DELTA-MENDOTA SGMA

DRAFT Consolidated WY2023 Annual Report

For the Delta-Mendota Subbasin

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March 21, 2024

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Table of Contents

List of Tables

List of Figures

Appendices

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Executive Summary

This Water Year 2023 (WY2023) Annual Report for the Delta-Mendota Subbasin was prepared as a consolidated effort for the entire Delta-Mendota Subbasin and is in compliance with California Code of Regulations (CCR) Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 7 Annual Reports and Periodic Evaluations by the Agency. WY2023 includes the period from October 1, 2022 through September 30, 2023 and compares data collected during this period against previously-collected data to develop an understanding of Subbasin conditions through the current reporting year.

The sustainability goal for the Delta-Mendota Subbasin was established to succinctly state the objectives and desired conditions of the Subbasin that culminates in the absence of undesirable results by 2040:

> *The Delta-Mendota Subbasin will manage groundwater resources for the benefit of all users of groundwater in a manner that allows for operational flexibility, ensures resource availability under drought conditions, and does not negatively impact surface water diversion and conveyance and delivery capabilities. This goal will be achieved through the implementation of the proposed projects and management actions to reach identified measurable objectives and milestones through the implementation of the GSP(s), and through continued coordination with neighboring subbasins to ensure the absence of undesirable results by 2040.*

Throughout the Subbasin, groundwater elevations during WY2023 were largely above their respective minimum thresholds, which were revised along with all numeric sustainable management criteria (SMC) to use consistent methodology across the six Subbasin Groundwater Sustainability Plans (GSPs) as requested by DWR in their "Incomplete" determination letter. The revised SMC were included in the revised Subbasin GSPs and Common Chapter submitted in July 2022 and are currently again being revised as part of the single GSP development effort. For wells that are currently operating below or fluctuating near their minimum threshold, each GSP region will assess if undesirable results are observed at the locations of those wells and will respond with the appropriate projects and management actions as described in their respective GSPs. No undesirable results relative to the chronic lowering of groundwater levels sustainability indicator were observed in WY2023; and therefore, no undesirable results relative to the reduction of groundwater in storage (as these two sustainability indicators are interconnected).

Current conditions throughout the Delta-Mendota Subbasin reflect the Wet water year classification according to the San Joaquin Valley Water Year Hydrologic Classification Index, as groundwater levels and groundwater storage show initial recovery following drought conditions

during WY2020 through WY2022. Groundwater extractions totaled 231,300 acre-feet (AF), surface water supply totaled 1,366,600 AF, and total water use[1] totaled 1,394,500 AF during WY2023. Change in groundwater storage during WY2023 increased in the Upper Aquifer by 21,500 AF and decreased in the Lower Aquifer by 74,700 AF, where total change in storage decreased by 53,200 AF.

Each of the six Delta-Mendota Subbasin GSPs continued to be implemented in a coordinated fashion throughout WY2023 as the single GSP for the Delta-Mendota Subbasin is currently under development. Implementation activities included continued monitoring at representative monitoring sites for all relevant sustainability indicators (seawater intrusion is not an applicable sustainability indicator for the Delta-Mendota Subbasin), continued implementation of projects and management actions, and continued coordination by the 23 Delta-Mendota Subbasin Groundwater Sustainability Agencies (GSAs), including regular meetings of the Delta-Mendota Subbasin Coordination Committee, preparation of Annual Reports, and development of a single GSP.

[1] Differences in reported volumes of groundwater extractions, surface water supply, and total water use are due to incorporating water loss through canal leakage, pipe leakage, and other percolating waters when tabulating total water use.

California Code of Regulations - GSP Regulation Sections	Annual Report Elements	Section(s) and page numbers(s) where requirements for Annual Report elements are included
Article 5	**Plan Contents**	
Subarticle 4	**Monitoring Networks**	
§ 354.40	**Reporting Monitoring Data to the Department**	
	Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.	Appendix A
	Note: Authority cited: Section 107.33.2, Water Code. Reference: Sections 10728, 10728.2, 10733.2, and 10733.8, Water Code.	
Article 7	**Annual Reports and Periodic Evaluations by Agency**	
§ 356.2	**Annual Reports**	
	Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:	
	(a) General information, including an executive summary and a location map depicting the basin covered by the report.	Executive Summary and General Information Figure 1
	(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:	
	(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:	
	(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	1. Groundwater Elevation Data Figure 2, Figure 3, Figure 4, Figure 5
	(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	Appendix A
	(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	2. Groundwater Extraction Data Table 1, Table 2, Figure 6
	(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	3. Surface Water Supply Table 3, Figure 7
	(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	4. Total Water Use Table 4, Figure 8
	(5) Change in groundwater in storage shall include the following:	
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	5. Change in Groundwater Storage Figure 11, Figure 12

California Code of Regulations - GSP Regulation Sections	Annual Report Elements	Section(s) and page numbers(s) where requirements for Annual Report elements are included
	(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.	5. Change in Groundwater Storage Figure 9, Figure 10
	(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	6. Plan Implementation

General Information

The Groundwater Sustainability Agencies (GSAs) of the Delta-Mendota Subbasin (Subbasin) have collaborated to prepare this Consolidated Annual Report for Water Year 2023 (WY2023), defined as the period from October 1, 2022 to September 30, 2023, in compliance with California Code of Regulations (CCR) Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 7 Annual Reports and Periodic Evaluations by the Agency. CCR 23 §356.2 outlines the annual report's required content. Data and conditions following the Subbasin's "current" water year of WY2013, as defined in the Delta-Mendota Subbasin's Groundwater Sustainability Plans (GSPs), are included in this Annual Report in order to describe trends and fill data gaps leading up to and through WY2023.

The Delta-Mendota Subbasin (DWR Basin 5-022.07) is located in the northwestern portion of the San Joaquin Valley Groundwater Basin and adjoins nine (9) other subbasins in the San Joaquin Valley Groundwater Basin. The Delta-Mendota Subbasin boundaries generally correspond to DWR's California's Groundwater Bulletin 118 – Update 2003 (Bulletin 118) groundwater basin boundaries descriptions, with jurisdictional boundary modifications incorporated into the 2016 and 2018 Bulletin 118 groundwater basin boundary definitions.

The western San Joaquin Valley is a highly agricultural region with an economy dependent on the agricultural industry. There are no large cities or industries in the Delta-Mendota Subbasin to provide an alternative economic base; hence, the availability of Central Valley Project (CVP) and State Water Project (SWP) imported water supplies and other surface water supplies (primarily from the San Joaquin and Kings Rivers) are essential elements to the economic health of the region. Other uses of CVP and local surface water in the Subbasin are for municipal and industrial (M&I) purposes and wildlife refuge water supply. The Delta-Mendota Subbasin, and the six GSP regions it contains, are shown in **Figure 1**.

In 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to continued overdraft of California's groundwater resources. The Delta-Mendota Subbasin (Subbasin) (5-022.07) is one of 21 alluvial basins and subbasins identified by the California Department of Water Resources (DWR) as being in a state of critical overdraft. Beginning in 2017, GSAs within the Subbasin formed to address the long-term reliability of groundwater through the development of six GSPs for the following regions: Aliso Water District, Farmers Water District, Fresno County Management Areas A and B, Grassland, Northern & Central Delta-Mendota Region, and San Joaquin River Exchange Contractors. The six Delta-Mendota Subbasin GSPs were developed in a coordinated fashion with the goal of achieving sustainability for the Subbasin as a whole. The GSAs adopted their respective GSPs and submitted them to DWR on January 23, 2020, prior to the January 31, 2020 deadline. On January 21, 2022, DWR released an "Incomplete" determination for all six Delta-Mendota Subbasin GSPs and the Common Chapter. All six revised GSPs and the Common Chapter

addressing deficiencies identified by DWR were resubmitted to DWR by the July 20, 2022 deadline. On March 2, 2023, DWR released an "Inadequate" determination for all six Delta-Mendota Subbasin GSPs and the associated Common Chapter. During WY 2023, representatives from the Delta-Mendota Subbasin began preparation of a single GSP and initiated consultation with the State Water Resources Control Board (SWRCB) in parallel with the single GSP development as part of the State intervention process.

Groundwater is a key component of overall water supplies in the Delta-Mendota Subbasin. For areas with access to surface water, agricultural, M&I, and wildlife refuge beneficial uses may be supplemented by groundwater, while other areas within the Subbasin may rely solely on groundwater for irrigation and/or potable purposes. M&I water use, which is a small share of total water use in the Subbasin, occurs primarily within the cities and local communities which predominantly use groundwater to meet those demands. The largest M&I use areas in the Delta-Mendota Subbasin, based on the 2020 Decennial Census from the U.S. Census Bureau, are the cities of Patterson (population 23,781)[2] and Los Banos (population 45,532)[3].

Smaller communities in the Subbasin include Grayson, Tranquillity, Mendota, Firebaugh, Dos Palos, Santa Nella, Newman, Gustine, Crows Landing, Westley, Volta, and Vernalis, all of which have economies greatly dependent on agricultural production and groundwater.

This Annual Report is broken into the following six sections:

1. Groundwater Elevation Data
2. Groundwater Extraction Data
3. Surface Water Supply
4. Total Water Use
5. Change in Groundwater Storage
6. Plan Implementation

[2] Source: https://data.census.gov/cedsci/profile?g=1600000US0656112.

[3] Source: https://data.census.gov/cedsci/profile?g=1600000US0644028.

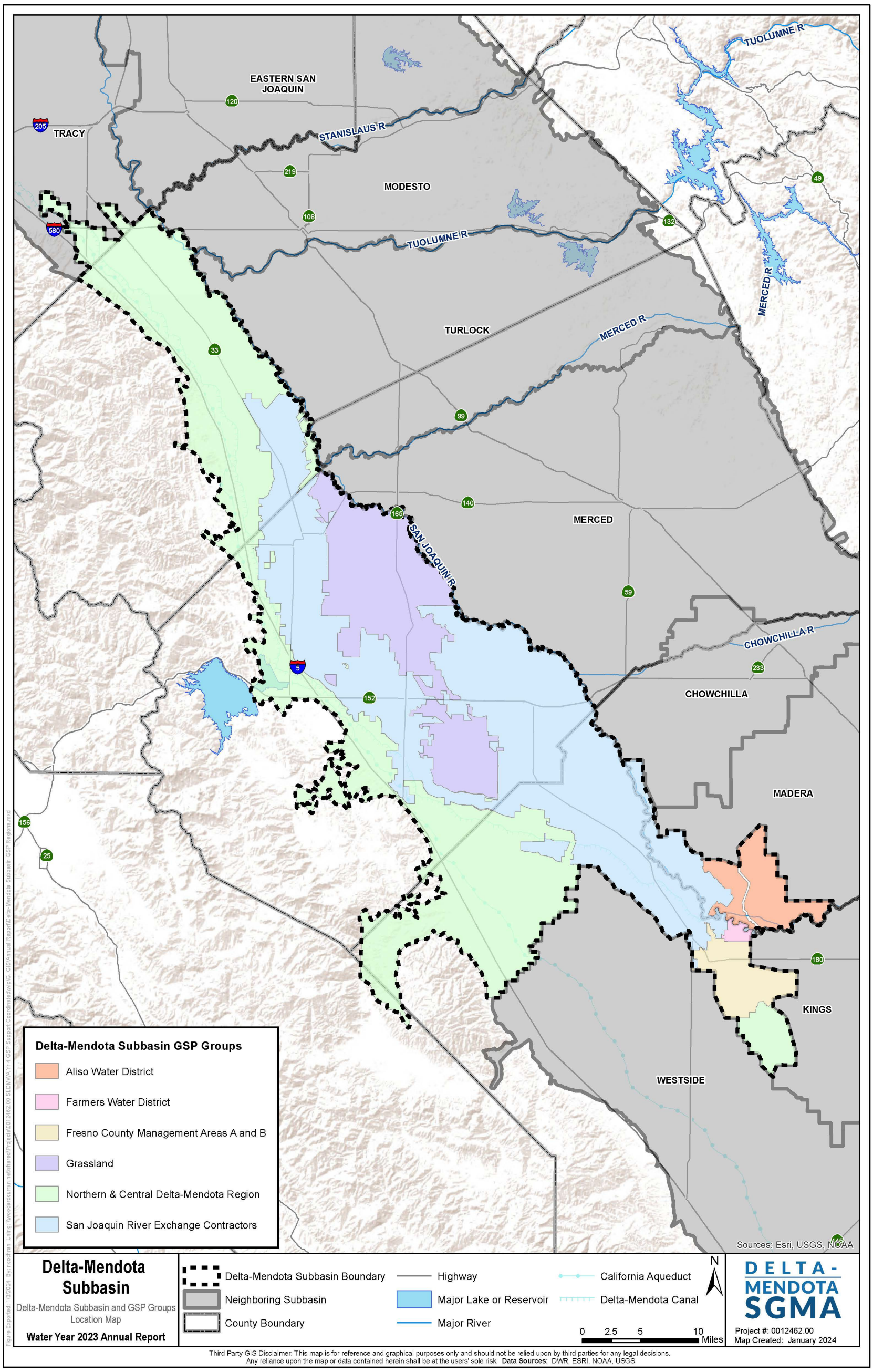

Figure 1. Delta-Mendota Subbasin and GSP Regions

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1. Groundwater Elevation Data

Groundwater elevation data are presented below in groundwater surface elevation contour maps. These maps were generated from groundwater elevation data collected from wells in the six Subbasin GSP representative monitoring networks to illustrate the seasonal high and seasonal low conditions in each principal aquifer (Upper Aquifer and Lower Aquifer) in the Delta-Mendota Subbasin during WY2023, with measurements from additional wells also incorporated into the mapping in order to provide adequate Subbasin-wide coverage. Seasonal high is defined as any groundwater level measurement recorded between February and April, and seasonal low is defined as any groundwater level measurement recorded in September or October. It should be noted that the WY2023 seasonal low is depicted by available data from September and October 2022, prior to a Wet water year (WY2023) characterized by wet conditions throughout the winter of 2023 that resulted in increased recharge to the groundwater following a Dry (WY2020) and two Shasta Critical (WY2021 and WY2022) water years.

Hydrographs of groundwater elevations, including historical data through WY2023 and indicating water year type, are included in **Appendix A** for each well in the Subbasin's representative monitoring network for the chronic lowering of groundwater levels sustainability indicator. Since the end of the 2012-2016 drought (starting in WY2017), groundwater elevations at many locations largely recovered to pre-drought levels and are generally similar to or higher than WY2012 pre-drought levels. During WY2019, groundwater elevations generally remained similar to WY2012 and WY2017 levels. Dry and critically dry conditions during WY2020 through WY2022, however, resulted in stable or declining groundwater levels throughout much of the Delta-Mendota Subbasin. Wet conditions during WY2023 resulted in stable or increasing groundwater levels throughout the Delta-Mendota Subbasin following the most recent drought (WY2020 to WY2022).

Figure 2 and **Figure 3** present contour maps of groundwater elevations for WY2023 seasonal high (February to April 2023) and seasonal low (September to October 2022), respectively, for the Upper Aquifer. During WY2023 seasonal high conditions, groundwater elevations ranged from about 10 feet above mean sea level (ft MSL) to 130 ft MSL throughout the Subbasin (**Figure 2**). Groundwater generally flowed in the north to northeast direction throughout the Subbasin; however, groundwater flowed in the southeast direction along the southern boundary towards the Kings Subbasin. During WY2023 seasonal low conditions, groundwater elevations again ranged from about -10 ft MSL to 130 ft MSL with similar flow direction patterns as observed during seasonal high conditions in the Subbasin (**Figure 3**). Differences in groundwater elevations in the Upper Aquifer between seasonal high and seasonal low conditions during WY2023 can likely be attributed to consecutive Dry (WY2020) and Shasta Critical (WY2021 and WY2022) water years prior to and during the seasonal low period of

September and October 2022, resulting in increased groundwater pumping. Initial groundwater level recovery during the seasonal high period of February through April 2023 occurred following precipitation and recharge after wet conditions in the winter of 2023.

Figure 4 and **Figure 5** present contour maps for groundwater elevations for WY2023 seasonal high (February to April 2023) and seasonal low (September to October 2022), respectively, for the Lower Aquifer. A great majority of wells perforated in the Lower Aquifer with groundwater level measurements during WY2023 seasonal high and seasonal low conditions are located within the Northern & Central Delta-Mendota Region and in the southern portion of the Subbasin around the Fresno County Management Areas A and B GSP region and Tranquillity Irrigation District area.

During WY2023 seasonal high conditions, groundwater elevations in the Lower Aquifer ranged from about -80 ft MSL to 100 ft MSL (**Figure 4**). During WY2023 seasonal low conditions, groundwater elevations ranged from -150 ft MSL to 100 ft MSL (**Figure 5**). The large range in groundwater elevations are due to a combination of Lower Aquifer elevations (high in the west along the Coastal Range and lower to the east near the Valley floor) and pumping. Groundwater flow patterns Subbasin-wide in the Lower Aquifer are generally to the north and northeastern direction in the northern portion of the Subbasin, and generally to the south direction towards the Westside and Kings Subbasins in the southern portion of the Subbasin. Similar to the Upper Aquifer, differences in groundwater elevations between seasonal high and seasonal low conditions during WY2023 can likely be attributed to consecutive Dry (WY2020) and Shasta Critical (WY2021 and WY2022) water years prior to and during the seasonal low period of September and October 2022, resulting in increased groundwater pumping. Initial groundwater level recovery occurred during the seasonal high period of February through April 2023 following precipitation and recharge after the wet conditions in the winter of 2023.

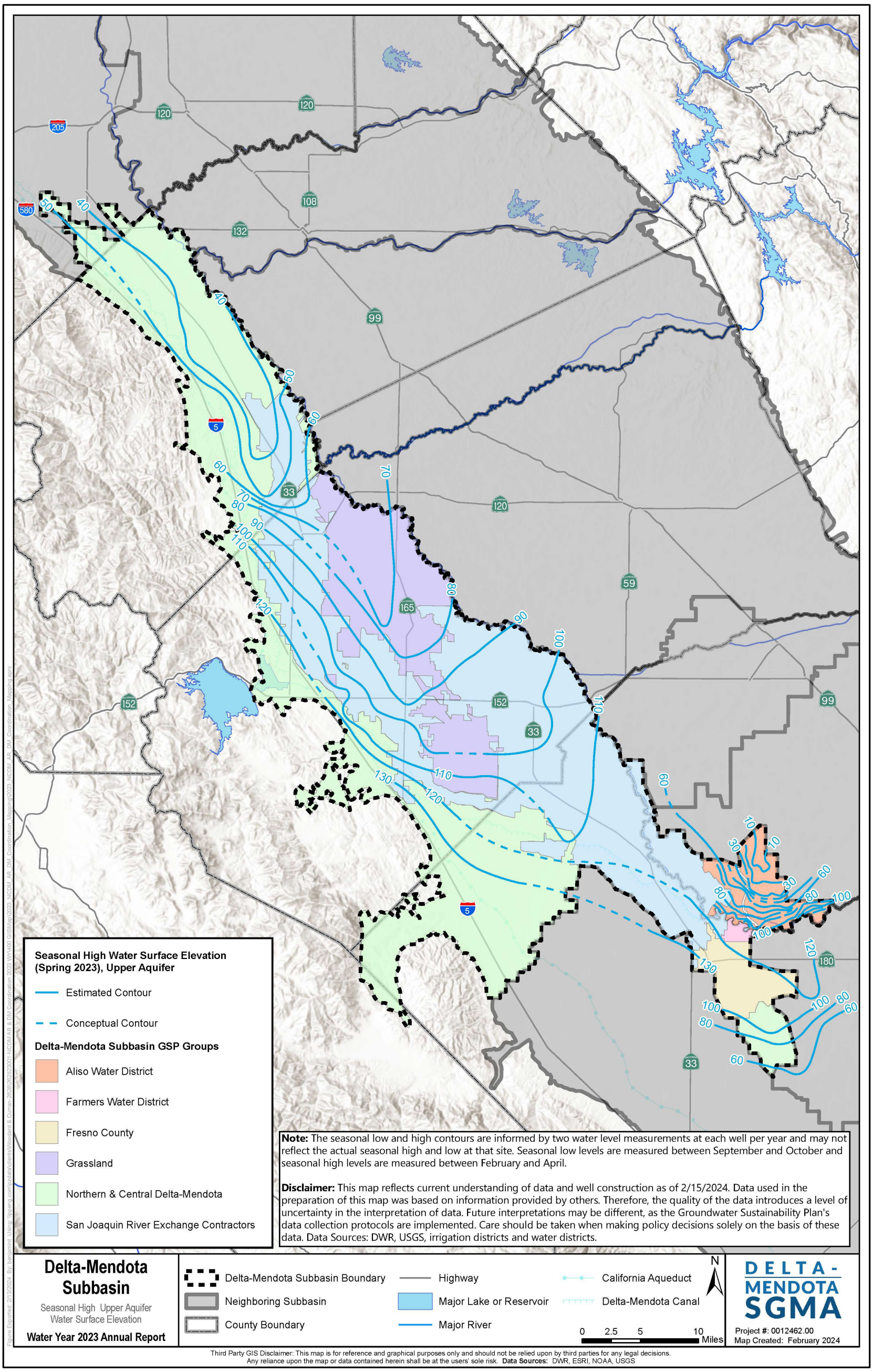

Figure 2. WY2023 Seasonal High (February-April 2023) Groundwater Elevations, Upper Aquifer

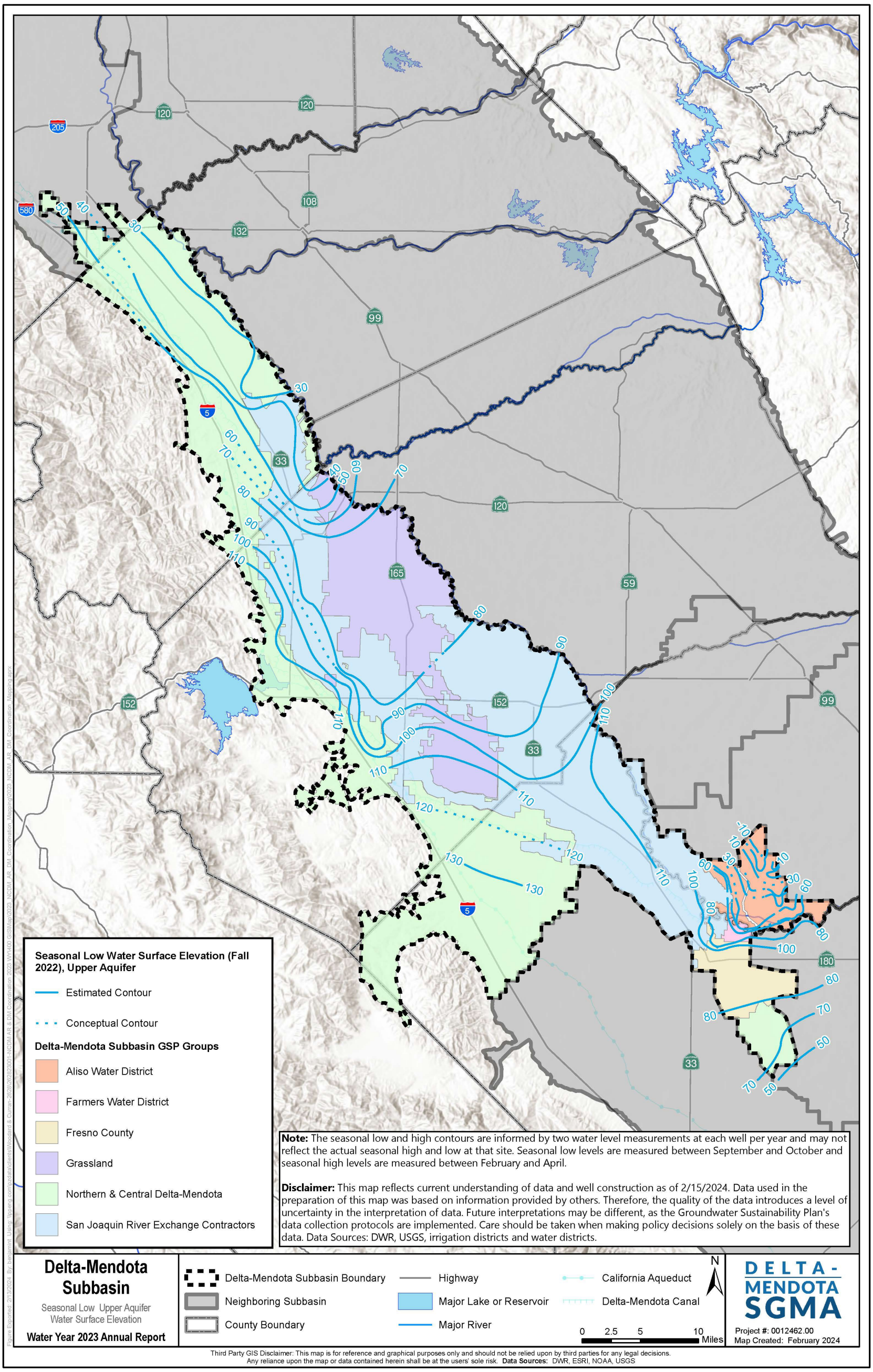

Figure 3. WY2023 Seasonal Low (September-October 2022) Groundwater Elevations, Upper Aquifer

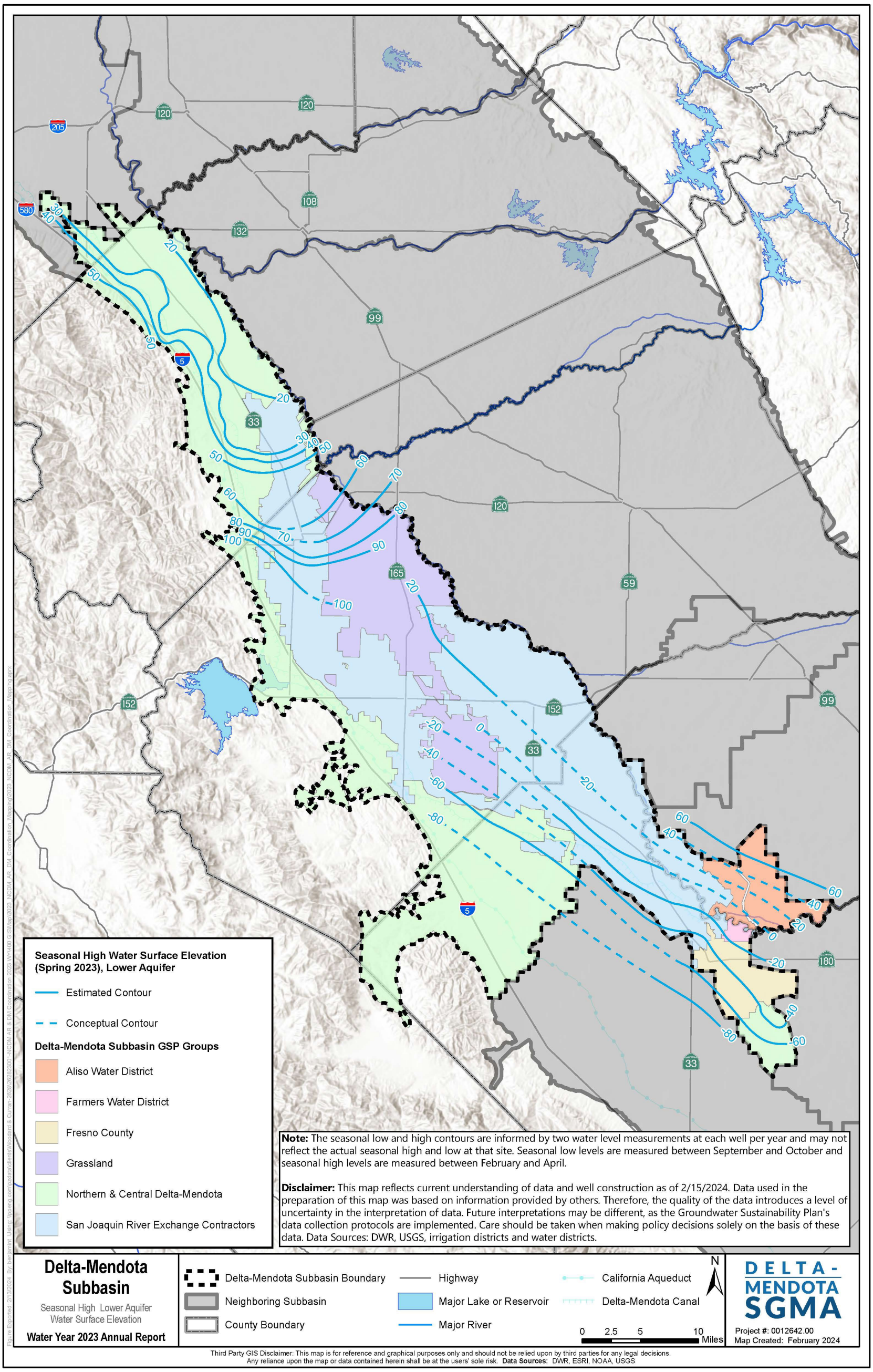

Figure 4. WY2023 Seasonal High (February-April 2023) Groundwater Elevations, Lower Aquifer

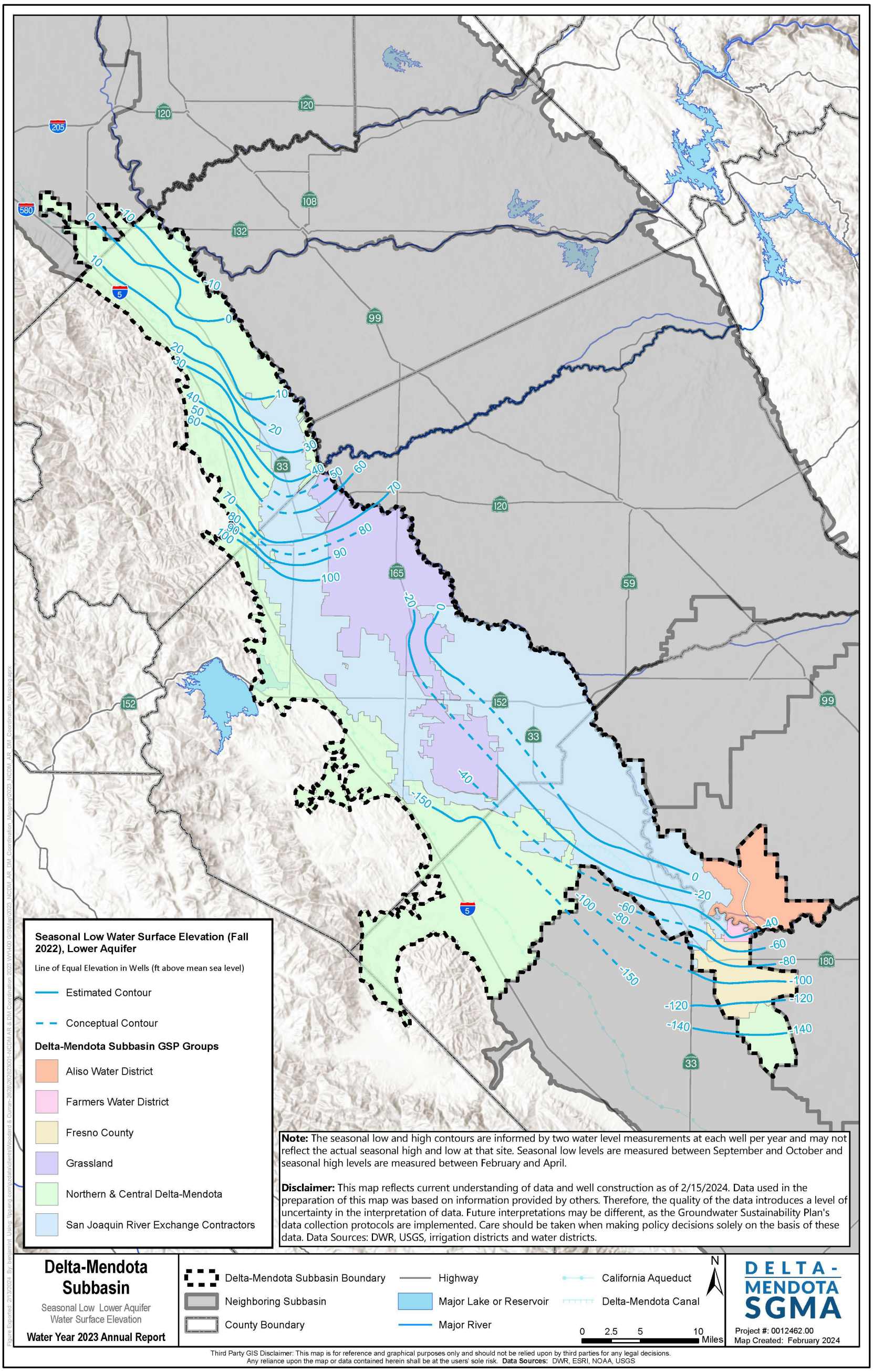

Figure 5. WY2023 Seasonal Low (September-October 2022) Groundwater Elevations, Lower Aquifer

2. Groundwater Extraction Data

The following WY2023 groundwater extraction data, summarized in **Table 1**, are a combination of direct measurements and estimates from each of the six GSP regions in the Delta-Mendota Subbasin. The accuracy of the measurements and estimates vary on a GSP region and site-by-site basis. The measurement methods also vary across the six Subbasin GSP regions and largely consists of self-reported groundwater extraction volumes from each GSA. **Table 2** shows the groundwater extraction measurement methods and accuracy by volume in the Delta-Mendota Subbasin during WY2023.

Agricultural groundwater pumping is the largest water use sector by volume in the Delta-Mendota Subbasin at an estimated 181,300 acre-feet (AF) of extraction during WY2023, representing approximately 78% of total groundwater extractions in the Delta-Mendota Subbasin (**Table 1**). Urban/Domestic/Municipal (20,700 AF), Managed Wetlands (20,600 AF), Industrial (5,800 AF), and Managed Recharge (2,900 AF) comprise the remaining 22% of total groundwater extractions in the Subbasin during WY2023 (**Table 1**). During WY2023, there were no quantifiable groundwater extractions for Native Vegetation or Outside Subbasin water use sectors. Future Annual Reports will collect and report extraction data according to the water use sectors identified in **Table 1**.

Table 1. WY2023 Groundwater Extraction by Water Use Sector, Delta-Mendota Subbasin

Water Use Sector	WY2023 Total (AF)	Measurement Method (Direct or Estimate) [1]	Measurement Accuracy (%)
Urban/Domestic/Municipal	20,700	Estimate	Unknown
Industrial	5,800	Estimate	Unknown
Agricultural	181,300	Estimate	Unknown
Managed Wetlands	20,600	Direct	Unknown
Managed Recharge	2,900	Direct	0-5%
Native Vegetation	0	N/A	N/A
Other: Outside Subbasin	0	N/A	N/A
Total	**231,300**	**Estimate**	**Unknown**

[1] Measurements include a combination of direct measurements and estimated values; therefore, measurement method is reported as estimate in these cases.

Table 2. WY 2023 Groundwater Extraction Volume Measurement Methods and Accuracy

Groundwater Extraction Volume (AF)	Measurement Type	Method	Accuracy	Accuracy Description
23,500	Direct	Meters	Unknown	Meter accuracy varies throughout the Subbasin based on water use sector, ranging from Unknown (Managed Wetlands) to 0-5% (Managed Recharge)
0	N/A	Electrical Records	N/A	N/A
0	N/A	Land Use	N/A	N/A
0	N/A	Groundwater Model	N/A	N/A
207,800	Estimate	Other: Sum of self-reported volumes from each GSA within the Delta-Mendota Subbasin	Other	Measurement method is 'Estimate' and varies by each of the 23 GSAs in the Delta-Mendota

N/A – Not Available
AF – acre-feet

Figure 6 shows the general location and volume of groundwater extractions for each of the six GSP regions during WY2023. Overall, groundwater extraction by GSP region is presented by the area covered by the individual GSP and reflects, to some extent, the availability of surface water supplies within each GSP region. Surface water rights and contracted imported surface water volumes vary among the GSP regions where, for example, the San Joaquin River Exchange Contractors are reliant on their senior surface water rights, and agencies in the central portion of the Northern & Central Delta-Mendota GSP Region hold CVP contracts with water rights junior to their neighbors and are thus subject to shortages. For region-specific information about groundwater use and hydrogeologic conditions unique to each GSP region, refer to the individual six Subbasin GSPs. As noted in the *Delta-Mendota Subbasin Revised Common Chapter* (July 2022), the estimated sustainable yield for the Upper Aquifer is 403,000 AF with values for the Lower Aquifer ranging from 101,000 to 250,000 AF. There is currently insufficient information available relative to groundwater pumping by principal aquifer to compare to the respective sustainable yields of each principal aquifer. Overall, total groundwater pumping for WY2023 is estimated at 231,300 AF (as noted in **Table 1**). Starting in WY2024, the CVHM2 model currently being refined as part of the single GSP development effort can be used to estimate groundwater pumping by principal aquifer for comparison against the respective sustainable yields of the Upper Aquifer and Lower Aquifer.

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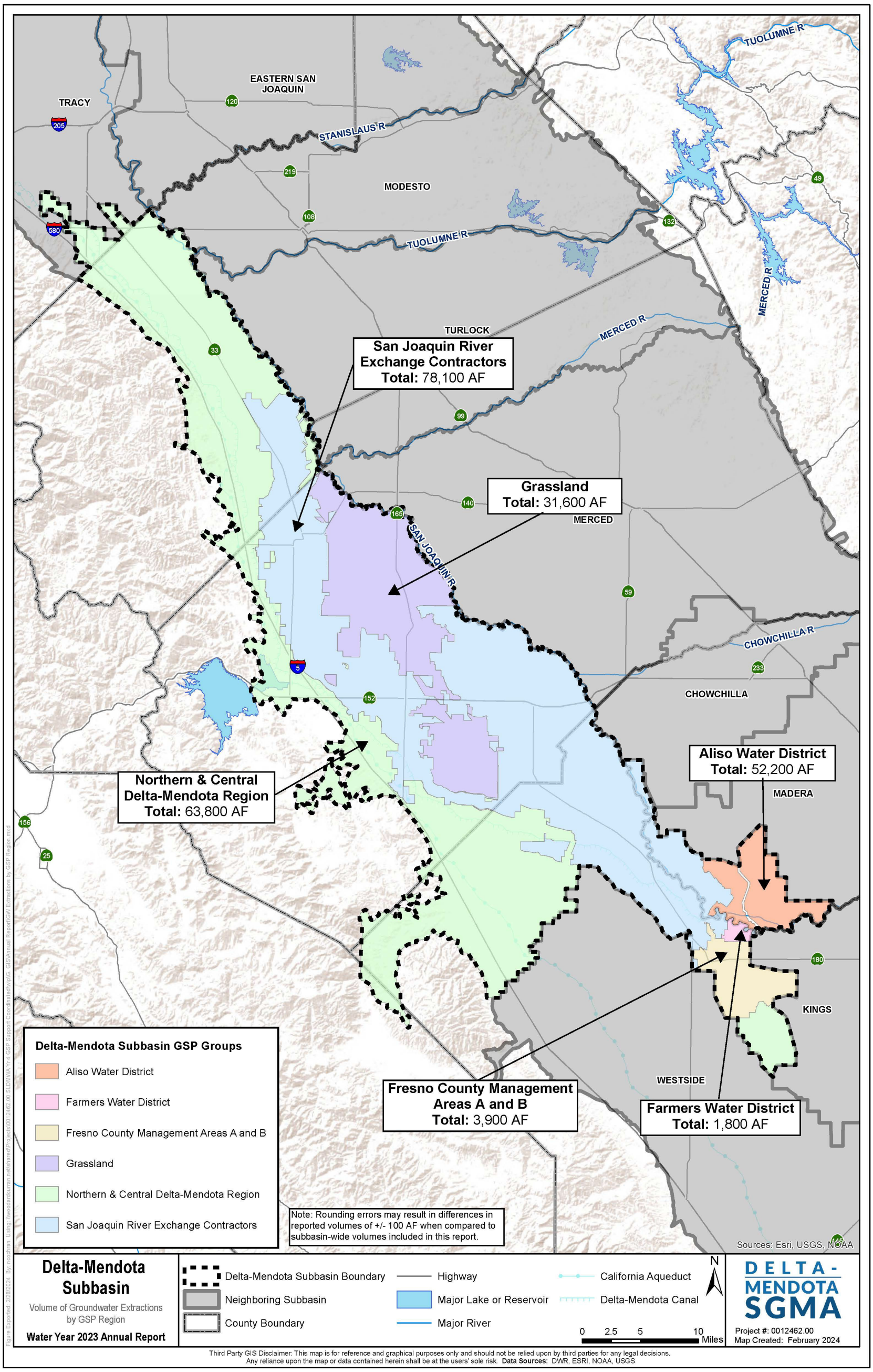

Figure 6. WY2023 General Location and Total Volume of Groundwater Extractions in Acre-Feet (AF)

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3. Surface Water Supply

The following surface water supply data are direct measurements from each of the six GSP regions in the Delta-Mendota Subbasin.

CVP water accounts for the largest surface water source by volume at 1,048,900 AF during WY2023, representing approximately 77% of total surface water used within the Delta-Mendota Subbasin (**Table 3**). Water supplies from the Kings and San Joaquin Rivers (Other) account for 262,000 AF (19% of total) of surface water used during WY2023 (**Table 3**). The remaining 4% of surface water supplies during WY2023 consist of Local Imported Supplies (27,400 AF); Recycled Water (21,700 AF), which is sourced from the North Valley Regional Recycled Water Program; water supplies sourced from local creeks, which include any naturally-occurring surface water course other than the Kings or San Joaquin Rivers (5,900 AF); and State Water Project (SWP) water (700 AF), where Oak Flat Water District is the only SWP contractor in the Delta-Mendota Subbasin (**Table 3**). A graphical representation of surface water supplies for WY2023 in the Delta-Mendota Subbasin is presented in **Figure 7**. Agriculture is the predominant surface water use sector within the Delta-Mendota Subbasin, with a lesser volume of CVP water delivered to Urban/Domestic/Municipal users and wildlife refuges.

Table 3. WY2023 Surface Water Supply, Delta-Mendota Subbasin

Surface Water Source	WY2023 Total (AF)	Methods Used to Determine
Central Valley Project (CVP)	1,048,900	Meters
State Water Project (SWP)	700	Meters
Colorado River Project	--	--
Local Supplies [1]	5,900	Meters
Local Imported Supplies	27,400	Meters
Recycled Water	21,700	Meters
Desalination	--	--
Other [2]	262,000	Meters
Total	**1,366,600**	**Meters**

[1] Surface water supplies sourced from local creeks, which include any naturally-occurring surface water course other than the Kings or San Joaquin Rivers.

[2] Surface water supplies sourced from the Kings and/or San Joaquin Rivers.

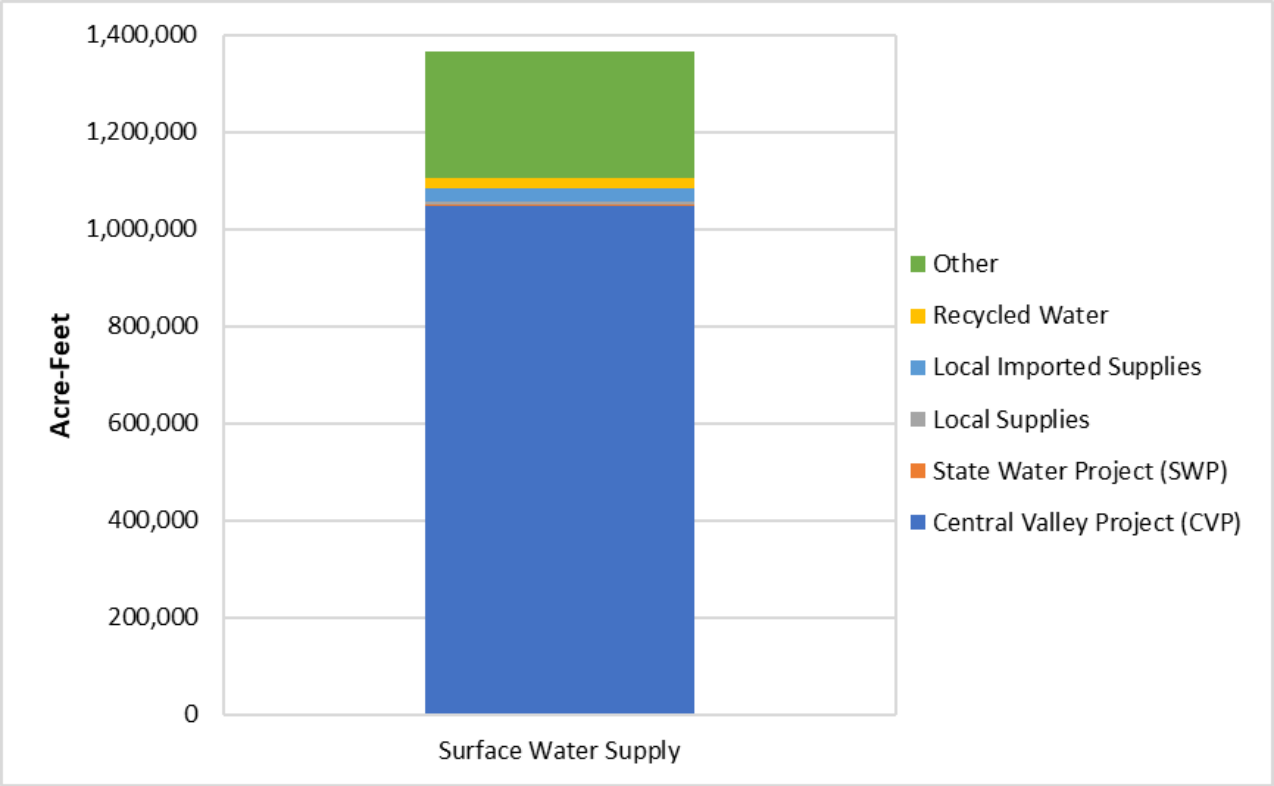

Figure 7. WY2023 Surface Water Supply, Delta-Mendota Subbasin

4. Total Water Use

Total water use by water use sector and supply is shown in **Table 4**. The measurement methods vary across the six Subbasin GSP regions and largely consists of self-reported volumes from each GSA. The data presented in **Table 4** is a summation of data from the six GSP regions and reflects a combination of direct measurements and estimates from each of the six GSP regions in the Delta-Mendota Subbasin. The difference between these values and the sum of the various supplies available to the Subbasin (groundwater, surface water, and recycled/reuse water) reflects water lost through canal leakage, pipe leakage, and other percolating or unaccounted-for waters.

Agricultural water use comprises approximately 72% of the total water use in the Delta-Mendota Subbasin during WY2023 and is estimated to be 1,005,700 AF (**Table 4**). Managed Wetlands water use comprises approximately 23% of the total water use in the Subbasin during WY2023 at an estimated volume of 317,500 AF (**Table 4**). Collectively, Managed Recharge (53,600 AF), Urban/Domestic/Municipal (15,100 AF), and Industrial (2,600 AF) comprise the remaining 5% of total water use in the Subbasin during WY2023 (**Table 4**). A graphical representation of total water use for WY2023 in the Delta-Mendota Subbasin is presented in **Figure 8**.

Table 4. WY2023 Total Water Use, Delta-Mendota Subbasin

Total Water Use	WY2023 Total (AF) [1]	Measurement Method (Direct or Estimate)	Measurement Accuracy (%)
Urban/Domestic/Municipal	--	--	--
Groundwater	13,700	Estimate	Unknown
Surface Water	1,400	Direct	Unknown
Recycled Water	0	N/A	N/A
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*15,100*	*Estimate*	*Unknown*
Industrial	--	--	--
Groundwater	2,600	Estimate	N/A
Surface Water	0	N/A	N/A
Recycled Water	0	N/A	N/A
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*2,600*	*Estimate*	*Unknown*
Agricultural	--	--	--
Groundwater	176,400	Estimate	Unknown
Surface Water	807,100	Direct	Unknown
Recycled Water	12,400	Direct	0-5%

Total Water Use	WY2023 Total (AF) [1]	Measurement Method (Direct or Estimate)	Measurement Accuracy (%)
Reused Water [2]	9,800	Estimate	Unknown
Other	0	N/A	N/A
Total	*1,005,700*	*Estimate*	*Unknown*
Managed Wetlands	--	--	--
Groundwater	20,600	Direct	Unknown
Surface Water	287,600	Direct	0-5%
Recycled Water	9,300	Direct	0-5%
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*317,500*	*Direct*	*0-5%*
Managed Recharge	--	--	--
Groundwater	2,900	Direct	0-5%
Surface Water	50,700	Direct	Unknown
Recycled Water	0	N/A	N/A
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*53,600*	*Direct*	*Unknown*
Native Vegetation	--	--	--
Groundwater	0	N/A	N/A
Surface Water	0	N/A	N/A
Recycled Water	0	N/A	N/A
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*0*	N/A	N/A
Other: N/A	--	--	--
Groundwater	0	N/A	N/A
Surface Water	0	N/A	N/A
Recycled Water	0	N/A	N/A
Reused Water	0	N/A	N/A
Other	0	N/A	N/A
Total	*0*	N/A	N/A
Total	***1,394,500***	***Estimate***	***Unknown***

[1] Differences in reported volumes in Table 3 compared to Tables 1 and 2 account for actual water use in Table 3 (incorporating water loss through canal leakage, pipe leakage, and other percolating waters), compared to extracted groundwater in Table 1 and metered contracted surface water supplies in Table 2.

[2] Includes drain water/recirculated water utilized within Mercy Springs Water District, Oro Loma Water District, Panoche Water District, and Patterson Irrigation District service areas.

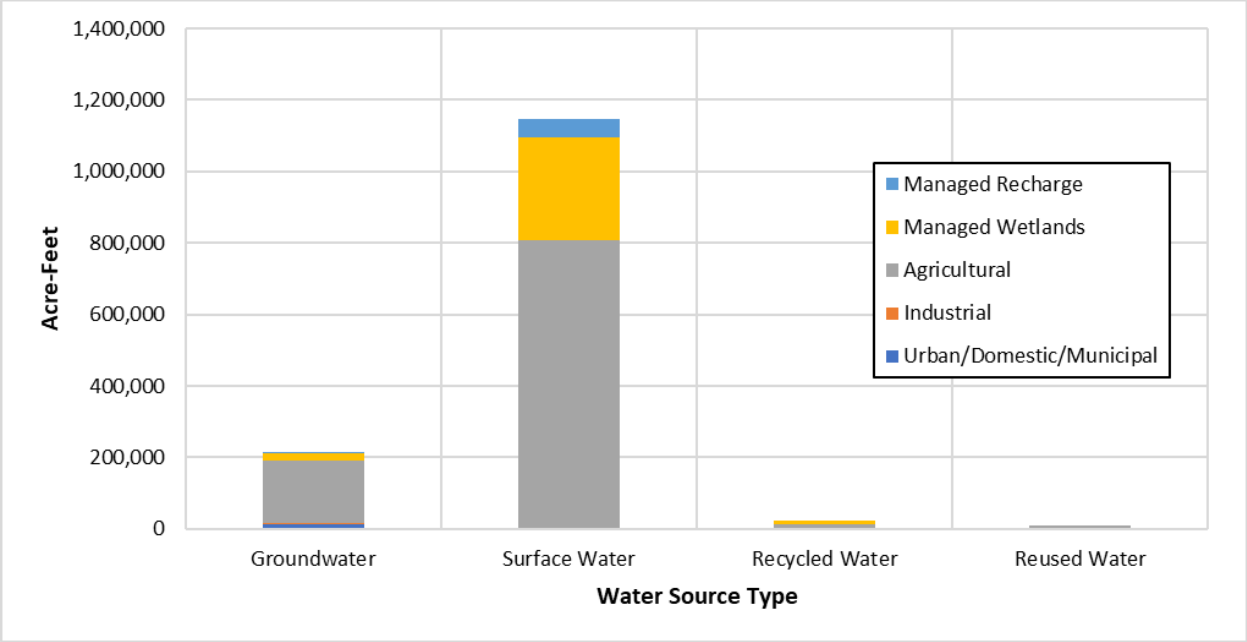

Figure 8. WY2023 Total Water Use, Delta-Mendota Subbasin

5. Change in Groundwater Storage

The change in groundwater storage for the Delta-Mendota Subbasin is shown below in a series of graphs depicting groundwater use and annual change in groundwater storage calculated from seasonal groundwater elevation highs in 2022 and seasonal groundwater elevation highs in 2023, along with the cumulative change in groundwater storage calculated using annual change in groundwater storage between seasonal groundwater elevation highs from 2013 and seasonal groundwater elevation highs from 2023. **Table 5** also shows the change in groundwater stored by principal aquifer cumulatively during these same periods.

Upper Aquifer change in groundwater storage calculated for the period between 2022 and 2023 seasonal groundwater elevation highs was estimated using two methods chosen by the respective GSP regions and summed to a Subbasin total: change in groundwater elevation contours used by the Aliso Water District, Farmers Water District, and Fresno County Management Areas A and B GSP regions; and representative hydrographs used by the Grassland GSP Region, Northern & Central Delta-Mendota GSP Region, and San Joaquin River Exchange Contractors GSP Region. The result of these estimations are presented in **Table 5**. As calculated, between 2022 seasonal groundwater elevation highs and 2023 seasonal groundwater elevation highs, groundwater stored in the Upper Aquifer increased by approximately 21,500 AF, a result of wet conditions during the early part of 2023 and associated increased surface water supplies available Subbasin-wide following three consecutive years of dry (WY2020) and critically dry (WY2021 and WY2022) conditions (**Table 5**).

Cumulative change in groundwater storage in the Upper Aquifer between 2013 seasonal groundwater elevation highs and 2023 seasonal groundwater elevation highs is presented in **Table 5** and was estimated utilizing the same methods on an annual basis by GSP region[4,5,6] as previously described. Cumulatively, from seasonal groundwater elevation high in 2013 through seasonal groundwater elevation high in 2023, groundwater stored in the Upper Aquifer decreased by approximately 719,900 AF (**Table 5**). It should be noted that the period in question included the height of the 2012-2016 drought (WY2014 through WY2016), which was

[4] For Aliso Water District, Upper Aquifer annual change in groundwater storage between 2013 seasonal high and 2017 seasonal high groundwater conditions was derived from the Projected Water Budget presented in the Aliso Water District GSP.

[5] For Grassland and Northern & Central Delta-Mendota Region GSP regions, Upper Aquifer annual change in groundwater storage between 2012 seasonal high and 2019 seasonal high groundwater conditions were derived from the Projected Water Budgets presented in their respective GSPs.

[6] For Grassland GSP Region, Upper Aquifer annual change in groundwater storage for WY2021 was calculated by calibrating the water budget to historic below normal water year conditions.

then followed by normal and wet conditions through WY2019, dry conditions in WY2020, Shasta Critical conditions in WY2021 and WY2022, and wet conditions in WY2023.

Lower Aquifer change in groundwater storage between the 2022 seasonal high in groundwater elevations and the 2023 seasonal high in groundwater elevations, presented in **Table 5**, was estimated utilizing two methods chosen by the respective GSP regions and summed for the Subbasin total: change in land surface elevation using the best available data[7,8,9,10] was used by the Aliso Water District, Grassland, Northern & Central Delta-Mendota Region, and San Joaquin River Exchange Contractors GSP regions; and change in groundwater elevation at GSP monitoring wells was utilized by the Farmers Water District and Fresno Management Areas A and B GSP regions. Between seasonal high groundwater elevations of 2022 and 2023, groundwater stored in the Lower Aquifer decreased by approximately 74,700 AF, which is likely the result of the Lower Aquifer being a confined system and reduced availability of surface water in the Subbasin during the three prior consecutive dry (WY2020) and Shasta Critical (WY2021 and WY2022) years dampening recovery as a result of wet conditions in WY2023 (**Table 5**).

Cumulative change in groundwater storage in the Lower Aquifer from the 2013 seasonal high groundwater elevations through the 2023 seasonal high groundwater elevations was estimated utilizing the same GSP-selected methodologies and sources[11], on an annual basis, as implemented for estimating change in groundwater storage between the seasonal groundwater elevation highs of 2022 and 2023, as described above. Cumulatively, groundwater stored in the

[7] Inelastic land subsidence is largely the result of groundwater pumping from the Lower Aquifer but is not directly equivalent to Lower Aquifer pumping.

[8] The following source was utilized to calculate Lower Aquifer change in groundwater storage between the 2022 and 2023 seasonal high groundwater elevations for the Aliso Water District and Grassland GSP regions: San Joaquin River Restoration Program. 2022. *December 2022 Table (Bureau of Reclamation Static GSP Survey for Subsidence Monitoring, Central Valley California)*. Retrieved from http://www.restoresjr.net/science/subsidence-monitoring/. Note: Additional refinements provided by Kenneth D. Schmidt & Associates using additional local data.

[9] The following source was utilized to calculate Lower Aquifer change in groundwater storage between the 2022 and 2023 seasonal high groundwater elevations for the San Joaquin River Exchange Contractors GSP region, where the average annual land subsidence from December 2013 to December 2020 was used: San Joaquin River Restoration Program. 2020. *December 2020 Table (Bureau of Reclamation Static GSP Survey for Subsidence Monitoring, Central Valley California)*. Retrieved from http://www.restoresjr.net/science/subsidence-monitoring/.

[10] For the Northern & Central Delta-Mendota GSP Region, in addition to the *Bureau of Reclamation Static GPS Survey for Subsidence Monitoring, Central Valley California* (December 2022), the Nevada Geodetic Laboratory data set (http://geodesy.unr.edu/) and local data collected by Patterson Irrigation District and Tranquillity Irrigation District were used to provide complete spatial coverage of the Northern & Central Delta-Mendota GSP Region.

[11] Lower Aquifer change in groundwater storage between 2013 and 2019 seasonal high conditions for the Northern & Central Delta-Mendota Region GSP was derived from the current and projected baseline water budgets presented in the GSP (November 2019).

Lower Aquifer decreased by approximately 602,300 AF (**Table 5**). As with the Upper Aquifer, it should be noted that the period in question included the height of the 2012-2016 drought (WY2014 through WY2016), which was then followed by normal and wet conditions through WY2019, dry conditions in WY2020, Shasta Critical conditions in WY2021 and WY2022, and wet conditions in WY2023.

Table 5. Annual and Cumulative Change in Storage by Principal Aquifer from Seasonal High 2013 to Seasonal High 2023, Delta-Mendota Subbasin

Principal Aquifer	Annual Change in Storage, Seasonal High 2022 to Seasonal High 2023 (AF) [1]	Cumulative Change in Storage, Seasonal High 2013 to Seasonal High 2023 (AF) [1]
Upper Aquifer	21,500	-719,900
Lower Aquifer	-74,700	-602,300
Total	**-53,200**	**-1,322,200**

[1] Rounding errors may result in differences in reported volumes by ± 100 AF.

Figure 9 shows annual change in groundwater stored by water year type with cumulative change in groundwater storage at the Subbasin level as calculated using the methods previously described. In general, groundwater stored largely decreases during Dry and Shasta Critical water years and increases during Wet and Normal water years. Following the end of the 2012-2016 drought (starting in WY2017), groundwater stored had increased due to increased precipitation and availability of imported surface water supplies. As a result, the negative trend in cumulative change in storage turned into a positive trend through WY2018 and plateaued through WY2020 and began to decrease in WY2021 and WY2022 due to critically dry conditions and a resulting increased reliance on groundwater. During WY2023, an overall decrease in storage was observed across the Upper Aquifer and Lower Aquifer despite wet conditions and the decline in cumulative change in storage began to decrease.

Figure 10 shows annual groundwater extraction estimates with cumulative change in groundwater storage at the Subbasin level. Groundwater extractions are greater in volume during Dry and Shasta Critical water years as compared to Normal and Wet water years, where increased precipitation and availability of imported water supplies result in a reduced reliance on groundwater. **Figure 10** demonstrates an inverse relationship between change in storage and groundwater extraction, where cumulative change in storage becomes more negative as groundwater extraction increases, and becomes more positive as groundwater extraction decreases. Cumulative change in storage long-term trends are heavily impacted by consecutive Dry and Shasta Critical water years (as evident in WY2021 and WY2022), with limited surface water availability and increased groundwater use, creating a compounding depletion of groundwater storage.

Figure 11 and **Figure 12** present change in groundwater storage by principal aquifer (Upper Aquifer and Lower Aquifer) by GSP region cumulatively for the period from spring 2013 to spring 2023 (periods of high groundwater elevations) and annually between spring 2022 and spring 2023, respectively. Cumulative change in storage depicted in **Figure 11** captures the height of the 2012-2016 drought (occurring during WY2014 through WY2016) as well as wetter conditions that occurred during WY2017 through WY2019 and the return of dry and critically dry conditions in WY2020, WY2021, and WY2022 followed by wet conditions in WY2023. Groundwater is a critically important water supply source during droughts with the associated decreased precipitation, higher temperatures, and little to no available imported surface water supplies. **Figure 11** demonstrates the impact the 2012-2016 and 2020-2022 droughts have had on the Delta-Mendota Subbasin and differences in water sources available within each of the GSP groups. Wet conditions during WY2019 resulted in increased recharge in the Upper Aquifer due to increased precipitation and imported surface water deliveries as well as reduced reliance on Lower Aquifer pumping due to availability of surface water supplies. During WY2020, the impacts of wet conditions during WY2019 and sizable late spring precipitation are evident as change in storage is similar to WY2016 conditions. As dry conditions persisted through WY2021 and WY2022, groundwater storage began to decrease following relatively stable conditions since the end of the 2012-2016 drought. Recovery in groundwater storage is starting to be observed as a result of wet conditions in WY2023 (**Figure 12**).

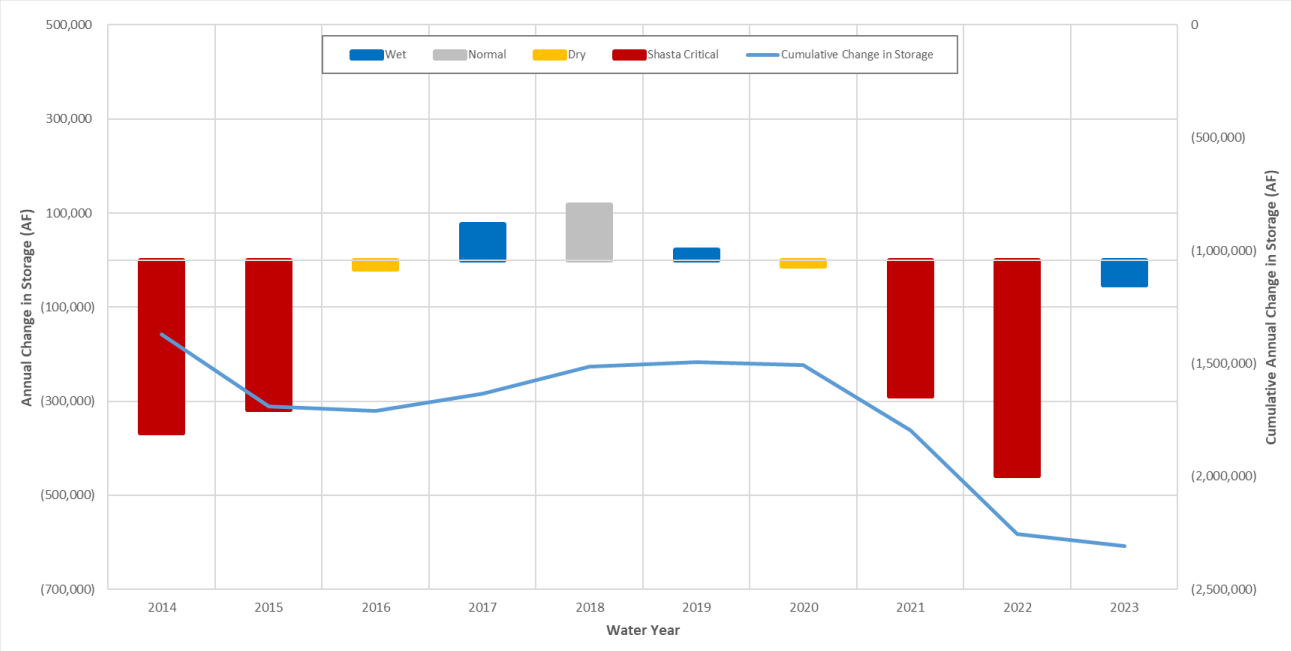

Figure 9. Annual Change in Storage and Cumulative Change in Storage, Seasonal High 2013 to Seasonal High 2023 [12]

[12] Water year types are mapped in the following manner according to the San Joaquin River Water Year Index water year types: Wet = Wet; Normal = Below Normal and Above Normal; Dry = Dry and Critical. Shasta Critical years are designated upon the request of the San Joaquin River Exchange Contractors and Grassland GSP regions as well as Tranquillity Irrigation District as this designation impacts surface water deliveries to exchange contracts and managed wetlands through the CVP. Shasta Critical designations are dependent on inflow to Shasta Reservoir and U.S. Bureau of Reclamation's operating rules for CVP deliveries.

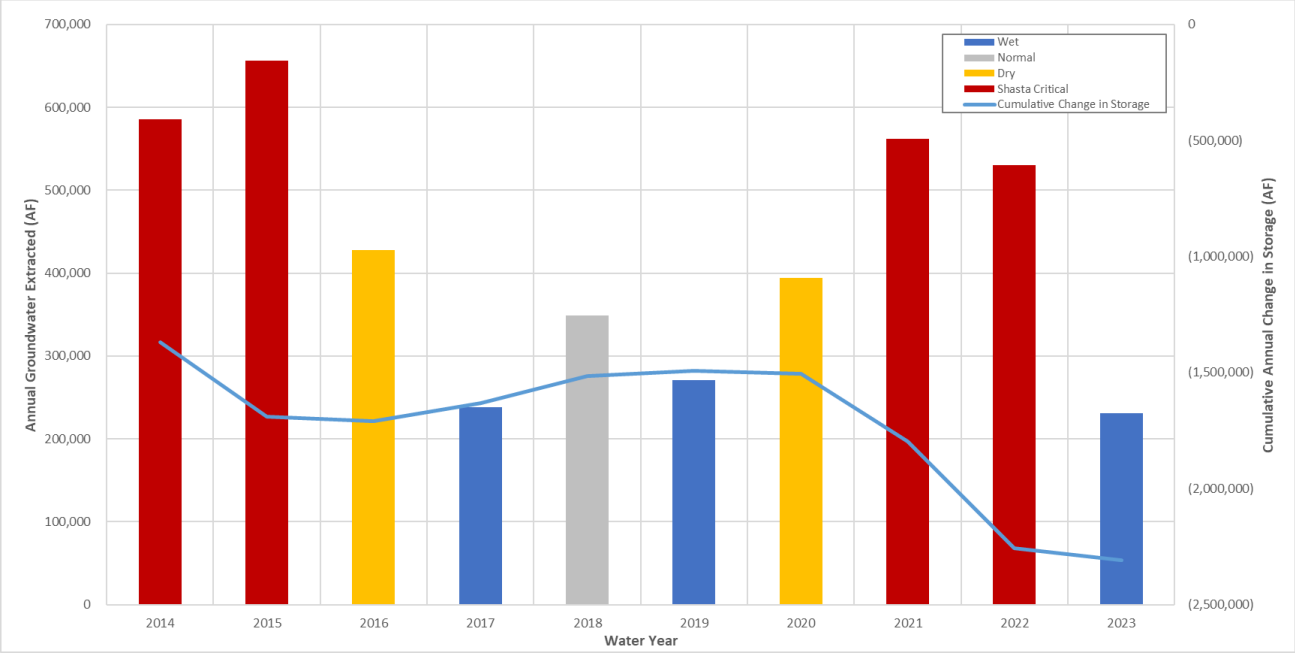

Figure 10. Groundwater Extraction and Cumulative Change in Storage, WY2014 to WY2023 [13]

[13] Water year types are mapped in the following manner according to the San Joaquin River Water Year Index water year types: Wet = Wet; Normal = Below Normal and Above Normal; Dry = Dry and Critical. Shasta Critical years are designated upon the request of the San Joaquin River Exchange Contractors and Grassland GSP regions as well as Tranquillity Irrigation District as this designation impacts surface water deliveries to exchange contracts and managed wetlands through the CVP. Shasta Critical designations are dependent on inflow to Shasta Reservoir and U.S. Bureau of Reclamation's operating rules for CVP deliveries.

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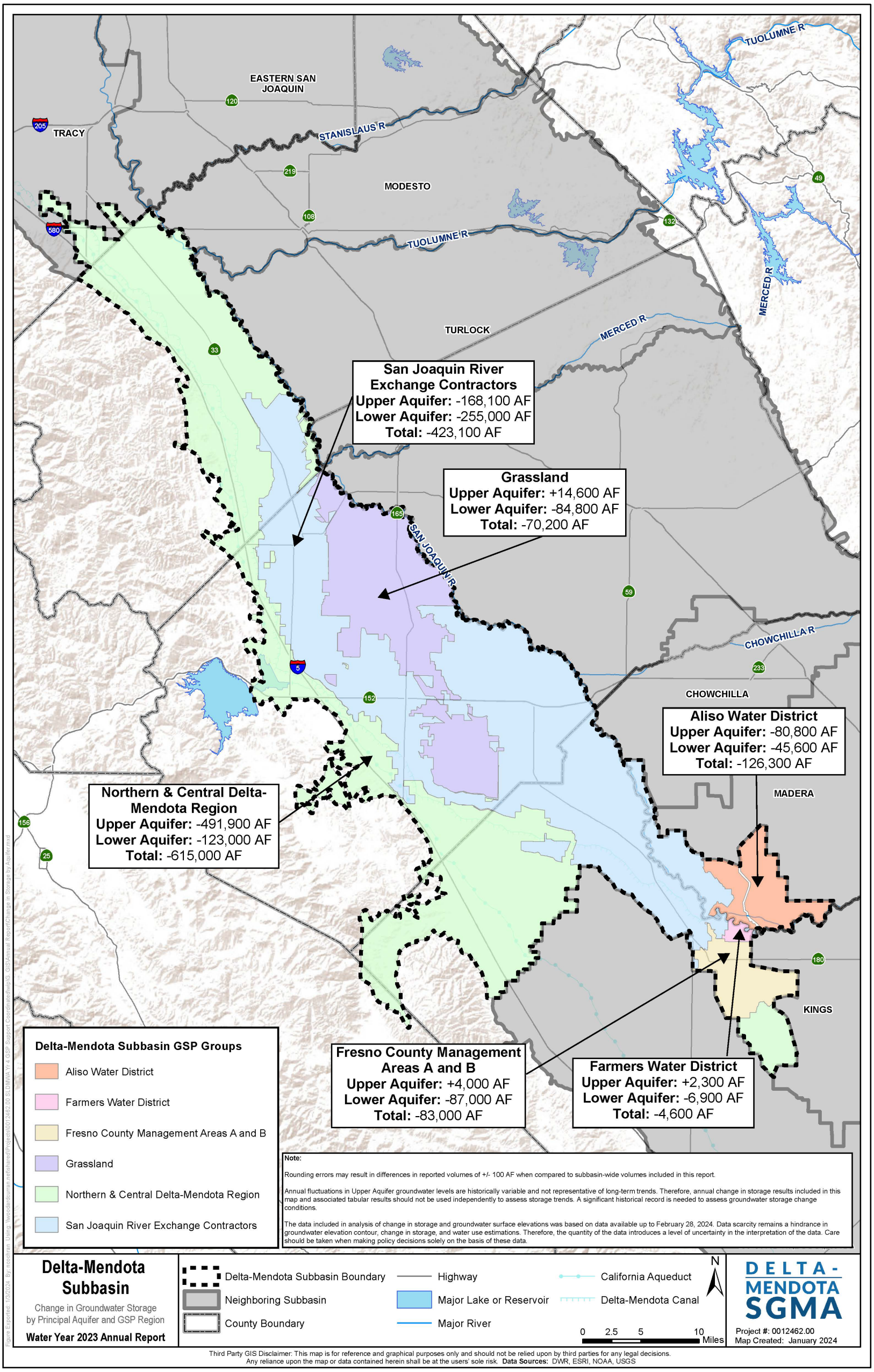

Figure 11. Seasonal High 2013 to Seasonal High 2023 Cumulative Change in Groundwater Storage by Principal Aquifer[14]

[14] There are minimal Lower Aquifer groundwater extractions within the Grassland GSP Region. The -70,200 AF cumulative Lower Aquifer change in storage in the Grassland GSP Region is influenced by Lower Aquifer groundwater extractions outside of the Subbasin and detected as a historic subsidence hotspot (depicted in Figure 3-21 in the Grassland GSP).

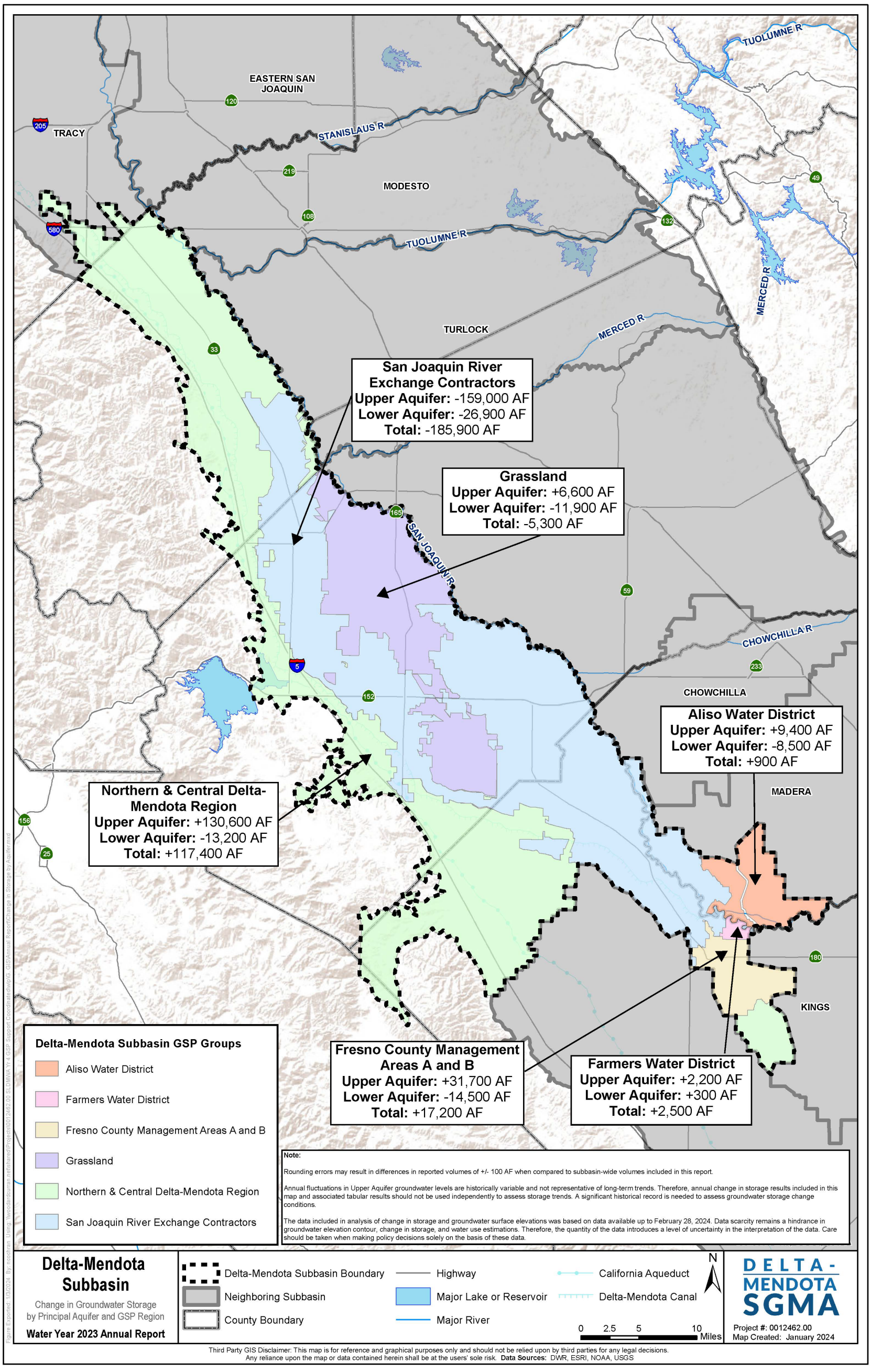

Figure 12. Seasonal High 2022 to Seasonal High 2023 Change in Groundwater Storage by Principal Aquifer

6. Plan Implementation

WY2023 marks the fourth year of GSP implementation for the Delta-Mendota Subbasin. The following subsections describe progress made by each of the six GSP regions toward implementing their respective Plans, including progress towards achieving interim milestones and the implementation of projects and management actions. Cumulatively, these efforts provide the required advancement towards achieving and maintaining groundwater sustainability in the Delta-Mendota Subbasin.

6.1 Aliso Water District GSP Region Progress

The Aliso Water District GSA (AWDGSA) continues to make progress towards sustainability by implementing projects and management actions.

Water Supply Augmentation – Imported Surface Water

In WY2023, the SWRCB authorized and approved the Temporary Water Right Permit for Aliso Water District to appropriate water by temporary permit pursuant to Water Code, section 1425 *et seq*. The permit allowed for the diversion of up to 10,000 AF of available San Joaquin River flood water from the Chowchilla Bypass to be applied on Aliso Water District's 75-acre Chowchilla Bypass recharge facility for underground storage and ultimately use for irrigation purposes. The permit allowed for diversions from January 1, 2023 to June 14, 2023. This comes after a voluntarily cancelled application in June 2022 and previously issued permits in January 2019 and 2021. Aliso Water District continues to pursue a permanent appropriative water right permit.

Aliso Water District diverted approximately 1,285 AF of surface water during WY2023. This consisted of 134 AF during the 2023 permit period, 578 AF under the provisions of Executive Order (EO) N-4-23, 527 AF following the signing of EO N-7-23, and 46 AF for flood control purposes. In addition to Aliso Water District's efforts to divert surface water, growers also took the initiative to divert surface water. Individual growers diverted approximately 45,000 AF in WY2023 and as a result received benefits from Aliso Water District's surface water incentive program.

Chowchilla Bypass Recharge Facility

Following authorization from the SWRCB and funding from DWR's Sustainable Groundwater Management (SGM) Program SGMA Implementation – Round 1 grant program, the AWDGSA continues to make progress on the Chowchilla Bypass Recharge Project (formally known as the Cottonwood Creek Recharge Project, outlined in the GSP) to recharge flood waters on Aliso Water District's 75-acre recharge facility east of the Bypass. The Project will tentatively start construction in summer 2024.

Addressing Data Gaps

At the time of this report's publication, the AWDGSA plans to have installed two Lower Aquifer (sub-Corcoran Clay) groundwater observation wells to fill Lower Aquifer data gaps within the AWDGSA boundary. The construction of these wells was funded through DWR's SGM Program SGMA Implementation – Round 1 grant program. Data collection from these wells will assist the AWDGSA in quantifying vertical groundwater flow across the two principal aquifers and horizontal flow across the AWDGSA boundary. Data from these observation wells will also assist in Aliso Water District's composite well study to better quantify Upper Aquifer and Lower Aquifer depletions caused by groundwater extraction. When the opportunity arises, the AWDGSA may look into converting deep composite irrigation wells to groundwater observation wells to improve spatial distribution of Lower Aquifer wells.

Well Policy

To comply with Section 9(a) of the State of California EO N-7-22 that requires GSAs to verify if new groundwater wells will decrease the likelihood of achieving SGMA goals, Aliso Water District adopted the "Policy for the Construction of Groundwater Extraction Wells within the Aliso Water District" on May 19, 2023. The intent of the policy is "…(i) to identify features of well construction that could affect the District's ability to operate sustainably, (ii) to gain valuable information of the aquifer system to understand and preserve groundwater extraction practices, and (iii) to provide a system for the District to issue a timely GSA verification letter to the applicant when seeking a permit from the County of Madera for the construction of new groundwater extraction wells." The new policy requires that well owners provide significant initial hydrogeologic data, necessary monitoring components, and on-going data on all new wells.

Current Conditions for Each Sustainability Indicator

Groundwater levels collected in the fall and spring of WY2023 are presented in **Table 6**. Current minimum thresholds were established similarly across the Subbasin as historical seasonal low prior to the end of WY2016. In WY2023, there were no undesirable results for the chronic lowering of groundwater levels sustainability indicator impacting beneficial uses and users of groundwater. However, there were two groundwater level measurement minimum threshold exceedances that occurred during the WY2023 sampling period in wells DMS ID Nos. 09-001 and 09-004 (**Table 6**). The minimum threshold exceedance in DMS ID No. 09-001 was caused by a questionable field measurement as noted by the sampling agency. The groundwater levels in both wells that experienced a minimum threshold exceedance recovered to above the minimum threshold in the following sampling period.

Table 6. Aliso Water District – WY2023 Water Levels Compared to Minimum Thresholds

DMS ID	Minimum Threshold (feet above mean sea level [ft MSL], NAVD88)	Fall 2022 Groundwater Elevation (ft MSL, NAVD88)	Spring 2023 Groundwater Elevation (ft MSL, NAVD88)	Fall 2023 (ft MSL, NAVD88)
09-001	40.5	59.41	-14.14	59.73
09-002	-4.0	10.54	15.14	18.45
09-003	37.4	46.46	72.83	64.06
09-004	37.7	32.28	99.90	90.87

Groundwater quality sampling occurred in July and August 2023. The Subbasin identified total dissolved solids (TDS) as the primary constituent of concern. The WY2023 TDS results are presented in **Table 7**. Current minimum thresholds were established consistently across the Subbasin as 1,000 milligrams per liter (mg/L) to align with the upper limit of the Secondary Maximum Contaminant Level (SMCL). All four representative sites were less than 1,000 mg/L TDS indicating sustainable conditions.

Table 7. Aliso Water District – WY 2023 Water Quality Sampling Results

DMS ID	Minimum Threshold (TDS, mg/L)	July/August 2023 (TDS, mg/L)
09-002	1,000	370
09-003	1,000	471
09-005	1,000	508
09-196	1,000	264

Table 8 shows land surface elevation data for WY2021, WY2022, and WY2023. The difference in land surface indicates that AWDGSA is on track to meeting the 2025 interim milestone for subsidence, which is no more than 1 foot of additional inelastic land subsidence in the first five years of SGMA implementation. It is important to note that San Joaquin River Restoration Program's monitoring equipment has a vertical accuracy of +/- 3 centimeters (0.1-foot).

Table 8. Aliso Water District – WY2023 Subsidence Results

Monitoring Point	December 2020 (WY2021), Land Surface Elevation (ft MSL, NAVD88)	December 2021 (WY2022), Land Surface Elevation (ft MSL, NAVD88)	December 2022 (WY20203), Land Surface Elevation (ft MSL, NAVD88)	Difference in Elevation (feet)
104 (DWR at Gravelly Ford)	202.39	202.27	201.99	0.40
114 (LIFESON)	179.33	179.03	178.79	0.54
201 (Aliso WD 1)	158.52	158.34	158.08	0.44

6.2 Farmers Water District GSP Region Progress

During WY2023, the Farmers Water District (FWD) GSA conducted the following GSP implementation activities:

Representative Monitoring and Data Collection Activities

FWD GSA monitored groundwater conditions in the Farmers Water District GSA Plan Area. Data collected from the monitoring wells indicate continued adherence to established measurable objectives and interim milestones in the areas of groundwater levels, groundwater storage, subsidence, groundwater quality, and interconnected surface waters. Monitoring data were uploaded to DWR's SGMA Portal and to the Delta-Mendota Subbasin Coordinated data management system (DMS). DMS ID No. 10-009/Local ID TSS-325 (Upper Aquifer) and DMS ID No. 10-010/Local ID TSS-485 (Lower Aquifer), which are dedicated monitoring wells, were added to the representative monitoring network for both groundwater level and groundwater quality.

Inadequate GSP Determination and Development of Single GSP

In March 2023, DWR made its final determination on the Revised 2020 GSPs. The six Delta-Mendota Subbasin GSPs were found to not substantially comply with the GSP regulations and did not satisfy the objectives of SGMA. In the summer of 2023, the Delta-Mendota Subbasin Coordination Committee tasked EKI with responding to the inadequate determination and developing a single GSP for the Subbasin. FWD and its consultant have participated in Coordination Committee and Technical Working Group meetings to address deficiencies identified by DWR and work with the SWRCB to develop a single GSP consistent with the requirements of SGMA.

Current Conditions for Each Sustainability Indicator

Chronic Lowering of Groundwater Levels

Significant and unreasonable impacts to beneficial uses and users of groundwater are substantially increased costs associated with higher total pumping lift, lowering pumps, drilling deeper wells, or otherwise modifying wells to increase access to groundwater, securing alternative water sources, or required mitigation of groundwater dependent ecosystems. Significant and unreasonable is quantitatively defined as exceeding the minimum threshold at more than 50% of representative monitoring sites by principal aquifer in a GSP region. Significant and unreasonable impacts did not occur for FWD during WY2023.

Measurable objectives are set as WY2015 seasonal highs, and minimum thresholds are set as the historical low occurring in WY2016 or prior. **Table 9** includes the established minimum thresholds and measurable objectives for FWD-R-8 (DMS ID No. 10-001), the single representative monitoring site identified in the Revised 2022 GSP. Also included are dedicated monitoring sites added to the FWD representative monitoring network in WY2023. TSS-325

(DMS ID No. 10-009) and TSS-485 (DMS ID No. 10-010) were completed in the summer of 2021. The minimum threshold and measurable objective are based on data from nearby construction wells with similar screen intervals. TSS-485 (DMS ID No. 10-010) fills a data gap in the Lower Aquifer for groundwater level measurements. A comparison of the WY2023 seasonal high groundwater elevation is compared to minimum threshold and measurable objective levels in **Table 9**.

Table 9. FWD Chronic Lowering of Groundwater Levels Representative Monitoring Network

Local ID (DMS ID)	Minimum Threshold (ft MSL, NAVD88)	Measurable Objective (ft MSL, NAVD88)	2023 Season High Groundwater Elevation (ft MSL, NAVD88)
FWD-R-8 (10-001)	34	102.7	104.5
TSS-325 (10-009)	4	88	106.7
TSS-485 (10-010)	-67	-17	-14.4

Groundwater levels during WY2023 remained above minimum thresholds and measurable objectives for Upper Aquifer sites (Local ID FWD-R-8/DMS ID No. 10-001 and Local ID TSS-325/DMS ID No. 10-009). The Lower Aquifer site (Local ID TSS-485/DMS ID No. 10-010) was above its minimum threshold but below the measurable objective. No wells have been reported to have gone dry within FWD.

The 5-year interim milestone was a narrative that states, “Gather data and complete the establishment of seasonal low and high elevations at representative monitoring sites in the Lower Aquifer for the Grassland GSP area. Develop a coordinated methodology and complete the establishment of acute groundwater elevation thresholds. Identify chronic lowering of groundwater levels cause by pumping outside the Subbasin.” As a result of the Inadequate determination, and given a single GSP for the Subbasin is currently under development, Year 5 (or 2025) interim milestones are currently being reassessed and subsequent Annual Reports will evaluate conditions relative to updated basin-wide interim milestones. Undesirable results have not occurred, and conditions for FWD are not significant and unreasonable.

Reduction in Groundwater Storage

A significant and unreasonable impact on beneficial uses and users of groundwater is insufficient water storage to maintain beneficial uses and natural resource areas in the Subbasin, including the conjunctive use of groundwater. The minimum thresholds, measurable objectives, and interim milestones for the Subbasin are narratives.

Minimum thresholds for the Upper Aquifer are as follows: “For the Upper Aquifer, as a reasonable proxy for individual groundwater storage threshold, maintain groundwater levels in accordance with the minimum thresholds set for Chronic Lowering of Groundwater Levels.” Groundwater levels for FWD representative monitoring sites are above minimum threshold

values in the Upper Aquifer. Minimum thresholds for the Lower Aquifer are as follows: “For the Lower Aquifer, correlate the [sustainable management criteria] for inelastic land subsidence with the reduction in groundwater storage that would cause undesirable results, estimated to be 1.1 million acre-feet of storage loss by 2040 attributed to groundwater extraction in the Subbasin.” FWD does not pump from the Lower Aquifer.

The measurable objective for the Upper Aquifer is to maintain groundwater levels in accordance with the measurable objectives set for the chronic lowering of groundwater levels sustainability indicator, and the Lower Aquifer measurable objective is to minimize storage losses caused by inelastic subsidence. As described above, FWD groundwater levels are above the measurable objective. The interim milestone is to maintain groundwater levels in accordance with measurable objectives set for the chronic lowering of groundwater levels sustainability indicator.

FWD saw an increase in storage in both the Upper Aquifer (+2,200 AF) and Lower Aquifer (+300 AF) for WY2023. Undesirable results have not occurred, and conditions for groundwater storage are not significant and unreasonable.

Degraded Water Quality

Significant and unreasonable impacts to beneficial uses and users of groundwater as a result of groundwater management activities are the migration of contaminant plumes or elevated concentrations of constituents of concern that reduce groundwater availability and the degradation of surface water quality as a result of groundwater migration that substantially impairs existing beneficial use. Significant and unreasonable is quantitatively defined as exceeding minimum thresholds at more than 50% of representative monitoring sites by principal aquifer in a GSP region where current groundwater quality does not exceed 1,000 mg/L TDS.

The measurable objective for groundwater quality is a value less than 1,000 mg/L TDS. The 5-year interim milestone is as follows: “Maintain salinity consistent with measurable objectives. Participate in, provide data for, and track and report on compliance with orders and objectives adopted by the State Water Resources and Central Valley Regional Water Quality Control Boards and similar regulatory agencies in coordination with the Central Valley Groundwater Monitoring Collaborative. Develop a correlation between groundwater quality and groundwater levels in order to establish a methodology for the use of groundwater levels as a proxy for groundwater quality.”

FWD has removed FWD-8 and PCF-1 from the representative monitoring network for degraded water quality. These sites were replaced with the Upper Aquifer monitoring TSS-325 (DMS ID No. 10-009) and the Lower Aquifer monitoring well TSS-485 (DMS ID No. 10-010). Comparisons

of groundwater quality measurements to minimum thresholds and measurable objective values are presented in **Table 10**.

Table 10. FWD Degraded Water Quality Representative Monitoring Network

Local ID (DMS ID)	Minimum Threshold and Measurable Objective (TDS, mg/L)	2023 Value (TDS, mg/L)
TSS-325 (10-009)	1,000	590
TSS-485 (10-010)	1,000	1,330

The TDS concentration at TSS-325 is consistent with historical conditions based on nearby production wells. In 2022, FWD-R-8 had a TDS concentration of 490 mg/L, and PCF-1 had a TDS concentration of 470 mg/L. TSS-485 is the only Lower Aquifer monitoring well in FWD, and there is no historical record of Lower Aquifer groundwater quality in FWD. Current conditions in the Lower Aquifer exceed the minimum threshold. FWD does not pump from the Lower Aquifer and, therefore, does not contribute to the migration of groundwater with elevated TDS concentrations. For the Upper Aquifer, undesirable results have not occurred, and conditions are not significant and unreasonable. For the Lower Aquifer, undesirable results have not occurred as the elevated TDS concentration in the Lower Aquifer is not due to groundwater management by FWD.

Inelastic Land Subsidence

Significant and unreasonable damage to conveyance capacity from inelastic land subsidence is structural damage that creates an unmitigated and unmanageable reduction of design capacity or freeboard. Significant and unreasonable impacts to natural resource areas from inelastic land subsidence are unmitigated decreases in the ability to flood or drain such areas by gravity. Significant and unreasonable threats to public health and safety from inelastic land subsidence are those that cause an unmitigated reduction of freeboard that allows for flooding or unmitigated damage to roads and bridges.

The minimum threshold is set as no more than two feet of land subsidence at the representative monitoring site location. The measurable objective is to minimize inelastic land subsidence and to have no additional subsidence after 2040. The 5-year interim milestone allows no more than 1 foot of additional inelastic land subsidence.

Land Subsidence within FWD is measured at an extensometer (Yearout) located within the GSA boundaries. This extensometer measures Upper Aquifer compaction. Since 2015, there has only been 0.05 feet of inelastic compaction. This value does not account for the total land subsidence, which, based on nearby UNAVCO Station P304, there have been 0.35 feet of subsidence since 2020.

As a result of groundwater management in FWD, undesirable results have not occurred, and conditions are not significant and unreasonable.

Depletion of Interconnected Surface Waters

Significant and unreasonable impacts on natural resources or downstream beneficial uses and users of groundwater are a reduction in available surface water supplies for natural resource areas and a reduction in downstream water availability as a result of increased stream flow depletions along the San Joaquin River.

Depletion of interconnected surface waters was identified as a data gap in the Subbasin. The Subbasin has developed a monitoring plan and is in the process of constructing new monitoring wells dedicated to the depletion of interconnected surface waters sustainability indicator. The groundwater level sustainable management criteria are currently being used as a proxy until the data gaps are filled. The 5-year interim milestone is to fill the data gaps and have a monitoring network dedicated to interconnected surface water.

6.3 Fresno County Management Areas A and B GSP Region Progress

During WY2023, the Fresno County Management Areas A and B GSAs (Fresno County GSAs or Fresno County) conducted the following GSP implementation activities:

Representative Monitoring and Data Collection Activities

The Fresno County GSAs monitored groundwater conditions in the Fresno County Management Areas A and B Plan Area. Data collected from the monitoring indicates continued adherence to established measurable objectives and interim milestones in the areas of groundwater levels, groundwater storage, subsidence, groundwater quality, and interconnected surface waters. Monitoring data were uploaded to DWR's SGMA Portal and to the Delta-Mendota Subbasin Coordinated DMS.

Inadequate GSP Determination and Development of Single GSP

In March 2023, DWR made its final determination on the Revised 2020 GSPs. The six Delta-Mendota Subbasin GSPs were found to not substantially comply with the GSP regulations and did not satisfy the objectives of the SGMA. In the summer of 2023, the Delta-Mendota Subbasin Coordination Committee tasked EKI with responding to the inadequate determination and developing a single GSP for the Subbasin. Fresno County and its consultant have participated in Coordination Committee and Technical Working Group meetings to address deficiencies identified by DWR and work with the SWRCB to develop a single GSP consistent with the requirements of SGMA.

Current Conditions for Each Sustainability Indicator

Chronic Lowering of Groundwater Levels

Significant and unreasonable impacts to beneficial uses and users of groundwater are substantially increased costs associated with higher total pumping lift, lowering pumps, drilling

deeper wells, or otherwise modifying wells to increase access to groundwater, securing alternative water sources, or required mitigation of groundwater dependent ecosystems. Significant and unreasonable is quantitatively defined as exceeding the minimum threshold at more than 50% of representative monitoring sites by principal aquifer in a GSP region. Significant and unreasonable impacts did not occur for the Fresno County GSAs during WY2023.

Measurable objectives are set as WY2015 seasonal highs, and minimum thresholds are set as the historical low occurring in WY2016 or prior. **Table 11** includes the established minimum thresholds and measurable objectives for the Fresno County GSAs representative monitoring sites. Fresno County is in the process of installing a dual completion monitoring well in Management Area B. This well will fill data gaps in both the Upper Aquifer and Lower Aquifer. Currently, USGS 31J6 (DMS ID No. 13-004), the Lower Aquifer representative monitoring site, is located outside the GSA boundaries within the City of Mendota. A comparison of the WY2023 seasonal high groundwater elevation is compared to minimum threshold and measurable objective levels in **Table 11**.

Table 11. Fresno County Chronic Lowering of Groundwater Levels Representative Monitoring Network

Local ID (DMS ID)	Minimum Threshold (ft MSL, NAVD88)	Measurable Objective (ft MSL, NAVD88)	2023 Season High Groundwater Elevation (ft MSL, NAVD88)
SPRECK-MW-7 (12-001)	98	103	116
TL-HS-3 (13-003)	49	116	112
HANS-7C1 (13-001)	109	120	131
USGS-31J6 (13-004)	-59	-27	-41

Groundwater levels during WY2023 remained above minimum thresholds and measurable objectives for Upper Aquifer sites. The Lower Aquifer site was below its minimum threshold during fall 2022 but rebounded above minimum threshold levels in spring 2023. No wells have been reported to have gone dry within the Fresno County GSAs. Undesirable results have not occurred due to groundwater management in Fresno County. The single Lower Aquifer site which is located outside of the Fresno County GSAs exceeded its minimum threshold.

The 5-year interim milestone was a narrative that states, “Gather data and complete the establishment of seasonal low and high elevations at representative monitoring sites in the Lower Aquifer for the Grassland GSP area. Develop a coordinated methodology and complete the establishment of acute groundwater elevation thresholds. Identify chronic lowering of groundwater levels cause by pumping outside the Subbasin.” As a result of the Inadequate determination, and given a single GSP for the Subbasin is currently under development, Year 5 interim milestones are currently being reassessed and subsequent Annual Reports will evaluate

conditions relative to updated basin-wide interim milestones. Undesirable results have not occurred, and conditions for the Fresno County GSAs are not significant and unreasonable.

Reduction in Groundwater Storage

A significant and unreasonable impact on beneficial uses and users of groundwater is insufficient water storage to maintain beneficial uses and natural resource areas in the Subbasin, including the conjunctive use of groundwater. The minimum thresholds, measurable objectives, and interim milestones for the Subbasin are narratives.

Minimum thresholds for the Upper Aquifer are as follows: "For the Upper Aquifer, as a reasonable proxy for individual groundwater storage threshold, maintain groundwater levels in accordance with the minimum thresholds set for Chronic Lowering of Groundwater Levels." Groundwater levels for Fresno County representative monitoring sites are above minimum threshold values in the Upper Aquifer. Minimum thresholds for the Lower Aquifer are as follows: "For the Lower Aquifer, correlate the [sustainable management criteria] for inelastic land subsidence with the reduction in groundwater storage that would cause undesirable results, estimated to be 1.1 million acre-feet of storage loss by 2040 attributed to groundwater extraction in the Subbasin." Fresno County GSAs do not pump from the Lower Aquifer.

The measurable objective for the Upper Aquifer is to maintain groundwater levels in accordance with the minimum thresholds set for the chronic lowering of groundwater levels sustainability indicator, and the Lower Aquifer measurable objective is to minimize storage losses caused by inelastic subsidence. As described above, Fresno County groundwater levels are above measurable objectives in the Upper Aquifer. The interim milestone is to maintain groundwater levels in accordance with measurable objectives set for the chronic lowering of groundwater levels sustainability indicator.

Fresno County saw an increase in storage in the Upper Aquifer (+31,700 AF) and a loss of storage in the Lower Aquifer (-14,500 AF) for WY2023. Undesirable results have not occurred, and conditions for groundwater storage are not significant and unreasonable.

Degraded Water Quality

Significant and unreasonable impacts to beneficial uses and users of groundwater as a result of groundwater management activities are the migration of contaminant plumes or elevated concentrations of constituents of concern that reduce groundwater availability and the degradation of surface water quality as a result of groundwater migration that substantially impairs existing beneficial use. Significant and unreasonable is quantitatively defined as exceeding minimum thresholds at more than 50% of representative monitoring sites by principal aquifer in a GSP region where current groundwater quality does not exceed 1,000 mg/L TDS.

For areas that were not impaired as of WY2016, the measurable objective is set as a value less than 1,000 mg/L TDS and the minimum threshold is set as 1,000 mg/L TDS. For areas with impaired groundwater quality (had a TDS concentration greater than 1,000 mg/L TDS), minimum thresholds and measurable objectives were not assigned.

The measurable objective for groundwater quality is a value less than 1,000 mg/L TDS. The 5-year interim milestone is as follows: "Maintain salinity consistent with measurable objectives. Participate in, provide data for, and track and report on compliance with orders and objectives adopted by the State Water Resources and Central Valley Regional Water Quality Control Boards and similar regulatory agencies in coordination with the Central Valley Groundwater Monitoring Collaborative. Develop a correlation between groundwater quality and groundwater levels in order to establish a methodology for the use of groundwater levels as a proxy for groundwater quality."

Comparisons of water quality measurements to minimum thresholds and measurable objective values are presented in **Table 12**.

Table 12. Fresno County Degraded Water Quality Representative Monitoring Sites

Local ID (DMS ID)	Minimum Threshold and Measurable Objective (TDS, mg/L)	2023 Value (TDS, mg/L)
MF-P-1 (12-002)	Impaired	4,710
SPRECK-MW-11 (12-004)	Impaired	1,500
TLF-6D (13-008)	Impaired	No Sample
SPRECK-MW-20 (12-005)	Impaired	1,800
SPRECK-PW-10 (12-008)	Impaired	520
SPRECK-PW-12 (12-009)	Impaired	960
SC-4B (13-006)	Impaired	No Sample
SPRECK-PW-9 (12-007)	Impaired	1,400
TLF-12D (13-007)	Impaired	No Sample
SPRECK-MW-1 (12-003)	Impaired	1,400
SPRECK-MW-32 (12-006)	1,000	160

All sites in the Fresno County groundwater quality representative monitoring network were identified as impaired with the exception of SPRECK-MW-32 (DMS ID No. 12-006) which had a TDS value of 160 mg/L during WY2023, consistent with historical records. As of this Annual Report, no wells are screened within the Lower Aquifer and no groundwater quality data has been collected. As part of the single GSP, Fresno County will continue to utilize SPRECK-MW-32 as a water quality representative monitoring site. Fresno County is currently constructing a dual completion monitoring well in Management Area B which will consist of monitoring zones in both the Upper Aquifer and Lower Aquifer. Once completed, these wells will be added to the groundwater quality representative monitoring network. Based on the groundwater quality results at SPRECK-MW-32, undesirable results have not occurred, and conditions are not significant and unreasonable.

Inelastic Land Subsidence

Significant and unreasonable damage to conveyance capacity from inelastic land subsidence is structural damage that creates an unmitigated and unmanageable reduction of design capacity or freeboard. Significant and unreasonable impacts to natural resource areas from inelastic land subsidence are unmitigated decreases in the ability to flood or drain such areas by gravity. Significant and unreasonable threats to public health and safety from inelastic land subsidence are those that cause an unmitigated reduction of freeboard that allows for flooding or unmitigated damage to roads and bridges.

The minimum threshold is set as no more than two feet of land subsidence at the representative monitoring site location. The measurable objective is to minimize inelastic land subsidence and to have no additional subsidence after 2040. The 5-year interim milestone allows no more than 1 foot of additional inelastic land subsidence.

Land Subsidence within Fresno County is measured at an Upper Aquifer extensometer (FORDEL) located just outside the GSA boundaries within the City of Mendota and a UNAVCO Station P304 located within the GSA boundaries. In the Upper Aquifer, there has been no additional compaction since 2020. Total land subsidence based on UNAVCO Station P304 has been 0.35 feet of subsidence since 2020.

At the rate of subsidence observed at UNAVCO Station P304 (>0.1 feet/year), total subsidence at this location will exceed the 2-foot threshold for the Subbasin. Fresno County does not pump from the Lower Aquifer and does not contribute to Lower Aquifer compaction.

Depletion of Interconnected Surface Waters

Significant and unreasonable impacts on natural resources or downstream beneficial uses and users of groundwater are a reduction in available surface water supplies for natural resource areas and a reduction in downstream water availability as a result of increased stream flow depletions along the San Joaquin River.

Depletion of interconnected surface waters was identified as a data gap in the Subbasin. The Subbasin has developed a monitoring plan and is in the process of constructing new monitoring wells dedicated to the depletion of interconnected surface waters sustainability indicator. The groundwater level sustainable management criteria are currently being used as a proxy until the data gaps are filled. The 5-year interim milestone is to fill the data gaps and have a monitoring network dedicated to interconnected surface water.

6.4 Grassland GSP Region Progress

The Grassland GSP Region (Grassland or GSP Region) submitted the Grassland GSP in January 2020, starting the GSP Region's SGMA implementation period. In its first four years of implementation, the GSP Region increased and refined monitoring efforts, developed improvements to the GSP Region's water budget, continued stakeholder outreach, contributed to the bimonthly Delta-Mendota Subbasin Coordination Committee and Technical Working Group meetings, and participated as a sub-applicant in the Delta-Mendota Subbasin's SGM Program SGMA Implementation – Round 1 grant application. The GSP Region is a participant in the following grant-funded projects: Los Banos Creek Recharge and Recovery, Los Banos Creek Detention Reservoir Regulation and Storage, Flood Water Capture to temporarily store up to 2,000 acre-feet (AF) of storm water, planning of the Subbasin's interconnected surface water monitoring network, and GSP revisions.

In WY2023, the implementation of Grassland's projects identified in the GSP resulted in approximately 10,700 AF of surface water for wetland use. This is made up of about 7,000 AF of recycled water from the North Valley Regional Recycled Water Program, 2,300 AF of reused water from the North Grasslands Water Conservation and Water Quality Control Project, and 1,400 AF of Los Banos Creek diversions. Grassland delivered a total of approximately 275,000 AF of surface water to supply managed wetlands.

In July 2022, the Grassland GSP was revised and resubmitted to address items of concern raised by DWR in its initial "Incomplete" Determination Letter of the 2020 Delta-Mendota Subbasin GSPs dated January 21, 2022. After submittal of the Revised 2020 GSPs, the Delta-Mendota Subbasin GSPs were deemed "Inadequate" under SGMA by DWR on March 2, 2023. The Grassland GSP Region and the multiple GSAs within Delta-Mendota Subbasin are continuing to make progress towards an approved GSP. This progress in SGMA implementation supports the achievement of the Delta-Mendota Subbasin's sustainability goal. The sustainable management criteria outlined in this Progress Towards Implementation section reflects the coordinated effort at the Subbasin level through the Coordination Committee and Technical Subcommittee.

Monitoring Implementation

As a function of local groundwater management and a requirement of the GSP implementation, the Grassland GSP Region's member agencies have continued monitoring for the applicable sustainability indicators in the region: chronic lowering of groundwater levels, reduction of groundwater storage, depletions of interconnected surface waters, degraded water quality, and land subsidence.

Representative Monitoring Network and Sustainable Management Criteria Analysis

There are four representative monitoring networks to support the sustainable management criteria assessments: Upper Aquifer groundwater levels monitoring network, Lower Aquifer groundwater levels monitoring network, groundwater quality monitoring network, and subsidence monitoring network.

Upper Aquifer Groundwater Levels Representative Monitoring Network

Upper Aquifer groundwater surface elevation monitoring across the Grassland GSP Region serves to study the annual and cumulative trends in changes to Upper Aquifer groundwater levels, Upper Aquifer groundwater storage, and gradient impacts to interconnected surface water, as described in Chapter 4 of the 2022 Revised Grassland GSP. The results are identified in **Appendix A** and **Table 9** below. Annual groundwater level (ft amsl) seasonal low measurements (September-October) are compared to the minimum threshold (MTs) to determine if an undesirable result is occurring. The current MTs for the Upper Aquifer and Lower Aquifer monitoring networks are a fixed elevation based on the historical seasonal low prior to the end of WY2016. As documented in the revised Common Chapter, undesirable results associated with groundwater levels occur when 50% of the groundwater level monitoring sites by principal aquifer exceed the MT. In WY2023, less than 50% of the Upper Aquifer monitoring sites had an MT exceedance; therefore, there were no undesirable results for the chronic lowering of groundwater level sustainability indicator during WY2023.

Note that many of the representative monitoring sites for groundwater levels are peripheral to the GSP boundary and are subject to surrounding agricultural pumping effects. In many cases, seasonal water level data could not be collected because the well pumps were running, or the data was skewed due to very recent pump shut-offs. During the current reporting period, however, many wells were added to the representative monitoring network that will provide better data on groundwater levels in the GSP Region. These wells do not yet have established sustainable management criteria. The Subbasin is making progress towards a methodology to establish meaningful sustainable management criteria that will be reflected in future GSP updates. The Upper Aquifer representative monitoring network consists of nine wells. Of these wells, four are production wells and five are monitoring wells. Well 3PU-2 (DMS ID No. 11-019) was originally characterized as an Upper Aquifer production well in the representative monitoring network. However, after reviewing the Well Completion Report that became available, it was then identified as a Lower Aquifer well. As a result, 3PU-2 was changed to 3PL-2 to remain consistent with the GSP Region's naming convention.

Following the 2022 GSP revision process, the representative monitoring network kept the changes documented in the WY2022 Delta-Mendota Subbasin Annual Report. In 2023, further revisions were made to the representative monitoring network and are discussed later in the

Changes to the Representative Monitoring Network section of this Progress Towards Implementation section. **Table 13** reflects the current representative sites and respective sustainable management criteria.

Lower Aquifer Groundwater Levels Representative Monitoring Network

The Lower Aquifer groundwater levels representative monitoring is useful to understand the Lower Aquifer groundwater levels, Lower Aquifer groundwater storage, and impacts related to subsidence. The Grassland GSP Region identified the Lower Aquifer as a data gap, considering the lack of Lower Aquifer wells to use for monitoring. This is due to the historic minimal groundwater extractions in the Lower Aquifer within the GSP Region. Similar to the Upper Aquifer monitoring network, in some cases data could not be collected or is compromised due to nearby active well pumping. It is currently not financially feasible to install additional Lower Aquifer groundwater monitoring sites; however, the Grassland GSP Region has initiated regular monitoring of several Lower Aquifer wells within the GSP Region that are intended to have sustainable management criteria assigned once enough data has been collected. The Grassland GSP Region is continuing to explore financial assistance opportunities to support closing the data gap in the Lower Aquifer. The Lower Aquifer representative monitoring network consists of eight wells. Of these, six are production wells and two are monitoring wells.

Lower Aquifer groundwater level monitoring results are reported in **Table 13**. Sustainable management criteria for four of the eight Lower Aquifer wells have not been established due to either having less than five years of data following WY2016 or a lack of seasonal low data to establish a meaningful trend. Of the wells with MTs, less than 50% of the Lower Aquifer monitoring sites had an MT exceedance during the WY2023 seasonal high period. Only two sites had seasonal low data and both measurements exceeded the MT, there was not sufficient data to determine if undesirable results occurred.

Table 13. Grassland GSP Region – Groundwater Levels Representative Monitoring Results

Local Well ID	DMS ID	Principal Aquifer	WY2023 Seasonal Low, October to September (ft MSL, NAVD88)	WY2023 Seasonal High, February to April (ft MSL, NAVD88)	Minimum Threshold (ft MSL, NAVD88)
1PU-1	11-013	Upper	NM[1]	81.60	76.8
1PU-2	11-023	Upper	93.20	92.70	95.67
1PU-3	19-010	Upper	19.15	44.90	18.81
2PU-1	19-002	Upper	41.50	59.90	28.72
2MU-1	19-005	Upper	50.14	NM[2]	48.90
2MU-4	19-008	Upper	51.53	NM[2]	51.52
2MU-5	19-009	Upper	52.40	NM[2]	53.14
1PL-6	11-020	Lower	-19.02[4]	58.65	8.71
1PL-7	11-024	Lower	6.82[4]	24.94	10.82
1ML-5[5]	11-005	Lower	NM[1]	11.90	6.90
1ML-6[5]	11-006	Lower	NM[1]	4.50	7.60
1PL-5	11-021	Lower	NM[3]	33.60	Meaningful thresholds have not been established due to the lack of historical data. Thresholds will be established in future GSP updates.
1PL-1	11-010	Lower	NM[3]	24.00	Meaningful thresholds have not been established due to the lack of historical data. Thresholds will be established in future GSP updates.
1PL-4	11-022	Lower	NM[3]	15.50	Meaningful thresholds have not been established due to the lack of historical data. Thresholds will be established in future GSP updates.
3PL-2	11-019	Lower	NM[1]	11.60	Meaningful thresholds have not been established due to the lack of historical data. Thresholds will be established in future GSP updates.

[1] Seasonal low data not available for Water Year 2023 due to pumps running.

[2] New well added to the water level representative monitoring network. No seasonal high data available for Water Year 2023.

[3] New well added to the water level representative monitoring network. No seasonal low data available for Water Year 2023.

[4] Measurement collected 10 minutes after pump was turned off.

[5] MT established using seasonal low from the first five years of monitoring following WY2016, as discussed in the Revised Common Chapter.

Groundwater Quality Representative Monitoring Network

Upper Aquifer and Lower Aquifer groundwater quality monitoring results are reported in **Table 14**. The groundwater quality representative monitoring network consists of six wells, including three wells in the Upper Aquifer and three wells in the Lower Aquifer. All six are production wells. The sustainable management criteria currently reflect TDS drinking water standards per Subbasin coordination, but it is worth noting that drinking water users are not present in the Grassland GSP Region. Additional constituents and criteria are being identified for regular monitoring by the Subbasin and will be reflected in the WY2024 Annual Report if necessary. Following the 2023 sampling event, more than 50% of the wells are above the minimum threshold. 1PL-1 (DMS ID No. 11-010) and 3PU-1 (DMS ID No. 11-018) have historically had higher concentrations of dissolved solids, and these concentrations existed prior to 2015; higher salt content is expected at these sites due to local geology. Since 1PL-1 and 3PU-1 are above the MT as of the current report period, the GSP Region will continue to monitor and track the water quality in these sites. **Table 14** reflects the current network. It should be noted that wells M3 and LT, as reported in the WY2022 Annual Report, were changed to 2PU-4 (DMS ID No. 19-004) and 1PL-5 (DMS ID No. 11-021) to remain consistent with the GSP Region's naming convention. In 2023, further revisions were made to the representative monitoring network and are discussed later in the *Changes to the Representative Monitoring Network* section of this Progress Towards Implementation section.

Table 14. Grassland GSP Region – Groundwater Quality Representative Monitoring Results

Local Well ID	DMS ID	Principal Aquifer	2023 Representative Monitoring Result (TDS, mg/L)	Measurable Objective (TDS, mg/L)	Minimum Threshold (TDS, mg/L)
2PU-1	19-002	Upper	630	<1,000	1,000
2PU-4	19-004	Upper	2,000	< 1,000	1,000
3PU-1	11-018	Upper	2,000	< 1,000	1,000
1PL-5	11-021	Lower	1,600	< 1,000	1,000
1PL-2	11-011	Lower	590	< 1,000	1,000
1PL-1	11-010	Lower	1,200	< 1,000	1,000

Subsidence Representative Monitoring Network

The United States Bureau of Reclamation (USBR) San Joaquin River Restoration Program's (SJRRP) subsidence monitoring data is used for subsidence monitoring in the GSP Region. The Grassland GSP Region selected three USBR SJRRP subsidence monitoring sites within or directly bordered with the Grassland GSP Region to serve in the representative monitoring network.

December 2018 through December 2022 (WY2019 through WY2023) land surface elevations at the three representative monitoring network sites are depicted in **Table 15**. However, unlike the groundwater level, groundwater quality, and change in storage sustainable management criteria, which are results-based, the subsidence sustainable management criteria are based on cumulative inelastic subsidence caused by groundwater extraction during the implementation period (2020-2040). As of the current reporting period, **Table 16** shows the Grassland GSP Region is on track to meet the 5-year interim milestone of no more than 1 foot of additional subsidence. The extended period average subsidence rates in the Grassland GSP Region are also provided as reference to historic trends. It is important to note that SJRRP's monitoring network has a vertical accuracy of +/- 3 centimeters (0.1 feet).

The Grassland GSP Region supports efforts to expand the USBR SJRRP's subsidence monitoring activities and enhance scientific understanding of subsidence trends in the Subbasin. It is worth noting that while December is theoretically outside the elastic subsidence window and most of the Subbasin is no longer pumping, pumping within Grassland GSP Region may occur during dry winters.

Table 15. Grassland GSP Region – Subsidence Representative Monitoring Results

Monitoring Point	December 2018 (WY2019), Land Surface Elevation (ft MSL, NAVD88)	December 2019 (WY2020), Land Surface Elevation (ft MSL, NAVD88)	December 2020 (WY2021), Land Surface Elevation (ft MSL, NAVD88)	December 2021 (WY2022), Land Surface Elevation (ft MSL, NAVD88)	December 2022 (WY2023), Land Surface Elevation (ft MSL, NAVD88)
108	*78.6*	*78.6*	*78.4*	*78.3*	*78.2*
152	*83.9*	*84.0*	*83.8*	*83.7*	*83.6*
137	*100.3*	*100.2*	*100.1*	*99.9*	*99.7*

Source: San Joaquin River Restoration Program Subsidence Monitoring
https://www.restoresjr.net/science/subsidence-monitoring/

Table 16. Grassland GSP Region – Subsidence Sustainable Management Criteria Monitoring

Monitoring Point	December 2019 (WY2020), Land Surface Elevation (ft MSL, NAVD88)	December 2020 (WY2021), Land Surface Elevation (ft MSL, NAVD88)	December 2021 (WY2022), Land Surface Elevation (ft MSL, NAVD88)	December 2021 (WY2022), Land Surface Elevation (ft MSL, NAVD88)	Cumulative Inelastic Subsidence During Implementation (Dec 2019 – Dec -2022) (ft)	Subsidence Rate During Implementation (Dec 2019 -2022) (ft/yr)	Historic Subsidence Rate (Dec 2011 - 2019) (ft/yr)	2025 Interim Milestone	2030 Interim Milestone	2035 Interim Milestone	Measurable Objective	Minimum Threshold
108	78.63	78.40	78.28	78.23	-0.40	-0.10	-0.06	No more that 1-ft additional subsidence	No more that 0.5-ft additional subsidence	No more that 0.25-ft additional subsidence	No additional subsidence	Inelastic subsidence of no more than 2 feet
152	84.03	83.80	83.67	83.61	-0.42	-0.11	-0.08	No more that 1-ft additional subsidence	No more that 0.5-ft additional subsidence	No more that 0.25-ft additional subsidence	No additional subsidence	Inelastic subsidence of no more than 2 feet
137	100.20	100.08	99.87	99.73	-0.47	-0.12	-0.11	No more that 1-ft additional subsidence	No more that 0.5-ft additional subsidence	No more that 0.25-ft additional subsidence	No additional subsidence	Inelastic subsidence of no more than 2 feet

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The subsidence rate during SGMA implementation of **Table 16** were generated using USBR subsidence monitoring data, beginning with December 2019 results, to capture the GSP implementation horizon (2020-2040). This historic rate of subsidence utilized USBR results beginning December 2011, as that was the initial survey year. Each year, the influence of the annual change at each site influences the long-term trend, generating the rate for comparison to the sustainable management criteria. The annual results that were averaged to generate the extended-period averages for the past four reporting periods are presented below in **Table 17**. Considering the accuracy/precision of the subsidence measurements are +/- 0.1 feet, no discernable trend can be projected from the data. Over the period of record shown below, Grassland Water District indicates that there has been no noticeable loss in canal conveyance capacity in the service area or GSP Region. Even when reviewing the data at face value, the rates of subsidence are less than the current interim goals, and could be considered approaching zero, which is the 2040 goal.

Table 17. Grassland GSP Region - Extended Period Average Subsidence

First Year	Second Year	108, Annual Subsidence (ft/year)	152 Annual Subsidence (ft/year)	137 Annual Subsidence (ft/year)
Dec-11	Dec-12	-	-0.06	-0.10
Dec-12	Dec-13	-	-0.23	-0.28
Dec-13	Dec-14	0.01	0.21	0.04
Dec-14	Dec-15	-0.21	-0.48	-0.16
Dec-15	Dec-16	-0.09	-0.07	-0.13
Dec-16	Dec-17	0.00	0.00	-0.05
Dec-17	Dec-18	-0.10	-0.10	-0.12
Dec-18	Dec-19	0.01	0.02	-0.08
Dec-19	Dec-20	-0.15	-0.17	-0.10
Dec-20	Dec-21	-0.12	-0.13	-0.21
Dec-21	Dec-22	-0.04	-0.06	-0.13
Extended Period Average	**Dec 2011 - Dec 2018**	**-0.08**	**-0.10**	**-0.11**
Extended Period Average	**Dec 2011 - Dec 2019**	**-0.06**	**-0.08**	**-0.11**
Extended Period Average	**Dec 2011 - Dec 2020**	**-0.08**	**-0.10**	**-0.11**
Extended Period Average	**Dec 2011 - Dec 2021**	**-0.08**	**-0.10**	**-0.12**
Extended Period Average	**Dec 2011 - Dec 2022**	**-0.08**	**-0.10**	**-0.12**

Changes to the Representative Monitoring Network

As part of the second GSP revision process, changes to Grassland GSP Region's representative monitoring network for groundwater quality and groundwater levels have been made. 1PL-3 (DMS ID No. 11-012) was removed from the groundwater quality network due to the wellhead being inoperable. This removal does not leave a gap in the network, as 1PL-1 (DMS ID No. 11-010) is screened in the same zone. Changes to the water level network are documented in **Table 18**. These modifications to the representative monitoring network remain current and are depicted in **Figure 13** and **Figure 14**. The GSP Region may entertain installing new monitoring wells near destroyed sites to use the historical data as a reference for long-term trends.

Table 18. Grassland GSP Region - Explanation of Changing the Water Level Representative Monitoring Network

Local Well ID	DMS ID	Principal Aquifer	Reason for Removal
2PU-3	19-003	Upper	Removed in 2023 as water level readings were found to be unrepresentative of upper aquifer conditions in this area of the GSA. Measurement was influenced by adjacent pumping when the depth to water measurements took place.
1MU-1	11-007	Upper	Removed in 2023 as water level readings were found to be unrepresentative of upper aquifer conditions in this area of the GSA. Measurement was influenced by adjacent pumping when the depth to water measurements took place.
1MU-2	11-008	Upper	Removed in 2023 as water level readings were found to be unrepresentative of upper aquifer conditions in this area of the GSA. Measurement was influenced by adjacent pumping when the depth to water measurements took place.
1MU-3	11-009	Upper	Removed in 2023 as water level readings were found to be unrepresentative of upper aquifer conditions in this area of the GSA. Measurement was influenced by adjacent pumping when the depth to water measurements took place.
11S12E30H002M	11-017	Upper	Destroyed
1ML-1	11-001	Lower	Removed nested lower aquifer wells due to variable potentiometric surfaces at different well depths/screened intervals. Water levels will continue to be collected from the well head (1PL-1)

Local Well ID	DMS ID	Principal Aquifer	Reason for Removal
1ML-2	11-002	Lower	Removed nested lower aquifer wells due to variable potentiometric surfaces at different well depths/screened intervals. Water levels will continue to be collected from the well head (1PL-1)
1ML-3	11-003	Lower	Removed nested lower aquifer wells due to variable potentiometric surfaces at different well depths/screened intervals. Water levels will continue to be collected from the well head (1PL-1)
1ML-4	11-004	Lower	Removed nested lower aquifer wells due to variable potentiometric surfaces at different well depths/screened intervals. Water levels will continue to be collected from the well head (1PL-1)

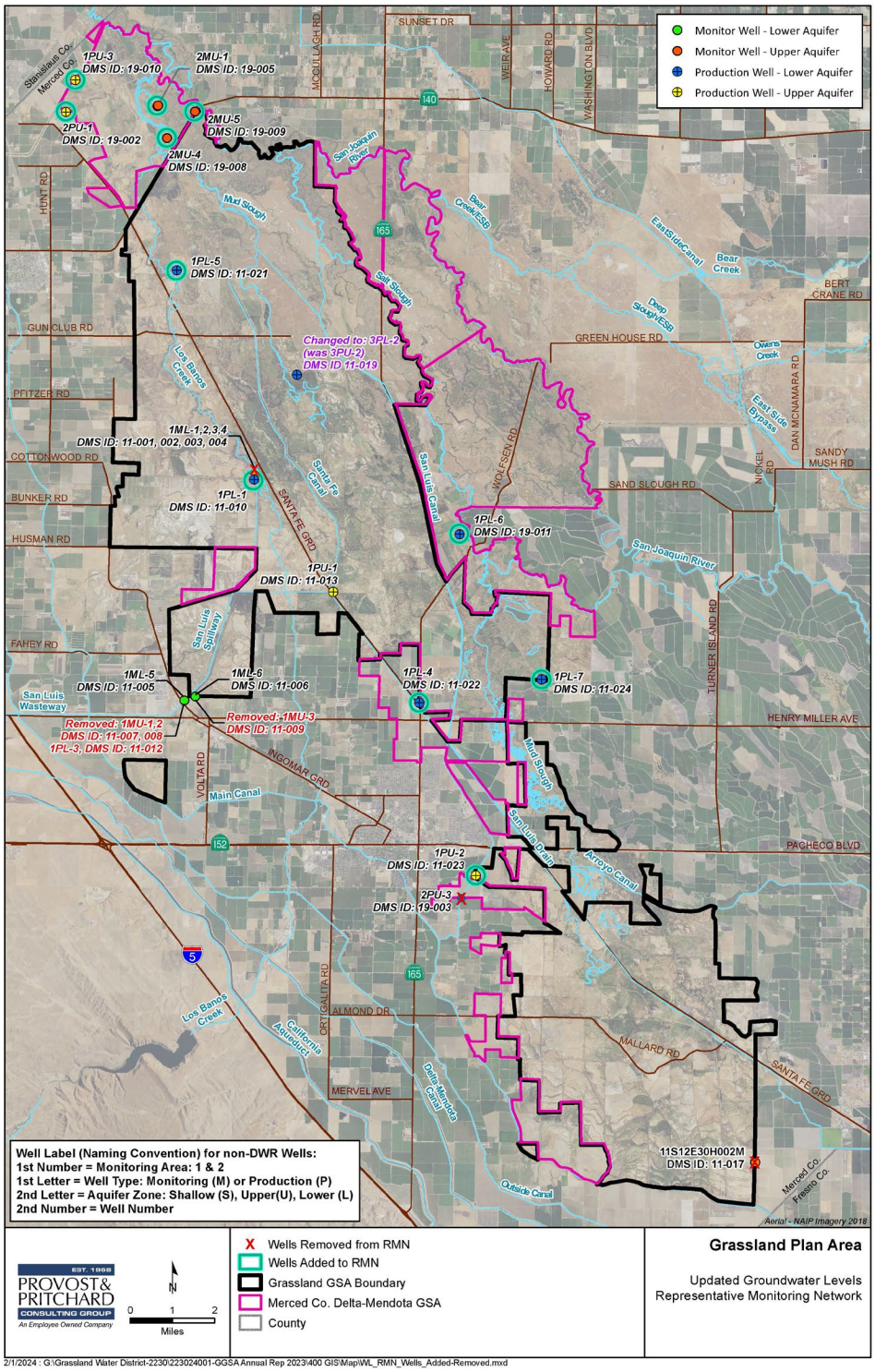

Figure 13. Grassland GSP Region - Changes to the Representative Groundwater Level Monitoring Network as of February 2024

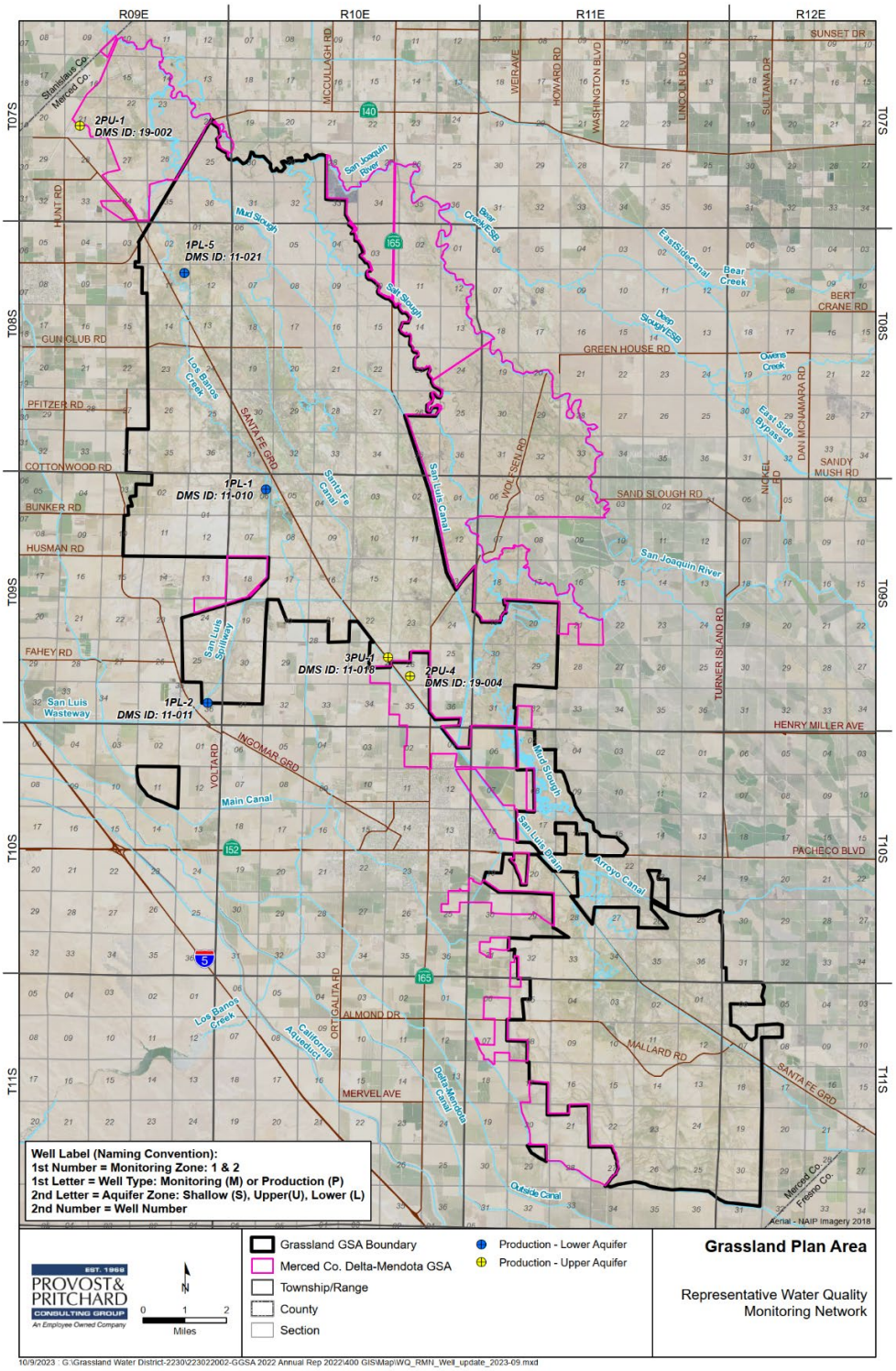

Figure 14. Grassland GSP Region - Changes to the Representative Groundwater Quality Monitoring Network as of February 2024

Subsidence Analysis for Lower Aquifer Change in Storage

In addition to the subsidence data review for sustainable management criteria purposes, the Grassland GSP Region performs a subsidence analysis to evaluate the annual Lower Aquifer change in storage within the Grassland GSP Region. However, the GSP Region may entertain using the Subbasin-wide model to estimate Lower Aquifer change in storage in the future. The current exercise uses USBR's SJRRP subsidence monitoring results, recognized as the best available data in the region despite the incomplete coverage in the central Grassland GSP Region and entire Delta-Mendota Subbasin. To refine the incomplete coverage, consultant hydrogeologist Kenneth D. Schmidt & Associates (KDSA) developed land surface elevation contours supported by KDSA's decades of professional experience studying groundwater conditions and subsidence in the region as well as the available USBR SJRRP monitoring results from December 2021 (Water Year 2022) vs. December 2022 (Water Year 2023). Those contours are presented in **Figure 15**, with USBR's raster map depicting their interpretation of subsidence in the region underlay. These data have a vertical accuracy of +/- 3 centimeters (0.1 feet), which could equate to a range of up to approximately +/- 10,000 AF in Lower Aquifer storage change across the GSP Region.

During the WY2023 analysis, the USBR monitoring stations indicated approximately a -0.1 foot change in ground surface elevation, which is comparable to the historic rate of subsidence in the GSP Region. Considering that the subsidence data has a vertical accuracy of +/- 0.1 feet, and this -0.1 foot average change across the GSP Region is within the margin of equipment error, a land surface change of net zero across the GSP Region is also indicated (i.e., zero AF change in storage in the Lower Aquifer). In previous reporting periods, there has been a quality control concern with the USBR SJRRP data, specifically in the northern GSP Region that resulted in the illusion of a steeper land surface elevation decline. The Grassland GSP Region aims to improve representative subsidence monitoring stations in the GSP Region and will continue to review USBR results for quality control concerns.

The Grassland GSP Region encourages opportunities to improve the understanding of subsidence and have supported a Subbasin-wide subsidence evaluation underway for the Delta-Mendota Subbasin and detailed in the *Projects and Management Actions* section of this Progress Towards Implementation section. It is not financially feasible for the Grassland GSP Region or its member agencies to implement a private subsidence monitoring program, nor can the member agencies mitigate subsidence, based on their sustainable water management being mostly limited to the Upper Aquifer and surface water deliveries.

There are few Lower Aquifer groundwater extractions within the Grassland GSP Region and the neighboring San Joaquin Exchange Contractors GSP Region; therefore, the subsidence results and resultant Lower Aquifer change in storage are correlated with Lower Aquifer pumping from

the adjacent subbasin. This external influence can be seen in **Figure 15**, as the neighboring subbasin's subsidence hotspot extends its influence into the Delta-Mendota Subbasin.

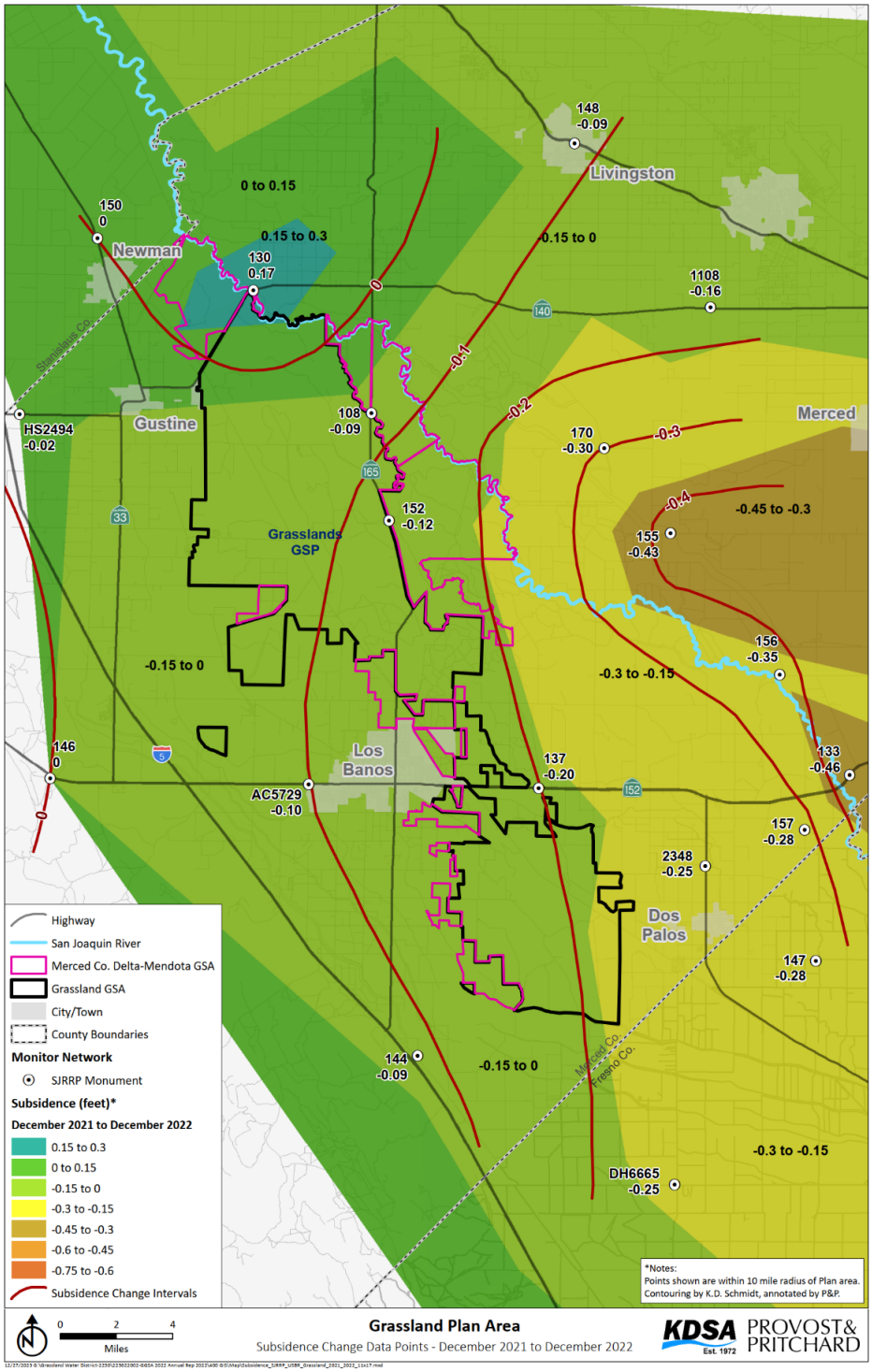

Figure 15. Grassland GSP Region - Annual Subsidence December 2021 to December 2022 (USBR SJRRP data, refined by KDSA)

Water Budget Refinement

The Grassland GSP Region has coordinated with Audubon California and its consultant team, which are working to develop water budgets for target wetlands in the Central Valley, with the intention of filling in GSP data gaps, where possible. Grassland GSP Region staff and their consultant team met video-telephonically four times and are continuing coordination with Audubon California and their team on refining the best methodology for water budgets through information and method sharing. In 2023, the Grassland GSP Region revisited prior estimates of groundwater extraction for agricultural use. After revisiting the previous assumptions, the water budget estimates were recalculated using the following revised assumptions. The new groundwater extraction estimates using these revised assumptions are summarized in **Table 19**.

1. Adjusted data from the USBR water year to the DWR water year by importing precipitation data and reorganizing metered surface water data for the respective months. This resulted in an increase in groundwater extraction of 400 to 6,600 AF for Grassland GSA and a 16% reduction in groundwater extraction for County of Merced GSA – Delta Mendota (MCDMGSA) (Non-Central Valley Project [CVP]).
2. Estimated the effective precipitation for agricultural and wetland use then subtracted those estimates from agricultural and wetland consumptive use. This resulted in a 300 to 700 AF reduction in groundwater extraction for Grassland GSA and a 23% reduction in groundwater extraction for MCDMGSA (Non-CVP).
    a. Agricultural effective precipitation is assumed as 50% of the precipitation and only impacts the extraction when calculating the applied water by consumptive use. The metered pumping reflects precipitation by assuming less physical pumping.
    b. Wetland effective precipitation is considered to be precipitation that has the potential to satisfy monthly evapotranspiration requirements, as stated in the GSP.
3. Rain-fed acreage was reduced by reevaluating the category criteria. Land removed from the groundwater extraction estimates include idle land, uplands, and moist soil vegetation. This resulted in a 61% reduction in groundwater extraction for MCDMGSA (Non-CVP).
4. In the prior estimate, GIS-calculated cropping acreages decreased between a normal/dry year to a critical year, resulting in a higher groundwater demand in a normal/dry year than a critical year. As this is not what is expected between those water year types, the same cropping acreages were used for both the normal/dry years and critically dry years. This resulted in an increase of 1,500 AF of groundwater extraction for the MCDMGSA (Non-CVP) during critical years.

5. Separated the private wetland and agricultural groundwater extraction estimates within the MCDMGSA (Non-CVP). This resulted in no net change to overall groundwater extraction estimates.
6. Use of the annual total groundwater pumping values for the State and Federal refuge areas within the MCDMGSA remains unchanged, as provided by the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service via email to the Grassland GSA.

Table 19. Grassland GSP Region - Revised Groundwater Extraction Values Based on Revisited Assumptions

DWR Schedule Water Year Type	Agricultural (AF), Grassland GSA	Agricultural (AF), MCDMGSA (CVP)	Agricultural (AF), MCDMGSA (Non-CVP)	Agricultural (AF), Subtotal	Wetland (AF), Grassland GSA	Wetland (AF), MCDMGSA (CVP)	Wetland (AF), MCDMGSA (Non-CVP)	Wetland (AF), Subtotal	Total (AF)
Dry (WY13)	3,600	0	9,400	13,000	18,500	1,400	13,600	33,500	46,500
Critical (WY15)	3,800	0	9,400	13,200	15,300	7,600	13,900	36,800	50,000
Wet (WY17)	1,700	0	9,300	11,000	7,000	1,100	10,300	18,400	29,400

Projects and Management Actions

Although the Grassland GSP Region is recognized as being historically and projectably sustainable, the greater Delta-Mendota Subbasin is classified as a critically overdrafted basin. To support the Delta-Mendota Subbasin's sustainability goals and to improve the understanding of groundwater conditions within the GSP Region, the Grassland GSP Region has and continues to identify potential projects and management actions in alignment with those objectives. Descriptions of potential projects that have gained traction since the last Annual Report are included below. In WY2023, the implementation of Grassland's projects resulted in approximately 10,700 AF of additional surface water for wetland use. This is made up of about 9,300 AF of recycled/reused surface water and 1,400 AF of Los Banos Creek diversions. In WY2023, the GSP Region extracted approximately 21,000 AF of groundwater to supply managed wetlands, as compared to approximately 34,000 AF of groundwater extracted for managed wetlands in WY2022. This reduction in groundwater extraction of 13,000 AF is a result of the additional surface water made available through project implementation.

In Progress: Flood Water Capture Project

The Grassland GSP Region participated as a sub-applicant in the Delta-Mendota Subbasin's SGM Program SGMA Implementation – Round 1 grant application with the "Flood Water Capture Project".

The GSP Region wishes to improve water conveyance facilities and water control structures to allow for the temporary storage of flood water and other surface water supplies to facilitate optimal wetland habitat management in the spring and summer months. Following environmental permitting, the Project is anticipated to be under construction in late summer 2024, and operational by spring 2025.

The Project will provide significant water supply and habitat benefits, as well as assist in demand reduction. The temporary holding ponds could provide up to approximately 500 AF of surface water storage and can be cycled monthly. This will allow for the irrigation of up to 1,000 acres per year of managed wetlands within the Grassland Water District and Grassland Resource Conservation District (GRCD), which will significantly increase the biological value of that habitat. If the ponds are cycled once per month, the Grassland GSA would be able to add approximately 6,000 AF per year to its surface water supply. Based on a preliminary evaluation performed by KDSA, groundwater recharge associated with approximately 140 acres of temporary holding ponds is estimated to be approximately 0.01 foot per day. If the ponds are kept full throughout the year, the ponds could recharge approximately 500 AFY. In addition, the property where the Project is located was previously 160 acres of irrigated alfalfa using approximately 800 AFY of groundwater (160 acres * 5 AF/acre). Therefore, the Subbasin receives an additional benefit of 800 AF per year due to demand reduction. The project will improve groundwater conditions within the Grassland GSP Region and City of Los Banos GSA plan areas. When filled, the temporary ponds will also provide habitat values for migratory birds and other wildlife on site.

In Progress: Los Banos Creek Regulation and Storage Project

A group of local agencies, including Grassland GSP Region's member agency Grassland Water District, San Luis Water District (SLWD), and the San Joaquin River Exchange Contractors Water Authority (SJRECWA) have initiated a project to regulate available water supplies by conveying water from SLWD Turnout 9-1 on its Lateral 9 into the Los Banos Creek Detention Reservoir (LBCDR or reservoir), located about five miles southwest of Los Banos in Merced County. A proof of concept for the project was developed in 2020 and completed in January 2021, in which the reservoir was used to regulate participant fall water supplies for release during the winter to supplement storm water releases from LBCDR. Facilities are under design and the project footprint is being evaluated for environmental and cultural clearances, with construction anticipated in 2024.

LBCDR and its dam facilities are federally owned by USBR and State operated by DWR as part of the San Luis Unit of the CVP and State Water Project to provide flood control protection to the San Luis Canal/California Aqueduct and City of Los Banos. The California Department of Parks and Recreation operates the public recreational facilities at LBCDR.

The project consists of five components: altering LBCDR operations to allow for 8,000 AF of project participant groundwater storage and beneficial release; utilizing/modifying SLWD California Aqueduct Pump Station 8 and SLWD Lateral 9 Pump Station to pump 30-36 cubic feet per second (cfs) into the LBCDR; a 36-inch discharge pipeline from Lateral 9 to the reservoir; a 450 cfs box culvert crossing of the Los Banos Creek at Canyon Road (just downstream of the LBCDR or outlet); and extending the existing LBCDR boat ramp. An instantaneous release flow of 250 cfs will be available during peak summer or fall months typically for 16 days and split between the project participants. The proposed project facilities are estimated to cost $3.0 million plus engineering, permitting, cultural, and environmental costs of $600,000 for a total of $3.6 million. Funding is pending for the GSP Region, Central California Irrigation District (CCID), and SLWD for this project. The estimated yield is 8,500 AF of spring releases of Los Banos Creek stored water in wet years and 8,000 AF of summer/fall participants' stored water. This is a shared project between the SJRECWA, SLWD, and Grassland Water District. Grassland GSA will receive approximately 2,700 AF of the total project benefit (1/3 share). This will allow for the irrigation of up to 5,400 acres of wetland habitat.

The Project yield would provide numerous benefits including:

- Improved water supply management and reliability
- Development of additional Incremental Level 4 refuge water supply
- Increased flood control protection to downstream facilities
- Increased access to LBCDR recreational facilities during most flood release scenarios
- Increased recreational opportunities at LBCDR, along Los Banos Creek and in the GSP Region
- Enhanced environmental conditions at LBCDR, along Los Banos Creek and in the GSP Region
- Improved rural/disadvantaged community water supply and water quality
- Improved dry year water supplies
- Improved groundwater recharge

Public Meetings Summary

Table 16 provides a summary of the Grassland GSA's public meetings and stakeholder outreach efforts conducted from January 2020 to the beginning of WY2024. The Grassland GSA recognizes that involving the public and stakeholder outreach is an important part of SGMA implementation.

Table 20. Grassland GSP Region - Summary of Public Meetings and Stakeholder Outreach Conducted from January 2020 to October 2023

DELTA-MENDOTA GROUNDWATER SUBBASIN
PUBLIC MEETINGS
SUMMARY FORM
GSA Name: Grassland Groundwater Sustainability Agency
Public Meetings Summary: Please fill out the following table containing records of Public Meetings and Stakeholder Outreach conducted from January 2020 to Present.

Meeting Type	Meeting Name	Date	Description
Direct Outreach	Delta-Mendota SGMA Newsletter	January 1, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	January 13, 2020	
Board Meeting	Grassland Water District	January 14, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	January 21, 2020	
Direct Outreach	Delta-Mendota SGMA Newsletter	February 1, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	February 10, 2020	
Board Meeting	Grassland Water District	February 18, 2020	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	March 10, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 16, 2020	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	March 17, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 30, 2020	
Direct Outreach	Delta-Mendota SGMA Newsletter	April 1, 2020	Spring 2020
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	April 13, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	May 11, 2020	
Board Meeting	Grassland Water District	May 13, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	June 2, 2020	Delta-Mendota Subbasin Data Management Demonstration
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	June 8, 2020	
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	June 9, 2020	General Manager Reports on GGSA GSP Progress
Direct Outreach	Delta-Mendota SGMA Newsletter	July 1, 2020	Summer 2020
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	July 13, 2020	
Board Meeting	Grassland Water District	July 14, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	August 5, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	August 10, 2020	
Board Meeting	Grassland Water District	August 11, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	September 14, 2020	
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	September 15, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	October 6, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	October 12, 2020	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	November 4, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	November 9, 2020	
Board Meeting	Grassland Water District	November 10, 2020	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	December 2, 2020	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	December 14, 2020	
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	December 15, 2020	General Manager Reports on GGSA GSP Progress
Direct Outreach	Delta-Mendota SGMA Newsletter	January 1, 2021	First Quarter
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	January 11, 2021	

DELTA-MENDOTA GROUNDWATER SUBBASIN
PUBLIC MEETINGS
SUMMARY FORM
GSA Name: Grassland Groundwater Sustainability Agency
Public Meetings Summary: Please fill out the following table containing records of Public Meetings and Stakeholder Outreach conducted from January 2020 to Present.

Meeting Type	Meeting Name	Date	Description
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	January 26, 2021	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	February 8, 2021	
Board Meeting	Grassland Water District	February 9, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	March 9, 2021	General Manager Reports on GGSA GSP Progress
Direct Outreach	Delta-Mendota SGMA Newsletter	April 1, 2021	Second Quarter
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	April 13, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	May 11, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	June 8, 2021	General Manager Reports on GGSA GSP Progress
Direct Outreach	Delta-Mendota SGMA Newsletter	July 1, 2021	Third Quarter
Board Meeting	Grassland Water District	July 13, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	September 14, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	October 12, 2021	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	November 9, 2021	General Manager Reports on GGSA GSP Progress
Direct Outreach	Delta-Mendota SGMA Newsletter	December 1, 2021	Fourth Quarter
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	December 14, 2021	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	January 18, 2022	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	January 28, 2022	
Board Meeting	Grassland Water District	February 8, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	February 8, 2022	
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	March 8, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 8, 2022	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 11, 2022	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 28, 2022	
Board Meeting	Grassland Water District	April 12, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	April 12, 2022	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	May 10, 2022	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	May 18, 2022	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	June 1, 2022	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	June 8, 2022	
Board Meeting	Grassland Water District	June 14, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	June 15, 2022	
Direct Outreach	Grassland Groundwater Sustainablility Agency	July 8, 2022	Notice of Public Hearing and Adoption
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	July 12, 2022	The Board of Directors of the Grassland Water District and the Grassland Resource Conservation District held a hearing to receive comments from the public concerning the adoption of a Revised Groundwater Sustainability Plan (GSP) for its portion of the Delta-Mendota Subbasin.

DELTA-MENDOTA GROUNDWATER SUBBASIN
PUBLIC MEETINGS
SUMMARY FORM
GSA Name: Grassland Groundwater Sustainability Agency
Public Meetings Summary: Please fill out the following table containing records of Public Meetings and Stakeholder Outreach conducted from January 2020 to Present.

Meeting Type	Meeting Name	Date	Description
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	August 8, 2022	
Board Meeting	Grassland Water District	August 9, 2022	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Water District	September 13, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	October 10, 2022	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	October 21, 2022	
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	November 15, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	December 12, 2022	
Board Meeting	Grassland Water District	December 13, 2022	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	January 3, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	January 5, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	January 9, 2023	
Board Meeting	Grassland Water District	January 10, 2023	General Manager Reports on GGSA GSP Progress
Board Meeting	Joint Meeting Grassland Water District, Grassland Resource Conservation District and Grassland Groundwater Sustainability Agency	January 12, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	February 13, 2023	
Board Meeting	Grassland Water District	February 14, 2023	General Manager Reports on GGSA GSP Progress
Board Meeting	Grassland Resource Conservation District	February 23, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	March 21, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	March 27, 2023	
Direct Outreach	Delta-Mendota SGMA Newsletter	April 1, 2023	Second Quarter
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	April 10, 2023	
Board Meeting	Grassland Water District	April 11, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	April 24, 2023	
Board Meeting	Grassland Resource Conservation District	April 25, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	April 28, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	May 8, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	May 22, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	May 31, 2023	
Miscellaneous Meeting/Stakeholder Workshop	Delta-Mendota Subbasin Coordination Committee Meeting and Groundwater Sustainability Agency Workshop	June 12, 2023	
Board Meeting	Grassland Water District	June 22, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	June 26, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	July 10, 2023	
Miscellaneous Meeting	Joint Delta-Mendota Subbasin Coordination Committee and Technical Working Group	July 24, 2023	
Board Meeting	Grassland Resource Conservation District	July 27, 2023	General Manager Reports on GGSA GSP Progress

DELTA-MENDOTA GROUNDWATER SUBBASIN
PUBLIC MEETINGS
SUMMARY FORM
GSA Name: Grassland Groundwater Sustainability Agency
Public Meetings Summary: Please fill out the following table containing records of Public Meetings and Stakeholder Outreach conducted from January 2020 to Present.

Meeting Type	Meeting Name	Date	Description
Board Meeting	Grassland Water District	August 8, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	August 8, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	August 14, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	August 28, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	September 11, 2023	
Board Meeting	Grassland Water District	September 12, 2023	General Manager Reports on GGSA GSP Progress
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	September 21, 2023	
Miscellaneous Meeting	Delta-Mendota Subbasin Coordination Committee	October 9, 2023	

6.5 Northern & Central Delta-Mendota Region GSP Region Progress

On March 2, 2023, DWR released an "Inadequate" determination for the Northern & Central Delta-Mendota Region GSP along with the five other Subbasin GSPs and the Subbasin's Common Chapter. This determination evaluated the revised GSPs and Common Chapter that were submitted in July 2022 in response to the "Incomplete" determination released by DWR on January 21, 2022. Throughout WY2023, the Northern and Central Delta-Mendota regions worked collaboratively with the Delta-Mendota Subbasin GSAs to begin development of a single GSP for the Delta-Mendota Subbasin. As the single GSP is still under development as of the writing of this Annual Report, all sustainable management criteria definitions and methodologies documented in the Northern & Central Delta-Mendota Region Revised GSP and Common Chapter (June 2022)[15] are used to assess whether undesirable results occurred during WY2023 for all applicable sustainability indicators.

During WY2023, groundwater level measurements were collected during the seasonal high (February through April 2023) and seasonal low (September through October 2023) monitoring events for all wells in the representative groundwater level monitoring network with the exception of DMS ID No. 06-003, 06-004, 07-008, and 07-012, which were inaccessible. Monitoring has been discontinued for some of these wells while replacement wells are being identified (DMS ID Nos. 06-003, 06-004, and 07-012 were removed from the representative network between the WY2023 seasonal high and low monitoring events). As agreed upon and documented in the revised Common Chapter (June 2022), undesirable results relative to the chronic lowering of groundwater levels sustainability indicator occur when 50% of representative monitoring sites by principal aquifer in a GSP area exceed the minimum threshold (6 out of 12 wells in the Upper Aquifer, and 9 out of 18 wells in the Lower Aquifer)[16]. The groundwater elevation indicating a chronic lowering of groundwater levels that may lead to undesirable results is an elevation that is lower than the historical seasonal low, where the seasonal low occurs between September and October. The historical seasonal low is a fixed elevation at each representative monitoring site based on available groundwater level data prior to the end of WY2016. To account for future year-to-year variations in hydrology, compliance with the minimum threshold will be compared with a 4-year rolling average of annual groundwater level measurements during the seasonal low period.

[15] The adopted Groundwater Sustainability Plan for the Northern & Central Delta-Mendota Region (November 2019; revised June 2022) can be accessed at https://sgma.water.ca.gov/portal/gsp/preview/13.

[16] The groundwater levels representative network contains an additional 4 wells in the Upper Aquifer and 2 wells in the Lower Aquifer where insufficient data are currently available to establish sustainable management criteria (either five years of monitoring data following WY2016 or following construction of the well is needed). These wells are excluded from the total representative well count in each aquifer as a more conservative approach to determining if undesirable results are occurring.

Table 21 includes the minimum thresholds and measurable objectives for representative groundwater level monitoring sites in the Northern and Central Delta-Mendota regions, as well as the 4-year average seasonal low groundwater elevation between calendar year 2020 and 2023. Four minimum threshold exceedances occurred based on the 4-year rolling average; DMS ID Nos. 01-004 and 01-005 in the Upper Aquifer exceeded the minimum threshold by 0.21 and 22.66 feet, respectively, and DMS ID Nos. 01-003 and 07-028 in the Lower Aquifer exceeded the minimum threshold by 25.31 and 1.74 feet, respectively. One well in the Patterson Irrigation District GSA was reported going dry in July 2023, according to DWR's Dry Well Reporting System dataset published to the SGMA Data Viewer.[17] An interim solution was provided to supply water to the well owner.

While undesirable results for the chronic lowering of groundwater levels sustainability indicator did not occur in WY2023, there were single groundwater level measurement minimum threshold exceedances that were observed at the following wells (by DMS ID Nos.) during the seasonal high and seasonal low periods; these exceedances can be seen in the well-specific hydrographs:

WY2023 Seasonal High

February 2023	*March 2023*	*April 2023*
• 01-005	• 01-005	• None

WY2023 Seasonal Low

September 2023	*October 2023*
• 01-003	• 01-003
• 01-004	• 01-005
• 01-005	

DMS ID Nos. 01-003 and 01-005 recovered to above the minimum threshold by November 2023 and DMS No. 01-004 recovered to above the minimum threshold in October 2023. Additional investigation is being conducted during WY 2024 by DM-II GSA regarding minimum threshold exceedances at DMS ID Nos. 01-003, 01-004, and 01-005 to verify collected groundwater level measurements are accurate and consistent with trends observed in nearby wells. WY2023 consisted of wetter conditions throughout the San Joaquin Valley and recovery from low groundwater levels observed during the WY2020-2022 drought. Recent downward trends in groundwater elevations were observed at the following wells and should be monitored by the GSAs to avoid experiencing undesirable results in the near future: Well DMS ID Nos. 01-003, 01-

[17] Local Reported Dry Wells dataset published to the SGMA Data Viewer and available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions.

004, 01-005, 01-008, 03-001, 06-001, 06-002, 07-005, 07-009, 07-014, 07-015, 07-016, 07-017 and 07-028. Hydrographs with numeric sustainable management criteria for all representative monitoring sites in the groundwater level monitoring network for the Northern and Central Delta-Mendota Regions are included in **Appendix A**.

As part of the Year 5 interim milestones documented in the Revised Northern & Central Delta-Mendota Region GSP and Common Chapter (June 2022), all Subbasin GSAs planned to coordinate to develop shorter-term (or "acute") groundwater level thresholds for the 2025 GSP and Common Chapter update that avoid short-term undesirable results, particularly for domestic water users, groundwater dependent ecosystems, interconnected surface water, and subsidence when present; where both the historic seasonal low minimum threshold value and acute groundwater elevation thresholds would apply, whichever is more protective. As a result of the Inadequate determination, and given a single GSP for the Subbasin is currently under development, Year 5 Interim Milestones are currently being reassessed and subsequent Annual Reports will evaluate conditions relative to updated basin-wide interim milestones.

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Table 21. Northern & Central Delta-Mendota Region - WY 2023 Groundwater Levels Sustainable Management Criteria Analysis

Data Management System (DMS) ID	CASGEM ID (if applicable)	Local ID	Principal Aquifer	Minimum Threshold (feet above msl NAVD88) [1]	Measurable Objective (feet above msl NAVD88) [1]	4-Year Average Seasonal Low Groundwater Elevation, 2020 - 2023 (feet above msl NAVD88)
01-001	375509N1212609W001	MP030.43R	Lower	-44.9	-13.4	-5.0
01-002	375313N1212242W001	MP033.71L	Lower	-36.1	-18.9	18.4
01-003	374061N1211212W001	MP045.78R	Lower	-21.79	62.3	-47.1
01-004	372907N1210875W002	MC10-2	Upper	158.9	161.8	158.7
01-005	372424N1210754W001	MP058.28L	Upper	110.6	179.6	87.9
01-006	372604N1210611W001	91	Lower	77.1	94	78.8
01-007	-	MP021.12L	Lower	12.3	56.7	18.1
01-008	-	MP051.66L	Lower	-44.9	2.4	-13.2
02-002	-	WELL 02 - NORTH 5TH STREET	Lower	-18.3	33.7	20.7
02-009	-	Keystone well	Upper	-6.2	29.8	31.5
03-001	375015N1211011W001	MW-2	Upper	30.7	46.7	32.7
03-002	-	MW-3	Upper	7.7	67.2	29.4
03-003 [2]	-	WSJ003	Upper	TBD	TBD	-
04-001	376129N1212942W001	121	Lower	-17.6	-3.6	7.9
06-001 [3]	374316N1210994W001	P259-1	Lower	-22.3	46.1	21.6
06-002 [3]	374316N1210994W003	P259-3	Upper	61.5	74.6	65.8
06-003 [4]	375774N1212096W001	WSID 3	Lower	-9.1	18.5	24.9
06-004 [4]	-	MP031.31L1-L2Well1	Upper	14.8	30.5	40.8
07-002	370173N1208999W001	MC15-1	Lower	1.6	10.8	16.4
07-003	370173N1208999W002	MC15-2	Upper	62.5	89.9	85.7
07-005	369097N1207554W001	MP091.68R	Lower	-84.7	-41.8	-73.5
07-007	368896N1206702W001	MC18-1	Lower	-53.4	-26.6	-15.3

Data Management System (DMS) ID	CASGEM ID (if applicable)	Local ID	Principal Aquifer	Minimum Threshold (feet above msl NAVD88) [1]	Measurable Objective (feet above msl NAVD88) [1]	4-Year Average Seasonal Low Groundwater Elevation, 2020 - 2023 (feet above msl NAVD88)
07-008 [4]	367885N1206510W001	PWD 48	Lower	-63	-47	116.0
07-009	366000N1202300W001	KRCDTID03	Upper	49.3	73.9	60.3
07-010	366500N1202500W001	KRCDTID02	Upper	64	96.2	84.3
07-012 [4]	-	GDA003	Upper	TBD	TBD	-
07-014	-	TW-4	Lower	-133.5	-47.2	-56.2
07-015	-	TW-5	Lower	-147	-65	-67.1
07-016	-	Well 01	Lower	-2.4	74.6	71.6
07-017	-	Well 1	Upper	TBD	TBD	-
07-018	-	WSJ001	Upper	TBD	TBD	-
07-028	369064N1207276W001	MP093.27L / Well 500	Lower	-88.2	-64.8	-89.9
07-031	-	CDMGSA-01C	Lower	TBD	TBD	-
07-032	-	CDMGSA-01D	Lower	TBD	TBD	-
07-035	368871N1206355W001	MP098.74L	Upper	-99.8	95.2	48.6
08-002	-	MP102.04L / Well M-1	Upper	50.7	83.7	92.9

[1] TBD = To be determined

[2] Numeric sustainable management criteria to be established based on methodologies described in the Common Chapter and Northern & Central Delta-Mendota Region GSP when sufficient monitoring has taken place (either five years of monitoring data following WY2016 or following construction of the well).

[3] An error in recorded ground surface elevation and reference point elevation were identified during development of this Annual Report, resulting in incorrect groundwater elevation. The historical record and associated sustainable management criteria have been corrected in this table and in Appendix A.

[4] DMS ID No. 06-003, 06-004, 07-008, and 07-012 were deemed inaccessible and therefore not monitored in WY2023 during the seasonal low event and all but DMS ID No. 07-008 were inaccessible during the seasonal high event. All wells will be removed from the representative monitoring network starting in WY2024 and replacement wells will be identified.

Groundwater quality samples were collected between May and August during WY2023 at 27 of the 35 representative monitoring sites.[18] Inoperable pumps/lack of pumps is the primary reason for missing groundwater quality monitoring results for WY2023. Groundwater quality sampling results for WY2023 are presented in **Table 22** and chemographs are included in **Appendix B**.

The Revised Northern & Central Delta-Mendota Region GSP (June 2022) only includes sampling of TDS as salinity was identified as the primary constituent of concern in the Delta-Mendota Subbasin. This approach was agreed upon with the other five Subbasin GSPs to address deficiencies regarding coordination across the Subbasin GSPs as identified in DWR's January 2022 Incomplete determination letter. As documented in the Revised Northern & Central Delta-Mendota Region GSP (June 2022), minimum thresholds are established at 1,000 mg/L TDS (the upper limit of the SMCL) and measurable objectives are established at less than 1,000 mg/L TDS in areas of the Subbasin where current groundwater quality as of revised GSP development (June 2022) does not exceed 1,000 mg/L TDS. The Year 5 interim milestones for TDS are to maintain salinity consistent with the measurable objectives. For representative monitoring sites that exceeded the minimum threshold at the time of revised GSP development in June 2022, existing regulatory water quality compliance and remediation programs will apply and no numeric sustainable management criteria were established, though monitoring of TDS concentrations will continue to ensure further degradation does not occur due to groundwater pumping or other groundwater management activities.

Of the total 22 out of 35 representative monitoring sites with established numeric sustainable management criteria for groundwater quality (i.e., current conditions are below 1,000 mg/L TDS), 17 representative sites were sampled for TDS in WY2023 (6 sites in the Upper Aquifer and 11 sites in the Lower Aquifer), of which 14 sites (5 sites in the Upper Aquifer and 9 sites in the Lower Aquifer) were below the minimum threshold and measurable objective indicating sustainable conditions. Three representative sites exceeded the minimum threshold and measurable objective (DMS ID Nos. 02-009 in the Upper Aquifer and 01-006 and 07-016 in the Lower Aquifer). Additional TDS sampling in WY2024 will be conducted to verify increasing trends in TDS concentrations. It should be noted that sustainable management criteria established are for ambient groundwater quality, and additional treatment and/or blending is required to meet water quality standards for potable use. Given that an undesirable result is defined as more than 50% of representative monitoring sites by principal aquifer in a GSP area exceeding the minimum threshold (as documented in the revised Common Chapter), no undesirable results were observed in WY2023.

[18] DMS ID Nos. 07-031 and 07-0.32 were sampled after the monitoring window in September 2023.

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Table 22. Northern & Central Delta-Mendota Region - WY2023 Groundwater Quality Monitoring Results

DMS ID	State Well Number	Master Site Code	Local ID	Status	Well Use	Aquifer	Sample Date	TDS Result (mg/L)	Minimum Threshold (TDS, mg/L) [1]	Measurable Objective (TDS, mg/L) [1]	If not sampled, why?	Comments
01-001	04S06E36C001M	375509N1212609W001	MP030.43R	Inactive	Irrigation	Lower	8/22/23	550	1,000	< 1,000		
01-002	05S07E05F001M	375313N1212242W001	MP033.71L	Inactive	Irrigation	Lower	8/23/23	900	1,000	< 1,000		
01-003	06S08E20D002M	374061N1211212W001	MP045.78R	Inactive	Irrigation	Lower	8/24/23	1,400	N/A	N/A		
01-004	07S08E28R002M	372907N1210875W002	MC10-2	Active	Monitoring	Upper	-	-	1,000	< 1,000	Samples collected as part of Irrigated Lands Regulatory Program (ILRP) and TDS sampled every 5 years (last sampled in 2022)	
01-006	-	372604N1210611W001	91	Active	Irrigation	Lower	8/24/23	1,000	1,000	< 1,000		
01-007	-	376429N1213651W001	MP021.12L	Unknown	Unknown	Lower	8/23/23	580	1,000	< 1,000		
01-008	-	373330N1210857W001	MP051.66L	Unknown	Unknown	Lower	8/22/23	600	1,000	< 1,000		
01-018	-	-	Gemperle well	Unknown	Unknown	Upper (assumed)	-	-	1,000	< 1,000	Well deactivated and to be removed from representative monitoring network	
02-002	-	374712N1211328W002	WELL 02 – NORTH 5TH STREET	Active	Public Supply	Lower	9/20/22	1,050	1,000	< 1,000	Well on standby and unable to obtain sample	
02-009	-	-	Keystone well	Active	Irrigation	Upper	8/15/23	1,080	1,000	< 1,000		
03-001	-	375015N1211011W001	MW-2	Active	Monitoring	Upper	8/22/23	1,500	N/A	N/A		
03-003	05S/08E-16R	-	WSJ003	Unknown	Irrigation	Upper	8/22/23	1,500	N/A	N/A		
03-007	-	374410N1210638W001	MW-1	Active	Monitoring	Upper	8/22/23	620	1,000	< 1,000		
04-001	-	376129N1212942W001	121	Active	Irrigation	Lower	-	-	1,000	< 1,000	Pump inoperable	
06-001	06S08E09E001M	374316N1210994W001	P259-1	Active	Monitoring	Lower	8/23/23	730	1,000	< 1,000		
06-002	06S08E09E003M	374316N1210994W003	P259-3	Active	Monitoring	Upper	8/23/23	700	1,000	< 1,000		
06-003	-	375774N1212096W001	WSID 3	Active	Monitoring	Lower	-	-	1,000	< 1,000	Inoperable	To be removed from representative network
06-004	-	375830N1212024W001	MP031.31L1-L2Well1	Unknown	Unknown	Upper	-	-	N/A	N/A	Inoperable	To be removed from representative network
07-002	10S10E32L001M	370173N1208999W001	MC15-1	Active	Monitoring	Lower	8/15/23	450	1,000	< 1,000		
07-003	10S10E32L002M	370173N1208999W002	MC15-2	Active	Monitoring	Upper	8/15/23	490	1,000	< 1,000		
07-007	12S12E16E003M	368896N1206702W001	MC18-1	Active	Monitoring	Lower	8/9/23	990	1,000	< 1,000		
07-008	13S12E22F001M	367885N1206510W001	PWD 48	Active	Irrigation	Lower	8/26/22	1,400	N/A	N/A	Inoperable	To be removed from representative network
07-012	12S/12E-16B	368910N1206609W002	GDA003	Unknown	Irrigation	Upper	8/26/22	3,000	N/A	N/A	Inaccessible	To be removed from representative network
07-014	-	366758N1202678W001	TW-4	Active	Nested Monitoring	Lower	8/16/23	830	1,000	< 1,000		Sampled with Hydrasleeve
07-015	-	366430N1202404W001	TW-5	Active	Monitoring	Lower	8/16/23	830	1,000	< 1,000		Sampled with Hydrasleeve

DMS ID	State Well Number	Master Site Code	Local ID	Status	Well Use	Aquifer	Sample Date	TDS Result (mg/L)	Minimum Threshold (TDS, mg/L) [1]	Measurable Objective (TDS, mg/L) [1]	If not sampled, why?	Comments
07-016	-	371004N1210072W001	Well 01	Active	Public Supply	Lower	8/16/23	1,000	1,000	< 1,000		
07-017	-	370929N1209258W001	Well 1	Active	Public Supply	Upper	8/16/23	440	1,000	< 1,000		
07-018	15S/16E-20	-	WSJ001	Inactive	Domestic	Upper	8/16/23	3,500	N/A	N/A		Unable to properly purge well due to generator/VFD malfunction
07-028	-	369064N1207276W001	MP093.27L	Active	Irrigation	Lower	8/4/23	1,300	N/A	N/A		
07-031	-	-	CDMGSA-01C	Active	Monitoring	Lower	9/14/23	1,500	N/A	N/A		Sampled outside of designated sampling window of May to August
07-032	-	-	CDMGSA-01D	Active	Monitoring	Lower	9/14/23	2,200	N/A	N/A		Sampled outside of designated Sampling window of May to August
07-033	-	-	TW-4 Upper	Active	Monitoring	Upper	8/16/23	960	1,000	< 1,000		
07-034	-	369057N1207470W001	MP092.20R	Active	Irrigation	Lower (assumed)	6/1/22	1,400	N/A	N/A	Unknown	
07-035	-	368871N1206355W001	MP098.74L	Active	Irrigation	Upper	5/23/23	1,400	N/A	N/A	Inoperable	To be removed from representative network
08-002	-	-	MP102.04L	Active	Irrigation	Upper	8/3/23	3,440	N/A	N/A		

[1] N/A indicates no numeric sustainable management criteria established as existing conditions exceed TDS thresholds. Existing regulatory water quality compliance and remediation programs will apply (including but not limited to CV-SALTS Salt Control Program, the County Drought Plan requirements for State Small Water Systems and Domestic Wells [SB 552}, the Safe and Affordable Funding for Equity and Resilience [SAFER] program, and the Bureau of Reclamations Refuge Water Supply Program).

Land subsidence results for WY2022 and for WY2023 to date, as presented in **Table 23**, indicate the Northern and Central Delta-Mendota regions are on track to meeting the Year 5 interim milestones for subsidence (no more than 1 foot of additional inelastic land subsidence attributable to groundwater extraction during the first 5-year period of SGMA implementation). The USBR conducted its biennial subsidence benchmark survey along the Delta-Mendota Canal (DMC) during July 2021 following a one-year delay due to the COVID-19 pandemic; the next survey is tentatively planned for the summer of 2024 (per communication with USBR). Review of the TRE Altamira InSAR Dataset from October 2022 to October 2023, available through the SGMA Data Viewer[19], indicates vertical displacement was between -0.1 and 0.1 feet throughout the Northern and Central Delta-Mendota regions.

Each responsible monitoring entity will ensure subsidence monitoring is conducted during the same period (e.g., Spring or Fall) every other year, with preference for attempting to align monitoring with USBR's DMC subsidence benchmark survey (anticipated to take place in even numbered years). Data will continue to be collected and evaluated from publicly available sources (such as UNAVCO and DWR's SGMA Data Viewer) annually and used to supplement survey data.

[19] TRE Altamira InSAR dataset showing vertical displacement raster data from October 2022 to October 2023 is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub.

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Table 23. Northern & Central Delta-Mendota Region - WY2022 and WY2023 Land Subsidence Monitoring Results

DMS ID	Responsible Monitoring Entity/Program	Date	WY2022 Elevation Survey (feet, GSE)	Date	WY2023 Elevation Survey (feet, GSE)	Difference in Elevation (feet, GSE)	Minimum Threshold (total feet, inelastic land subsidence)	Measurable Objective (total feet, inelastic subsidence)	Year 5 Interim Milestone (total feet, inelastic subsidence) [2]
01-009	UNAVCO	9/30/2022	131.69	9/30/2023	131.73	0.1	2	0	1
01-010 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-011 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-012 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-013 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-014 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-015 [2]	UNAVCO	-	-	-	-	-	2	0	1
01-016 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
01-017 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
02-003	City of Patterson	-	-	3/23/2023	122.91	-	2	0	1
02-004 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
02-005	City of Patterson	-	-	3/23/2023	106.25	-	2	0	1
02-006	City of Patterson	-	-	3/23/2023	102.70	-	2	0	1
02-007	City of Patterson	-	-	3/23/2023	115.70	-	2	0	1
02-008	City of Patterson	-	-	3/23/2023	80.81	-	2	0	1
03-004	Patterson Irrigation District	12/31/2021	101.70	12/31/2022	101.73	0.03	2	0	1
03-005	Patterson Irrigation District	12/31/2021	66.83	12/31/2022	67.05	0.22	2	0	1
03-006	Patterson Irrigation District	12/31/2021	55.03	12/31/2022	55.12	0.09	2	0	1
04-003	West Stanislaus Irrigation District	12/31/2021	102.59	-	-	-	2	0	1
04-004	West Stanislaus Irrigation District	12/31/2021	171.07	-	-	-	2	0	1
04-005	West Stanislaus Irrigation District	12/31/2021	42.06	-	-	-	2	0	1
06-006 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-019	Tranquillity Irrigation District	7/21/2022	157.04	6/28/2023	156.88	-0.16	2	0	1
07-020 [3]	DWR / San Luis Water District	-	-	-	-	-	2	0	1
07-021 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-022 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-023 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-024 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-025 [1]	USBR DMC subsidence survey	-	-	-	-	-	2	0	1
07-026	Tranquillity Irrigation District	7/21/2022	159.96	6/28/2023	159.86	-0.1	2	0	1
07-027	Tranquillity Irrigation District	7/21/2022	168.93	6/28/2023	168.69	-0.24	2	0	1

[1] Monitored as part of USBR's DMC subsidence survey, which is conducted every two years and tentatively scheduled for 2024.
[2] DMS ID 01-015 (P259) is monitored by UNAVCO and has been inoperable since July 2021, with latest data transmitted in June 2021 (https://www.unavco.org/instrumentation/networks/status/nota/overview/P259).
[3] Site to be removed from representative monitoring network starting in WY2024 due to inability to access data from DWR in a timely manner for analysis.

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The depletion of interconnected surface water sustainability indicator has been identified as a data gap within the Delta-Mendota Subbasin. As documented in the Delta-Mendota Subbasin's GSP Common Chapter (revised June 2022), until the GSAs are able to collect additional data necessary to set quantitative sustainable management criteria, the sustainable management criteria in the Upper Aquifer for the chronic lowering of groundwater levels sustainability indicator will serve as proxy as sustainable management criteria are designed to maintain groundwater levels above historic low conditions and are understood to be protective of interconnected surface water and local natural resources and downstream beneficial uses and users. As part of the single GSP effort, the Subbasin GSAs anticipate developing a representative monitoring network for interconnected surface water that includes existing sites monitored as part of the San Joaquin River Restoration Program in addition to new monitoring sites to be installed using funding received as part of the SGM Program SGMA Implementation – Round 1 grant funding awarded by DWR in April 2022 and other funding sources as necessary.

Table 24 and Table **25** provide updates on projects and management actions, respectively, that occurred in the Northern and Central Delta-Mendota regions during WY2023. For more detailed descriptions of all projects and management actions, refer to Chapter 7 *Sustainability Implementation* of the Northern & Central Delta-Mendota Region GSP.[20] In addition to the projects identified in the GSP, Santa Nella County Water District applied a total of 228 AF of treated wastewater at its wastewater treatment plant to a settling pond in WY2023, which ultimately recharged the underlying groundwater basin.

Table 24. Northern & Central Delta-Mendota Region WY2023 Projects Updates, Tier 1 and Tier 2

Project	Tier	Project Proponent	Status
Los Banos Creek Recharge and Recovery Project	1	San Luis Water District	Preliminary design completed in 2018; Pending funding for California Environmental Quality Act (CEQA)/permitting, design, and construction; Funding received as part of DWR's SGM Program SGMA Implementation – Round 1 Grant awarded in April 2022
Orestimba Creek Recharge and Recovery Project	1	Del Puerto Water District	Final design, CEQA, and permitting anticipated to be completed in early 2023; Construction began in July 2023 and is anticipated to be complete in 2025; A total of 1,583 AF of recharge occurred as part of Phase 1 of the project in WY2023
North Valley Regional Recycled Water Program (NVRRWP) – Modesto and Early Turlock Years	1	Del Puerto Water District	Completed in March 2020

[20] The adopted Groundwater Sustainability Plan for the Northern & Central Delta-Mendota Region (November 2019; revised June 2022) can be accessed at https://sgma.water.ca.gov/portal/gsp/preview/13.

Project	Tier	Project Proponent	Status
City of Patterson Percolation Ponds for Stormwater Capture and Recharge	1	City of Patterson	Included in Water Master Plan; Project still in conceptual and Environmental Impact Report (EIR) phase (linked to planned development); Project design activities commenced in WY2022 and a preliminary design report will be completed in 2024
Kaljian Drainwater Reuse Project	1	San Luis Water District	Preliminary design and CEQA/permitting in progress, developing a Master Plan for drainwater (Fall 2021); Design planned between 2020 and 2025 (100% design planned in phases); Construction planned in phases beginning in 2025 (construction planned in phases)
West Stanislaus Irrigation District Lateral 4-North Recapture and Recirculation Reservoir	1	West Stanislaus Irrigation District	Feasibility study began in April 2021 and completed in September 2021; CEQA complete; Design underway; Funding received as part of the SGM Program SGMA Implementation – Round 1 Grant awarded in April 2022
Revision to Tranquillity Irrigation District Lower Aquifer Pumping	1	Tranquillity Irrigation District	Well Water Operations Plan established in 2017 and implemented on an annual basis
Del Puerto Canyon Reservoir Project	2	Del Puerto Water District	Revised CEQA anticipated to be certified in 2024; NEPA draft completed in late 2024; Preliminary design completed in 2023; Permitting and final design are anticipated to be complete in 2025; Construction is estimated to be complete in 2034
Little Salado Creek Groundwater Recharge and Flood Control Basin	2	Stanislaus County	Project will be constructed as part of the mitigation activities related to the construction and operation of the Crows Landing Industrial Business Park (CLIBP); CLIBP has been certified by the County Board of Supervisors and Phase 1 (first 115 acres) is moving forward; The Little Salado Flood Control Project is scheduled for development in subsequent phases of the overall CLIBP project; Design underway; Draft CEQA completed in January 2018
Patterson Irrigation District Groundwater Bank and/or Flood-Managed Aquifer Recharge (MAR)-type Project	2	Patterson Irrigation District	Testing of property will be performed in spring/summer 2024 and design will start after testing
West Stanislaus Irrigation District Lateral 4-South Recapture and Recirculation Reservoir	2	West Stanislaus Irrigation District	Preliminary design completed in September 2021; Waiting on available funding
Ortigalita Creek Groundwater Recharge and Recovery Project	2	San Luis Water District	Design underway

Table 25. Northern & Central Delta-Mendota Region WY2023 Management Actions Updates, Tier 1

Management Action	Status
Lower Aquifer Pumping Rules for Minimizing Subsidence	Several GSAs have adopted ordinances requiring the registration of wells and/or reporting of pumping. The Central Delta-Mendota GSA adopted an Administrative Policy for metering/reporting for all wells.
Maximizing Use of Other Water Supplies	Del Puerto Water District (DM-II GSA member agency) adopted a policy in November 2022 requiring the use of all available surface water supplies to a District customer prior to the use of groundwater. The policy requires District customers prepay for all CVP supply allocated to an account up to 75% allocation. The goal of this policy is to incentivize customers to utilize surface water supply over groundwater, as the water is already purchased. It is anticipated this policy will augment groundwater pumping by up to 11,000 AFY on average.
Increasing GSA Access to and Input on Well Permits	Governor Newsom's Executive Order N-7-22 provides additional clarity and authority in the role GSAs play in well permitting. Merced and Stanislaus Counties have updated their well permitting process and requirements.
Drought Contingency Planning in Urban Area	Included in the City of Patterson's adopted 2020 Urban Water Management Plan.
Fill Data Gaps	Funding was awarded in April 2022 to fill data gaps in interconnected surface water and subsidence monitoring under the SGM Round 1 Implementation grant. Additional funding for interconnected surface water monitoring was requested under the SGM Round 2 Implementation grant application submitted in December 2022. An ISW representative monitoring network has been designed (with the Basis of Design Report released in 2023) and will be constructed in 2024.

The Northern and Central Delta-Mendota GSAs continued to hold publicly noticed regular board and council meetings (with topics including GSP implementation updates) as well as Northern and Central Delta-Mendota Activity Management Committees meetings during WY2023 according to the Brown Act. Individual GSAs included SGMA/GSP information with water bills to customers, on their respective websites, and/or as part of noticing of local board and council meetings, and Subbasin-wide information regarding GSP implementation has been included in quarterly newsletters released by SLDMWA on behalf of the Subbasin GSAs.

6.6 San Joaquin River Exchange Contractors GSP Region Progress

Groundwater has been sustainably managed within the San Joaquin River Exchange Contractors (SJREC) GSP area historically prior to SGMA requirements and has continued to be sustainably managed during GSP implementation. Groundwater management for WY2023 is consistent with the SJREC GSP submitted to DWR in January 2020 and the updated SJREC GSP submitted in July 2022. Projects and management actions will continually be reviewed and implemented to maintain regional sustainability.

In 2009, CCID completed a study on the impacts of declining water levels in the Los Banos Creek area to domestic and agricultural wells in the region. In 2010, a multi-agency agreement (which is still active in 2024) was executed to reduce groundwater extractions if water levels in a representative well were below an established trigger level. Although this management action was implemented well before SGMA, it mimics the expectations the State has on local water managers. In March 2023, the SJREC reviewed water levels from representative wells in each management zone described in the GSP. The water level in the Los Banos Creek subarea of Monitoring Zone C was below the trigger water level. Management actions were imposed to reduce groundwater extractions from the area to be protective of the local resources and the domestic wells in the region. Additionally, water levels in Monitoring Zone A were reviewed in March 2023, where the water level was below the established trigger and groundwater extractions were restricted to protect the local area.

The SJREC have partnered with Del Puerto Water District to expand the Orestimba Creek Recharge and Recovery project to reduce impacts to lands in their respective districts which are subject to multiple hazards, including flooding and drought. DWR has awarded CCID $809,264 through the Integrated Regional Water Management Grant Program for the project. Further, the project was awarded about $5,600,000 in funds from the Stormwater Grant Program administered by the SWRCB. The project has started construction and is expected to be operational by February 2025. This project will improve groundwater storage, water quality, and reduce inelastic land subsidence in the region.

The SJREC have partnered with Grassland Water District and San Luis Water District on the Los Banos Creek Storage Project. In fall 2020, the project partners successfully completed a pilot project to pump conserved water into the Los Banos Creek Detention Reservoir. The pilot project included the installation of a temporary pipeline from an existing pump station down into the reservoir. Currently, a joint CEQA/NEPA document is under development. Construction of the project is scheduled to begin in late 2024.

The SJREC has received $1,000,000 in DWR's SGM Program SGMA Implementation – Round 1 grant funding to construct a recharge project along Los Banos Creek. The project will reduce flooding downstream, while also improving groundwater storage, restoring riparian habitat and

improving the water quality for a disadvantaged community downstream. Environmental review was completed in summer 2023 and construction is scheduled for 2024.

The SJREC GSP Group currently participating in the single GSP effort for the Subbasin and is preparing for the next GSP update and submittal with a focus on protecting the resource for our most vulnerable communities.

6.7 Subbasin-Wide GSP Progress

On March 2, 2023, DWR released an "Inadequate" determination for all six 2022 Revised Delta-Mendota Subbasin GSPs and the Subbasin's Common Chapter. Revised GSPs and Common Chapter were submitted to DWR by the July 20, 2022 deadline in response to the "Incomplete" determination released on January 21, 2022. The "Inadequate" determination moved the Subbasin to the jurisdiction of the SWRCB.

Representatives of the Delta-Mendota Coordination Committee voted to develop a single GSP to address the "Inadequate" determination and satisfy the requirements of SGMA legislation and SWRCB. The Delta-Mendota Subbasin GSAs worked collaboratively through WY2023 to begin development of that single Subbasin GSP. The Delta-Mendota Coordination Committee meets monthly in addition to special meetings as needed, in accordance with the Brown Act. An ad hoc technical subcommittee consisting of consultants and technically oriented GSA representatives and alternates meet at least monthly to work through the technical intricacies of consolidating six GSPs into a single document. This group then makes policy recommendations to the Coordination Committee regarding single GSP development. In tandem, an ad hoc subcommittee of Coordination Committee members meets nearly monthly with SWRCB and DWR staff to discuss the single GSP development process. Committee members discuss proposed changes with staff to get general direction on addressing the Inadequate determination. In addition to the meetings with staff, two tours of areas of the Subbasin have been held with members of the SWRCB. A third tour for the SWRCB Chair is scheduled as of the writing of this Annual Report.

As preparation of the single GSP occurred throughout WY2023, the Delta-Mendota Subbasin GSAs has continued to implement projects and management actions (details contained in **Appendix C**).

In February 2022, the Delta-Mendota Subbasin submitted an application totaling more than $10 million in projects that support GSP implementation under DWR's SGM Program SGMA Implementation – Round 1 for critically overdrafted basins. In March 2022, the Subbasin was notified that the full anticipated award about of $7.6 million would be awarded to the Subbasin. Activities to be funded under this grant include the several groundwater recharge projects, interconnected surface water and subsidence monitoring network improvements, GSP

revisions, and outreach and engagement. All grant-funded activities will be complete by April 30, 2025.

In December 2022, the Delta-Mendota Subbasin submitted an application totaling $20 million in grant funding under DWR's SGM Program SGMA Implementation – Round 2, which included proposed activities to fill interconnected surface water monitoring and groundwater dependent ecosystem data gaps, canal lining projects, groundwater recharge projects, and water use efficiency and reclamation projects. The Delta-Mendota Subbasin was not awarded funding under this solicitation.

Appendix A. Hydrographs for Representative Monitoring Wells

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Table A-1. Chronic Lowering of Groundwater Levels Representative Monitoring Wells, by GSP Group

DMS Site ID	Local Well ID	Aquifer Designation	GSP Group
09-001	2480-72	Upper	Aliso Water District GSP
09-002	12S16E31G001M	Upper (Composite)	Aliso Water District GSP
09-003	13S15E14M001M	Upper	Aliso Water District GSP
09-004	13S16E30A001M	Upper	Aliso Water District GSP
10-001	FWD-R-8	Upper	Farmers Water District GSP
10-009	TSS-MW-325	Upper	Farmers Water District GSP
10-010	TSS-MW-485	Lower	Farmers Water District GSP
12-001	SPRECK-MW-7	Upper	Fresno County GSP
13-001	HANS-7C1	Upper	Fresno County GSP
13-003	TL-HS-3	Upper	Fresno County GSP
13-004	USGS-31J6	Lower	Fresno County GSP
11-005	1ML-5	Lower	Grassland GSP
11-006	1ML-6	Lower	Grassland GSP
11-010	1PL-1	Lower	Grassland GSP
11-013	1PU-1	Upper	Grassland GSP
11-019 [2]	3PL-2	Lower	Grassland GSP
11-020	1PL-6	Lower	Grassland GSP
11-021 [2]	1PL-5	Lower	Grassland GSP
11-022 [2]	1PL-4	Lower	Grassland GSP
11-023	1PU-2	Upper	Grassland GSP
11-024	1PL-7	Lower	Grassland GSP
19-002	2PU-1	Upper	Grassland GSP
19-005 [2]	2MU-1	Upper	Grassland GSP
19-008 [2]	2MU-4	Upper	Grassland GSP
19-009 [2]	2MU-5	Upper	Grassland GSP
19-010	1PU-3	Upper	Grassland GSP
01-001	MP030.43R	Lower	Northern & Central Delta-Mendota Region GSP
01-002	MP033.71L	Lower	Northern & Central Delta-Mendota Region GSP
01-003	MP45.78R	Lower	Northern & Central Delta-Mendota Region GSP
01-004	MC10#2	Upper	Northern & Central Delta-Mendota Region GSP
01-005	MP058.28L	Upper	Northern & Central Delta-Mendota Region GSP
01-006	91	Lower	Northern & Central Delta-Mendota Region GSP
01-007	MP021.12L	Lower	Northern & Central Delta-Mendota Region GSP
01-008	MP051.66L	Lower	Northern & Central Delta-Mendota Region GSP
02-002	WELL 02 - NORTH 5TH STREET	Lower	Northern & Central Delta-Mendota Region GSP
02-009	Keystone well	Upper	Northern & Central Delta-Mendota Region GSP
03-001	PIDMW2	Upper	Northern & Central Delta-Mendota Region GSP
03-002	MW-3	Upper	Northern & Central Delta-Mendota Region GSP
03-003 [1]	WSJ003	Upper	Northern & Central Delta-Mendota Region GSP
04-001	121	Lower	Northern & Central Delta-Mendota Region GSP
06-001	P259-1	Lower	Northern & Central Delta-Mendota Region GSP
06-002	P259#3	Upper	Northern & Central Delta-Mendota Region GSP
06-003	WSID3	Lower	Northern & Central Delta-Mendota Region GSP
06-004	MP031.31L1-L2Well1	Upper	Northern & Central Delta-Mendota Region GSP
07-002	MC15-1	Lower	Northern & Central Delta-Mendota Region GSP
07-003	MC15-2	Upper	Northern & Central Delta-Mendota Region GSP
07-005	MP091.68R	Lower	Northern & Central Delta-Mendota Region GSP
07-007	MC18-1	Lower	Northern & Central Delta-Mendota Region GSP
07-008	PWD 48	Lower	Northern & Central Delta-Mendota Region GSP
07-009	KRCDTID03	Upper	Northern & Central Delta-Mendota Region GSP
07-010	KRCDTID02	Upper	Northern & Central Delta-Mendota Region GSP
07-012 [1]	GDA003	Upper	Northern & Central Delta-Mendota Region GSP
07-014	TW-4	Lower	Northern & Central Delta-Mendota Region GSP
07-015	TW-5	Lower	Northern & Central Delta-Mendota Region GSP
07-016	Well 01	Lower	Northern & Central Delta-Mendota Region GSP
07-017 [1]	Well 1	Upper	Northern & Central Delta-Mendota Region GSP
07-018 [1]	WSJ001	Upper	Northern & Central Delta-Mendota Region GSP
07-028	MP093.27L (Well 500)	Lower	Northern & Central Delta-Mendota Region GSP
07-031 [1]	CDMGSA-01C	Lower	Northern & Central Delta-Mendota Region GSP
07-032 [1]	CDMGSA-01D	Lower	Northern & Central Delta-Mendota Region GSP
07-035	MP098.74L	Upper	Northern & Central Delta-Mendota Region GSP
08-002	Well M-1/MP102.04L	Upper	Northern & Central Delta-Mendota Region GSP
14-001	CCID Well #2	Upper	San Joaquin River Exchange Contractors GSP
14-002	1005	Upper	San Joaquin River Exchange Contractors GSP
14-003	1006	Upper	San Joaquin River Exchange Contractors GSP
14-004	1008	Upper	San Joaquin River Exchange Contractors GSP
14-005	1011	Upper	San Joaquin River Exchange Contractors GSP
14-006	1014	Upper	San Joaquin River Exchange Contractors GSP
14-007	1043	Upper	San Joaquin River Exchange Contractors GSP
14-008	2410	Upper	San Joaquin River Exchange Contractors GSP
14-019	1050	Lower	San Joaquin River Exchange Contractors GSP
14-020	1027	Lower	San Joaquin River Exchange Contractors GSP
14-021	1056	Lower	San Joaquin River Exchange Contractors GSP
23-001	3199	Upper	San Joaquin River Exchange Contractors GSP

[1] Numeric sustainable management criteria to be established based on methdologies described in the Common Chapter when sufficient monitoring has taken place (either five years of monitoring data following WY2016 or following constrution of the well).

[2] Insufficient data available during appropriate time periods to establish both minimum thresholds and measurable objectives. Numeric sustainable management criteria will be revised and developed as part of the single GSP effort.

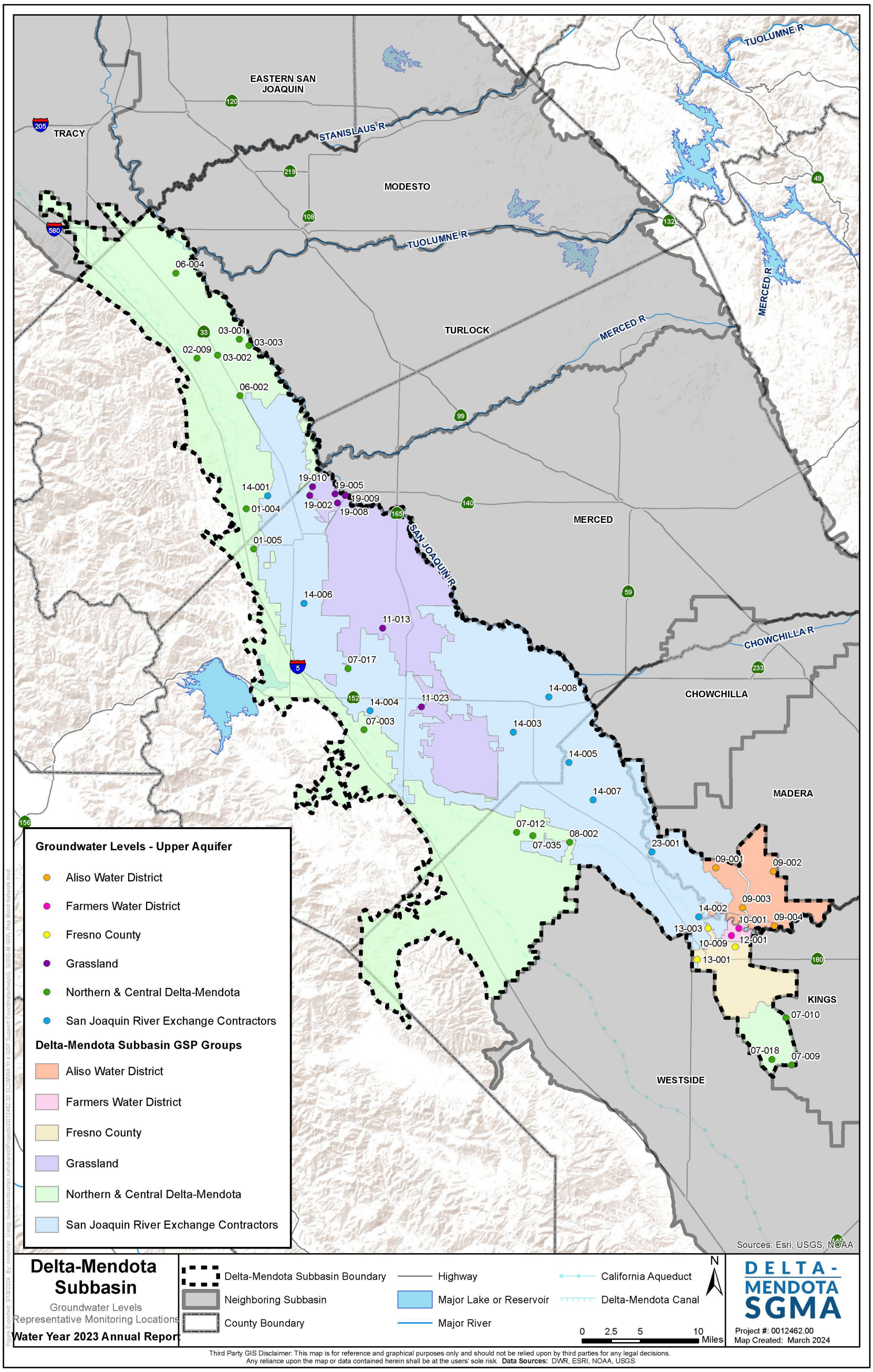

Figure A-1. Chronic Lowering of Groundwater Levels Representative Monitoring Network, Upper Aquifer

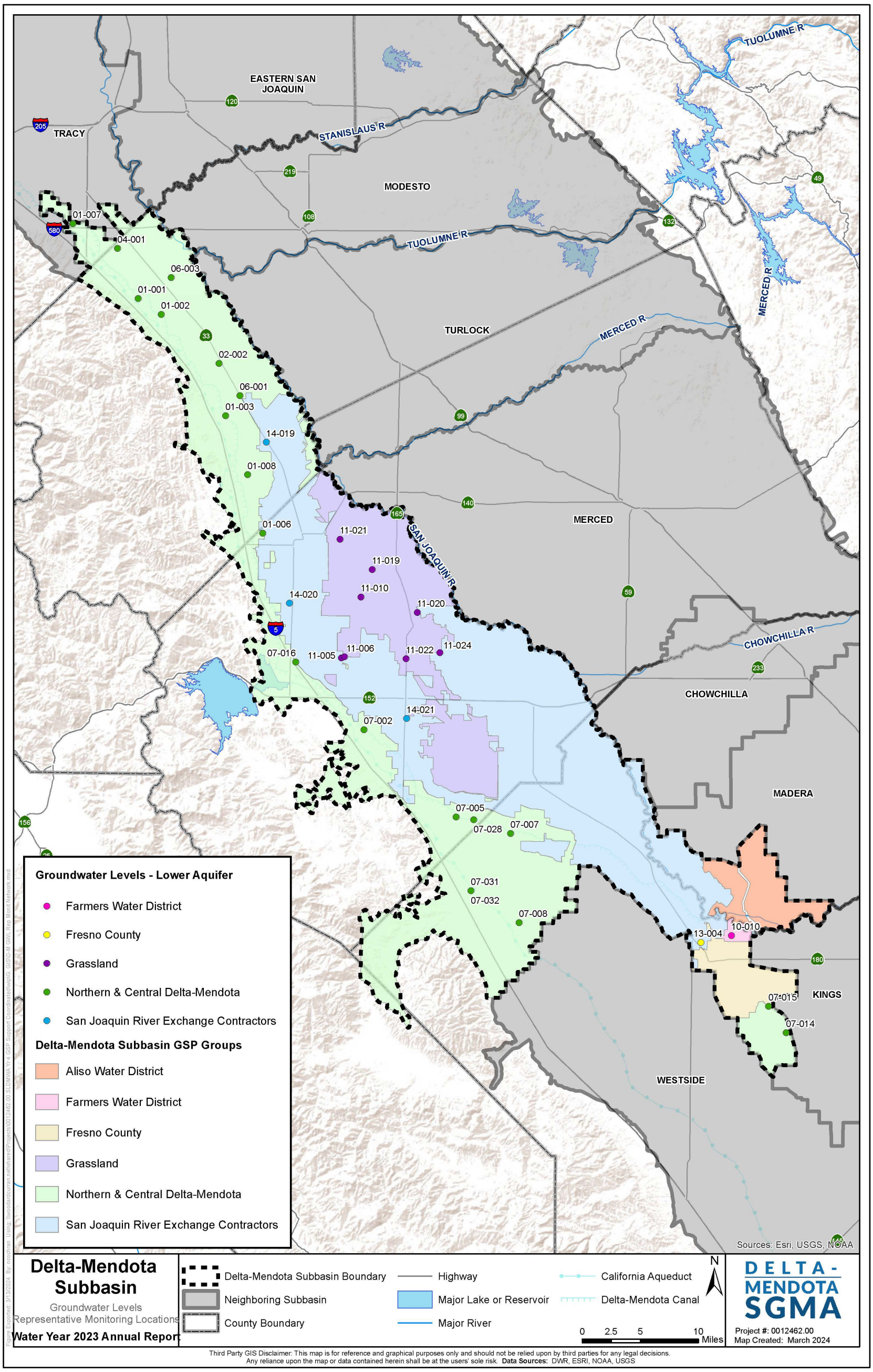

Figure A-2. Chronic Lowering of Groundwater Levels Representative Monitoring Network, Lower Aquifer

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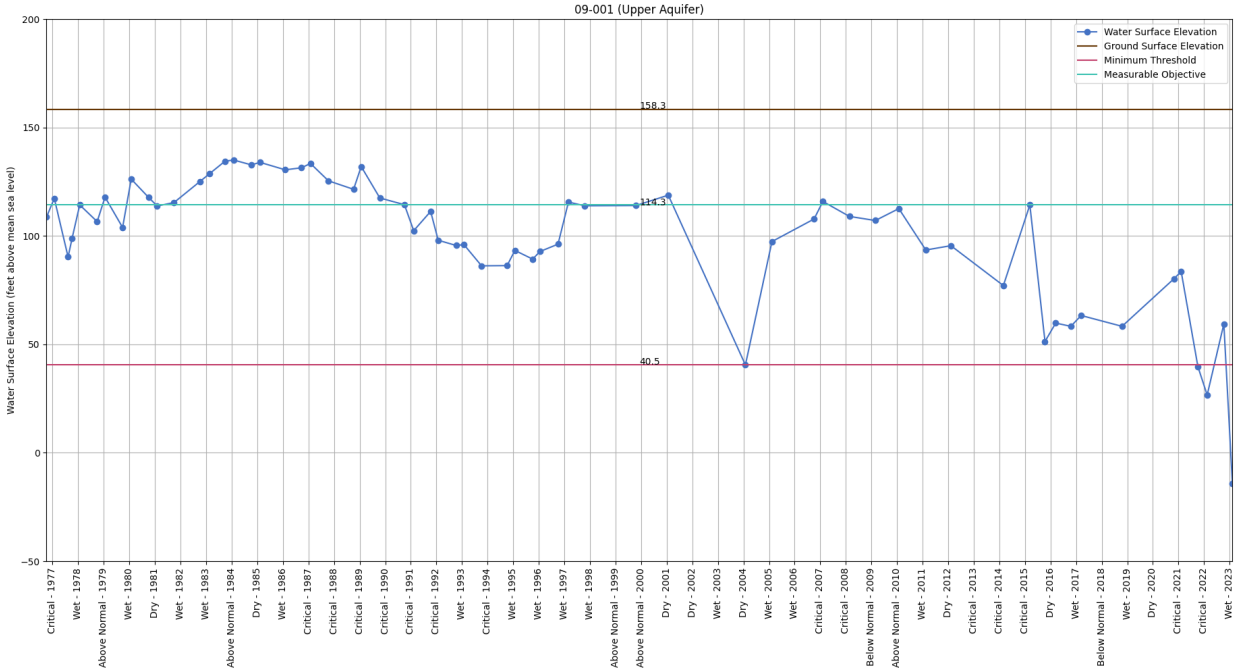
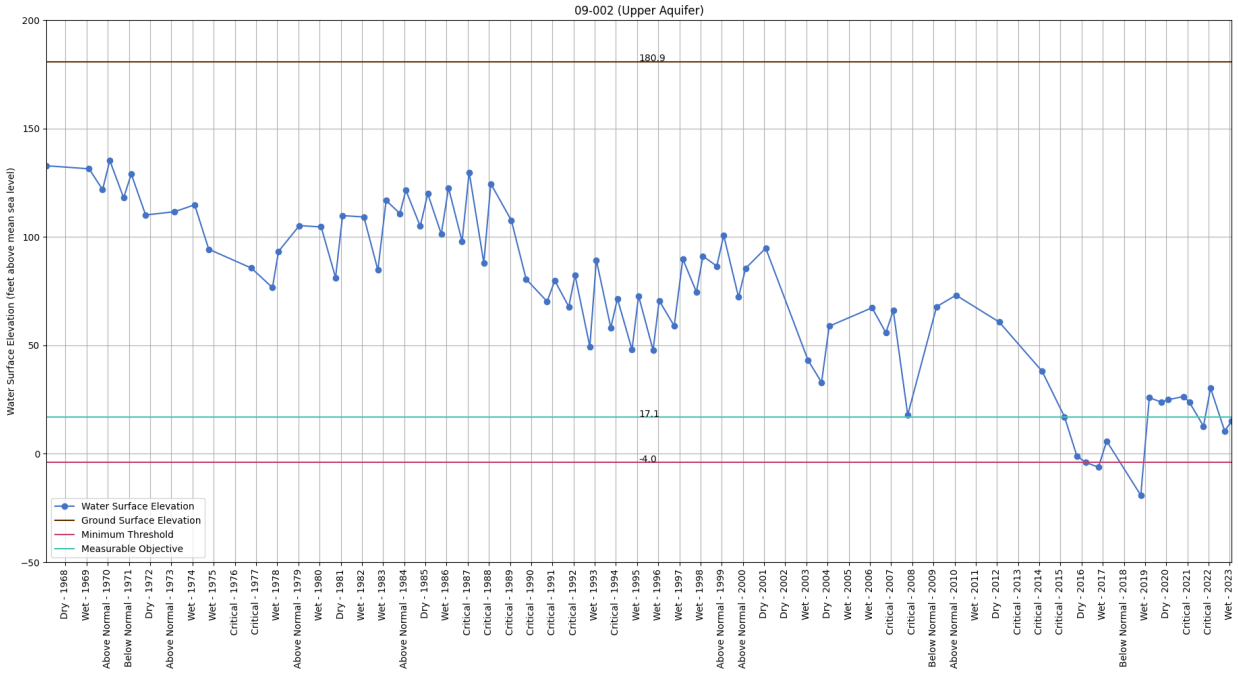
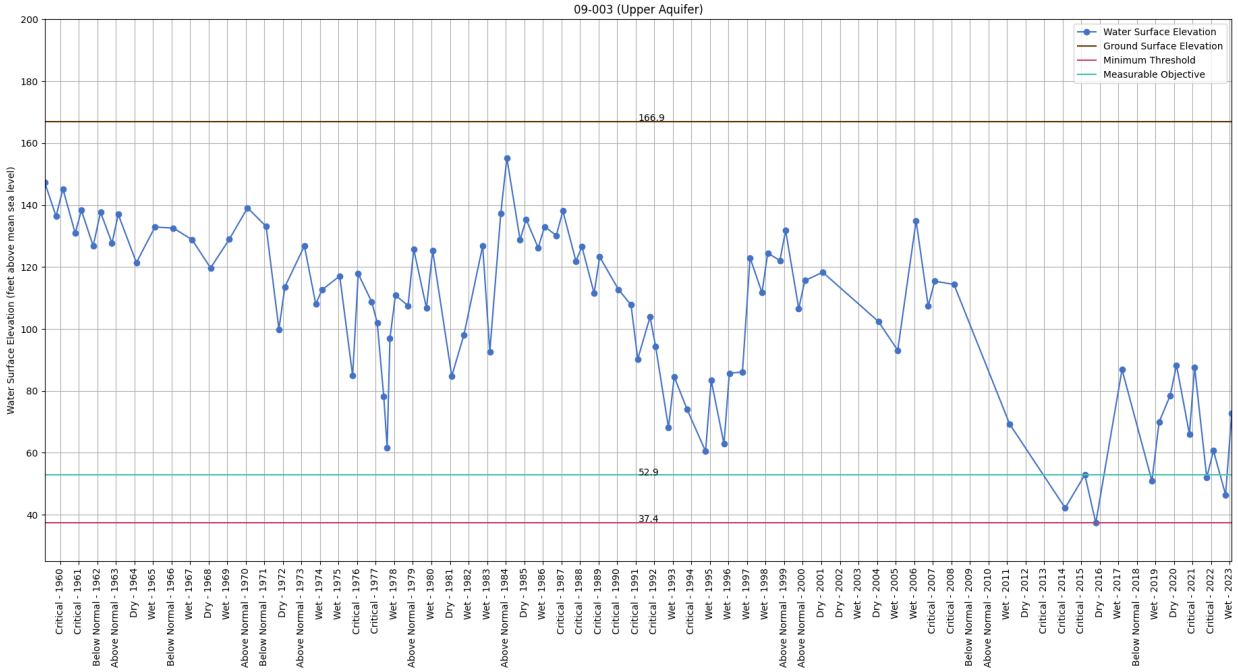
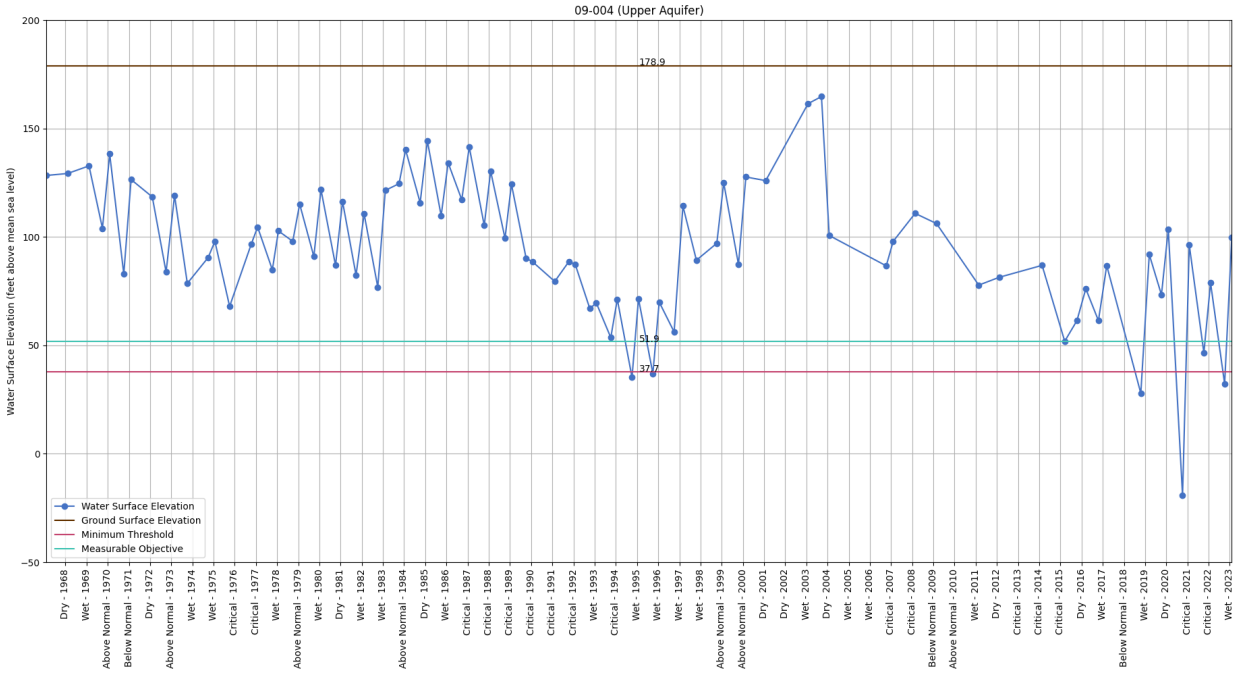
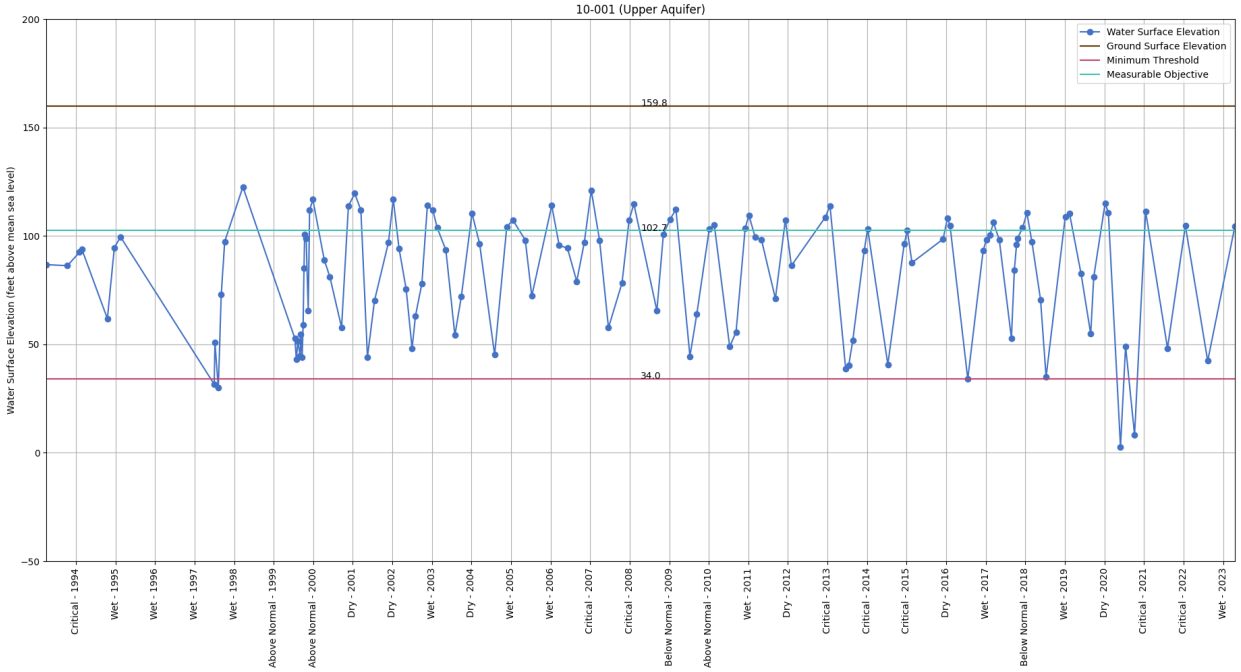
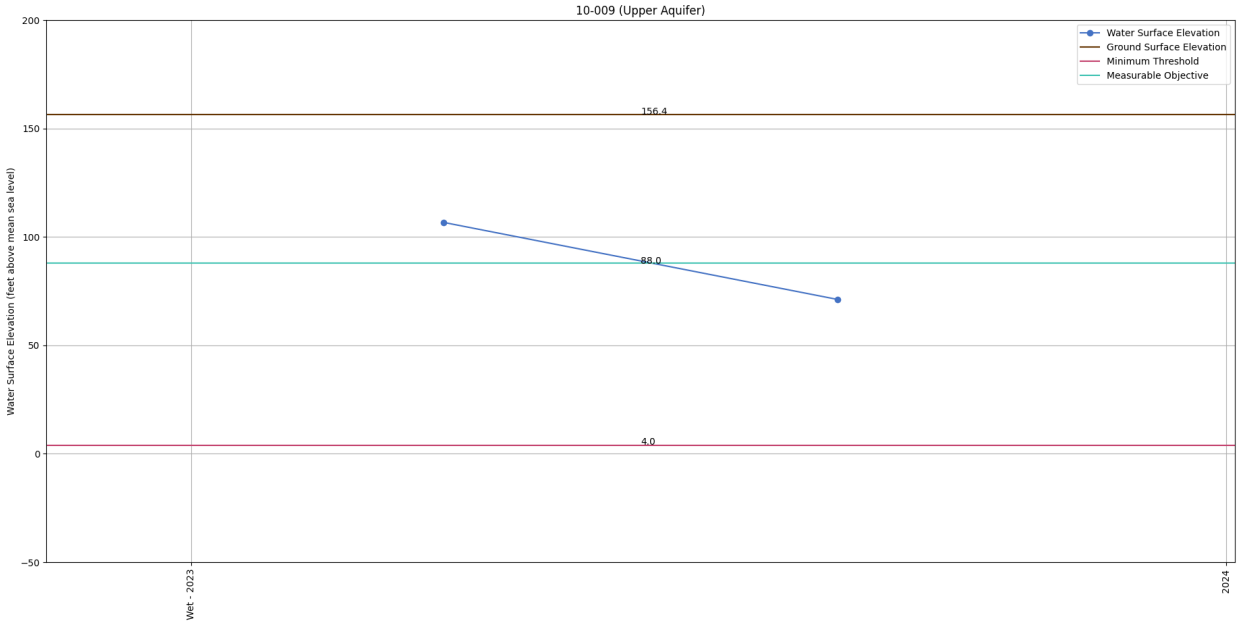

09-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
158.3
114.3
40.5
Water Surface Elevation (feet above mean sea level)

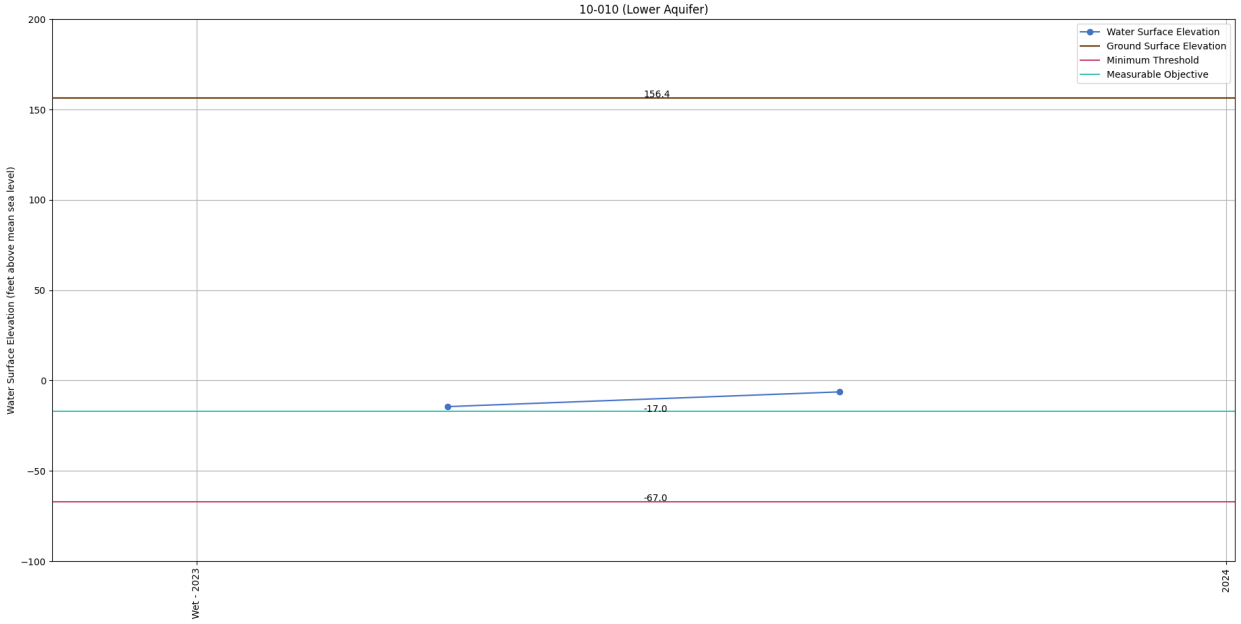

09-002 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
180.9
17.1
-4.0
Water Surface Elevation (feet above mean sea level)

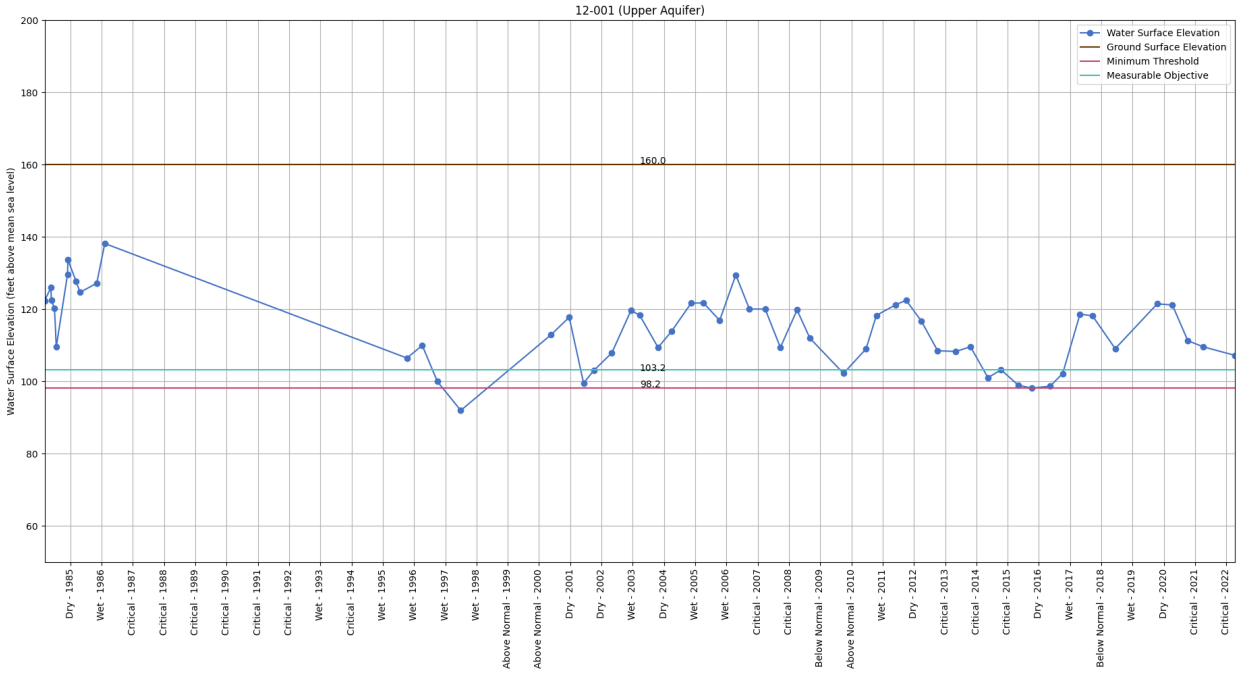

09-003 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
166.9
52.9
37.4
Water Surface Elevation (feet above mean sea level)

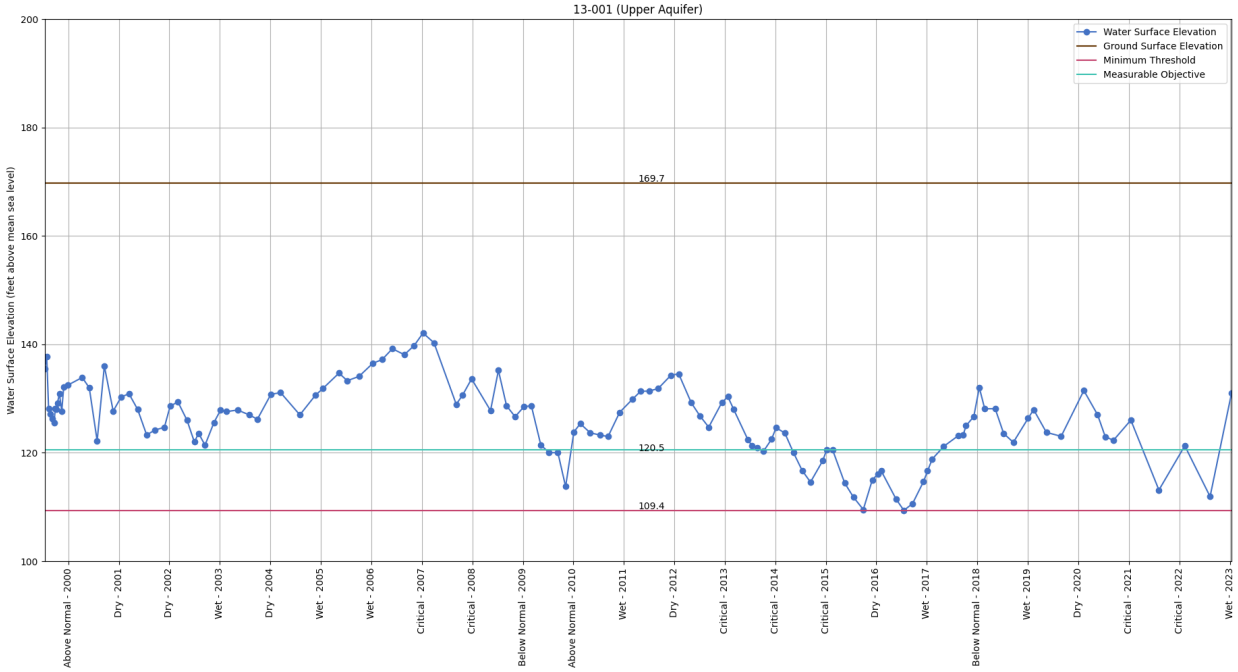

09-004 (Upper Aquifer)
178.9
51.9
37.7
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)

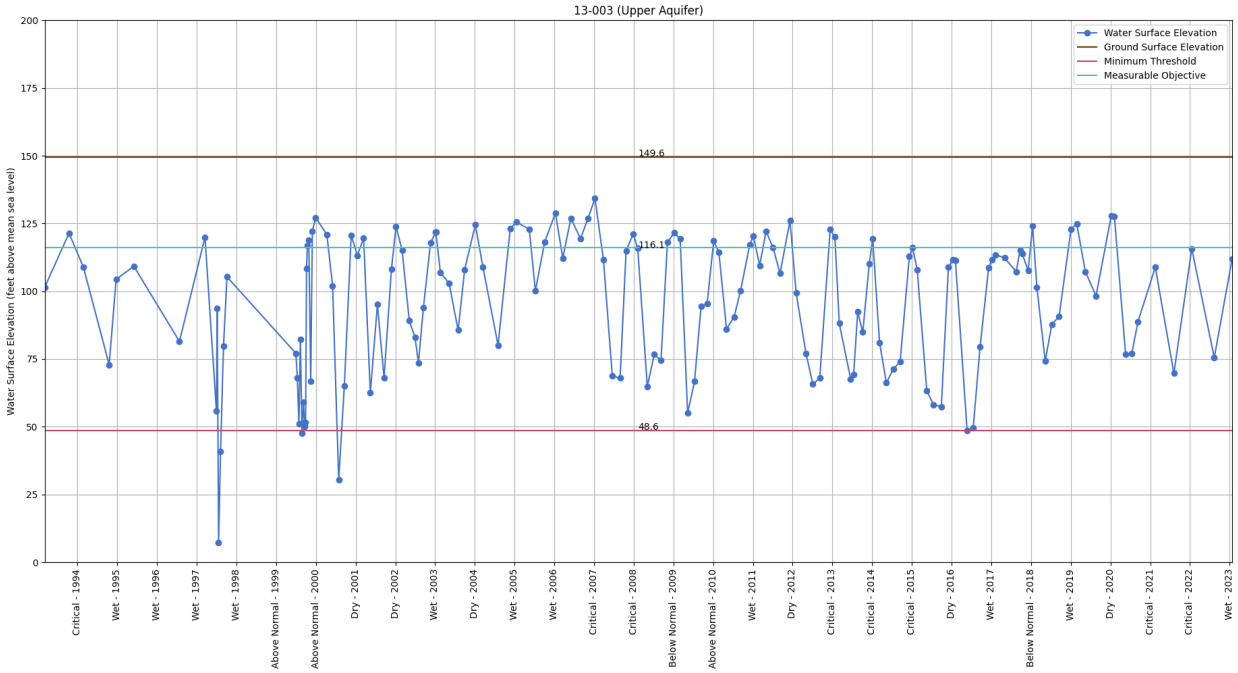

10-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
159.8
102.7
34.0
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
Critical - 1994
Wet - 1995
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

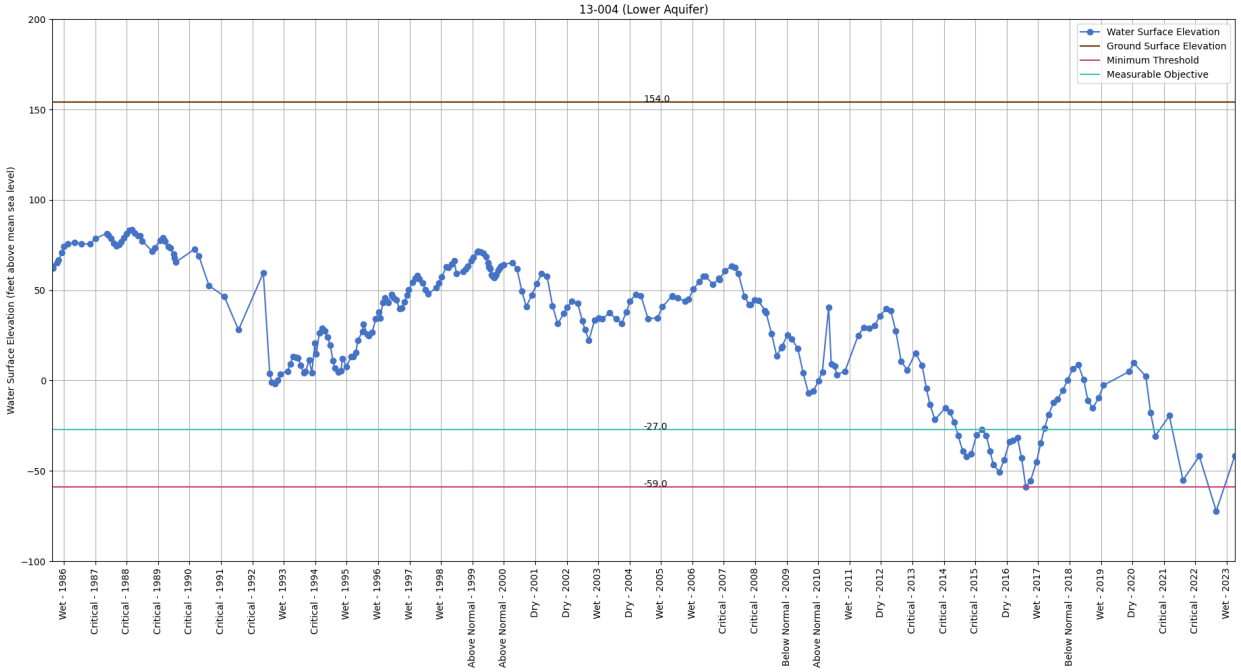

10-009 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
156.4
88.0
4.0
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
Wet - 2023
2024

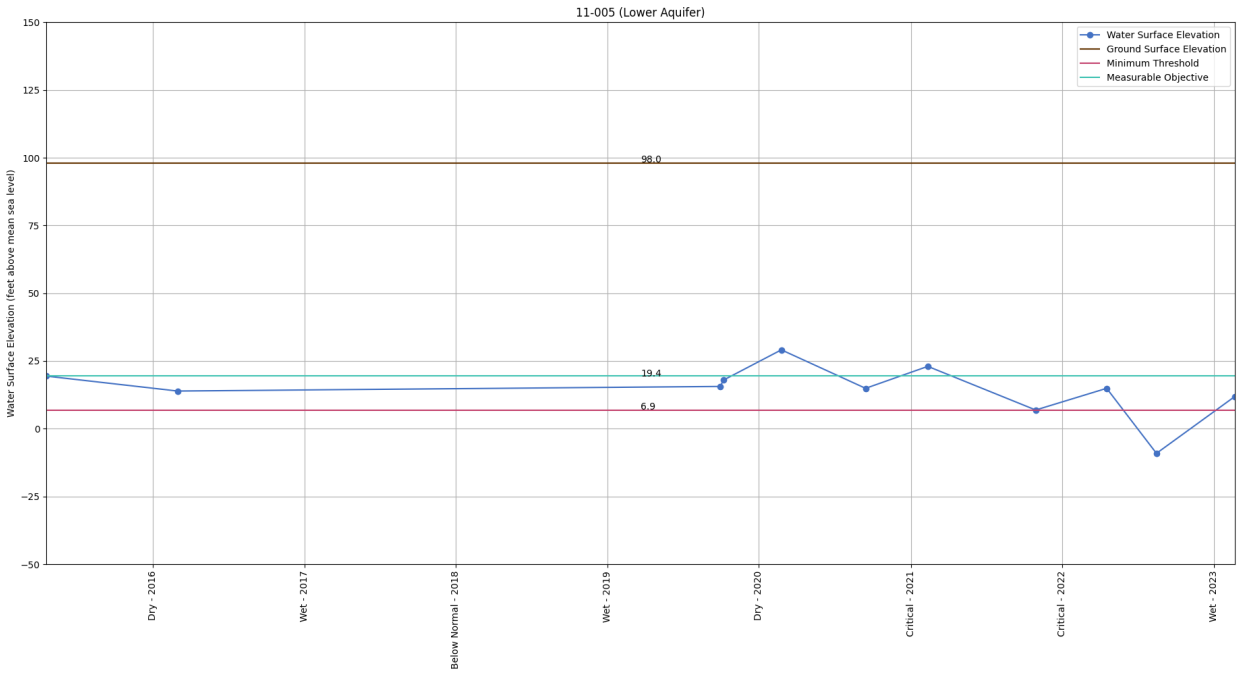

10-010 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
156.4
-17.0
-67.0
200
150
100
50
0
−50
−100
Wet - 2023
2024

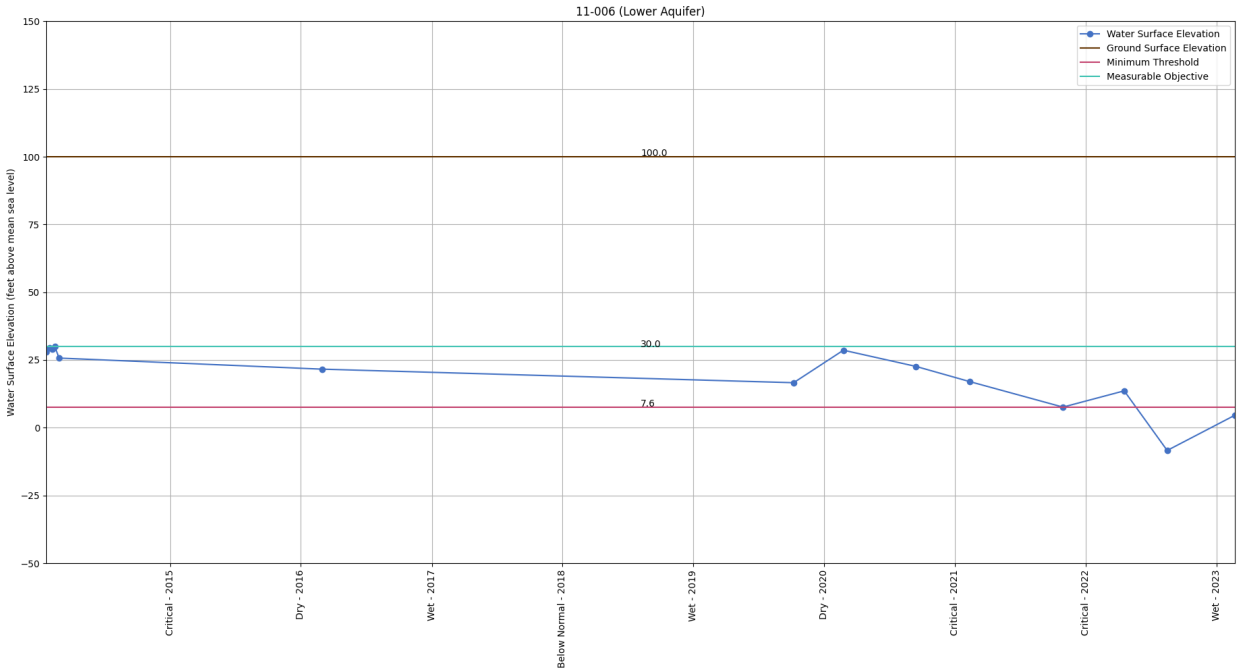

12-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
160.0
103.2
98.2
200
180
160
140
120
100
80
60
Dry - 1985
Wet - 1986
Critical - 1987
Critical - 1988
Critical - 1989
Critical - 1990
Critical - 1991
Critical - 1992
Wet - 1993
Critical - 1994
Wet - 1995
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022

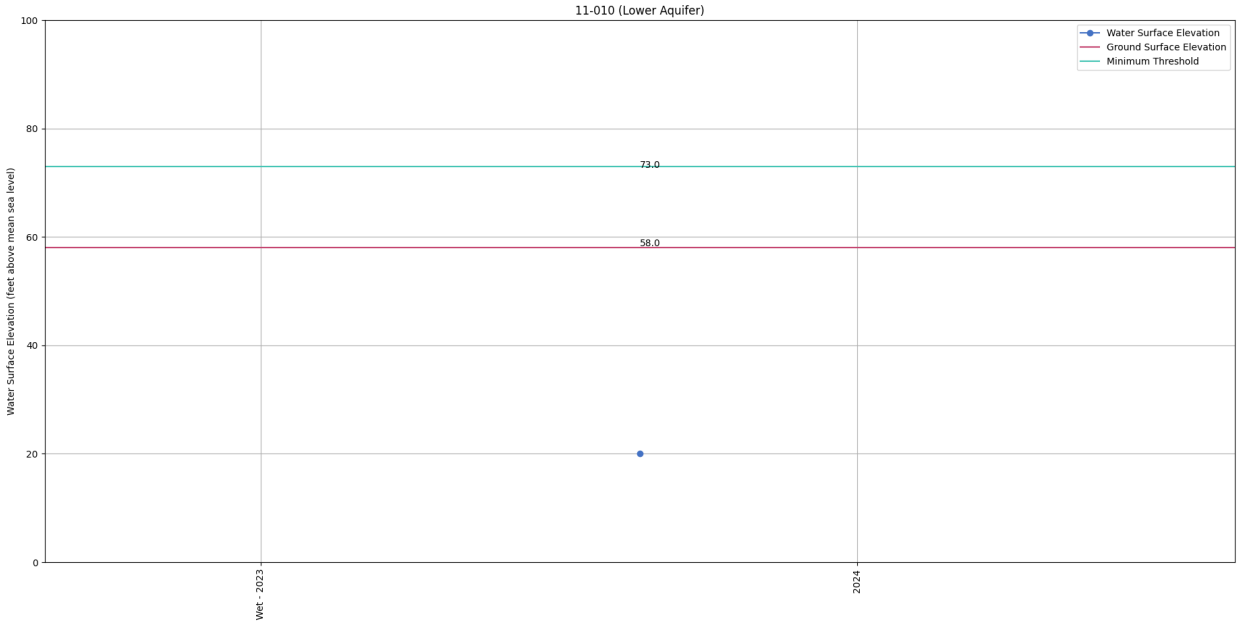

13-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
169.7
120.5
109.4
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

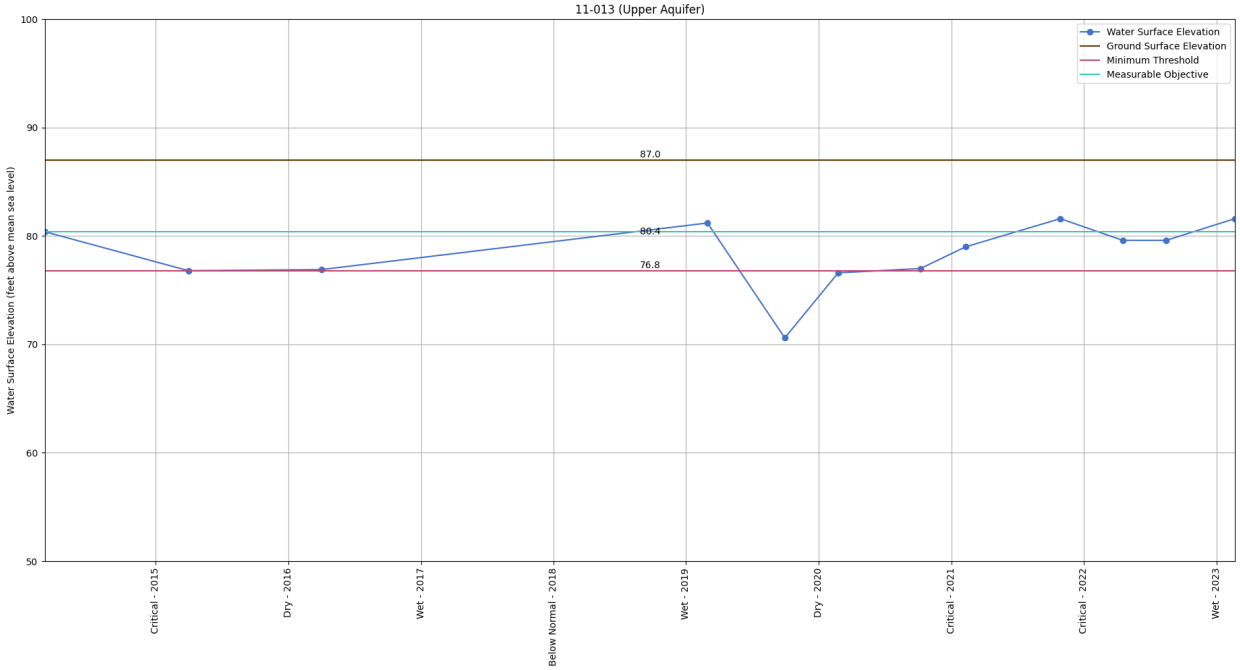

13-003 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
149.6
116.1
48.6
Critical - 1994
Wet - 1995
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

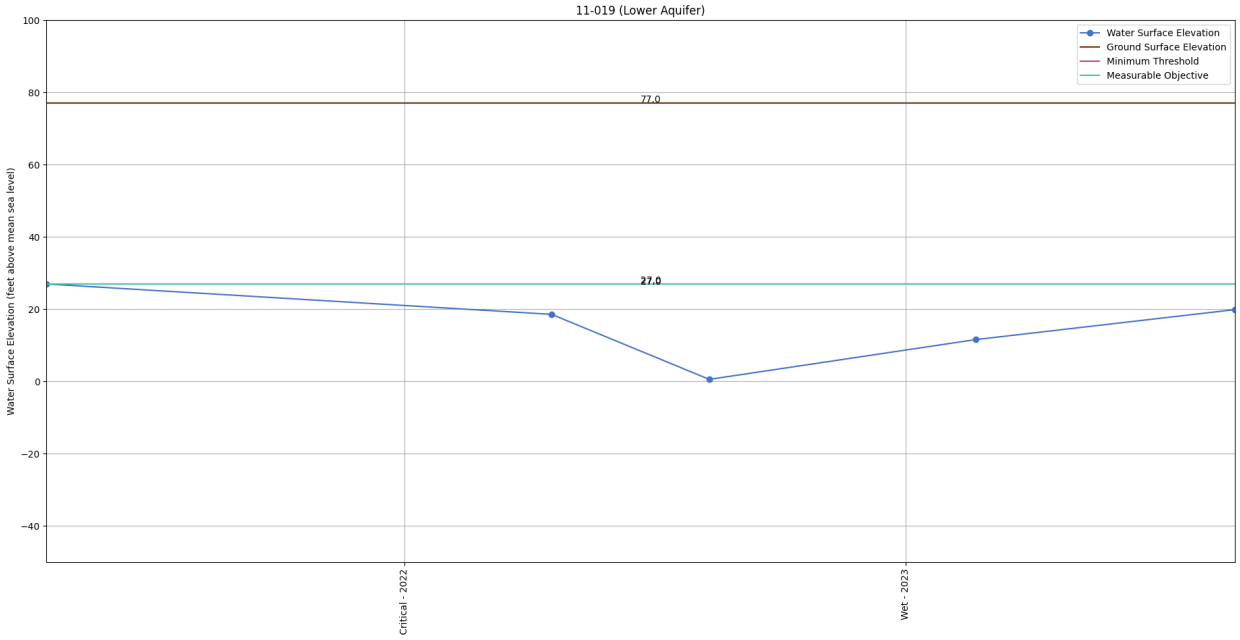

13-004 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
154.0
-27.0
-59.0
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
−100
Wet - 1986
Critical - 1987
Critical - 1988
Critical - 1989
Critical - 1990
Critical - 1991
Critical - 1992
Wet - 1993
Critical - 1994
Wet - 1995
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

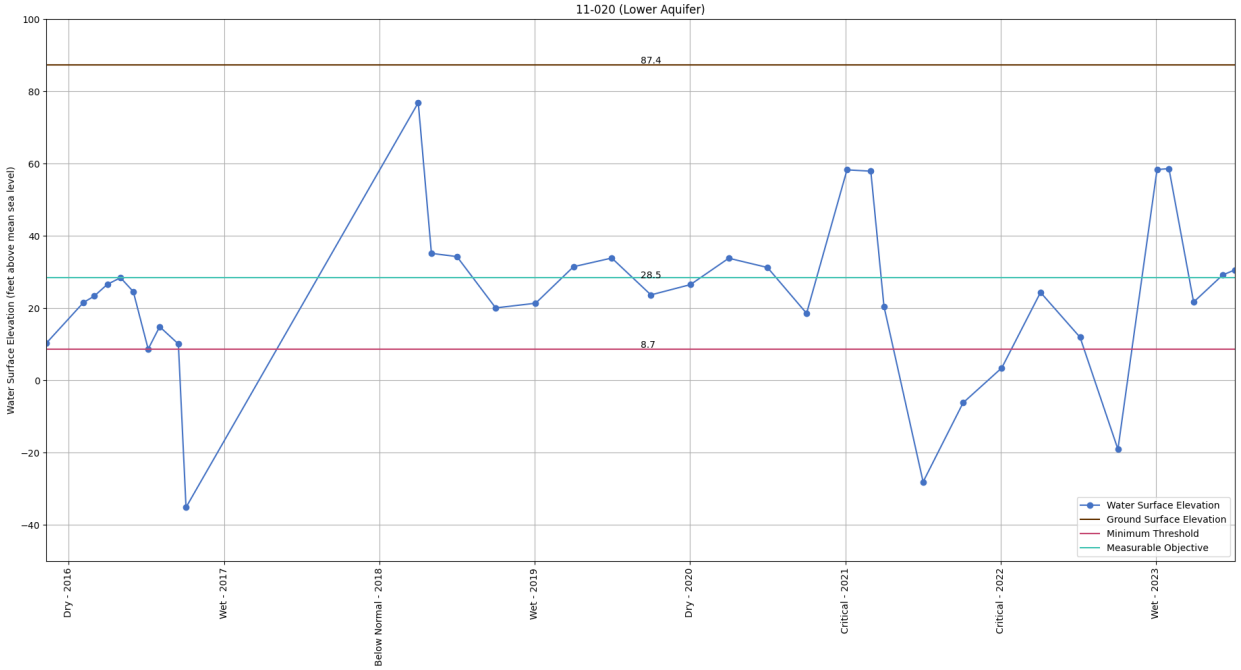

11-005 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
98.0
19.4
6.9
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

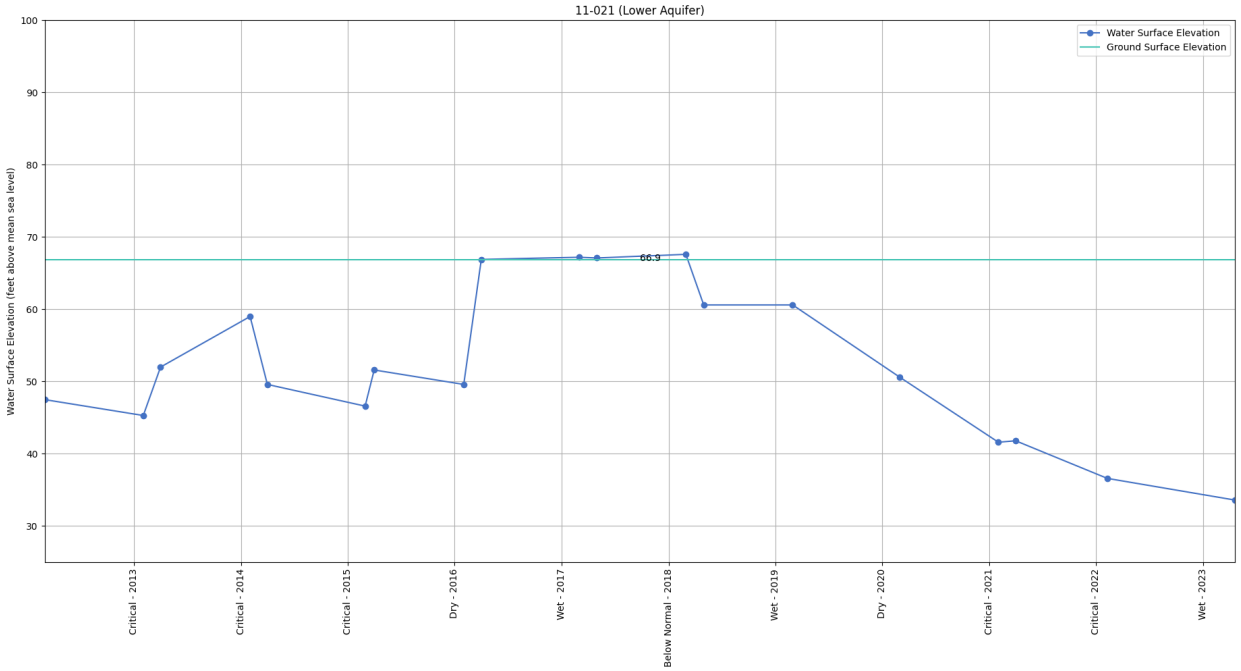

11-006 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
100.0
30.0
7.6
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

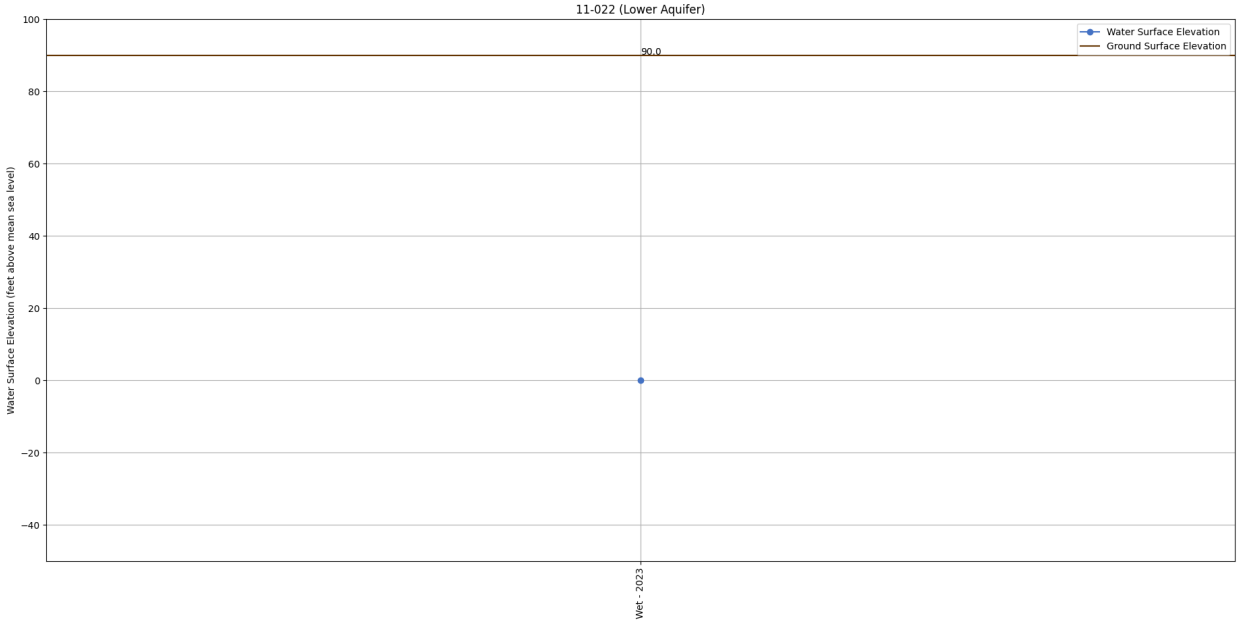

11-010 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
73.0
58.0
Water Surface Elevation (feet above mean sea level)
100
80
60
40
20
0
Wet - 2023
2024

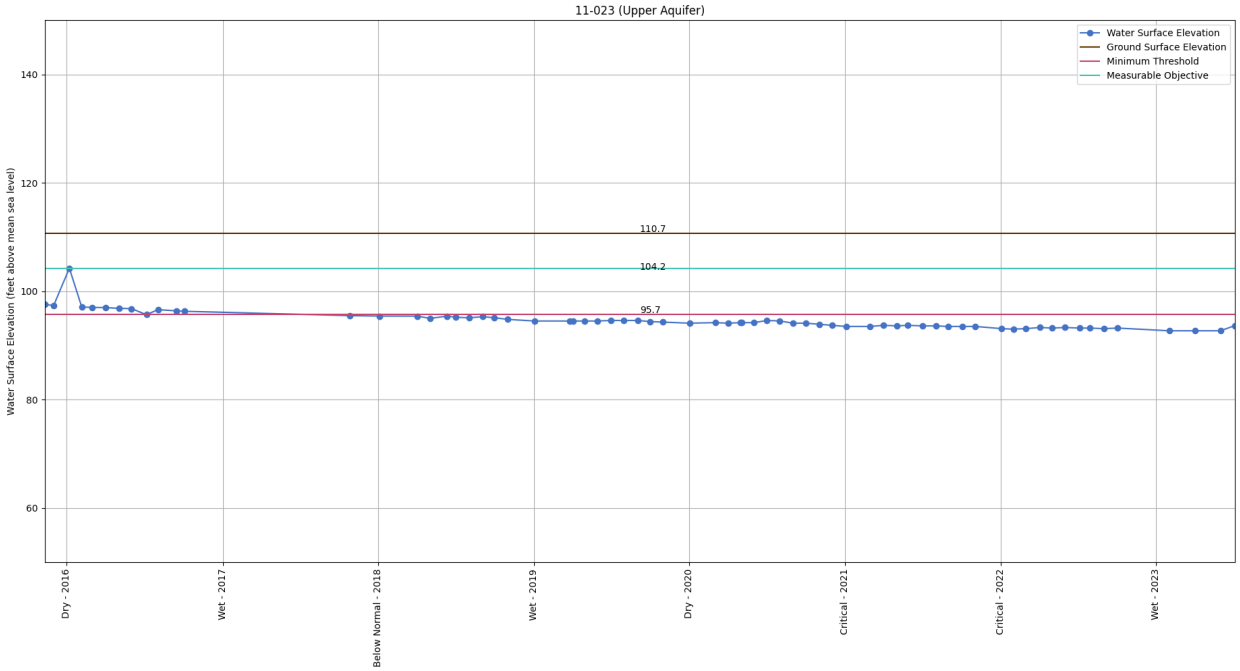

11-013 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
100
90
80
70
60
50
87.0
80.4
76.8
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

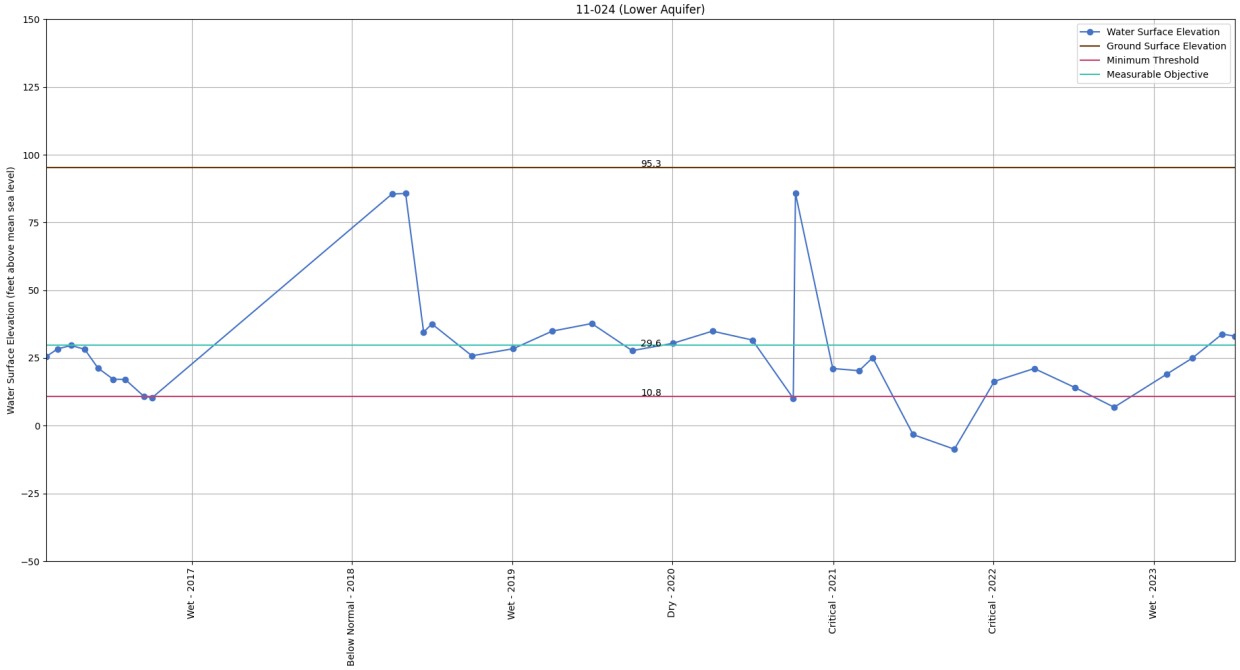

11-019 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
100
80
60
40
20
0
−20
−40
77.0
27.0
Critical - 2022
Wet - 2023

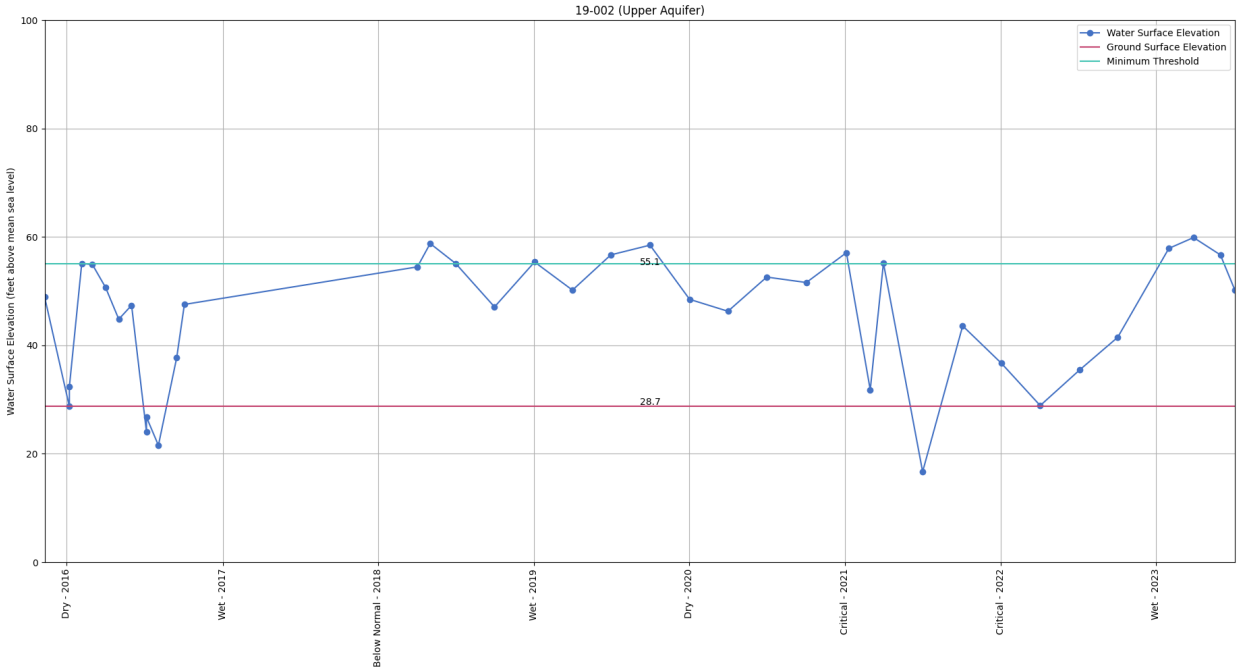

11-020 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
87.4
28.5
8.7
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

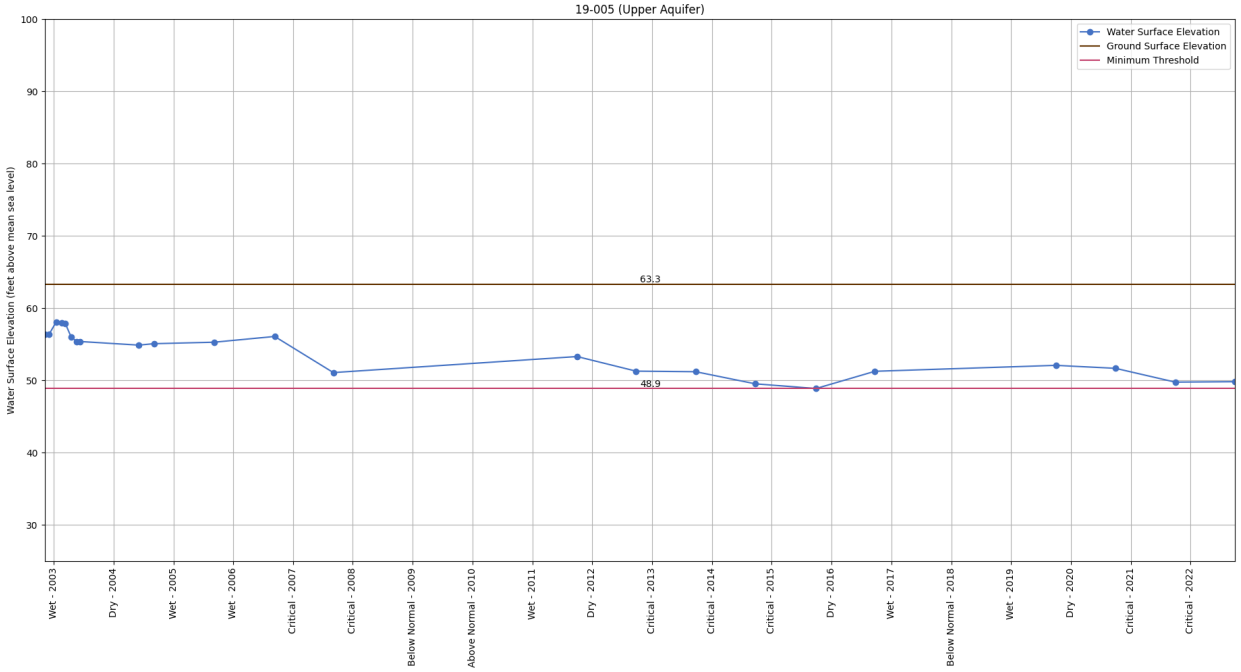

11-021 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
66.9
Water Surface Elevation
Ground Surface Elevation
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

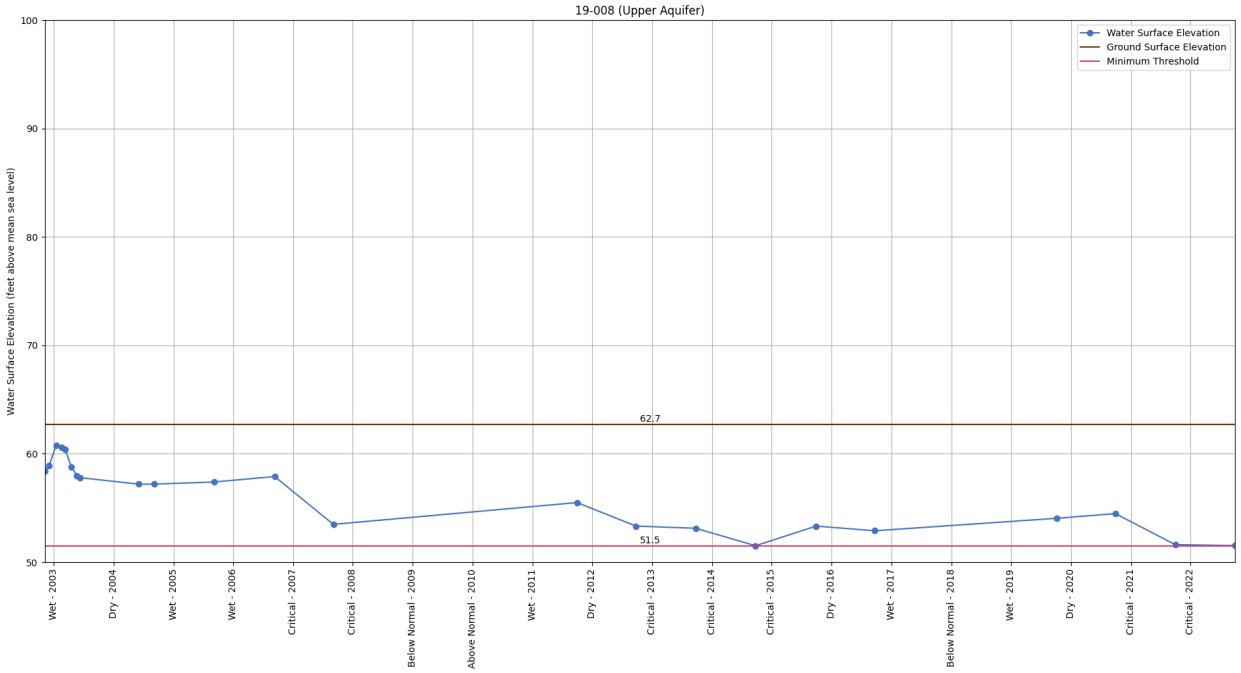

11-022 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
90.0
Water Surface Elevation (feet above mean sea level)
100
80
60
40
20
0
−20
−40
Wet - 2023

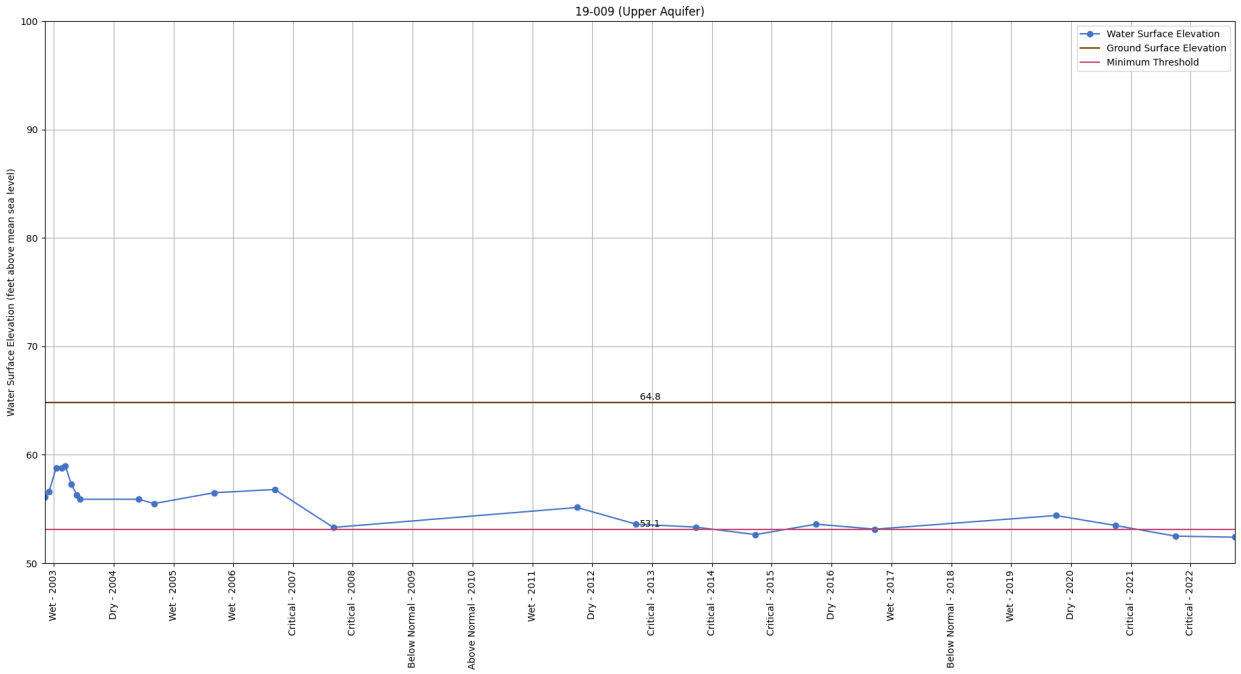

11-023 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
110.7
104.2
95.7
Water Surface Elevation (feet above mean sea level)
140
120
100
80
60
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

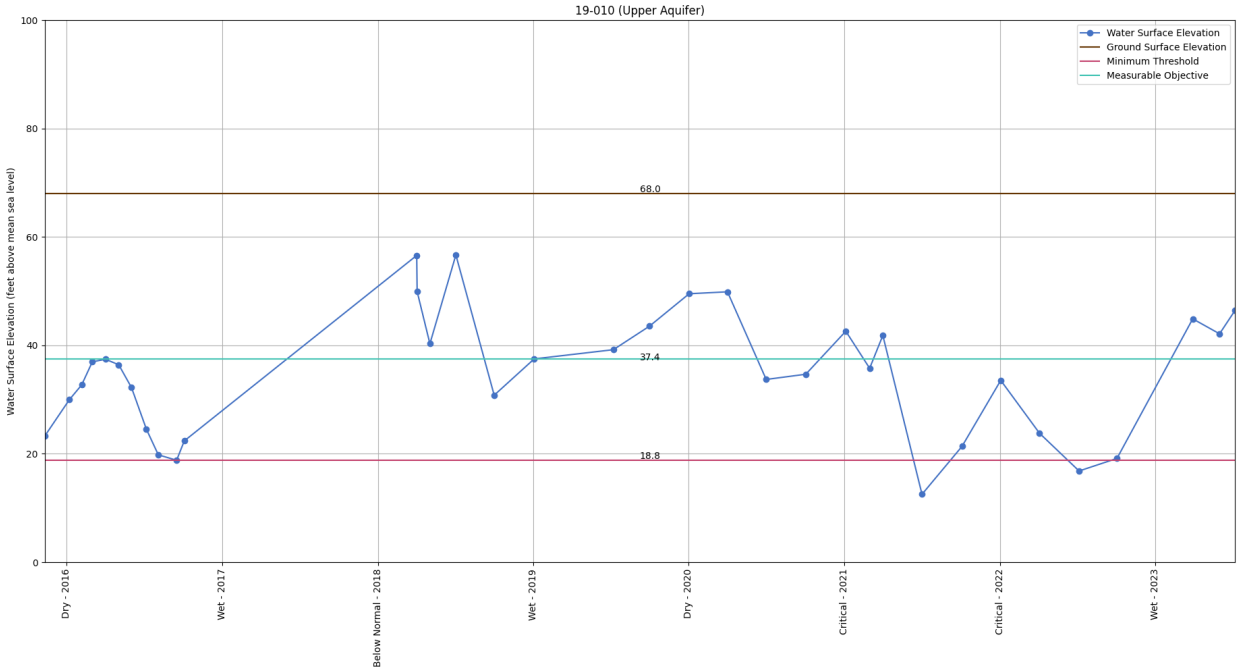

11-024 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
95.3
29.6
10.8
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

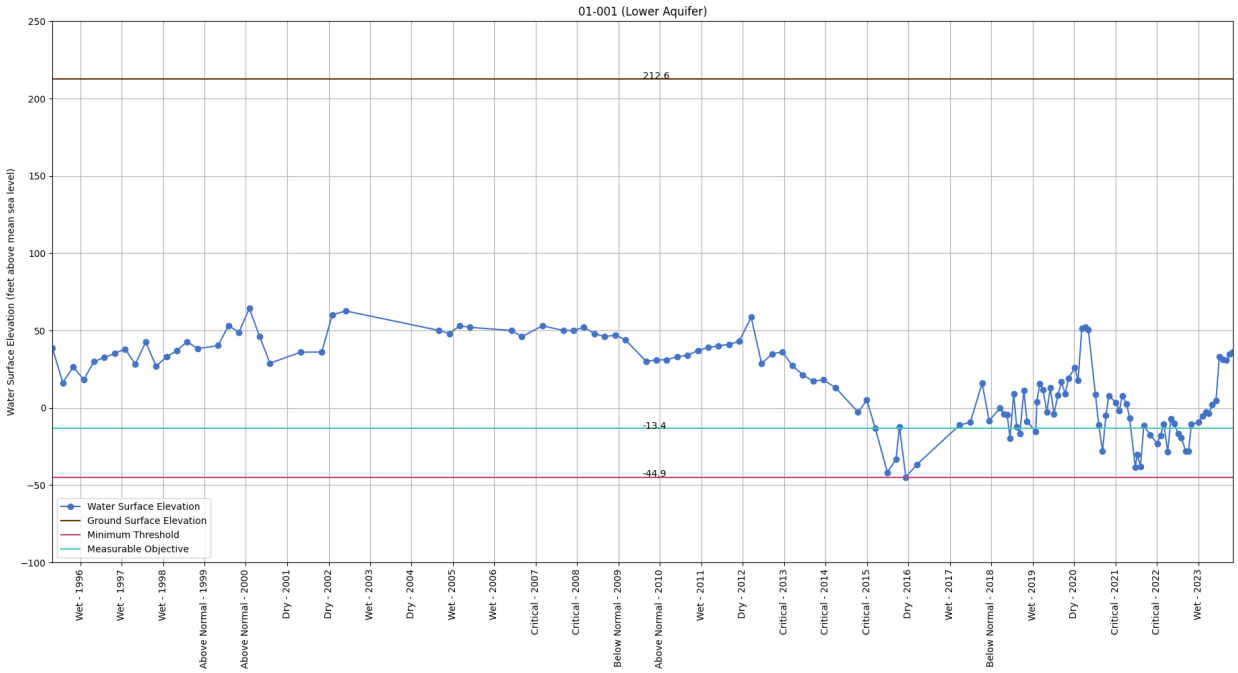

19-002 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Water Surface Elevation (feet above mean sea level)
100
80
60
40
20
0
55.1
28.7
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

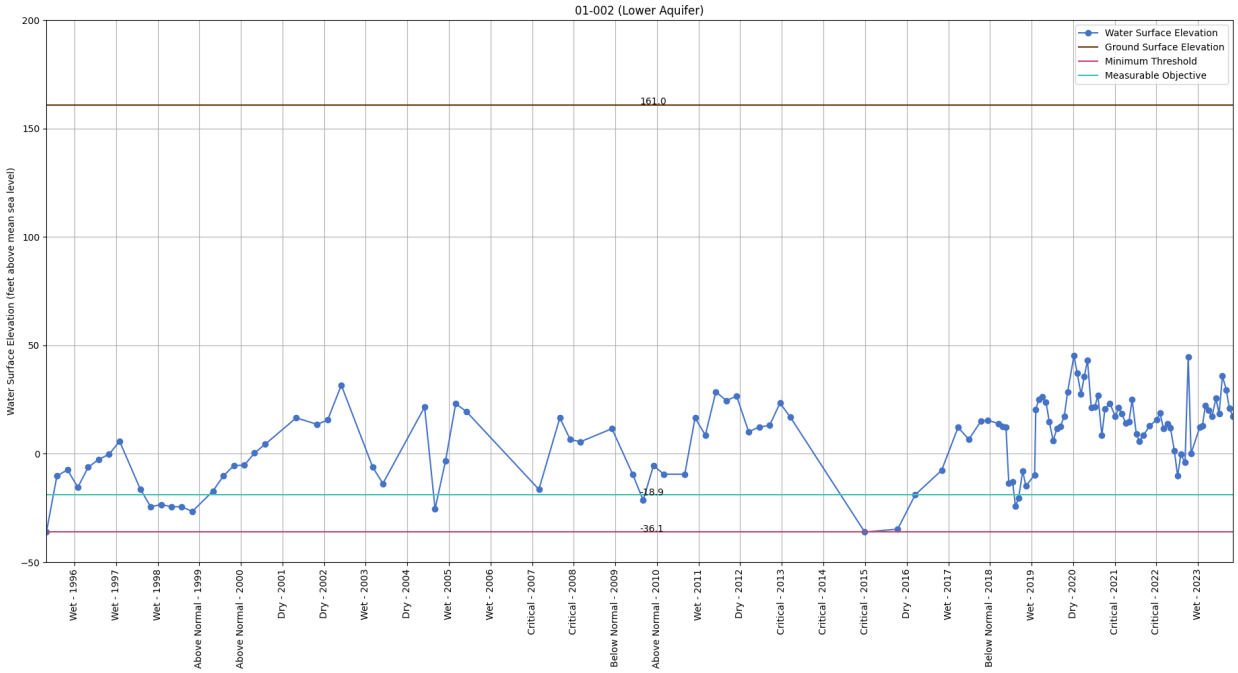

19-005 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Water Surface Elevation (feet above mean sea level)
63.3
48.9
100
90
80
70
60
50
40
30
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022

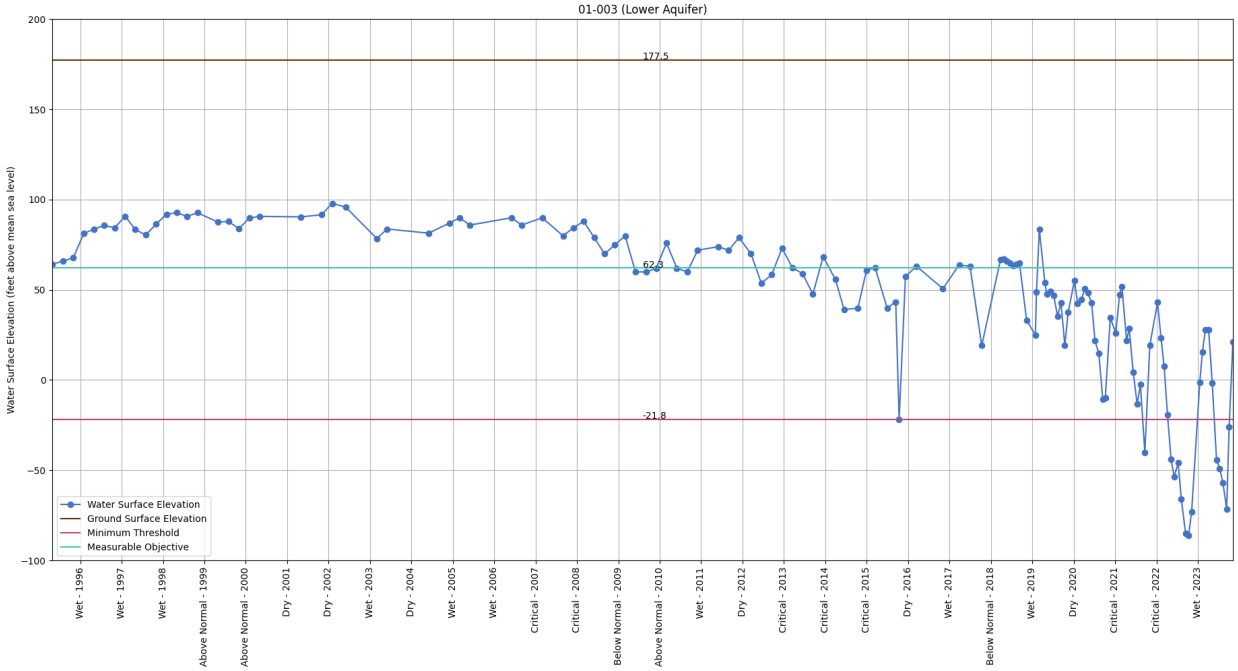

19-008 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Water Surface Elevation (feet above mean sea level)
62.7
51.5
100
90
80
70
60
50
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022

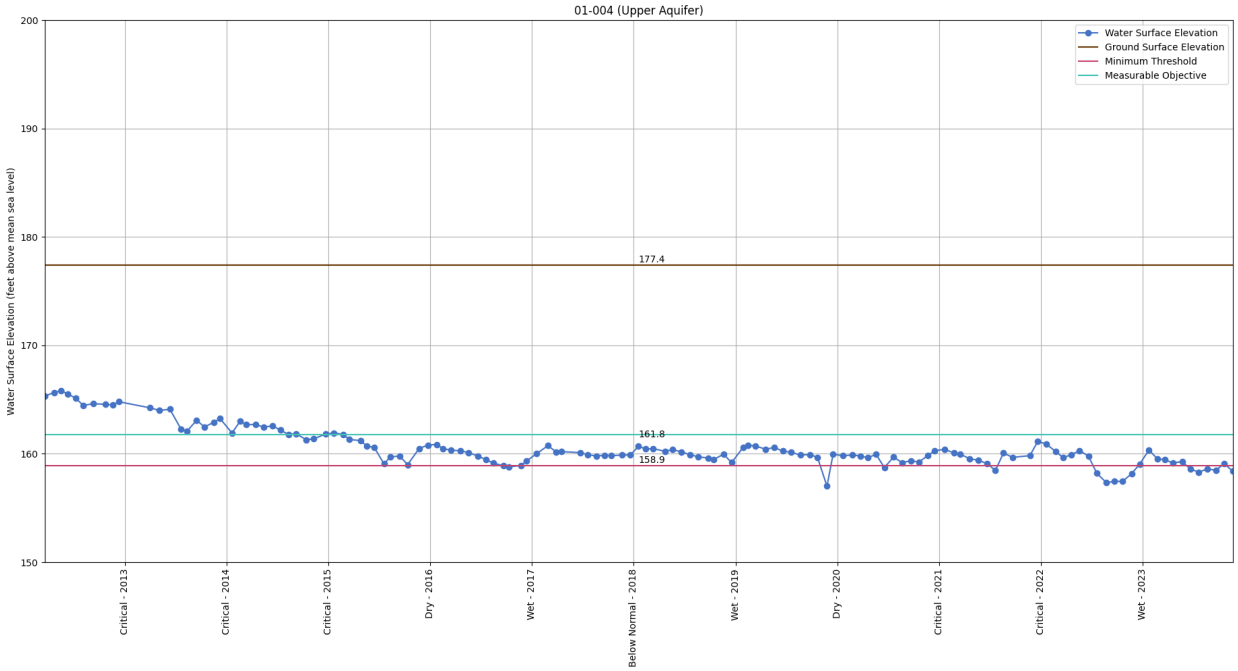

19-009 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Water Surface Elevation (feet above mean sea level)
100
90
80
70
60
50
64.8
53.1
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022

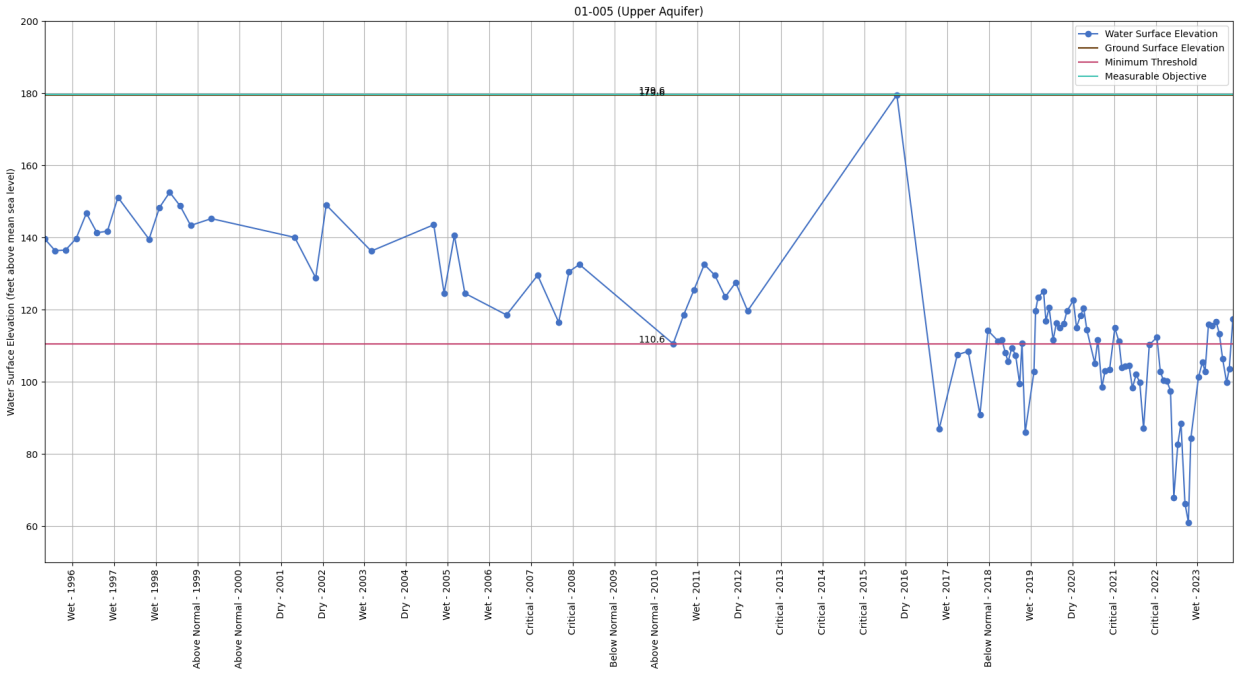

19-010 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
100
80
60
40
20
0
68.0
37.4
18.8
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

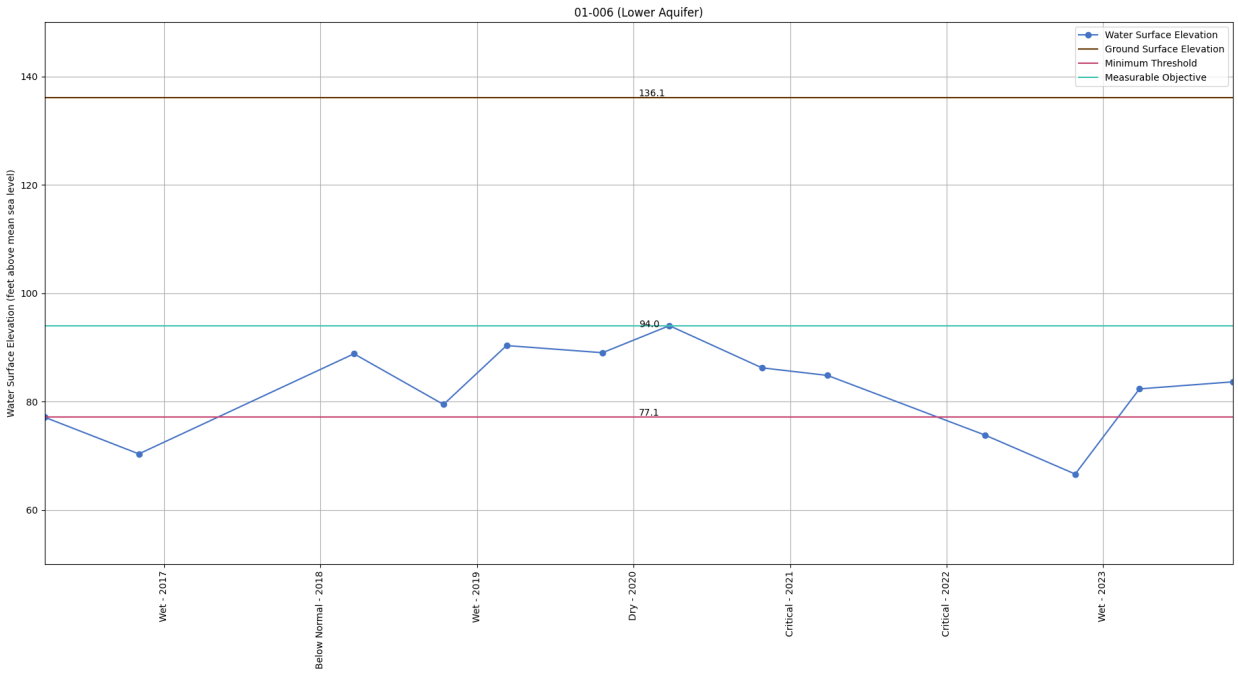

01-001 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
212.6
-13.4
-44.9
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

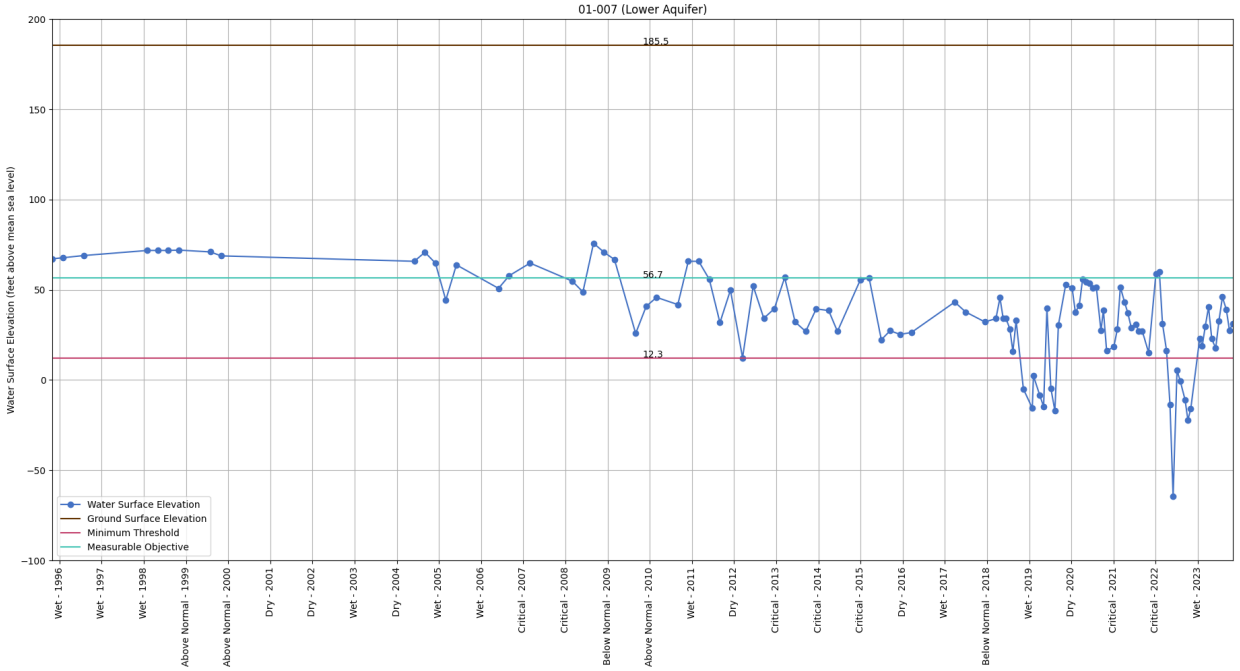

01-002 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
161.0
-18.9
-36.1
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

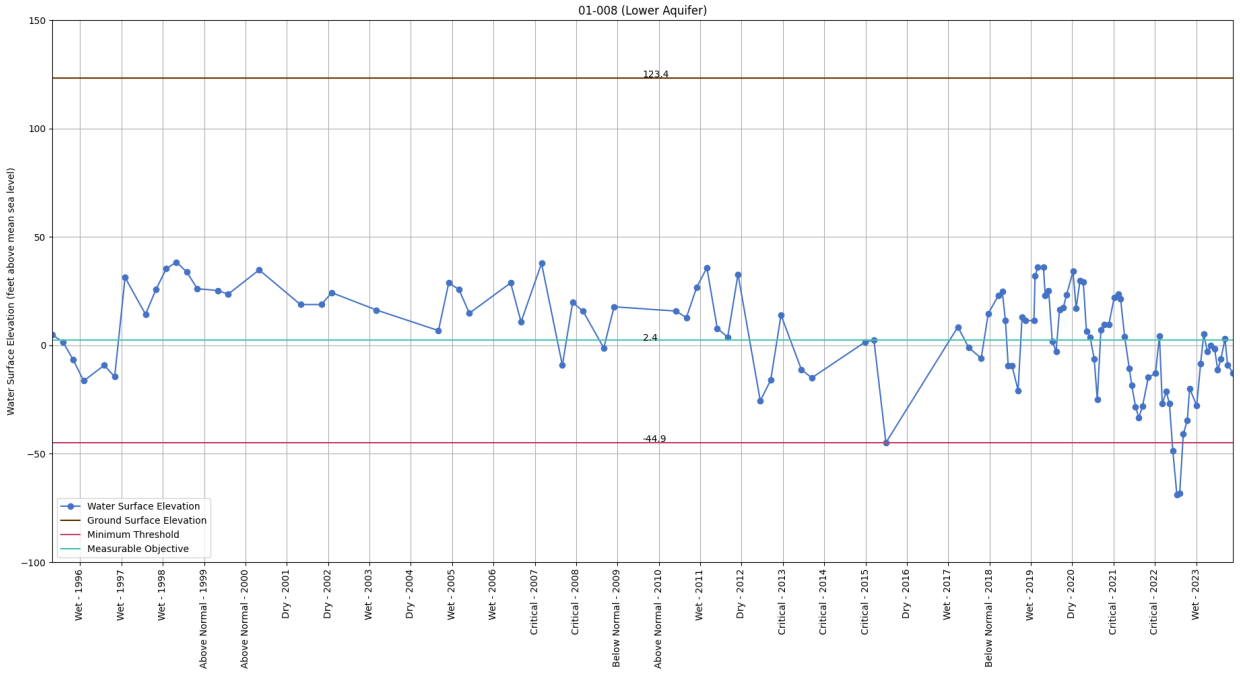

01-003 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
177.5
62.3
-21.8
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

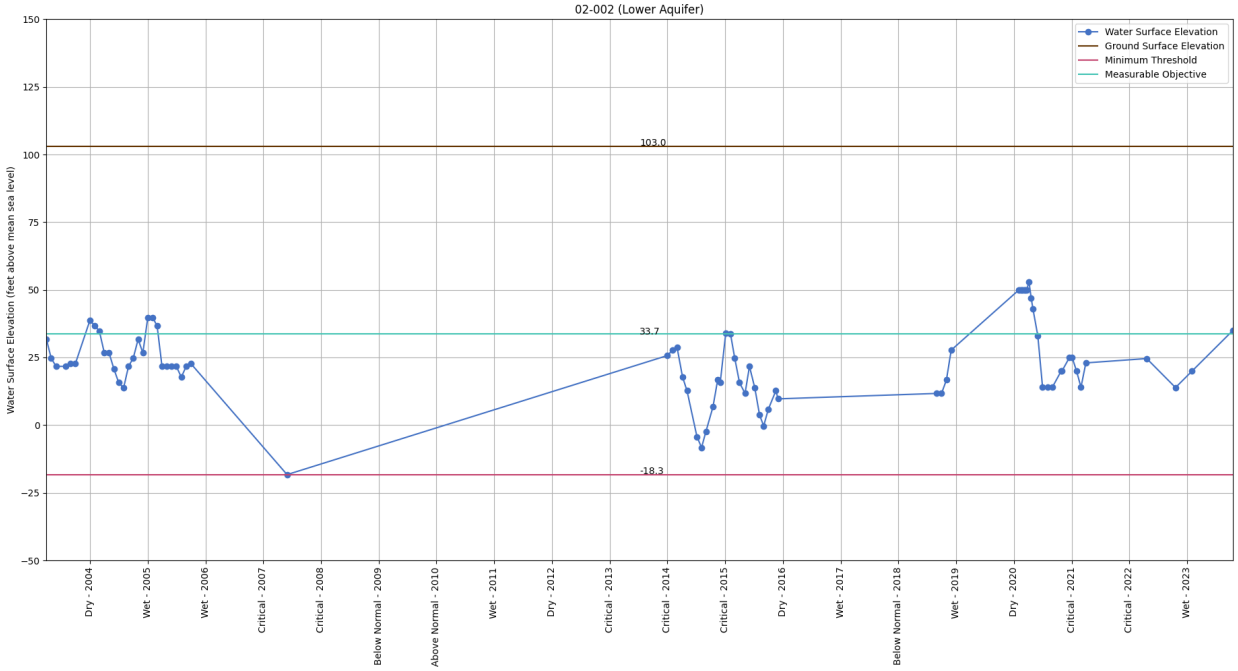

01-004 (Upper Aquifer)
Water Surface Elevation (feet above mean sea level)
177.4
161.8
158.9
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

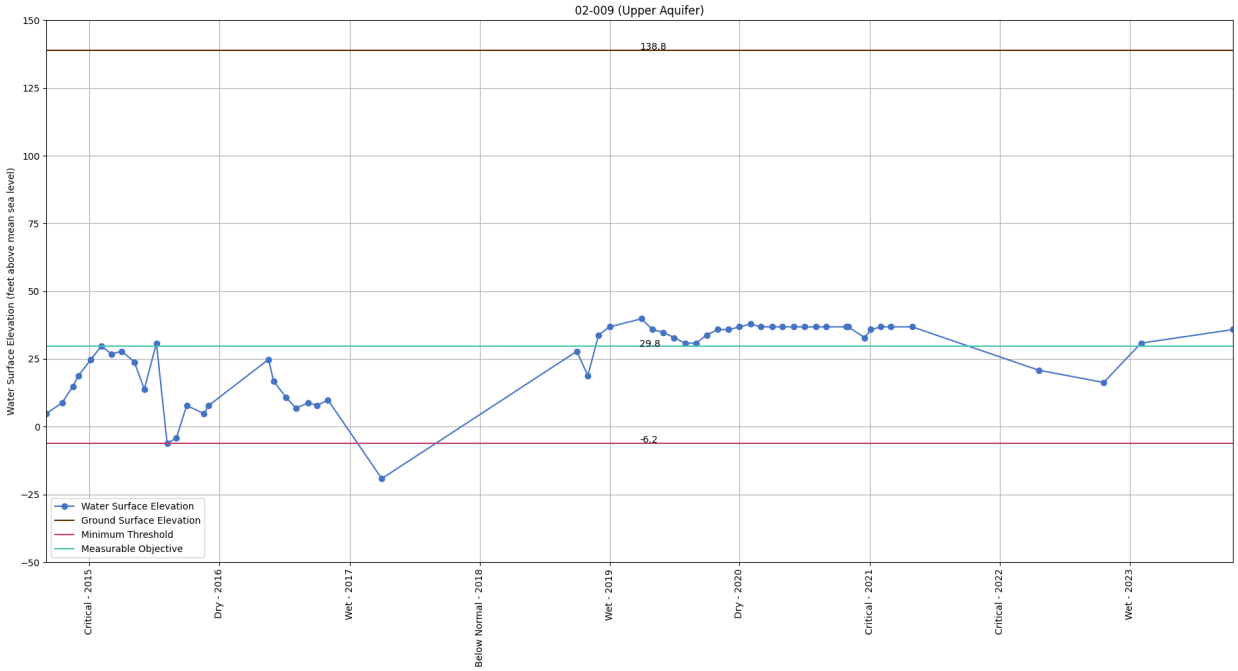

01-005 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
200
180
160
140
120
100
80
60
179.6
110.6
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

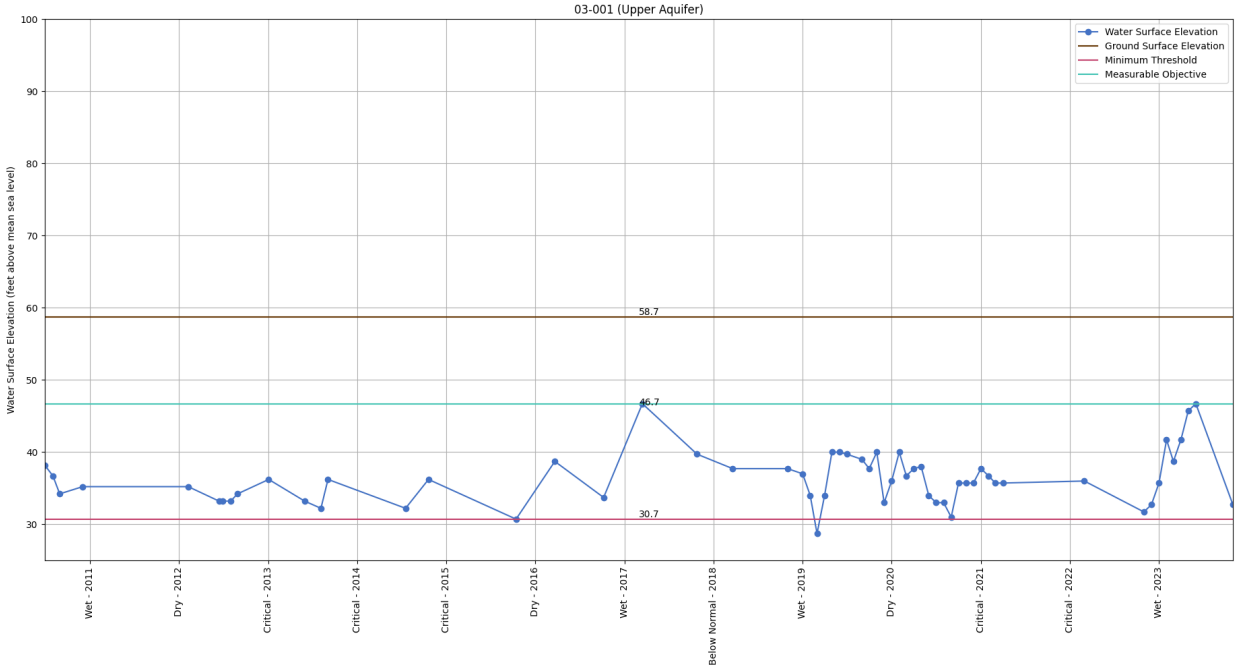

01-006 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
140
120
100
80
60
136.1
94.0
77.1
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

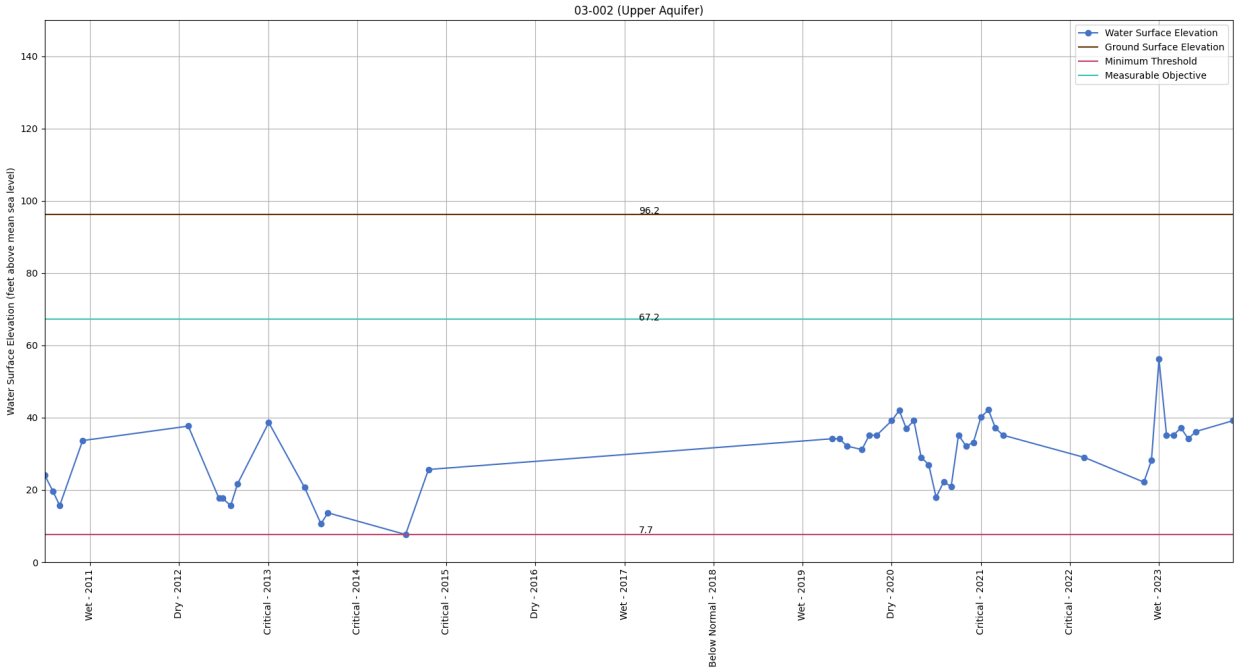

01-007 (Lower Aquifer)
185.5
56.7
12.3
Water Surface Elevation (feet above mean sea level)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

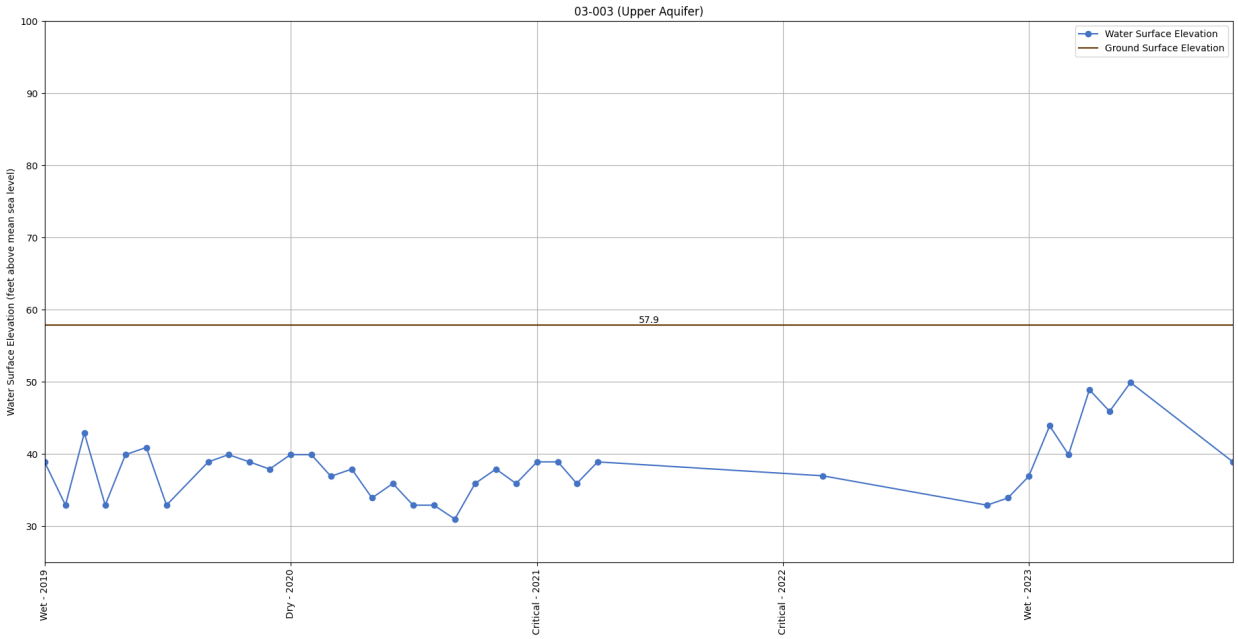

01-008 (Lower Aquifer)
123.4
2.4
-44.9
Water Surface Elevation (feet above mean sea level)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

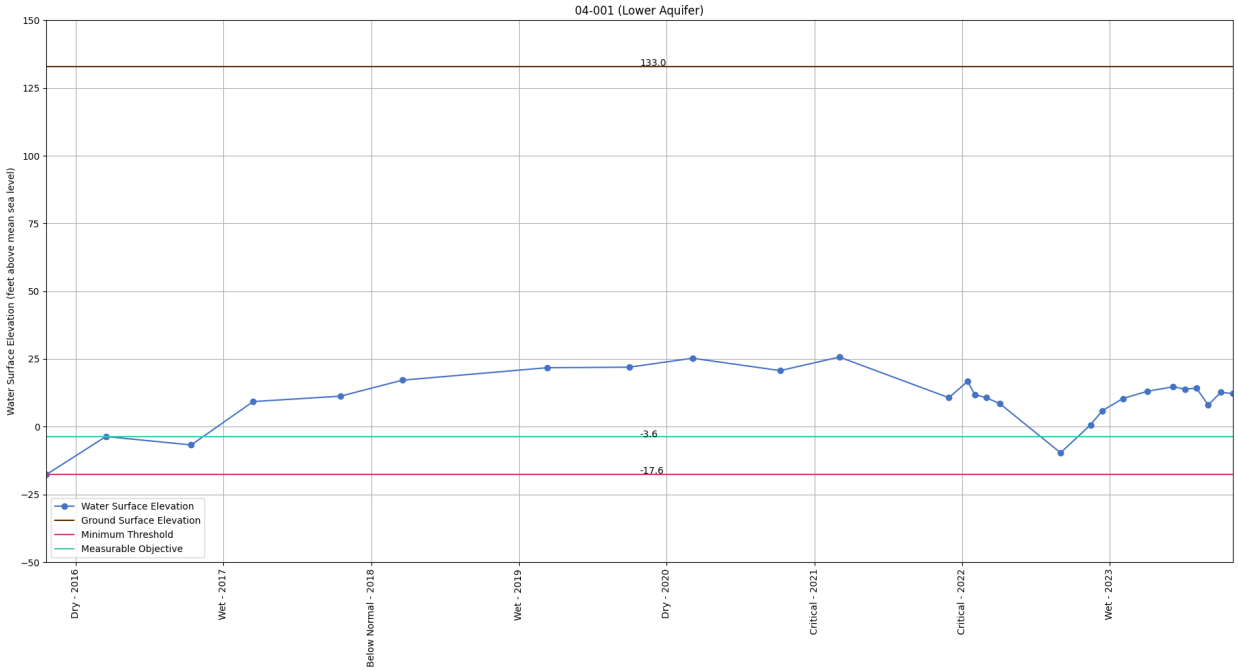

02-002 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
103.0
33.7
-18.3
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

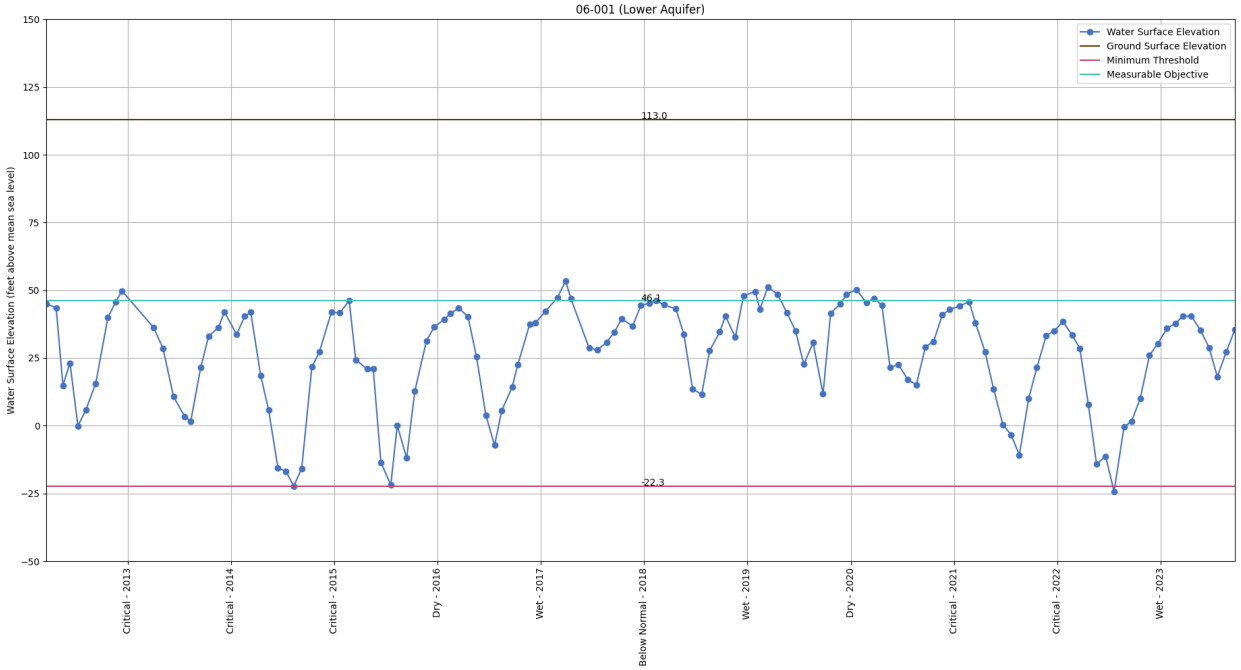

02-009 (Upper Aquifer)
138.8
29.8
-6.2
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

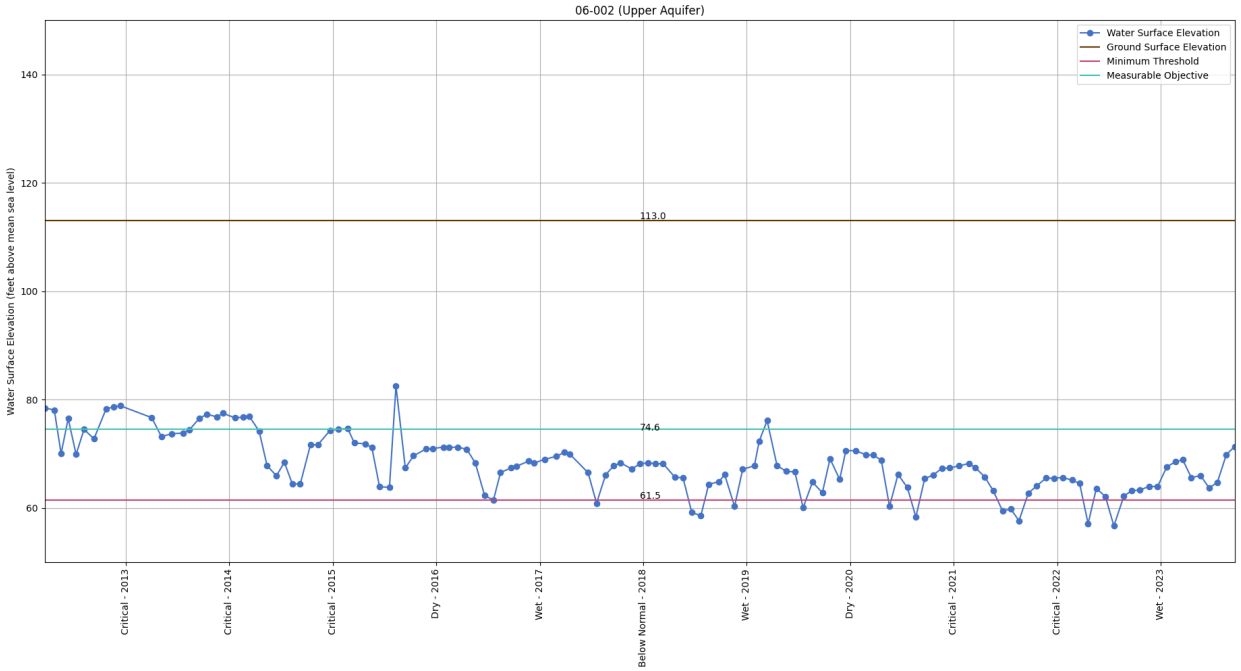

03-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
58.7
46.7
30.7
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

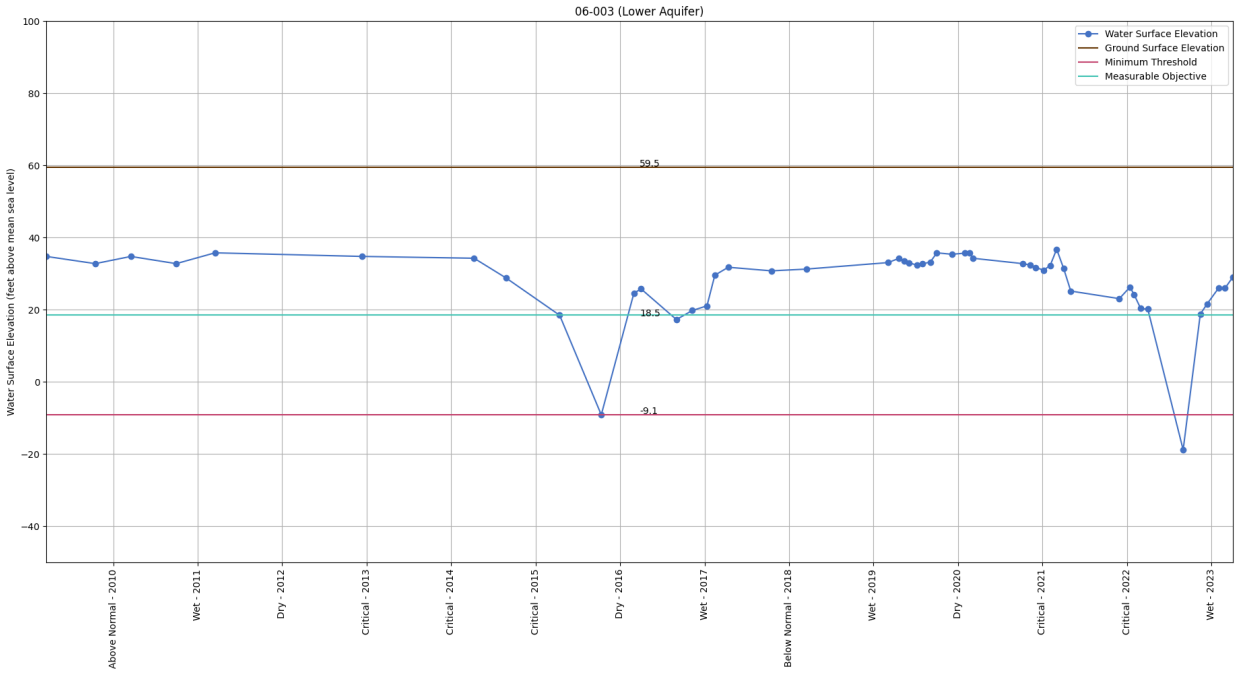

03-002 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
96.2
67.2
7.7
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

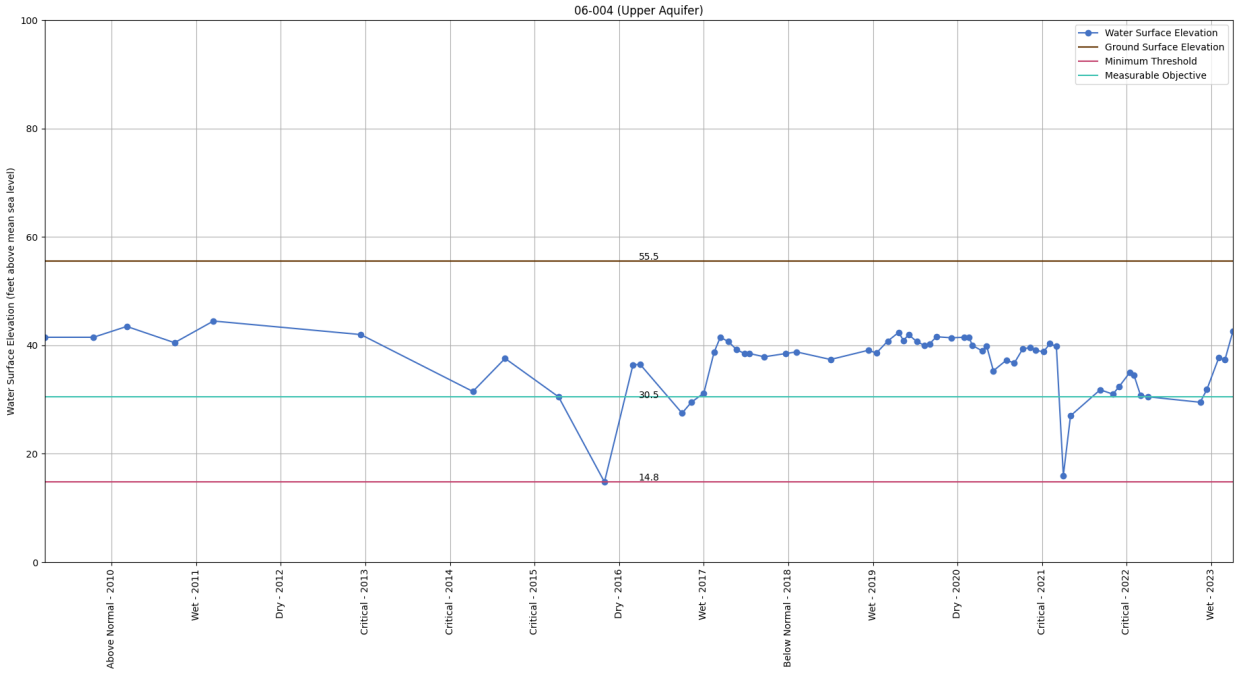

03-003 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Water Surface Elevation (feet above mean sea level)
57.9
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

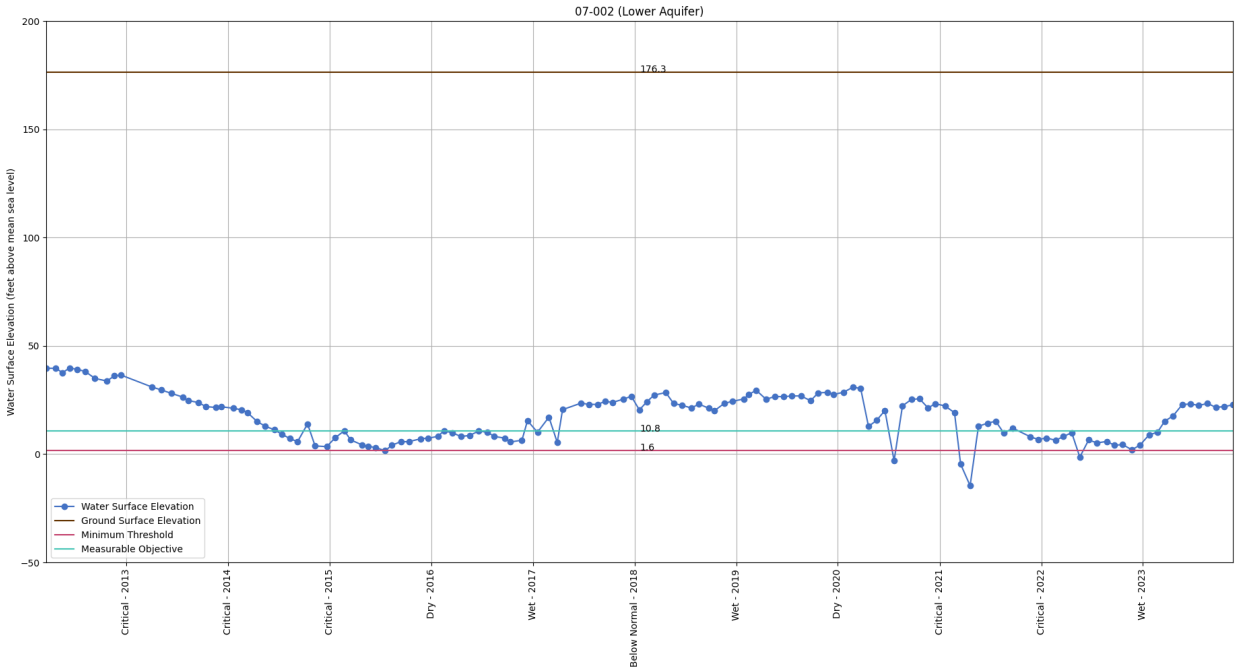

04-001 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
133.0
-3.6
-17.6
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

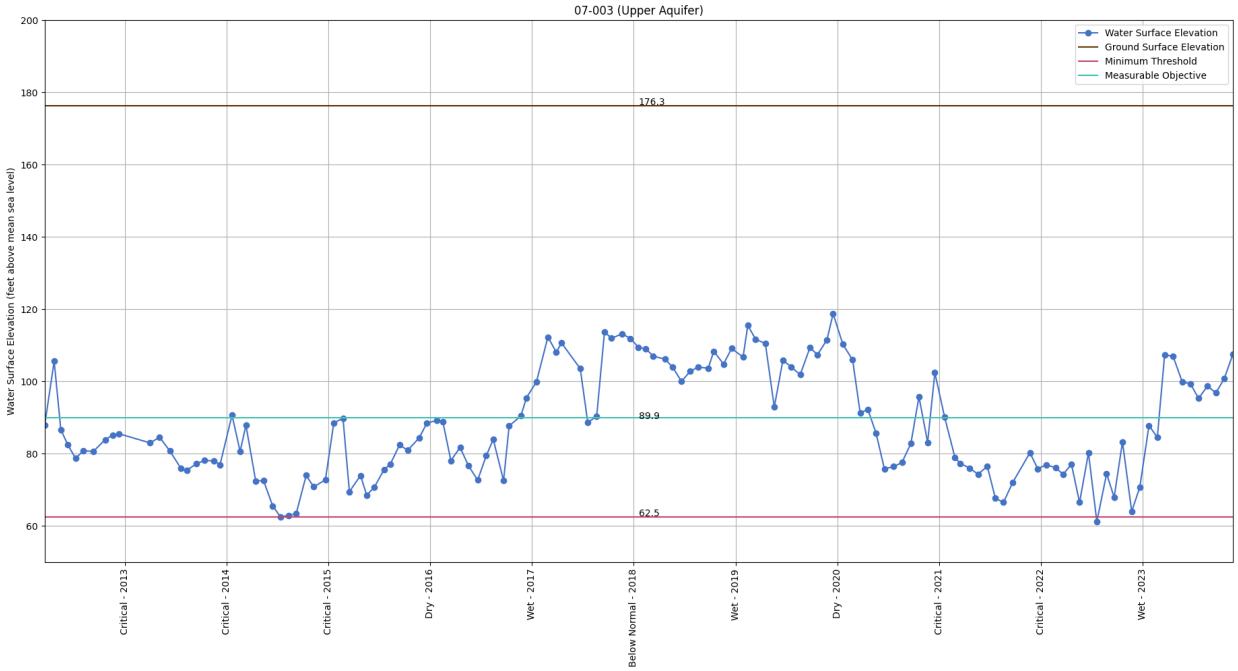

06-001 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
113.0
46.1
-22.3
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

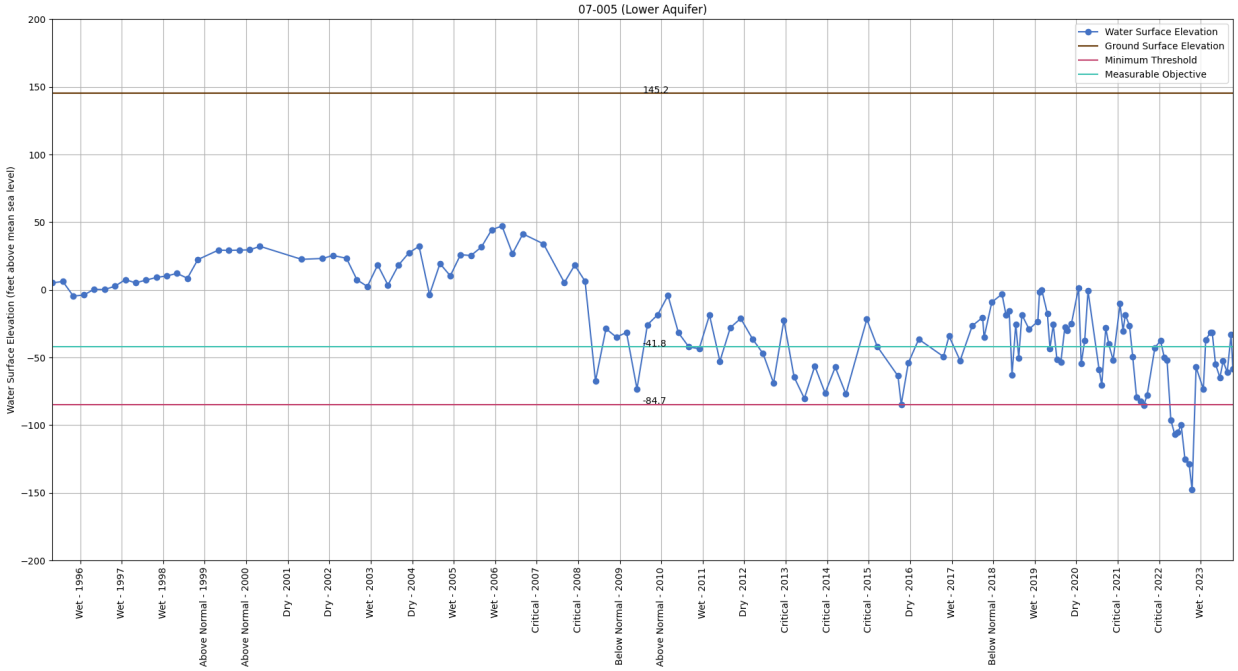

06-002 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
113.0
74.6
61.5
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

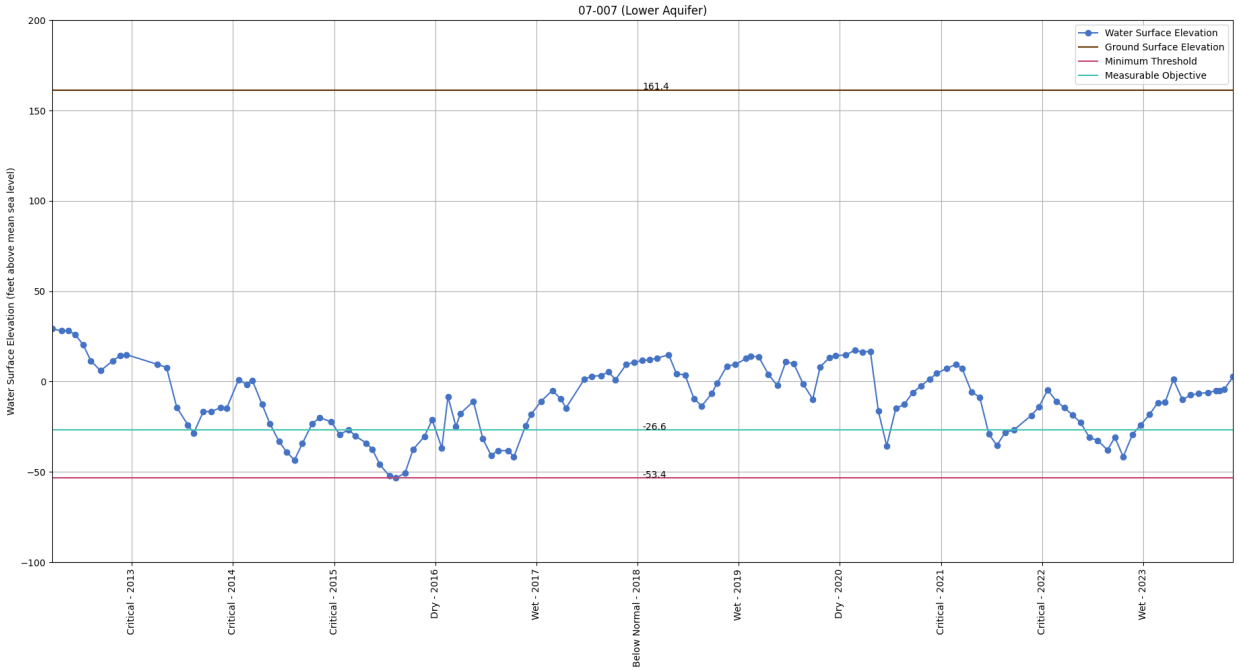

06-003 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
59.5
18.5
-9.1
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

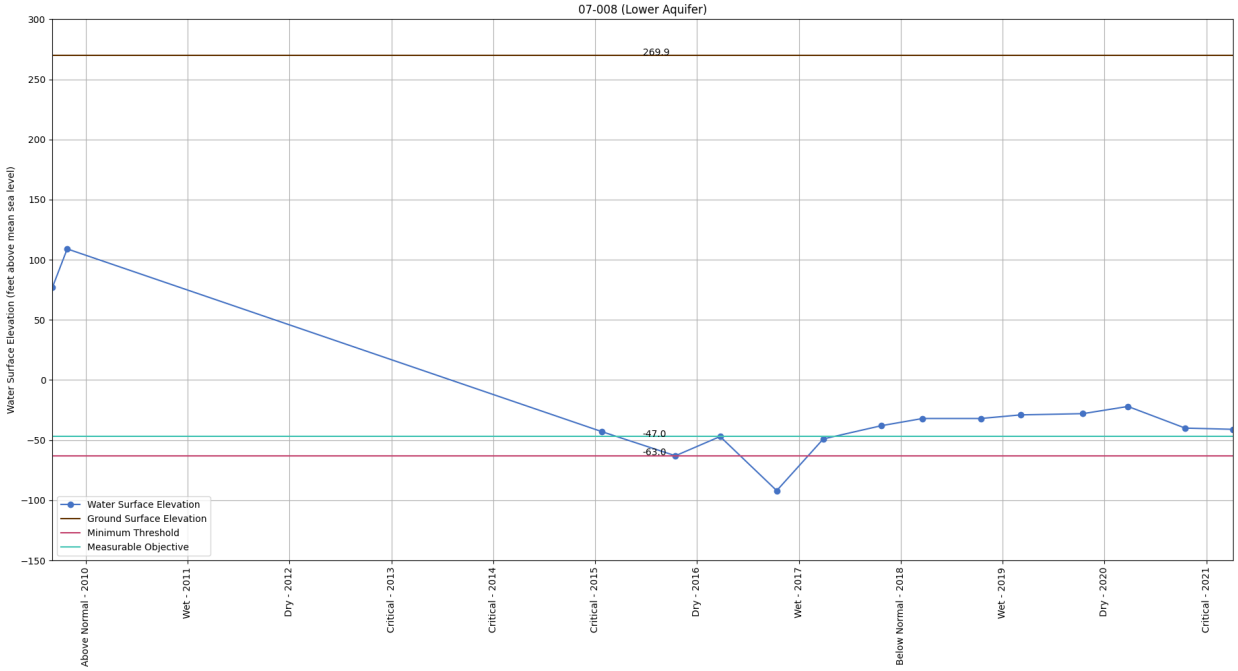

06-004 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
55.5
30.5
14.8
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

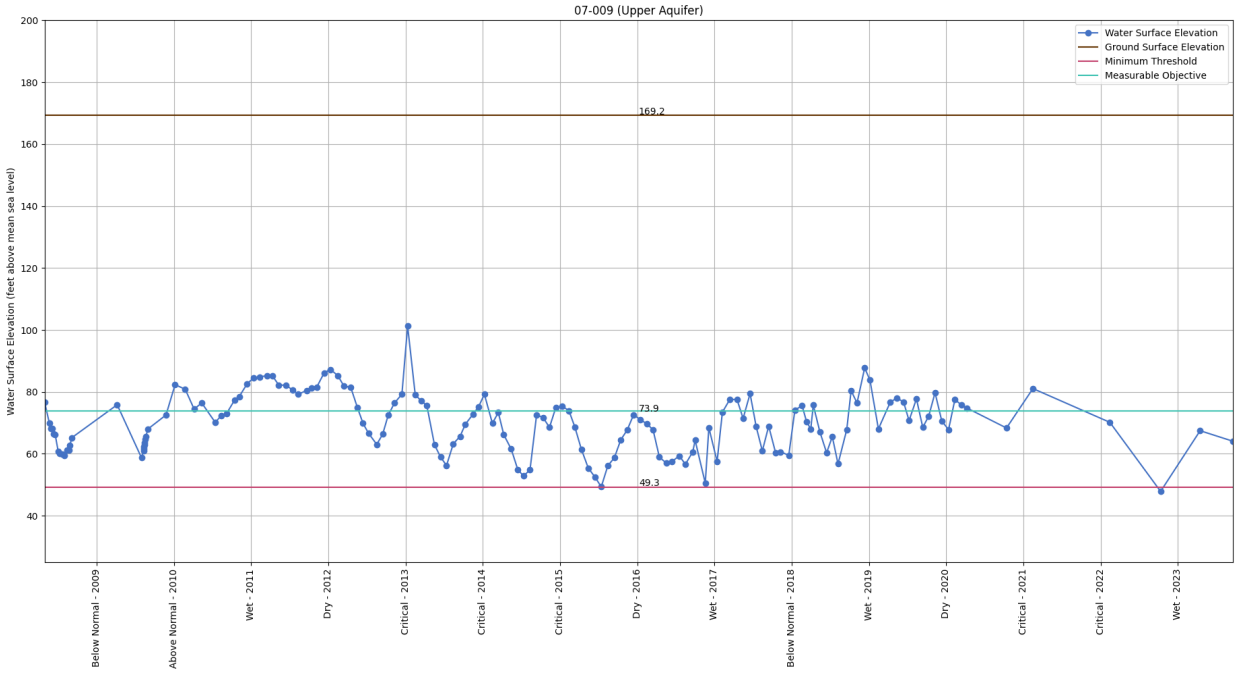

07-002 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
176.3
10.8
1.6
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

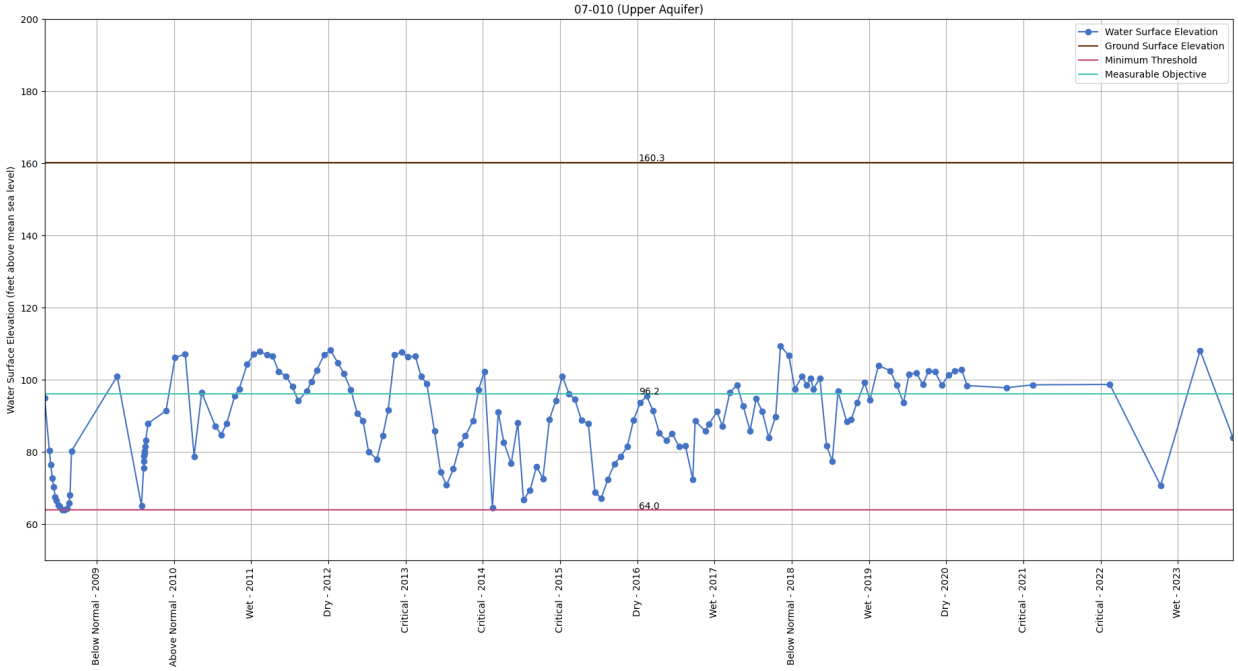

07-003 (Upper Aquifer)
Water Surface Elevation (feet above mean sea level)
176.3
89.9
62.5
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

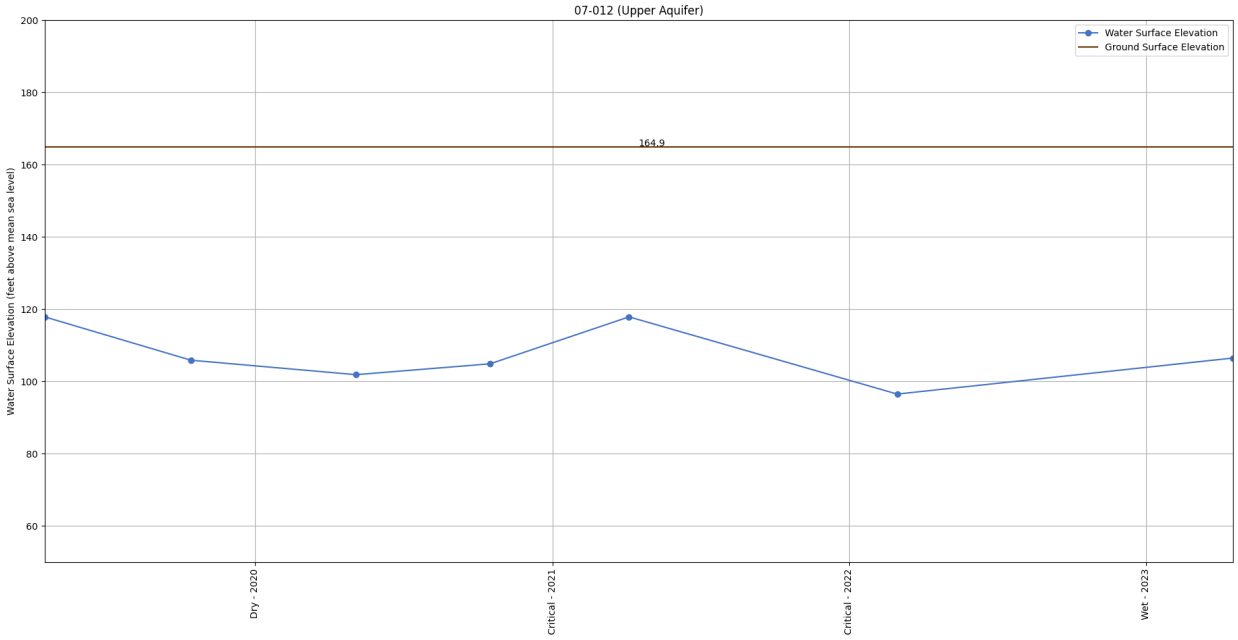

07-005 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
145.2
-41.8
-84.7
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
−100
−150
−200
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

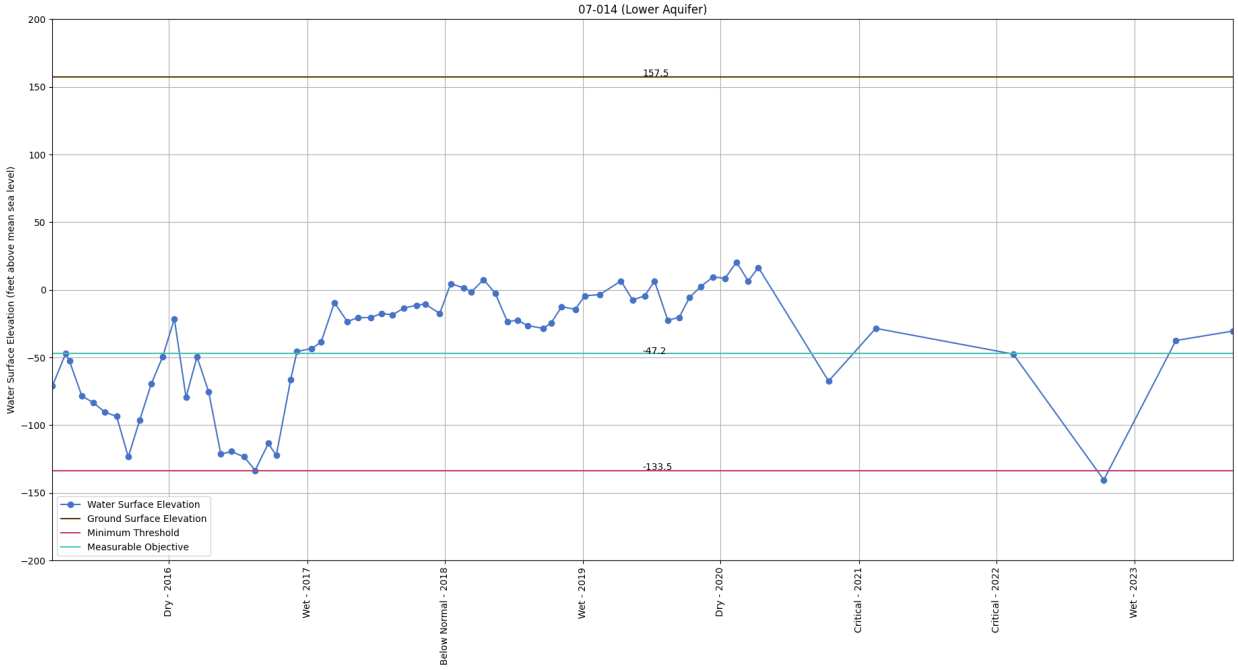

07-007 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
161.4
-26.6
-53.4
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
−100
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

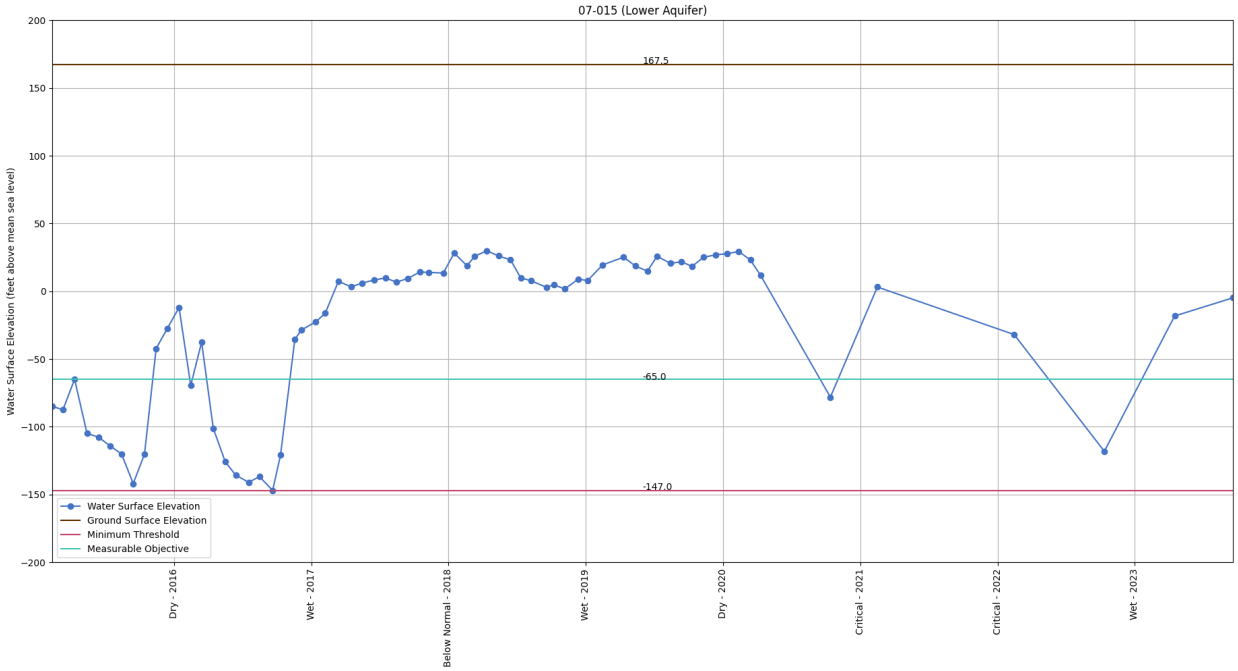

07-008 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
269.9
-47.0
-63.0
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021

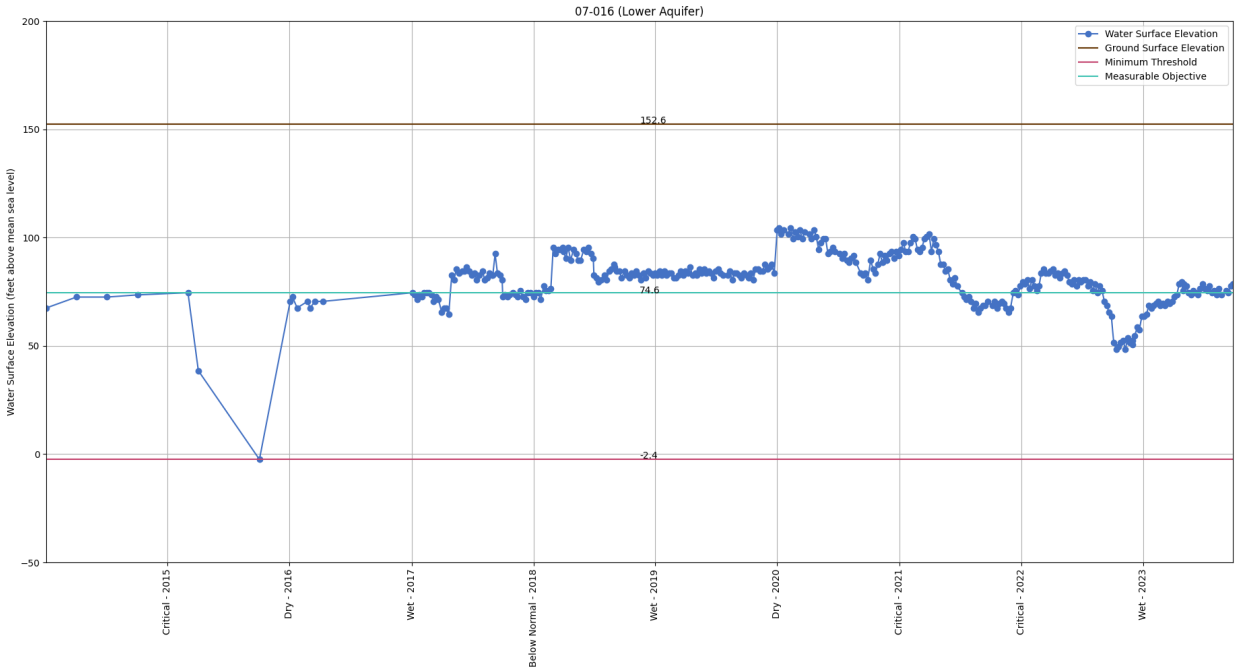

07-009 (Upper Aquifer)
Water Surface Elevation (feet above mean sea level)
169.2
73.9
49.3
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

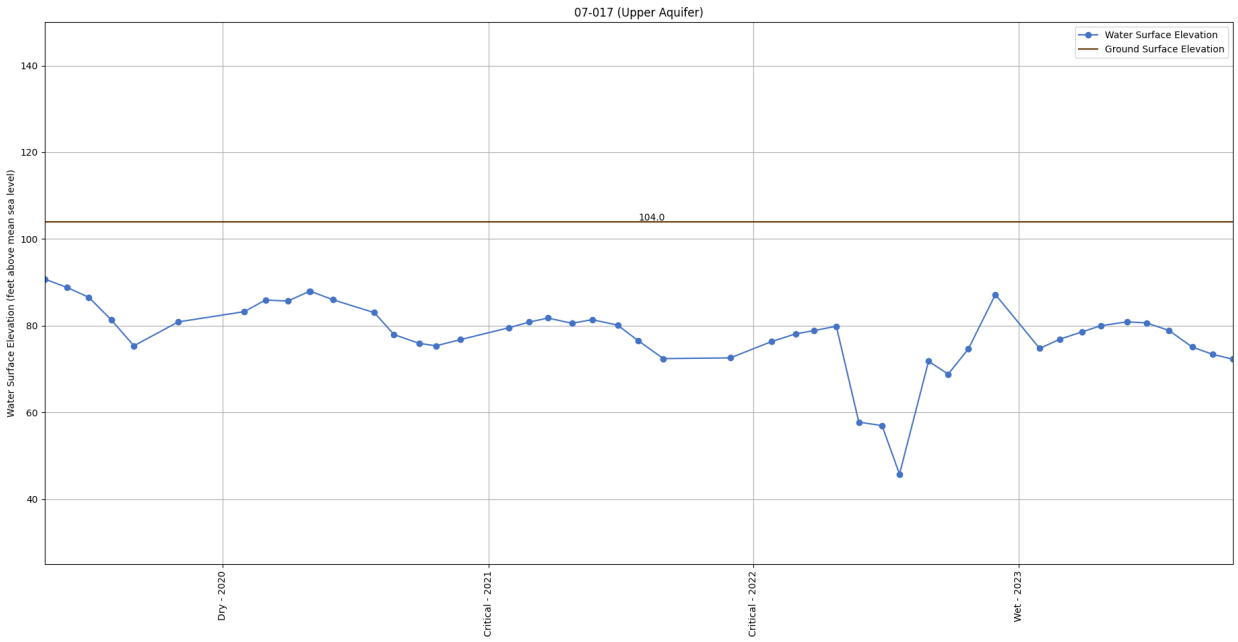

07-010 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
160.3
96.2
64.0
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

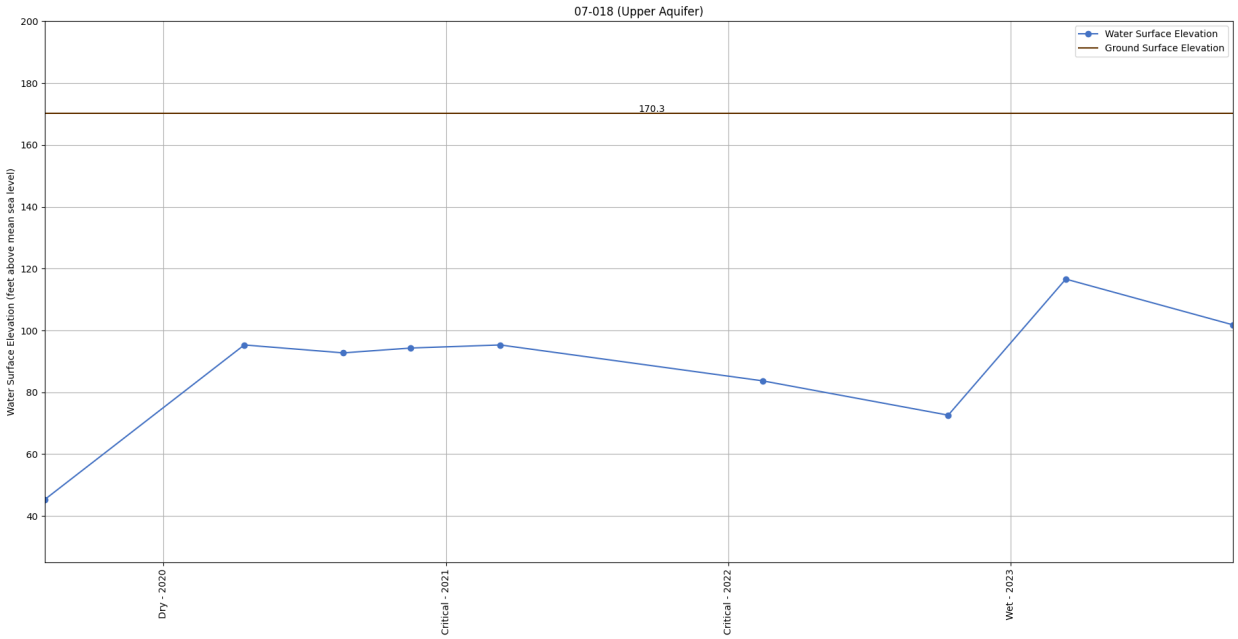

07-012 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Water Surface Elevation (feet above mean sea level)
164.9
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

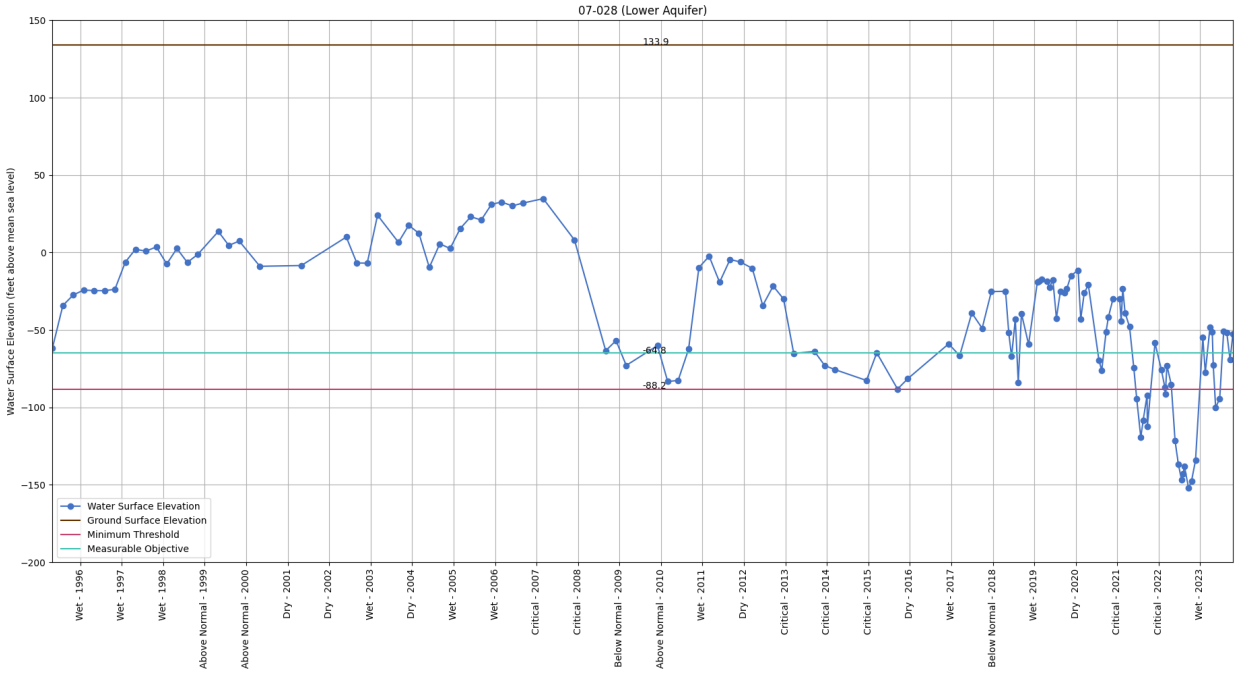

07-014 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
157.5
-47.2
-133.5
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

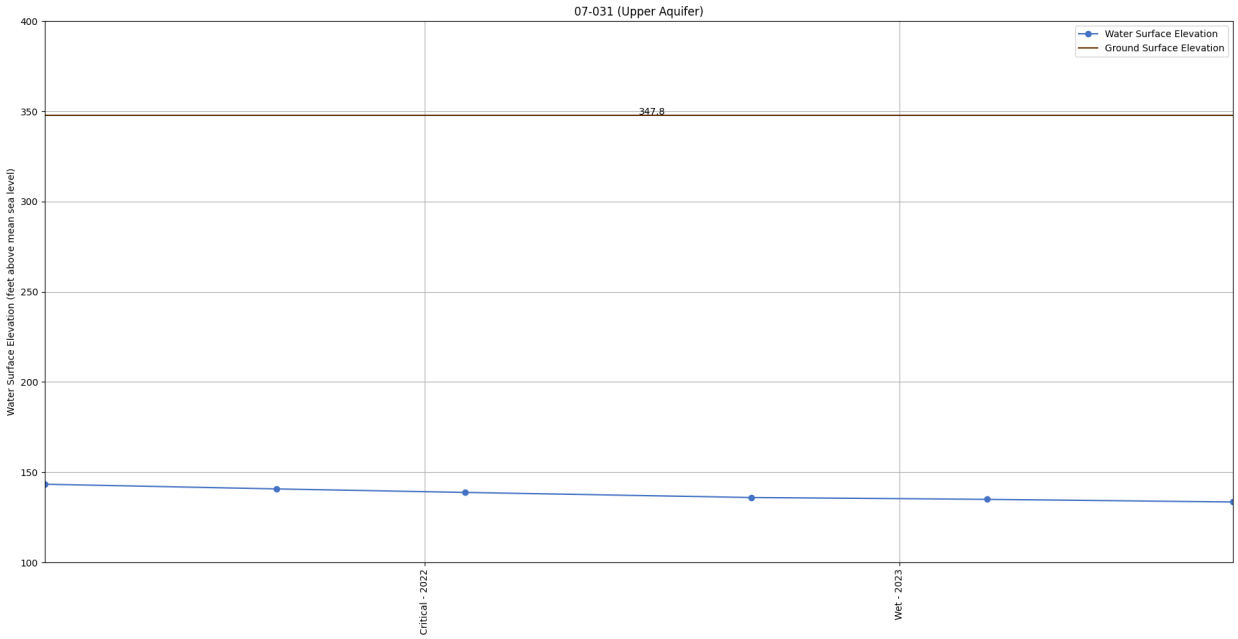

07-015 (Lower Aquifer)
Water Surface Elevation (feet above mean sea level)
167.5
-65.0
-147.0
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

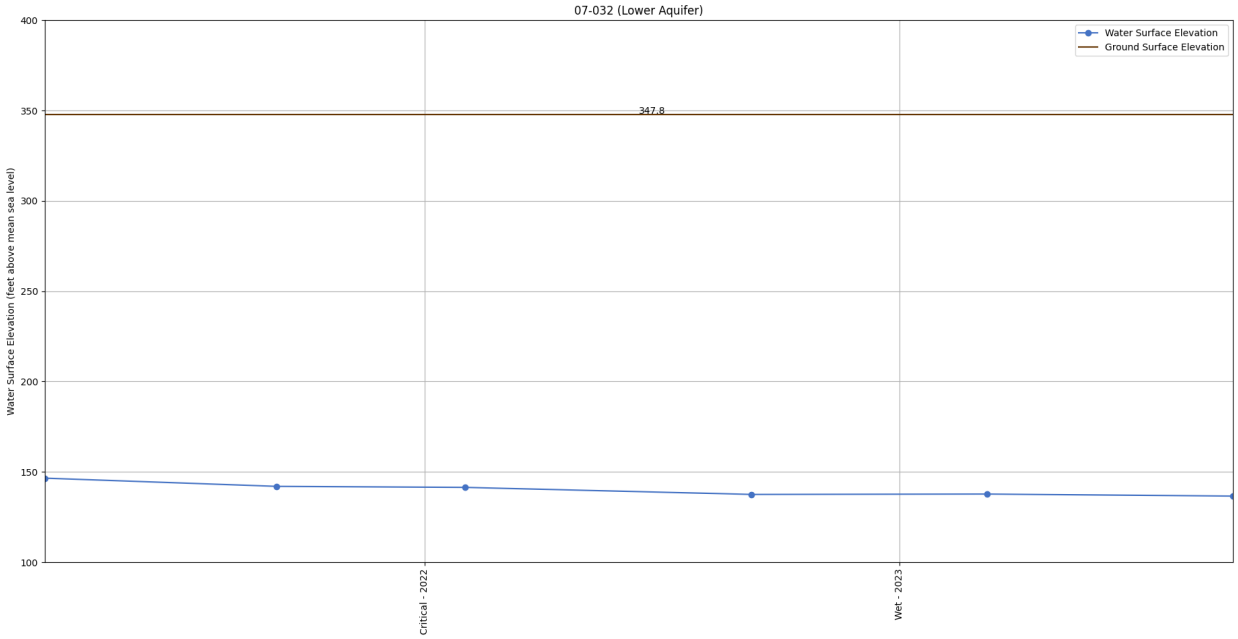

07-016 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
152.6
74.6
-2.4
Water Surface Elevation (feet above mean sea level)
200
150
100
50
0
−50
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

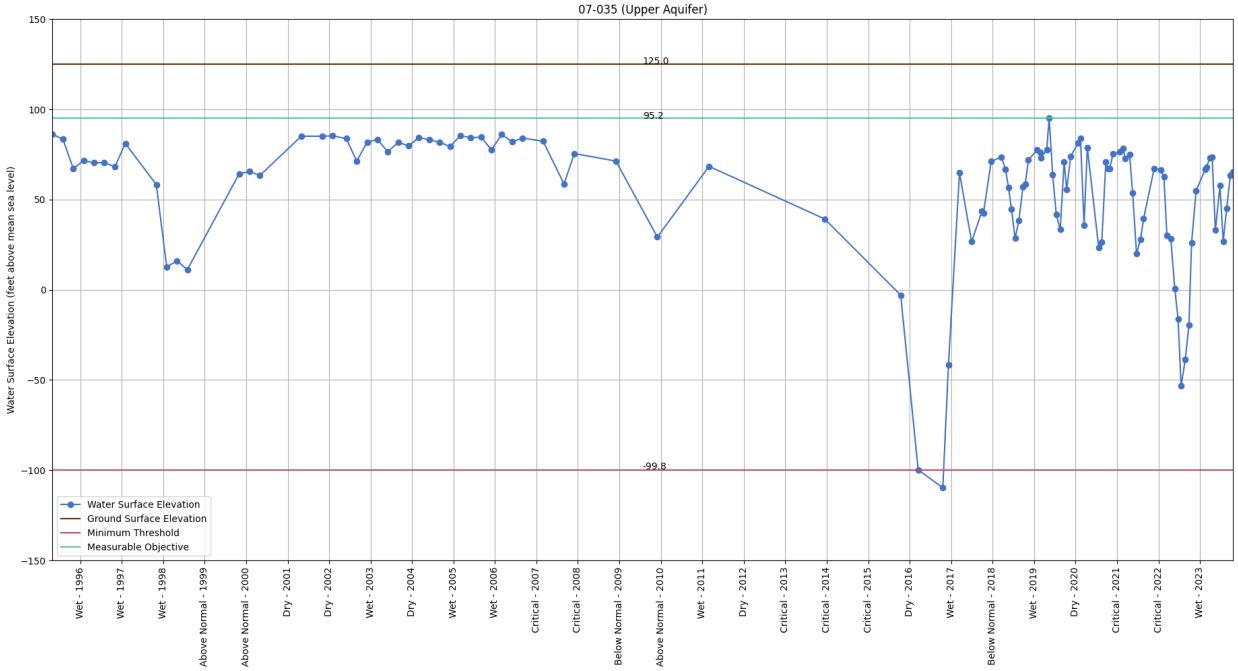

07-017 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
104.0
Water Surface Elevation (feet above mean sea level)
140
120
100
80
60
40
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

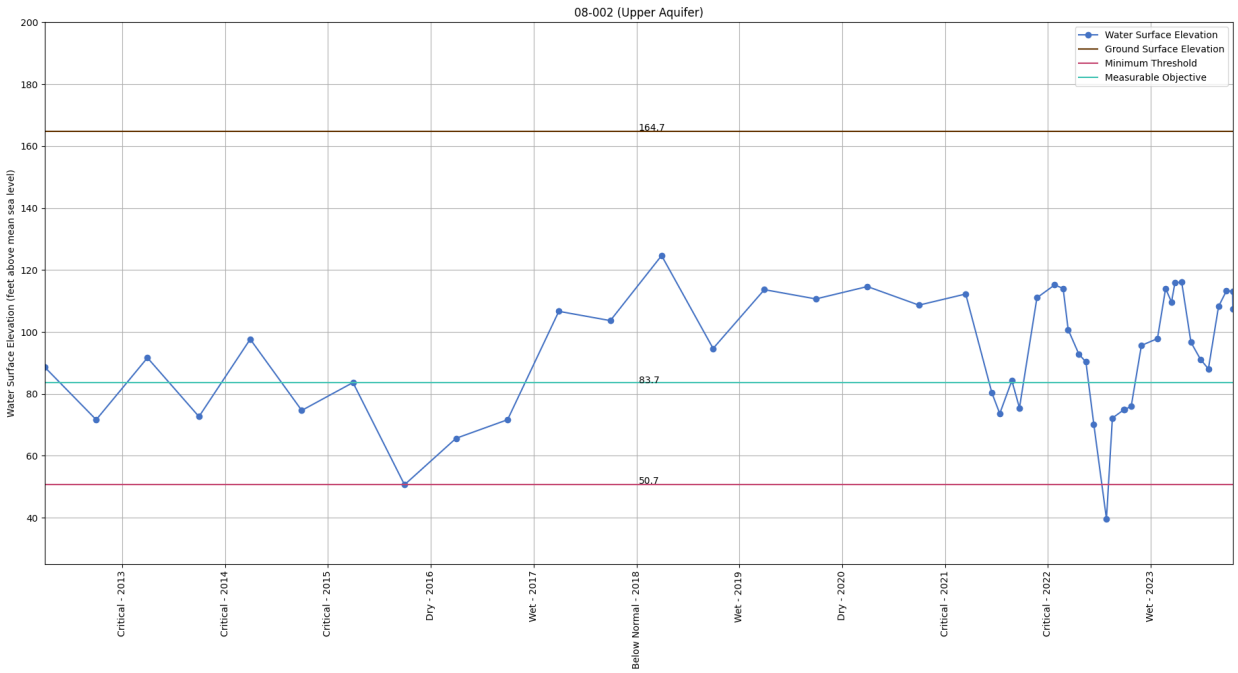

07-018 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
170.3
Water Surface Elevation (feet above mean sea level)
200
180
160
140
120
100
80
60
40
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

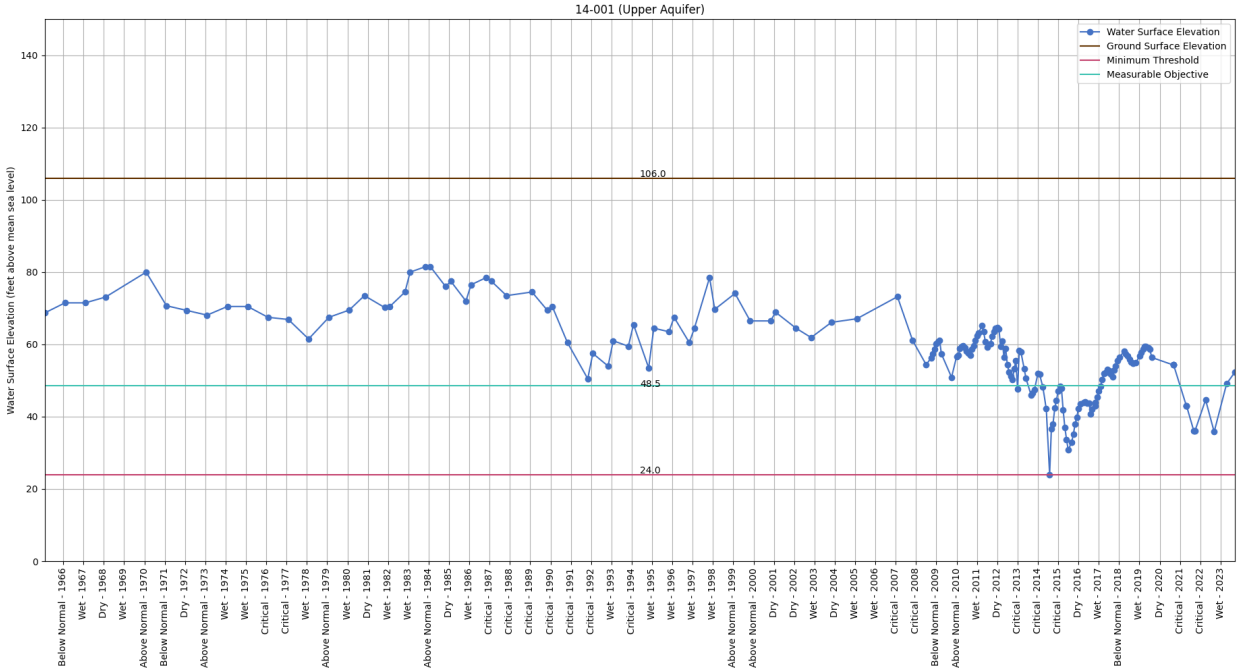

07-028 (Lower Aquifer)
133.9
-64.8
-88.2
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
150
100
50
0
−50
−100
−150
−200
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

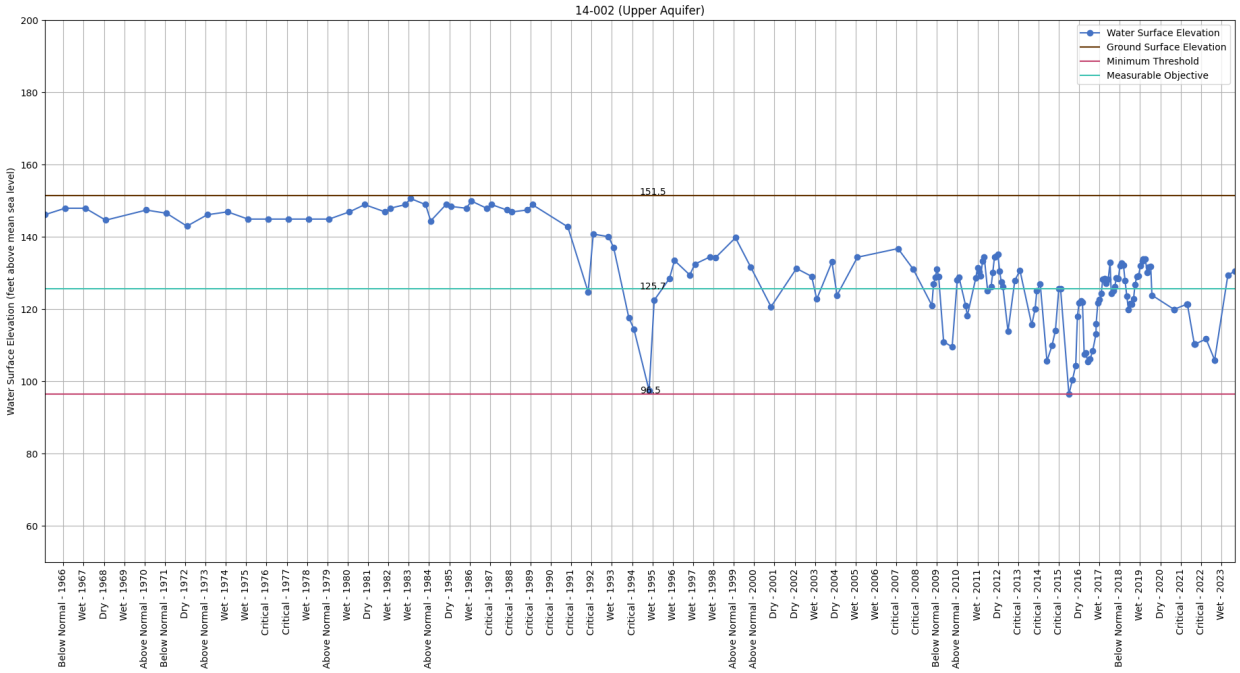

07-031 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
347.8
Water Surface Elevation (feet above mean sea level)
400
350
300
250
200
150
100
Critical - 2022
Wet - 2023

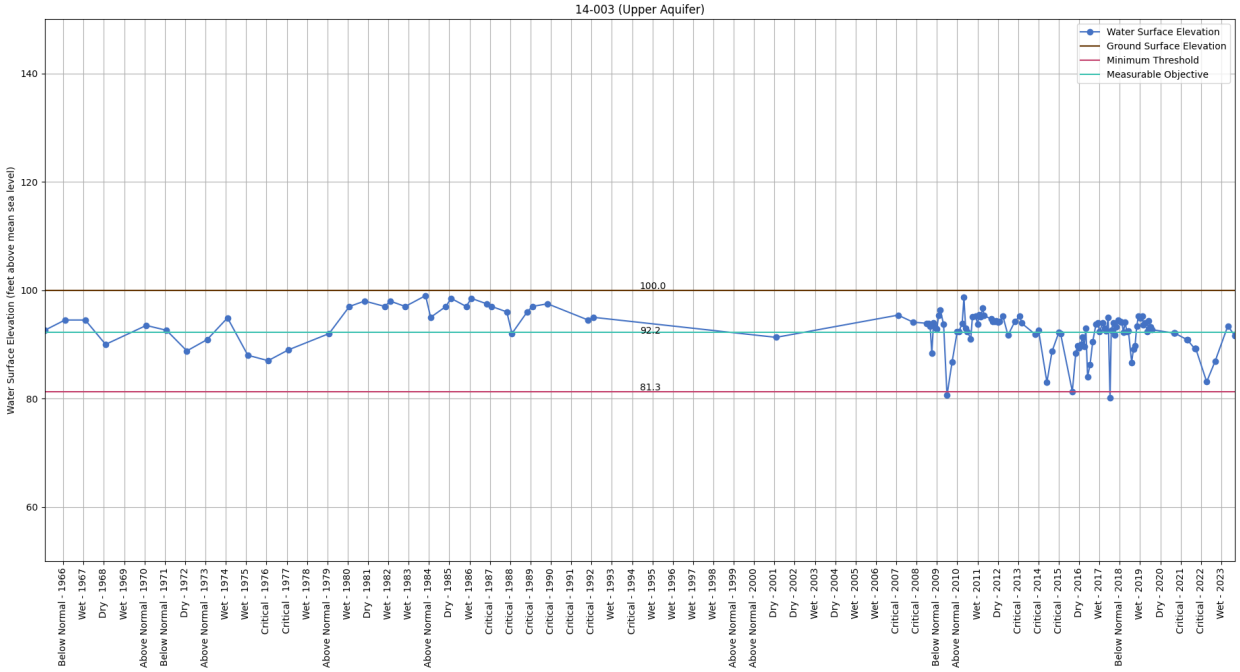

07-032 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
347.8
Water Surface Elevation (feet above mean sea level)
400
350
300
250
200
150
100
Critical - 2022
Wet - 2023

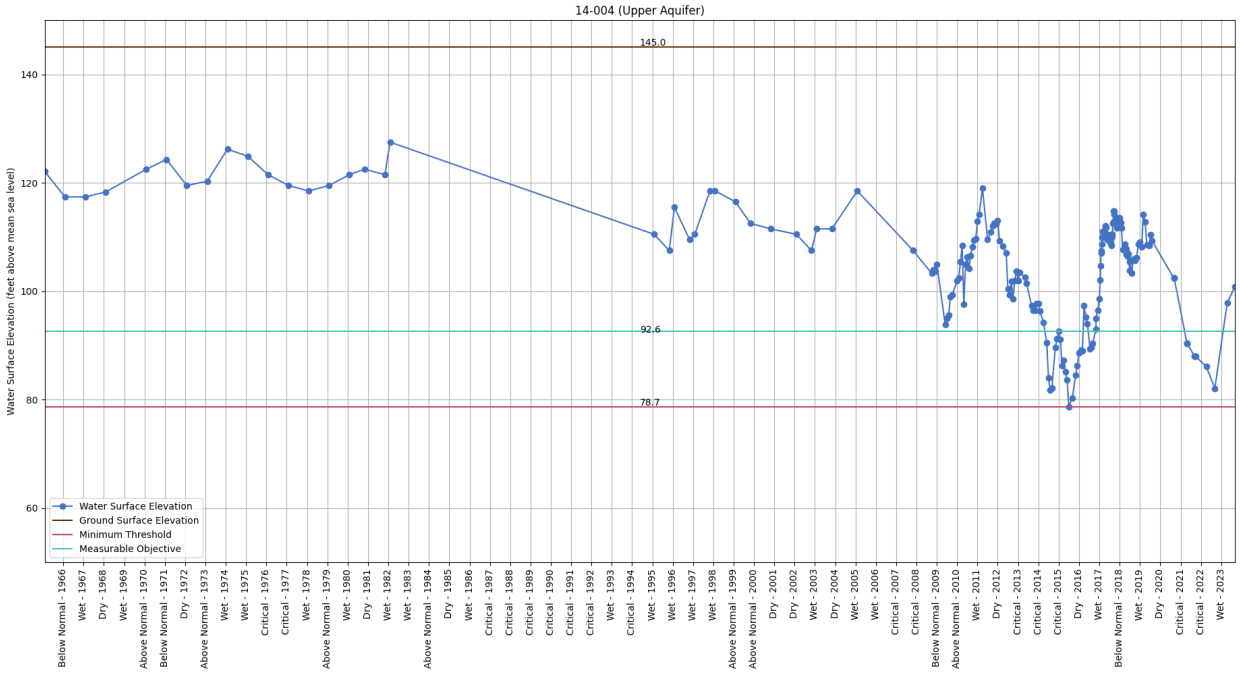

07-035 (Upper Aquifer)
Water Surface Elevation (feet above mean sea level)
125.0
95.2
-99.8
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

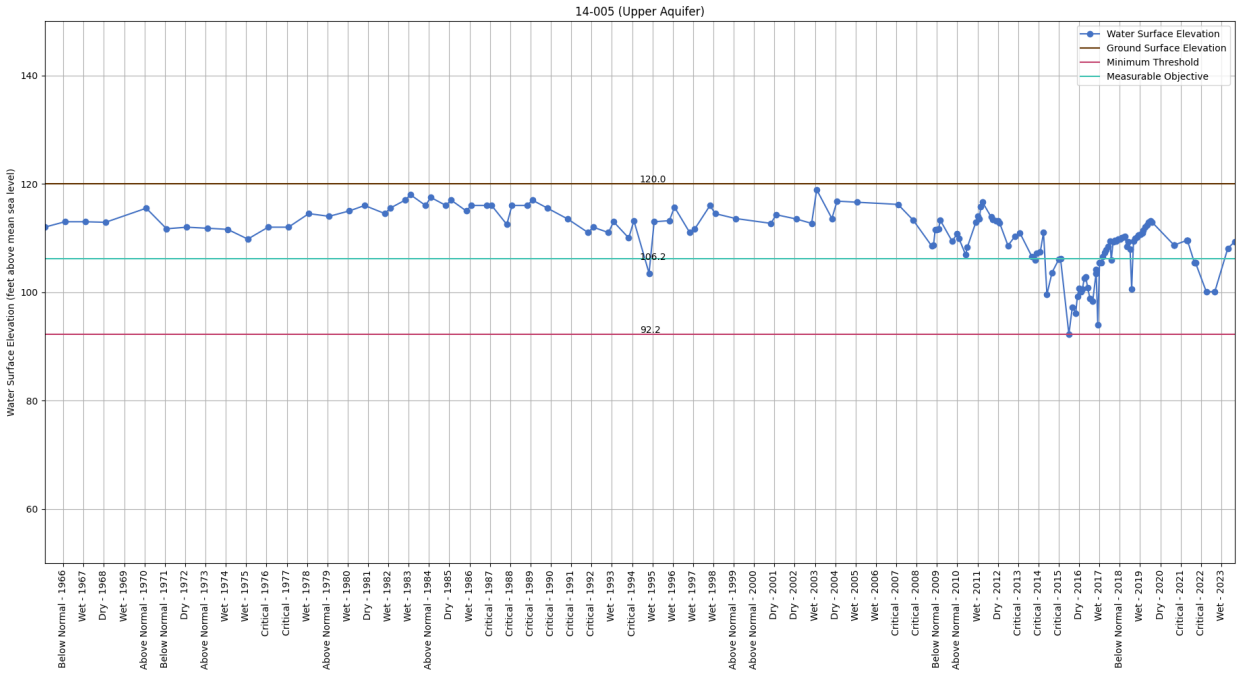

08-002 (Upper Aquifer)
Water Surface Elevation (feet above mean sea level)
164.7
83.7
50.7
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022
Wet - 2023

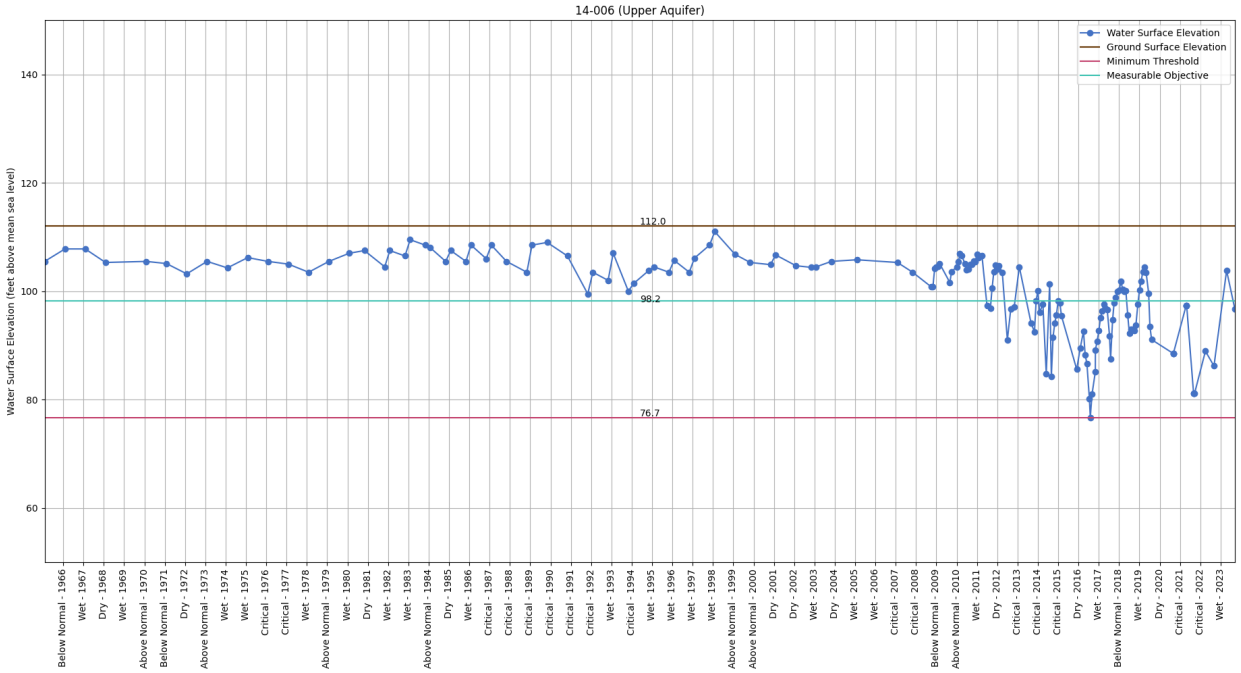

14-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
106.0
48.5
24.0

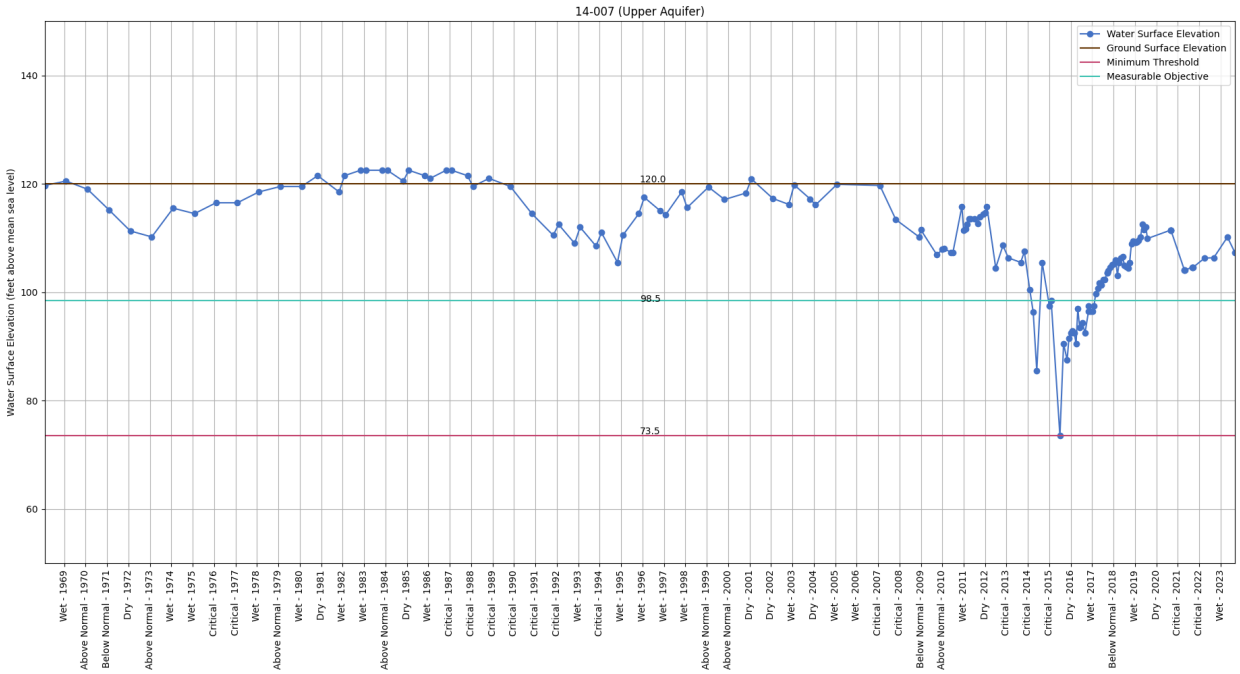

14-002 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
151.5
125.7
96.5

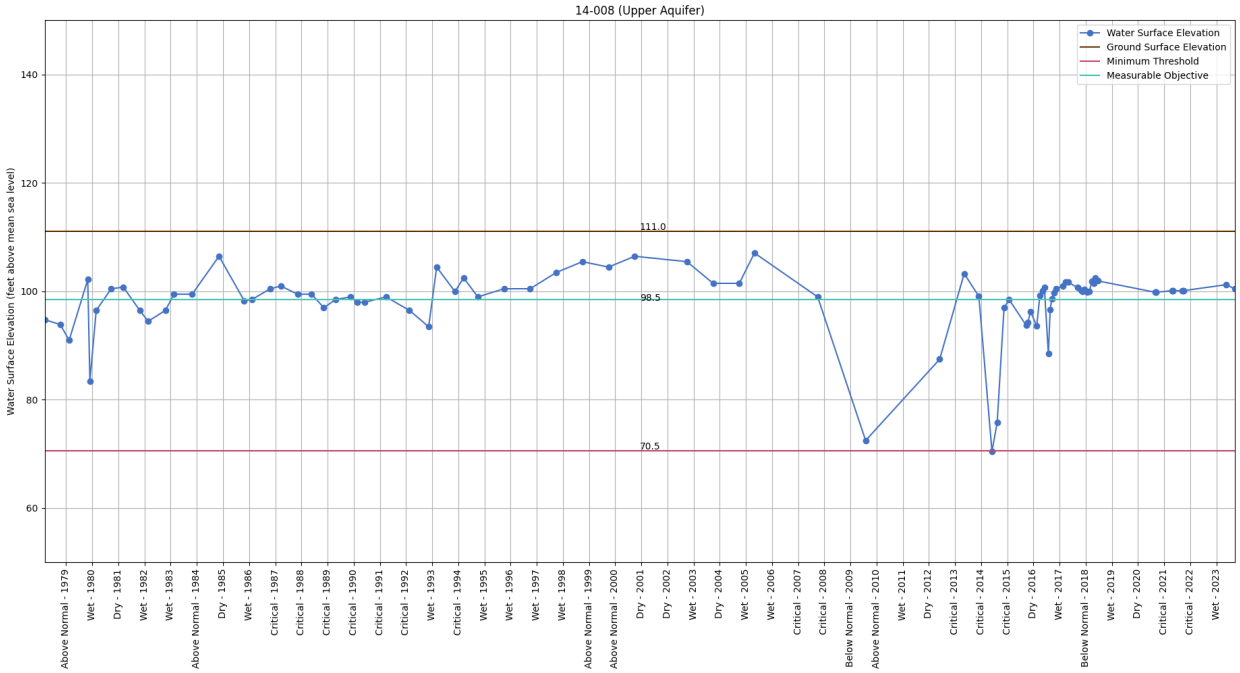

14-003 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
100.0
92.2
81.3

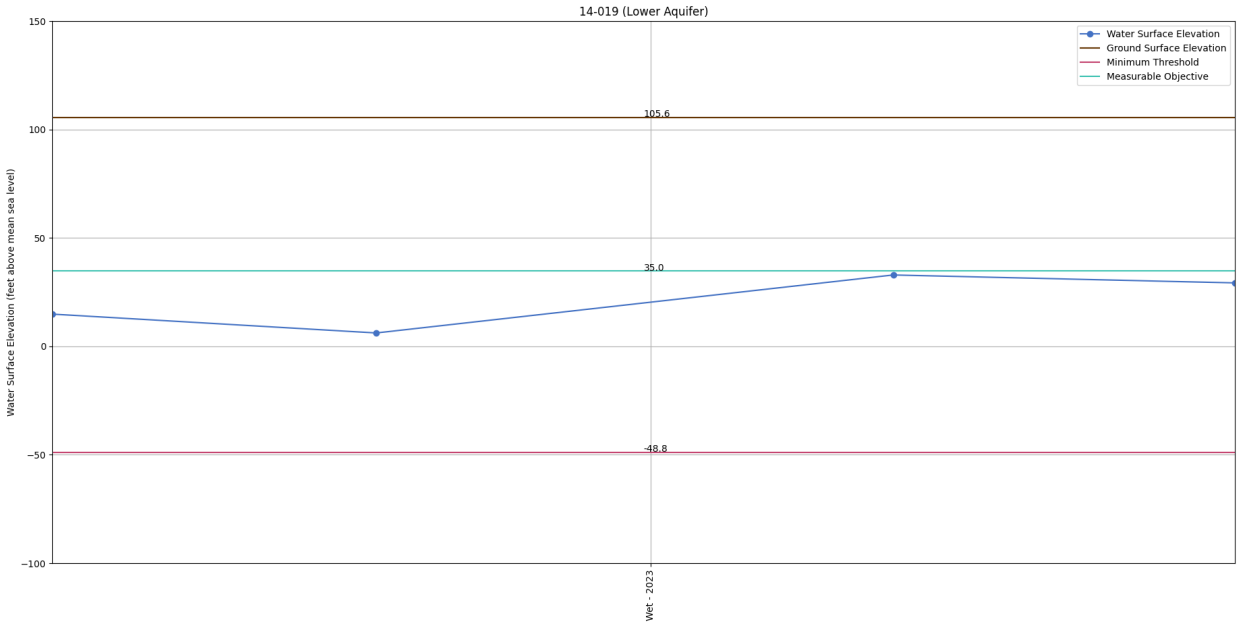

14-004 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
145.0
92.6
78.7

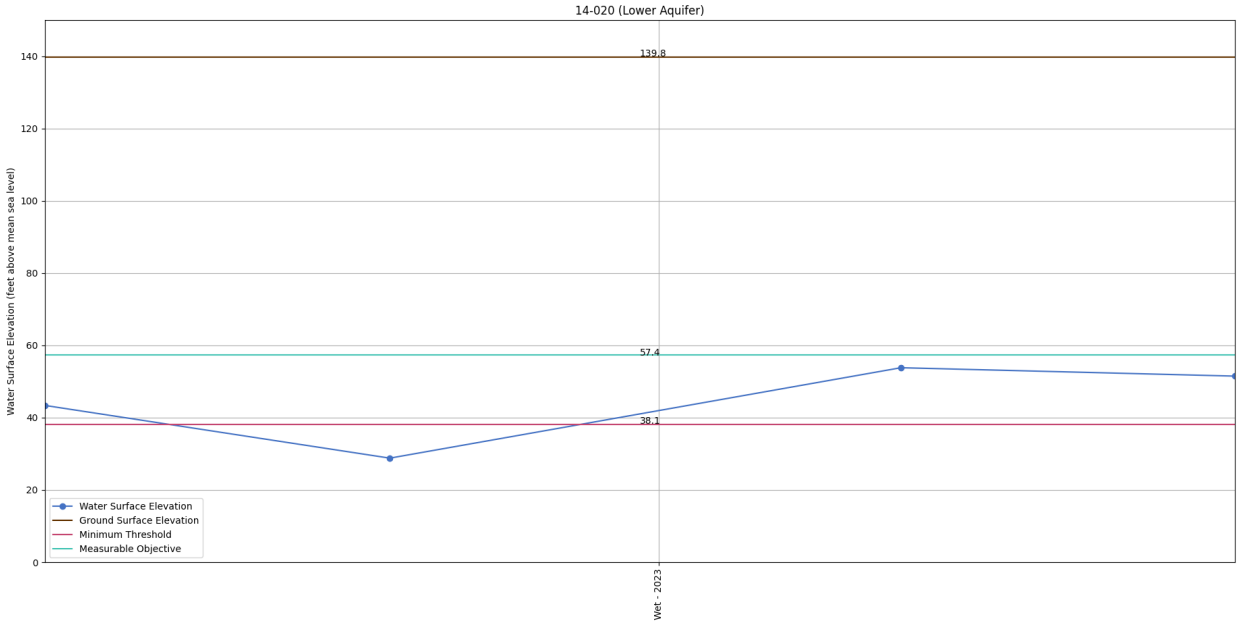

14-005 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
120.0
106.2
92.2

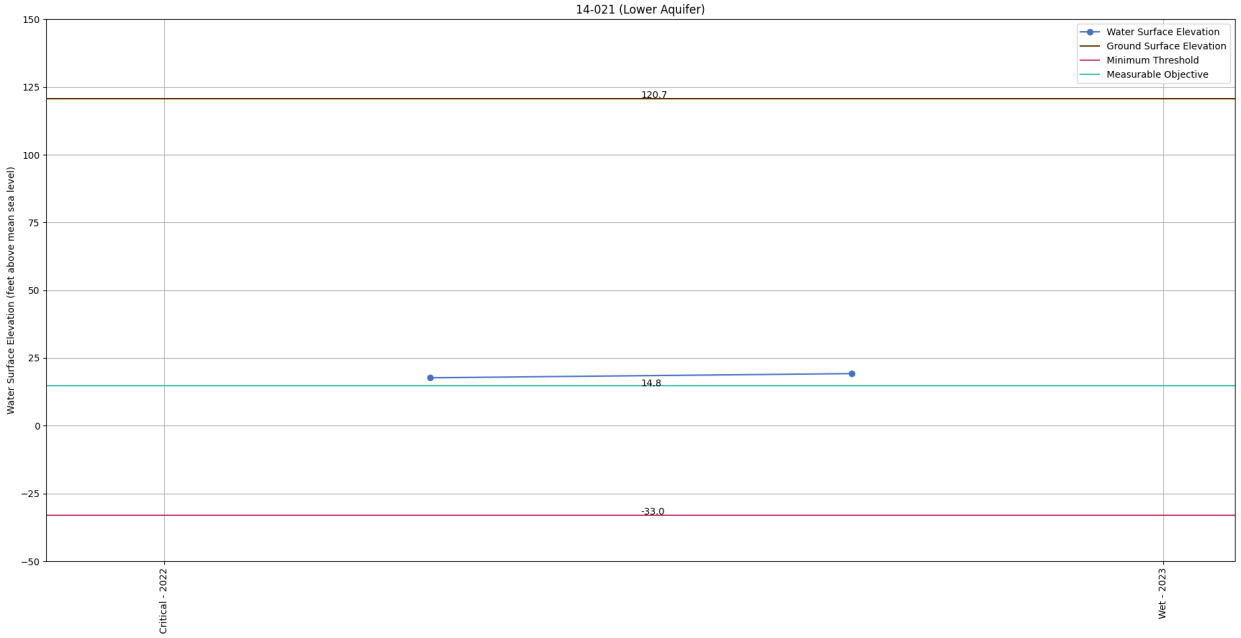

14-006 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
112.0
98.2
76.7

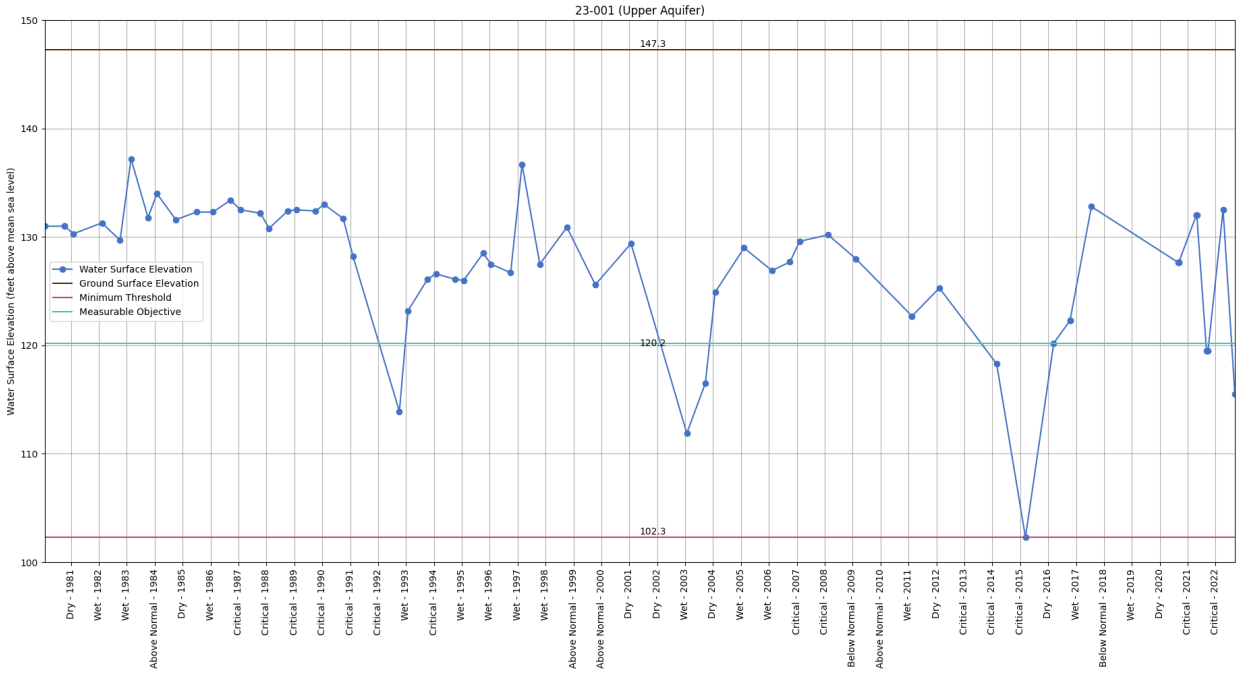

14-007 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
120.0
98.5
73.5


14-008 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
111.0
98.5
70.5


14-019 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
105.6
35.0
-48.8
Water Surface Elevation (feet above mean sea level)
150
100
50
0
−50
−100
Wet - 2023


14-020 (Lower Aquifer)
139.8
57.4
38.1
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
Water Surface Elevation (feet above mean sea level)
140
120
100
80
60
40
20
0
Wet - 2023


14-021 (Lower Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
120.7
14.8
-33.0
Water Surface Elevation (feet above mean sea level)
150
125
100
75
50
25
0
−25
−50
Critical - 2022
Wet - 2023


23-001 (Upper Aquifer)
Water Surface Elevation
Ground Surface Elevation
Minimum Threshold
Measurable Objective
147.3
120.2
102.3
Water Surface Elevation (feet above mean sea level)
150
140
130
120
110
100
Dry - 1981
Wet - 1982
Wet - 1983
Above Normal - 1984
Dry - 1985
Wet - 1986
Critical - 1987
Critical - 1988
Critical - 1989
Critical - 1990
Critical - 1991
Critical - 1992
Wet - 1993
Critical - 1994
Wet - 1995
Wet - 1996
Wet - 1997
Wet - 1998
Above Normal - 1999
Above Normal - 2000
Dry - 2001
Dry - 2002
Wet - 2003
Dry - 2004
Wet - 2005
Wet - 2006
Critical - 2007
Critical - 2008
Below Normal - 2009
Above Normal - 2010
Wet - 2011
Dry - 2012
Critical - 2013
Critical - 2014
Critical - 2015
Dry - 2016
Wet - 2017
Below Normal - 2018
Wet - 2019
Dry - 2020
Critical - 2021
Critical - 2022

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Appendix B. Northern & Central Delta-Mendota GSP Region WY2023 Annual Report Supplemental Information

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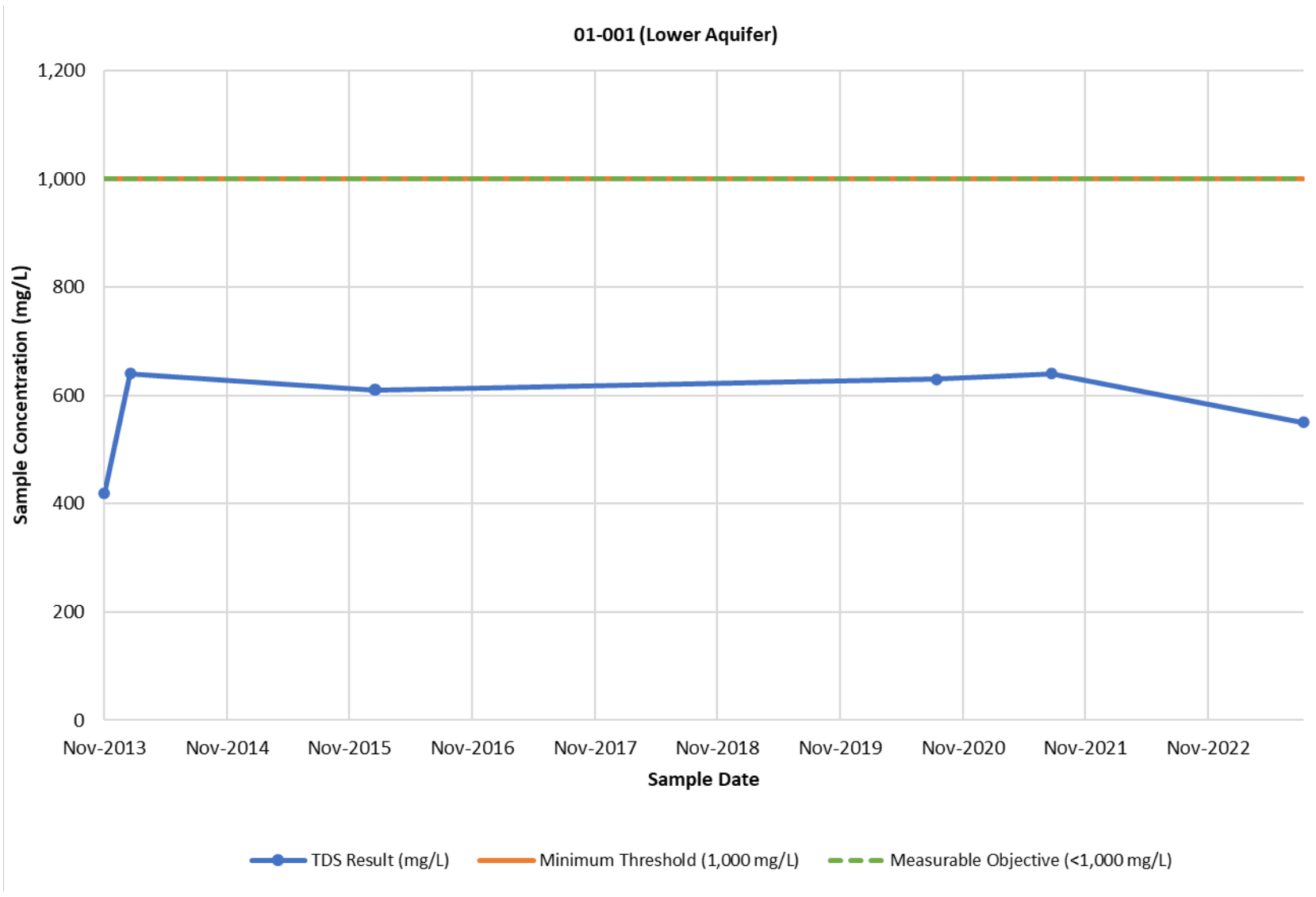
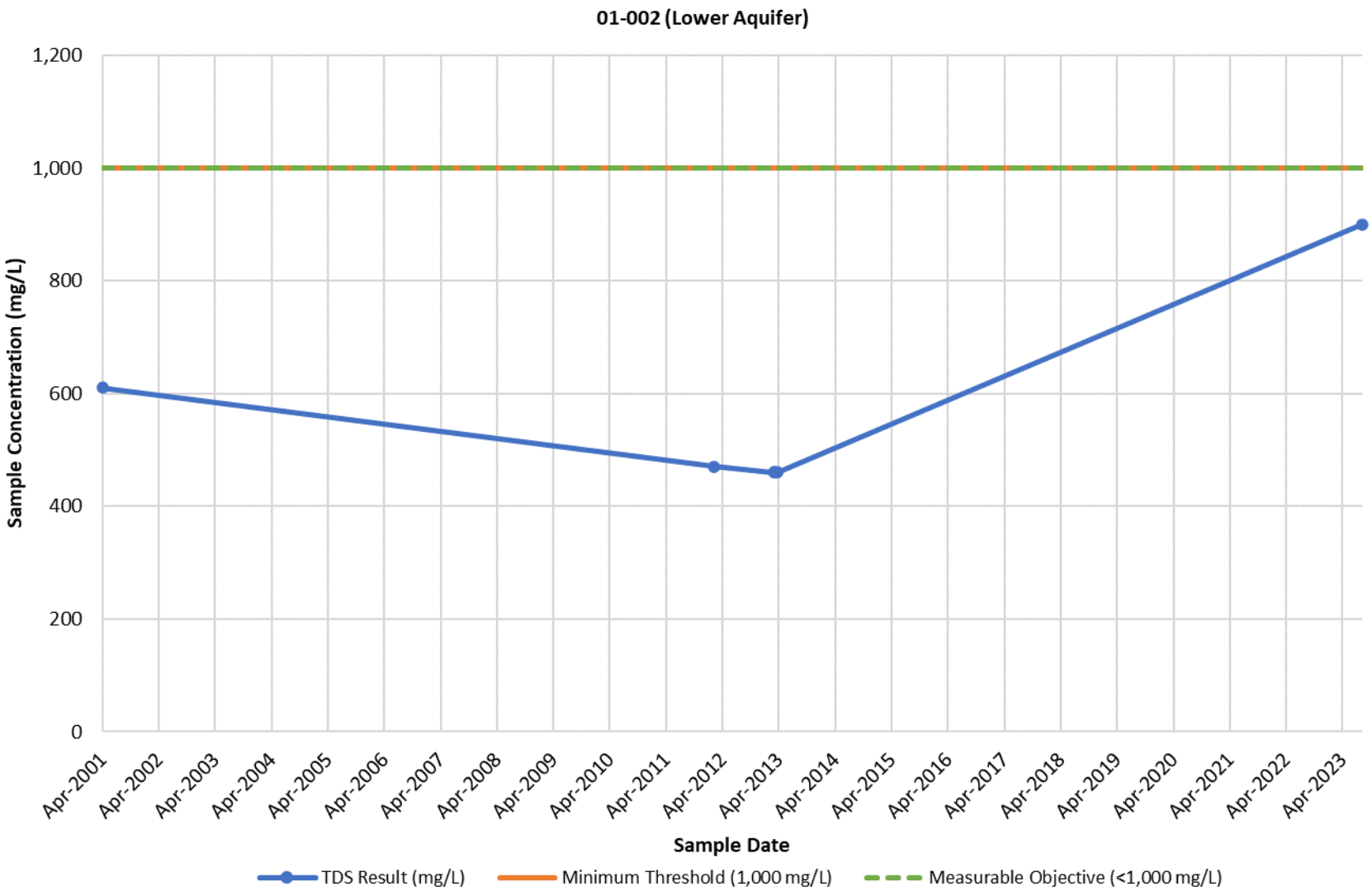
This appendix contains chemographs for representative monitoring locations in the Northern and Central Delta-Mendota Regions. Each chemograph is presented as TDS in milligrams per liter (mg/L), with the associated numeric Minimum Threshold and Measurable Objective also presented, as applicable.

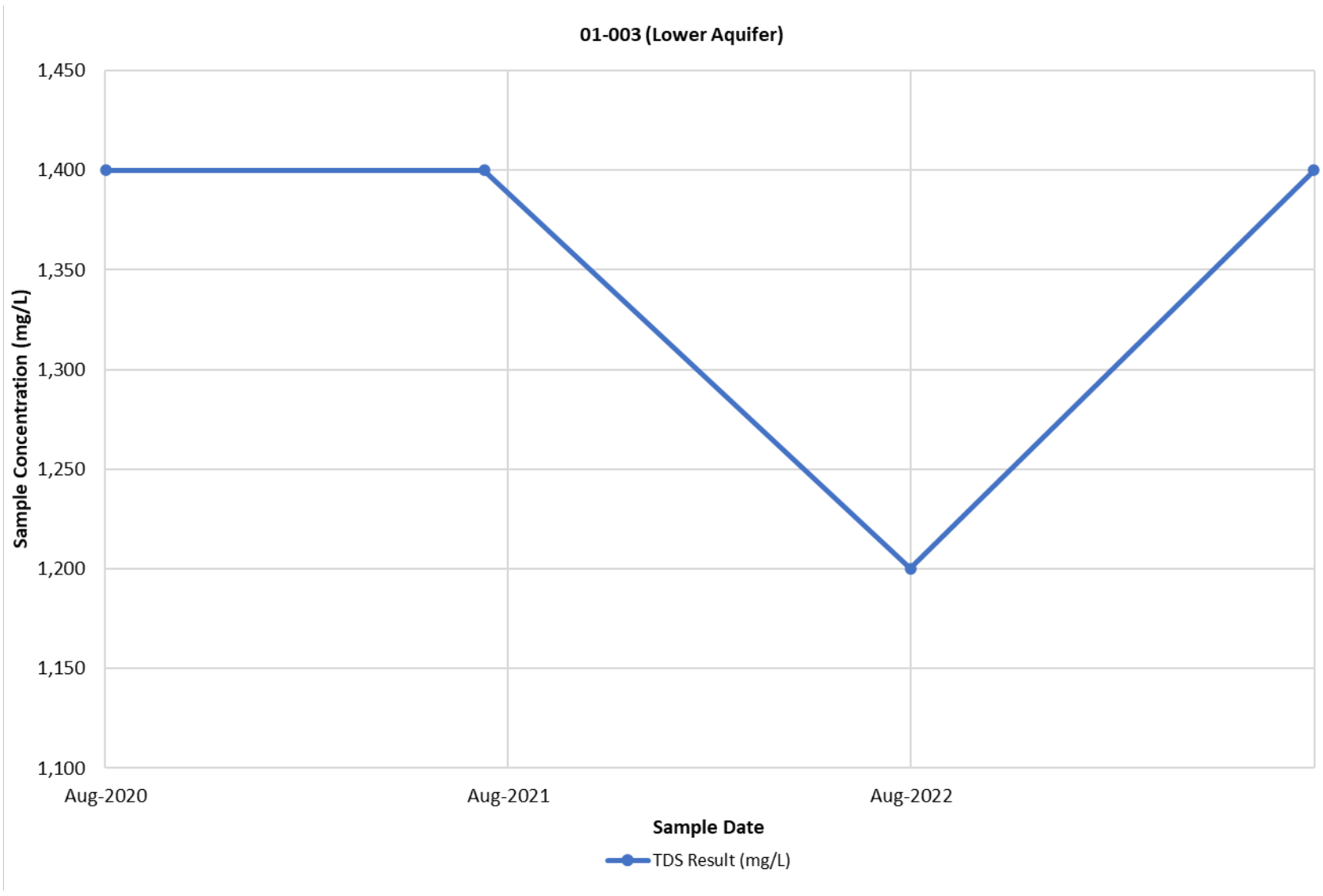
DMS ID	Local Well ID	Aquifer Designation	Notes
01-001	MP30.43R	Lower	
01-002	MP33.71L	Lower	
01-003 [1]	MP45.78R	Lower	
01-004	MC10-2	Upper	Samples collected as part of Irrigated Lands Regulatory Program (ILRP); Larger analysis that includes TDS collected every 5 years under ILRP, which was performed in 2022 to sync all wells in the ILRP network; No TDS sampled in 2023
01-006	91	Lower	
01-007	MP021.12L	Lower	
01-008	MP051.66L	Lower	
01-018	Gemperle well	Upper	Well deactivated and to be removed from representative monitoring network
02-002	WELL 02 - N 5TH ST	Lower	Well on standby in 2023 and unable to obtain sample
02-009	Keystone well	Upper	
03-001 [1]	PIDMW2	Upper	
03-003 [1]	WSJ003	Upper	
03-007	MW-1	Upper	
04-001	121	Lower	Not sampled in 2020, 2021, 2022, or 2023; Pump inoperable
06-001	P259-1	Lower	
06-002	P259-3	Upper	
06-003	WSID3	Lower	Inoperable, unable to sample in 2021, 2022, or 2023; To be removed from representative monitoring network
06-004	MP031.31L1-L2Well1	Upper	Inoperable, unable to sample in 2020, 2021, 2022, or 2023; To be removed from representative monitoring network
07-002	MC15-1	Lower	
07-003	MC15-2	Upper	
07-007	MC18-1	Lower	
07-008	PWD 48	Lower	Inoperable in 2023; To be removed from representative network
07-012	GDA003	Upper	To be removed from representative network
07-014	TW-4	Lower	Samples collected using Hydrasleeve
07-015	TW-5	Lower	Samples collected using Hydrasleeve
07-016	Well 01	Lower	
07-017	Well 1	Upper	
07-018 [1]	WSJ001	Upper	
07-028 [1]	MP093.27L (Well 500)	Lower	
07-031 [1]	CDMGSA-01C	Lower	

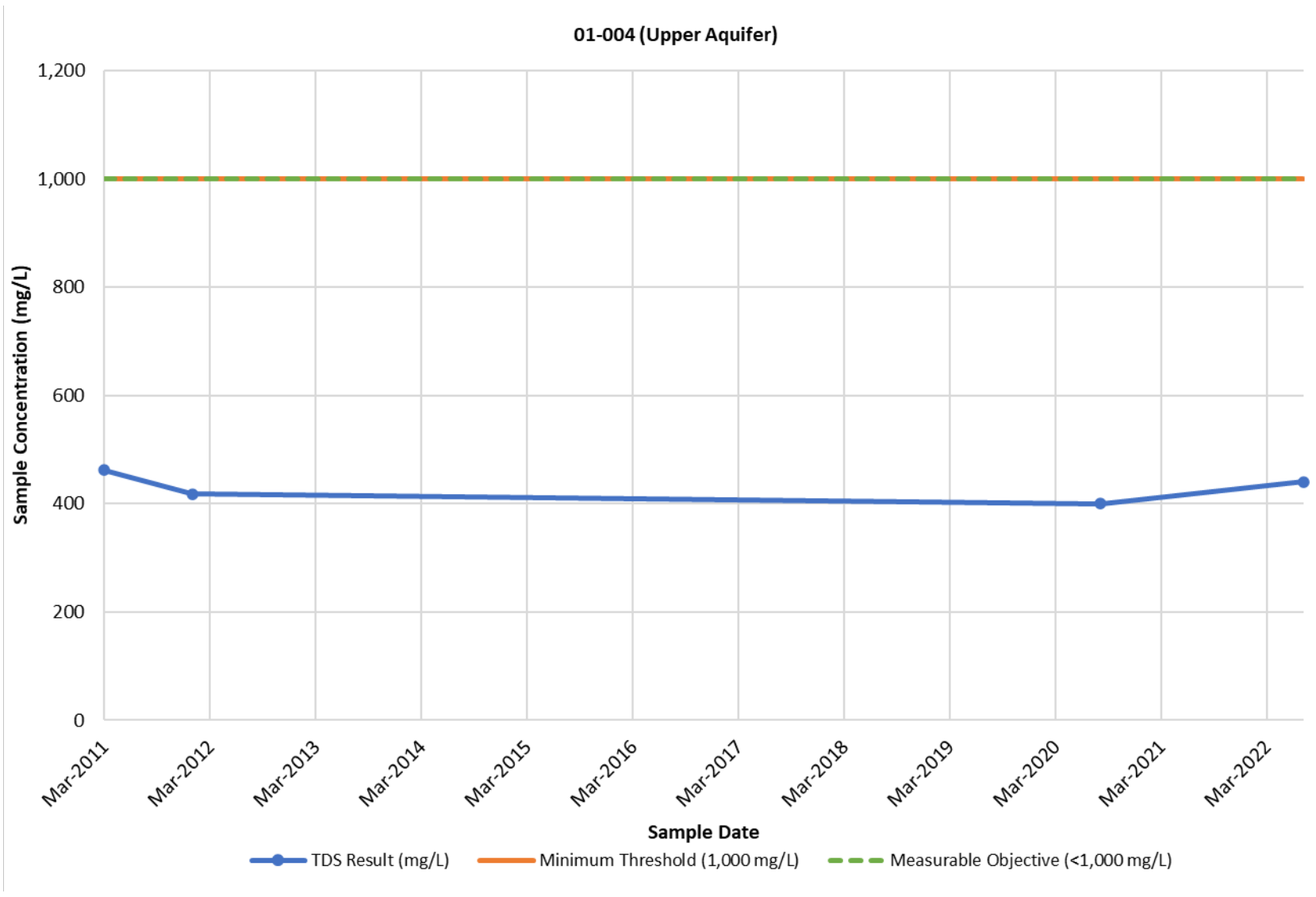
DMS ID	Local Well ID	Aquifer Designation	Notes
07-032 [1]	CDMGSA-01D	Lower	
07-033	TW-4 (upper component)	Upper	
07-034 [1]	MP092.20R	Lower	Well not sampled in 2023
07-035	MP098.74L	Upper	Inoperable in 2023; To be removed from representative network
08-002 [1]	Well M-1/MP102.04L	Upper	

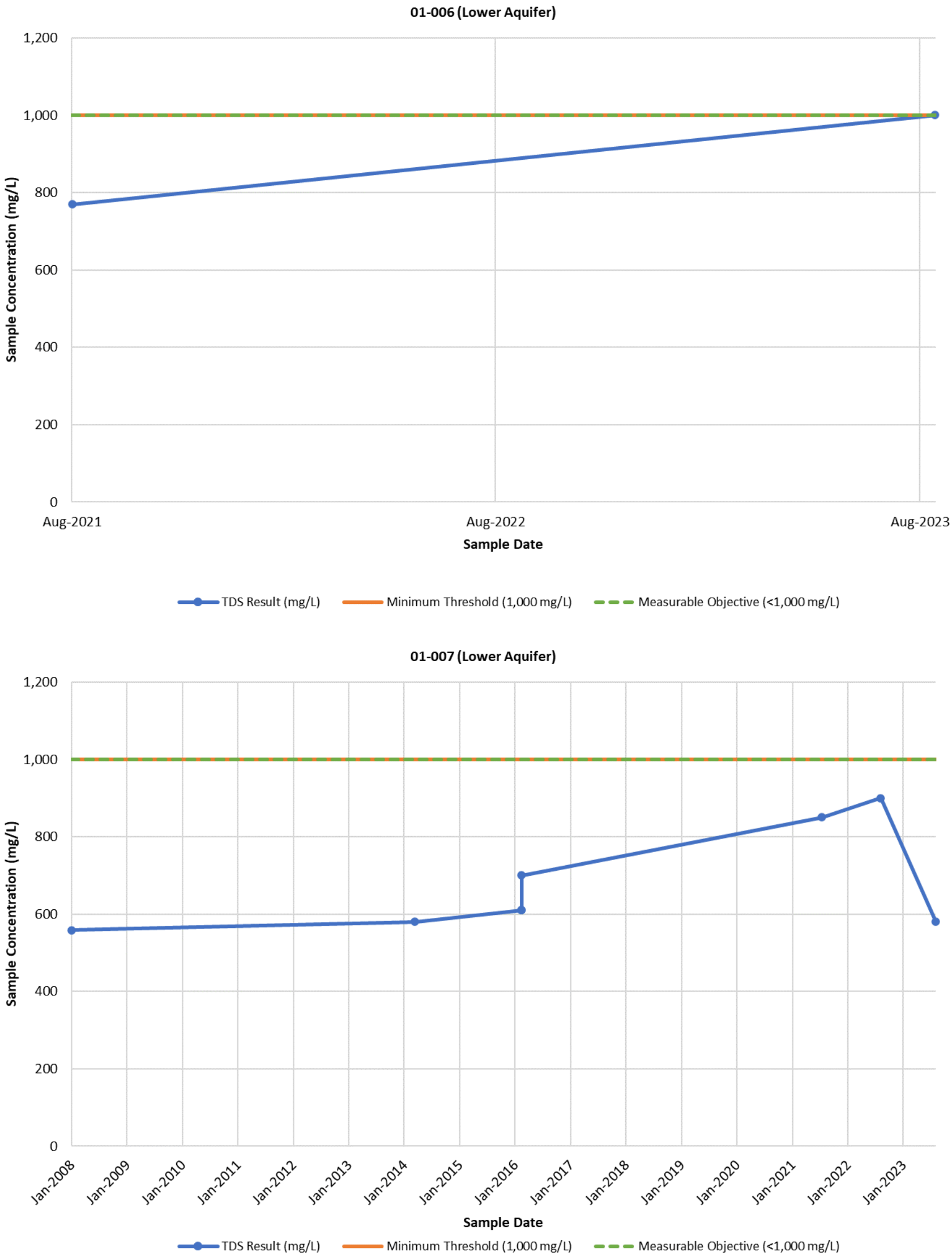
[1] No numeric sustainable management criteria established as existing conditions exceed TDS thresholds. Existing regulatory water quality compliance and remediation programs will apply (including but not limited to CV-SALTS Salt Control Program, the County Drought Plan requirements for State Small Water Systems and Domestic Wells [SB 552}, the Safe and Affordable Funding for Equity and Resilience [SAFER] program, and the Bureau of Reclamations Refuge Water Supply Program).

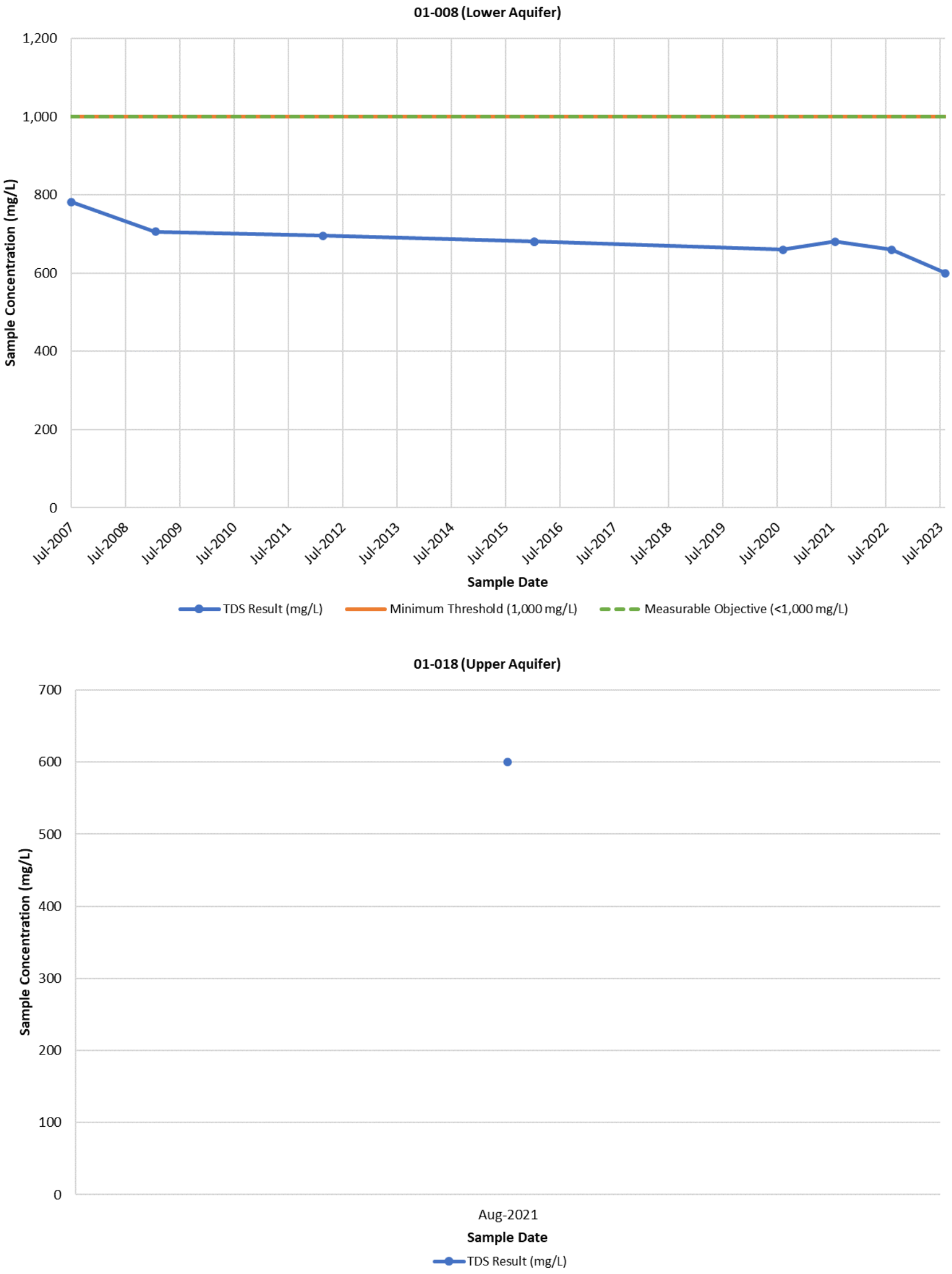

01-001 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Nov-2013
Nov-2014
Nov-2015
Nov-2016
Nov-2017
Nov-2018
Nov-2019
Nov-2020
Nov-2021
Nov-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

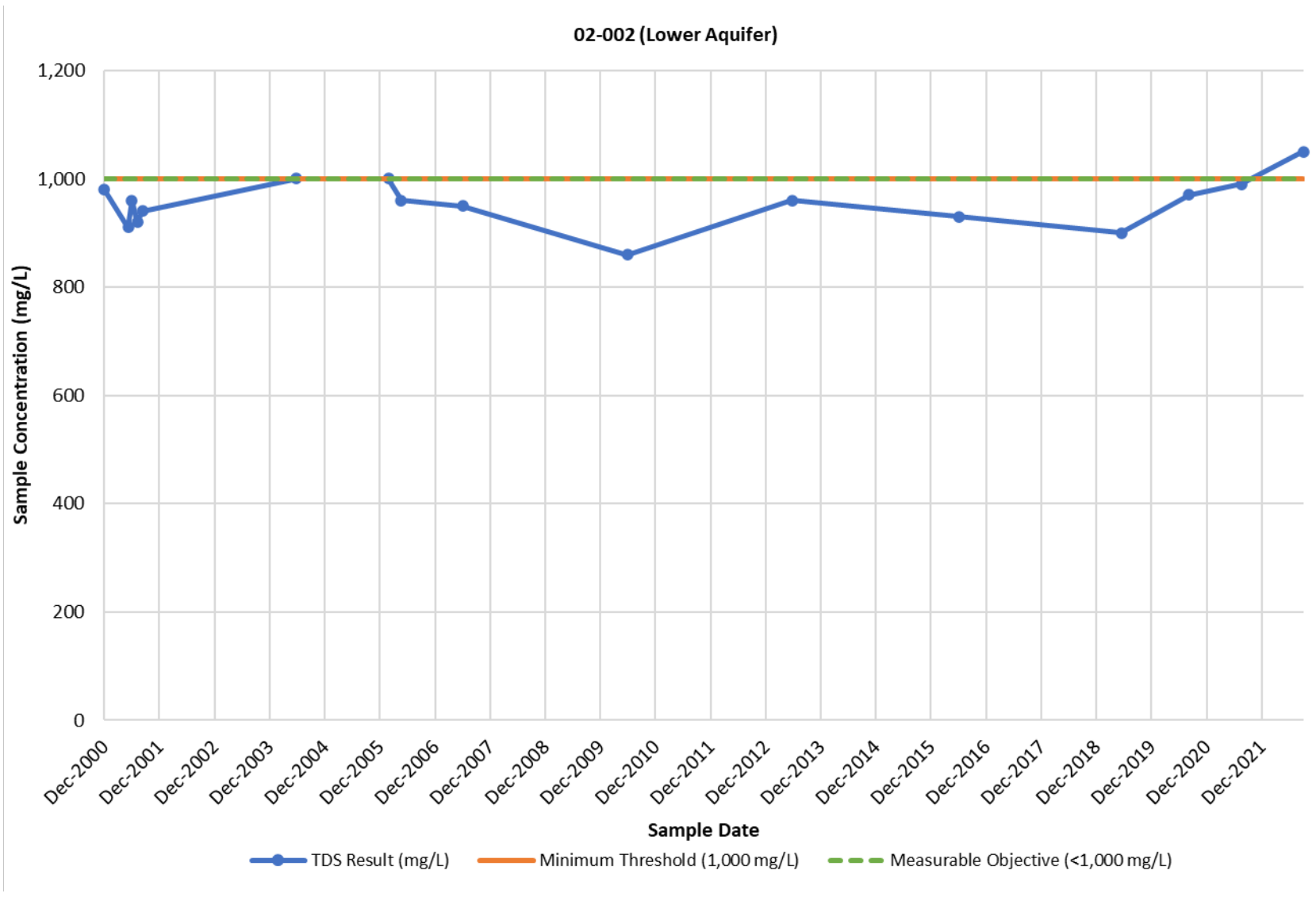

01-002 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Apr-2001
Apr-2002
Apr-2003
Apr-2004
Apr-2005
Apr-2006
Apr-2007
Apr-2008
Apr-2009
Apr-2010
Apr-2011
Apr-2012
Apr-2013
Apr-2014
Apr-2015
Apr-2016
Apr-2017
Apr-2018
Apr-2019
Apr-2020
Apr-2021
Apr-2022
Apr-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

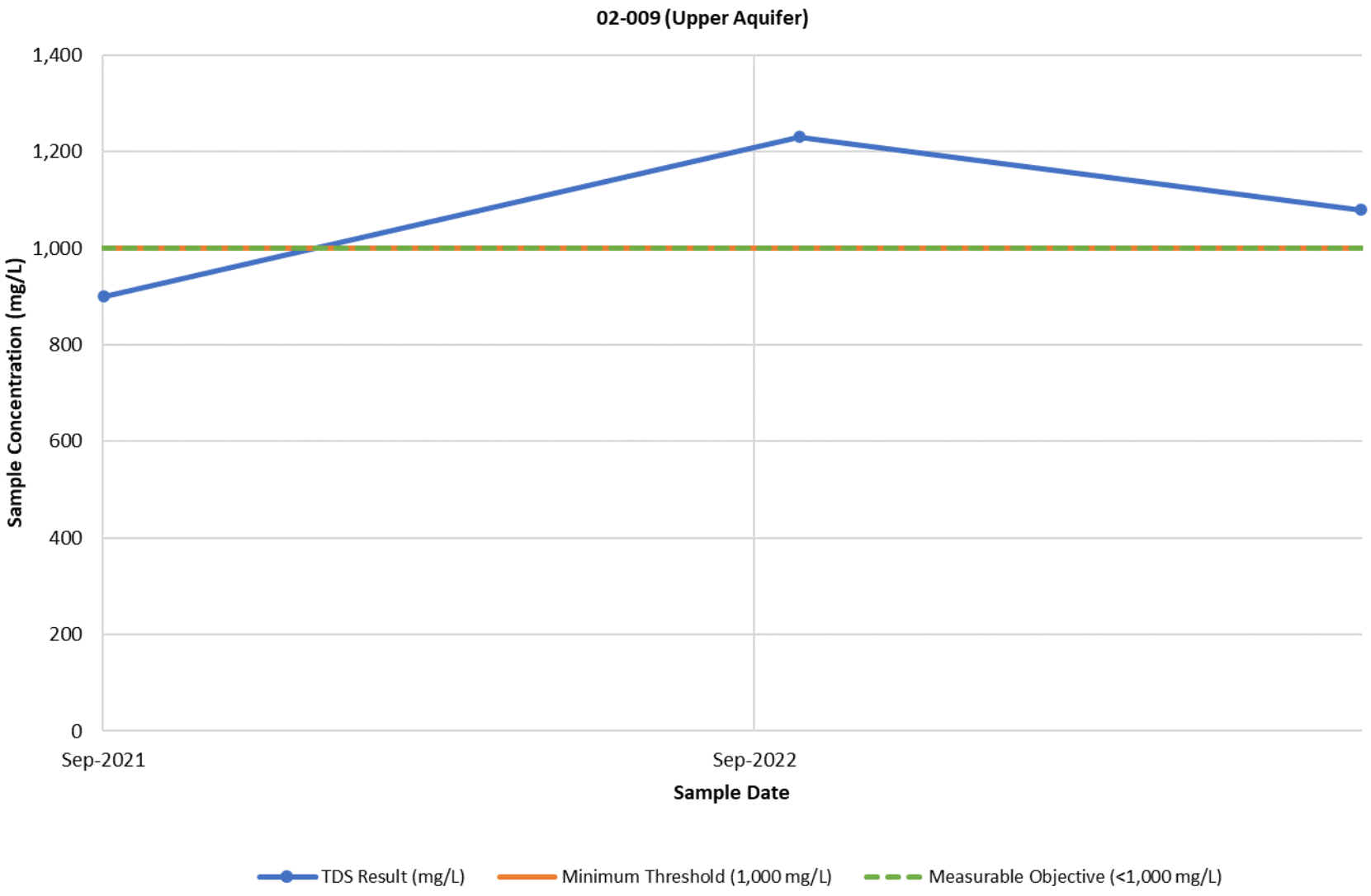

01-003 (Lower Aquifer)
Sample Concentration (mg/L)
1,450
1,400
1,350
1,300
1,250
1,200
1,150
1,100
Aug-2020
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)

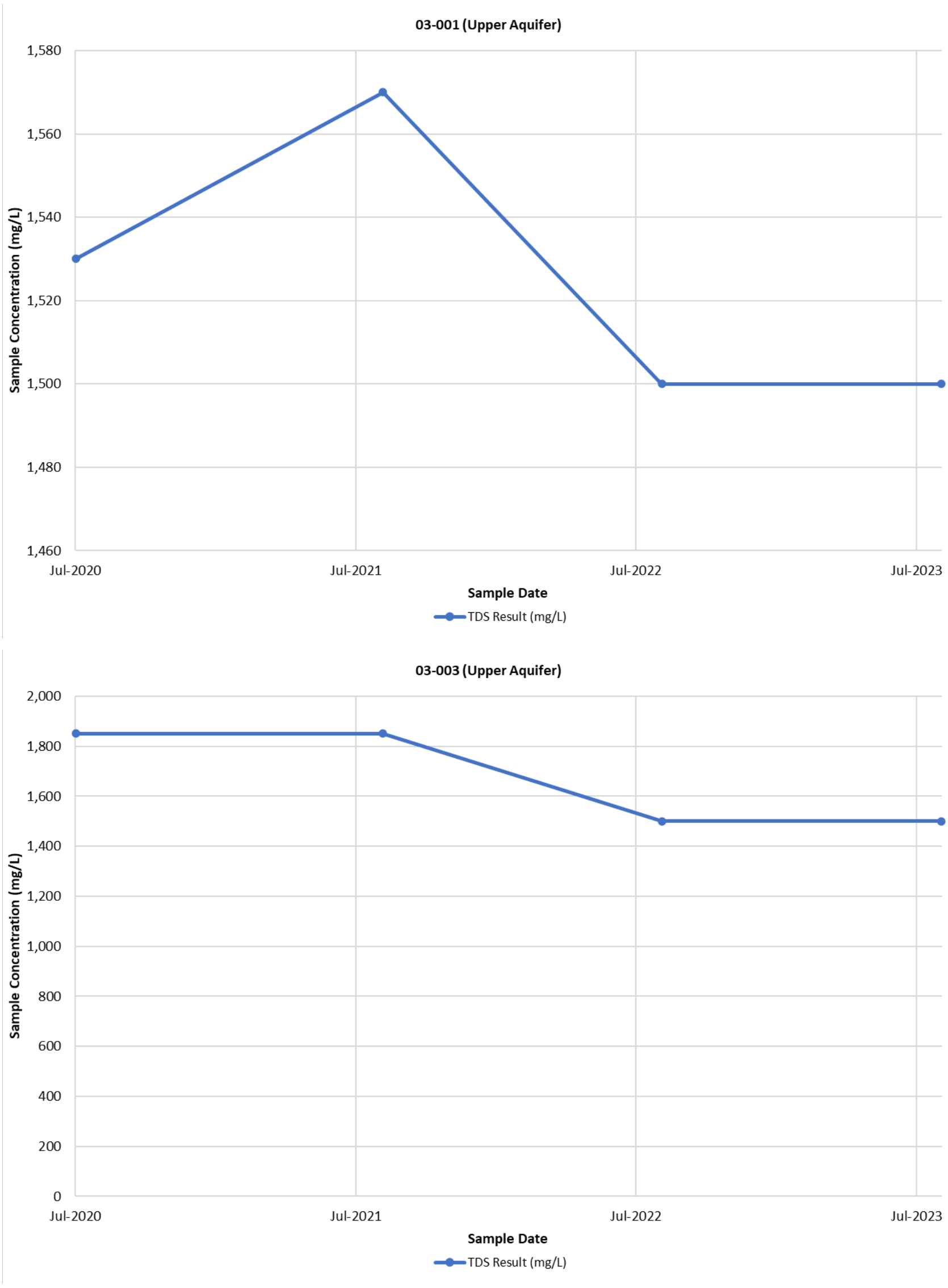

01-004 (Upper Aquifer)
Sample Concentration (mg/L)
1,200
1,000
800
600
400
200
0
Mar-2011
Mar-2012
Mar-2013
Mar-2014
Mar-2015
Mar-2016
Mar-2017
Mar-2018
Mar-2019
Mar-2020
Mar-2021
Mar-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

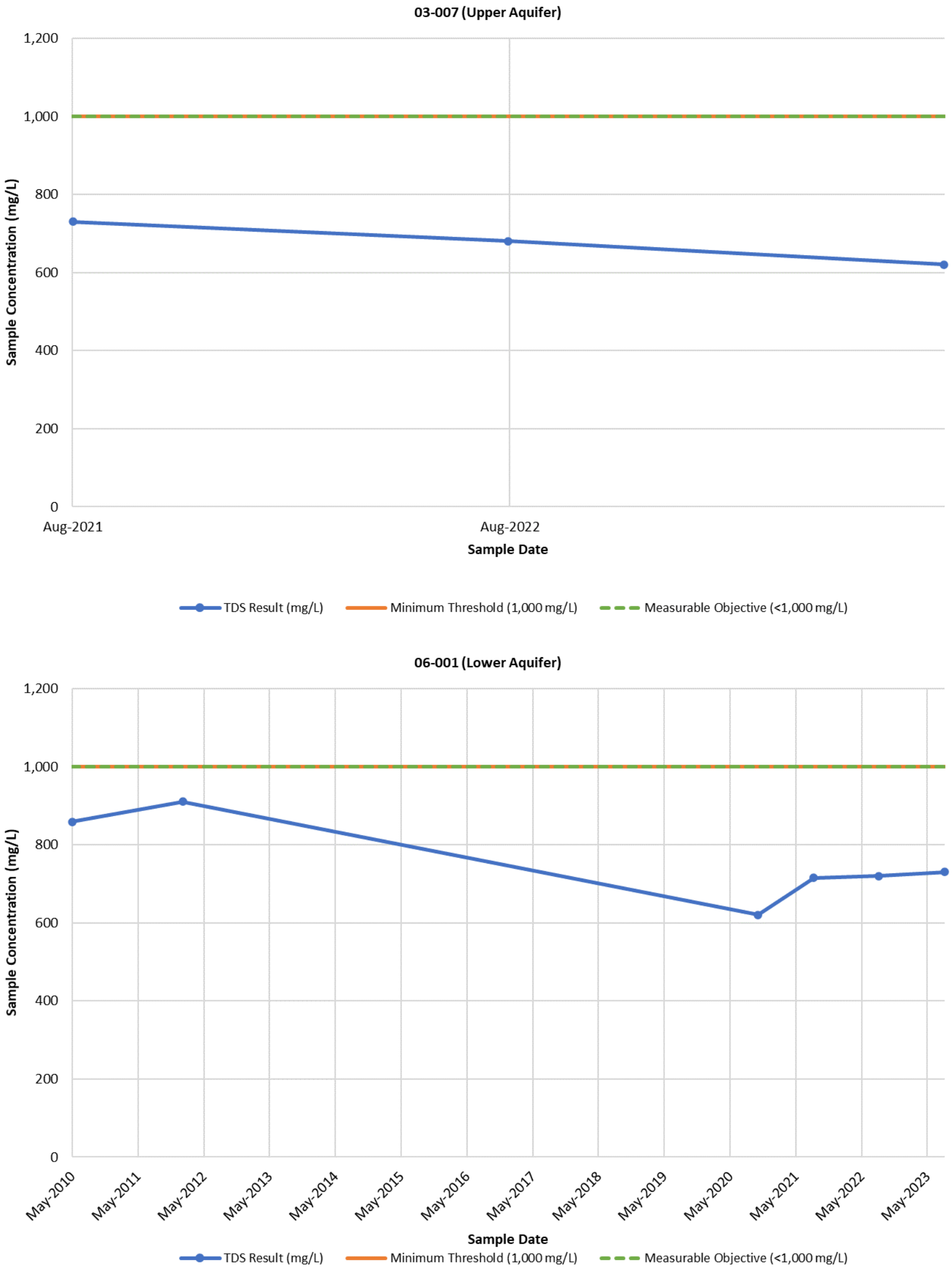

01-006 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2021
Aug-2022
Aug-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)
01-007 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
Jan-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

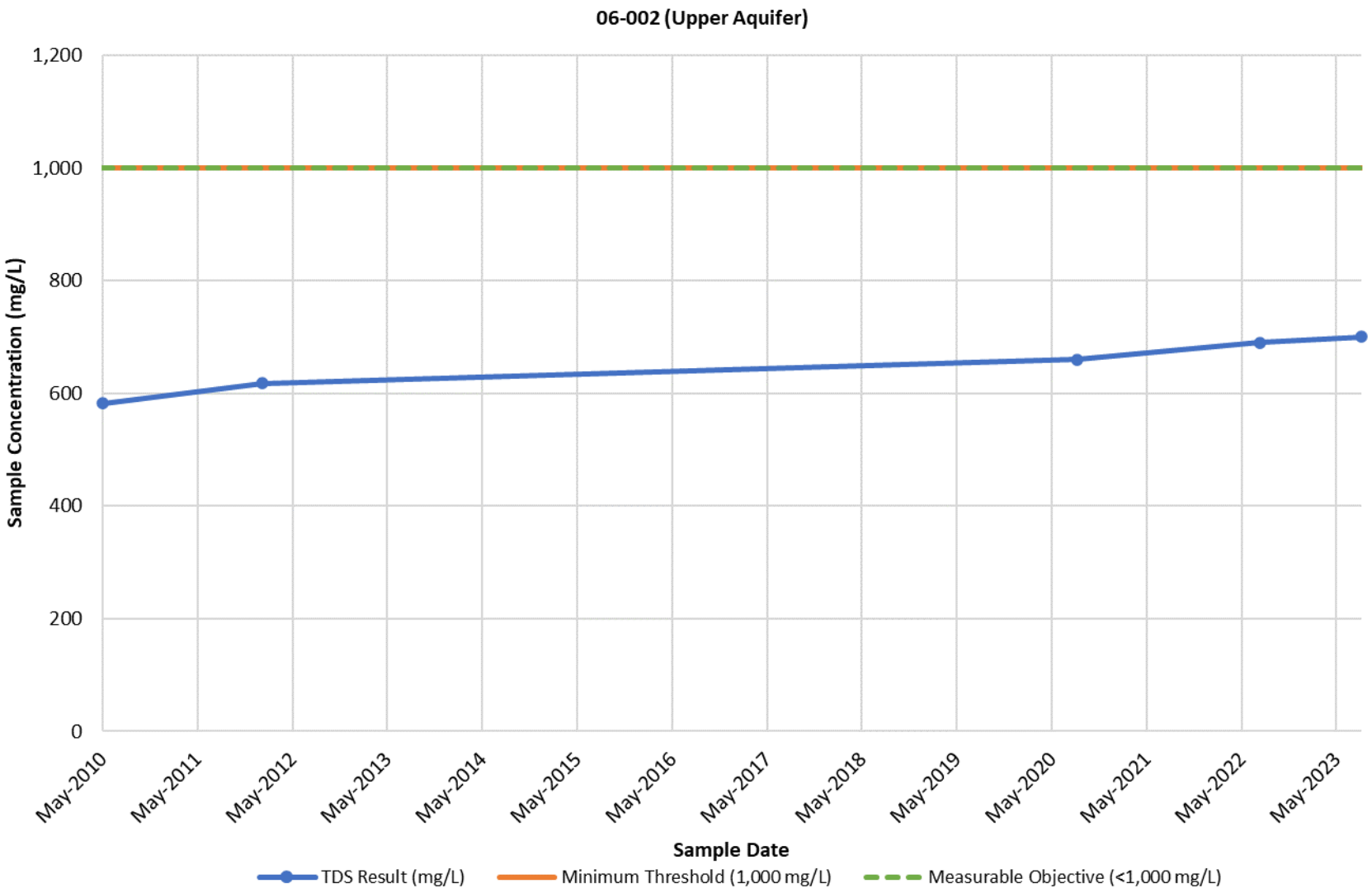

01-008 (Lower Aquifer)
Sample Concentration (mg/L)
1,200
1,000
800
600
400
200
0
Jul-2007
Jul-2008
Jul-2009
Jul-2010
Jul-2011
Jul-2012
Jul-2013
Jul-2014
Jul-2015
Jul-2016
Jul-2017
Jul-2018
Jul-2019
Jul-2020
Jul-2021
Jul-2022
Jul-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)
01-018 (Upper Aquifer)
Sample Concentration (mg/L)
700
600
500
400
300
200
100
0
Aug-2021
Sample Date
TDS Result (mg/L)

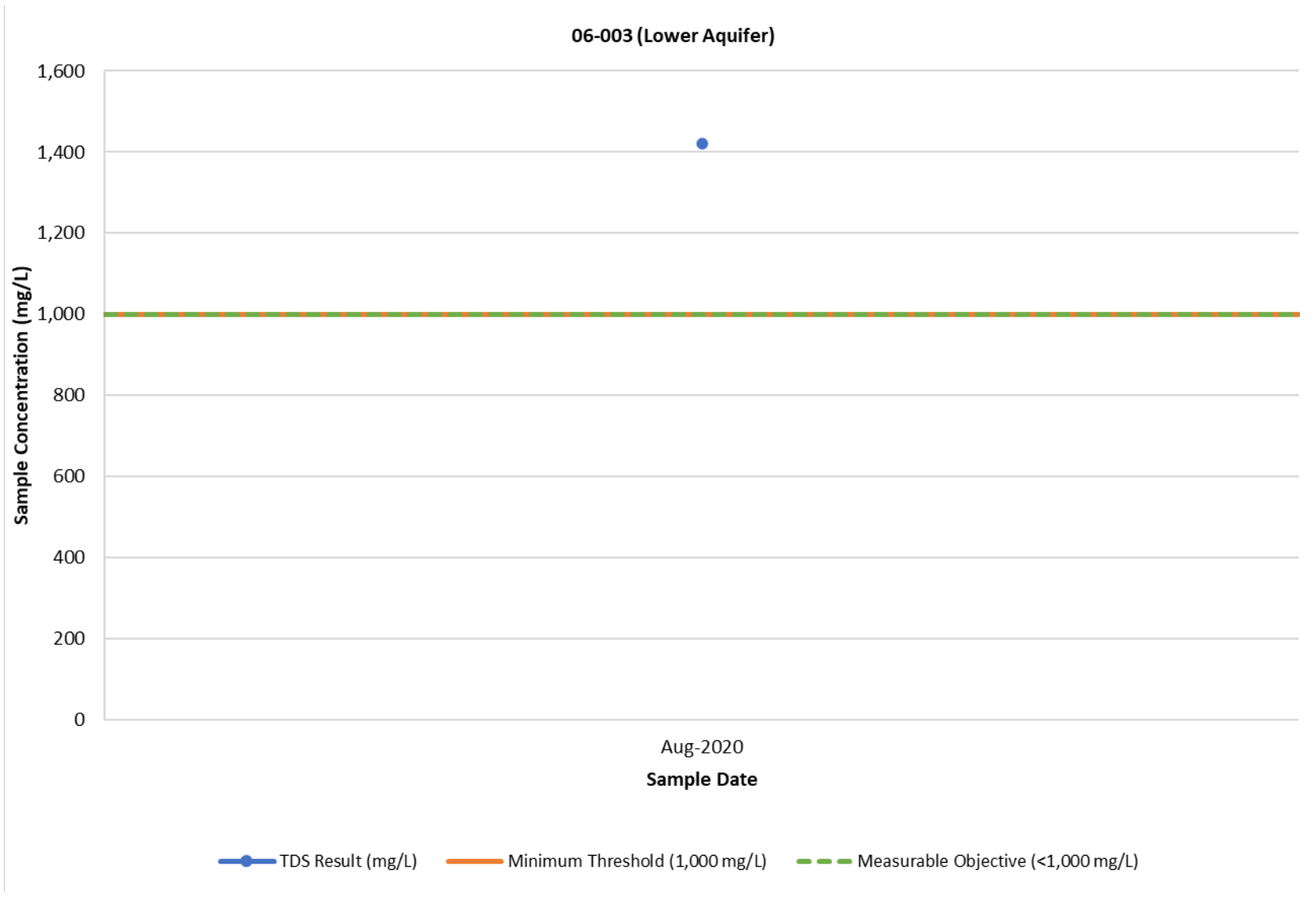

02-002 (Lower Aquifer)
Sample Concentration (mg/L)
1,200
1,000
800
600
400
200
0
Dec-2000
Dec-2001
Dec-2002
Dec-2003
Dec-2004
Dec-2005
Dec-2006
Dec-2007
Dec-2008
Dec-2009
Dec-2010
Dec-2011
Dec-2012
Dec-2013
Dec-2014
Dec-2015
Dec-2016
Dec-2017
Dec-2018
Dec-2019
Dec-2020
Dec-2021
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

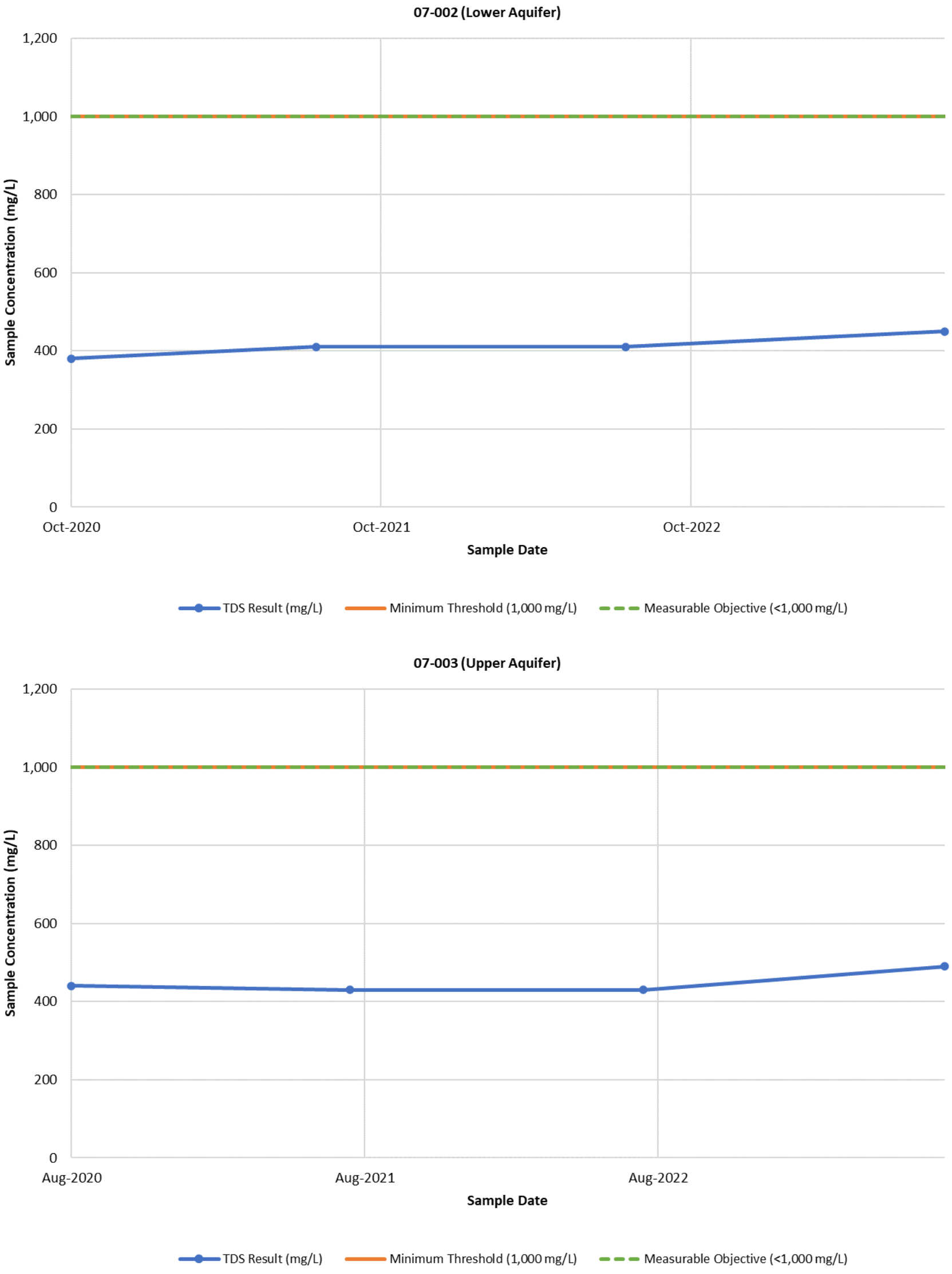

02-009 (Upper Aquifer)
Sample Concentration (mg/L)
1,400
1,200
1,000
800
600
400
200
0
Sep-2021
Sep-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

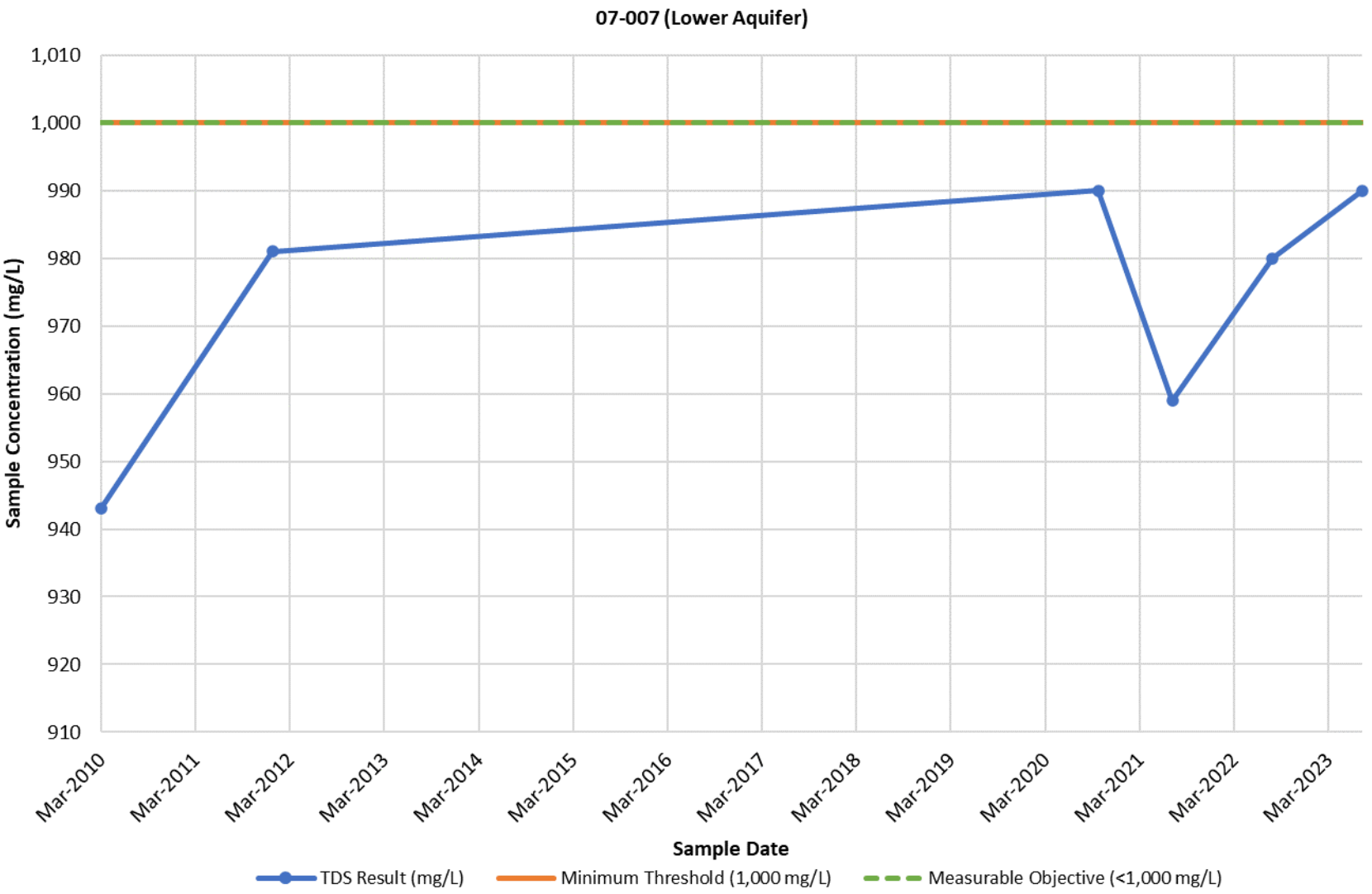

03-001 (Upper Aquifer)
1,580
1,560
1,540
1,520
1,500
1,480
1,460
Sample Concentration (mg/L)
Jul-2020
Jul-2021
Jul-2022
Jul-2023
Sample Date
TDS Result (mg/L)
03-003 (Upper Aquifer)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Jul-2020
Jul-2021
Jul-2022
Jul-2023
Sample Date
TDS Result (mg/L)

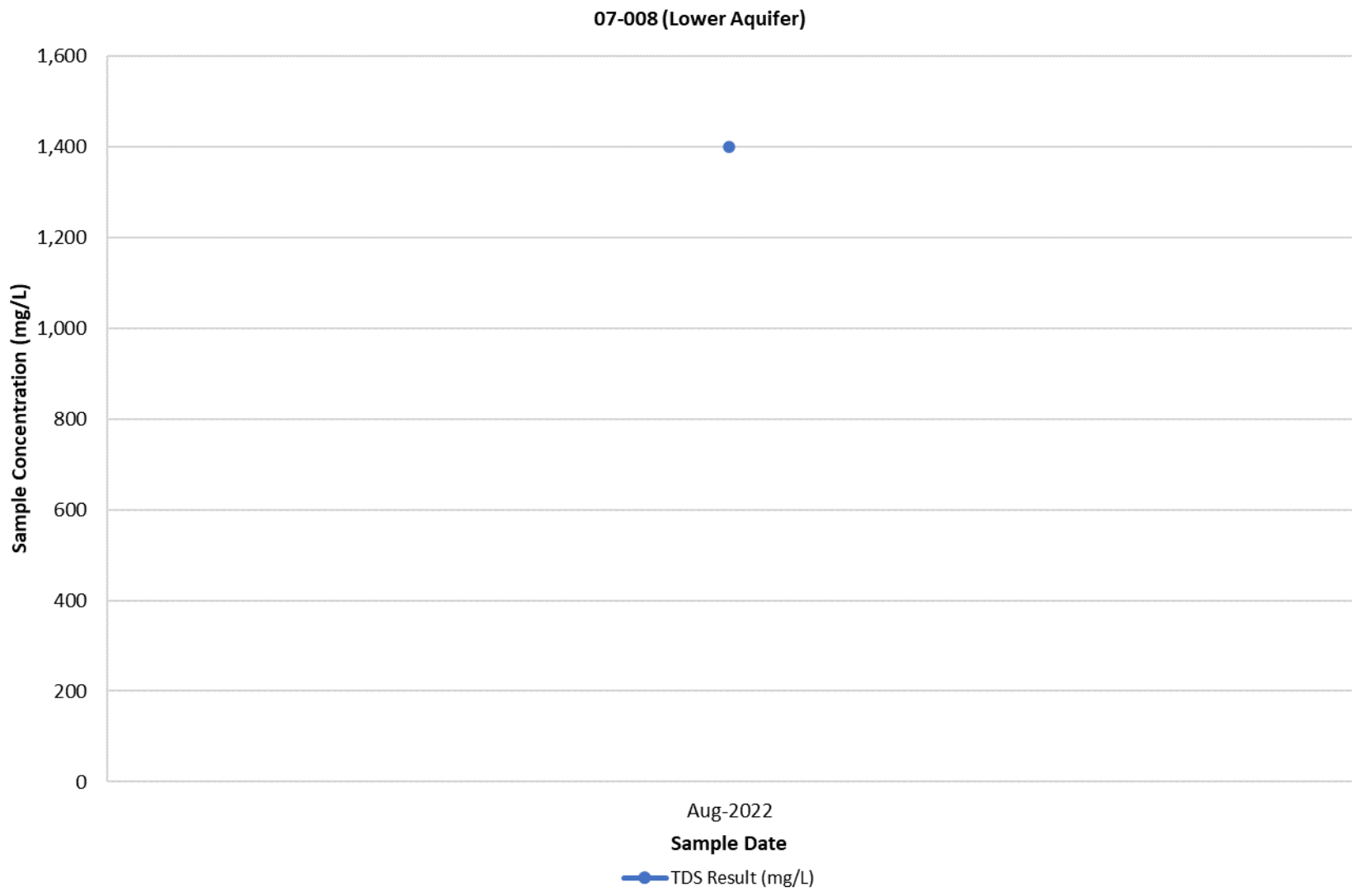

03-007 (Upper Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)
06-001 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
May-2010
May-2011
May-2012
May-2013
May-2014
May-2015
May-2016
May-2017
May-2018
May-2019
May-2020
May-2021
May-2022
May-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

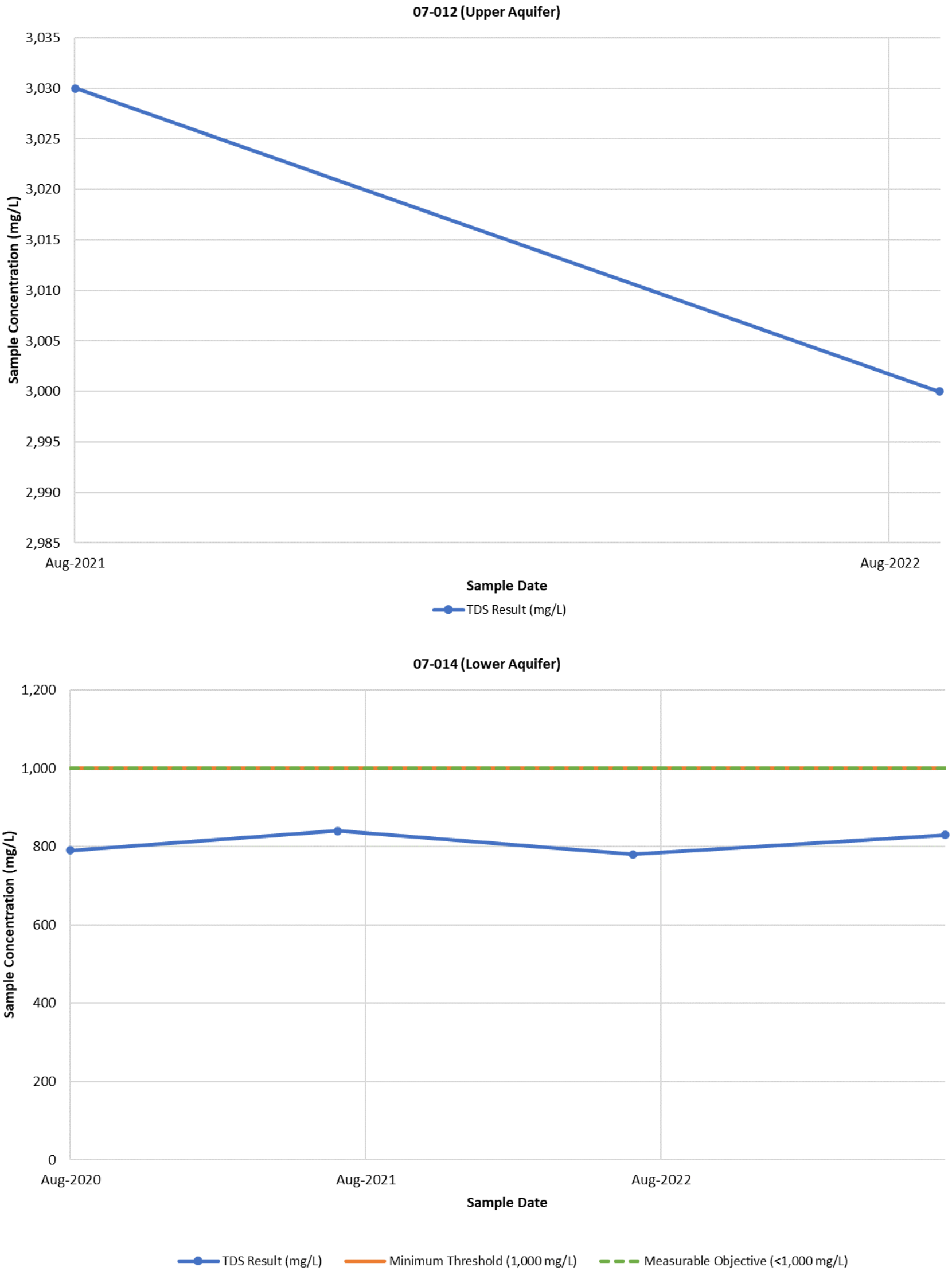

06-002 (Upper Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
May-2010
May-2011
May-2012
May-2013
May-2014
May-2015
May-2016
May-2017
May-2018
May-2019
May-2020
May-2021
May-2022
May-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

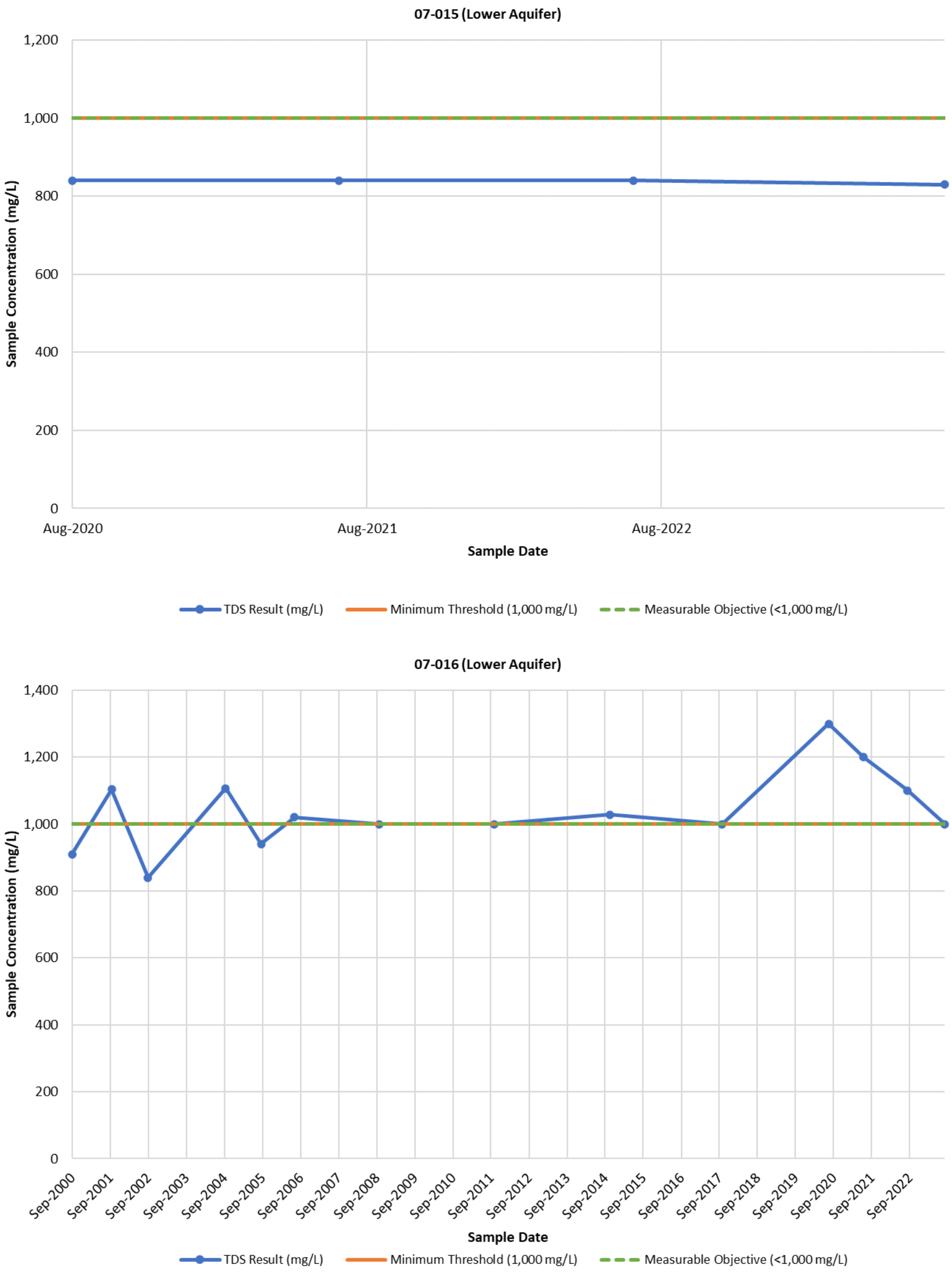

06-003 (Lower Aquifer)
1,600
1,400
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2020
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

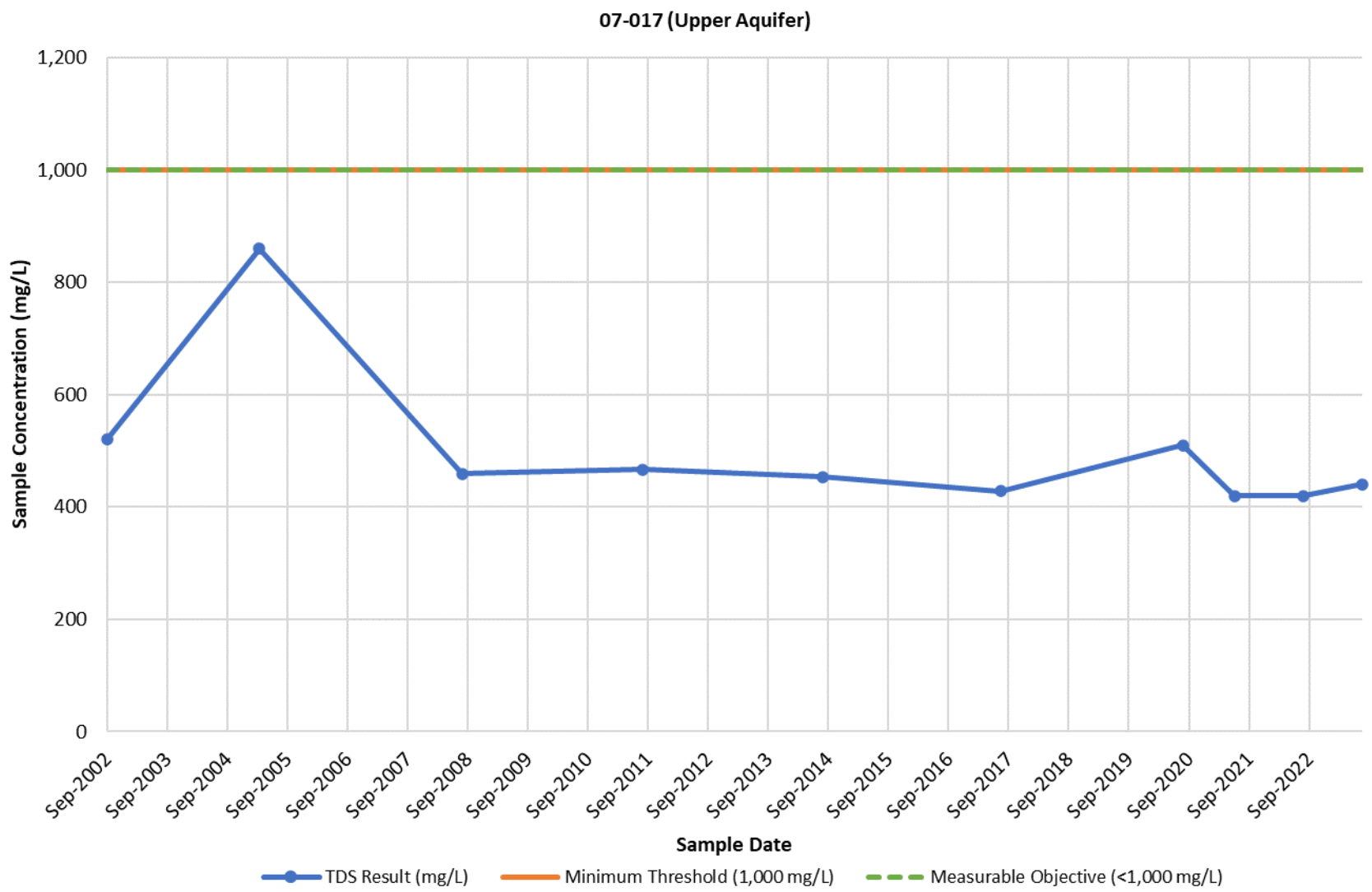

07-002 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Oct-2020
Oct-2021
Oct-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)
07-003 (Upper Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2020
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

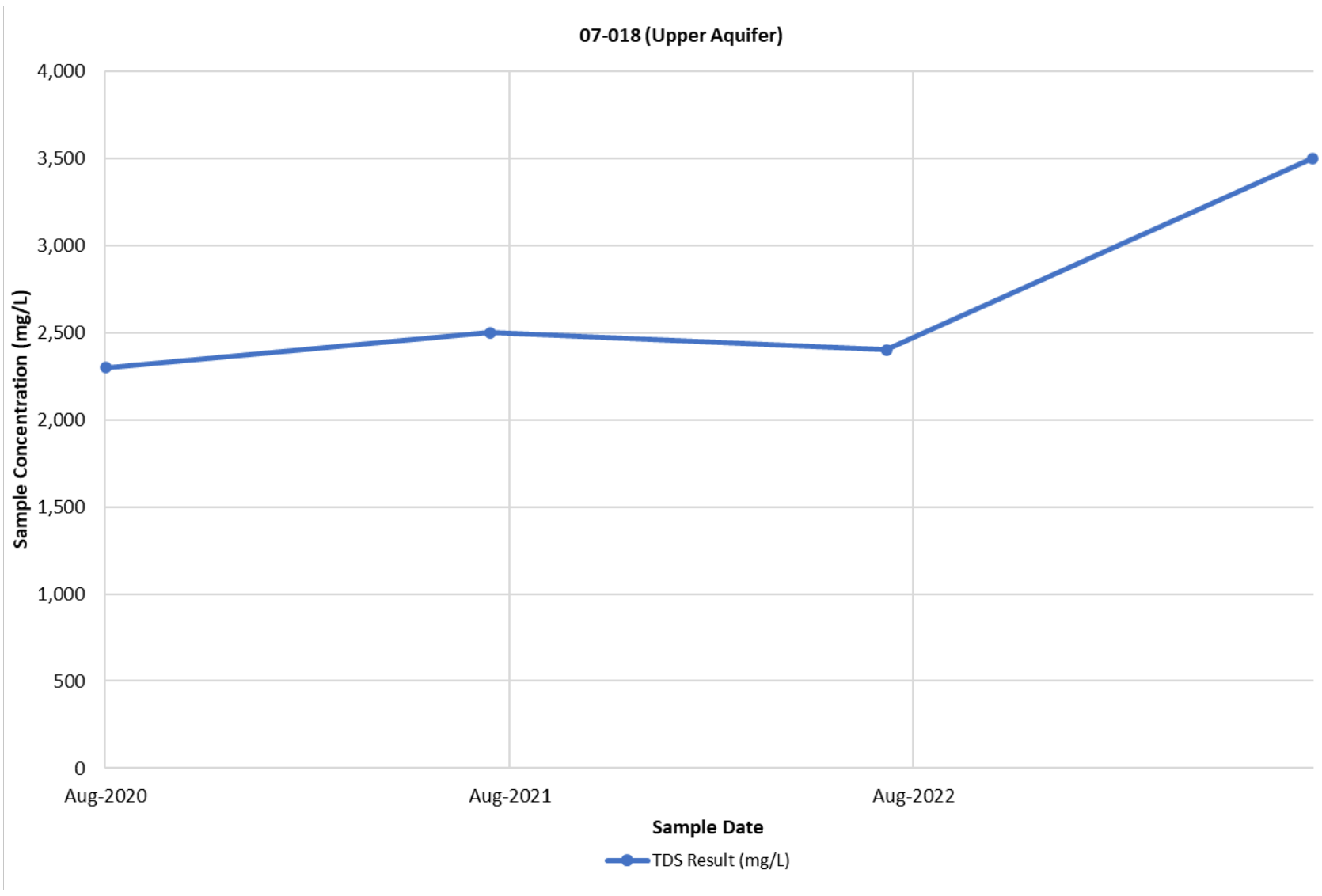

07-007 (Lower Aquifer)
1,010
1,000
990
980
970
960
950
940
930
920
910
Sample Concentration (mg/L)
Mar-2010
Mar-2011
Mar-2012
Mar-2013
Mar-2014
Mar-2015
Mar-2016
Mar-2017
Mar-2018
Mar-2019
Mar-2020
Mar-2021
Mar-2022
Mar-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

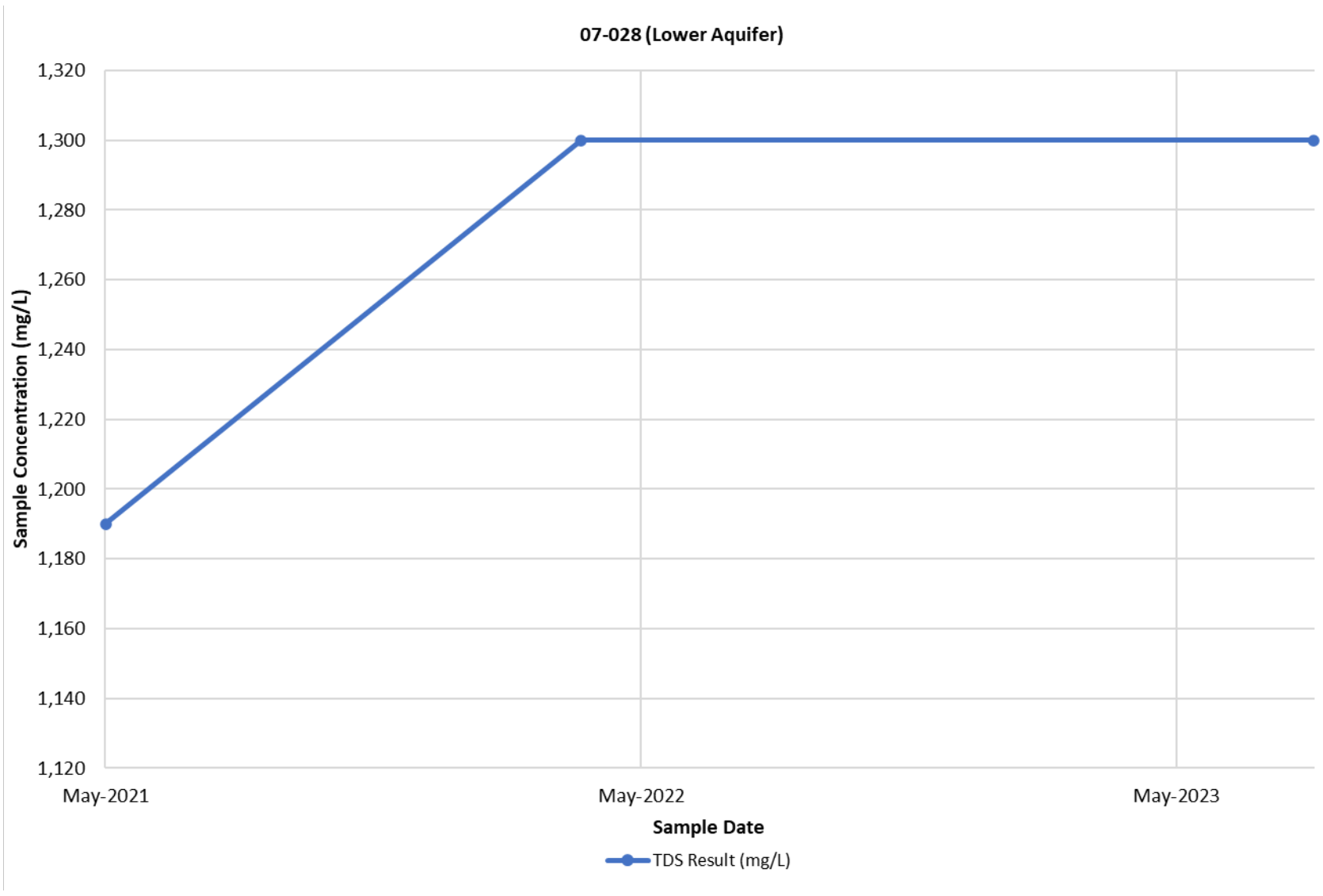

07-008 (Lower Aquifer)
1,600
1,400
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2022
Sample Date
TDS Result (mg/L)

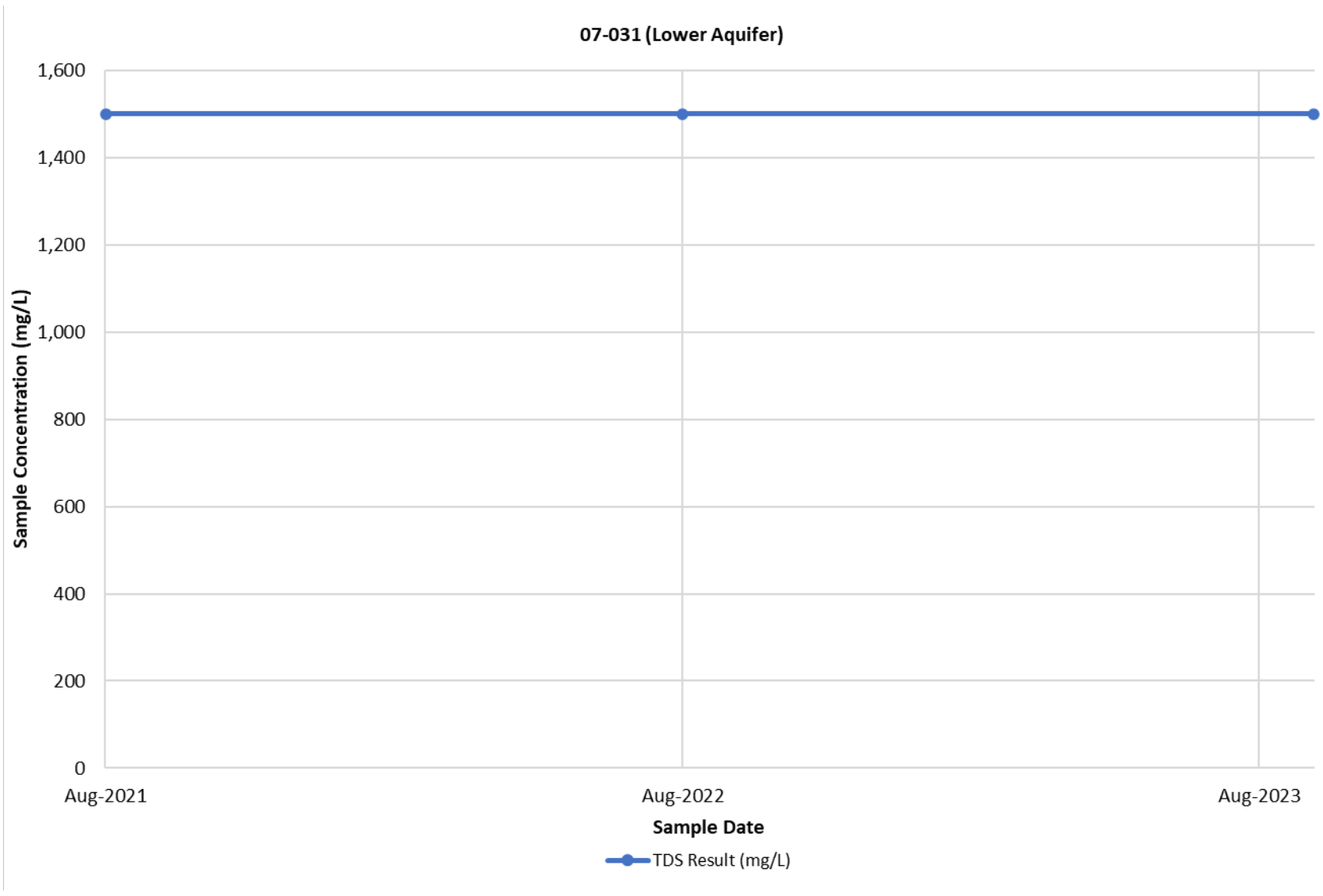

07-012 (Upper Aquifer)
Sample Concentration (mg/L)
3,035
3,030
3,025
3,020
3,015
3,010
3,005
3,000
2,995
2,990
2,985
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)
07-014 (Lower Aquifer)
Sample Concentration (mg/L)
1,200
1,000
800
600
400
200
0
Aug-2020
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

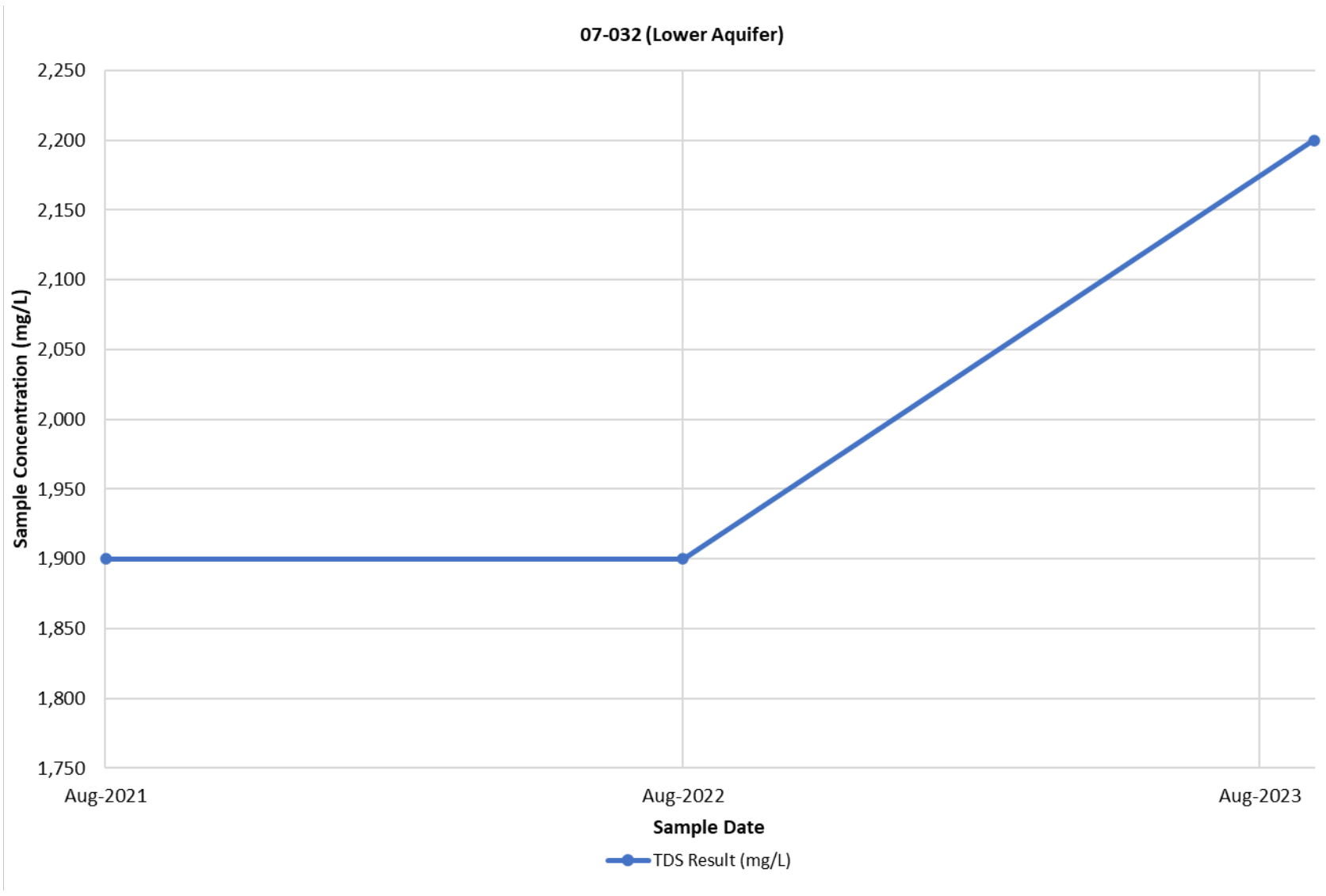

07-015 (Lower Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2020
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)
07-016 (Lower Aquifer)
1,400
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Sep-2000
Sep-2001
Sep-2002
Sep-2003
Sep-2004
Sep-2005
Sep-2006
Sep-2007
Sep-2008
Sep-2009
Sep-2010
Sep-2011
Sep-2012
Sep-2013
Sep-2014
Sep-2015
Sep-2016
Sep-2017
Sep-2018
Sep-2019
Sep-2020
Sep-2021
Sep-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

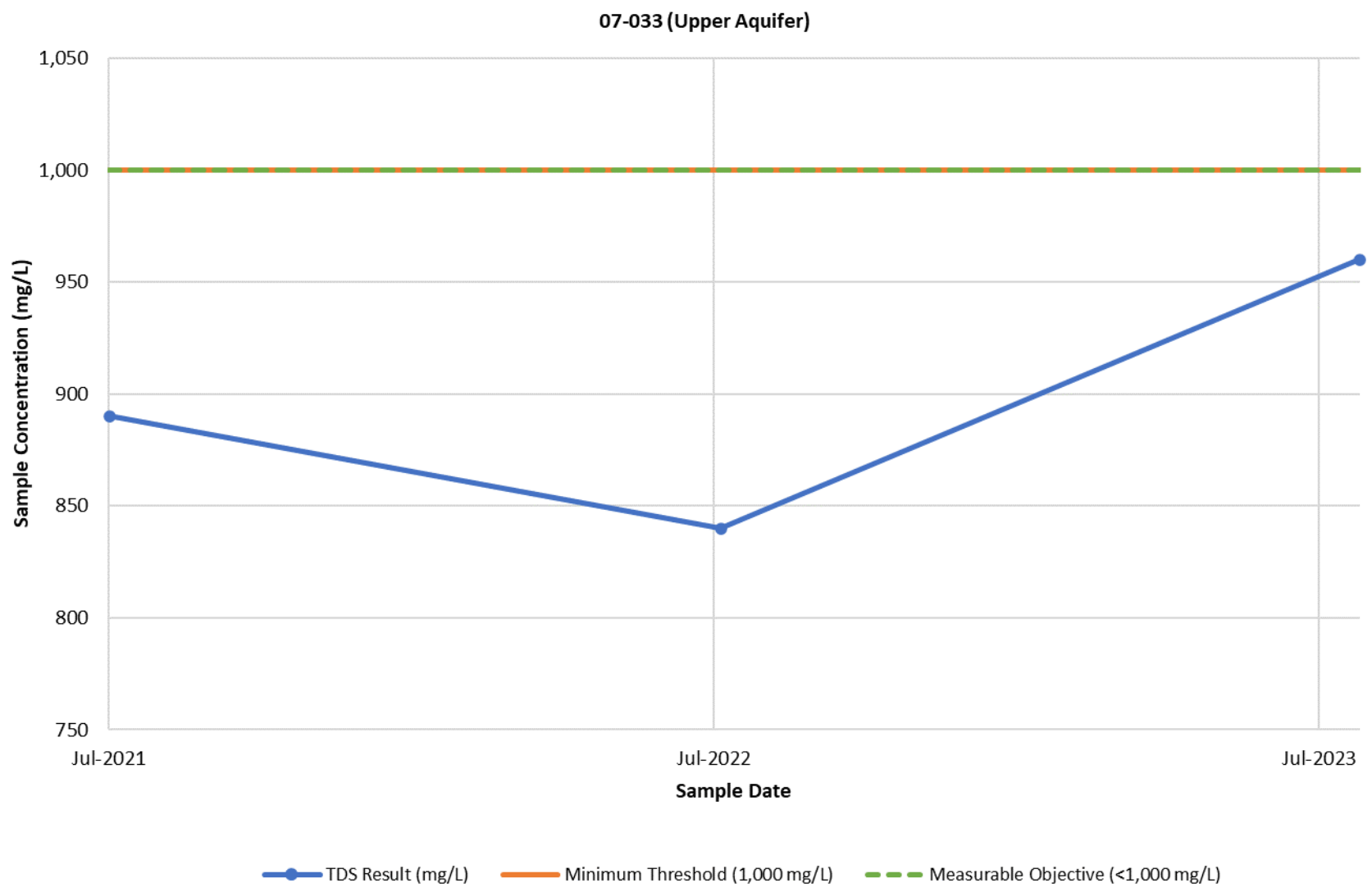

07-017 (Upper Aquifer)
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Sep-2002
Sep-2003
Sep-2004
Sep-2005
Sep-2006
Sep-2007
Sep-2008
Sep-2009
Sep-2010
Sep-2011
Sep-2012
Sep-2013
Sep-2014
Sep-2015
Sep-2016
Sep-2017
Sep-2018
Sep-2019
Sep-2020
Sep-2021
Sep-2022
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)

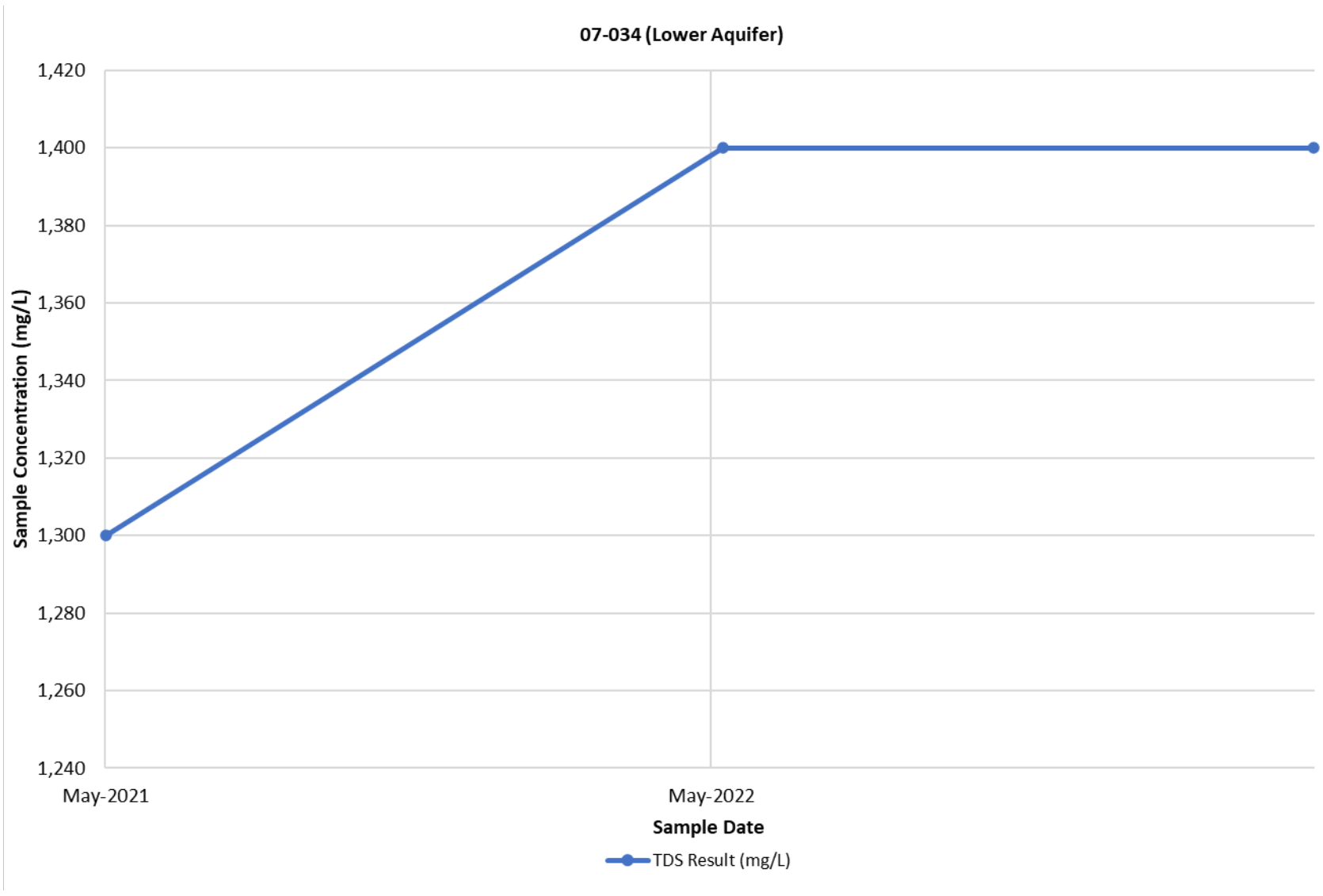

07-018 (Upper Aquifer)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Sample Concentration (mg/L)
Aug-2020
Aug-2021
Aug-2022
Sample Date
TDS Result (mg/L)

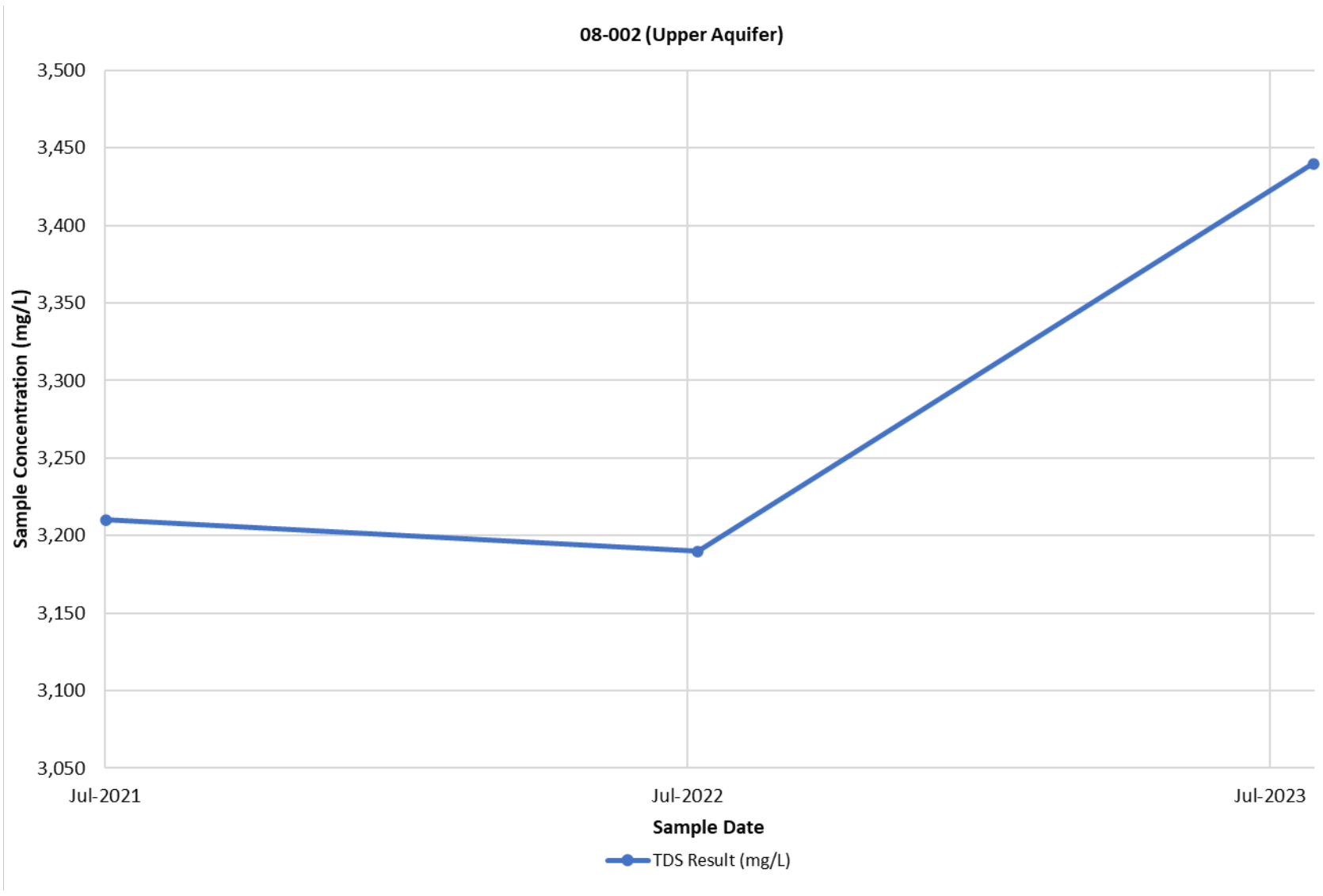

07-028 (Lower Aquifer)
1,320
1,300
1,280
1,260
1,240
1,220
1,200
1,180
1,160
1,140
1,120
Sample Concentration (mg/L)
May-2021
May-2022
May-2023
Sample Date
TDS Result (mg/L)


07-031 (Lower Aquifer)
1,600
1,400
1,200
1,000
800
600
400
200
0
Sample Concentration (mg/L)
Aug-2021
Aug-2022
Aug-2023
Sample Date
TDS Result (mg/L)


07-032 (Lower Aquifer)
Sample Concentration (mg/L)
2,250
2,200
2,150
2,100
2,050
2,000
1,950
1,900
1,850
1,800
1,750
Aug-2021
Aug-2022
Aug-2023
Sample Date
TDS Result (mg/L)


07-033 (Upper Aquifer)
Sample Concentration (mg/L)
1,050
1,000
950
900
850
800
750
Jul-2021
Jul-2022
Jul-2023
Sample Date
TDS Result (mg/L)
Minimum Threshold (1,000 mg/L)
Measurable Objective (<1,000 mg/L)


07-034 (Lower Aquifer)
Sample Concentration (mg/L)
1,420
1,400
1,380
1,360
1,340
1,320
1,300
1,280
1,260
1,240
May-2021
May-2022
Sample Date
TDS Result (mg/L)


08-002 (Upper Aquifer)
Sample Concentration (mg/L)
3,500
3,450
3,400
3,350
3,300
3,250
3,200
3,150
3,100
3,050
Jul-2021
Jul-2022
Jul-2023
Sample Date
TDS Result (mg/L)

Appendix C. Delta-Mendota Subbasin Projects and Management Actions

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