Groundwater Report

Fall 2022

San Joaquin County

Flood Control and Water Conservation District

San Joaquin County

Flood Control and Water Conservation District

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Report Prepared by:

DISTRICT STAFF

Matt Zidar, Water Resources Manager

Justin Padilla, Engineering Assistant II

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Copies of the 2022 Fall Groundwater Report may be available upon request from:

San Joaquin County Department of Public Works
P.O. Box 1810 Stockton, California 95201

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

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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 including 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. Water level data is collected on a semi-annual basis, during the months of April 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 bi-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 the 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, from approximately twelve (12) municipal and domestic supply wells (exact number varies from year to year) located in proximity to the saline front.

1.2 Procedure

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

Groundwater quality sampling is conducted on an annual basis during the month of October, along with the Fall measurements.

2 Rainfall Distribution

The two groundwater basins in the County (Tracy and Eastern San Joaquin) respond in part to changes in annual precipitation. There are four 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 stations currently providing data. The precipitation from west to east, is presented on Figures 2-2 through 2-7. 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 2022, rainfall was about 70 to 95 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 2022, is the end of the 2022 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 2022 was preliminarily classified by DWR as a Critical Year with 1.56 maf.

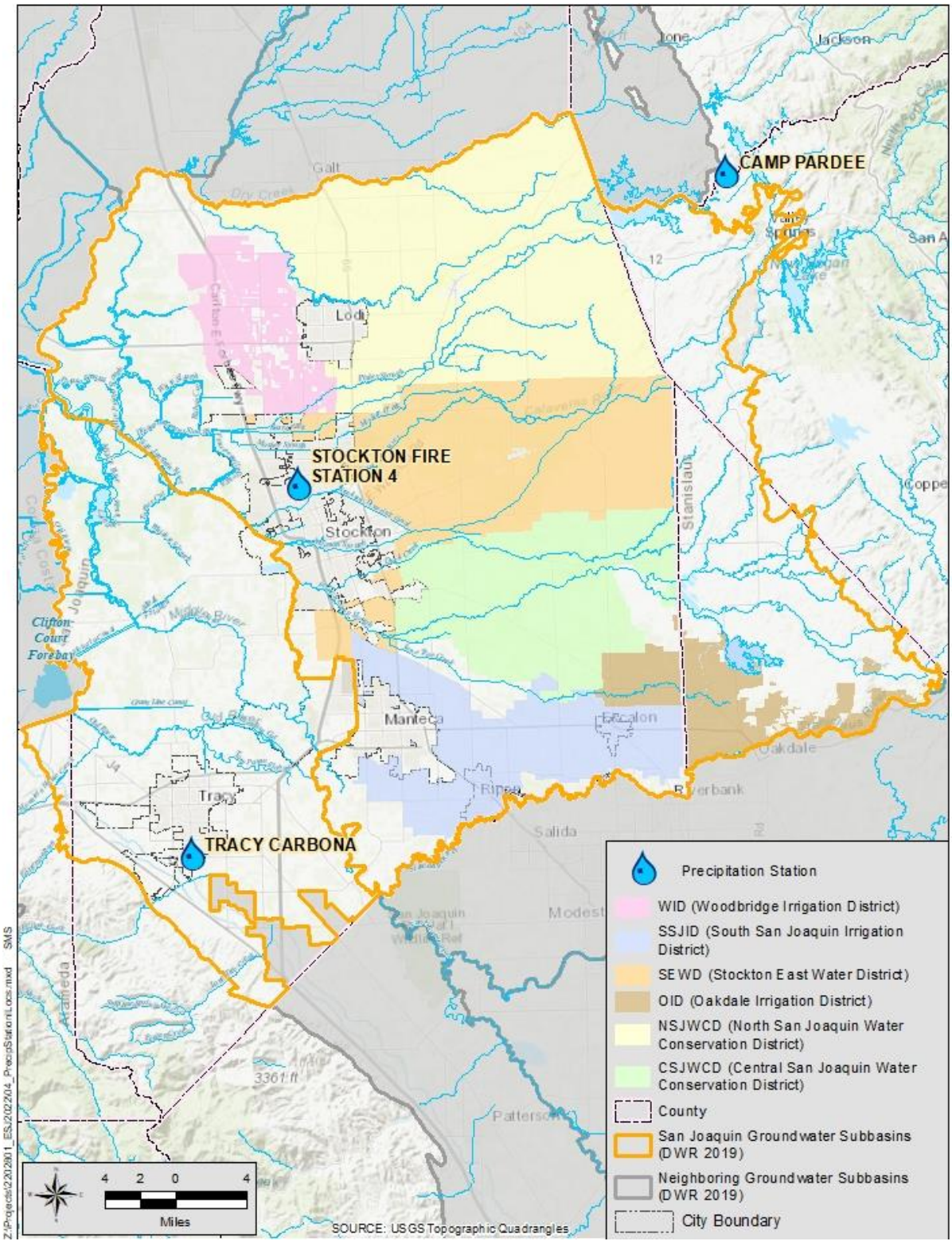

Figure 2-1 Precipitation Station Locations

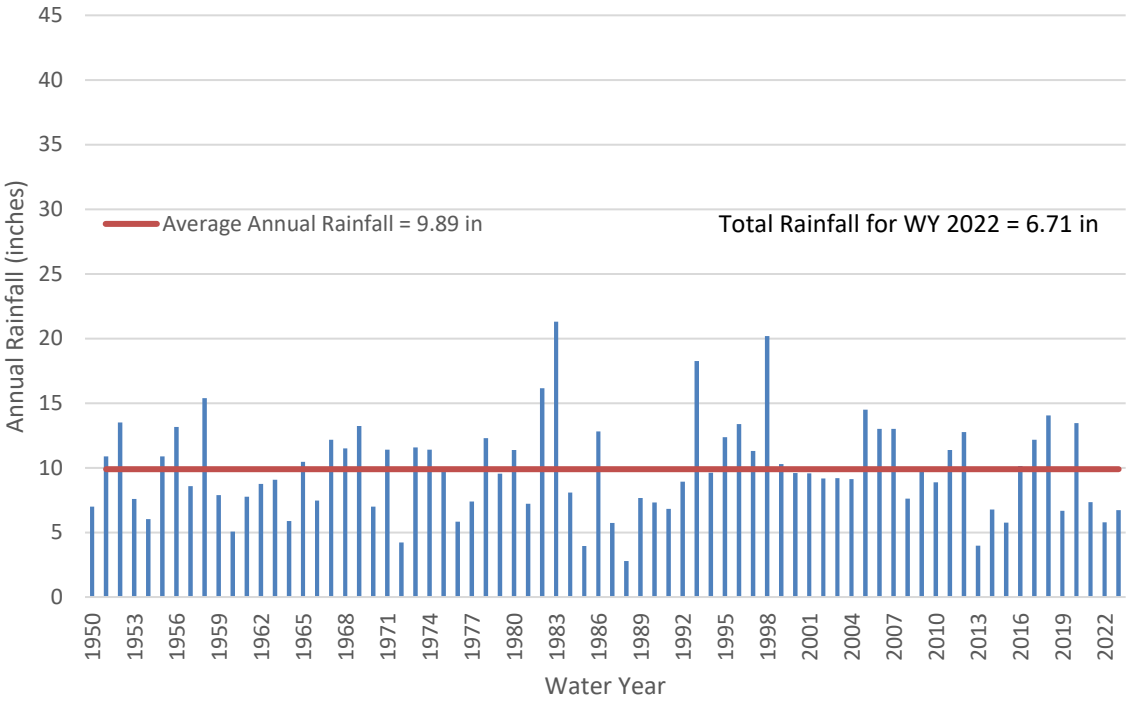

Figure 2-2 Total Annual Rainfall (Tracy Carbona Station)

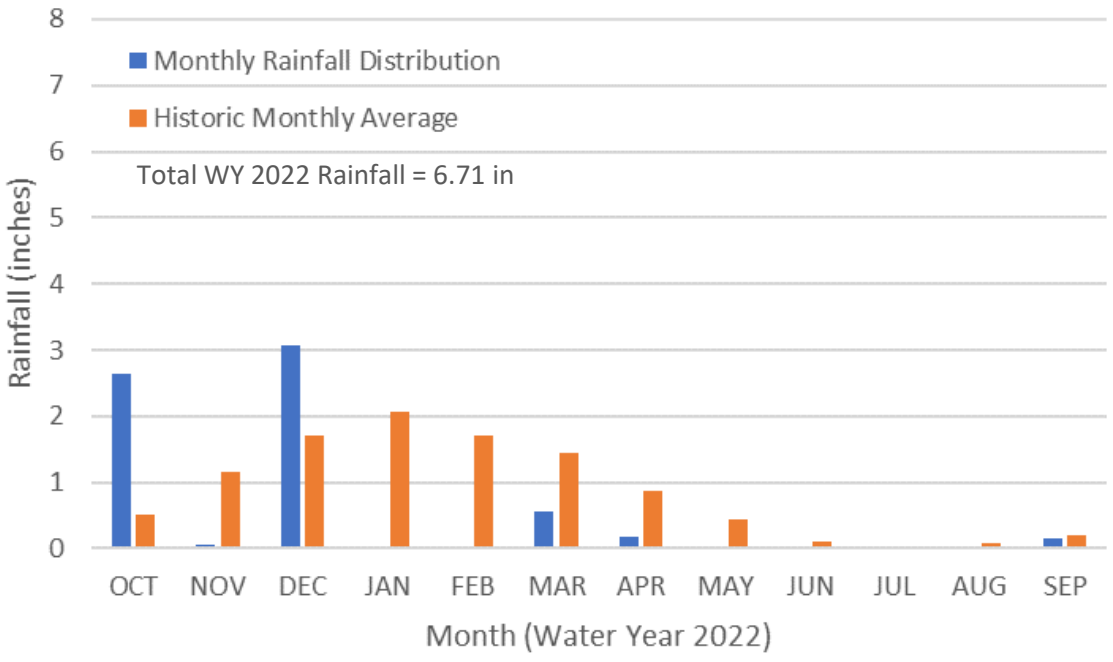

Figure 2-3 Monthly Rainfall Distribution (Tracy Carbona Station)

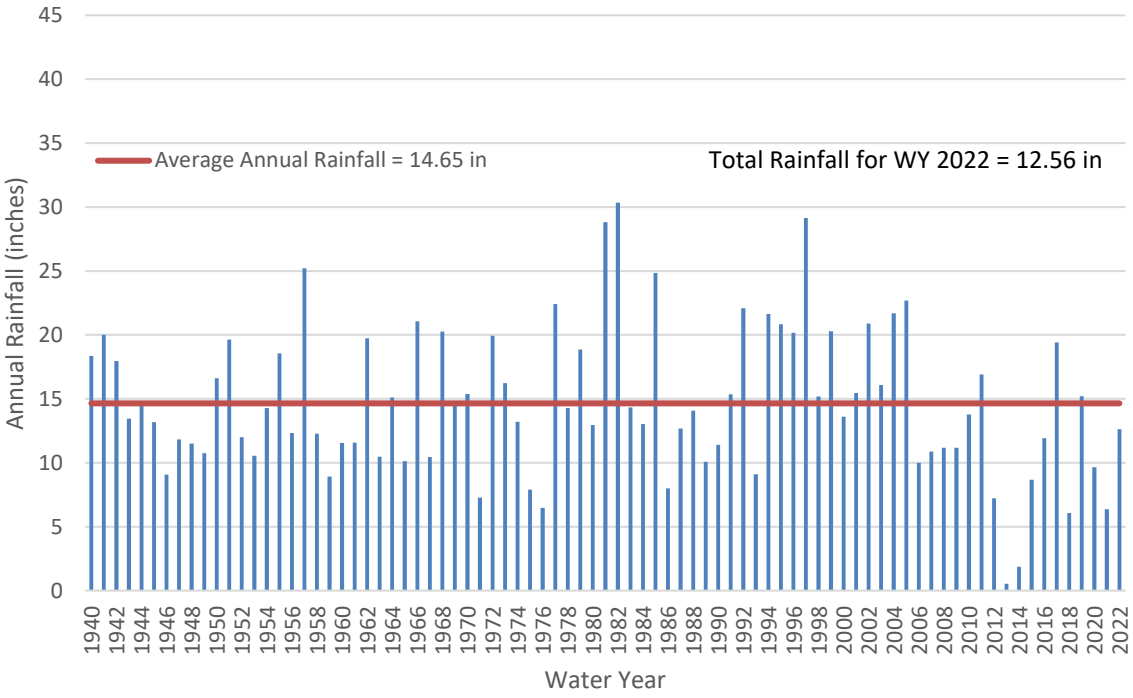

Figure 2-4 Total Annual Rainfall (Stockton Fire Station)

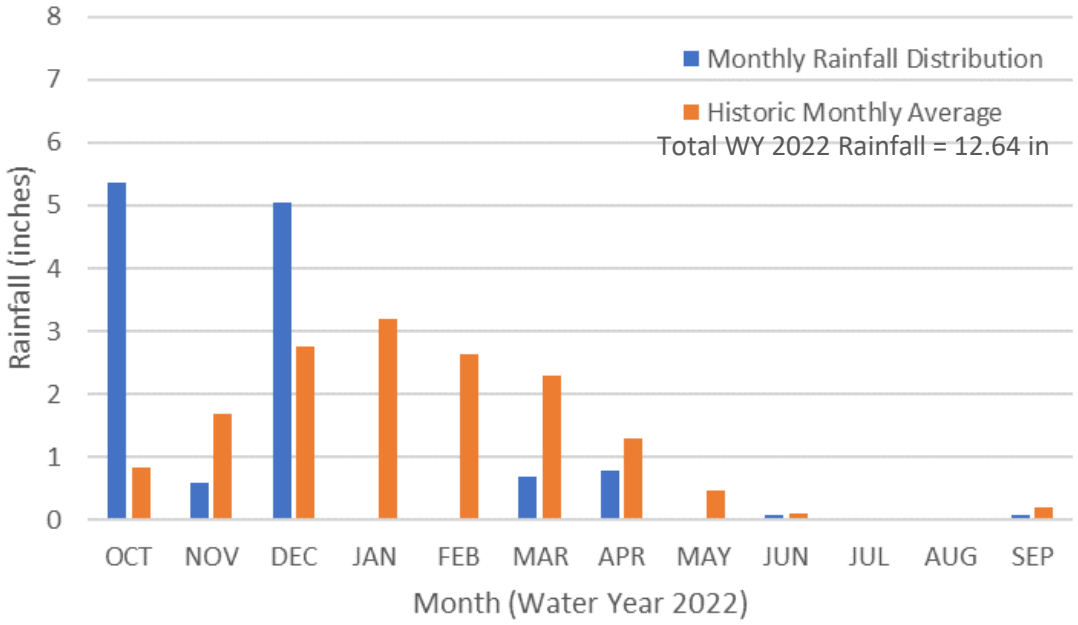

Figure 2-5 Monthly Rainfall Distribution (Stockton Fire Station)

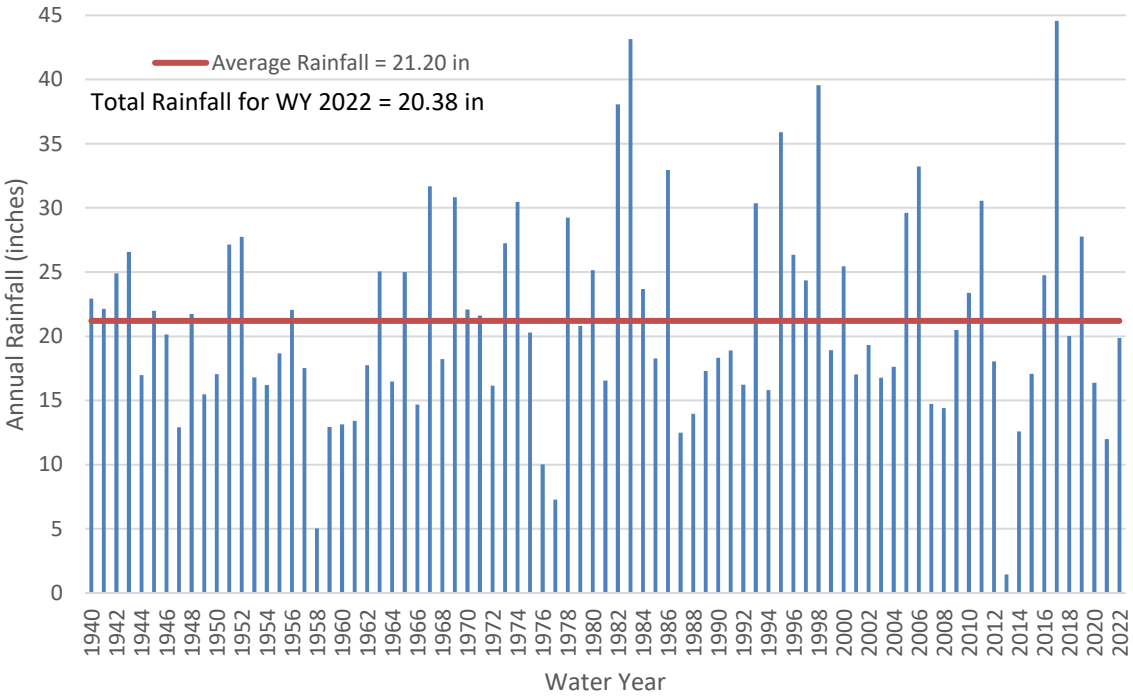

Figure 2-6 Total Annual Rainfall (Camp Pardee Station)

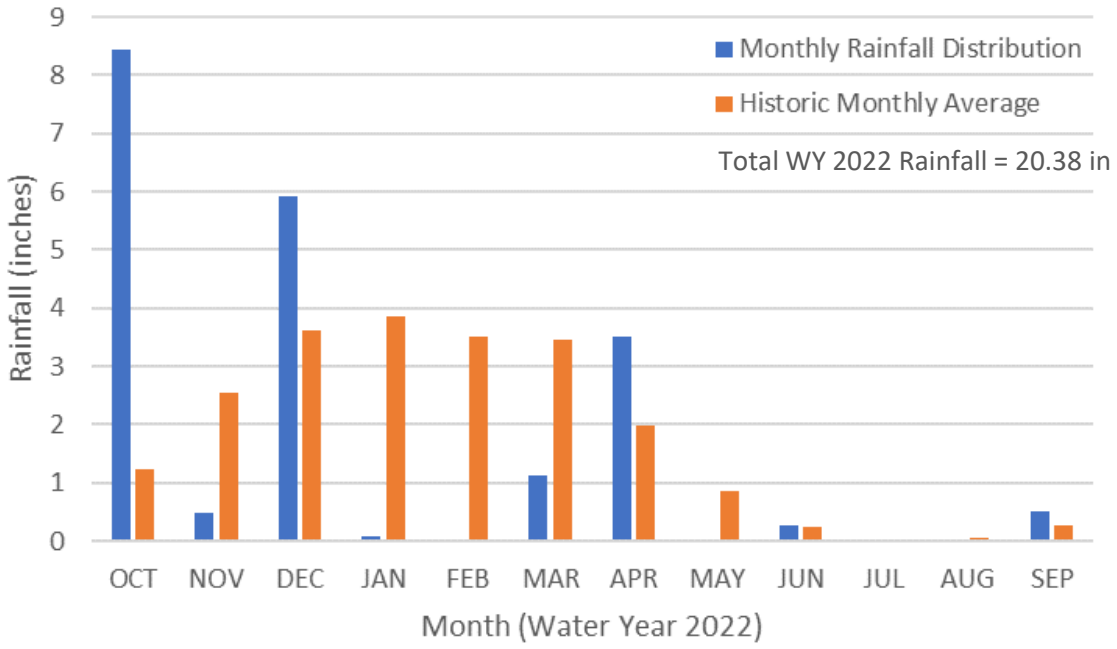

Figure 2-7 Monthly Rainfall Distribution (Camp Pardee Station)

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 3-4 provide the recorded reservoir storage and outflows, and river stages for WY 2022. 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.

Figure 3-6 shows monthly average flow data for the San Joaquin River.

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.

Table 3-1 Flow Gages

Station Name	River Basin	Station Code	Station Type	WY 2022 Average Flow	Unit of Measurement	Historic Average Flow[1]	WY 2022 % of Historic Average
San Joaquin River near Vernalis	San Joaquin	11303500	USGS River flow, Discharge 00060	12455	cubic feet per second	52510	23.72%
Mokelumne River at Woodbridge	Mokelumne River	11325500	USGS River flow, Discharge 00060	1530	cubic feet per second	6912	22.14%
New Melones Dam Releases	Stanislaus River	NML	USACE Outflow, Discharge	1093	cubic feet per second	1592	68.66%
Stanislaus River at Orange Blossom Bridge	Stanislaus River	NML	USACE River flow, Discharge	471	cubic feet per second	1029	45.77%
New Hogan Dam Releases	Calaveras River	NHG	USACE Outflow, Discharge	133	cubic feet per second	208	63.94%
Calaveras River, Bellota at Mormon Slough	Calaveras River	NHG	USACE River flow, Discharge	44	cubic feet per second	126	34.92%
Camanche Reservoir Releases	Mokelumne River	CMN	USACE Outflow, Discharge	267	cubic feet per second	574	46.52%

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

Table 3-2 Reservoir Storage

Station Name	River Basin	Station Code	Station Type	Total Capacity	Unit of Measurement	Total Storage Start of WY 2022	Total Storage End of WY 2022	Peak Storage WY 2022
New Melones Dam & Reservoir	Stanislaus River	NML	USACE Storage	2.5 Million	Acre-feet	0.84 Million AF	0.62 Million AF	0.99 Million AF
New Hogan Dam & Reservoir	Calaveras River	NHG	USACE Storage	317 Thousand	Acre-feet	89 Thousand AF	56 Thousand AF	133 Thousand AF
Camanche Reservoir	Mokelumne River	CMN	USACE Storage	417 Thousand	Acre-feet	178 Thousand AF	202 Thousand AF	243 Thousand AF

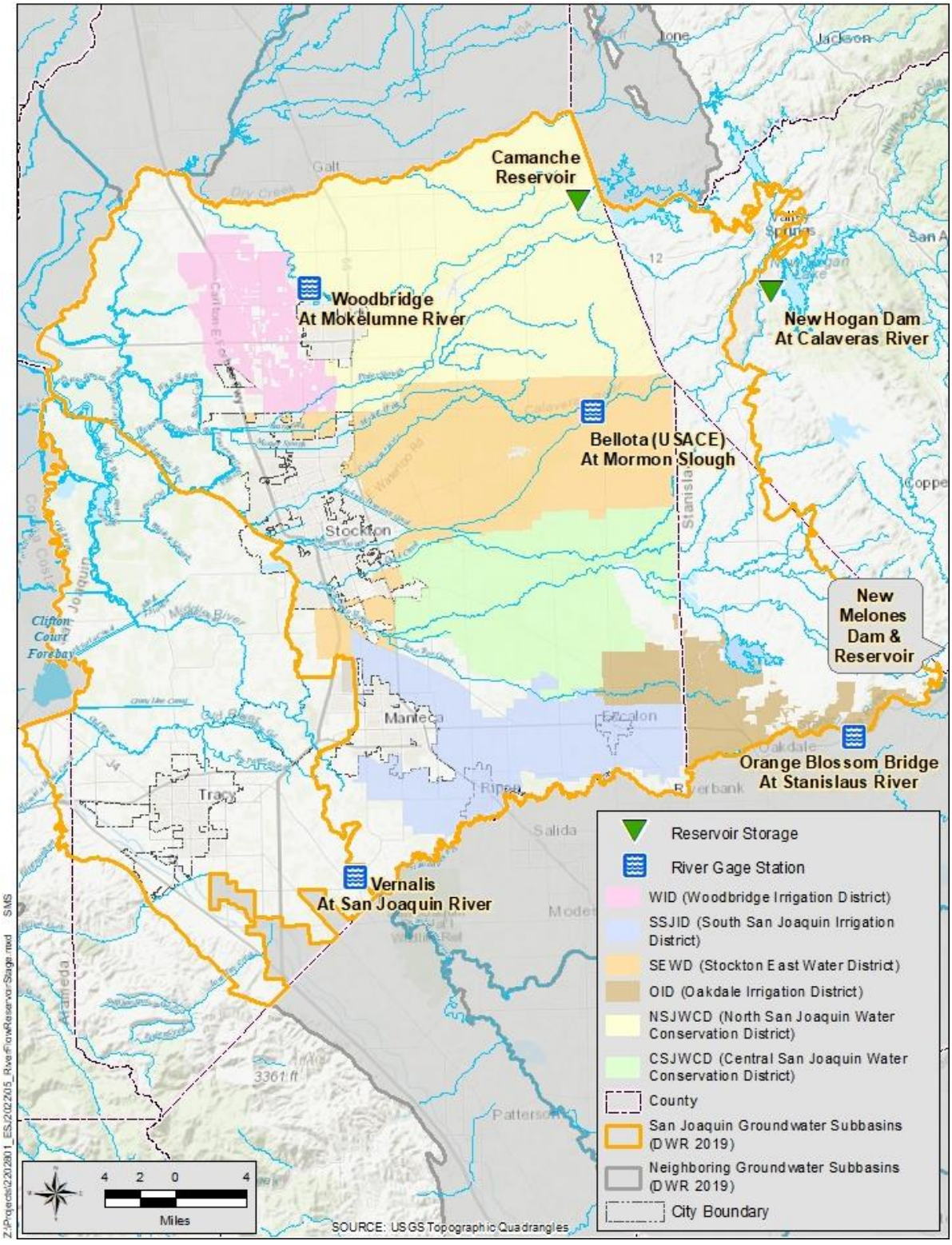

Figure 3-1 Surface Water Station Locations

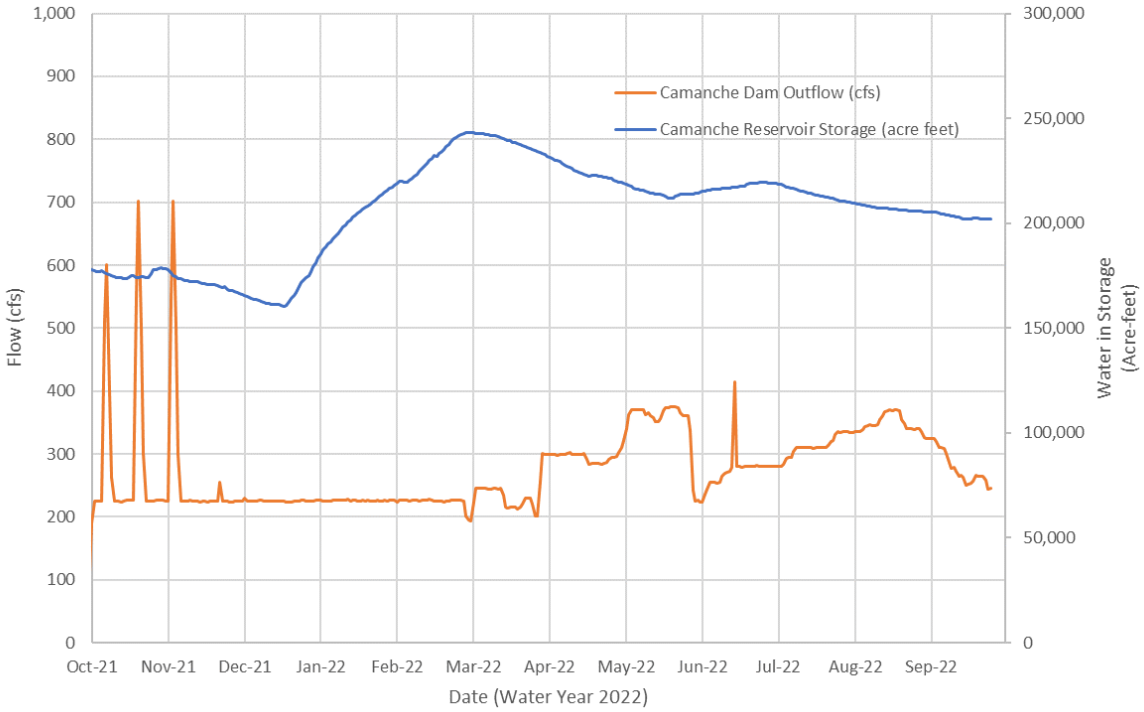

Figure 3-2 Camanche Reservoir

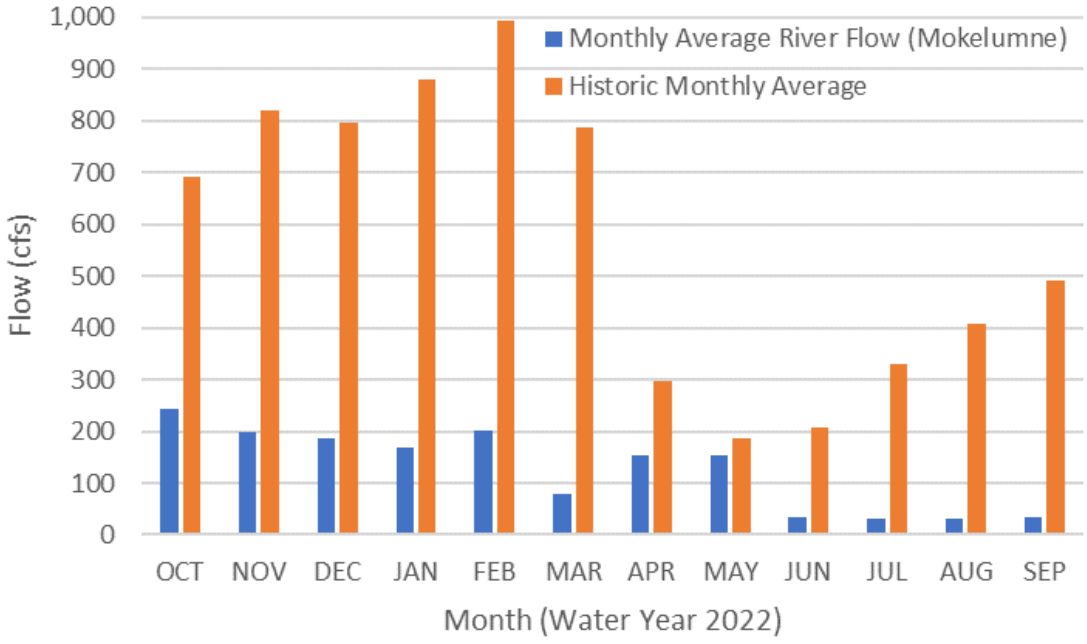

Figure 3-3 Mokelumne River Flow (Woodbridge Station) Monthly Average

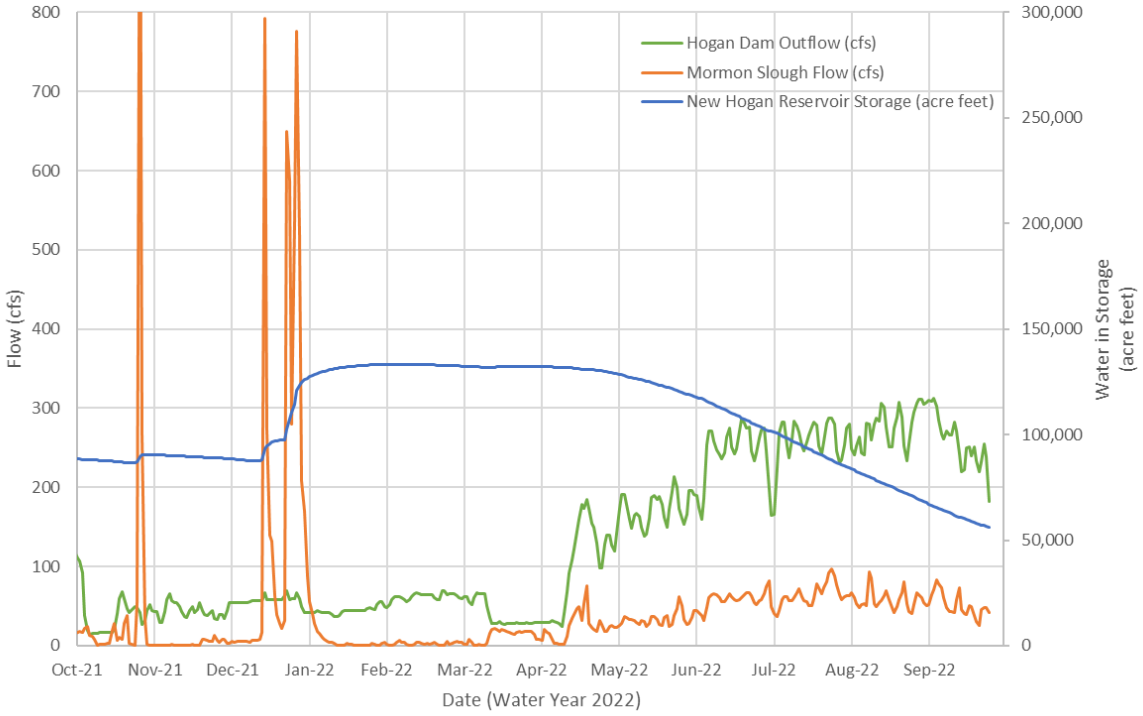

Figure 3-4 New Hogan Dam & Mormon Slough at Bellota

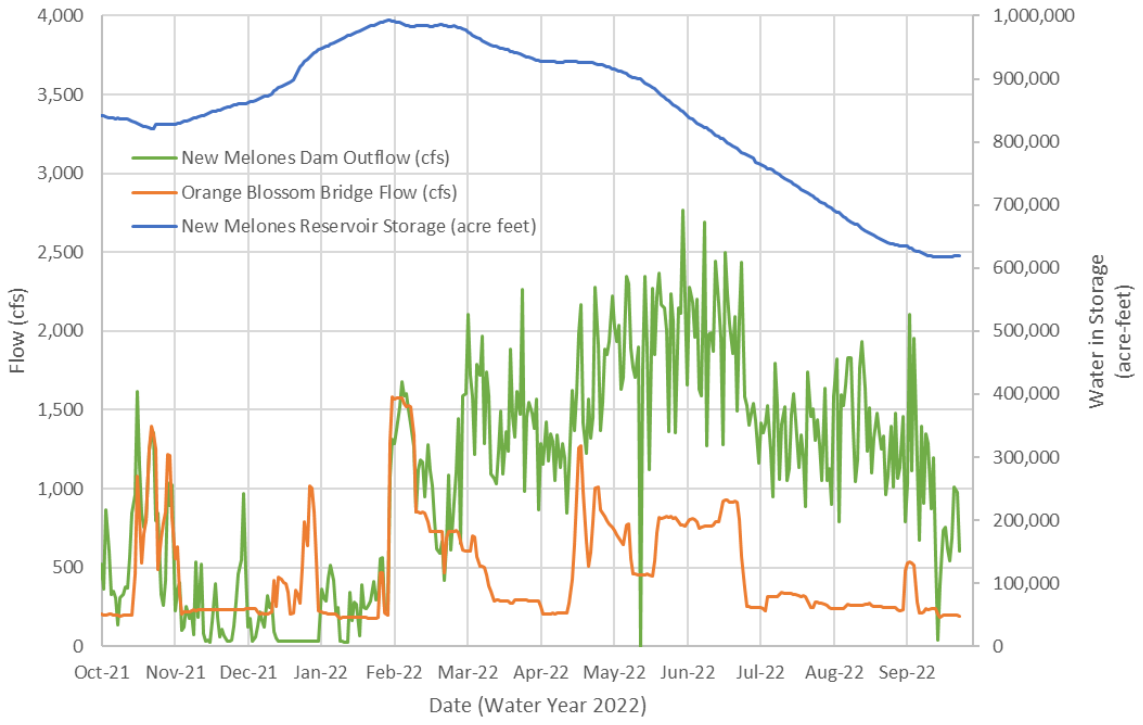

Figure 3-5 New Melones Dam & Orange Blossom Bridge

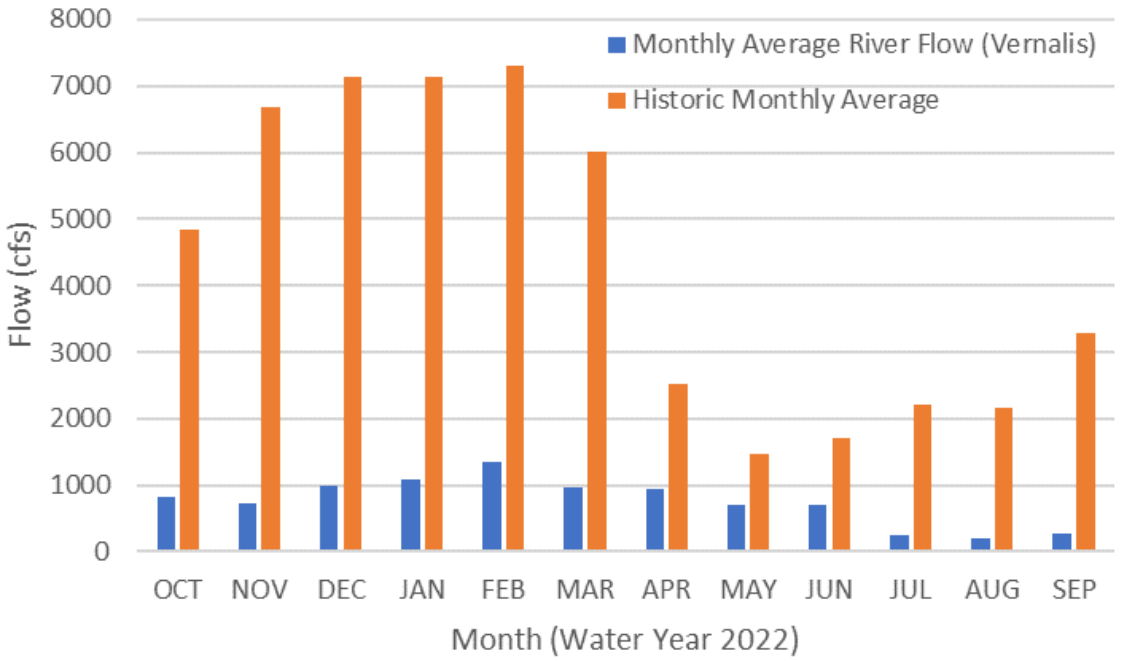

Figure 3-6 San Joaquin River Flow (Vernalis Station) Monthly Average

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 2021 and Fall 2022.

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. CASGEM data is highlighted blue in the tables. If a well was not measured by as part of the county data, it is reported as no measurement (NM). If CASGEM data was not available, it is reported as "—."

Due to well access issues; several monitoring wells were not able to be sampled in Fall 2022, 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, with fourteen (14) wells were comparable (Table 4-1). In the Fall, fourteen (14) wells show decreases in groundwater levels.

North San Joaquin Water Conservation District (NSJWCD) – Thirty-three (33) wells were monitored, twenty-five (25) wells were compared in NSJWCD (Table 4-2). In the Fall, twenty-three (23) wells decreased in groundwater levels, one (1) increased, and one (1) well had no change.

Oakdale Irrigation District (OID) – Out of the two (2) wells in OID, neither were measured for Fall 2022, so no change in elevation data is available. (Table 4-3).

Stockton East Water District (SEWD) – Seventy-eight (78) wells were monitored, with thirty-one (31) wells comparable (Table 4-4). In the Fall, twenty-five (25) wells decreased in groundwater levels, while six (6) increased.

South San Joaquin Irrigation District (SSJID) – Twenty-six (26) wells were monitored, thirteen (13) wells could be compared (Table 4-5). In Fall, all thirteen (13) wells had decreased water levels.

Southwest County Area in the Tracy Subbasin – Out of twenty-five (25) wells monitored, twenty-one (21) were comparable in the southwestern portion of the County (Table 4-6). During Fall, eleven (11) wells declined in groundwater elevation, while ten (10) showed increases.

Woodbridge Irrigation District (WID) – Eighteen (18) total wells were monitored, with twelve (12) comparable (Table 4-7). During the Fall, seven (7) wells decreased in groundwater levels, while the other five (5) wells increased.

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, with six (6) comparable to the previous Fall. Out of those wells, all six (6) showed decreased water elevations.

4.2 Hydrographs

Twenty-six (26) wells were selected to represent groundwater conditions throughout the basin (A through Z), these wells have historically consistent water level measurements. A map of these wells is shown on Figure 4-1. Hydrographs of these selected wells within the County are provided on Figures 4-2 through 4-27 to illustrate the changes in groundwater levels with time. Trend lines are plotted on each figure using data from 1984 to present (or shorter period if measurements are not available) to illustrate current groundwater levels, whether they are increasing or decreasing.

Hydrographs for Wells H, L, and N are provided but monitoring at these wells have been prevented due to ongoing 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 4-28 shows the location of the profiles and Figures 4-29 through 4-31 provide the profiles.

4.4 Groundwater Level Changes

Changes in groundwater levels from Fall 2021 through to Fall 2022 throughout the County are summarized on Figure 4-32. Figures 4-33 and 4-34 show depths to groundwater along with groundwater elevation maps that were used to develop Figure 4-32.

Table 4-1 Comparison of CSJWCD Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (Feet)
01N07E11L001	-51	-52	-1
01N07E14J002	-60	-67.6	-7.6
01N07E24R001	-59	NM	--
01N07E26H003	NM	NM	--
01N07E32A001	-21.09	--	--
01N08E11L001	NM	-70.28	--
01N08E13J001	-49	NM	--
01N08E16G001	-61	-68.32	-7.32
01N08E16H002	-60	-67.31	-7.31
01N08E27R002	-52	NM	--
01N08E29M002	NM	NM	--
01N08E35F001	-74	-76.9	-2.9
01N08E36F001	-40	NM	--
01N09E13D001	-3	NM	--
01N09E17D001	NM	NM	--
01N09E17M001	-44	-53.62	-9.62
01N09E19C001	-68	NM	--
01N09E22G002	NM	NM	--
01N09E29R001	-35	-39.5	-4.5
01N09E30C005	-41	-51.7	-10.7
01S07E01J001	-42	NM	--
01S08E04R001	-42	NM	--
01S08E05A001	-69	-102.4	-33.4
01S08E05R001	-43	-81.8	-38.8
01S08E06D001	NM	NM	--
01S08E09Q001	-41	NM	--
01S08E11F001	-35	NM	--
01S08E14B001	-30	-64.7	-34.7
01S09E05H002	-20	-30	-10
01S09E07A001	-23	-81.3	-58.3
01S09E07N001	-19	NM	--
01S09E09R001	NM	NM	--
01S09E19Q002	-1	-47	-46

County Certified
CASGEM Data

NM = Measurement not able to be taken
-- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.
CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall
Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
33	14	14	0	0	-58.3 to -1	-19.44

Table 4-2 Comparison of NSJWCD Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (Feet)
03N06E04C001	--	--	--
03N07E02G003	--	--	--
03N07E03R001	-36	-42.8	-6.8
03N07E08E002	-31	-35	-4
03N07E09C001	-32	-39.7	-7.7
03N07E15C004	-47	-53.5	-6.5
03N07E17D004	-33	-35.4	-2.4
03N07E18D012	-33	-36	-3
03N07E19J004	NM	NM	--
03N07E23C002	NM	-86	--
03N08E07D002	--	--	--
03N08E22A001	NM	NM	--
04N06E12C004	-42	-42	0
04N06E12N002	NM	NM	--
04N06E15B002	-17	-19.7	-2.7
04N06E23K00	-13	-16	-3
04N06E24F001	-26	-28.5	-2.5
04N06E25R001	-8	-10	-2
04N06E27D002	1	-0.8	-1.8
04N07E12E001	-55	NM	--
04N07E17N001	-41	-58.8	-17.8
04N07E19K001	-32	-35.2	-3.2
04N07E20H003	-38.44	-40.22	-1.78
04N07E21F001	-39	-45.4	-6.4
04N07E27C002	-35	-40.5	-5.5
04N07E28J002	-30	-39.2	-9.2
04N07E33H001	22	16	-6
04N07E36L001	-43	-46.46	-3.46
04N08E14K001	-19	-24.1	-5.1
04N08E17J001	-46	-49.5	-3.5
04N08E21M001	-50	-53.1	-3.1
04N08E32N001	-53	-65.1	-12.1
05N07E34G001	-66	-60.1	5.9

County Certified NM = Measurement not able to be taken

CASGEM Data -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.

CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall

Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
33	25	23	1	1	-17.8 to 5.9	-4.55

Table 4-3 Comparison of OID Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
01S09E21J002	20	NM	--
01S09E24R001	48	NM	--

County Certified
CASGEM Data

NM = Measurement not able to be taken
-- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.
CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall
Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					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 2021	Fall 2022	Change Fall (feet)
01N06E02C001	-9.63	NM	--
01N06E04J003	-13.13	-15.23	-2.1
01N06E04J004	-7.77	-9.67	-1.9
01N06E04J005	-3.31	-4.91	-1.6
01N06E05M004	NM	NM	--
01N06E36C003	-16	NM	--
01N06E36C004	-12.4	NM	--
01N06E36C005	-10.3	NM	--
01N07E01M002	-52	-75	-23
01N07E02G001	NM	NM	--
01N07E04R001	-19	-34.6	-15.6
01N07E09E004	-24	NM	--
01N07E09H001	-47	NM	--
01N07E09Q003	-51	-48.2	2.8
01N07E10D001	-22	-45	-23
01N07E20G001	-19	-28	-9
01S06E01C002	-8	-24	-16
01S06E02G002	-11.57	--	--
01S06E10G001	NM	NM	--
01S07E06M002	NM	NM	--
01S07E08J002	-13	NM	--
02N06E01A001	--	--	--
02N06E08N001	-27.08	-28.38	-1.3
02N06E08N002	-24.82	-26.32	-1.5
02N06E08N003	-21.21	-22.61	-1.4
02N06E12H001	--	--	--
02N06E20E001	NM	-16.5	--
02N06E24F001	NM	-32.5	--
02N06E24J002	NM	NM	--
02N06E24J003	--	--	--
02N07E03D001	NM	NM	--
02N07E08D001	NM	NM	--
02N07E08K003	-64	-66.8	-2.8
02N07E08R002	-64.64	--	--
02N07E11F001	-101	-103	-2
02N07E11R002	-100	-85	15
02N07E16F002	NM	-67.6	--
02N07E16L001	-63	-89.3	-26.3
02N07E20N002	-45	-56	-11
02N07E21A002	-69	-74.81	-5.81
02N07E21K002	-61	--	--
02N07E21N001	-53	--	--
02N07E23B001	-75	--	--
02N07E24Q001	-76	-78.7	-2.7
02N07E26N001	-78	-74.9	3.1
02N07E28K002	-73	-77	-4
02N07E28N004	NM	NM	--
02N07E28P001	NM	NM	--

County Certified — NM = Measurement not able to be taken

CASGEM Data — -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.

CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall

Elevations in Feet above mean sea level (ft msl)

Comparison of SEWD Groundwater Elevations (continued)

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
02N07E29B001	NM	-50.81	--
02N07E29M002	-36	-40.3	-4.3
02N07E30H001	-36	NM	--
02N07E31M001	NM	NM	--
02N07E32J002	-21	-31.9	-10.9
02N07E32M002	NM	-26.18	--
02N07E32R001	-43	-23.6	19.4
02N07E33L001	-17	-39	-22
02N07E34R001	-67	-55	12
02N08E03G002	-69	NM	--
02N08E04C001	NM	-73.5	--
02N08E05C001	-89	-94.5	-5.5
02N08E08N001	-91	NM	--
02N08E09G002	NM	26	--
02N08E10H002	-70	-75.4	-5.4
02N08E14C001	-71	-72	-1
02N08E16D001	-99	-86.1	12.9
02N08E18C001	-99	-114.7	--
02N08E20F001	NM	NM	--
02N08E24J001	-85	-65.1	--
02N08E28H002	NM	-53.6	--
02N08E33E001	-72	-102.6	-30.6
02N09E05N001	-38.39	--	--
02N09E09D001	NM	-26.8	--
02N09E28N001	NM	NM	--
03N06E35P002	--	--	--
03N07E35C002	NM	-69	--
03N07E35L001	-101	-107.5	--
03N07E36J001	NM	-82.3	--
03N09E25R001	NM	72.5	--

County Certified — NM = Measurement not able to be taken

CASGEM Data — -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.

CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall

Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
78	31	25	6	0	-30.6 to 19.4	-5.34

Table 4-5 Comparison of SSJID Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
01S07E14M001	-23	NM	--
01S07E14P003	NM	NM	--
01S07E15F002	-22	NM	--
01S07E18L001	-2.23	-3.73	-1.5
01S07E21G001	1.75	0.65	-1.1
01S07E25E001	-14	--	--
01S07E26G001	NM	--	--
01S07E27K001	-3	-5.48	-2.48
01S07E30R001	2.96	2.5	-0.46
01S07E36D001	3.55	1.41	-2.14
01S08E30C002	-7	NM	--
01S09E29M002	NM	NM	--
01S09E33J002	39.82	37.92	-1.9
01S09E33P001	36.01	32.31	-3.7
02S07E07D002	8	1	-7
02S07E11N002	NM	NM	--
02S07E19H001	20	12	-8
02S08E04M001	NM	-2.5	--
02S08E06J001	3	1	-2
02S08E07R001	NM	NM	--
02S08E08A001	14	9.41	-4.59
02S08E08E001	NM	3.2	--
02S08E09J001	--	--	--
02S08E12D001	29.97	28.17	-1.8
02S08E14E001	--	--	--
02S09E12R001	56.45	55.62	-0.83

County Certified NM = Measurement not able to be taken

CASGEM Data -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.

CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall

Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
26	13	13	0	0	-8 to -0.46	-2.88

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

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
01S05E31R002	1	-1.4	-2.4
02S04E15R001	NM	51.41	--
02S05E08B001	-1	-4.2	--
02S06E25J001	16	13.74	-2.26
02S06E31N001	NM	36.5	--
03S06E27N001	56	56.3	0.3
03S07E06Q001	--	--	--
MW-1A	-28.45	-27.74	0.71
MW-1B	-39.81	-40.41	-0.6
MW-1C	-40.32	-40.8	-0.48
MW-2A	-35.87	-34.98	0.89
MW-2B	-44.5	-43.09	1.41
MW-2C	-44.42	-43.22	1.2
MW-3A	-29.21	-29.92	-0.71
MW-3B	-46.78	-43.34	3.44
MW-3C	-48.9	-43.94	4.96
MW-4A	-38.51	-35.93	2.58
MW-4B	-44.27	-42.31	1.96
MW-4C	-44.57	-42.69	1.88
MW-5A	-36.46	-37.96	-1.5
MW-5B	-37.61	-39.53	-1.92
MW-5C	-35.26	-37.94	-2.68
MW-6A	-29.61	-30.03	-0.42
MW-6B	-34.85	-35.4	-0.55
MW-6C	-32.09	-32.99	-0.9

County Certified — NM = Measurement not able to be taken
CASGEM Data — -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.
CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall
Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
25	21	11	10	0	-2.68 to 4.96	0.23

Table 4-7 Comparison of WID Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
03N05E14C001	NM	NM	--
03N06E05N003	NM	-18.5	--
03N06E07H003	-15	-17.6	-2.6
03N06E17A004	-23	-25.3	-2.3
03N06E18M003	-16	-17.1	-1.1
03N06E20D002	-20	-23	-3
03N06E32R001	-28	-28.5	-0.5
04N05E10K001	-6	NM	--
04N05E13H001	NM	-7	--
04N05E13R004	-12	-11.6	0.4
04N05E14B002	NM	-9.4	--
04N05E24J004	NM	NM	--
04N05E36H003	-7	-5.81	1.19
04N06E17G004	-6	-6.5	-0.5
04N06E29N002	-11	-8	3
04N06E30E001	-6	-4.3	1.7
04N06E34J002	19	20.4	1.4
05N05E28L003	-5	-6.9	-1.9

County Certified NM = Measurement not able to be taken

CASGEM Data -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.

CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall

Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
18	12	7	5	0	-2.6 to 3	-0.35

Table 4-8 Comparison of Calaveras County Groundwater Elevations

Local Well ID	Fall 2021	Fall 2022	Change Fall (feet)
CCWD 001	DRY	No Data	--
CCWD 002	79.92	No Data	--
CCWD 003	NM	No Data	--
CCWD 004	94.15	No Data	--
CCWD 005	90.35	No Data	--
CCWD 006	102.39	No Data	--
CCWD 007	DRY	No Data	--
CCWD 008	NM	No Data	--
CCWD 009	109.89	No Data	--
CCWD 010	85.86	No Data	--
CCWD 011	85.57	No Data	--
CCWD 012	150.08	No Data	--
CCWD 014	147.79	No Data	--
CCWD 015	NM	No Data	--

County Certified NM = Measurement not able to be taken
CASGEM Data -- = No Data Available
County Data takes precedence over CASGEM due to the date proximity of all county recorded data.
CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall
Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
14	0	--	--	--	--	--

*Calaveras County 2022 data has not been uploaded to DWR databases as of March 2023.

Table 4-9 Comparison of Stanislaus Groundwater Elevations

State Well ID	Fall 2021	Fall 2022	Change Fall (feet)
01S10E04C001	--	60.47	--
01S10E21A001	85.195	83.315	-1.88
01S10E26J001	79	75.94	-3.06
01S10E27Q001	68.83	65.99	-2.84
01S10E34R001	72.99	67.68	-5.31
01S11E25N001	NM	106.71	--
02S10E02P001	81.7	78.86	-2.84
02S10E10M002	70.88	66.95	-3.93

County Certified NM = Measurement not able to be taken
CASGEM Data -- = No Data Available

County Data takes precedence over CASGEM due to the date proximity of all county recorded data.
CASGEM Data was used if no county measured data was recorded, and generally within the same season e.g. Spring or Fall
Elevations in Feet above mean sea level (ft msl)

Number of Wells Fall 2021-2022					Change in Elevation	
Total	Comparable	Decrease	Increase	No Change	Range	Average
8	6	6	0	0	-5.31 to -1.88	-3.31

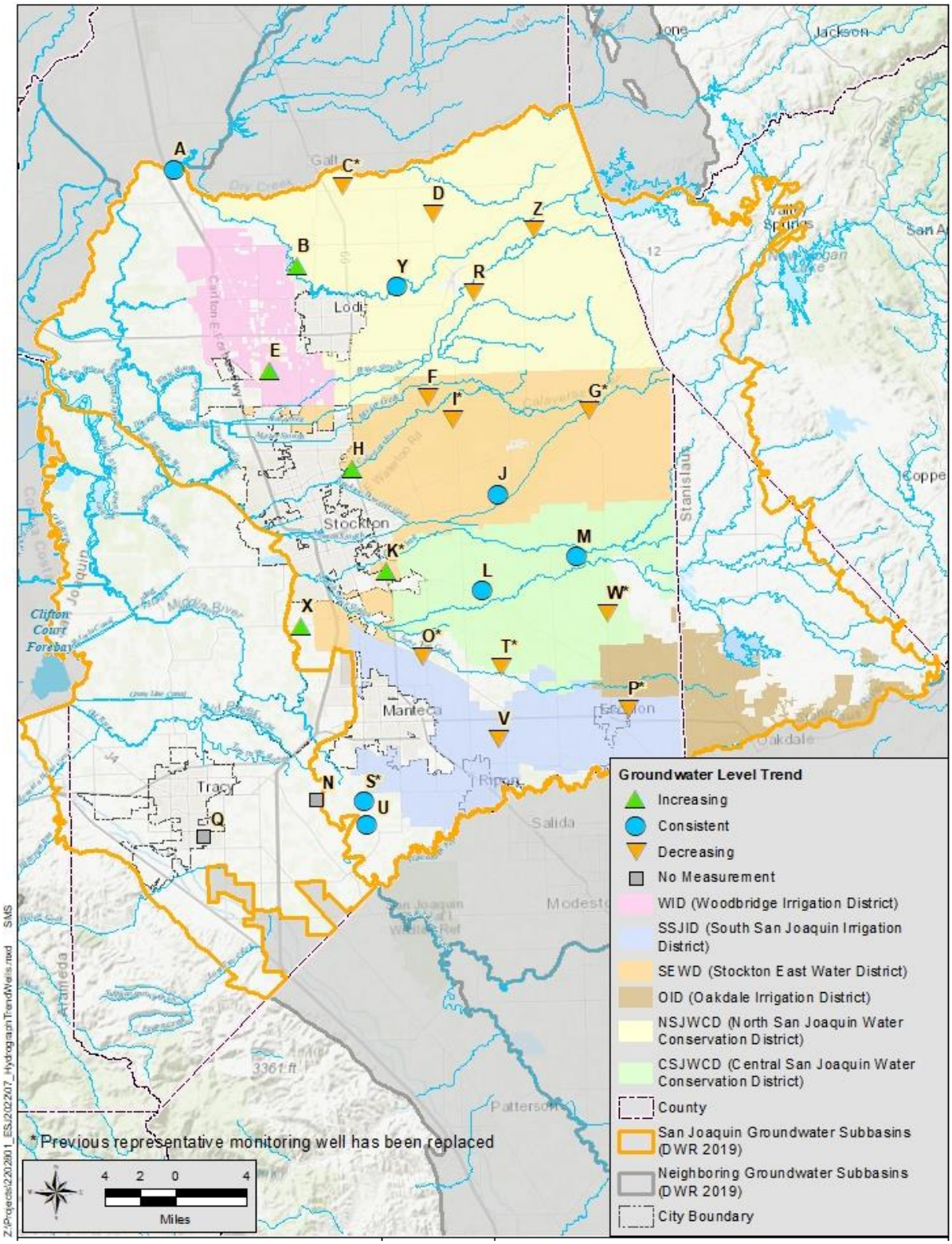

Figure 4-1 Selected Hydrograph Well Locations

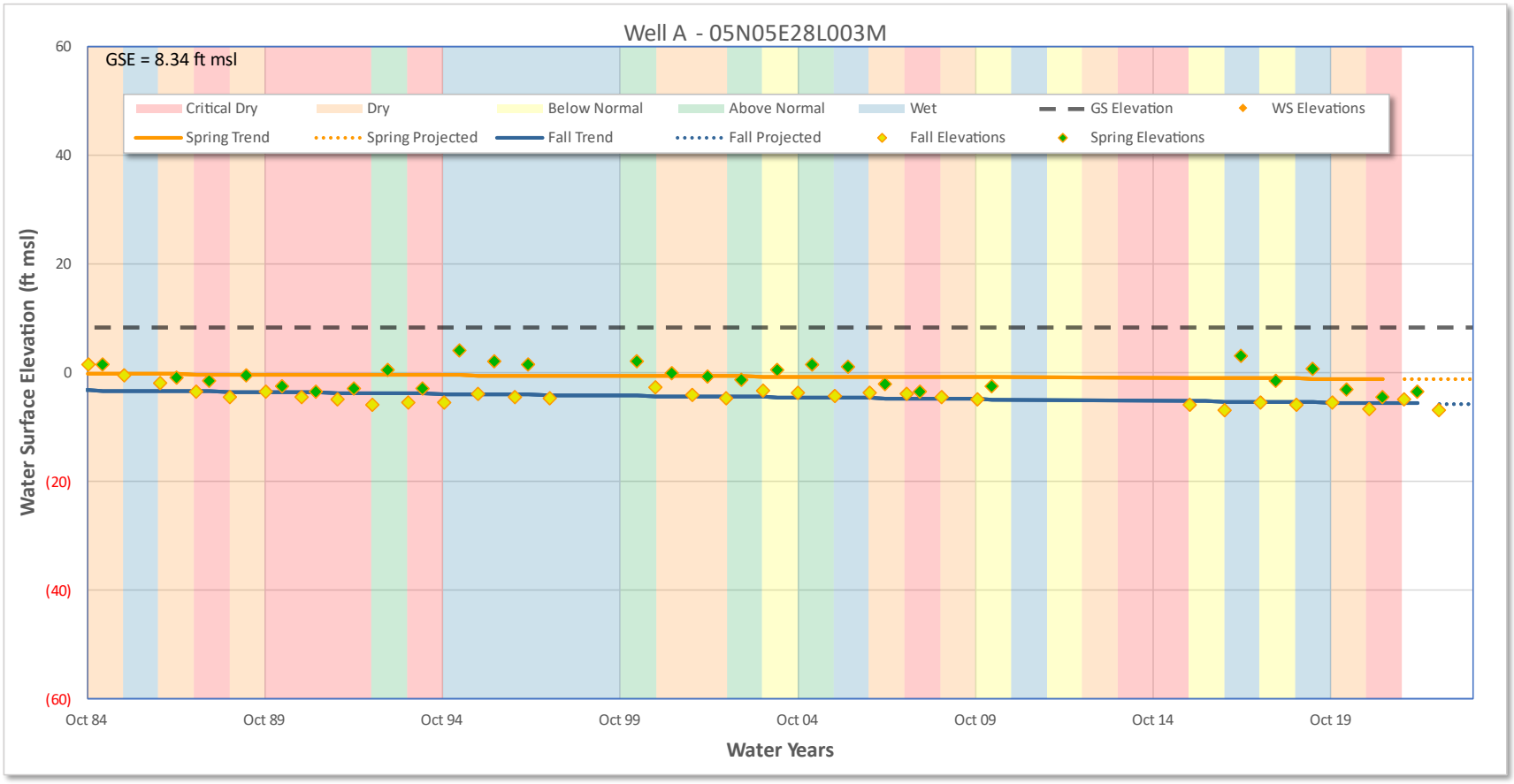

Figure 4-2 Hydrograph Well A - East of Thornton Rd & South of Benson Ferry Rd.

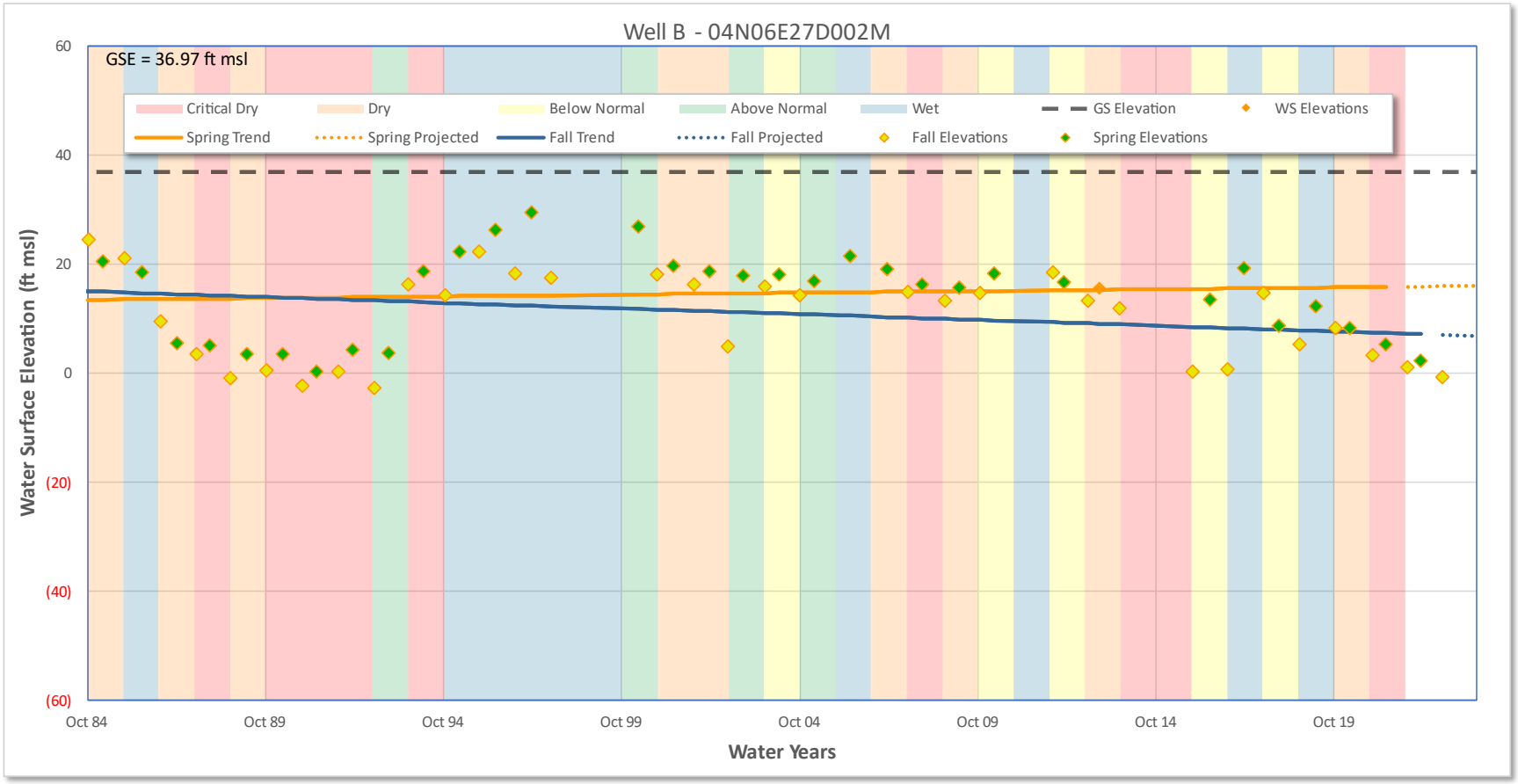

Figure 4-3 Hydrograph Well B - East of Lower Sac Rd. & South of Acampo Rd.

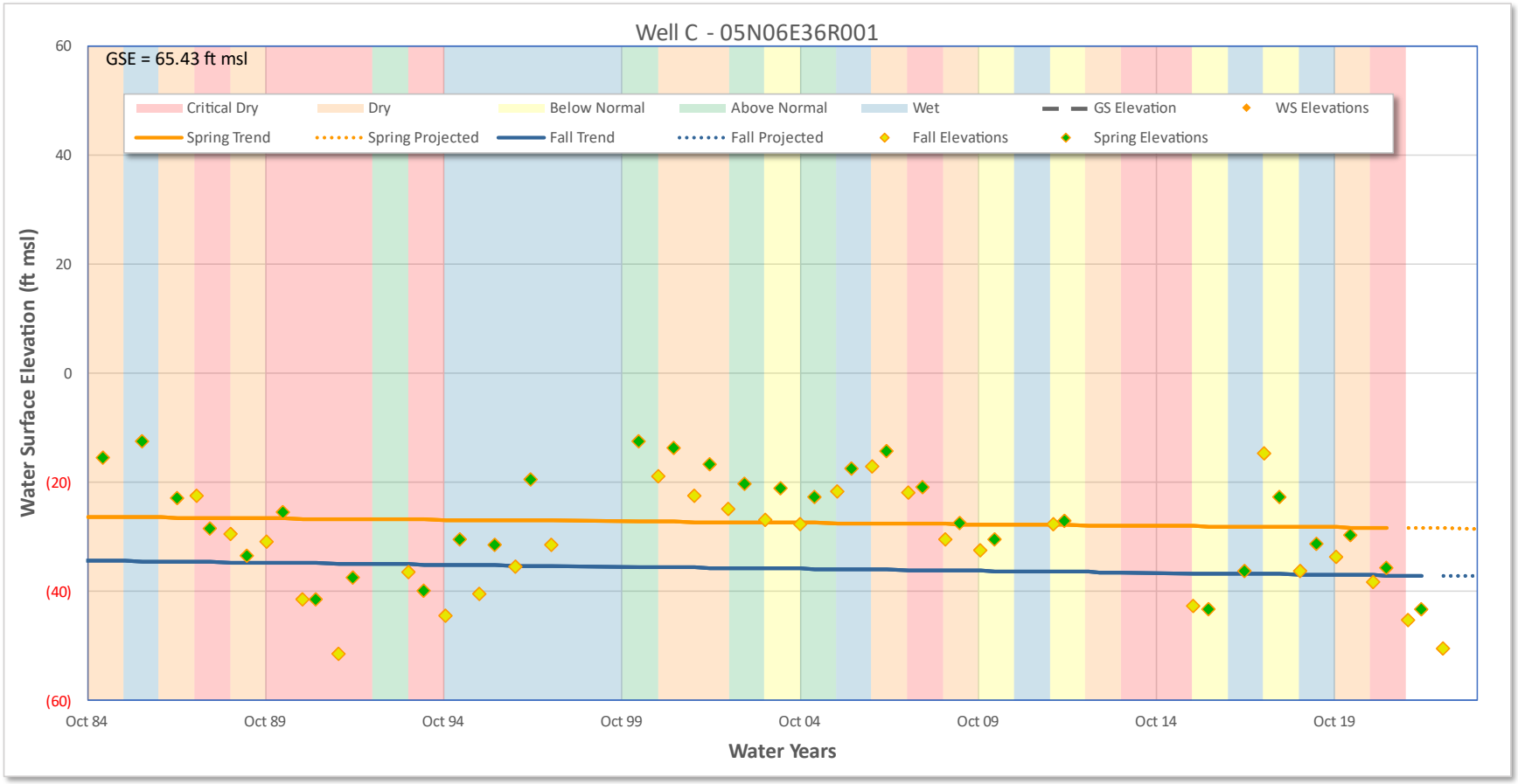

Figure 4-4 Hydrograph Well C - North of Liberty Rd. & West of North Cherokee Ln.

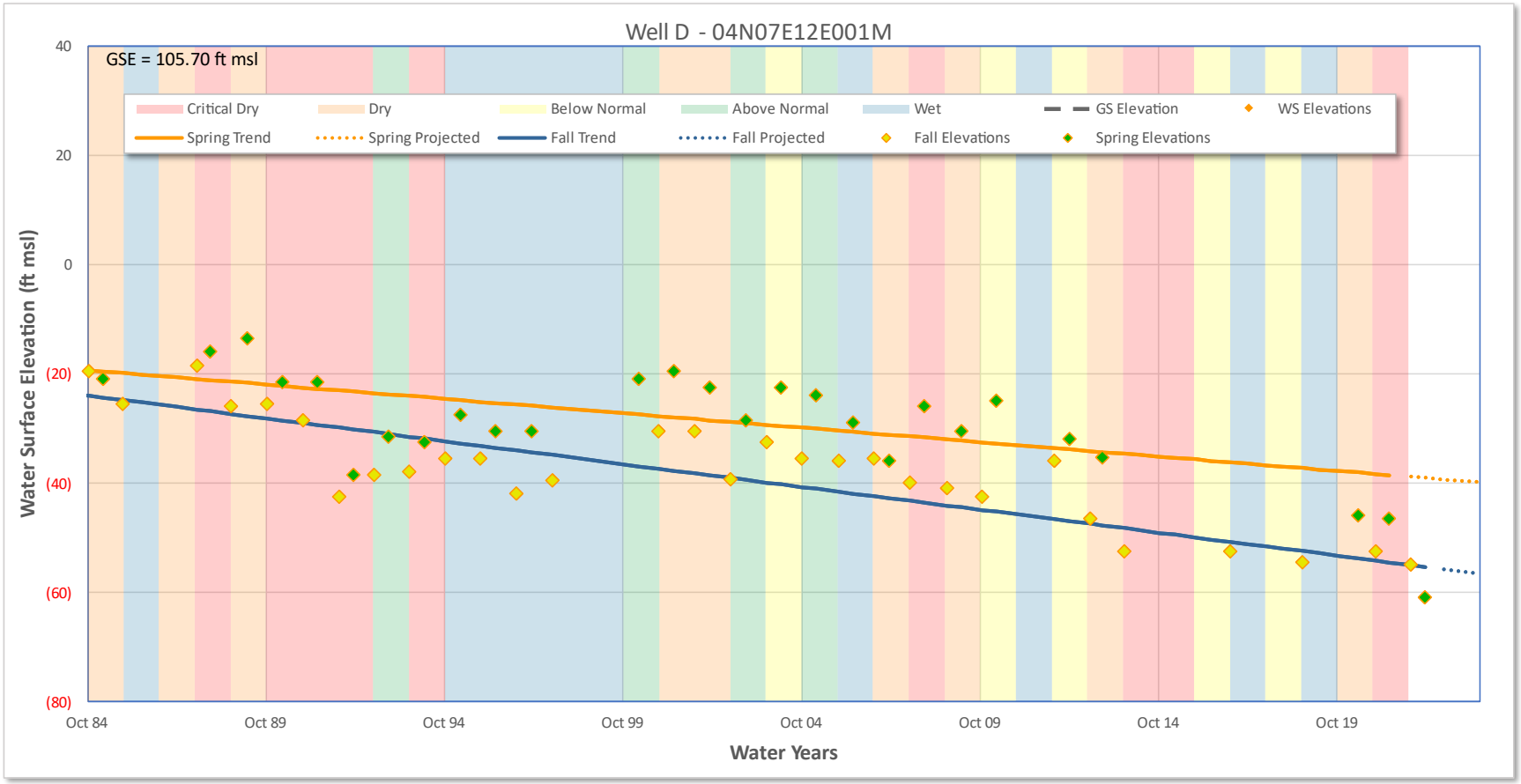

Figure 4-5 Hydrograph Well D - West of Elliotto Rd. & North of Jahant Rd.

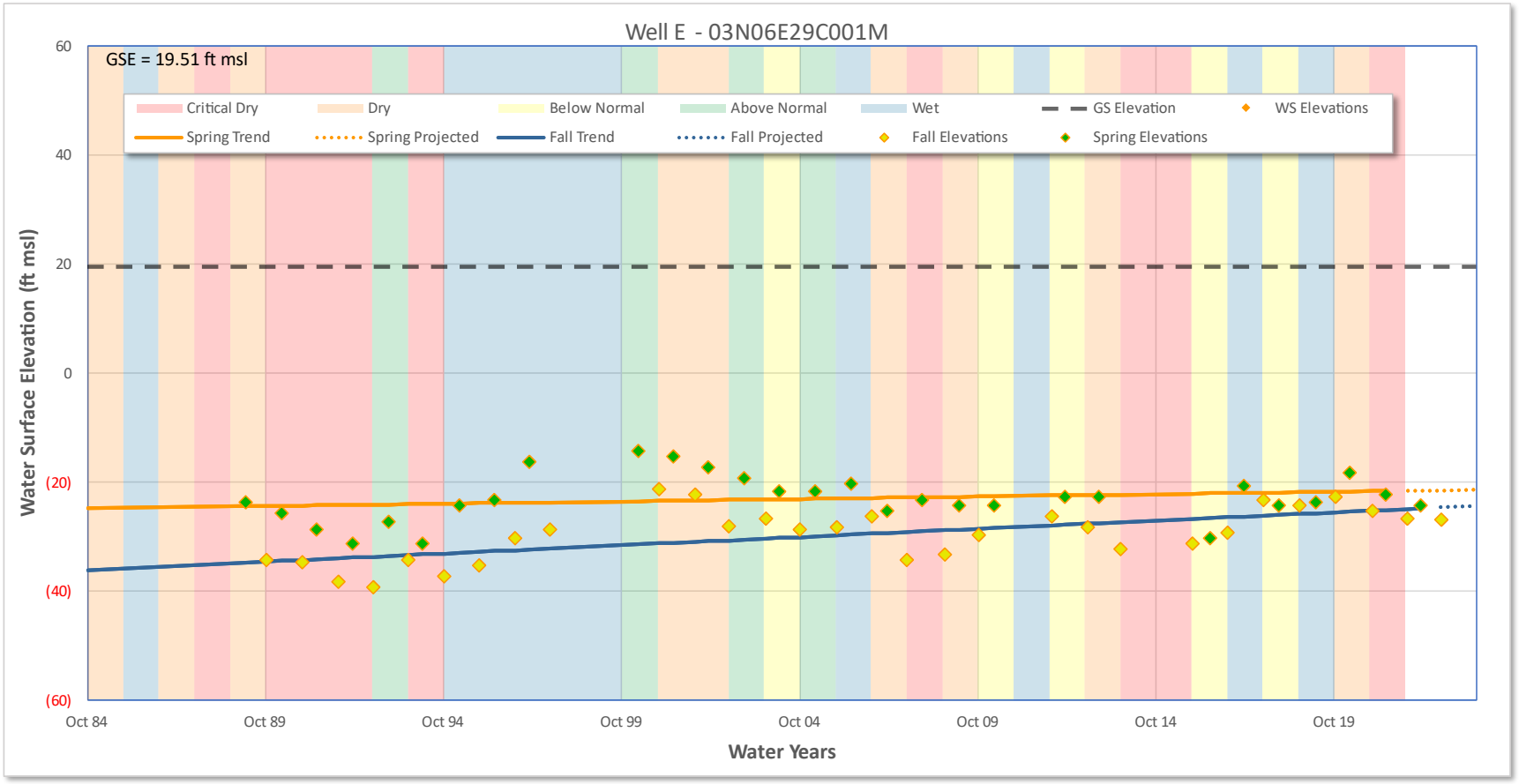

Figure 4-6 Hydrograph Well E - East of Davis R. & South of Armstrong Rd.

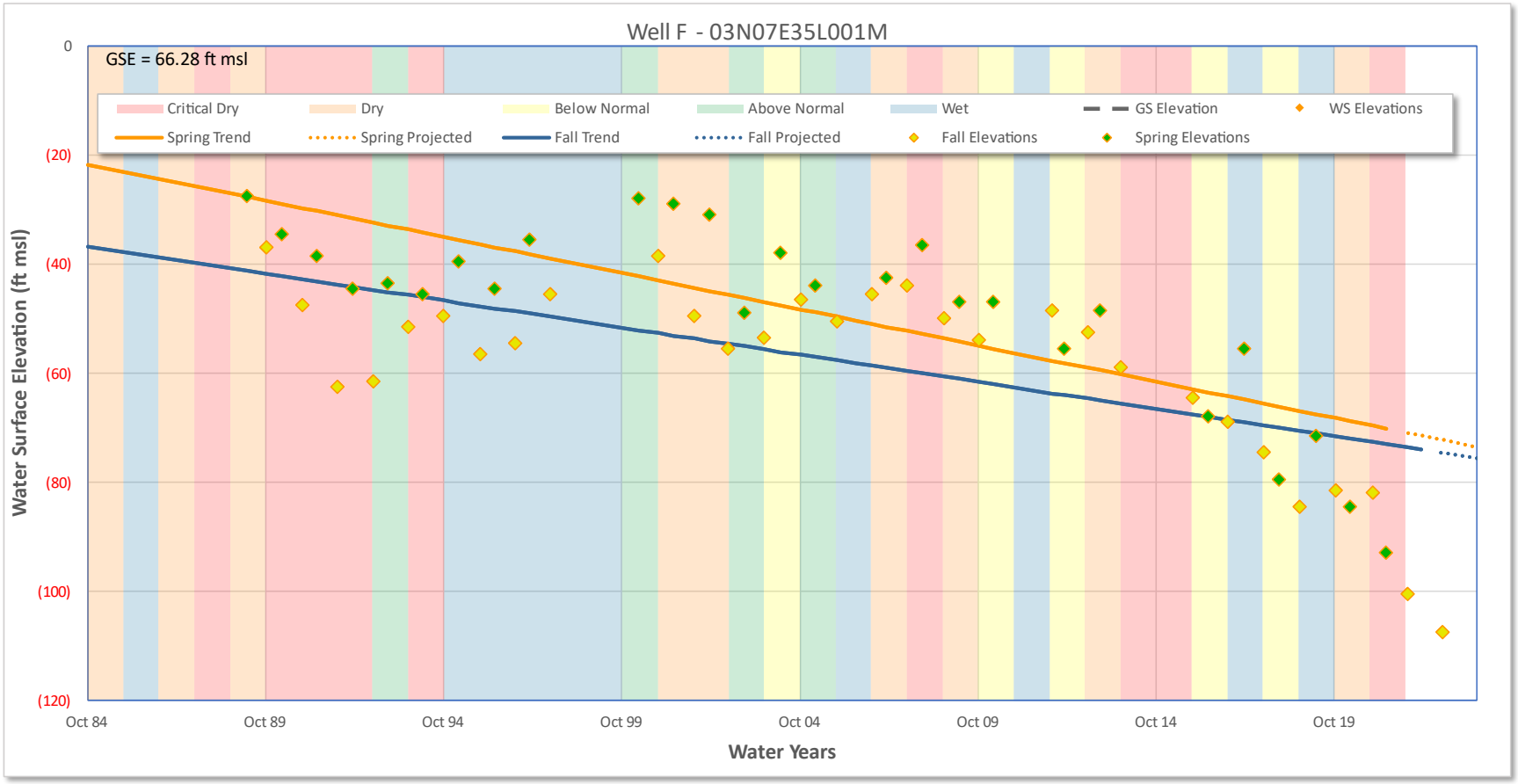

Figure 4-7 Hydrograph Well F - West of Route 88 & North of Eight Mile Rd.

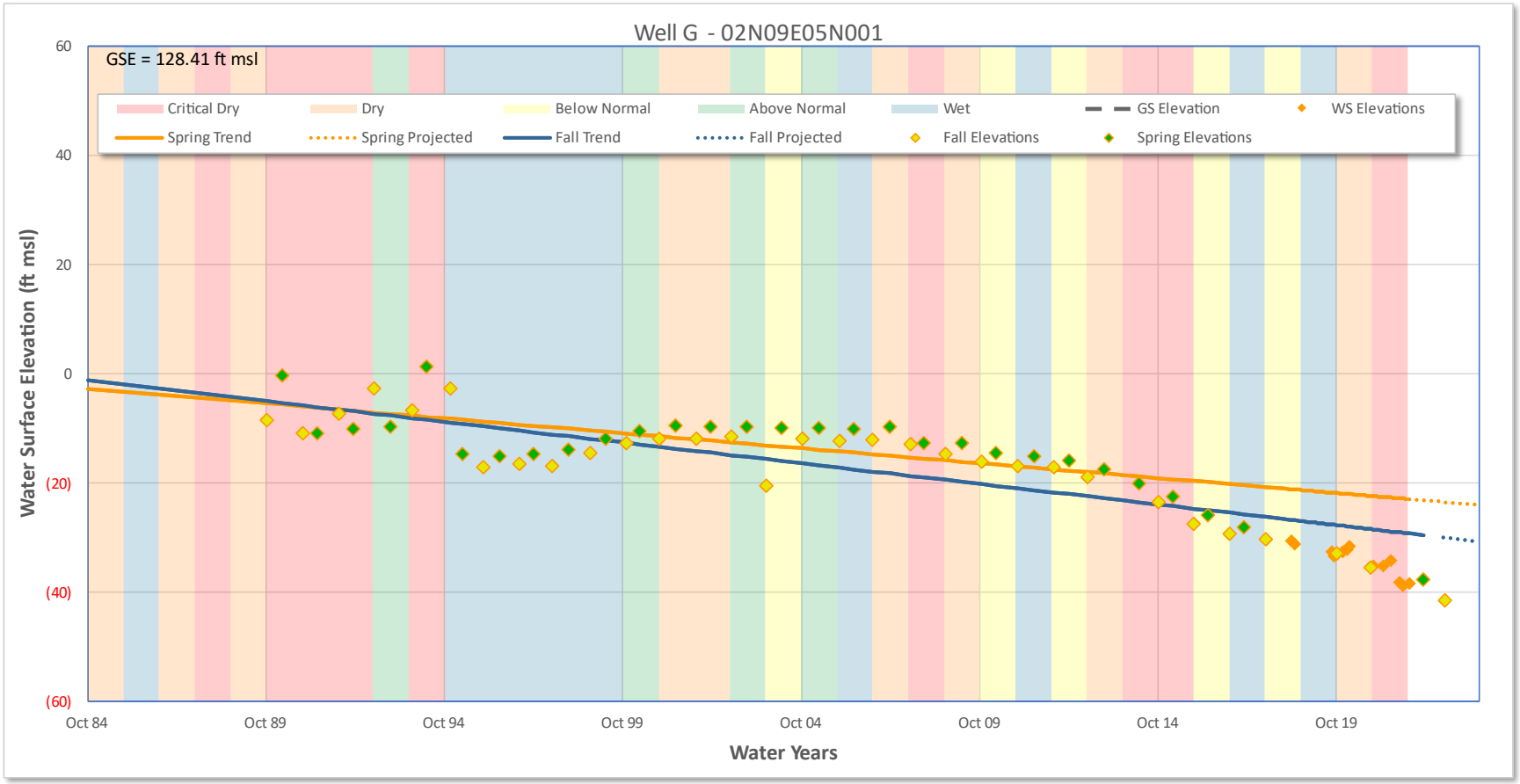

Figure 4-8 Hydrograph Well G - West of Route 26 & South of Shelton Rd.

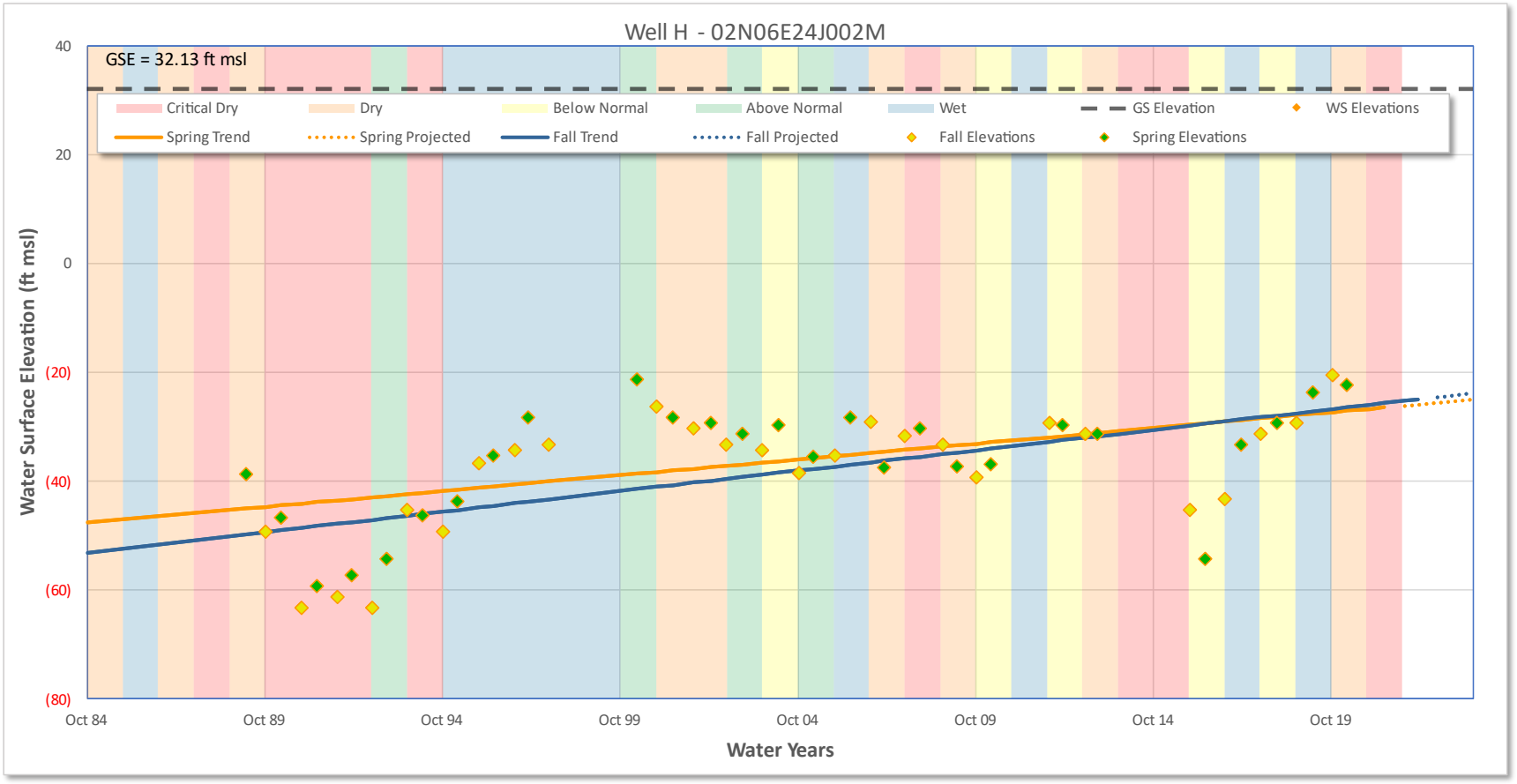

Figure 4-9 Hydrograph Well H - East of Ijams Rd. & North of McAllen Rd.

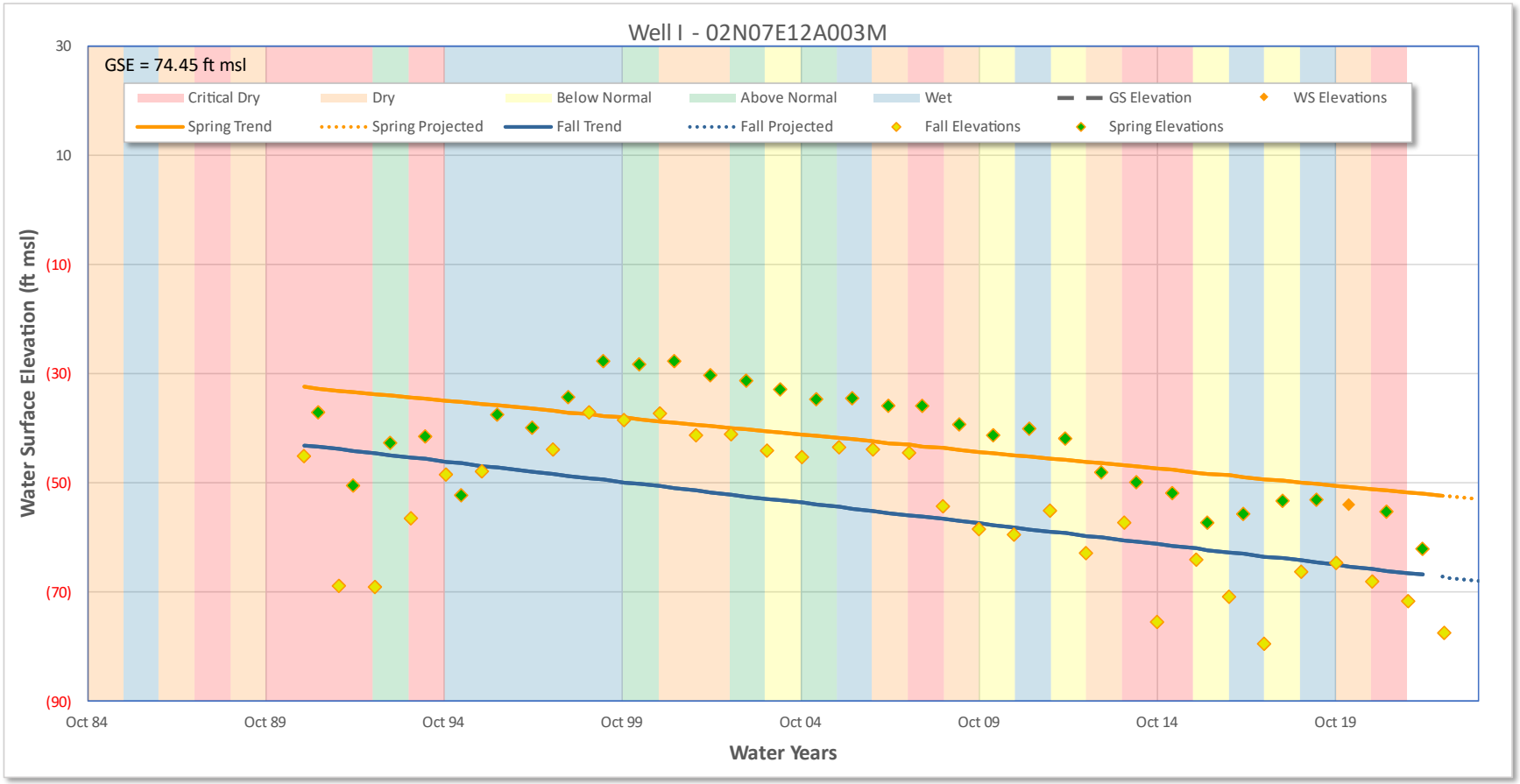

Figure 4-10 Hydrograph Well I - West of Gogna Rd. & North of Route 26

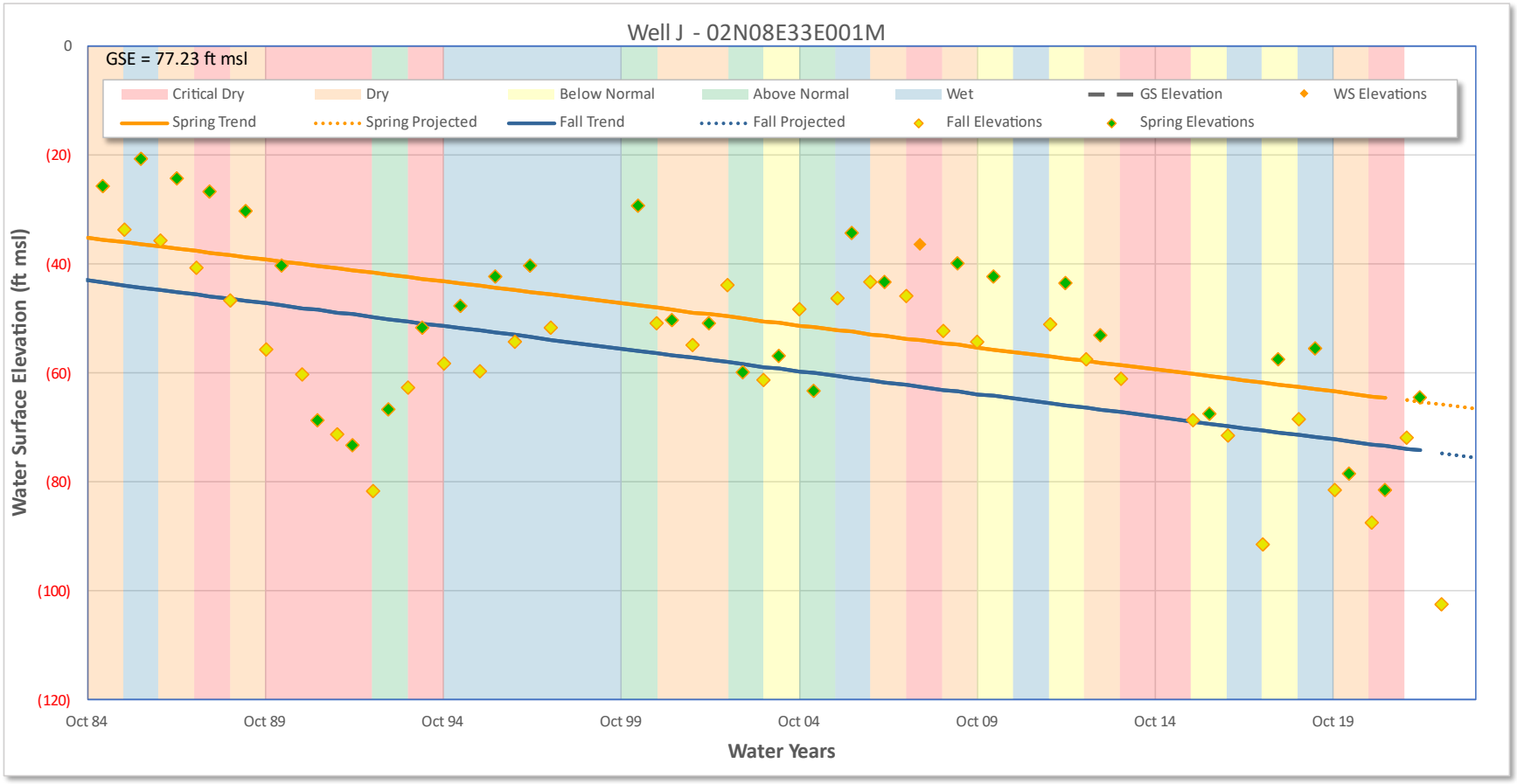

Figure 4-11 Hydrograph Well J - East of Duncan Rd. & South of Milton Rd.

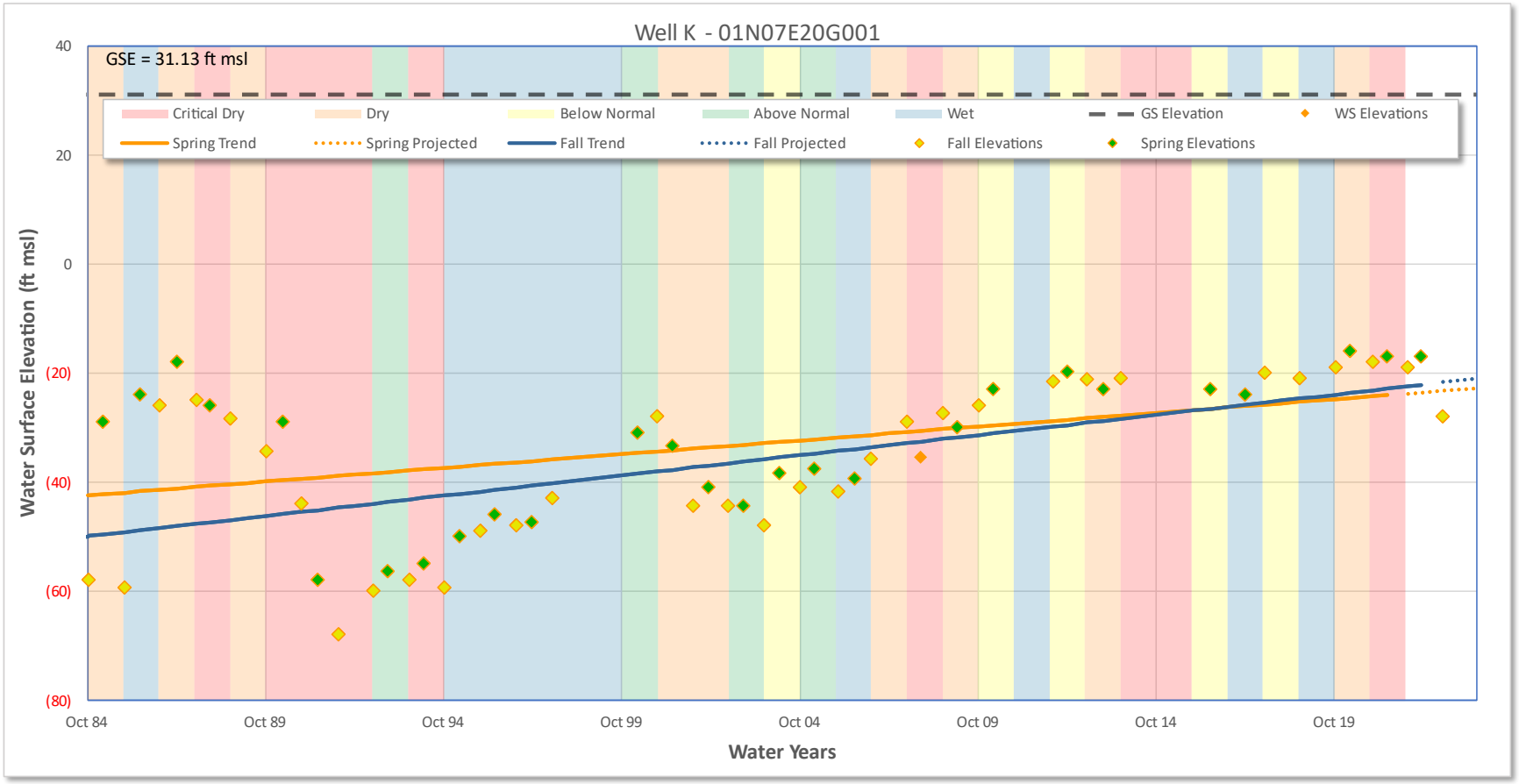

Figure 4-12 Hydrograph Well K - East of Ash Rd. & North of Carpenter Rd.

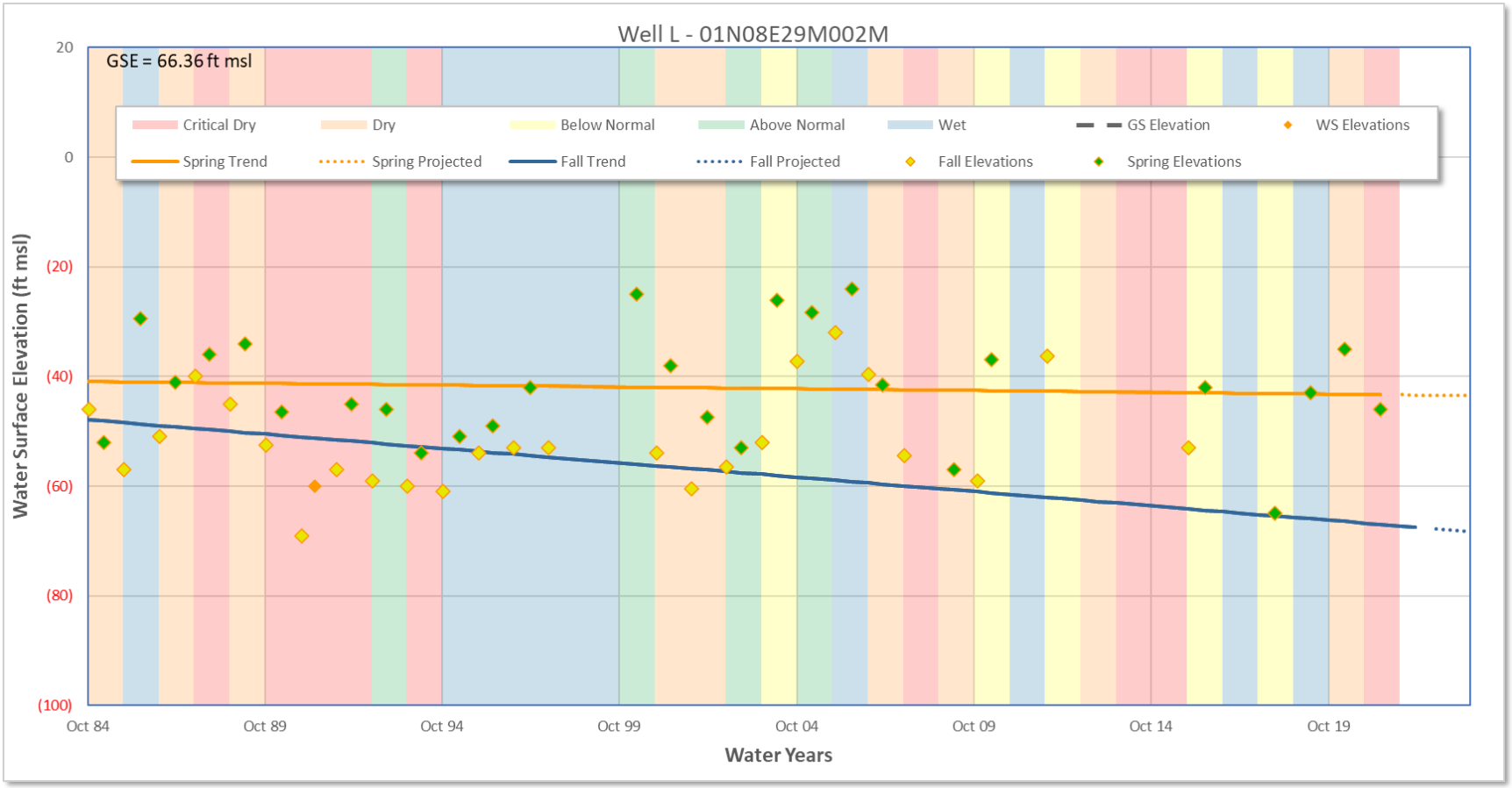

Figure 4-13 Hydrograph Well L - West of Jack Tone Rd. & North of Mariposa Rd.

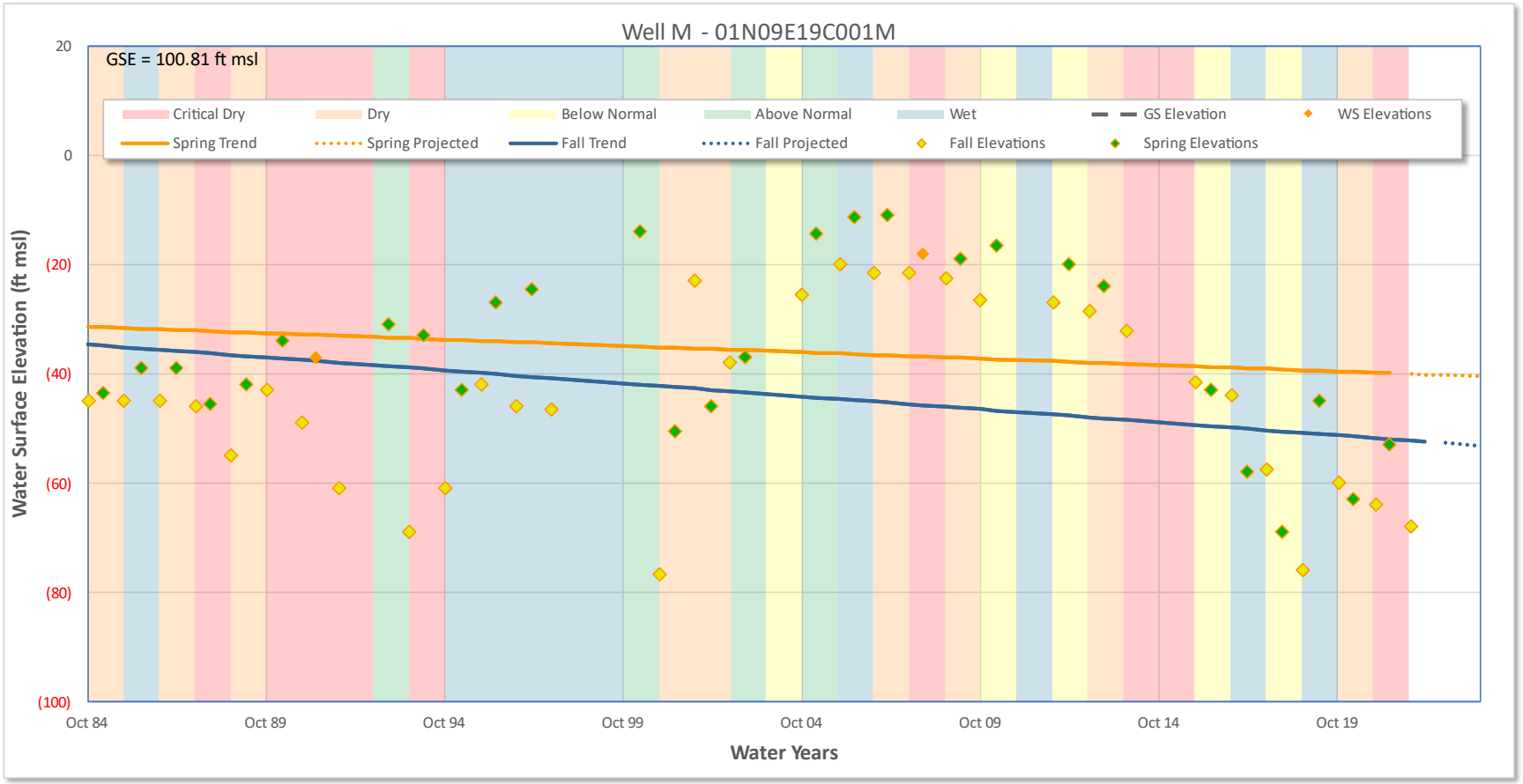

Figure 4-14 Hydrograph Well M - West of Hewitt Rd. & South of Hwy. 4

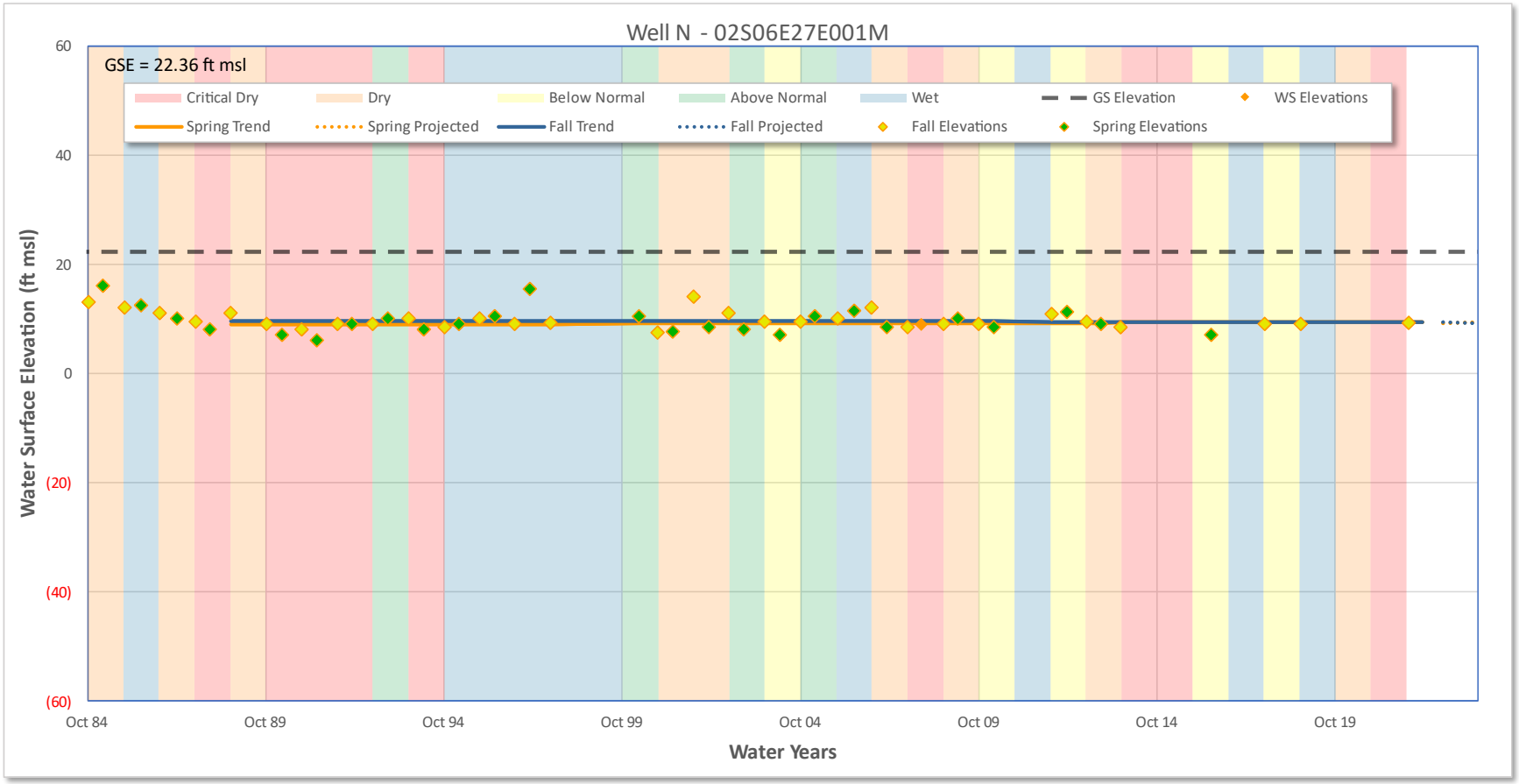

Figure 4-15 Hydrograph Well N - West of Wright Rd. & North of Kasson Rd.

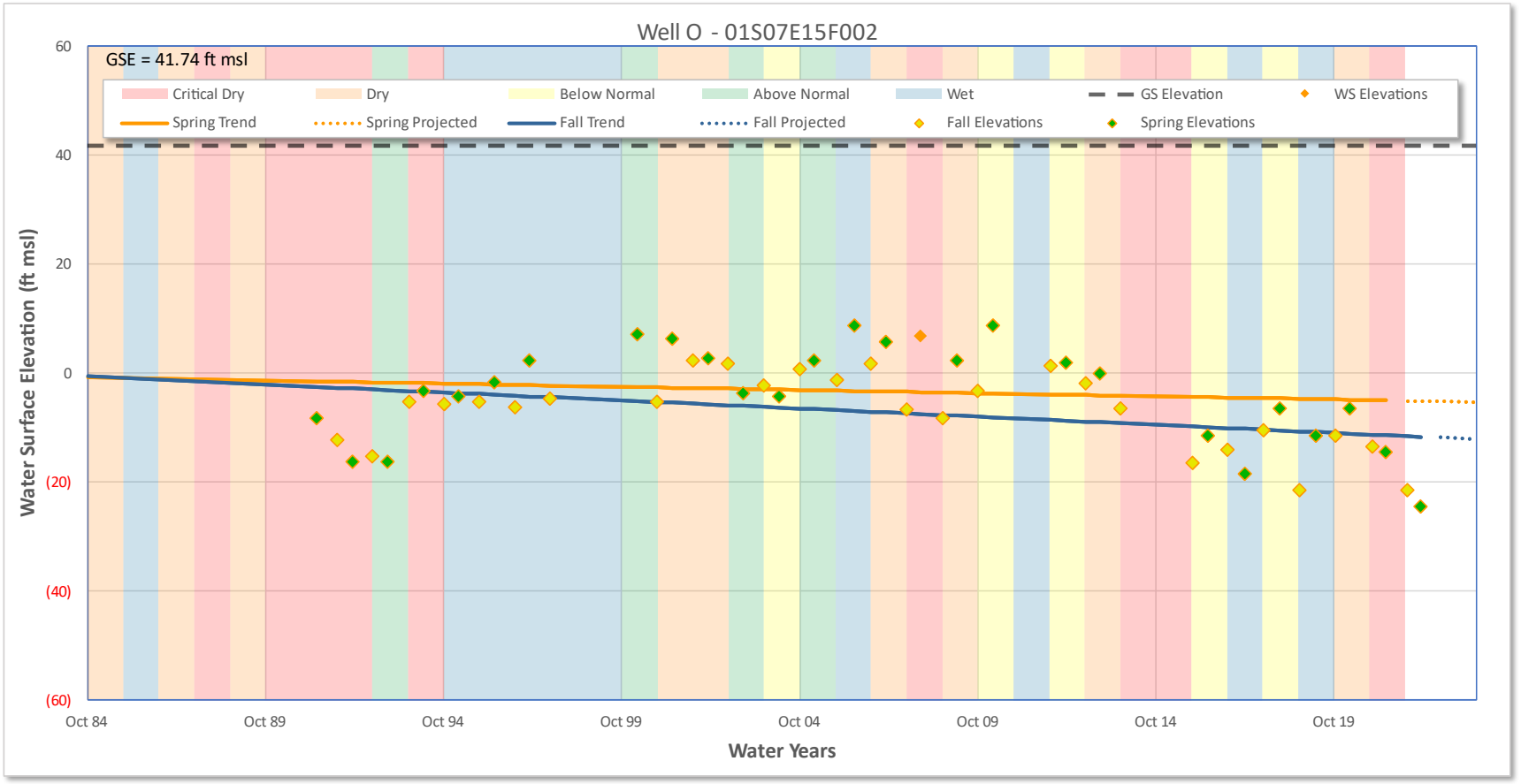

Figure 4-16 Hydrograph Well O – West of Austin Rd. & North of French Camp Rd.

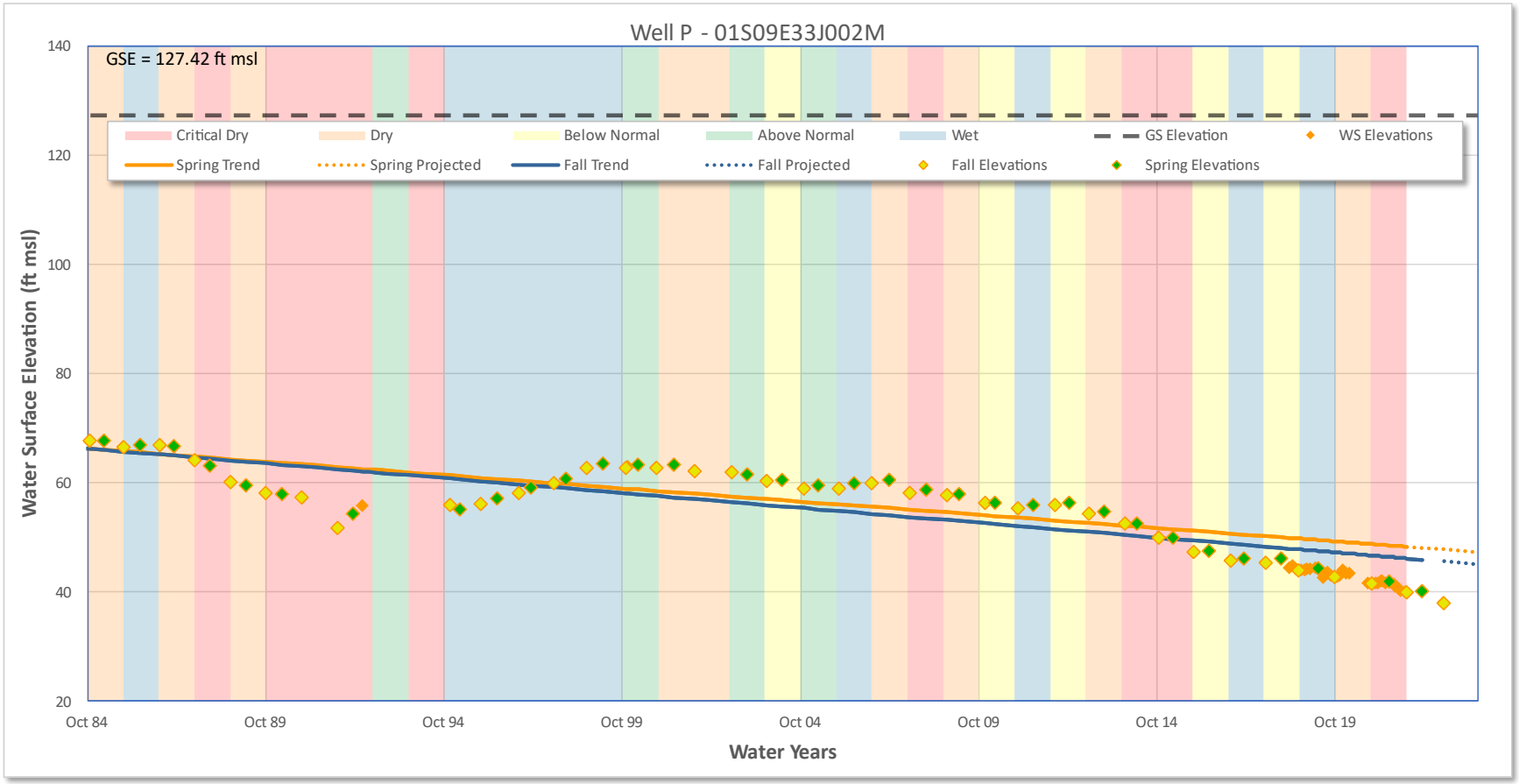

Figure 4-17 Hydrograph Well P - West of Campbell Ave. & North of Hwy 120.

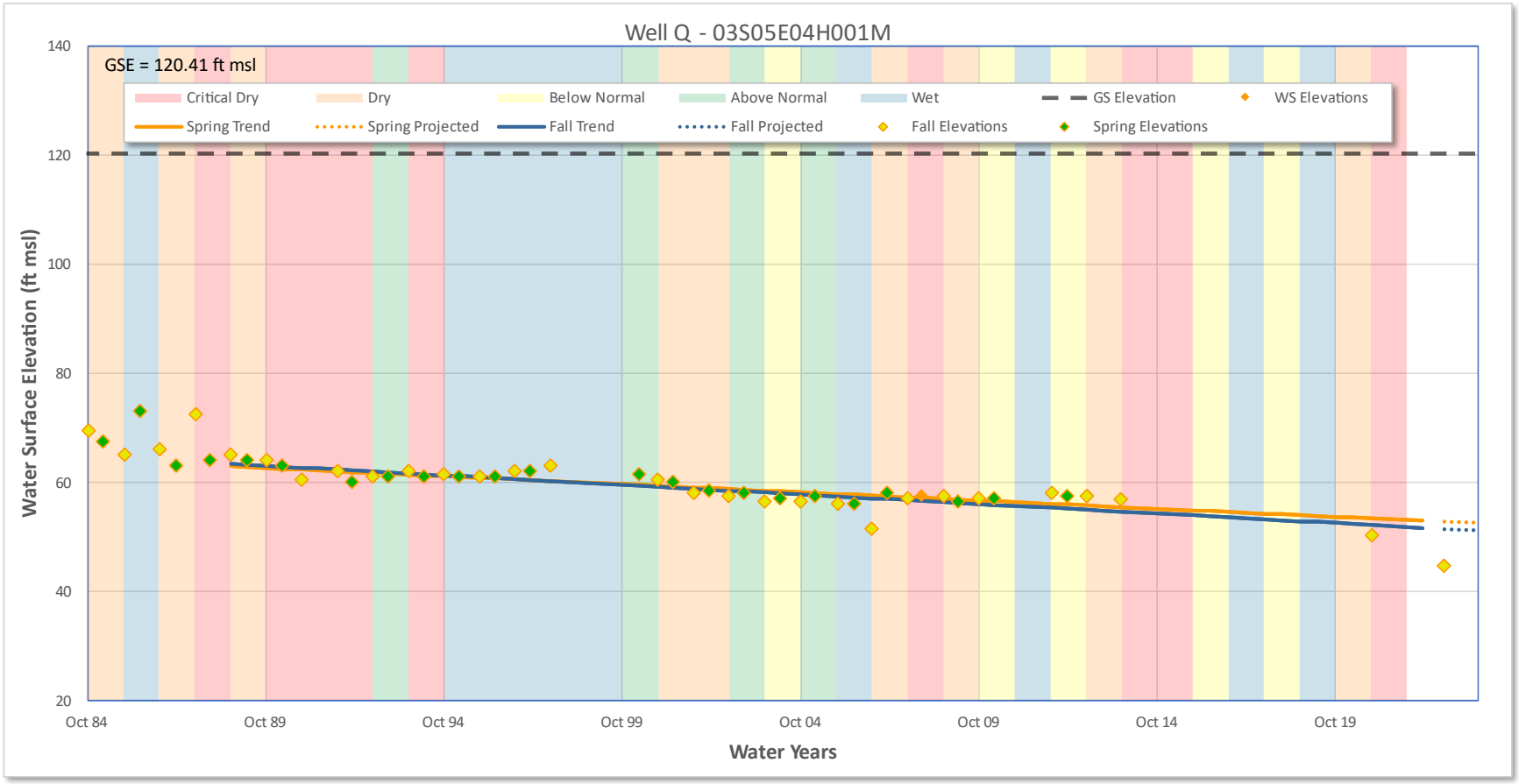

Figure 4-18 Hydrograph Well Q - East of McArthur Rd. & North of Darlene Rd.

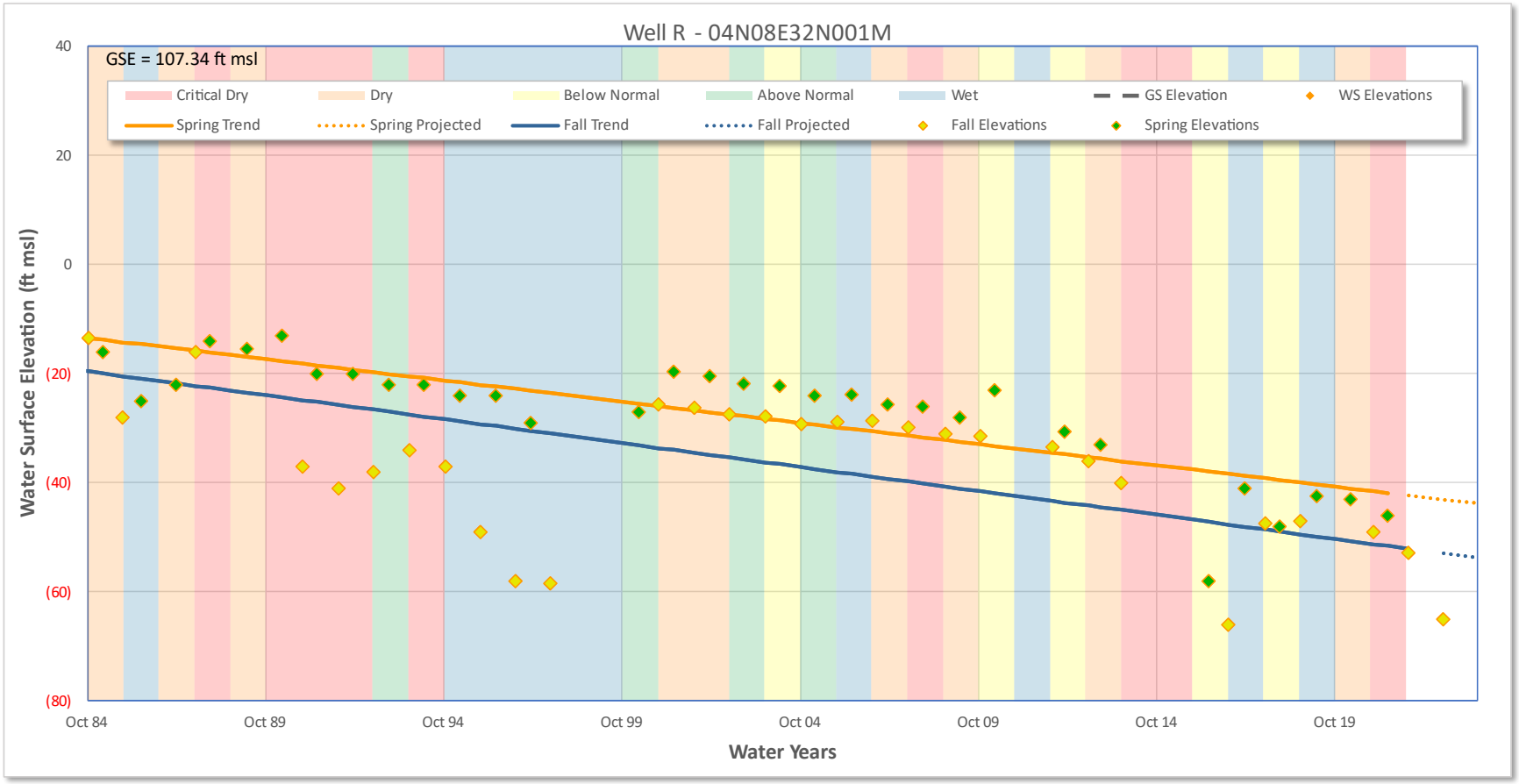

Figure 4-19 Hydrograph Well R - West of Tully Rd. & North of Brandt Rd.

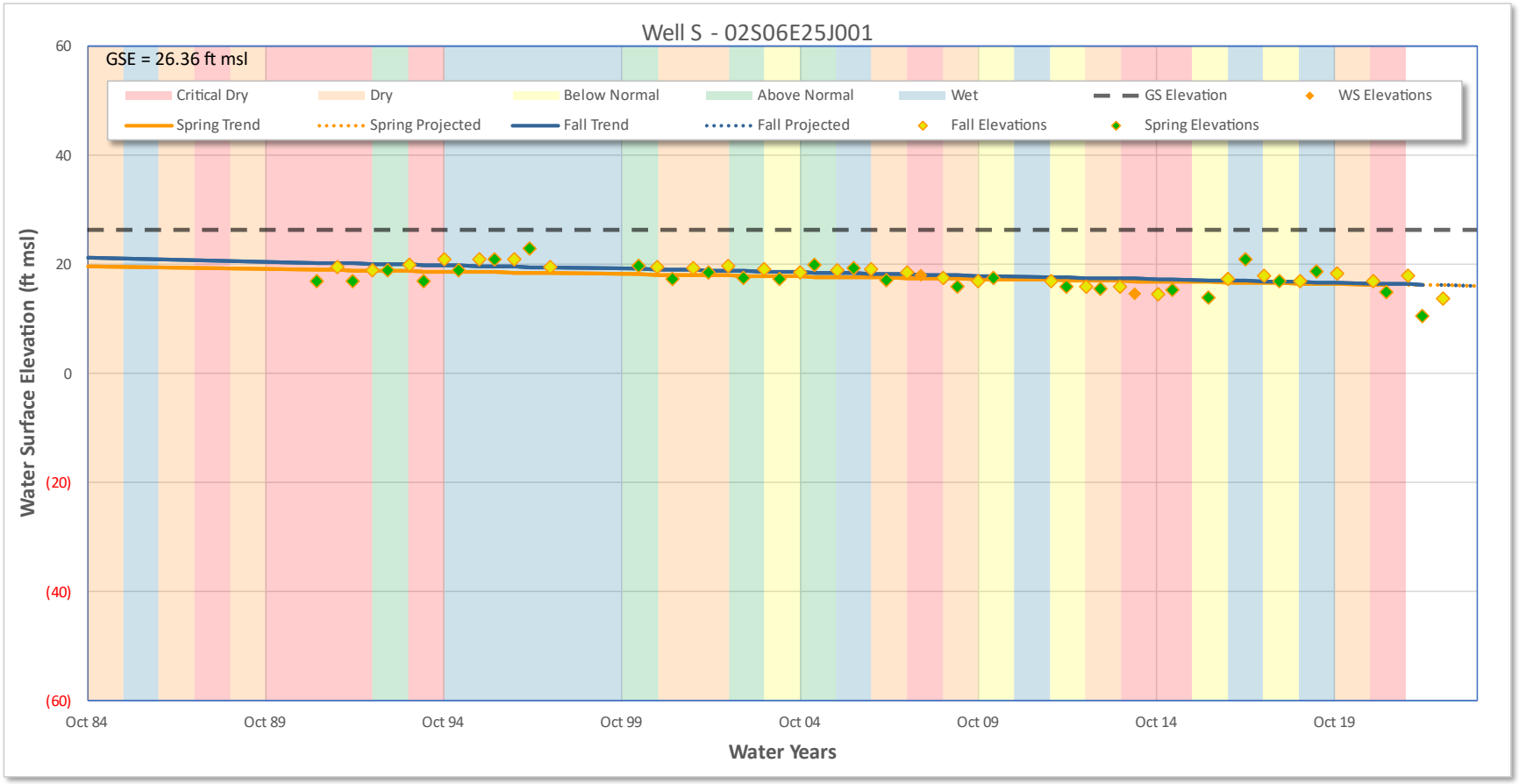

Figure 4-20 Hydrograph Well S - East of Hays Rd. & North of Mullin Rd.

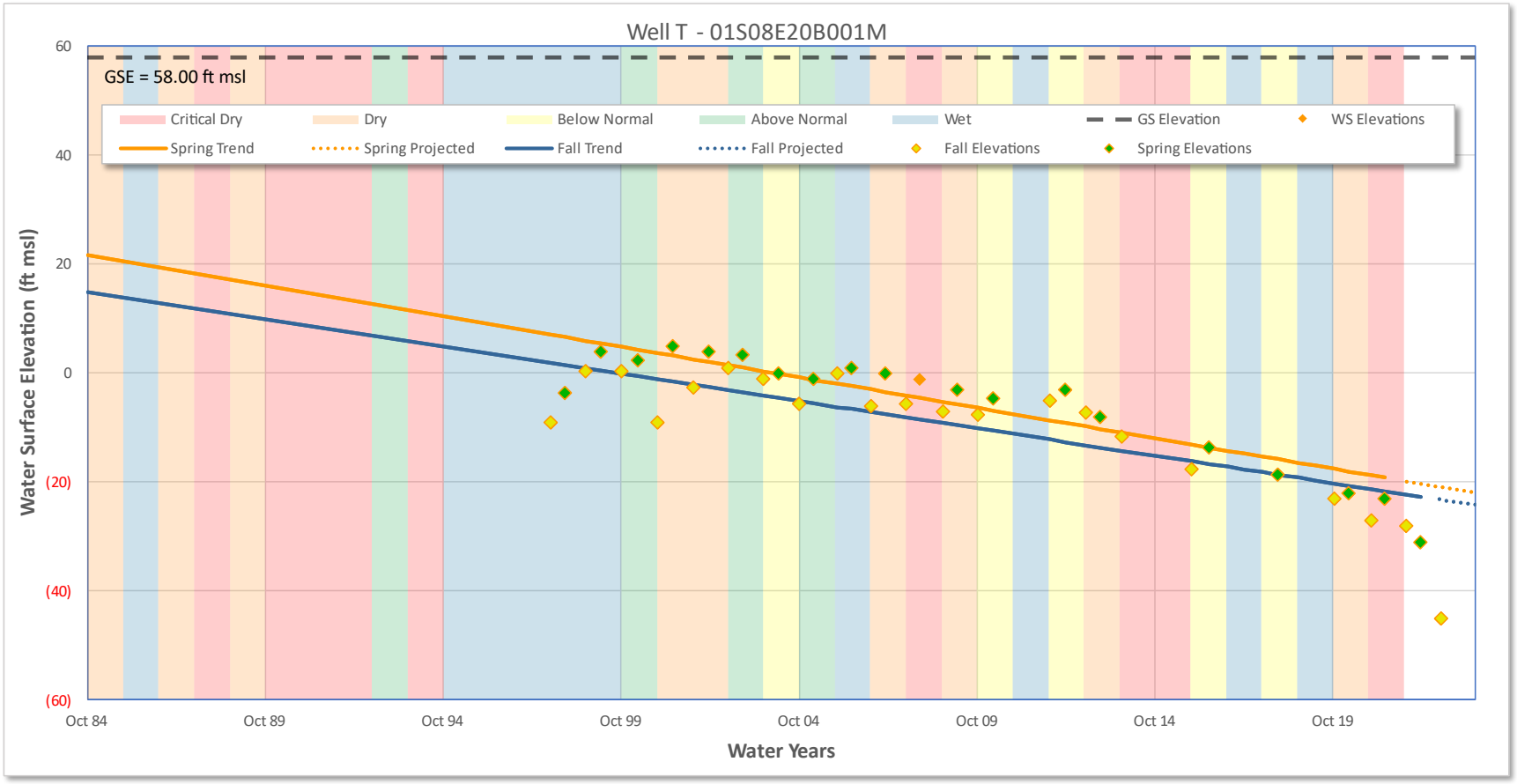

Figure 4-21 Hydrograph Well T - West of Murphy Rd. & South of Avena Rd.

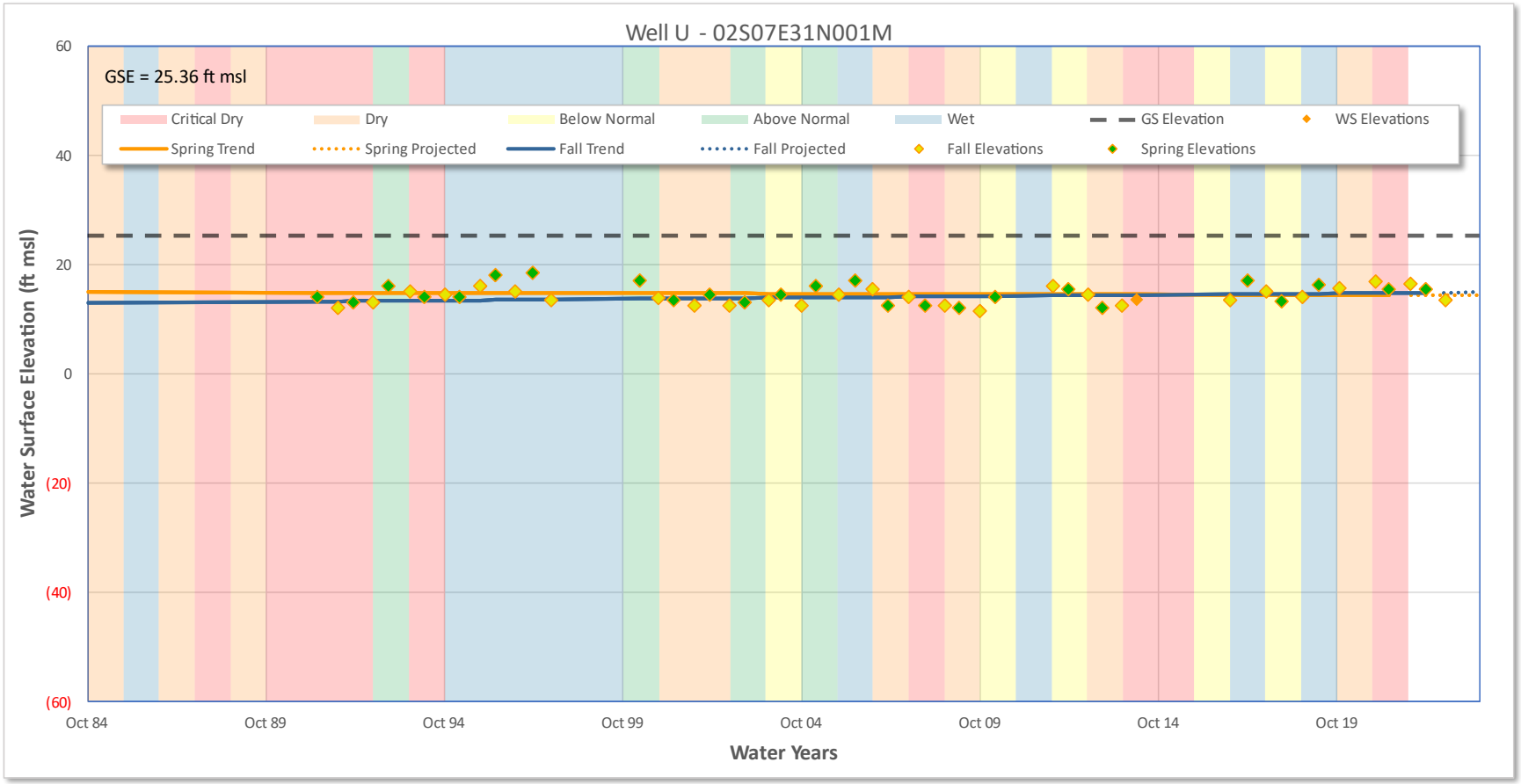

Figure 4-22 Hydrograph Well U - East of Airport Rd. & South of Perrin Rd.

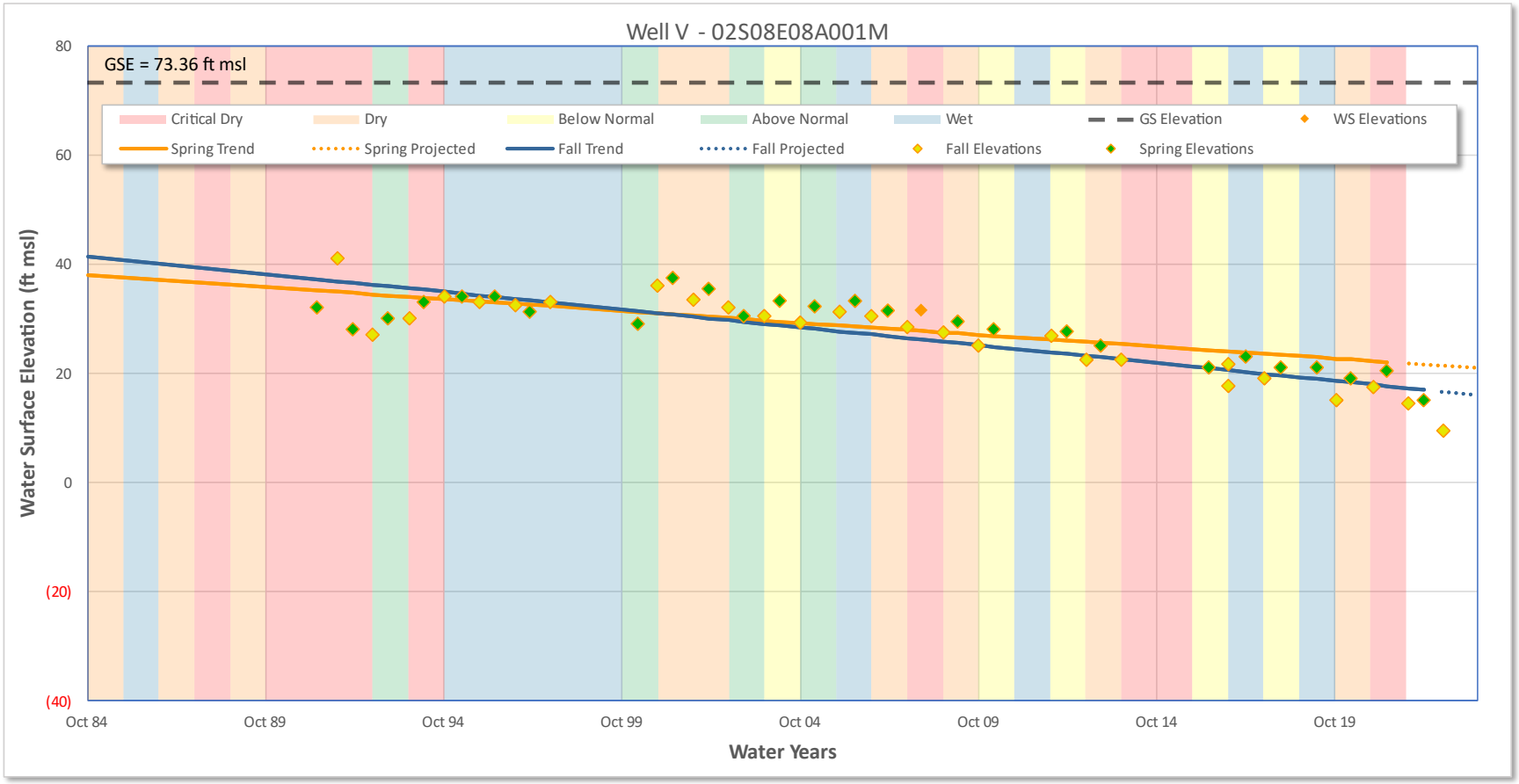

Figure 4-23 Hydrograph Well V - East of Murphy Rd. & South of Cedar Ln.

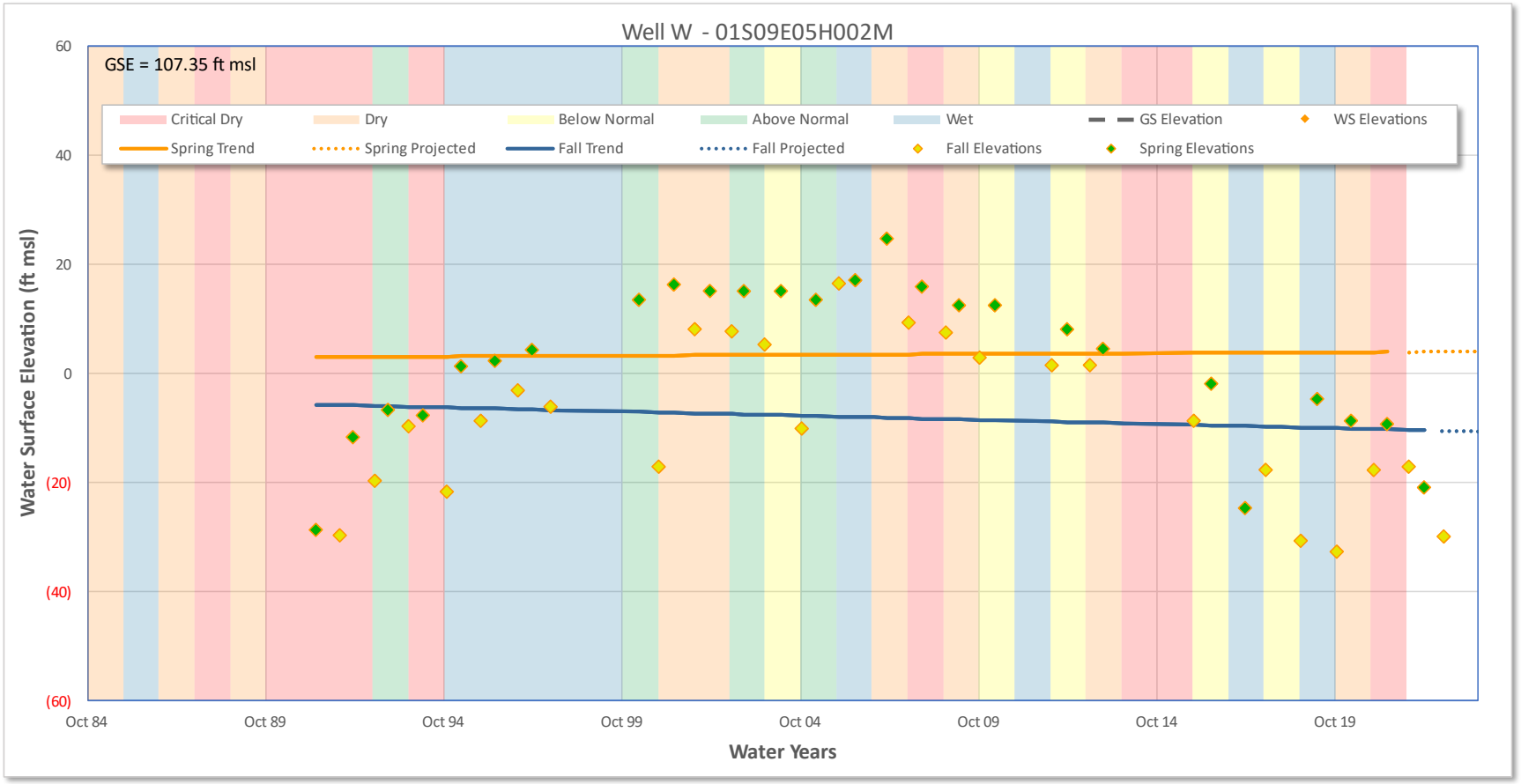

Figure 4-24 Hydrograph Well W - West of Henry Rd. & South of Sonora Rd.

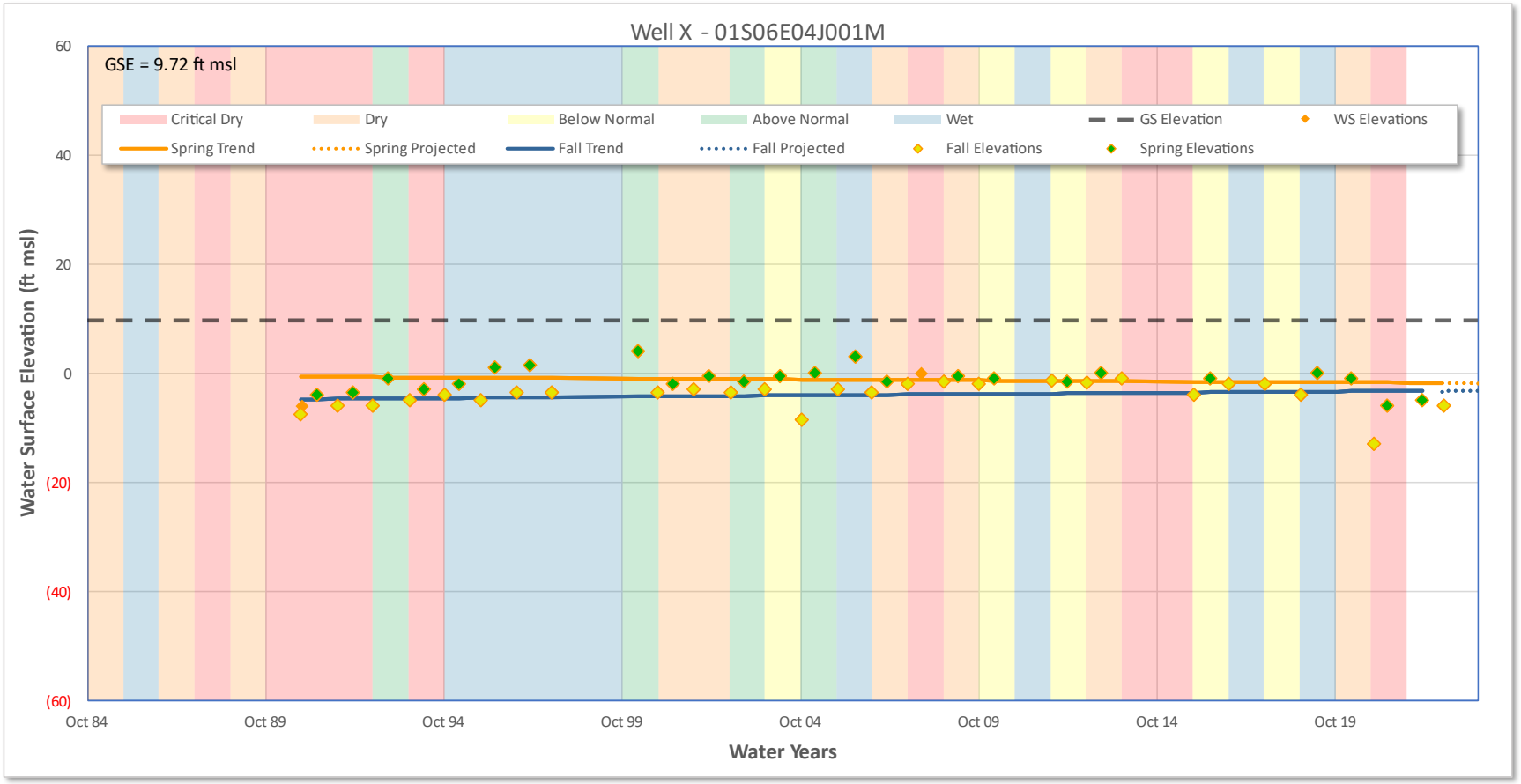

Figure 4-25 Hydrograph Well X - East of Wolfe Rd. & South of Howard Rd.

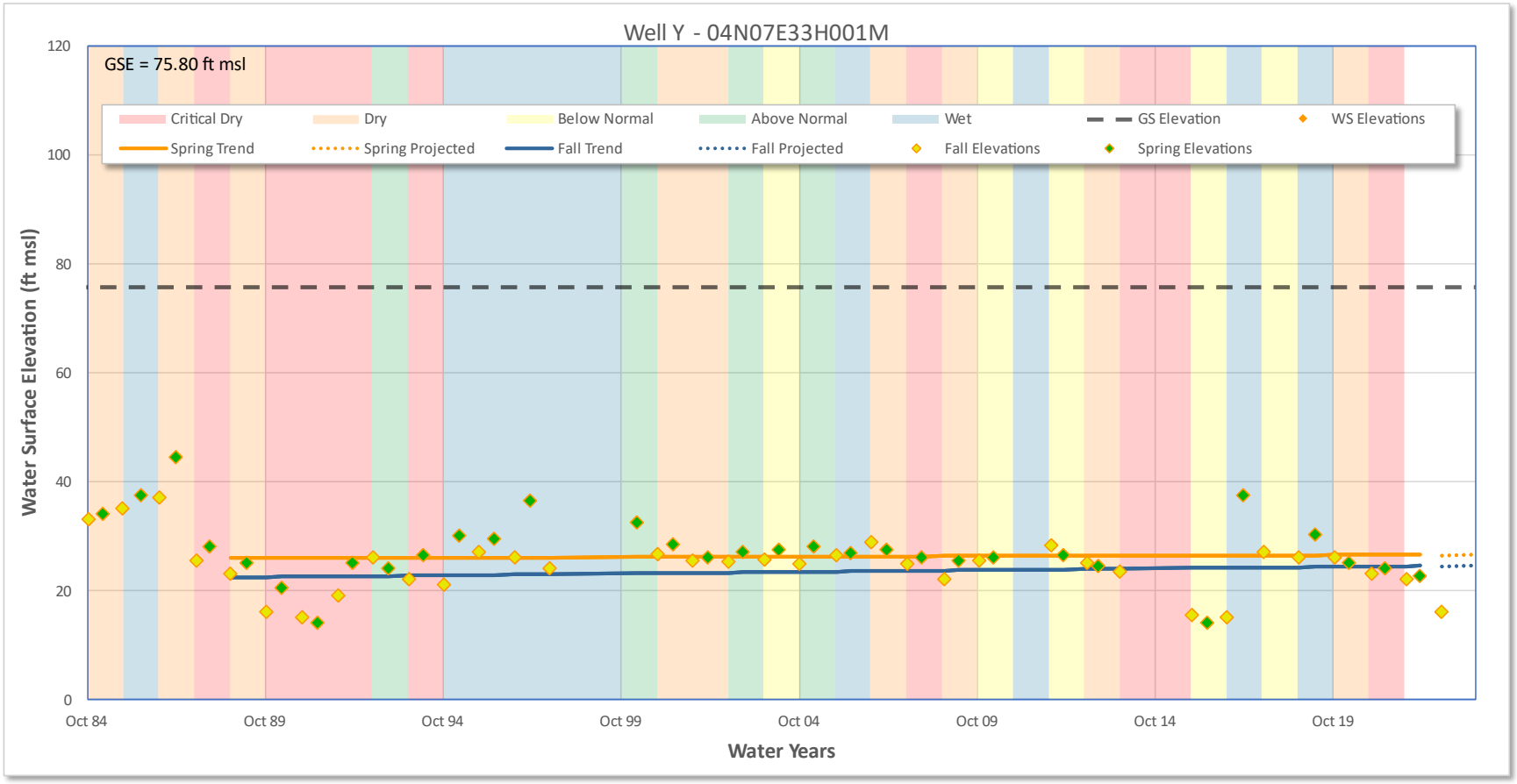

Figure 4-26 Hydrograph Well Y - East of Bruella Rd. & North of Schmiedt Rd.

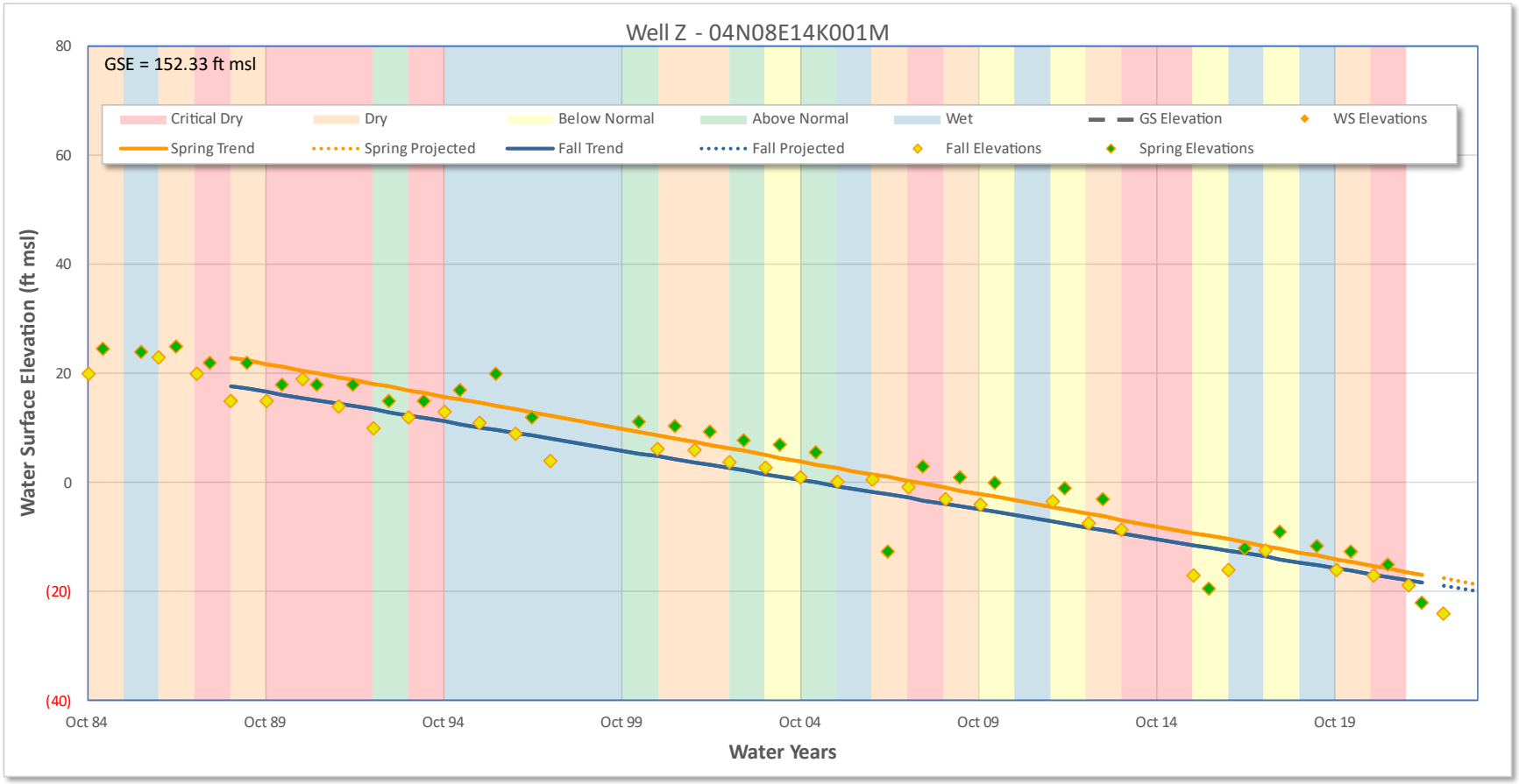

Figure 4-27 Hydrograph Well Z - East of Johnson Rd. & South of Route 1

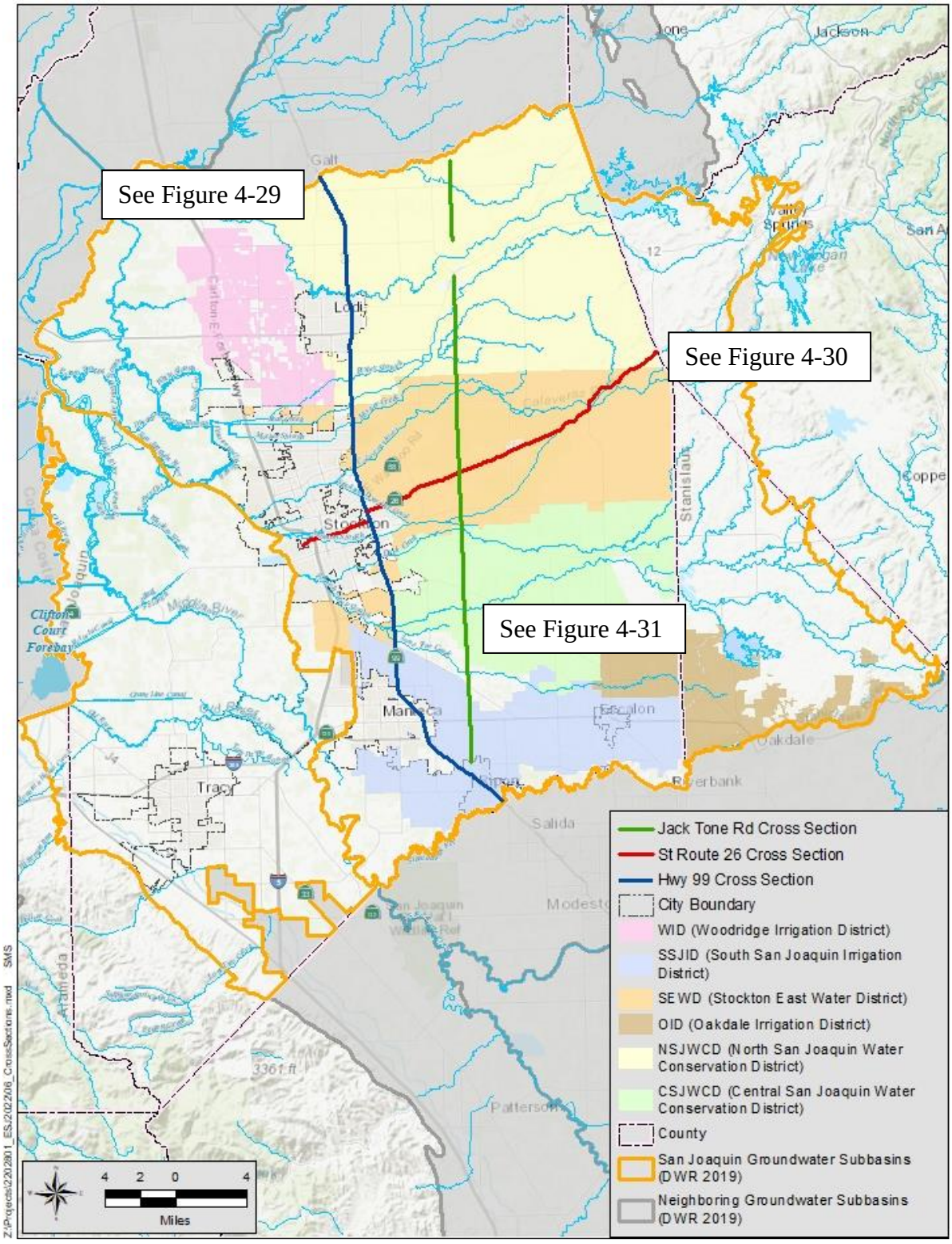

Figure 4-28 Groundwater Surface Cross Sections

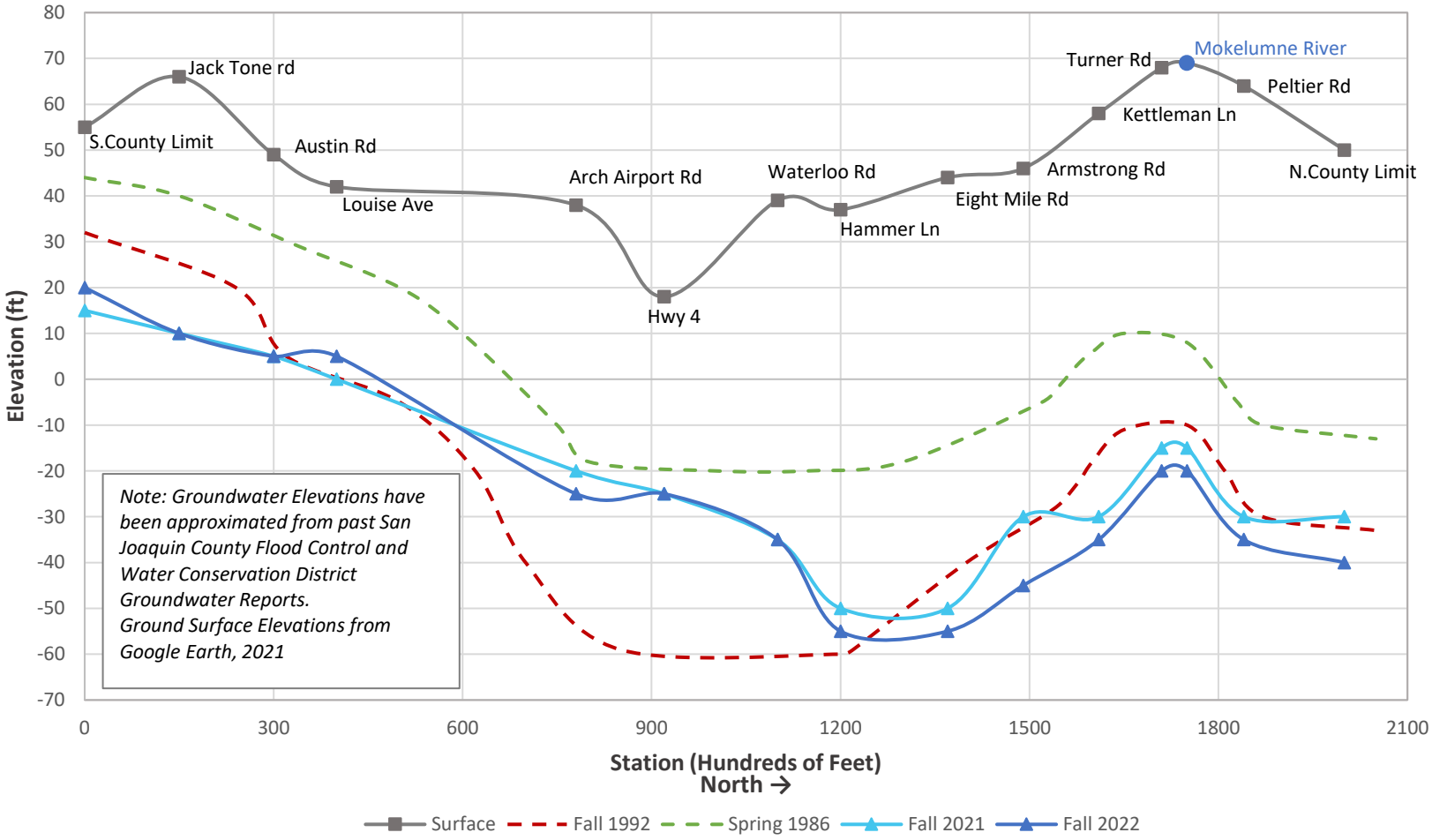

Figure 4-29 Highway 99 Cross Section Fall 2022

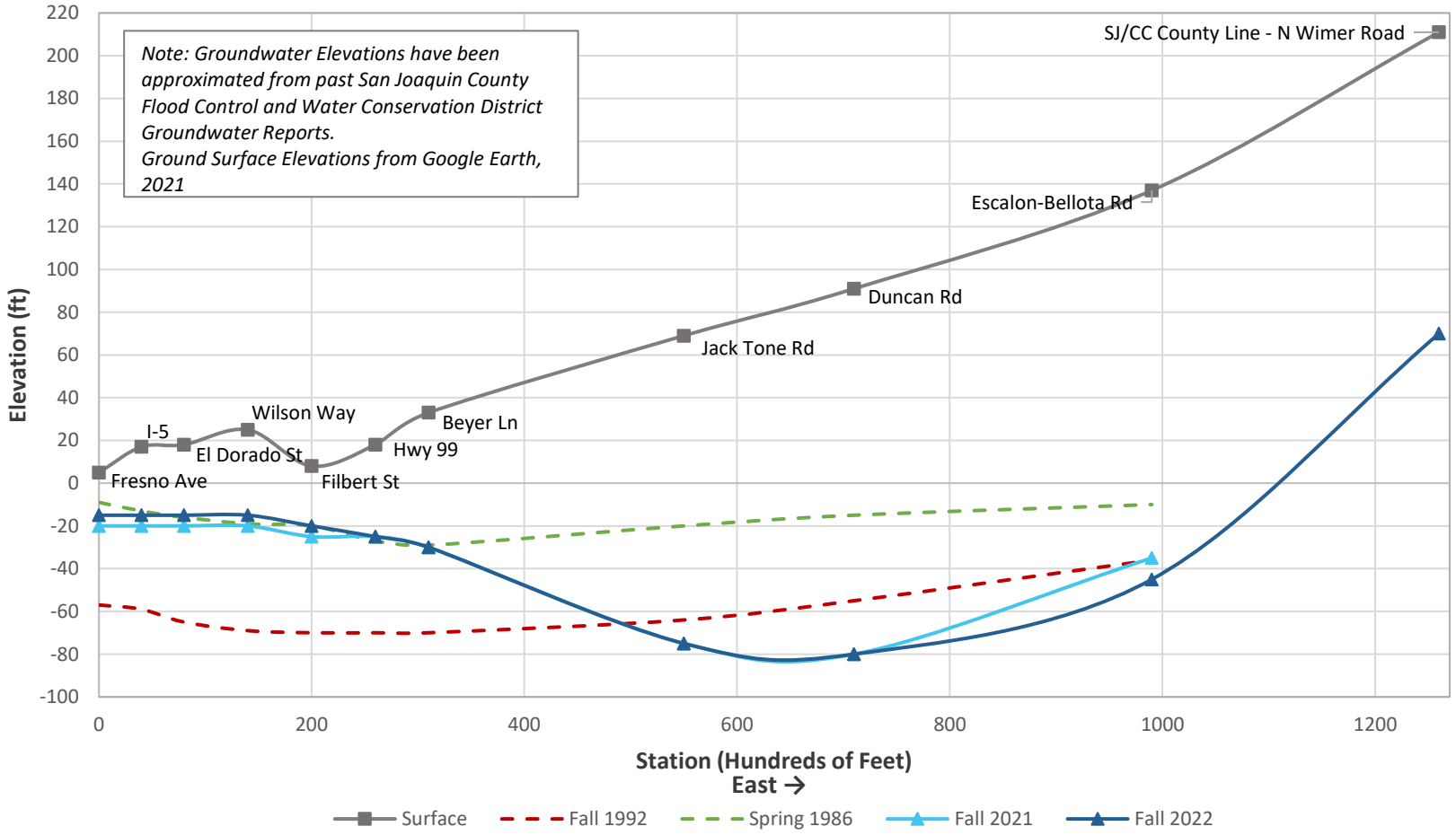

Figure 4-30 Highway 4 & Highway 26 Cross Section Fall 2022

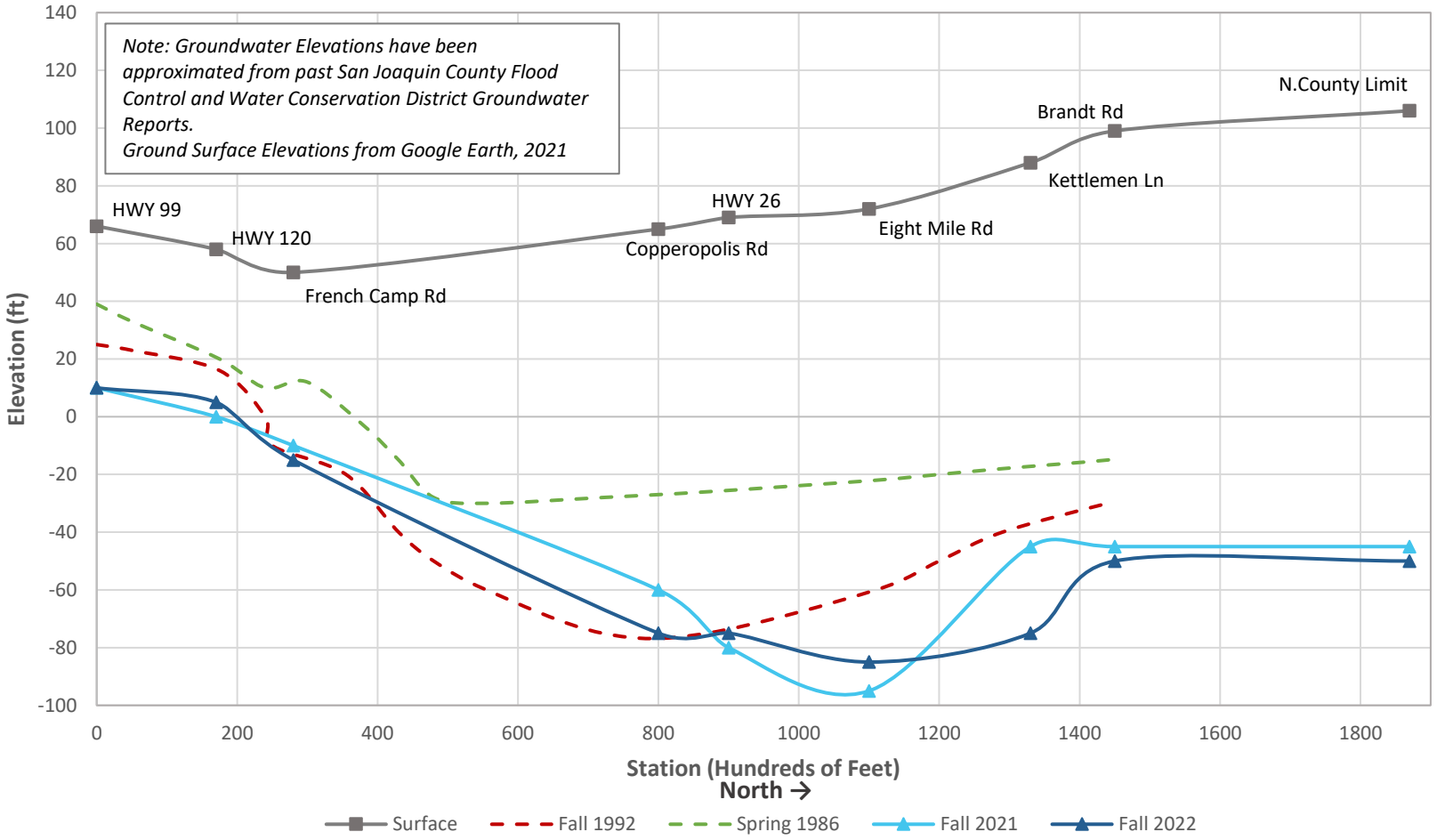

Figure 4-31 Jack Tone Rd Cross Section Fall 2022

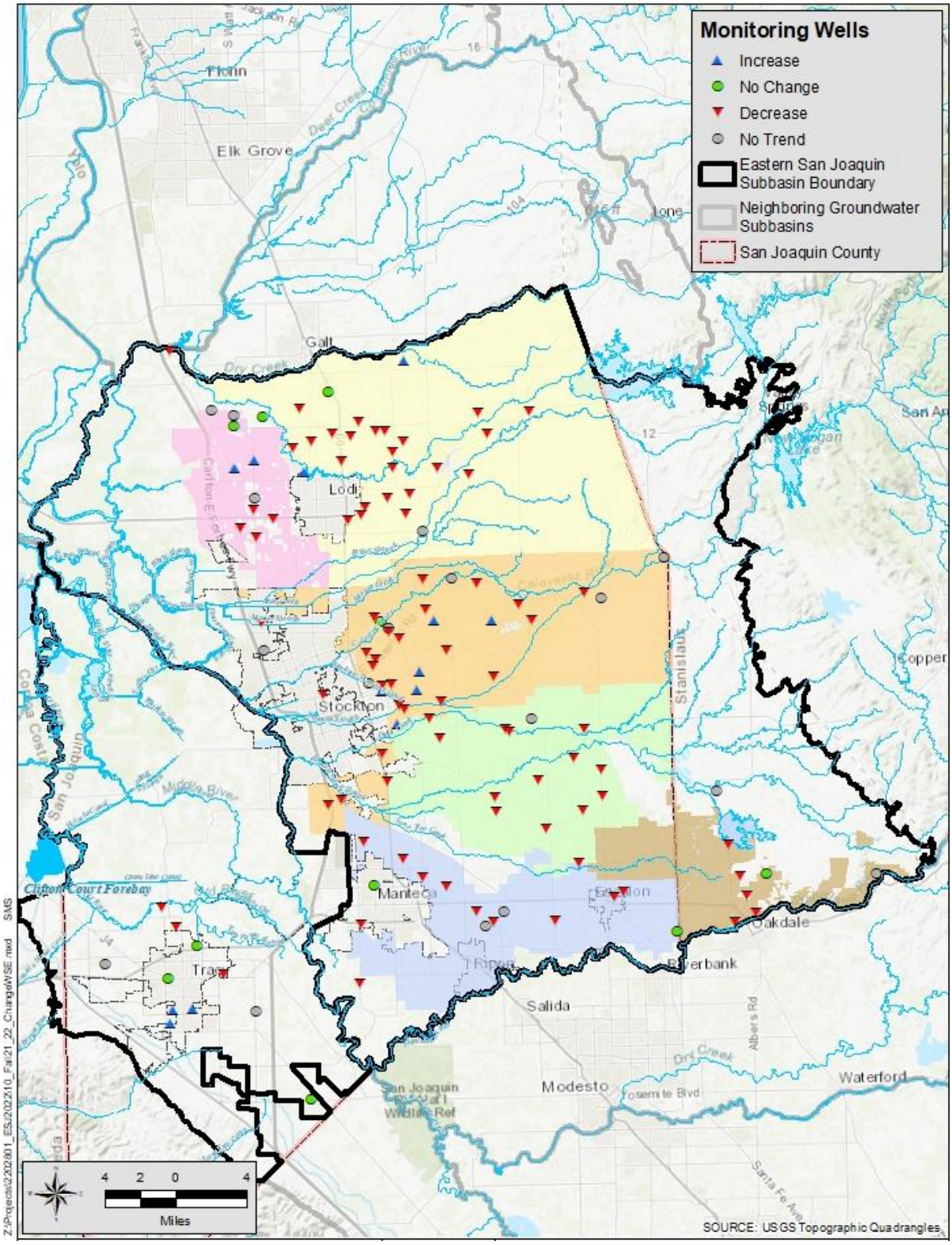

Figure 4-32 Change in Groundwater Elevation – Fall 2021 to Fall 2022

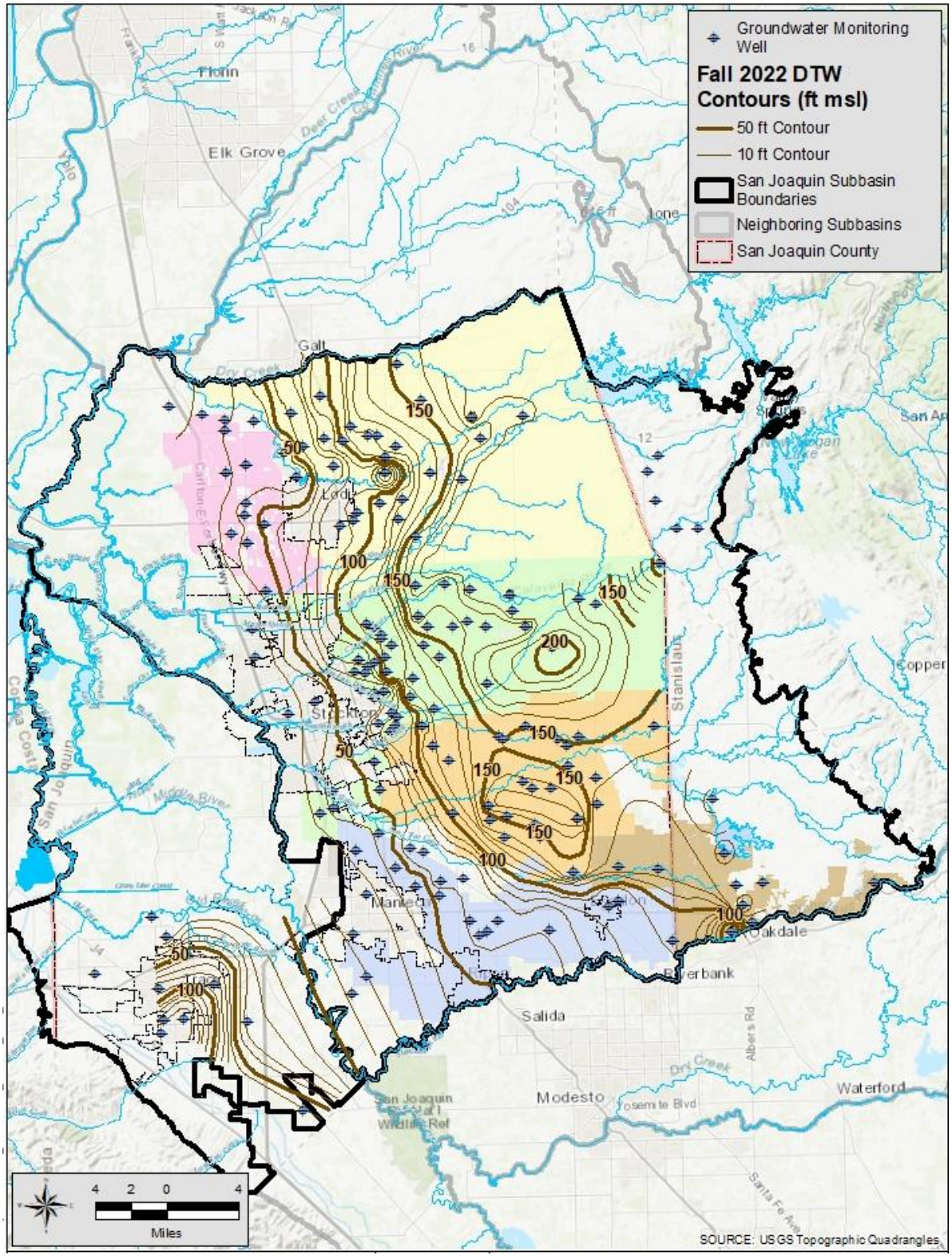

Figure 4-33 Depth to Groundwater – Fall 2022

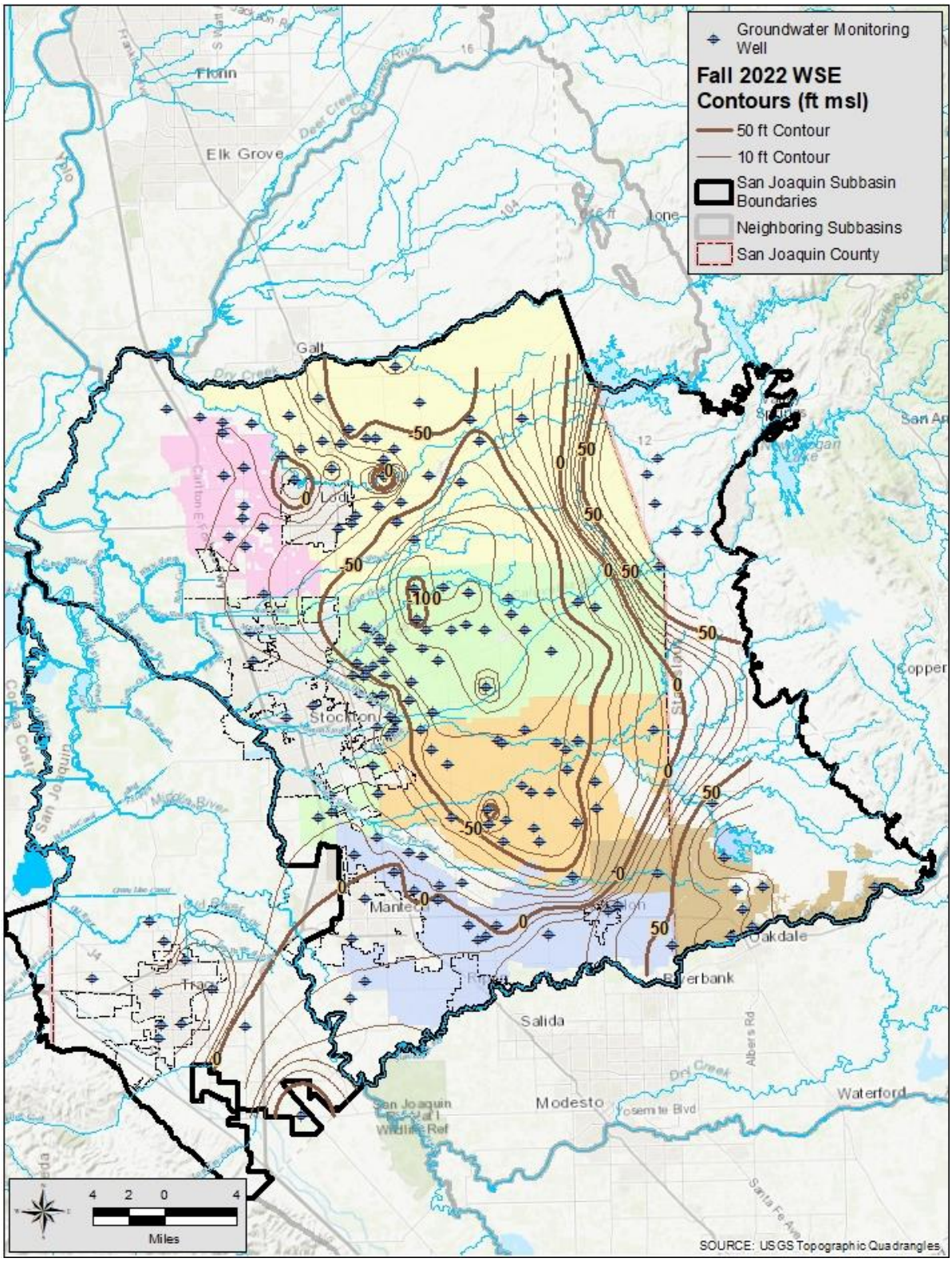

Figure 4-34 Groundwater Surface Elevation – Fall 2022

5 Groundwater Quality Monitoring

County personnel collected water quality samples from three (3) of fourteen (14) wells in 2022. The information for water quality in the Fall 2022 in comparison to 2021 concentrations are summarized as follows:

North Stockton, County Hospital, and Lathrop area data was not available when this report was published due to access constraints or data not being uploaded to the DDW.

Historic water quality sampling locations are shown on Figure 5-1. Water quality concentration trends are shown on Figures 5-2 through 5-14.

Table 5-1 Comparison of Water Quality Results

Well	Fall 2021			Fall 2022		
	Chloride (ppm)	EC (umhos/cm)	TDS (ppm)	Chloride (ppm)	EC (umhos/cm)	TDS (ppm)
North Stockton						
4E1	33	753	470	--	--	--
8C1	10	314	210	--	--	--
8Q2	--	--	--	--	--	--
29M1	--	--	--	--	--	--
7D2	6	409	270	--	--	--
County Hospital Area						
35G2	--	--	--	--	--	--
35N1	--	--	--	--	--	--
Lathrop Area						
25M3	--	--	--	--	--	--
25M4	--	--	--	--	--	--
New Wells						
1	2	161	120	3	170	160
2	7	288	200	5	441	320
3	--	--	--	--	--	--
4	--	--	--	46	944	600

Notes: Water quality from Drinking Water Watch was not available for 2022 data

New Well 3 was offline for 2022 sample period

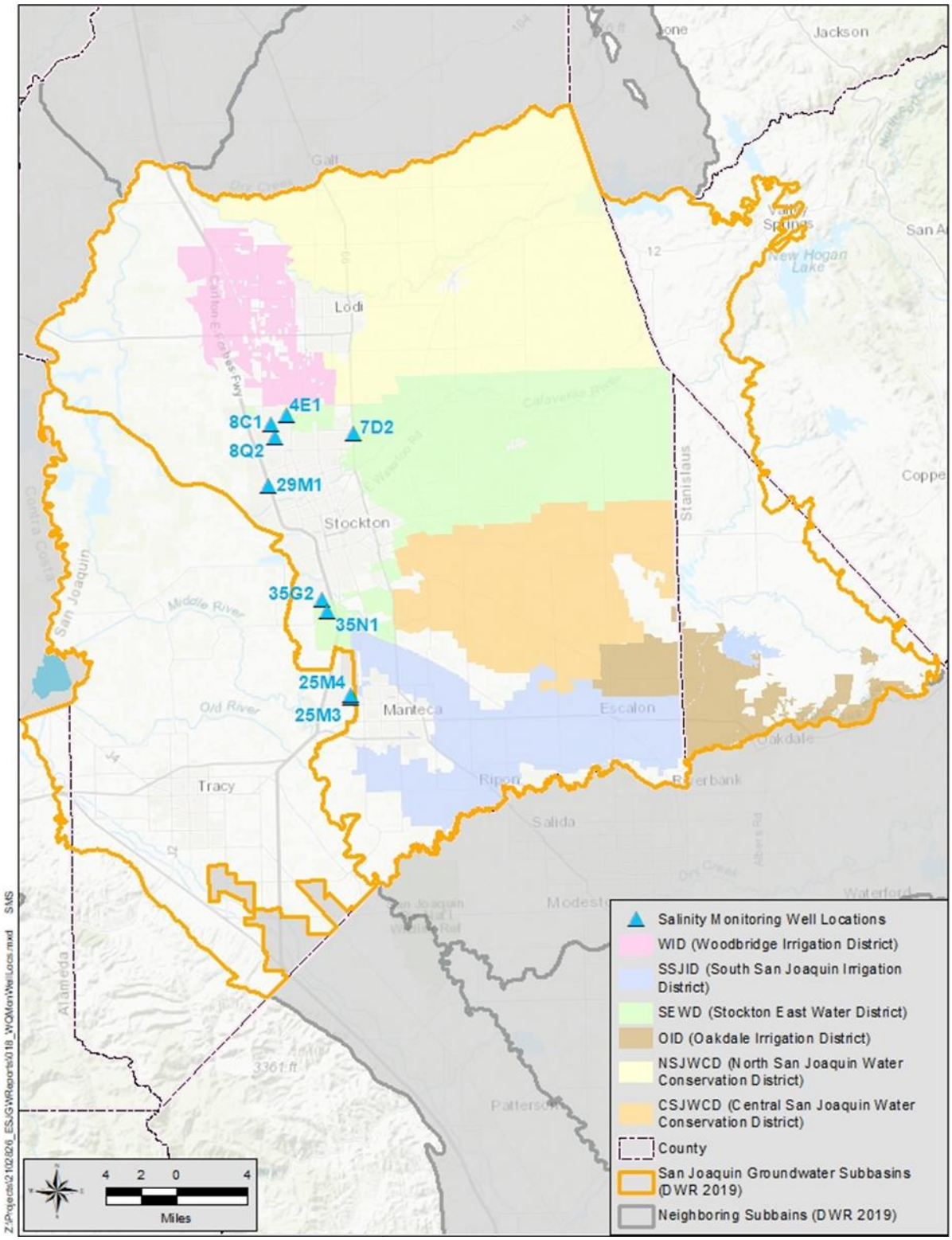

Figure 5-1 Salinity Monitoring Well Locations

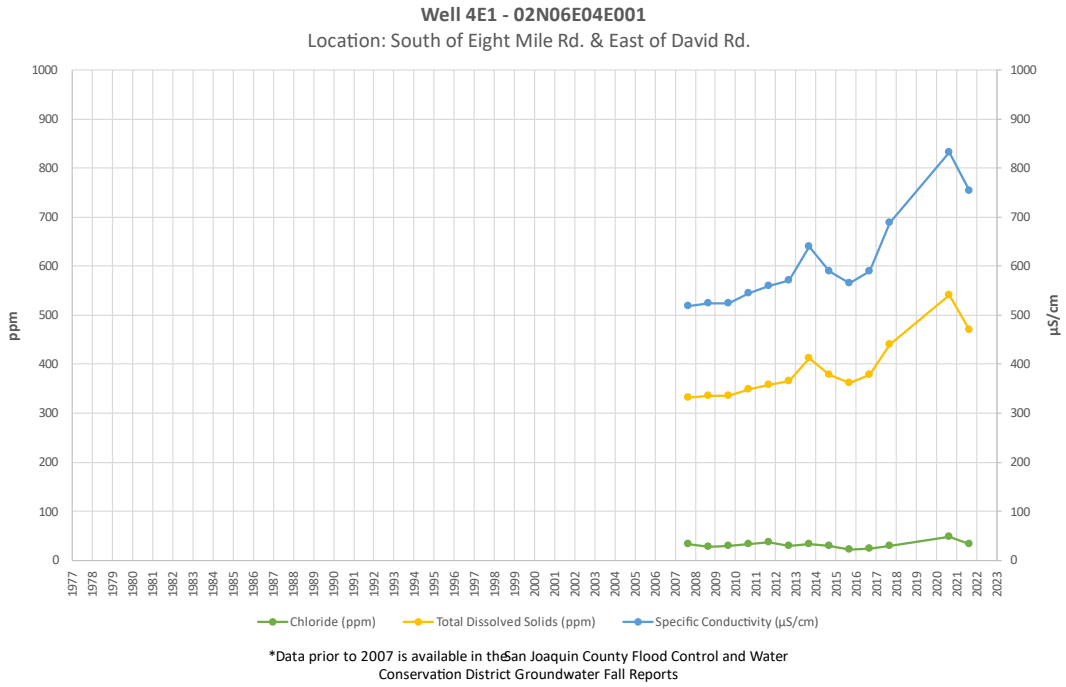

Figure 5-2 Water Quality Comparison Graph Well 4E1

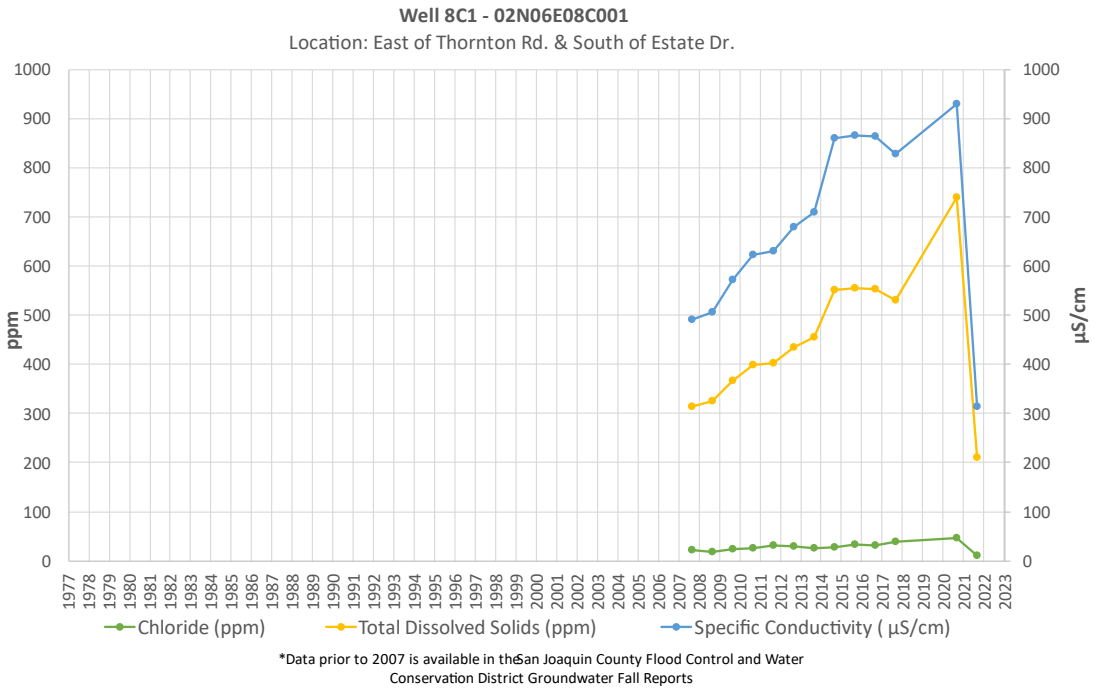

Figure 5-3 Water Quality Comparison Graph Well 8C1

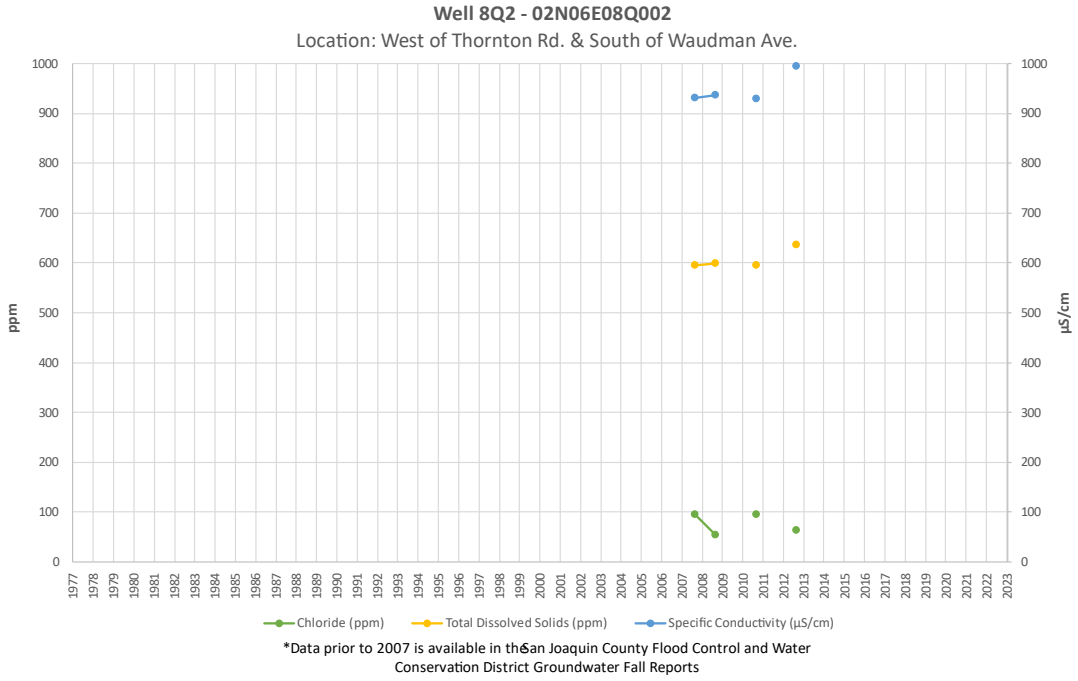

Figure 5-4 Water Quality Comparison Graph Well 8Q2

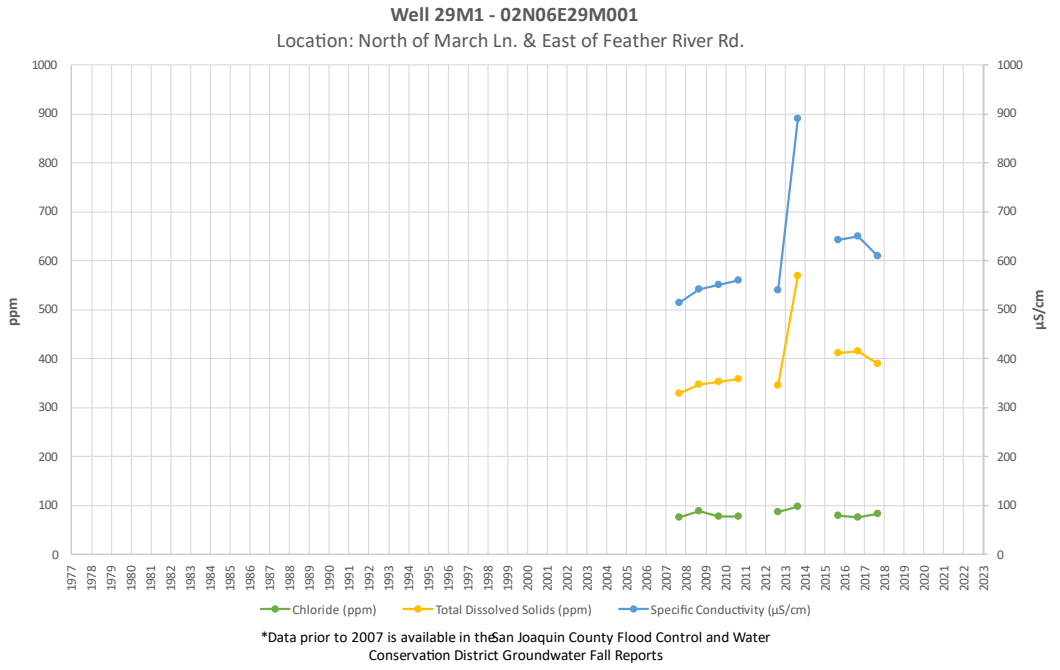

Figure 5-5 Water Quality Comparison Graph Well 29M1

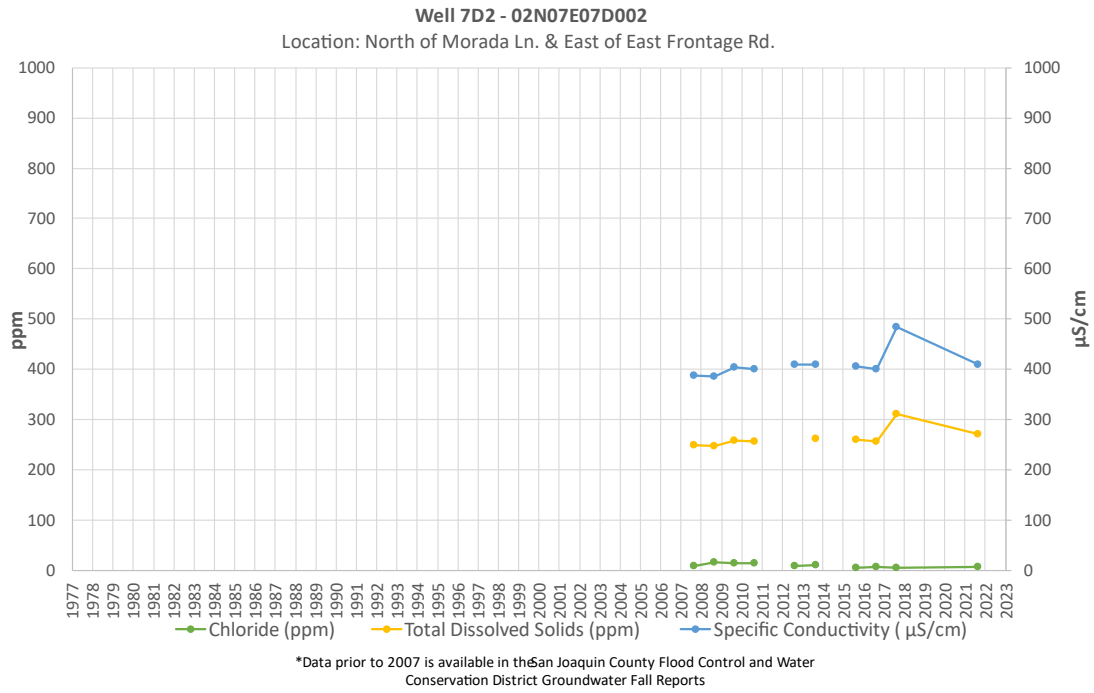

Figure 5-6 Water Quality Comparison Graph Well 7D2

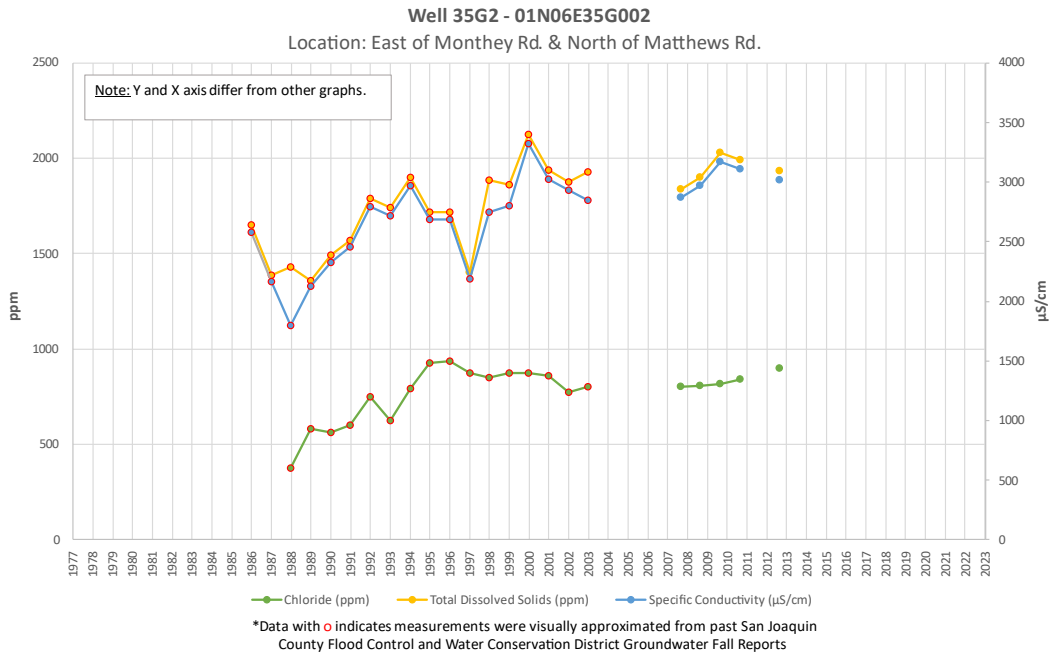

Figure 5-7 Water Quality Comparison Graph Well 35G2

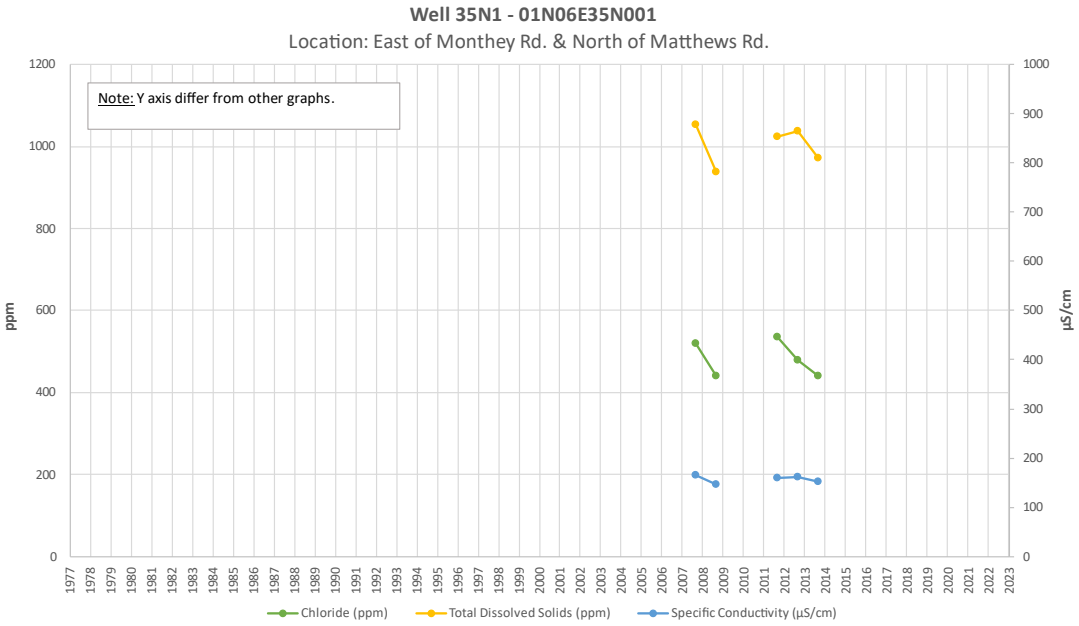

Figure 5-8 Water Quality Comparison Graph Well 35N1

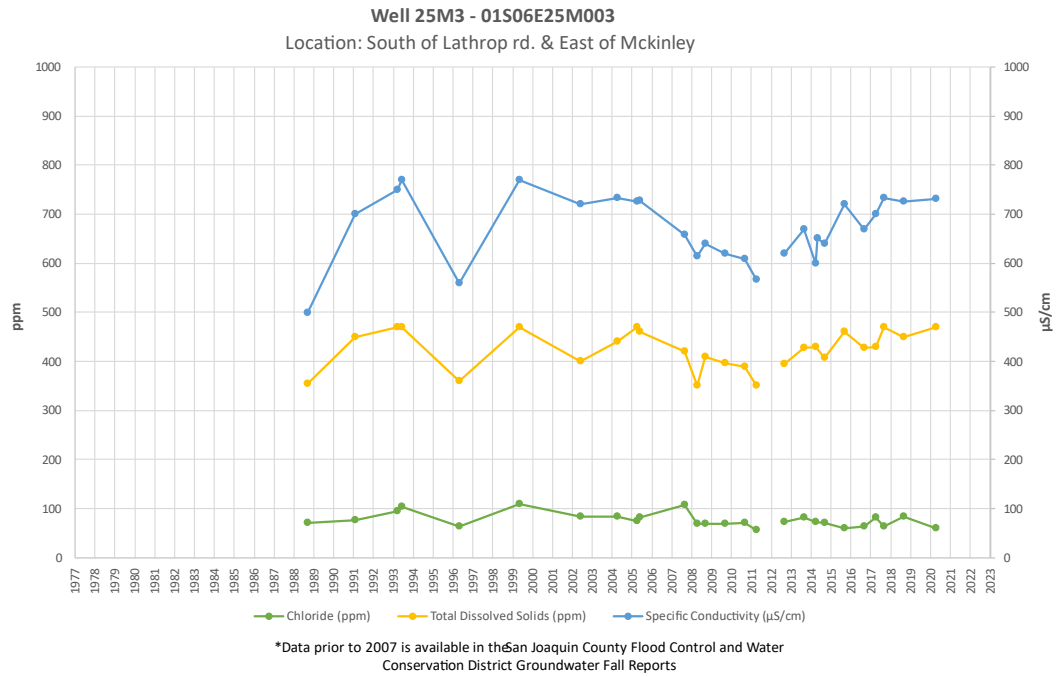

Figure 5-9 Water Quality Comparison Graph Well 25M3

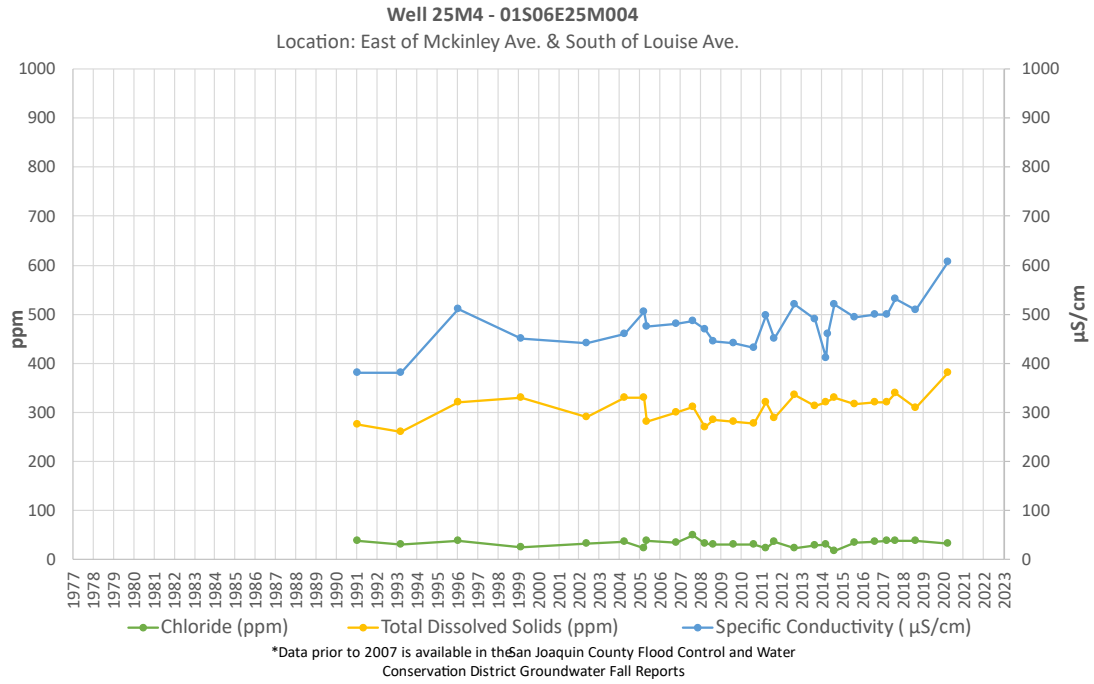

Figure 5-10 Water Quality Comparison Graph Well 25M4

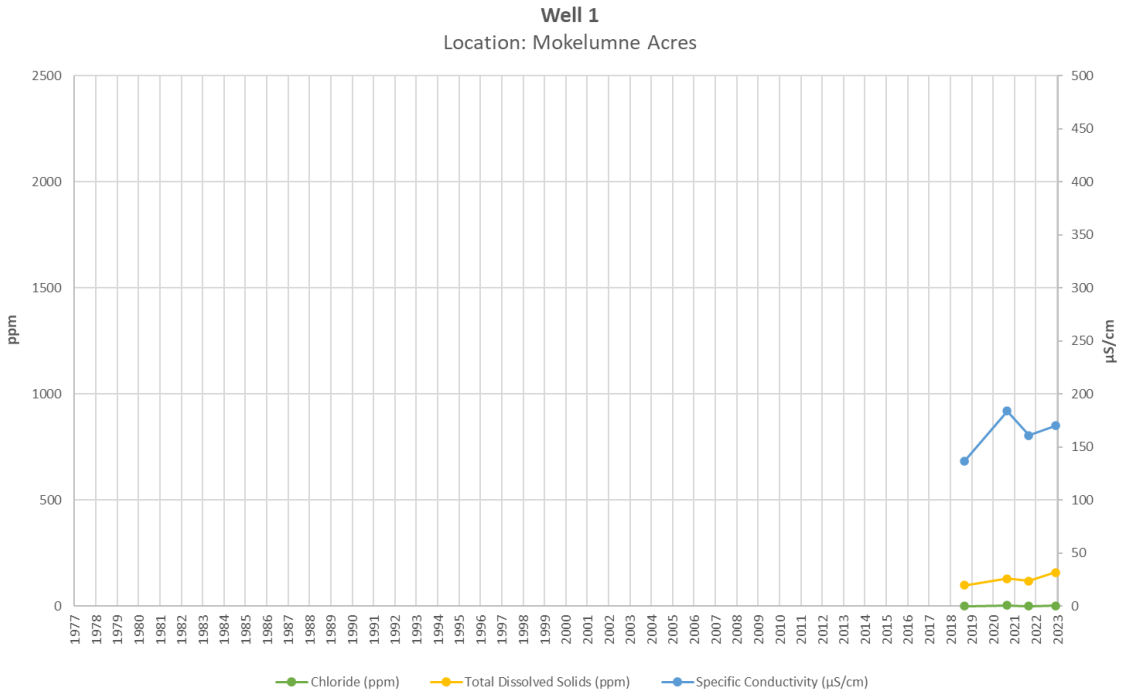

Figure 5-11 Water Quality Comparison Graph Well 1

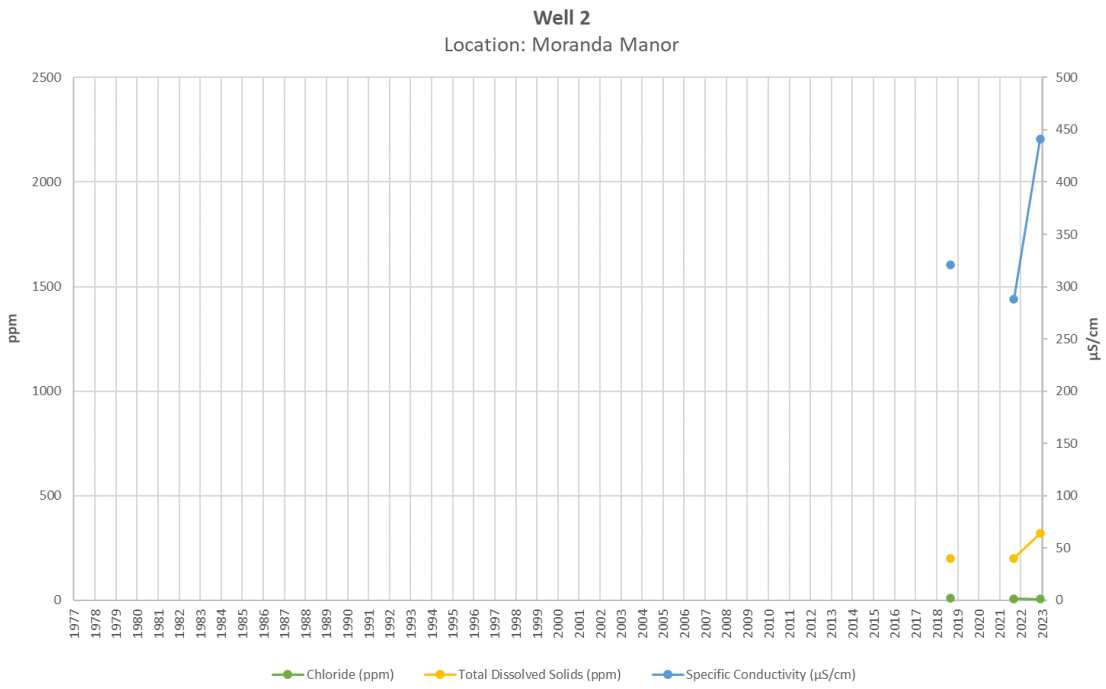

Figure 5-12 Water Quality Comparison Graph Well 2

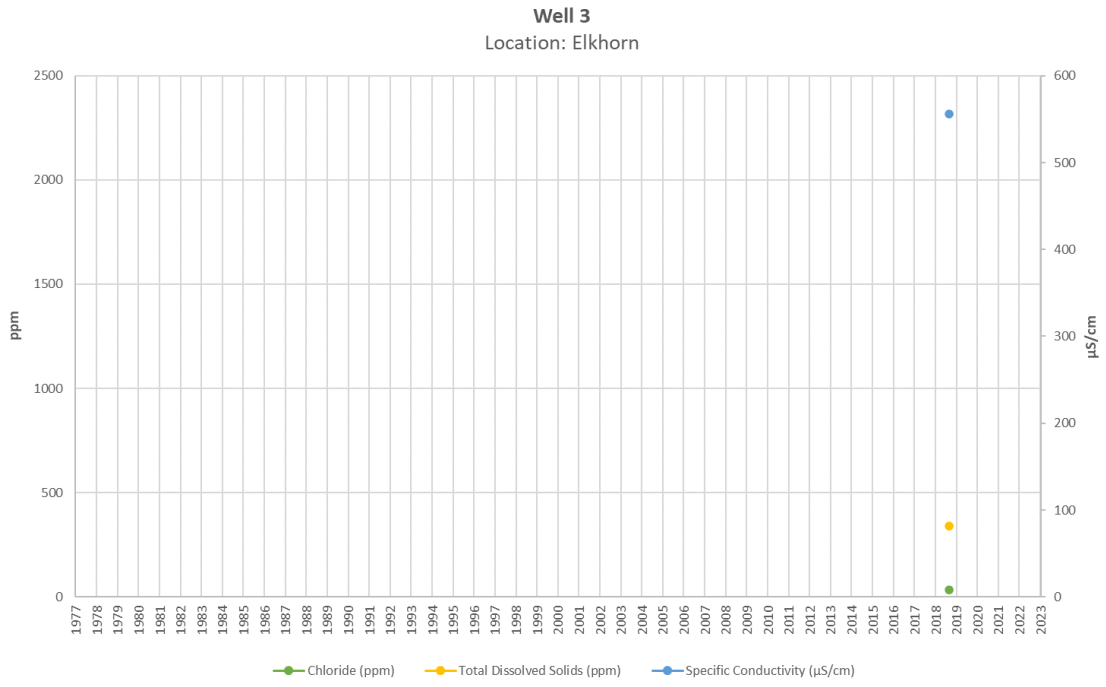

Figure 5-13 Water Quality Comparison Graph Well 3

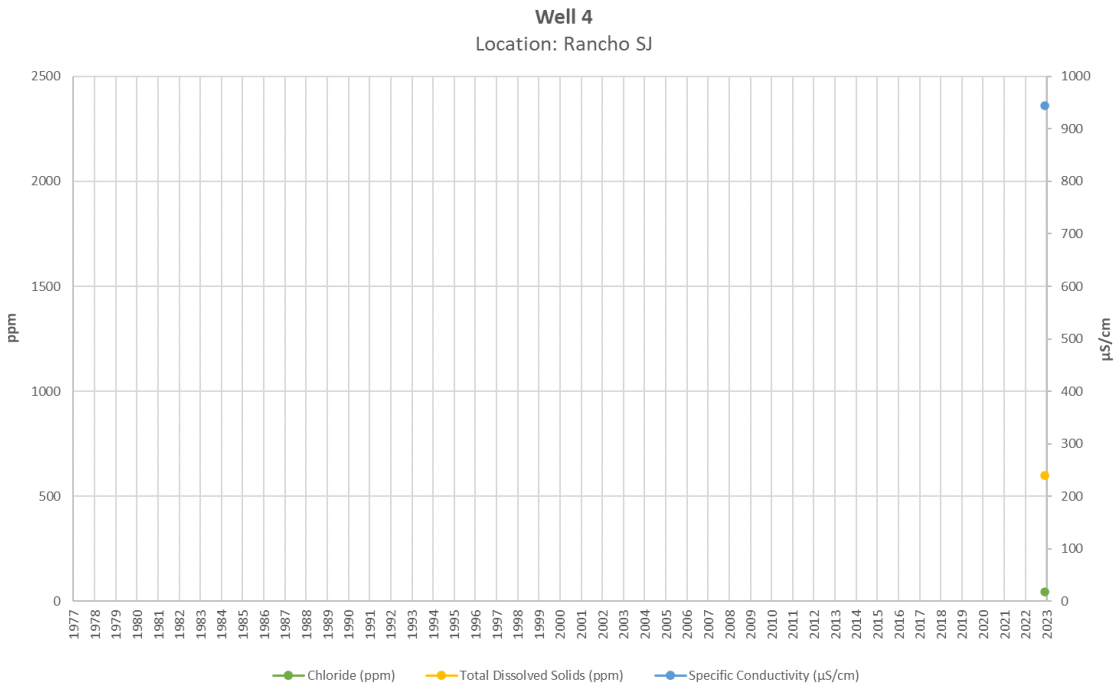

Figure 5-14 Water Quality Comparison Graph Well 4