Groundwater Report

Fall 2023

San Joaquin County

Flood Control and Water Conservation District

San Joaquin County

Flood Control and Water Conservation District

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This report was published in March 2024.

Copies of the 2023 Fall Groundwater Report may be available upon request from:

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Acknowledgements

This Groundwater Report is a product of the commitment that the San Joaquin County Flood Control and Water Conservation District together with many other interested agencies made to sustain and enhance the groundwater resources of the Eastern San Joaquin Groundwater Subbasin and the Tracy Subbasin. The District extends thanks to:

California Water Service

City of Lathrop

City of Lodi

City of Manteca

City of Stockton Municipal Utilities Department

East Bay Municipal Utility District

Morada Area Association Pacific Gas and Electric Company

San Joaquin County Department of Public Works

State of California, Department of Water Resources

Central District Stockton East Water District

United States Bureau of Reclamation

United States Geological Survey

Most of all, we would like to thank all the individual well owners, who give us access to their wells and in some cases, their time.

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1 Introduction

Since the Fall of 1971, the San Joaquin County Flood Control and Water Conservation District (District) has monitored groundwater levels and groundwater quality and has published the data in semi-annual Groundwater Reports. This report utilizes data from federal, state, and local government agencies, as well as non-governmental sources.

This report represents data from the Eastern San Joaquin Subbasin (5-022.01) and Tracy Subbasin (5-022.15). The Eastern San Joaquin Subbasin includes portions of Calaveras County, Stanislaus County, and San Joaquin County east of the San Joaquin River. The Tracy Subbasin is located primarily in San Joaquin County west of the San Joaquin River and includes a small portion of Alameda County.

Water level data is collected on a semi-annual basis, during the months of March and October, to observe groundwater levels before and after peak groundwater pumping conditions. Over 250 wells, most of which are measured by County staff, are included in the Monitoring Program. The exact number of wells varies from year to year, depending on circumstances such as destructions, new well construction, well accessibility, and well condition.

1.1 Purpose

The purpose of the semi-annual Groundwater Reports is to provide information on groundwater conditions in San Joaquin County (County) and to publish the results of the groundwater monitoring program which consists of the following:

1. Measure groundwater levels on a County-wide basis.
2. Monitor groundwater quality along a North-South line from north of the City of Stockton to the City of Lathrop.

In general, water quality data is more meaningful after peak production which usually occurs during the summer months. Therefore, groundwater quality data is only published for the fall months. The groundwater depth and elevation data are published for both the spring and fall.

Saline intrusion from the west is a continuing concern affecting the quality of groundwater in the San Joaquin groundwater subbasins. Groundwater quality analysis is completed on an annual basis and this year, San Joaquin County has decided to use USGS monitoring well clusters constructed specifically to assess saline water intrusion into the Eastern San Joaquin Subbasin. These eight well clusters monitor Total Dissolved Solids (TDS) and Chloride across multiple zones below ground surface.

1.2 Procedure

Water level measurements are performed using either a steel tape or sounder. Data is then immediately recorded in field books and then stored in a database for accessibility and reporting requirements.

Groundwater quality sampling has been historically conducted on an annual basis during the month of October, along with the fall measurements. This year sampling was performed at the eight (8) well clusters after water level data was measured in late October 2023.

2 Rainfall Distribution

The two groundwater basins in the County (Eastern San Joaquin and Tracy) respond in part to changes in annual precipitation. There are four precipitation stations throughout and adjacent to the county which have historically tracked rainfall; however, rainfall records for one of these stations (Lodi Station) has not been updated since 2017.

Figure 2-1 shows the locations of the three active stations currently providing data. The precipitation records from west to east, are presented on Figures 2-2 through 2-7 for the entire water year. As shown, almost all of the precipitation fell during the winter and spring months. These graphs reflect areas located across the County and one area in neighboring Calaveras County. These stations have been collecting rainfall data since the 1950's. In water year 2023, rainfall was about 130 to 150 percent of average.

A Water Year (WY) is the period between October 1st and September 30th. The year in which the period ends denote the water year, e.g., September 30th 2023, is the end of the 2023 WY. The WY type is based on unimpaired river water runoff observed during the WY for the San Joaquin area is defined by the Four Rivers Index. The Four Rivers Index is the sum of unimpaired flow in million acre-feet (maf) at:

- Stanislaus River below Goodwin Reservoir (aka inflow to New Melones Res.)
- Tuolumne River below La Grange (aka inflow to New Don Pedro Reservoir)
- Merced River below Merced Falls (aka inflow to Lake McClure)
- San Joaquin River inflow to Millerton Lake

The water year types are described as follows.

Wet	Equal to or greater than 3.8 maf
Above Normal	Greater than 3.1, and less than 3.8 maf
Below Normal	Greater than 2.5, and equal to or less than 3.1 maf
Dry	Greater than 2.1, and equal to or less than 2.5 maf
Critical	Equal to or less than 2.1 maf

WY 2023 was preliminarily classified by DWR as a wet year with greater than 3.8 maf.

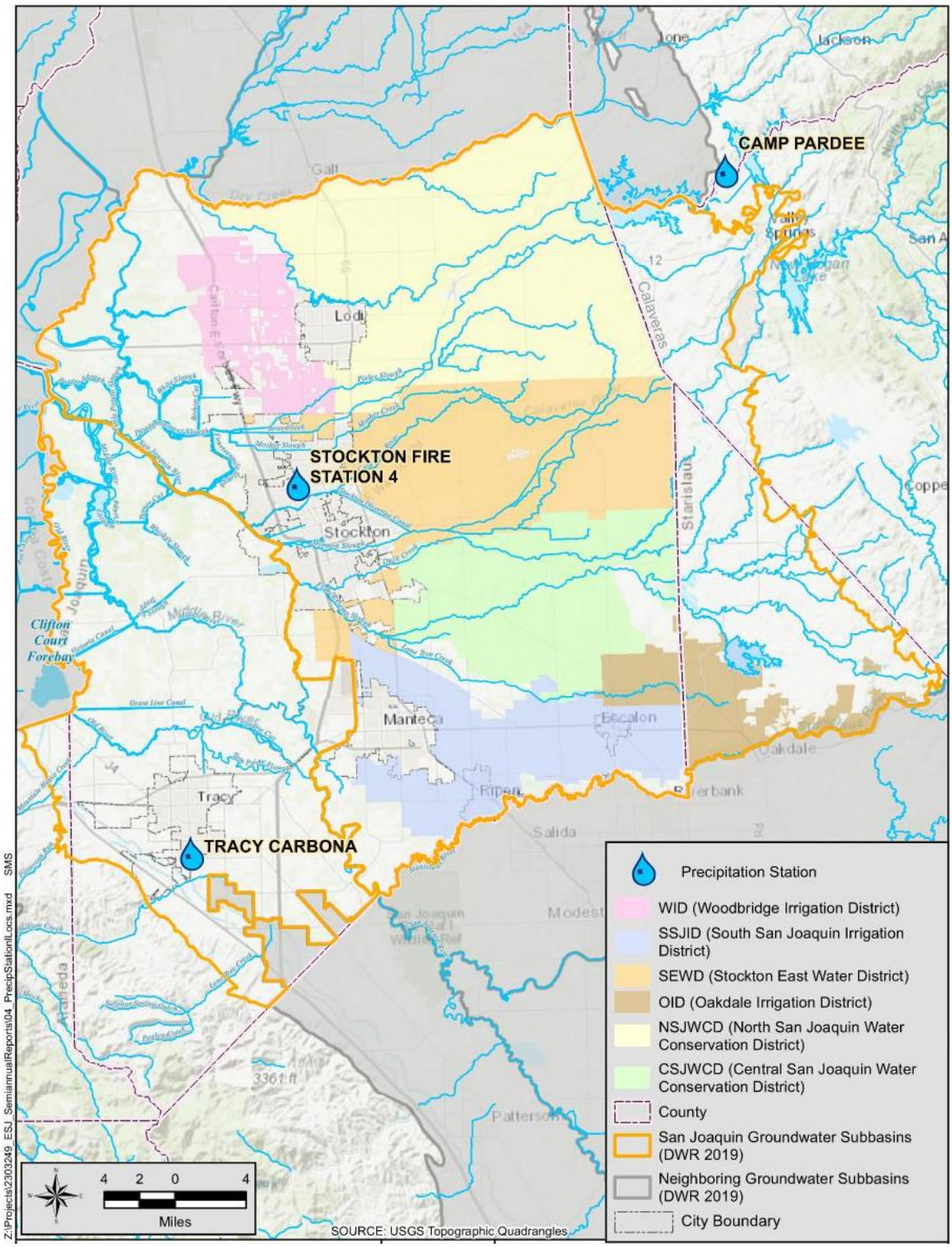


Figure 2-1 Precipitation Station Locations

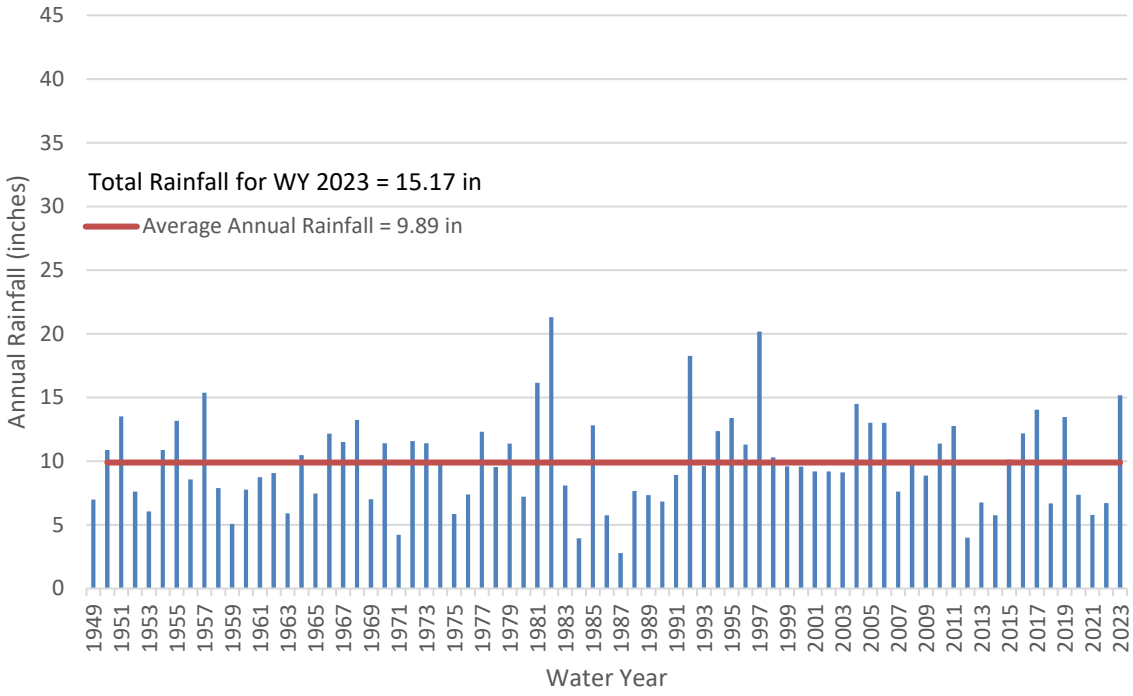


Figure 2-2 Total Annual Rainfall (Tracy Carbona Station)

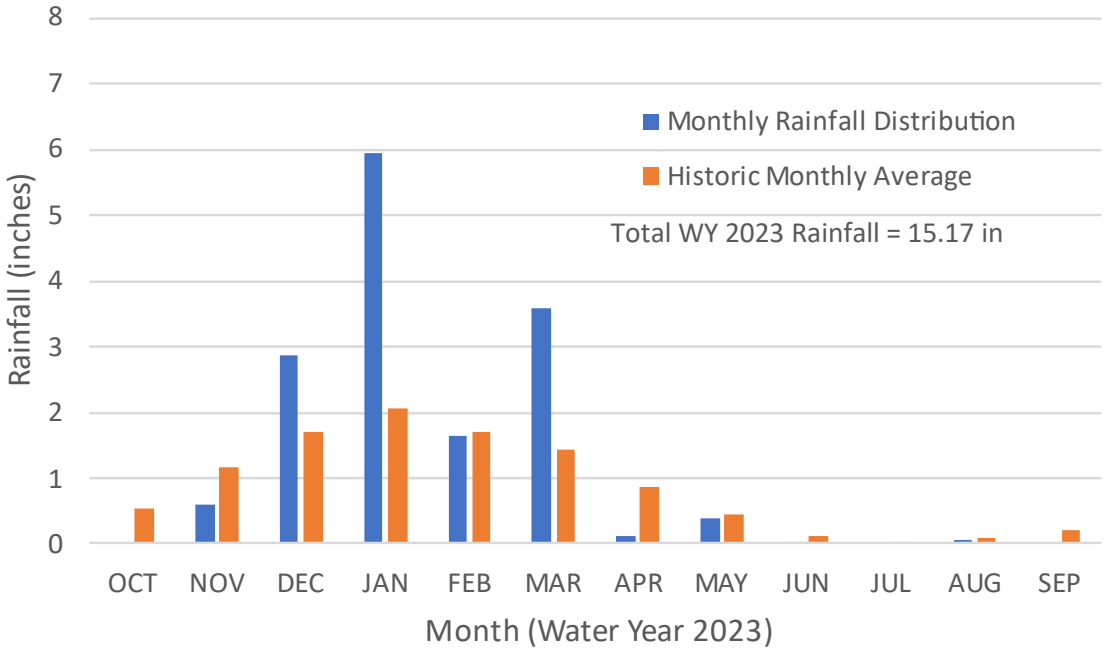


Figure 2-3 Monthly Rainfall Distribution (Tracy Carbona Station)

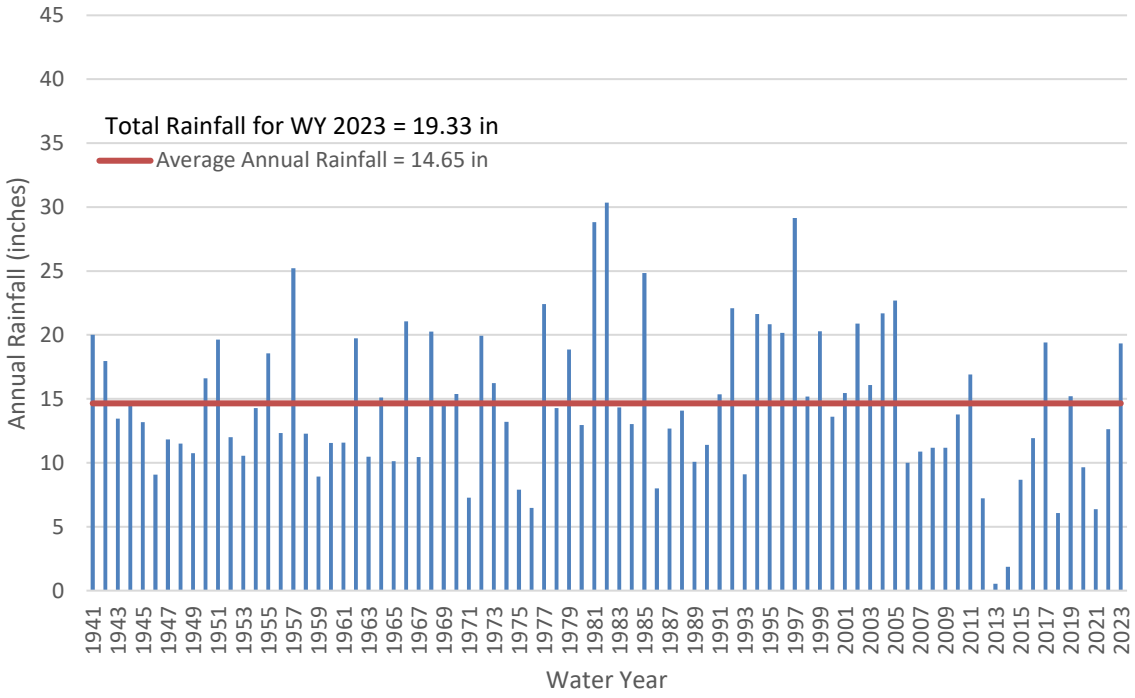


Figure 2-4 Total Annual Rainfall (Stockton Fire Station)

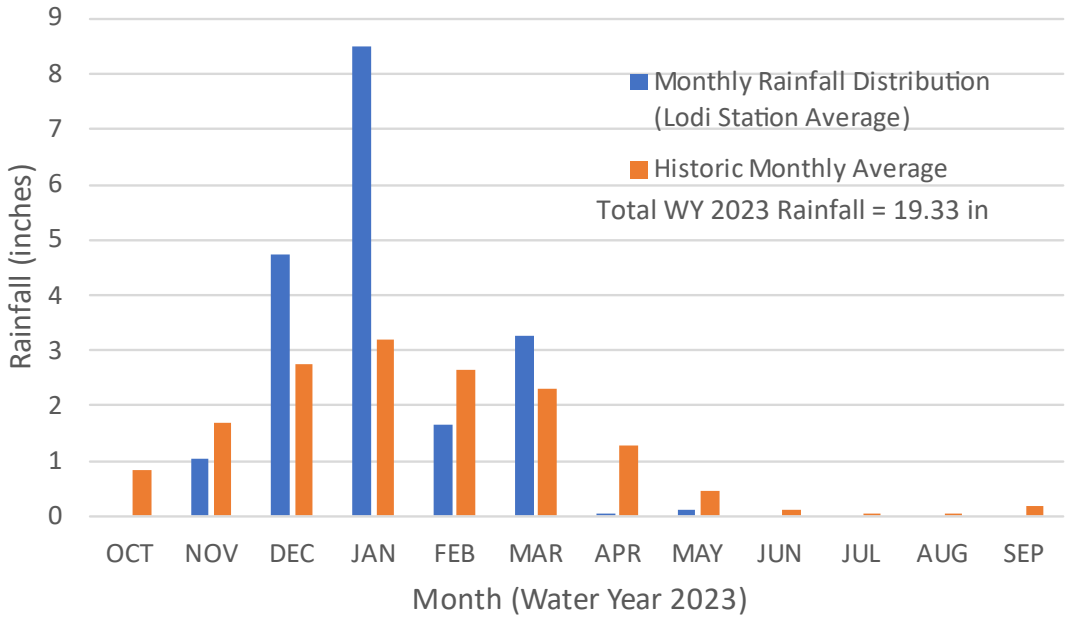


Figure 2-5 Monthly Rainfall Distribution (Stockton Fire Station)

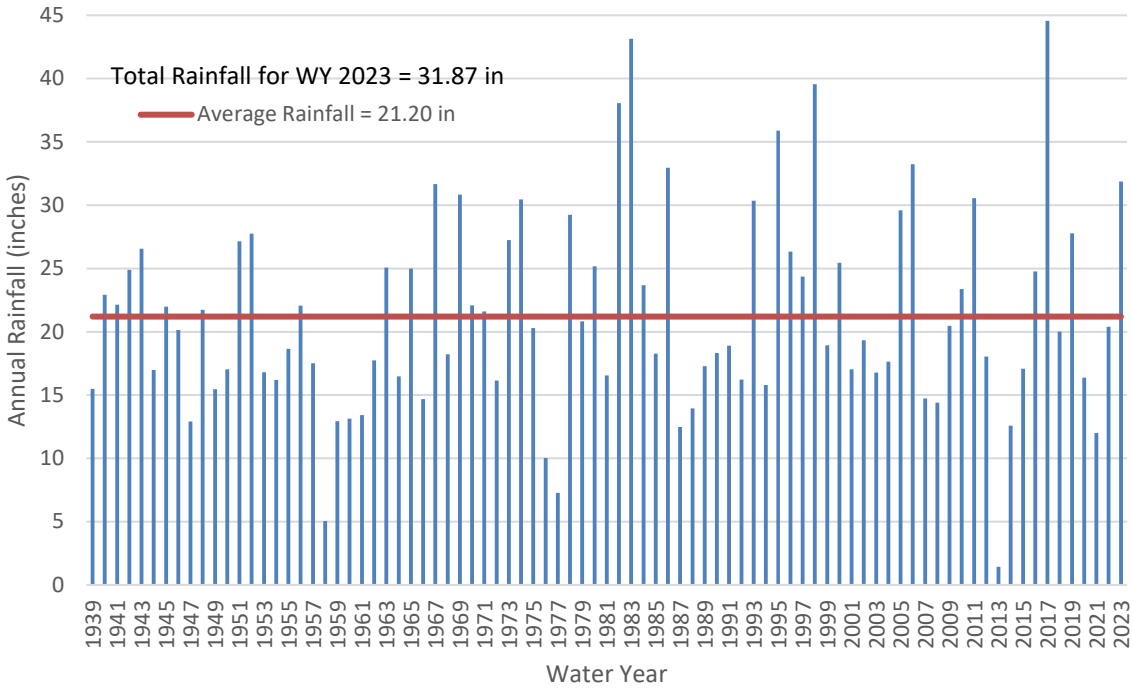


Figure 2-6 Total Annual Rainfall (Camp Pardee Station)

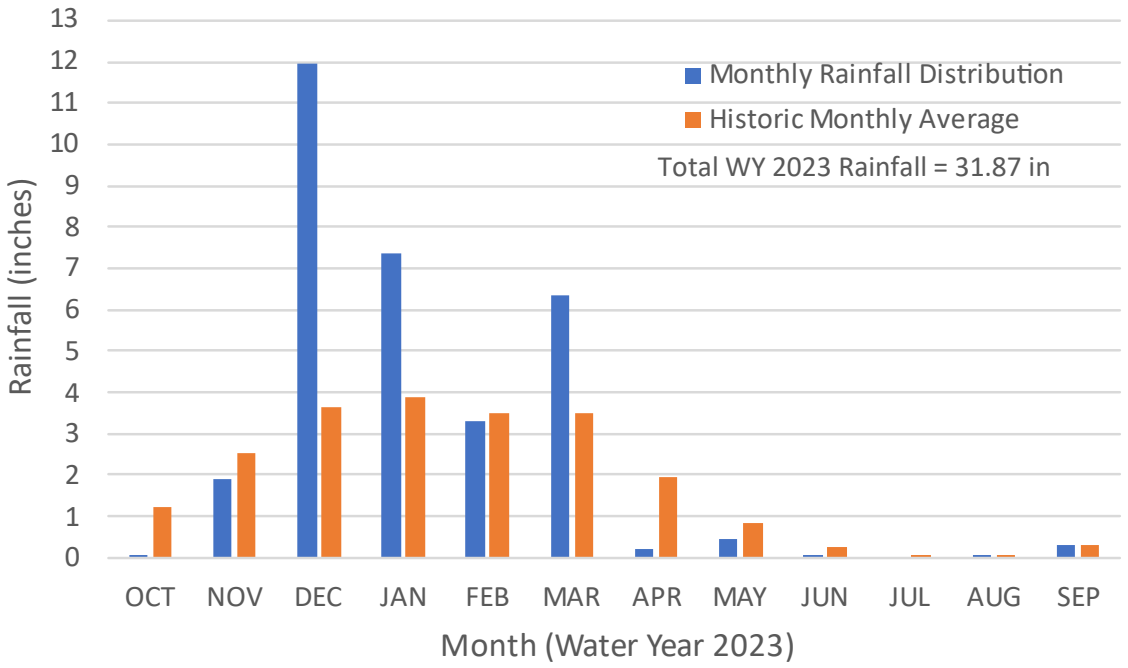


Figure 2-7 Monthly Rainfall Distribution (Camp Pardee Station)

3 Surface Water Levels and Storage

The groundwater levels in the County respond to not only changes in annual precipitation, but also to the amount of surface water in storage and flow in the rivers. Typically, lower amounts of surface water in storage indicates higher amounts of groundwater pumping. Four river gaging stations were selected along the rivers and three reservoir storage stations to represent these conditions.

Figure 3-1 shows the location of these gages and Figures 3-2 through 3-5 provide the recorded reservoir storage and outflows, and river stages for WY 2023. Rain events are shown in the high river flow spikes and reservoir increases, while lower river flow spikes represent the decreases in reservoir levels due to managed outflow. Note: Monthly average river flow data for Mokelumne River at Woodbridge Station is not yet available for WY 2023.

Tables 3-1 and 3-2 detail the station info for each of the flow gages and reservoir storage totals used for Figures 3-1 through 3-5.

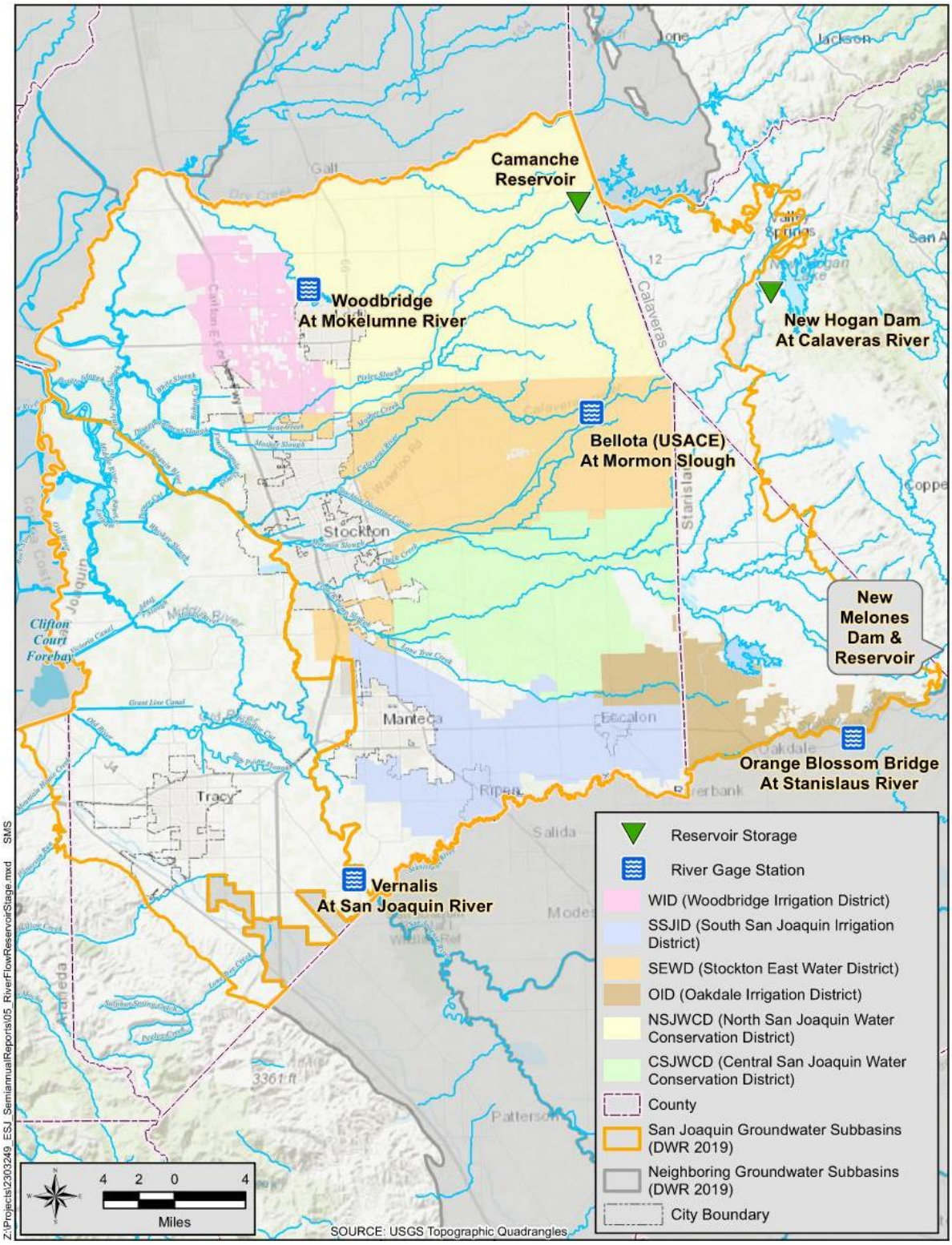


Figure 3-1 Reservoir Storage and River Gage Station Locations

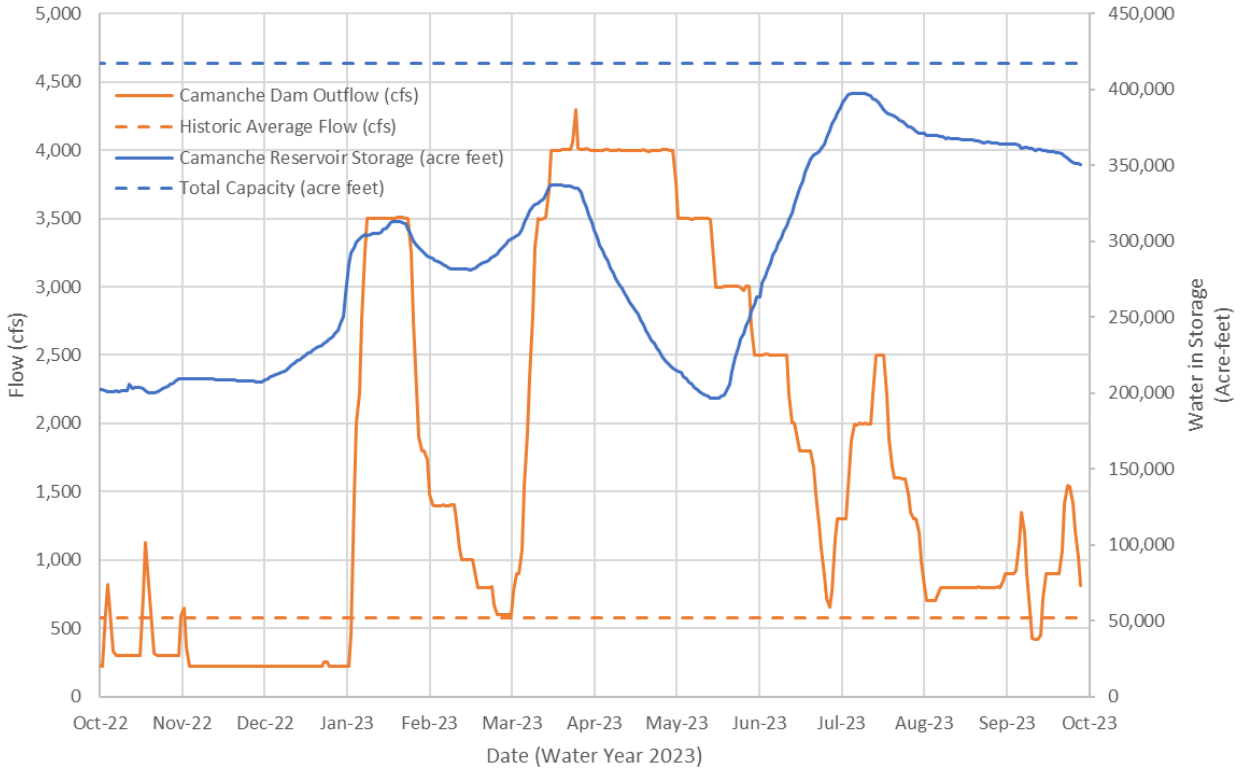


Figure 3-2 Camanche Reservoir

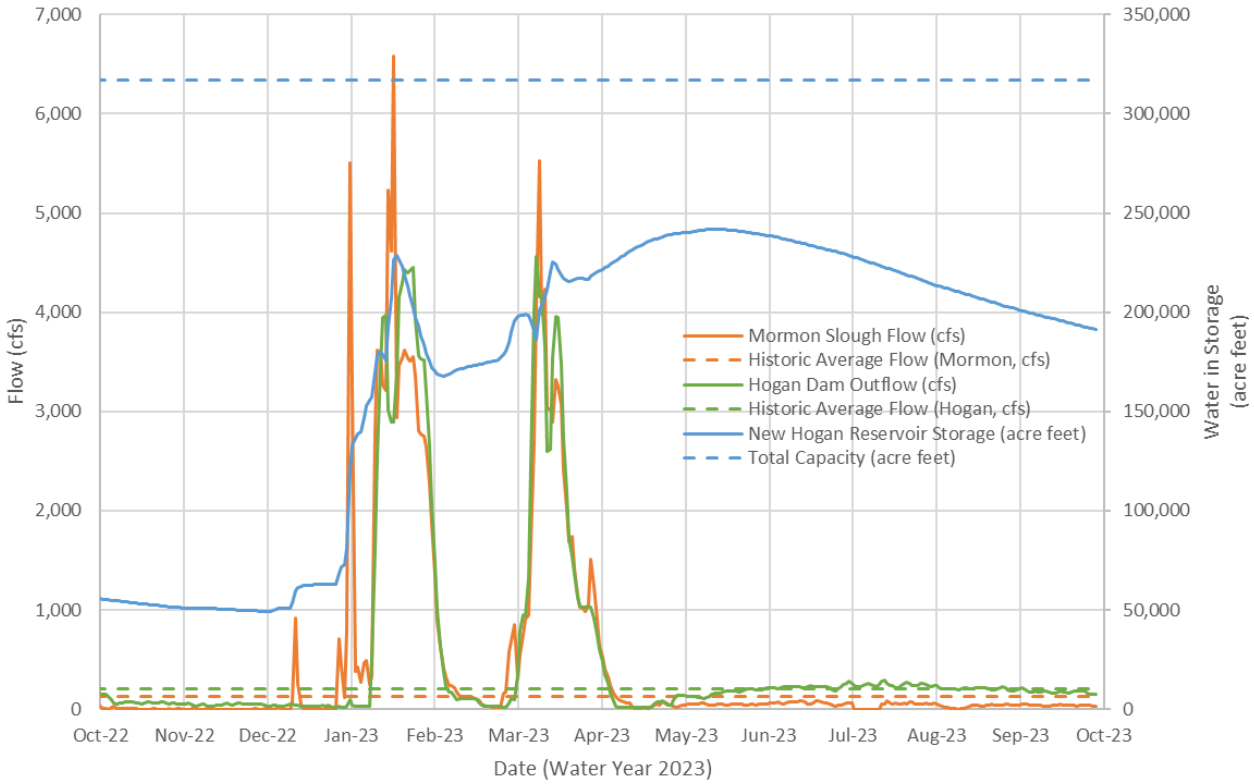


Figure 3-3 New Hogan Dam and Calaveras River (Mormon Slough at Bellota)

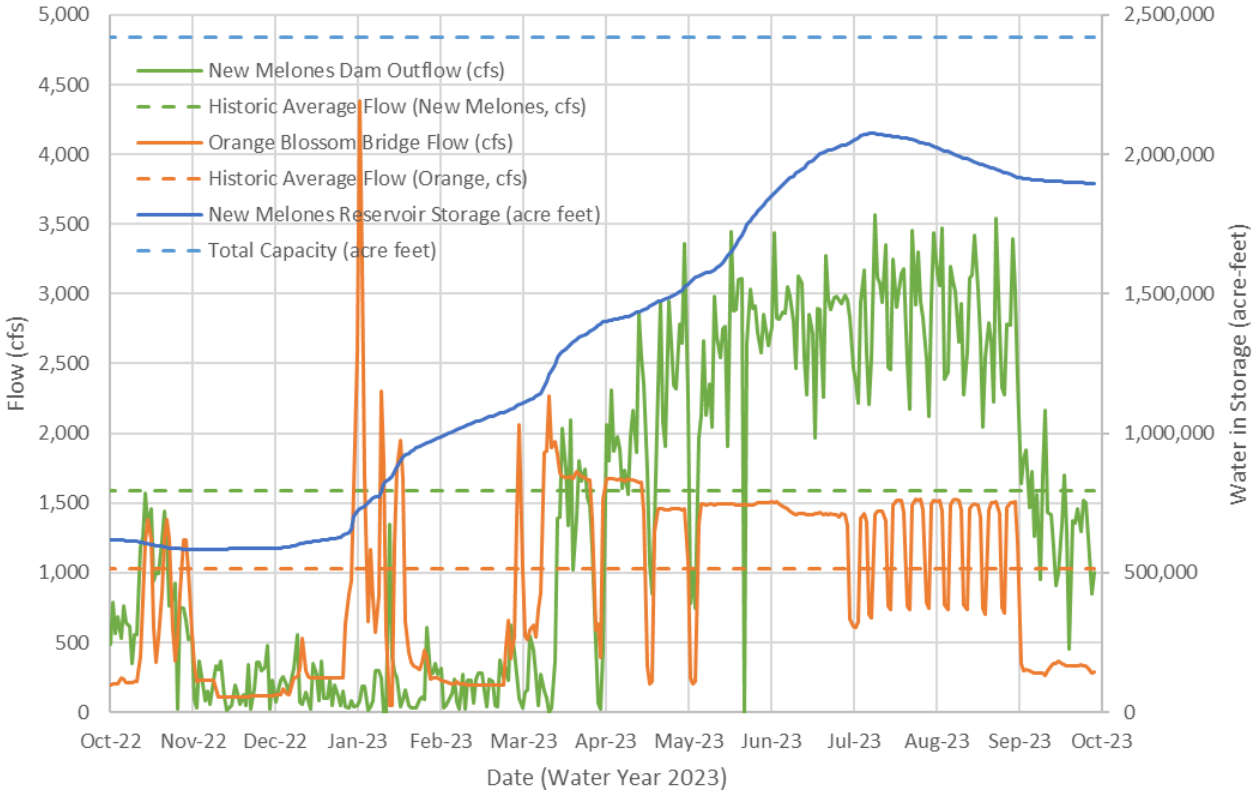


Figure 3-4 New Melones Dam at Stanislaus River (Orange Blossom Bridge)

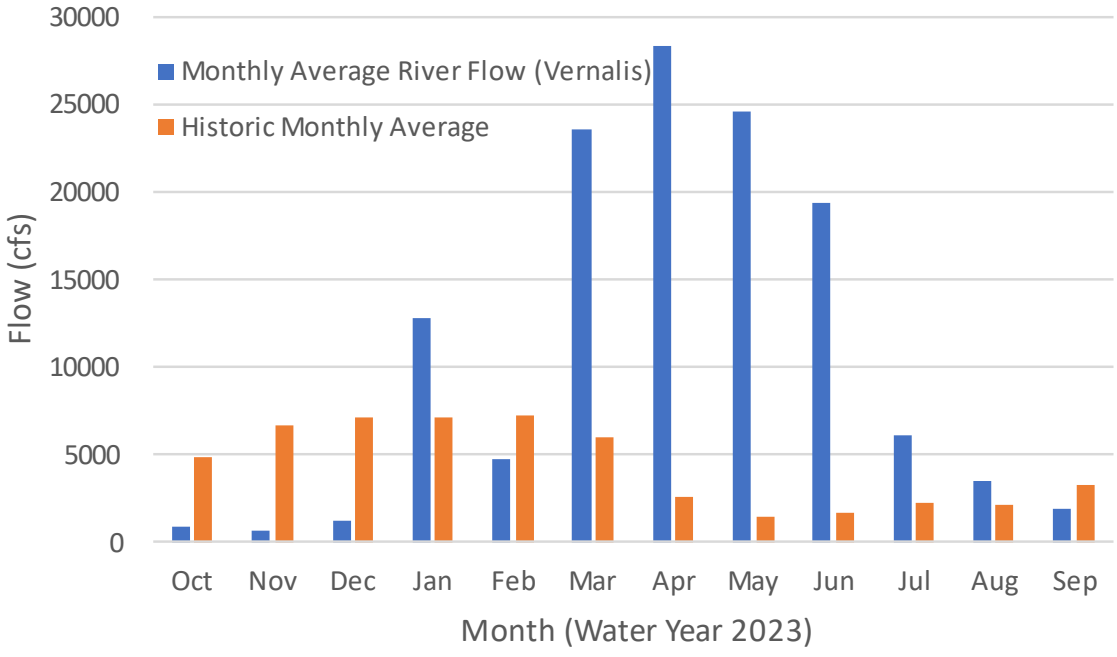


Figure 3-5 San Joaquin River Flow (Vernalis Station) Monthly Average

Table 3-1 Flow Gages

Station Name	River Basin	Station Code	Station Type	WY 2023, Monthly Average Flow	Unit of Measurement	Historic Average Yearly Total Flow[1]	WY 2023, % of Historic Average
Camanche Reservoir Releases	Mokelumne River	CMN	USACE Outflow, Discharge	1697	cubic feet per second	574	295.73%
Mokelumne River at Woodbridge	Mokelumne River	11325500	USGS River flow, Discharge 00060	No Data[2]	cubic feet per second	6912	--
New Hogan Dam Releases	Calaveras River	NHG	USACE Outflow, Discharge	510	cubic feet per second	208	245.35%
Calaveras River Bellota at Mormon Slough	Calaveras River	NHG	USACE River flow, Discharge	482	cubic feet per second	126	382.25%
New Melones Dam Releases	Stanislaus River	NML	USACE Outflow, Discharge	1416	cubic feet per second	1592	88.94%
Stanislaus River at Orange Blossom Bridge	Stanislaus River	NML	USACE River flow, Discharge	907	cubic feet per second	1029	88.13%
San Joaquin River near Vernalis	San Joaquin	11303500	USGS River flow, Discharge 00060	10645	cubic feet per second	52510	243.53%

Notes:

[1] Historic Monthly Average Flow data for USACE (United States Army Corp of Engineers) gages is not available, averages are derived from previous 4 years of data.

[2] Data not yet available for WY 2023.

Table 3-2 Reservoir Storage

Station Name	River Basin	Station Code	Station Type	Total Capacity	Unit of Measurement	Total Storage Start of WY 2023	Total Storage End of WY 2023	Peak Storage WY 2023
Camanche Reservoir	Mokelumne River	CMN	USACE Storage	417 Thousand	Acre-feet	202 Thousand AF 48% Capacity	350 Thousand AF 84% Capacity	397 Thousand AF 95% Capacity
New Hogan Dam & Reservoir	Calaveras River	NHG	USACE Storage	317 Thousand	Acre-feet	56 Thousand AF 17% Capacity	191 Thousand AF 60% Capacity	241 Thousand AF 76% Capacity
New Melones Dam & Reservoir	Stanislaus River	NML	USACE Storage	2.5 Million	Acre-feet	0.62 Million AF 24% Capacity	1.89 Million AF 75% Capacity	2.07 Million AF 83% Capacity

Notes: [1] Historic Monthly Average Flow data for USACE gages is not available, averages are derived from previous 4 years of data.

[2] Data not yet available for WY 2023

4 Groundwater Elevation Monitoring

Groundwater level data was provided by the County and supplemented with data available through the Department of Water Resources California Statewide Groundwater Elevation Monitoring (CASGEM) program. Groundwater levels were gathered by the County for the Eastern San Joaquin Subbasin (5-022.01) while the data for the Tracy Subbasin, and portions of Calaveras and Stanislaus County were sourced from the CASGEM or Sustainable Groundwater Management Act, Monitoring Network Module (SGMA Data Viewer, or MNM) website.

4.1 Groundwater Levels in San Joaquin County

Wells included in previous reports that had no available construction details, or discontinued measurements have been removed from Tables 4-1 to 4-9. Wells with comparable data are those wells with groundwater level measurements in both Fall 2022 and Fall 2023. Figure 4-1 shows locations of wells with symbols representing increases, decreases, no change, or no data.

Measurements included in the tables are from two sources. County collected data is prioritized over CASGEM data for consistency as CASGEM data may not be measured within the same timeframe. If County data is not available or the well could not be monitored, CASGEM data was used. If a well was not measured by the County, it is reported as no measurement (NM). If comparable measurements were not available, it is reported as "--."

Due to well access issues; several monitoring wells were monitored but were not able to be measured in Fall 2023, which affects the total amount of comparable wells for this report.

The information gathered is summarized as follows:

Central San Joaquin Water Conservation District (CSJWCD) – Thirty-three (33) wells were monitored in the fall of 2023, but groundwater levels were measured at seventeen (17) wells. Eleven (11) wells have comparable measurements (Table 4-1). In the fall, three (3) wells decreased in groundwater levels, while eight (8) increased. Average groundwater levels rose over eight (8) feet across the district.

North San Joaquin Water Conservation District (NSJWCD) – Thirty-three (33) wells were monitored in the fall of 2023, but groundwater levels were measured at thirty-five (35) wells. Twenty-three (23) wells have comparable measurements (Table 4-2). In the fall, eleven (11) wells decreased in groundwater levels, while twelve (12) increased. Average groundwater levels rose about one-third of a foot (0.3 feet) across the district.

Oakdale Irrigation District (OID) – Two wells were monitored in the fall of 2023, but no measurements were able to be obtained. There was no data from the previous year to compare it to, so no change in groundwater level data is available for this district. (Table 4-3).

Stockton East Water District (SEWD) – Seventy-eight (78) wells were monitored in the fall of 2023, but groundwater levels were measured at fifty-two (52) wells. Thirty-five (35) wells have

comparable measurements (Table 4-4). Six (6) wells decreased in groundwater levels; twenty-nine (29) wells increased. Average groundwater levels rose by over four (4) feet across the district.

South San Joaquin Irrigation District (SSJID) – Twenty-six (26) wells were monitored in the fall of 2023, but groundwater levels were measured at seventeen (17) wells. Twelve (12) wells have comparable measurements (Table 4-5). Groundwater levels in all twelve (12) wells increased. Average groundwater levels rose by over six (6) feet across the district.

Southwest County Area in the Tracy Subbasin – Twenty-five (25) wells were monitored in the fall of 2023, and only one (1) was not accessible. Twenty-four (24) wells have comparable measurements (Table 4-6). One (1) well decreased in groundwater levels, twenty-three (23) increased. Average groundwater levels rose by over ten (10) feet in the Tracy Subbasin.

Woodbridge Irrigation District (WID) – Eighteen (18) total wells were monitored in the fall of 2023, and measurements were obtained at sixteen (16) wells. Thirteen (13) wells have comparable measurements (Table 4-7). No (0) wells decreased in groundwater levels and all thirteen (13) wells increased. Average groundwater levels rose by over eight (8) feet across the district.

Calaveras County – Groundwater measurements have not been uploaded to the CASGEM or MNM websites and therefore were not able to be compared at the time of this report.

Stanislaus County – Eight (8) total wells were monitored in the fall of 2023, and measurements were obtained at seven (7) wells. Seven (7) wells have comparable measurements. Four (4) wells decreased in groundwater levels; three (3) wells increased. Average groundwater levels declined by about two (2) feet across the district.

Changes in groundwater levels from Fall 2022 through to Fall 2023 throughout the County are summarized on Figure 4-1 with the well location symbol indicating the difference in levels.

4.2 Hydrographs

Twenty-six (26) wells were selected to represent groundwater conditions throughout the basin (A through Z). These wells have historical spring and fall groundwater level measurements. The location of these wells is shown on Figure 4-2. Hydrographs of these selected wells within the County are provided on Figures 4-3 through 4-28 to illustrate the changes in groundwater levels with time. Trend lines are plotted on each figure using data from 1984 to 2022 (or shorter period if measurements are not available). Five (5) wells had Fall measurements above the trend lines.

Hydrographs for Wells D, K, M, N, T, and V are provided but monitoring at these wells has been prevented this period due to well access issues. Work is being done to resolve access.

4.3 Groundwater Level Profiles

Groundwater level profiles were developed to illustrate the relationship of where groundwater levels were increasing or decreasing in relationship to Spring 1986, the historic high groundwater

levels, and Fall 1992, historic low groundwater levels. Figure 4-29 shows the location of the profiles and Figures 4-30 through 4-32 provide the profiles.

4.4 Groundwater Level Changes

Figure 4-34 shows a groundwater elevation map that was used to develop Figures 4-30 through 4-32.

5 Groundwater Quality Monitoring

County personnel collected water quality samples from eight (8) well clusters in 2023. Their locations are shown on Figure 5-1. The wells are part of Eastern San Joaquin's Groundwater Quality Network under their SGMA Groundwater Sustainability Plan. Due to the change in water quality network for this annual report, information for water quality in the Fall 2023 wells are not able to be compared to water quality measurements taken in 2022.

High TDS concentrations historically have occurred in the western portion of the Subbasin, near the San Joaquin River and urban areas; as such, the majority of monitoring wells are located in the western half of the Eastern San Joaquin Subbasin. Monitoring wells are located both within areas of high TDS concentrations, to observe and monitor TDS trends, and adjacent to high TDS areas, to observe potential TDS movement. Chloride concentrations are also monitored as have been done in previous reports. Figures 5-2 through 5-9 provide concentrations at these well clusters. Note: Well Clusters STK 1 through 7 are shown with the exception of STK 3, which is not in use at the time of this report.

These wells are already equipped for monitoring and have existing protocols to ensure accurate and consistent measurements, and they represent a current asset for the Subbasin that can be further utilized.

Overall, water quality in the selected well clusters remains consistent with the historic concentrations taken over the last two decades, with more data, trends can be identified to explain if the concentrations are increasing or decreasing over time. Fall 2023 measurements show general increased groundwater basin levels along the western portion of the basin as shown in Figures 4-1 and 4-2 indicating that intrusion of high TDS water into the basin is being sufficiently retarded.

6 Summary

WY2023 was classified as a wet year and received about 130 to 150 percent of average precipitation. Combined, surface water storage in Camanche, New Melones and New Hogan reservoirs increased by nearly 2 million AF.

Groundwater levels rose in 100 of the wells measured in comparison to Fall 2022 levels in response to the above normal precipitation. However, groundwater levels declined in about 20 percent of the wells, with comparable measurements. Most of the wells with declines are in the northern portion of the County, generally north and east of Stockton. The greatest rises were present near the rivers.

The pumping depression in the central portion of the County continued to be present and the bottom of the depression declined by about 10 feet from Fall 2022 to Fall 2023 and lost the 10 feet of recovery seen in the Spring 2023 measurements.

Groundwater quality in the region has been monitored for TDS and chloride concentrations, and the network has been refined to include a focused monitoring network, as found in the Eastern San Joaquin Subbasin's GSP.

Table 4-1 Comparison of CSJWCD Groundwater Elevations

State Well ID	Fall 2022	Fall 2023	Change Fall (Feet)
01N07E11L001	-52	NM	--
01N07E14J002	-67.6	-54.6	13
01N07E24R001	NM	NM	--
01N07E26H003	NM	NM	--
01N07E32A001	NM	-11.72	--
01N08E11L001	-70.28	-67.5	2.78
01N08E13J001	NM	NM	--
01N08E16G001	-68.32	-64.4	3.92
01N08E16H002	-67.31	-63.5	3.81
01N08E27R002	NM	NM	--
01N08E29M002	NM	-56.9	--
01N08E35F001	-76.9	NM	--
01N08E36F001	NM	-43.5	--
01N09E13D001	NM	NM	--
01N09E17D001	NM	NM	--
01N09E17M001	-53.62	-49.6	4.02
01N09E19C001	NM	-67.5	--
01N09E22G002	NM	NM	--
01N09E29R001	-39.5	-41.5	-2
01N09E30C005	-51.7	-62.2	-10.5
01S07E01J001	NM	-41.1	--
01S08E04R001	NM	NM	--
01S08E05A001	-102.4	NM	--
01S08E05R001	-81.8	-48.8	33
01S08E06D001	NM	NM	--
01S08E09Q001	NM	NM	--
01S08E11F001	NM	-37.2	--
01S08E14B001	-64.7	-56.2	8.5
01S09E05H002	-30	-53	-23
01S09E07A001	-81.3	-25.8	55.5
01S09E07N001	NM	NM	--
01S09E09R001	NM	NM	--
01S09E19Q002	-47	NM	--

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
33	11	3	8	0	-23 to 55.5	8.09

Table 4-2 Comparison of NSJWCD Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (Feet)
03N06E04C001	--	--	--
03N07E02G003	--	--	--
03N07E03R001	-42.8	-46.8	-4
03N07E08E002	-35	-36	-1
03N07E09C001	-39.7	-23.7	16
03N07E15C004	-53.5	-50.5	3
03N07E17D004	-35.4	-36.9	-1.5
03N07E18D012	-36	-31.4	4.6
03N07E19J004	NM	NM	--
03N07E23C002	-86	-86.5	-0.5
03N08E07D002	--	--	--
03N08E22A001	NM	-74	--
04N06E12C004	-42	NM	--
04N06E12N002	NM	-51.3	--
04N06E15B002	-19.7	-17.2	2.5
04N06E23K00	-16	-17	-1
04N06E24F001	-28.5	-33	-4.5
04N06E25R001	-10	-5	5
04N06E27D002	-0.8	8.2	9
04N07E12E001	NM	NM	--
04N07E17N001	-58.8	-60.3	-1.5
04N07E19K001	-35.2	-59.6	-24.4
04N07E20H003	-40.22	-33.89	6.33
04N07E21F001	-45.4	NM	--
04N07E27C002	-40.5	-59	-18.5
04N07E28J002	-39.2	-33.7	5.5
04N07E33H001	16	25.6	9.6
04N07E36L001	-46.46	-43.5	2.96
04N08E14K001	-24.1	-3.1	21
04N08E17J001	-49.5	-49.2	0.3
04N08E21M001	-53.1	NM	--
04N08E32N001	-65.1	-70.1	-5
05N07E34G001	-60.1	-77.1	-17

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
33	23	11	12	0	-24.4 to 21	0.30

Table 4-3 Comparison of OID Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
01S09E21J002	NM	NM	--
01S09E24R001	NM	NM	--

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
2	0	0	0	0	--	--

Table 4-4 Comparison of SEWD Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
01N06E02C001	-10.13	-8.3	1.83
01N06E04J003	-15.23	-9.33	5.9
01N06E04J004	-9.67	-4.87	4.8
01N06E04J005	-4.91	-1.81	3.1
01N06E05M004	NM	NM	--
01N06E36C003	NM	-11.5	--
01N06E36C004	NM	-5.8	--
01N06E36C005	NM	-3.5	--
01N07E01M002	-75	NM	--
01N07E02G001	NM	NM	--
01N07E04R001	-34.6	-10.8	23.8
01N07E09E004	NM	NM	--
01N07E09H001	NM	NM	--
01N07E09Q003	-48.2	-35.2	13
01N07E10D001	-45	-26.5	18.5
01N07E20G001	-28	NM	--
01S06E01C002	-24	-0.9	23.1
01S06E02G002	-11.07	-1.48	9.59
01S06E10G001	NM	NM	--
01S07E06M002	NM	1	--
01S07E08J002	NM	NM	--
02N06E01A001	--	--	--
02N06E08N001	-28.38	-21.98	6.4
02N06E08N002	-26.32	-19.72	6.6
02N06E08N003	-22.61	-16.81	5.8
02N06E12H001	--	--	--
02N06E20E001	-16.5	-13.7	2.8
02N06E24F001	-32.5	-36.5	-4
02N06E24J002	NM	-22.9	--
02N06E24J003	--	--	--
02N07E03D001	NM	NM	--
02N07E08D001	NM	--	--
02N07E08K003	-66.8	-58.2	8.6
02N07E08R002	-57.64	-50.47	7.17
02N07E11F001	-103	-88.5	14.5
02N07E11R002	-85	-81	4
02N07E16F002	-67.6	-60.64	6.96
02N07E16L001	-89.3	-73.8	15.5
02N07E20N002	-56	-47	9
02N07E21A002	-74.81	-66.31	8.5
02N07E21K002	--	NM	--
02N07E21N001	--	NM	--
02N07E23B001	--	-73.6	--
02N07E24Q001	-78.7	NM	--
02N07E26N001	-74.9	NM	--
02N07E28K002	-77	NM	--
02N07E28N004	NM	NM	--
02N07E28P001	NM	NM	--

Comparison of SEWD Groundwater Elevations (continued)

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
02N07E29B001	-50.81	NM	--
02N07E29M002	-40.3	NM	--
02N07E30H001	NM	NM	--
02N07E31M001	NM	NM	--
02N07E32J002	-31.9	NM	--
02N07E32M002	-26.18	-10.6	15.58
02N07E32R001	-23.6	-16.6	7
02N07E33L001	-39	NM	--
02N07E34R001	-55	-40.5	14.5
02N08E03G002	NM	-71.6	--
02N08E04C001	-73.5	NM	--
02N08E05C001	-94.5	NM	--
02N08E08N001	NM	NM	--
02N08E09G002	26	NM	--
02N08E10H002	-75.4	-70.5	4.9
02N08E14C001	-72	-68.5	3.5
02N08E16D001	-86.1	NM	--
02N08E18C001	-114.7	-100.7	14
02N08E20F001	NM	NM	--
02N08E24J001	-65.1	-111.1	-46
02N08E28H002	-53.6	-99.6	-46
02N08E33E001	-102.6	-83.6	19
02N09E05N001	--	-40.43	--
02N09E09D001	-26.8	-53.8	-27
02N09E28N001	NM	-28.1	--
03N06E35P002	--	--	--
03N07E35C002	-69	-69.3	-0.3
03N07E35L001	-107.5	-110.5	-3
03N07E36J001	-82.3	NM	--
03N09E25R001	72.5	79	6.5

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
78	35	6	29	0	-46 to 23.8	4.52

Table 4-5 Comparison of SSJID Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
01S07E14M001	NM	NM	--
01S07E14P003	NM	NM	--
01S07E15F002	NM	-8.9	--
01S07E18L001	-3.73	6.16	9.89
01S07E21G001	0.65	4.94	4.29
01S07E25E001	--	-3.5	--
01S07E26G001	--	NM	--
01S07E27K001	-5.48	-0.7	4.78
01S07E30R001	2.5	10.16	7.66
01S07E36D001	1.41	6.38	4.97
01S08E30C002	NM	-10	--
01S09E29M002	NM	NM	--
01S09E33J002	37.92	39.9	1.98
01S09E33P001	32.31	36.05	3.74
02S07E07D002	1	8.8	7.8
02S07E11N002	NM	23.5	--
02S07E19H001	12	19.5	7.5
02S08E04M001	-2.5	NM	--
02S08E06J001	1	11	10
02S08E07R001	NM	21	--
02S08E08A001	9.41	NM	--
02S08E08E001	3.2	NM	--
02S08E09J001	--	--	--
02S08E12D001	28.17	32.28	4.11
02S08E14E001	--	--	--
02S09E12R001	55.62	65.87	10.25

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
26	12	0	12	0	1.98 to 10.25	6.41

Table 4-6 Comparison of Southwest County Area in Tracy Subbasin Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
01S05E31R002	-1.4	1.1	2.5
02S04E15R001	51.41	52	0.59
02S05E08B001	-4.2	-0.2	4
02S06E25J001	13.74	17.2	3.46
02S06E31N001	36.5	41	4.5
03S06E27N001	56.3	55.8	-0.5
03S07E06Q001	--	--	--
MW-1A	-27.74	-17.84	9.9
MW-1B	-40.41	-25.2	15.21
MW-1C	-40.8	-27.7	13.1
MW-2A	-34.98	-23.97	11.01
MW-2B	-43.09	-29.18	13.91
MW-2C	-43.22	-29.61	13.61
MW-3A	-29.92	-19.91	10.01
MW-3B	-43.34	-26.71	16.63
MW-3C	-43.94	-30.4	13.54
MW-4A	-35.93	-23.72	12.21
MW-4B	-42.31	-28.58	13.73
MW-4C	-42.69	-29.32	13.37
MW-5A	-37.96	-26.78	11.18
MW-5B	-39.53	-22.89	16.64
MW-5C	-37.94	-25.23	12.71
MW-6A	-30.03	-20.02	10.01
MW-6B	-35.4	-22.79	12.61
MW-6C	-32.99	-22.78	10.21

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
25	24	1	23	0	-0.5 to 16.64	10.17

Note: Monitoring wells MW-1 through MW-6 are measured by City of Tracy. All wells monitor aquifers below the Corcoran Clay at six locations.

Table 4-7 Comparison of WID Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Spring (feet)
03N05E14C001	NM	-3.8	--
03N06E05N003	-18.5	-5.5	13
03N06E07H003	-17.6	-8.7	8.9
03N06E17A004	-25.3	-21.7	3.6
03N06E18M003	-17.1	NM	--
03N06E20D002	-23	-16	7
03N06E32R001	-28.5	-20.5	8
04N05E10K001	NM	-4.5	--
04N05E13H001	-7	3	10
04N05E13R004	-11.6	0.6	12.2
04N05E14B002	-9.4	0.1	9.5
04N05E24J004	NM	4.9	--
04N05E36H003	-5.81	NM	--
04N06E17G004	-6.5	4.5	11
04N06E29N002	-8	3	11
04N06E30E001	-4.3	3.7	8
04N06E34J002	20.4	23.4	3
05N05E28L003	-6.9	-4.5	2.4

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
18	13	0	13	0	2.4 to 13	8.28

Table 4-8 Comparison of Calaveras County Groundwater Elevations

Local Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
CCWD 001	NM	NM	--
CCWD 002	NM	NM	--
CCWD 003	NM	NM	--
CCWD 004	NM	NM	--
CCWD 005	NM	NM	--
CCWD 006	NM	NM	--
CCWD 007	NM	NM	--
CCWD 008	NM	NM	--
CCWD 009	NM	NM	--
CCWD 010	NM	NM	--
CCWD 011	NM	NM	--
CCWD 012	NM	NM	--
CCWD 014	NM	NM	--
CCWD 015	NM	NM	--

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
14	0	0	0	0	--	--

*Calaveras County 2022 & 2023 data has not been uploaded to DWR databases.

Table 4-9 Comparison of Stanislaus Groundwater Elevations

State Well ID	Fall 2022 (feet)	Fall 2023 (feet)	Change Fall (feet)
01S10E04C001	60.47	44.52	-15.95
01S10E21A001	83.315	81.82	-1.495
01S10E26J001	75.94	75.5	-0.44
01S10E27Q001	65.99	65.48	-0.51
01S10E34R001	67.68	67.99	0.31
01S11E25N001	106.71	NM	--
02S10E02P001	78.86	81.5	2.64
02S10E10M002	66.95	68.69	1.74

Number of Wells Fall 2022-2023					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
8	7	4	3	0	-15.95 to 2.64	-1.96

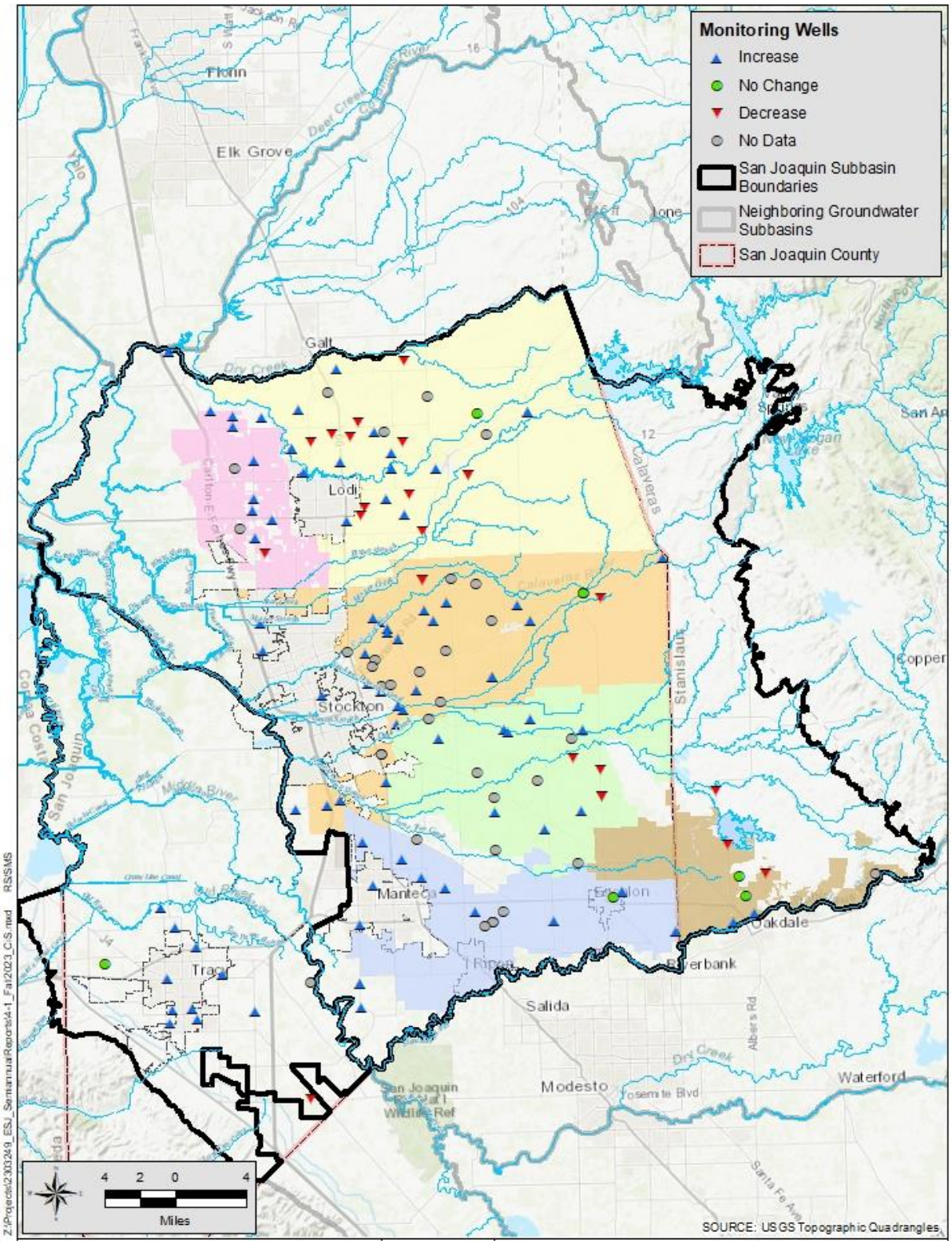


Figure 4-1 Change in Groundwater Elevation – Fall 2022 to Fall 2023

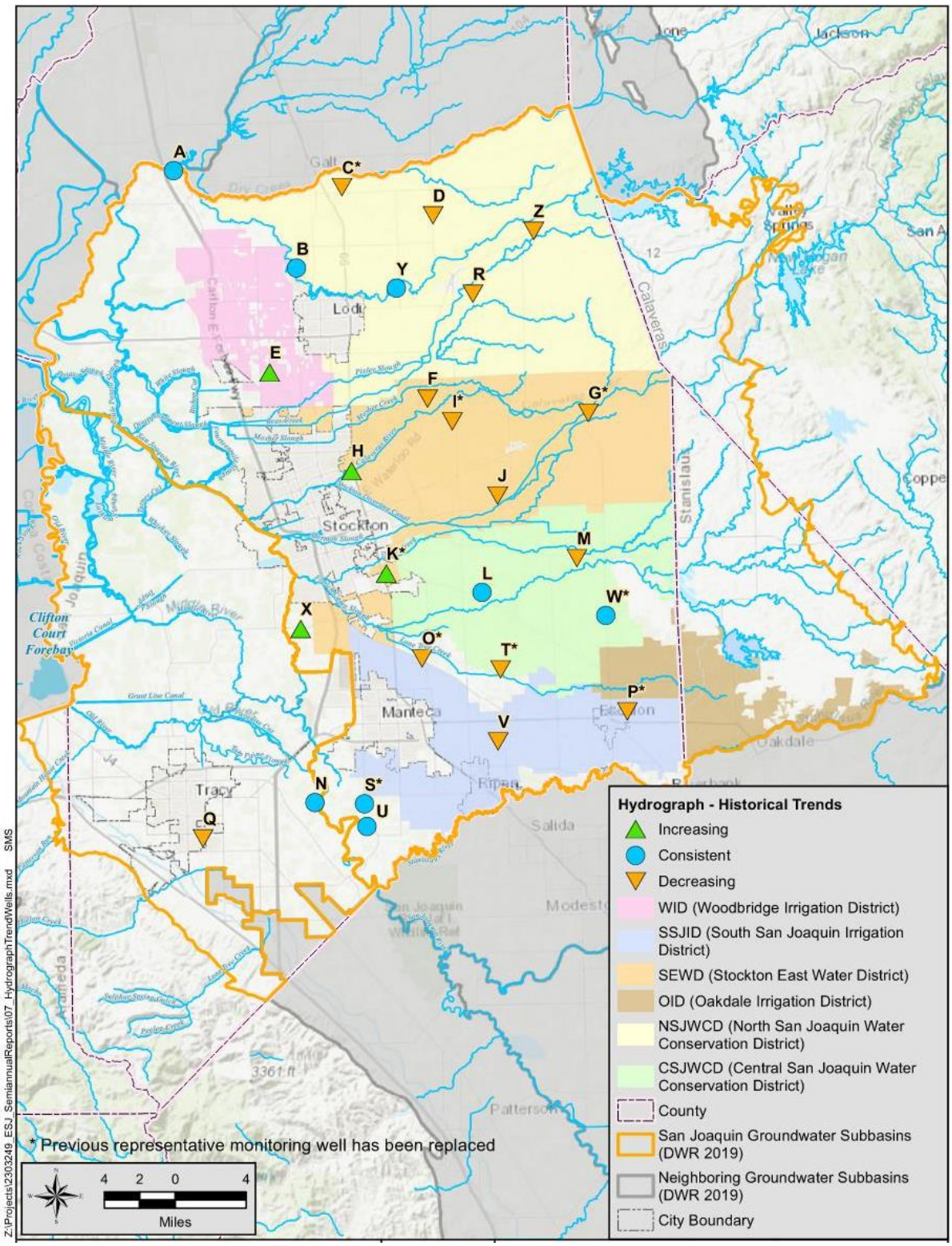


Figure 4-2 Selected Hydrograph Well Historic Trends

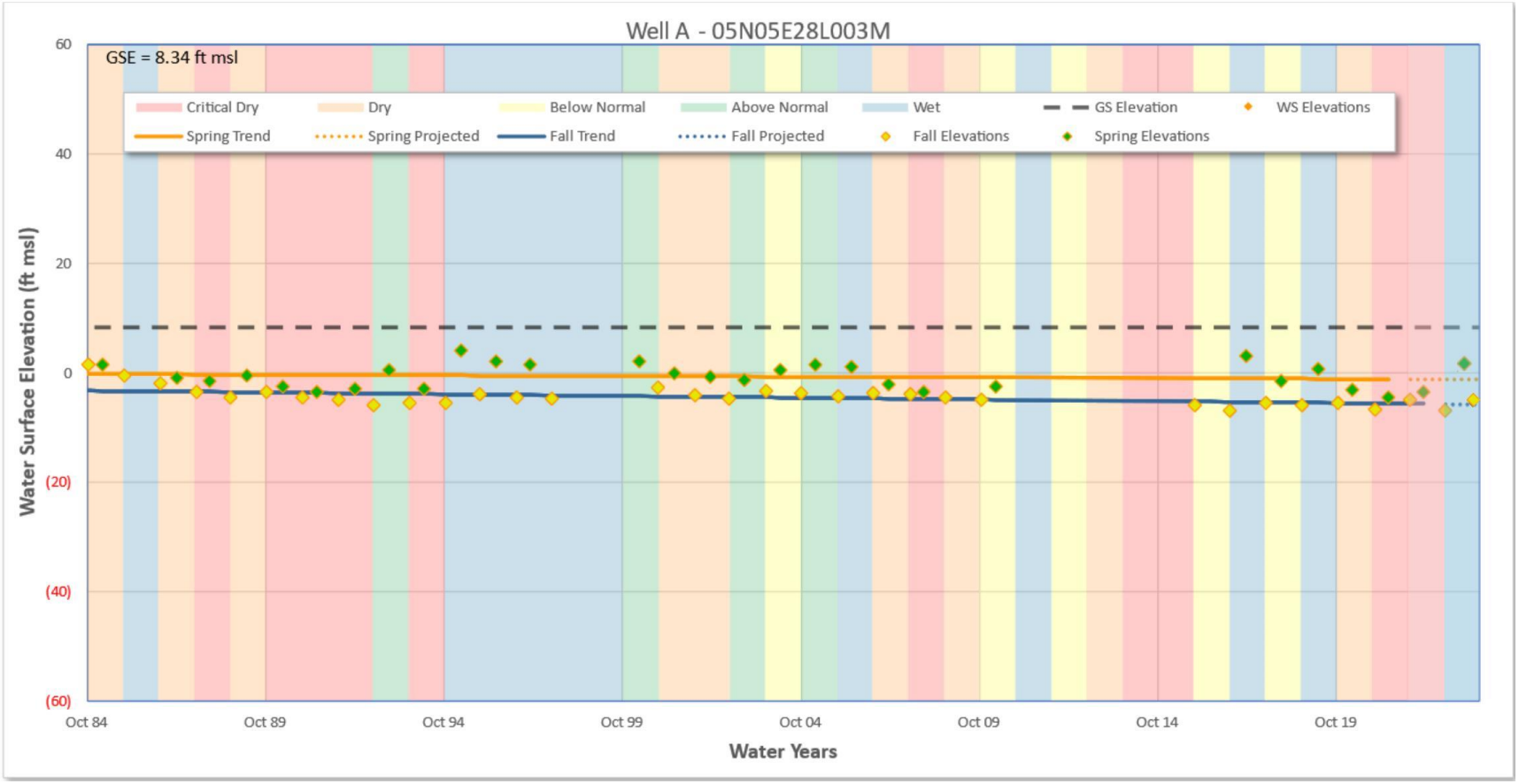


Figure 4-3 Hydrograph Well A - East of Thornton Rd & South of Benson Ferry Rd.

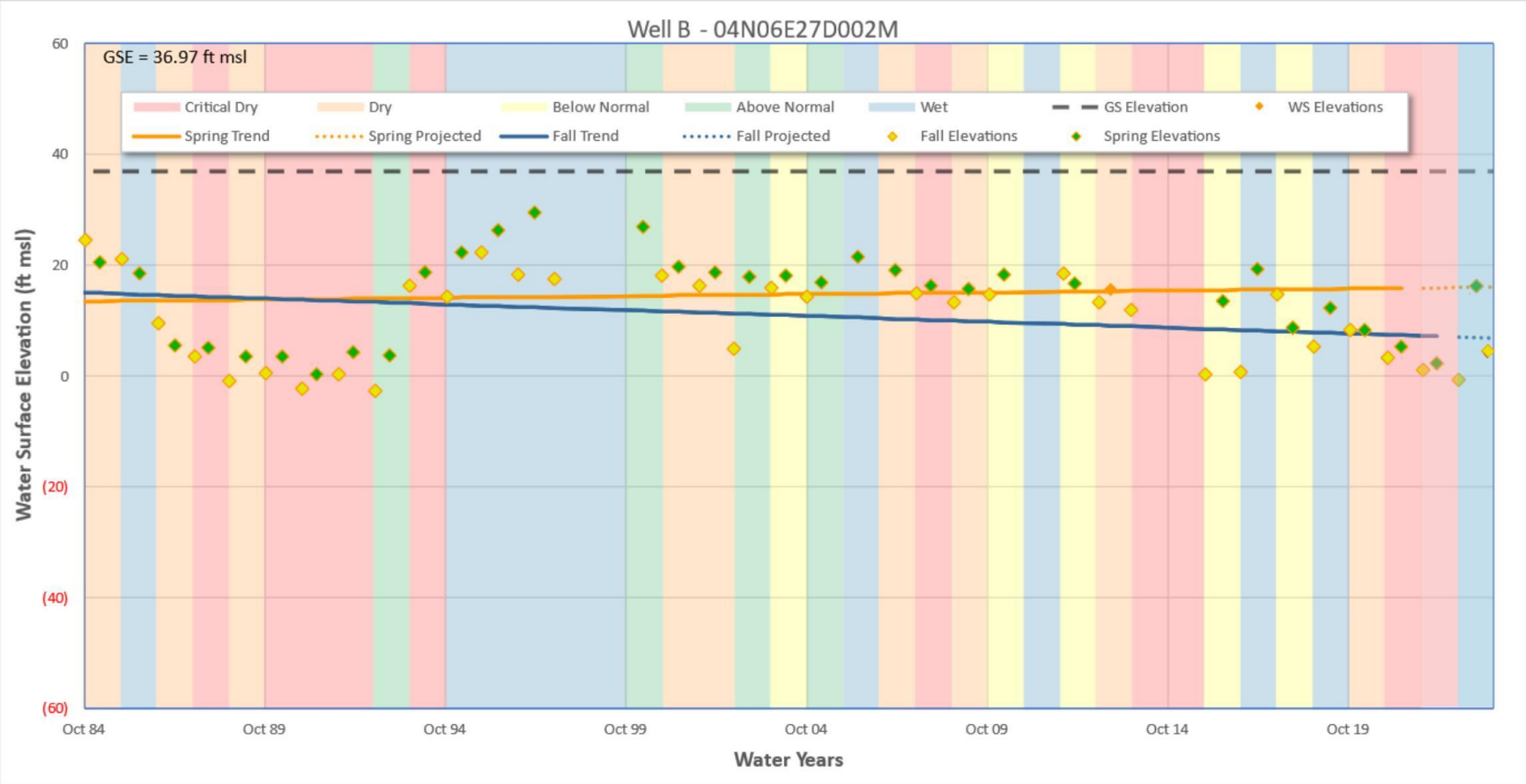


Figure 4-4 Hydrograph Well B - East of Lower Sac Rd. & South of Acampo Rd.

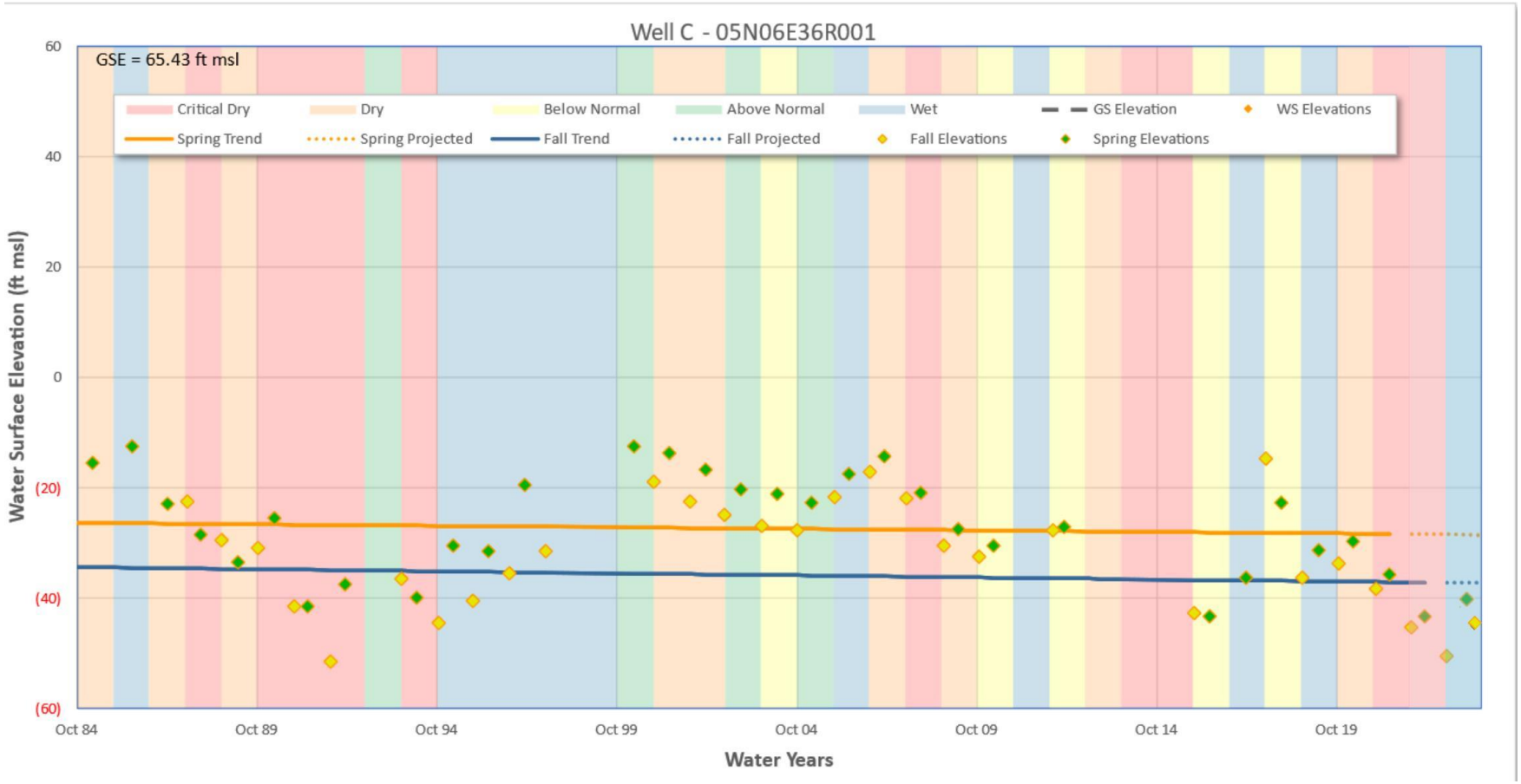


Figure 4-5 Hydrograph Well C - North of Liberty Rd. & West of North Cherokee Ln.

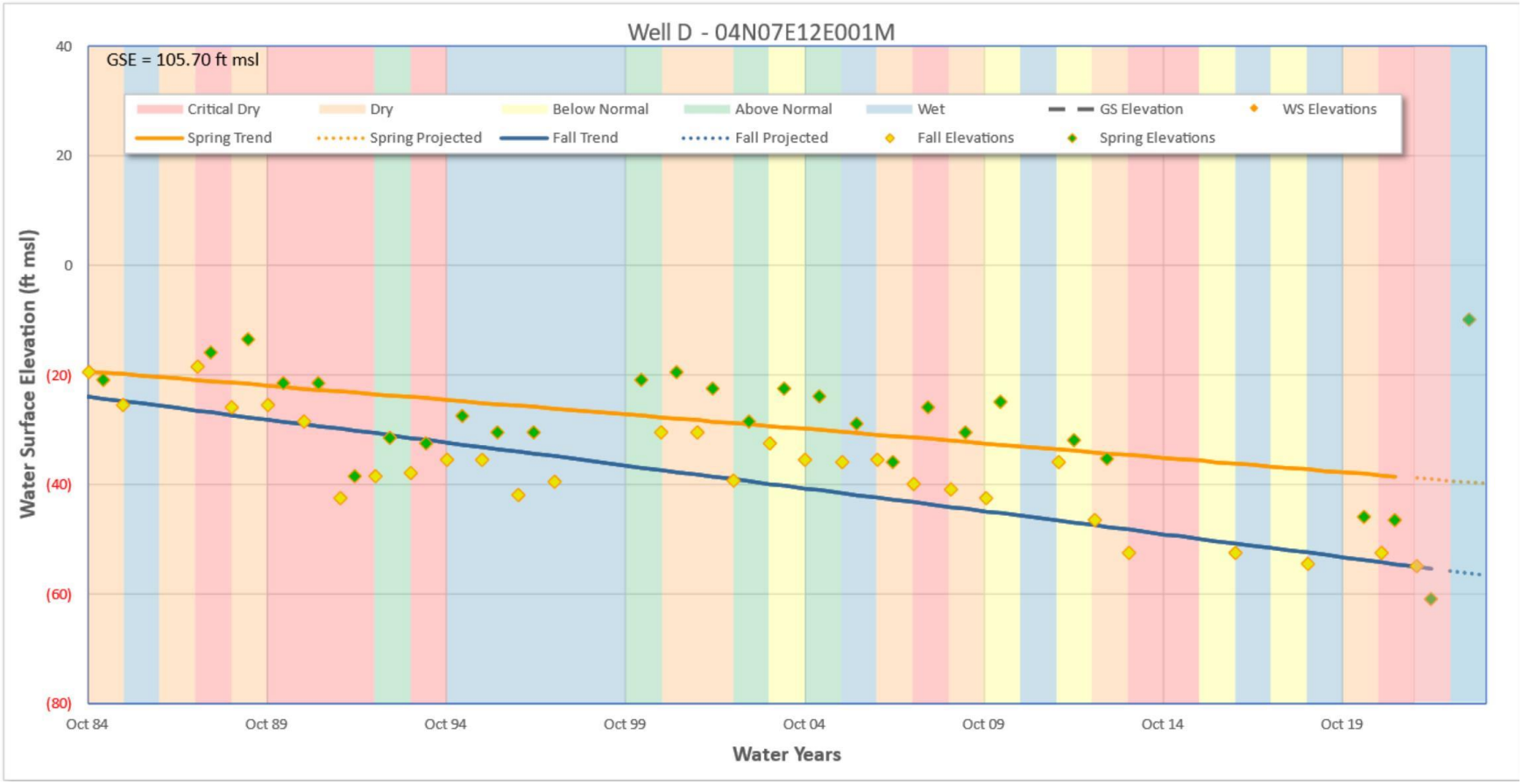


Figure 4-6 Hydrograph Well D - West of Elliotto Rd. & North of Jahant Rd.

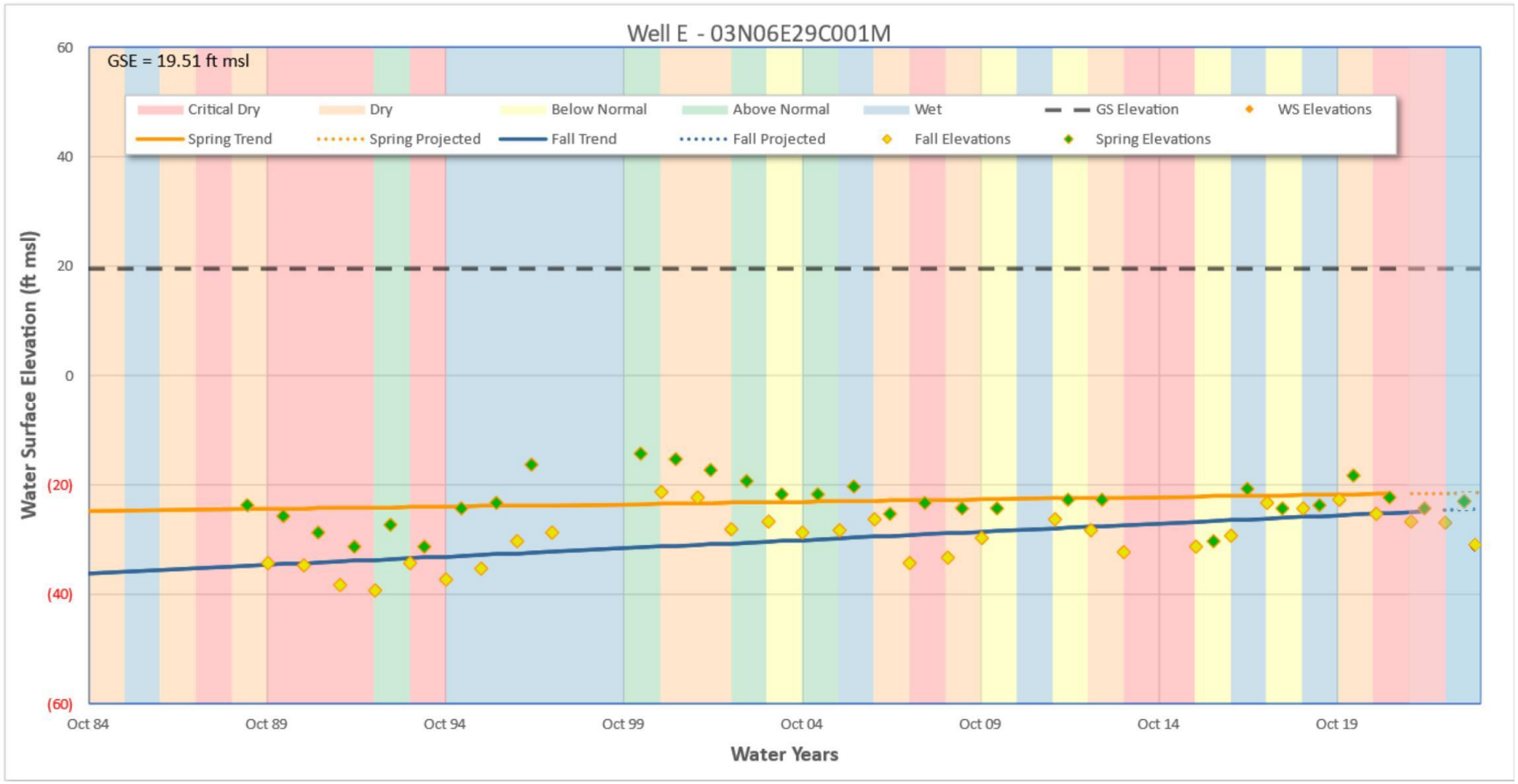


Figure 4-7 Hydrograph Well E - East of Davis R. & South of Armstrong Rd.

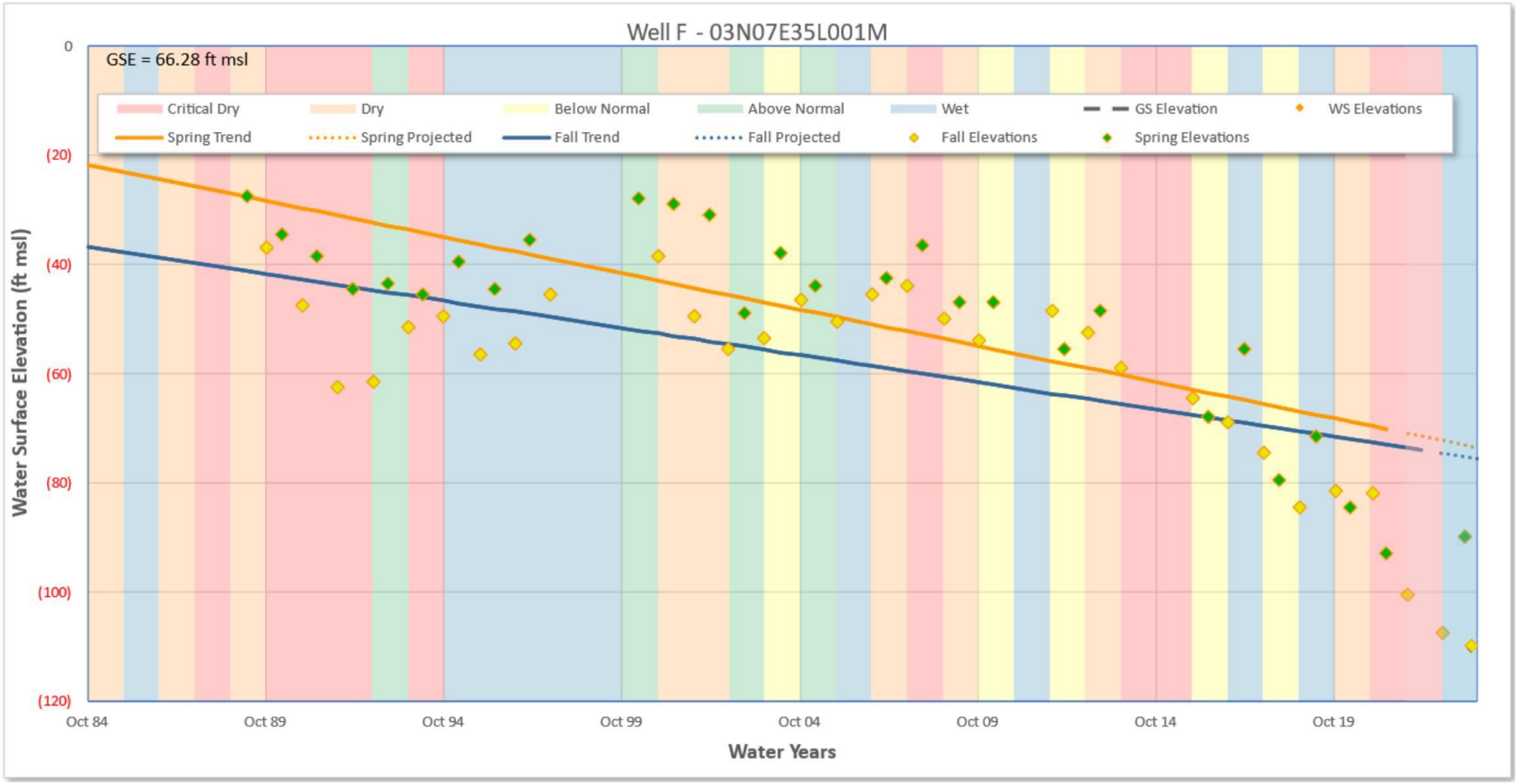


Figure 4-8 Hydrograph Well F - West of Route 88 & North of Eight Mile Rd.

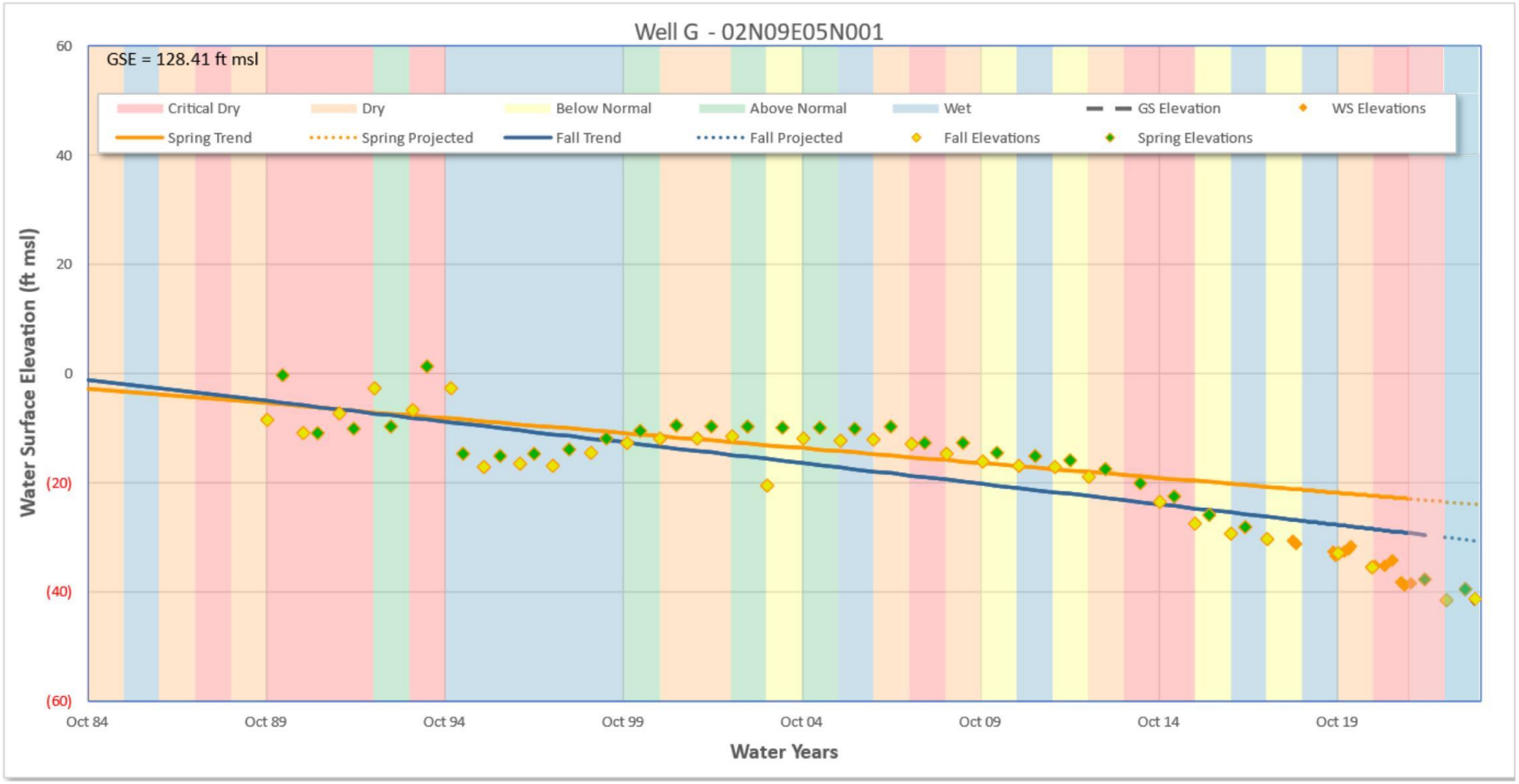


Figure 4-9 Hydrograph Well G - West of Route 26 & South of Shelton Rd.

Figure 4-10 Hydrograph Well H - East of Ijams Rd. & North of McAllen Rd.

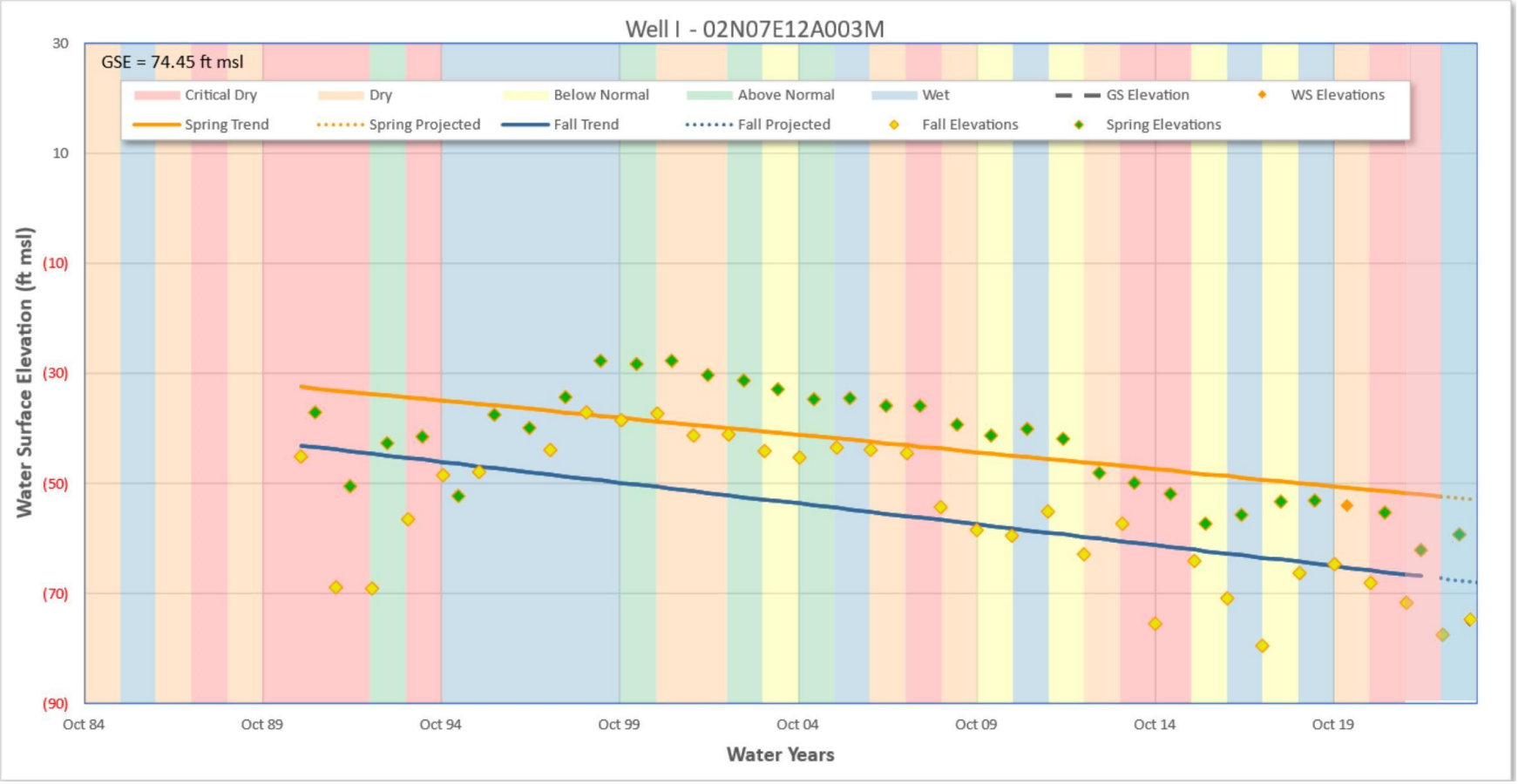


Figure 4-11 Hydrograph Well I - West of Gogna Rd. & North of Route 26

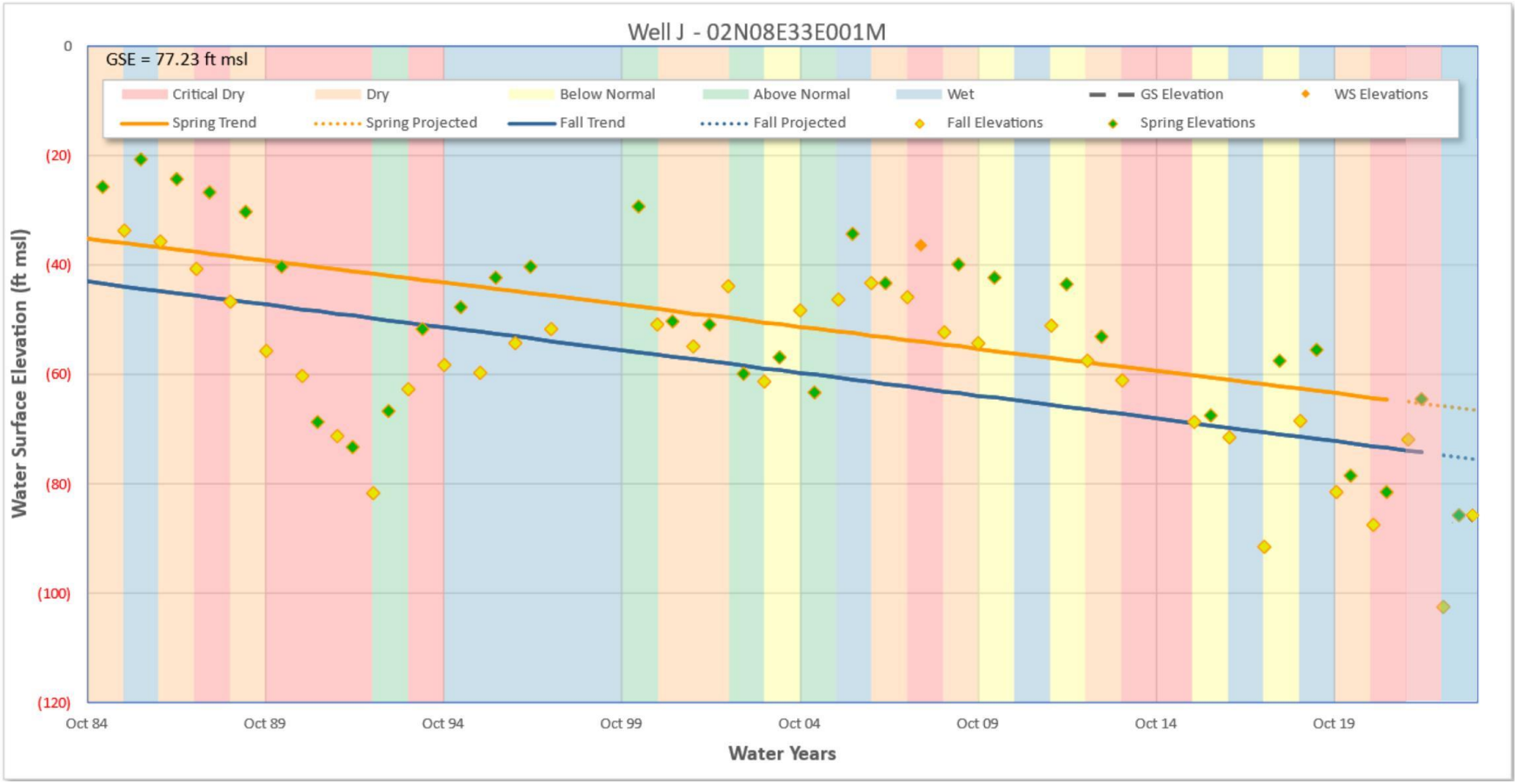


Figure 4-12 Hydrograph Well J - East of Duncan Rd. & South of Milton Rd.

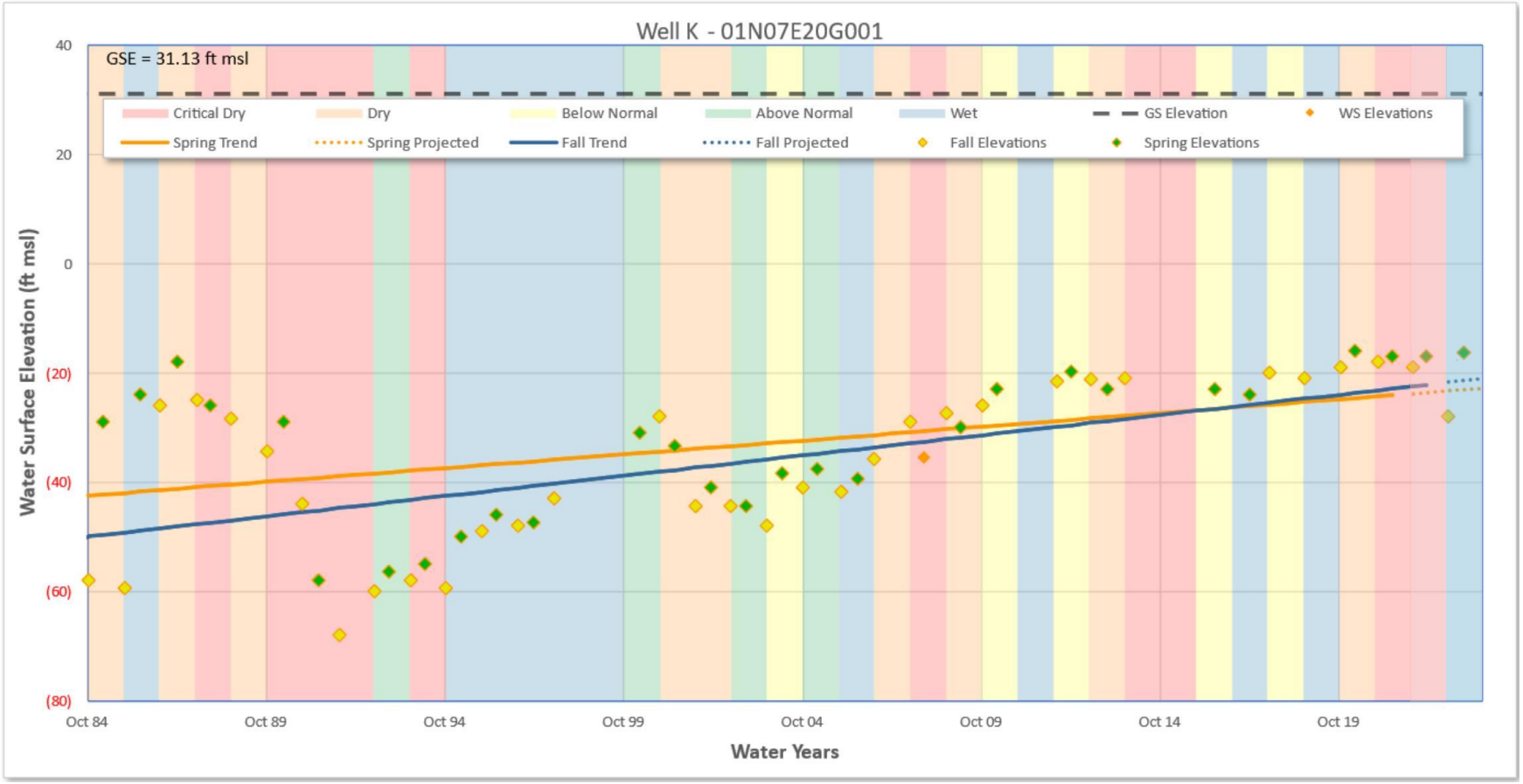


Figure 4-13 Hydrograph Well K - East of Ash Rd. & North of Carpenter Rd.

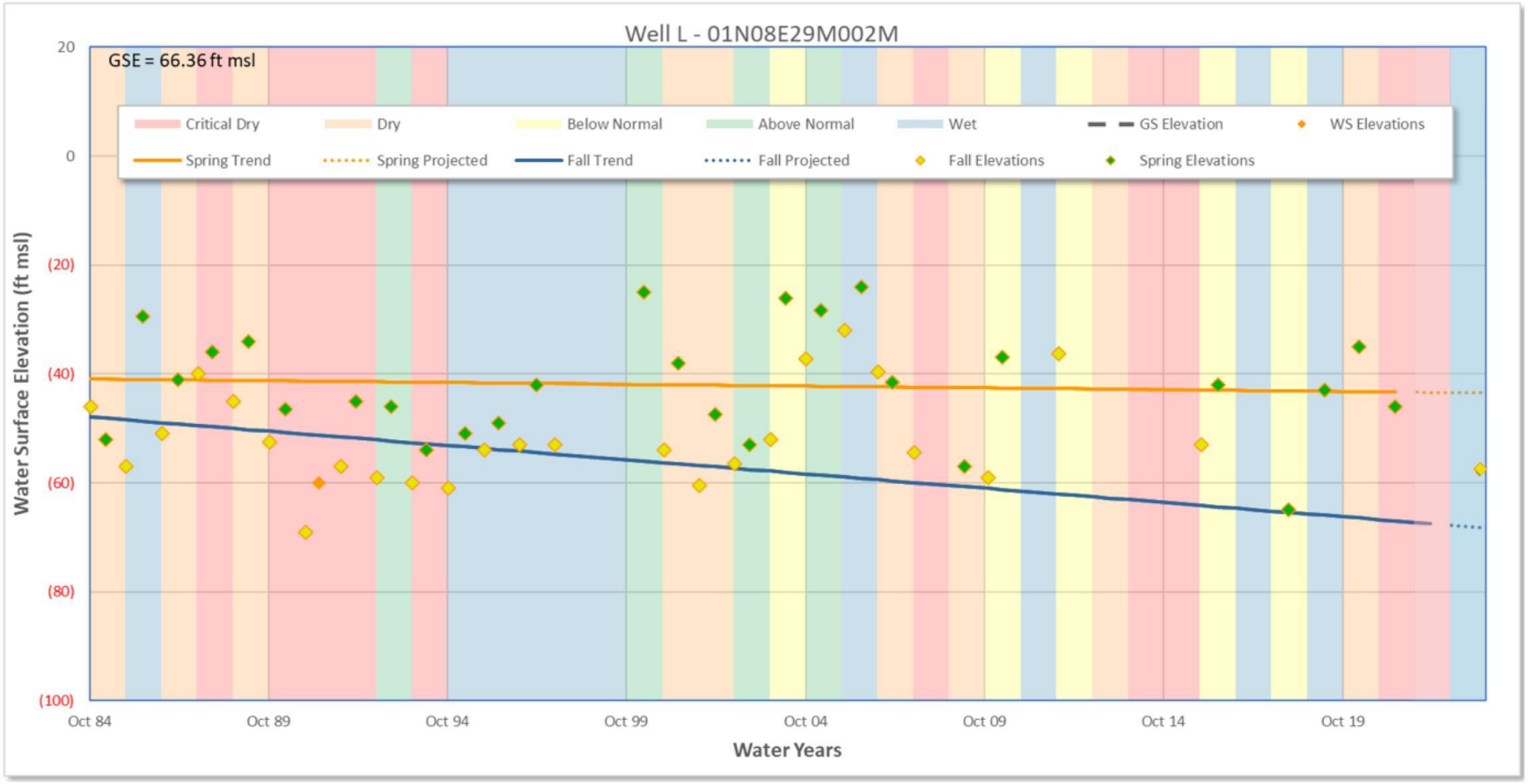


Figure 4-14 Hydrograph Well L - West of Jack Tone Rd. & North of Mariposa Rd.

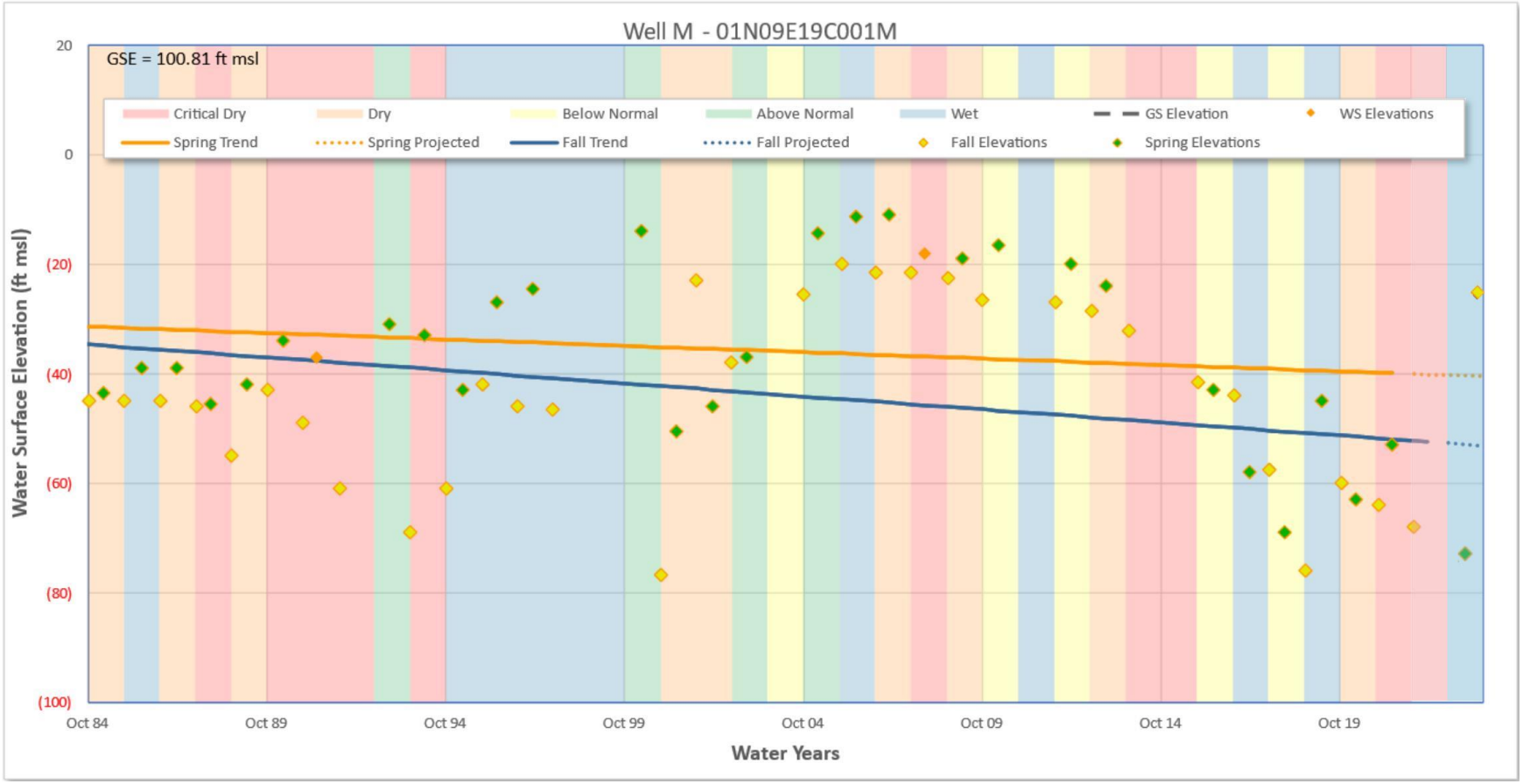


Figure 4-15 Hydrograph Well M - West of Hewitt Rd. & South of Hwy. 4

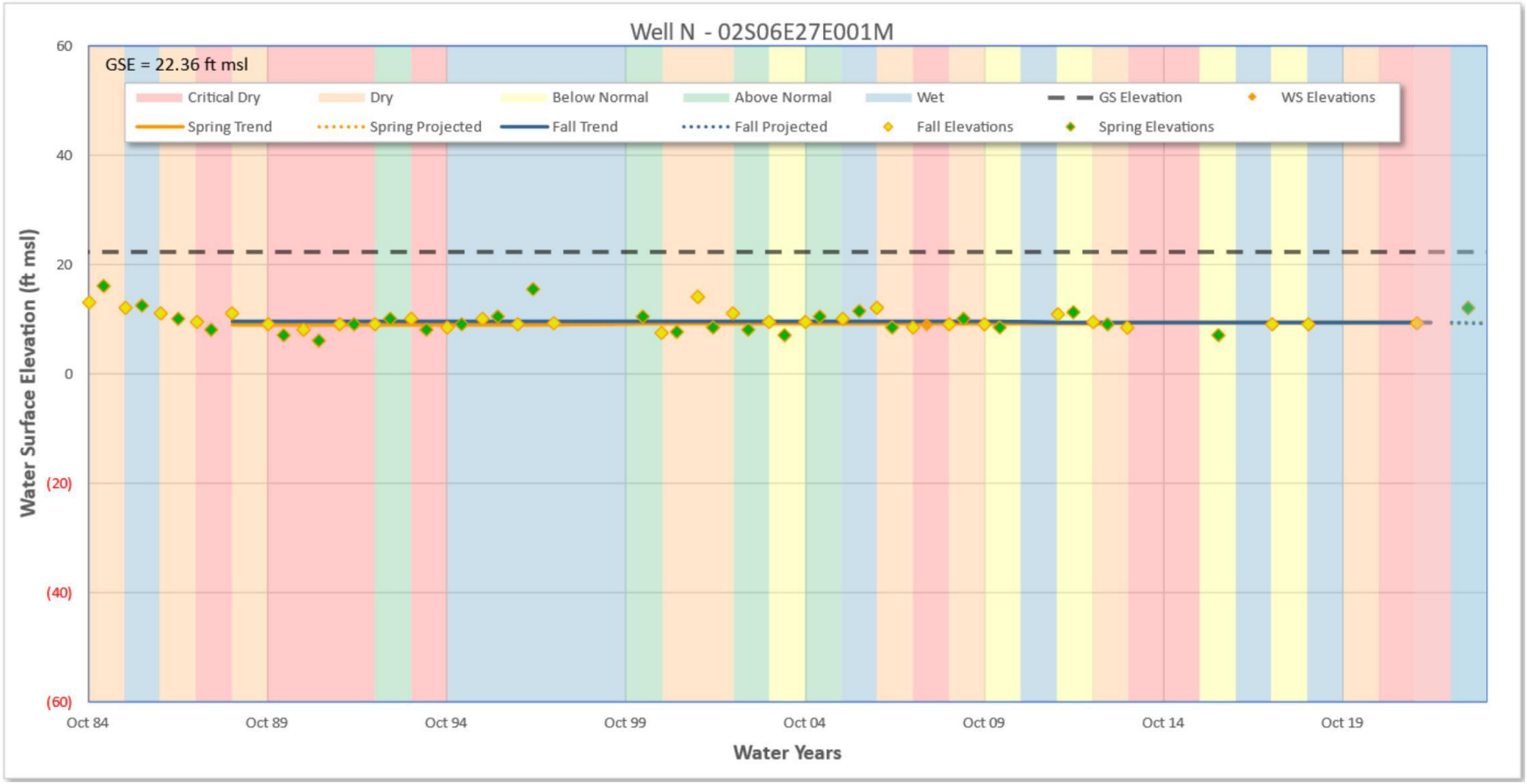


Figure 4-16 Hydrograph Well N - West of Wright Rd. & North of Kasson Rd.

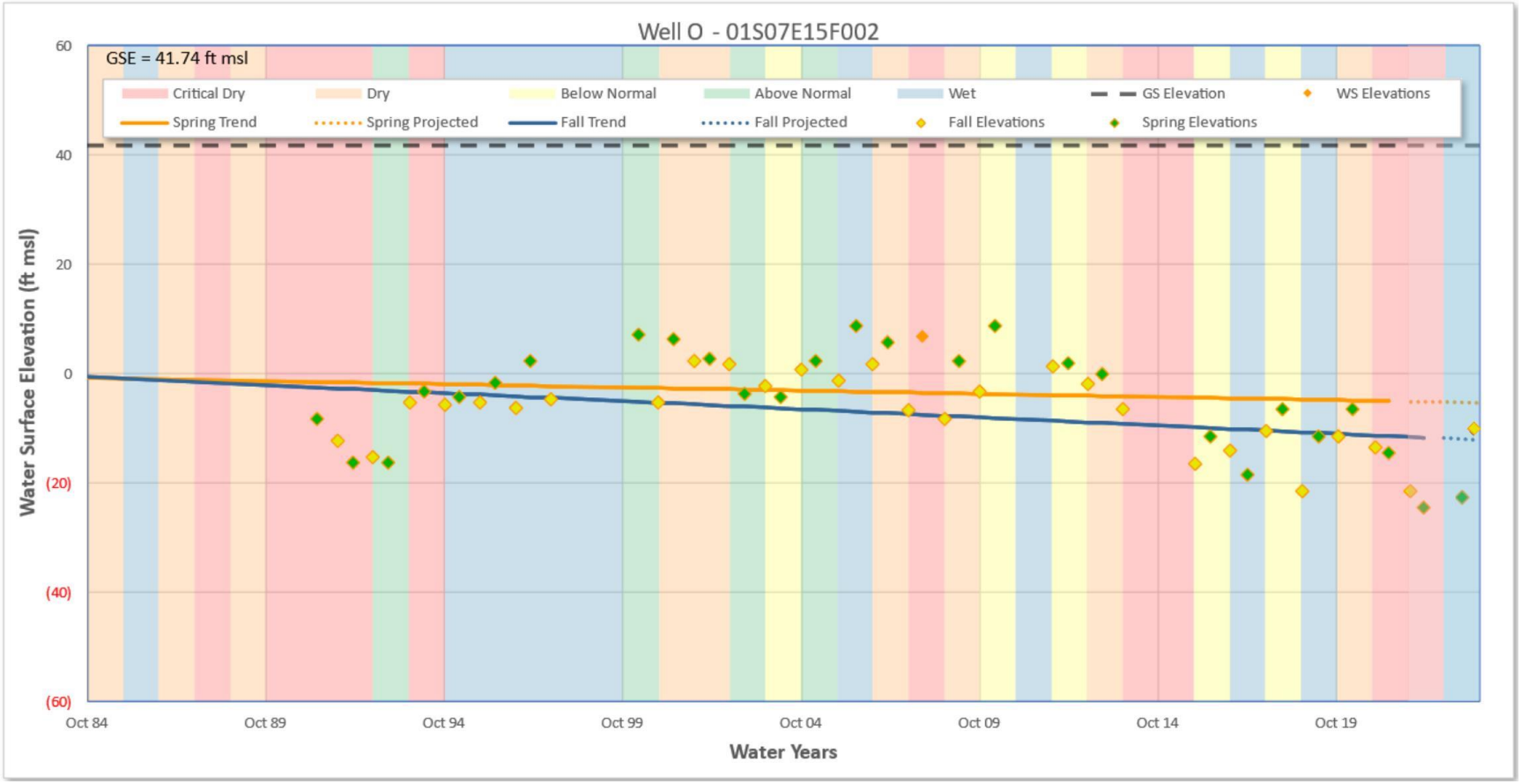


Figure 4-17 Hydrograph Well O – West of Austin Rd. & North of French Camp Rd.

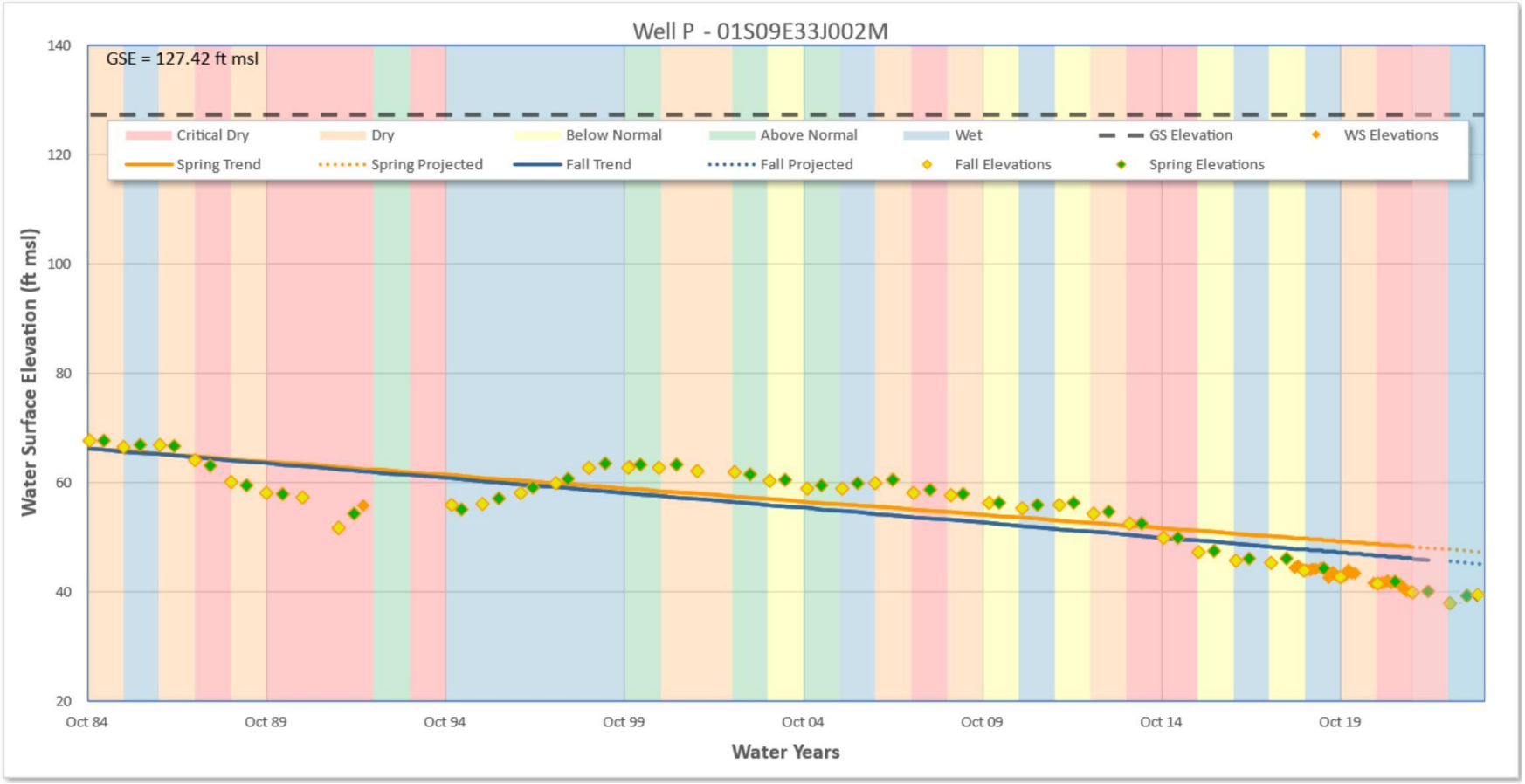


Figure 4-18 Hydrograph Well P - West of Campbell Ave. & North of Hwy 120.

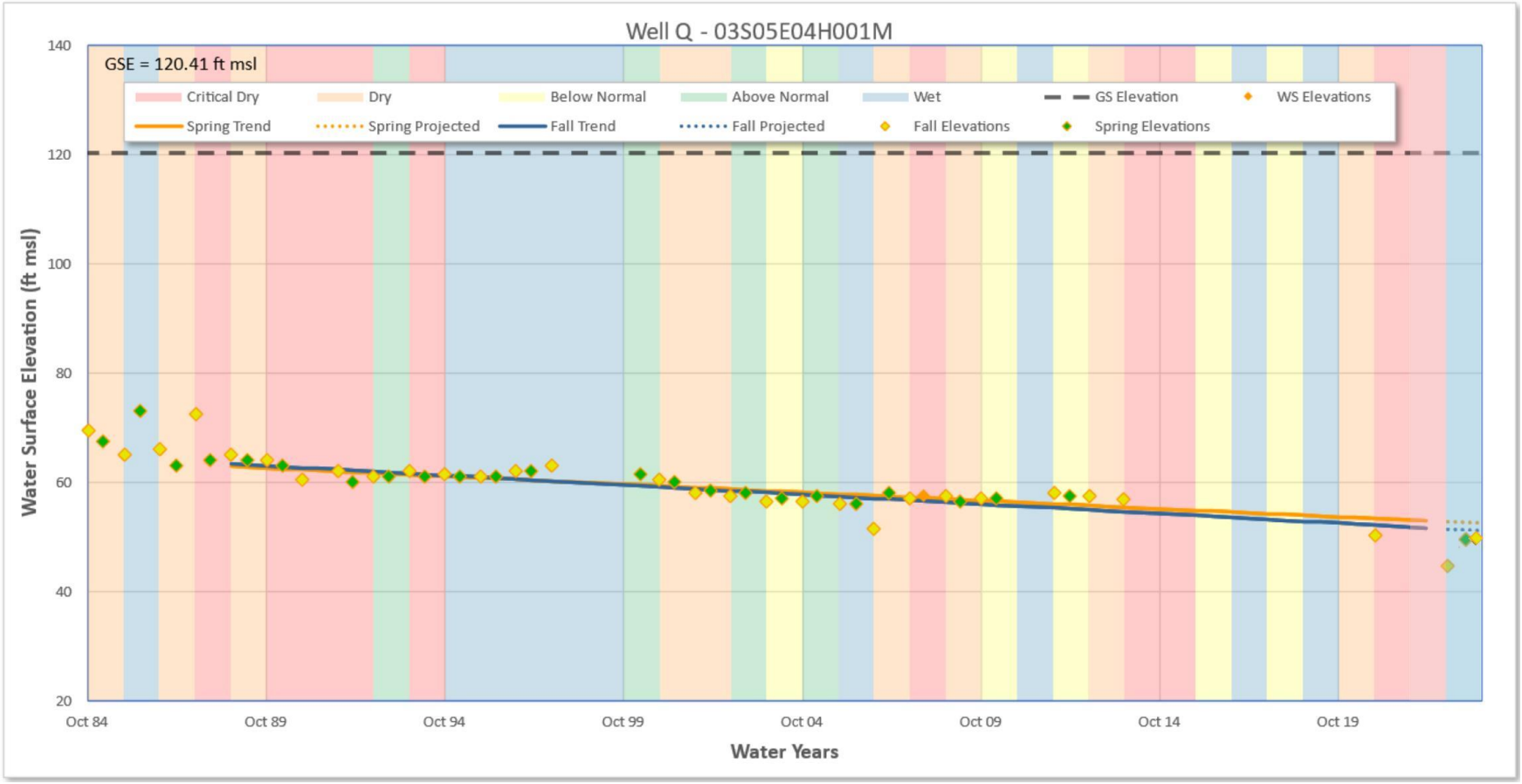


Figure 4-19 Hydrograph Well Q - East of McArthur Rd. & North of Darlene Rd.

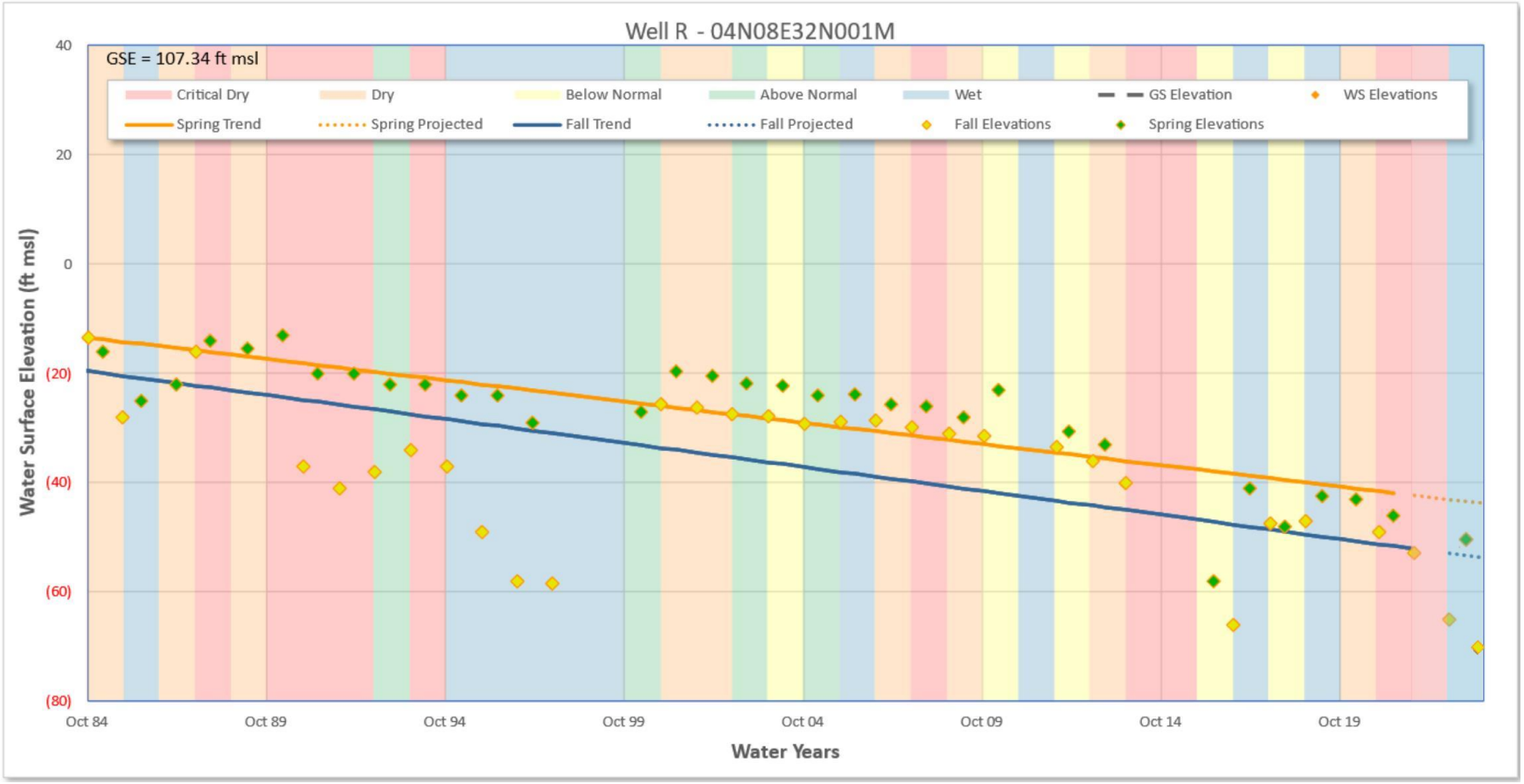


Figure 4-20 Hydrograph Well R - West of Tully Rd. & North of Brandt Rd.

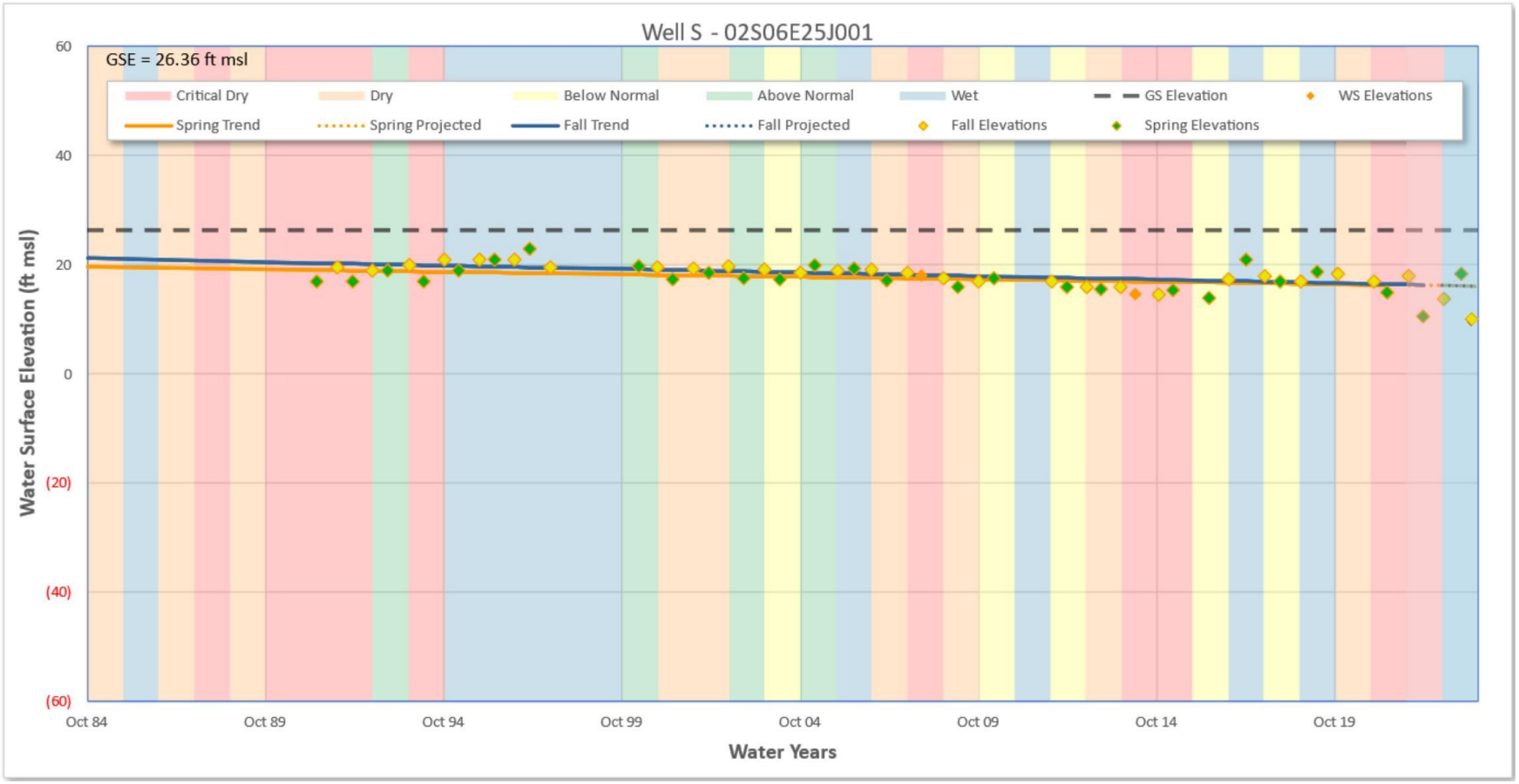


Figure 4-21 Hydrograph Well S - East of Hays Rd. & North of Mullin Rd.

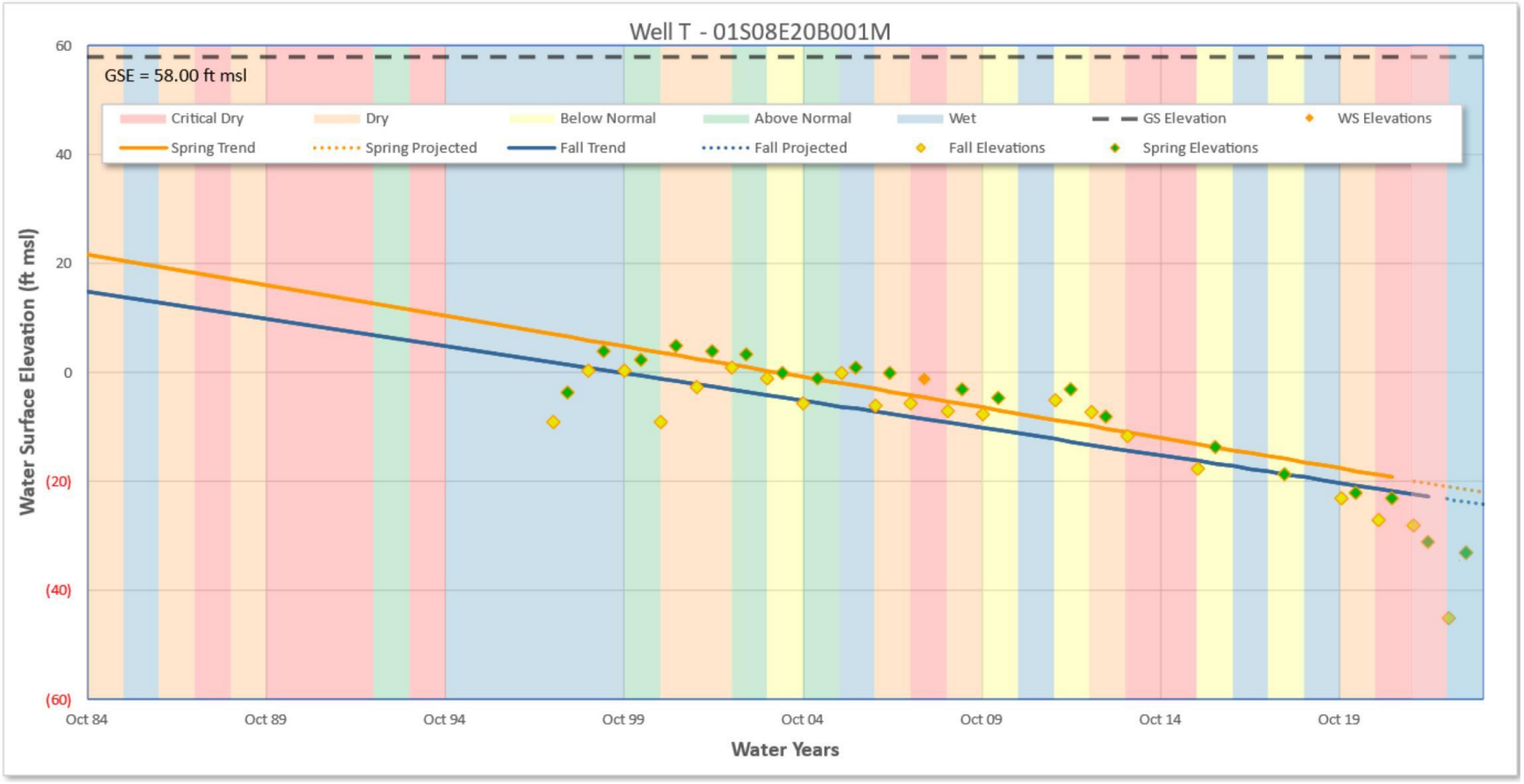


Figure 4-22 Hydrograph Well T - West of Murphy Rd. & South of Avena Rd.

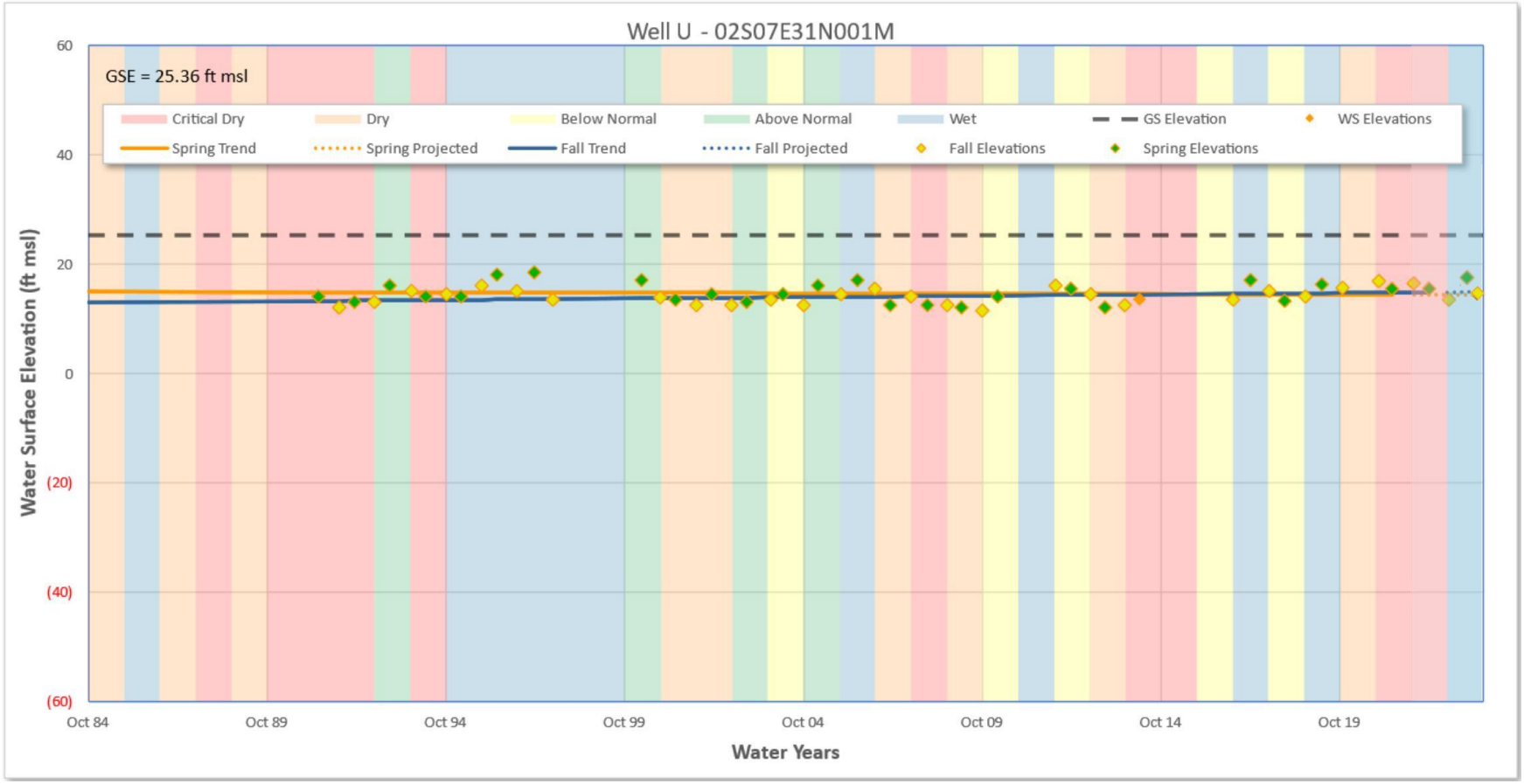


Figure 4-23 Hydrograph Well U - East of Airport Rd. & South of Perrin Rd.

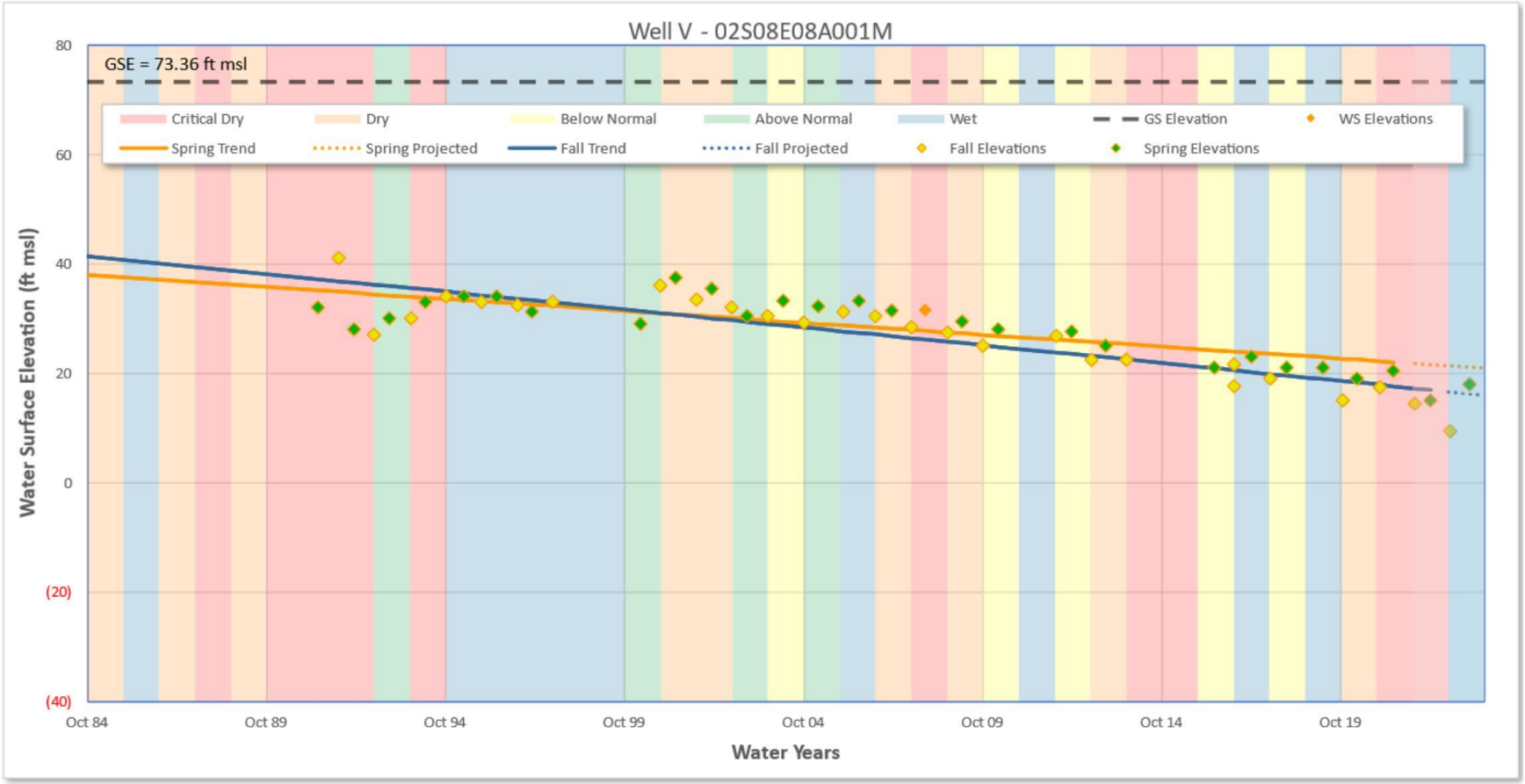


Figure 4-24 Hydrograph Well V - East of Murphy Rd. & South of Cedar Ln.

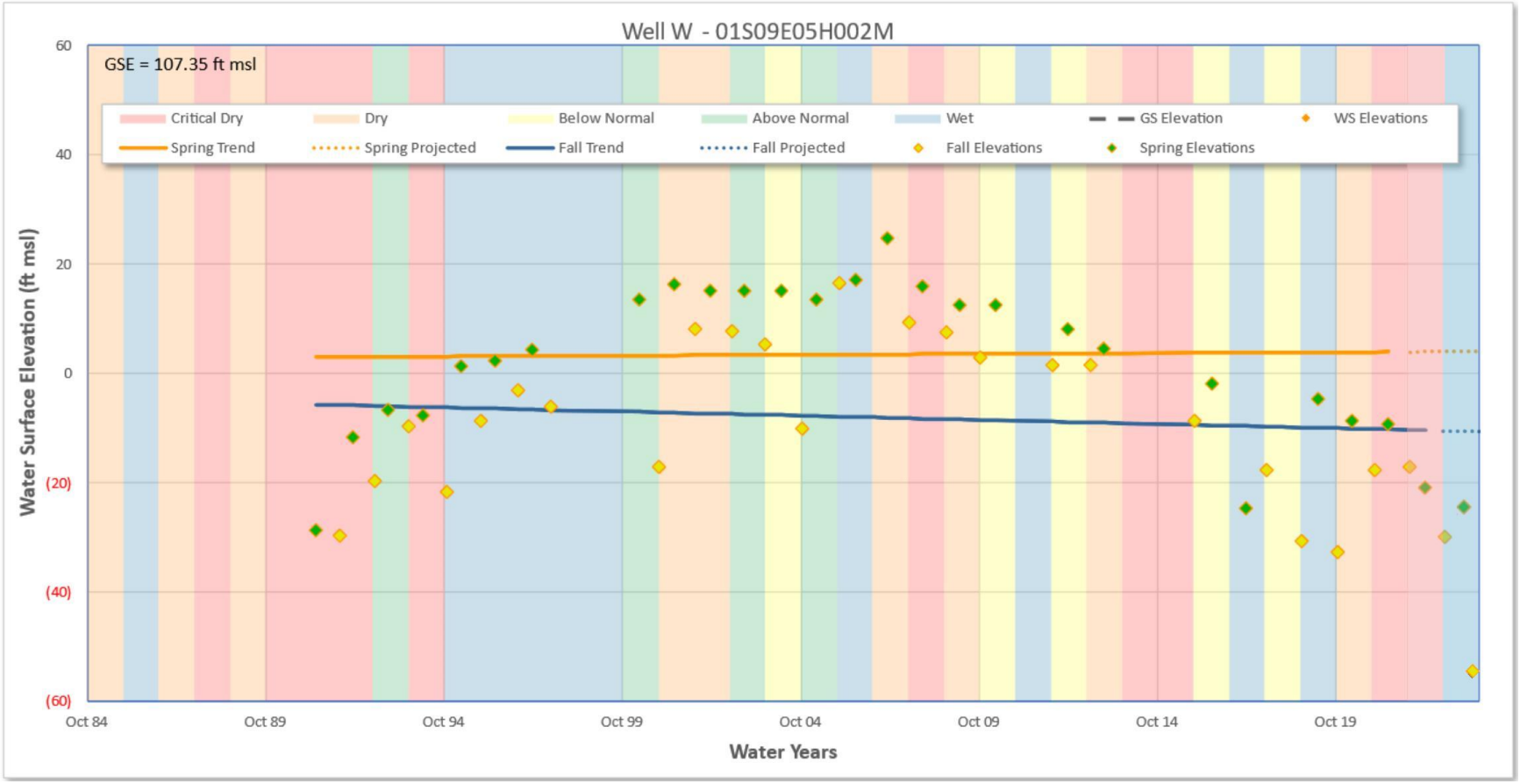


Figure 4-25 Hydrograph Well W - West of Henry Rd. & South of Sonora Rd.

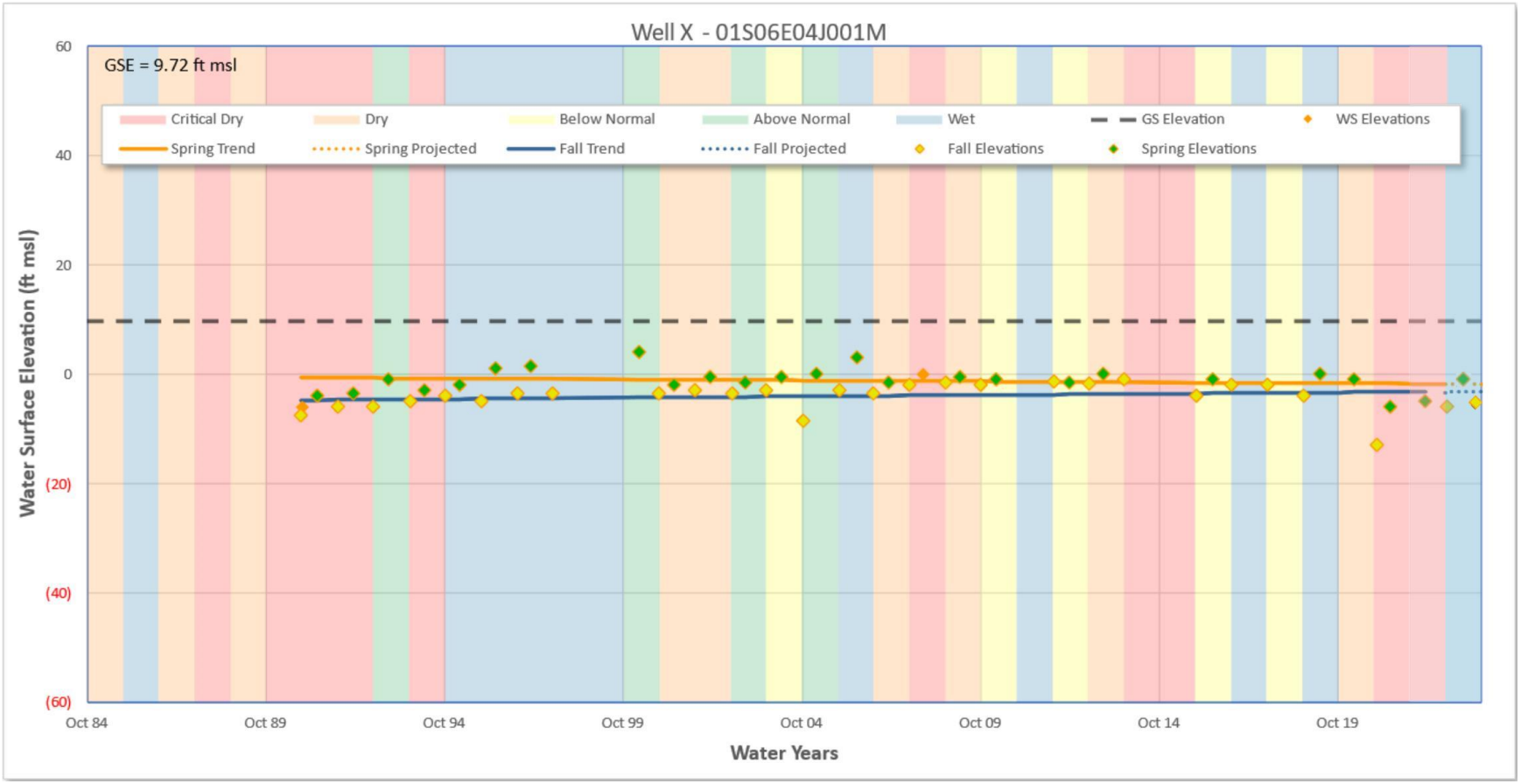


Figure 4-26 Hydrograph Well X - East of Wolfe Rd. & South of Howard Rd.

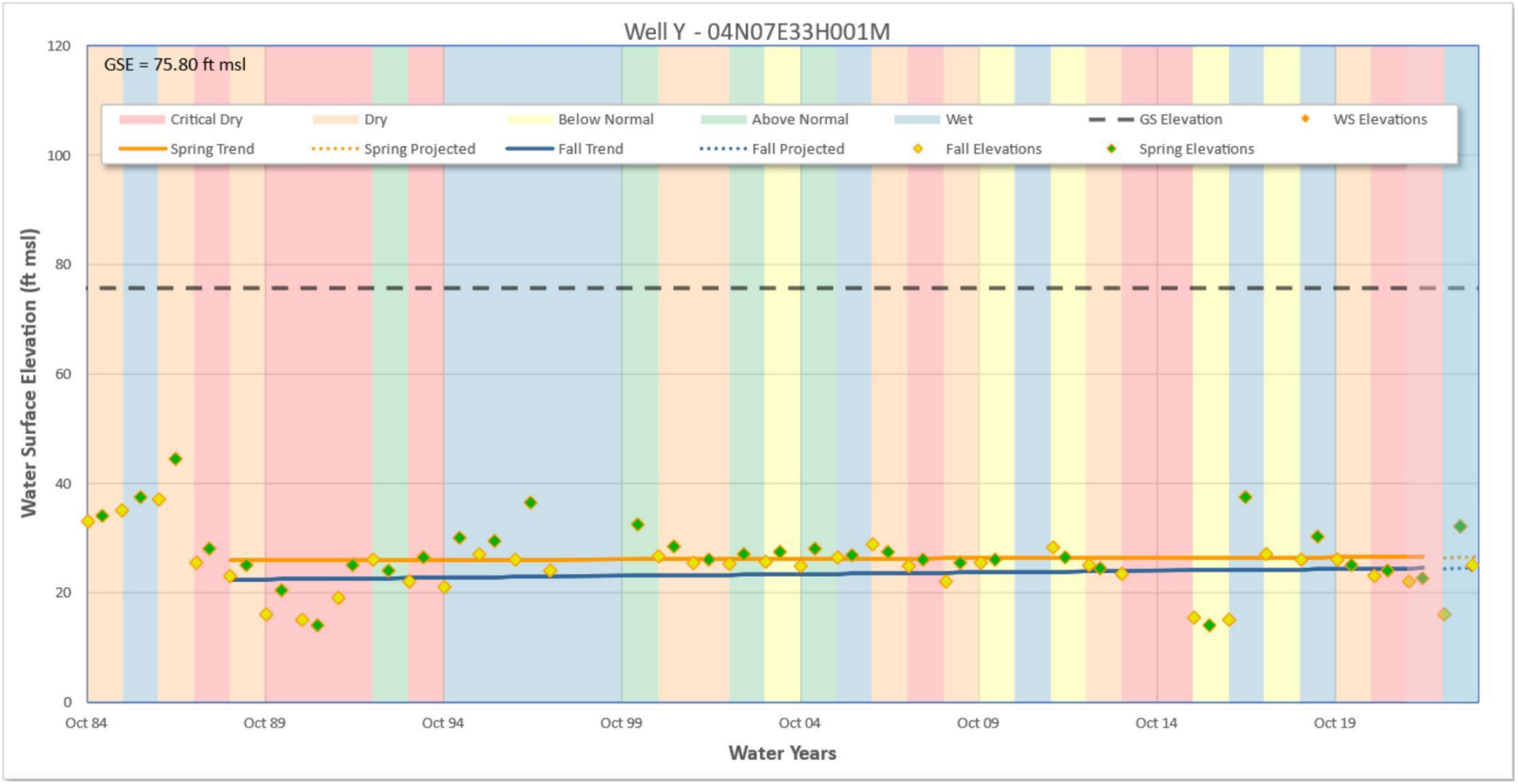


Figure 4-27 Hydrograph Well Y - East of Bruella Rd. & North of Schmiedt Rd.

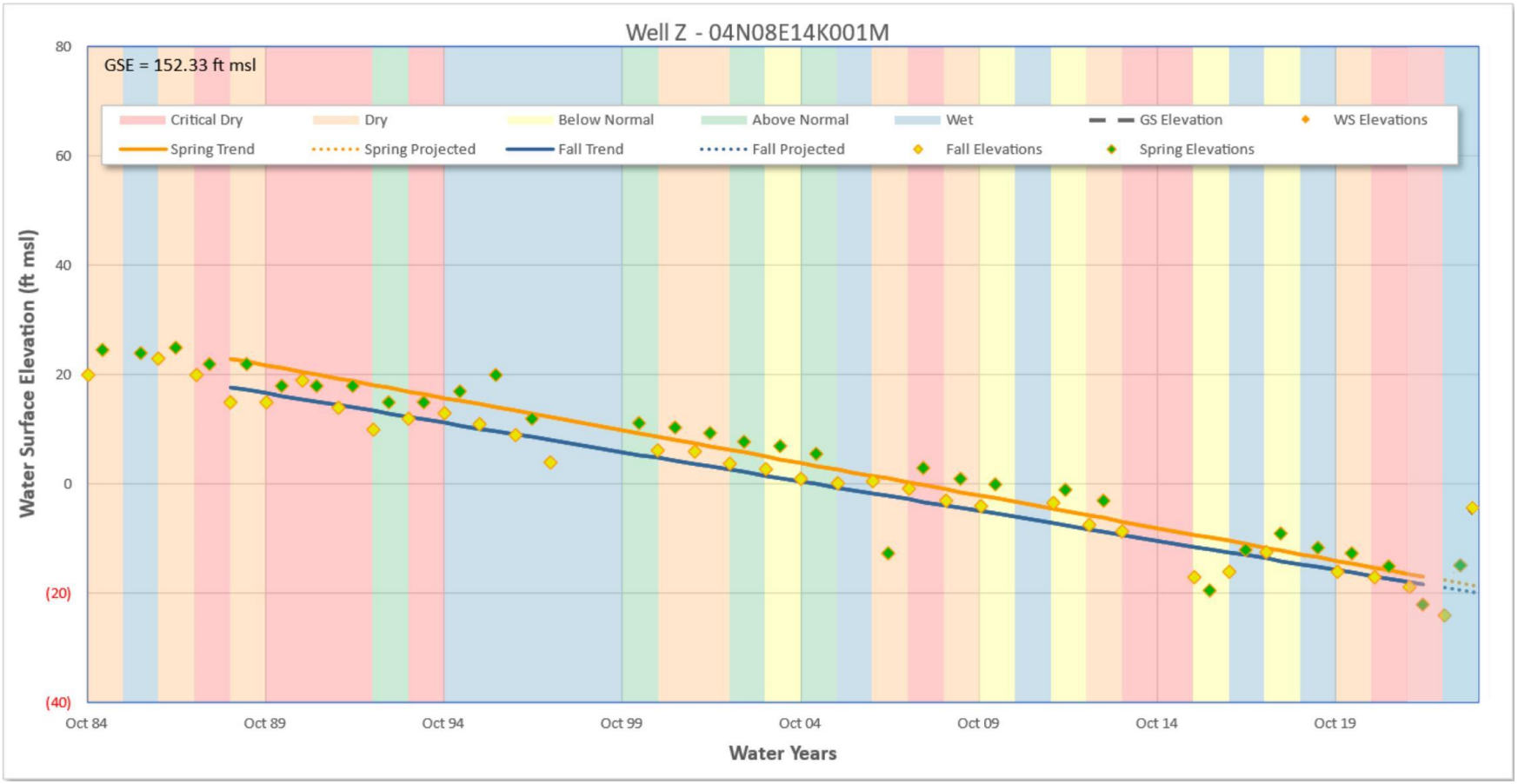


Figure 4-28 Hydrograph Well Z - East of Johnson Rd. & South of Route 1

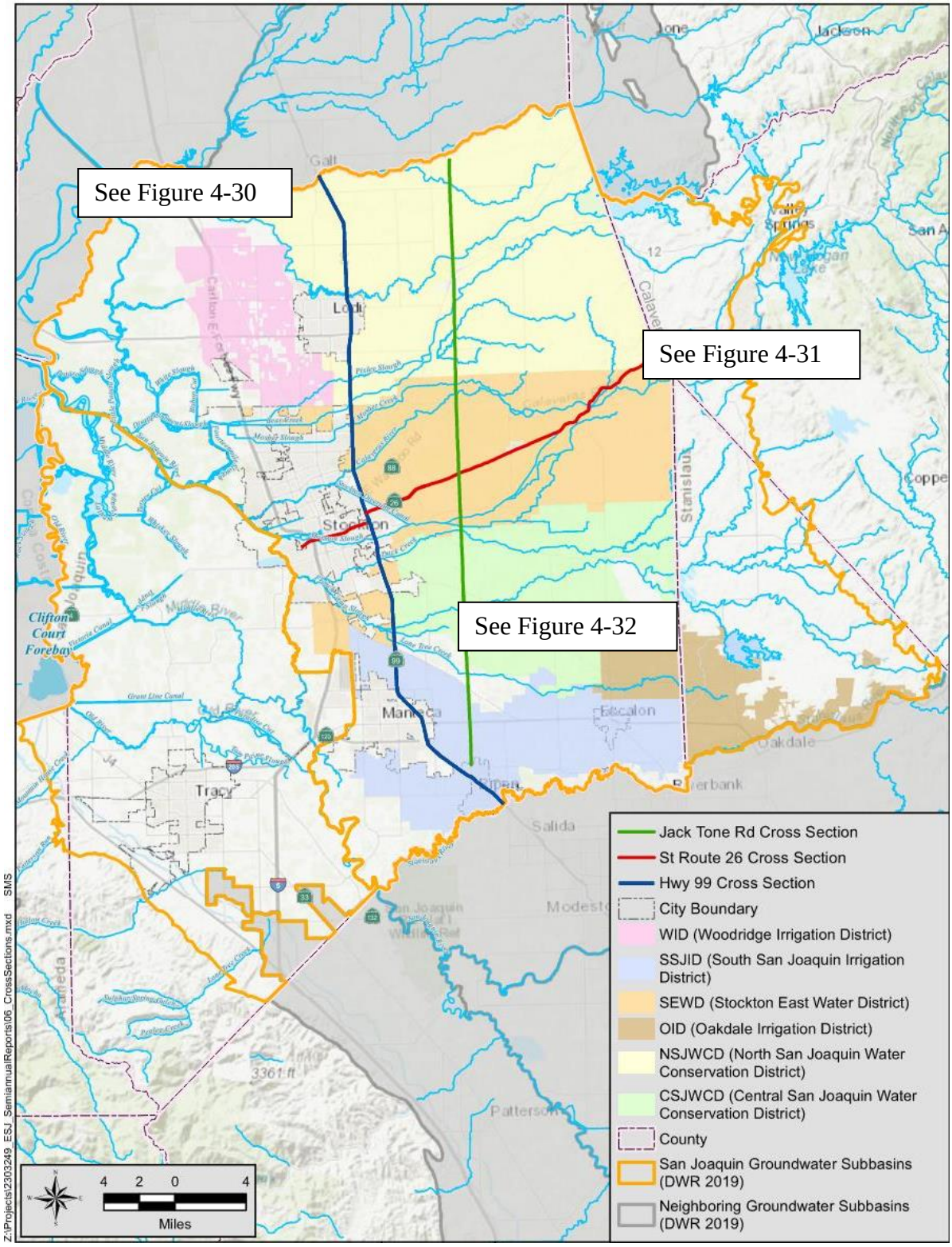


Figure 4-29 Groundwater Surface Cross Sections

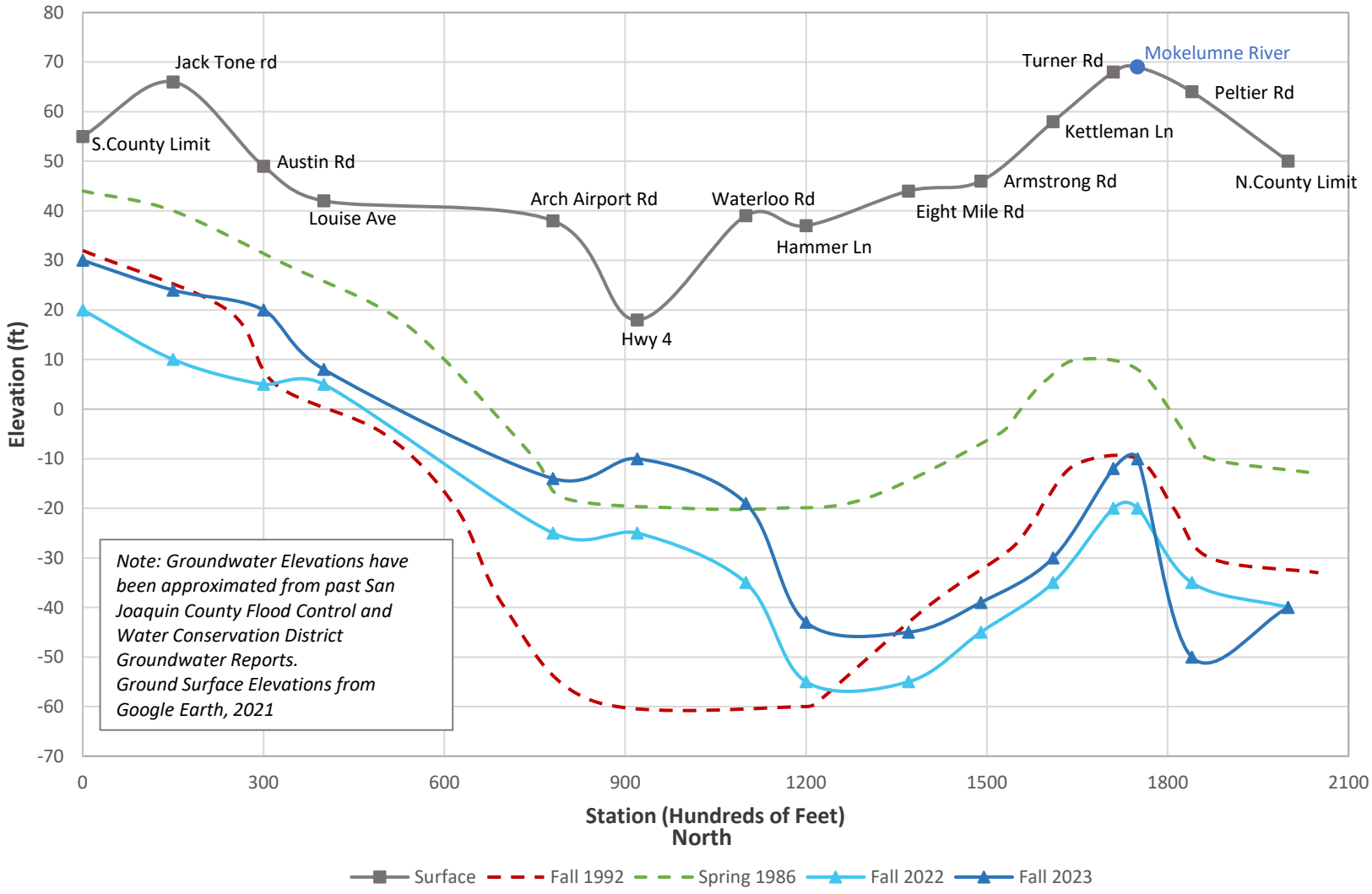


Figure 4-30 Highway 99 Cross Section Fall 2023

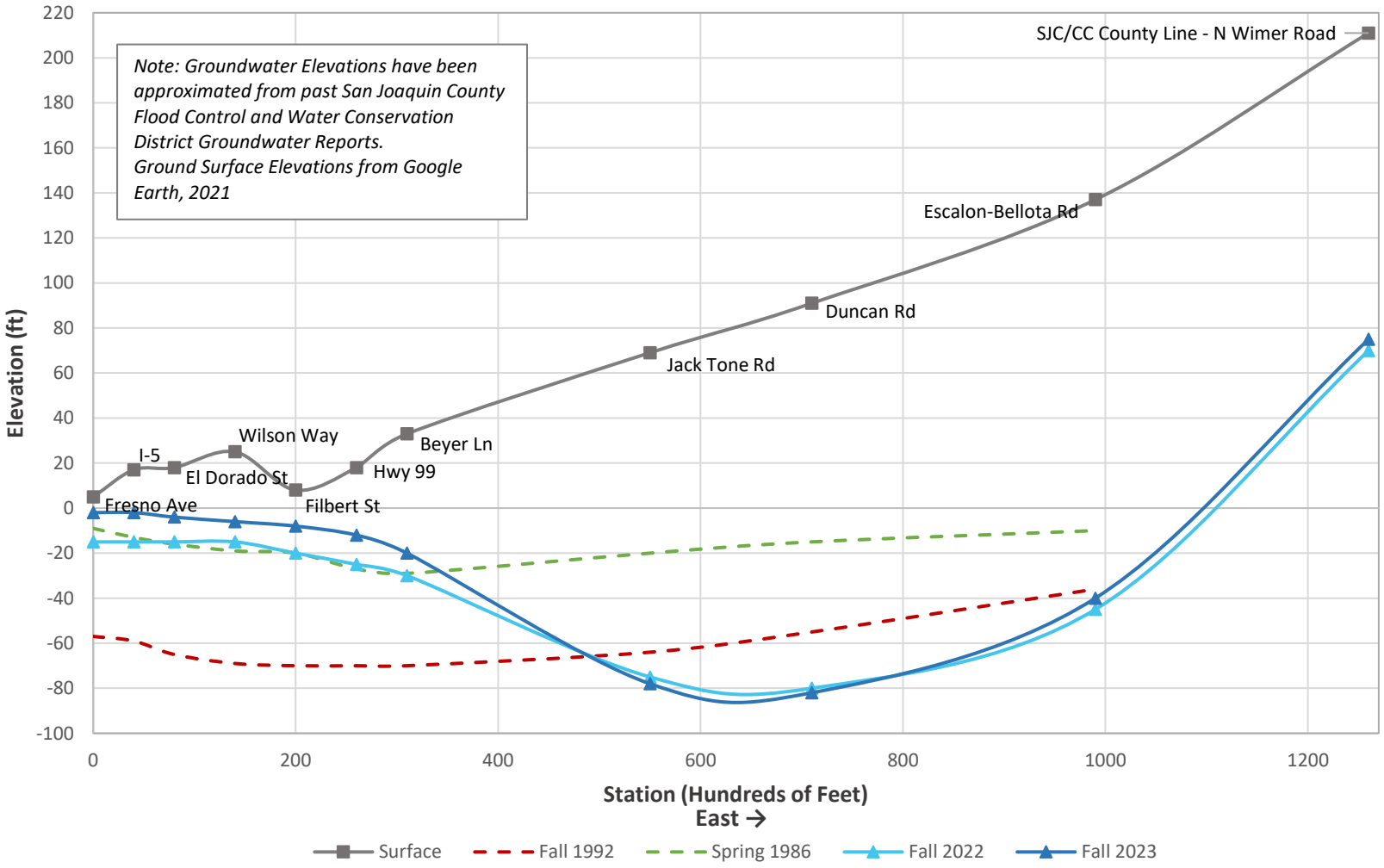


Figure 4-31 Highway 4 & Highway 26 Cross Section Fall 2023

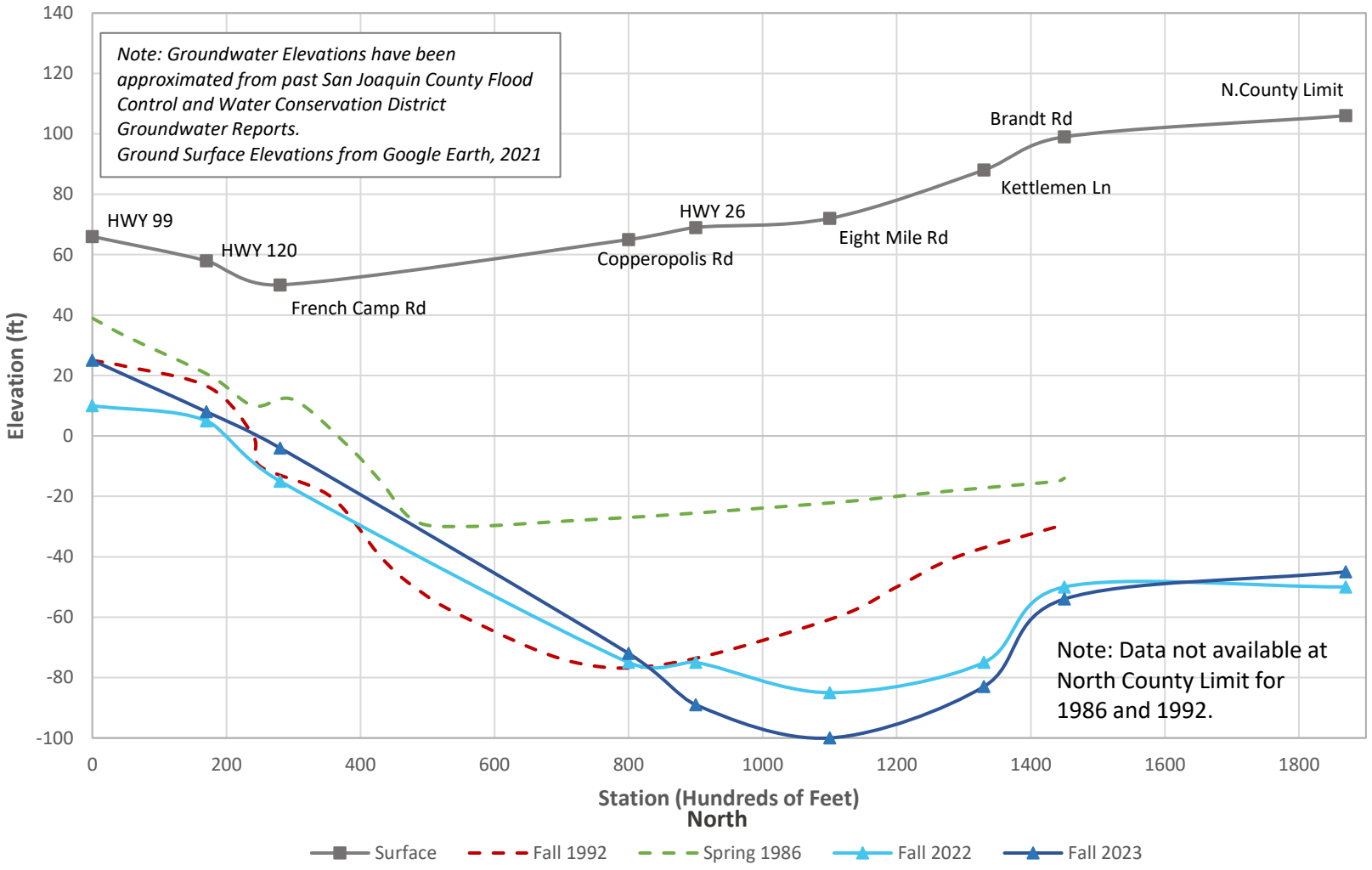


Figure 4-32 Jack Tone Rd Cross Section Fall 2023

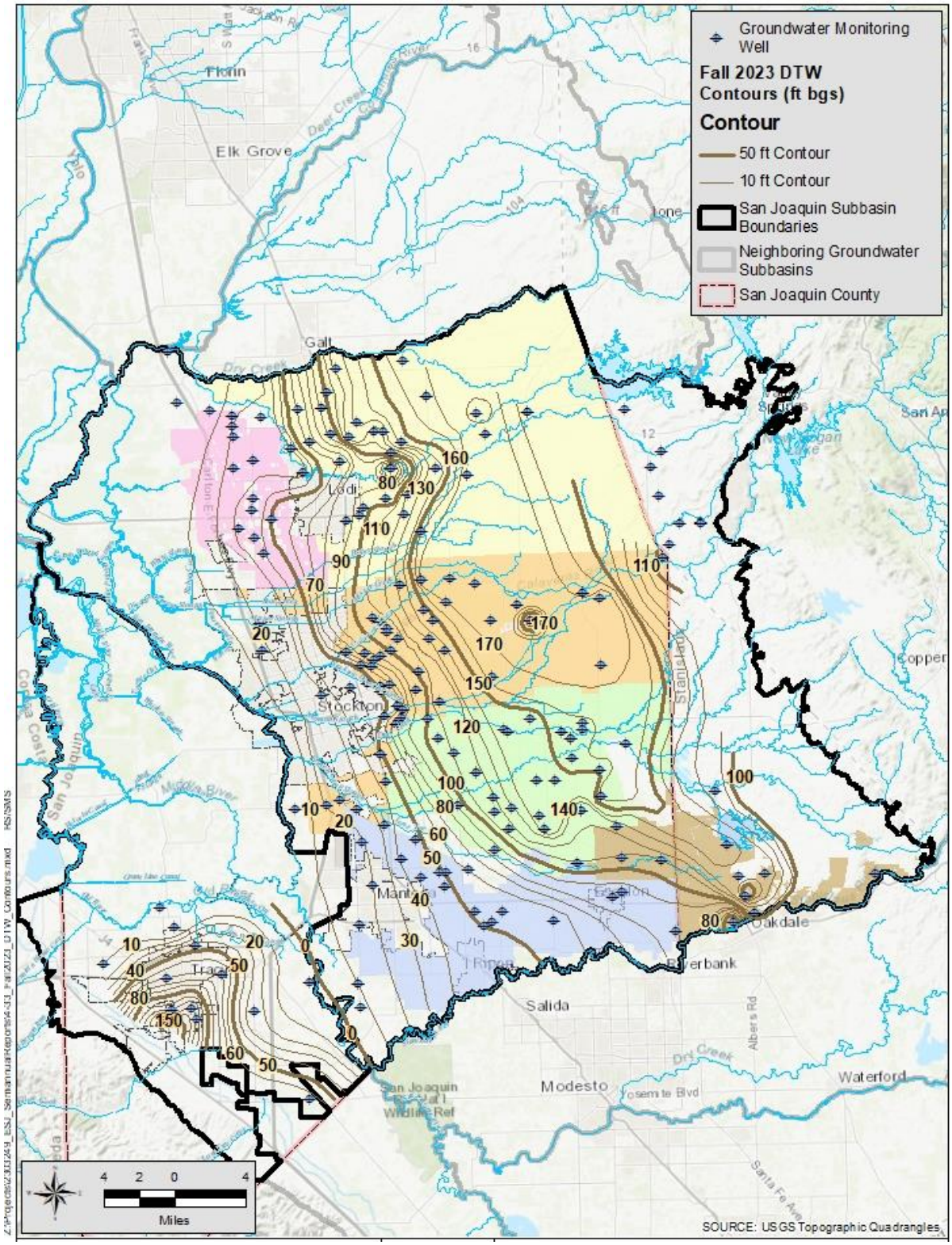


Figure 4-33 Depth to Groundwater – Fall 2023

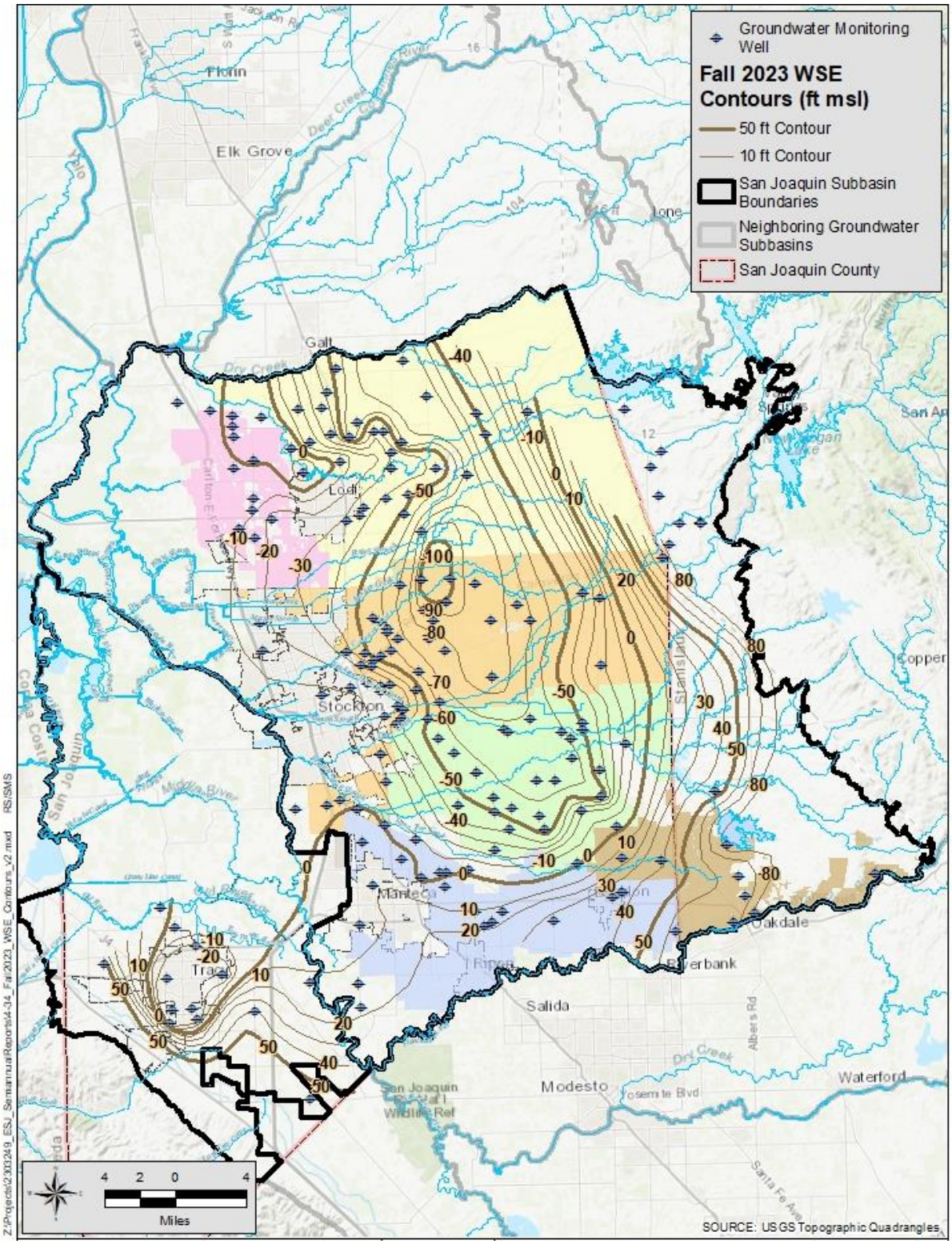


Figure 4-34 Groundwater Surface Elevation – Fall 2023

Note: Tracy Subbasin, only wells above the Corcoran Clay were used for contouring.

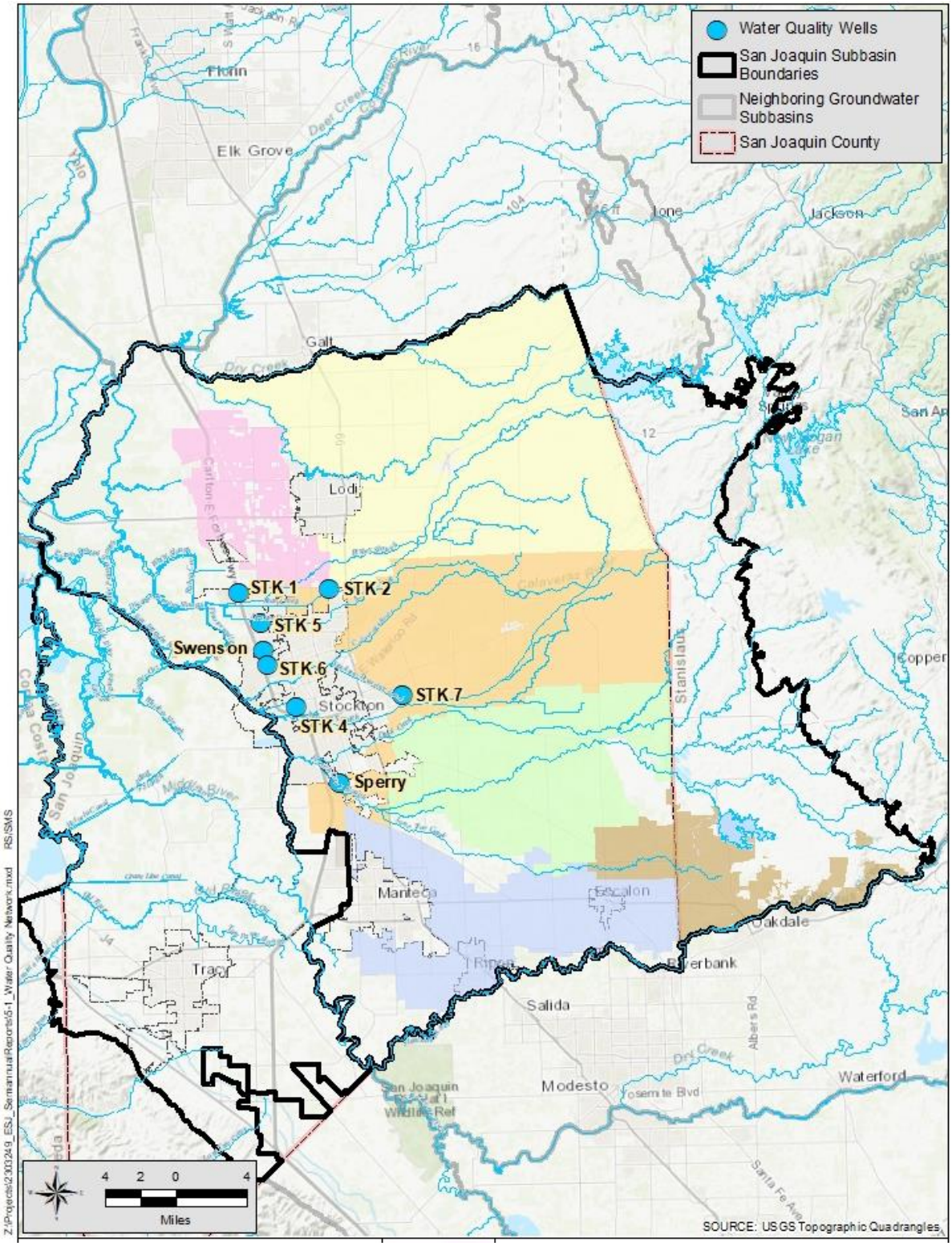
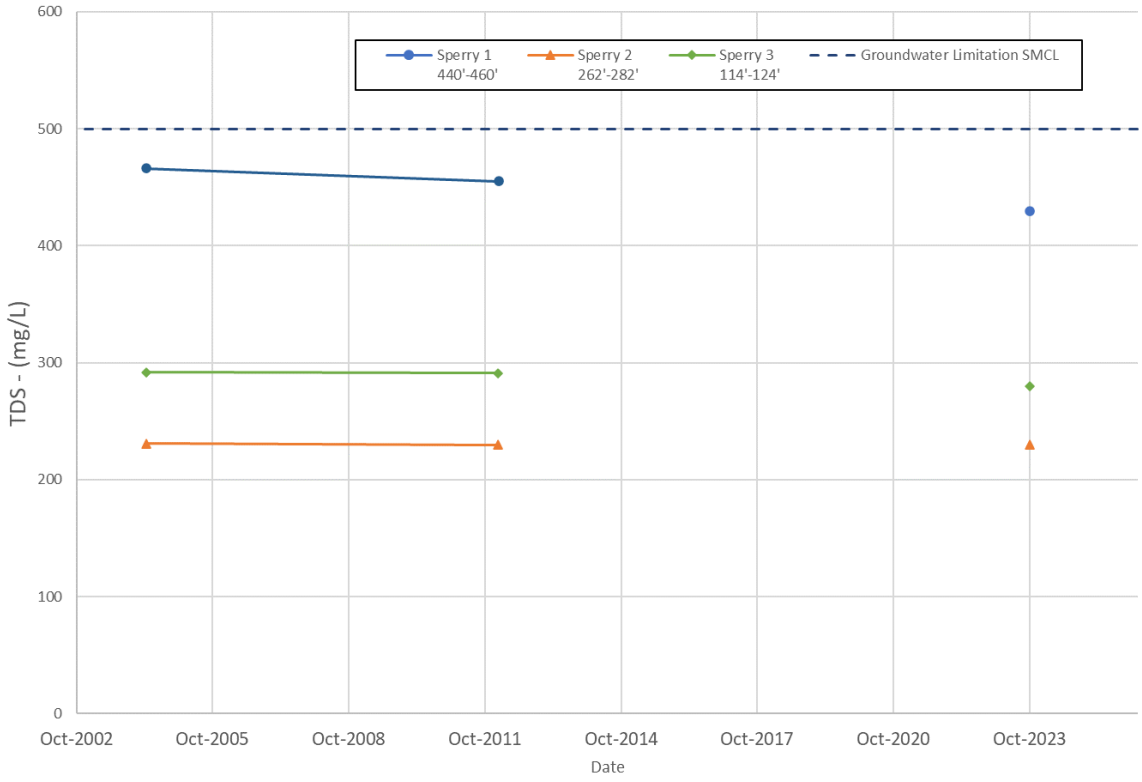


Figure 5-1 Groundwater Quality Network



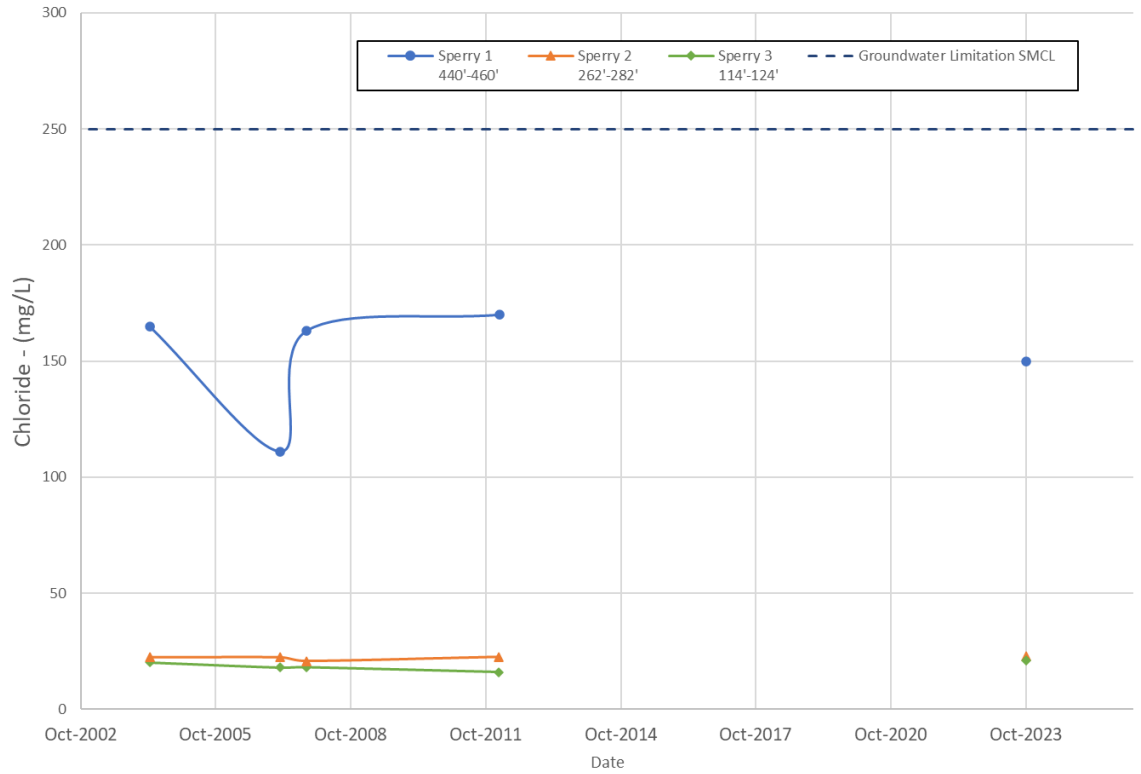


Figure 5-2 Water Quality – Sperry Well

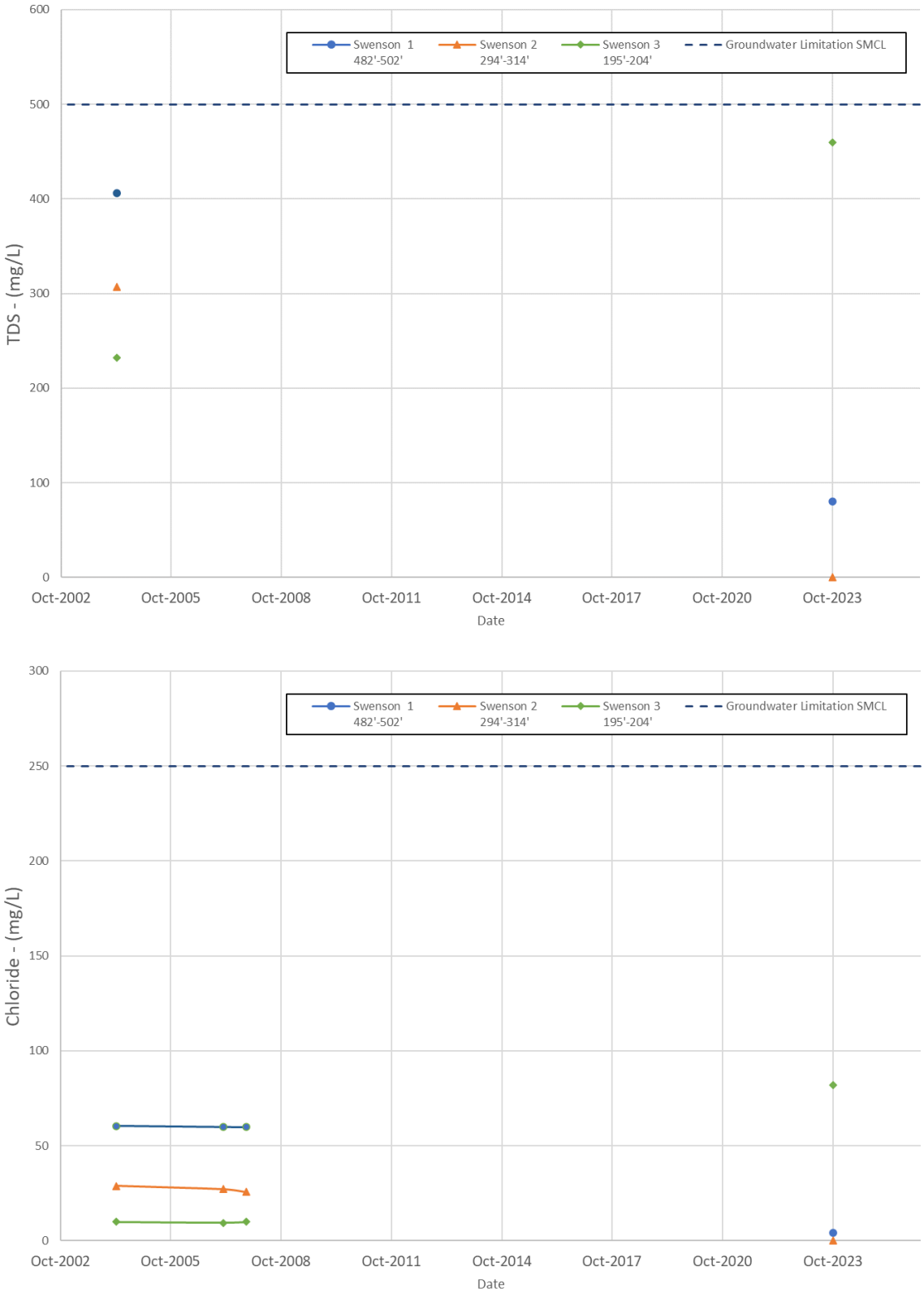


Figure 5-3 Water Quality – Swenson Well

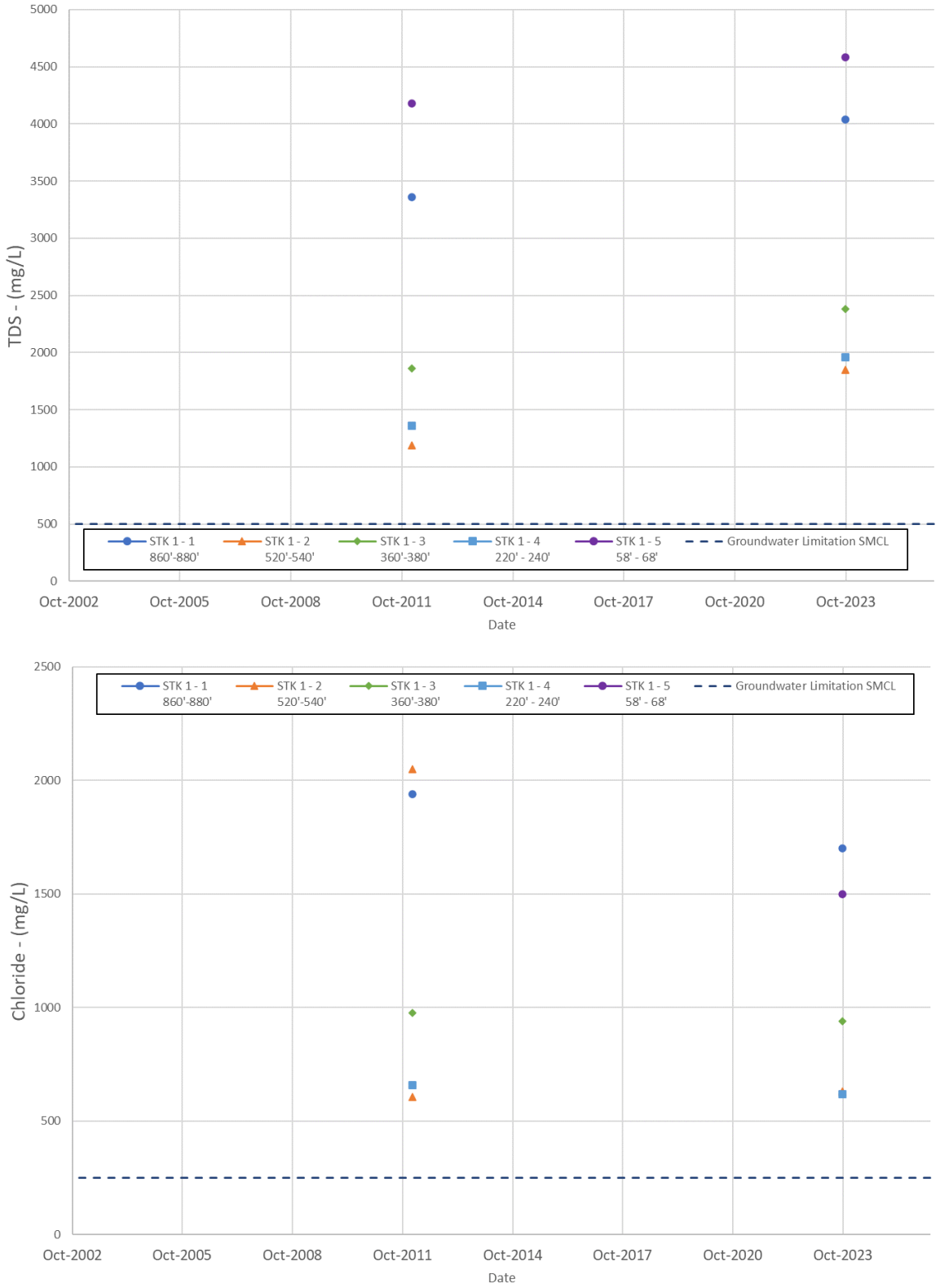


Figure 5-4 Water Quality – STK 1

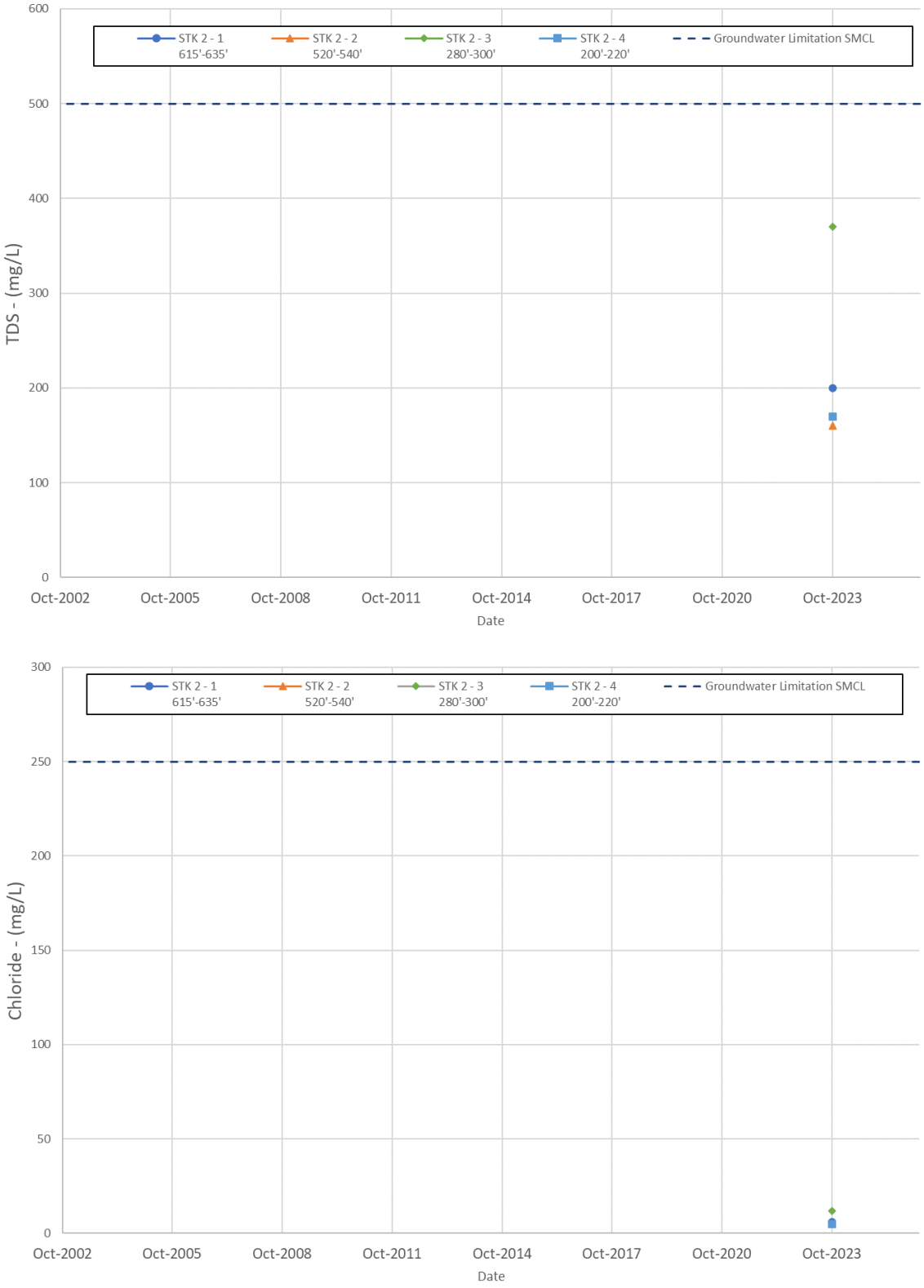
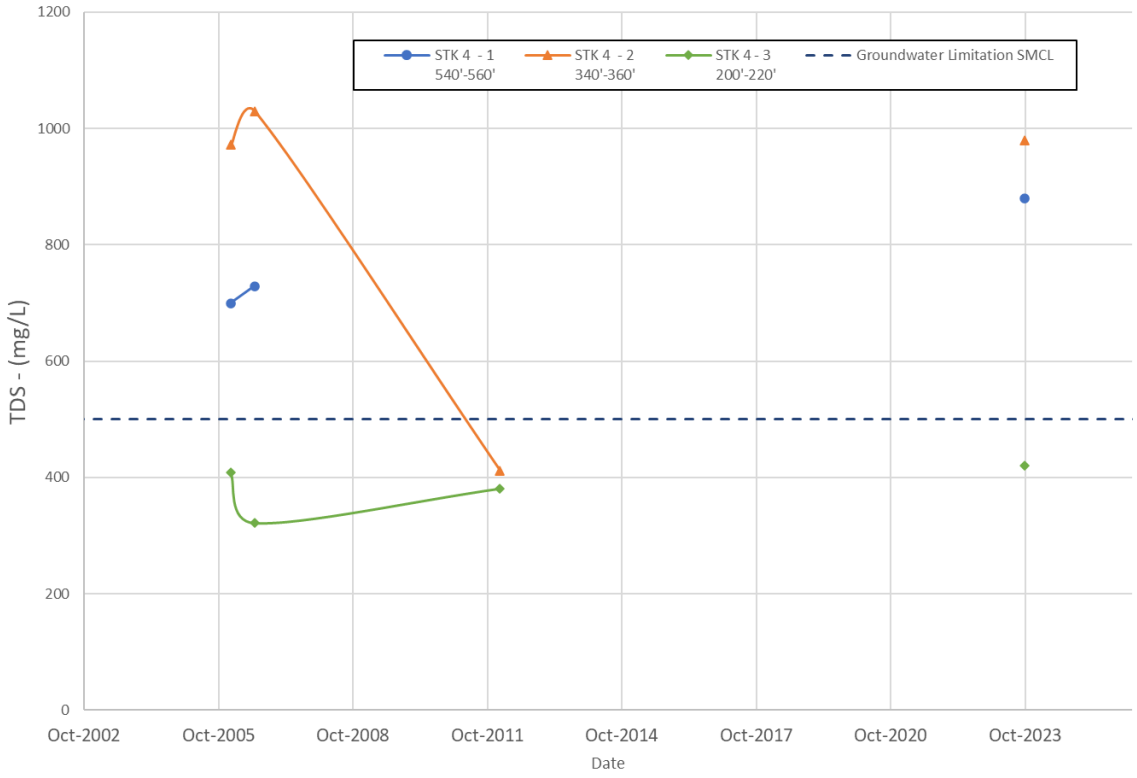


Figure 5-5 Water Quality – STK 2



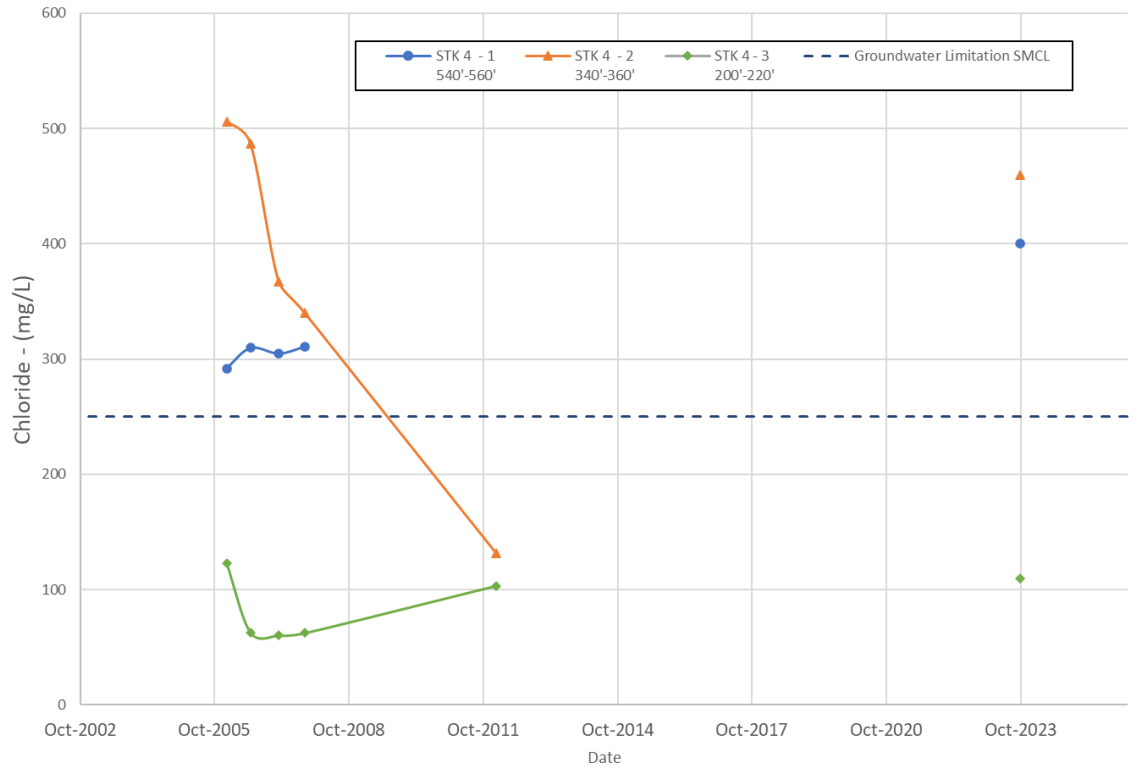


Figure 5-6 Water Quality – STK 4

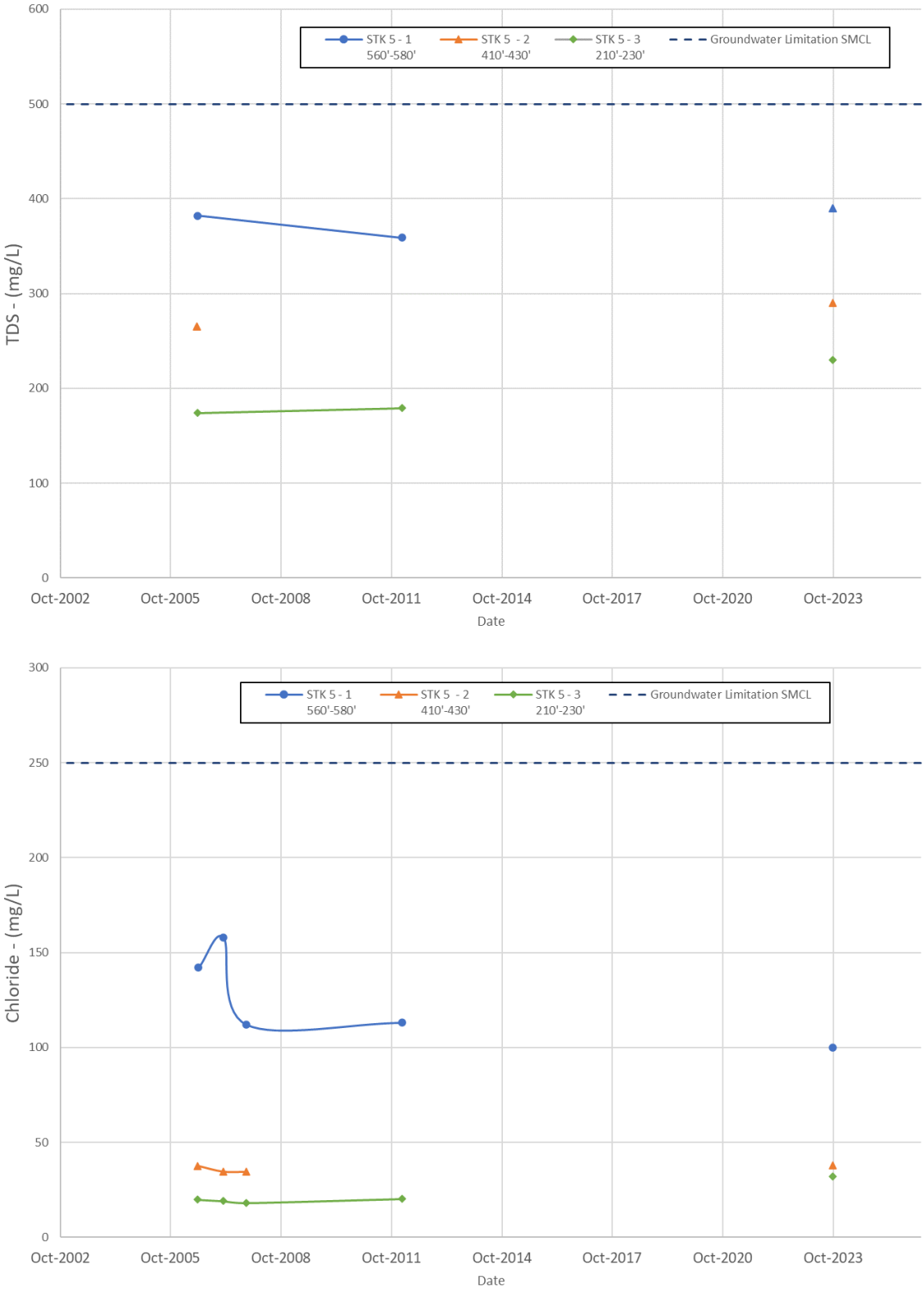


Figure 5-7 Water Quality – STK 5

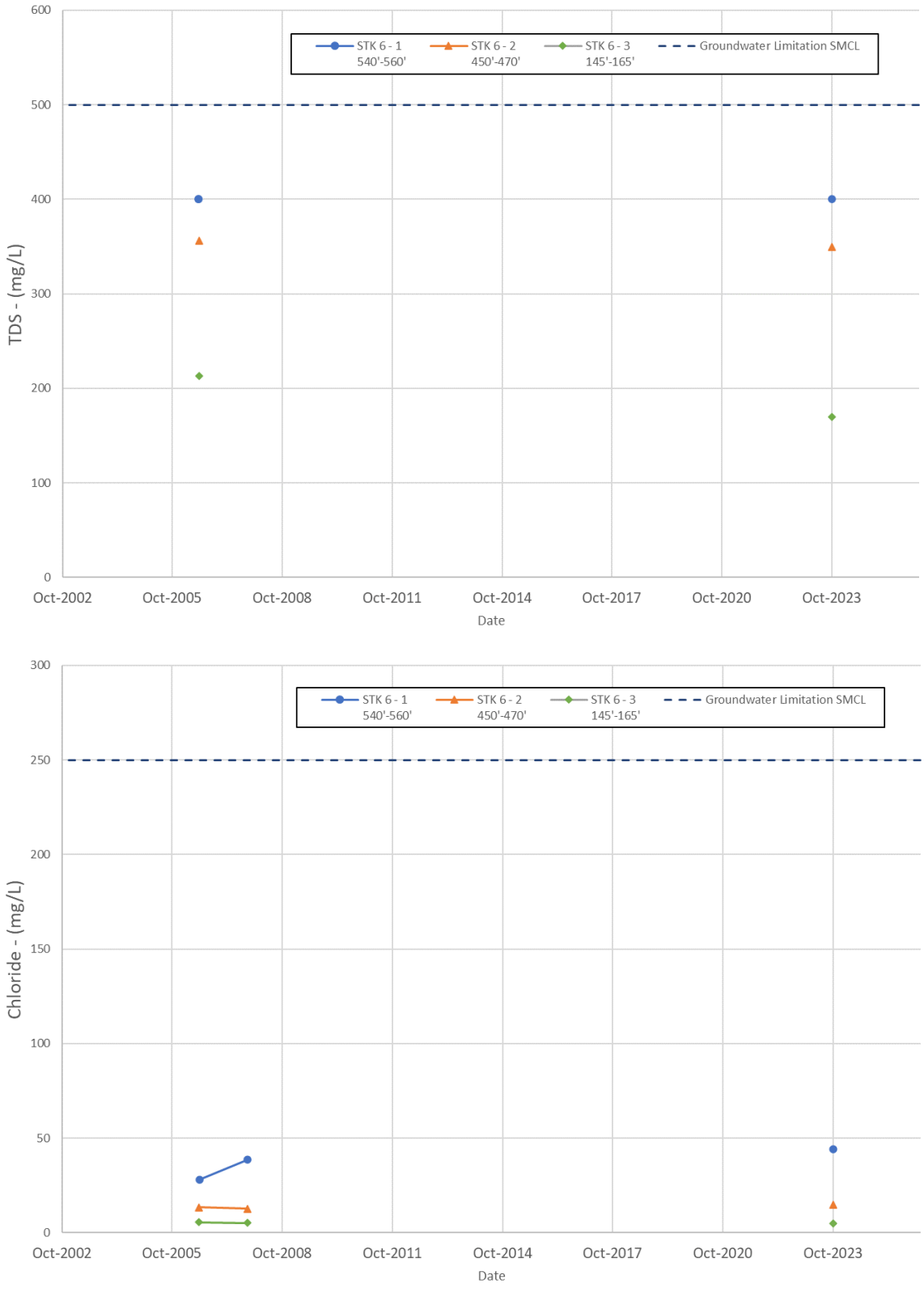


Figure 5-8 Water Quality – STK 6

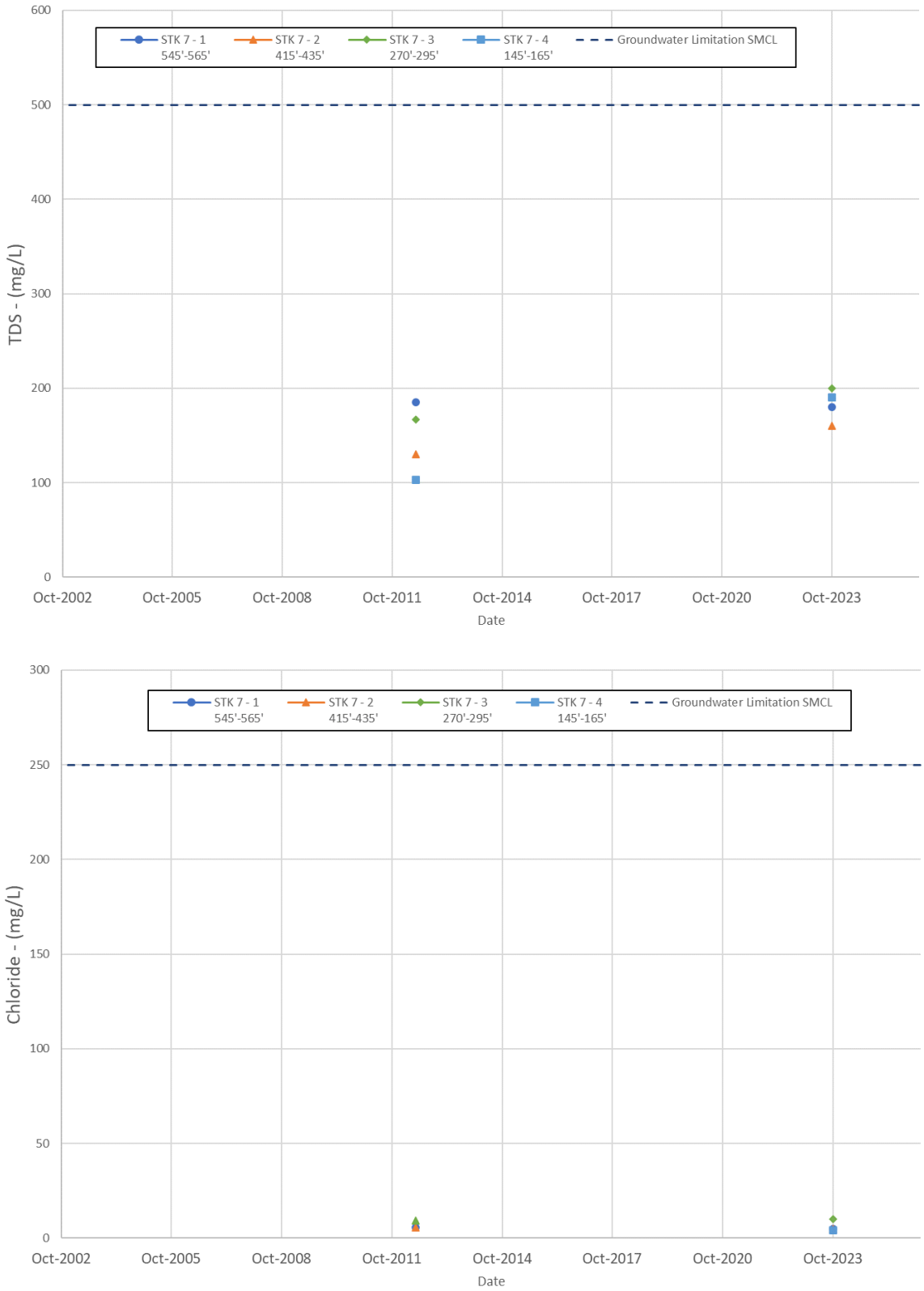


Figure 5-9 Water Quality – STK 7