FINAL

Annual Report

Yucaipa Subbasin Groundwater Sustainability Plan 2024 Water Year

MARCH 31, 2025

Prepared for:

YUCAIPA GROUNDWATER SUSTAINABILITY AGENCY
c/o Western Heights Water Company
32352 Avenue D
Yucaipa, California 92399-1801
Contact: Mark Iverson, President

Prepared by:

DUDEK

605 Third Street
Encinitas, California 92024
Contact: Steven Stuart, PE

Steven Stuart, PE C79764
Project Manager

Table of Contents

SECTION **PAGE NO.**

TABLES

FIGURE(S)

APPENDICES

INTENTIONALLY LEFT BLANK

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AF	acre-feet
AFY	acre-feet per year
bgs	below ground surface
CIMIS	California Irrigation Management Information System
DTW	depth-to-water
DWR	California Department of Water Resources
ET	evapotranspiration
ft/ft	feet per foot
GDE	groundwater dependent ecosystem
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
MOA	Memorandum of Agreement
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanographic and Atmospheric Administration
OGSWFF	Oak Glen Surface Water Filtration Facility
RMP	representative monitoring point
SBCFCD	San Bernardino County Flood Control District;
SBVMWD	San Bernardino Valley Municipal Water District
SGMA	Sustainable Groundwater Management Act
SGPWA	San Gorgonio Pass Water Agency
SWP	State Water Project
USGS	U.S. Geological Survey
WHWC	Western Heights Water Company
WY	water year
YIHM	Yucaipa Integrated Hydrologic Model
YVRWFF	Yucaipa Valley Regional Water Filtration Facility
YVWD	Yucaipa Valley Water District

INTENTIONALLY LEFT BLANK

1 Executive Summary

1.1 Introduction

The Yucaipa Subbasin (Subbasin, Plan Area) lies within the Upper Santa Ana River Basin Hydrologic Region (DWR basin number 8-002.07). The California Department of Water Resources (DWR) designated the Yucaipa Subbasin (Subbasin) a high priority basin based primarily on its reliance on groundwater for the region's water supply (DWR 2019). Nine (9) local agencies with jurisdiction in the Plan Area formed the Yucaipa Groundwater Sustainability Agency (Yucaipa GSA) per a Memorandum of Agreement (MOA) adopted in 2017. The Yucaipa GSA adopted the Yucaipa Subbasin Groundwater Sustainability Plan (GSP) on January 26, 2022 (Dudek 2022a). The GSP was approved by the DWR on January 18, 2024.

The GSP established sustainability criteria and management actions to sustainably manage the groundwater resource per the following sustainability indicators: chronic lowering of groundwater levels, the significant and unreasonable reduction in groundwater in storage, the significant and unreasonable loss of surface water/ groundwater interaction, and the significant and unreasonable occurrence of land subsidence resulting from groundwater production in the principal aquifer.

The Subbasin was divided into four management areas: North Bench, Calimesa, Western Heights, and San Timoteo. The boundaries of the management areas were based on geologic structures (i.e., faults, hydraulic barriers) that influence groundwater flow, the distribution of water supply wells by the different water users, and the identification and location of groundwater dependent ecosystems (GDEs) in the Subbasin. Sustainability criteria were identified for each management area. A network of wells was identified to monitor and characterize groundwater conditions in the principal aquifer. A subset of wells from the monitoring network were designated as representative monitoring points (RMPs). Specific groundwater levels were defined at each RMP and represent minimum thresholds and measurable objectives that, based on the number and occurrence when conditions at the RMPs fall below these thresholds, will trigger the implementation of management actions to protect and manage the groundwater resource sustainably.

This annual GSP update report meets the requirements put forth in Sub-article 7 of Article 5 of the California Code of Regulations Division 2 Chapter 1.5 (23 CCR, Section 356.2). The Yucaipa Subbasin GSP included climatic, groundwater elevation and pumping data from the 1966 Water Year (WY) to the 2018 WY. The first three (3) annual reports included climatic, groundwater elevation and pumping data from the 2019 WY to 2023 WY. This fourth annual report includes data collected from the 2024 WY. Groundwater conditions observed in the 2024 WY are compared to the measurable objectives and minimum thresholds established in the GSP to assess whether management actions need to be implemented in the 2025 WY.

1.2 Climatic Conditions

Daily precipitation data was obtained from a network of climatic stations maintained by the San Bernardino County Flood Control District (SBCFCD), the National Oceanic and Atmospheric Administration (NOAA), and the United States Geological Survey (USGS) in the Plan Area. The precipitation data was compiled by month and used to characterize the water year-type for the 2024 WY. The 2024 WY was characterized as an "Above Normal" water year-type.

1.3 Groundwater Conditions

Groundwater conditions in the Subbasin in the 2024 WY were characterized using static groundwater elevation data collected from 72 of the 73 wells included in the groundwater monitoring network defined in the GSP. Groundwater elevations were typically measured on a monthly basis by the member agencies of the Yucaipa GSA. Monthly groundwater extractions were reported by the member agencies of the Yucaipa GSA, and extractions by native vegetation in the Subbasin were estimated using the USGS Yucaipa Integrated Hydrologic Model (YIHM), an integrated surface water and groundwater numerical model developed for the San Timoteo Wash watershed and used in developing the GSP (Dudek 2022a).

Static groundwater elevations indicated that groundwater flows from northeast to southwest, and that groundwater elevations have generally remained at consistent levels or increased in the past five (5) water years. However, groundwater elevations measured in the North Bench management area showed a general decreasing trend from late 2020 to late 2022, and then exhibited a general increasing trend of approximately 10 to 100 feet since December 2022 as rainfall in the region has been above average annual rainfall, 10,933 AF of supplemental water was discharged to the Wilson Creek and Oak Glen Creek spreading basins to artificially recharge the Subbasin in 2023 and 2024, and groundwater production decreased in the last two water years. Groundwater elevations remain above the measurable objectives and minimum thresholds defined in the North Bench management area.

1.4 Change in Groundwater in Storage

The change in groundwater in storage in the Subbasin for the 2024 WY was estimated using the YIHM. The YIHM simulates the hydrologic system using a combination of local climate conditions, land surface and land use properties, estimated aquifer properties, and native and non-native groundwater supplies and demands. The YIHM was updated to include observed climatic conditions in the watershed and actual pumping data through the end of the 2024 WY. The annual change in groundwater in storage for the Subbasin was estimated at an increase of 6,153 AF in the 2024 WY.

1.5 GSP Implementation Progress

The Yucaipa Subbasin GSP was adopted by the Yucaipa GSA on January 26, 2022. The 2024 WY marks the third year that groundwater conditions are evaluated against the sustainability criteria established in the GSP and whether, based on conditions in the 2024 WY, management actions will be implemented to sustainably manage the Subbasin in the 2025 WY. Groundwater conditions observed in the 2019 to 2023 WY were used to define previous conditions and establish basin trends into the 2024 WY (Dudek 2022b).

Groundwater conditions observed in the 2024 WY indicate that Management Action #1, which requires a reduction in net groundwater use when groundwater levels fall below the measurable objectives and minimum thresholds established in the GSP, will not be implemented in the 2025 WY. Groundwater levels in the Subbasin did not fall below measurable objectives at 50% or more of the RMPs for two consecutive years in any of the management areas in the Plan Area.

Management Action #2, which established sustainable yield pumping allocations for the groundwater users in the Subbasin and established a 5-year pumping credit system, was intended to constrain pumping to the sustainable yields estimated for each management area and to incentivize groundwater production below the sustainable yield pumping allocations. Yucaipa Valley Water District (YVWD) and Private Users exceeded their respective sustainable yield pumping allocations in the 2024 WY (YVWD in the North Bench management area, private users (estimated by the YIHM) in the Calimesa management area). South Mountain exceeded its pumping allocations in the 2022 WY and 2023 WY, but did not exceed its allocations in the 2024 WY.

Management Action #3 established a separate accounting for groundwater users that use surplus supplemental water to artificially recharge the Subbasin. The volume of supplemental water that was purchased and used to artificially recharge the Subbasin is available to the groundwater user to offset pumping exceedances above their respective sustainable yield pumping allocation. YVWD diverted 6,378 AF imported State Water Project (SWP) water to the Wilson Creek and Oak Glen Creek spreading basins to artificially recharge the Subbasin, which resolved YVWD's exceedance of their sustainable yield pumping allocation in the North Bench management area (see Section 7.3). No other groundwater user imported supplemental water to artificially recharge the Subbasin.

The Yucaipa GSA identified proposed projects that have been designed, permitted, and are undergoing development or will in the near future. These include the Wilson Creek III Basins, the Pendleton Avenue Low Water Crossing, and the Upper Wildwood Creek Basin (Dudek 2022a). These basins are designed to capture stormwater flows and enhance recharge to the Subbasin. These basins will be located in the North Bench Management Area.

In the Calimesa Management Area, the YIHM predicts that groundwater elevations will decline below the measurable objective under the Future Baseline with Climate Change II scenario within the 50-year planning and implementation horizon (Dudek 2022a). The two Regionals, San Bernardino Valley Municipal Water District (SBVMWD) and San Gorgonio Pass Water Agency (SGPWA), of the Yucaipa GSA entered into a Memorandum of Understanding in 2023 to work collaboratively in developing the County Line Road Recharge Basin and Turnout Project (the Project). The Project will convey imported water from the SWP to the Calimesa management area to artificially recharge the Subbasin. SGPWA and Riverside County executed an American Rescue Plan Act (ARPA) funding agreement in October 2024. The ARPA funding amounts to $3.1 million, covering approximately half of the total project cost. South Mesa Water Company, one of the water purveyors in the Yucaipa GSA, is making available an existing unused potable water pipeline to convey the SWP water to the County Line Road recharge basin. Construction is anticipated to being in late spring/summer of 2025. The construction would take approximately 6-9 months, with an estimated completion date of March 2026.

2 Background and Plan Area

2.1 Background

The Subbasin lies within the Upper Santa Ana River Basin Hydrologic Region (DWR basin number 8-002.07) and underlies an area of approximately 25,300 acres under portions of the cities of Calimesa, Redlands, and Yucaipa, as well as unincorporated portions of San Bernardino and Riverside Counties. The Yucaipa GSA jurisdictional boundary consists of the entire Subbasin within San Bernardino County and Riverside County Counties (Figure 1).

DWR designated the Subbasin a high priority basin based primarily on its reliance on groundwater for water supply (DWR 2019). In addition, the Subbasin receives little surface water to recharge groundwater with local sources. However, the Subbasin is not in a state of critical overdraft. Marked declines in groundwater levels were observed in the Subbasin prior to the mid-2000s. The declining trends in groundwater levels ceased following the importation of SWP water into the Subbasin in 2004. The importation of SWP water supplemented some of the local groundwater production to where the annual rate of groundwater production fell below the estimated sustainable yield of the Subbasin (Dudek 2022a). Occasionally, a portion of the imported SWP water, when available, was discharged to spreading basins to promote artificial recharge to the principal aquifer in the Subbasin. Consequently, groundwater levels observed in the principal aquifer of the Subbasin either stopped declining or recovered to historical highs observed previously in the late 1980s.

Prior to the SGMA, the water agencies in the Subbasin worked collaboratively in developing a groundwater management plan. The agencies implemented investigations to estimate the safe yield of the Subbasin and evaluated potential sites to enhance artificial recharge. The agencies formed the Yucaipa GSA in 2017 to develop a GSP for the Subbasin. Groundwater production continues to be the primary contributor to the water supply in the Subbasin with imported SWP water supplementing some of the supply. The Yucaipa Subbasin GSP establishes management actions to protect and maintain the beneficial use of the groundwater resource for all beneficial users, including groundwater dependent ecosystems located along riparian corridors.

2.1.1 Yucaipa Groundwater Sustainability Agency

Nine (9) local agencies in the Plan Area entered into an agreement to form the Yucaipa GSA per a MOA adopted in 2017. These local agencies include South Mesa Water Company, South Mountain Water Company, Western Heights Water Company and Yucaipa Valley Water District, herein collectively referred to as the “Water Purveyors”; the City of Calimesa, the City of Redlands, and the City of Yucaipa, herein collectively referred to as the “Municipalities”; and San Bernardino Valley Municipal Water District and San Gorgonio Pass Water Agency, herein collectively referred to as the “Regionals” (Table 1). Each agency is individually referred to as a “Party” and are collectively referred to as the “Parties.” The County of Riverside and the County of San Bernardino, collectively referred to as the “Counties,” are considered “Stakeholders” and were not Parties to this MOA.

The City of Calimesa submitted a written Notice of Withdrawal dated November 19, 2018, and the Yucaipa GSA subsequently acknowledged the withdrawal of the City of Calimesa from the Yucaipa GSA at the January 23, 2019 GSA Board meeting. The City of Redlands submitted a formal notice to the Yucaipa GSA to withdraw from the GSA on June 6, 2024. The Yucaipa GSA accepted the withdrawal of the City of Redlands from the Yucaipa GSA by adopting Resolution 2024-01 at the October 30, 2024 Yucaipa GSA Board meeting. The Cities of Calimesa and Redlands are stakeholders in the Plan Area.

Table 1. Yucaipa GSA Member Agencies

Water Purveyors
South Mesa Water Company
South Mountain Water Company
Western Heights Water Company
Yucaipa Valley Water District
Municipalities
City of Yucaipa
Regionals
San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency

Source: Yucaipa Subbasin Groundwater Sustainability Plan (Dudek 2022a).

2.1.2 Yucaipa Subbasin Groundwater Sustainability Plan

The Yucaipa GSA adopted the Yucaipa Subbasin GSP on January 26, 2022. The DWR approved the GSP on January 18, 2024. The GSP provides the framework for the sustainable management of the Subbasin's groundwater resource. The GSP identifies the Yucaipa GSA member agencies and legal authority of the GSA, presents historical observations of groundwater levels and usage in the Subbasin, and how climate, land use, and water management programs influenced groundwater conditions since the 1965-1966 WY (a water year extends from October 1 to September 30 of the following calendar year). The GSP also evaluated future conditions over the next 50 years by incorporating two different climate change scenarios.

A hydrogeological conceptual model was developed that identified the geological and hydrogeological characteristics of the Subbasin and identified the inflow and outflow components of a water balance for the Subbasin (Dudek 2022a). The USGS developed an integrated hydrological numerical model to simulate groundwater conditions in the Subbasin (Cromwell and Alzraiee 2022). The numerical model was used to estimate the sustainable yield of the Subbasin (10,980 acre-feet per year) and to calculate the annual change in storage for the Subbasin from the 1965 WY to the 2069 WY. The numerical model was also used to establish groundwater level thresholds for the sustainability criteria defined in the GSP.

The GSP established sustainability criteria and management actions to sustainably manage the groundwater resource per the following sustainability indicators: chronic lowering of groundwater levels, the significant and unreasonable reduction in groundwater in storage, the significant and unreasonable loss of surface water/groundwater interaction, and the significant and unreasonable occurrence of land subsidence resulting from groundwater production in the principal aquifer.

The Subbasin was divided into four (4) management areas: North Bench, Calimesa, Western Heights, and San Timoteo (Figure 2). The boundaries of the management areas were based on the geologic structures (i.e., faults, hydraulic barriers) that influence groundwater flow, the distribution of water supply wells by the different water users, and the identification and location of GDEs in the Subbasin. Sustainability criteria were identified for each management area. For the North Bench, Calimesa, and Western Heights Management Areas, minimum thresholds were defined at either the historical low in groundwater elevations in the North Bench Management Area, or below historical lows in the Calimesa and Western Heights Management Areas. The minimum threshold and measurable objective for the San Timoteo Management Area were defined to prevent significant and unreasonable effects on GDEs identified along San Timoteo Creek. A drought buffer was defined for the North Bench, Calimesa, and Western Heights Management Areas to provide operational flexibility between their respective measurable objectives and minimum thresholds.

A network of wells was identified to monitor and characterize groundwater conditions in the principal aquifer (Figure 3). A subset of wells from the monitoring network were designated as representative monitoring points (RMP, Figure 4). Specific groundwater levels were defined at each RMP and represent minimum thresholds and measurable objectives that, based on the number and occurrence when conditions at the RMPs fall below these thresholds, will trigger the implementation of management actions to protect and manage the groundwater resource sustainably.

Three (3) management actions were defined in the GSP: 1) reduce the net use of groundwater when groundwater levels fall below measurable objectives and minimum thresholds, 2) constrain annual pumping to sustainable yield pumping allocations assigned to each groundwater user per management area and issue pumping credits when annual production is below their respective sustainable yield pumping allocation, and 3) provide an accounting of surplus supplemental water used to artificially recharge the Subbasin that is available to the groundwater user that purchased the water and percolated it at a spreading basin. The Yucaipa GSA has also designed, permitted and is currently developing the installation of storm water capture basins to increase artificial recharge to the Subbasin and reduce the dependence on imported water.

The Yucaipa Subbasin GSP includes groundwater and pumping data from the 1965 WY to the 2018 WY. This fourth annual report includes data collected in the 2024 WY and provides a review of groundwater levels measured against the minimum thresholds and measurable objectives defined for each RMP in each management area. Section 7 provides a review of the GSP implementation progress and identifies whether conditions have required the implementation of management actions.

2.2 Plan Area

2.2.1 Description of the Plan Area

The Plan Area encompasses the entire Subbasin (DWR Basin Number 8-002.07) of the Upper Santa Ana Valley Basin (DWR Basin Number 8-002) as defined following the basin boundary modification adopted by DWR in 2016 (DWR 2016). The Plan Area has a surface area of approximately 39.5 square miles or 25,300 acres (Figure 1). The Plan Area is bounded to the north by the San Andreas Fault Zone and San Bernardino Mountains, to the east by the Yucaipa Hills, to the west by the Crafton Hills, and to the south by the San Timoteo Badlands.

The San Timoteo Subbasin (DWR Basin Number 8-002.08) is adjacent to the Subbasin on its southern boundary (Figure 5). The adjudicated San Bernardino Subbasin (DWR Basin Number 8-002.06) is adjacent to the Subbasin on its western boundary. The adjudicated Beaumont Basin lies almost entirely in the San Timoteo Subbasin and its northwestern boundary is adjacent to southeastern boundary of the Live Oak subarea in the Subbasin.

2.2.2 Climate

San Bernardino Valley has a semiarid, Mediterranean climate characterized by relatively hot, dry summers and cool winters with intermittent precipitation. Most precipitation occurs from December through March, and rainless periods of several months are common in the summer. Precipitation is mostly in the form of rain in the lower elevations and mostly snow above approximately 6,000 feet above NAVD88 in the San Bernardino Mountains.

Mean annual precipitation by water year in the San Bernardino Valley ranges from approximately 10 inches near Riverside to approximately 30 inches in the upper San Bernardino Mountains (WSC 2018). Mean annual precipitation in the Subbasin is approximately 16 inches. Historical precipitation data indicates that a period of above average or below-average precipitation can last more than 30 years, such as the dry period that extended from 1947 to 1977. The region has been experiencing an ongoing drought since 1999 (WSC 2018).

2.2.1 Precipitation

2.2.1.1 San Bernardino County Flood Control District

The San Bernardino County Flood Control District (SBCFCD), a division of the Department of Public Works, installed a network of climate stations throughout San Bernardino County to collect precipitation, stream flow and temperature data. The data is used to manage flood control storm warnings, structure and channel design, runoff calculations, and environmental studies (SBCFCD 2023). Historical Daily precipitation data was obtained from San Bernardino's online database for 17 stations within the Plan Area (Figure 6). The stations range in elevation from 1,285 feet above NAVD88 at the Redlands – Roth station (Site ID 3023), which is located approximately 850 feet downstream of the farthest downstream extent of the Yucaipa Subbasin, to 4,630 feet above NAVD88 at the Oak Glen station (Site ID 3015) located near the eastern end of the Triple Falls Creek subarea (Figures 6 and 7). Table 2 summarizes the locations and periods of record for the stations used to characterize precipitation in the Yucaipa Subbasin.

The historical precipitation data collected at the 17 SBCFCD climate stations was used to characterize the water year types from the 1954 WY to the 2024 WY. Daily precipitation data was collected at various periods between these stations, with the longest running data collection period recorded at the Oak Glen station (SBCFCD Station ID No. 3015) from October 1, 1945 to September 30, 2024. The daily precipitation data was compiled by water year for each station.

Mean annual precipitation per water year ranged from 12.04 inches at Station 2890 in the Crafton subarea to 24.37 inches at Station 3015 in the Triple Falls Creek subarea (Table 5, Figures 6 and 7). Precipitation amounts tended to follow the topographical landscape of the Yucaipa Subbasin. Mean annual precipitation declined when transitioning from the highest elevations in the Triple Falls Creek subarea (24.37 inches) and the foothills of the San Bernardino Mountains to the lower elevations in the Yucaipa Plain where mean annual precipitation ranged from 15.45 to 18.16 inches in the Oak Glen, Gateway, Wilson Creek and Calimesa subareas. The mean annual precipitation in the Crafton, Western Heights and Live Oak subareas, which are the western subareas and lowest in elevation, ranged from 12.04 to 13.91 inches.

Table 2. San Bernardino County Flood Control District Climatic Stations in the Yucaipa Subbasin

SBCFCD Station ID No.	Site Name	Subarea	Latitude	Longitude	Elevation (ft NAVD88)	Begin Data Record	End Data Record
2890	Yucaipa Regional	Crafton	34.04876	−117.04857	2,606	9/5/1989	Ongoing
2915	Wilson Creek	Western Heights	34.03437	−117.07441	2,235	2/12/2004	Ongoing
3015	Oak Glen	Triple Falls Creek	34.05185	−116.95272	4,680	10/1/1945	Ongoing
3023	Redlands–Roth	Live Oak	34.03402	−117.21035	1,285	2/1/1932	Ongoing
3099	Yucaipa County Yard	Western Heights	34.03351	−117.10241	2,140	5/1/1957	10/1/1978
3126	Yucaipa	Wilson Creek	34.03340	−117.03511	2,815	1/31/1949	10/1/1990
3126A	Calimesa East	Calimesa	34.00444	−117.01733	2,813	5/1/1964	Ongoing
3128B	Yucaipa Adams 2e	Wilson Creek	34.02924	−117.04426	2,860	10/1/1949	10/1/1980
3129	Yucaipa C.D.F.	Gateway	34.04653	−117.03558	2,660	1/1/1951	1/22/1980
3129A	Yucaipa C.D.F.	Gateway	34.04654	−117.03559	2,660	1/22/1980	Ongoing
3132	Yucaipa Water Company (YVWD)	Calimesa	34.02157	−117.04470	2,710	2/20/1953	Ongoing
3239	Redlands Country Club	Live Oak	34.01898	−117.14947	2,080	5/24/1964	1/27/2005
3239A	Redlands Country Club WT	Live Oak	34.01385	−117.13868	2,281	1/27/2005	Ongoing
3356	Crafton Hills Fire Station #18	Western Heights	34.03435	−117.09252	2,125	9/28/1979	Ongoing
3386	Calimesa–Raisner	Calimesa	34.00435	−117.03375	2,620	11/23/1988	1/3/2007
3121	Oak Glen–Sample	Oak Glen	34.05525	−116.98675	3,695	10/2/1980	4/30/2005
2800	Wildwood Canyon	Oak Glen	34.01434	−117.00778	2,946	9/14/1999	Ongoing

Note: SBCFCD = San Bernardino County Flood Control District; ft NAVD88 = feet above North American Vertical Datum of 1988.

2.2.1.2 National Oceanic and Atmospheric Administration

Daily precipitation data were also obtained from National Oceanic and Atmospheric Administration (NOAA) weather stations located in Redlands (Station #USC00047306), Yucaipa (Station #US1CASR0044), and Beaumont (Station #US1CARV0018), California. The Redlands station is located approximately 0.5 miles northeast of the farthest downgradient end of the Plan Area (Figure 6). The station is at an elevation of 1,417 feet above NAVD88. The Yucaipa station, "Yucaipa 1.5NNE," is located approximately 0.5 miles northwest of the Wilson Creek spreading basins. The Yucaipa station is at an elevation of 2,776 feet above NAVD88. The Beaumont station is located approximately 2 miles northwest of the intersection of Interstate 10 and State Route 60 in the San Timoteo Wash Watershed, approximately 1.9 miles south of the Singleton hydrogeological subarea (Figures 6 and 7). The elevation of the Beaumont station is 2,532 feet above NAVD88 (Table 4).

The mean annual (by water year) precipitation at these three NOAA stations ranged from 12.54 inches to 17.01 inches. The Redlands station, with a mean annual precipitation of 12.54 inches, has the longer record of data and is also at the lowest elevation. The highest mean annual precipitation is 17.01 inches at the Yucaipa 1.5 NNE station, which is at the highest elevation at 2,776 feet above NAVD88 (Table 3).

Table 3. Summary Information for NOAA Climatic Stations in the Vicinity of the Yucaipa Subbasin

NOAA Station ID	NOAA Network ID	Latitude (degrees)	Longitude (degrees)	Elevation (ft NAVD88)	Period of Data Collection	Mean Annual Precipitation (inches)[a]
Redlands	USC00047306	34.037	−117.195	1,417	Oct. 1963–Sep. 2024	12.54
Beaumont 2.5 NW	US1CARV0018	33.954	−117.012	2,532	Oct. 2009–Sep. 2024	13.94
Yucaipa 1.5 NNE	US1CASR0044	34.054	−117.038	2,776	Oct. 2014–Sep. 2024	17.01

Notes: NOAA = National Oceanic and Atmospheric Administration; ft NAVD88 = feet above North American Vertical Datum of 1988; NW = northwest; NNE = north by northeast.
[a] Per water year (October 1 to September 30).

2.2.1.3 United States Geological Survey

The USGS installed climate stations in the Calimesa and North Bench management areas in May 2022 and April 2023, respectively. The USGS station in the Calimesa management area is identified as the "W. County Line Rd" climate station. The USGS station in the North Bench management area is identified as the "Oak Glen Rd Nr Yucaipa CA" climate station. A summary of the details for each USGS station are included in Table 4.

Table 4. Summary Information for USGS Climate Stations in the Yucaipa Subbasin

USGS Station ID	USGS Network ID	Latitude (degrees)	Longitude (degrees)	Elevation (ft NAVD88)	Period of Data Collection	Mean Annual Precipitation (inches)[a]
W. County Line RD	340014117040901	34.0038	-117.069	2,362	May 2022 – Sep. 2024	21.66
Oak Glen RD NR Yucaipa CA	340312116592701	34.0535	-116.991	3,569	Apr. 2023– Sep. 2024	22.90

Notes: USGS = United States Geological Survey; ft NAVD88 = feet above North American Vertical Datum of 1988;
[a] Per water year (October 1 to September 30).

2.2.1.4 Mean Annual Precipitation in the Yucaipa Subbasin

The weighted mean annual precipitation across the Plan Area is 15.60 inches based on precipitation data collected at the SBCFCD, NOAA and USGS climate stations from the 1953 WY to the 2024 WY (Table 3). The mean annual precipitation estimate was weighted against the number of annual precipitation totals recorded for each station divided by the total number of annual precipitation totals across the Subbasin.

Table 5. Mean Annual Precipitation in the Yucaipa Subbasin

Subarea	Mean Annual Precipitation (inches)[a]	Minimum Elevation at Climate Stations (ft NAVD88)	Maximum Elevation at Climate Stations (ft NAVD88)
Crafton	12.04	2,606	2,606
Live Oak	12.03	1,285	2,281
Western Heights	13.91	2,125	2,235
Gateway	15.45	2,660	2,776
Wilson Creek	15.31	2,815	2,860
Calimesa + Singleton	16.64	2,362	2,813
Oak Glen	18.16	2,946	3,695
Triple Falls Creek	24.37	4,680	4,680
Yucaipa Subbasin	**15.60**	**1,285**	**4,680**

Note: ft NAVD88 = feet above North American Vertical Datum of 1988.
[a] Per water year (October 1 to September 30).

2.2.1.5 Cumulative Departure from Mean Monthly Precipitation

Historical daily precipitation data from the SBCFCD climatic stations 3015 (Site name: Oak Glen) and 3126A (Site name: Calimesa East) and from the NOAA Redlands, Yucaipa 1.5 NNE, and Beaumont 2.5NW stations were compiled as total monthly precipitation. Mean monthly precipitation was calculated for each station. Mean monthly precipitation ranged from 0.06 inches in June at the NOAA Beaumont 2.5 NW station to 4.59 inches in February at the SBCFCD Oak Glen station (Table 6).

The cumulative departure from the mean monthly precipitation was calculated for the SBCFCD Oak Glen and Calimesa East stations and the NOAA Redlands station because these stations had precipitation data records extending as far back as 1963 (Figure 8). The declining cumulative departure of mean monthly precipitation (i.e., less-than-normal rainfall) from the 1945 WY to 1965 WY at the Oak Glen station indicates an extended 20-year drought with intermittent wet years in 1951 and 1958. The trend after 1965 reversed direction and generally increased with significant wet periods from 1965 to 1969, 1978 to 1983, and 1992 to 1998. The region is currently experiencing a drought that started in the 1999 WY (Figure 8). The cumulative departure from the mean monthly precipitation for the SBCFCD Calimesa East and NOAA Redlands stations show the same trends, but with less variation in the changes in rainfall because these stations are at lower elevations than the Oak Glen station.

Table 6. Mean Monthly Precipitation in the Yucaipa Subbasin

Climatic Station ID	Elevation (ft NAVD88)	Mean Monthly Precipitation (inches)											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SBCFCD 3015 (Oak Glen)	4,680	0.88	2.27	3.23	4.33	4.59	4.11	1.88	0.94	0.15	0.39	0.49	0.63
SBCFCD 3126A (Calimesa East)	2,813	0.67	1.67	2.47	3.21	3.42	2.82	1.25	0.61	0.14	0.20	0.18	0.39
NOAA Yucaipa 1.5 NNE	2,776	0.50	1.36	2.64	3.57	3.14	2.93	1.04	0.80	0.08	0.20	0.44	0.27
NOAA Beaumont 2.5 NW	2,532	0.36	1.12	2.65	2.80	2.37	2.36	0.83	0.50	0.06	0.20	0.29	0.14
NOAA Redlands	1,417	0.48	1.15	1.86	2.62	2.64	2.04	0.93	0.36	0.08	0.11	0.21	0.33
Maximum Mean Monthly Precipitation		**0.88**	**2.27**	**3.23**	**4.33**	**4.59**	**4.11**	**1.88**	**0.94**	**0.15**	**0.39**	**0.49**	**0.63**
Minimum Mean Monthly Precipitation		**0.36**	**1.12**	**1.86**	**2.62**	**2.37**	**2.04**	**0.83**	**0.36**	**0.06**	**0.11**	**0.18**	**0.14**

Notes: ft NAVD88 = feet above North American Vertical Datum of 1988;
SBCFCD = San Bernardino County Flood Control District;
NOAA = National Oceanic and Atmospheric Administration;
NNE = north by northeast;
NW = northwest.

2.2.1.6 Water Year Type

Periods of above or below average precipitation affect the volume of water that naturally recharges the groundwater aquifer underlying the Plan Area. To characterize the effects of total water year precipitation on local groundwater supplies and demands, and the volume of groundwater in storage, the Yucaipa GSA defined the following six categories to characterize the water year types: Wet, Above Normal, Normal, Below Normal, Dry, and Critically Dry. Water year type was characterized by normalizing measured water year precipitation by the long-term water-year precipitation averages measured at the SBCFCD, NOAA and USGS climate stations in the Subbasin. The normalized water year precipitation measurements were then categorized into the following water year types:

(1) Critically Dry: <50% of the long-term precipitation mean
(2) Dry: ≥50%, but <75% of the long-term precipitation mean
(3) Below Normal: ≥75%, but <90% of the long-term precipitation mean
(4) Normal: ≥90%, but <110% of the long-term precipitation mean
(5) Above Normal: ≥110%, but <150% of the long-term precipitation mean
(6) Wet: ≥150% of the long-term precipitation mean

Figure 9 shows the water year-types for the Subbasin. Characterization of the basin-wide water year-types was computed by taking the average water year-type characterizations across the SBCFCD, NOAA and USGS stations for each water year. The mean annual rainfall in the Plan Area for the 2024 WY was 18.70 inches, which was 120% of the mean annual rainfall of 15.60 inches. The water year-type for the 2024 WY was characterized as "Above Normal" (Table 7).

Table 7. Water Year-Type for the 2024 WY

Water Year[a]	Mean Annual Rainfall in Plan Area (inches)	Percentage of Mean Historical Annual Rainfall	Water Year-Type
2023-2024	18.70	120%	Above Normal

Source: San Bernardino County Flood Control District.
Note:
a Water Year corresponds to October 1 of the previous year through September 30 of the current year.

3 Groundwater Conditions

3.1 Groundwater Monitoring Network

The existing network of wells to assess groundwater conditions in the Yucaipa Subbasin includes the majority of municipal water supply wells operated by South Mesa, South Mountain, WHWC, and YVWD. Monitoring wells installed by YVWD, the USGS and SBVMWD also provide data characterizing groundwater conditions in the Subbasin. The groundwater monitoring network includes 77 wells (Figure 3). Groundwater elevation data is collected at 73 of these wells; water quality data is collected at 40 of these wells; and groundwater production data is collected at 31 wells. Four of the municipal wells in the monitoring network are located outside the Plan Area and supply water to the Subbasin. This water supply is characterized as an imported groundwater supply to the

Subbasin. The majority of the wells are municipal supply and monitoring wells; however, the network does include two irrigation wells operated by South Mountain. Table 8 presents the number and type of wells located in each management area.

Table 8. Types Of Wells In The Monitoring Network

Management Area	Municipal	Monitoring	Private/Domestic[a]	Agricultural/ Irrigation
All Wells	41	33	Unknown	3
Calimesa	13	9	Unknown	2
North Bench	17	13	Unknown	0
San Timoteo	0	6	Unknown	1
Western Heights	7	5	0	0
Outside Subbasin	4	0	0	0

Source: Yucaipa Subbasin Groundwater Sustainability Plan (Dudek 2022a).
Note:
[a] The number of private well owners in the North Bench and San Timoteo management areas is unknown at this time. The Yucaipa GSA is in the process of establishing contact with the individual owners to confirm their use of groundwater and obtain well information and usage.

3.2 Groundwater Elevations

The water purveyors, YVWD, WHWC, South Mesa, and South Mountain, measure depths-to-water (DTW) at their respective wells on a monthly basis. The DTW are either measured using an electric tape, airline or by sonic methods. The electric tape, or DTW sounder, is a double-wired and graduated tape fitted with a weighted probe at the end of the tape that houses a water sensor. The accuracy of the electric tape sounder is +/− 0.01 foot (Cunningham and Schalk 2011). The airline involves the pressurization of a dedicated tube, or airline, to displace water from it. The pressure required to displace all water is equivalent to the height of water above the bottom of the airline, which is then converted to a DTW. The accuracy of the airline ranges between +/− 0.1 to 1 foot (Cunningham and Schalk 2011). All DTW measurements are referenced to a surveyed measuring point that was referenced to the National Geodetic Vertical Datum of 1929 (NGVD29) or the NAVD88. Elevations referenced to the NGVD29 datum were converted to the NAVD88 datum using the U.S. Army Corps of Engineers software program, Corpscon 6.0 (ACOE 2004). This is a publicly owned, free software program that converts coordinates and vertical elevations between various datums used in the United States.

The USGS, in cooperation with SBVMWD, constructed a network of multiple-well monitoring sites to characterize groundwater conditions in the San Bernardino Basin Area and Yucaipa Subbasin (Mendez et al. 2018). The USGS installed four (4) multiple-well monitoring sites in the Yucaipa Subbasin: Wilson Creek (YVWC), 6th and E (YV6E), Dunlap Acres (YVDA), and Equestrian Park (YVEP). These multiple-well monitoring sites were constructed as nested wells in one boring with each well completed with 20 feet to 50 feet of screen set at various depths below ground surface.

Each well at the monitoring sites was equipped with a dedicated, non-vented pressure transducer programmed to measure and record absolute pressures every hour. The USGS installed a barometer at each monitoring site to adjust the absolute pressure readings by subtracting atmospheric pressure (Mendez et al. 2018). The resulting pressure represented the height of water above the pressure transducer, which was then converted to an elevation referenced to NAVD88. Water level data was downloaded from the USGS website (USGS 2023). USGS noted that the accuracy of the measurements recorded by the dedicated pressure transducers is to the nearest hundredth of a foot (USGS 2023). Other sources of groundwater elevation data include the USGS integrated hydrologic numerical model and the CASGEM website, which includes a selection of YVWD wells and one South Mountain well.

3.2.1 Seasonal High Groundwater Conditions in the Plan Area

Groundwater elevations measured in the Spring of 2024 indicated seasonal high groundwater level conditions in the 2024 WY. The following subsection summarizes the seasonal high groundwater conditions observed in the last water year.

3.2.1.1 Spring 2024

Static groundwater levels measured in March/April 2024 represented the seasonal highs in groundwater elevations measured in the 2024 WY. Table 9 summarizes the range in groundwater elevations observed in the Plan Area for Spring 2024. The general direction of groundwater flow in the Plan Area was from northeast to southwest. Figure 10 shows the piezometric surface, or contours of equal groundwater elevation, in the Plan Area for the seasonal high groundwater elevations observed in the 2024 WY. Table 10 summarizes the estimated hydraulic gradient in the principal aquifer in the Plan Area for Spring 2024. The hydraulic gradient was estimated using groundwater elevations measured at wells YVWD-43, South Mesa-11, and WHWC-11.

Table 9. Range of Seasonal High Groundwater Elevations in the Plan Area

Water Year[a]	Highest Groundwater Elevation (ft NAVD88)	Lowest Groundwater Elevation (ft NAVD88)	Water Year-Type
Spring-2024	3,861	1,344	Above Normal

Source: YVWD, WHWC, South Mesa Water Company.
Note:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.

Table 10. Seasonal High Hydraulic Gradient in the Plan Area

Season + Water Year[a]	Groundwater Elevation at YVWD-43 (ft NAVD88)	Groundwater Elevation at South Mesa 11 (ft NAVD88)	Groundwater Elevation at WHWC-11 (ft NAVD88)	Hydraulic Gradient (ft/ft)	Direction of Groundwater Flow (Degrees Azimuth)
Spring-2024	2,648.4	2,141	1,733	0.044	269

Source: YVWD, WHWC, South Mesa Water Company.
Note:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.

3.2.2 Seasonal Low Groundwater Conditions in the Plan Area

Groundwater elevations measured in the Fall of 2024 indicated seasonal low groundwater level conditions in the 2024 WY. The following subsections summarize the seasonal low groundwater conditions observed in the 2024 WY.

3.2.2.1 Fall 2024

Static groundwater levels measured in August/September 2024 represented the seasonal lows in groundwater elevations measured in the 2024 WY. Table 11 summarizes the range in groundwater elevations observed in Fall 2024. The general direction of groundwater flow in the Plan Area was from northeast to southwest. Figure 11 show the piezometric surface, or contours of equal groundwater elevation, in the Plan Area for the seasonal low groundwater elevations observed in the 2024 WY. Table 12 summarizes the estimated hydraulic gradient in the principal aquifer in the Fall for the 2024 WY. The hydraulic gradient was estimated using groundwater elevations measured at wells YVWD-43, South Mesa-11, and WHWC-11.

Table 11. Range of Seasonal Low Groundwater Elevations in the Plan Area

Water Year[a]	Highest Groundwater Elevation (ft NAVD88)	Lowest Groundwater Elevation (ft NAVD88)	Water Year-Type
Fall-2024	3,852.8	1,343.1	Above Normal

Source: YVWD, WHWC, South Mesa Water Company.
Note:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.

Table 12. Seasonal Low Hydraulic Gradients in the Plan Area

Water Year[a]	Groundwater Elevation at YVWD-43 (ft NAVD88)	Groundwater Elevation at South Mesa 11 (ft NAVD88)	Groundwater Elevation at WHWC-11 (ft NAVD88)	Hydraulic Gradient (ft/ft)	Direction of Groundwater Flow (Degrees Azimuth)
Fall-2024	2,646.9	2,143	1,714	0.046	269.7

Source: YVWD, WHWC, South Mesa Water Company.
Note:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.

3.3 Groundwater Elevation Hydrographs

Historical groundwater elevations observed at the 73 groundwater wells designated in the monitoring network to monitor groundwater elevations are included as individual hydrographs in Appendix A. The following subsections summarize groundwater level conditions observed in the four management areas in the Plan Area for the 2024 WY.

3.3.1 North Bench Management Area

In general, groundwater elevations in the North Bench Management Area have either remained stable or increased in the 2024 WY. Static groundwater elevations measured at the USGS Wilson Creek nested monitoring wells increased approximately 50 to 90 feet since June 2024 (Appendix A-1 to A-4). This increase in groundwater elevation was attributed to the 5,300 AF of SWP water discharged to the Wilson Creek and Oak Glen Creek spreading basins by YVWD from June to September 2024. Similar increases were observed at monitoring wells YRP-PZ1, and YRP-PZ2 (Appendix A-9 and A-10) and for the production wells located near the USGS Wilson Creek nested wells, such as YVWD-05, YVWD-07, YVWD-13, YVWD-14, YVWD-18, YVWD-53, and YVWD-56 (Appendix A-12, A-14, A-16, A-17, A-18, A-26, A-27 and A-29). Groundwater elevations at wells located approximately 1 to 2 miles from this production area have either stable groundwater elevations or exhibited a decrease in elevation of approximately 1 foot or more in the fall of 2023 (Appendix A-5, A-6, A-7, A-8, A-11, A-13, A-15, A-19 to 23, and A-24).

3.3.2 Calimesa Management Area

Groundwater elevations in the Calimesa Management Area have generally followed an increasing trend since October 2020 (Appendix A-31 to A-54). Groundwater elevations in the eastern half of the management area at USGS Equestrian Park wells increased approximately 7 feet since fall of 2023 (Appendix A-46 to A-49).

3.3.3 Western Heights Management Area

Static groundwater elevations trends in the Western Heights Management Area have generally increased or remained stable since October 2020 (Appendix A-55 to A-66). Groundwater elevations in the USGS Dunlap nested wells appear to be influenced by production by the nearby WHWC-14 well, but exhibit a general increasing trend since October 2021. Well WHWC-14 is located approximately 50 feet from the USGS nested well cluster (Appendix A-61 and A-62). Groundwater elevations at USGS Dunlap #1 and WHWC-14 fluctuated 30 feet. Groundwater elevations at WHWC-02A, WHWC-10, and WHWC-11 show a general decreasing trend since January 2024 (Appendix A-55, A-58, and A-59).

3.3.4 San Timoteo Management Area

Groundwater elevations in the San Timoteo management area were stable or increased slightly since October 2022. Water levels at the RMPs in the San Timoteo management area are expressed as depths-to-water because the measurable objective and minimum threshold relate to a depth below ground surface (bgs) as it relates to GDEs along the reach of San Timoteo Creek in the Plan Area (Appendix A-68 to A-73). Depths-to-water at the RMPs were consistently above the measurable objective of 20 ft bgs, with the exception of YVWD GWMW-5A, which increased to approximately 20 ft bgs, which meets the measurable objective. Groundwater levels were influenced by climate (e.g., precipitation events) with general increasing trends observed after January 2024, which were attributed to the “Above Normal” water year-type in the 2024 WY.

The San Timoteo management area is north of the San Timoteo Subbasin (DWR No. 8-002.02). The management area does include the lower portion of San Timoteo Creek before it enters the Santa Ana River. The San Timoteo Subbasin is overseen by a separate GSA and is currently classified as a low priority basin under SGMA. The San Timoteo Subbasin includes the majority of San Timoteo Creek.

3.4 Groundwater Extractions

Groundwater extractions in the Subbasin for the 2024 WY included groundwater pumping by municipal and private well users, and evapotranspiration by native vegetation. Table 13 summarizes the total volume of groundwater extracted in the 2024 WY and identifies the quantities per water use sector. Urban use was the largest use of groundwater in the Subbasin. Total groundwater extractions in the Subbasin were 12,060 AF in the 2024 WY, an “Above Normal” water year-type.

YVWD maintains 54 municipal water supply wells and monitoring wells within the Subbasin, with 13 municipal supply wells currently active. YVWD also maintains 25 wells outside the Subbasin, 20 of which produce groundwater from the fractured San Gabriel-type rock in the Yucaipa Hills. These wells supply water to the local communities outside the Subbasin, but within YVWD's service area. The exceptions are YVWD-16 and YVWD-61 that do supply groundwater to the Subbasin. Groundwater produced from these wells is characterized as a groundwater supply imported from outside the Yucaipa Subbasin. YVWD also maintains three (3) wells, YVWD-34, YVWD-35, and YVWD-48, in the adjudicated Beaumont Basin. Wells YVWD-34 and YVWD-35 are inactive and used for monitoring purposes only, but YVWD-48 is active and supplies water to YVWD's service area within the Subbasin.

WHWC maintains 12 municipal water supply wells (5 are currently active), all within the Western Heights management area. South Mesa maintains 14 municipal water supply wells in the Calimesa management area (8 are currently active). South Mesa also has 2 municipal water supply wells outside the Subbasin in the adjudicated Beaumont Basin. One of these wells, South Mesa-04, is active and conveys water to South Mesa's drinking water distribution system in the Plan Area. The other well, South Mesa-03, is inactive and used to monitor static groundwater elevations only.

Groundwater produced by YVWD, South Mesa and WHWC is for municipal use (i.e., Urban water use sector category in Table 13). South Mountain operates two (2) irrigation supply wells in the Calimesa management area: Hog Canyon 2 and Chicken Hill. Water produced by these two wells falls within the "Agricultural" water use sector category in Table 13. No groundwater is used for industrial purposes. There are no managed wetlands in the Plan Area.

Private well extractions were estimated at 346 AFY for the 2024 WY based on the YIHM developed by the USGS (Cromwell and Alzraiee 2022). The Yucaipa GSA has an ongoing outreach to private well owners in the Subbasin to obtain information about their wells, groundwater production, and projections of future use to enhance the overall understanding of groundwater usage in the Subbasin. The majority of private well users are located at the base of the San Bernardino Mountains in the upper reaches of the North Bench Management Area and along Yucaipa Creek and San Timoteo Creek in the San Timoteo Management Area. Groundwater production by the water purveyors in these areas is minimal to non-existent and, therefore, does not threaten the water supply for these private users.

3.4.1 Native Vegetation

The YIHM was used to estimate the quantity of groundwater consumed by native vegetation in areas where GDEs were confirmed within the Plan Area. These areas include the reach of San Timoteo Creek within the Plan Area. The estimated consumption of groundwater by native vegetation is 4,505 AF in the 2024 WY (Table 13).

3.4.2 North Bench Management Area

The distribution and relative magnitude of groundwater extractions in the Subbasin for the 2024 WY are included in Figure 12. In the North Bench management area, the majority of groundwater extractions were at YVWD-46, YVWD-48, YVWD-53, and YVWD-55 in the 2024 WY. Groundwater extractions in the North Bench management area totaled 3,854 AF in the 2024 WY (Figure 11).

3.4.3 Calimesa Management Area

In the Calimesa management area, the majority of groundwater extractions were at South Mesa 7, South Mesa 9, South Mesa 17 and South Mountain's Chicken Hill well. Groundwater extractions in the Calimesa management area totaled 2,252 AF in the 2024 WY (Figure 12).

3.4.4 Western Heights Management Area

In the Western Heights management area, the majority of groundwater extractions were at WHWC-02A, WHWC-11, WHWC-12 and WHWC-14. Groundwater extractions in the Western Heights management area equaled 1,450 AF in the 2024 WY (Figure 12).

3.4.5 San Timoteo Management Area

Currently, there is no information on groundwater extractions from the San Timoteo management area. There are no municipal supply wells. There are two (2) known irrigation supply wells, but these wells are not metered. The Yucaipa GSA is in the process of contacting the private well users to obtain information about their respective wells and to establish a means of quantifying the volumes of groundwater extracted. Groundwater usage does not appear to cause declining groundwater levels and reduction in groundwater in storage. Nor does it appear to influence surface water flows and the GDEs identified along San Timoteo Creek as flows are regulated by storm water runoff and the riparian habitat is thriving along the creek.

Table 13. Groundwater Extractions

Water Year[a]	Total Groundwater Extractions (AF)	Water Use Sector Urban (AF)[b]	Water Use Sector Industrial (AF)	Water Use Sector Agricultural (AF)[b]	Water Use Sector Managed Wetlands (AF)	Water Use Sector Native Vegetation (AF)[c]	Water Use Sector Other (AF)
2024	12,060	7,309	0	246	0	4,505	0

Source: YVWD, WHWC, South Mesa Water Company, South Mountain Water Company, USGS Yucaipa Integrated Hydrological Model (YIHM).

Notes:

a Water Year corresponds to October 1 of the previous year through September 30 of the current year.

b The volumes of groundwater extracted are directly measured using inline propeller flow meters with an accuracy of 2%.

c The volume of groundwater extracted by native vegetation is estimated from the USGS Yucaipa Integrated Hydrologic Model (Cromwell and Alzraizee, 2022). The normalized root mean square error for the groundwater model is 0.97% (Cromwell and Alzraizee, 2022).

AF Acre-feet.

4 Surface Water Supply

Surface water supplies include imported State Water Project (SWP) water that is treated at the Yucaipa Valley Regional Water Filtration Facility (YVRWFF) for drinking water purposes. Surplus raw SWP water, if available, may be diverted to the Wilson Creek and/or Oak Glen Creek spreading basins in the North Bench management area to artificially recharge the aquifer in the Subbasin. Stream flow in Oak Glen Creek and Birch Creek used to be diverted to the Oak Glen Surface Water Filtration Facility (OGSWFF) and treated for drinking water purposes, but no surface water has been diverted to the OGSWFF since 2019.

The Yucaipa Subbasin lies within the San Timoteo Wash sub-watershed of the Santa Ana River watershed. The primary surface water drainage features are Wilson Creek, Oak Glen Creek, Yucaipa Creek, and San Timoteo Creek (Figure 1). The headwaters for Wilson Creek and Oak Glen Creek originate in the San Bernardino Mountains. Yucaipa Creek begins in the Yucaipa Hills and flows east to west from Wildwood Canyon. San Timoteo Creek is the major drainage feature in the San Timoteo Wash watershed. It enters the Yucaipa Subbasin at the southern end of the Live Oak subarea and runs approximately 3.5 miles before exiting the Plan Area. San Timoteo Creek is tributary to the Santa Ana River.

Stream flow near the upper reaches of Wilson Creek and Oak Glen Creek may be diverted to the Wilson Creek spreading basins and, on occasion, the Oak Glen spreading basins, respectively (Dudek, 2022a). The Wilson Creek spreading basins are used for the infiltration of imported SWP water and stormwater. The Oak Glen Creek spreading basins were designed to reduce flooding downstream of Bryant Street, collect debris and sediment in the basins to improve downstream water quality, enhance groundwater recharge by capturing stormwater runoff, and provide additional open space and habitat. Yucaipa Creek originates out of the Yucaipa Hills through Wildwood Canyon. An unlined, trapezoidal engineered channel runs from Wildwood Canyon approximately 0.33 miles to the Wildwood Creek spreading basins where stream flow may be diverted for flood control and enhance groundwater recharge.

4.1 Surface Water Diversions

YVWD constructed diversion structures to divert surface water from Oak Glen Creek and Birch Creek, which is tributary to Oak Glen Creek, to the OGSWFF for treatment and distribution in YVWD's drinking water system. YVWD historically diverted an average 40 AFY from the 2001 WY to 2018 WY at the Oak Glen Creek diversion, and an average of 70 AFY from the 2001 WY to 2009 WY at the Birch Creek diversion point. No surface water has been diverted from Birch Creek since the 2009 WY. No surface water was diverted from Oak Glen Creek since the 2019 WY. Therefore, no surface water was diverted from Birch Creek and Oak Glen Creek in the 2024 WY (Table 14). Both surface water diversion structures have experienced clogging and other technical issues that prevent further diversions of surface water.

4.2 Imported Water

YVWD straddles the service area of the two Regionals, namely SBVMWD and SGPWA, and can physically receive SWP from the former to meet demands in San Bernardino County and from the latter to meet demands in Riverside County. SWP purchases from both sources are physically delivered by SBVMWD. Through its regional filtration facility, YVWD can treat and deliver imported water to the Western Heights Water Company. YVWD has received SWP water from the SBVMWD every year since the 2003 WY. Table 14 summarizes the volumes of imported SWP water to the Subbasin in the 2024 WY. No water was imported from the Central Valley Project or from the Colorado River in the 2024 WY.

YVWD received 12,669 AF of SWP water from SBVMWD in the 2024 WY, of which 6,291 AF was delivered to the YVRWFF for treatment and distribution to YVWD's drinking water system. Historically, surplus SWP water received from SBVMWD has been diverted to the Wilson Creek and Oak Glen Creek spreading basins to artificially recharge the Yucaipa Subbasin. YVWD diverted 6,378 AF of SWP water to the Wilson Creek Basins and Oak Glen Creek Basins. Applying an estimated 1 percent evaporative loss of the basins' surface water, the YIHM simulated artificial recharge to the groundwater at 6,315 AF.

Table 14. Surface Water Supplies

Water Year[a]	Water Source Type Central Valley Project (AF)	Water Source Type State Water Project (AF)	Water Source Type Colorado River Project (AF)	Water Source Type Local Supplies (AF)[b]	Water Source Type Local Imported Supplies (AF)
2024	0	12,669	0	0	0

Source: Yucaipa Valley Water District.
Notes:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.
[b] Local Supplies includes surface water diverted from Oak Glen Creek and Birch Creek.
AF Acre-feet.

5 Total Water Use

Total water use in the Yucaipa Subbasin for the 2024 WY is summarized in Tables 15 and 16. The total water usage in the 2024 WY, an "Above Normal" water year-type, was 27,745 AF. In the 2024 WY, 6,291 AF of water imported from SWP was directed to the YVRWFF for treatment and distribution in YVWD's drinking water system, a portion of which was served to WHWC. 6,378 AF SWP water was diverted to the Wilson Creek and Oak Glen Creek spreading basins to artificially recharge the Subbasin. The Oak Glen Creek spreading basins are utilized during wet water years. 983 AF of the 6,378 AF SWP water imported into the Subbasin was diverted to the Oak Glen Creek spreading basins.

In the 2024 WY, YVWD delivered 1,853 AF of recycled water to its customers for applied irrigation and public facilities use; YVWD and South Mesa imported 1,164 AF of groundwater produced from their respective wells outside the Subbasin; and YVWD diverted no water from the YVRWFF to the Oak Glen spreading basins. Groundwater extractions in the Subbasin totaled 12,060 AF in the 2024 WY (Table 15).

The majority of water used in the Subbasin was for urban supply, 16,616 AF (Table 16). Water used for managed recharge was 6,378 AF. Groundwater use by native vegetation was estimated from the YIHM at 4,505 AF. Groundwater production of 246 AF from the South Mountain wells was used for irrigation purposes only.

Table 15. Total Water Use – Water Source Type

Water Year[a]	Total Water Use (AF)	Water Source Type - Groundwater[b] (AF)	Water Source Type – Surface Water[b] (AF)	Water Source Type – Recycled Water[b] (AF)	Water Source Type – Reused Water[b] (AF)	Water Source Type – Imported Groundwater [b] (AF)
2024	27,745	12,060	12,669	1,853	0	1,164

Source: YVWD, WHWC, South Mesa Water Company, South Mountain Water Company.
Notes:
a Water Year corresponds to October 1 of the previous year through September 30 of the current year.
b Groundwater extractions for municipal use are directly measured using in-line flow propellers and digital totalizers; groundwater extractions via native vegetation are estimated using a numerical model; imported SWP water volumes are purchased and measured directly using flow meters on delivery; imported groundwater pumped from outside the Subbasin is directly measured using in-line flow propellers and digital totalizers; recycled water delivery by YVWD is measured directly using flow meters; and reused water is treated water from YVRWFF that is discharged to spreading basins and measured directly using flow meters. The delivery of the reused water to the spreading basins is measured directly using flow meters.
AF Acre-feet.

Table 16. Total Water Use – Water Use Sector

Water Year[a]	Total Water Use (AF)	Water Use Sector – Urban (AF)	Water Use Sector – Industrial (AF)	Water Use Sector – Agricultural (AF)	Water Use Sector – Managed Wetlands (AF)	Water Use Sector – Managed Recharge (AF)	Water Use Sector – Native Vegetation (AF)
2024	27,745	16,616	0	246	0	6,378	4,505

Source: YVWD, WHWC, South Mesa Water Company, South Mountain Water Company, USGS Yucaipa Integrated Hydrological Model (YIHM).
Notes:
a Water Year corresponds to October 1 of the previous year through September 30 of the current year.
AF Acre-feet

6 Change in Groundwater in Storage

The change in groundwater in storage in the Subbasin for the 2024 WY was estimated using the YIHM, which was developed to simulate the hydrologic system in the San Timoteo Wash watershed (Cromwell and Alzraiee, 2022). The YIHM simulates the hydrologic system using a combination of local climate conditions, land surface and land use properties, estimated aquifer properties, and native and non-native groundwater supplies and demands. The model was originally designed to quantify conditions in the watershed between January 1, 1947 and December 31, 2014 and was calibrated to groundwater elevation and stream flow measurements collected between January 1, 1970 and December 31, 2014. As part of the GSP development for the Subbasin, the YIHM was extended using measured climate and groundwater pumping rates to simulate conditions across the watershed through the end of the 2018 WY (Dudek 2022a).

The YIHM was extended to simulate conditions in the watershed through the end of the 2024 WY as part of this annual report preparation. The model update included incorporation of the following:

(1) Daily precipitation measured at the NOAA climate measurement station located in Redlands (GHCND: USC00047306).

(2) Daily temperature data measured at the NOAA Mill Creek station (GHCND: USR0000CMCB).

(3) Measured monthly groundwater extractions for each active groundwater extraction well in the watershed.

(4) Measured volumes of imported SWP water discharged to the Oak Glen Creek and Wilson Creek spreading basins.

(5) Land use and land surface properties across the watershed were not changed because no significant changes to land use and land surface properties occurred within the last five years.

The YIHM was used to simulate the water balance of the Subbasin for the 2024 WY. Inflows to the principal aquifer included stream leakage, return flows (municipal distribution network leaks, septic system discharges, and infiltration of applied irrigation water), precipitation recharge, subsurface inflows from upgradient adjacent basins, and surface water spreading. Outflows from the principal aquifer included evapotranspiration (ET), subsurface outflows to downgradient adjacent basins, groundwater discharges to streams, groundwater well production, and groundwater discharges to land surface. Total basin inflows totaled 41,963 AF in the 2024 WY (an “Above Normal” water year-type). Total basin outflows totaled 35,810 AF in the 2024 WY (Table 17).

The annual change in groundwater in storage for the Subbasin was estimated at an increase of 6,153 AF (Table 17). The annual changes in storage for the previous water years were appended to the annual change in groundwater storage chart (Figure 13) and to the historical water budget table (Appendix B) showing the cumulative change in storage from the 1965 WY to the 2018 WY that was presented in the GSP. Juxtaposed with the cumulative change in storage in Figure 13 are annual volumes of groundwater well production (for municipal and agricultural uses) from the Subbasin and spreading of imported SWP water.

Increasing trends in the change in storage were observed in the late 1970s to late 1980s and after 2009 when groundwater well production was below the sustainable yield of 10,980 AFY, while declining trends were observed in the 1990s and early 2000s when groundwater well production exceeded the sustainable yield. The marked increase in storage in the late 1970s to late 1980s corresponded with a very wet period in the region (Figure 14). The marked decrease in storage from 1999 to 2009 corresponded with a drier climate (including two critically dry water year-types) and groundwater well production that approached 5,000 AFY more than the sustainable yield (Figure 13).

Annual changes in groundwater in storage were also calculated for the four management areas (Table 18). The North Bench management area showed the greatest variation in the change in storage as this management area is influenced by climate, artificial recharge from the Oak Glen and Wilson Creek spreading basins, and recharge from runoff from the surrounding San Bernardino Mountains, Yucaipa Hills and Crafton Hills. The lower management areas, Western Heights and San Timoteo, showed less variation as these management areas are at lower elevations with flatter hydraulic gradients. Figure 15 shows the spatial distribution of the changes in groundwater in storage for each management area in the 2024 WY.

Table 17. Water Balance for the 2024 WY in the Yucaipa Subbasin

Water Year[a]	Water Year-Type	Individual Components of the Basin Water Budget Reported in Units of Acre-Feet (AF)												
		Inflows to the Groundwater System						Outflows from the Groundwater System						Annual Change in Storage
		Stream Leakage	Return Flows[b]	Precipitation Recharge	Subsurface Inflows	Surface Water Spreading[c]	Total Basin Inflows	ET	Subsurface Outflows	GW Discharge to Streams	GW Extractions	GW Discharge to Land Surface	Total Basin Outflows	
2024	Above Normal	13,099	4,020	5,787	12,742	6,315	41,963	4,505	17,719	5,720	7,555	311	35,810	6,153

Source: USGS Yucaipa Integrated Hydrological Model (YIHM).
Notes:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.
[b] Return flows consist of water that recharges the Subbasin via municipal distribution network leaks, septic system discharges, and infiltration of irrigation water (Cromwell and Alzraiee, 2022).
[c] The sum volume of surface water spreading is the managed recharge in the Wilson Creek and Oak Glen Creek spreading basins (Table 16), which is then reduced by 1% to account for evaporative losses.

Table 18. Annual Change in Storage per Management Area

Water Year[a]	Management Area				Yucaipa Subbasin
	North Bench	Calimesa	Western Heights	San Timoteo	
2024	3,698	2,139	469	-153	6,153

Source: USGS Yucaipa Integrated Hydrological Model (YIHM).
Note:
[a] Water Year corresponds to October 1 of the previous year through September 30 of the current year.

INTENTIONALLY LEFT BLANK

7 GSP Implementation Progress

The Yucaipa Subbasin GSP was adopted by the Yucaipa GSA on January 26, 2022. Groundwater conditions will be evaluated against the sustainability criteria established in the GSP. Based on conditions found in the 2024 WY, management actions will be implemented in the 2025 WY.

7.1 Management Action #1

Management Action #1 is designed to reduce the net use of groundwater to prevent further significant and unreasonable decline in groundwater levels, groundwater in storage, reduction in the interaction of surface water and groundwater, and the potential for land subsidence. Groundwater elevations measured in the 2024 WY were compared to the groundwater elevation thresholds established for the RMPs in each management area to evaluate how conditions are trending into the 2025 WY.

Tables 19 to 21 summarize the ranges of groundwater elevations observed for the 2024 water year and how groundwater elevations compare to the measurable objectives and minimum thresholds defined for each management area. A comparison of groundwater elevations to the measurable objectives and minimum thresholds is the basis for determining if Management Action #1 in the GSP will be implemented. The criteria for when Management Action #1 is implemented is 1) groundwater elevations decline below the measurable objectives or minimum thresholds at 50% or more of the RMPs in a management area, and 2) the groundwater elevation declines are below the thresholds for two consecutive years.

7.1.1 North Bench Management Area

The mean annual groundwater elevations measured at the eight representative monitoring points (RMP) for the North Bench Management Area did not fall below the individual measurable objectives established at each well for two consecutive years. No groundwater levels fell below the minimum thresholds established for each RMP (Appendix A-1, A-3, A-13, A-14, A-23, A-26, A-27 and A-29). Table 19 summarizes the groundwater elevations observed in the 2024 WY compared to the groundwater elevations representing the measurable objectives and minimum thresholds established at each well.

7.1.2 Calimesa Management Area

The mean annual groundwater elevation measured at thirteen RMPs for the Calimesa Management Area did not fall below the individual Tier 1 measurable objectives established at each well for two consecutive years. No groundwater levels fell below the minimum thresholds established for each RMP (Appendix A-32, A-35, A-36, A-38, A-40, A-42, A-44, A-47, A-49, A-51, A-52, A-53, and A-54). Table 20 summarizes the groundwater elevations observed in the 2024 WY compared to the groundwater elevations representing the measurable objectives and minimum thresholds established at each well.

7.1.3 Western Heights Management Area

The mean annual groundwater elevations measured at the seven RMP for the Western Heights Management Area did not fall below the individual Tier 1 measurable objectives established at each well for two consecutive years

(Appendix A-58, A-60, A-61 A-63 and A-65), except at three RMPs, WHWC-02A, WHWC-10, and WHWC-11 (Appendix A-55, A-58, and A-59). The average groundwater elevations observed at wells WHWC-02A, WHWC-10, and WHWC-11 over a two-water year period were below the tier 1 measurable objectives established for each well. Table 21 summarizes the groundwater elevations observed in the 2024 WY compared to the groundwater elevations representing the measurable objectives and minimum thresholds established at each well.

7.1.4 San Timoteo Management Area

The measurable objective established for the six RMPs in the San Timoteo management area was designed to protect the GDEs confirmed along the reach of San Timoteo Creek in the Subbasin. The measurable objective was set at 20 feet below ground surface. Measured depths-to-water, either manually with an electric water level sounder, or with dedicated pressure transducers programmed to measure absolute pressure every hour, indicated that groundwater levels did not fall below the 20-ft measurable objective threshold (Appendix A-67 to A-72). Increasing trends of 2 to 3 feet were observed at these wells since the 2023 “Wet” water year-type. Management Action #1 will not be implemented because groundwater levels were not observed below the measurable objectives at the 6 RMPs.

Table 19. Groundwater Elevations at RMPs in the North Bench Management Area

Representative Monitoring Point	Measurable Objective (ft NAVD88)	Minimum Threshold (ft NAVD88)	Range of Groundwater Elevations in 2024 WY			Average Groundwater Elevation Below Measurable Objective?
			Lowest Elevation (ft NAVD88)	Highest Elevation (ft NAVD88)	Average Elevation (ft NAVD88)	
YVWD-06	2,276.91	2,255.47	2,335.0	2,368.3	2,348.5	No
YVWD-07	2,318.07	2,239.38	2,382.8	2,433.2	2,405.3	No
YVWD-37	2,527.68	2,503.91	2,637.3	2,641.2	2,639.0	No
YVWD-46	2,228.73	2,209.32	2,326.0	2,416.6	2,366.3	No
YVWD-53	2,337.17	2,315.55	2,437.4	2,469.9	2,454.9	No
YVWD-56	2,291.03	2,269.24	2,369.3	2,404.0	2,391.4	No
USGS Wilson Creek #1 (820'-840')	2,329.25	2,300.24	2,416.98	2,448.85	2,432.23	No
USGS Wilson Creek #3 (500'-520')	2,345.20	2,313.02	2,449.64	2,484.36	2,466.20	No

Source: YVWD, USGS, Dudek 2022a.
Note: Ft NAVD88 Feet above the North American Vertical Datum of 1988.

Table 20. Groundwater Elevations at RMPs in the Calimesa Management Area

Representative Monitoring Point	Measurable Objective (Tier 1 in the Drought Buffer) (ft NAVD88)	Measurable Objective (Tier 2 in the Drought Buffer) (ft NAVD88)	Measurable Objective (Tier 3 in the Drought Buffer) (ft NAVD88)	Minimum Threshold (ft NAVD88)	Range of Groundwater Elevations in 2024 WY			Average Groundwater Elevation Below Measurable Objective?
					Lowest Elevation (ft NAVD88)	Highest Elevation (ft NAVD88)	Average Elevation (ft NAVD88)	
Hog Canyon 2	2,083.77	2,063.66	2,040.10	2,021.82	2,094	2,107	2,100	No
South Mesa 07	2,044.08	2,022.66	2,000.74	1,982.14	2,085	2,102	2,095	No
South Mesa 09	2,024.19	1,993.77	1,972.09	1,958.58	2,097	2,115	2,109	No
South Mesa 12	2,080.33	2,059.58	2,036.88	2,018.27	2,121	2,135	2,130	No
South Mesa 17	2,068.72	2,048.20	2,024.96	2,006.30	2,115	2,129	2,124	No
USGS 6th St #2 (730-750)	2,121.51	2,101.06	2,077.69	2,058.22	2,157.68	2,160.29	2,158.56	No
USGS 6th St #4 (380'-400')	2,175.05	2,165.66	2,146.93	2,127.70	2,176.08	2,178.73	2,176.99	No
USGS Equestrian Park #2 (625-655)	2,203.60	2,197.67	2,186.58	2,172.80	2,213.47	2,217.82	2,215.30	No
USGS Equestrian Park #4 (380'-400')	2,207.39	2,201.74	2,190.86	2,176.87	2,216.72	2,221.20	2,218.29	No
YVWD-10	2,076.79	2,056.62	2,033.14	2,014.16	2,124.9	2,135.7	2,129.4	No
YVWD-12	2,081.92	2,062.26	2,037.96	2,020.26	2,138.2	2,151.1	2,144.2	No
YVWD-24	2,120.42	2,100.29	2,075.90	2,061.63	2,148.9	2,162.2	2,155.1	No
YVWD-49	2,076.94	2,056.68	2,033.31	2,041.03	2,125.3	2,133.7	2,130.5	No

Source: YVWD, South Mesa Water Company, South Mountain Water Company, USGS, Dudek 2022a.
Note: Ft NAVD88 Feet above the North American Vertical Datum of 1988..

Table 21. Groundwater Elevations at RMPs in the Western Heights Management Area

Representative Monitoring Point	Measurable Objective (Tier 1 in the Drought Buffer) (ft NAVD88)	Measurable Objective (Tier 2 in the Drought Buffer) (ft NAVD88)	Minimum Threshold (ft NAVD88)	Range of Groundwater Elevations in 2024 WY			Average Groundwater Elevation Below Measurable Objective?
				Lowest Elevation (ft NAVD88)	Highest Elevation (ft NAVD88)	Average Elevation (ft NAVD88)	
WHWC-2A	1,735.68	1,716.00	1,695.24	1,600	1,743	1,656	Yes
WHWC-10	1,750.04	1,734.04	1,714.26	1,683	1,756	1,722	Yes
WHWC-11	1,748.93	1,735.76	1,712.24	1,698	1,733	1,716	Yes
WHWC-12	1,747.11	1,732.52	1,708.84	1,738	1,789	1,772	No
WHWC-14	1,726.90	1,717.20	1,696.12	1,731	1,759	1,744	No
USGS Dunlap #2 (830'-850')	1,748.40	1,729.36	1,708.97	1,769.09	1,784.98	1,777.60	No
USGS Dunlap #4 (440'-460')	1,740.32	1,720.05	1,699.54	1,771.28	1,786.52	1,778.13	No

Source: WHWC, USGS, Dudek 2022a.
Note: Ft NAVD88 Feet above the North American Vertical Datum of 1988.

7.2 Management Action #2

Management Action #2 established sustainable yield pumping allocations for the municipal, agricultural and private well users in each management area in the Subbasin. The sustainable yield pumping allocations were based on historical usages for each user from the 1966 WY to the 2018 WY (Dudek, 2022a), which were then proportioned by percentage of total production. The percentages of historical production were applied to the sustainable yield. As an incentive to manage groundwater production at or below the sustainable yield pumping allocation, a groundwater user may earn pumping credits in the amount of the sustainable yield pumping allocation less the groundwater pumped. This management action is implemented if a user pumps more than their assigned pumping allocation. If the user has accrued pumping credits, then the pumping credits may be applied to offset the pumping exceedance. If the pumping credits don't offset the total overage, then the user will need to reduce the net use of groundwater in the subsequent water year to match the exceedance. This may be done by reducing groundwater pumping, replenishing the basin with supplemental water, the implementation of water conservation programs, the use of recycled water to reduce groundwater pumping (i.e., in lieu recharge), or a combination of any of these actions (or others) that will reduce the net use of groundwater.

The Yucaipa Subbasin GSP stated that the assessment of the sustainable yield pumping allocations and pumping credits will begin with the 2022 WY. The following review of pumping data in the 2024 WY characterizes conditions relative to Management Action #2.

7.2.1 North Bench Management Area

YVWD and private well users pump groundwater from the North Bench Management Area for municipal and domestic use. Sustainable yield pumping allocations were assigned to each user based on historical usage from the 1966 WY to the 2018 WY (Dudek 2022a). Groundwater extractions by private well users were estimated at 154 AF in the 2024 WY using the USGS YIHM. This is below the sustainable yield pumping allocation for private well users in this management area. YVWD pumped 3,699 AF from the management area in the 2024 WY. YVWD exceeded their sustainable yield pumping allocation of 3,045 AFY in the 2024 WY by 654 AF (Figure 16).

7.2.2 Calimesa Management Area

YVWD, South Mesa, South Mountain, and private well users operate water supply wells in the Calimesa management area for municipal, agricultural and domestic uses. Sustainable yield pumping allocations were assigned to each user based on historical usage from the 1966 WY to the 2018 WY (Dudek 2022a). Groundwater extractions by private well users were estimated at 192 AF in the 2024 WY using the USGS YIHM. This exceeds the sustainable yield pumping allocation of 137 AFY for private well users in this management area (Figure 17). The Yucaipa GSA will identify and contact the private well users in the Calimesa management area to confirm their use of groundwater and reassess the sustainable yield pumping allocations in the first 5-year period after adopting the GSP.

YVWD did not pump groundwater in the Calimesa Management Area in the 2024 WY. South Mesa pumped 1,814 AF in the 2024 WY, which was below their sustainable yield pumping allocation of 1,959 AFY (Figure 17). South Mountain pumped 246 AF in the 2024 WY, which was below their sustainable yield pumping allocation of 518 AFY (Figure 17). Total pumping in the Calimesa management area for the 2024 WY was 2,252 AF, which was below its respective sustainable yield of 4,955 AFY (Figure 18).

7.2.3 Western Heights Management Area

WHWC is the only user of groundwater in the Western Heights Management Area. The sustainable yield pumping allocation assigned to WHWC is the sustainable yield for the Western Heights management area, which is estimated at 1,760 AFY. WHWC pumped 1,450 AF in the 2024 WY (Figure 19). WHWC did not exceed their sustainable yield pumping allocation assigned for the Western Heights Management Area.

7.2.4 San Timoteo Management Area

Management Action #2 does not apply to the San Timoteo management area because there is no municipal pumping. There are two (2) known agricultural wells operating in the management area, but the wells are not metered. The Yucaipa GSA will work with the private well-owners to have meters installed. Sustainable yield pumping allocations will be assigned when the volume of groundwater extracted from the management area is measured.

7.3 Management Action #3

This management action provides a separate accounting mechanism for surplus supplemental water discharged directly to a spreading basin to artificially recharge the Subbasin. The surplus supplemental water will be accessible to the water purveyor that purchased the water and percolated it at a spreading basin. This water will be available to help offset production exceedances above the sustainable yield pumping allocations instead of pumping credits earned via Management Action No. 2.

The estimated amount of water lost from the point of discharge at a spreading basin to the water table is 1% of the volume discharged to the spreading basin. This estimated loss accounts for evaporative losses at the water surface and soil retention (Scanlon et al., 2016). The estimated 1% of water loss will be applied to the volume of surplus supplemental water discharged. The remaining water will directly recharge the aquifer and be available to the water purveyor that purchased the water. YVWD began discharging surplus supplemental water in 2009 to the Wilson Creek spreading basins and occasionally to the Oak Glen Creek spreading basins. YVWD has discharged a total 33,377 AF of imported SWP water to these spreading basins since 2009. In 2024 WY, 6,378 AF of water was discharged to the spreading basins (Table 15).

During the development of the GSP, the YIHM was used to simulate the flow of water from the Wilson Creek and Oak Glen Creek spreading basins over the 50-year implementation and planning horizon. The YIHM indicated that water originating from these two spreading basins will remain in the North Bench Management Area over the 50-year planning and implementation horizon. Therefore, YVWD has accumulated 33,043 AF (accounting for a 1% loss of applied water due to evaporation and soil retention) of surplus supplemental water that was directed to the spreading basins and may use this water to offset pumping exceedances above their respective sustainable yield pumping allocation established under Management Action #2.

YVWD will use 654 AF of the 33,043 AF of supplemental surplus already artificially recharged into the Subbasin to offset the 654 AF pumping overage in the North Bench Management area in the 2024 WY. The remaining volume of supplemental water in the North Bench management area available to YVWD entering into the 2025 WY is 32,389 AF.

7.4 Projects

7.4.1 County Line Road Recharge Basin and Turnout Project

The two Regionals, San Bernardino Valley Municipal Water District (SBVMWD) and San Gorgonio Pass Water Agency (SGPWA), of the Yucaipa GSA entered into a Memorandum of Understanding in 2023 to work collaboratively in developing the County Line Road Recharge Basin and Turnout Project (the Project). The Project will convey imported water from the SWP to the Calimesa management area to artificially recharge the Subbasin. SGPWA and Riverside County executed an American Rescue Plan Act (ARPA) funding agreement in October 2024. The ARPA funding amounts to $3.1 million, covering approximately half of the total project cost. The key components of the project are as follows:

(1) Turnout Construction: SBVMWD will complete a turnout on the East Branch Extension of the California Aqueduct at Bryant St and County Line Rd.

(2) Pipeline Modification: SGPWA will repurpose an abandoned South Mesa Water Company pipeline along County Line Rd, running from Bryant St to 4th St, for raw water conveyance. This pipeline will be connected to the newly constructed turnout.

(3) New Pipeline Installation: A new pipeline will be installed along 4th St, connecting the modified pipeline in County Line Rd to the property just south of the park.

(4) Recharge Basin Construction: A 2.7-acre recharge basin will be developed on the property just south of the park on 4th St.

(5) The recharge basin will be designed to recharge up to 1,470 AFY of SWP water when it is available.

Construction is anticipated to being in late spring/summer of 2025. The construction would take approximately 6-9 months, with an estimated completion date of March 2026.

8 References

ACOE (U.S. Army Corps of Engineers). 2004. Corpscon, Version 6.x, Technical Documentation and Operating Instructions. Prepared by the ACOE Engineer Research and Development Center, Topographic Engineering Center, Alexandria, Virginia 22315-3864. August.

Cromwell, G., and A.H. Alzraiee, eds. 2022. *Hydrology of the Yucaipa Groundwater Subbasin—Characterization and Integrated Numerical Model, San Bernardino and Riverside Counties, California*. U.S. Geological Survey Scientific Investigations Report 2021–5118. https://doi.org/ 10.3133/sir20215118.

Cunningham, W.L., and C.W. Schalk. 2011. *Groundwater Technical Procedures of the U. S. Geological Survey*. U.S. Geological Survey Techniques and Methods 1-A1.

Dudek, 2022a. Final Groundwater Sustainability Plan for the Yucaipa Groundwater Subbasin. Prepared for the Yucaipa Groundwater Sustainability Agency, c/o San Bernardino Valley Municipal Water District. Prepared by Dudek, 605 Third Street, Encinitas, California. January 2022.

Dudek, 2022b. Annual Report Yucaipa Subbasin Groundwater Sustainability Plan. Prepared for the Yucaipa Groundwater Sustainability Agency, c/o San Bernardino Valley Municipal Water District. Prepared by Dudek, 605 Third Street, Encinitas, California. March.

DWR (Department of Water Resources). 2016. *Groundwater Basin Boundary Assessment Tool*. Accessed October 2021. https://gis.water.ca.gov/app/bbat/.

DWR. 2019. Sustainable Groundwater Management Act Basin Prioritization Dashboard. Accessed January 18, 2019. https://gis.water.ca.gov/app/bp-dashboard/final/.

Mendez, G. O., Anders, R., McPherson, K. R., and Danskin, W. R., 2018. Geologic, Hydrologic, and Water-Quality Data from Multiple-Well Monitoring Sites in the Bunker Hill and Yucaipa Groundwater Subbasins, San Bernardino County, California, 1974-2016. Prepared in cooperation with the San Bernardino Valley Municipal Water District. Data Series 1096.

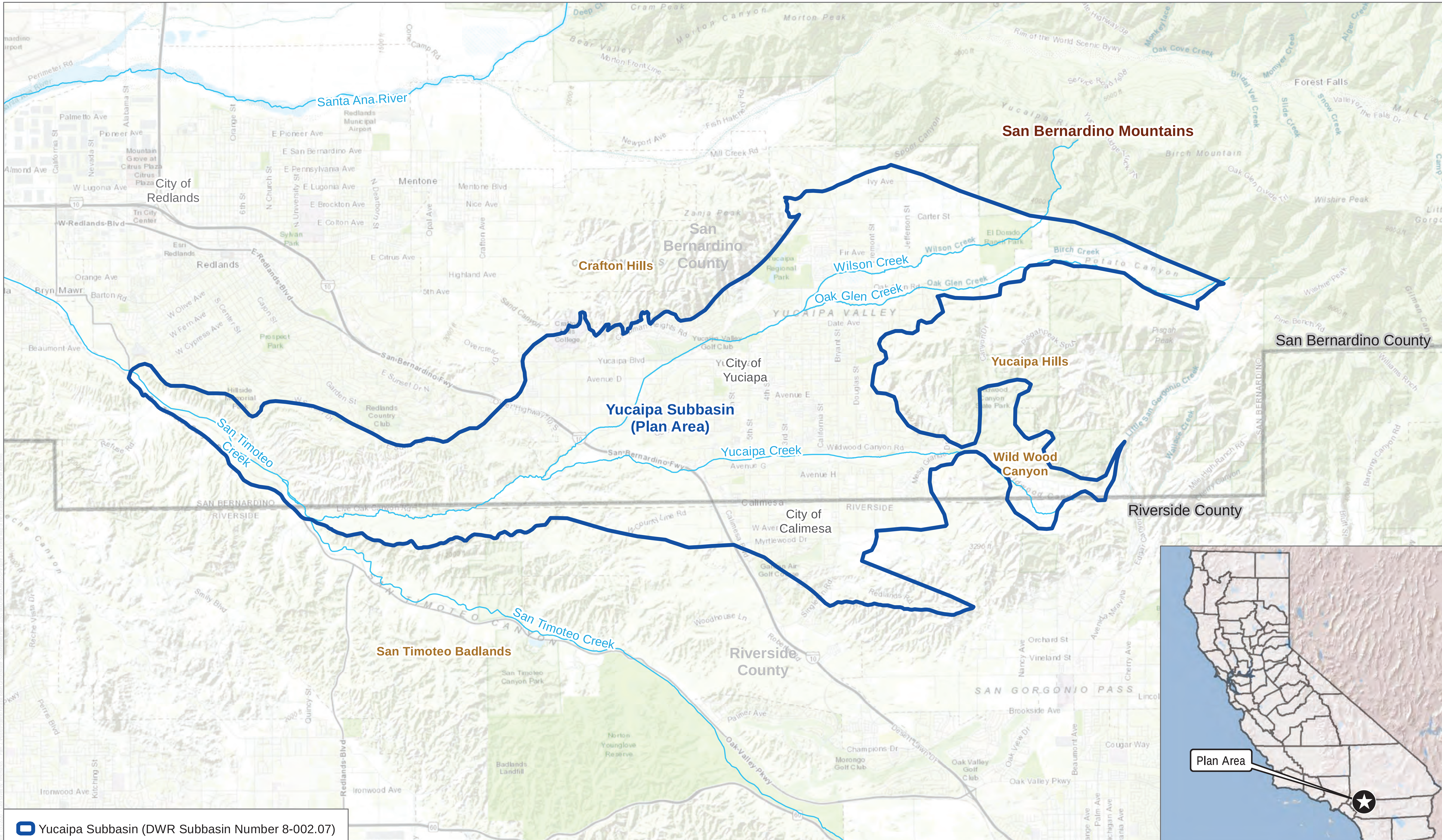
SBCFCD. 2023. "Water Resources." Online data for floodplain management, flood warning information, and hydrology expertise. http://cms.sbcounty.gov/dpw/FloodControl/WaterResources.aspx. Accessed January 2024

Scanlon, B. R., Reedy, R. C., Faunt, C. C., Pool, D., and Uhlman, K. 2016. *Enhancing Drought Resilience with Conjunctive Use and Managed Aquifer Recharge in California and Arizona*. Environmental Research Letters, Vol. 11, No. 035013.

USGS. 2023. USGS Water Data for California. USGS National Water Information System (NWIS) [web application]. Accessed December, 2023. https://waterdata.usgs.gov/ca/nwis.

WSC (Water Systems Consulting Inc.). 2018. *2015 San Bernardino Valley Regional Urban Water Management Plan*. Prepared by Water Systems Consulting Inc. for San Bernardino Valley Municipal Water District et al. Amended June 2017. Errata Incorporated April 2018.

INTENTIONALLY LEFT BLANK



SOURCE: ESRI, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordanance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community; DWR 2015; USGS NHD 2017

DUDEK

0 0.5 1 Miles

FIGURE 1

Vicinity Map of the Yucaipa Subbasin Plan Area

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan

Yucaipa Groundwater Subbasin
Management Area Boundaries
Hydrogeologic Subareas

Geologic Units (CGS 2012)

Quaternary

Qa, Young Alluvium

Qsdloc, Sedimentary Deposits of Live Oak Formation

Tertiary

QTst, San Timoteo Formation (Middle Member)

Tsh, Mill Creek Formation

Tv, Dacite Dikes

Mesozoic and Older

pKm, Cretaceous and Pre-Cretaceous Metamorphic Formations of Sedimentary and Volcanic Origin

Trb, Granitic and Other Intrusive Crystalline Rocks, San Gabriel Mountains-type

Faults and Geologic Contacts

contact, identity and existence certain, location accurate

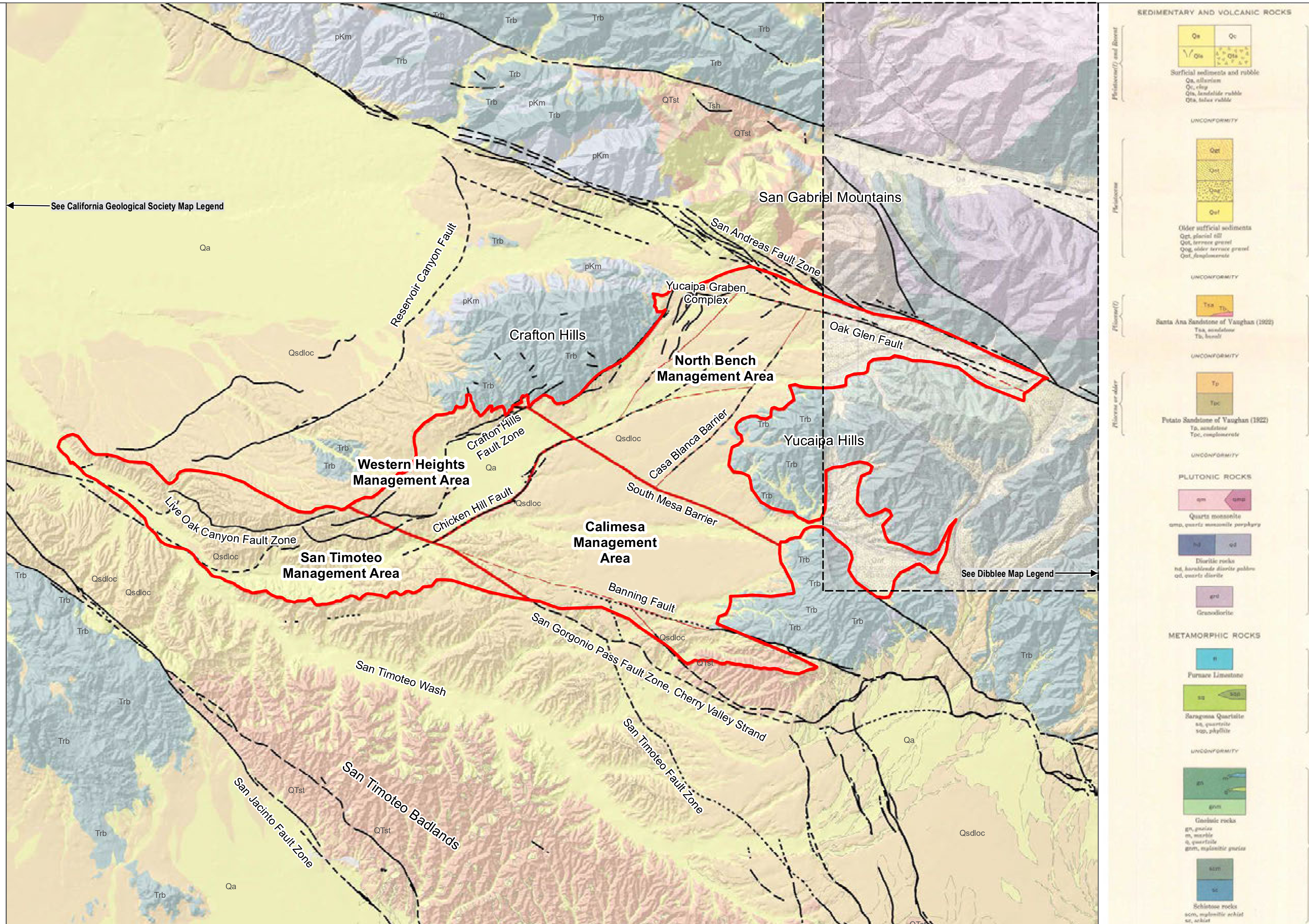
contact, identity and existence certain, location approximate

fault, identity and existence certain, location accurate

fault, identity and existence certain, location approximate

fault, identity and existence certain, location concealed

fault, identity and existence certain, location inferred



SOURCE: CGS 2012, USGS 1999

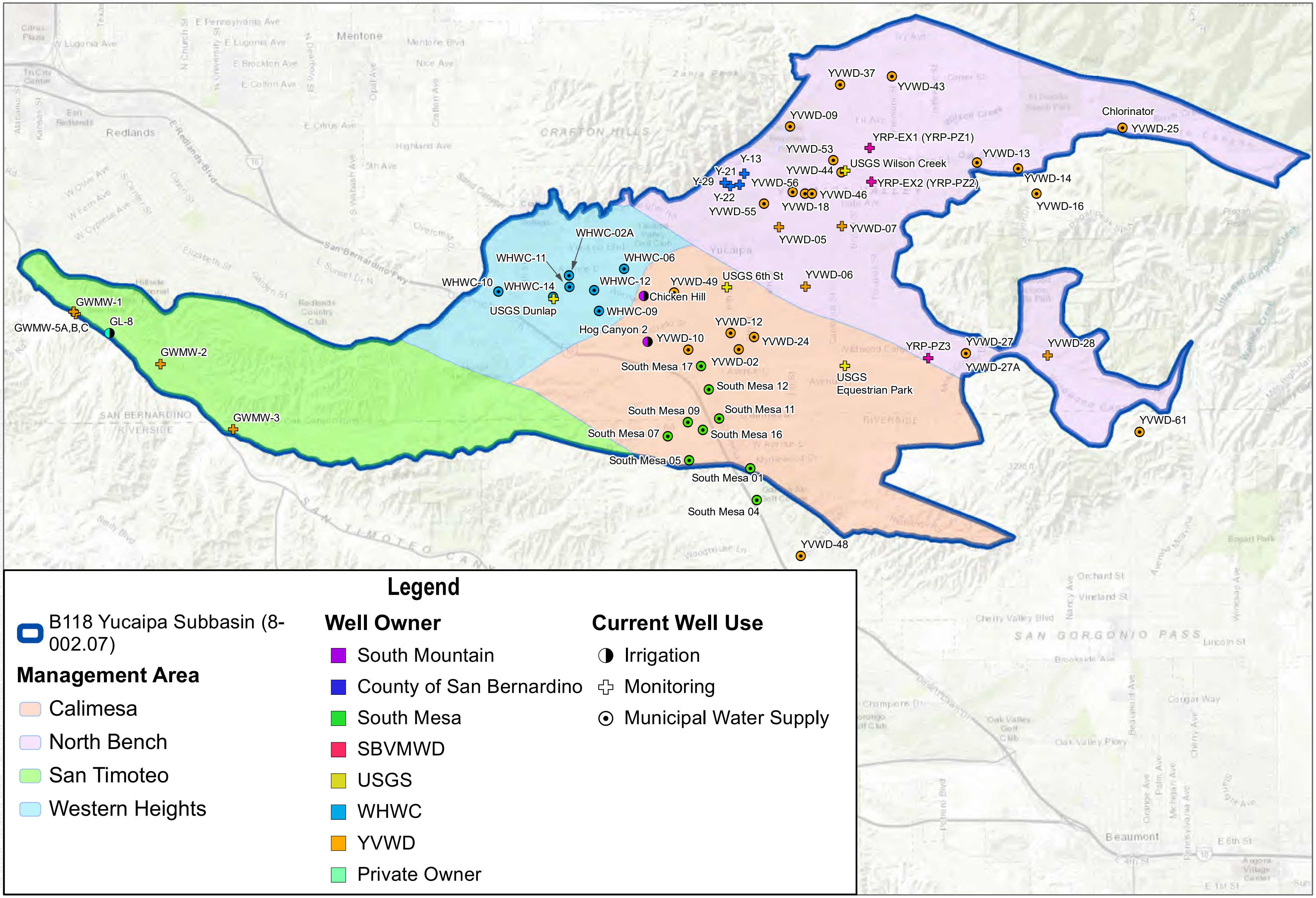
DUDEK

0 0.5 1 2 Miles

FIGURE 2

Geologic Map and Management Area Boundaries in the Yucaipa Subbasin

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan



SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

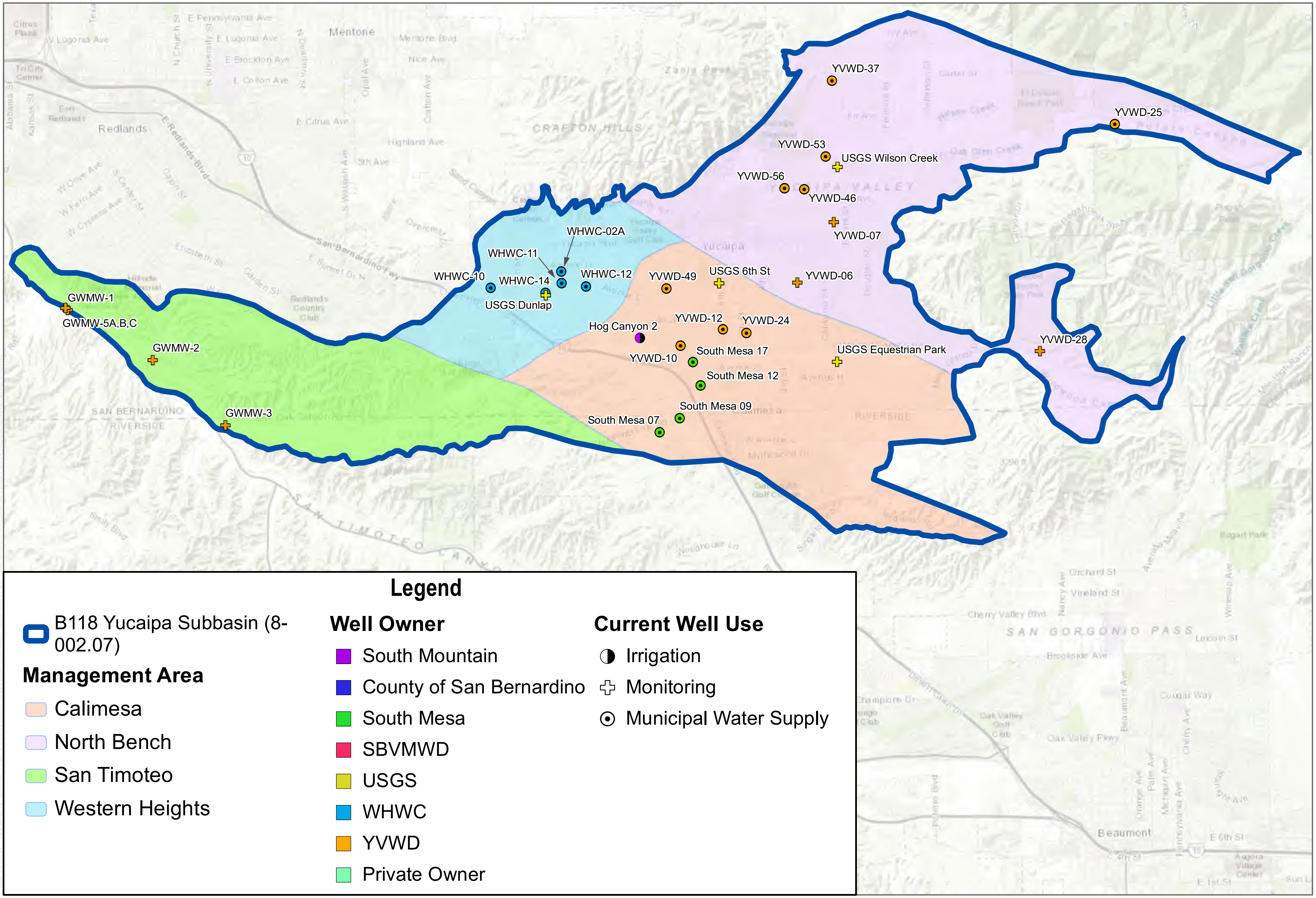
DUDEK

0 0.5 1 Miles

FIGURE 3

Yucaipa Subbasin Groundwater Monitoring Network

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan



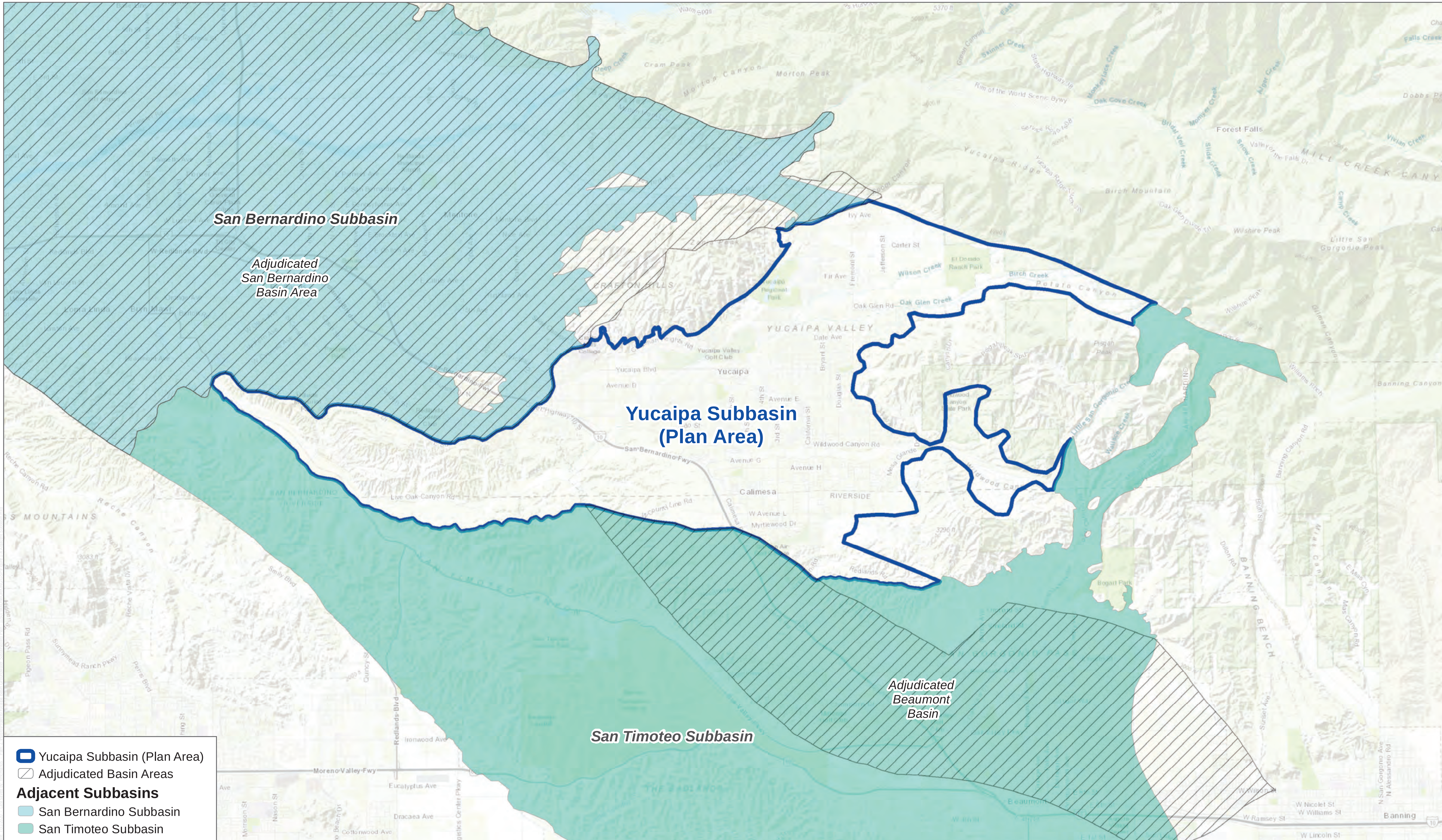
SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

DUDEK

FIGURE 4

Representative Monitoring Points

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan

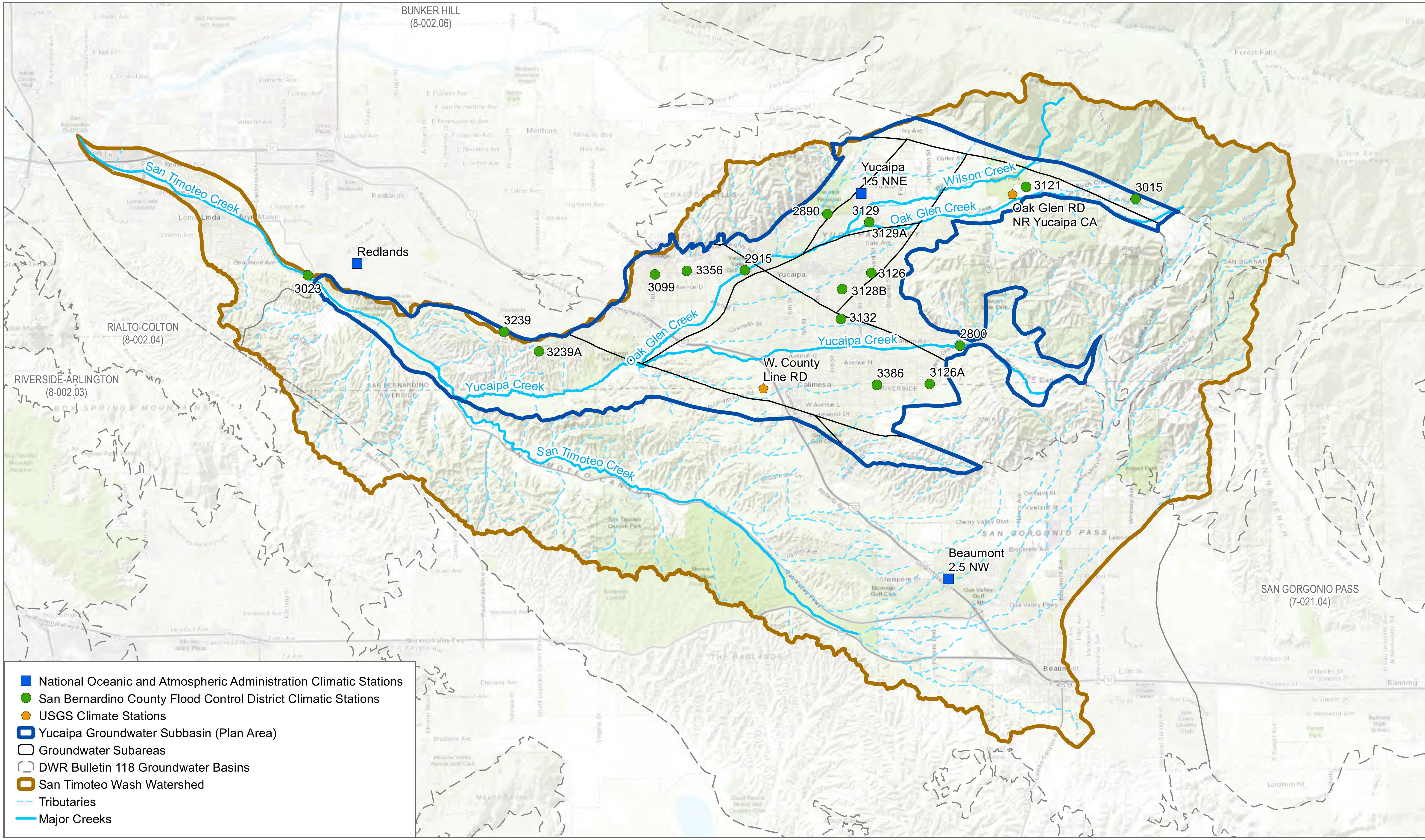


SOURCE: ESRI, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordanance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community; DWR 2015; USGS NHD 2017

DUDEK

0 0.5 1 Miles

FIGURE 5
Adjacent Subbasins

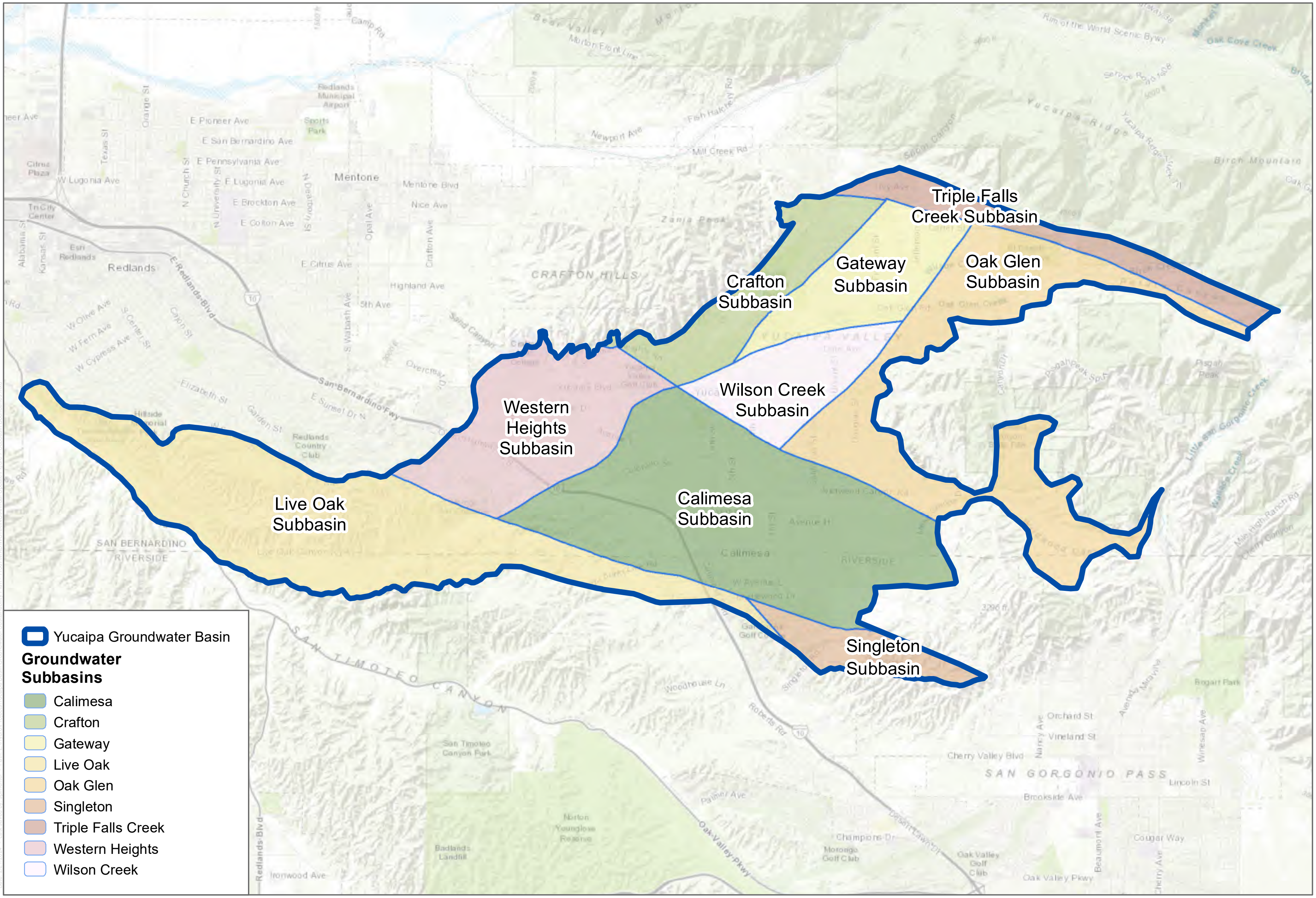


SOURCE: ESRI, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordanance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community; DWR 2015; USGS NHD 2017; Geoscience 2017, USGS 2024,

DUDEK 0 0.5 1 Miles

FIGURE 6

Precipitation Station Locations in the Yucaipa Valley Subbasin and San Timoteo Wash Watershed



SOURCE: ESRI; Geoscience 2018

DUDEK

0 0.5 1 Miles

FIGURE 7

Hydrogeological Subareas in the Yucaipa Subbasin

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan

Figure 8. Cumulative Departure from Mean Monthly Precipitation at the SBCFCD Oak Glen and Calimesa East Climatic Stations and the NOAA Redlands Climatic Station

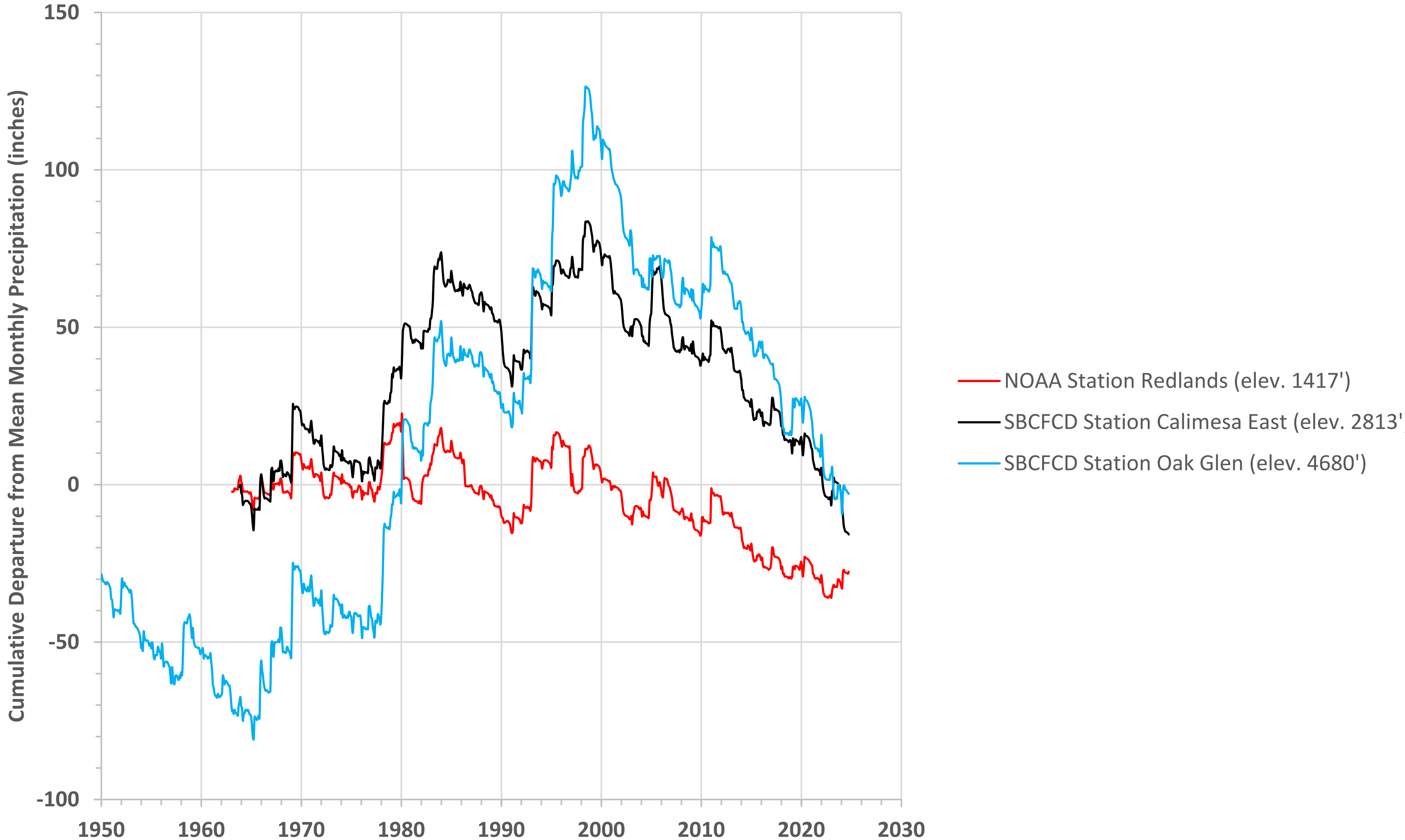
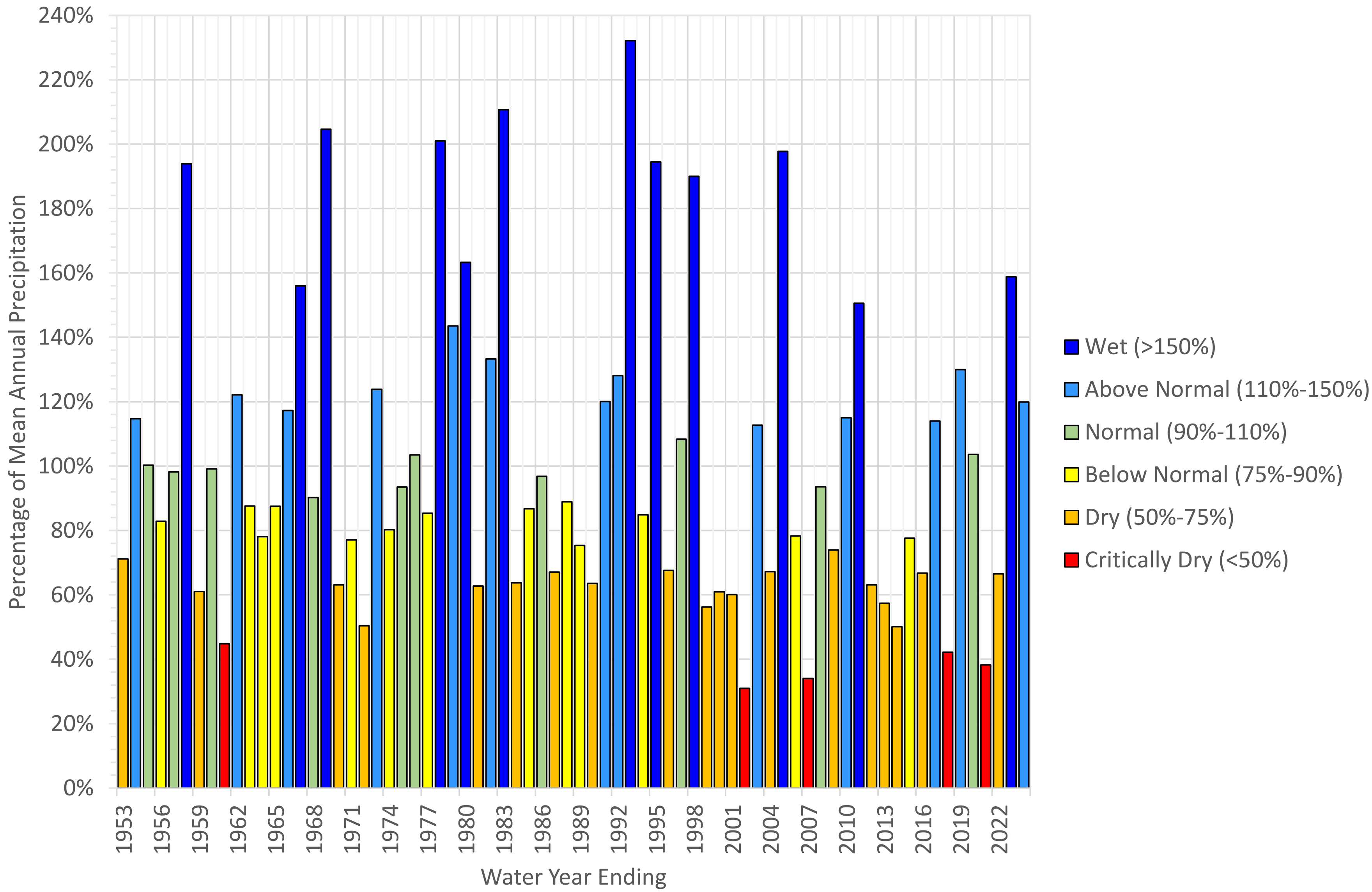
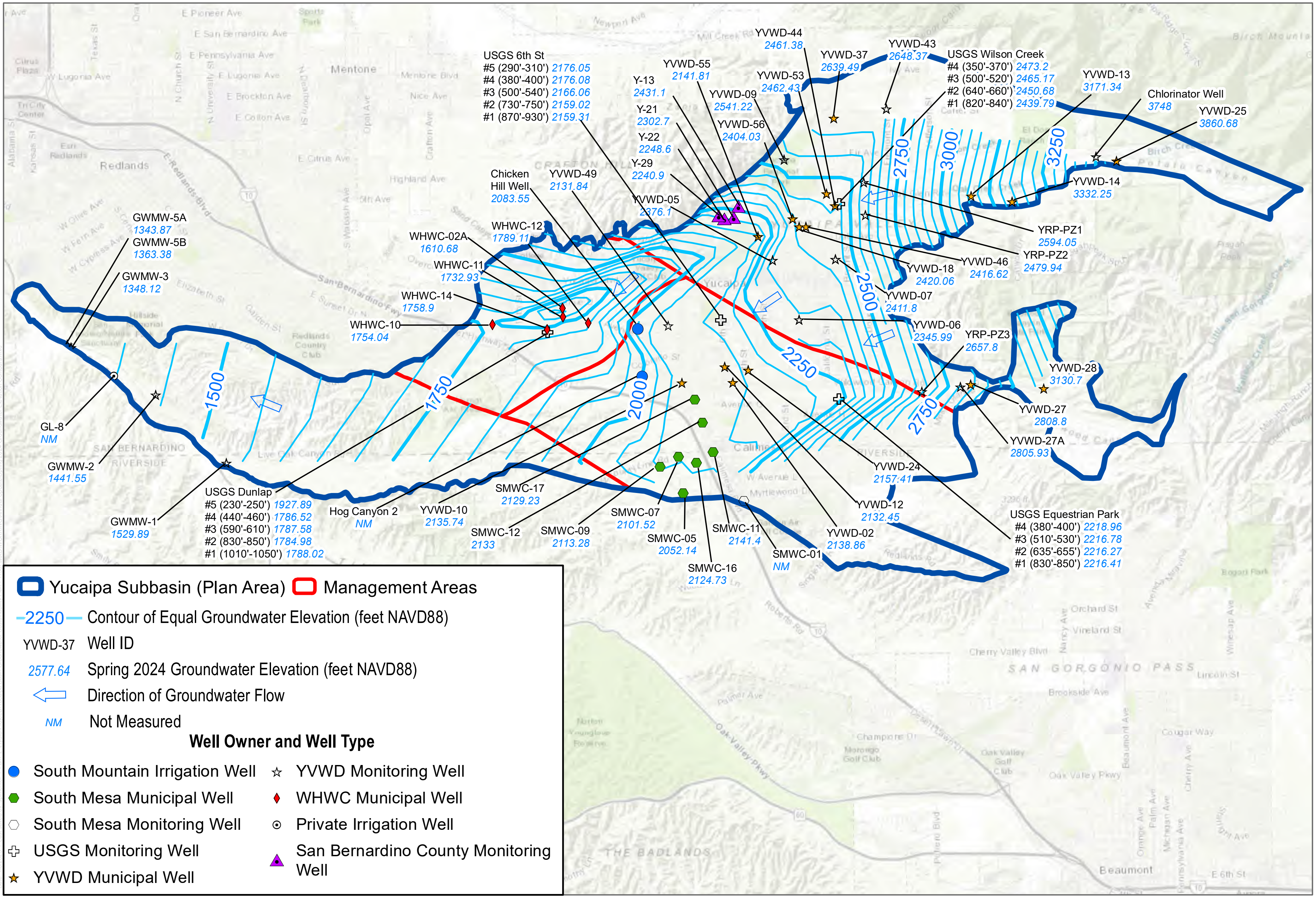


Figure 9. Historical Water Year-Types in the Yucaipa Subbasin





SOURCE: YVWD, WHWC, South Mesa, City of Redlands, USGS

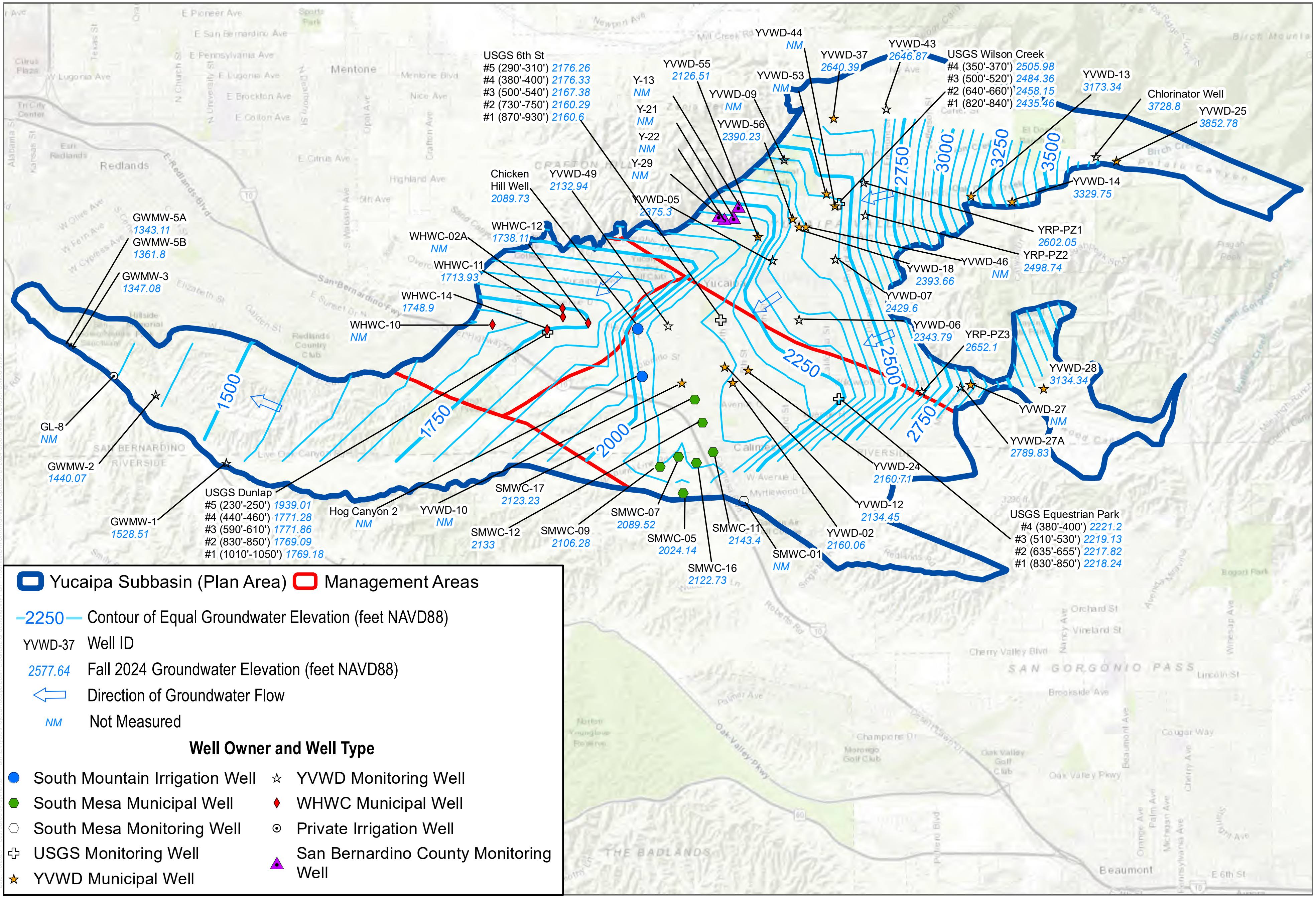
DUDEK

0 0.5 1 Miles

FIGURE 10

Spring 2024 Groundwater Elevations within the Yucaipa Subbasin

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan



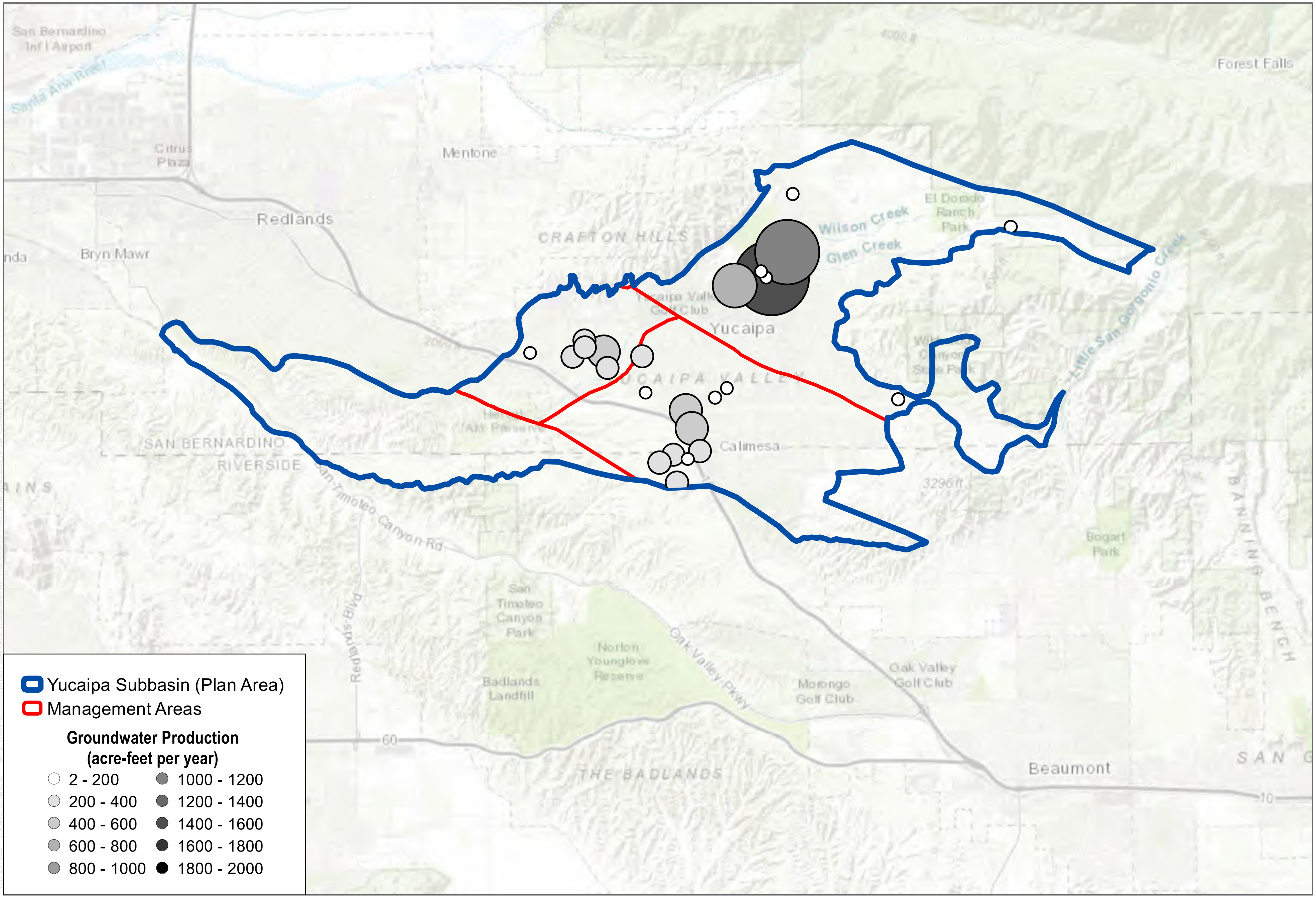
SOURCE: YVWD, WHWC, South Mesa, City of Redlands, USGS

DUDEK

0 0.5 1 Miles

FIGURE 11

Fall 2024 Groundwater Elevations within the Yucaipa Subbasin



SOURCE: YVWD, WHWC, South Mesa, City of Redlands, USGS

DUDEK

0 1 2 Miles

FIGURE 12

2024 Water Year Groundwater Production in the Yucaipa Subbasin

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan

Figure 13. Annual Change in Groundwater in Storage in the Yucaipa Subbasin

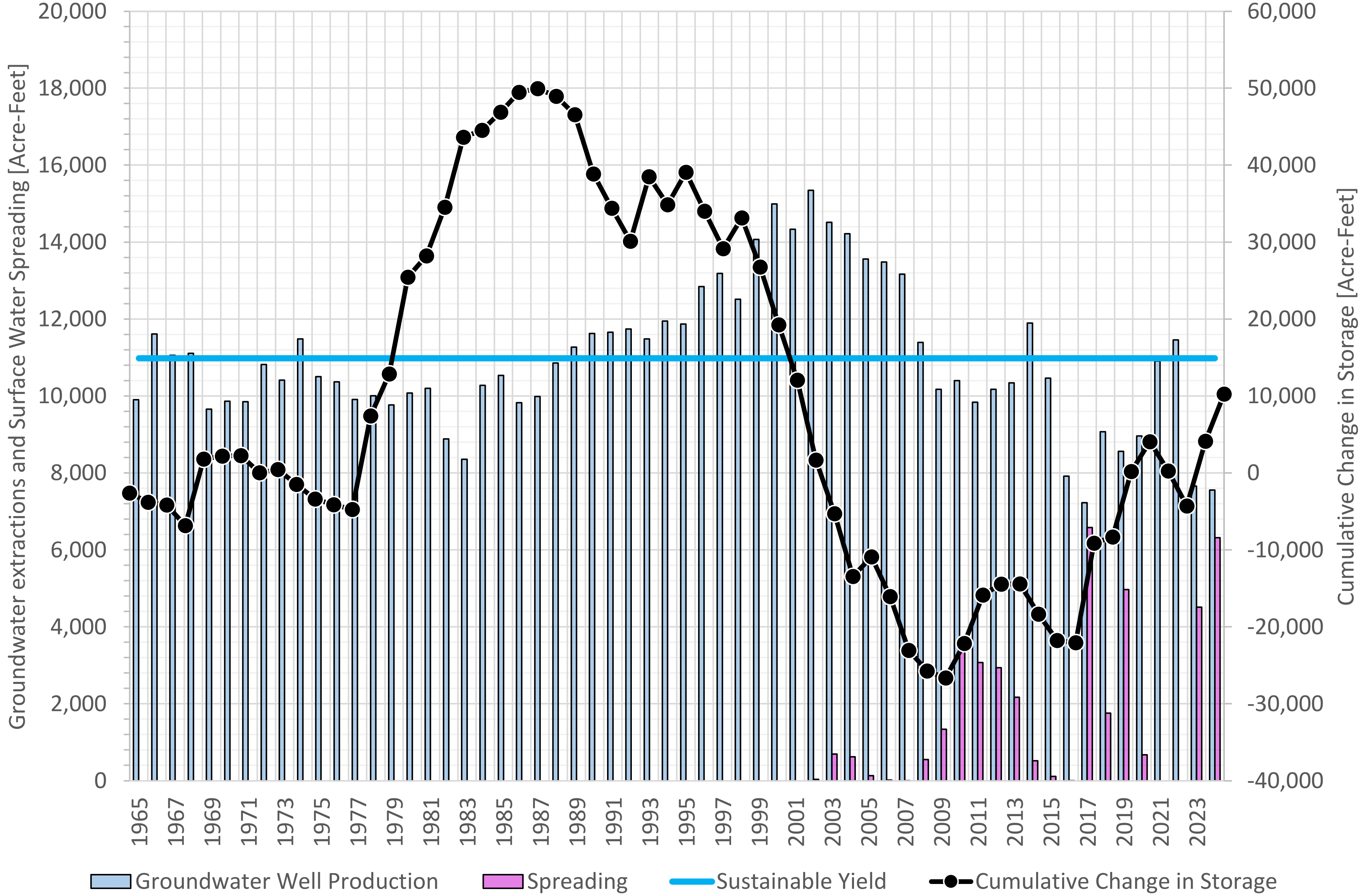
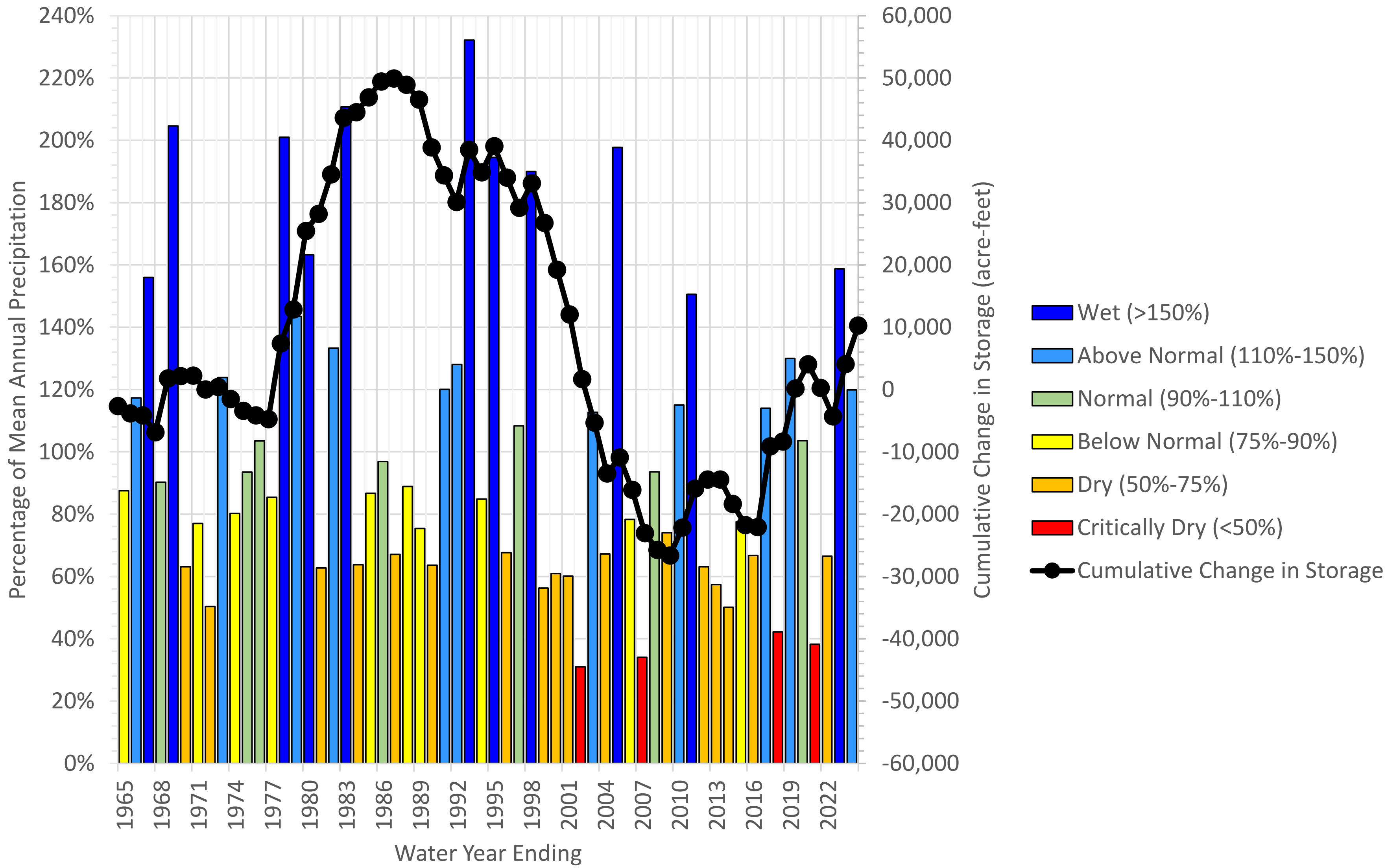
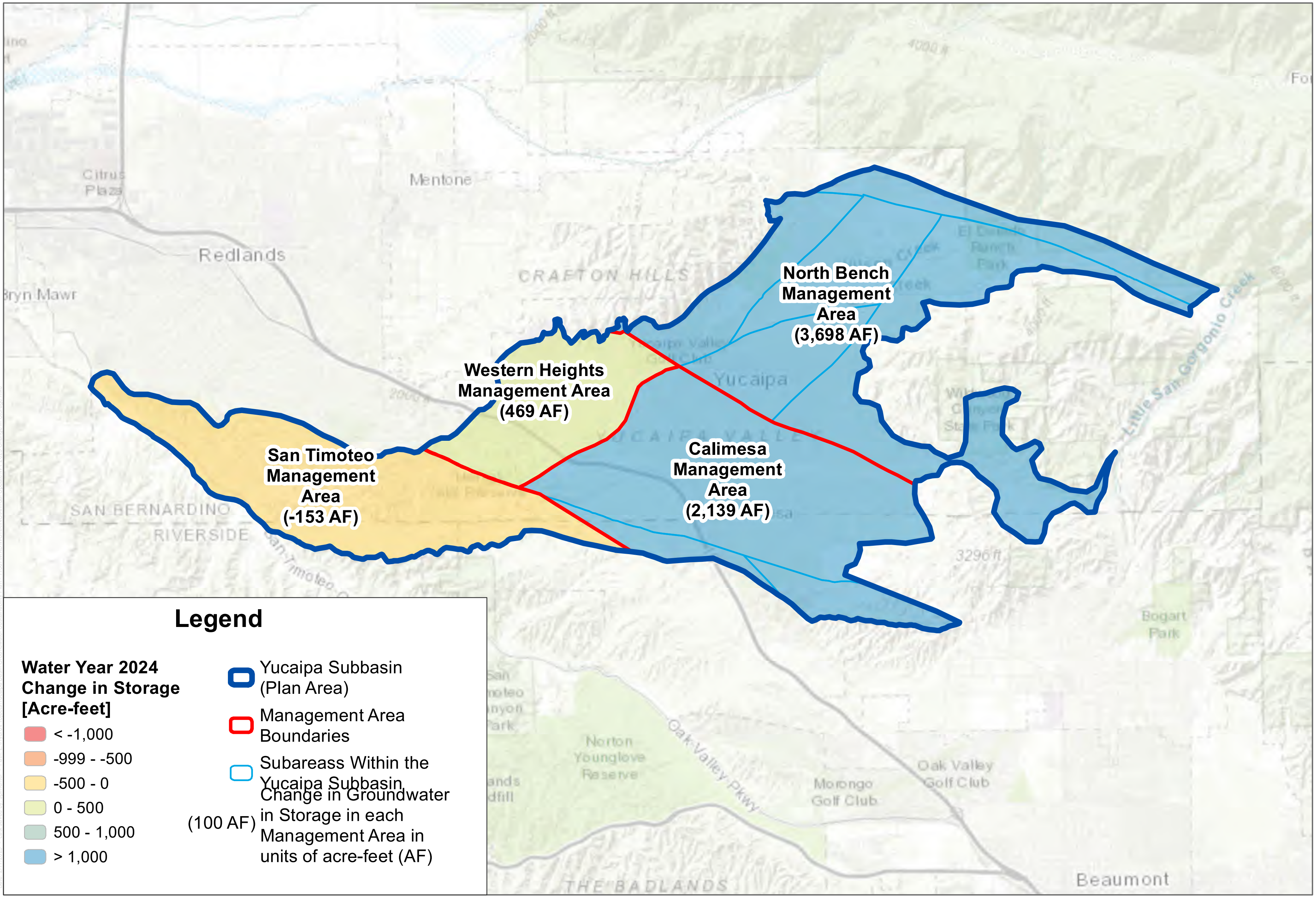


Figure 14. Historical Water Year-Types and Cumulative Change in Storage in the Yucaipa Subbasin





SOURCE: ESRI, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordanance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community; DWR 2015; USGS NHD 2017

DUDEK

FIGURE 15

Water Year 2024 Change in Groundwater in Storage

Annual Update - Yucaipa Subbasin Groundwater Sustainability Plan

Figure 16. Annual Pumping and Spreading in the North Bench Management Area for the 2019-2024 Water Years

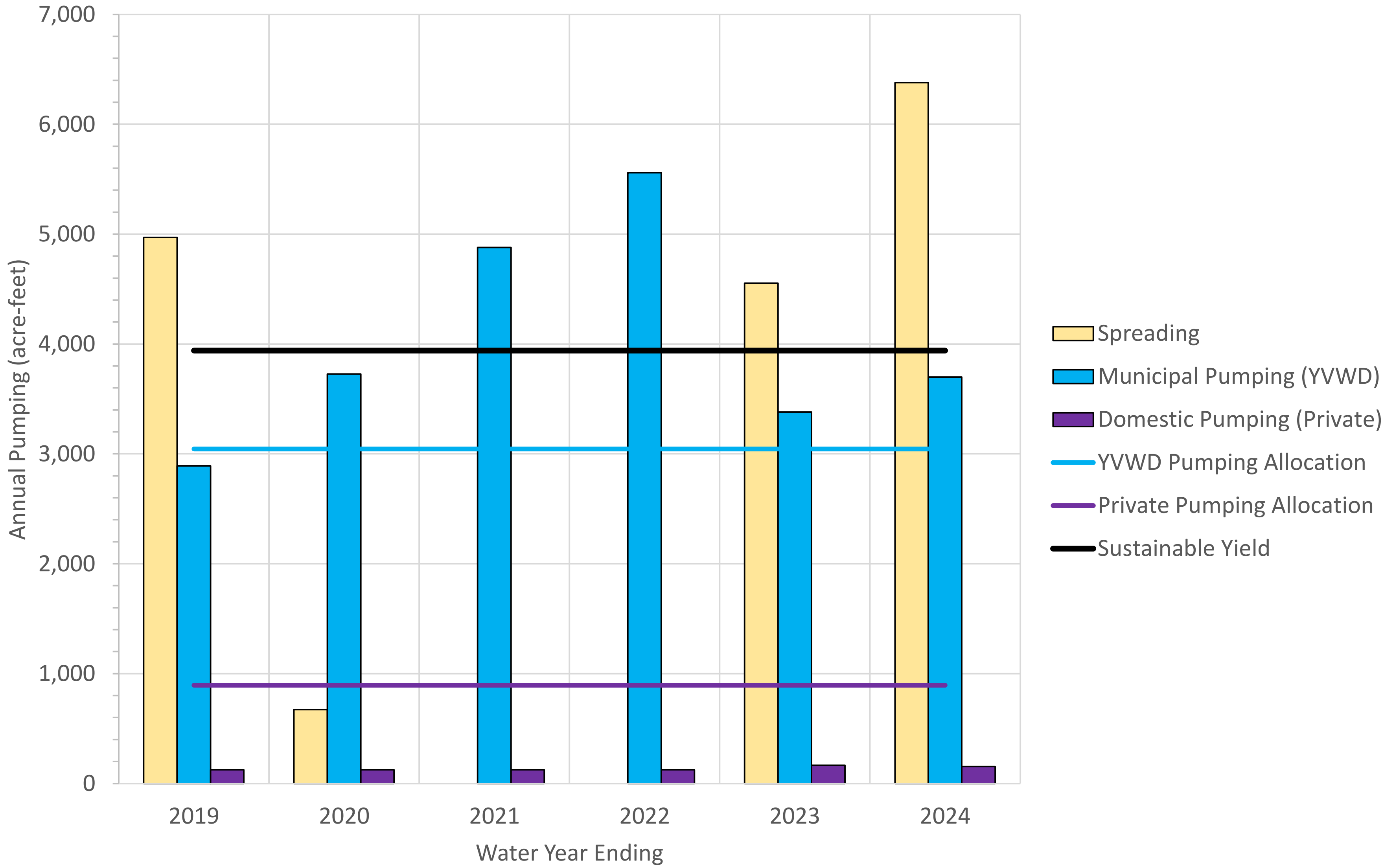


Figure 17. Annual Pumping by User in the Calimesa Management Area for the 2019 - 2024 Water Years

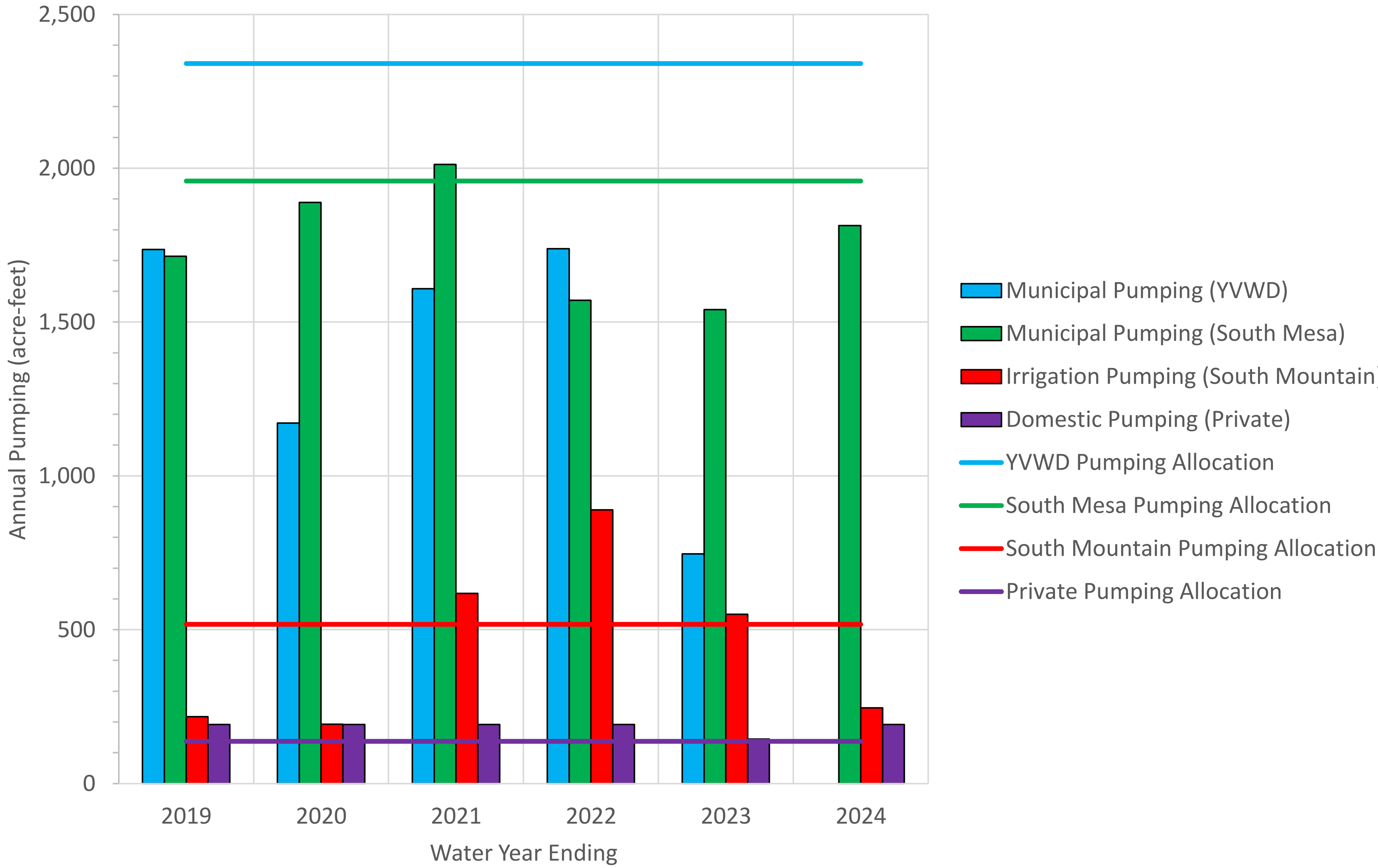


Figure 18. Annual Pumping in the Calimesa Management Area for the 2019 - 2024 Water Years

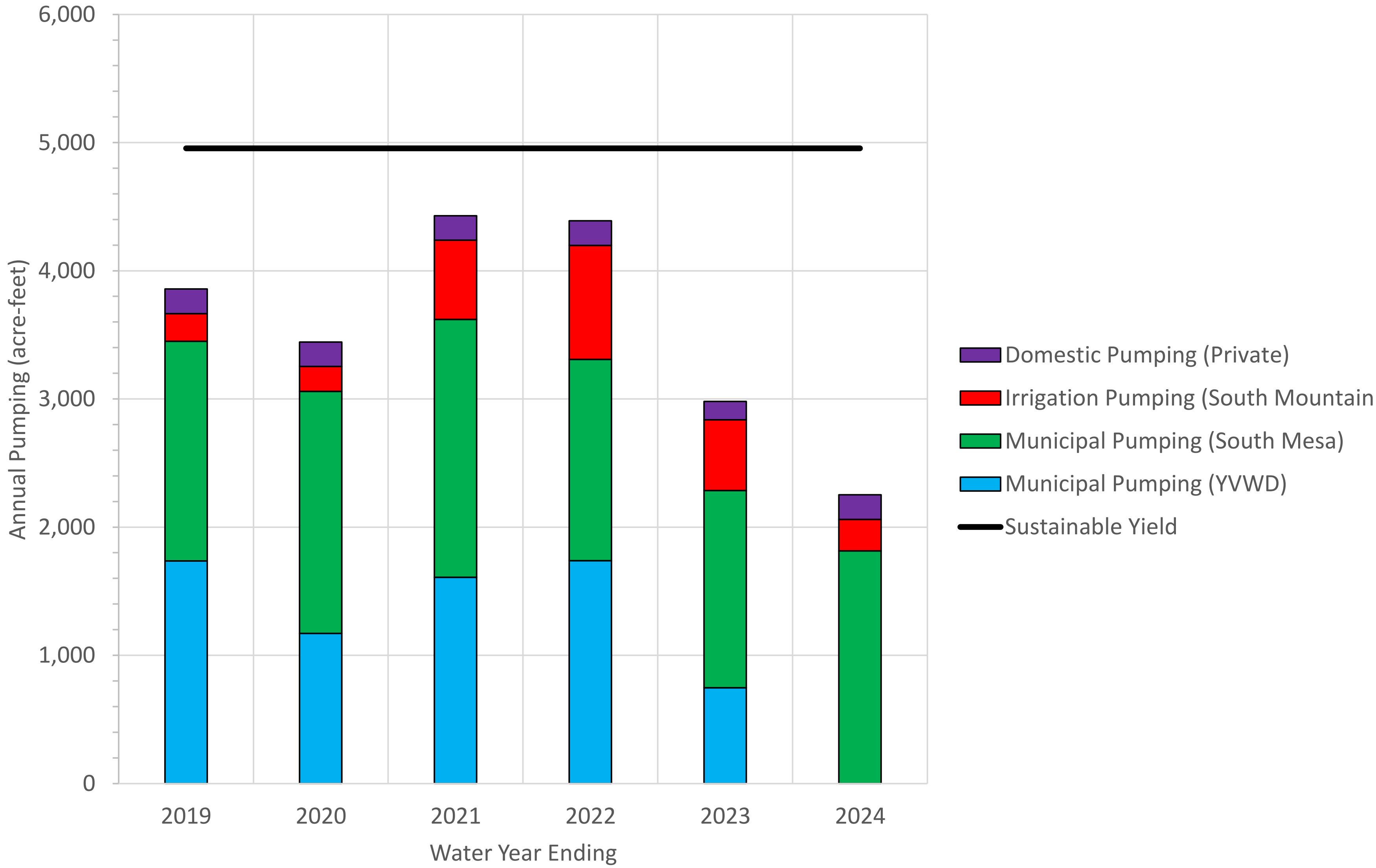
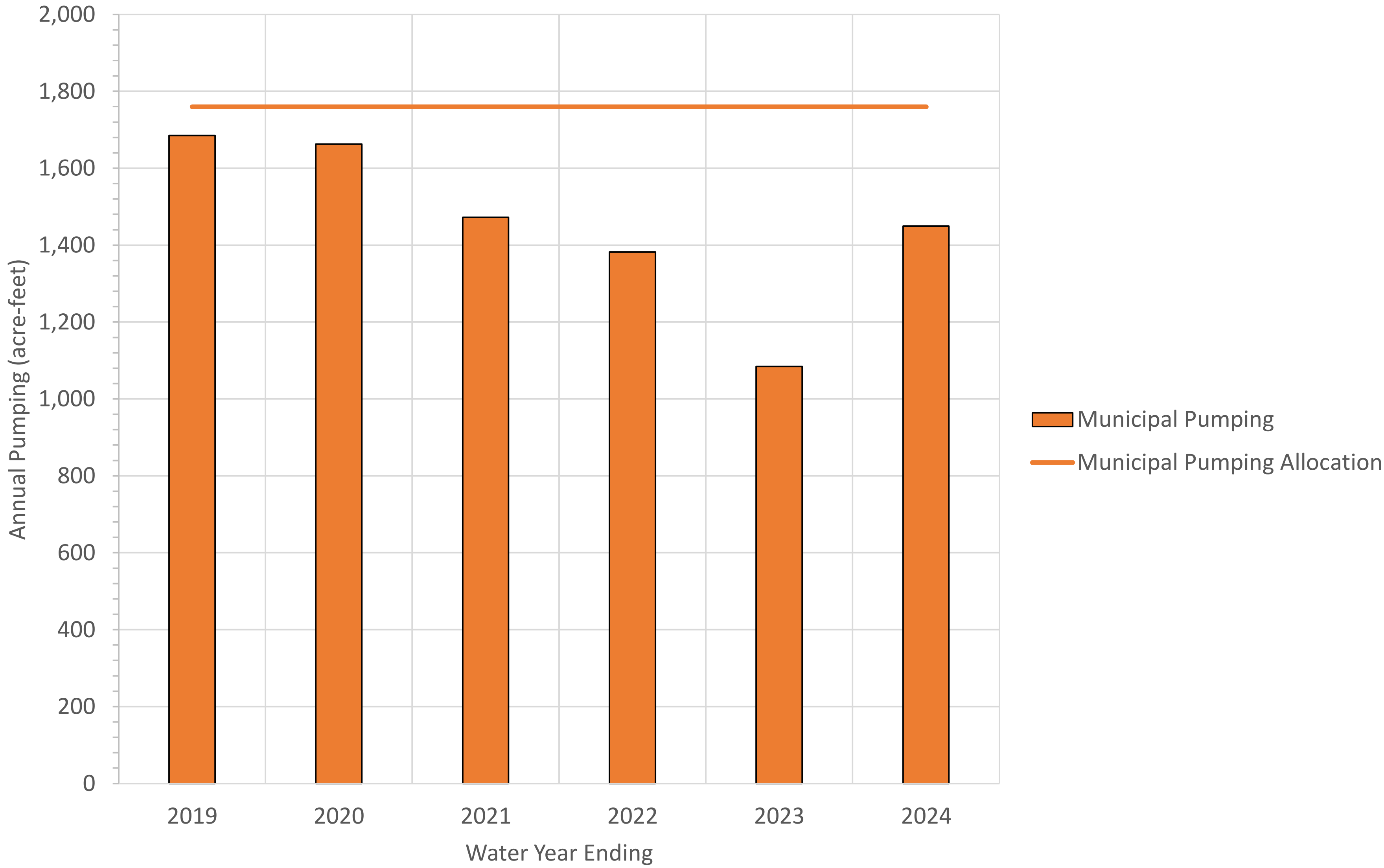


Figure 19. Annual Pumping in Western Heights Management Area for 2019 - 2024 Water Years



APPENDIX A

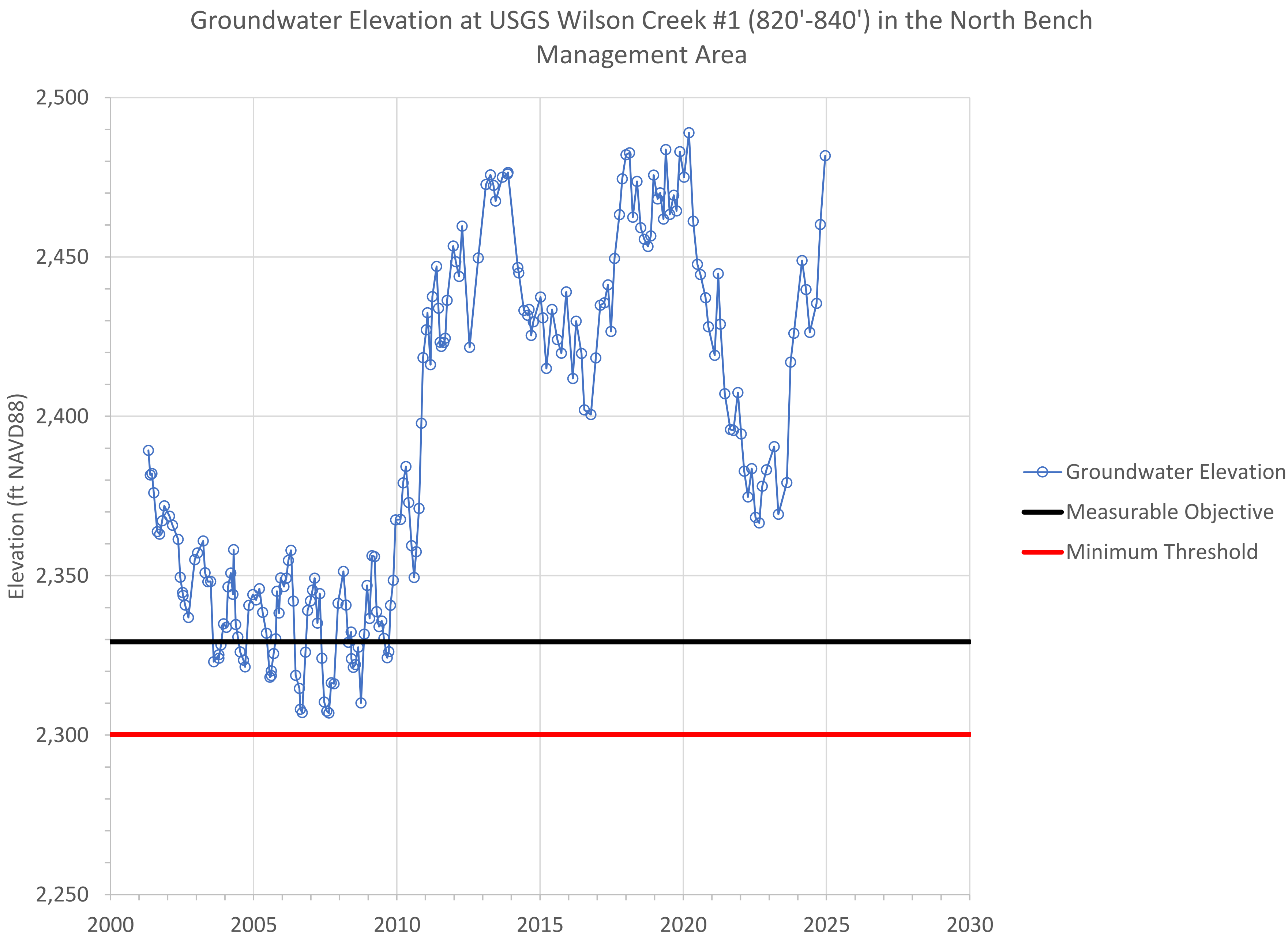
Groundwater Elevation Hydrographs for the Yucaipa Subbasin Groundwater Monitoring Network

APPENDIX A

Groundwater Elevation Hydrographs

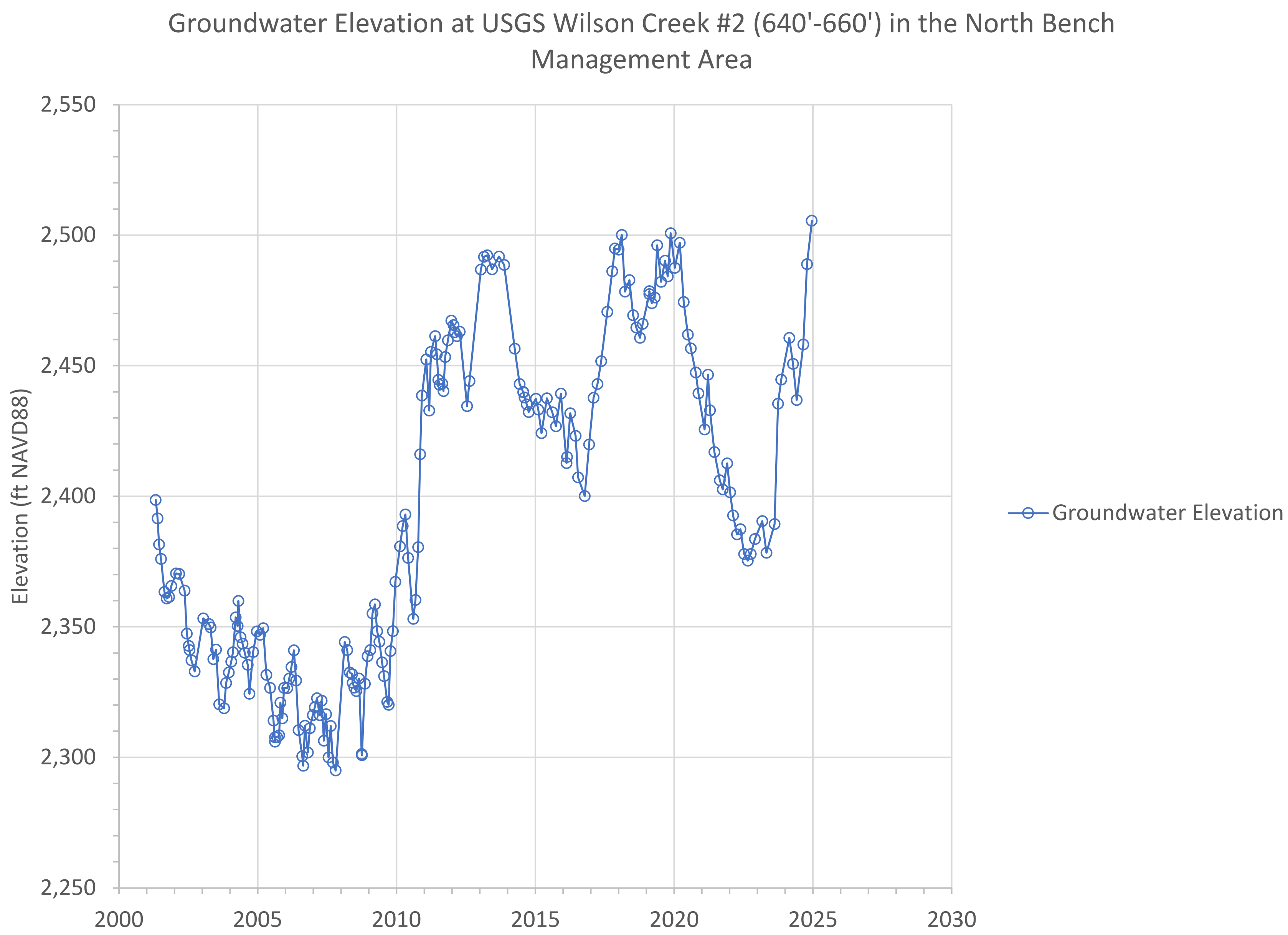
Table of Contents

Figure



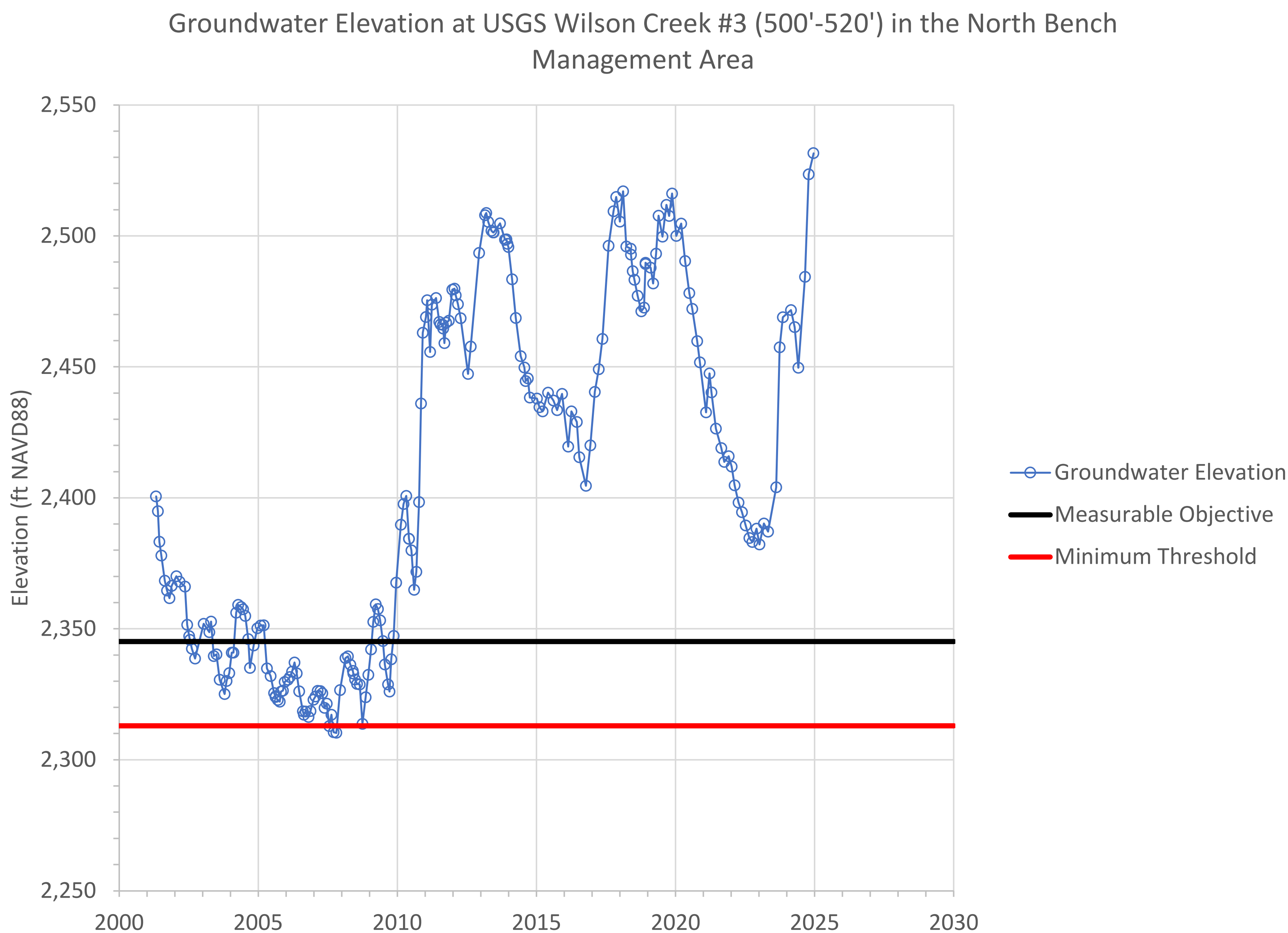
Groundwater Elevation at USGS Wilson Creek #1 (820'-840') in the North Bench Management Area
Elevation (ft NAVD88)
2,500
2,450
2,400
2,350
2,300
2,250
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-1



Groundwater Elevation at USGS Wilson Creek #2 (640'-660') in the North Bench Management Area
Elevation (ft NAVD88)
2,550
2,500
2,450
2,400
2,350
2,300
2,250
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-2



Groundwater Elevation at USGS Wilson Creek #3 (500'-520') in the North Bench Management Area
2,550
2,500
2,450
2,400
2,350
2,300
2,250
Elevation (ft NAVD88)
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-3

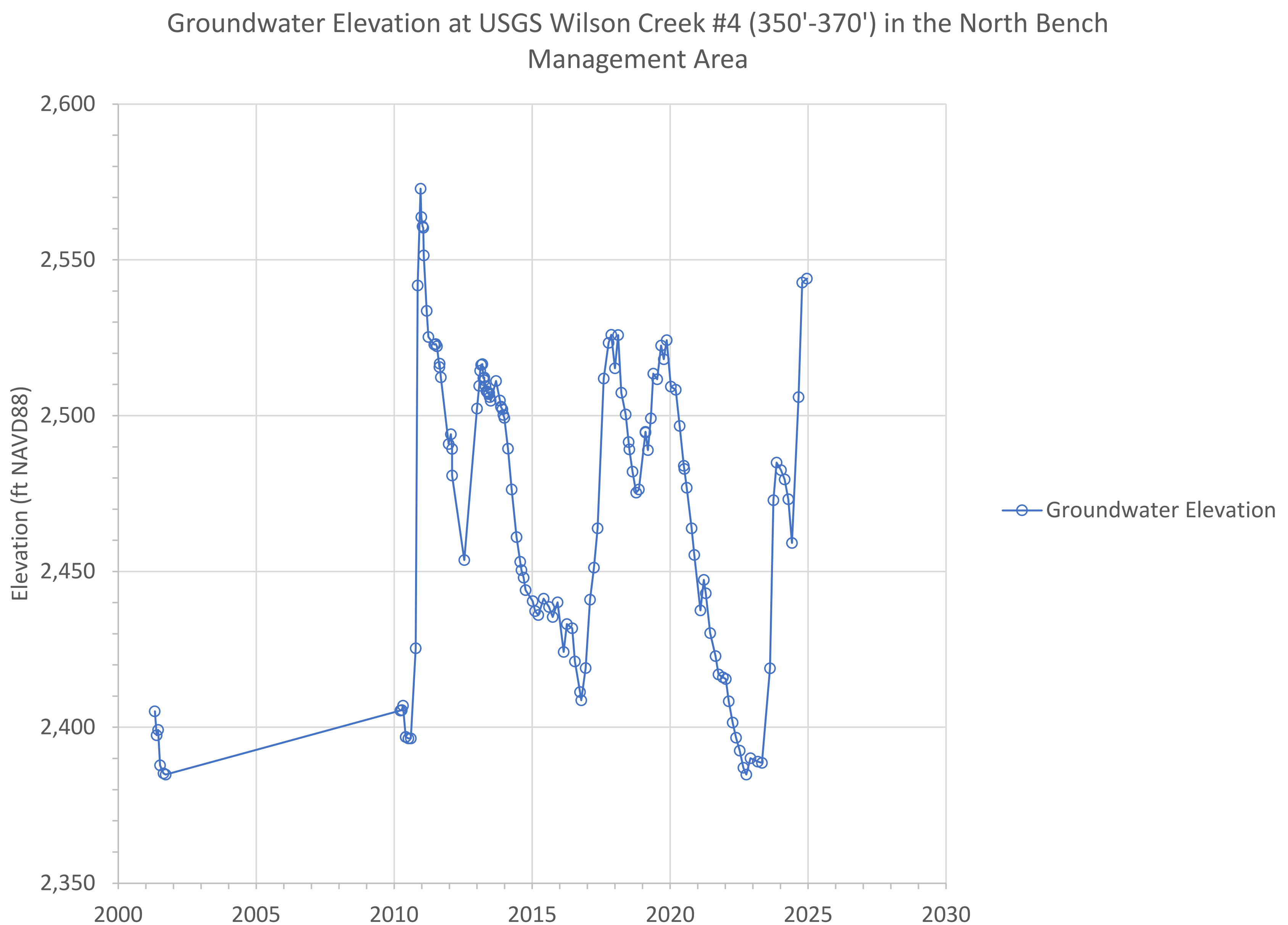
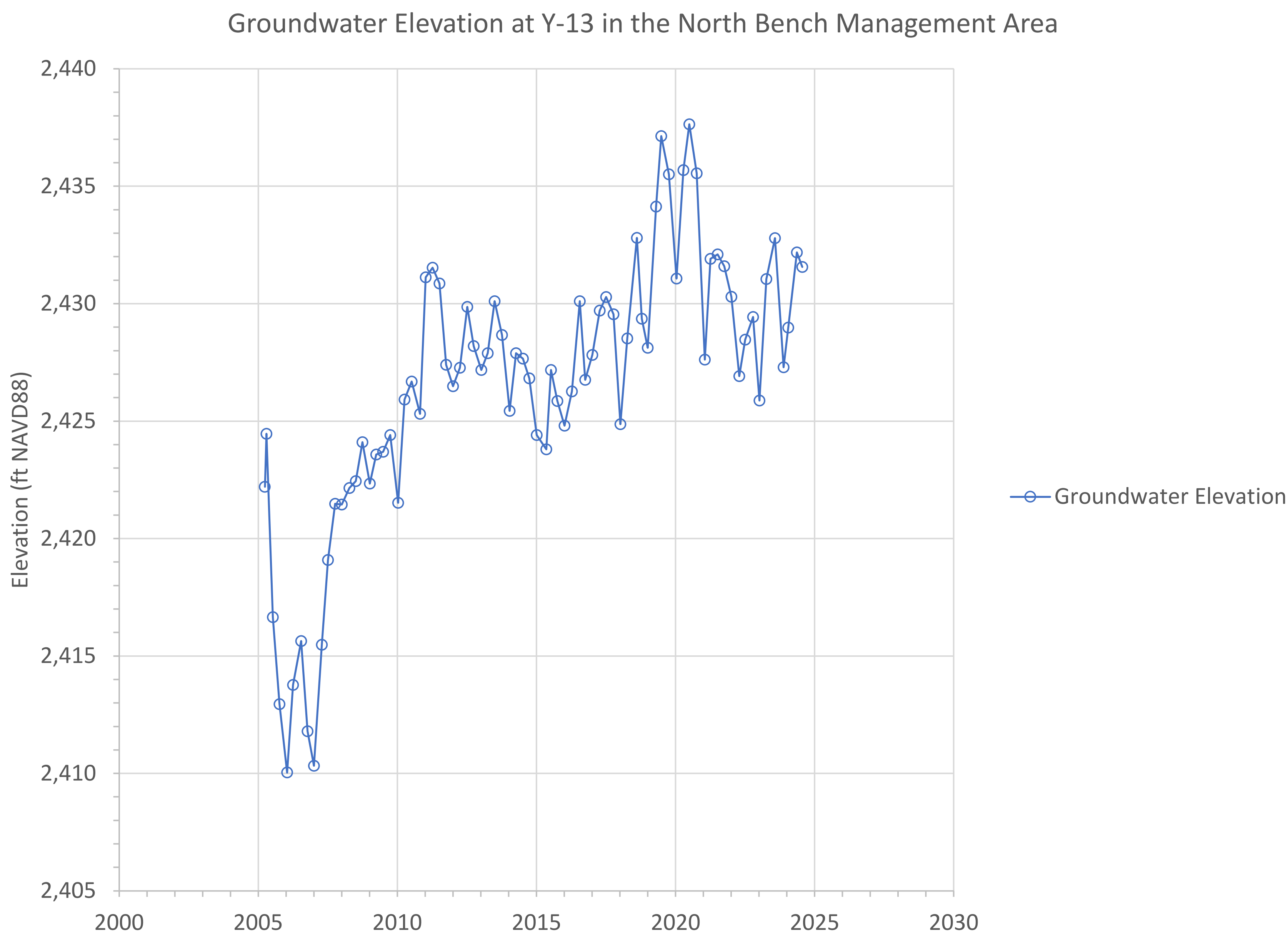

Groundwater Elevation at USGS Wilson Creek #4 (350'-370') in the North Bench Management Area
Elevation (ft NAVD88)
2,600
2,550
2,500
2,450
2,400
2,350
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-4



Groundwater Elevation at Y-13 in the North Bench Management Area
Elevation (ft NAVD88)
2,440
2,435
2,430
2,425
2,420
2,415
2,410
2,405
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-5

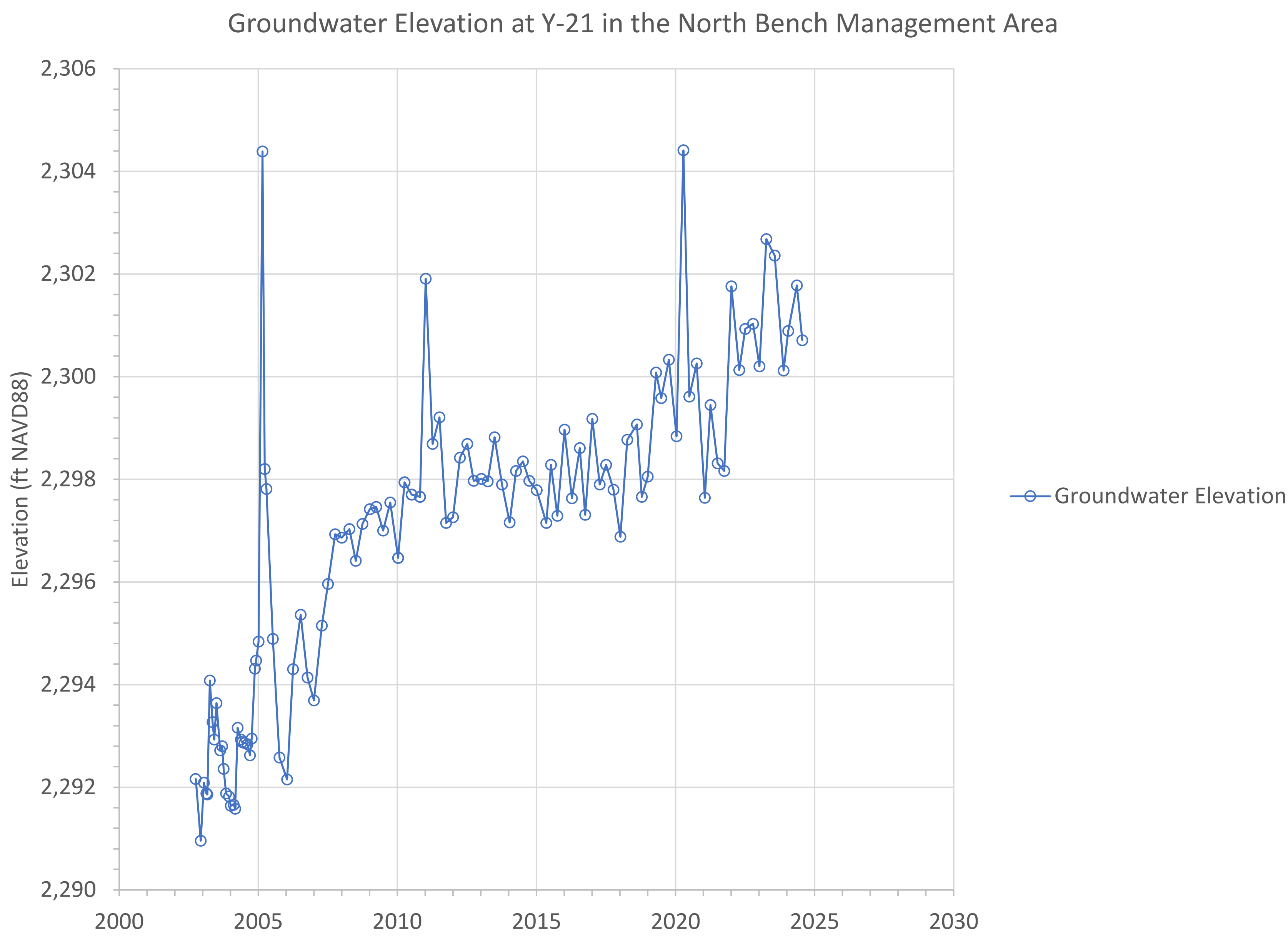

Groundwater Elevation at Y-21 in the North Bench Management Area
Elevation (ft NAVD88)
2,306
2,304
2,302
2,300
2,298
2,296
2,294
2,292
2,290
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-6

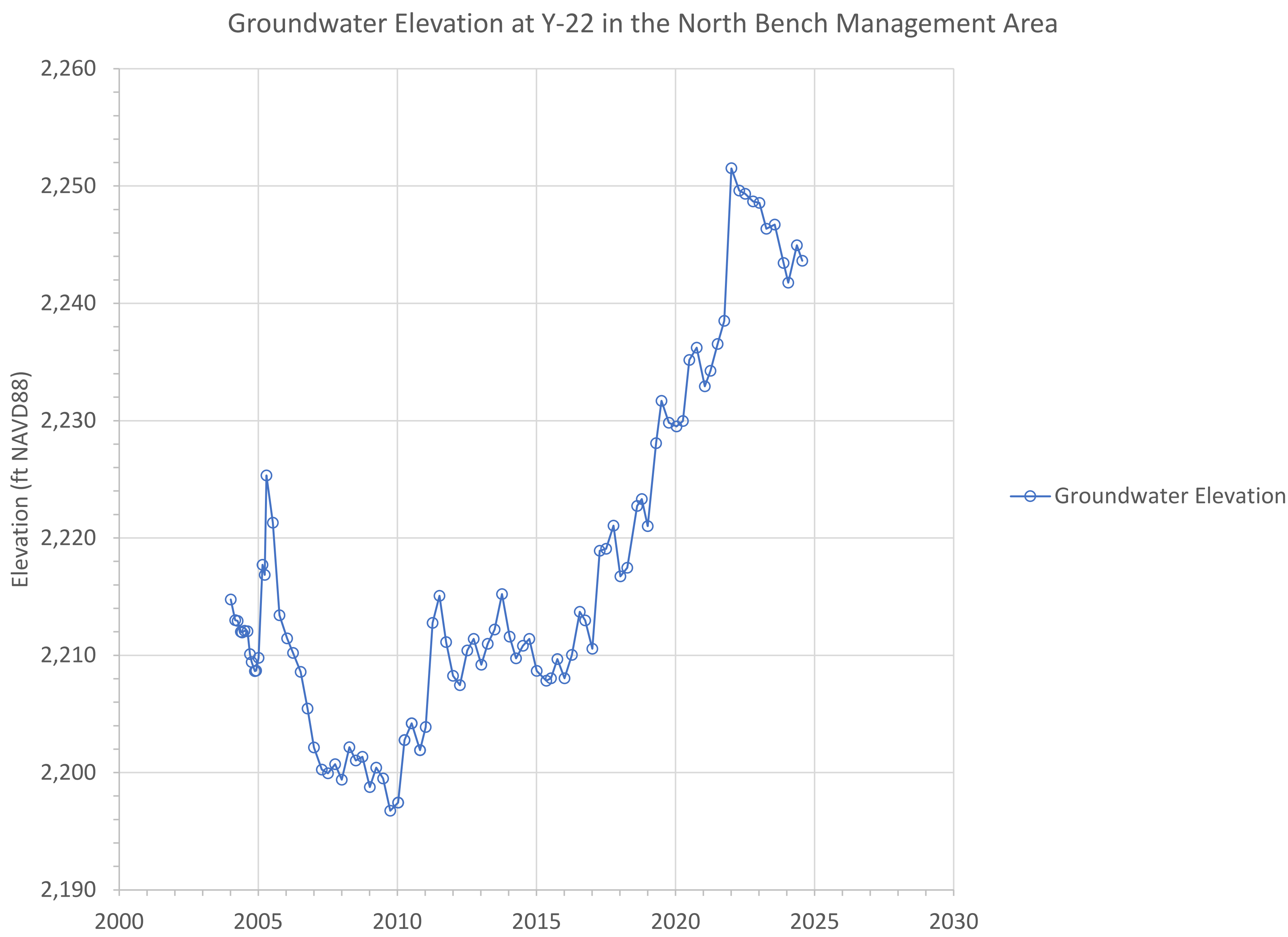
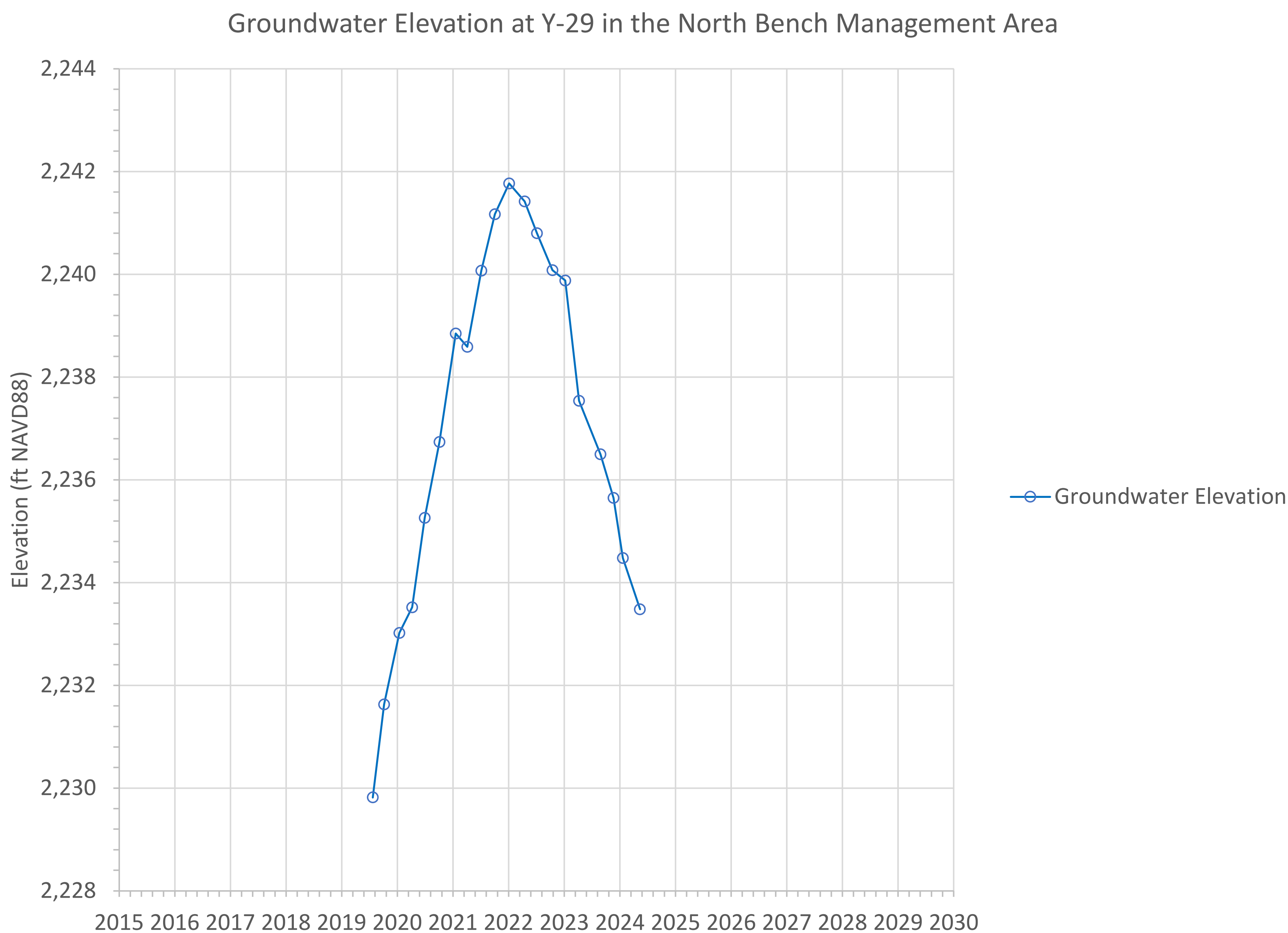

Groundwater Elevation at Y-22 in the North Bench Management Area
Elevation (ft NAVD88)
2,260
2,250
2,240
2,230
2,220
2,210
2,200
2,190
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-7



Groundwater Elevation at Y-29 in the North Bench Management Area
Elevation (ft NAVD88)
2,244
2,242
2,240
2,238
2,236
2,234
2,232
2,230
2,228
2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Groundwater Elevation

Figure A-8

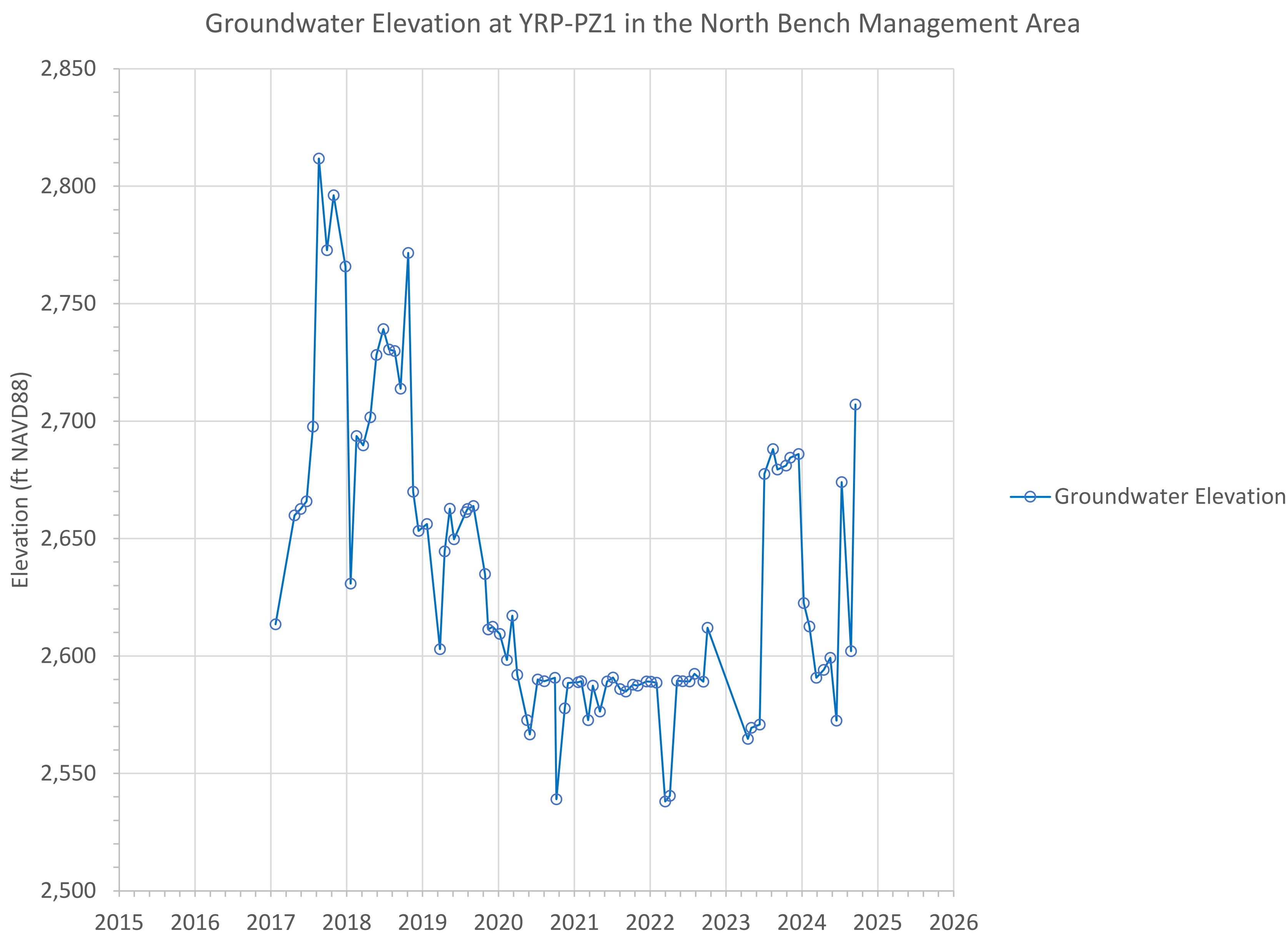

Groundwater Elevation at YRP-PZ1 in the North Bench Management Area
Elevation (ft NAVD88)
2,850
2,800
2,750
2,700
2,650
2,600
2,550
2,500
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Groundwater Elevation

Figure A-9

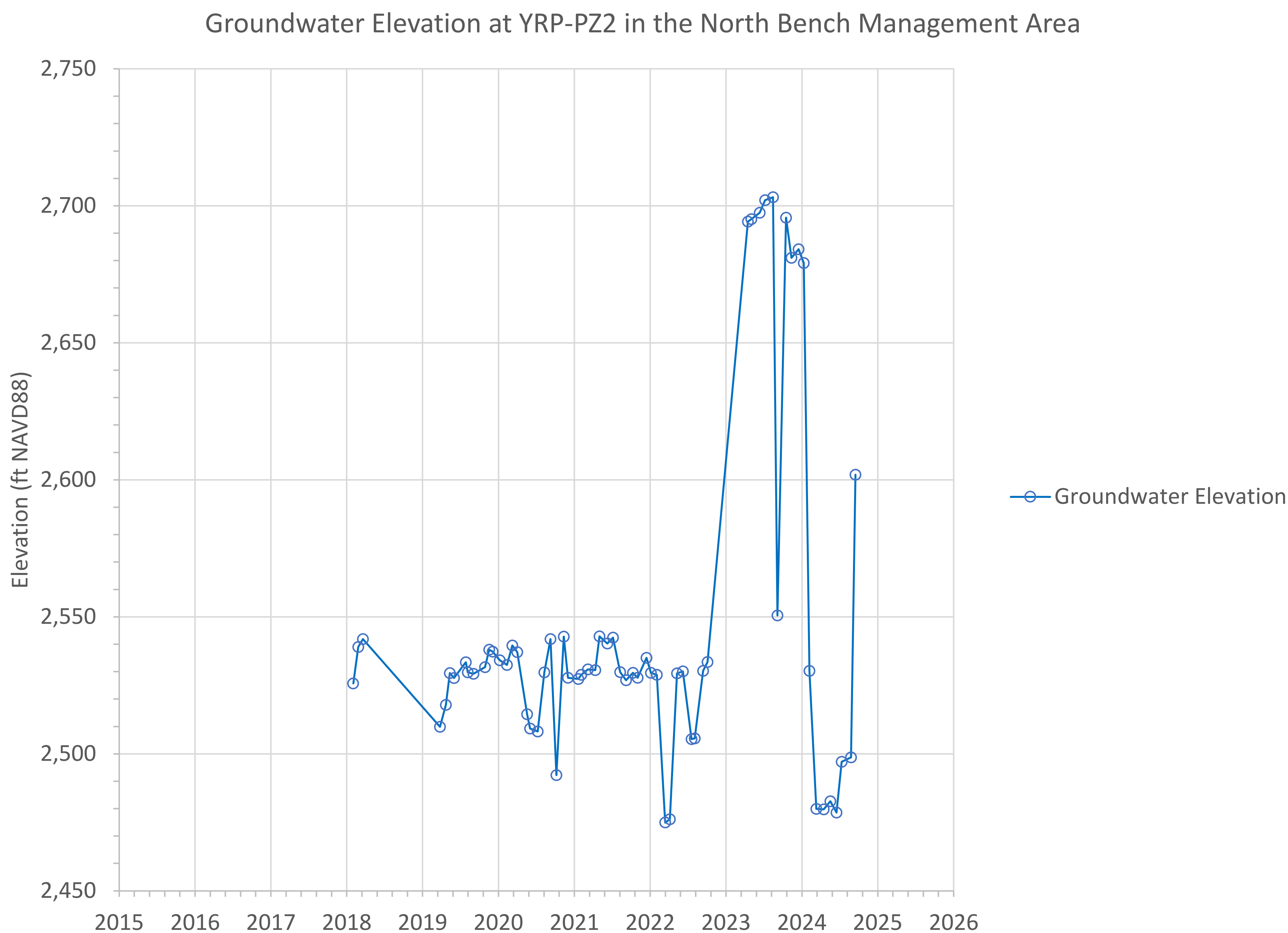

Groundwater Elevation at YRP-PZ2 in the North Bench Management Area
Elevation (ft NAVD88)
2,750
2,700
2,650
2,600
2,550
2,500
2,450
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Groundwater Elevation

Figure A-10

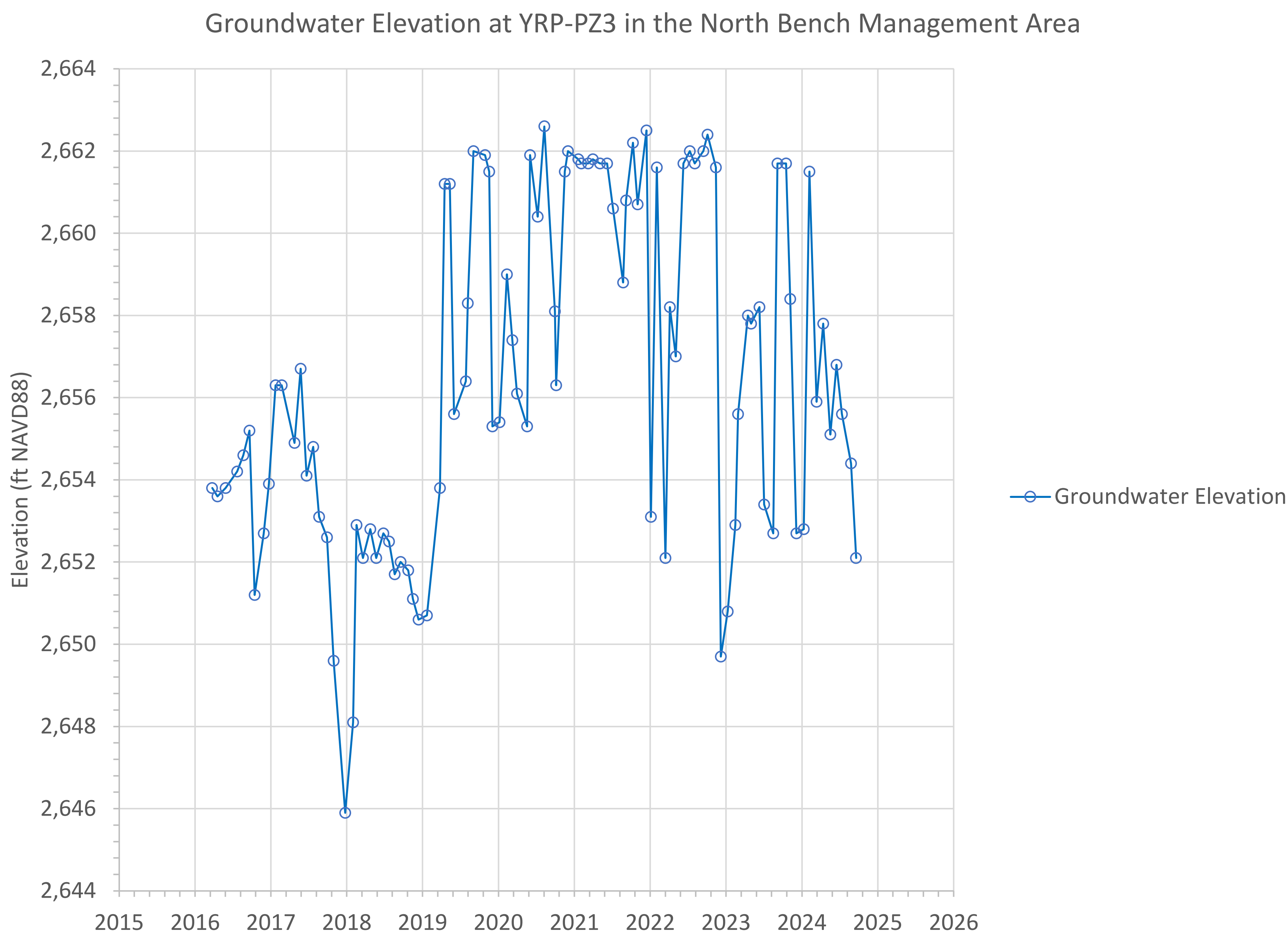

Groundwater Elevation at YRP-PZ3 in the North Bench Management Area
Elevation (ft NAVD88)
2,664
2,662
2,660
2,658
2,656
2,654
2,652
2,650
2,648
2,646
2,644
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Groundwater Elevation

Figure A-11

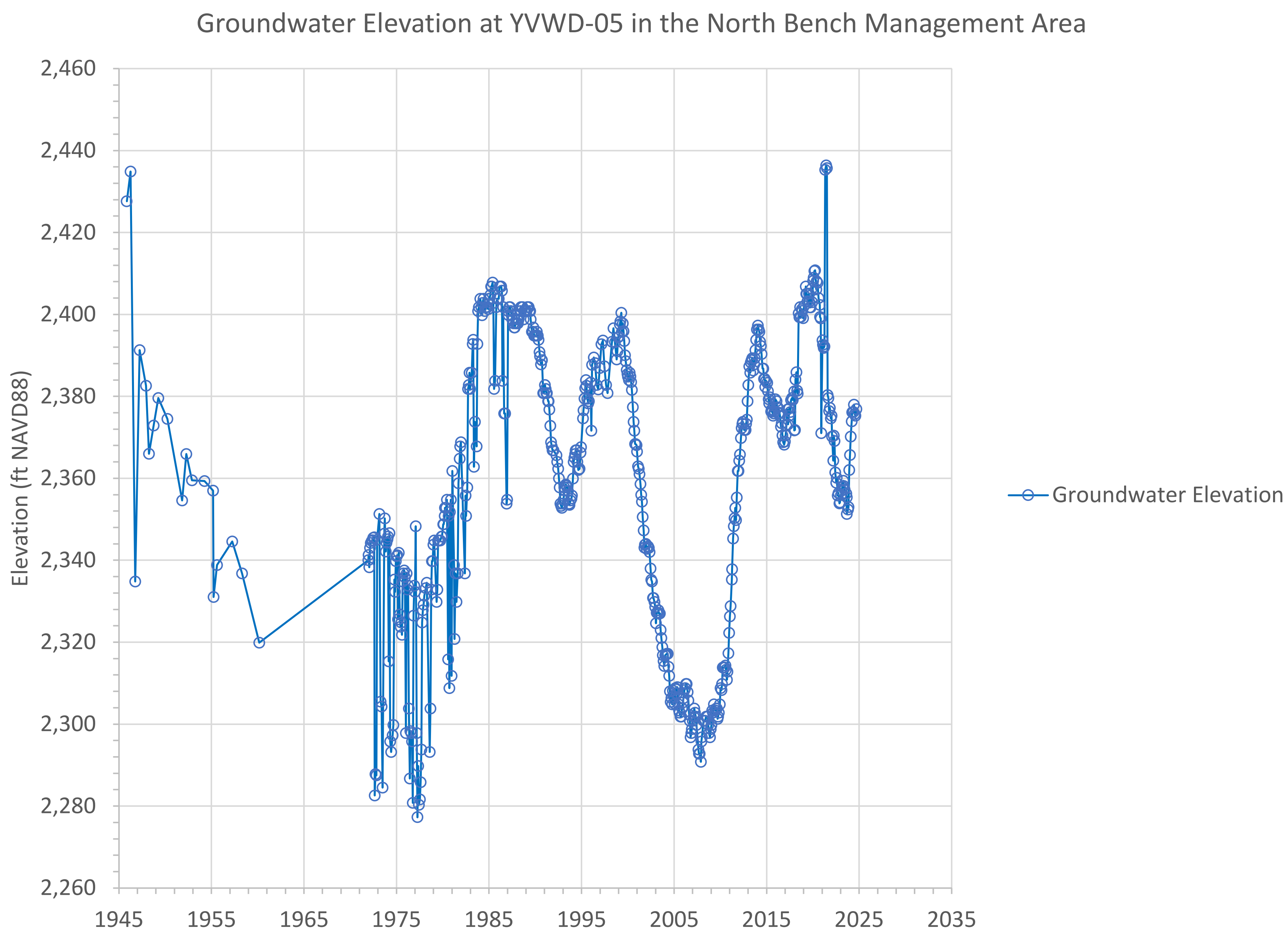

Groundwater Elevation at YVWD-05 in the North Bench Management Area
Elevation (ft NAVD88)
2,460
2,440
2,420
2,400
2,380
2,360
2,340
2,320
2,300
2,280
2,260
1945
1955
1965
1975
1985
1995
2005
2015
2025
2035
Groundwater Elevation

Figure A-12

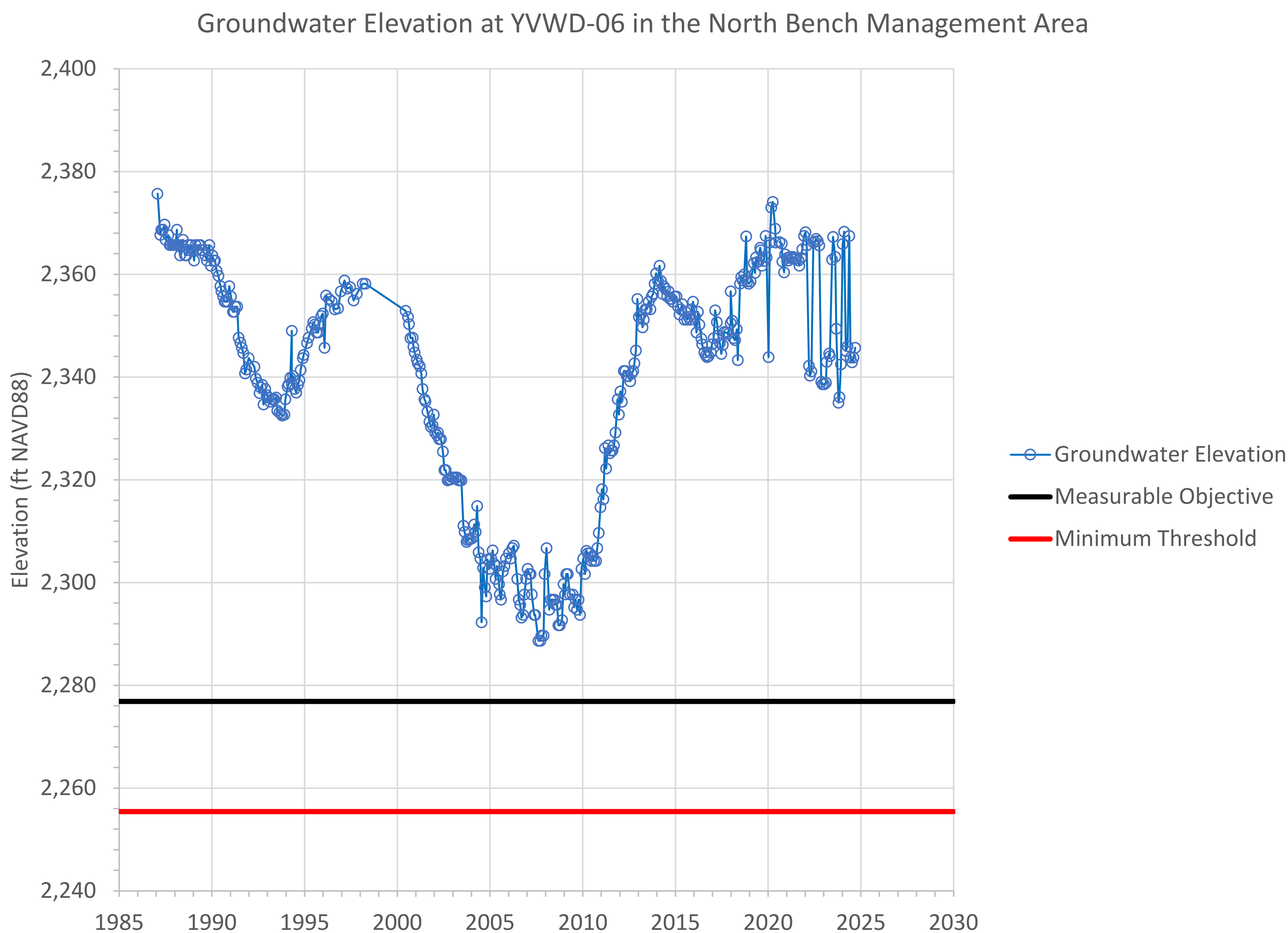
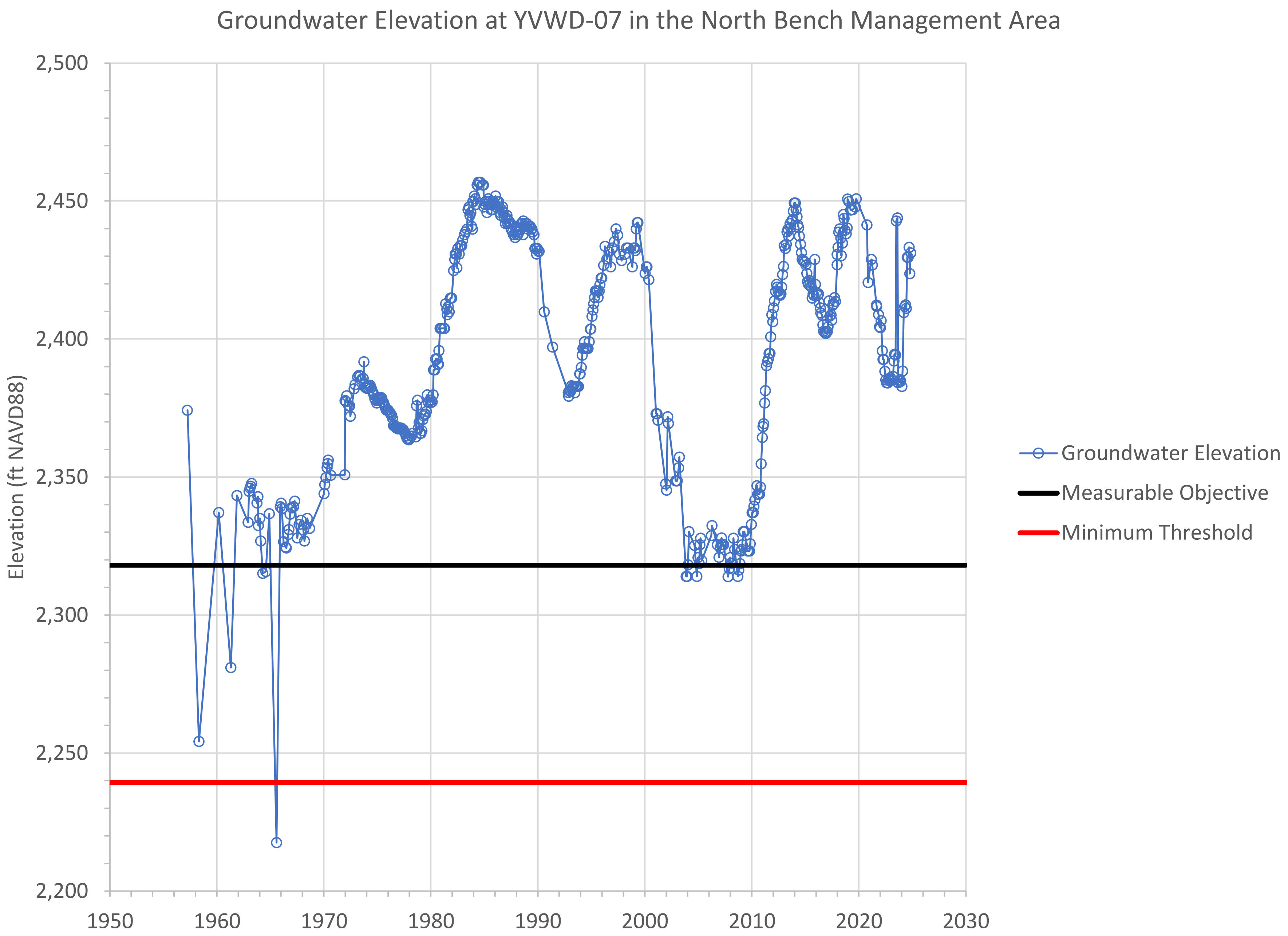

Groundwater Elevation at YVWD-06 in the North Bench Management Area
Elevation (ft NAVD88)
2,400
2,380
2,360
2,340
2,320
2,300
2,280
2,260
2,240
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-13



Groundwater Elevation at YVWD-07 in the North Bench Management Area
Elevation (ft NAVD88)
2,500
2,450
2,400
2,350
2,300
2,250
2,200
1950
1960
1970
1980
1990
2000
2010
2020
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-14

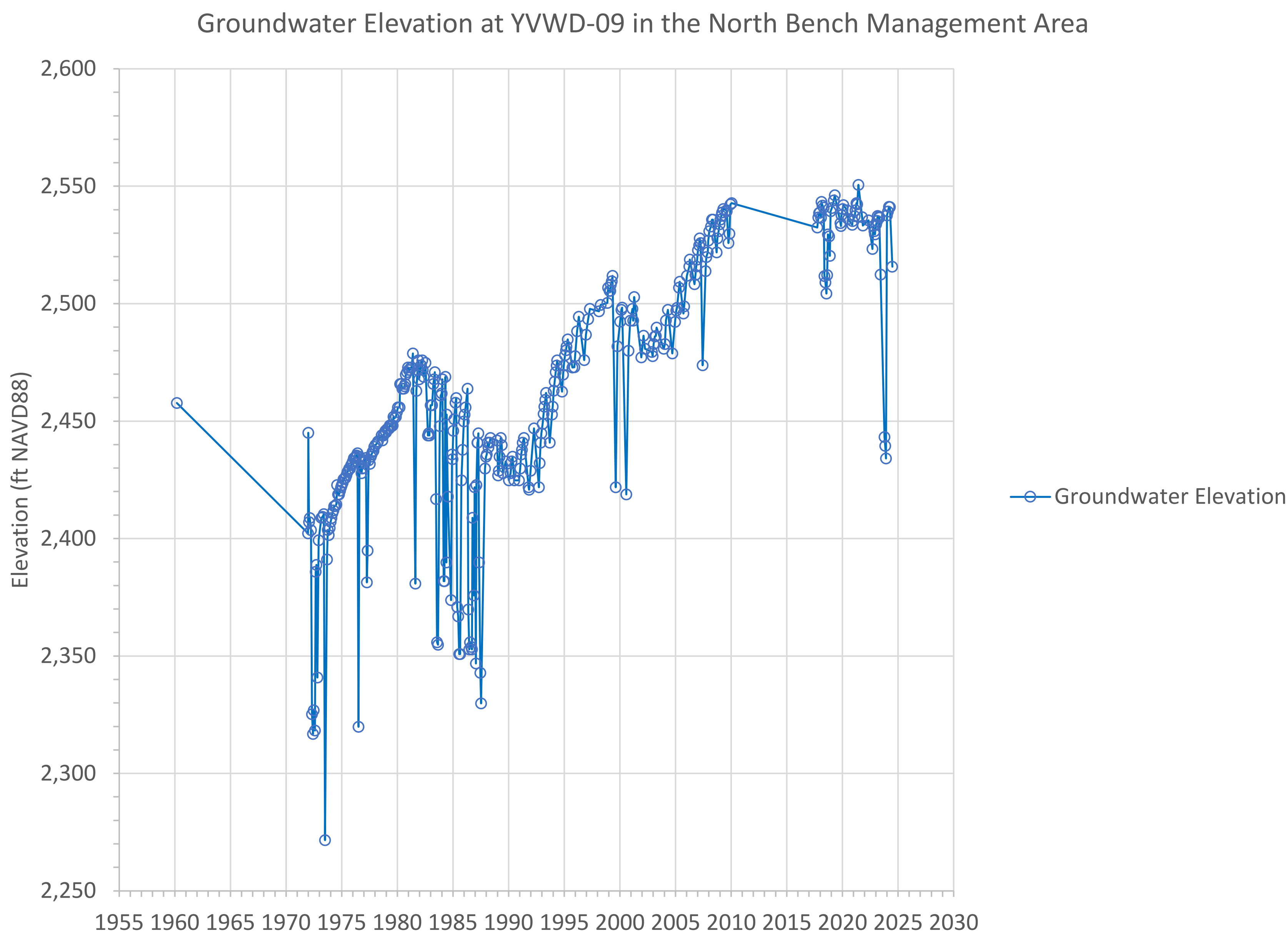
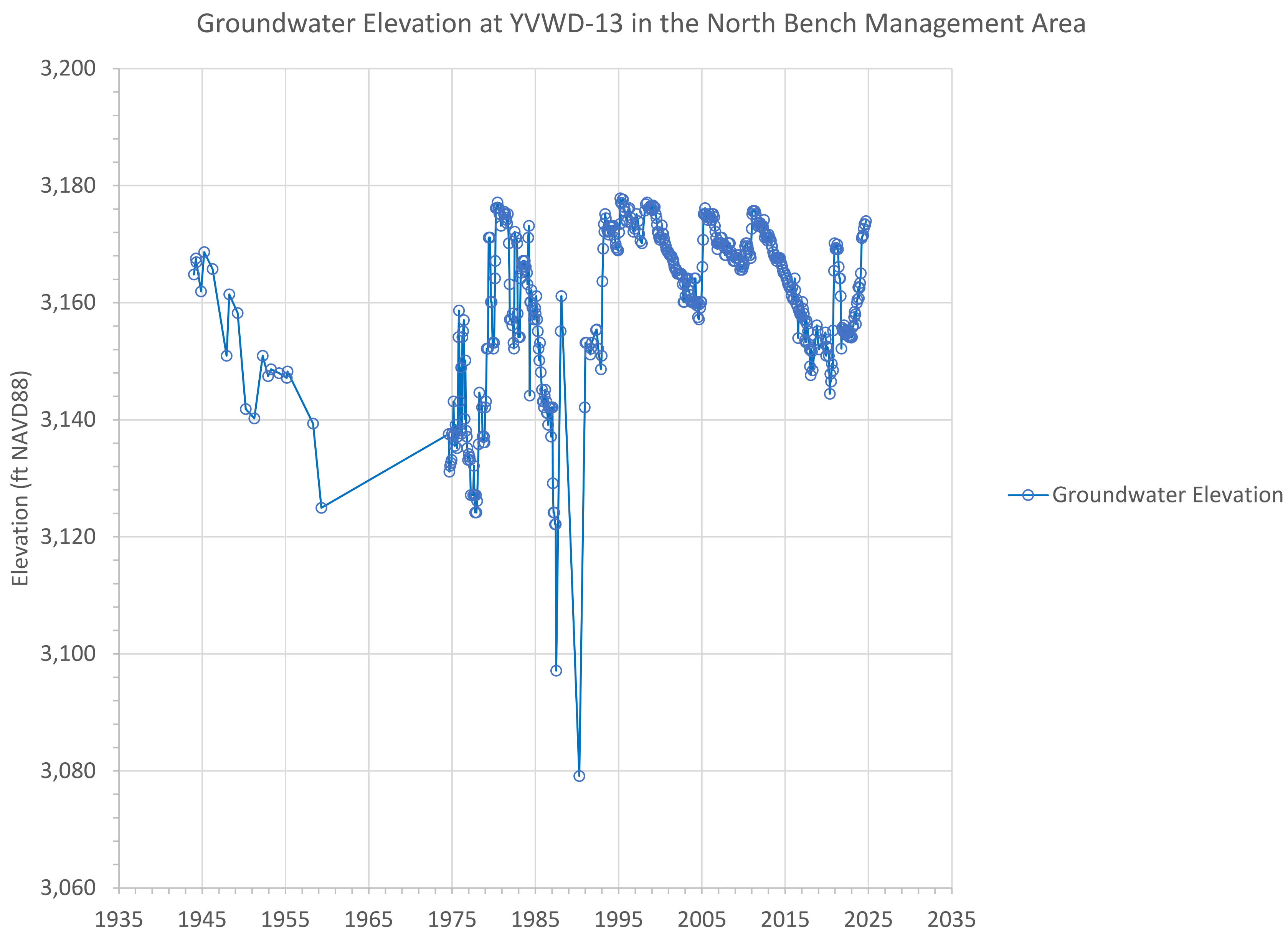
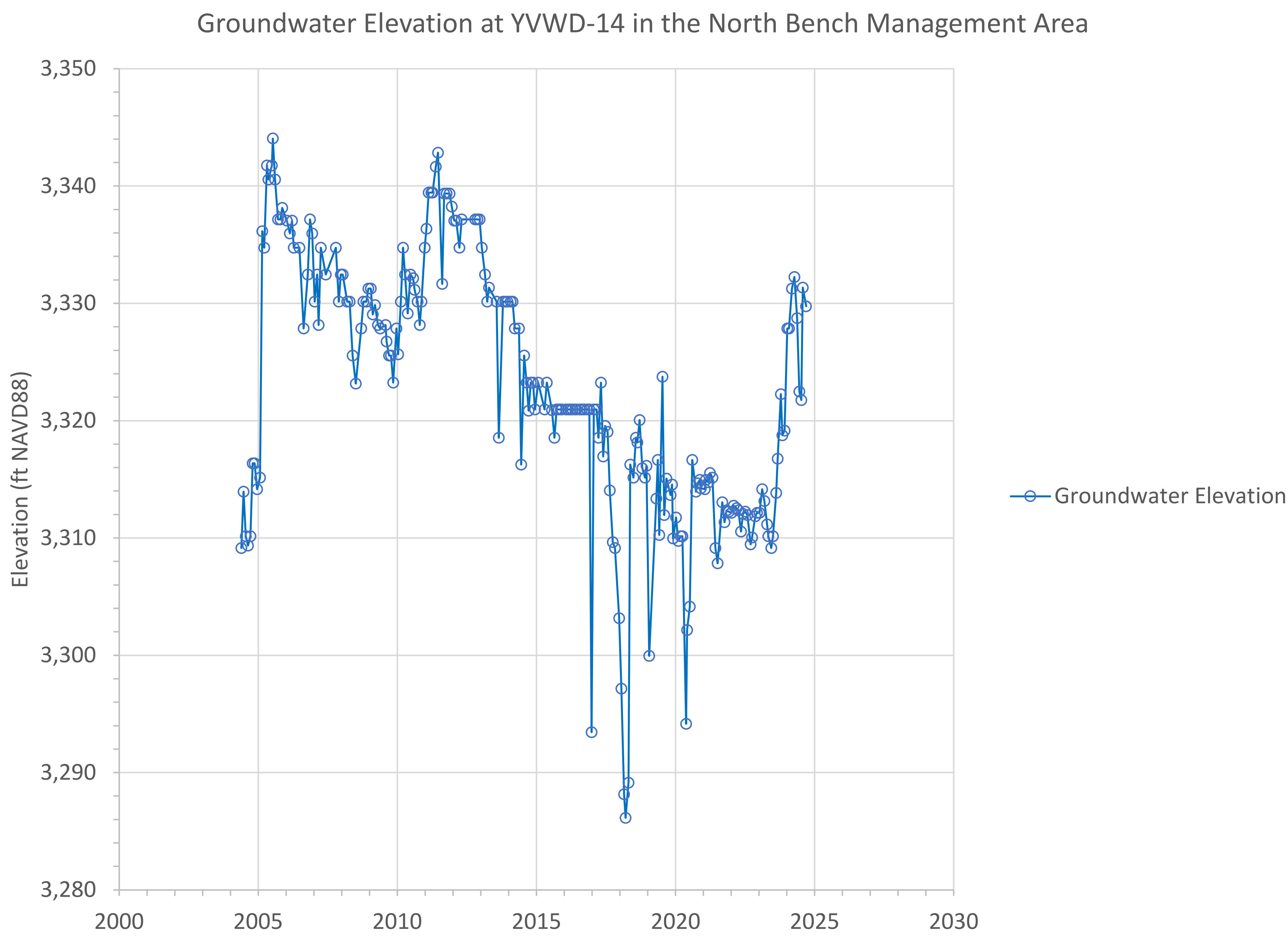

Groundwater Elevation at YVWD-09 in the North Bench Management Area
2,600
2,550
2,500
2,450
2,400
2,350
2,300
2,250
Elevation (ft NAVD88)
1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030
Groundwater Elevation

Figure A-15



Groundwater Elevation at YVWD-13 in the North Bench Management Area
Elevation (ft NAVD88)
3,200
3,180
3,160
3,140
3,120
3,100
3,080
3,060
1935
1945
1955
1965
1975
1985
1995
2005
2015
2025
2035
Groundwater Elevation

Figure A-16



Groundwater Elevation at YVWD-14 in the North Bench Management Area
Elevation (ft NAVD88)
3,350
3,340
3,330
3,320
3,310
3,300
3,290
3,280
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-17

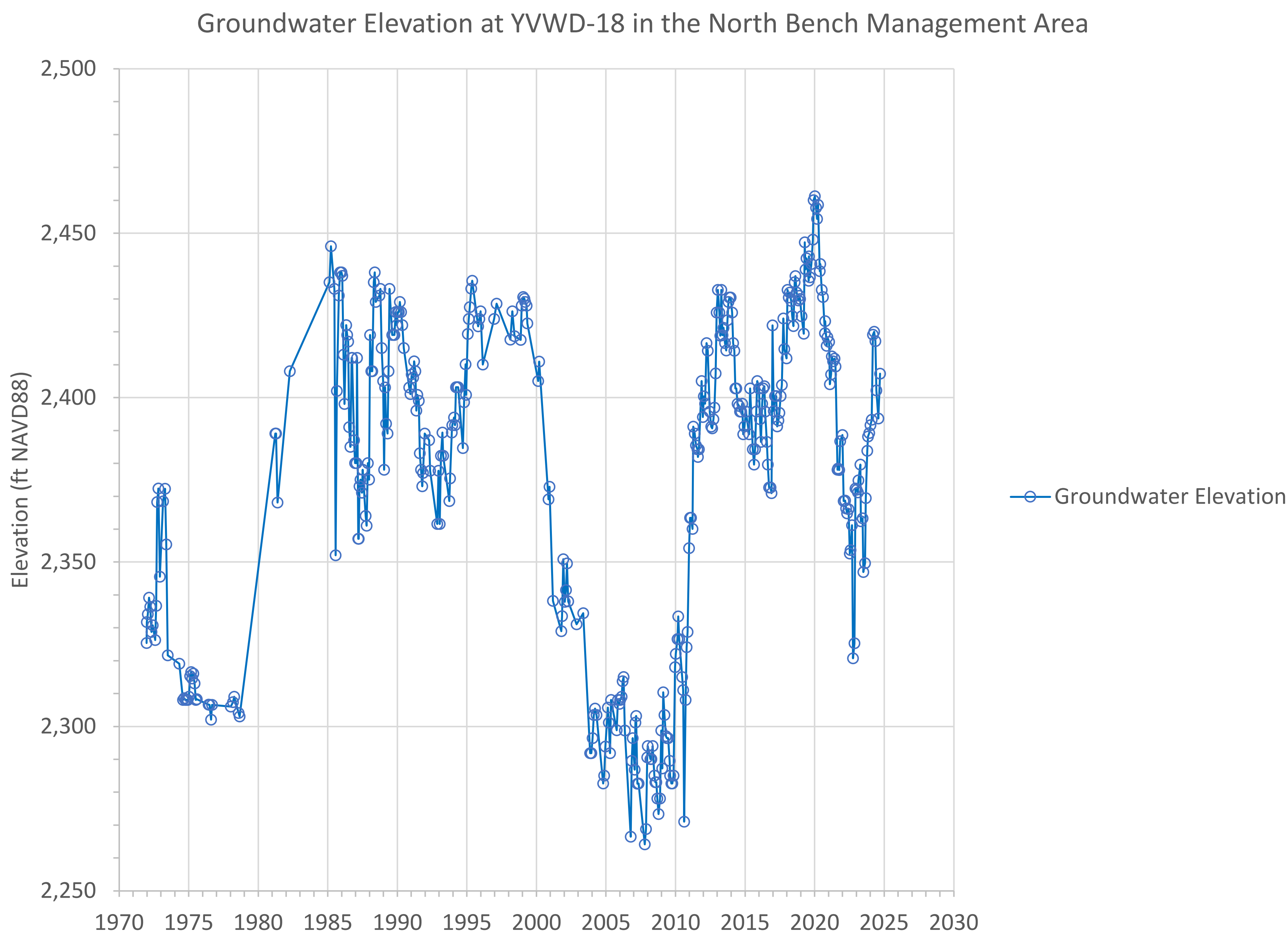

Groundwater Elevation at YVWD-18 in the North Bench Management Area
Elevation (ft NAVD88)
2,500
2,450
2,400
2,350
2,300
2,250
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-18

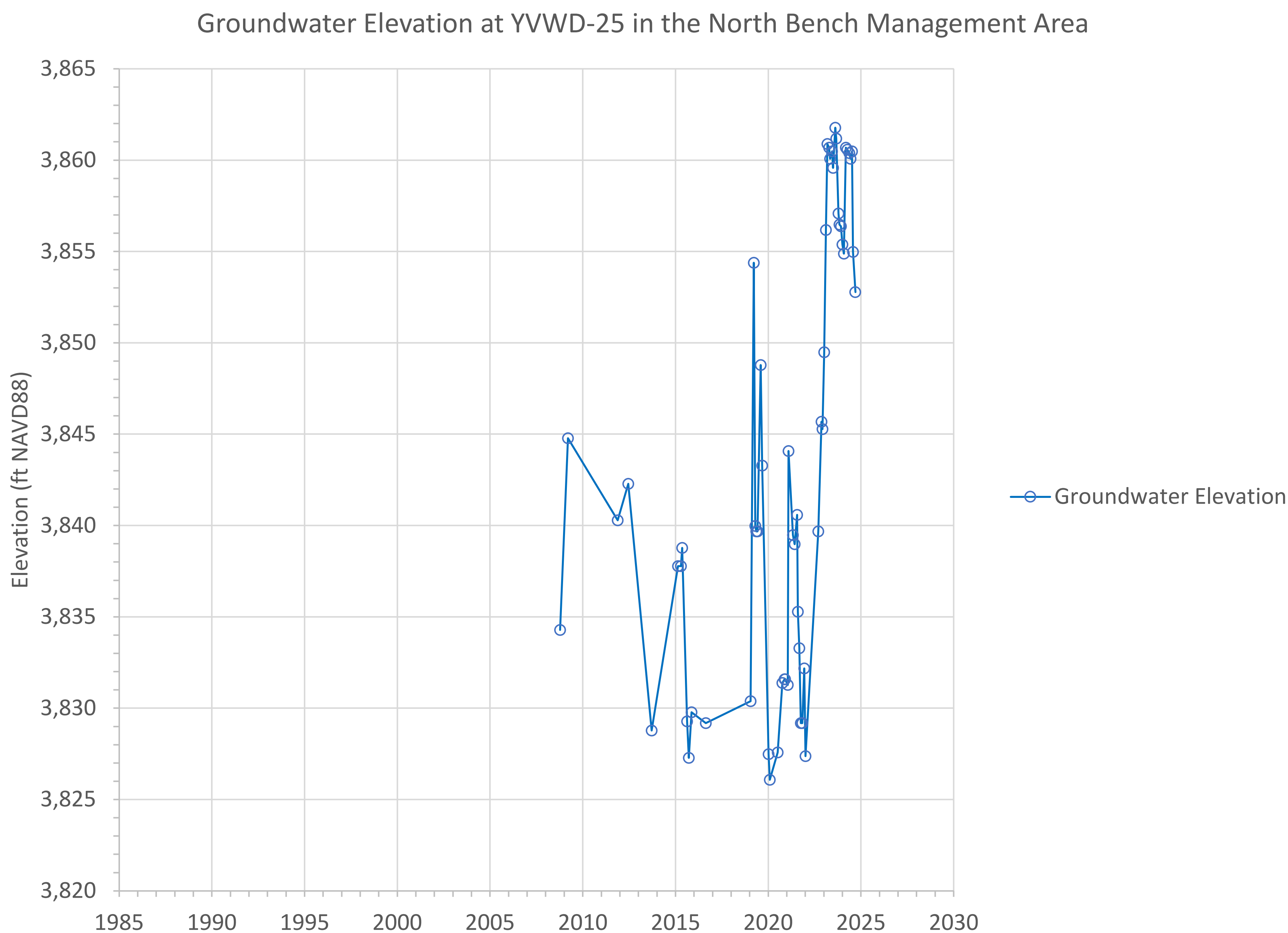

Groundwater Elevation at YVWD-25 in the North Bench Management Area
Elevation (ft NAVD88)
3,865
3,860
3,855
3,850
3,845
3,840
3,835
3,830
3,825
3,820
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-19

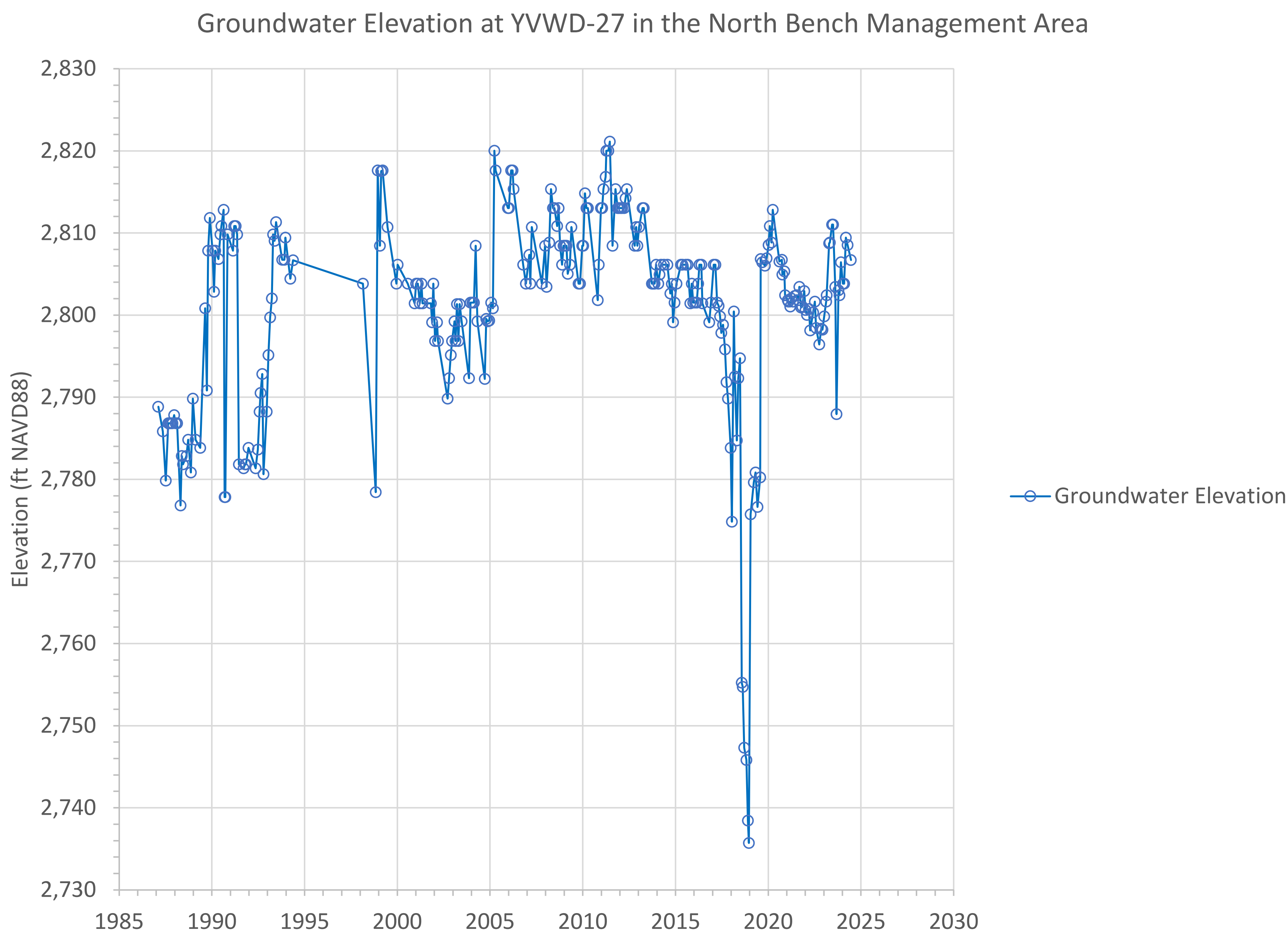
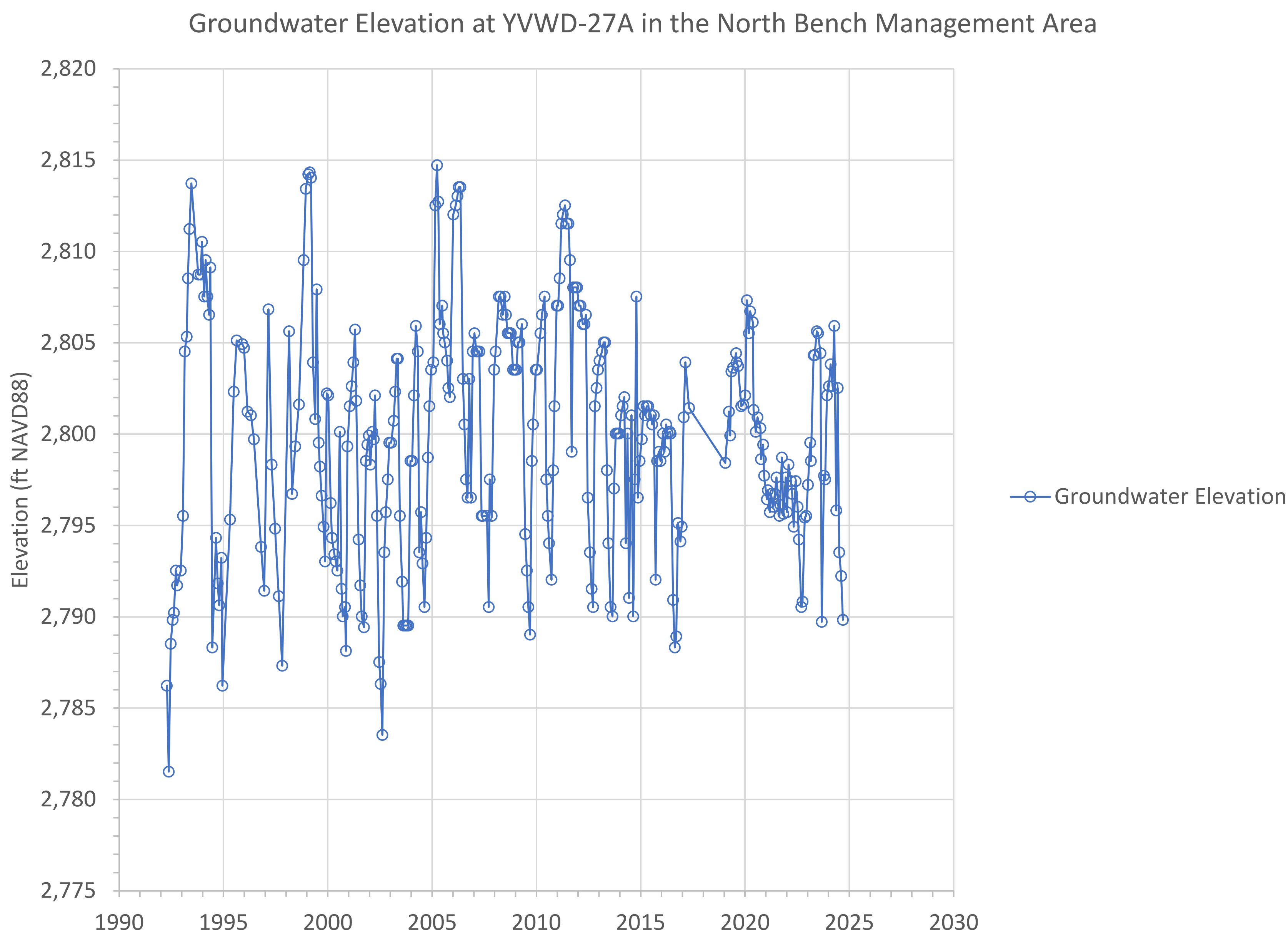

Groundwater Elevation at YVWD-27 in the North Bench Management Area
Elevation (ft NAVD88)
2,830
2,820
2,810
2,800
2,790
2,780
2,770
2,760
2,750
2,740
2,730
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-20



Groundwater Elevation at YVWD-27A in the North Bench Management Area
Elevation (ft NAVD88)
2,820
2,815
2,810
2,805
2,800
2,795
2,790
2,785
2,780
2,775
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-21

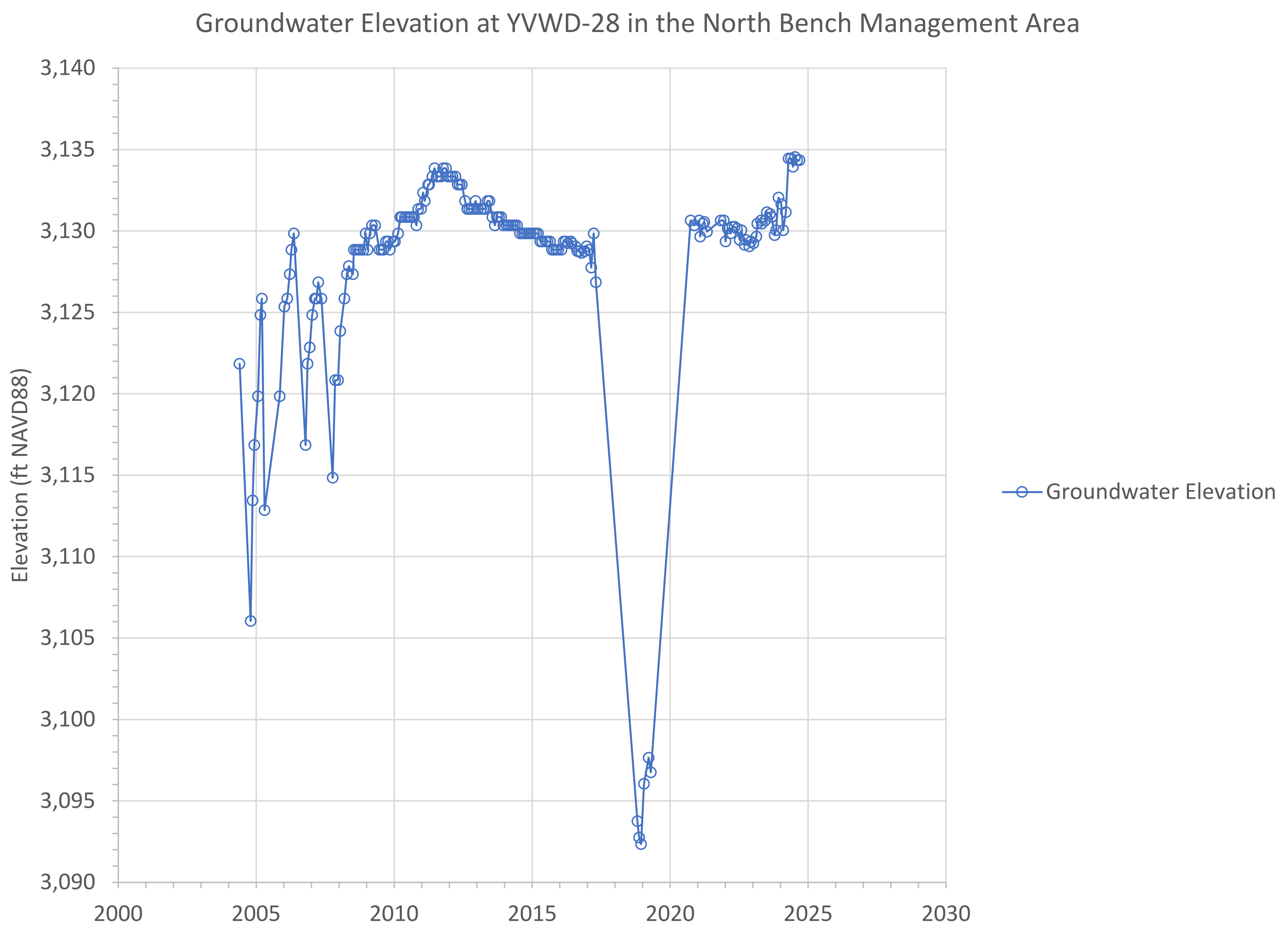

Groundwater Elevation at YVWD-28 in the North Bench Management Area
Elevation (ft NAVD88)
3,140
3,135
3,130
3,125
3,120
3,115
3,110
3,105
3,100
3,095
3,090
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-22

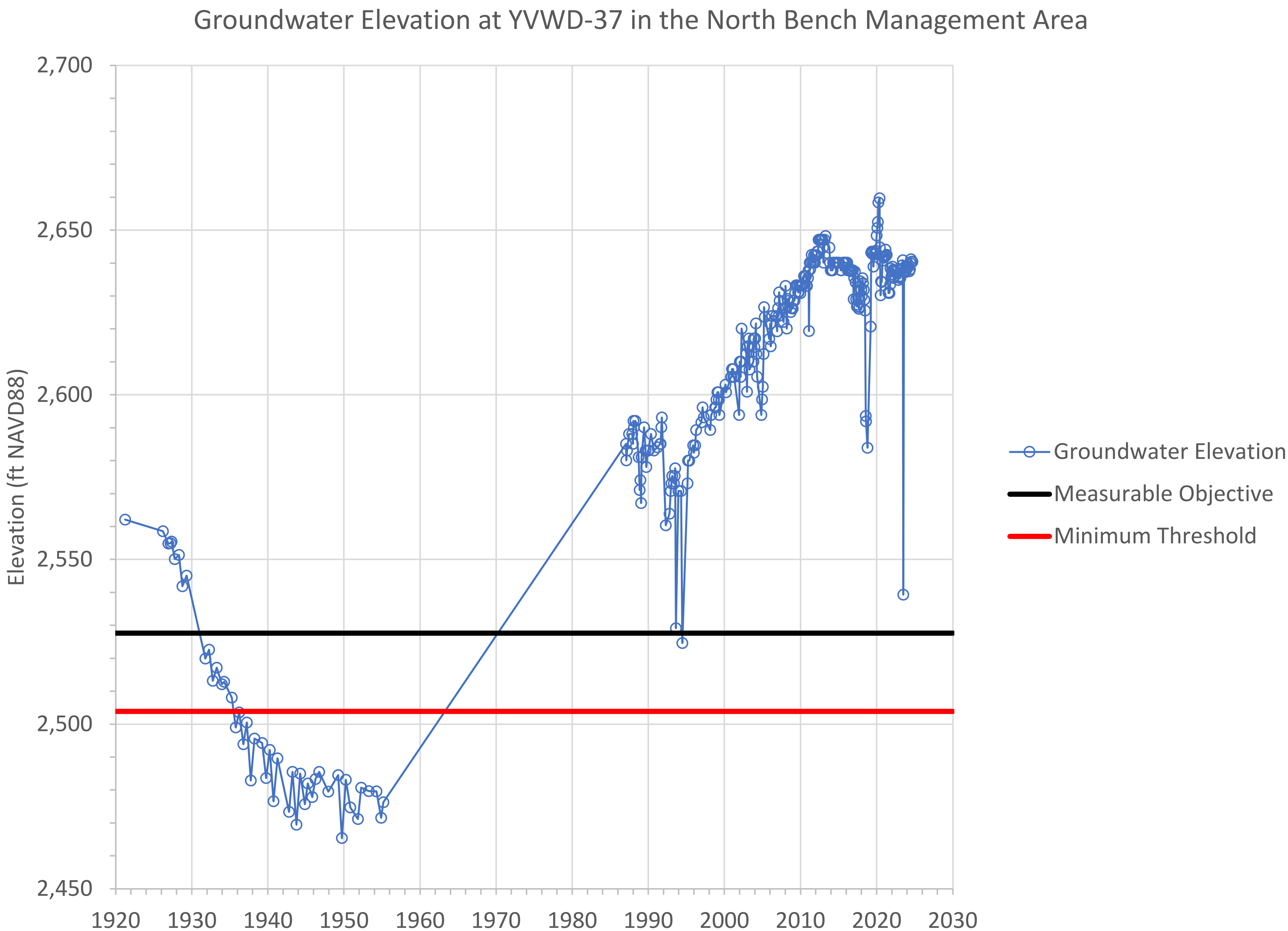

Groundwater Elevation at YVWD-37 in the North Bench Management Area
2,700
2,650
2,600
2,550
2,500
2,450
Elevation (ft NAVD88)
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-23

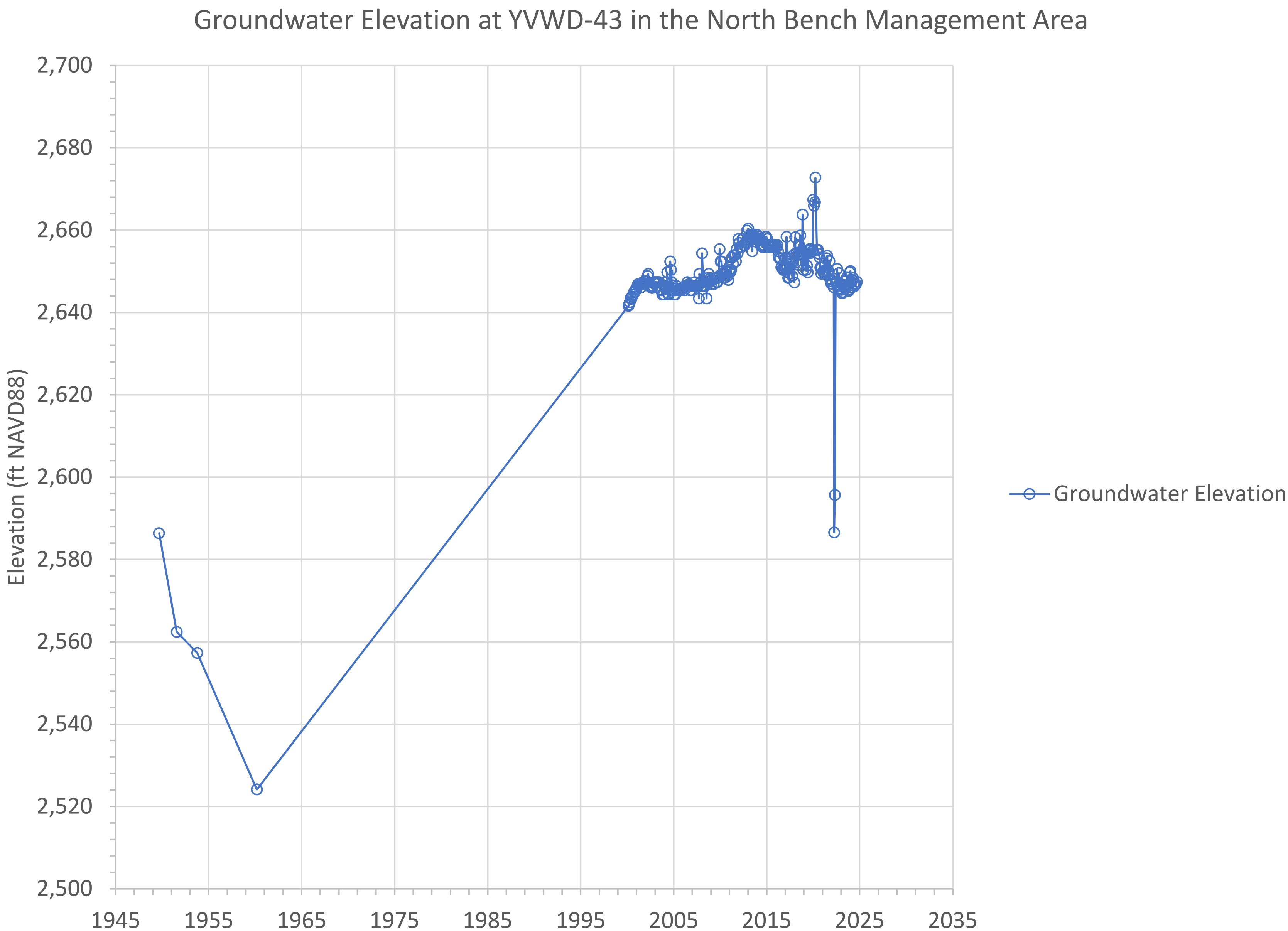

Groundwater Elevation at YVWD-43 in the North Bench Management Area
Elevation (ft NAVD88)
2,700
2,680
2,660
2,640
2,620
2,600
2,580
2,560
2,540
2,520
2,500
1945
1955
1965
1975
1985
1995
2005
2015
2025
2035
Groundwater Elevation

Figure A-24

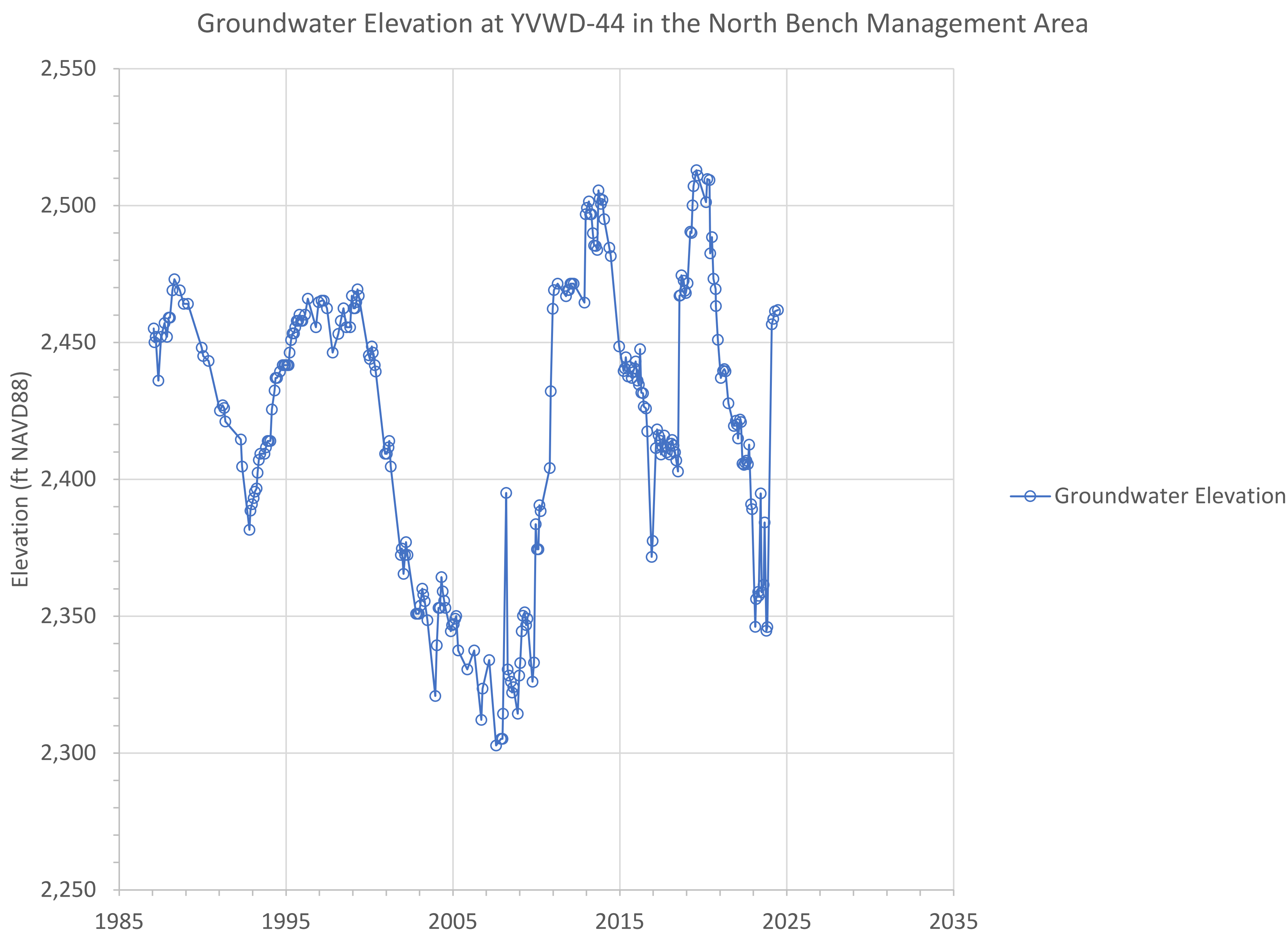

Groundwater Elevation at YVWD-44 in the North Bench Management Area
Elevation (ft NAVD88)
2,550
2,500
2,450
2,400
2,350
2,300
2,250
1985
1995
2005
2015
2025
2035
Groundwater Elevation

Figure A-25

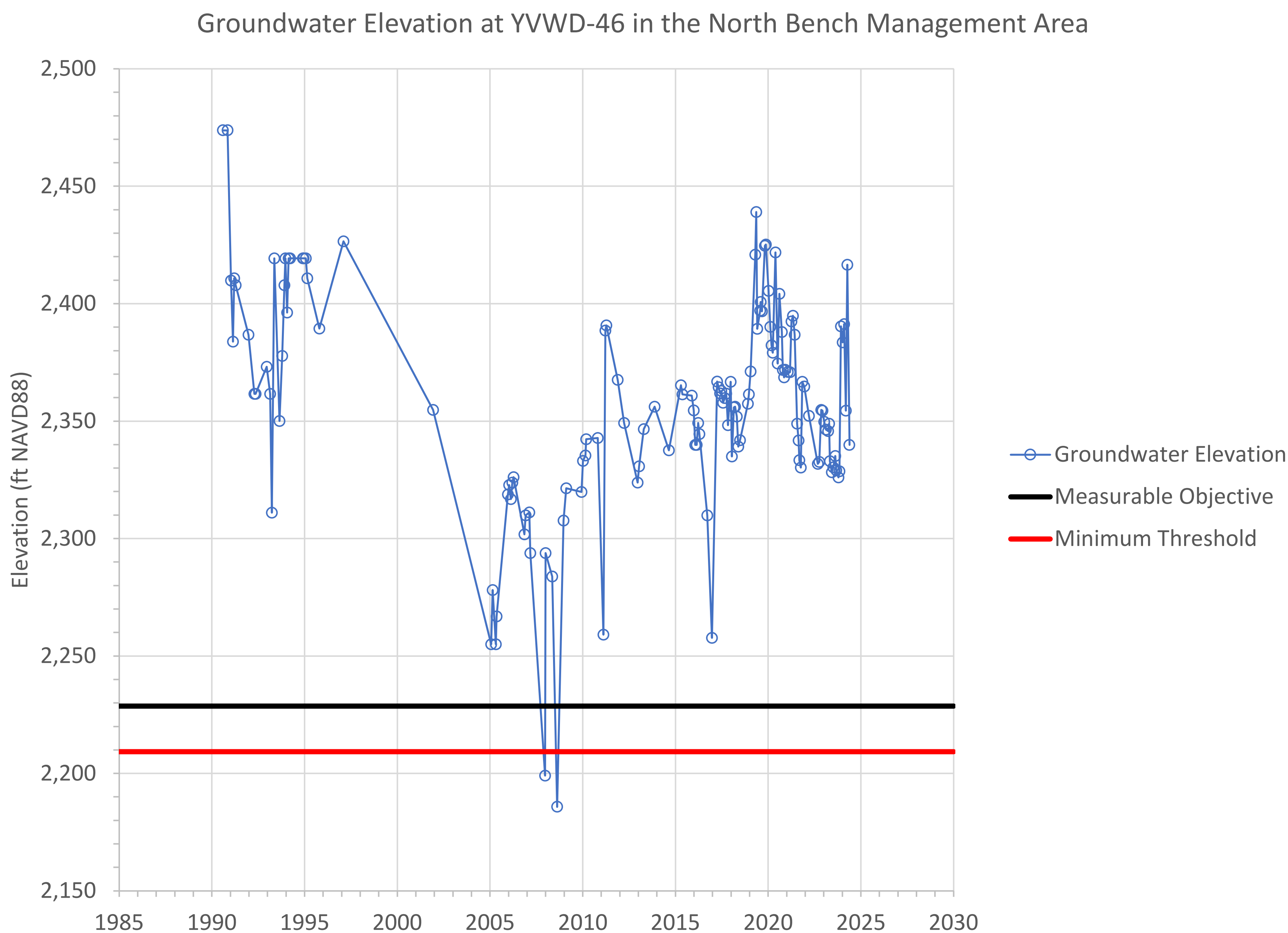

Groundwater Elevation at YVWD-46 in the North Bench Management Area
Elevation (ft NAVD88)
2,500
2,450
2,400
2,350
2,300
2,250
2,200
2,150
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-26

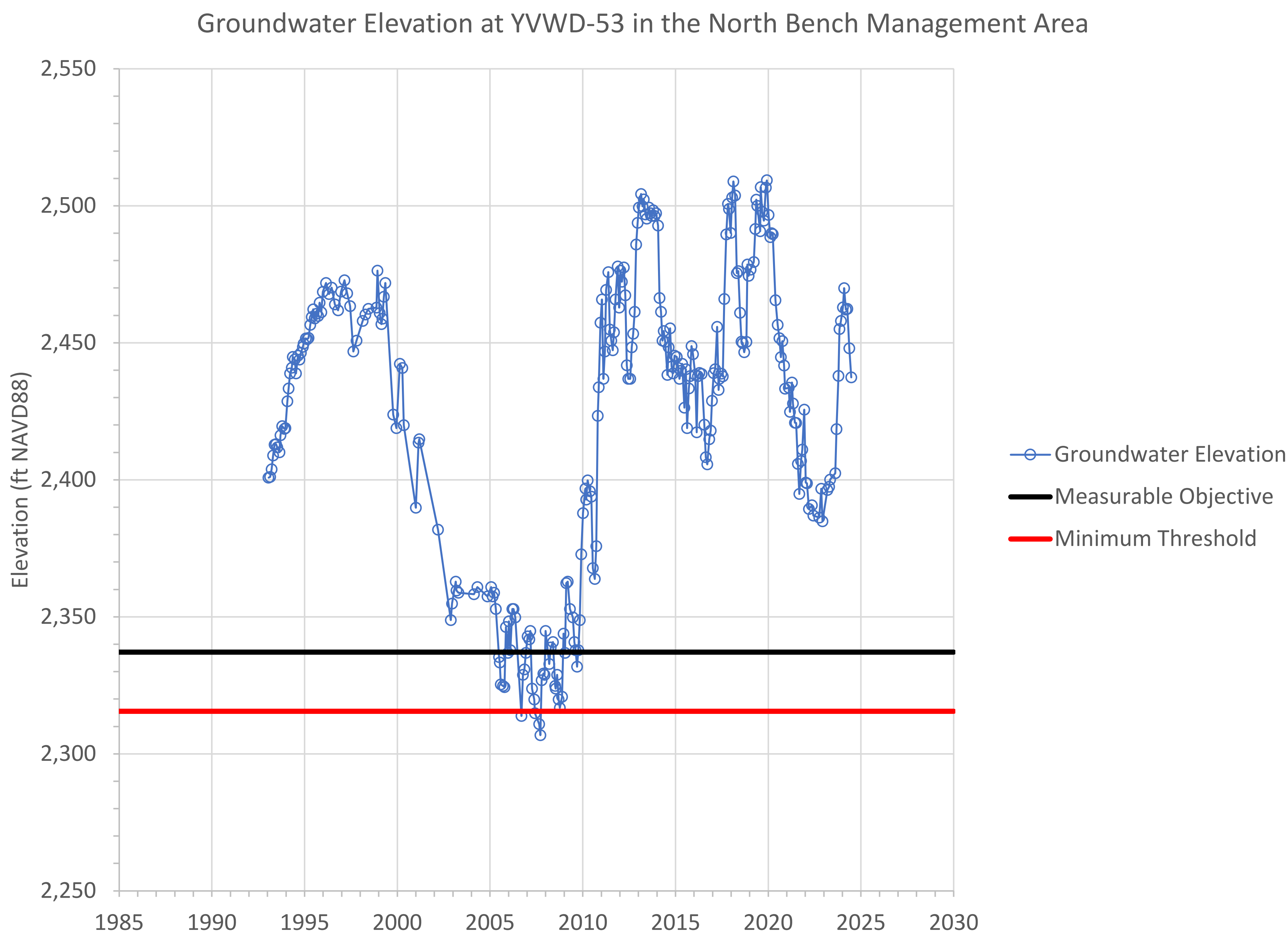

Groundwater Elevation at YVWD-53 in the North Bench Management Area
Elevation (ft NAVD88)
2,550
2,500
2,450
2,400
2,350
2,300
2,250
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-27

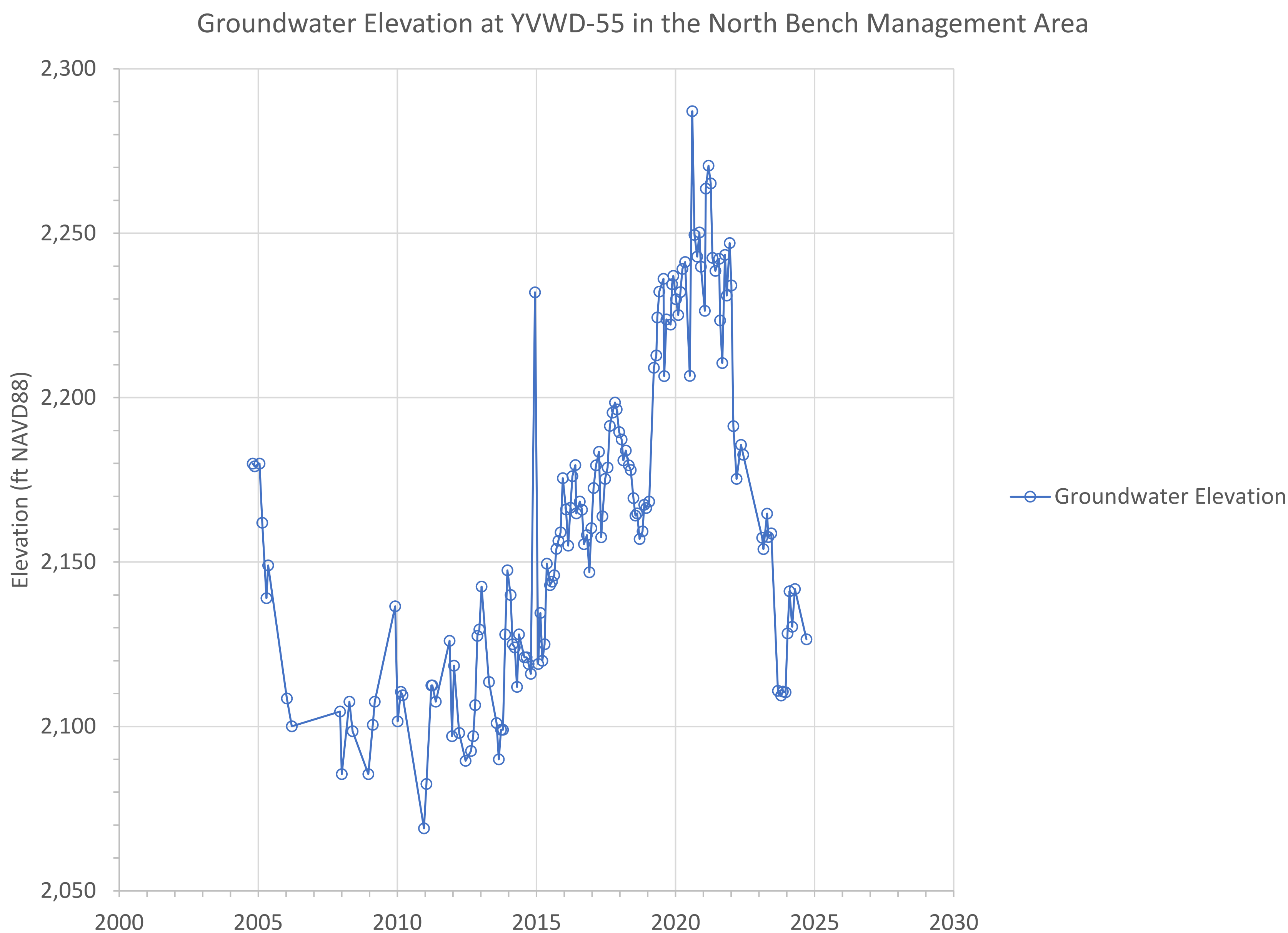
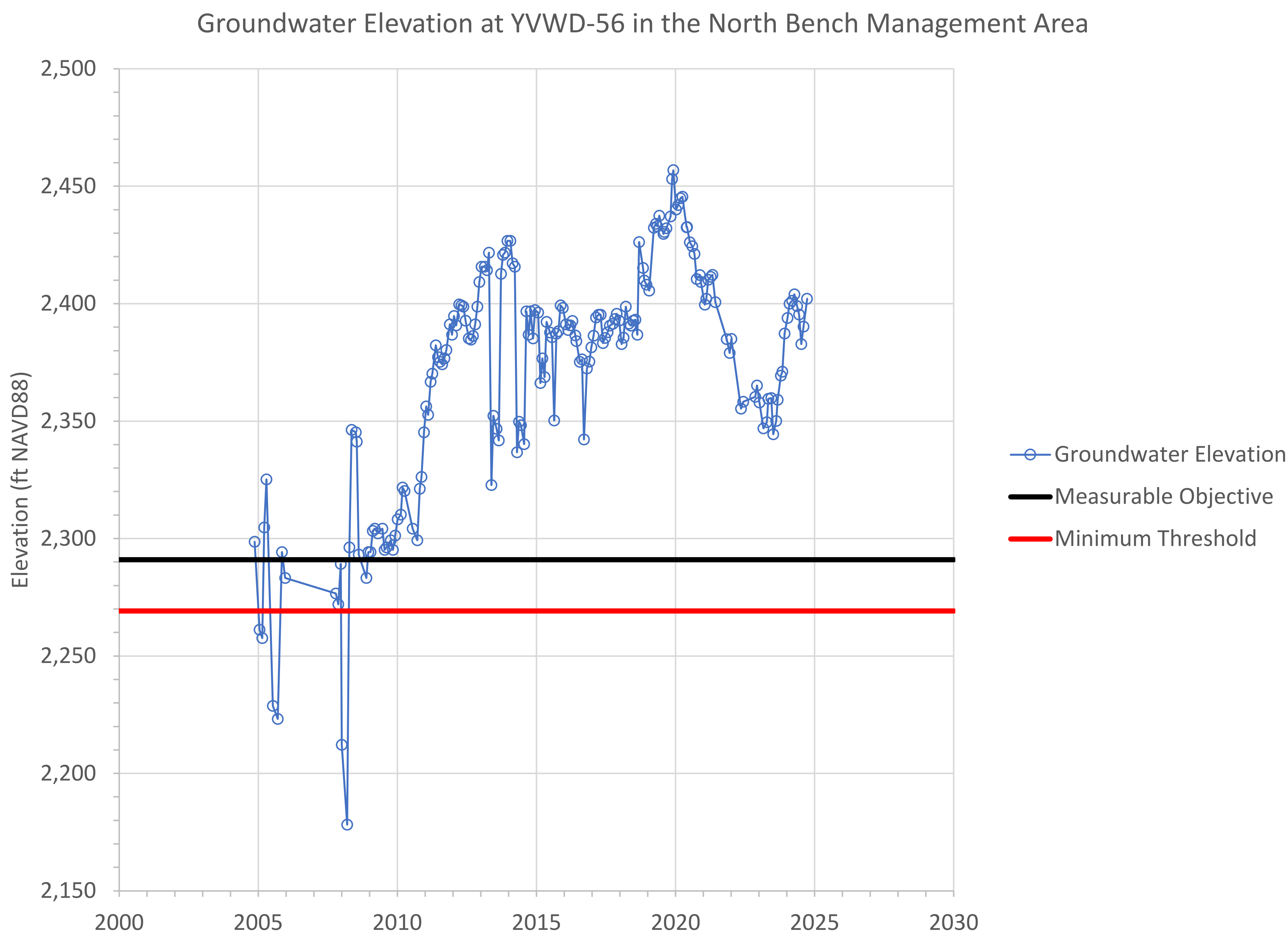

Groundwater Elevation at YVWD-55 in the North Bench Management Area
Elevation (ft NAVD88)
2,300
2,250
2,200
2,150
2,100
2,050
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-28



Groundwater Elevation at YVWD-56 in the North Bench Management Area
Elevation (ft NAVD88)
2,500
2,450
2,400
2,350
2,300
2,250
2,200
2,150
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective
Minimum Threshold

Figure A-29

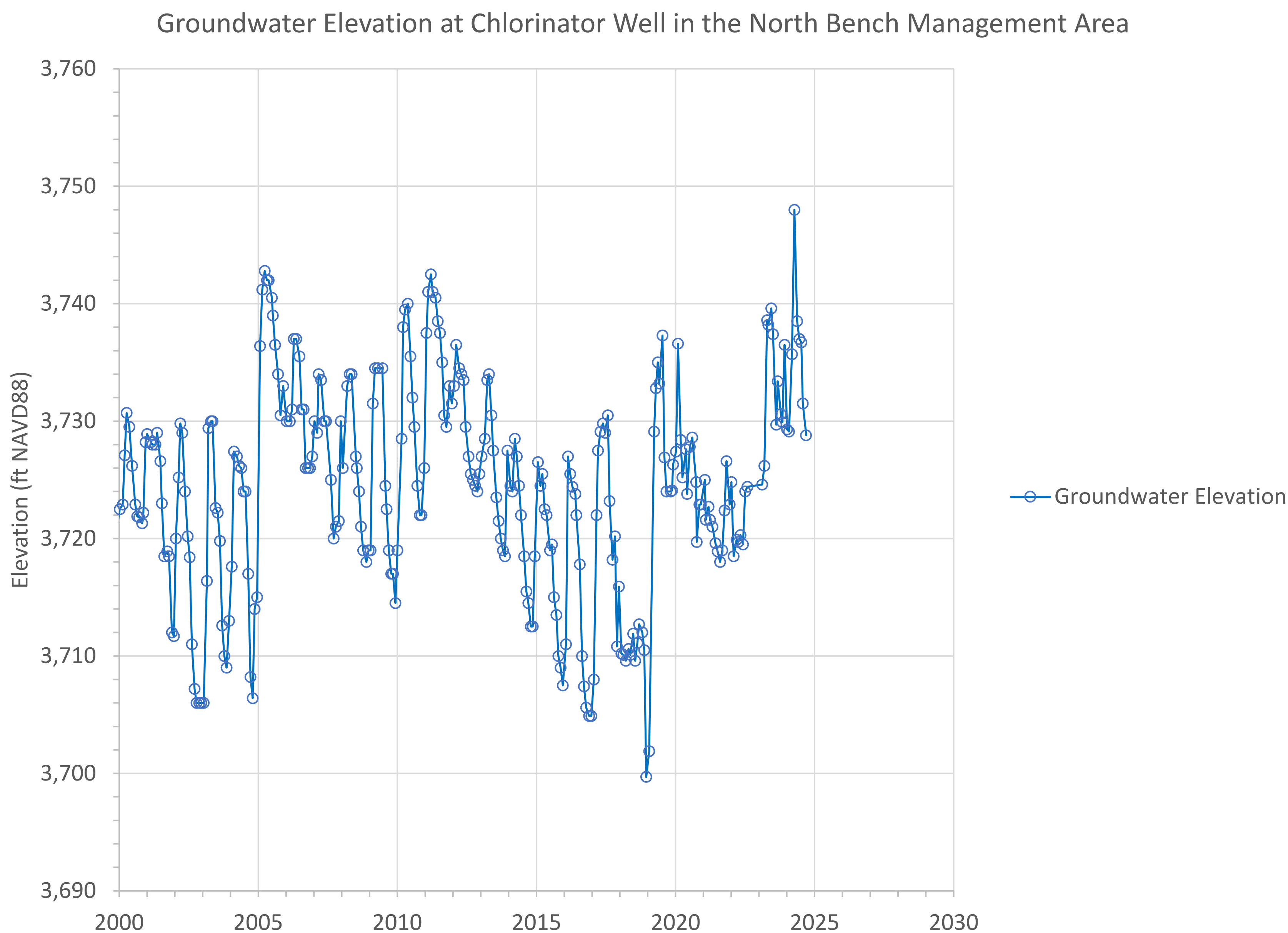

Groundwater Elevation at Chlorinator Well in the North Bench Management Area
Elevation (ft NAVD88)
3,760
3,750
3,740
3,730
3,720
3,710
3,700
3,690
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-30

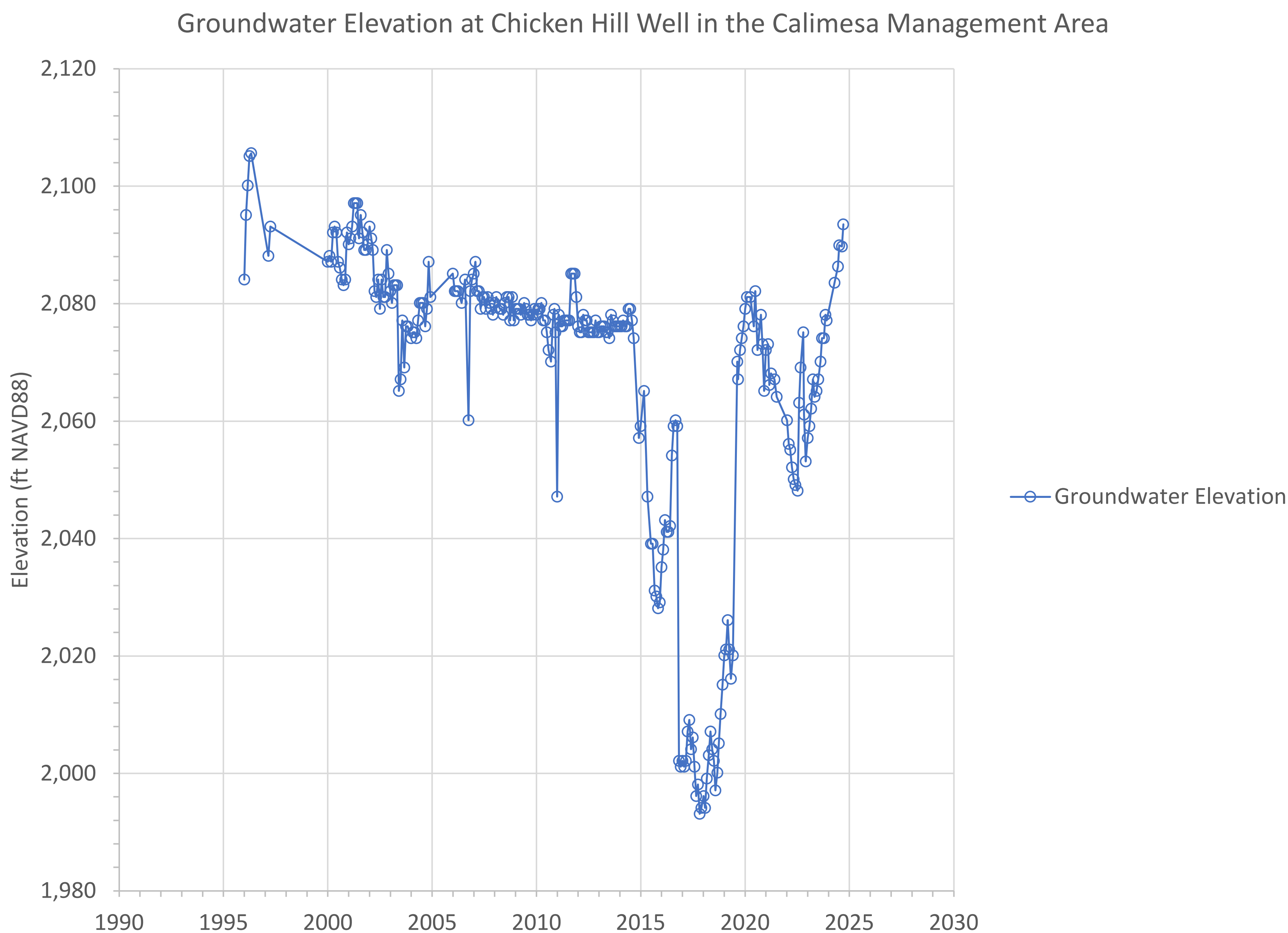

Groundwater Elevation at Chicken Hill Well in the Calimesa Management Area
Elevation (ft NAVD88)
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1,980
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-31

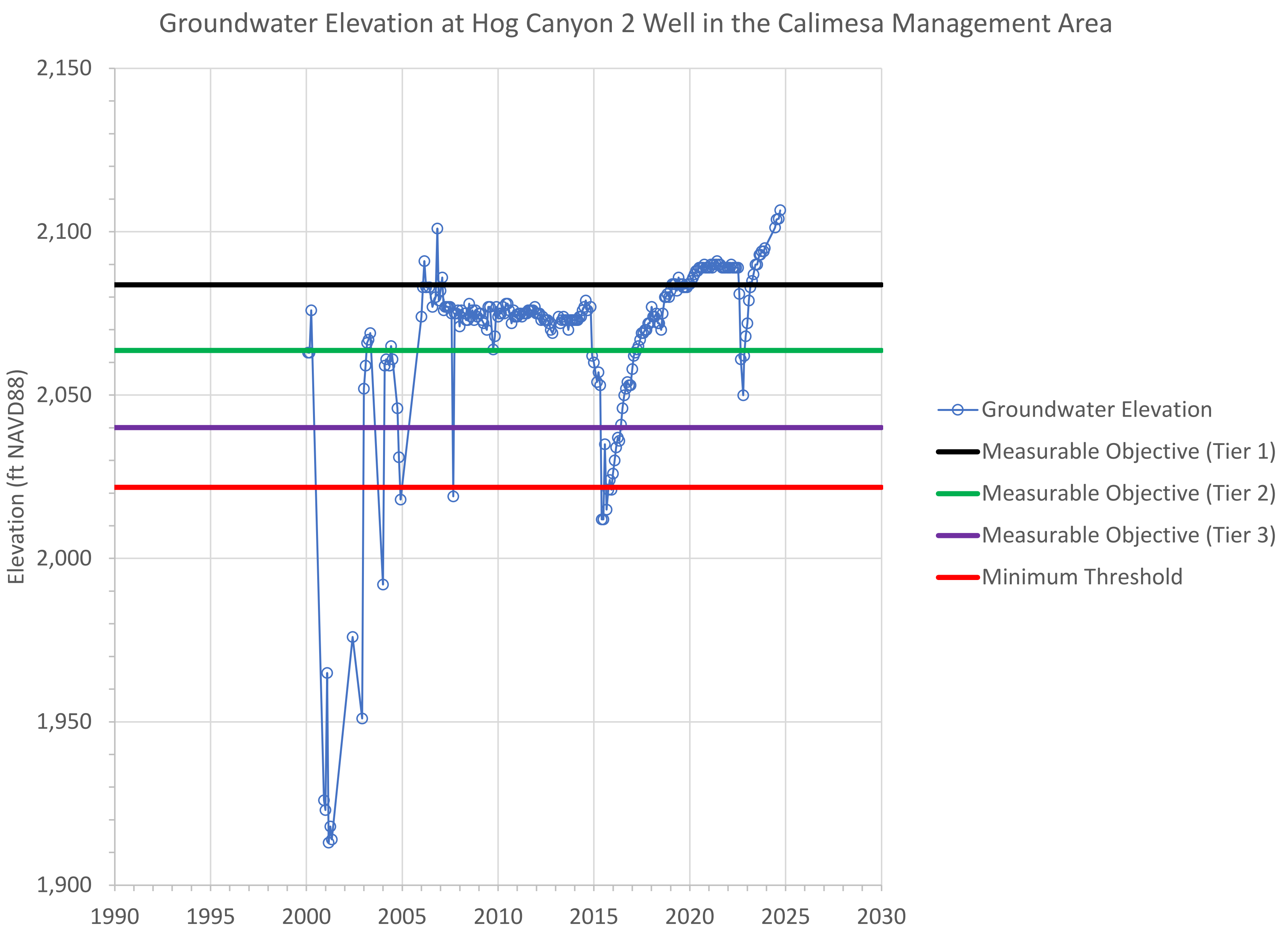

Groundwater Elevation at Hog Canyon 2 Well in the Calimesa Management Area
2,150
2,100
2,050
2,000
1,950
1,900
Elevation (ft NAVD88)
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-32

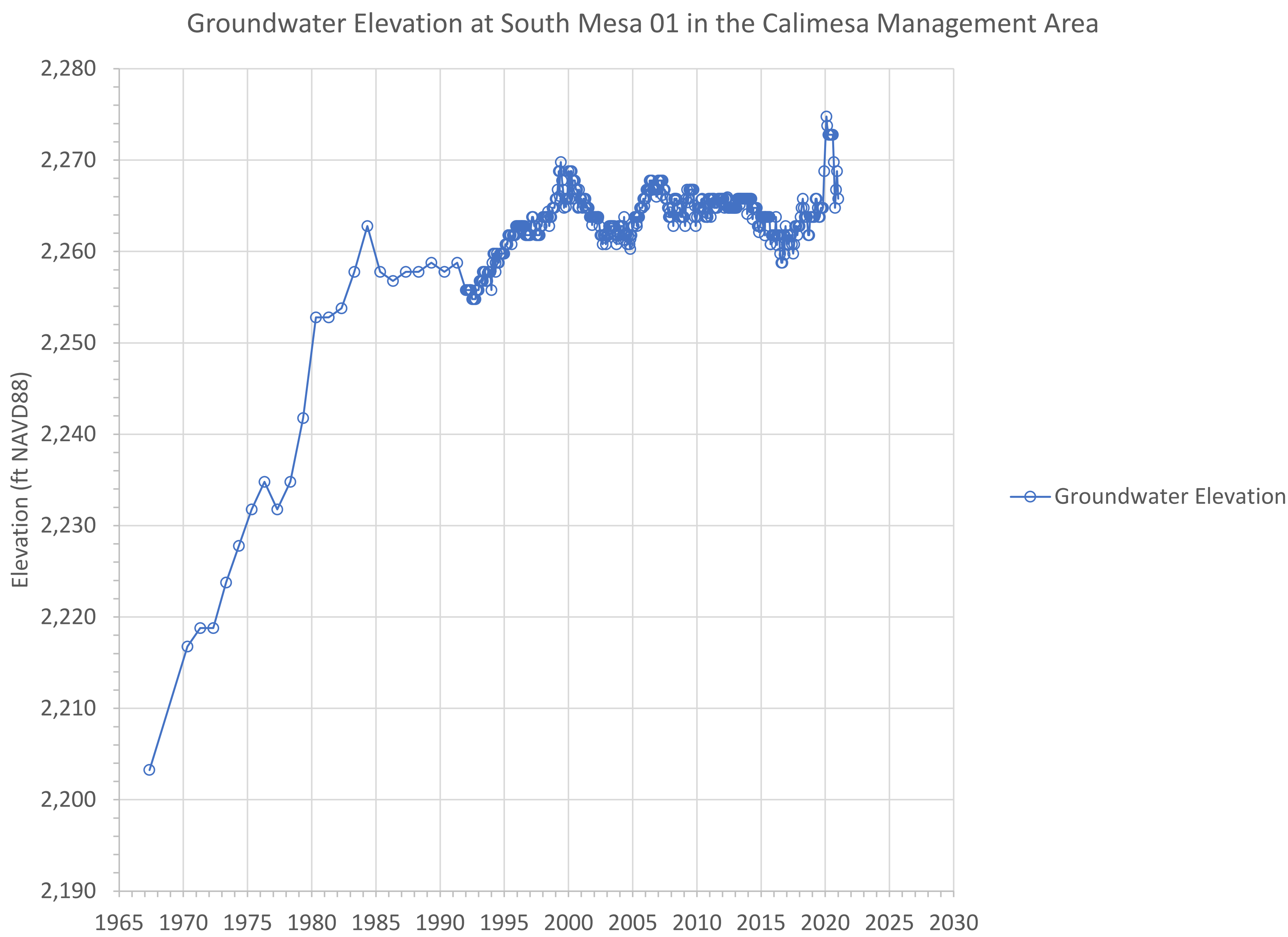
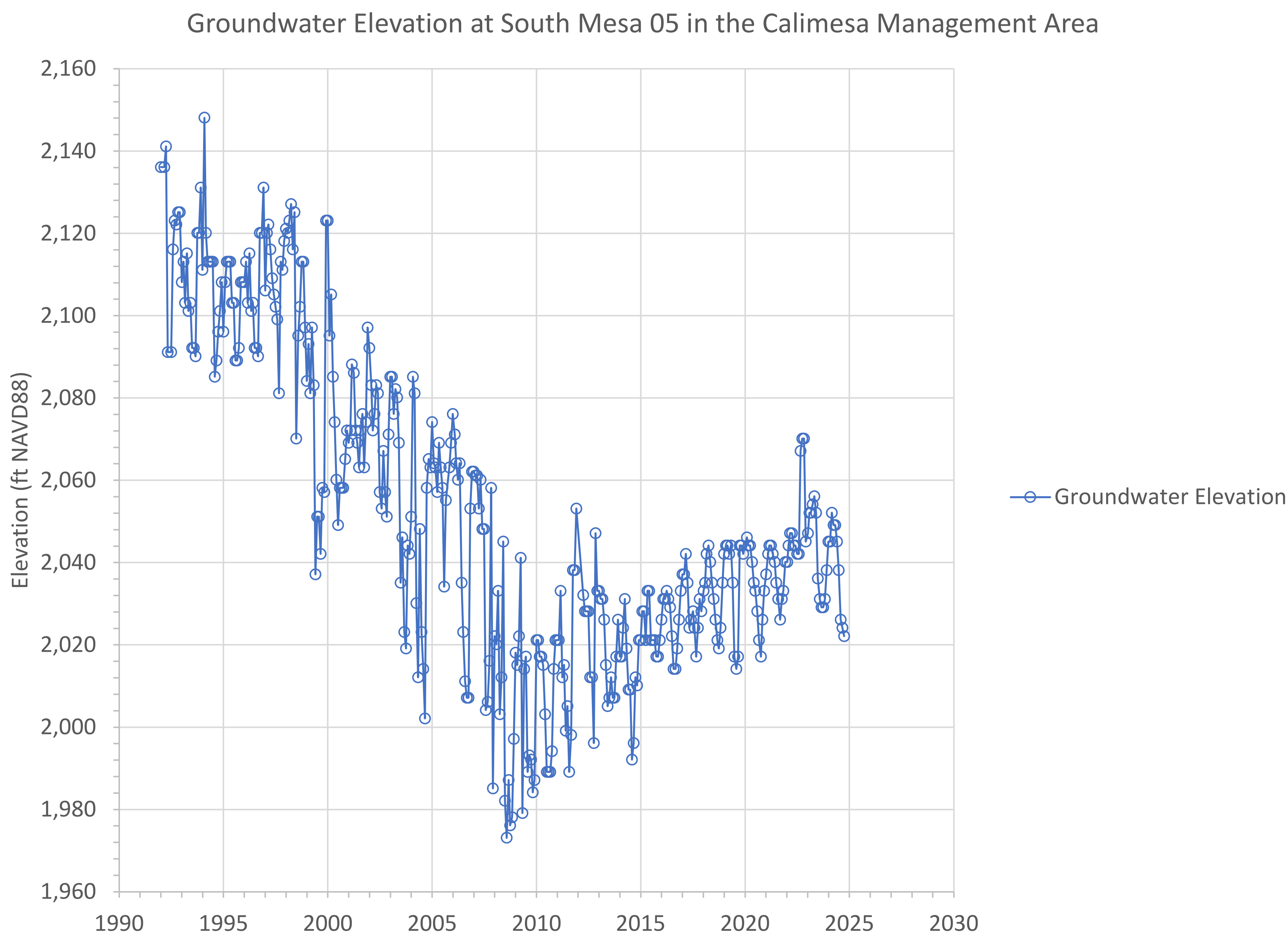

Groundwater Elevation at South Mesa 01 in the Calimesa Management Area
Elevation (ft NAVD88)
2,280
2,270
2,260
2,250
2,240
2,230
2,220
2,210
2,200
2,190
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-33



Groundwater Elevation at South Mesa 05 in the Calimesa Management Area
Elevation (ft NAVD88)
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1,980
1,960
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-34

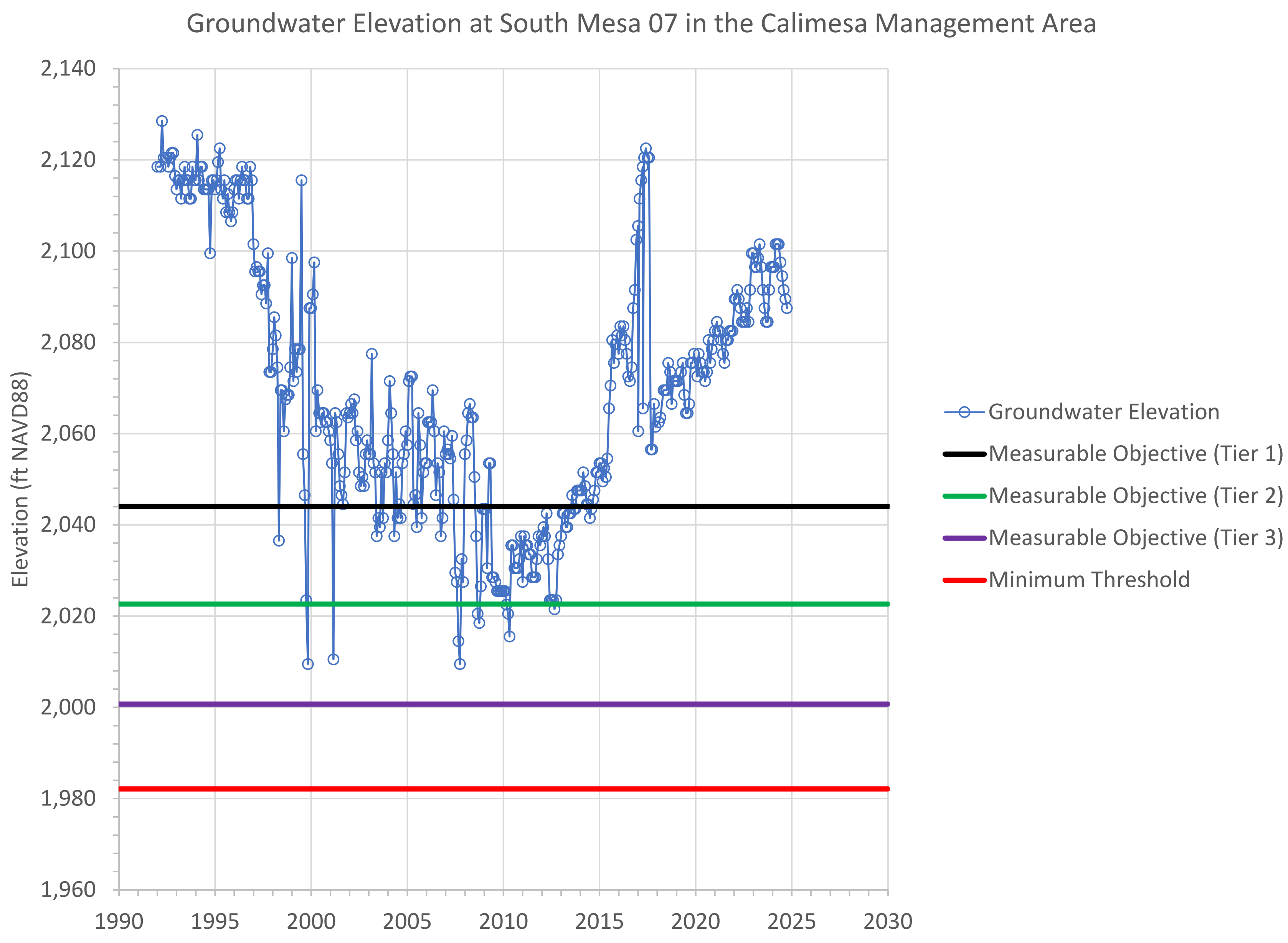

Groundwater Elevation at South Mesa 07 in the Calimesa Management Area
Elevation (ft NAVD88)
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1,980
1,960
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-35

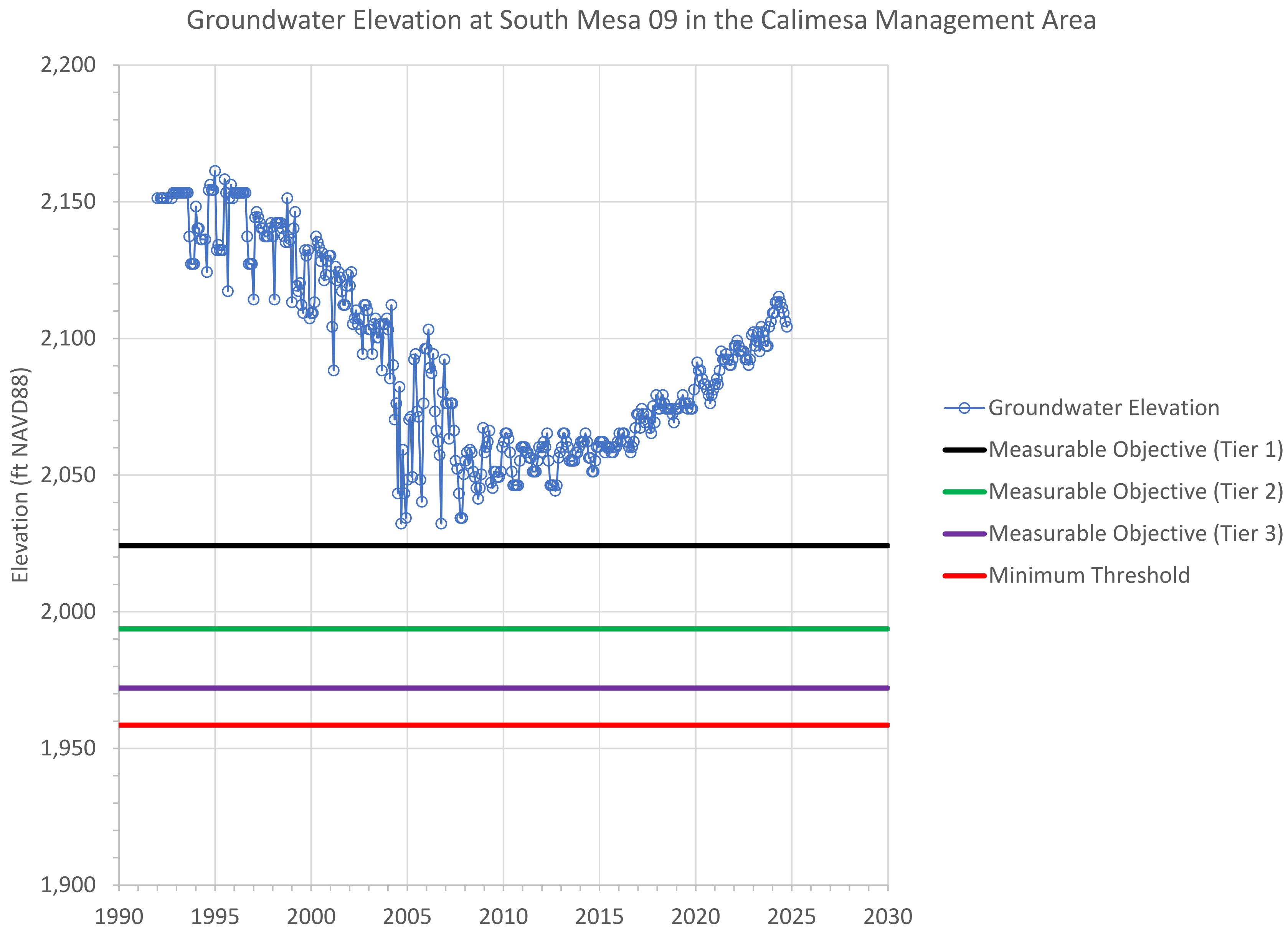
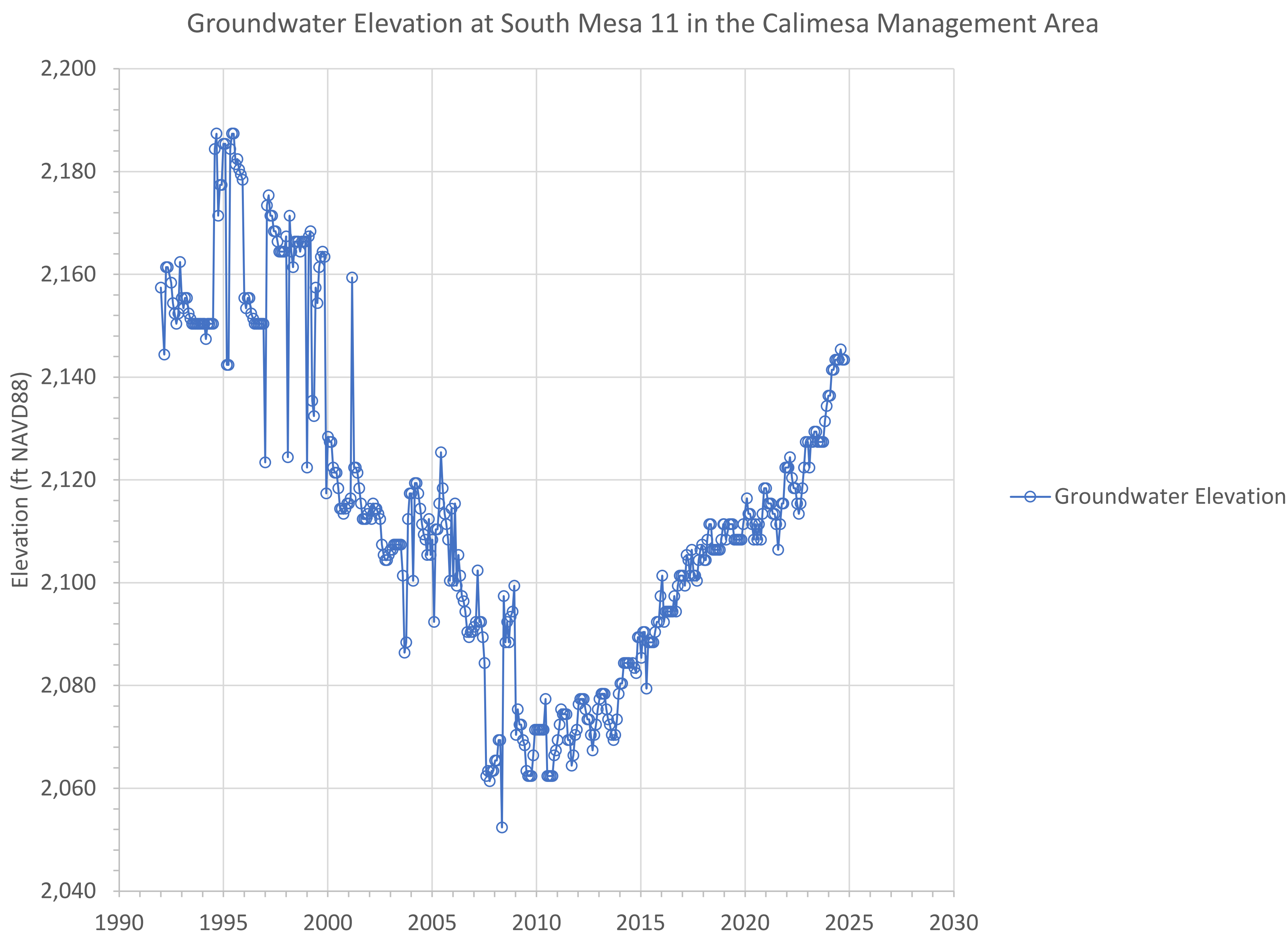

Groundwater Elevation at South Mesa 09 in the Calimesa Management Area
2,200
2,150
2,100
2,050
2,000
1,950
1,900
Elevation (ft NAVD88)
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-36



Groundwater Elevation at South Mesa 11 in the Calimesa Management Area
Elevation (ft NAVD88)
2,200
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-37

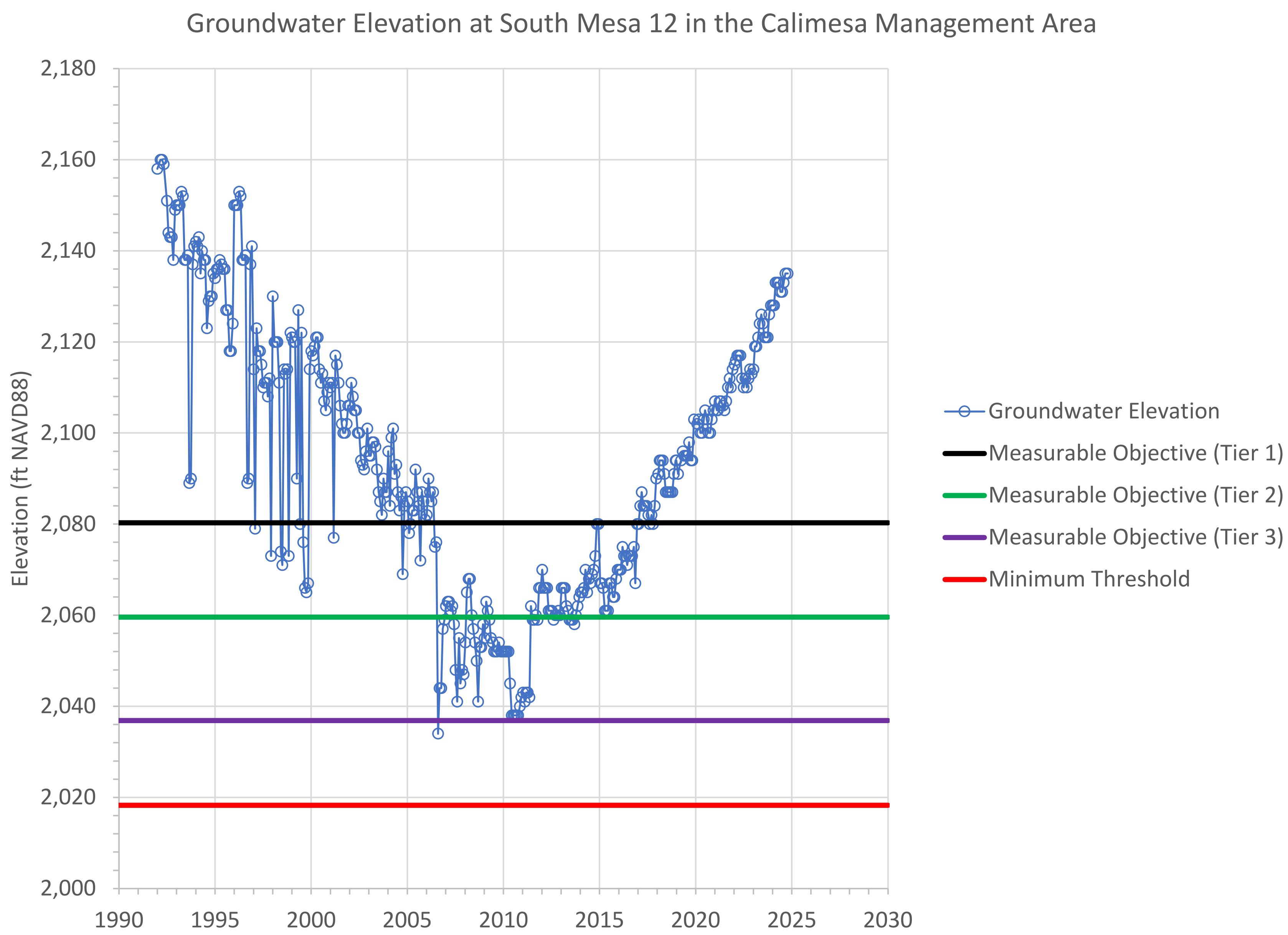
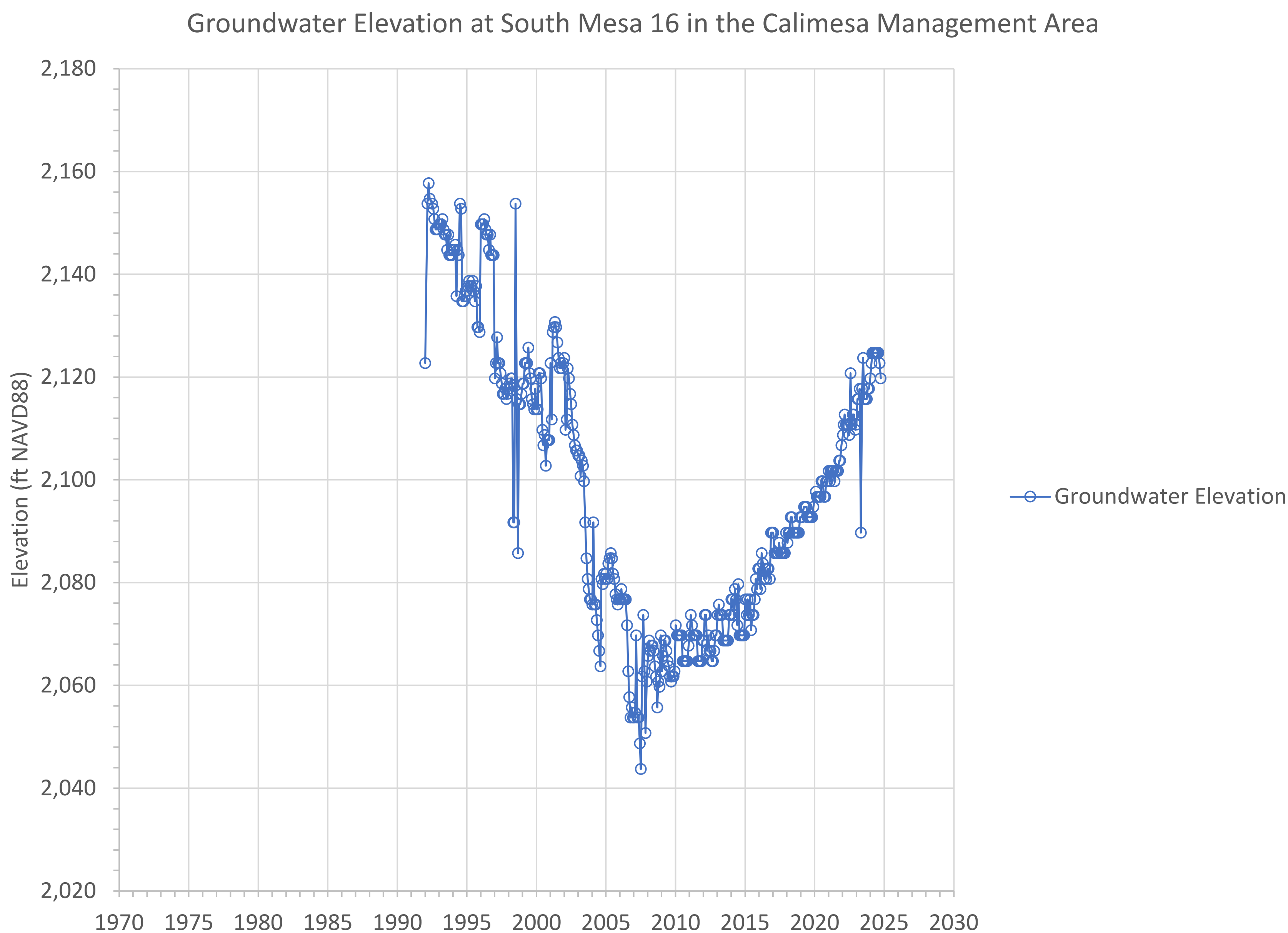
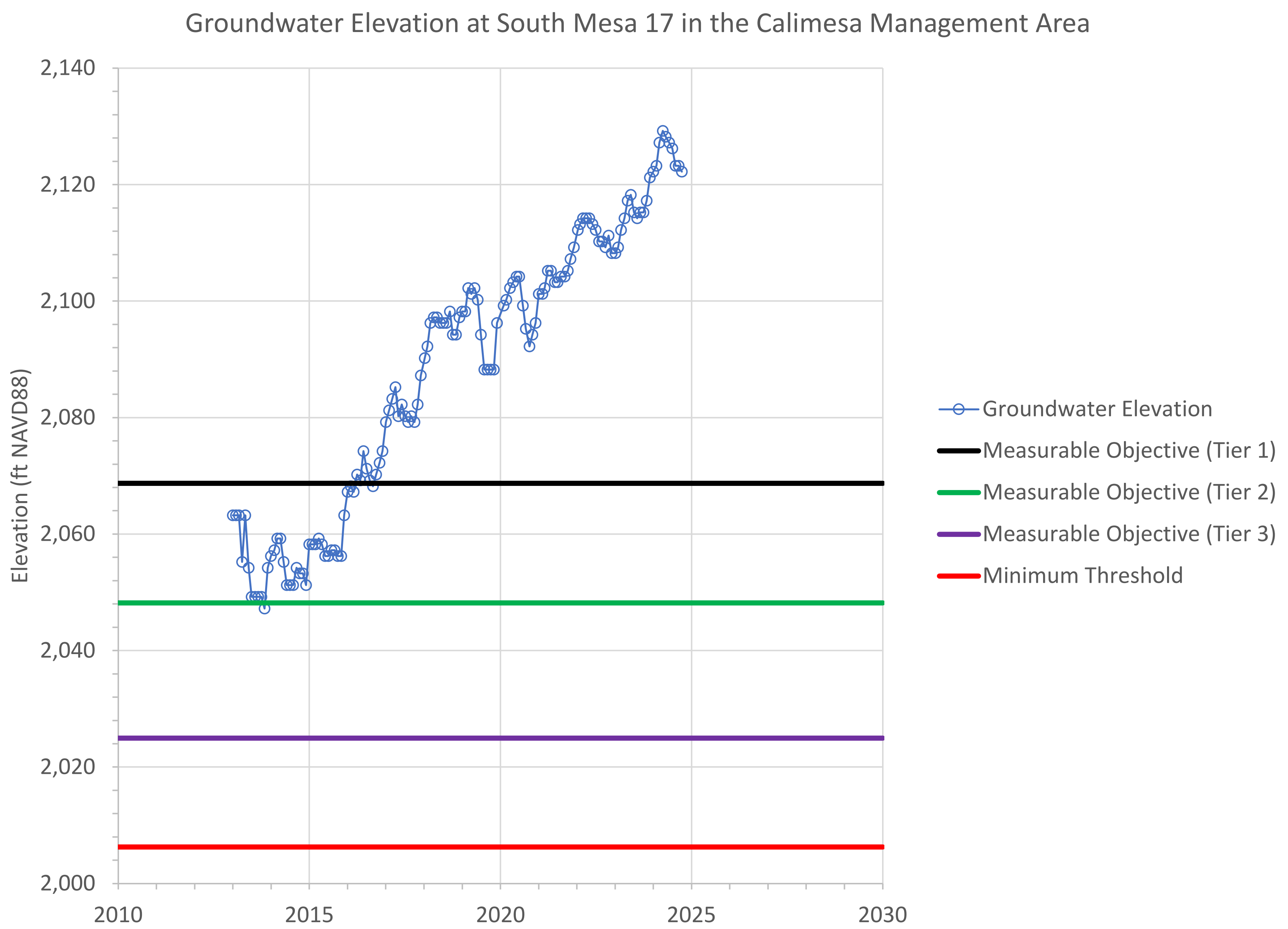

Groundwater Elevation at South Mesa 12 in the Calimesa Management Area
Elevation (ft NAVD88)
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-38



Groundwater Elevation at South Mesa 16 in the Calimesa Management Area
Elevation (ft NAVD88)
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2,020
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-39



Groundwater Elevation at South Mesa 17 in the Calimesa Management Area
Elevation (ft NAVD88)
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-40

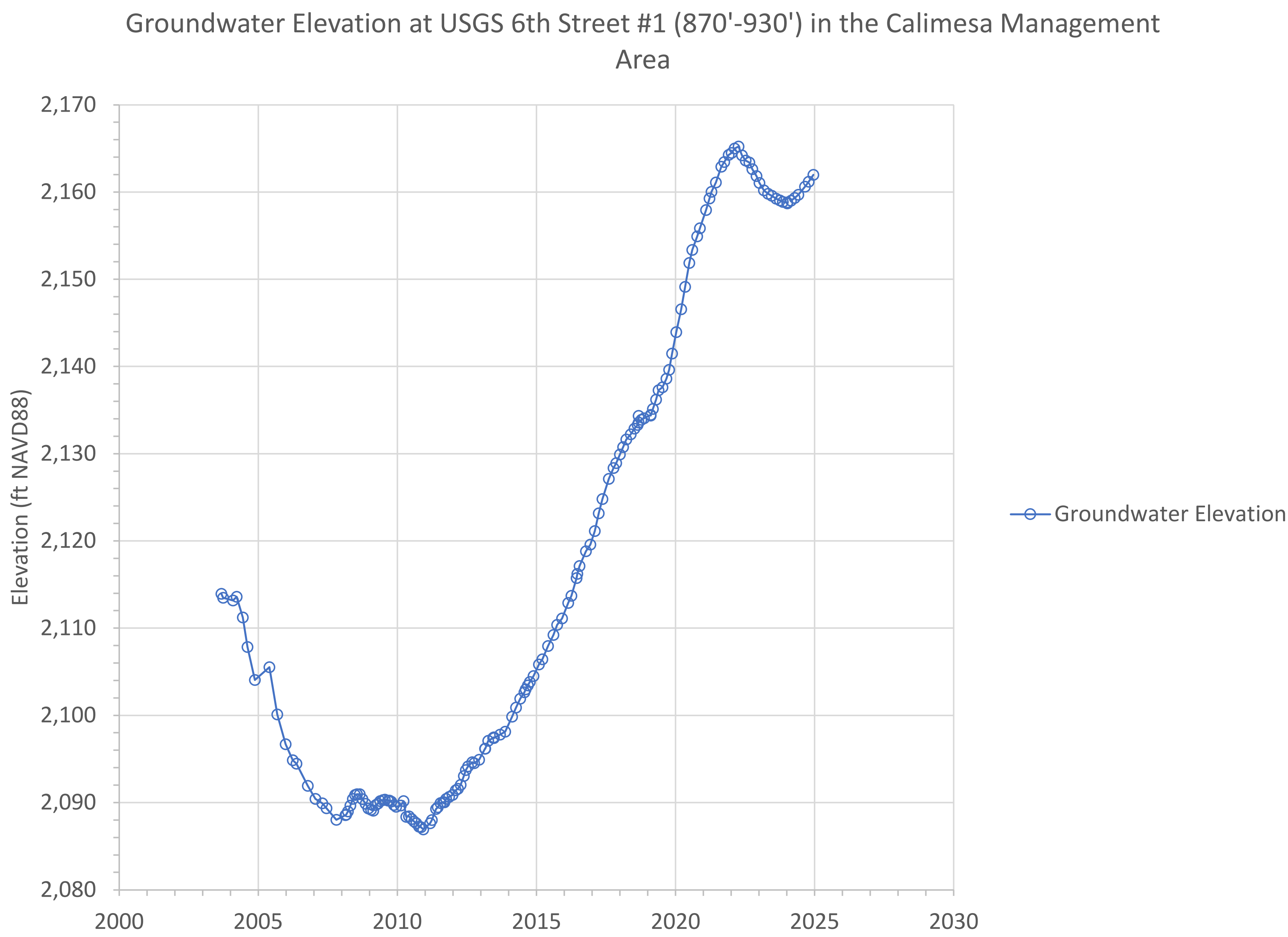
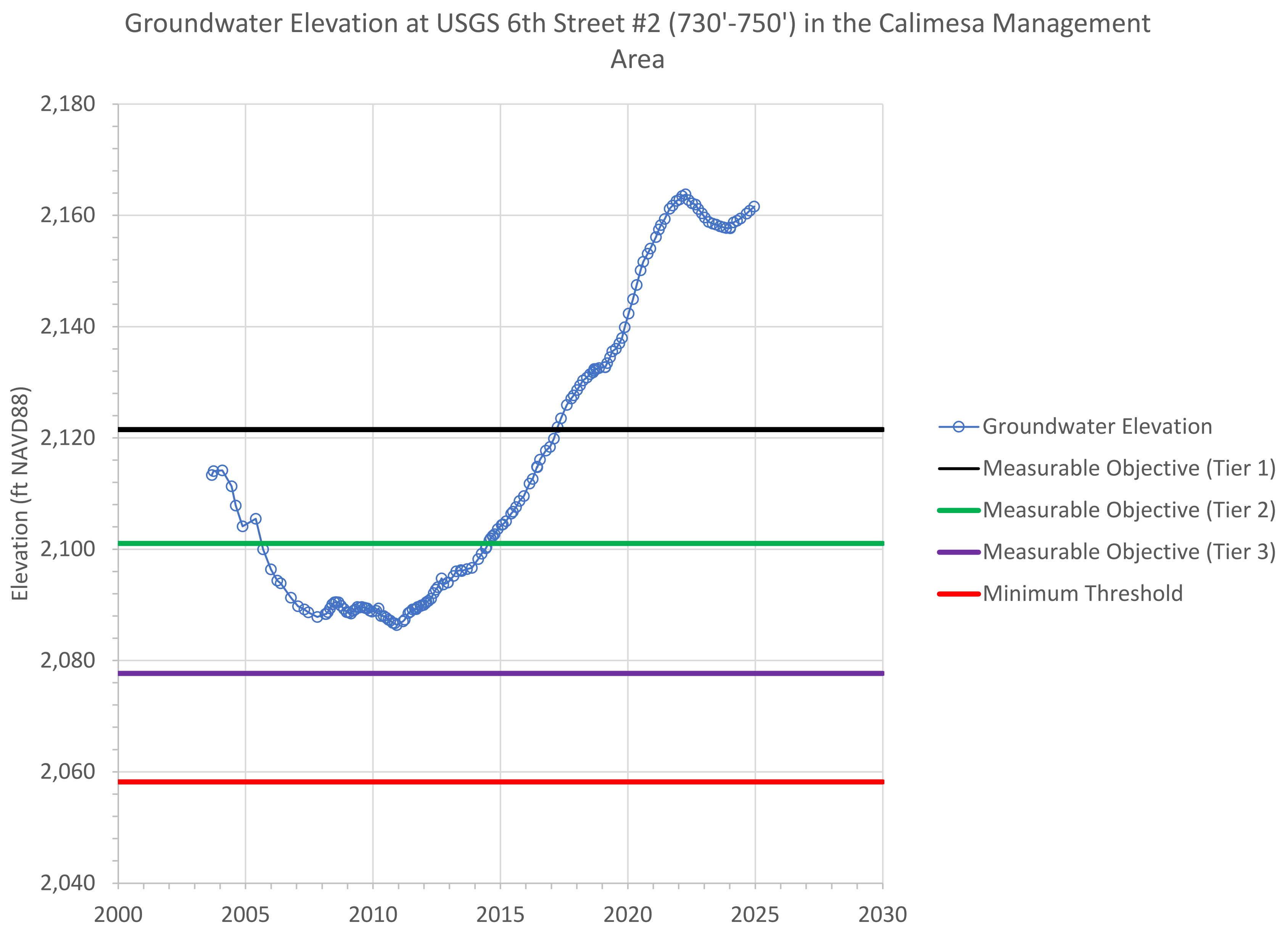

Groundwater Elevation at USGS 6th Street #1 (870'-930') in the Calimesa Management Area
Elevation (ft NAVD88)
2,170
2,160
2,150
2,140
2,130
2,120
2,110
2,100
2,090
2,080
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-41



Groundwater Elevation at USGS 6th Street #2 (730'-750') in the Calimesa Management Area
Elevation (ft NAVD88)
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-42

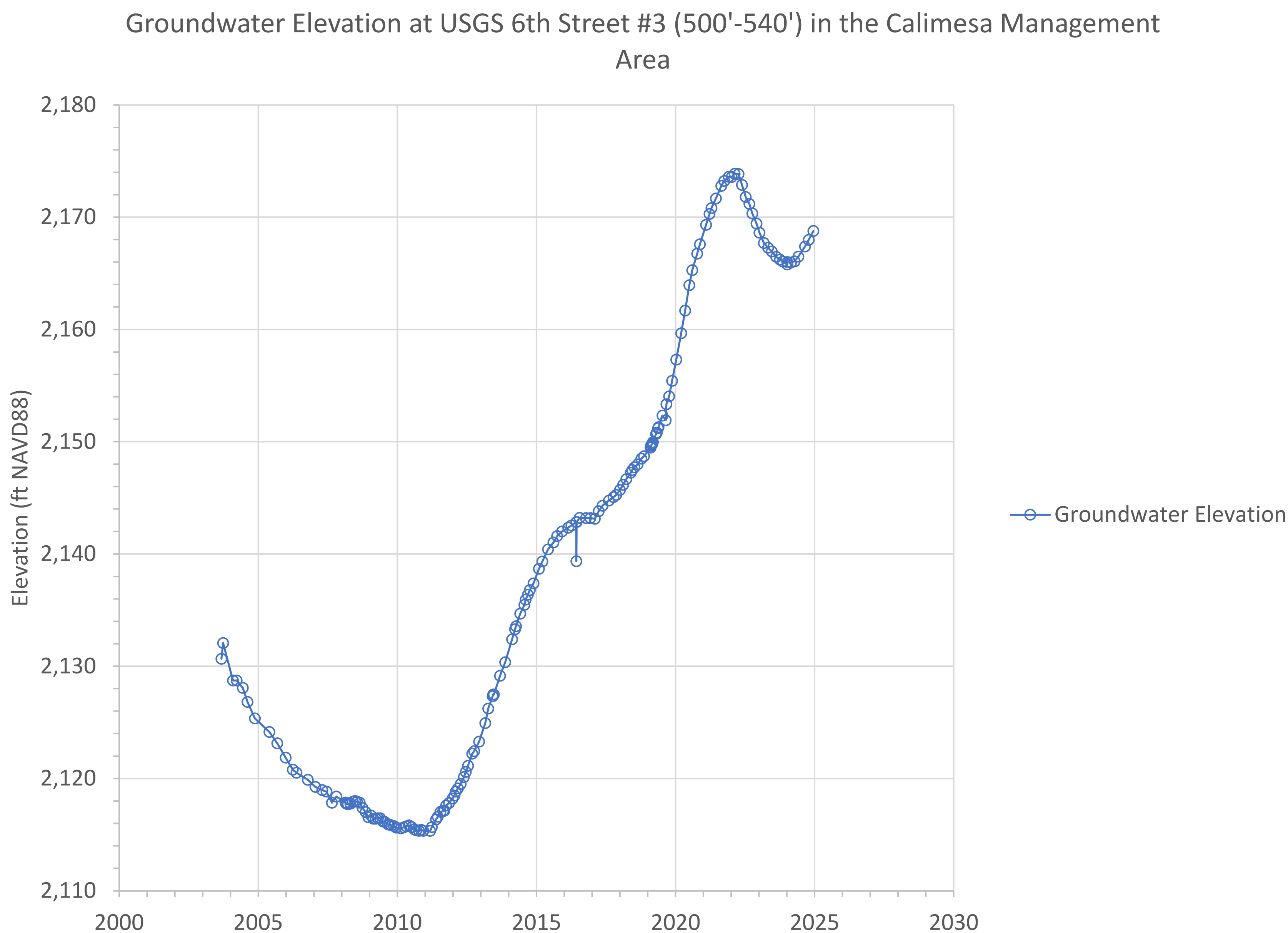

Groundwater Elevation at USGS 6th Street #3 (500'-540') in the Calimesa Management Area
Elevation (ft NAVD88)
2,180
2,170
2,160
2,150
2,140
2,130
2,120
2,110
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-43

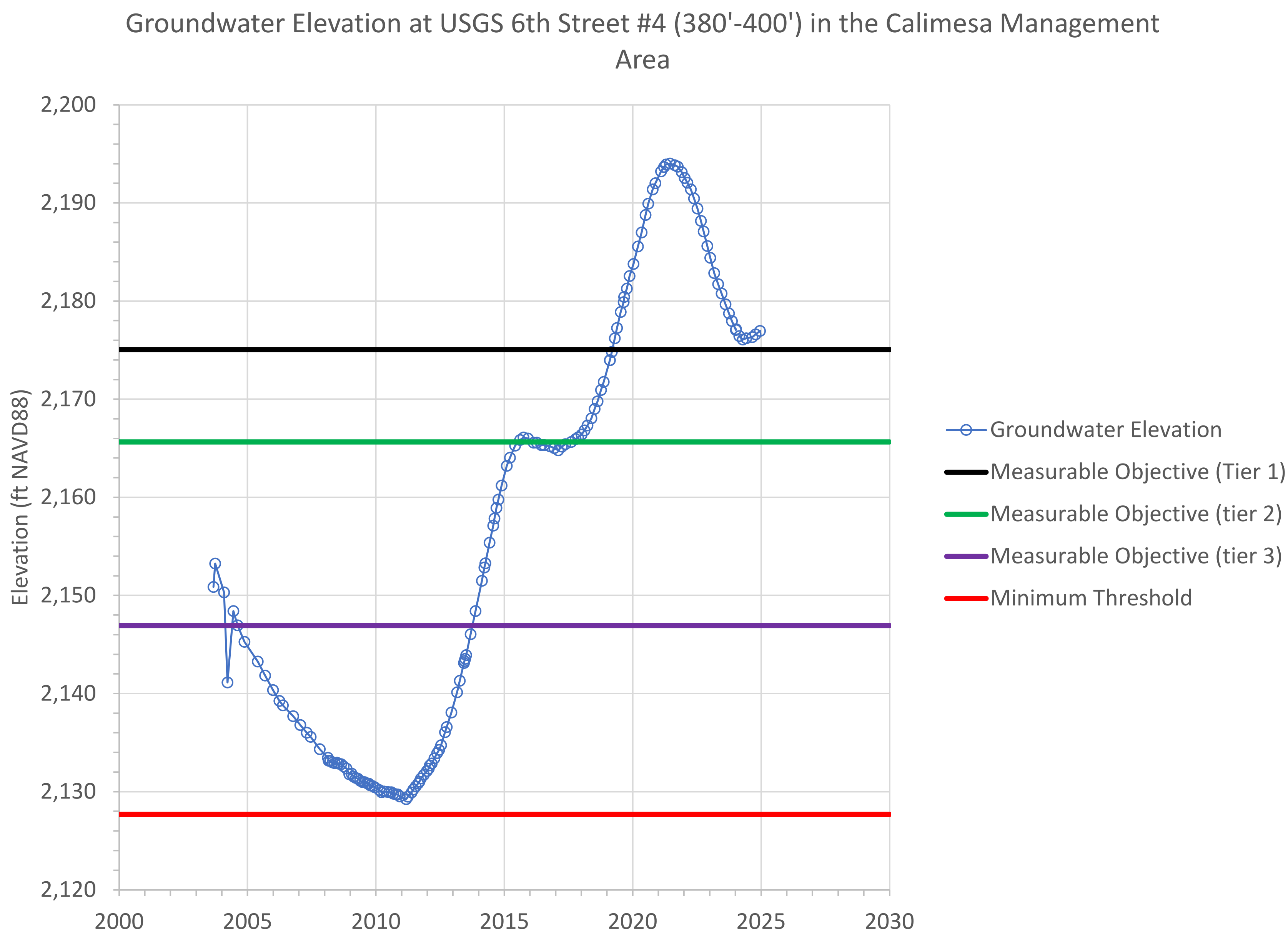

Groundwater Elevation at USGS 6th Street #4 (380'-400') in the Calimesa Management Area
Elevation (ft NAVD88)
2,200
2,190
2,180
2,170
2,160
2,150
2,140
2,130
2,120
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (tier 2)
Measurable Objective (tier 3)
Minimum Threshold

Figure A-44

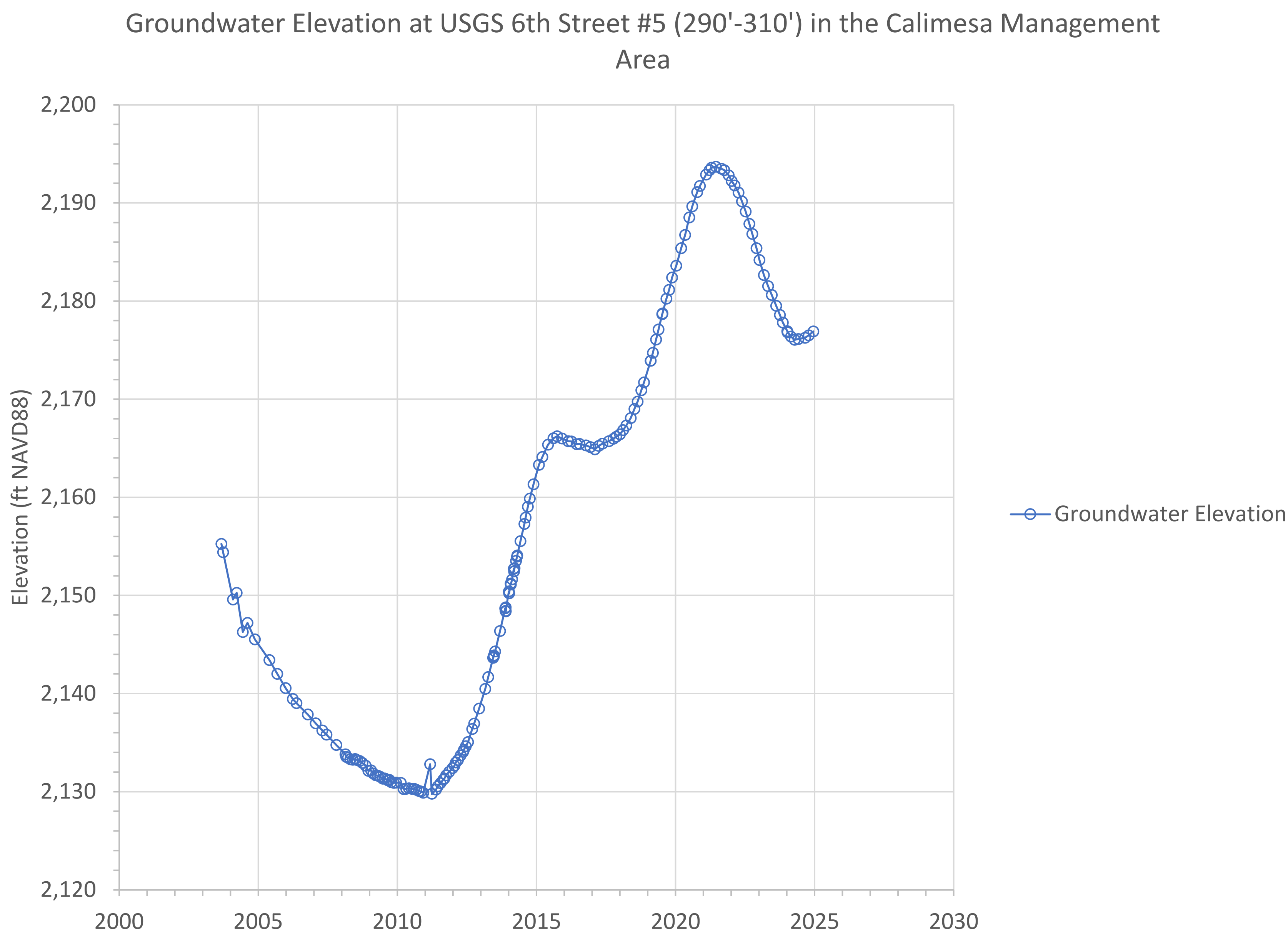
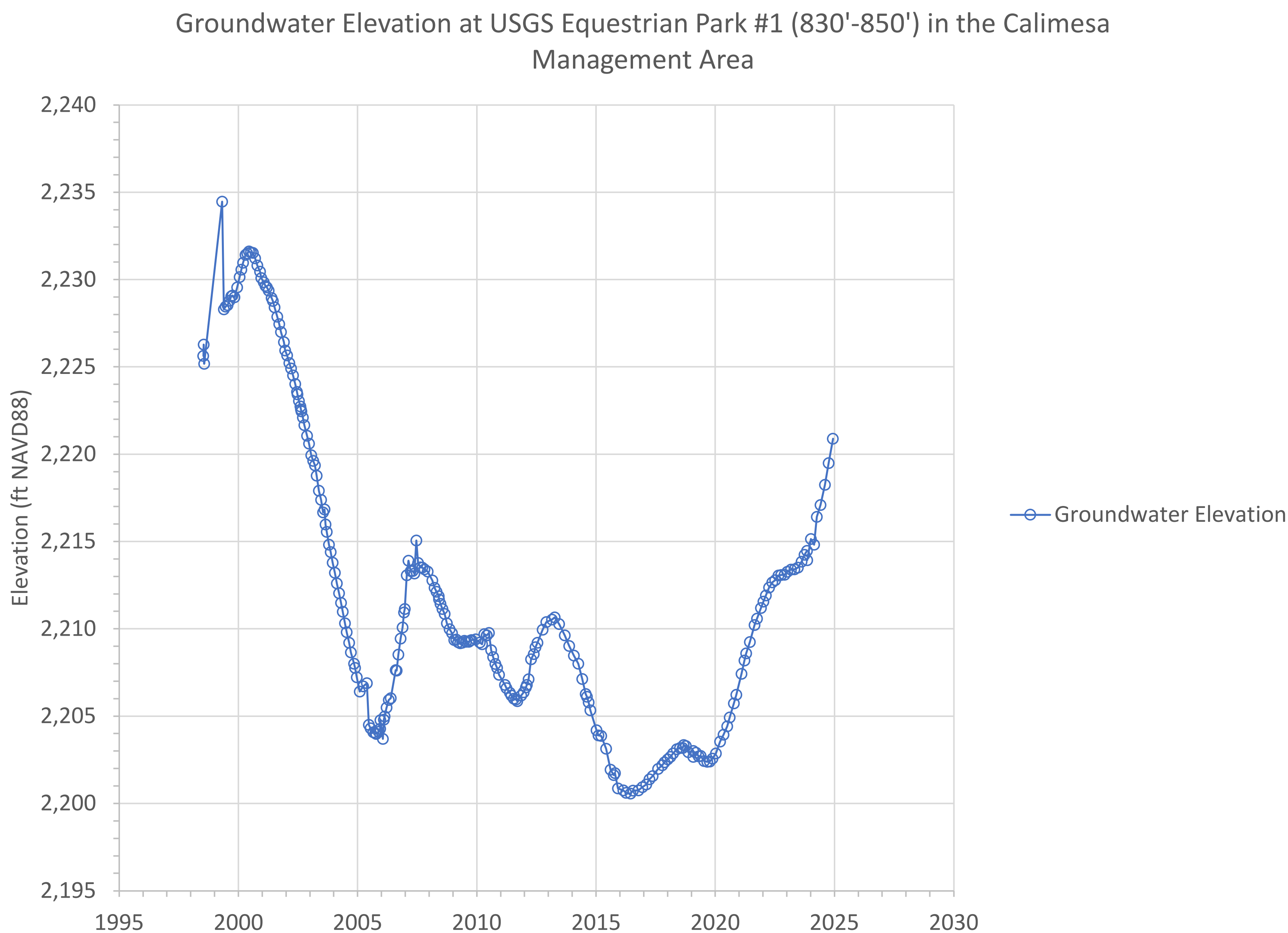

Groundwater Elevation at USGS 6th Street #5 (290'-310') in the Calimesa Management Area
Elevation (ft NAVD88)
2,200
2,190
2,180
2,170
2,160
2,150
2,140
2,130
2,120
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-45



Groundwater Elevation at USGS Equestrian Park #1 (830'-850') in the Calimesa Management Area
Elevation (ft NAVD88)
2,240
2,235
2,230
2,225
2,220
2,215
2,210
2,205
2,200
2,195
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-46

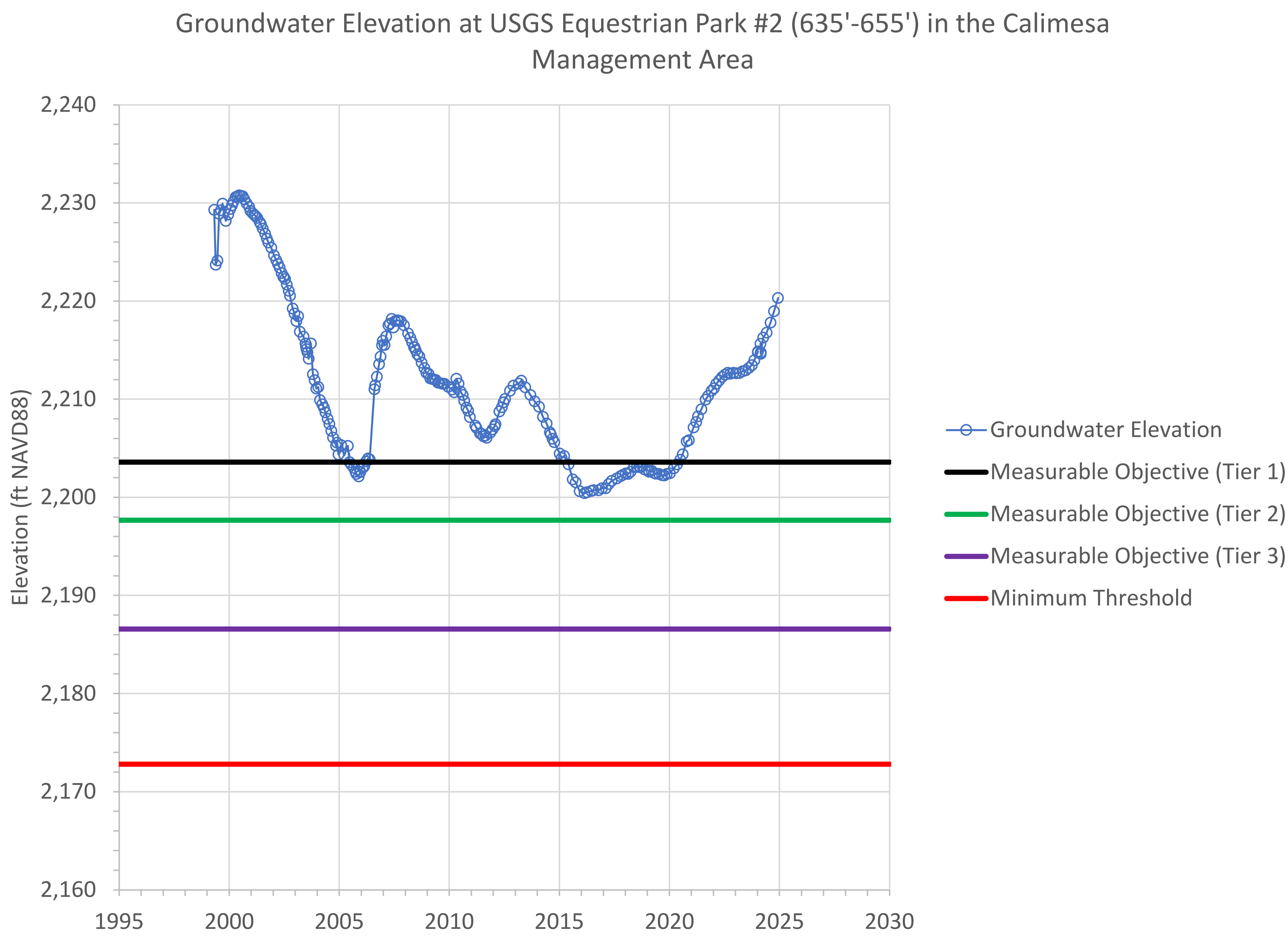

Groundwater Elevation at USGS Equestrian Park #2 (635'-655') in the Calimesa Management Area
Elevation (ft NAVD88)
2,240
2,230
2,220
2,210
2,200
2,190
2,180
2,170
2,160
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-47

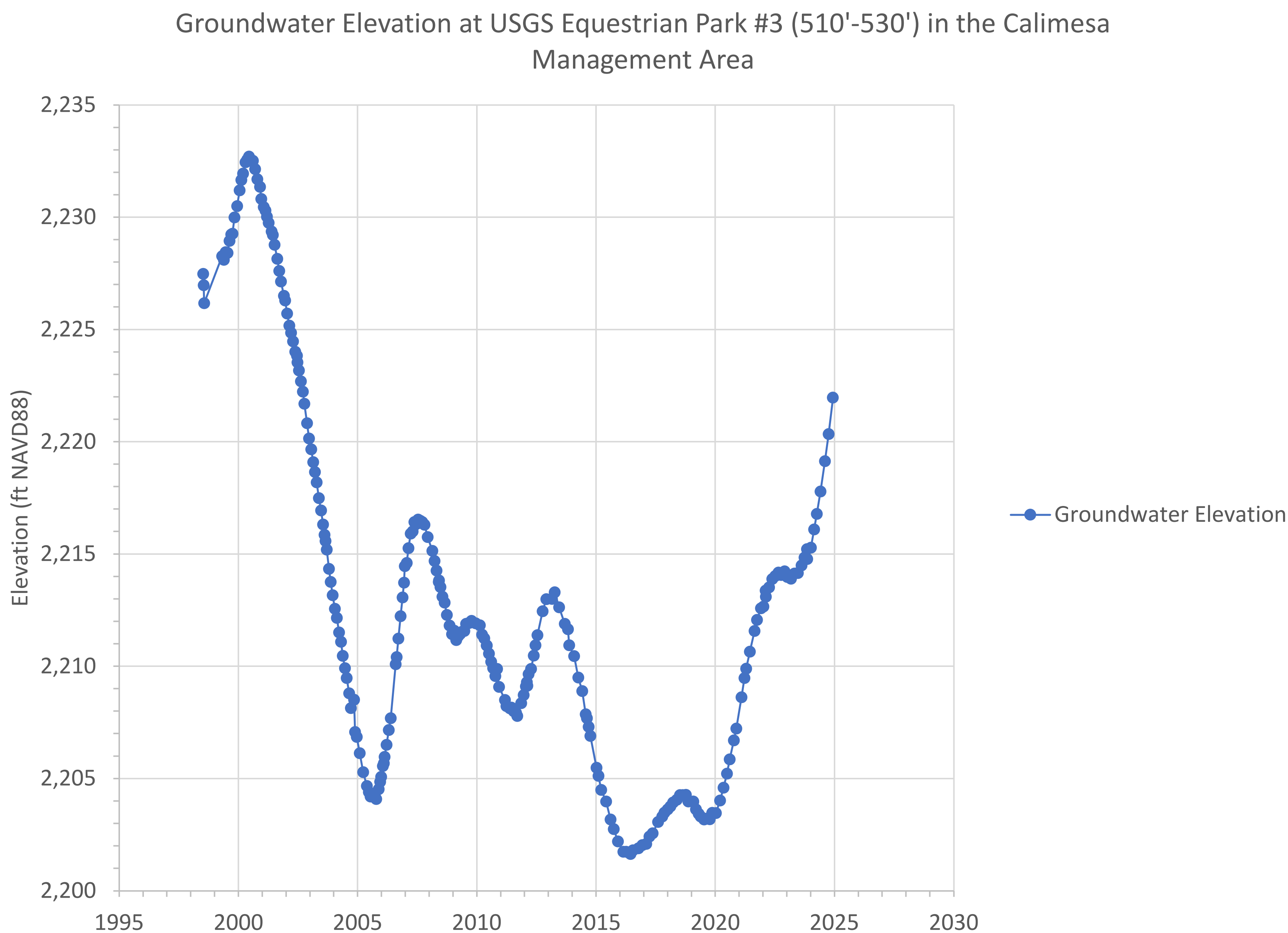

Groundwater Elevation at USGS Equestrian Park #3 (510'-530') in the Calimesa Management Area
Elevation (ft NAVD88)
2,235
2,230
2,225
2,220
2,215
2,210
2,205
2,200
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-48

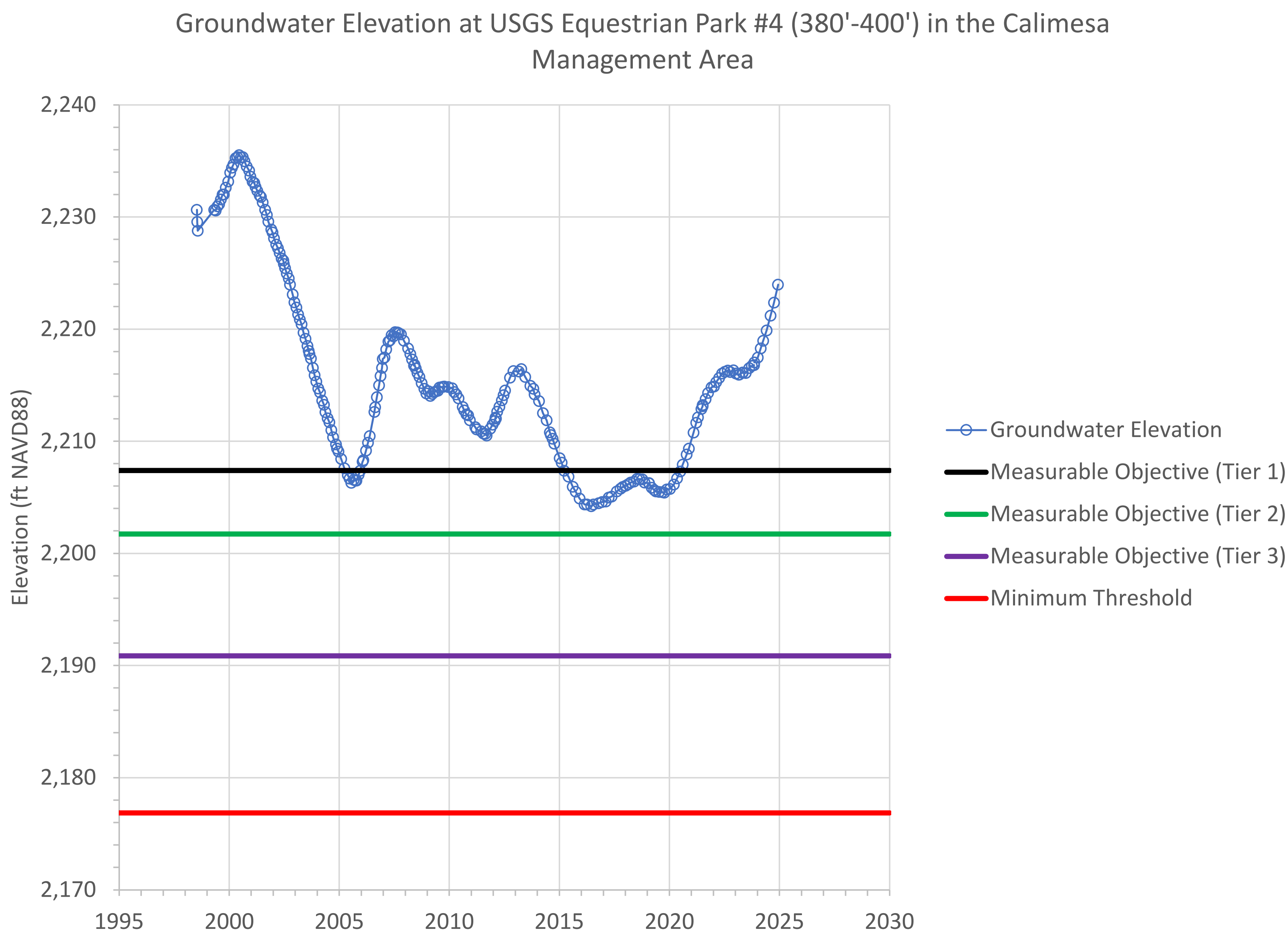

Groundwater Elevation at USGS Equestrian Park #4 (380'-400') in the Calimesa Management Area
Elevation (ft NAVD88)
2,240
2,230
2,220
2,210
2,200
2,190
2,180
2,170
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-49

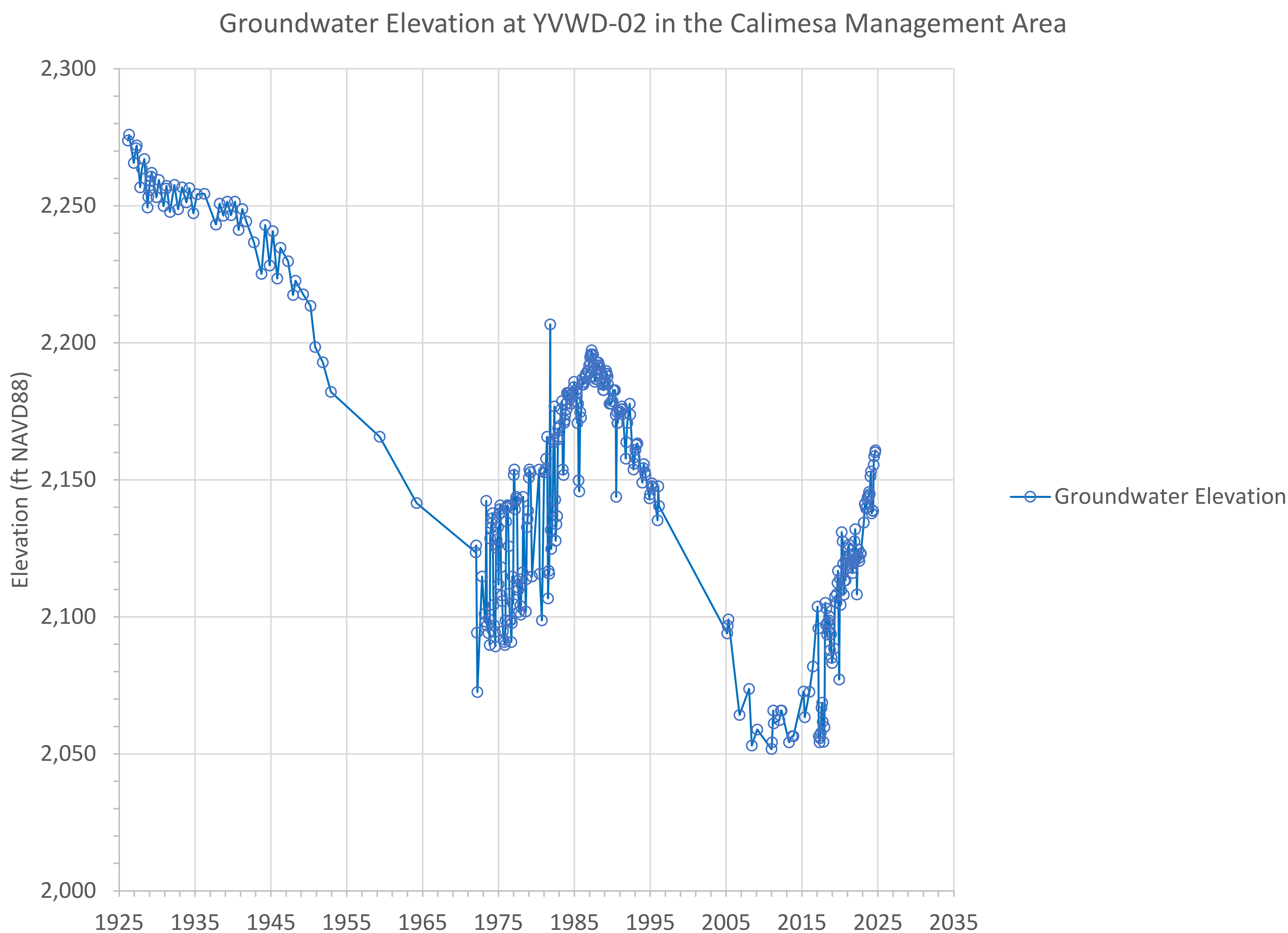

Groundwater Elevation at YVWD-02 in the Calimesa Management Area
Elevation (ft NAVD88)
2,300
2,250
2,200
2,150
2,100
2,050
2,000
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
2025
2035
Groundwater Elevation

Figure A-50

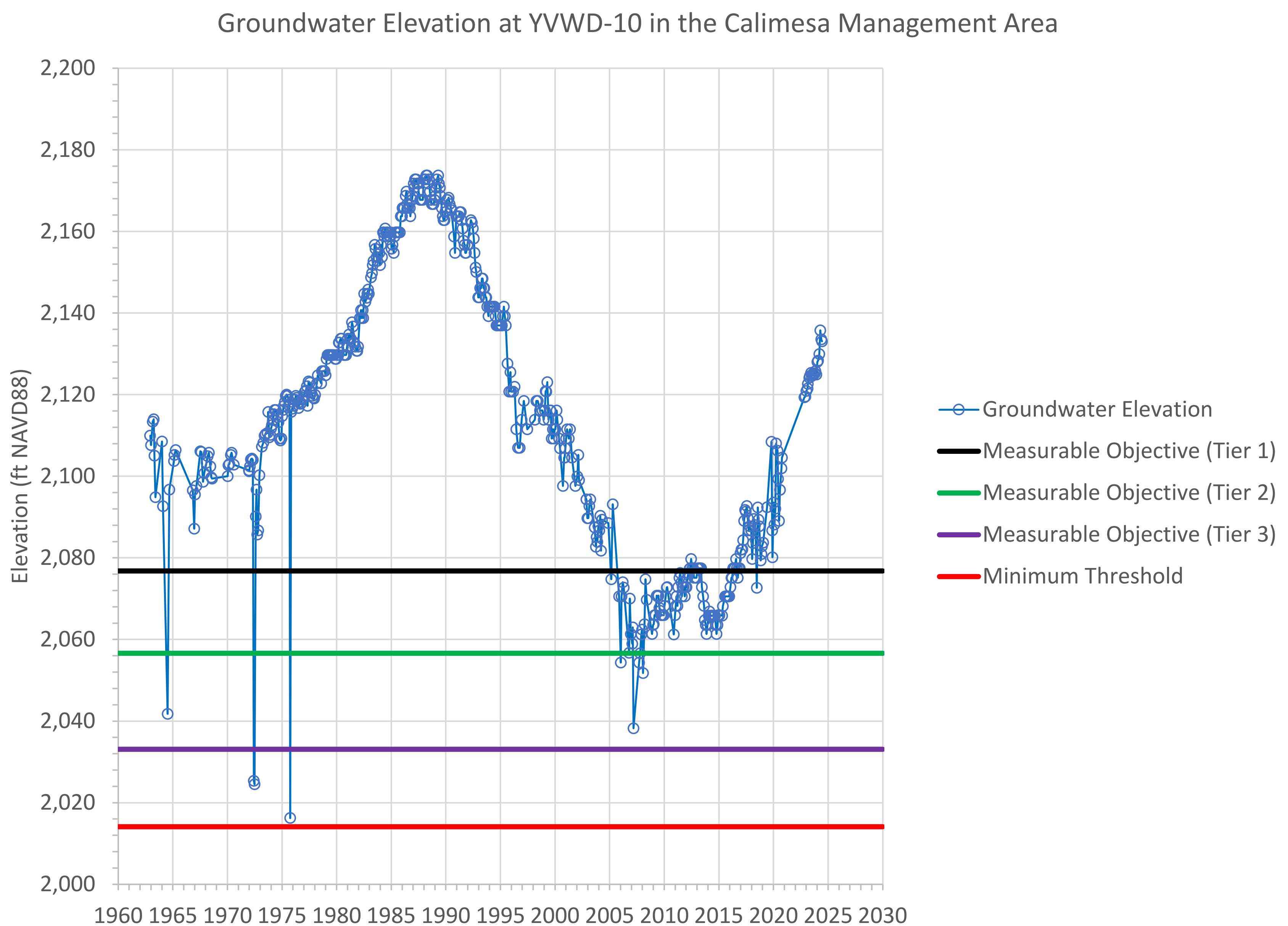
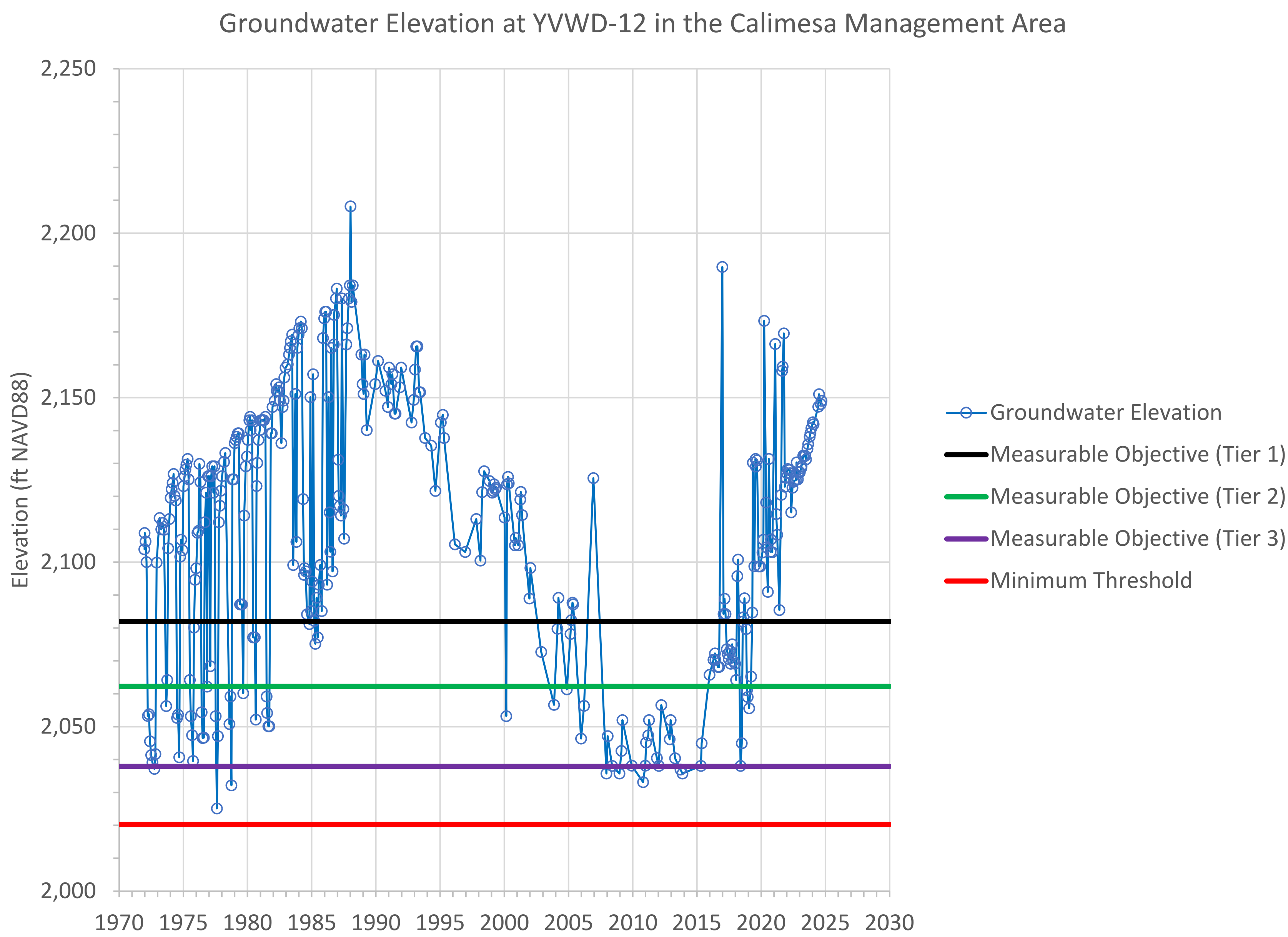
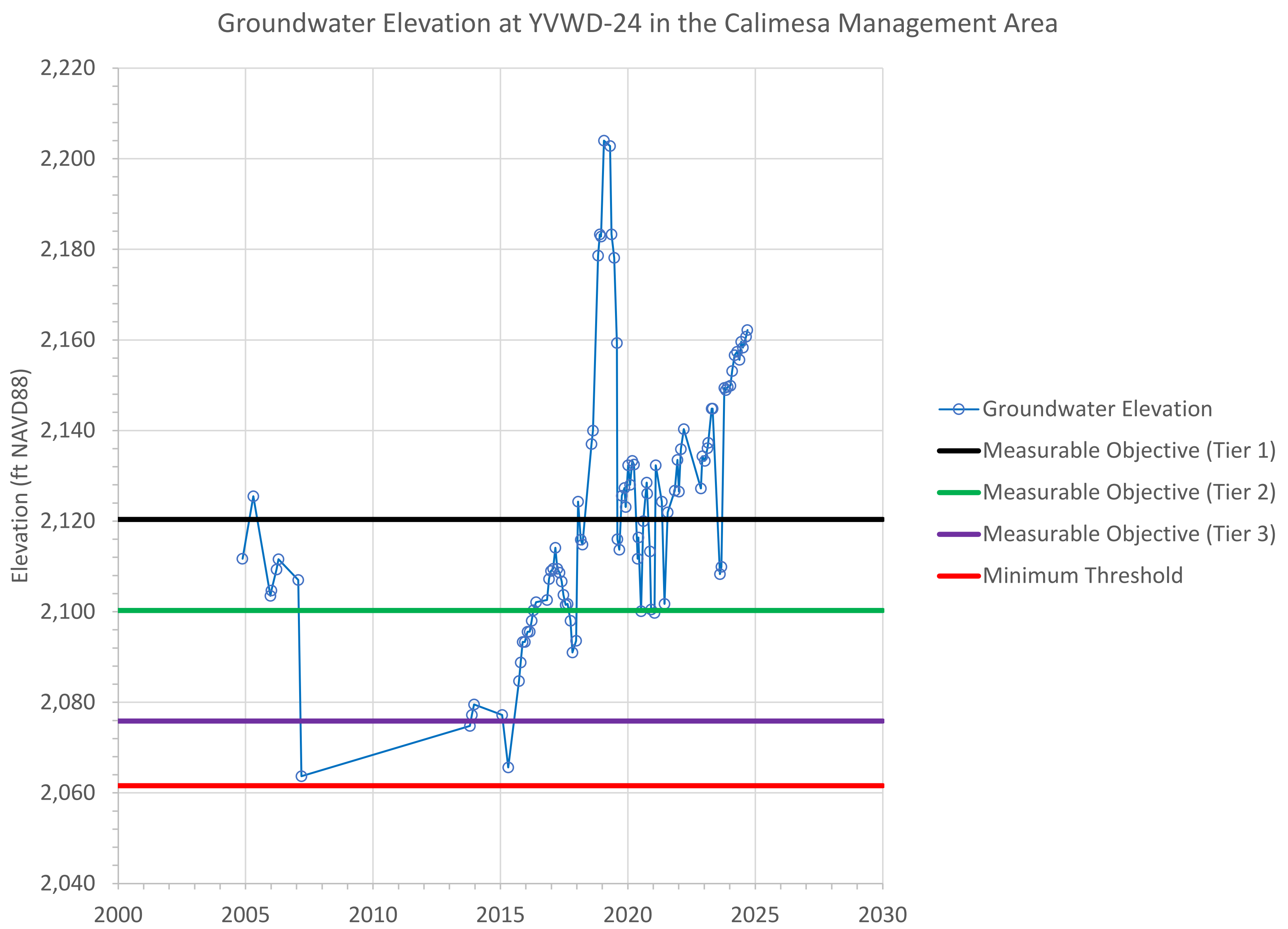

Groundwater Elevation at YVWD-10 in the Calimesa Management Area
Elevation (ft NAVD88)
2,200
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-51



Groundwater Elevation at YVWD-12 in the Calimesa Management Area
Elevation (ft NAVD88)
2,250
2,200
2,150
2,100
2,050
2,000
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-52



Groundwater Elevation at YVWD-24 in the Calimesa Management Area
Elevation (ft NAVD88)
2,220
2,200
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-53

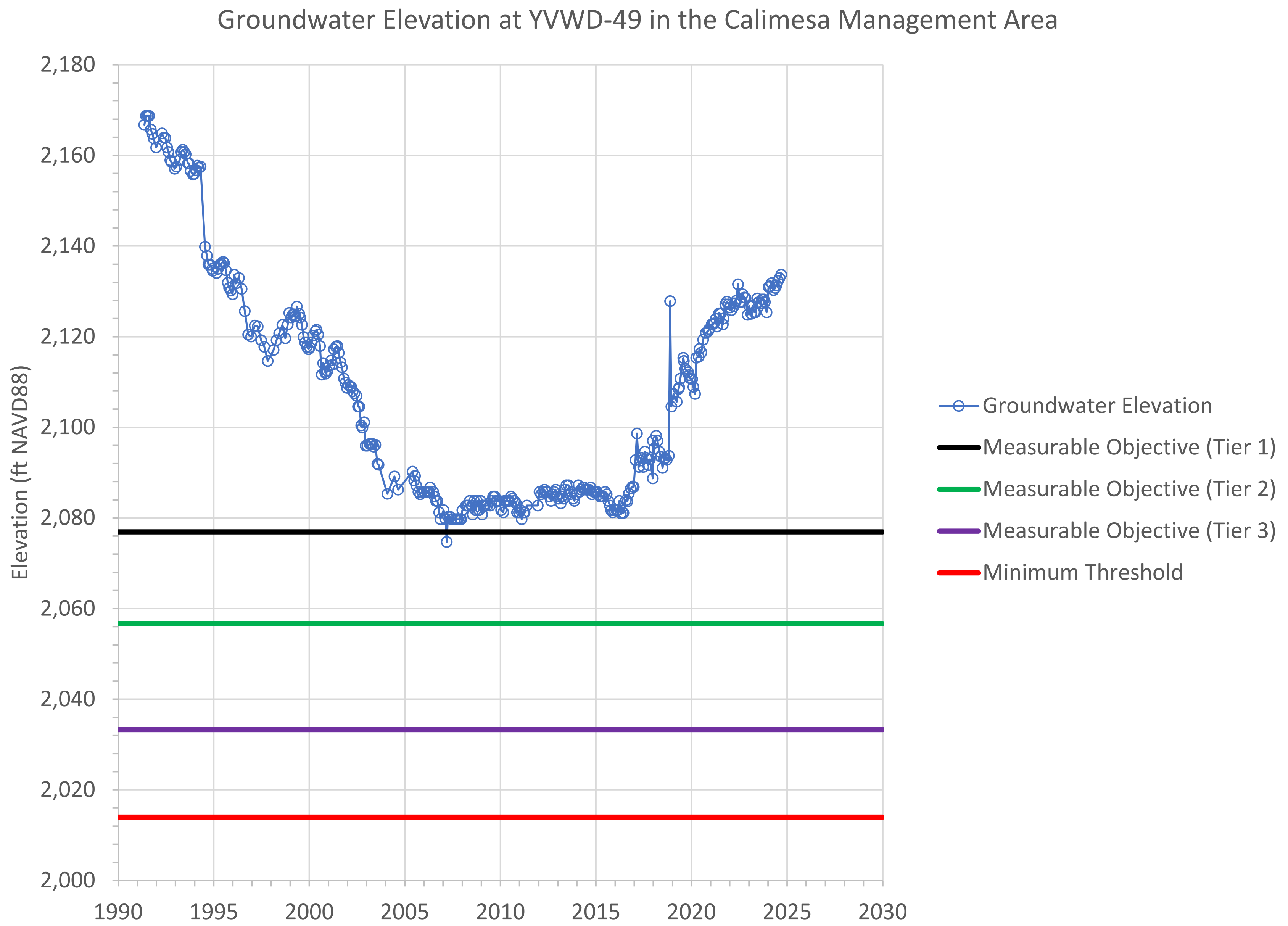

Groundwater Elevation at YVWD-49 in the Calimesa Management Area
Elevation (ft NAVD88)
2,180
2,160
2,140
2,120
2,100
2,080
2,060
2,040
2,020
2,000
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Measurable Objective (Tier 3)
Minimum Threshold

Figure A-54

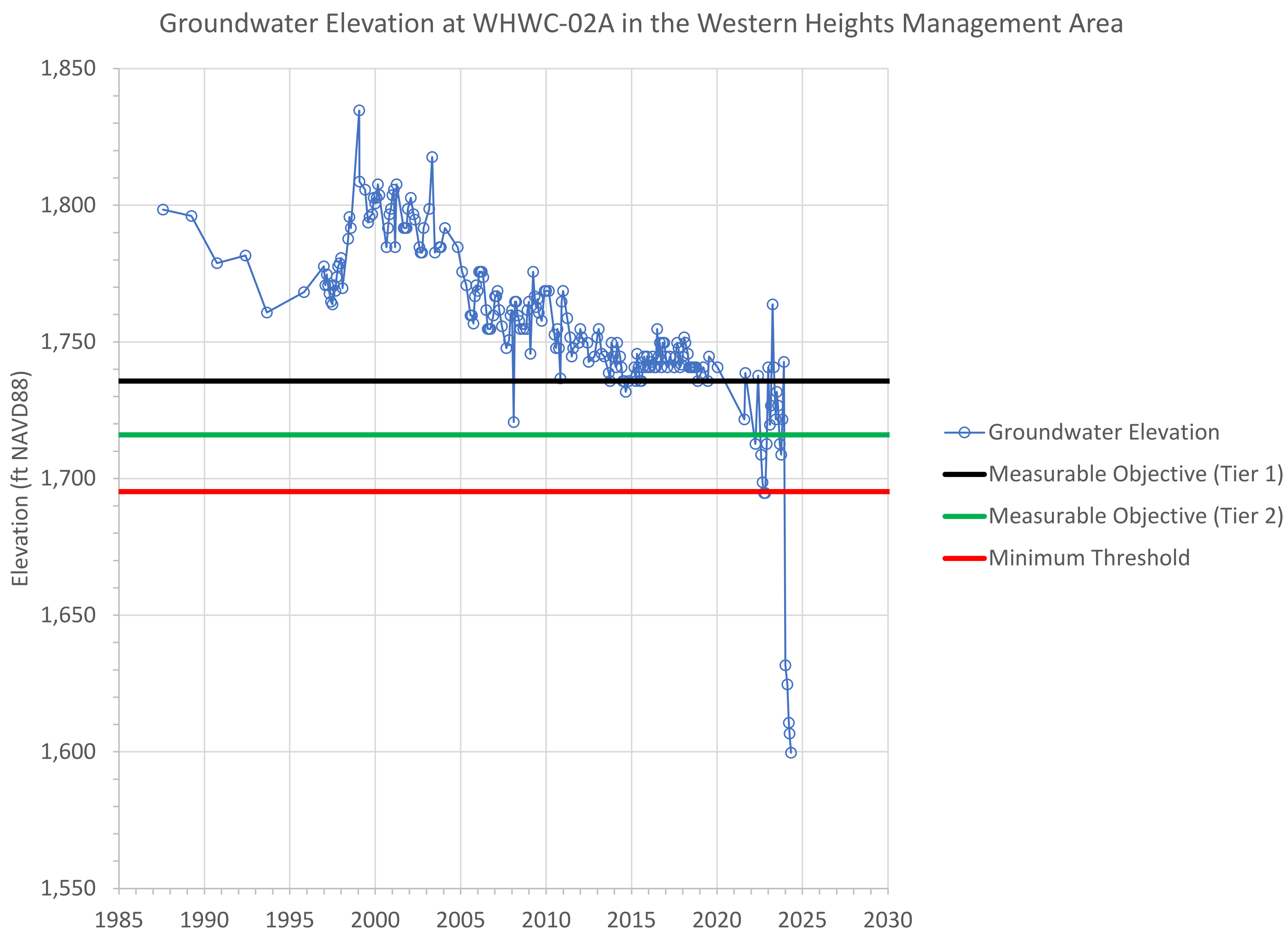

Groundwater Elevation at WHWC-02A in the Western Heights Management Area
Elevation (ft NAVD88)
1,850
1,800
1,750
1,700
1,650
1,600
1,550
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-55

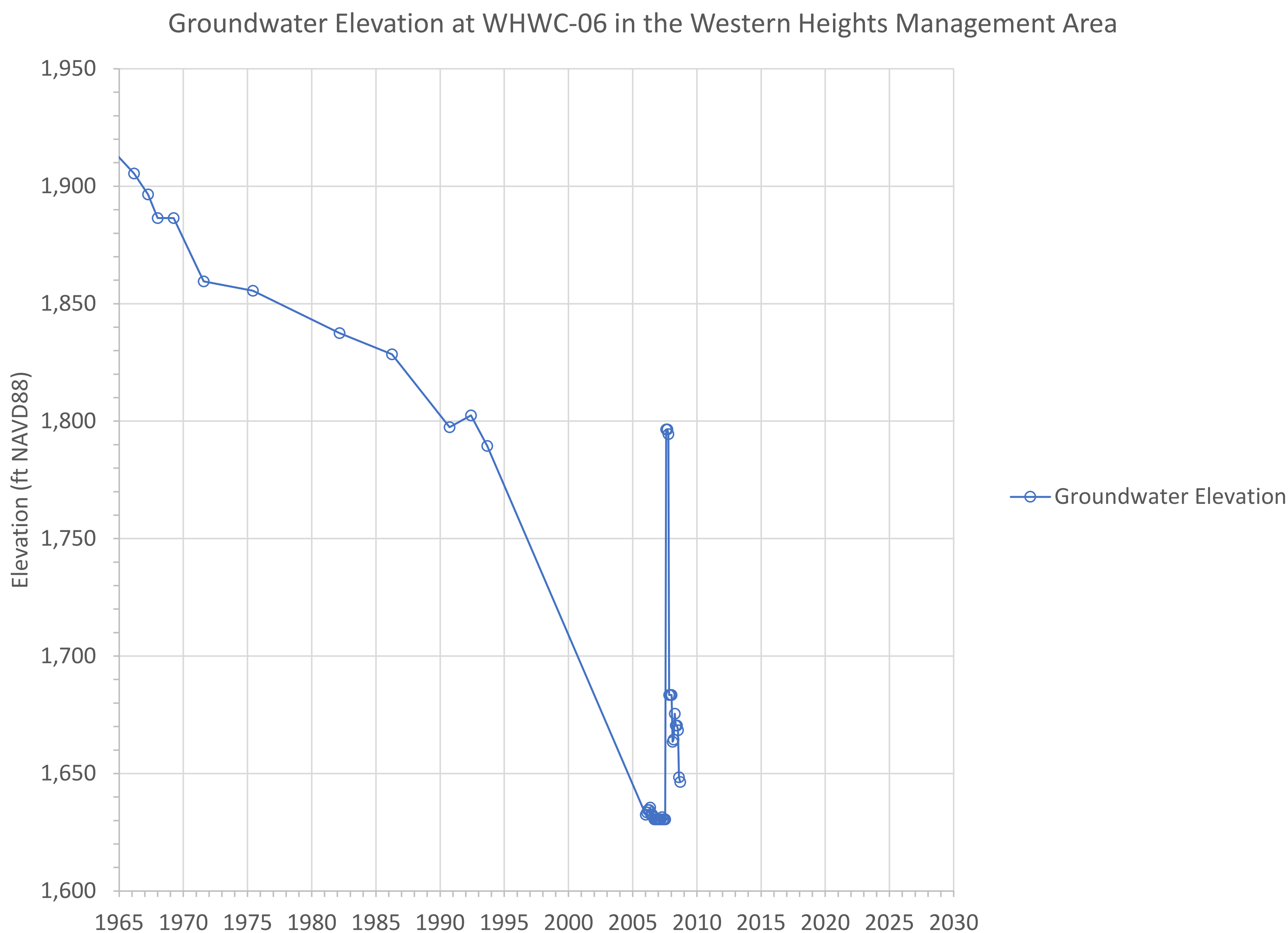

Groundwater Elevation at WHWC-06 in the Western Heights Management Area
Elevation (ft NAVD88)
1,950
1,900
1,850
1,800
1,750
1,700
1,650
1,600
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-56

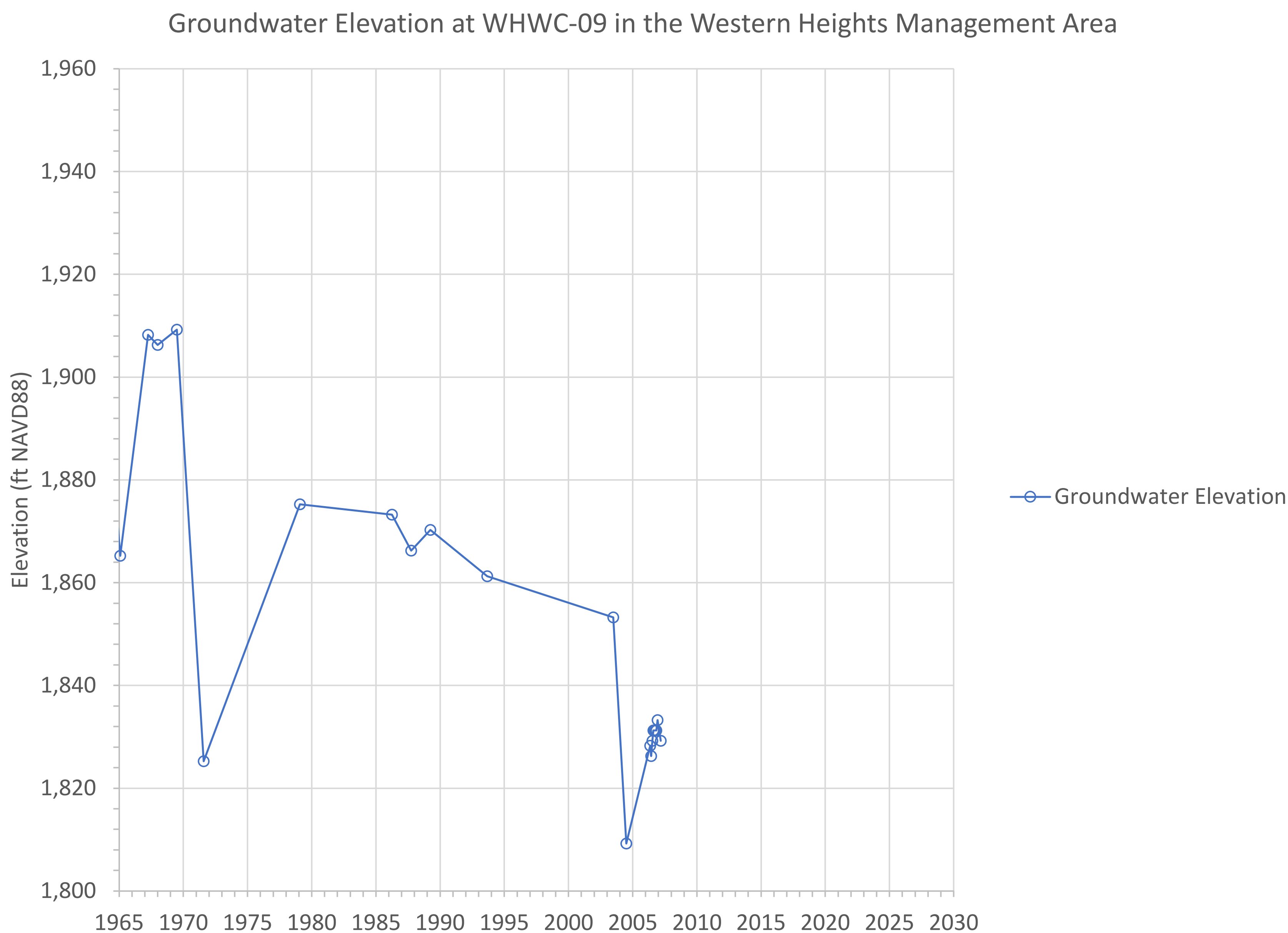

Groundwater Elevation at WHWC-09 in the Western Heights Management Area
Elevation (ft NAVD88)
1,960
1,940
1,920
1,900
1,880
1,860
1,840
1,820
1,800
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-57

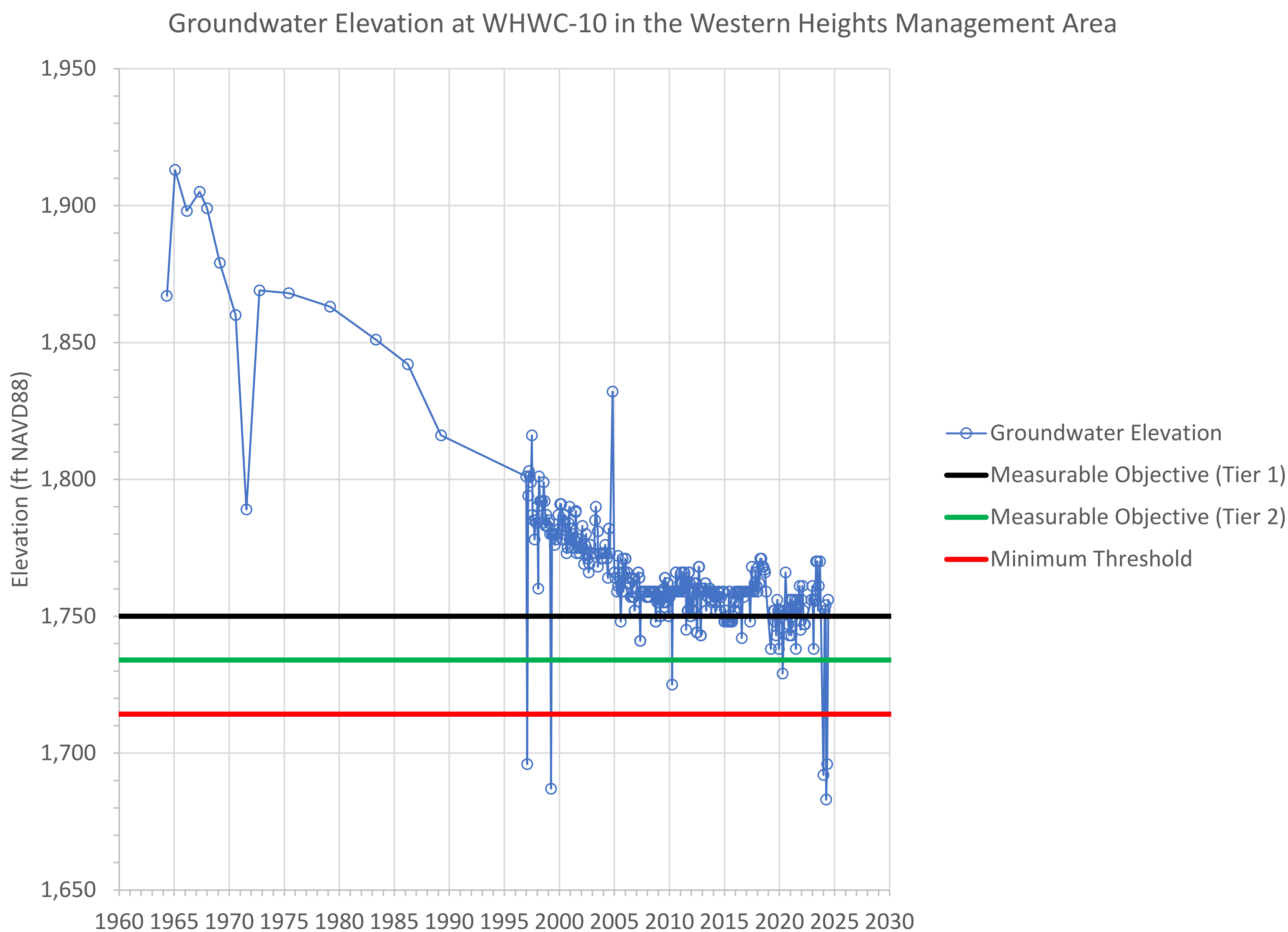
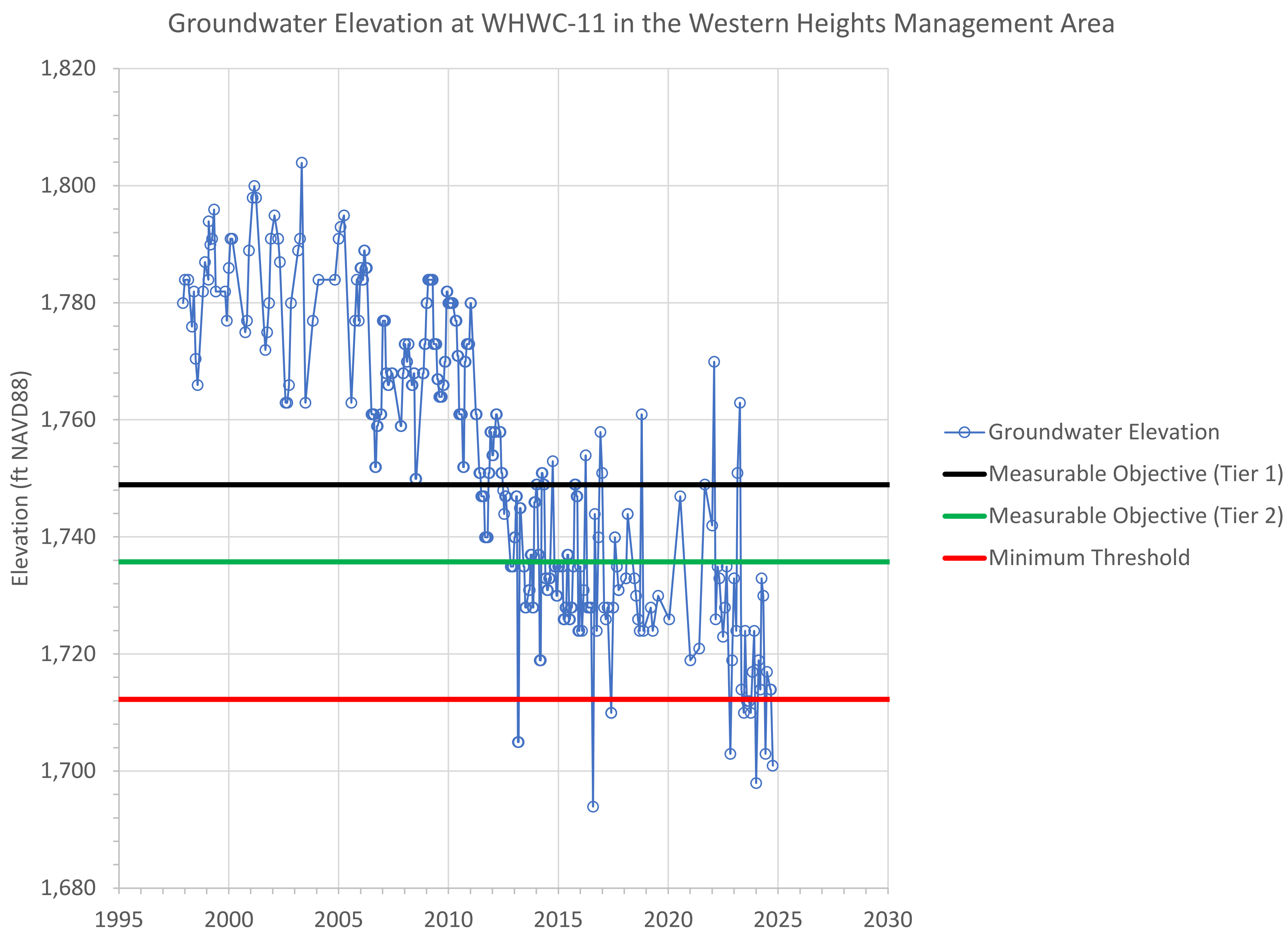

Groundwater Elevation at WHWC-10 in the Western Heights Management Area
Elevation (ft NAVD88)
1,950
1,900
1,850
1,800
1,750
1,700
1,650
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-58



Groundwater Elevation at WHWC-11 in the Western Heights Management Area
Elevation (ft NAVD88)
1,820
1,800
1,780
1,760
1,740
1,720
1,700
1,680
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-59

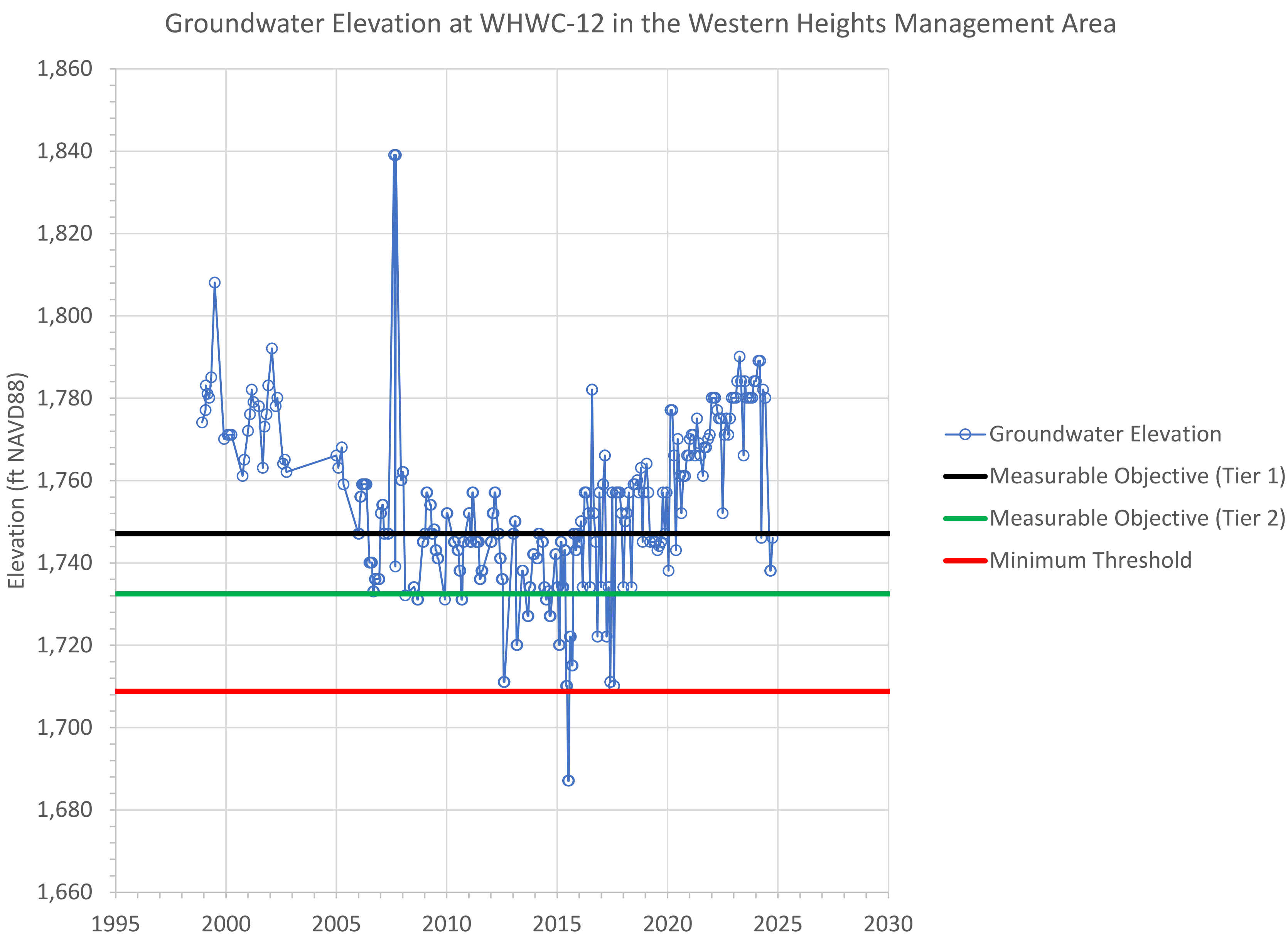
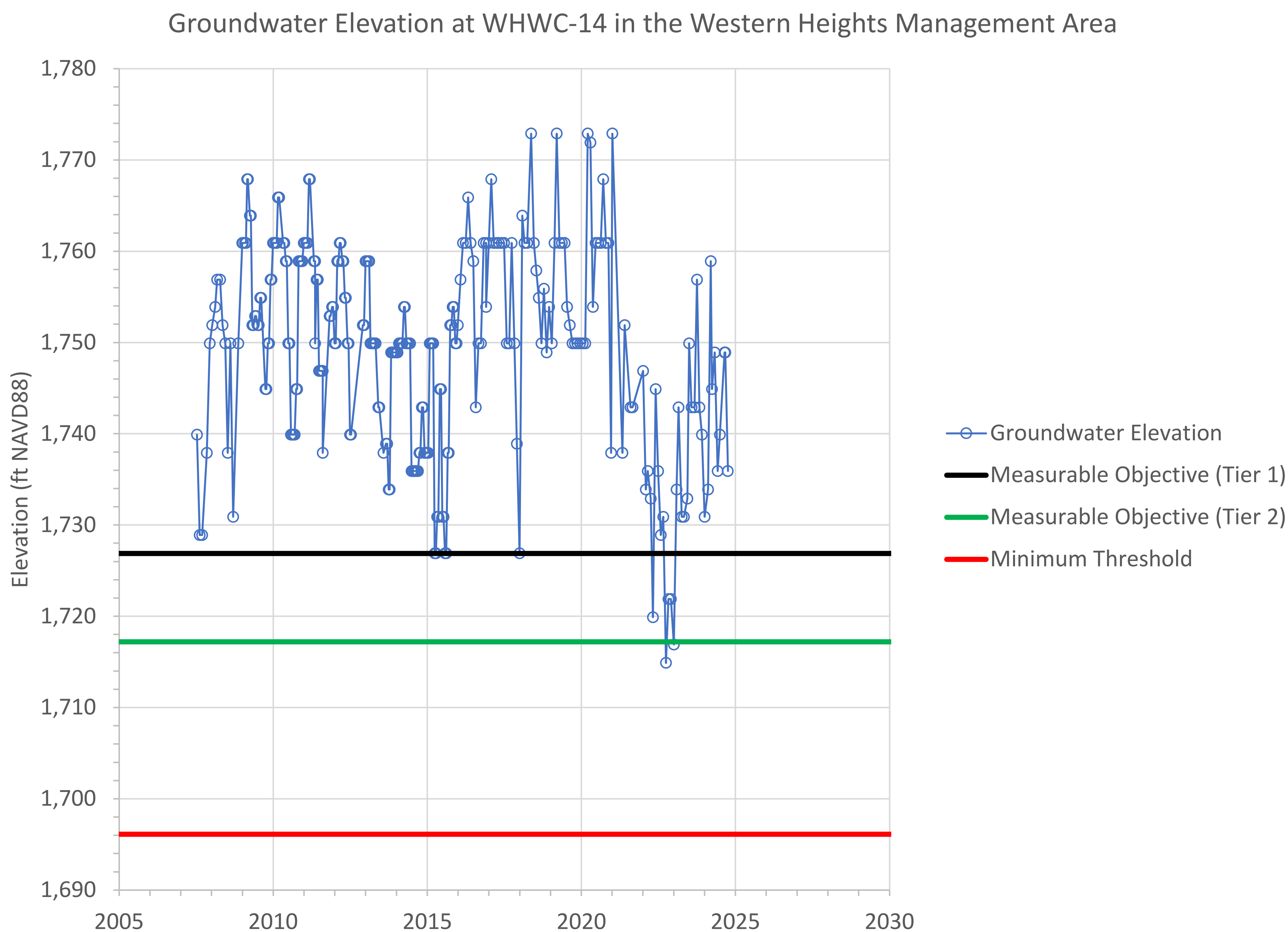

Groundwater Elevation at WHWC-12 in the Western Heights Management Area
Elevation (ft NAVD88)
1,860
1,840
1,820
1,800
1,780
1,760
1,740
1,720
1,700
1,680
1,660
1995
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-60



Groundwater Elevation at WHWC-14 in the Western Heights Management Area
Elevation (ft NAVD88)
1,780
1,770
1,760
1,750
1,740
1,730
1,720
1,710
1,700
1,690
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-61

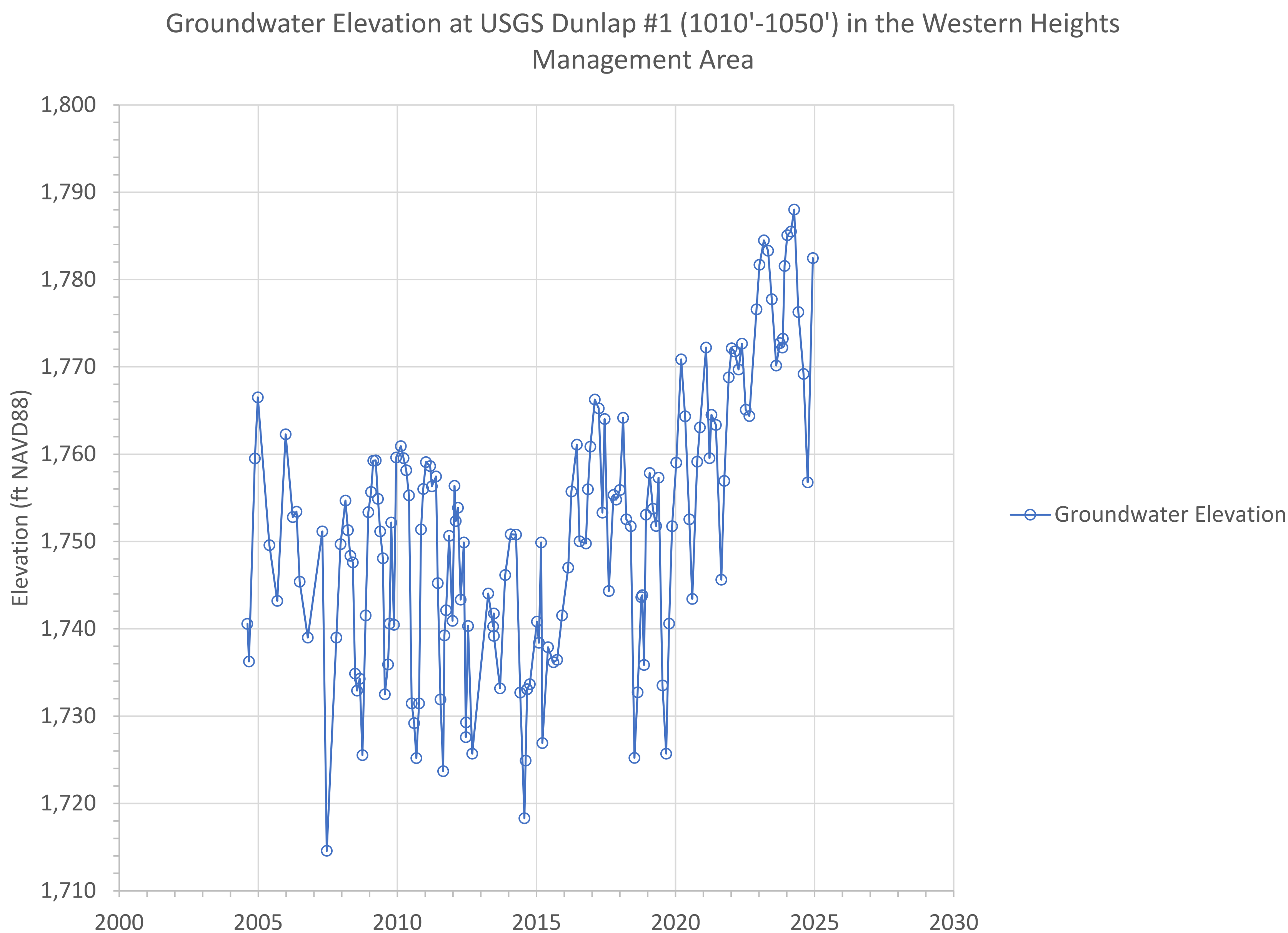

Groundwater Elevation at USGS Dunlap #1 (1010'-1050') in the Western Heights Management Area
Elevation (ft NAVD88)
1,800
1,790
1,780
1,770
1,760
1,750
1,740
1,730
1,720
1,710
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-62

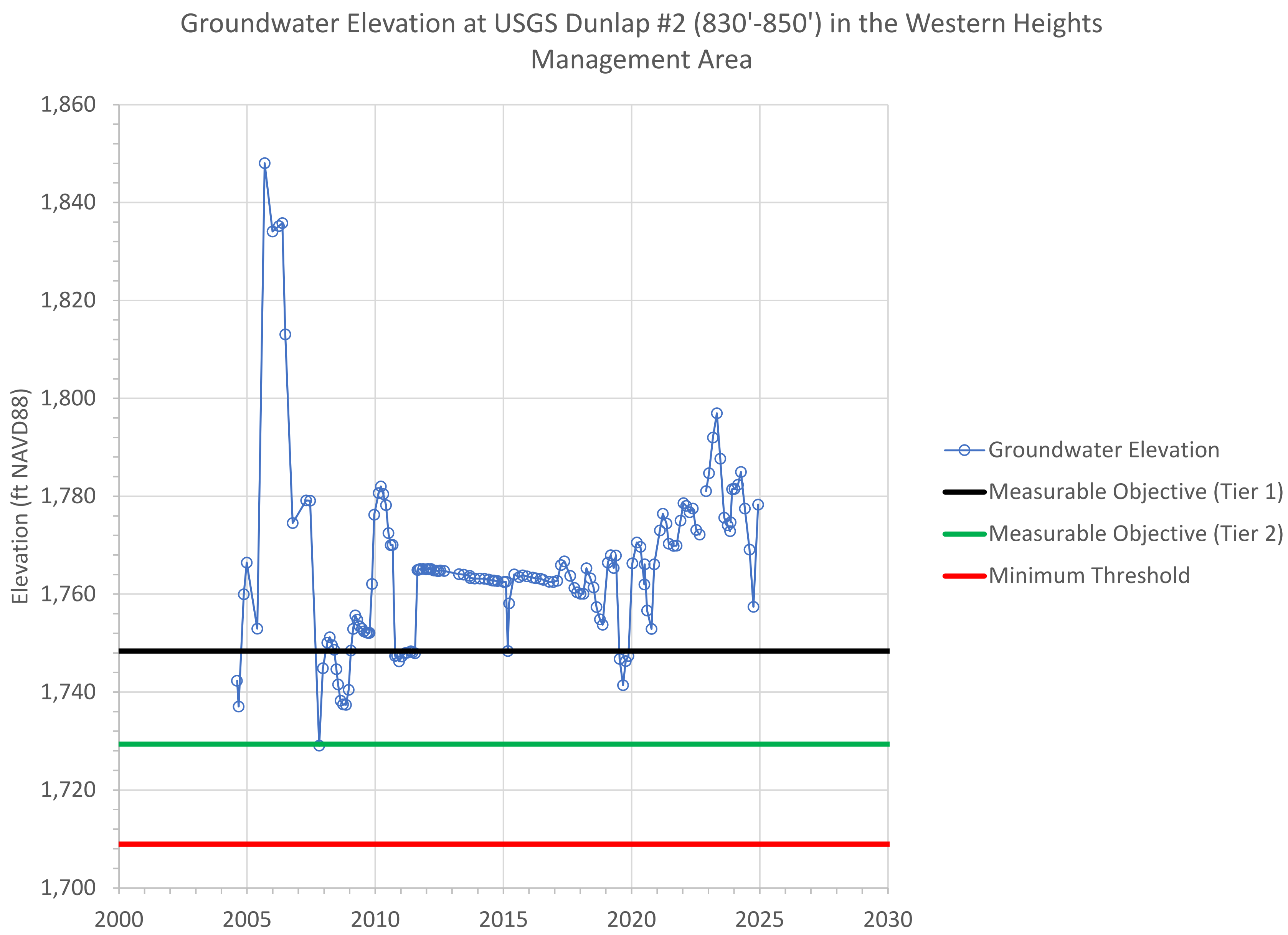
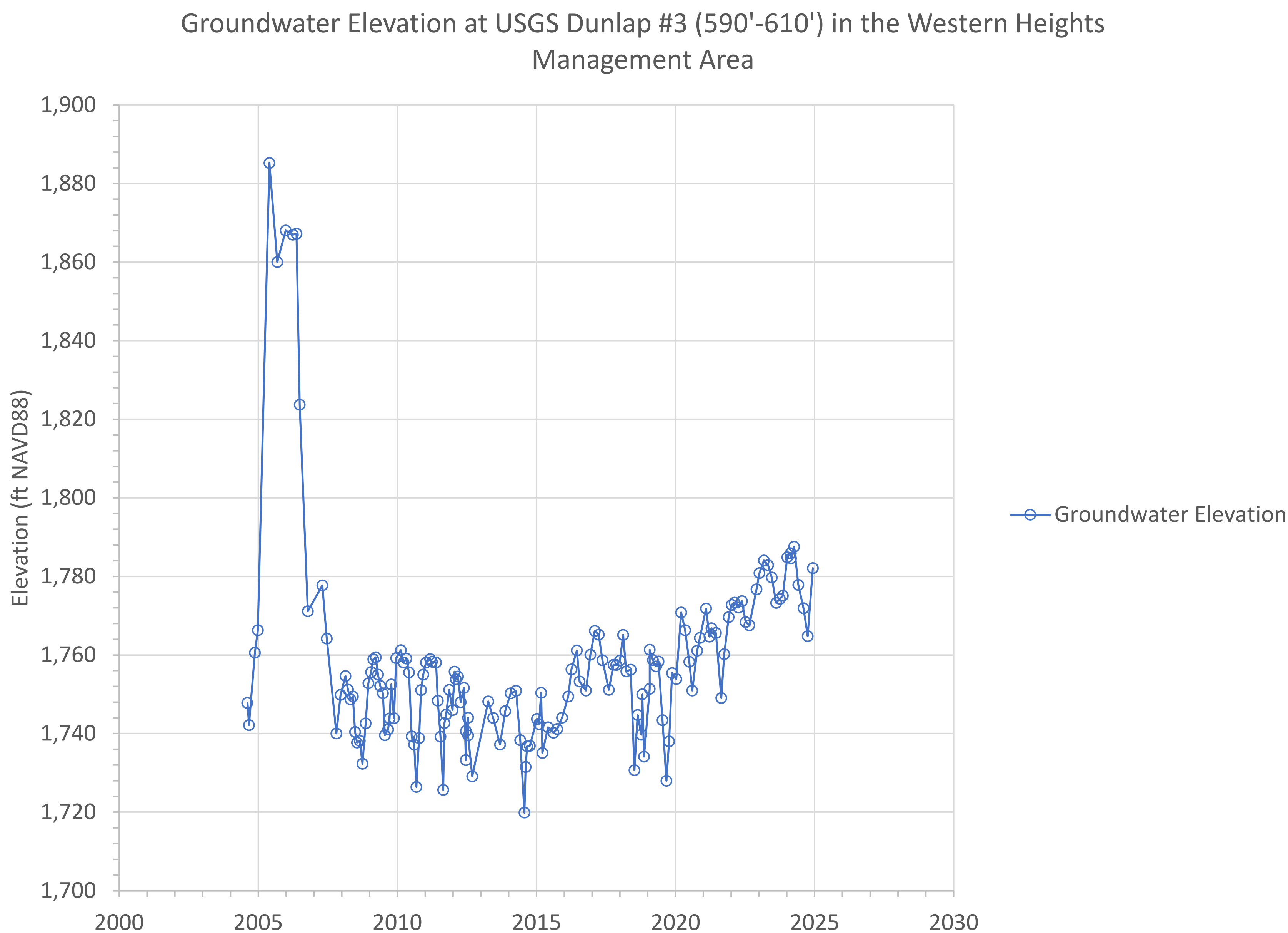
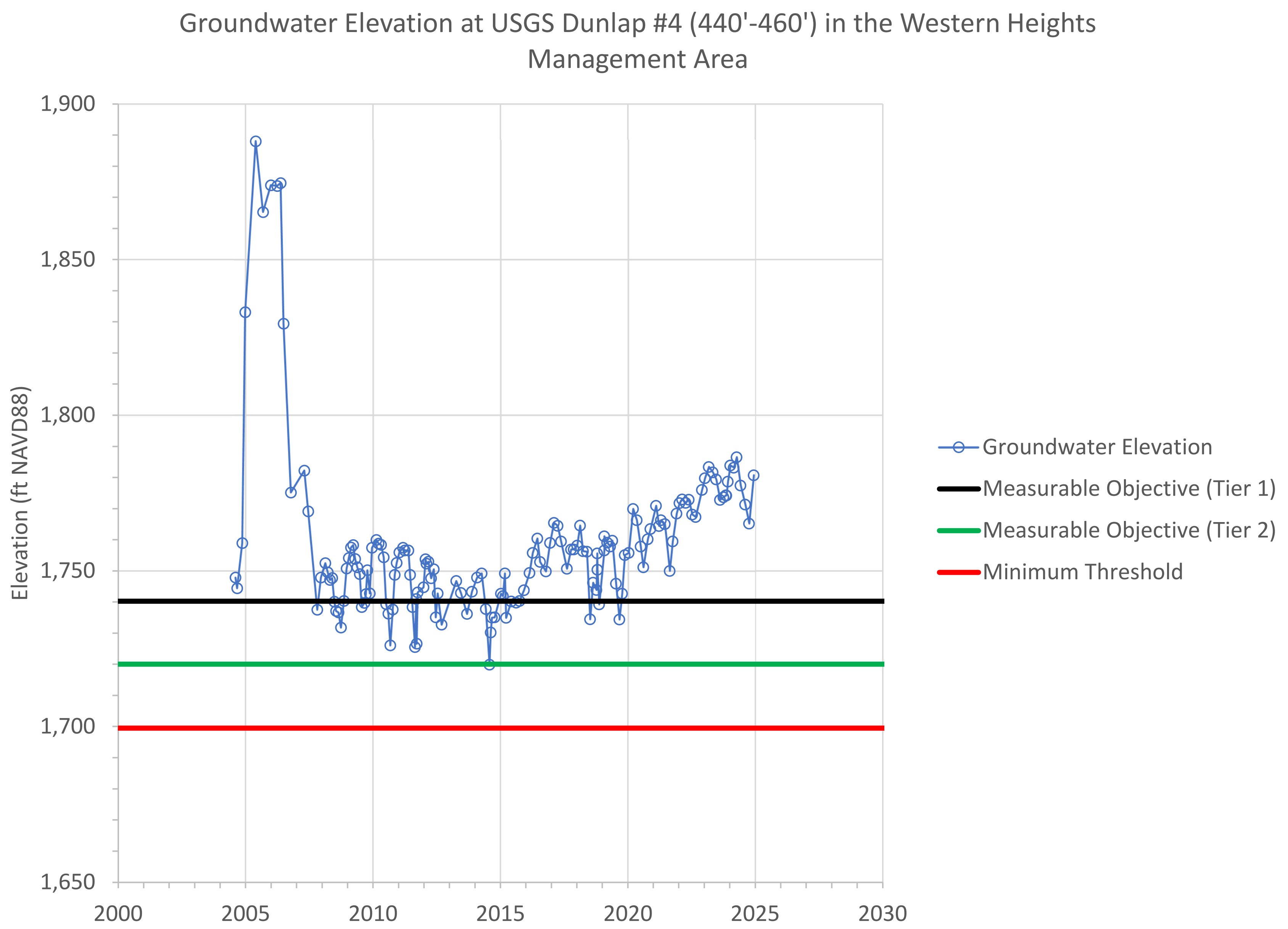

Groundwater Elevation at USGS Dunlap #2 (830'-850') in the Western Heights Management Area
Elevation (ft NAVD88)
1,860
1,840
1,820
1,800
1,780
1,760
1,740
1,720
1,700
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-63



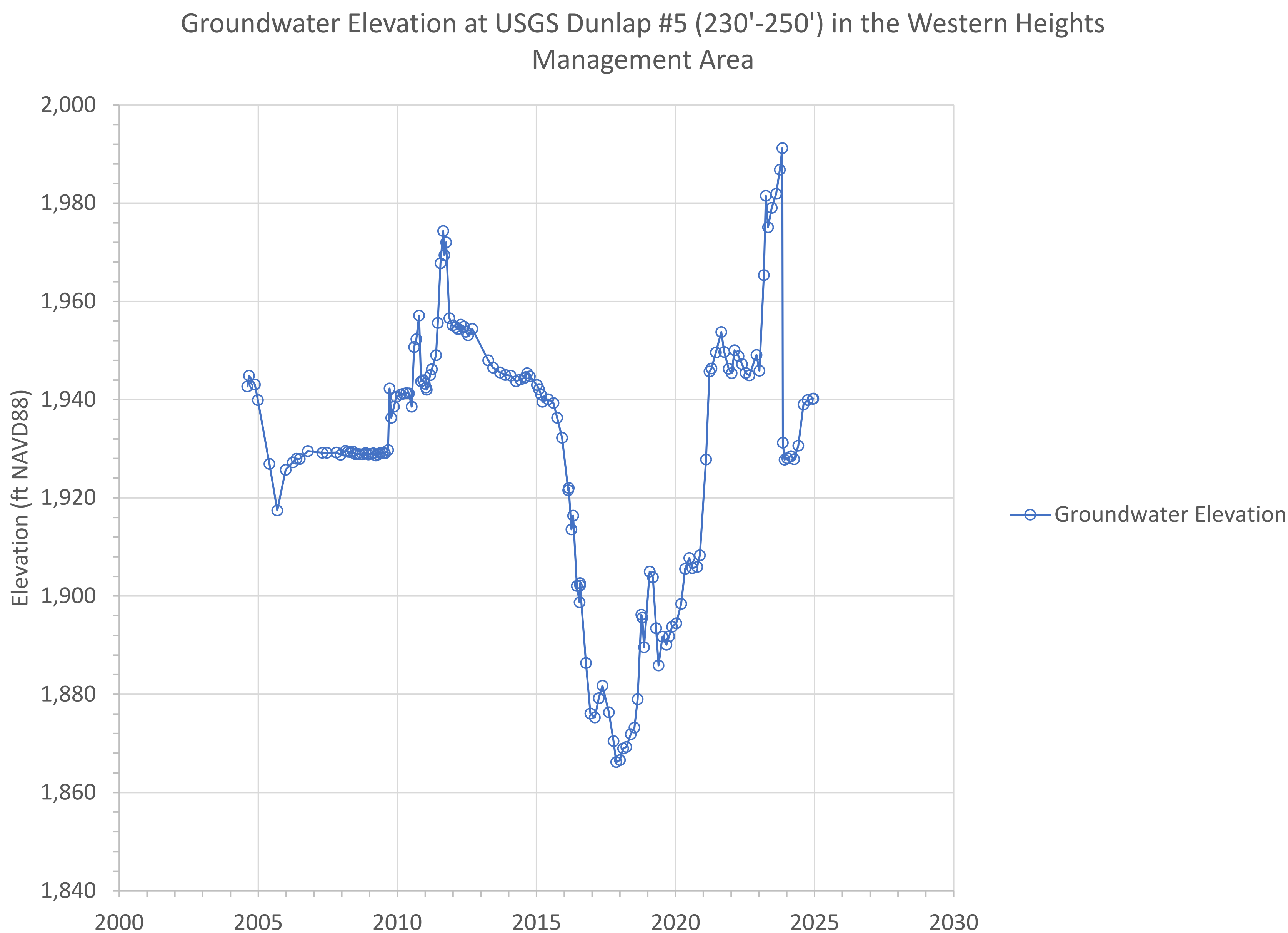
Groundwater Elevation at USGS Dunlap #3 (590'-610') in the Western Heights Management Area
Elevation (ft NAVD88)
1,900
1,880
1,860
1,840
1,820
1,800
1,780
1,760
1,740
1,720
1,700
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-64



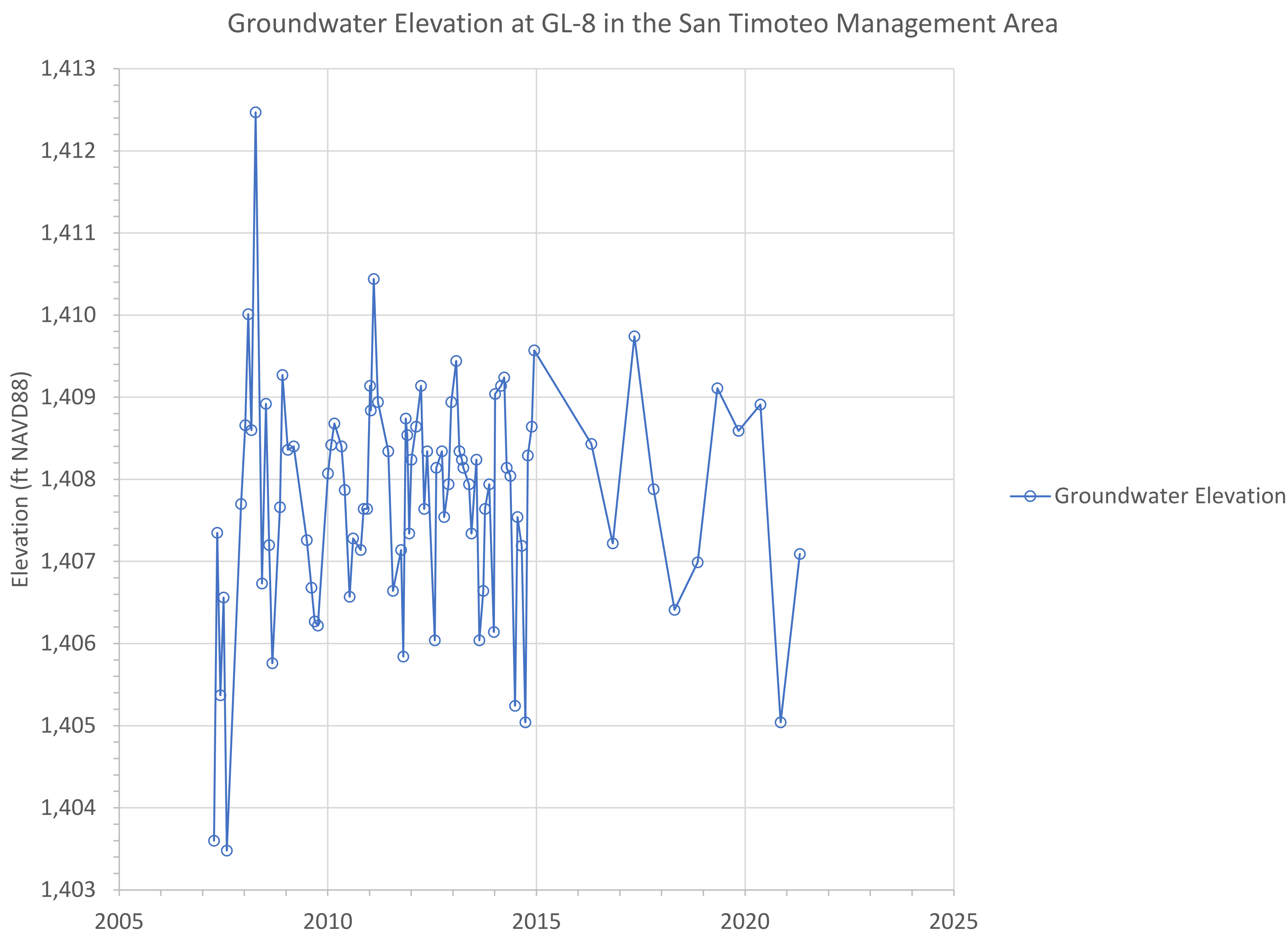
Groundwater Elevation at USGS Dunlap #4 (440'-460') in the Western Heights Management Area
Elevation (ft NAVD88)
1,900
1,850
1,800
1,750
1,700
1,650
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation
Measurable Objective (Tier 1)
Measurable Objective (Tier 2)
Minimum Threshold

Figure A-65



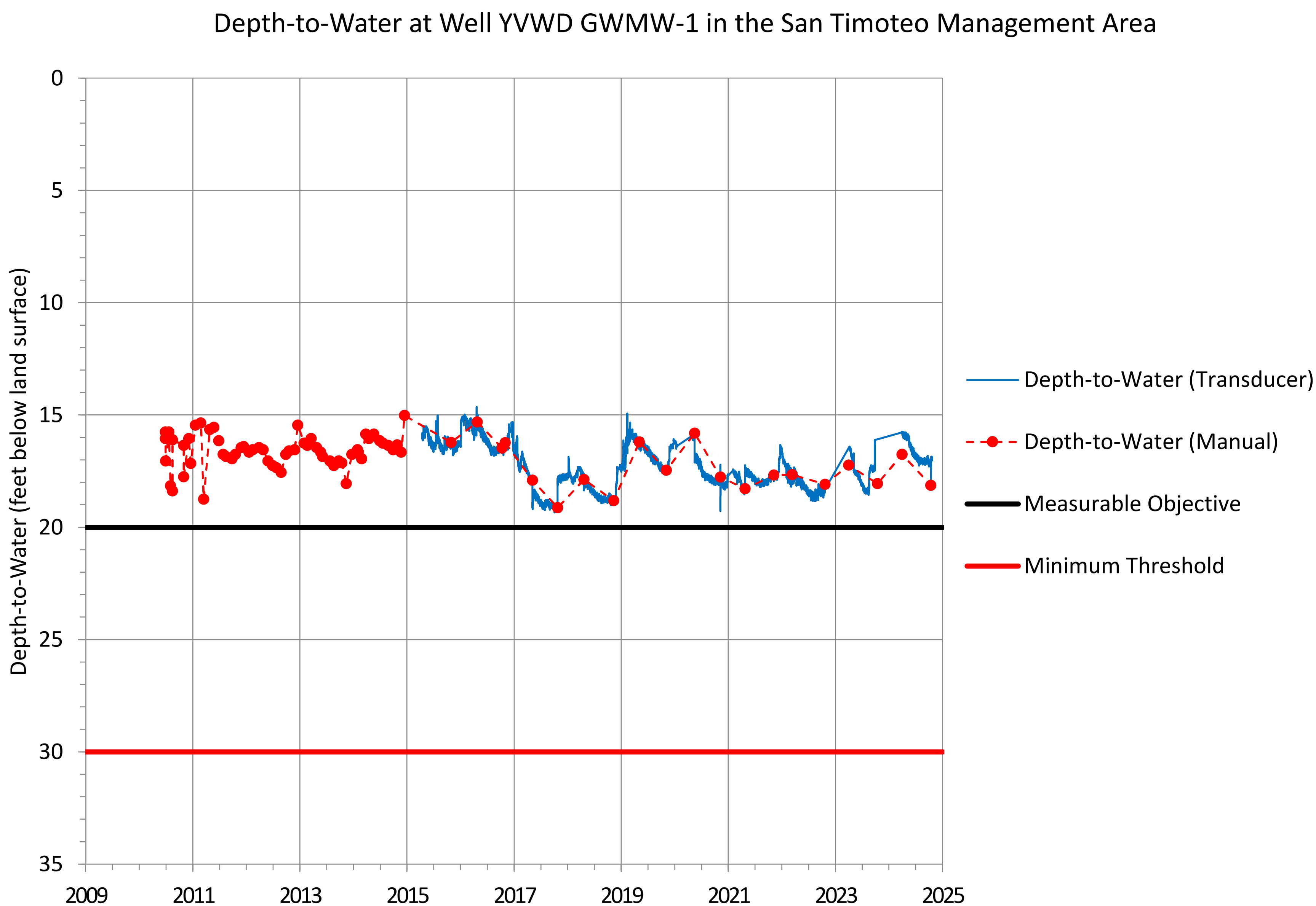
Groundwater Elevation at USGS Dunlap #5 (230'-250') in the Western Heights Management Area
Elevation (ft NAVD88)
2,000
1,980
1,960
1,940
1,920
1,900
1,880
1,860
1,840
2000
2005
2010
2015
2020
2025
2030
Groundwater Elevation

Figure A-66



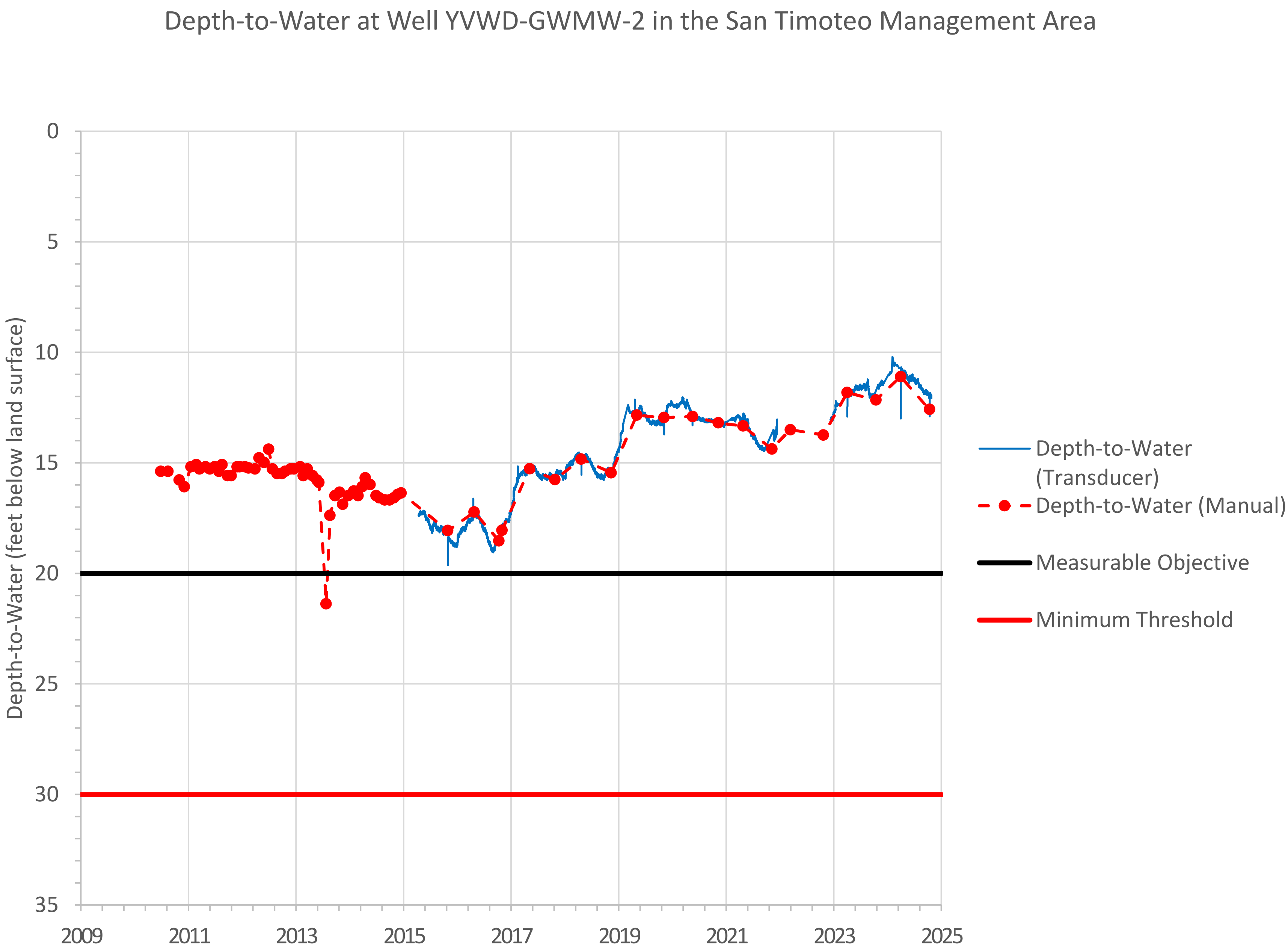
Groundwater Elevation at GL-8 in the San Timoteo Management Area
Elevation (ft NAVD88)
1,413
1,412
1,411
1,410
1,409
1,408
1,407
1,406
1,405
1,404
1,403
2005
2010
2015
2020
2025
Groundwater Elevation

Figure A-67



Depth-to-Water at Well YVWD GWMW-1 in the San Timoteo Management Area
Depth-to-Water (feet below land surface)
0
5
10
15
20
25
30
35
2009
2011
2013
2015
2017
2019
2021
2023
2025
Depth-to-Water (Transducer)
Depth-to-Water (Manual)
Measurable Objective
Minimum Threshold

Figure A-68



Depth-to-Water at Well YVWD-GWMW-2 in the San Timoteo Management Area
Depth-to-Water (feet below land surface)
0
5
10
15
20
25
30
35
2009
2011
2013
2015
2017
2019
2021
2023
2025
Depth-to-Water (Transducer)
Depth-to-Water (Manual)
Measurable Objective
Minimum Threshold

Figure A-69

Depth-to-Water at Well YVWD GWMW-3 in the San Timoteo Management Area

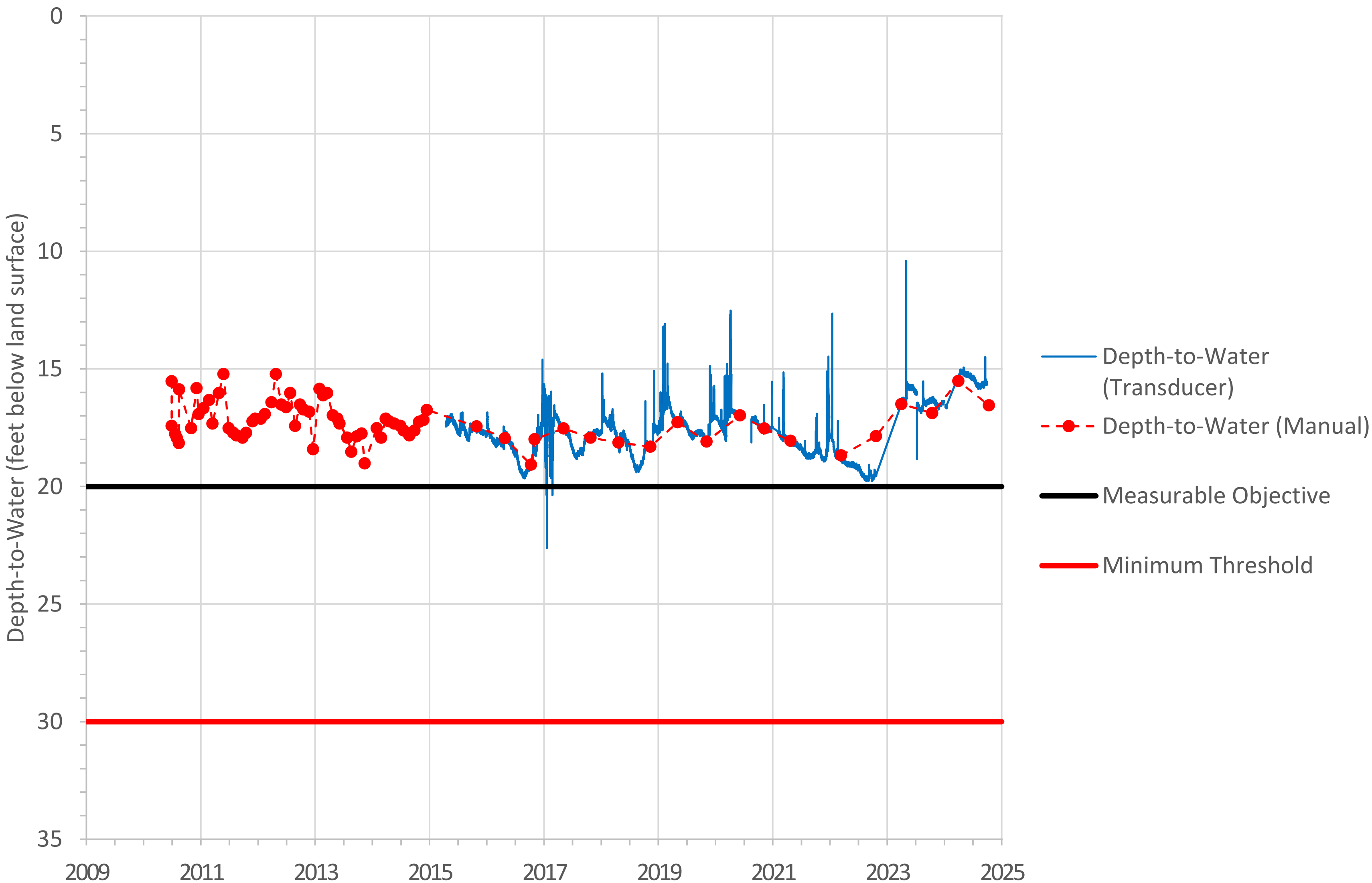
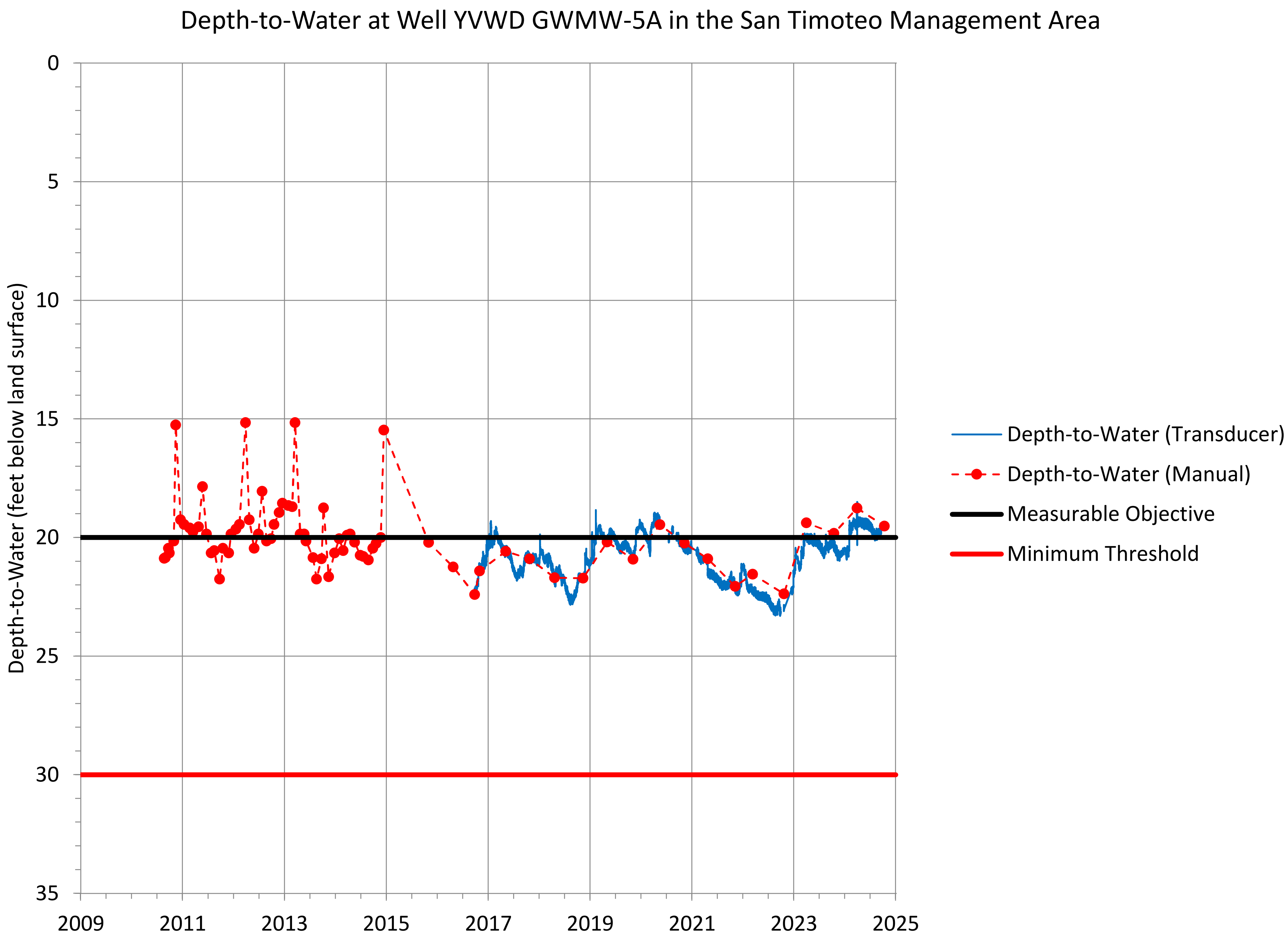


Figure A-70



Depth-to-Water at Well YVWD GWMW-5A in the San Timoteo Management Area
Depth-to-Water (feet below land surface)
0
5
10
15
20
25
30
35
2009
2011
2013
2015
2017
2019
2021
2023
2025
Depth-to-Water (Transducer)
Depth-to-Water (Manual)
Measurable Objective
Minimum Threshold

Figure A-71

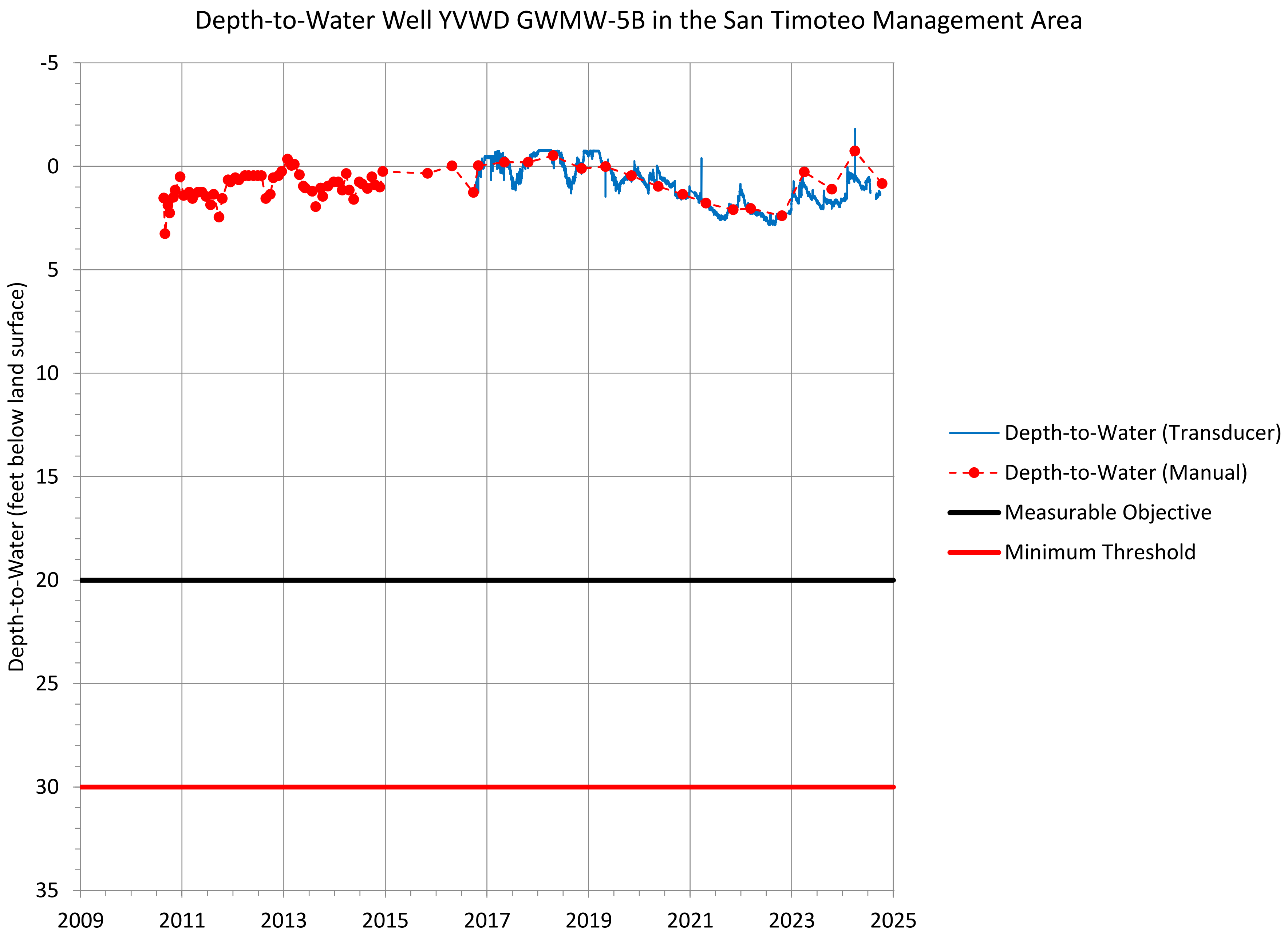

Depth-to-Water Well YVWD GWMW-5B in the San Timoteo Management Area
Depth-to-Water (feet below land surface)
-5
0
5
10
15
20
25
30
35
2009
2011
2013
2015
2017
2019
2021
2023
2025
Depth-to-Water (Transducer)
Depth-to-Water (Manual)
Measurable Objective
Minimum Threshold

Figure A-72

No Hydrograph for YVWD GWMW – 5C because well is artesian and no hydraulic heads have been measured to date. The Yucaipa GSA will look into measuring a pressure head at this well and convert it to hydraulic head to characterize conditions at the depth the well is screened (340’ to 360’ below land surface).

Figure A-73

APPENDIX B

Historical Water Budget Analysis for the Yucaipa Subbasin

Water Year[A]	Water Year Type	Appendix B - Historical Water Budget For the Yucipa Subbasin										
		Individual Components of the Basin Water Budget Reported in Units of Acre-Feet (AF)										
		Inflows to Groundwater System										
					Underflows into basin							
		Stream Leakage	Return Flows[B]	Precipitation Recharge	San Timoteo Subbasin	Beaumont Basin	SBBA	San Bernardino Mtns	Crafton Hills	Wildwood Canyon and Yucaipa Hills	Surface Water Spreading	Total Basin Inflows
1965	Normal	9,416	2,101	2,209	6,511	2,023	269	1,455	47	2,732	21	26,782
1966	Above Normal	10,441	2,101	5,153	6,449	2,115	248	1,596	46	2,791	10	30,948
1967	Wet	10,656	2,101	4,957	6,382	2,212	234	1,705	44	2,832	6	31,128
1968	Normal	9,688	2,107	3,166	6,379	2,232	229	1,837	43	2,861	1	28,542
1969	Wet	12,421	2,101	11,878	6,300	2,251	209	2,374	43	3,016	45	40,638
1970	Dry	10,341	2,515	4,557	6,313	2,148	185	2,298	41	3,187	4	31,589
1971	Below Normal	10,382	2,439	4,088	6,327	2,204	174	2,453	41	3,075	3	31,187
1972	Dry	10,002	2,446	3,302	6,356	2,223	169	2,295	41	3,016	5	29,855
1973	Above Normal	10,912	2,439	5,141	6,286	2,197	165	2,241	41	2,951	16	32,390
1974	Below Normal	10,663	2,392	4,457	6,267	2,128	161	2,070	40	3,036	26	31,241
1975	Normal	10,059	2,571	3,316	6,263	1,975	157	2,021	39	3,005	23	29,428
1976	Normal	10,530	2,641	4,050	6,282	1,820	156	2,077	39	2,958	10	30,566
1977	Below Normal	10,098	2,634	4,238	6,246	1,720	160	2,093	39	2,929	5	30,163
1978	Wet	13,296	2,634	16,145	6,210	1,883	158	2,517	38	3,311	74	46,266
1979	Above Normal	12,654	2,634	9,423	6,251	1,845	139	2,618	35	3,642	51	39,293
1980	Wet	15,176	3,278	15,677	6,351	1,580	126	3,033	34	3,958	120	49,332
1981	Dry	12,933	3,483	6,838	6,413	1,187	119	2,842	32	4,029	61	37,938
1982	Above Normal	13,988	3,483	8,545	6,452	927	119	2,987	33	3,823	101	40,456
1983	Wet	14,684	3,483	11,157	6,457	788	116	2,913	31	3,857	79	43,565
1984	Dry	12,179	3,492	6,583	6,475	684	108	2,581	29	3,978	93	36,202
1985	Below Normal	12,335	5,337	6,275	6,467	652	102	2,555	29	3,861	99	37,714
1986	Normal	12,023	5,961	5,568	6,459	513	98	2,505	29	3,741	82	36,979
1987	Dry	11,289	5,961	4,170	6,430	438	96	2,385	30	3,640	90	34,529
1988	Below Normal	11,108	5,978	3,721	6,411	400	99	2,304	30	3,533	97	33,682
1989	Below Normal	10,602	5,961	3,336	6,375	382	106	2,122	30	3,433	84	32,431
1990	Dry	10,285	2,208	2,023	6,391	442	114	1,953	31	3,349	72	26,868
1991	Above Normal	11,275	942	5,677	6,429	654	124	1,959	31	3,334	72	30,498
1992	Above Normal	11,389	945	5,911	6,464	832	127	1,986	31	3,430	48	31,164
1993	Wet	14,133	1,173	17,007	6,483	954	128	2,434	29	3,879	117	46,338
1994	Below Normal	12,201	1,195	5,643	6,561	964	109	2,454	28	4,023	52	33,229
1995	Wet	15,315	1,489	12,358	6,618	936	111	2,873	27	4,046	116	43,890
1996	Dry	13,062	1,592	5,069	6,722	975	97	2,530	25	4,114	25	34,213
1997	Above Normal	12,896	1,588	5,442	6,768	1,086	88	2,470	25	3,966	59	34,388
1998	Wet	15,355	1,588	12,254	6,777	1,227	85	2,743	25	4,036	30	44,119
1999	Dry	12,540	1,588	4,722	6,784	1,275	79	2,404	24	4,131	15	33,561
2000	Dry	12,304	1,868	4,044	6,867	1,409	79	2,425	26	4,011	20	33,052
2001	Dry	12,246	1,955	3,666	6,840	1,241	84	2,417	27	3,836	14	32,326
2002	Critically Dry	10,896	1,955	2,245	6,864	1,135	90	2,206	29	3,747	46	29,213
2003	Above Normal	11,589	1,955	3,589	6,847	1,219	98	2,133	29	3,606	703	31,768
2004	Dry	10,939	1,961	2,926	6,849	1,212	106	1,988	30	3,581	632	30,224
2005	Wet	13,561	2,831	11,620	6,795	1,205	106	2,257	30	3,757	147	42,309

Appendix B - Historical Water Budget For the Yucipa Subbasin

Individual Components of the Basin Water Budget Reported in Units of Acre-Feet (AF)

Inflows to Groundwater System

Water Year[A]	Water Year Type	Stream Leakage	Return Flows[B]	Precipitation Recharge	Underflows into basin						Surface Water Spreading	Total Basin Inflows
					San Timoteo Subbasin	Beaumont Basin	SBBA	San Bernardino Mtns	Crafton Hills	Wildwood Canyon and Yucaipa Hills		
2006	Below Normal	11,309	3,126	4,449	6,807	1,193	90	2,152	29	3,894	29	33,077
2007	Critically Dry	10,581	3,126	2,745	6,866	1,218	84	2,284	29	3,741	13	30,686
2008	Normal	11,284	3,135	4,099	6,877	1,234	85	2,292	29	3,580	570	33,185
2009	Below Normal	11,112	3,126	4,005	6,825	1,251	84	2,096	29	3,482	1,364	33,376
2010	Above Normal	12,416	3,787	6,687	6,752	1,222	79	1,985	28	3,465	3,575	39,997
2011	Wet	12,924	4,009	8,383	6,708	1,161	66	2,000	27	3,523	3,098	41,902
2012	Dry	11,403	4,020	4,835	6,720	1,101	52	1,886	26	3,584	2,949	36,577
2013	Dry	11,089	4,009	4,164	6,724	1,051	44	2,030	25	3,491	2,257	34,886
2014	Dry	10,633	4,009	3,544	6,731	1,013	41	2,005	25	3,398	551	31,950
2015	Below Normal	10,575	4,009	2,932	6,721	1,001	39	1,887	25	3,292	138	30,618
2016	Dry	10,579	4,020	3,665	6,699	991	39	1,752	26	3,222	50	31,042
2017	Above Normal	14,435	4,009	10,074	6,612	945	38	1,815	25	3,251	6,711	47,916
2018	Critically Dry	11,351	4,009	5,339	6,580	886	32	1,577	22	3,298	1,835	34,929
2019	Above Normal	13,734	4,009	8,753	6,552	869	27	1,799	20	3,240	4,983	43,987
2020	Normal	12,794	4,020	9,545	6,523	889	19	1,910	18	3,319	672	39,711
2021	Critically Dry	10,901	4,009	4,603	6,506	896	15	1,835	18	3,415	0	32,200
2022	Dry	10,577	4,009	4,012	6,552	851	16	1,918	21	3,344	0	31,299
2023	Wet	13,774	4,009	8,093	6,539	860	18	2,193	24	3,277	4,509	43,297
2024	Above Normal	13,099	4,020	5,787	6,565	853	18	1,903	22	3,382	6,315	41,963
Historical Average		11,874	3,026	6,131	6,551	1,246	107	2,207	31	3,487	717	35,265
Critically Dry Water Year Average		10,932	3,275	3,733	6,704	1,034	55	1,976	24	3,550	474	31,757
Dry Water Year Average		11,400	3,071	4,258	6,617	1,140	89	2,232	29	3,620	427	32,882
Below Normal Water Year Average		11,039	3,620	4,314	6,501	1,190	112	2,219	32	3,456	190	32,672
Normal Water Year Average		10,828	3,219	4,565	6,471	1,527	145	2,014	35	3,171	197	32,171
Above Normal Water Year Average		12,402	2,659	6,682	6,536	1,230	106	2,124	31	3,407	1,887	37,064
Wet Water Year Average		13,754	2,609	11,775	6,511	1,369	123	2,458	32	3,590	758	42,980

[A] Water Year corresponds to October 1 of the previous year, through September 30 of the current year

[B] Return flows consist of water that recharges the Subbasin via municipal distribution network leaks, septic system discharges and infiltration of irrigation water

Appendix B - Historical Water Budget For the Yucipa Subbasin

Individual Components of the Basin Water Budget Reported in Units of Acre-Feet (AF)

Outflows from Groundwater System

Water Year[A]	Water Year Type	ET	Subsurface Outflows						GW Discharges to Streams	GW Extractions	GW Discharge to Surface	Total Basin Outflows	Change in Groundwater Storage	
			San Timoteo Subbasin	Beaumont Basin	SBBA	San Bernardino Mtns	Crafton Hills	Wildwood Canyon and Yucaipa Hills					Annual	Cumulative
1965	Normal	2,340	8,980	740	3,281	13	0	1,925	2,199	9,920	7	29,399	-2,617	-2,617
1966	Above Normal	2,697	8,954	741	3,464	14	0	1,958	2,629	11,651	9	32,118	-1,169	-3,786
1967	Wet	2,399	8,944	760	3,516	13	0	1,954	2,792	11,099	10	31,487	-359	-4,146
1968	Normal	2,611	8,974	774	3,356	13	0	1,945	2,422	11,122	8	31,226	-2,684	-6,830
1969	Wet	2,821	8,872	766	3,650	15	0	2,072	3,967	9,830	11	32,004	8,634	1,804
1970	Dry	2,925	8,958	737	3,490	17	0	2,072	3,018	9,976	11	31,204	385	2,188
1971	Below Normal	2,774	8,981	733	3,512	18	0	2,059	3,038	9,994	10	31,121	67	2,255
1972	Dry	3,004	9,018	747	3,494	21	0	2,019	2,783	10,979	8	32,074	-2,218	36
1973	Above Normal	2,478	9,003	746	3,665	20	0	2,019	3,391	10,644	10	31,977	413	449
1974	Below Normal	2,888	9,001	736	3,688	20	0	2,007	3,109	11,717	10	33,177	-1,936	-1,487
1975	Normal	2,546	9,009	718	3,640	19	0	1,977	2,748	10,657	9	31,322	-1,894	-3,381
1976	Normal	2,662	9,020	701	3,709	18	0	1,961	2,747	10,465	8	31,292	-726	-4,107
1977	Below Normal	2,753	9,020	687	3,632	19	0	1,956	2,716	10,011	9	30,803	-640	-4,747
1978	Wet	3,137	8,931	695	3,896	19	0	2,205	4,909	10,296	14	34,103	12,163	7,417
1979	Above Normal	3,072	9,016	698	3,967	23	0	2,296	4,675	10,082	18	33,848	5,445	12,861
1980	Wet	3,550	9,010	654	4,017	25	0	2,485	6,449	10,527	20	36,737	12,596	25,457
1981	Dry	3,860	9,083	612	3,853	27	0	2,419	4,774	10,545	17	35,190	2,748	28,205
1982	Above Normal	3,152	9,079	592	4,104	30	0	2,370	5,490	9,280	19	34,118	6,338	34,543
1983	Wet	3,110	9,100	598	4,248	29	0	2,427	6,184	8,765	22	34,484	9,081	43,624
1984	Dry	4,117	9,184	597	4,005	27	0	2,429	4,257	10,649	18	35,284	918	44,542
1985	Below Normal	3,874	9,162	601	4,081	27	0	2,402	4,297	10,900	18	35,364	2,351	46,893
1986	Normal	3,857	9,176	685	4,042	26	0	2,343	4,106	10,161	19	34,415	2,564	49,457
1987	Dry	3,878	9,179	698	4,037	24	0	2,299	3,593	10,307	19	34,035	494	49,952
1988	Below Normal	3,738	9,198	762	4,057	23	0	2,260	3,459	11,172	21	34,690	-1,008	48,943
1989	Below Normal	3,885	9,166	818	4,004	22	0	2,215	3,142	11,544	20	34,816	-2,385	46,558
1990	Dry	3,689	9,156	822	3,914	21	0	2,170	2,891	11,870	19	34,551	-7,683	38,875
1991	Above Normal	3,628	9,084	683	4,031	19	0	2,186	3,403	11,928	16	34,978	-4,480	34,395
1992	Above Normal	3,662	9,131	656	4,083	18	0	2,243	3,596	12,026	16	35,431	-4,267	30,127
1993	Wet	3,989	9,037	683	4,126	22	0	2,487	5,707	11,900	21	37,971	8,367	38,495
1994	Below Normal	3,815	9,147	697	4,145	19	0	2,490	4,233	12,278	20	36,846	-3,617	34,878
1995	Wet	3,876	9,088	724	4,227	22	0	2,566	6,814	12,339	22	39,678	4,212	39,090
1996	Dry	4,352	9,211	700	4,195	21	0	2,531	5,069	13,196	17	39,293	-5,080	34,010
1997	Above Normal	4,141	9,183	709	4,231	22	0	2,489	4,894	13,548	16	39,233	-4,845	29,164
1998	Wet	3,465	9,137	696	4,464	23	0	2,568	6,870	12,888	22	40,132	3,987	33,151
1999	Dry	3,976	9,227	699	4,338	21	0	2,537	4,719	14,395	18	39,932	-6,371	26,781
2000	Dry	4,176	9,260	727	4,276	21	0	2,505	4,279	15,307	15	40,566	-7,514	19,267
2001	Dry	3,699	9,221	800	4,358	20	0	2,437	4,338	14,642	15	39,531	-7,204	12,062
2002	Critically Dry	3,864	9,234	955	4,126	21	0	2,373	3,400	15,592	12	39,577	-10,364	1,698
2003	Above Normal	3,435	9,206	946	4,294	20	0	2,344	3,722	14,766	19	38,751	-6,983	-5,285
2004	Dry	3,649	9,233	1,224	4,155	17	0	2,323	3,316	14,438	19	38,375	-8,151	-13,436
2005	Wet	3,483	9,112	1,173	4,413	19	0	2,442	5,250	13,849	19	39,759	2,550	-10,887

Water Year[A]	Water Year Type	Appendix B - Historical Water Budget For the Yucipa Subbasin												
		Individual Components of the Basin Water Budget Reported in Units of Acre-Feet (AF)												
		Outflows from Groundwater System												
		ET	Subsurface Outflows						GW Discharges to Streams	GW Extractions	GW Discharge to Surface	Total Basin Outflows	Change in Groundwater Storage	
			San Timoteo Subbasin	Beaumont Basin	SBBA	San Bernardino Mtns	Crafton Hills	Wildwood Canyon and Yucaipa Hills					Annual	Cumulative
2006	Below Normal	3,685	9,203	1,290	4,248	17	0	2,435	3,628	13,730	13	38,249	-5,172	-16,058
2007	Critically Dry	3,823	9,220	1,604	4,102	17	0	2,382	3,132	13,373	10	37,664	-6,979	-23,037
2008	Normal	3,664	9,226	1,148	4,276	17	0	2,343	3,554	11,633	17	35,878	-2,693	-25,730
2009	Below Normal	3,769	9,200	831	4,214	17	0	2,284	3,503	10,414	38	34,270	-895	-26,624
2010	Above Normal	3,635	9,165	810	4,322	18	0	2,274	4,528	10,662	112	35,527	4,470	-22,155
2011	Wet	3,740	9,145	791	4,482	17	0	2,304	4,892	10,120	128	35,618	6,283	-15,871
2012	Dry	4,066	9,227	812	4,356	16	1	2,301	3,864	10,396	98	35,136	1,441	-14,431
2013	Dry	3,806	9,190	900	4,441	16	1	2,263	3,562	10,611	79	34,868	18	-14,413
2014	Dry	3,767	9,199	1,068	4,340	16	1	2,222	3,127	12,102	29	35,870	-3,920	-18,333
2015	Below Normal	3,426	9,186	1,045	4,372	17	1	2,180	3,075	10,368	9	33,679	-3,061	-21,394
2016	Dry	3,444	9,199	920	4,439	17	1	2,138	3,027	8,149	10	31,344	-301	-21,695
2017	Above Normal	3,719	9,126	943	4,552	21	1	2,176	6,558	7,557	320	34,973	12,943	-8,752
2018	Critically Dry	3,965	9,163	1,006	4,457	20	1	2,154	3,852	9,333	191	34,141	788	-7,964
2019	Above Normal	3,649	9,122	1,035	4,674	17	1	2,176	5,957	8,559	274	35,464	8,522	558
2020	Normal	4,241	9,159	1,481	4,789	18	2	2,231	4,866	8,959	104	35,850	3,861	4,419
2021	Critically Dry	4,017	9,166	1,612	4,615	18	2	2,230	3,415	10,907	11	35,991	-3,792	627
2022	Dry	3,735	9,165	1,612	4,549	17	1	2,195	3,118	11,455	10	35,857	-4,558	-3,931
2023	Wet	3,302	9,134	1,715	4,766	18	1	2,211	5,906	7,660	178	34,891	8,405	4,475
2024	Above Normal	4,505	9,205	1,757	4,542	20	1	2,194	5,720	7,555	311	35,810	6,153	10,628
Historical Average		3,516	9,118	881	4,105	20	0	2,258	4,078	11,180	43	35,194	71	
Critically Dry Water Year Average		3,917	9,196	1,294	4,325	19	1	2,285	3,450	12,301	56	36,843	-5,087	
Dry Water Year Average		3,759	9,169	855	4,140	20	0	2,304	3,733	11,814	25	35,819	-2,937	
Below Normal Water Year Average		3,461	9,126	820	3,995	20	0	2,229	3,420	11,213	17	34,301	-1,630	
Normal Water Year Average		3,132	9,078	892	3,870	18	1	2,104	3,235	10,417	25	32,769	-598	
Above Normal Water Year Average		3,481	9,106	860	4,161	20	0	2,227	4,547	10,688	95	35,186	1,878	
Wet Water Year Average		3,352	9,046	841	4,164	20	0	2,338	5,431	10,843	43	36,079	6,902	

[A] Water Year corresponds to October 1 of the previous year, through September 30 of the current year

[B] Return flows consist of water that recharges the Subbasin via municipal distribution network leaks, septic system discharges and infiltration of irrigation water