 displays the groundwater storage between Fall 2024 and Fall 2025. Dropping groundwater levels in parts of the district are a result of pumping to the West and North of the Root Creek Water District boundary. The Root Creek Water District experiences impacts as a result of the Subbasin GSAs' implementation of projects and management actions.

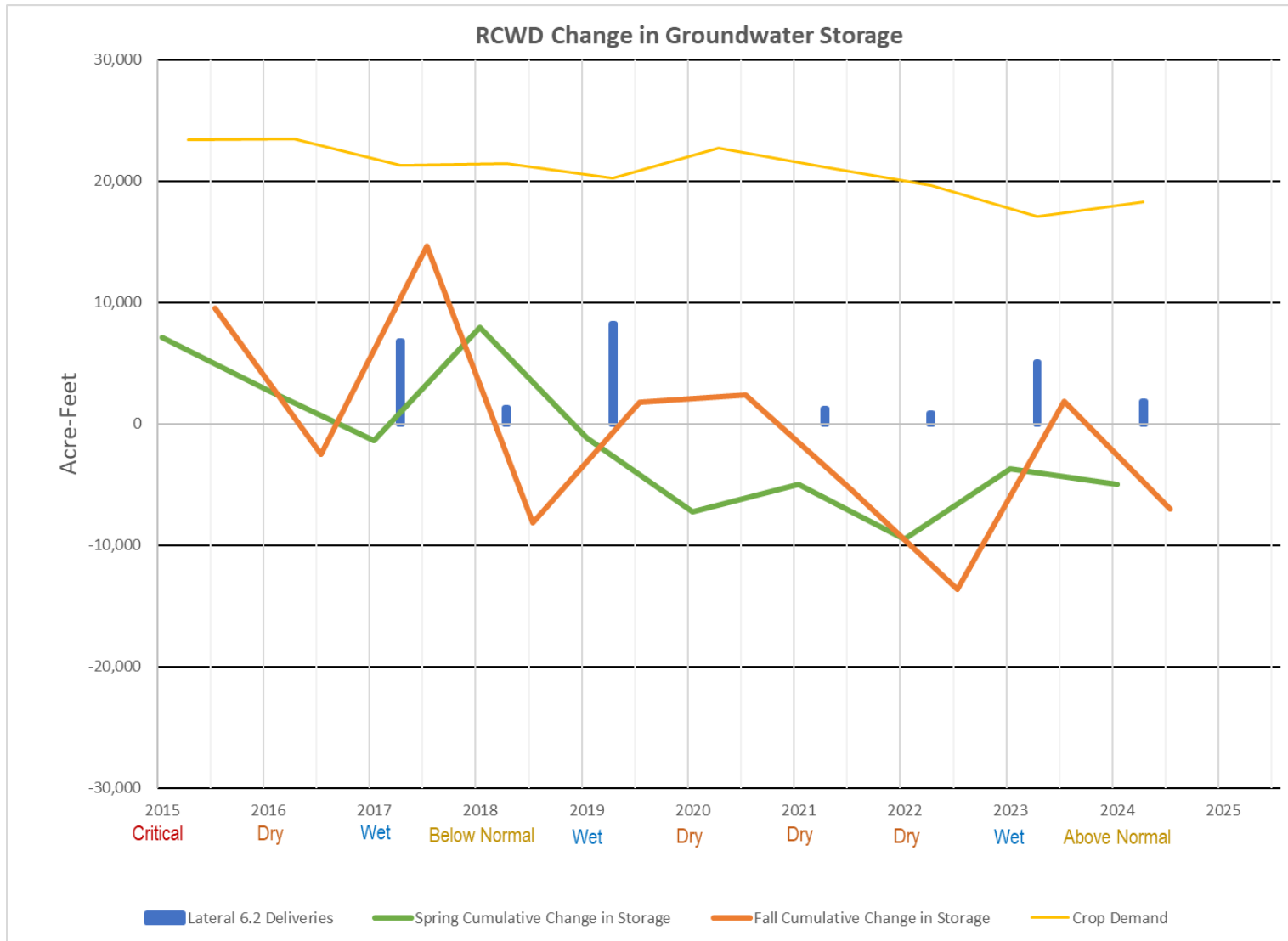


Figure 15. Groundwater Storage Change Between Fall Seasons 2015 to 2025

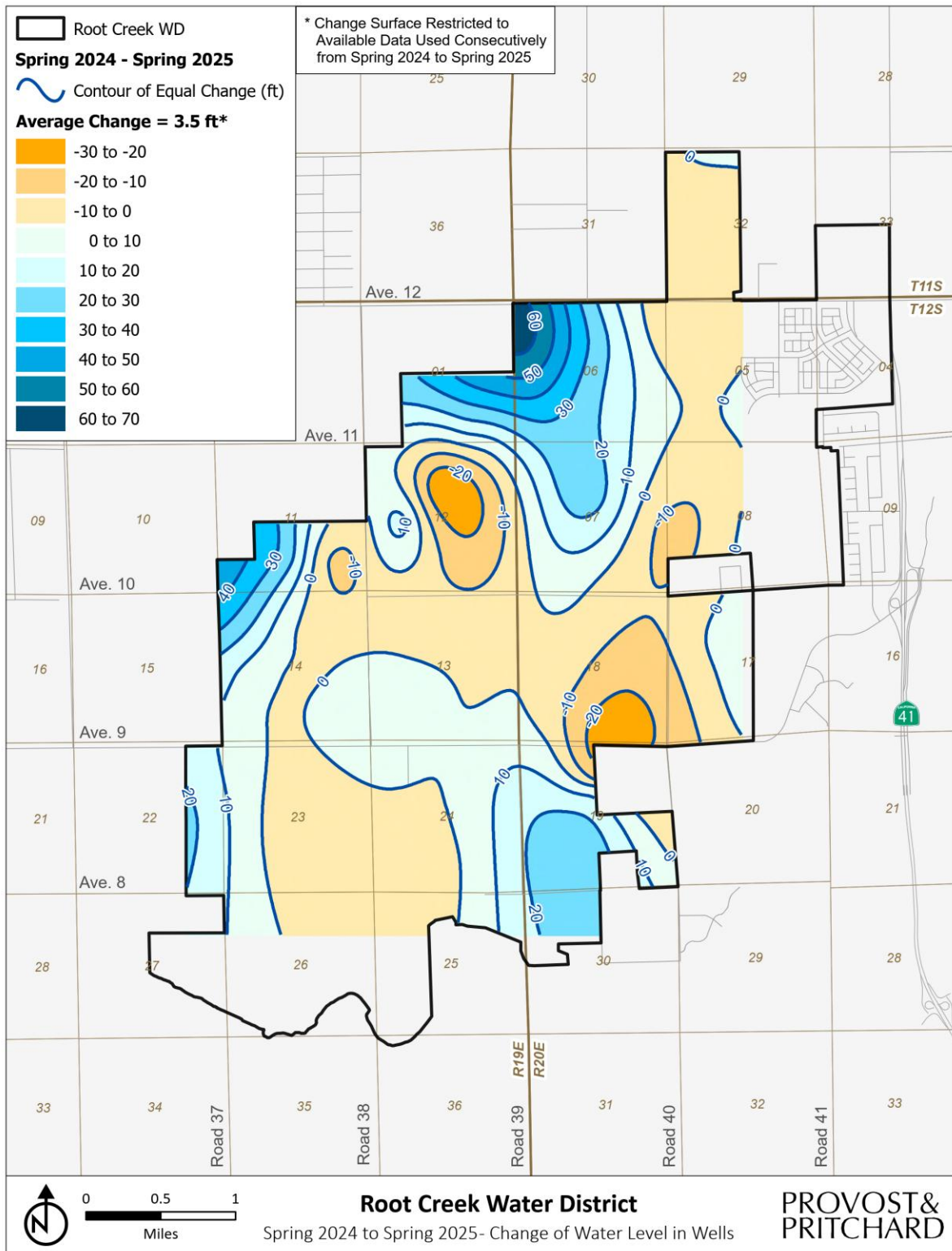


Figure 16. Change in Groundwater Storage in RCWDGSA - Spring 2024 to Spring 2025

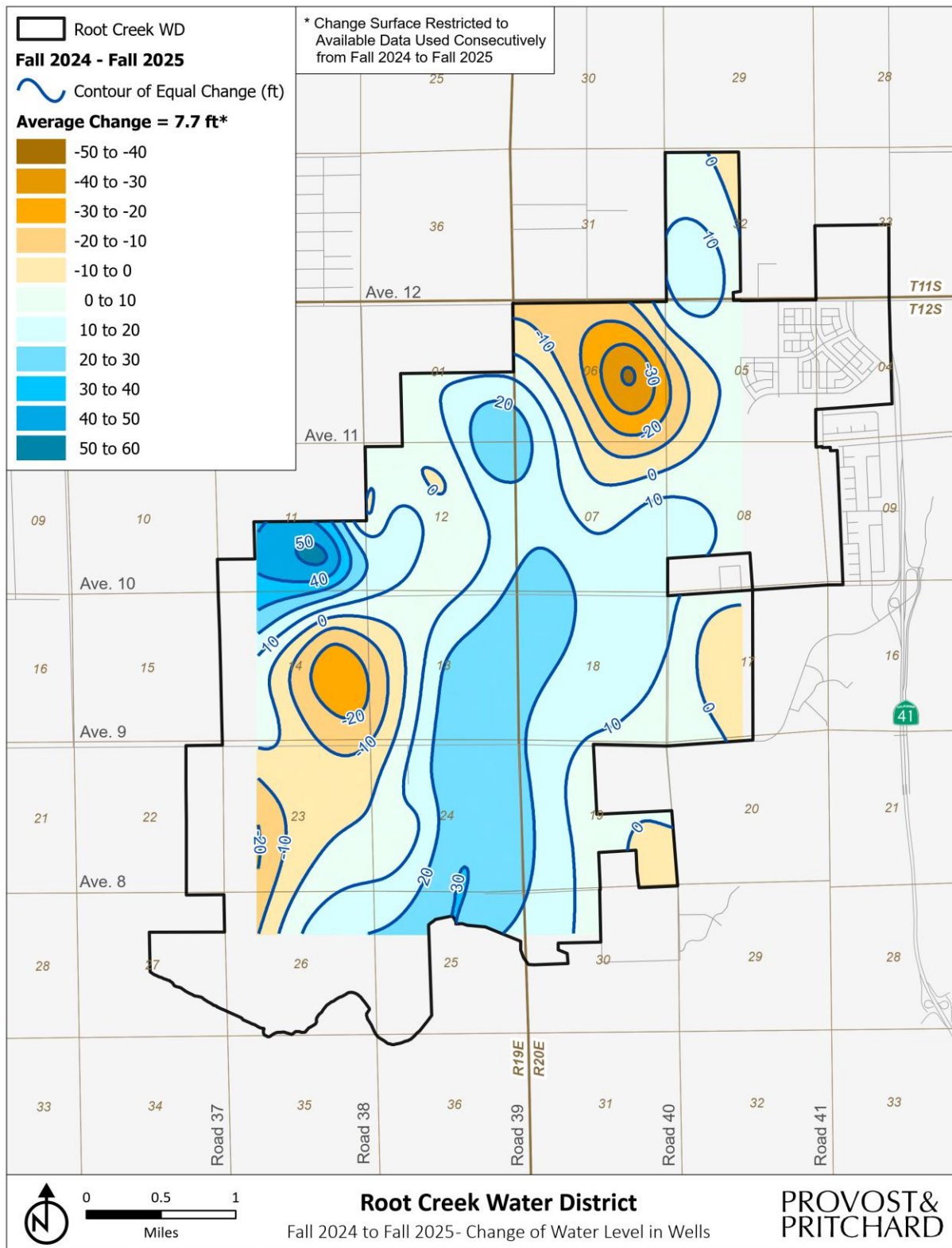


Figure 17. Change in Groundwater Storage in RCWDGSA - Fall 2024 to Fall 2025

Chapter 7 – Progress of Implementation

In October 2020, the RCWDGSA submitted its initial GSP to DWR. The RCWDGSA submitted a revised GSP in 2025 following a subbasin wide period evaluation. The successful implementation of the RCWDGSA GSP over the implementation period (2020-2040) will require ongoing sustainable management by the GSA as well as the cooperation and enactment of projects and management actions by the other GSA's within the basin. Achieving sustainability with the RCWDGSA is not enough. To avoid continued subsurface outflow and potential overdraft conditions, the RCWDGSA is dependent on other GSAs in the Madera Subbasin implementing projects and management actions (P/MAs) to achieve sustainable conditions. Data indicates that RCWDGSA is trending towards sustainability as the District has enacted many of the P/MAs outlined in the GSP. These P/MAs have resulted in approximately 4,100 AF of demand reduction since 2014. The average benefit of all P/MAs since WY 2019, including demand reduction and supply augmentation, is approximately 5,000 AF.

Basin Coordination

The GSAs that collectively represent the entire Subbasin have been meeting since the passage of the Sustainability Groundwater Management Act (SGMA) in 2014. GSAs must work together to maintain the viability of the aquifers beneath the Subbasin. To that end, the Subbasin has made progress towards basin-wide coordination by providing annual report updates on current groundwater conditions relating to progress towards sustainability within the Subbasin. The Subbasin's GSAs also coordinated on project identification and sustainable groundwater management implementation grant development in 2022 and are in the process of completing the projects that are covered under the funding award with DWR.

In December 2023, the Madera Subbasin GSPs were approved by DWR. The approval was accompanied by a series of recommended corrective actions to be addressed by January 2025. The RCWDGSA amended their GSP in coordination with all Madera Subbasin GSAs to respond to DWR's corrective actions. On December 9, 2024, the RCWDGSA adopted the amended GSP ahead of DWR's schedule. This annual report marks the first annual report following the 2025 amended plan.

Sustainable Management Criteria

This report is used to demonstrate progress towards achieving interim milestones and measurable objectives described in the RCWDGSA GSP.

Groundwater Levels

Groundwater levels in the RCWDGSA are discussed in the Groundwater Levels section of **Chapter 2 – Groundwater Conditions**.

Groundwater Storage

The changes in groundwater storage in the RCWDGSA are discussed in **Chapter 6 – Change in Groundwater Storage**.

Groundwater Quality

In the Madera Subbasin, Sustainable Management Criteria for degraded groundwater quality were set for nitrate, total dissolved solids, and arsenic. These constituents were selected with consideration of existing

and historical groundwater quality conditions in the Subbasin. The MTs for Degraded Water Quality across the Subbasin are set at the following MCLs for drinking water for the identified key constituents of nitrate as nitrogen, TDS, and arsenic.

- Nitrate as nitrogen = 10 mg/L, or baseline concentration plus 20%
- TDS = 500 mg/L, or baseline concentration plus 20%
- Arsenic = 10 µg/L, or baseline concentration plus 20%

When existing or historical concentrations for the key constituents already exceed the MCL, the MT is set at the baseline concentration plus 20 percent. When current or historical water quality for the key constituents has not been measured, the MT will be set as the MCL and will be adjusted if needed. **Table 19** lists the estimated thresholds for water quality for the RCWD GSP.

Table 19 Summary of Groundwater Quality Minimum Thresholds for Representative Monitoring Sites

| Well ID | Well Type | MT Arsenic Concentration (µg/L) | MT Nitrate Concentration (mg/L) | MT TDS Concentration (mg/L) |
|---------|------------|---------------------------------|---------------------------------|-----------------------------|
| MW5 | Monitoring | 10 ⁺ | 14.8 | 500 ⁺ |
| MW4 | Monitoring | 10 ⁺ | 10.7 ⁺ | 500 ⁺ |
| MW3 | Monitoring | 10 ⁺ | 18.1 | 500 ⁺ |
| MW2 | Monitoring | 10 ⁺ | 13.3 | 500 ⁺ |
| MW1 | Monitoring | 10 ⁺ | 10 ⁺ | 500 ⁺ |
| Well M5 | Municipal | 10 ⁺ | 10 ⁺ | 500 ⁺ |
| Well M2 | Municipal | 10 ⁺ | 10 ⁺ | 500 ⁺ |
| Well M1 | Municipal | 10 ⁺ | 10 ⁺ | 500 ⁺ |

⁺Values will be confirmed and/or adjusted as needed once enough data are collected to establish meaningful baselines. If initial sampling exceeds the MCL, then the MT is set at the baseline concentration plus 20%.

Existing and historical concentrations for the key constituents from RCWDGSA’s representative monitoring sites are shown in **Table 20**, **Table 21**, and **Table 22**. Among the wells sampled consistently for each key constituent over the three-year baseline period (2022-2024), three wells exceeded the initial MT for nitrate (as N) on average (MW5, MW3, and MW2), while no wells exceeded the TDS MT during this period. Given that the baseline nitrate concentrations in three wells exceed initial MTs, the RCWDGSA, in coordination with the Subbasin methodology, has decided to adjust the MTs for MW5, MW3, and MW2 to baseline concentrations plus 20%. Adjusted MTs are shown in **Table 19**. Arsenic has not been consistently sampled within the RCWDGSA, as it was only recently added to the list of key constituents. Initial MTs will be confirmed and/or adjusted as needed once enough data is collected to establish

meaningful baselines. The 2025 Nitrate as N analysis found exceedances in MW3 and MW5. Location of the monitor wells are shown in **Figure 18**.

Table 20 Summary of Nitrate (as N) Results from RCWD GSA Representative Sites

| Well | Nitrate as N (mg/L) | | | | | | | | | Average (2022-2025) |
|------|---------------------|------|------|------|------|------|------|------|------|------------------------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | |
| MW5 | 8.5 | 8.2 | 8.5 | 11 | 9.9 | 12 | 13 | 12 | 15 | 13 |
| MW4 | 11 | 12 | 12 | 8.6 | 8.4 | 9.3 | 8.8 | 8.6 | 8.5 | 8.8 |
| MW3 | 19 | 18 | 15 | 20 | 15 | 14 | 9.2 | 22 | 24 | 17.3 |
| MW2 | 4.9 | 7.1 | 7 | 8.9 | 8.7 | 11 | 13 | 9.4 | 11 | 11.1 |
| MW1 | 3.7 | 3.6 | 2.8 | 2.6 | 3.5 | 2.6 | 2.8 | 2.2 | 2.2 | 2.5 |
| M5 | | | | | | | 1 | - | ND | |
| M2 | 2.8 | - | - | 5.3 | ND | - | ND | - | ND | |
| M1 | 3 | - | - | 2.9 | 3.8 | - | 3.7 | - | 6.3 | |

Table 21 Summary of TDS Results from RCWD GSA Representative Sites

| Well | Total Dissolved Solids (TDS) (mg/L) | | | | | | | | | Average (2022-2025) |
|------|-------------------------------------|------|------|------|------|------|------|------|------|------------------------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | |
| MW5 | 210 | 180 | 190 | 230 | 230 | 200 | 280 | 320 | 300 | 275 |
| MW4 | 280 | 290 | 330 | 200 | 200 | 200 | 220 | 280 | 200 | 225 |
| MW3 | 330 | 290 | 330 | 360 | 310 | 350 | 290 | 550 | 420 | 403 |
| MW2 | 210 | 260 | 280 | 250 | 260 | 290 | 440 | 360 | 390 | 370 |
| MW1 | 220 | 210 | 200 | 200 | 220 | 180 | 180 | 250 | 180 | 198 |
| M5 | - | - | - | - | - | - | 370 | - | 400 | - |
| M2 | 370 | - | - | 260 | 790 | - | 840 | - | 860 | - |
| M1 | 260 | - | - | 330 | 227 | - | 180 | - | 260 | - |

Table 22 Summary of Arsenic Results from RCWD GSA Representative Sites

| Well | Arsenic (µg/L) | | | | | | | | | Average | |
|------|--|------|------|------|------|------|------|------|------|---------|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | | |
| MW5 | Not historically measured. Constituent added to the RMN for 2025 update. | | | | | | | | | ND | - |
| MW4 | | | | | | | | | | ND | - |
| MW3 | | | | | | | | | | ND | - |
| MW2 | | | | | | | | | | ND | - |
| MW1 | | | | | | | | | | ND | - |
| M5 | | | | | | | | | | - | - |
| M2 | - | - | 4.5 | - | - | 5.1 | - | - | 4.9 | - | |
| M1 | - | - | 3.4 | - | - | 5.8 | - | - | 3.3 | - | |

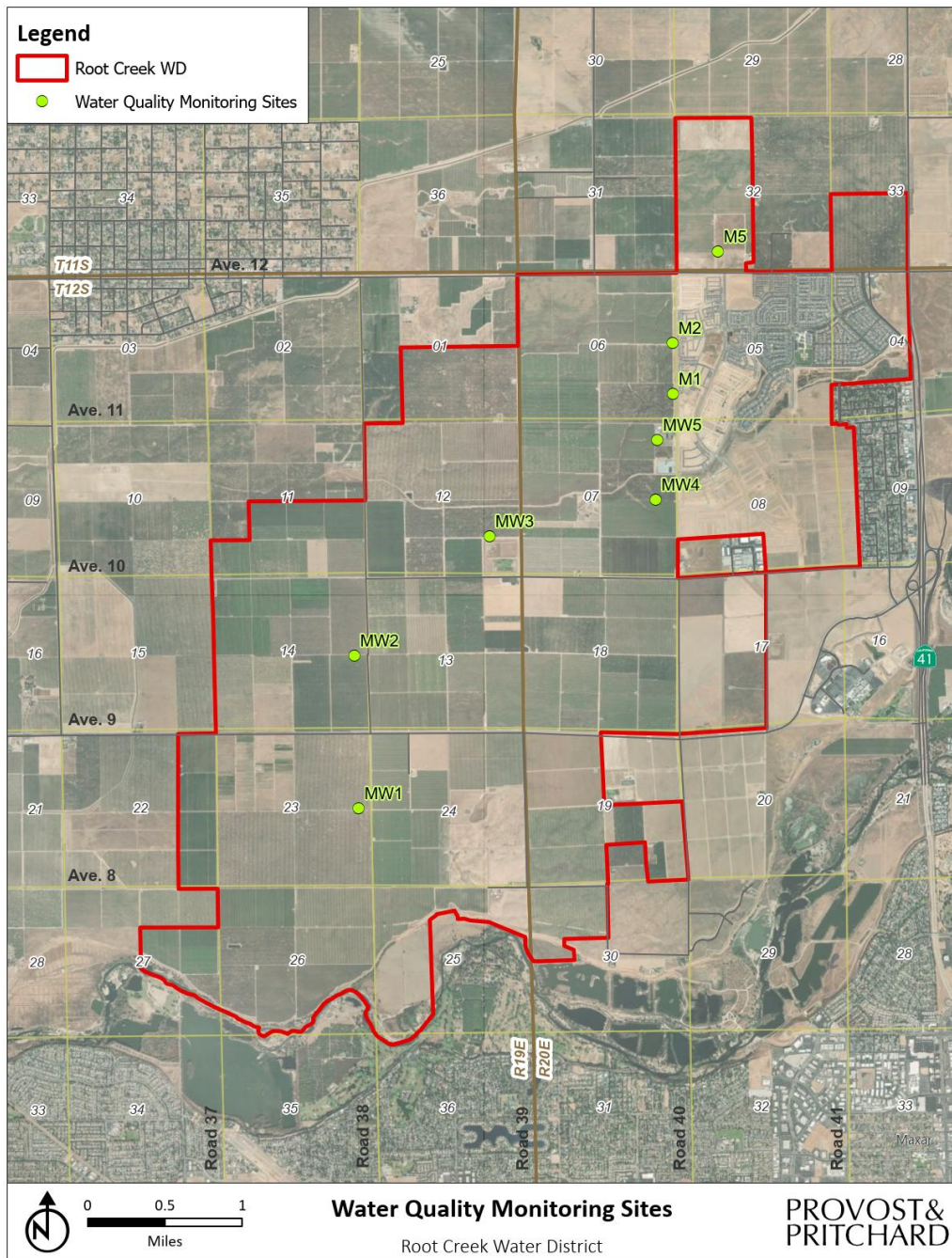


Figure 18. Water Quality Monitoring Sites for Wells in RCWDGSA

Land Subsidence

Land subsidence is a concern in the Subbasin. Even though RCWDGSA has not historically experienced land subsidence as discussed in the GSP, sustainability management criteria have been established to reflect coordination within the Subbasin (**Table 23**). The Subbasin has identified a total seven representative monitoring stations (**Figure 19**). The USBR produces subsidence data through the San Joaquin River Restoration program and is shown on **Figure 20** indicates no significant subsidence north, east, and south of RCWD. However, subsidence along Highway 99 west of the RCWDGSA is significant. Annual changes in land surface elevation from December 2016 to December 2023 for stations near RCWDGSA are summarized in **Table 24**. The month of December is used as a reference point to capture potential inelastic rebound. The subsidence data for SJRRP stations 141 and 165 appears questionable from December 2021 to 2022. It is important to note that the SJRRP has a vertical accuracy of +/- 3 cm (0.1 feet).

USBR ended the measurement of subsidence benchmarks, under the San Joaquin River Restoration Program, in 2025. Monitoring points 142 and 165 are part of this network. Due to this lapse in data collection, the annual report provides the best information regarding land subsidence, as available. The Subbasin is working to coordinate data collection efforts moving forward.

Table 23 Summary of Madera Subbasin Land Subsidence SMCs

| 5-Year Interval | Maximum Average Annual Rate of Subsidence (feet/year) | Maximum 5-Year Cumulative Subsidence (feet) ¹ |
|---|---|--|
| 2020-2025 | | 1.5 |
| 2025-2030 | 0.2 | 1.0 |
| 2030-2035 | 0.1 | 0.5 |
| 2035-2040 | 0.05 | 0.25 |
| <p>Note: Due to the uncertainty in land subsidence measurement accuracy of +/- 0.16 feet/year, there may be instances where measurement error will indicate a rate of subsidence greater than the IMs. Undesirable results will trigger further management actions within the Subbasin.</p> | | |

¹ A cumulative total of up to 1.0 feet of subsidence has already occurred in some portions of the subbasin between December 2019 and December 2023. Therefore, the maximum allowable cumulative subsidence of 1.5 feet as of December 2024 requires annual subsidence in 2024 to be less than 0.5 feet. Subsequent years after 2024 have significantly lower allowable annual rates of subsidence.

Table 24. Annual Subsidence

| Annual Inelastic Subsidence | | |
|------------------------------------|------------|------------|
| Monitoring Points | | |
| Years | 142 | 165 |
| Dec-16 – Dec-17 | -0.02 | NA |
| Dec-17 – Dec-18 | -0.05 | -0.09 |
| Dec-18 – Dec-19 | -0.01 | -0.02 |
| Dec-19 – Dec-20 | +0.03 | -0.05 |
| Dec-20 – Dec-21 | 0.00 | -0.03 |
| Dec-21 – Dec-22 | -0.14 | -0.13 |
| Dec-22 – Dec-23 | +0.15 | +0.09 |
| Average Dec-20 – Dec-23 | 0.00 | -0.02 |
| Cumulative Dec 20 – Dec 23 | +0.01 | -0.07 |

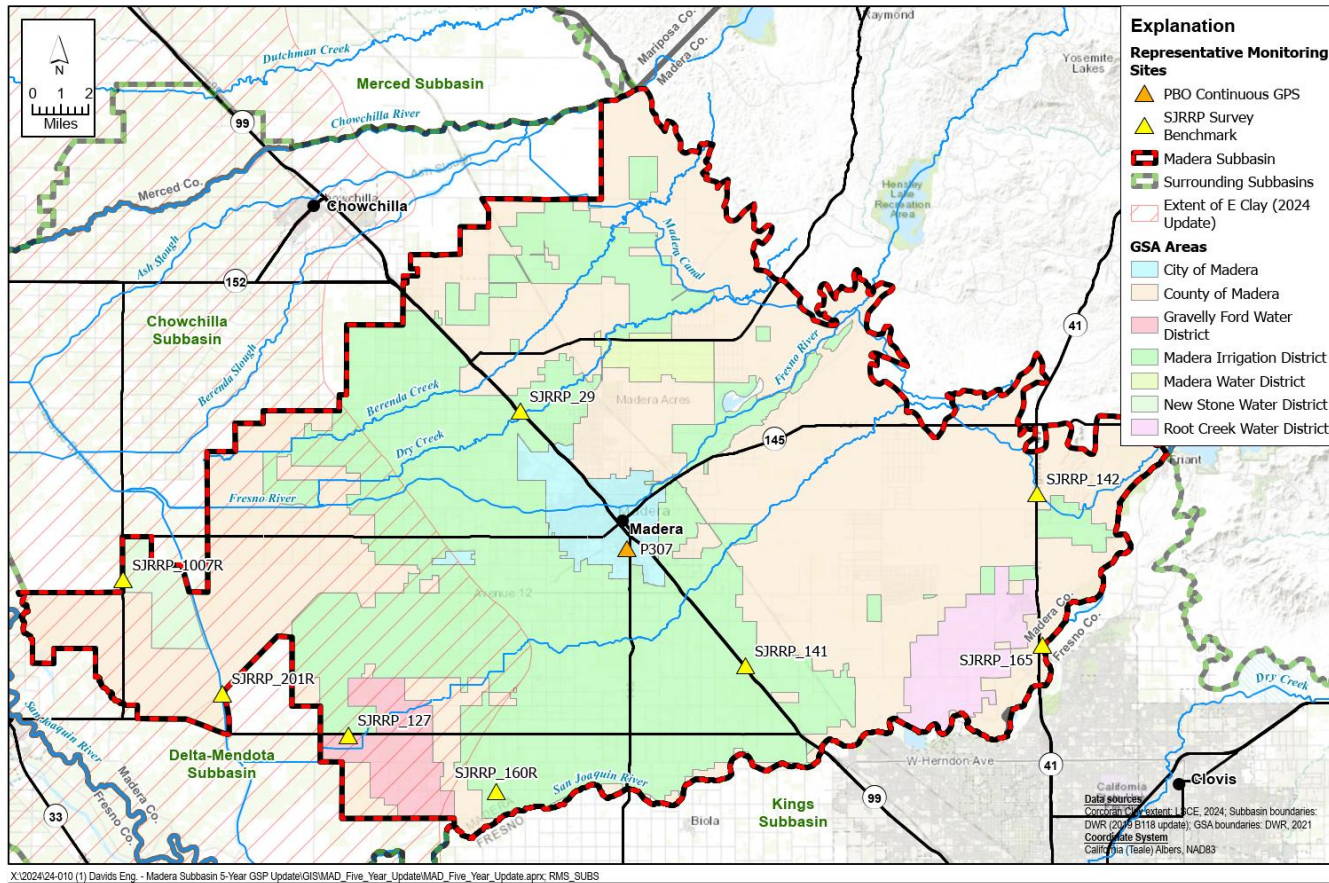


FIGURE 3-2
Proposed Subsidence Sustainability Indicator
Representative Monitoring Sites
Madera Subbasin
Groundwater Sustainability Plan - First Plan Amendment

Figure 19 Subbasin Land Subsidence Monitoring Stations

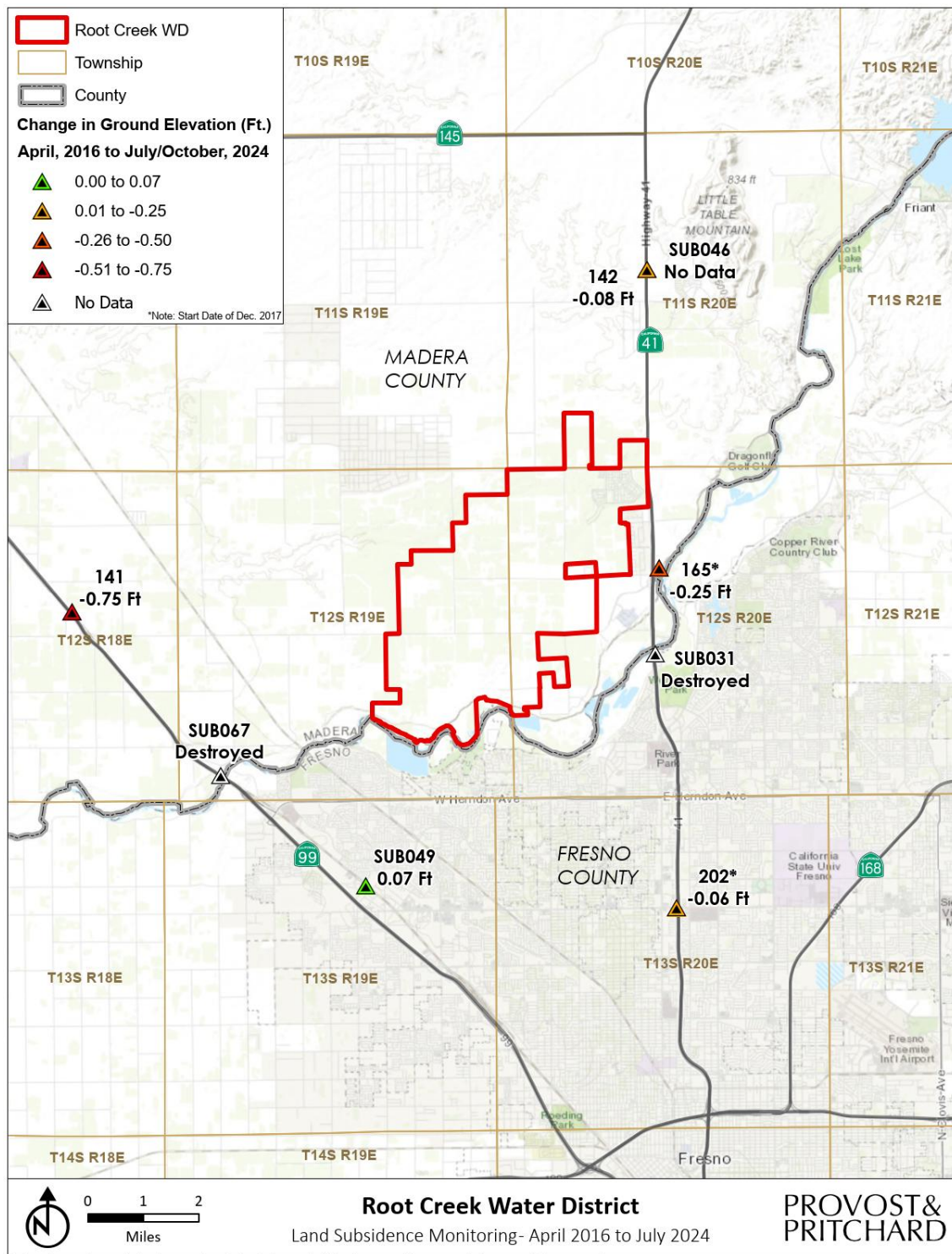


Figure 20 Land Subsidence 2016-2024

Interconnected Surface Water and Groundwater

In RCWD, the primary area of potential interconnected surface water exists along the San Joaquin River. Available information to evaluate the presence of interconnected systems in RCWDGSA is minimal but will continue to be gathered by the USGS and the San Joaquin River Restoration (SJRRP). The Madera Subbasin GSAs, along with neighboring Kings Subbasin GSAs along the San Joaquin River, have established the framework of an Interconnected Surface Water Working Group outlined in a Memorandum of Understanding (MOU) included in the GSP. The MOU will establish a collaborative scope of work for further investigation of possible ISW along the San Joaquin River from Reach 1a to Mendota Pool. This investigation will help the GSAs better understand the timing and magnitude of potential surface water depletions from the San Joaquin River from groundwater pumping. This MOU and associated Working Group also includes involvement from the USBR and Friant Water Authority (FWA).

With the construction of Friant Dam in 1940's, the USBR offered the landowners adjacent to the river Holding Contracts recognizing both the landowners right to divert surface water supplies as well as the possible impact to these rights from the construction of the dam, which could result in a curtailment of supplies to these landowners due to the storage and collection of surface waters behind the proposed dam. To this end the Holding Contracts require the USBR to release to the river surface water supplies to meet the demands of the landowners by maintaining a flow of at least 5 cfs past the point known as Gravelly Ford approximately 26 miles downstream of the dam. Additionally, these same contracts allow for the surface supplies delivered by the USBR to be diverted directly from the river adjacent to the property or to be pumped from wells located on the property. The Holding Contracts recognized the supply developed from wells to be considered delivery of surface water from the USBR. Hence these contracts represent conditions that the federal government will need to meet with the local landowners.

Projects and Management Actions

In order to eliminate systematic overdraft within the RCWDGSA, the District has continued to operate and implement the projects and management actions in the GSP that balance average annual groundwater withdrawals with average annual groundwater recharge. The most impactful effort has been the use of surface water in place of groundwater when available. RCWD is contributing to the Subbasin overall balance and sustainability by importing surface water when available. In addition to successful implementation of management actions, the Madera Subbasin and RCWDGSA have made progress towards various projects since the last Annual Report which are further discussed below.

The 2025 GSP outlines projects and management actions including the expansion of the In-Lieu Pipeline, intentional recharge projects, agricultural land conservation, tiered pricing to incentivize surface water use, a domestic well mitigation program, and a monitoring well program for interconnected surface water. The "Intentional Recharge Projects" included a "Stormwater Basin Modification Project" and a proposed 80-acre recharge project outside of the District. The RCWDGSA has provided updates on Projects and Management Actions through the preceding Annual Reports submitted to the Department. These projects include those described in **Table 25**.

Table 25 Project and Management Actions from Previous Annual Reports

| Project or Management Action Name | Project or Management Action Description | Project Status |
|--|---|--|
| In-Lieu Pipeline | Increase ability for conjunctive use in wet years | Operational – Completed 2014 |
| Agricultural System Expansion/In-Lieu Recharge Project | 2-mile pipeline to increase in-lieu recharge and direct groundwater recharge | Operational - Completed 2023 |
| Storm Basin Modification Project | Reshaped and dredged basins to increase percolation | Operational – Completed 2022 |
| Tiered Pricing | Incentivize use of surface water through pricing model | Implemented |
| Domestic Well Mitigation Program | A subbasin wide program to fund replacement of domestic wells impacted by lowering groundwater levels | Implemented |
| Monitoring Well Program – Interconnected Surface Water | Construction of nested monitoring wells to monitor the interconnectivity of surface water and groundwater | In Development with GSAs in multiple Subbasins |

The 2025 RCWDGSA GSP revised the Project and Management Actions chapter from the 2023 GSP, for clarity, not because existing PMAs are insufficient or need revision. Completed projects have been removed from the 2025 Revised RCWDGSA GSP but are still included in summary tables. The ongoing implementation will continue to be reported, and project benefits will be communicated through Annual Reports and Periodic Evaluations. The 2025 Revised RCWDGSA GSP also includes a list of additional PMAs that could be implemented as part of an adaptive management strategy, should there be Undesirable Results or exceedances within the RCWDGSA.

Completed Projects

Domestic Well Mitigation Program (2025)

The RCWDGSA adopted a GSA specific Domestic Well Mitigation Program (Program) that is consistent with the overall program developed for the Madera Subbasin by other GSAs. The purpose of the Program is to mitigate impacts experienced by domestic and State Small Water System water users whose wells have gone dry due to groundwater levels dropping as a result of Groundwater Sustainability Plan (GSP) Implementation in the Subbasin. This program provides Short Term Emergency Water Supply Mitigation and Domestic Well Mitigation Measures, to be implemented sequentially based on eligibility.

Agriculture System Expansion/In-Lieu Recharge Project (2023)

The project includes incorporation of a 2-mile pipeline to increase in-lieu recharge of approximately 1,800 AF/yr and an additional diversion of 275 AF/yr for groundwater recharge. The project connects to the in-lieu pipeline, built in 2014 to increase the ability of the RCWD to implement conjunctive use in wet years. **Table 26** includes the associated costs with the projects and management actions taken by the District. **Figure 21** shows the existing conveyance pipelines and distribution facilities within the District.

Table 26. Associated Costs

| Year | Capital Cost (\$) | Water Purchase (\$) | Note |
|---------------|------------------------|------------------------|--|
| 2002-2013 | 650,000 | | MID Contract |
| 2006-2017 | 1,122,822 | 2,182,571 | Westside Mutual Contract |
| 2014 | 5,376,008 | | In-Lieu Pipeline |
| 2015 | | | |
| 2016 | | | |
| 2017 | | 923,060 | Water Purchases |
| 2018 | | 793,360 | Water Purchases |
| 2019 | | 2,544,750 | Water Purchases |
| 2020 | | 100,000 | Water Purchases |
| 2021 | | 1,380,247 | Water Purchases |
| 2022 | | 1,865,442 | Water Purchases |
| 2023 | 2,719,548.53 | 943,459 | Agriculture System Expansion and Water Purchases |
| 2024 | | 360,722 | Water Purchases |
| 2025 | | 100,000 | Contract Fees |
| TOTALS | \$ 9,868,378.53 | \$10,029,433.00 | |

Storm Basin Modification Project (2022)

Three existing storm drain basins were reshaped and dredged in 2022 to increase their percolation potential. The three basins are sourced by surface runoff from the Riverstone urban development and are not currently measured.

Tiered Pricing (2020)

The RCWD Board of Directors adopted a tiered pricing structure in December of 2020 which established groundwater rates at \$95 per acre-foot. Comparatively, surface water rates for imported water were \$138 per acre-foot. These rates were raised to \$114.68 for groundwater pumping and \$162.23 for surface water. Rates will continue to increase with a pricing structure which is intended to incentivize growers to use surface water when it is available.

Future Projects

Monitoring Well Program – Interconnected Surface Water

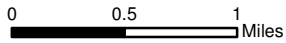
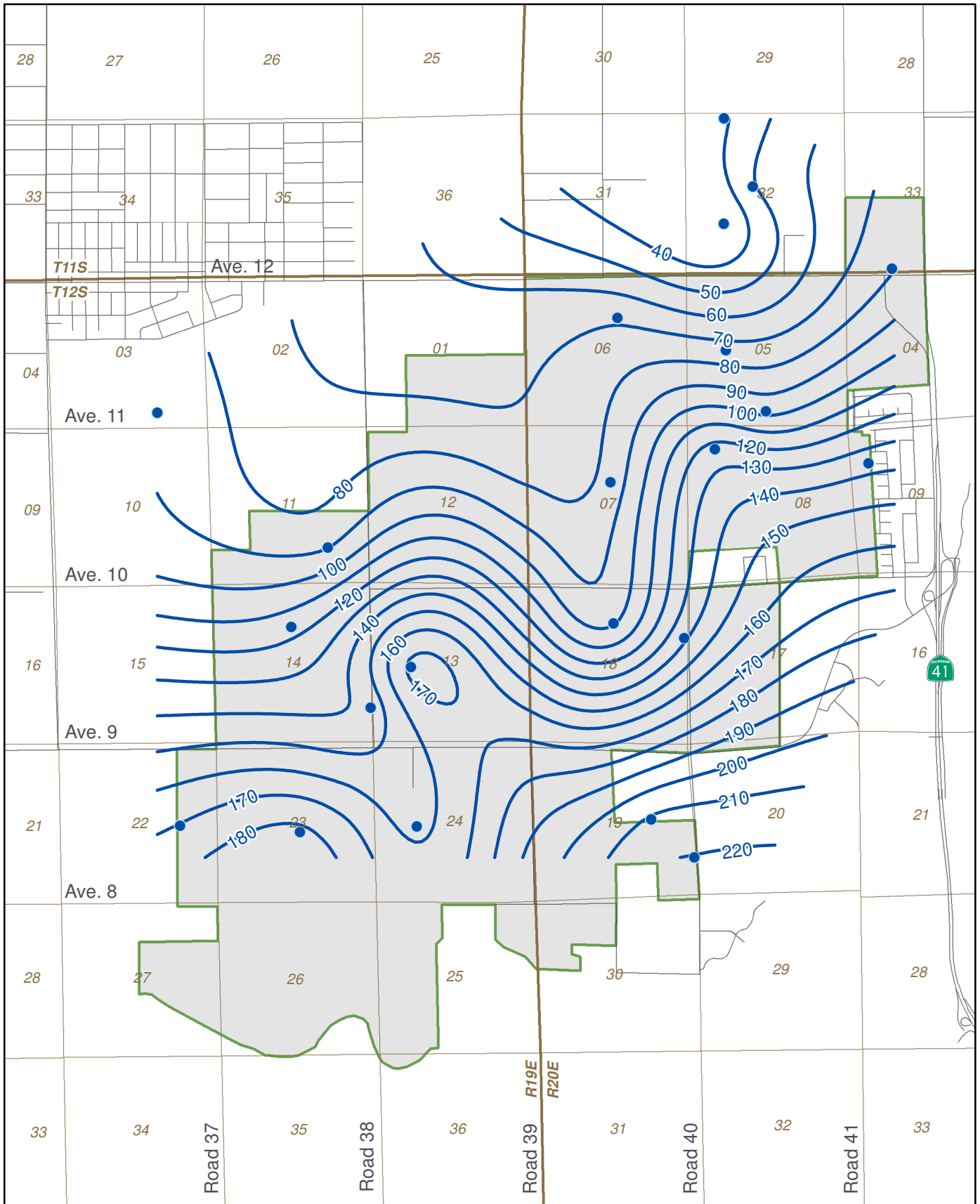
The Kings and Madera subbasins have developed a Memorandum of Understanding (MOU) with USBR and FWA that includes a cooperative scope of work for further investigation of possible ISW from along the SJR from Reach 1a to Mendota Pool. RCWDGSA will support the need for additional monitoring along the San Joaquin River, if USBR and FWA’s work leads to that determination. The current GSP groundwater monitoring network was developed using existing wells in the Subbasin. It is expected that this network will be supplemented (and/or some initial wells replaced) by new nested monitoring wells.

DWR Determination

DWR made the determination that the Madera Subbasin GSPs were incomplete in September 2022, prompting the 180-day response period. The 180-day response period allows basins to respond to DWR’s comments and make updates to their GSPs. DWR’s determination letter for the Madera Subbasin encouraged increased coordination on methodology and messaging amongst the GSAs. As a result, the

consulting groups of the Subbasin developed an ad-hoc group to identify actionable improvements to the methodology and reporting coordination. The Subbasin GSAs resubmitted their coordinated GSPs in March 2023. DWR evaluated the resubmitted GSPs and determined that the GSPs took sufficient action to correct DWR's September 2022 comments. In December 2023, DWR approved the submitted GSPs and identified additional corrective actions to be incorporated into the first periodic update that occurs at least every five years. The RCWDGSA amended their GSP in coordination with all Madera Subbasin GSAs to respond to DWR's corrective actions. On December 9, 2024, the RCWDGSA adopted the amended GSP.

Appendix A - Groundwater Elevation Contours Spring 2015 – Spring 2025



EST. 1968
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286 W. Cromwell Ave.
 Fresno, CA 93711-6162
 (559) 449-2700

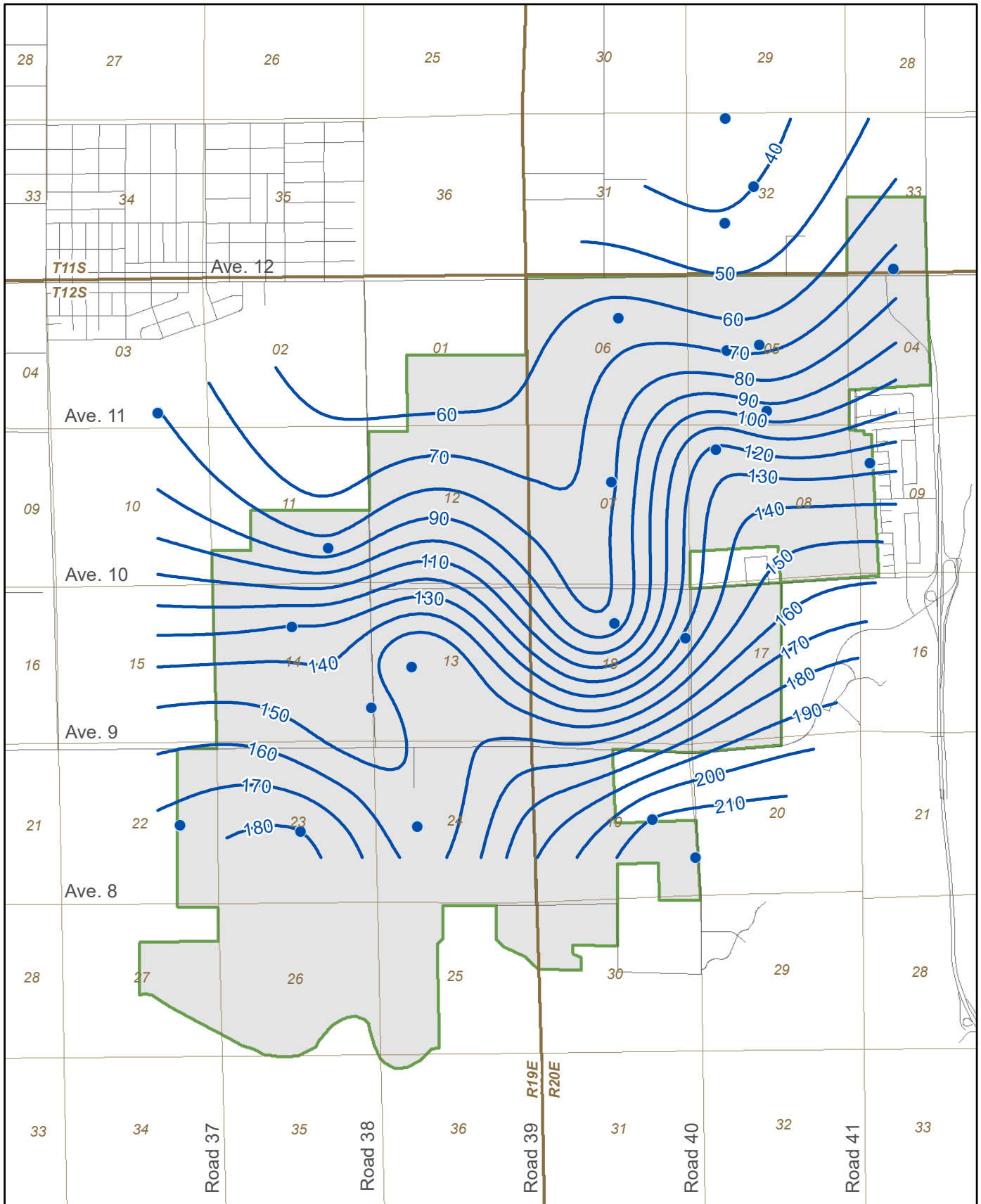
Legend



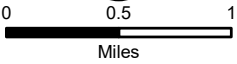
- Well Used In Analysis
- Elevation of Water in Wells (feet above sea level)**
- Line of Equal Elevation (10 ft interval)
- ▭ Root Creek WD

ROOT CREEK WATER DISTRICT

Elevation of Water in Wells

Spring 2015

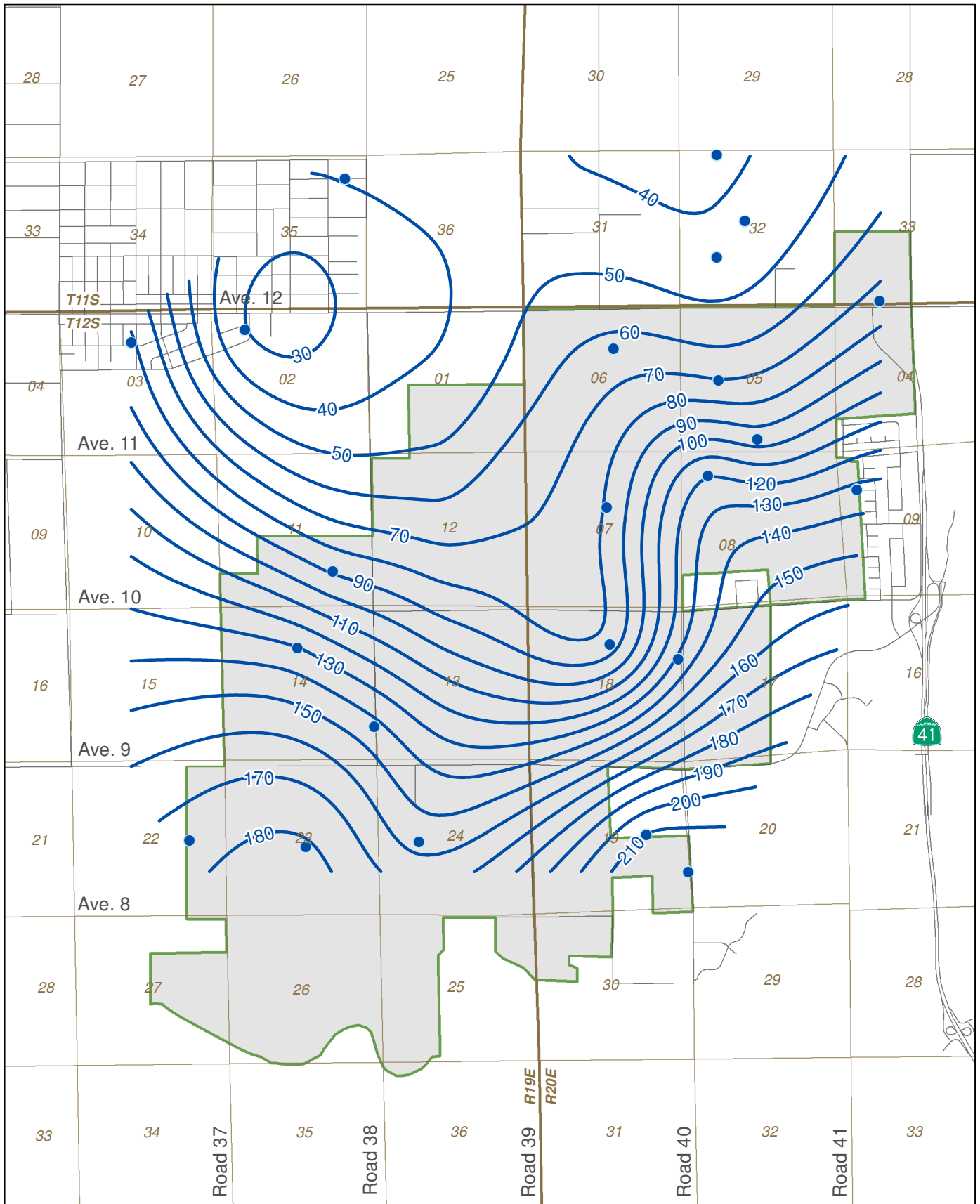


Legend

- Well Used In Analysis
- Elevation of Water in Wells (feet above sea level)**
- Line of Equal Elevation (10 ft interval)
- Root Creek WD

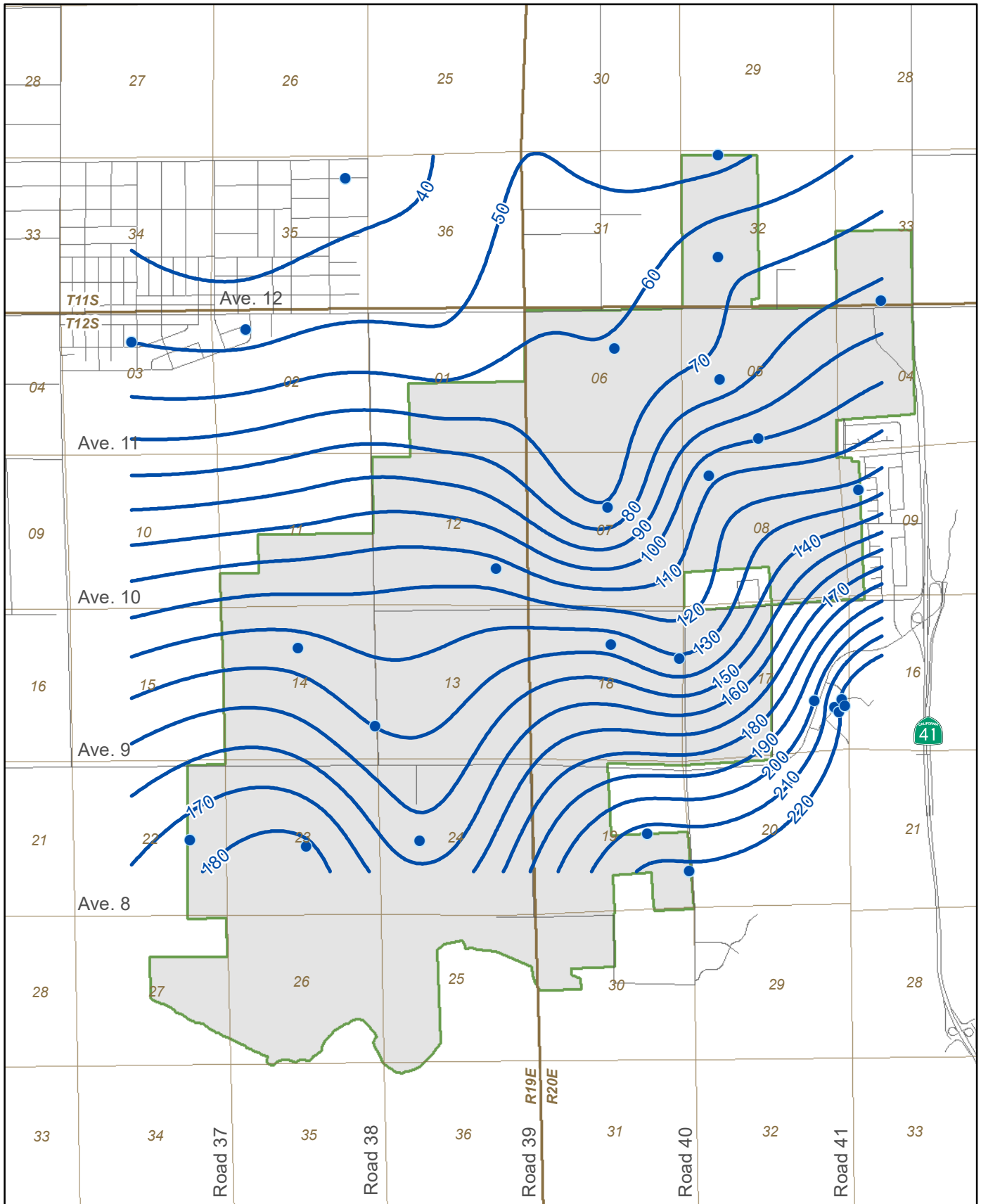
ROOT CREEK WATER DISTRICT
 Elevation of Water in Wells
 Spring 2016


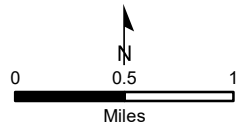


Legend




- Well Used In Analysis
- Elevation of Water in Wells (feet above sea level)**
- Line of Equal Elevation (10 ft interval)
- Root Creek WD

ROOT CREEK WATER DISTRICT
 Elevation of Water in Wells
 Spring 2017

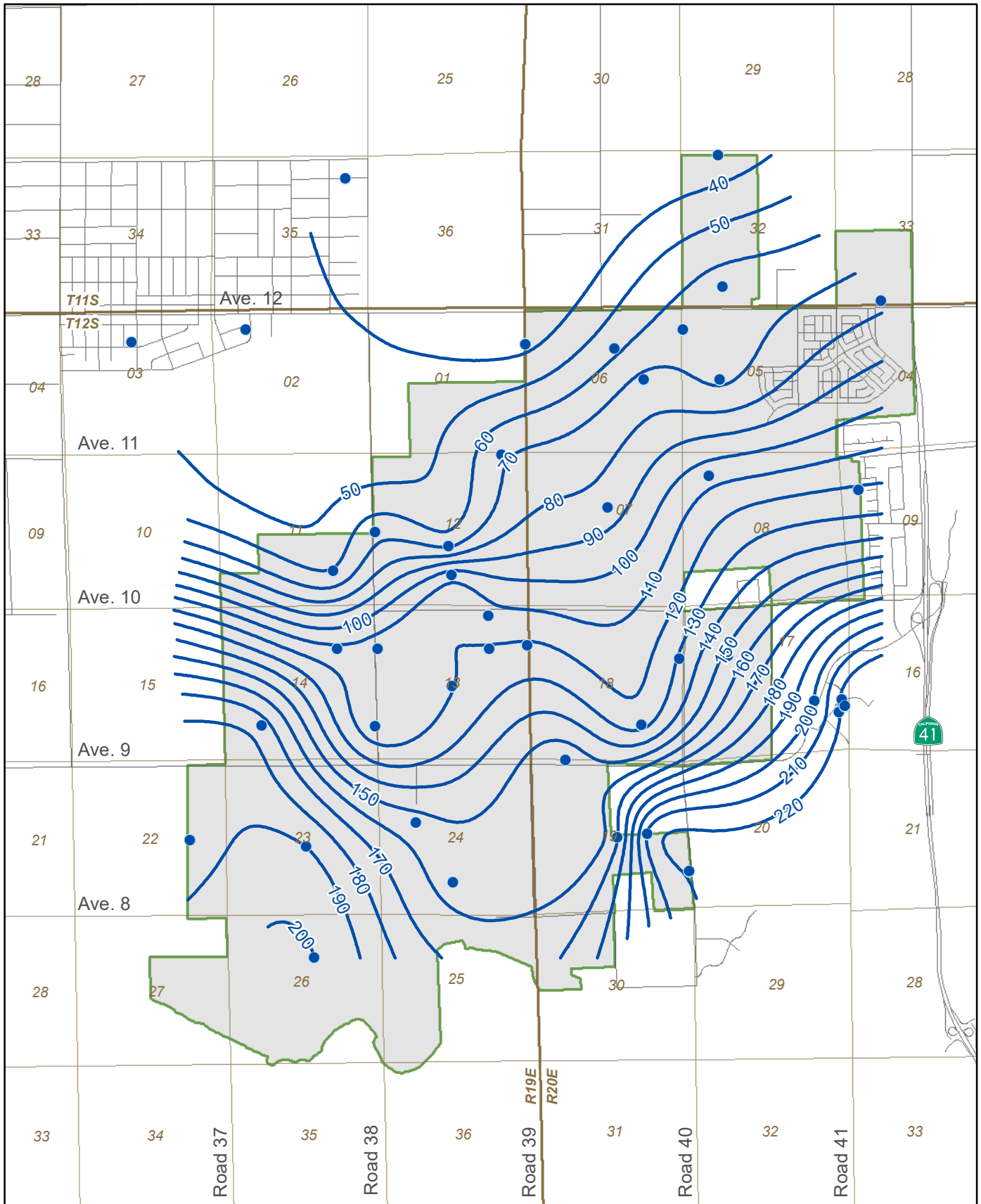


Legend

-  Root Creek WD
-  Well Used In Analysis
- Elevation of Water in Wells (feet above sea level)**
-  Line of Equal Elevation (10 ft interval)

ROOT CREEK WATER DISTRICT
 Elevation of Water in Wells
 Spring 2018



PROVOST & PRITCHARD
 CONSULTING GROUP
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EST. 1968

0 0.5 1
 Miles

Legend

- Root Creek WD
- Well Used In Analysis

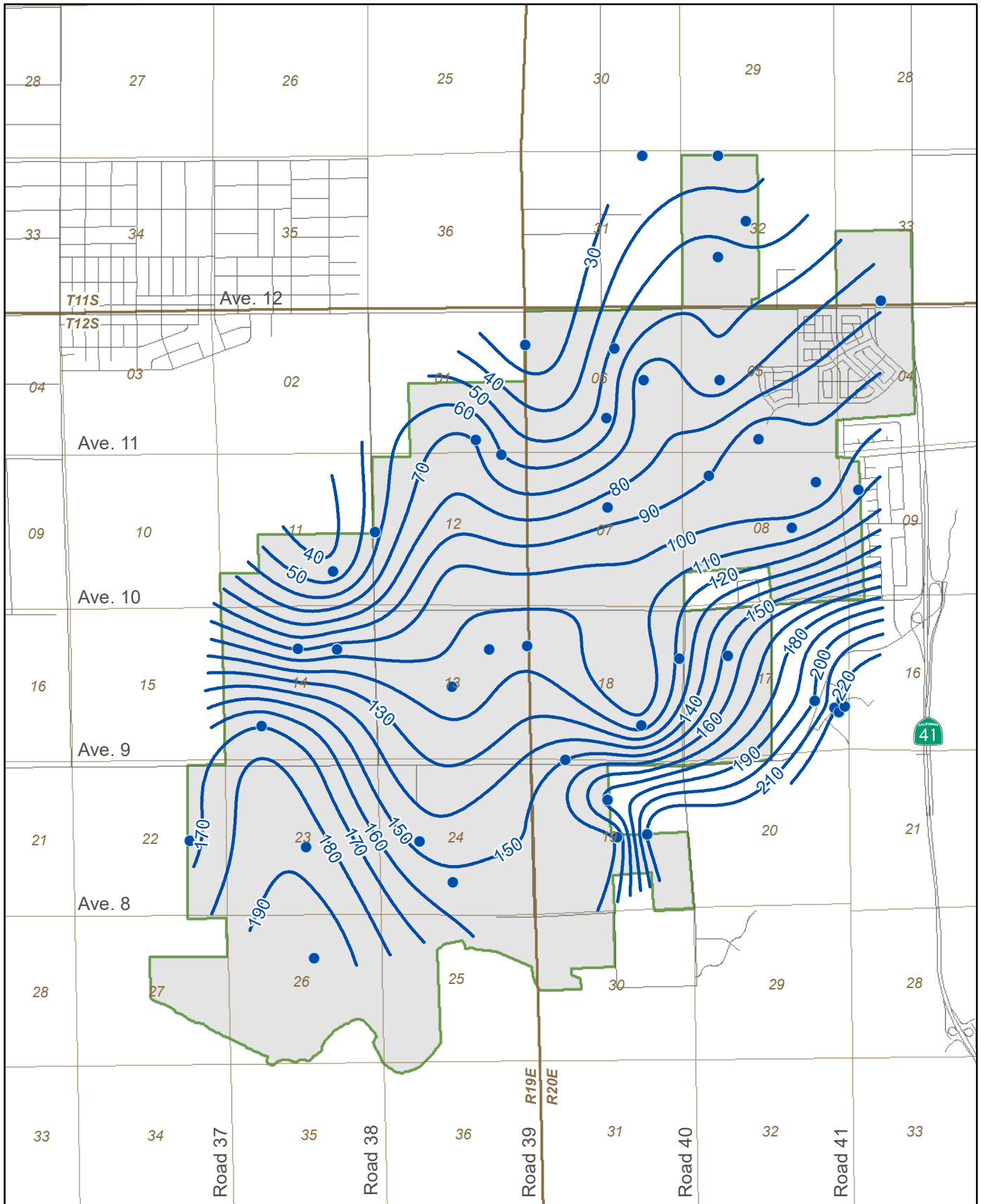
Elevation of Water in Wells (feet above sea level)


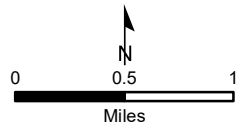
- Line of Equal Elevation (10 ft interval)

ROOT CREEK WATER DISTRICT




Elevation of Water in Wells

Spring 2019

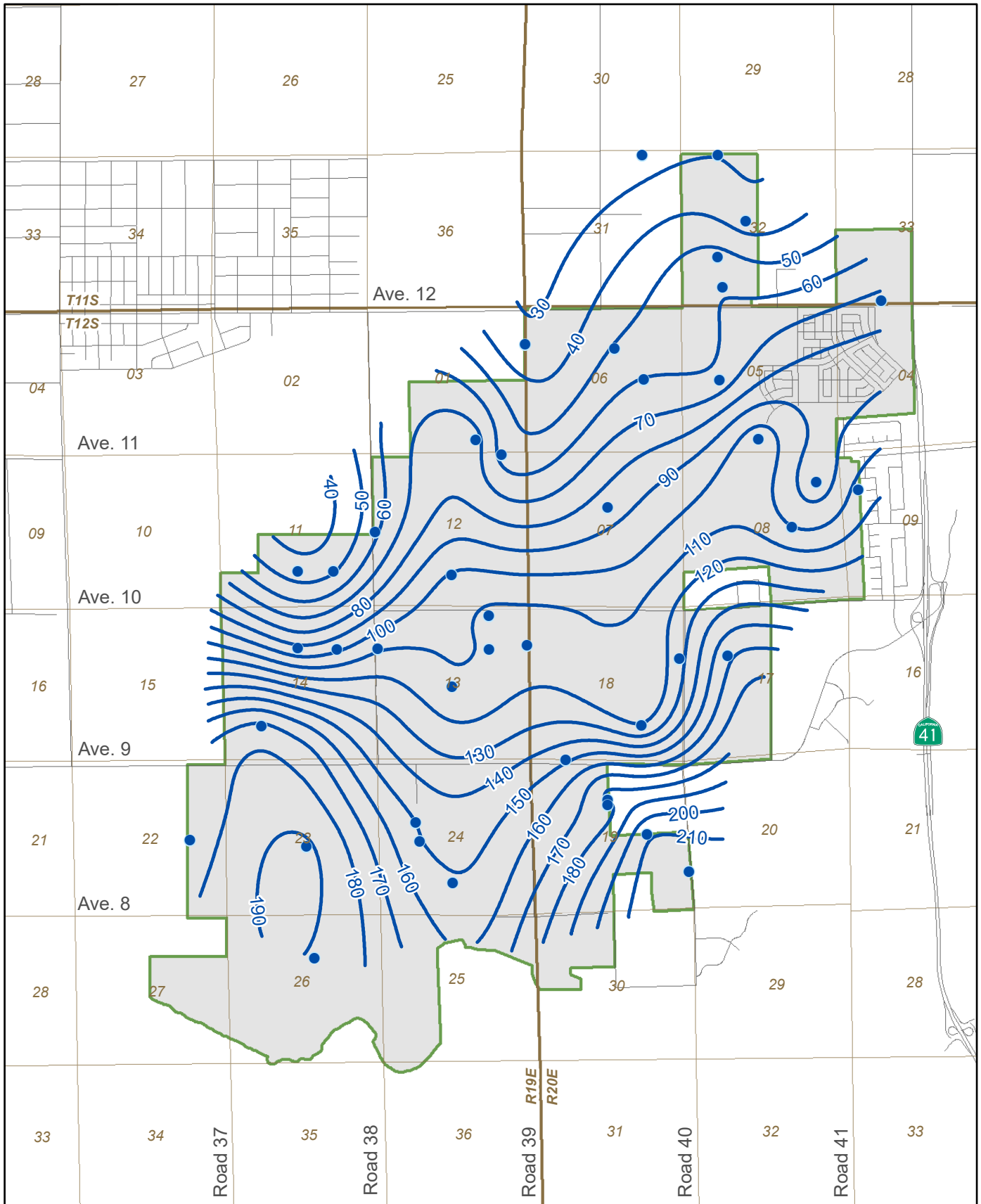


Legend

-  Root Creek WD
-  Well Used In Analysis
- Elevation of Water in Wells (feet above sea level)**
-  Line of Equal Elevation (10 ft interval)

ROOT CREEK WATER DISTRICT
 Elevation of Water in Wells
 Spring 2020



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EST. 1908

0 0.5 1
 Miles

Legend

- Root Creek WD
- Well Used In Analysis

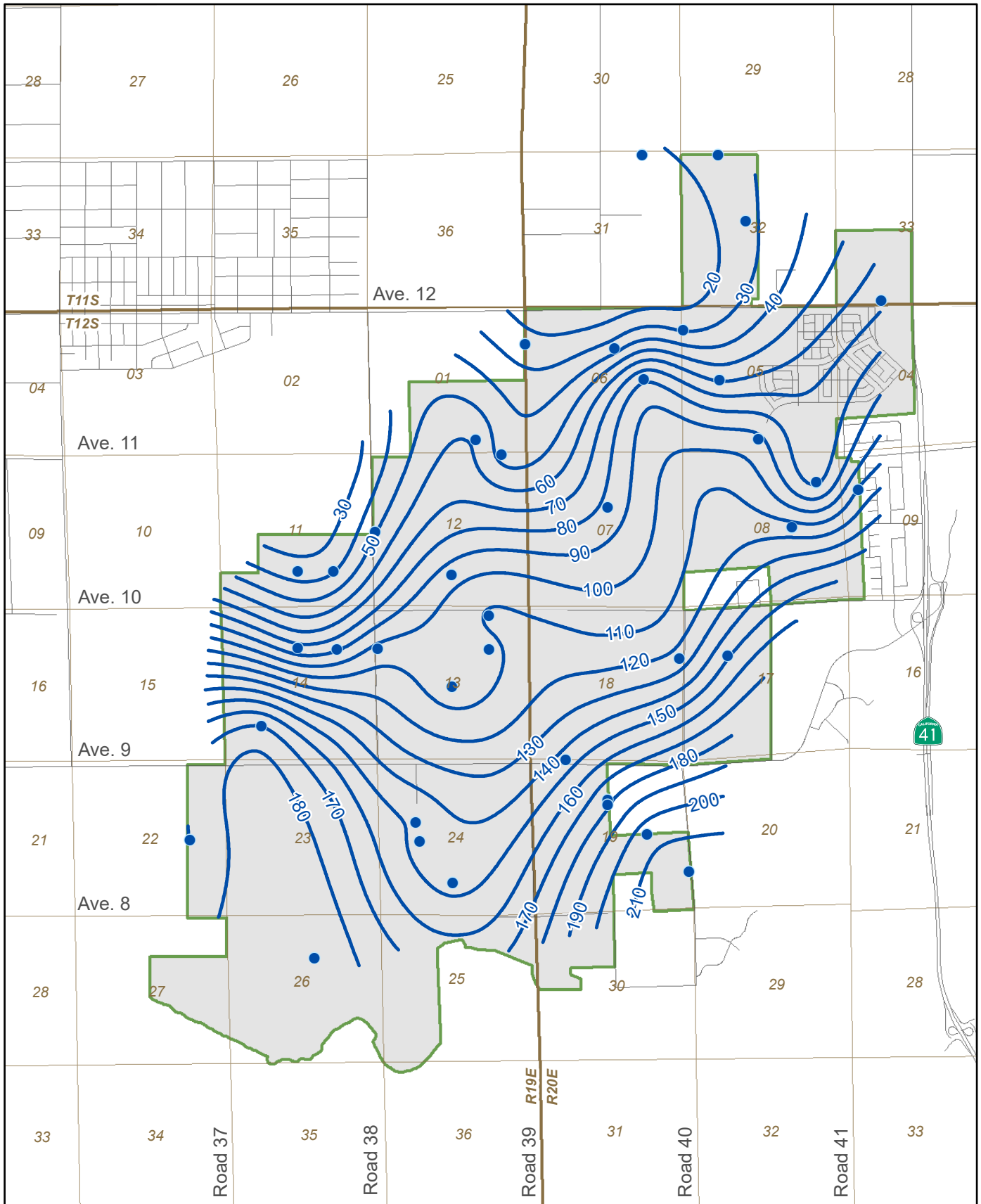
Elevation of Water in Wells (feet above sea level)

- Line of Equal Elevation (10 ft interval)

ROOT CREEK WATER DISTRICT

Elevation of Water in Wells

Spring 2021



PROVOST & PRITCHARD
 EST. 1908
 CONSULTING GROUP
 An Employee Owned Company

0 0.5 1
 Miles

Legend

- Root Creek WD
- Well Used In Analysis




Elevation of Water in Wells (feet above sea level)

- Line of Equal Elevation (10 ft interval)


ROOT CREEK WATER DISTRICT

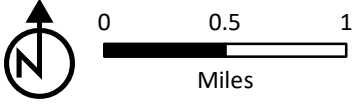
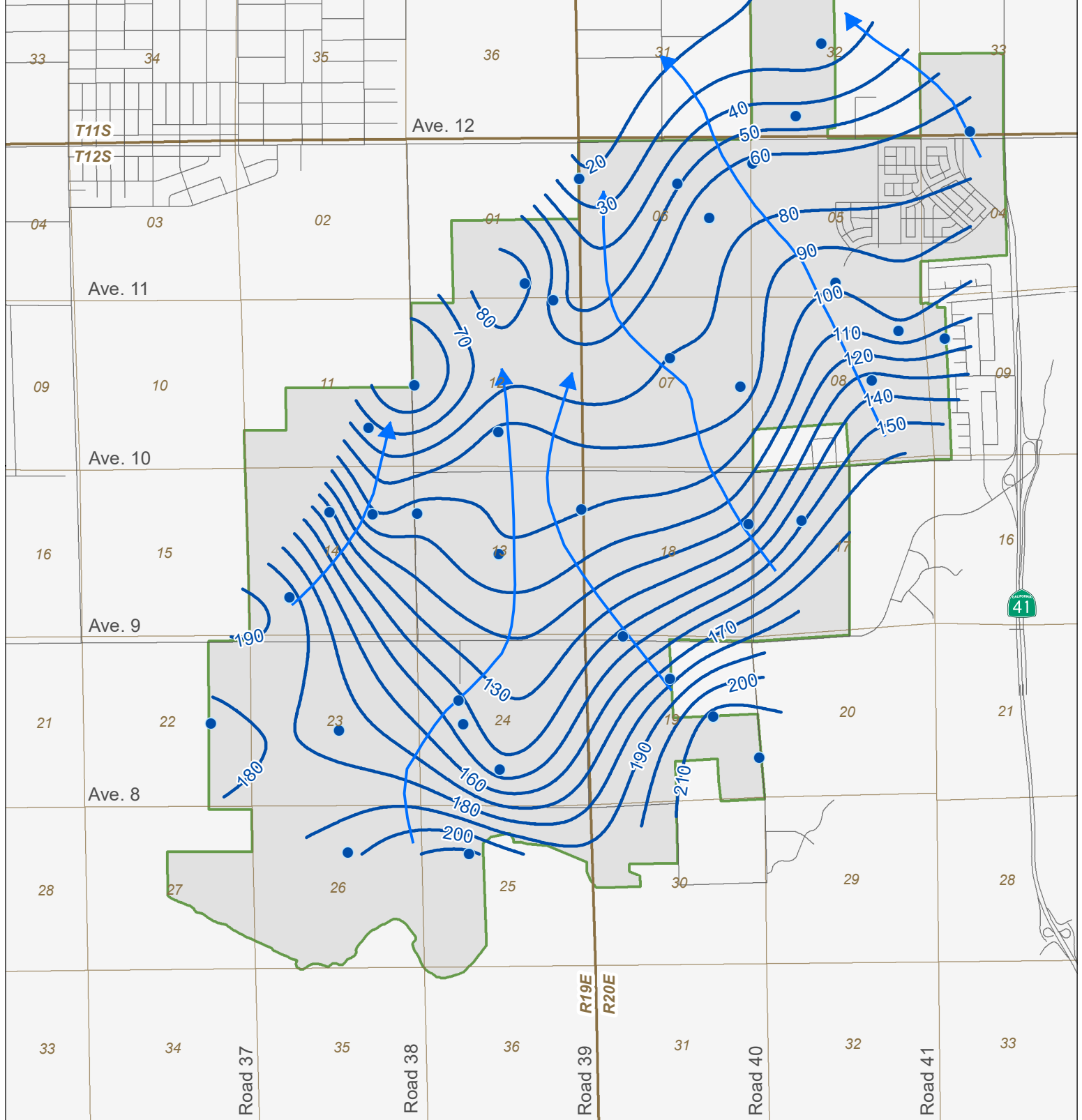
Elevation of Water in Wells

Spring 2022

-  Root Creek WD
-  Well Used In Analysis
-  Flow Arrow

Elevation of Water in Wells (feet above sea level)

-  Line of Equal Elevation (10 ft interval)



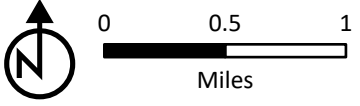
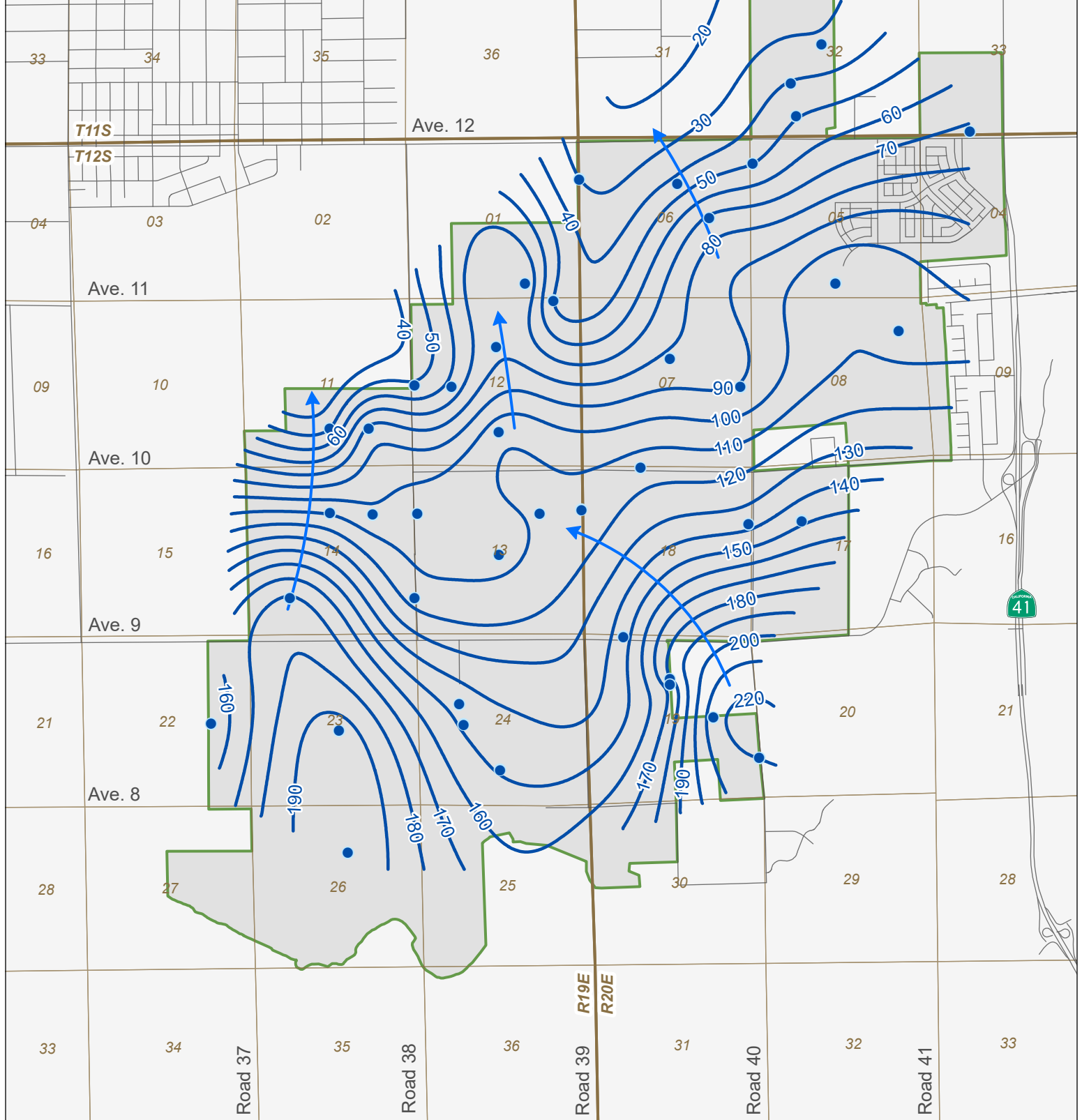
Root Creek Water District
 Spring 2023 - Elevation of Water in Wells

**PROVOST &
 PRITCHARD**

- Root Creek WD
- Well Used In Analysis
- Flow Arrow

Elevation of Water in Wells (feet above sea level)

- Line of Equal Elevation (10 ft interval)



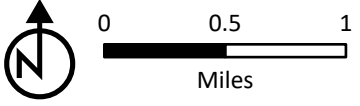
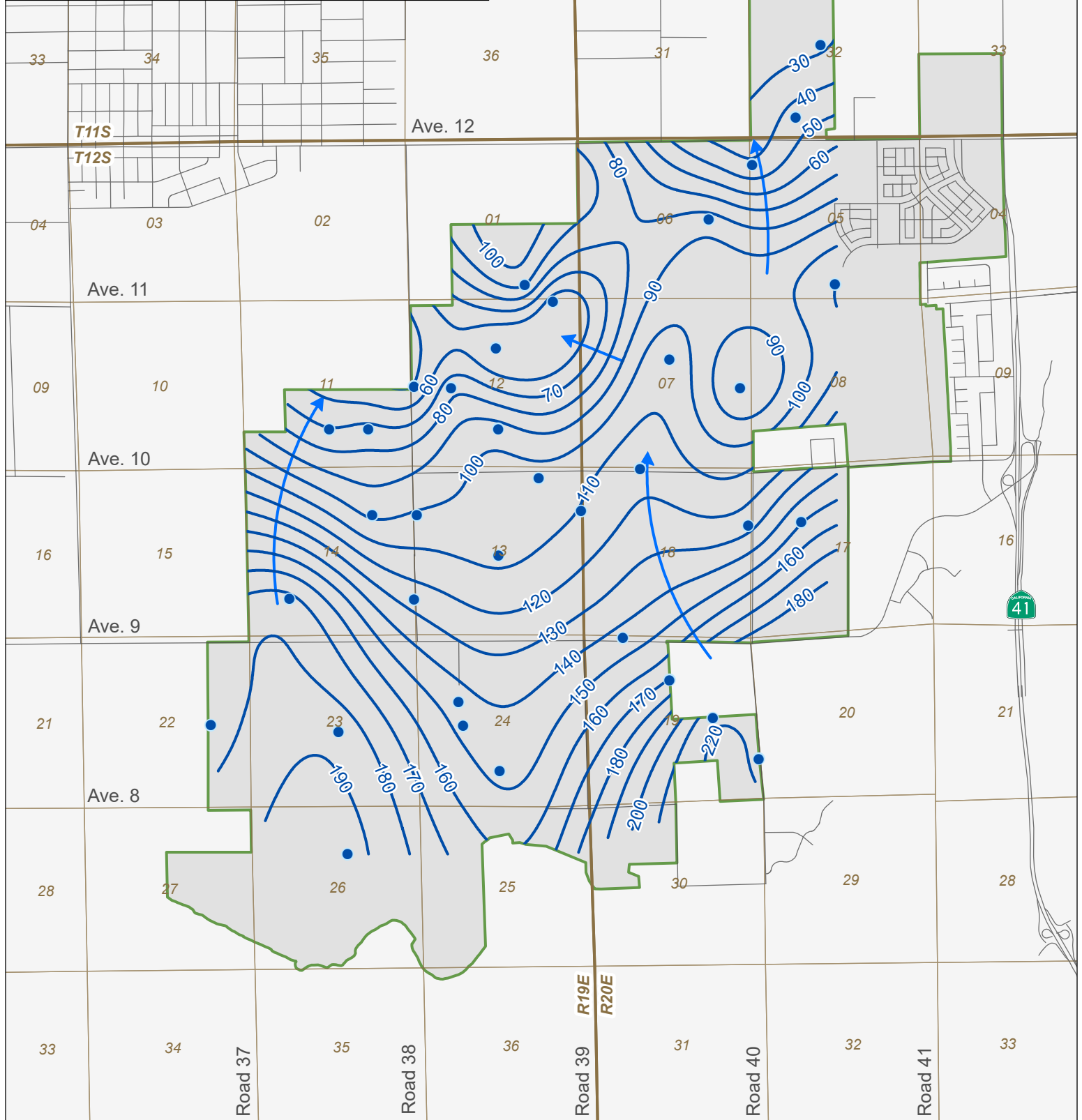
Root Creek Water District
Spring 2024 - Elevation of Water in Wells

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- Root Creek WD
- Well Used In Analysis
- Flow Arrow

Elevation of Water in Wells (feet above sea level)

- Line of Equal Elevation (10 ft interval)



Root Creek Water District
Spring 2025- Elevation of Water in Wells

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