3 Sustainable Management Criteria

3.1 Introduction to Sustainable Management Criteria

Subarticle 3 of Article 5 of the California Code of Regulations (CCR) Division 2 Chapter 1.5 (23 CCR, Sections 354.22–354.30) describes the criteria by which a Groundwater Sustainability Agency (GSA) will define conditions in a Groundwater Sustainability Plan (GSP) that constitute sustainable groundwater management. The following terms (in **bold**) were defined in the Sustainable Groundwater Management Act to guide a GSA in defining sustainability and the criteria used to evaluate whether a basin is being managed sustainably. A **sustainability goal** is defined by a GSA as a goal "that culminates in the absence of undesirable results within 20 years of the applicable statutory deadline" (23 CCR, Section 354.24). **Undesirable results** are defined by a GSA and represent condition(s) in the basin when "significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin" (23 CCR, Section 354.26). **Minimum thresholds** are quantifiable measures or conditions in a basin that "represent a point in the basin that, if exceeded, may cause undesirable results" (23 CCR, Section 354.28). A minimum threshold is defined for each sustainability indicator applicable to the groundwater basin. **Measurable objectives** are interim milestones or quantifiable thresholds established to "achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin of the planning and implementation horizon" (23 CCR, Section 354.30). Measurable objectives shall be defined to "provide a reasonable margin of operational flexibility under adverse conditions which shall take into consideration components such as historical water budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty" (23 CCR, Section 354.30).

3.2 Sustainability Goal

The sustainability goal for the Plan Area is to manage groundwater resources in a way that facilitates long-term sustainable use of groundwater in the Yucaipa Subbasin. Long-term sustainable management includes the following:

- Maintaining sufficient groundwater in storage to allow for ongoing groundwater production that meets the operational demands of South Mesa, South Mountain, Western Heights Water Company (WHWC), Yucaipa Valley Water District (YVWD), and private well users, and the regulatory commitments established in the Plan Area.
- Ensuring that groundwater production does not result in significant and unreasonable loss of groundwater-dependent ecosystems (GDEs).

The sustainability goal for the Plan Area was developed using historical groundwater elevations, groundwater in storage, and the identification of GDEs in the Plan Area as discussed in Chapter 2 of this GSP. The importation of State Water Project (SWP) water into the Yucaipa Subbasin (Subbasin) in 2003 has provided a supplemental source of water, which led to a reduction in groundwater production in the Yucaipa Subbasin. This supplemental source of water, which averaged approximately 8,000 acre-feet per year (AFY) since 2008, has led to an average reduction in groundwater production by 3,000 AFY. Consequently, groundwater levels have recovered between 50 feet in the Calimesa Management Area and 200 feet in the North Bench Management Area in the past 10 years, with the volume of groundwater in storage in the Subbasin increasing by approximately 18,000 AF. The cessation of the decline in groundwater levels observed from 1997 to 2007, and observed storage increase over the last 10 years, indicates that the Yucaipa GSA member agencies have been managing the groundwater resources in the Plan Area sustainably.

In 2017, nine agencies entered into an agreement to form the Yucaipa GSA, the GSA for the Plan Area. The nine agencies included four water purveyors (South Mesa, South Mountain, WHWC and YVWD), three municipalities (City of Calimesa, City of Redlands, and City of Yucaipa – the City Calimesa withdrew from the Yucaipa GSA in 2019), and two regionals (SBVMWD and SGPWA). The Yucaipa GSA, acting as the Yucaipa Subbasin GSA, has the authority to ensure long-term sustainable management of the groundwater resources within its jurisdiction. This authority includes adjusting groundwater production from all wells, not just municipal water supply wells in the Plan Area. The undesirable results, minimum thresholds, and measurable objectives discussed in this chapter (Sections 3.3 through 3.5) are intended to provide the metrics by which the Yucaipa GSA will decide whether pumping adjustments are necessary. The Yucaipa GSA will continue to work with stakeholders and regulatory agencies to further improve groundwater conditions within the Plan Area throughout the 50-year GSP planning and implementation horizon.

3.3 Undesirable Results

Under the Sustainable Groundwater Management Act (SGMA), undesirable results occur when groundwater conditions in the Plan Area cause significant and unreasonable effects to any of the six sustainability indicators:

- Chronic Lowering of Groundwater Levels
- Reduction of Groundwater Storage
- Degraded Water Quality
- Land Subsidence
- Depletions of Interconnected Surface Water
- Seawater Intrusion

The definition of significant and unreasonable for each of the six indicators is determined by the Yucaipa SGMA using the processes and criteria described in this GSP. The Yucaipa GSA is required to characterize undesirable results for each indicator, unless "undesirable results to one or more sustainability indicators are not present and are not likely to occur in the basin" (23 CCR, Section 354.26 [d]).

Based on the characterization of groundwater elevations, groundwater production, groundwater quality, and the hydrogeology of the principal aquifer in the Subbasin, the following sustainability indicators do not apply to the Plan Area:

- **Seawater Intrusion.** Seawater intrusion does not apply to the Plan Area because the Pacific Ocean is approximately 50 miles west of the Plan Area. The lowest elevation of the base of the principal aquifer (contact with the underlying crystalline bedrock) is 1,000 feet above North American Vertical Datum of 1988 (NAVD88), which is approximately 1,000 feet above mean sea level. Therefore, the Yucaipa Subbasin is not threatened by seawater intrusion nor the potential for seawater intrusion in the future.
- **Degradation of Water Quality**. Degradation of groundwater quality does not apply to the Plan Area as agriculture use has declined markedly since the 1950s to approximately 7% of the total land use, and the concerted efforts by the Yucaipa GSA member agencies to convert from septic systems to sanitary sewer systems has decreased nitrate and salt contributions to the aquifer. Limited contamination at some active remediation sites and the cessation of operations at the former Yucaipa Landfill have limited contamination to shallow, perched groundwater that has not impacted water quality in the principal aquifer.

The four sustainability indicators that do apply to the Yucaipa Subbasin, and which will be used to evaluate sustainable management in the Subbasin, include (1) chronic lowering of groundwater levels, (2) reduction of groundwater storage, (3) land subsidence, and (4) interconnected surface water. Descriptions of the undesirable results applicable to these four sustainability indicators are provided in Sections 3.3.1 through 3.3.6. Each section describes the cause of groundwater conditions throughout the Plan Area that would lead to undesirable results and the potential effects of undesirable results on the beneficial uses and users of groundwater in the Plan Area.

The criteria used to define groundwater conditions at which undesirable results occur is described in Section 3.3.7. These criteria are based on a quantitative combination of minimum threshold exceedances for each sustainability indicator.

3.3.1 Chronic Lowering of Groundwater Levels

Chronic lowering of groundwater levels indicating a depletion of supply is an undesirable result applicable to the Plan Area. The primary cause leading to chronic lowering of groundwater levels is groundwater production in excess of natural and artificial recharge over a period that contains both wet and dry water years. Chronic lowering of groundwater levels is also associated with a reduction of groundwater storage, potential significant and unreasonable effects to GDEs and land subsidence.

A chronic lowering of groundwater levels was observed in the Calimesa Management Area from 1988 to 2007 when annual groundwater production exceeded the estimated sustainable yield of 4,955 AFY in this management area (Figure 2-69). The average groundwater level in 1988 was approximately 2,180 feet above NAVD88. The average groundwater level in 2007 was approximately 2,060 feet above NAVD88, a decline of approximately 120 feet over 19 years at a rate of 6.3 feet per year. A chronic lowering of groundwater levels was observed in the Western Heights Management Area from the late 1960s to 2008 when annual groundwater production exceeded the estimated sustainable yield of 1,760 AFY for the management area (Figure 2-71). Groundwater levels declined from approximately 1,900 feet above NAVD88 in 1965 to approximately 1,750 feet above NAVD88 in 2010, a rate of decline of approximately 5.6 feet per year. The chronic lowering of groundwater levels observed in these two management areas occurred in periods with wet water years having annual precipitation ranging from 167% to 231% of mean annual rainfall (Figure 2-35).

Groundwater levels in the North Bench Management Area fluctuated in response to the climatic variations observed between wet and dry water year types. However, groundwater levels markedly declined from 1999 to 2007 when groundwater production exceeded the estimated sustainable yield of 3,940 AFY for the North Bench Management Area, a period when six of the nine water years were characterized as dry and critically dry water year types (Figure 2-66). During this period, groundwater levels fell from an average 2,450 feet above NAVD88 to 2,300 feet above NAVD88, a rate of decline of approximately 18 feet per year. Groundwater levels after 2007 recovered to levels observed in 1999 or higher as the importation of SWP water supplemented the water supply in the Plan Area and groundwater production subsequently declined to less than the estimated sustainable yield of 3,940 AFY for the North Bench Management Area.

There are no municipal supply wells in the San Timoteo Management Area. Groundwater levels in San Timoteo Canyon are shallow and sustain the riparian GDE along San Timoteo Creek. A deeper, confined aquifer unit is artesian. No chronic lowering of groundwater levels has been observed in the San Timoteo Management Area.

Chronic lowering of groundwater levels may impact beneficial uses of groundwater in the Plan Area. Chronic lowering of groundwater levels may impact well operations in the Subbasin and cause undesirable results if groundwater levels drop to elevations below which:

- The volume of groundwater available in storage is insufficient to meet public water supply demands.
- Subsidence that substantially interferes with land use is induced.
- Depletion of interconnected surface water that leads to a decline of the water table that threatens GDEs.

Well construction information, production history, and historical water levels were used to develop sustainable management criteria for the Calimesa, North Bench, San Timoteo, and Western Heights Management Areas. The minimum thresholds defined for the Calimesa, North Bench, and Western Heights Management Areas were based on the condition when groundwater elevations declined below a drought buffer established for each management area (Section 3.4, Minimum Thresholds). Therefore, the criterion used to define undesirable results associated with a chronic lowering of groundwater levels is a groundwater elevation measured below a drought buffer at a network of representative monitoring points (RMPs). The undesirable result defined for the San Timoteo Management Area was based on the condition when shallow groundwater levels supporting GDEs fell below 30 feet below ground surface (bgs) as a result of pumping from the principal aquifer.

Groundwater elevations that decline below a drought buffer or to levels that threaten GDEs are lower than historical low water levels. However, groundwater elevations that drop below historical low water levels may be required to ensure ongoing beneficial use of groundwater for municipal supplies. The sustainability criteria established in this GSP allow for groundwater levels to fall below the historical lows observed in the four management areas in the Plan Area, but under such conditions the Yucaipa GSA will implement management actions to reduce the net loss of groundwater from the management areas by reducing groundwater extractions, supplement the groundwater supply with other sources of water (e.g., SWP water, recycled water, increased stormwater capture for recharge), or a combination of both (Section 4.2, Management Actions).

3.3.2 Reduction of Groundwater Storage

Significant and unreasonable reduction of groundwater storage is an undesirable result applicable to the Plan Area. Reduction of groundwater storage is associated with a chronic lowering of groundwater levels, and potential significant and unreasonable effects to GDEs and land subsidence. The primary cause for a reduction of groundwater storage is groundwater production in excess of natural and artificial recharge during a period containing both wet and dry water years. Significant and unreasonable reduction of groundwater storage would impact beneficial uses and users of groundwater in the Plan Area by limiting the volume of groundwater available for municipal, private and agricultural uses.

Groundwater elevations in the Plan Area will be used to evaluate whether significant and unreasonable reduction of groundwater storage occurs. Groundwater elevations, and the corresponding volume of groundwater storage, have either stabilized or increased in the Plan Area since 2007 with the importation of SWP water as a supplemental water supply and subsequent reduction in groundwater production (see Section 2.7). The Yucaipa Integrated Hydrologic Model (YIHM) indicates that groundwater management from 2009 to 2014 resulted in an increase in groundwater storage of approximately 8,300 AF in the Yucaipa Subbasin.

Under projected operations, groundwater in storage is estimated to increase by approximately 23,300 AF to 42,300 AF under the Future Baseline and Future Baseline with Climate Change I scenarios, or decrease by approximately 4,200 AF under the Future Baseline with Climate Change II scenario over the 50-year planning and implementation horizon for this GSP (see Section 2.8.7).

Well construction information, production history, and historical water levels were used to develop sustainable management criteria for the Western Heights, North Bench, Calimesa and San Timoteo Management Areas to indicate when significant and unreasonable reduction of groundwater in storage would occur. The criterion used to define an undesirable result associated with reduction of groundwater storage for each management area is when groundwater levels fall below a drought buffer established for each management area. Groundwater elevations that

represent the condition below the drought buffer are lower than historical low water levels. However, reduction of groundwater storage beyond that previously experienced in the Plan Area may be required to maintain operational flexibility to ensure ongoing beneficial use of groundwater.

3.3.3 Land Subsidence

Land subsidence resulting from groundwater withdrawal is an undesirable result applicable to the Plan Area. Groundwater levels that fall below historical low levels may cause subsidence because groundwater acts to reduce the effective stress needed to maintain pore-structures in the aquifer. As groundwater levels decline, pressure on the aquifer matrix increases, which may cause the pore-structure to collapse, causing the land surface to subside. Land subsidence resulting from groundwater withdrawals that substantially interferes with surface land uses has the potential to impact beneficial uses and users of groundwater in the Plan Area by negatively impacting surface infrastructure including roads, pipelines, and buildings.

Historical records of land subsidence in the Plan Area do not indicate that land subsidence resulting from past groundwater production from the principal aquifer has caused an undesirable result. Land subsidence data obtained from the SGMA Data Portal (sgma.water.ca.gov) indicated a range of subsidence for the Plan Area from 0.0 feet to 0.054 feet, or 0.65 inches, from June 2015 to October 1, 2018 (Figure 2-55). This does not constitute a significant and unreasonable vertical displacement of land surface that "substantially interferes with surface land uses and may lead to undesirable results" (23 CCR, Section 354.28[c][5]). Land subsidence observed in the Plan Area was attributed to past geological activity and displacement (Section 2.7.7). For instance, land displacement data obtained from a GPS station located at the Crafton Hills College in the Western Heights Management Area from January 1996 through September 2018 indicated a positive displacement of 0.18 feet (Figure 3-1, 31-Day Running Average of Vertical Displacement Measured at the Crafton Hills College). This displacement represents a possible uplift of the Crafton Hills as a result of tectonic activity associated with the Crafton Hills Fault Zone. No land subsidence associated with groundwater production was indicated by this GPS station.

Because the minimum thresholds established in Section 3.4 are based on groundwater elevations at or below the historical low groundwater elevations observed in the Plan Area, there exists the potential for land subsidence to occur should groundwater levels fall below the historical lows over a long period. Subsidence related to declining groundwater levels as a result of groundwater withdrawals cannot be directly measured in the Plan Area, so the minimum thresholds established for the chronic lowering of groundwater levels will be used as a surrogate for direct measurements of land subsidence. Should groundwater levels fall below the historical lows and persist at such a level for more than 12 months, then the Yucaipa GSA will refer to the InSAR data set included in the SGMA Data Portal and periodically obtain future data to compare to the baseline dataset compiled from June 2015 to October 1, 2018. This evaluation will determine if land subsidence has occurred as a result of groundwater withdrawals from the principal aquifer (Section 2.7.7).

3.3.4 Depletions of Interconnected Surface Water

Loss of interconnected surface water is an undesirable result that may be applicable to the Plan Area if groundwater level declines result in a significant and unreasonable reduction in the rate of the volume of surface water caused by groundwater production and/or the loss of GDEs. Observation wells set in the principal aquifer in the reach of San Timoteo Creek in the Plan Area are under artesian conditions, indicating an upward hydraulic gradient, and are interconnected to surface water and groundwater. There are no municipal water supply wells operating in the San

Timoteo Creek area. There are two known irrigation supply wells. Historical groundwater elevations measured at observation wells and one of the irrigation wells indicate that groundwater elevations have been consistent. Any future new production from the principal aquifer in the San Timoteo Creek area will include aquifer testing to evaluate whether such production will cause a significant and unreasonable depletion in surface water flow.

The NCCAG dataset reviewed for this GSP identified 37 habitats within the Plan Area that consist of common phreatophytes. These habitats were grouped into "GDE Evaluation Units" based on the locations of the habitats. Three GDE Evaluation Units were identified as having GDEs within the Plan Area (Section 2.7.8). These habitats lie along the banks of Oak Glen Creek in the northern part of the Oak Glen subarea, Wildwood Canyon Creek in the southeastern part of the Oak Glen subarea, and San Timoteo Creek in the Live Oak subarea (Figure 2-56). The GDEs adjacent to Oak Glen Creek and Wildwood Canyon Creek occur along the upstream reaches of these creeks. The GDE located along San Timoteo Creek is located downstream of its confluence with Yucaipa Creek. Other GDE Evaluation Units were characterized as either potential GDEs or ecosystems not dependent on groundwater.

Groundwater level declines have the potential to negatively impact the GDEs along the banks of Oak Glen Creek, Wildwood Canyon Creek, and San Timoteo Creek. These GDEs cover an area of approximately 268 acres. A significant and unreasonable loss of GDE habitat may occur if there is a long-term decline in groundwater levels below 30 feet bgs. Historical groundwater level data collected at shallow groundwater observation wells completed adjacent to Oak Glen Creek and San Timoteo Creek have demonstrated seasonal fluctuations in response to major precipitation events and subsequent runoff. Long-term trends in groundwater levels have been stable. The San Timoteo Habitat Monitoring Program (see Section 1.5.1.2) includes a management action to maintain shallow groundwater at 10 feet bgs, which is more stringent and protective of the GDE habitat than the 30 feet bgs characterizing undesirable results.

The GDEs located in the upper elevations of Wildwood Canyon and Oak Glen are sustained by shallow groundwater not influenced by pumping. The remaining potential GDEs in the Plan Area are not adjacent to current groundwater production wells, and groundwater levels in the vicinity of these potential GDEs are not known. Because the potential GDEs are not located near existing or currently planned groundwater extraction wells, it is not anticipated that they will be impacted by future extractions within the Plan Area. However, in the event that future groundwater production is planned within a mile of a potential GDE, additional investigations will be performed to identify whether the potential GDE relies on groundwater, and whether the planned production may negatively impact the potential GDE. If the potential GDE is found to rely on groundwater and planned production may impact groundwater levels in the vicinity of the potential GDE, sustainability criteria related to the depletion of interconnected surface water will be established to protect against the significant and unreasonable loss of GDE habitat.

3.3.5 Degraded Water Quality

Impacts to groundwater supplies as a result of degradation of groundwater quality is not an undesirable result applicable to the Plan Area. The Yucaipa GSA member agencies have implemented programs to reduce the use of fertilizers, self-generating water softeners, and septic systems to improve groundwater quality, while at the same time increasing the capacities of wastewater treatment facilities to reduce TDS and nitrate concentrations of tertiary treated effluent (i.e., recycled water) discharged to surface waters and used for irrigation purposes (Section 2.7.4).

YVWD implemented a program in the 1980s and 1990s to provide sanitary sewer service throughout the Yucaipa Subbasin, which included an incentive program to abandon septic systems and connect to a collector sewer main. YVWD issued an ordinance to prohibit the use of self-generating water softeners. The goal of these two efforts was

to reduce the concentrations of TDS and nitrate in the wastewater directly to the Subbasin via septic systems and to the sanitary sewer systems. Some septic systems remain in the Western Heights Management Area, but wastewater flows from those systems impact groundwater quality in a shallow, perched aquifer and have not impaired water quality in the principal aquifer.

Agricultural use in the Plan Area has declined from a peak in the 1930s and 1940s (approximately 4,000 AFY) to approximately 400 AFY in the 2000s over 7% of the land use in the Plan Area. Other occurrences of groundwater quality degradation were localized and confined to shallow groundwater in a perched zone in the Western Heights subarea and at the former Yucaipa Landfill in the Crafton subarea (Section 2.7.5). Contamination observed in the shallow groundwater at these locations has not impaired water quality in the principal aquifer.

The Regional Board adopted order number R8-2014-0005 in 2014, an amendment to the Basin Plan that revised the maximum benefit commitments in the Yucaipa, San Timoteo and Beaumont GMZs. The Yucaipa GMZ includes the North Bench, Western Heights and most of the Calimesa (area north of the Banning Fault) Management Areas. The San Timoteo GMZ includes the San Timoteo Management Area and a portion of the Live Oak and Singleton hydrogeological subareas in the Calimesa Management Area (Figure 2-64). The maximum benefit water quality objectives established for TDS and nitrate (as N) for these GMZs were defined as the water quality objectives in the Basin Plan.

YVWD has implemented reverse osmosis and denitrification treatment processes at the WRWRF that have markedly reduced TDS and nitrate concentrations in the tertiary treated effluent (i.e., recycled water) discharged to San Timoteo Creek or served via YVWD's recycled water distribution system. The implementation of RO and denitrification treatment at the YVWD WRWRF facility has reduced the TDS and nitrate concentrations in recycled water to an average <300 mg/L and 2.8 mg/L, respectively. The maximum benefit water quality objectives (and Basin Plan water quality objectives) for TDS and nitrate (as N) are 370 mg/L and 5.0 mg/L, respectively, in the Yucaipa GMZ. The maximum benefit water quality objectives (and Basin Plan water quality objectives) for TDS and nitrate (as N) in the San Timoteo GMZ are 400 mg/L and 5.0 mg/L, respectively. The application of recycled water for irrigation purposes has not increased TDS and nitrate (as N) concentrations in the principal aquifer.

In summary, concerted efforts by the Yucaipa GSA member agencies to improve water quality by removing septic systems and connecting users to sanitary sewer systems, increasing wastewater treatment capacities and implementing advanced treatment technologies, along with a marked reduction in water use for agricultural purposes, has improved water quality throughout the Subbasin. Water quality issues only occur in localized areas (e.g., former Yucaipa landfill, active remediation of shallow groundwater in the Western Heights Management Area) that have not impacted water quality in the principal aquifer. Therefore, there are no water quality issues that may affect the long-term supply and beneficial uses of groundwater produced from the principal aquifer.

3.3.6 Seawater Intrusion

The Plan Area is approximately 50 miles inland and approximately 1,300 feet higher in elevation at its lowest point to the Pacific Ocean. Because operations in the Plan Area do not impact groundwater elevations near the coast, seawater intrusion is not defined as an undesirable result in the Plan Area.

3.3.7 Defining Undesirable Results

Groundwater conditions in the Plan Area are currently monitored with a network of 77 wells (Table 3-1; Section 3.6, Monitoring Network). In total, 36 of these wells were selected as RMPs for the Plan Area (Section 3.6.5, Representative Monitoring). The Plan Area is divided into four Management Areas: North Bench, Calimesa, Western Heights, and San Timoteo (Section 2.9). Eight YVWD wells and two USGS wells (Wilson Creek nested wells) were selected as the RMPs for the North Bench Management Area. Four YVWD wells, four South Mesa wells, one South Mountain well, and four USGS wells (two from the 6th Street and two from the Equestrian Park nested wells) were selected as the RMPs for the Calimesa Management Area. Five WHWC wells and two USGS wells (Dunlap nested wells) were selected as the RMPs for the Western Heights Management Area. The San Timoteo Management Area does not currently have municipal supply wells operating within it but does include six shallow groundwater observation wells that have been designated as RMPs to evaluate conditions relative to the GDEs identified within it (Table 3-2).

The 36 wells selected to evaluate the sustainable management criteria in the North Bench, Calimesa, Western Heights, and San Timoteo Management Areas will be used to measure static groundwater levels to characterize conditions in the four management areas. Although groundwater elevation measurements will continue to be collected from the broader monitoring network, minimum thresholds used to assess whether the Plan Area is experiencing undesirable results were only selected at the 36 RMPs.

Undesirable results in the Plan Area will be identified by comparing groundwater elevation measurements from these 36 RMPs to their respective minimum thresholds for the applicable sustainability indicators established in each management area. Undesirable results related to chronic declines in groundwater levels and significant and unreasonable loss of groundwater storage because of groundwater withdrawals from the principal aquifer will be evaluated for each management area using the 36 RMPs. The undesirable results related to significant and unreasonable loss of surface water interconnection in the San Timoteo Management area will be evaluated using groundwater levels measured at five shallow observation wells owned by YVWD and one private irrigation well. An undesirable result is characterized when groundwater elevations at 50% or more of the RMPs in a management area for two consecutive years decline below their associated minimum threshold levels. Section 4.2 details the management actions that will be implemented when conditions decline below the measurable objective and minimum threshold in each management area.

Table 3-1. Wells in the Groundwater Monitoring Network for the Yucaipa Subbasin

Well ID	State Well Number (from DWR)	Latitude	Longitude	Well Owner	Well Use Type	Well Status	Management Area	Hydrogeological Subarea	GSP Monitoring Network	Groundwater Elevation Data Collection	Groundwater Quality Data Collection	Groundwater Production Data Collection
Chicken Hill	—	34.02536	−117.078245	South Mountain	Irrigation	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
Chlorinator	—	34.054666	−116.982175	YVWD	Monitoring	Active	North Bench	Oak Glen	Yes	Yes	No	No
GL-8	—	34.019697	−117.189954	Private Owner	Irrigation	Active	San Timoteo	Live Oak	Yes	Yes	No	No
GWMW-1	02S03W14xxx	34.023129	−117.19702	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
GWMW-2	02S03W14xxx	34.01425	−117.179388	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
GWMW-3	02S03W04xxx	34.002819	−117.16431	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
GWMW-5A	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
GWMW-5B	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
GWMW-5C	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No
Hog Canyon 2	02S02W10B002S	34.017388	−117.077507	South Mountain	Irrigation	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
South Mesa 01	02S02W14xxx	33.995246	−117.056387	South Mesa	Municipal	Inactive, Measure Only	Calimesa	Live Oak	Yes	Yes	No	No
South Mesa 04	02S02W14R03	33.989679	−117.055096	South Mesa	Municipal	Active	Outside Subbasin	Outside Subbasin	Yes	No	No	Yes
South Mesa 05	02S02W15H	33.996753	−117.069131	South Mesa	Municipal	Active	Calimesa	Live Oak	Yes	Yes	Yes	Yes
South Mesa 07	02S02W15A03	34.000936	−117.073543	South Mesa	Municipal	Active	Calimesa	Live Oak	Yes	Yes	Yes	Yes
South Mesa 09	02S02W15A04	34.003344	−117.069334	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
South Mesa 11	02S02W14C01	34.003878	−117.062745	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
South Mesa 12	02S02W11M01	34.00902	−117.064891	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
South Mesa 16	02S02W14D01	34.002029	−117.066197	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
South Mesa 17	02S02W11xxx	34.013077	−117.066467	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
USGS 6th St #1 (870′–930′)	02S02W02F02	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS 6th St #2 (730′–750′)	02S02W02F03	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS 6th St #3 (500′–540′)	02S02W02F04	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS 6th St #4 (380′–400′)	02S02W02F05	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS 6th St #5 (290′–310′)	02S02W02F06	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS Dunlap #1 (1010′–1050′)	02S02W04L02	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No
USGS Dunlap #2 (830′–850′)	02S02W04L03	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No
USGS Dunlap #3 (590′–610′)	02S02W04L04	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No
USGS Dunlap #4 (440′–460′)	02S02W04L05	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No
USGS Dunlap #5 (230′–250′)	02S02W04L06	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No
USGS Equestrian Park #1 (830′–850′)	02S02W12H01	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No

Table 3-1. Wells in the Groundwater Monitoring Network for the Yucaipa Subbasin

Well ID	State Well Number (from DWR)	Latitude	Longitude	Well Owner	Well Use Type	Well Status	Management Area	Hydrogeological Subarea	GSP Monitoring Network	Groundwater Elevation Data Collection	Groundwater Quality Data Collection	Groundwater Production Data Collection
USGS Equestrian Park #2 (635′–655′)	02S02W12H02	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS Equestrian Park #3 (510′–530′)	02S02W12H03	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS Equestrian Park #4 (380′–400′)	02S02W12H04	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No
USGS Wilson Creek #1 (820′–840′)	01S02W36A02S	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No
USGS Wilson Creek #2 (640′–660′)	01S02W36A03	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No
USGS Wilson Creek #3 (500′–520′)	01S02W36A04S	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No
USGS Wilson Creek #4 (350′–370′)	01S02W36A05S	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No
WHWC-06	02S02W03E01	34.030084	−117.082361	WHWC	Municipal	Inactive	Western Heights	Western Heights	Yes	Yes	No	No
WHWC-09	02S02W04R01	34.022838	−117.087701	WHWC	Municipal	Inactive	Western Heights	Western Heights	Yes	Yes	No	No
WHWC-10	02S02W05K01	34.026377	−117.108623	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes
WHWC-11	02S02W04G04	34.027037	−117.093769	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes
WHWC-12	02S02W04J03	34.026399	−117.088647	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes
WHWC-14	02S02W04Lxx	34.02535	−117.097185	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes
WHWC-02A	02S02W04G03	34.029065	−117.093859	WHWC	Municipal	Inactive; Measure Only	Western Heights	Western Heights	Yes	Yes	Yes	Yes
Y-13	—	34.0465	−117.057	County of San Bernardino	Monitoring	Active	North Bench	Crafton	Yes	Yes	Yes	No
Y-21	—	34.0446	−117.058	County of San Bernardino	Monitoring	Active	North Bench	Crafton	Yes	Yes	Yes	No
Y-22	—	34.0444	−117.06	County of San Bernardino	Monitoring	Active	North Bench	Crafton	Yes	Yes	Yes	No
Y-29	—	34.0449	−117.0611	County of San Bernardino	Monitoring	Active	North Bench	Crafton	Yes	Yes	Yes	No
YRP-EX1 (YRP-PZ1)	—	34.050759	−117.03081	SBVMWD	Monitoring	Active	North Bench	Gateway	Yes	Yes	Yes	No
YRP-EX2 (YRP-PZ2)	—	34.044864	−117.030476	SBVMWD	Monitoring	Active	North Bench	Wilson Creek	Yes	Yes	Yes	No
YRP-PZ3	—	34.014110	−117.018992	SBVMWD	Monitoring	Active	North Bench	Oak Glen	Yes	Yes	Yes	No
YVWD-02	02S02W11B01S	34.015932	−117.058511	YVWD	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
YVWD-05	01S02W36N001S	34.037156	−117.049895	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Wilson Creek	Yes	Yes	No	No
YVWD-06	02S02W01F001S	34.026767	−117.044495	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Wilson Creek	Yes	Yes	No	No
YVWD-07	01S02W36R001S	34.03722	−117.036785	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Wilson Creek	Yes	Yes	No	No
YVWD-09	01S02WS5M1S	34.054618	−117.047336	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Crafton	Yes	Yes	No	No

Table 3-1. Wells in the Groundwater Monitoring Network for the Yucaipa Subbasin

Well ID	State Well Number (from DWR)	Latitude	Longitude	Well Owner	Well Use Type	Well Status	Management Area	Hydrogeological Subarea	GSP Monitoring Network	Groundwater Elevation Data Collection	Groundwater Quality Data Collection	Groundwater Production Data Collection
YVWD-10	02S02W11D01S	34.015967	−117.069083	YVWD	Municipal	Inactive – Monitoring Well	Calimesa	Calimesa	Yes	Yes	No	No
YVWD-12	02S02W11B02S	34.018738	−117.06019	YVWD	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
YVWD-13	01S01W32C01S	34.048028	−117.008331	YVWD	Municipal	Inactive	North Bench	Oak Glen	Yes	Yes	No	No
YVWD-14	01S01W32A01S	34.046973	−116.999753	YVWD	Municipal	Active	North Bench	Oak Glen	Yes	Yes	Yes	Yes
YVWD-16	01S01W33E02S	34.0425	−116.996	YVWD	Municipal	Active	Outside Subbasin	Outside Subbasin	Yes	No	No	Yes
YVWD-18	01S02W36F01S	34.042922	−117.044347	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes
YVWD-24	02S02W11A01S	34.018067	−117.055283	YVWD	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes
YVWD-25	01S01W27I01S	34.053821	−116.977864	YVWD	Municipal	Active	North Bench	Oak Glen	Yes	Yes	Yes	Yes
YVWD-27	02S01W08F01S	34.014848	−117.01104	YVWD	Municipal	Active	North Bench	Oak Glen	Yes	Yes	Yes	Yes
YVWD-27A	02S01W08F02S	34.014711	−117.011137	YVWD	Monitoring	Active	North Bench	Oak Glen	Yes	Yes	No	No
YVWD-28	02S01W09G01S	34.0144	−116.994	YVWD	Municipal	Abandoned/ Capped	North Bench	Oak Glen	Yes	Yes	No	No
YVWD-37	01S02W25A01S	34.061818	−117.036858	YVWD	Municipal	Active	North Bench	Crafton	Yes	Yes	Yes	Yes
YVWD-43	01S01W19P001S	34.06314	−117.026002	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Gateway	Yes	Yes	No	No
YVWD-44	01S02W36A03S	34.046549	−117.036751	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes
YVWD-46	01S02W36G05S	34.042926	−117.042911	YVWD	Municipal	Active	North Bench	Wilson Creek	Yes	Yes	Yes	Yes
YVWD-48	02S02W24L02S	33.9799	−117.046	YVWD	Municipal	Active	Outside Subbasin	Outside Subbasin	Yes	No	No	Yes
YVWD-49	02S02W03J001S	34.025913	−117.07187	YVWD	Municipal	Inactive – Monitoring Well	Calimesa	Calimesa	Yes	Yes	No	No
YVWD-53	01S02W25R04S	34.048641	−117.0384	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes
YVWD-55	01S02W35H03S	34.041256	−117.052936	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes
YVWD-56	01S02W36F02S	34.043191	−117.046995	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes
YVWD-61	02S01W15F01S	34.0009	−116.975	YVWD	Municipal	Active	Outside Subbasin	Outside Subbasin	Yes	No	No	Yes

Notes: DWR = California Department of Water Resources; GSP = Groundwater Sustainability Plan; South Mountain = South Mountain Water Company; YVWD = Yucaipa Valley Water District; South Mesa = South Mesa Water Company; USGS = U.S. Geological Survey; WHWC = Western Heights Water Company; SBVWMD = San Bernardino Valley Municipal Water District.

Table 3-2. Representative Monitoring Points in the Yucaipa Subbasin

Well ID	State Well Number (from DWR)	Latitude	Longitude	Well Owner	Well Use Type	Well Status	Management Area	Hydrogeological Subarea	GSP Monitoring Network	Groundwater Elevation Data Collection	Groundwater Quality Data Collection	Groundwater Production Data Collection	RMP
GWMW-1	02S03W14xxx	34.023129	−117.19702	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
GWMW-2	02S03W14xxx	34.01425	−117.179388	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
GWMW-3	02S03W04xxx	34.002819	−117.16431	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
GWMW-5A	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
GWMW-5B	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
GWMW-5C	02S03W04xxx	34.0235	−117.197459	YVWD	Monitoring	Active	San Timoteo	Live Oak	Yes	Yes	Yes	No	Yes
Hog Canyon 2	02S02W10B002S	34.017388	−117.077507	South Mountain	Irrigation	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
South Mesa 07	02S02W15A03	34.000936	−117.073543	South Mesa	Municipal	Active	Calimesa	Live Oak	Yes	Yes	Yes	Yes	Yes
South Mesa 09	02S02W15A04	34.003344	−117.069334	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
South Mesa 12	02S02W11M01	34.00902	−117.064891	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
South Mesa 17	02S02W11xxx	34.013077	−117.066467	South Mesa	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
USGS 6th St #1 (870′–930′)	02S02W02F02	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No	Yes
USGS 6th St #4 (380′–400′)	02S02W02F05	34.02676944	−117.0608778	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No	Yes
USGS Dunlap #2 (830′–850′)	02S02W04L03	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No	Yes
USGS Dunlap #4 (440′–460′)	02S02W04L05	34.0249778	−117.0970917	USGS	Monitoring	Active	Western Heights	Western Heights	Yes	Yes	No	No	Yes
USGS Equestrian Park #1 (830′–850′)	02S02W12H01	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No	Yes
USGS Equestrian Park #4 (380′–400′)	02S02W12H04	34.01291667	−117.0363917	USGS	Monitoring	Active	Calimesa	Calimesa	Yes	Yes	No	No	Yes
USGS Wilson Creek #1 (820′–840′)	01S02W36A02S	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No	Yes
USGS Wilson Creek #4 (350′–370′)	01S02W36A05S	34.046825	−117.0358778	USGS	Monitoring	Active	North Bench	Gateway	Yes	Yes	No	No	Yes
WHWC-10	02S02W05K01	34.026377	−117.108623	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes	Yes
WHWC-11	02S02W04G04	34.027037	−117.093769	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes	Yes
WHWC-12	02S02W04J03	34.026399	−117.088647	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes	Yes
WHWC-14	02S02W04Lxx	34.02535	−117.097185	WHWC	Municipal	Active	Western Heights	Western Heights	Yes	Yes	Yes	Yes	Yes
WHWC-02A	02S02W04G03	34.029065	−117.093859	WHWC	Municipal	Inactive, Measure Only	Western Heights	Western Heights	Yes	Yes	Yes	Yes	Yes
YVWD-06	02S02W01F001S	34.026767	−117.044495	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Wilson Creek	Yes	Yes	No	No	Yes
YVWD-07	01S02W36R001S	34.03722	−117.036785	YVWD	Municipal	Inactive – Monitoring Well	North Bench	Wilson Creek	Yes	Yes	No	No	Yes
YVWD-10	02S02W11D01S	34.015967	−117.069083	YVWD	Municipal	Inactive – Monitoring Well	Calimesa	Calimesa	Yes	Yes	No	No	Yes

Table 3-2. Representative Monitoring Points in the Yucaipa Subbasin

Well ID	State Well Number (from DWR)	Latitude	Longitude	Well Owner	Well Use Type	Well Status	Management Area	Hydrogeological Subarea	GSP Monitoring Network	Groundwater Elevation Data Collection	Groundwater Quality Data Collection	Groundwater Production Data Collection	RMP
YVWD-12	02S02W11B02S	34.018738	−117.06019	YVWD	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
YVWD-24	02S02W11A01S	34.018067	−117.055283	YVWD	Municipal	Active	Calimesa	Calimesa	Yes	Yes	Yes	Yes	Yes
YVWD-25	01S01W27I01S	34.053821	−116.977864	YVWD	Municipal	Active	North Bench	Oak Glen	Yes	Yes	Yes	Yes	Yes
YVWD-28	02S01W09G01S	34.0144	−116.994	YVWD	Municipal	Abandoned/ Capped	North Bench	Oak Glen	Yes	Yes	No	No	Yes
YVWD-37	01S02W25A01S	34.061818	−117.036858	YVWD	Municipal	Active	North Bench	Crafton	Yes	Yes	Yes	Yes	Yes
YVWD-46	01S02W36G05S	34.042926	−117.042911	YVWD	Municipal	Active	North Bench	Wilson Creek	Yes	Yes	Yes	Yes	Yes
YVWD-49	02S02W03J001S	34.025913	−117.07187	YVWD	Municipal	Inactive – Monitoring Well	Calimesa	Calimesa	Yes	Yes	No	No	Yes
YVWD-53	01S02W25R04S	34.048641	−117.0384	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes	Yes
YVWD-56	01S02W36F02S	34.043191	−117.046995	YVWD	Municipal	Active	North Bench	Gateway	Yes	Yes	Yes	Yes	Yes

Notes: DWR = California Department of Water Resources; GSP = Groundwater Sustainability Plan; RMP = representative monitoring point; YVWD = Yucaipa Valley Water District; South Mountain = South Mountain Water Company; South Mesa = South Mesa Water Company; USGS = U.S. Geological Survey; WHWC = Western Heights Water Company.

3.4 Minimum Thresholds

This section describes the minimum thresholds established for chronic lowering of groundwater levels, reduction of groundwater storage, land subsidence, and interconnected surface water/groundwater for each management area. Minimum thresholds for degradation of water quality and seawater intrusion are not established in this GSP (see Sections 3.3.5 and 3.3.6).

3.4.1 North Bench Management Area

The North Bench Management Area comprises the Triple Falls Creek, Oak Glen, Gateway, Crafton, and Wilson Creek hydrogeological subareas and includes municipal water supply wells owned and operated by YVWD. Minimum thresholds for this management area were established for chronic lowering of groundwater levels, reduction of groundwater storage, land subsidence, and depletion of interconnected surface water. The minimum threshold for interconnected surface water was established to protect GDEs that were identified in Wildwood Canyon and the upper elevations of the Oak Glen subarea near the Triple Falls Creek subarea (Figure 2-57). No other GDEs, potential GDEs, or interconnected surface waters were identified in the other four subareas in the North Bench Management Area.

The undesirable result applicable to the chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence is the condition when the volume of groundwater in storage falls below a drought buffer established in this management area. Using the YIHM, the drought buffer was based on the simulated decline in storage from the 1984 WY to the 1992 WY, a period when the volume of groundwater in storage declined approximately 10,000 AF (Figure 3-2, Drought Buffer in the North Bench Management Area). During this period, the average annual rainfall in the Subbasin was 14 inches, or 88% of normal. This period included three "dry" and three "below normal" water year types, with one "normal" water year type and two "above normal" water year types (Figure 2-3). Groundwater levels declined 50 to 75 feet from 1984-1992 (Figure 2-66). Pumping averaged approximately 2,600 AFY, which was approximately 66% of the estimated sustainable yield of 3,940 AFY (Figure 3-3, Historical and Current Volume of Groundwater in Storage in the North Bench Management Area). This period was selected because groundwater elevations declined when pumping was below the estimated sustainable yield, which was more of a function of climate than groundwater withdrawals.

The Yucaipa GSA identified a decline of 10,000 AF from storage over a 9-year period as a significant and unreasonable decline in the storage of groundwater in this management area. The drought buffer provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent a net loss of groundwater that results in the undesirable result of the volume in storage declining below the drought buffer.

The bottom of the drought buffer was established at the historical low in the volume in storage at 220,000 AF (Figure 3-4, Minimum Threshold and Measurable Objective in the North Bench Management Area). **The minimum threshold is established at the historical low for groundwater in storage at 220,000 AF.** The top of the drought buffer is at a volume in storage of 230,000 AF, 10,000 AF above the minimum threshold. This represents the measurable objective (Section 3.5.1) and provides operational flexibility to implement management actions and/or programs to prevent undesirable results when conditions decline below the minimum threshold. The RMPs identified for the North Bench Management Area are: USGS Wilson Creek nested wells No. 1 and No. 4, YVWD-06, YVWD-07, YVWD-37, YVWD-46, YVWD-53, and YVWD-56 (Figure 3-5, Representative Monitoring Points). Static groundwater levels measured at these wells will be used to characterize conditions in this management area. The simulated groundwater levels at these wells at the end of the 1965 WY, which represented the historical low in groundwater in storage, or the minimum threshold, ranged from 2,276 to 2,529 feet above NAVD88 (Table 3-3).

The simulated static groundwater elevations at the end of the 2018 WY (i.e., the current condition) ranged from 2,381 to 2,602 feet above NAVD88 (Table 3-3). Corresponding static groundwater elevations measured at the RMPs ranged from 2,357 to 2,578 feet above NAVD88 (Table 3-3). The YIHM tended to overestimate the groundwater elevations at the RMPs by an average 48 feet. Therefore, the groundwater elevations at each RMP that represent the minimum threshold in the North Bench Management Area are the simulated groundwater elevations corrected by the differences between the simulated and measured groundwater elevations in September 2018. The minimum threshold groundwater elevations at the RMPs range from 2,209 to 2,504 feet above NAVD88 (Table 3-3).

Table 3-3. Groundwater Elevations Pertaining to the Measurable Objective and Minimum Threshold in the North Bench Management Area

RMP	Simulated Groundwater Elevation at Sep. 30, 1965 (ft NAVD88)	Simulated Groundwater Elevation at Sep. 30, 2018 (ft NAVD88)	Measured Groundwater Elevation near Sep. 30, 2018 (ft NAVD88)	Measured – Simulated Groundwater Elevation at Sep. 2018 (feet)	Groundwater Elevations at the Minimum Threshold (ft NAVD88)	Groundwater Elevations at the Measurable Objective (ft NAVD88)
YVWD-06	2,276.74	2,381.26	2,359.99	−21.27	**2,255.47**	**2,276.91**
YVWD-07	2,276.08	2,472.12	2,435.42	−36.70	**2,239.38**	**2,318.07**
YVWD-37	2,528.67	2,602.40	2,577.64	−24.75	**2,503.91**	**2,527.68**
YVWD-46	2,329.04	2,477.14	2,357.42	−119.73	**2,209.32**	**2,228.73**
YVWD-53	2,341.22	2,472.20	2,446.53	−25.67	**2,315.55**	**2,337.17**
YVWD-56	2,329.10	2,475.09	2,415.23	−59.86	**2,269.24**	**2,291.03**
USGS Wilson Creek No. 1 (820′–840′)	2,354.52	2,507.52	2,453.24	−54.28	**2,300.24**	**2,329.25**
USGS Wilson Creek#4 (350′–370′)	2,357.at 38	2,515.57	2,475.28	−40.29	**2,317.09**	**2,349.27**
Average	2,349.09	2,487.91	2,440.09	−47.82	**2,301.27**	**2,332.26**

Notes: RMP = representative monitoring point; ft NAVD88 = feet above the North American Vertical Datum of 1988.

3.4.1.1 Chronic Lowering of Groundwater Levels

Groundwater elevations in the North Bench Management Area are influenced by climate. Groundwater elevations markedly increased following periods with "above normal" and "wet" water year types, and markedly declined during periods with "below normal" and "critically dry" water year types. Groundwater elevations at the RMPs declined approximately 170 feet at a rate of approximately 21 feet per year from 1999 to 2007, a period when pumping in the management area exceeded the estimated sustainable yield of 3,940 AFY (Figure 3-6, Historical Groundwater Elevations and Pumping in the North Bench Management Area). The declining trend in groundwater levels ceased in 2008 when YVWD increased its importation of SWP water from approximately 3,500 AF in 2007 to 7,300 AF in 2008, which subsequently led to a decline in groundwater production by YVWD from 4,800 AF in 2007 to 3,800 AF in 2008. Groundwater production in the North Bench Management Area averaged approximately 3,600 AFY from 2008 to 2018 (Figure 3-6).

Predicted groundwater elevations calculated using the YIHM indicate that future operations in the North Bench Management Area with pumping constrained to the estimated sustainable yield of 3,940 AFY will result in groundwater elevations remaining above the minimum threshold (Figures 3-7 to 3-14). The YIHM predicts that groundwater elevations in the Future Baseline and Future Baseline with Climate Change I and II (i.e., 2030 and 2070 change factors) scenarios will increase from 2018 to peak levels in 2040 (climate scenarios similar to the wet 1978-1983 period), and then generally decline in all three scenarios after 2040. The climate record from 1984 to 2012 was used to simulate climatic conditions from 2041 through 2069, when the median annual precipitation was 84% of the mean annual and this period included more "dry" and "critically dry" water year types than the earlier climatic record from 1962 to 1983 that was used to simulate conditions from 2019 to 2040.

The Future Baseline and Future Baseline with Climate Change I and II scenarios predict that groundwater elevations at the end of the 2069 WY will range from approximately 135 feet to 158 feet higher than the minimum threshold levels established at each RMP (Figures 3-7 to 3-14).

Over the 50-year planning and implementation horizon, the groundwater elevation minimum threshold allows for groundwater extractions to exceed historical levels while protecting against long-term aquifer supply depletion. Historical production from 1999 to 2007 averaged 5,200 AFY, which led to a groundwater level decline of 21 feet per year. If, beginning with the current condition, pumping increased from the estimated sustainable yield of 3,940 AFY to an average of 5,200 AFY, then this historical rate may be sustained for approximately 6 years before groundwater levels fall to the minimum threshold established at an average elevation of 2,301 feet above NAVD88 (Table 3-3).

3.4.1.2 Reduction of Groundwater Storage

The YIHM indicated a net increase of approximately 35,000 AF in groundwater storage from 1965 to 2018 (Figure 2-67). As demonstrated by the fluctuating groundwater levels observed in the management area since 1965, increases in groundwater storage occurred following periods with "above normal" and "wet" water year types, and declined during periods dominated by "below normal" and "critically dry" water year types. Marked increases in storage occurred from the 1977 WY through 1983 WY, and during the 2017 WY when the area experienced predominantly "above normal" to "wet" water year types.

The YIHM predicts, with pumping constrained to the estimated sustainable yield of 3,940 AFY of the management area, a net increase in the volume of groundwater in storage of 2,250 AF (Future Baseline with Climate Change II scenario) to 12,200 AF (Future Baseline scenario) from the current condition (Figure 3-15, Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the North Bench Management Area). A peak volume in storage is predicted between 275,000 AF and 285,500 AF in the 2039 WY, followed by a general declining trend to the end of the 2069 WY (Figure 3-15). The volume in storage is not predicted to fall below the minimum threshold of 220,000 AF, or the measurable objective of 230,000 AF, during the 50-year planning and implementation horizon.

A decline in groundwater elevation from the current level to the minimum threshold represents a net decline in groundwater storage of approximately 35,000 AF (Figure 3-15). The minimum threshold represents a volume in storage at approximately 220,000 AF, which is 86% of the volume in storage (255,000 AF) estimated under current conditions. This analysis indicates that maintaining an average aquifer saturation that is at least 86% of current conditions will protect against long-term aquifer supply depletion and provide necessary operational flexibility for municipal and private groundwater users.

3.4.1.3 Land Subsidence

The minimum threshold established to assess chronic lowering of groundwater levels and reduction of groundwater storage is the historical low groundwater elevation. Long-term declines below the historical low groundwater elevation may introduce the potential for future land subsidence. DWR has designated the Plan Area has having a medium to low risk for future land subsidence (DWR 2014). The subsurface geology below the historical low groundwater elevation of 2,301 feet above NAVD88 is, based on driller's logs for the YVWD wells, characterized as having relatively thin, discontinuous lenses of clay interbedded between thicker layers of coarse-grained sand and gravel (Appendix 3-A). This presents a low risk for future subsidence, and land subsidence related to groundwater withdrawal was not induced when historical water levels were lower than current water levels. No interference or damage to infrastructure and surface land uses were observed in 2007 and 2008 when groundwater elevations at this time were comparable to the historical lows simulated at the end of the 1965 WY (Figure 2-66; Table 3-3).

The minimum threshold for chronic declines in groundwater level and reduction of groundwater storage were adopted for land subsidence as well. The use of the groundwater elevation minimum threshold as a surrogate for land subsidence will be reviewed with each 5-year GSP evaluation to ensure that they adequately protect the Plan Area from experiencing undesirable results related to land subsidence. Each 5-year GSP evaluation will include InSAR data obtained from the SGMA Data Portal, which will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

3.4.1.4 Depletion of Interconnected Surface Water

Surface water flows in the upper reaches of Wilson Creek and Oak Glen are ephemeral (Section 2.3). Groundwater level measurements indicate that surface water and groundwater along the upper reach of Oak Glen Creek in the northeast section of the North Bench Management Area may experience periods of interconnectedness, but these conditions are not persistent. Groundwater elevations decline downgradient of this area to depths that have historically ranged from 22 to 200 feet bgs. These measurements indicate that surface water and groundwater are not interconnected downgradient of YVWD-25 (Figure 2-56).

GDEs were identified along Wildwood Canyon Creek near Wildwood Canyon State Park, and the upper elevations of the Oak Glen subarea near the Triple Falls Creek subarea (Figure 2-56). No other GDEs and no potential GDEs were identified in the other four hydrogeological subareas in the North Bench Management Area. Wells YVWD-25 and YVWD-28 are identified as RMPs to characterize and assess groundwater conditions in the areas of the GDEs.

3.4.1.4.1 Oak Glen Creek near the Triple Falls Creek Subarea

Groundwater levels are measured at two wells within 1 kilometer (0.6 miles) of the mapped habitats in this part of the management area: YVWD-25 (screened 45 to 55 feet bgs) and the Chlorinator Well, a groundwater observation well (unknown screen interval). Historical static water levels at YVWD-25 have ranged from 7 feet bgs to 43 feet bgs (Figure 3-16, Depths-to-Groundwater at the Chlorinator Well and YVWD-25 in the North Bench Management Area). Static groundwater levels measured at the Chlorinator well since January 1987 have ranged from 13 feet bgs to 60 feet bgs (Figure 3-16). Since 2015, the average depth-to-water measured at the Chlorinator well was approximately 49 feet bgs. The chlorinator well is not an RMP at this time because the well construction details are unknown. This well may be considered an RMP when the screen interval is determined and water levels measured at this well represent shallow groundwater conditions.

YVWD-25 has produced an average 270 AFY since 2001 (Figure 2-20). Between 2001 and 2013, the normalized difference vegetation index (NDVI) and normalized difference moisture index (NDMI) increased; this increase was correlated with above average annual precipitation for this 12-year period (Section 2.7.8). The fact that NDVI and NDMI increased between 2001 and 2013, a period when YVWD-25 was actively producing approximately 270 AFY, suggests that continued production at YVWD-25 at current extraction rates will not adversely impact the health of these mapped habitats.

YVWD-25 is designated as an RMP to evaluate conditions at the GDE mapped in this area of the North Bench management area. The minimum threshold to protect GDEs in the North Bench Management Area is the condition when the shallow groundwater table sustaining the GDE falls below 30 feet bgs for 2 consecutive years. Additionally, under such conditions, an analysis of the NDVI and NDMI trends over the same 2 years will be conducted to confirm whether the decline in groundwater level below the minimum threshold correlates with a declining trend in NDVI and NDMI. If a correlation is found between declining groundwater level (as a result of groundwater extractions more than the historical average of 270 AFY) and NDVI and NDMI, then the net removal of groundwater from the area will be reduced until groundwater levels recover above the minimum threshold for two consecutive years.

If future groundwater extractions planned in this region are expected to exceed historical extractions in the region, additional field work will be required to characterize the impact that proposed pumping rates will have on the habitats along Oak Glen Creek near the Triple Falls Creek subarea. This would include installing one or more shallow groundwater observation wells screened from the historical high groundwater level to approximately 35 feet bgs. Groundwater elevation data collected from the shallow groundwater observation well(s) will be analyzed to evaluate whether the local habitat is sustained by shallow groundwater (<30 feet bgs) and will be used to evaluate potential influences by nearby pumping in the principal aquifer.

3.4.1.4.2 Wildwood Canyon State Park

The mapped habitats in this part of the management area predominantly border Wildwood Canyon Creek, but also extend south into undeveloped lands that border the local residential community (Figure 2-56). NDVI moderately increased across the majority of this habitat between 2009 and 2018, while NDMI moderately decreased. During this period, annual precipitation was generally lower than the 33-year average of 14 inches between 1985 and 2018.

Static groundwater levels have been measured within 1 kilometer (0.6 miles) of this habitat at YVWD-28 since May 2004. The static depths-to-water measured at this well have ranged from 36 feet bgs to 8 feet bgs (Figure 3-17, Static Depths-to-Groundwater at YVWD-28 in the North Bench Management Area). There are no active groundwater extraction wells (YVWD has not pumped groundwater since 2007) within 1 kilometer of this habitat that may impact future health of the Coast Live Oak.

YVWD-28 is designated as an RMP to evaluate conditions at the GDE mapped in this area of the North Bench management area. The minimum threshold to protect GDEs in the North Bench Management Area is the condition when the shallow groundwater table sustaining the GDE falls below 30 feet bgs for 2 consecutive years. Additionally, under such conditions, an analysis of the NDVI and NDMI trends over the same 2 years will be conducted to confirm whether the decline in groundwater level below the minimum threshold correlates with a declining trend in NDVI and NDMI. If a correlation is found between declining groundwater level (as a result of groundwater extractions more than the historical average) and NDVI and NDMI, then the net removal of groundwater from the area will be reduced until groundwater levels recover above the minimum threshold for 2 consecutive years.

If future extractions planned in this region are expected to exceed historical extractions, additional field work will be required to characterize the impact that proposed pumping rates will have on the habitats along Wildwood Canyon Creek. This would include installing one or more shallow groundwater observation wells screened from the historical high groundwater level to approximately 35 feet bgs. Groundwater elevation data collected from the shallow groundwater observation well(s) will be analyzed to evaluate whether the local habitat is sustained by shallow groundwater (<30 feet bgs), and will be used to evaluate seasonal fluctuations and potential influences by nearby pumping in the principal aquifer.

3.4.1.5 Degradation of Water Quality

No minimum threshold relative to the significant and unreasonable degradation of water quality was established for the North Bench Management Area. Only one groundwater remediation program is active in the management area: the former Yucaipa landfill. Groundwater contamination is located in the shallow alluvial aquifer unit above the principal aquifer, which has not been influenced by contamination originating at the landfill.

YVWD implemented a program to replace septic systems in the management area with sanitary sewer services that subsequently led to a marked decline in contributions of nitrate and TDS to groundwater. YVWD implemented reverse osmosis and denitrification treatment at the WRWRF, which produces tertiary treated wastewater for recycled water purposes. The recycled water includes concentrations of TDS and nitrate below the maximum benefits water quality objectives established in the 2014 Basin Plan Amendment (Section 2.7.4).

3.4.1.6 Seawater Intrusion

The North Bench Management Area is approximately 53 miles northeast of the Pacific Ocean and is, at its lowest elevation, approximately 2,300 feet above NAVD88, which is approximately 2,300 feet above mean sea level. No minimum threshold was established for the North Bench Management Area with regard to seawater intrusion.

3.4.2 Calimesa Management Area

The Calimesa Management Area comprises the Calimesa and Singleton subareas, and the upper northeast portion of the Live Oak subarea (Figure 2-63). This management area includes municipal water supply wells owned and operated by YVWD and South Mesa. South Mountain owns and operates two irrigation supply wells that supply water to the Crafton Hills community college that is partly in the northern section of the Western Heights Management Area. A minimum threshold for this management area was established for chronic lowering of groundwater levels, reduction of groundwater storage, and land subsidence. No GDEs were identified in this management area (Section 2.7.8). One potential GDE was identified in the Singleton subarea (Section 2.7.8).

The undesirable result identified for the Calimesa Management Area is the condition when groundwater in storage falls below a drought buffer established in this management area. Using the YIHM, the drought buffer was based on the simulated decline in storage from the 1995-WY to the 2004 WY, a period when the volume of groundwater in storage declined approximately 26,000 AF (Figure 3-18, Drought Buffer in the Calimesa Management Area). This period was selected because the management area experienced the highest rate of decline in storage at 2,600 AFY over the 50-year historical period. Groundwater production from the management area from the 1995 WY to the 2004 WY averaged approximately 6,600 AFY, which was approximately 133% of the estimated sustainable yield of 4,955 AFY (Figure 3-19, Historical and Current Volume of Groundwater in

Storage in the Calimesa Management Area). During this period, the average annual rainfall in the Subbasin was 15 inches, or 96% of normal. This period included five "dry" and one "critically dry" water year types, with two "above normal" and two "wet" water year types (Figure 2-3). Groundwater levels declined approximately 50 feet from 1994 to 2004 (Figure 2-69).

The Yucaipa GSA identified a decline of 26,000 AF from storage over a 10-year period as a significant and unreasonable decline in the storage of groundwater in this management area. The drought buffer provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent a net loss of groundwater that results in the undesirable result of the volume in storage declining below the drought buffer.

The drought buffer begins at the historical low in volume in storage at 798,700 AF and ends 26,000 AF below that mark at 772,700 AF (Figure 3-20, Minimum Threshold and Measurable Objective in the Calimesa Management Area). Undesirable results were not experienced at the historical low storage condition in that groundwater supply was not impacted. **The minimum threshold is established at the bottom of the drought buffer at 772,700 AF.** The RMPs for the Calimesa Management Area are: South Mesa wells 7, 9, 12 and 17; YVWD wells YVWD-10, YVWD-12, YVWD-24, and YVWD-49; South Mountain well Hog Canyon 2, and the USGS 6th Street #1 and #4 and Equestrian Park #1 and #4 nested wells (Figure 3-5). Static groundwater levels measured at the RMPs will be used to evaluate conditions against the minimum threshold and measurable objective related to the undesirable results of chronic lowering of groundwater levels, reduction of groundwater storage, and land subsidence.

3.4.2.1 Chronic Lowering of Groundwater Levels

Groundwater elevations in the Calimesa Management Area experienced a declining trend from 1988 to 2007 (Figure 2-69). Groundwater levels declined at an approximate rate of 6.1 feet per year during that period. Groundwater production from the management area in that period averaged 6,100 AFY, which is above the estimated sustainable yield of 4,955 AFY. The declining trend in groundwater levels ceased in 2008 when YVWD markedly increased its importation of SWP water as a supplemental water source. Subsequently, YVWD reduced its groundwater production in the management area from an annual average 3,400 AFY (1988-2007) to 2,100 AFY from 2008 to 2018 (Figure 3-21, Annual Groundwater Production and Historical Groundwater Elevations in the Calimesa Management Area). South Mesa has averaged an annual groundwater production rate of 2,000 AFY from the management area from 1988 to 2018 (Figure 3-21). South Mountain has averaged 100 AFY from 2008 to 2018 (Figure 3-21). The average annual production from the management area from 2008 to 2018 was approximately 4,400 AFY, which is below the estimated sustainable yield of 4,955 AFY. Consequently, groundwater elevations in the management area have either stabilized or been recovering since 2008 (Figure 3-21).

The static measured groundwater elevations in the Calimesa Management Area at the end of the 2018 WY (i.e., the current condition) ranged from 2,056 to 2,207 feet above NAVD88 (Table 3-4). The simulated groundwater elevations at the end of the 2018 WY ranged from 2,012 to 2,193 feet above NAVD88 (Table 3-4). The differences between the observed and simulated groundwater levels ranged from −15.9 to 64.8 feet, or an average of 19.3 feet, meaning the YIHM tended to underestimate groundwater elevations in the Calimesa Management Area. To associate groundwater levels at each RMP to the minimum threshold, the YIHM was used to simulate conditions at the minimum threshold. The simulated groundwater elevations at the minimum threshold for each RMP range from 1,912 to 2,164 feet above NAVD88 (Table 3-4). Applying the difference between measured and simulated groundwater levels at the end of the

2018 WY, the minimum threshold established at 772,700 AF in storage is represented by groundwater elevations at the RMPs that range from 1,959 to 2,177 feet above NAVD88 (Table 3-4).

Projected water levels calculated using the YIHM indicate that future operations in the Calimesa Management Area with pumping constrained to the estimated sustainable yield of 4,955 AFY will result in groundwater elevations remaining above the minimum threshold (Figures 3-22 to 3-34). The Future Baseline scenario predicts that groundwater elevations at the RMPs will increase by the end of the 2069 WY by approximately 2 to 38 feet (Figures 3-22 to 3-34). The Future Baseline with Climate Change I scenario predicts that groundwater elevations, on average, will be comparable to levels observed at the end of the 2018 WY (Figures 3-22 to 3-34). The Future Baseline with Climate Change II scenario predicts that groundwater elevations, on average, will be approximately 22 feet below the 2018 WY levels (Figures 3-22 to 3-34). Predicted groundwater elevations will not decline below the minimum threshold at any of the RMPs.

Over the 50-year planning and implementation horizon, the groundwater elevation minimum threshold allows for groundwater extractions to exceed historical levels while protecting against long-term aquifer supply depletion. Historical production from 1988 to 2007 averaged 6,100 AFY, which led to a groundwater level decline of 6.1 feet per year (Figure 3-21). If, beginning with the current condition, pumping increased from the estimated sustainable yield of 4,955 AFY to an average of 6,100 AFY, then this historical rate may be sustained for approximately 12 years before groundwater levels fall to the average minimum threshold established at 2,044 feet above NAVD88.

3.4.2.2 Reduction of Groundwater Storage

The YIHM indicated a net decrease of approximately 16,000 AF in groundwater storage from 1965 to 2018 (Figure 2-70). From 1965 to 1977, the volume in storage remained consistent at approximately 814,000 AF when rainfall averaged 104% of normal annual precipitation and pumping averaged 4,800 AFY, or 97% of the estimated sustainable yield (Figure 3-19). From 1978 to 1989, the volume in storage increased approximately 35,000 AF when rainfall averaged 118% of normal annual precipitation and pumping averaged 4,900 AFY, or 99% of the estimated sustainable yield. (Figure 3-19). From 1990 to 2008, groundwater production averaged 6,100 AFY (or 123% of the estimated sustainable yield) and the YIHM calculated a net loss of approximately 46,000 AF. The historical low in the volume of groundwater in storage was simulated at the end of the 2015 WY at 798,700 AF. Since the historical low in the volume of groundwater in storage, the management area has recovered approximately 1,700 AF (Figure 3-19).

Simulation results of future projected conditions using the YIHM indicate that the volume in storage is expected to remain above the minimum threshold throughout the 50-year planning and implementation horizon (Figure 3-35, Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the Calimesa Management Area). The YIHM predicted a net increase of 7,500 AF in the volume in storage by the end of the 2069 WY in the Future Baseline scenario, and net decreases of 1,500 AF and 14,000 AF for the Future Baseline with Climate Change I and II scenarios, respectively (Figure 3-35).

The decline in groundwater elevation from the current level to the minimum threshold represents a net decline in groundwater storage of approximately 27,700 AF (Figure 3-20). The volume in groundwater storage at the minimum threshold is approximately 772,700 AF, which is 97% of the current volume in storage at 800,400 AF. The reduction in groundwater storage to 772,700 AF would be an undesirable result. Groundwater elevations that result in a reduction in groundwater storage of approximately 27,700 AF from the current condition are lower than the historical low groundwater levels. This analysis indicates that maintaining an average aquifer saturation that is at

least 97% of current conditions will protect against long-term aquifer supply depletion and provide necessary operational flexibility for municipal and private groundwater users.

3.4.2.3 Land Subsidence

The minimum threshold static groundwater elevation established to assess chronic lowering of groundwater levels and reduction of groundwater storage is lower than the historical low observed between 2010 and 2015, and therefore introduces the potential for future land subsidence. DWR has designated the Plan Area has having a medium to low risk for future land subsidence (DWR 2014). The subsurface geology below the historical low groundwater elevation of 2,097 feet above NAVD88 is, based on driller's logs for the South Mesa and YVWD wells, characterized as having relatively thin, discontinuous lenses of clay interbedded between thicker layers of coarse-grain sand and gravel (Appendix 3-A). This presents a low risk for future subsidence, and land subsidence related to groundwater withdrawal was not induced when historical water levels were lower than current water levels. No interference or damage to infrastructure and surface land uses were observed when the historical lows in groundwater elevations were observed in this management area.

The minimum threshold for chronic declines in groundwater level and reduction of groundwater storage were adopted for land subsidence as well. The use of the groundwater elevation minimum threshold as a surrogate for land subsidence will be reviewed with each 5-year GSP evaluation to ensure that they adequately protect the Plan Area from experiencing undesirable results related to land subsidence. Each 5-year GSP evaluation will include InSAR data obtained from the SGMA Data Portal, which will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

Table 3-4. Groundwater Elevations Pertaining to the Measurable Objective and Minimum Threshold in the Calimesa Management Area

Representative Monitoring Point	Simulated Groundwater Elevation at Sep. 30, 2015 (ft NAVD88)	Measured Static Groundwater Elevation at Sept. 30, 2015 (ft NAVD88)	Measured – Simulated Groundwater Elevation at Sep. 2015 (feet)	Simulated Groundwater Elevation at Sep. 30, 2018 (ft NAVD88)	Measured Groundwater Elevation near Sep. 30, 2018 (ft NAVD88)	Measured – Simulated Groundwater Elevation at Sep. 2018 (feet)	Simulated Groundwater Elevations at the Minimum Threshold (ft NAVD88)	Estimated Measured Groundwater Elevationsat the Minimum Threshold (ft NAVD88)	Measured Groundwater Elevations at the Measurable Objective (ft NAVD88)
Hog Canyon 2	2,053.55	2,067.13	13.57	2,079.54	2,090.13	10.59	2,009.74	**2,021.82**	**2,067.13**
South Mesa 07	2,063.24	2,039.73	−23.51	2,071.67	2,055.73	-15.93	2,001.86	**1,982.14**	**2,039.73**
South Mesa 09	2,014.06	2,052.70	38.64	2,011.53	2,066.70	55.17	1,911.67	**1,958.58**	**2,052.70**
South Mesa 12	2,067.87	2,068.46	0.59	2,079.01	2,095.74	16.73	2,009.61	**2,018.27**	**2,068.46**
South Mesa 17	2,067.34	2,050.77	−16.57	2,079.49	2,088.77	9.28	2,009.94	**2,006.30**	**2,050.77**
USGS 6th St #1 (870′–930′)	2,073.38	2,107.94	34.56	2,086.58	2,133.89	47.31	2,017.67	**2,058.61**	**2,107.94**
USGS 6th St #4 (380′–400′)	2,150.61	2,165.27	14.66	2,154.56	2,170.93	16.37	2,112.19	**2,127.70**	**2,165.27**
USGS Equestrian Park #1 (830′–850′)	2,193.59	2,201.62	8.03	2,193.29	2,203.28	9.99	2,164.36	**2,173.37**	**2,201.62**
USGS Equestrian Park #4 (380′–400′)	2,190.36	2,205.51	15.15	2,190.21	2,206.59	16.38	2,161.10	**2,176.87**	**2,205.51**
YVWD-10	2,068.33	2,065.84	−2.49	2,081.09	2,087.74	6.65	2,012.08	**2,014.16**	**2,065.84**
YVWD-12	2,068.67	2,071.38	2.70	2,081.33	2,094.66	13.33	2,012.25	**2,020.26**	**2,071.38**
YVWD-24	2,069.97	2,099.36	29.39	2,081.30	2,146.06	64.76	2,014.56	**2,061.63**	**2,099.36**
YVWD-49	2,068.54	2,070.64	2.11	2,081.55	2,082.24	0.69	2,012.63	**2,014.03**	**2,070.64**
Average	2,088.42	2,097.41	8.99	2,097.78	2,117.11	19.33	2,034.59	**2,048.75**	**2,097.41**

Note: ft NAVD88 = feet above the North American Vertical Datum of 1988.

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3.4.2.4 Depletion of Interconnected Surface Water

No GDEs or interconnected surface water bodies were identified in the Calimesa Management Area. One potential GDE was identified in the Singleton subarea, located in the southeastern corner of the management area (Section 2.7.8). No existing wells are within 1 kilometer (0.6 miles) of the potential GDE, so no water levels have been measured to characterize the depth to groundwater. The natural community of this potential GDE has not been impacted by historical groundwater extractions from the principal aquifer, so no minimum threshold was established relative to this undesirable result.

If future extractions planned in this region are expected to exceed historical extractions in the region, additional field work will be required to characterize the impact that proposed pumping rates will have on the potential GDE in the Singleton subarea. This would include installing one or more shallow groundwater observation wells screened from the historical high groundwater level to approximately 35 feet bgs. Groundwater elevation data collected from the shallow groundwater observation well(s) will be analyzed to evaluate whether the local habitat is sustained by shallow groundwater (<30 feet bgs) and will be used to evaluate seasonal fluctuations and potential influences by nearby pumping in the principal aquifer. Additionally, a spring survey is recommended for the upstream reach of the drainage above the potential GDE. Spring flow may be another potential source of water to the GDE, which may be influenced by groundwater production in the principal aquifer. If spring flow is identified, then a surface water flow monitoring program will be implemented to monitor spring flow should a new production well be installed within 1 kilometer (0.6 miles) of the potential GDE.

3.4.2.5 Degradation of Water Quality

No minimum threshold relative to the significant and unreasonable degradation of water quality was established for the Calimesa Management Area. There are no active groundwater remediation programs in the management area.

YVWD implemented a program to replace septic systems in the management area with sanitary sewer services that subsequently led to a marked decline in contributions of nitrate and TDS to groundwater. YVWD implemented reverse osmosis and denitrification treatment at the WRWRF, which produces tertiary treated wastewater for recycled water purposes. The recycled water includes concentrations of TDS and nitrate below the maximum benefits water quality objectives established in the 2014 Basin Plan Amendment (Section 2.7.4).

3.4.2.6 Seawater Intrusion

The Calimesa Management Area is approximately 51 miles northeast of the Pacific Ocean and approximately 2,000 feet above NAVD88 at its lowest elevation, which is approximately 2,300 feet above mean sea level. No minimum threshold was established for the Calimesa Management Area with regard to seawater intrusion.

3.4.3 Western Heights Management Area

The Western Heights Management Area comprises the Western Heights hydrogeological subarea and includes all municipal water supply wells owned and operated by WHWC (Figure 2-63). The USGS installed one nested observation well, identified as the Dunlap Acres well, approximately 55 feet from WHWC-14. A minimum threshold for this management area was established for chronic lowering of groundwater levels, reduction of groundwater

storage, and land subsidence. No GDEs and no potential GDEs were identified in this management area. Therefore, no sustainable management criteria were established for the depletion of interconnected surface water in this management area.

The undesirable result associated with chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence is the condition when groundwater levels fall below a drought buffer established in this management area. The drought buffer was based on the simulated decline in storage from the 1983 WY to the 1992 WY, a period when the volume of groundwater in storage declined approximately 10,000 AF (Figure 3-36, Drought Buffer in the Western Heights Management Area). This period was selected to define a drought buffer because the management area experienced the highest rate of decline in storage at 900 AFY over the 50-year historical period. Groundwater production from the 1983 WY to the 1992 WY averaged approximately 2,500 AFY, which was approximately 142% of the estimated sustainable yield of 1,760 AFY (Figure 3-37, Annual Groundwater Production and Historical Groundwater Elevations in the Western Heights Management Area). During this period, the average annual rainfall in the Subbasin was 16 inches, or 101% of normal. This period included three "dry" and three "below normal" water year types, with two "above normal" and one "wet" water year types (Figure 2-3). Groundwater levels declined approximately 35 feet from 1982 to 1992 (Figure 3-37).

The Yucaipa GSA identified a decline of 10,000 AF from storage over a 10-year period as a significant and unreasonable decline in the storage of groundwater in this management area. The drought buffer provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent a net loss of groundwater that results in the undesirable result of the volume in storage declining below the drought buffer.

The drought buffer begins at the historical low in volume in storage at 408,800 AF and ends 10,000 AF below that mark at 398,800 AF (Figure 3-38, Minimum Threshold and Measurable Objective in the Western Heights Management Area). Undesirable results were not experienced at the historical low storage condition in that groundwater supply was not impacted. **The minimum threshold is established at 398,800 AF.** The RMPs for the Western Heights Management Area are WHWC wells WHWC-2A, WHWC-10, WHWC-11, WHWC-12, and WHWC-14, and the USGS Dunlap Acres nested monitoring wells No. 2 and No. 4 (Figure 3-5). Static groundwater elevations measured at these wells will be used to evaluate conditions against the minimum threshold and measurable objective related to the undesirable results of chronic lowering of groundwater levels, reduction of groundwater storage, and land subsidence.

3.4.3.1 Chronic Lowering of Groundwater Levels

Groundwater elevations in the Western Heights Management Area experienced a long-term declining trend from the mid-1960s to 2015 (Figure 2-71). Groundwater levels declined at an approximate rate of 3.2 feet per year during that period. The cause of the long-term declining trend was groundwater production that exceeded the estimated sustainable yield of 1,760 AFY (Figure 3-37). The declining trend in groundwater levels ceased in 2015 when WHWC increased its purchase of supplemental water from YVWD in 2016 and, subsequently, WHWC reduced groundwater production from an average 2,300 AFY (1990–2015) to 1,600 AFY (2016–2018), a rate less than the estimated sustainable yield (Figure 3-39, Groundwater Production and Supplemental Water Purchased in the Western Heights Management Area).

The current average static groundwater elevation in the Western Heights Management Area is 1,753 feet above NAVD88 (Table 3-5). This is approximately 11 feet higher than the average static groundwater elevation of 1,742 feet above NAVD88 measured at the historical low condition between the RMPs in September 2015 (Table 3-5). The YIHM was used to simulate conditions at the minimum threshold. The simulated groundwater elevations at the minimum threshold for each RMP range from 1,705 to 1,713 feet above NAVD88 (Table 3-5). On average, the YIHM overestimated groundwater elevations in the Western Heights Management Area by approximately 5.3 feet between 2015 and 2018. Therefore, the minimum threshold will be characterized by measured groundwater elevations at the RMPs that range from 1,695 to 1,714 feet above NAVD88 (Table 3-5). The average groundwater elevation between the RMPs representing the minimum threshold is 1,705 feet above NAVD88.

Projected groundwater elevations calculated by the YIHM indicate that future operations in the Western Heights Management Area with pumping constrained to the estimated sustainable yield of 1,760 AFY will result in groundwater level increases from 2019 to 2070. Under the Future Baseline scenario, and the Future Baseline with Climate Change I and II (i.e., 2030 and 2070 climate change factors) scenarios, the YIHM predicts that groundwater elevations will increase at rates of approximately 1.5 foot per year (ft/yr), 1.2 ft/yr, and 0.8 ft/yr, respectively. Groundwater elevations are projected to be approximately 73 feet, 59 feet, and 39 feet higher than the groundwater elevations observed in September 2018 (Figures 3-40 to 3-46). Projected groundwater elevations at the RMPs will be above the groundwater elevations characterizing the minimum threshold in the management area.

Over the 50-year planning and implementation horizon, the groundwater elevation minimum thresholds allow for groundwater extractions to exceed historical levels while protecting against long-term aquifer supply depletion. Historical production at an average 2,500 AFY from 1966 to 2015 led to a groundwater level decline of approximately 2.7 feet per year. If, beginning with the current condition, pumping increased from the estimated sustainable yield of 1,760 AFY to the historical average of 2,500 AFY, then this historical rate may be sustained for approximately 18 years before groundwater levels fall to the minimum threshold established at an average elevation of 1,705 feet above NAVD88.

3.4.3.2 Reduction of Groundwater Storage

The YIHM indicated a net decrease of approximately 32,500 AF in groundwater storage from 1965 to 2018 (Figure 2-72). In this period, the average annual rate of groundwater production from the management area was approximately 2,400 AFY. Groundwater production was, on average, 136% of the estimated sustainable yield of 1,760 AFY. The rate of groundwater production consistently exceeded the natural recharge over this period despite the relatively wet periods observed from 1978-1983, 1993-1998, 2005, and 2011 (Figure 2-3). The decline in storage stopped in 2016 when WHWC markedly increased its purchase of supplemental water from YVWD, which subsequently led to a decline in groundwater production to below the estimated sustainable yield (Figures 3-37 and 3-39).

Simulation results of future projected conditions using the YIHM indicate that the volume in storage will, by the end of the 50-year planning and implementation horizon, increase by approximately 19,000 AF to 29,000 AF above the minimum threshold (Figure 3-47, Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the Western Heights Management Area).

The decline in groundwater elevation from the current level to the minimum threshold represents a net decline in groundwater storage of approximately 10,500 AF (Figure 3-38). The volume in groundwater storage at the minimum threshold is approximately 398,800 AF, which is 97% of the current volume in storage at 409,300 AF. The reduction

in groundwater storage to 398,800 AF would be an undesirable result. Groundwater elevations that result in a reduction in groundwater storage of approximately 10,500 AF from the current condition are lower than the historical low groundwater levels. This analysis indicates that maintaining an average aquifer saturation that is at least 97% of current conditions will protect against long-term aquifer supply depletion and provide necessary operational flexibility for municipal and private groundwater users.

3.4.3.3 Land Subsidence

The minimum threshold static groundwater elevation established to assess chronic lowering of groundwater levels and reduction of groundwater storage is lower than the historical low condition, and therefore introduces the potential for future land subsidence. DWR has designated the Plan Area has having a medium to low risk for future land subsidence (DWR 2014). The subsurface geology below the average historical low groundwater elevation of 1,742 feet above NAVD88 is, based on driller's logs for the WHWC wells, characterized as having relatively thin, discontinuous lenses of clay interbedded between thicker layers of coarse-grained sand and gravel (Appendix 3-A). This presents a low risk for future subsidence, and land subsidence related to groundwater withdrawal was not induced when historical water levels were lower than current water levels.

Groundwater elevations declined from 1996 to the historical low observed in 2015, a period when the GPS station located at Crafton Hills College indicated a net increase in vertical displacement (Figure 3-1). No significant and unreasonable land subsidence that would substantially interfere with land surface uses or infrastructure was experienced during this period. Despite no occurrence of land subsidence due to past groundwater withdrawals, there is a potential for land subsidence when groundwater levels fall below the historical low condition. Therefore, the minimum threshold for chronic declines in groundwater level and reduction of groundwater storage were adopted for land subsidence as well. The use of the groundwater elevation minimum threshold as a surrogate for land subsidence will be reviewed with each 5-year GSP evaluation to ensure that they adequately protect the Plan Area from experiencing undesirable results related to land subsidence. Each 5-year GSP evaluation will include InSAR data obtained from the SGMA Data Portal, which will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018 – a time when groundwater levels were recovering from the historical lows) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

3.4.3.4 Depletion of Interconnected Surface Water

No GDEs, potential GDEs, or interconnected surface waters were identified in the Western Heights Management Area, so no minimum threshold was established relative to this undesirable result.

3.4.3.5 Degradation of Water Quality

No minimum threshold relative to the significant and unreasonable degradation of water quality was established for the Western Heights Management Area. Active groundwater remediation programs in the Western Heights Management Area are addressing shallow groundwater contamination issues in a perched aquifer hydraulically disconnected from the underlying principal aquifer. Water quality at the active WHWC municipal supply wells has not been influenced by groundwater contamination observed in the shallow perched aquifer (see Section 2.7.5).

WHWC continues to participate in the Maximum Benefits Monitoring Program and submits groundwater level and groundwater quality (i.e., TDS and nitrate concentrations) data to YVWD, the acting data manager for the Maximum Benefits Monitoring Program, which is included in annual reports submitted to the RWQCB.

3.4.3.6 Seawater Intrusion

The Western Heights Management Area is approximately 50 miles northeast of the Pacific Ocean and approximately 1,700 feet above NAVD88. No minimum threshold was established for the Western Heights Management Area with regard to seawater intrusion.

3.4.4 San Timoteo Management Area

The San Timoteo Management Area comprises the portion of the Live Oak hydrogeological subarea that is not in the Calimesa Management Area (Figure 2-63). There are no municipal water supply wells in this management area. There are two known private agricultural supply wells in the lower portion of the management area on the westside of San Timoteo Creek. One of the wells, GL-8, supplies water to the citrus groves located near the well. The other agricultural well, the Knight Well, is used to irrigate a small field adjacent to the San Timoteo Creek. YVWD installed shallow groundwater observation wells to monitor groundwater elevations in San Timoteo Canyon. Some of these wells were set approximately 15 to 20 feet below grade and were screened to monitor fluctuations in the shallow groundwater table near San Timoteo Creek.

A minimum threshold for this management area was established for the GDEs identified along San Timoteo Creek. At this time, no sustainability criteria are established for the other sustainability indicators because there are no existing municipal water supply wells that extract groundwater from the principal aquifer. If a water purveyor plans to install and operate a municipal water supply well and produce from the principal aquifer, then the water purveyor must investigate the potential influences of pumping from the principal aquifer on the shallow groundwater table sustaining the GDEs identified along San Timoteo Creek and the potential GDEs identified along Yucaipa Creek upstream of its confluence with San Timoteo Creek. Additionally, the average long-term groundwater production from the principal aquifer in the San Timoteo Management Area will be held at or below the estimated sustainable yield of 325 AFY.

The undesirable result identified for the San Timoteo Management Area is the condition when the shallow groundwater table sustaining the GDEs falls below 30 feet bgs as a result of groundwater production from the principal aquifer. Static groundwater levels measured at YVWD shallow wells OW-3P, OW-6A and OW-6B indicated a water table above 10 feet bgs (Figure 3-48, Groundwater Elevations and Sustainability Criteria for the San Timoteo Management Area). These wells no longer exist, but were previously screened from 5 to 20 feet bgs. Deeper wells GWMW-1, GWMW-2, and GWMW-3, which are screened approximately 45 to 70 feet bgs, each had static groundwater elevations at 15 to 20 feet bgs. These groundwater elevations, or hydraulic heads, measured approximately 25 to 30 feet higher than the top of their respective well screens indicate that the alluvial aquifer is confined (Figure 3-49, Historical Groundwater Elevations Measured in the San Timoteo Management Area).

YVWD installed a deeper nested well, GWMW-5, near GWMW-1 with three well casings set at 120 to 140 feet bgs (GWMW-5A), 285 to 305 feet bgs (GMWMW-5B), and 340 to 360 feet bgs (GWMW-5C). Static groundwater elevations at the shallowest well, GWMW-5A, ranged between 15 and 25 feet bgs, and between ground surface and 5 feet bgs at GWMW-5B (Figure 3-50, Groundwater Elevations at Nested Well GWMW-5 in the San Timoteo Management Area). The deepest well, GWMW-5C, has been artesian, with flow continuously discharged to land surface. The static groundwater elevations observed at these nested wells indicated an upward vertical hydraulic gradient estimated at 0.115 feet per foot.

The RMPs for the San Timoteo Management Area are GWMW-1, GWMW-2, GWMW-3, GWMW-5A, GWMW-5B, and GWMW-5C (Figure 3-5).

3.4.4.1 Chronic Lowering of Groundwater Levels

At this time, no minimum threshold is established for the chronic lowering of groundwater levels in the San Timoteo Management Area. Static depths-to-water measured at the GL-8 agricultural well ranged from 29.17 to 38.16 feet bgs (average of 33.88 feet bgs) from 2006 to 2018 (Figure 3-49). The groundwater level dropped to an average 99.73 feet bgs when the well pumped groundwater, but subsequent groundwater level measurements when the well was idle indicated full recovery to previously observed static levels at approximately 34 feet bgs. There was no chronic lowering of groundwater levels in the principal aquifer.

The well construction and groundwater production details for the GL-8 well are unknown. The Yucaipa SGMA will request the installation of a flow meter and installation of a dedicated pressure transducer, if feasible, at GL-8 to begin recording pumping data and measuring water level data on an hourly frequency. If a water purveyor plans to install a water supply well in this management area to produce water from the principal aquifer, then aquifer testing and instrumentation of the new well, plus increased monitoring at existing wells (e.g., GL-8, GWMW-5A, GWMW-5B, GWMW-5C) will be conducted to evaluate the potential influences of pumping by the new well on other wells and the shallow groundwater sustaining the GDEs in proximity.

3.4.4.2 Reduction of Groundwater Storage

Static groundwater levels measured at GL-8, GWMW-1, GWMW-2 and GWMW-3 have been consistent since 2010, indicating no significant and unreasonable reduction in groundwater storage (Figure 3-49). At this time, no minimum threshold is established for a reduction in groundwater storage.

The YIHM predicted a net increase in groundwater in storage of approximately 4,200 to 1,600 AF by the end of the 50-year planning and implementation horizon for the Future Baseline and Future Baseline with Climate Change I scenarios, respectively (Figure 3-51, Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the San Timoteo Management Area). The YIHM predicted a net decrease of 1,600 AF for the Future Baseline with Climate Change II scenario (Figure 3-51). No future pumping in the principal aquifer was simulated in these scenarios. The model will be updated with pumping data for GL-8 and the Knight well should their respective construction details indicate that the wells are producing groundwater from the principal aquifer.

Table 3-5. Groundwater Elevations Pertaining to the Measurable Objective and Minimum Threshold in the Western Heights Management Area

Representative Monitoring Point	Simulated Groundwater Elevation at Sep. 30, 2015 (ft NAVD88)	Measured Groundwater Elevation near Sep. 30, 2015 (ft NAVD88)	Measured – Simulated Groundwater Elevation at Sep. 2015 (feet)	Simulated Groundwater Elevation at Sep. 30, 2018 (ft NAVD88)	Measured Groundwater Elevation near Sep. 30, 2018 (ft NAVD88)	Measured – Simulated Groundwater Elevation at Sep. 2018 (feet)	Simulated Groundwater Elevations at the Minimum Threshold (ft NAVD88)	Groundwater Elevations at the Minimum Threshold (ft NAVD88)	Groundwater Elevations at the Measurable Objective (ft NAVD88)
WHWC-2A	1,752.75	1,735.68	−17.07	1,756.69	1,740.68	−16.01	1,711.78	**1,695.24**	**1,735.68**
WHWC-10	1,754.44	1,750.04	−4.40	1,758.57	1,766.04	7.47	1,712.73	**1,714.26**	**1,750.04**
WHWC-11	1,747.23	1,748.93	1.70	1,748.33	1,760.93	12.60	1,705.09	**1,712.24**	**1,748.93**
WHWC-12	1,751.15	1,747.11	−4.04	1,749.20	1,757.11	7.91	1,706.91	**1,708.84**	**1,747.11**
WHWC-14	1,752.21	1,726.90	−25.31	1,754.80	1,749.90	−4.90	1,711.23	**1,696.12**	**1,726.90**
USGS Dunlap #2 (830′–850′)	1,753.21	1,748.40	−4.81	1,756.60	1,754.85	−1.75	1,712.25	**1,708.97**	**1,748.40**
USGS Dunlap #4 (440′–460′)	1,753.18	1,740.32	−12.86	1,756.46	1,743.89	−12.57	1,712.25	**1,699.54**	**1,740.32**
Average	1,752.03	1,742.48	−9.54	1,754.38	1,753.34	−1.04	1,710.32	**1,705.03**	**1,742.48**

Note: ft NAVD88 = feet above the North American Vertical Datum of 1988.

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3.4.4.3 Land Subsidence

At this time, no minimum threshold for land subsidence was established for the San Timoteo Management Area because there are no known existing water supply wells producing water from the principal aquifer, there is an upward vertical hydraulic gradient to where deep observation wells screened in the principal aquifer are artesian, and shallow groundwater levels have been consistently above 30 feet bgs.

3.4.4.4 Depletion of Interconnected Surface Water

GDEs were identified along the reach of San Timoteo Creek from its confluence with Yucaipa Creek downstream to where the flood control basins installed by SBCFCD begin (Figure 2-56). These GDEs were identified based on shallow groundwater levels observed at the water table observation wells OW-3P, OW-6A and OW-6B (Figure 3-48), and the vertical hydraulic gradient observed at the nested well, GWMW-5 (Figure 3-50). Potential GDEs were identified on the lower reach of Yucaipa Creek running 2.6 miles upstream from near its confluence with San Timoteo Creek. These GDEs were identified as potential GDEs due to the lack of groundwater level data in the area to confirm whether the GDEs were dependent on shallow groundwater.

If future extractions from the principal aquifer are planned in this region, then additional field work will be required to evaluate the potential influence of pumping on the shallow groundwater table sustaining the GDEs along San Timoteo Creek and the potential GDEs along Yucaipa Creek. The evaluation would include installing one or more shallow groundwater observation wells screened from the historical high groundwater level to approximately 35 feet bgs. Groundwater elevation data collected from the shallow groundwater observation well(s) will be analyzed to evaluate whether the potential GDEs along Yucaipa Creek are sustained by shallow groundwater (<30 feet bgs) and will be used to evaluate seasonal fluctuations and potential influences by pumping in the principal aquifer.

3.4.4.5 Degradation of Water Quality

No minimum threshold relative to the significant and unreasonable degradation of water quality was established for the San Timoteo Management Area.

3.4.4.6 Seawater Intrusion

The San Timoteo Management Area is approximately 48 miles northeast of the Pacific Ocean and approximately 1,300 feet above NAVD88, which is approximately 1,300 feet above mean sea level. No minimum threshold was established for the San Timoteo Management Area with regard to seawater intrusion.

3.5 Measurable Objectives

Measurable objectives are "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (23 CCR, Section 351, Definitions). Based on the sustainability goal (Section 3.2) and undesirable results (Section 3.3) in the Plan Area, measurable objectives were set for chronic declines in groundwater levels, reduction of groundwater in storage, land subsidence and depletion of interconnected surface water.

3.5.1 North Bench Management Area

A measurable objective was established in the North Bench Management Area to sustainably manage the groundwater resource currently and into the future by the Yucaipa GSA. **The measurable objective was established at a volume in storage of 230,000 AF**, which is 10,000 AF above the minimum threshold (Figure 3-4). The measurable objective represents the condition when the groundwater resource in the management area is managed sustainably and no undesirable results are experienced. It also represents the top end of the drought buffer. The drought buffer provides the Yucaipa GSA operation flexibility where management actions and/or programs may be implemented to prevent undesirable results should conditions fall below the minimum threshold. The measurable objective is below current conditions and projections by the YIHM indicate that future conditions will not approach the measurable objective (Figure 3-15).

3.5.1.1 Chronic Lowering of Groundwater Levels

The groundwater elevations at the RMPs that correspond to the measurable objective for the North Bench Management Area range from 2,229 to 2,528 feet above NAVD88 (Table 3-3). Since the 2007 WY, groundwater levels have exhibited an increasing trend because of the importation of SWP water as a supplemental source of water and the subsequent reduction in groundwater production by YVWD to below the estimated sustainable yield for the North Bench Management Area (Figure 3-6). Current groundwater levels in the management area are approximately 100 feet above the measurable objective.

Future predictions of groundwater elevations at each RMP in the management area by the YIHM will remain above the measurable objective (Figures 3-7 to 3-14). If, however, groundwater elevations fall below the measurable objective, the Yucaipa GSA will implement actions and/or programs to avoid the undesirable result of groundwater elevations declining below the drought buffer. The groundwater level difference of approximately 30 feet between the measurable objective and the minimum threshold provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent a net loss of groundwater from the management area before groundwater levels fall to the minimum threshold.

3.5.1.2 Reduction of Groundwater Storage

The measurable objective defined for the chronic lowering of groundwater levels (Section 3.5.1.1) applies to the reduction of groundwater storage. The groundwater elevations at the RMPs that correspond to the measurable objective range from 2,229 feet above NAVD88 to 2,528 feet above NAVD88 (Table 3-3). This marks the condition when approximately 230,000 AF of groundwater is in storage, which is approximately 90% of the volume in storage under current conditions.

Future predictions of the volume in storage by the YIHM, with groundwater production constrained to the estimated sustainable yield of 3,940 AFY, indicate a net increase in storage over the 50-year planning and implementation horizon. The volume in storage in the management area at the end of the 2069 WY will range from approximately 257,000 AF to 267,000 AF, or 27,000 AF to 37,000 AF above the measurable objective (Figure 3-15). The measurable objective also marks the beginning of the drought buffer, which allows an operational flexibility of 10,000 AF for the Yucaipa GSA to implement actions and/or programs to avoid undesirable results should conditions decline to the minimum threshold (i.e., the bottom of the drought buffer).

3.5.1.3 Land Subsidence

The measurable objective defined for the chronic lowering of groundwater levels at an average elevation of 2,332 feet above NAVD88 is approximately 30 feet above the minimum threshold, or historical low (Table 3-3). The measurable objective defined at this average elevation provides operational flexibility to implement actions and/or programs to avoid undesirable results should groundwater elevations fall below the minimum threshold. Land subsidence may be induced if the average static groundwater level declines below the historical low level for a long period of time. Static groundwater level measurements at the RMPs for this management area will act as a surrogate for direct measurements of land subsidence as a function of groundwater withdrawals from the principal aquifer. InSAR data obtained from the SGMA Data Portal will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

3.5.1.4 Depletion of Interconnected Surface Water

One measurable objective related to the protection of GDEs is defined for the North Bench Management Area, which corresponds to a shallow groundwater level measured at 20 feet bgs. This measurable objective is 10 feet higher than the minimum threshold, which provides a reasonable margin of operational flexibility under adverse conditions by allowing for changes to groundwater production (if demonstrated to influence shallow groundwater) or the implementation of projects and/or programs before groundwater levels fall to an elevation at which an undesirable result would occurs.

If future extractions planned in this region are expected to exceed historical extractions in the region, additional field work may be required to characterize the potential impact that proposed pumping rates will have on the habitats along Oak Glen Creek and Wildwood Canyon Creek. This would include installing one or more shallow groundwater observation wells screened from the historical high groundwater level to approximately 35 feet bgs. Groundwater elevation data collected from the shallow groundwater observation well(s) will be analyzed to evaluate whether the local habitat is sustained by shallow groundwater (<30 feet bgs).

3.5.1.5 Degradation of Water Quality

No measurable objectives were established relative to the significant and unreasonable degradation of water quality for the Western Heights Management Area.

3.5.1.6 Seawater Intrusion

No measurable objectives were established relative to seawater intrusion for the Western Heights Management Zone.

3.5.2 Calimesa Management Area

A measurable objective was established in the Calimesa Management Area to sustainably manage the groundwater resource currently and into the future by the Yucaipa GSA. **The measurable objective was established at the historical low volume in storage of 798,700 AF**, which is 26,000 AF above the minimum threshold (Figure 3-20). The measurable objective represents the condition when the groundwater resource in the management area is managed sustainably and no undesirable results are experienced. It also represents the beginning of the drought buffer (Figure 3-20). The

drought buffer provides the Yucaipa GSA operational flexibility where management actions and/or programs may be implemented to prevent undesirable results should conditions fall below the minimum threshold.

3.5.2.1 Chronic Lowering of Groundwater Levels

The groundwater elevations at the RMPs that correspond to the measurable objective for the Calimesa Management Area are based on the historical low conditions, which range from 2,040 to 2,206 feet above NAVD88 (Table 3-4). Groundwater levels have exhibited an increasing trend since the historical low because of the importation of SWP water as a supplemental source of water and the subsequent reduction in groundwater production by YVWD, which led to a decline in the total production in the Calimesa Management Area to below the estimated sustainable yield of 4,955 AFY (Figures 2-69 and 3-19).

Future predictions of groundwater elevations in the management area by the YIHM indicate that groundwater levels will be above the measurable objective in the Future Baseline and Future Baseline with Climate Change I scenarios, but will fall below the measurable objective under the Future Baseline with Climate Change II scenario at the end of the 50-year planning and implementation horizon (Figures 3-22 to 3-34).

When the groundwater elevation falls below the measurable objective, the Yucaipa GSA will implement actions and/or programs to avoid the undesirable result of groundwater elevations declining below the drought buffer (Section 4.2.1). The drought buffer provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent undesirable results.

3.5.2.2 Reduction of Groundwater Storage

The measurable objective defined for the chronic lowering of groundwater levels (Section 3.5.2.1) applies to the reduction of groundwater storage. The groundwater elevations at the RMPs that correspond to the measurable objective range from 2,040 feet above NAVD88 to 2,206 feet above NAVD88 (Table 3-4). This marks the condition when approximately 798,700 AF of groundwater is in storage. The measurable objective is approximately 1,700 AF below the current condition and marks the upper level of the drought buffer. The drought buffer provides operational flexibility for the Yucaipa GSA to implement actions and/or programs to avoid undesirable results should conditions decline to the minimum threshold (i.e., the bottom of the drought buffer).

The YIHM indicates that future conditions, with groundwater production constrained to the estimated sustainable yield of 4,955 AFY, will fluctuate above and below the measurable objective depending on climate (Figure 3-35). The Future Baseline scenario indicates that the volume in storage will be approximately 807,900 AF, which is 7,500 AF above the current condition. The Future Baseline with Climate Change I and II scenarios indicate that from the 2058 WY to 2069 WY, a period represented by the relatively dry period observed from 2002 to 2013, the volume in storage will approach the measurable objective or decline below the measurable objective by 12,000 AF, respectively (Figure 3-35).

3.5.2.3 Land Subsidence

The groundwater elevations representing the measurable objective are the historical lows in groundwater elevations observed between 2010 and 2015. There is no potential for land subsidence when groundwater elevations are at or above the measurable objective. However, land subsidence may be induced if the static groundwater levels

measured at the RMPs decline below the historical low condition (i.e., the beginning of the drought buffer) for a long period of time. Static groundwater level measurements at the RMPs for this management area will act as a surrogate for direct measurements of land subsidence as a function of groundwater withdrawals from the principal aquifer. InSAR data obtained from the SGMA Data Portal will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

3.5.2.4 Depletion of Interconnected Surface Water

No measurable objectives are defined relative to the significant and unreasonable effect of depleting interconnected surface water in the management area. No GDEs were identified in the Calimesa Management Area. One potential GDE was identified in the Singleton subarea. If a new water supply well is installed within 1 kilometer (0.6 miles) of this potential GDE and pumping from the principal aquifer lowers shallow groundwater levels that sustain the GDE, then sustainability criteria will be developed to prevent an undesirable result related to the significant and unreasonable decline in the shallow water table that may cause adverse impacts to the GDE.

3.5.2.5 Degradation of Water Quality

No measurable objectives were established relative to the significant and unreasonable degradation of water quality for the Calimesa Management Area.

3.5.2.6 Seawater Intrusion

No measurable objectives were established relative to seawater intrusion for the Calimesa Management Zone.

3.5.3 Western Heights Management Area

A measurable objective was established in the Western Heights Management Area to sustainably manage the groundwater resource currently and into the future by the Yucaipa GSA. **The measurable objective was established at a volume in storage of 408,800 AF**, which is the historical low in volume in storage observed in 2015 (Figure 3-38). The measurable objective represents the condition when the groundwater resource in the management area is managed sustainably and no undesirable results are experienced. It also represents the beginning of the drought buffer (Figure 3-38). The drought buffer provides the Yucaipa GSA operation flexibility where management actions and/or programs may be implemented to prevent undesirable results should conditions fall below the minimum threshold.

3.5.3.1 Chronic Lowering of Groundwater Levels

The groundwater elevations at the RMPs that correspond to the measurable objective for the Western Heights Management Area are based on the historical low groundwater levels, which range from 1,727 to 1,750 feet above NAVD88 (Table 3-5). Groundwater levels have exhibited an increasing trend since the historical low because WHWC purchases supplemental water from YVWD that, subsequently, decreases the groundwater production from the management area.

The YIHM predicts that groundwater elevations under the Future Baseline and Future Baseline with Climate Change I and II scenarios will be higher than the measurable objective by approximately 39 to 80 feet at the end of the 50-year planning and implementation horizon (Figures 3-40 to 3-46). If groundwater elevations fall below the measurable objective, the Yucaipa GSA will implement actions and/or programs to avoid the undesirable result of groundwater elevations declining below the drought buffer (Section 4.2.1). The drought buffer provides a reasonable margin of operational flexibility under adverse conditions, by allowing for changes to groundwater production or the implementation of projects and/or programs to prevent undesirable results.

3.5.3.2 Reduction of Groundwater Storage

The measurable objective defined for the chronic lowering of groundwater levels (Section 3.5.3.1) apply to the reduction of groundwater storage. The groundwater elevations at the RMPs that correspond to the measurable objective range from 1,727 to 1,750 feet above NAVD88 (Table 3-5. This marks the condition when approximately 408,800 AF of groundwater is in storage (Figure 3-38). The measurable objective is approximately 500 AF below the current condition and marks the beginning of the drought buffer. The drought buffer provides operational flexibility for the Yucaipa GSA to implement actions and/or programs to avoid undesirable results should conditions decline to the minimum threshold (i.e., the bottom of the drought buffer).

The YIHM indicates that, with groundwater production constrained to the estimated sustainable yield of 1,760 AFY, the volume of groundwater in storage will increase to approximately 9,500 AF to 19,000 AF above the measurable objective (Figure 3-47).

3.5.3.3 Land Subsidence

The measurable objective defined for the chronic lowering of groundwater levels (Section 3.5.3.1) applies to land subsidence in that static groundwater levels below the historical low level for a long period of time may induce land subsidence. Static groundwater level measurements at the RMPs for this management area will act as a surrogate for direct measurements of land subsidence as a function of groundwater withdrawals from the principal aquifer. InSAR data obtained from the SGMA Data Portal will be compared to previous InSAR data (including the baseline dataset collected from 2015 to 2018) to evaluate potential land subsidence as a result of groundwater levels falling below historical lows in the principal aquifer.

3.5.3.4 Depletion of Interconnected Surface Water

No GDEs and no potential GDEs were identified in the Western Heights Management Area, so no measurable objective was established relative to this undesirable result.

3.5.3.5 Degradation of Water Quality

No measurable objectives were established relative to the significant and unreasonable degradation of water quality in the principal aquifer for the Western Heights Management Area.

3.5.3.6 Seawater Intrusion

No measurable objectives were established relative to seawater intrusion for the Western Heights Management Zone.

3.5.4 San Timoteo Management Area

A measurable objective for this management area was established for the GDEs identified along San Timoteo Creek. At this time, no sustainability criteria were established for the other sustainability indicators because there are no existing municipal water supply wells and historical groundwater elevations indicate that private well use did not cause long-term declines in shallow groundwater levels. If a water purveyor plans to install and operate a municipal water supply well and produce from the principal aquifer, then the water purveyor must investigate the potential influences of pumping from the principal aquifer on the relationship between shallow groundwater and surface water in San Timoteo Creek and Yucaipa Creek.

3.5.4.1 Chronic Lowering of Groundwater Levels

At this time, no measurable objectives were established for the chronic lowering of groundwater levels. Static groundwater levels measured at GL-8, GWMW-1, GWMW-2 and GWMW-3 have been consistent since 2010, indicating no significant and unreasonable decline in groundwater elevations (Figure 3-49).

3.5.4.2 Reduction of Groundwater Storage

At this time, no measurable objectives were established for reduction in groundwater storage. Static groundwater levels measured at GL-8, GWMW-1, GWMW-2 and GWMW-3 have been fairly consistent since 2010, indicating no significant and unreasonable reduction in groundwater storage.

3.5.4.3 Land Subsidence

At this time, no measurable objectives for land subsidence were established for the San Timoteo Management Area because there are no existing water supply wells producing water from the principal aquifer, there is an upward vertical hydraulic gradient to where deep observation wells screened in the principal aquifer are artesian, and shallow groundwater levels have been consistently above 30 feet bgs.

3.5.4.4 Depletion of Interconnected Surface Water

One measurable objective is defined for the San Timoteo Management Area, which corresponds to a shallow groundwater level measured at 20 feet bgs (Figure 3-48). This measurable objective is 10 feet higher than the minimum threshold, and it provides a reasonable margin of operational flexibility under adverse conditions by allowing for changes to groundwater production (if demonstrated to influence shallow groundwater) or the implementation of projects and/or programs before groundwater levels fall to an elevation at which undesirable results would occur.

3.5.4.5 Degradation of Water Quality

No measurable objectives were established relative to the significant and unreasonable degradation of water quality for the San Timoteo Management Area.

3.5.4.6 Seawater Intrusion

No measurable objectives were established relative to seawater intrusion for the San Timoteo Management Area.

3.6 Monitoring Network

The objective of a monitoring network is to track and monitor parameters that demonstrate "short-term, seasonal, and long-terms trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation," (23 CCR §354.34). In order to accomplish this objective, the monitoring network must be capable of:

- Monitoring changes in groundwater and surface water conditions that may impact the beneficial uses or users of groundwater,
- Monitoring groundwater conditions relative to the sustainable management criteria, and
- Quantifying annual changes in water budget components.

The water purveyors operating in the Yucaipa Subbasin have been monitoring groundwater conditions through their respective networks of water supply and monitoring wells by collecting groundwater elevation, groundwater quality and groundwater production data since the 1920s. The current network of water supply wells and monitoring wells is capable of characterizing groundwater conditions in the Plan Area. The network will continue to be used to monitor groundwater conditions to assess long-term and short-term trends in groundwater elevations, production, and groundwater quality.

SBCFCD maintains five stream flow gauging stations in the Plan Area. These gauging stations were designed to measure peak flow events in Oak Glen Creek and Yucaipa Creek; they were not designed to measure low flows. SBCFCD reported issues with the stream flow measuring systems at three of the five locations and does not have confidence that the data collected is representative of actual flows (Section 2.3.1). The USGS has one active stream flow gauging station (110575000 located approximately 4.2 miles downstream of the farthest downstream end of the Plan Area. Flows measured at this gauging station include runoff from the San Timoteo watershed, and other drainages downstream of the watershed that contribute flow in addition to flows from the Plan Area. Flows measured at the USGS gauging station are not considered representative of surface water flow leaving the Plan Area. The unreliable low-flow data collected by the SBCFCD gauging stations was recognized as a data gap (Section 2.6.3). The Yucaipa GSA will evaluate the feasibility of installing new gauging stations, if funding becomes available, or work with SBCFCD to improve the existing stations to more accurately measure stream flows in the Plan Area.

3.6.1 Description of Existing Groundwater Network

The existing network of wells to assess groundwater conditions in the Yucaipa Subbasin includes the majority of 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 3-52, Yucaipa Subbasin Groundwater Monitoring Network; Table 3-1). 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 3-6 presents the number and type of wells located in each management area.

Table 3-6. Types of Wells in the Existing Monitoring Network

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

Of the 77 wells incorporated into the monitoring network, 13 lack well construction information, such as screen intervals and depths. Since there is only one principal aquifer in the Plan Area, well construction information is not critical for understanding general groundwater conditions. However, any projects implemented in the Plan Area may include the construction of new wells that may be designed to provide additional data on depth discrete groundwater conditions within the principal aquifer. Table 3-7 describes the maximum depth of the screens of the wells by production areas.

Table 3-7. Maximum Screen Depth of Wells in the Monitoring Network

Management Area	Wells with No Screening Information	Bottom of Screen (feet bgs)				
		<100	*100–300*	*300–500*	*500–1,000*	*>1,000*
Calimesa	2	0	0	6	15	1
North Bench	7	1	5	5	10	2
San Timoteo	1	3	1	2	0	0
Western Heights	1	0	1	1	5	4
Outside Subbasin	2	0	0	1	1	0
Total	**13**	**4**	**7**	**15**	**31**	**7**

Note: bgs = below ground surface.

3.6.1.1 Groundwater Monitoring

The monitoring network tracks groundwater elevations, groundwater quality, and groundwater extractions on a monthly to annual basis. The types of measurements collected at each well are divided into seven categories: Extraction, Extraction-Level, Extraction-Level-Quality, Extraction-Quality, Level, Level-Quality, and Quality (Table 3-8). The four water purveyors participate in the Maximum Benefits Monitoring Program (MBMP), which includes the collection of groundwater elevation data and water quality data from a select list of municipal and monitoring wells in the Plan Area (see Sections 1.5.1 and 2.7.4).

At a minimum for the MBMP, static groundwater level data is collected every April/May (i.e., seasonal high) and October/November (i.e., seasonal low) and groundwater quality data is collected annually or every three years. The municipal water suppliers also adhere to the provisions of Title 22 regarding water quality monitoring of municipal water supply wells. In general, TDS, chloride, and sulfate samples are collected once every three years and nitrate samples are collected annually. The water purveyors have collected groundwater level data on a monthly basis since the 1990s. Groundwater production data is collected monthly by the water purveyors.

Table 3-8. Monitoring Network Wells by Measurement Type

Management Area	Number of Wells by Measurement Types							
	Extraction	*Extraction Level*	*Extraction Level Quality*	*Extraction Quality*	*Level*	*Level Quality*	*Quality*	*Total*
Calimesa	0	0	12	0	12	0	0	24
North Bench	0	0	10	0	13	7	0	30
San Timoteo	0	0	0	0	1	6	0	7
Western Heights	0	0	5	0	7	0	0	12
Outside Subbasin	4	0	0	0	0	0	0	4
Total	**4**	**0**	**27**	**0**	**33**	**13**	**0**	**77**

3.6.1.1.1 Groundwater Elevations

Groundwater levels are measured, at a minimum, semi-annually in the spring and fall to characterize conditions at the end of the wet and dry seasons, respectively, and to evaluate hydraulic gradients in the Plan Area. The water purveyors collect groundwater elevation data on a monthly basis, and that data will be incorporated into the data management system (DMS) and reported in the annual and periodic evaluation reports as part of the implementation of the GSP. Static groundwater elevations are measured at 73 of the 77 wells (or 95%) in the monitoring network (Figure 3-53, Monitoring Network Wells Designated to Measure Groundwater Elevations). The coverage of the static groundwater level measurements by management area is summarized in Table 3-9.

Table 3-9. Well Distribution and Coverage for Water Level Measurements in the Plan Area

Management Area	First Water Level Record	No. of Wells Measured in 2018	% of Area Within 1 mile of Water Level Measurement	No. of 2018 Wells Regularly Measured between 2007 and 2017	No. of 2018 Wells Regularly Measured within the Same Quarter	No. of 2018 Wells Measured Seasonally
Calimesa	1926	24	60%	22	24	24
North Bench	1926	26	80%	25	26	26
San Timoteo	2010	6	40%	6	6	6
Western Heights	1950	10	90%	10	10	10

Table 3-9. Well Distribution and Coverage for Water Level Measurements in the Plan Area

Management Area	First Water Level Record	No. of Wells Measured in 2018	% of Area Within 1 mile of Water Level Measurement	No. of 2018 Wells Regularly Measured between 2007 and 2017	No. of 2018 Wells Regularly Measured within the Same Quarter	No. of 2018 Wells Measured Seasonally
Outside Subbasin	1956	1	N/A	1	1	1

Note: N/A = not applicable.

Based on the density of the monitoring network wells in each management area, the length of the historical record at each well, the spatial and temporal coverage of the existing monitoring network is sufficient to characterize groundwater conditions in the Plan Area. The current network will be used to demonstrate continued sustainable use of the groundwater resources in a way that is consistent with the sustainability goal.

3.6.1.1.2 Groundwater Extraction

Groundwater extraction in the Plan Area has been monitored by the four water purveyors since 1965. In 2018, 31 municipal water supply wells, or approximately 40% of the wells in the monitoring network, were monitored for groundwater extractions (Figure 3-54, Monitoring Network Wells Designated to Measure Groundwater Production). All of these wells had meters in 2018. There are two irrigation supply wells, GL-8 and Knight, in the San Timoteo management area that are not metered. The Yucaipa GSA will make attempts to contact the individual private well owners and inquire about the installation of meters at these wells and include them as additional RMPs to the San Timoteo Management Area. The coverage of groundwater extractions by management area is summarized in Table 3-10.

Table 3-10. Well Distribution and Coverage for Groundwater Production in the Plan Area

Management Area	First Extraction Record	No. of Wells with Recorded Extractions in 2018	% of Area within 1 Mile of Extraction	No. of 2018 Wells Measured between 2007 and 2017	No. of 2018 Wells Measured within the Same Quarter
Calimesa	1948	12	60%	12	12
North Bench	1965	10	80%	10	10
San Timoteo	N/A	0	N/A	0	0
Western Heights	1965	5	90%	5	5
Outside Subbasin	1956	4	N/A	4	4

Note: N/A = not applicable.

3.6.1.1.3 Groundwater Quality

Groundwater quality sampling is performed quarterly to annually. Samples are collected from active municipal supply wells that have pumped at least three casing volumes and from inactive and/or monitoring wells that were

purged at least three casing volumes using a dedicated pump or portable submersible pump. The water quality samples are collected using standardized procedures established by the various member agencies and analyzed for a variety of parameters per Title 22 requirements for municipal supply wells and the MBMP for monitoring wells (Wildermuth, 2014). Groundwater quality samples are collected at 52% of the wells in the monitoring network (Figure 3-55 and Table 3-11).

Table 3-11. Well Distribution and Coverage for Water Quality Measurements in the Plan Area

Management Area	First Water Quality Record	No. of Wells Measured in 2018	% of Area within 1 Mile of Water Quality Measurement	No. of 2018 Wells Measured between 2007 and 2017	No. of 2018 Wells Measured within the Same Quarter
Calimesa	1993	12	60%	12	12
North Bench	1994	17	80%	17	17
San Timoteo	2010	6	50%	6	6
Western Heights	1995	5	90%	5	5
Outside Subbasin	N/A	0	0%	0	0

Note: N/A = not applicable.

3.6.1.2 Surface Water Monitoring Conditions

In addition to monitoring groundwater conditions in the Plan Area, Yucaipa GSA uses surface water flow and precipitation data collected by other agencies, including the USGS and the SBCFCD, to monitor the parameters that influence groundwater recharge in the Subbasin.

3.6.1.2.1 Surface Water Flow

SBCFCD manages five stream gauges within the Plan Area (Figure 2-7). Two stream gauges are located on Yucaipa Creek, one is located on Wilson Creek upstream of the confluence with Oak Glen Creek, and two stream gauges are located on Oak Glen Creek upstream of its confluence with Yucaipa Creek. Surface water flow is also manually measured in San Timoteo Creek downstream of its confluence with Yucaipa Creek (see Section 2.3.1). These stream gauges record mean daily flow rates. These stations were designed to measure peak flow events. SBCFCD stated that for "95% of the year the creeks do not contain significant quantities of water" and, therefore, do not accurately measure flow outside of those peak events (personnel communication with SBCFCD, July 2019). SBCFCD has confidence in measurements collected at stations 3601C and 3608A, the two farthest downstream gauging stations in the Subbasin. The Yucaipa GSA will evaluate the feasibility of installing new gauging stations, if funding becomes available, or work with SBCFCD to improve the existing stations to more accurately measure stream flows in the Subbasin. No historical records exist for identifying the locations where ephemeral or intermittent flowing streams cease to flow. The Yucaipa GSA will make efforts in the first 5 years of the implementation period to identify where and when these flows cease to improve the characterization of interconnected surface water.

3.6.1.2.2 Precipitation

The precipitation monitoring program currently utilizes 17 precipitation stations managed by SBCFCD within the Plan Area and three NOAA stations with one in the Plan Area, one in the City of Redlands, and one in Beaumont (Section 2.2.1; Figure 2-1). Daily precipitation is recorded at these stations, which provides adequate temporal resolution to evaluate short-term and seasonal impacts of precipitation on groundwater conditions in the Plan Area.

Of the currently active precipitation stations in the Plan Area, the Redlands-Roth and Oak Glen stations, both maintained by SBCFCD, have the longest continuous records of daily precipitation, with measurements dating back to 1932 and 1945, respectively. The lengths of these records, plus long-term records for other stations, are adequate to evaluate long-term trends in precipitation within the Plan Area.

3.6.2 Monitoring Network Relationship to Sustainability Indicators

The existing groundwater network will be used to monitor and document changes in groundwater conditions related to the four sustainability indicators relevant to the Plan Area. This network includes the wells that have been designated as RMPs for reporting purposes to DWR. Minimum thresholds and measurable objectives were established for the RMPs. An assessment of groundwater conditions and the potential for undesirable results will be based on the conditions measured at the RMPs. The broader groundwater monitoring network, including the RMPs, will be used to document conditions in the Plan Area and provide support for recommendations and findings based on the conditions recorded at the RMPs.

3.6.2.1 Chronic Lowering of Groundwater Levels

The groundwater monitoring network must accomplish the following to adequately monitor conditions related to chronic lowering of groundwater levels:

- Track short-term, seasonal, and long-term trends in groundwater elevations.
- Characterize groundwater elevations in mid-March and mid-October for the principal aquifer.
- Record groundwater elevations at RMPs for which minimum thresholds and measurable objectives have been identified.
- Provide data from which hydraulic gradients within the principal aquifer can be calculated.

Spatial Coverage

The groundwater elevation monitoring well density in the Plan Area is approximately 2.1 wells per square mile (Figure 3-53). The highest density of wells occurs in the Western Heights (3.1 wells/sq. mi.) and Calimesa (2.3 wells/sq. mi.) management areas. The majority of wells in Western Heights Management Area are located in the central part of the management area. The majority of wells in the Calimesa Management area are located in the western half of the management area. The density of groundwater level wells in the North Bench Management and San Timoteo Management Areas are 2.1 and 1.2 wells/sq. mi., respectively (Figure 3-53).

DWR guidelines recommend a well network with a density of one observation per 16 square miles (DWR 2016a). The monitoring well density recommended by CASGEM Groundwater Elevation Monitoring Guidelines ranges from one to 10 wells per 100 square miles (DWR 2010). The density of monitoring wells in the Plan Area exceeds the guidance and provides adequate spatial coverage to assess whether the Plan Area is experiencing chronic lowering of groundwater levels.

Temporal Coverage

Groundwater elevation data will be collected, at a minimum, in the spring and fall of each year to characterize groundwater elevation conditions. Further discussion of the monitoring schedule is provided in Section 3.6.3, Monitoring Network Implementation.

3.6.2.2 Reduction of Groundwater Storage

The groundwater monitoring network must accomplish the following to monitor conditions related to reduction of groundwater storage:

- Track short-term, seasonal, and long-term trends in groundwater storage.
- Calculate year-over-year (mid-March to mid-March) changes in storage.

The requirements for evaluating a reduction in groundwater storage are similar to those for chronic lowering of groundwater levels (Section 3.3.2) because these two sustainability indicators are linked. The spatial and temporal density of groundwater elevation data necessary to evaluate a reduction in groundwater storage in the Plan Area is the same for groundwater elevation changes. The current network of wells is capable of documenting changes to both sustainability indicators.

3.6.2.3 Land Subsidence

The groundwater monitoring network must be able to track long-term trends in groundwater elevation in order to adequately monitor conditions related to land subsidence that may result from groundwater elevations falling below historical low levels for a long period of time. Groundwater elevations will be used as a surrogate for direct measurements of land subsidence in the Plan Area (see Section 3.3.3). Because fine grained sediments prone to subsidence tend to occur in thin discontinuous layers in the subsurface of the Plan Area, direct monitoring of subsidence rates is not currently required in the Plan Area. Instead, the network of groundwater monitoring wells discussed in Section 3.6.1 will be used to evaluate whether groundwater level declines in the principal aquifer to below historical lows for a long period may potentially induce land subsidence. If these conditions develop, then the Yucaipa GSA will obtain InSAR data from the SGMA Data Portal to evaluate conditions relative to the baseline (2015 to 2018) when groundwater levels in the Plan Area were recovering from historical lows.

3.6.2.4 Depletions of Interconnected Surface Water

The groundwater monitoring network includes shallow groundwater observation wells completed in San Timoteo Canyon near San Timoteo Creek, and two wells completed near confirmed GDEs in the North Bench Management Area. Groundwater elevations will be monitored at these wells to characterize seasonal conditions in the shallow aquifer, and whether pumping from the principal aquifer influences the shallow groundwater levels. Under the MBMP, surface water flows are measured manually in San Timoteo Creek on a biweekly basis and following major precipitation events. This data will be incorporated into the GSP dataset to evaluate surface water flow conditions relative to climate and groundwater conditions monitored in the San Timoteo Management Area. Other GDEs identified in the North Bench Management Area were not influenced by existing pumping conditions, but any planned new wells in proximity to these GDEs, or increases in groundwater withdrawals that exceed historical

averages, will require an investigation to determine if groundwater production from the principal aquifer will influence shallow groundwater levels that may adversely impact the GDEs.

3.6.3 Monitoring Network Implementation

3.6.3.1 Groundwater Elevation Monitoring Schedule

Following the guidance provided by DWR (DWR 2016a), groundwater elevation measurements will be collected, at a minimum, two times per year from all accessible wells in the monitoring network to characterize the spring high and fall low groundwater levels. Spring groundwater levels will be collected during the month of April and fall groundwater levels will be collected during the month of October. By collecting groundwater elevation data within a single month, the groundwater elevation data will be used to characterize groundwater conditions during the seasonal highs (i.e. spring at the end of the wet season) and lows (i.e., fall at the end of the dry season).

3.6.3.2 Groundwater Storage Monitoring Schedule

Groundwater storage is directly linked to groundwater elevation. Therefore, the groundwater elevation monitoring network and schedule will be used to monitor changes in groundwater storage.

3.6.3.3 Groundwater Production Monitoring Schedule

Groundwater production data will be collected on a monthly basis and reported as monthly totals.

3.6.4 Monitoring Protocols

To monitor groundwater conditions in the Plan Area and evaluate sustainable management of the Subbasin with an acceptable level of confidence, the Yucaipa GSA adopted and slightly modified monitoring protocols already in place for the MBMP and those recommended in the Monitoring Protocols, Standards, and Sites Best Management Practices BMP published by DWR (DWR 2016b). The GSP Regulations require that GSPs include monitoring protocols that are (1) developed according to best management practices; (2) adhere to protocols recommended by DWR, or comparable protocols, that will yield quality data; and (3) shall be reviewed at least every 5 years as part of the periodic evaluation of the GSP and modified as necessary (23 CCR, Section 352.2).

The four water purveyors operating in the Plan Area are currently participating in the MBMP, which was implemented following the 2014 amendment to the Water Quality Control Plan for the Santa Ana River Basin (RWQCB 2019). The amendment included modifications to the Maximum Benefit Salt Management Plan in the San Timoteo Watershed, and specifically modified the maximum-benefit commitments in the Beaumont, San Timoteo and Yucaipa Groundwater Management Zones (GMZs), to which the Yucaipa and part of the San Timoteo GMZs are included in the Plan Area (Figure 2-64). The draft Maximum Benefit Monitoring Report 2015 Work Plan provided monitoring protocols to collect representative groundwater and surface water data in the watershed (Wildermuth, 2014). The monitoring protocols were adopted by all participating agencies in the MBMP, which includes the four water purveyors in the Yucaipa GSA. Additionally, groundwater level data collected at the USGS groundwater nested monitoring wells, and monitoring wells installed by YVWD, SBVMWD, and the County of San Bernardino, is collected for the MBMP and will be incorporated into the groundwater level dataset for the GSP. The monitoring protocols

established for the MBMP are adopted in this GSP, plus additional protocols and reporting standards detailed in the GSP Regulations under 23 CCR, Section 352.4, Data and Reporting Standards.

3.6.4.1 Groundwater Level Monitoring

Consistent with the groundwater level monitoring program described in the MBMP Draft 2015 Work Plan and the Monitoring Protocols, Standards, and Sites BMPs, the following groundwater level monitoring protocols will be implemented by the Yucaipa GSA:

1. Static depths-to-water (DTW) will be measured, at a minimum, at all wells in the monitoring network within a 1- to 2-week period every spring (middle April) and fall (middle October) to characterize the seasonal highs and seasonal lows, respectively, in groundwater elevations in the Plan Area. The period of data collection will be centered on the middle of the month. Currently, and for the last ten years, the Yucaipa GSA member agencies have provided groundwater level data on a more frequent basis (e.g., monthly to quarterly).
2. The static DTW measurements are collected relative to an established Reference Point (RP) elevation surveyed on the well casing or other established measuring point. The elevations of the RPs are referenced to the North American Vertical Datum of 1988 (NAVD88). The elevation of the RP is accurate to within 0.5 foot. DTW measurements are accurate to 0.1 foot but will be measured to an accuracy of 0.01 when possible.
3. All groundwater level data will be recorded on standardized field monitoring forms, either paper or digital, that will be utilized by all member agencies in the Yucaipa GSA. The following information will be recorded for each groundwater level measurement:
    a. Agency name and field personnel name(s) measuring and recording the DTW measurement.
    b. Well name or other standard identifier.
    c. Type of equipment used to measure the DTW (e.g., electric sounder, steel tape, airline).
    d. A description of the measuring point (e.g., sounding tube, top of well casing, access port).
    e. Date and time of the DTW measurement.
    f. Status of the well measured (e.g., static, offline for # of hours but recovering, pumping). If the status of the well is “recovering” or “pumping”, then subsequent attempts will be made within the 1- to 2-week data collection period to measure a static DTW.
    g. Depth in feet from the RP to the groundwater level (accurate to 0.1 foot at a minimum).
    h. If the well is not accessible to collect a static DTW, then an explanation will be documented in the field form.
4. Some wells in the monitoring network are extraction wells. For these wells, the pump will be turned off for at least 24 hours before determining if the water level in the well is at a static condition. If operational constraints prevent shutting the pump off for 24 hours in April or October, a DTW measurement will not be collected at that well during the monitoring event. This will be documented in the accompanying field form for the well.
5. The equipment used to measure the DTW will be decontaminated after use at each well. This includes using a PFAS-free detergent (e.g., Alconox) and deionized water to clean the equipment.
6. Some wells in the monitoring network are instrumented with dedicated pressure transducers for higher temporal resolution monitoring. The groundwater elevation data recorded by the transducers will be downloaded on a monthly to quarterly basis.

7. All DTW data and associated information collected during the monitoring events will be processed into standard formats, checked for quality assurance and quality control (QA/QC), and uploaded to the Data Management System (DMS) within 1 week of collection. The QA/QC process will include calibrating the DTW measuring equipment prior to the monitoring event, reviewing historical DTW measurements to compare to the current measurement, and review climatic conditions or other factors that may potentially influence groundwater levels.
8. A copy of the field monitoring form and monitoring protocol to be used by the Yucaipa GSA member agencies when collecting groundwater elevation data is in Appendix 3-B.

3.6.4.2 Groundwater Production Monitoring

The four water purveyors will provide monthly production data for their respective municipal and/or irrigation wells operating in the Plan Area, and for the wells operating outside the Plan Area that provide an imported groundwater supply. As part of the GSP implementation, the Yucaipa GSA will request production data from private well users in the Plan Area. All wells are equipped with a calibrated flow meter and totalizer to gauge the instantaneous pumping rate and record the total gallons (or acre-feet) pumped. All pumping data recorded in gallons will be converted to acre-feet, as per 23 CCR, Section 352.4.

Pumping data will be recorded for each well using the standard well name or identifier, the date of record (preferably the last day of the calendar month), the instantaneous pumping rate when the total volume pumped is recorded, and operational issues or conditions during the month of record that influenced pumping (e.g., pump was offline for 2 weeks for maintenance reasons). A copy of the groundwater production monitoring record is included in Appendix 3-B. All production data and associated information will undergo QA/QC procedures (e.g., compare to previous monthly totals, well operations, DTW measurements that may indicate a change in operation) to ensure that accurate pumping information is uploaded to the DMS.

3.6.4.3 Groundwater Quality Monitoring

Even though degraded water quality is not a sustainability indicator applicable to the Plan Area, the Yucaipa GSA member agencies collect water quality data per the monitoring requirements under Title 22 for municipal water supply wells and the MBMP. The water quality data collected under these monitoring requirements will be incorporated into the DMS for this GSP and evaluated to characterize water quality conditions in the Plan Area.

Consistent with the groundwater level monitoring program described in the MBMP Draft 2015 Work Plan and the Monitoring Protocols, Standards, and Sites BMPs, the following groundwater level monitoring protocols will be implemented by the Yucaipa GSA:

1. Water quality samples will be collected at all municipal water supply wells per Title 22 regulations and at all wells included in the MBMP sampling schedule. These wells are sampled on a semi-annual basis every March/April and October/November.
2. All information pertinent to the collection of representative water quality samples will be recorded in standardized forms by the field crew collecting the sample(s). This information will include the well identifier, status of well, sampling method utilized (e.g., operation of dedicated pump, portable submersible pump), static DTW (if pump not operating), calculation of three casing volumes, duration of pumping prior

to and/or during purging process, measurements of water quality parameters (pH, temperature, electrical conductivity) and times of measurements.

3. All water quality samples will be collected in the appropriate containers supplied by the state certified analytical laboratory that will conduct the analyses. All sample containers will include a label detailing the well identifier, date/time of sample collection, name of the analytical laboratory conducting the analysis, the type of analysis, and initials of the individual(s) collecting the sample(s).
4. The water quality samples will be placed in an ice chest to be chilled and maintained at 4°C from the moment of collection to delivery to the analytical laboratory.
5. A chain-of-custody (COC) form will be filled out at the time of each sample collection. The COC will be included with the samples upon delivery to the analytical laboratory for analysis. The COC will be signed by the sampling crew and the analytical laboratory at the time of transfer.
6. The analytical laboratory will be instructed to use reporting limits that are equal to or less than the applicable water quality objectives established under the Basin Plan.
7. All water quality data, including water quality parameters recorded during the purging process, will be documented in the DMS.
8. A copy of the field monitoring form and monitoring protocol to be used by the Yucaipa GSA member agencies when collecting groundwater quality data is in Appendix 3-B.

3.6.5 Representative Monitoring

Representative monitoring points (RMPs) for each management area were selected from the wider network of municipal and monitoring wells in the Plan Area (Figure 3-5; Table 3-2). These RMPs represent point locations in their respective management areas where sustainability indicators are evaluated and were used to define the quantitative values for the minimum thresholds and measurable objectives established in Sections 3.4 and 3.5 (23 CCR, Section 354.36).

The criteria used for selection of the RMPs were:

- Municipal water supply wells active in the last 5 years to characterize groundwater production, and inactive municipal supply wells and monitoring wells to characterize static groundwater elevations
- Length of historical groundwater level and production data, where applicable, at the RMP
- Inclusion of the RMP in other monitoring programs (e.g., MBMP)
- Long-term accessibility and well ownership considerations.

Using the criteria listed above, 36 RMPs were selected from the wells in the monitoring network (Table 3-2). Groundwater elevation data is collected from the 36 RMPs (28 are single completion wells and 8 are nested wells) to characterize groundwater conditions in their respective management areas. Groundwater production data will be collected from all active wells that produced groundwater in the corresponding water year, including the RMPs. The RMPs in the San Timoteo management area are monitoring wells and do not produce water. Groundwater quality data is collected at 23 RMPs.

3.6.5.1 Groundwater Elevation RMPs

Groundwater elevations are directly related to groundwater in storage. Therefore, the use of groundwater elevation data to characterize changes in groundwater storage is adequate to assess groundwater conditions in the Plan Area. Figure 3-C1 in Appendix 3-C shows the RMPs in relation to the disadvantaged and severely disadvantaged communities identified in the Plan Area (see Section 1.8.8). The distribution of the RMPs relative to the disadvantaged communities is appropriate to characterize groundwater conditions for South Mesa and YVWD, the two water purveyors that supply water to these disadvantaged communities. YVWD-25, the RMP located in the upper reaches of the North Bench management area, provides characterization of groundwater conditions where some private well users have been identified. Figure 3-C2 in Appendix 3-C shows the RMPs in relation to GDEs identified in the Plan Area. YVWD-25 and YVWD-28 provide characterization of groundwater conditions at the confirmed GDEs located in the upper reaches of the Oak Glen subarea and Wildwood Canyon. The monitoring wells, GWMW-1 to GWMW-5C, provide characterization of groundwater conditions for the confirmed GDEs along the reach of San Timoteo Creek in the Plan Area. No groundwater level information is available at this time to characterize conditions for the potential GDEs identified along Yucaipa Creek (just upstream of its confluence with San Timoteo Creek in the San Timoteo management area) and in the Singleton subarea. These areas are identified as a data gap in characterizing groundwater conditions and the interconnection of surface water.

Groundwater elevation data is also used as a surrogate for direct measurements of land subsidence as groundwater levels that fall below historical lows for a long period of time may induce subsidence. Land subsidence in the Plan Area has the potential to occur both as a result of tectonic forcing and as a result of groundwater level declines (see Section 2.7.7). Therefore, measuring groundwater elevations is a better proxy for evaluating land subsidence induced by groundwater withdrawals than measuring total land subsidence, because the tectonic and groundwater elevation components of the total subsidence measurement cannot be separated from each other.

Groundwater elevations measured at each of the RMPs will be reported to DWR in the annual reports that will follow the submittal of this GSP. Each of these wells may be instrumented with a pressure transducer capable of recording groundwater levels at a higher frequency (e.g., daily) if there is access to securely install the transducer. Groundwater elevations measured at the RMPs will be compared to their respective measurable objective and minimum threshold levels for each management area to evaluate whether groundwater conditions are approaching or experiencing undesirable results associated with the chronic lowering of groundwater levels, reduction in groundwater storage, and the depletion of interconnected surface water that may adversely impact GDEs. The criteria characterizing conditions below the measurable objective or minimum threshold in a management area are for groundwater elevations measured at 50% or more of the RMPs below their respective measurable objective or minimum threshold levels for two consecutive years.

The Yucaipa GSA will evaluate the ongoing representativeness of the current RMPs during the 5-year GSP evaluation and update process. RMPs may be added to the monitoring network to enhance characterization of the Subbasin and evaluation of groundwater conditions relative to the sustainability criteria established in this GSP. Current RMPs may be removed in the event that groundwater elevations at that RMP are found to no longer represent groundwater conditions in the principal aquifer, or if changes are made to access agreements or well construction. In the event that an RMP must be removed from the monitoring program, Yucaipa GSA will evaluate existing wells as a replacement RMP or potential sites to install a new replacement well. Any existing well that is added to the current groundwater elevation RMPs must have a record of sufficient length to establish that groundwater conditions at that well are representative of groundwater conditions measured at other nearby wells.

3.6.6 Monitoring Network Improvements

The GSP Regulations call for each GSA to review and evaluate the monitoring network established for the Plan Area in the GSP and every 5-year assessment. Specifically, "each agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency" (23 CCR, Section 354.38). While the existing monitoring network satisfies the requirements to "demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions" (23 CCR, Section 354.34), there are improvements that can be made to improve local spatial coverage. Section 2.6.3 identified data gaps in characterizing the hydrogeology of the Subbasin, a few of which related to monitoring activities.

3.6.6.1 Stream Flow Gauging

The existing stream flow gauging stations maintained by SBCFCD were designed to measure peak flows in Wilson Creek, Oak Glen Creek and Yucaipa Creek; they were not designed to measure low to normal flows. The lack of flow data under these conditions limits the Yucaipa GSA understanding of recharge to the groundwater basin as a result of leakage from stream beds. The Yucaipa GSA has initiated discussions with DWR in installing additional stream flow gauging stations in Yucaipa Creek. The Yucaipa GSA may also reach out to SBCFCD to potentially modify the existing gauging stations or install new ones; and may contact the USGS about installing new gauges in the Plan Area.

3.6.6.2 Interconnected Surface Water

The YIHM suggests that surface water in the upper reaches of Wilson Creek, Oak Glen Creek, and Yucaipa Creek in the North Bench Management Area may be interconnected with shallow groundwater. However, there are no existing shallow groundwater wells to confirm this relationship. The Yucaipa GSA will investigate the feasibility of installing shallow groundwater observation wells to characterize the relationship between surface water and groundwater, in conjunction with additional stream flow gauging stations to enhance the characterization of interconnected surface water in the upper reaches of the North Bench Management Area. The Yucaipa GSA will also document when and where ephemeral and intermittent flowing streams cease to flow.

3.6.6.3 Information for Private Wells

The status of private wells in the Yucaipa Subbasin, including information on well construction, pumping operations, and the ability to measure groundwater levels, are mostly unknown. The Yucaipa GSA recognizes this lack of information as a data gap in evaluating conditions in the Subbasin. The Yucaipa GSA will make efforts to contact the known and potential private well users to obtain the pertinent information needed to evaluate and preserve their beneficial use of groundwater in the Plan Area.

3.6.6.4 Spatial Data Gaps in Groundwater Level Measurements

No known wells exist in the eastern half of the Calimesa Management Area, with the exception of the USGS nested well, Equestrian Park, to provide groundwater elevation data. The Yucaipa GSA will evaluate the feasibility of installing an additional monitoring well in the eastern portion of the Calimesa Management Area to address the data gap in groundwater elevations in that part of the Plan Area.

A lack of knowledge of existing private wells serving domestic and/or irrigation purposes in the Subbasin is a data gap for groundwater elevations and groundwater production. The Yucaipa-SGAM is making efforts to contact the private well owners to obtain information about their wells, including depths-to-waters and groundwater production.

3.6.6.5 Temporal Data Gaps in Groundwater Level Measurements

The DWR Monitoring Protocol BMP (DWR 2016a) states the following:

> Groundwater elevation data … should approximate conditions at a discrete period in time. Therefore, all groundwater levels in a basin should be collected within as short a time as possible, preferably within a 1- to 2-week period.

The DWR Monitoring Networks BMP (DWR 2016b) states the following:

> Groundwater levels will be collected during the middle of October and March for comparative reporting purposes.

Groundwater elevation data collection, at a minimum, every April/May and October/November for the MBMP, or every month on either the beginning of the month or near the end. The protocol for measuring groundwater elevations throughout the Plan Area will establish a schedule of collecting this data within a 1- to 2-week window centered on the middle of the month.

Installation of pressure transducers capable of recording hourly or daily groundwater conditions in key monitoring wells would reduce the need for staff to take manual measurements from wells in the monitoring network within a 2-week window. Pressure transducers could be downloaded after the 2-week window has passed and recorded data from within the 2-week window would be incorporated into groundwater elevation maps and calculations of groundwater in storage. The recommended 2-week window during which groundwater elevations should be collected is March 9 to 22 for the spring and October 9 to 22 for the fall.

3.6.7 Monitoring Network Modifications

The GSP Regulations (23 CCR, Section 354.38 [e]) require that each GSA "adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances," including the following:

1. **Minimum threshold exceedances**. The status of RMPs and the frequency of data collection will be evaluated following an exceedance of a minimum threshold established at an RMP. This evaluation will include an assessment of the methodology and integrity of the data collected, and determination of its representativeness of conditions in the management area to which it is monitoring. Any errors or deficiencies in the data will be identified and corrected, if possible, and other potential sites will be assessed that may replace the RMP. Section 4.2.1, Management Action No. 1, also details the steps in implementing management actions when minimum thresholds are exceeded and undesirable results are experienced in a management area. This section also calls for a reevaluation of the YIHM to assess its accuracy in predicting conditions representative of undesirable results.
2. **Highly variable spatial and temporal conditions**. Substantial variations in spatial and temporal conditions will be assessed to determine if they are the results of real conditions, or if the specific monitoring point or station is experiencing issues that affect its ability to accurately collect representative data. If a monitoring

point or station is found unreliable, a replacement monitoring point or station will be identified, or a new one designed, to provide accurate data to effectively characterize conditions in the Subbasin and appropriate management area.

3. **Adverse impacts to beneficial uses and users of groundwater**. The monitoring network suffices in providing information to characterize conditions in the Subbasin and for each management area. However, should adverse conditions impact the beneficial uses and/or users of groundwater while the monitoring network fails to characterize these conditions, then the Yucaipa GSA will reevaluate the monitoring network and, within a 1-year period, conduct a feasibility study of modifying and/or expand the monitoring network to improve its ability to characterize conditions so that the appropriate management actions may be implemented to protect and sustainably manage the groundwater resources.
4. **The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin**. This circumstance is not applicable because the adjacent basins are either exempt from the SGMA or are a low-priority basin with no established sustainability criteria.

3.7 References

DWR (California Department of Water Resources). 2010. *Department of Water Resources Groundwater Elevation Monitoring Guidelines.* December 2010.

DWR. 2014. *Summary of Recent, Historical, and Estimated Potential for Future Land Subsidence in California*.

DWR. 2016a. *Best Management Practices for the Sustainable Management of Groundwater: Monitoring Networks and Identification of Data Gaps.* December 2016.

DWR. 2016b. *Best Management Practices for the Sustainable Management of Groundwater: Monitoring Protocols, Standards, and Sites.* December 2016.

RWQCB (Regional Water Quality Control Board). 2019. *Water Quality Control Plan, Santa Ana River Basin* (8). January 24, 1995. Updated June 2019 to include approved amendments. https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/.

Wildermuth (Wildermuth Environmental Inc.). 2014. *Maximum Benefit Monitoring Report 2015 Work Plan*. Prepared for City of Beaumont, Yucaipa Valley Water District, San Gorgonio Pass Water Agency, Beaumont Cherry Valley Water District, and City of Banning. September 30, 2014. Updated December 22, 2014.

Figure 3-1. 31-Day Running Average of Vertical Displacement Measured at the Crafton Hills College

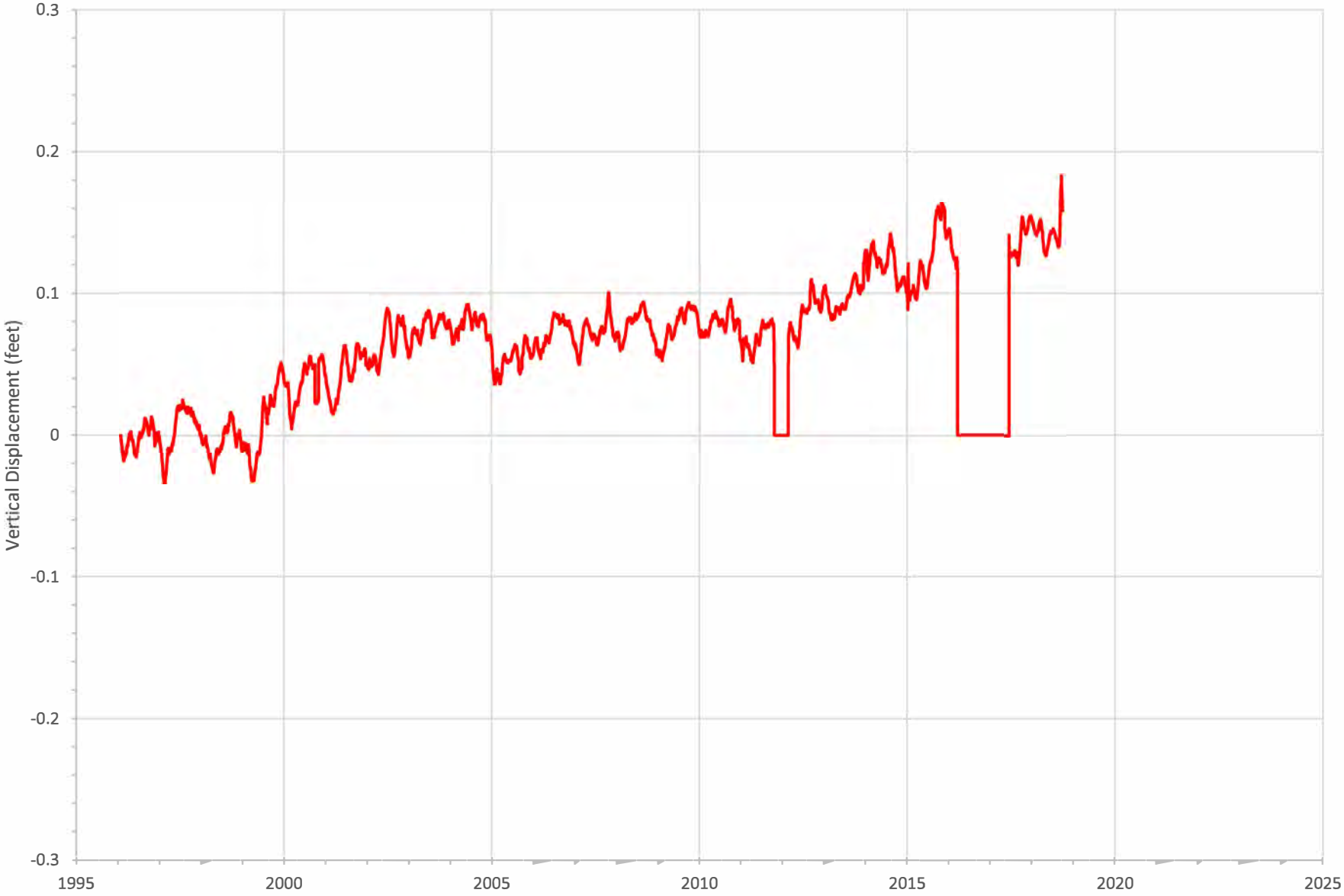

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Figure 3-2. Drought Buffer in the North Bench Management Area

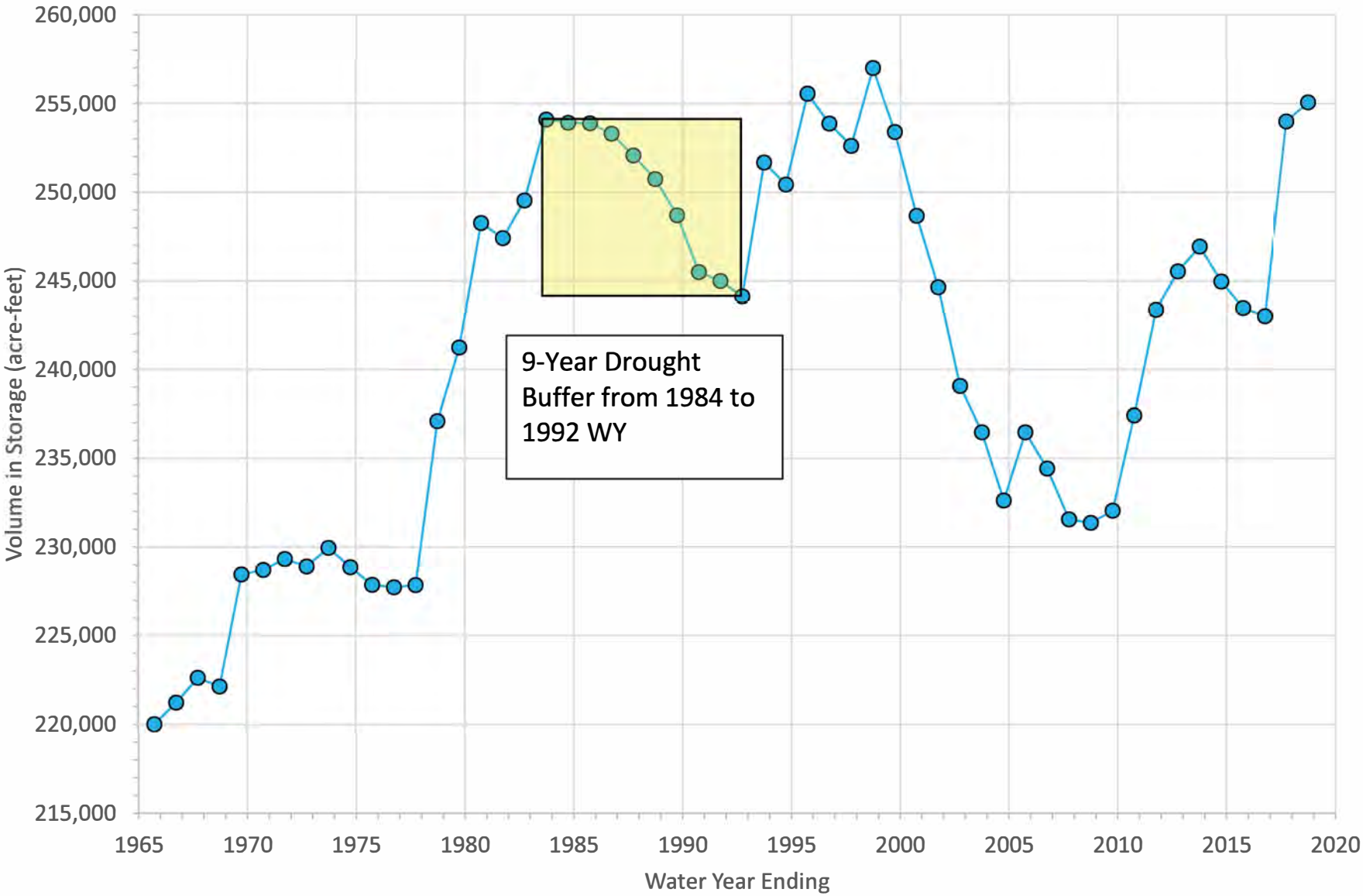

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Figure 3-3. Historical and Current Volume of Groundwater in Storage in the North Bench Management Area

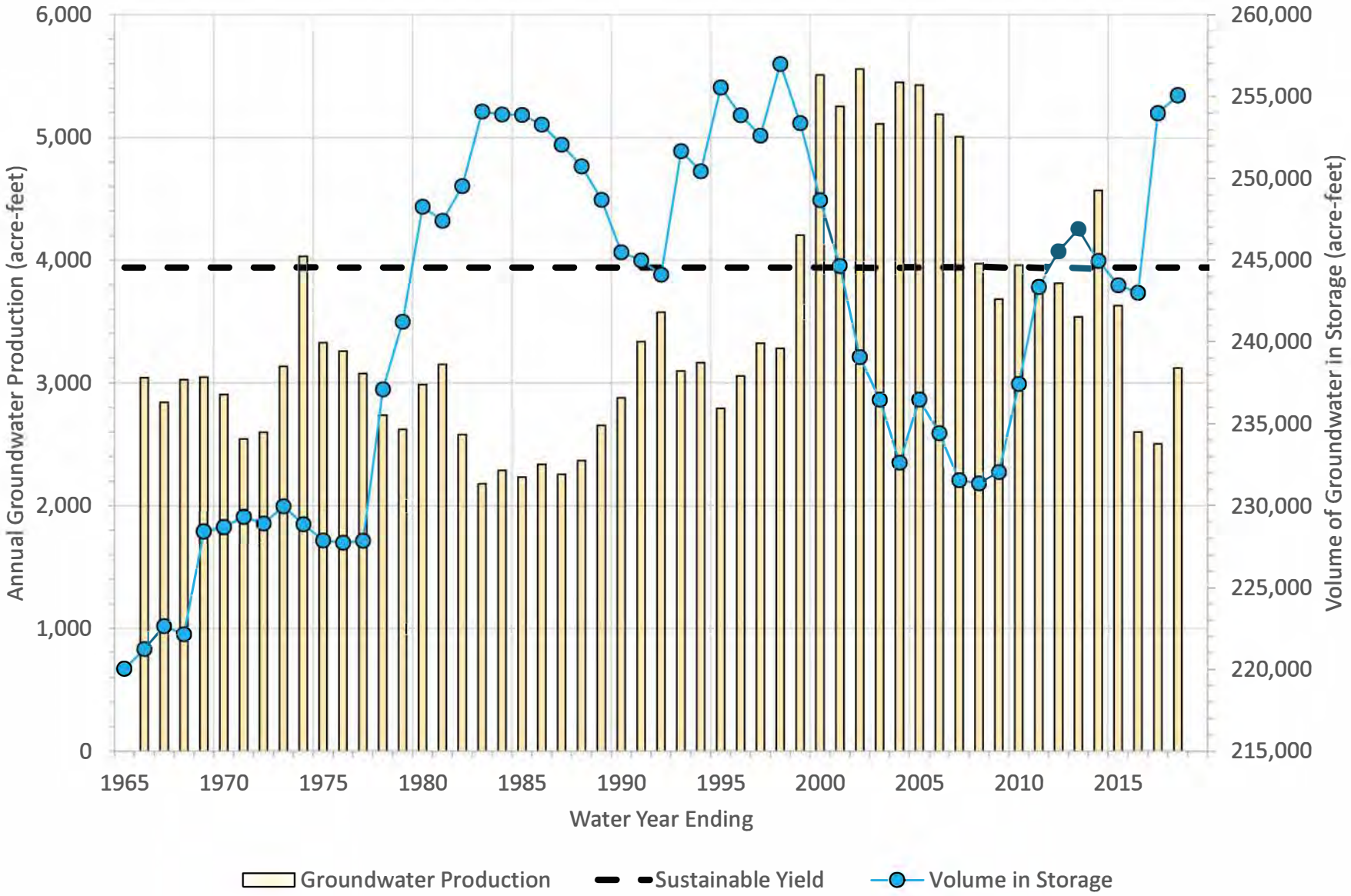

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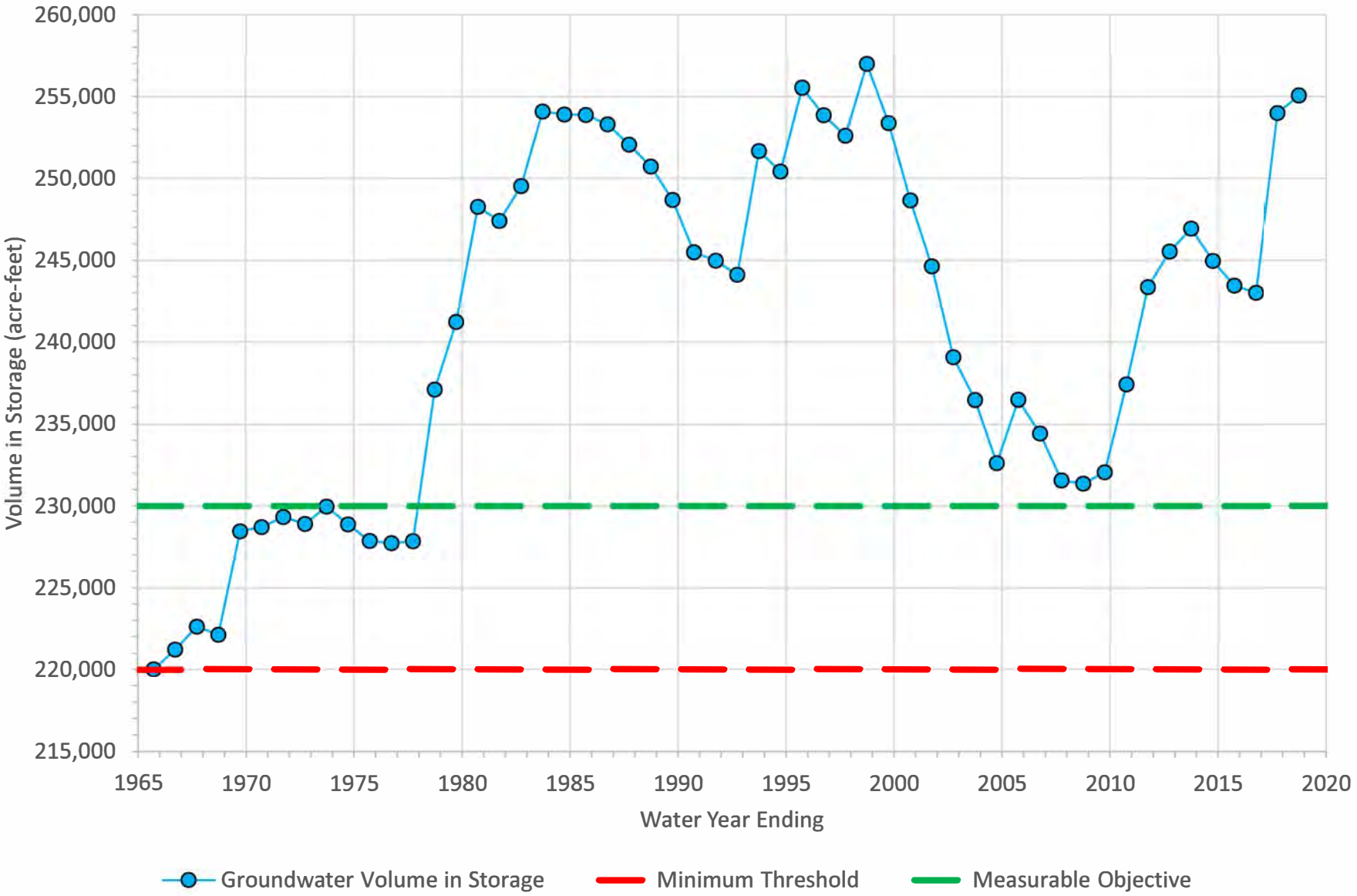
Figure 3-4. Minimum Threshold and Measurable Objective in the North Bench Management Area



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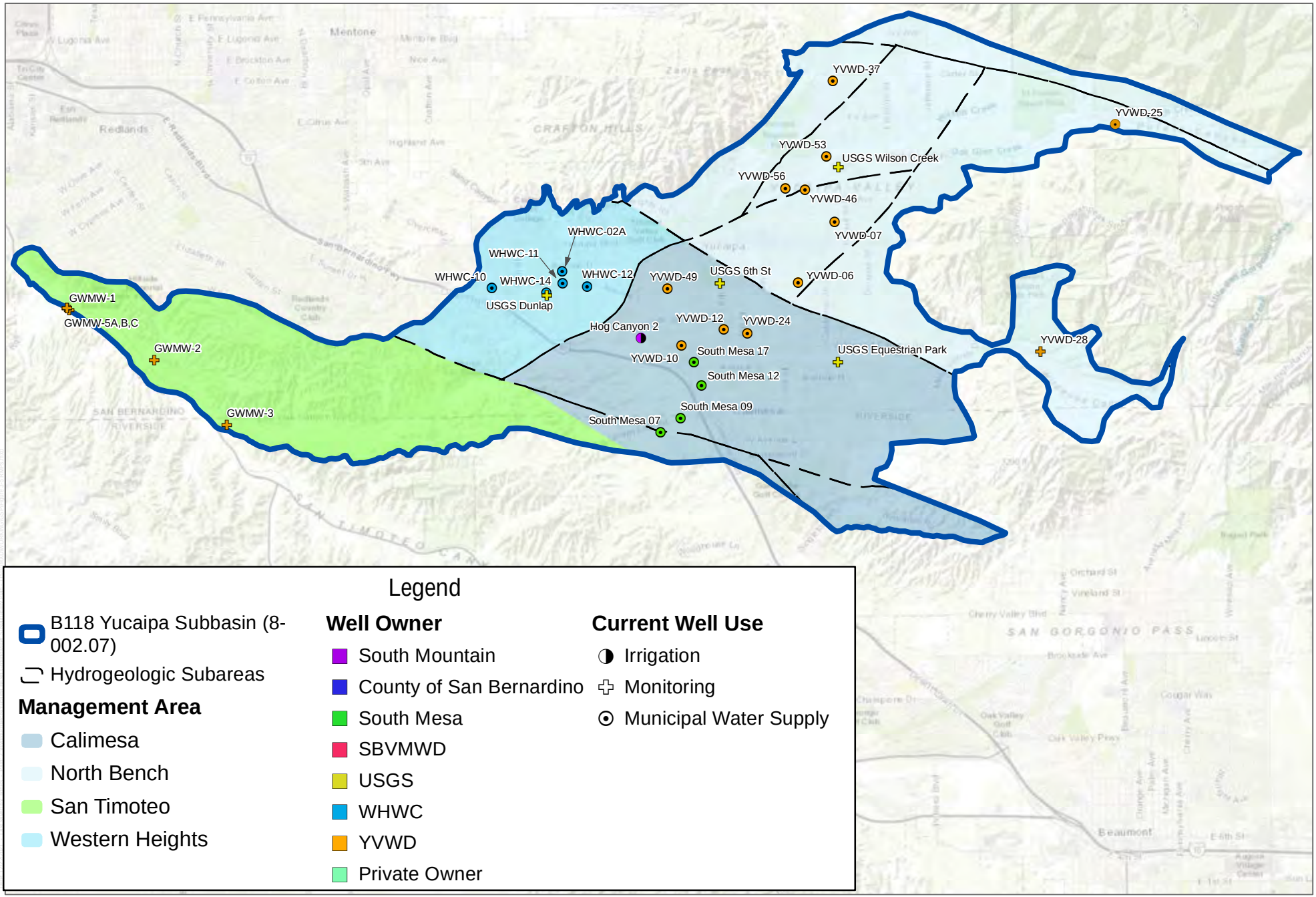

SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

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FIGURE 3-5

Representative Monitoring Points

Yucaipa Subbasin Groundwater Sustainability Plan

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Figure 3-6. Historical Groundwater Elevations and Pumping in the North Bench Management Area

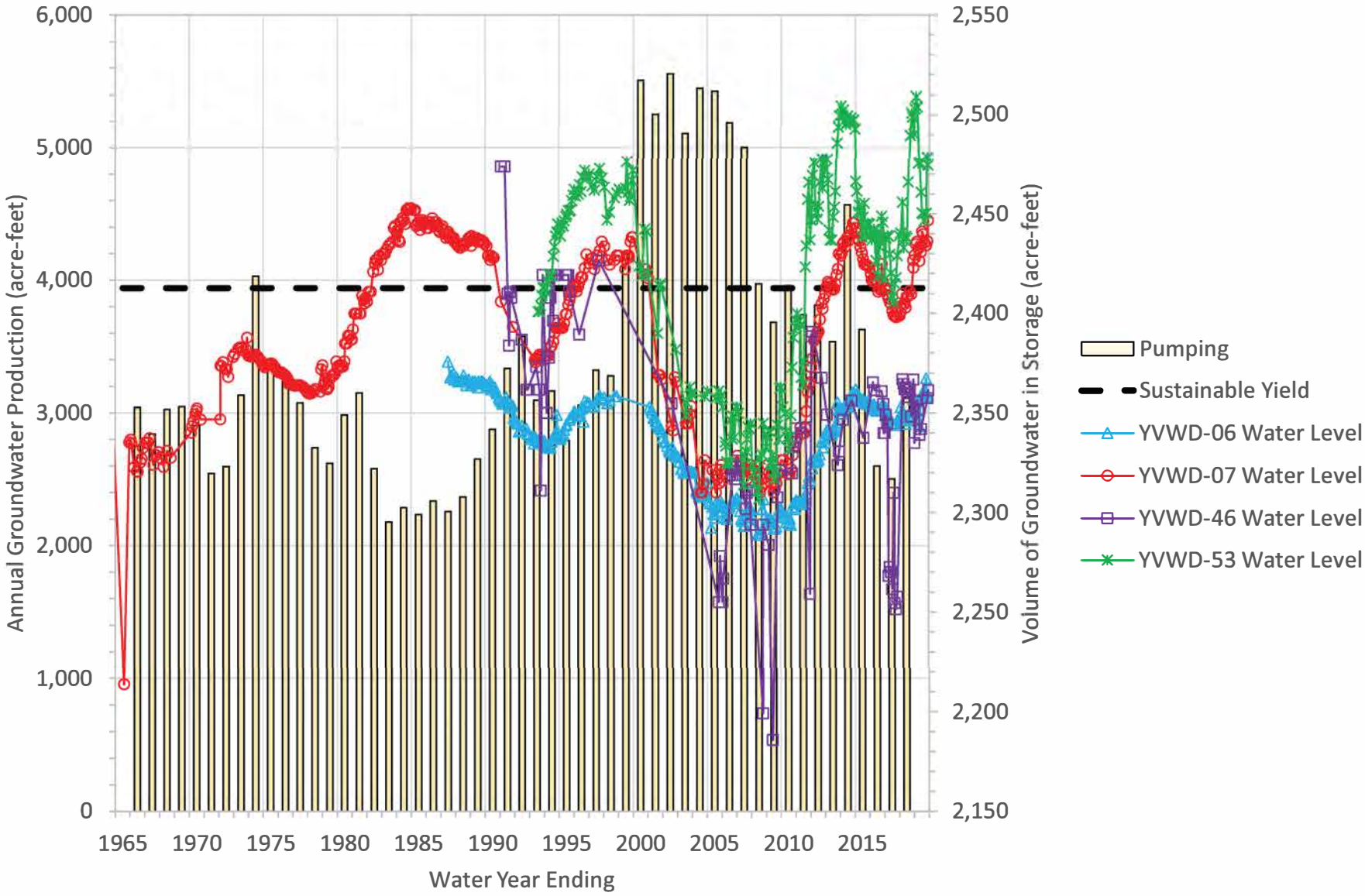

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Figure 3-7. Predicted Hydraulic Heads at YVWD-06 in the North Bench Management Area

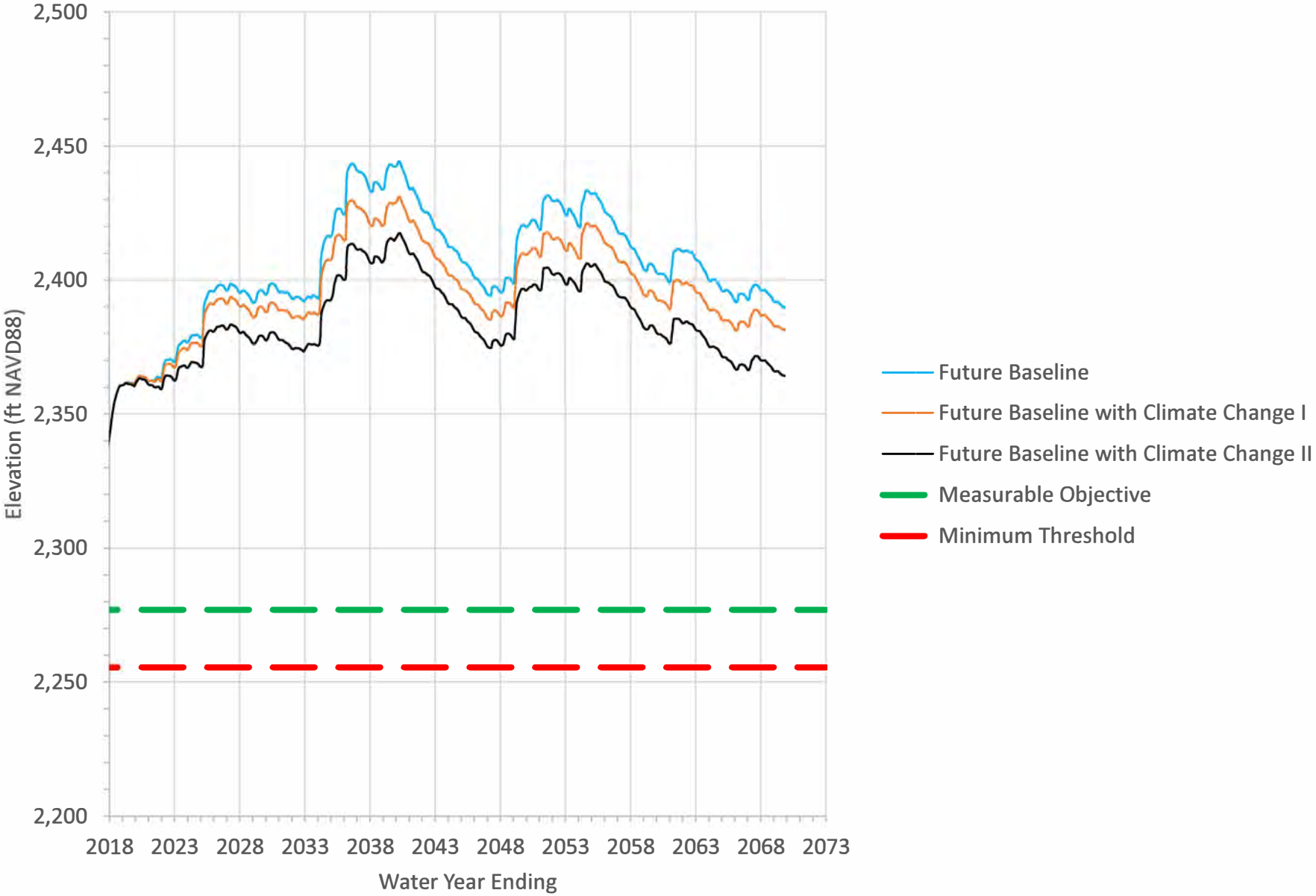

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Figure 3-8. Predicted Hydraulic Heads at YVWD-07 in the North Bench Management Area

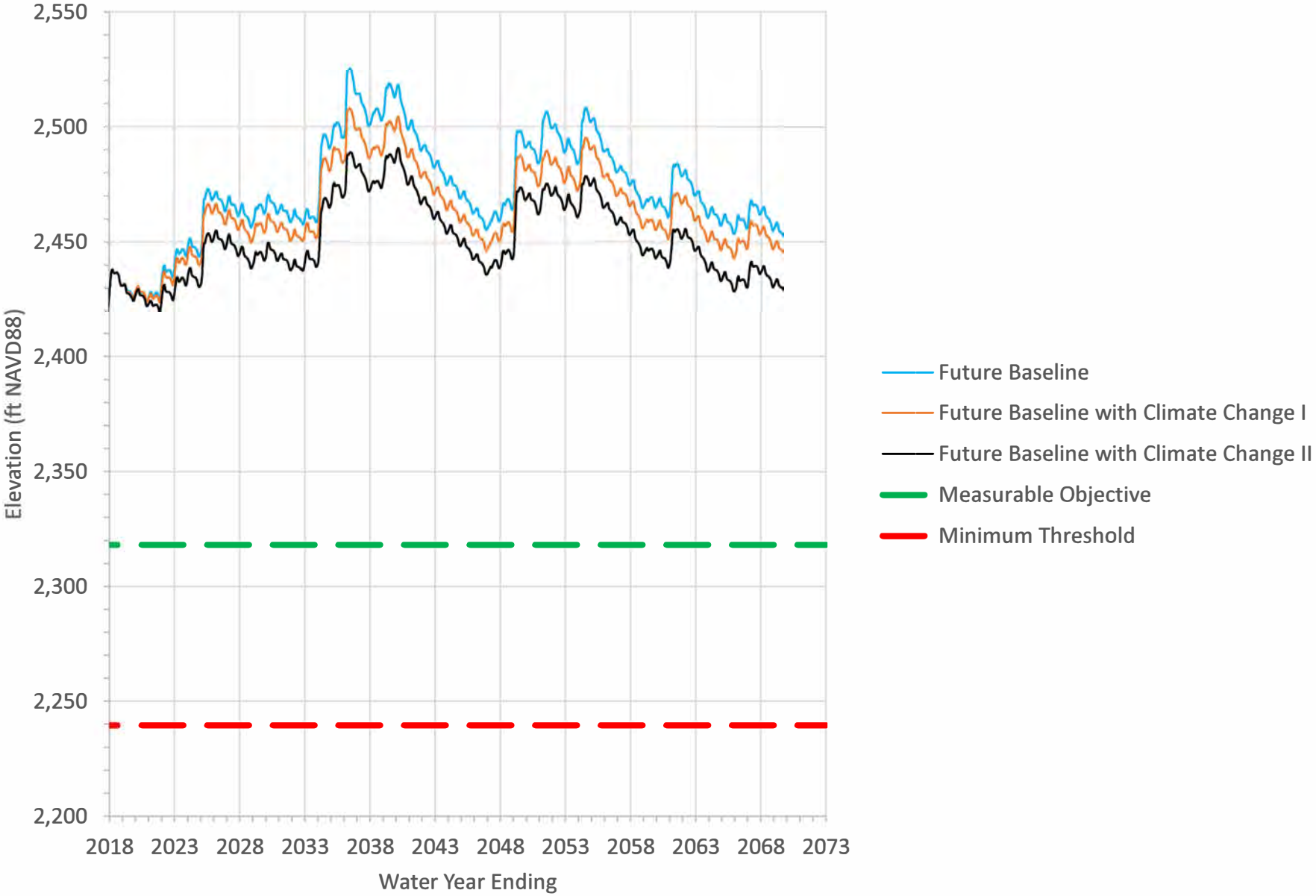

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Figure 3-9. Predicted Hydraulic Heads at YVWD-37 in the North Bench Management Area

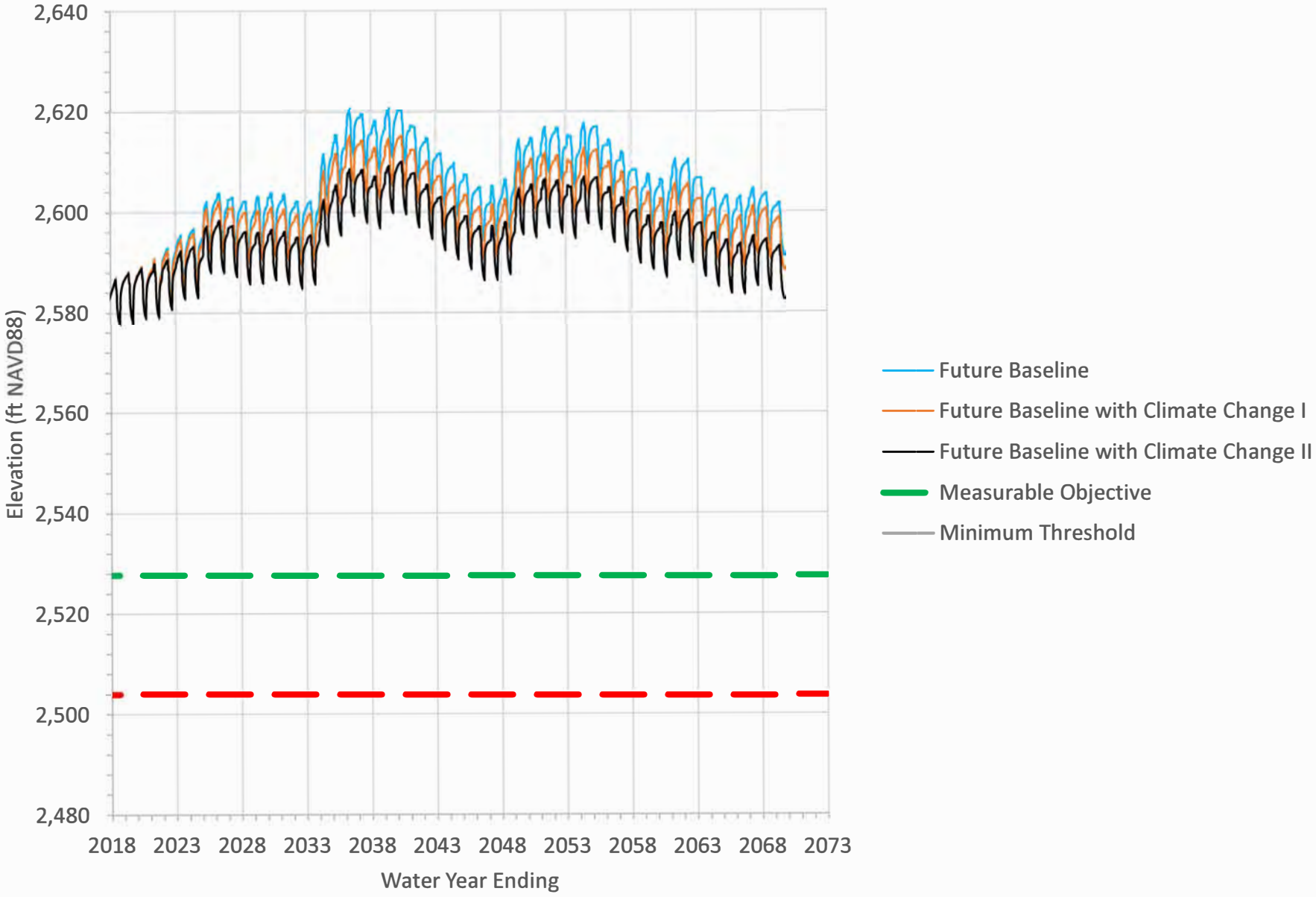

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Figure 3-10. Predicted Hydraulic Heads at YVWD-46 in the North Bench Management Area

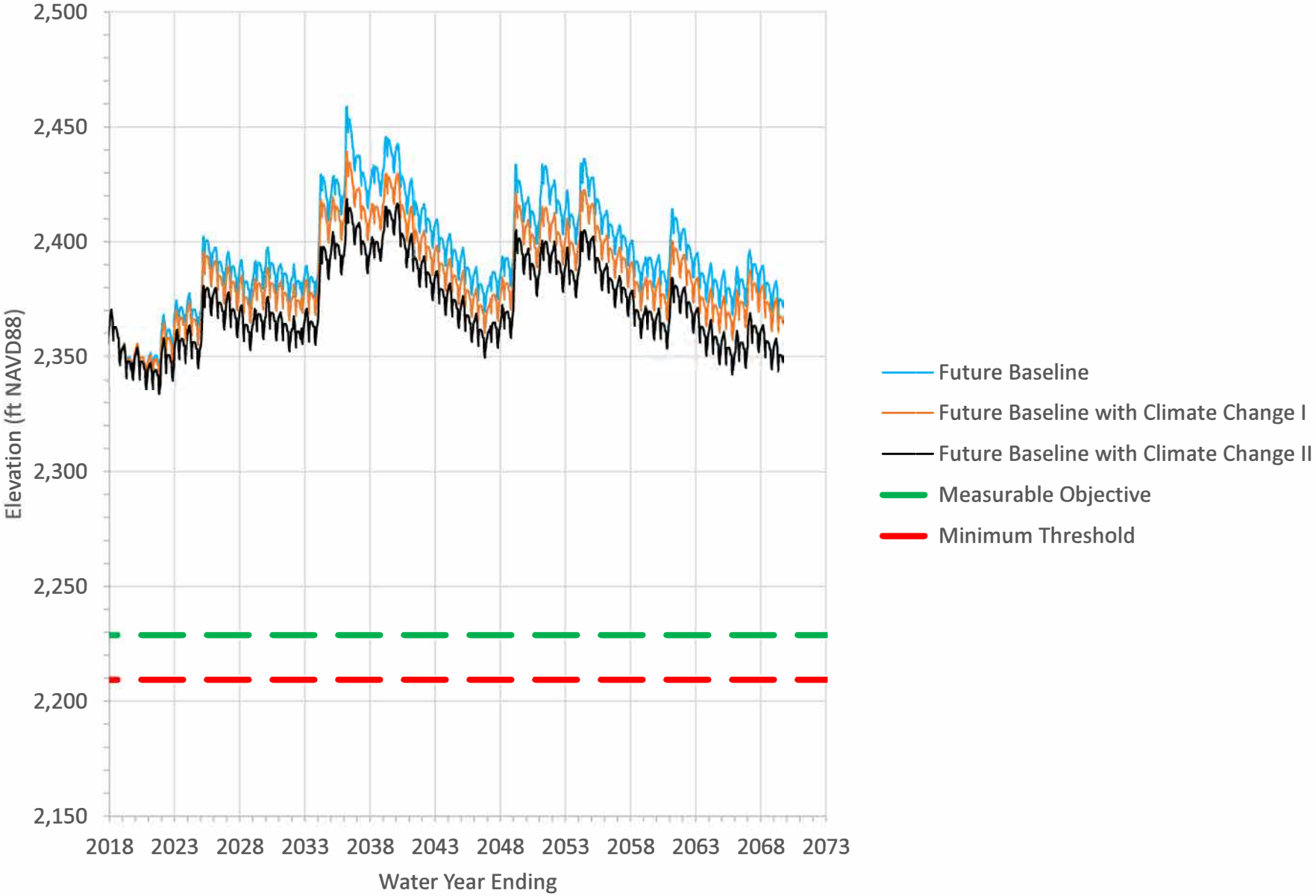

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Figure 3-11. Predicted Hydraulic Heads at YVWD-53 in the North Bench Management Area

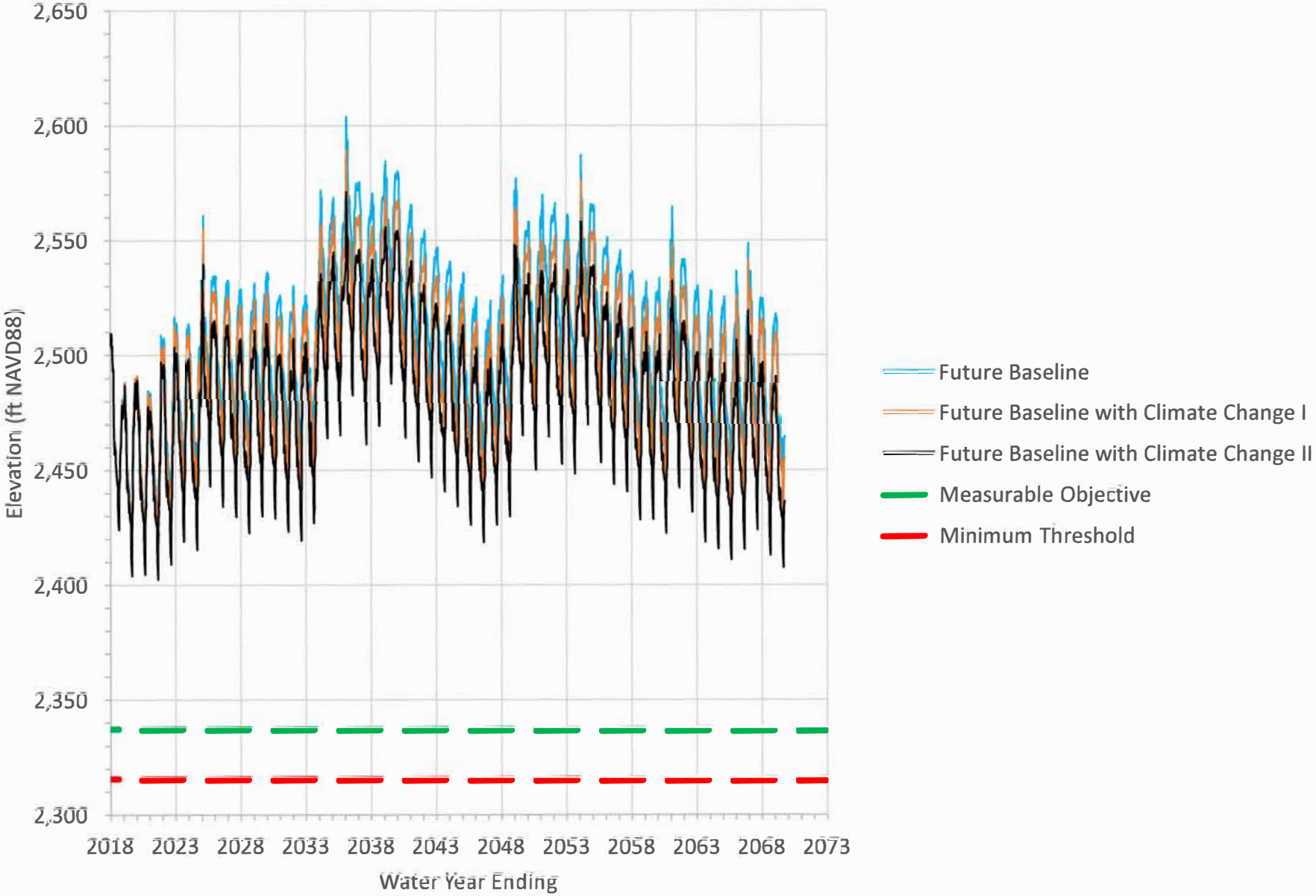

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Figure 3-12. Predicted Hydraulic Heads at YVWD-56 in the North Bench Management Area

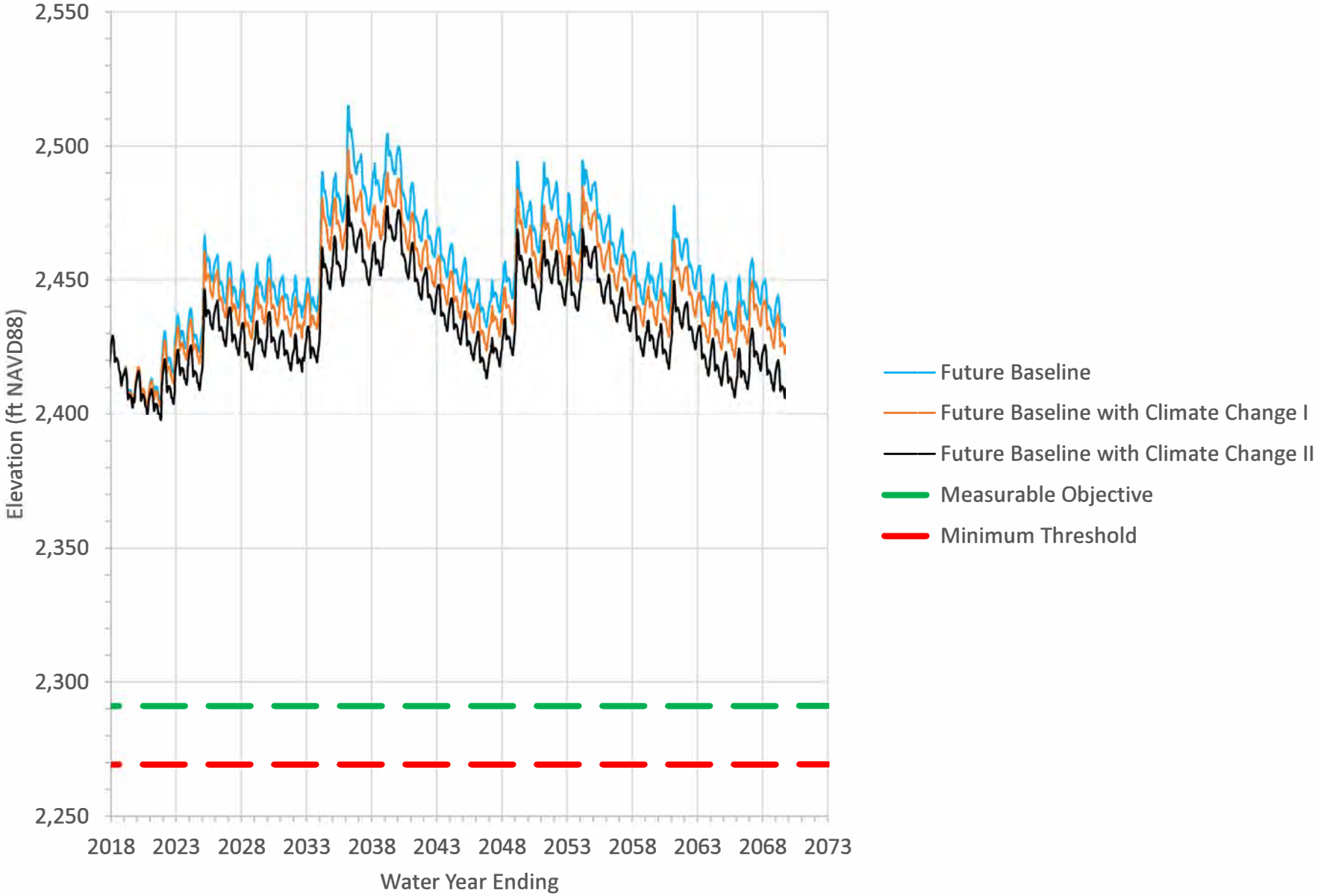

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Figure 3-13. Predicted Hydraulic Heads at USGS Wilson Creek #1 in the North Bench Management Area

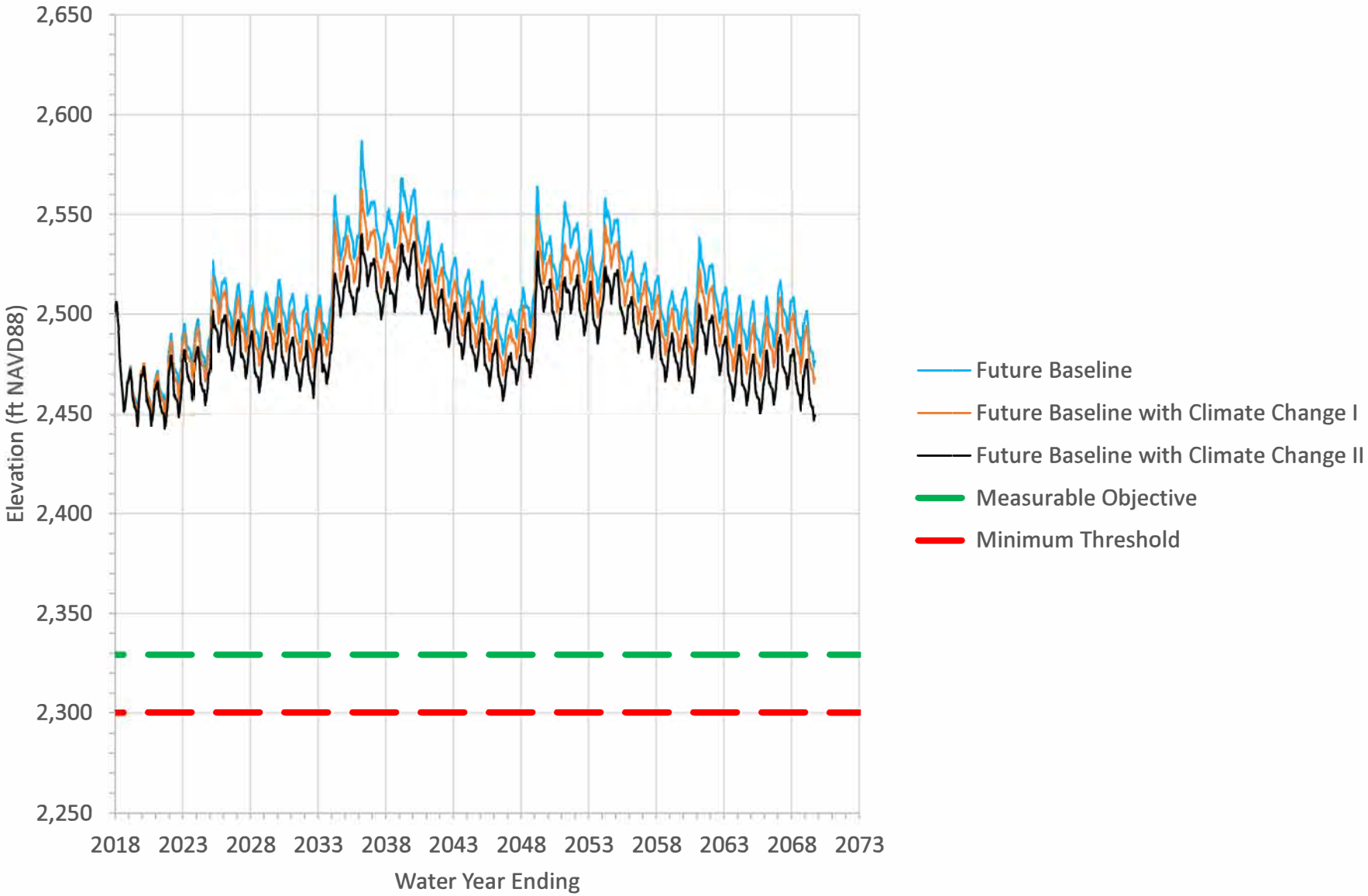

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Figure 3-14. Predicted Hydraulic Heads at USGS Wilson Creek #4 in the North Bench Management Area

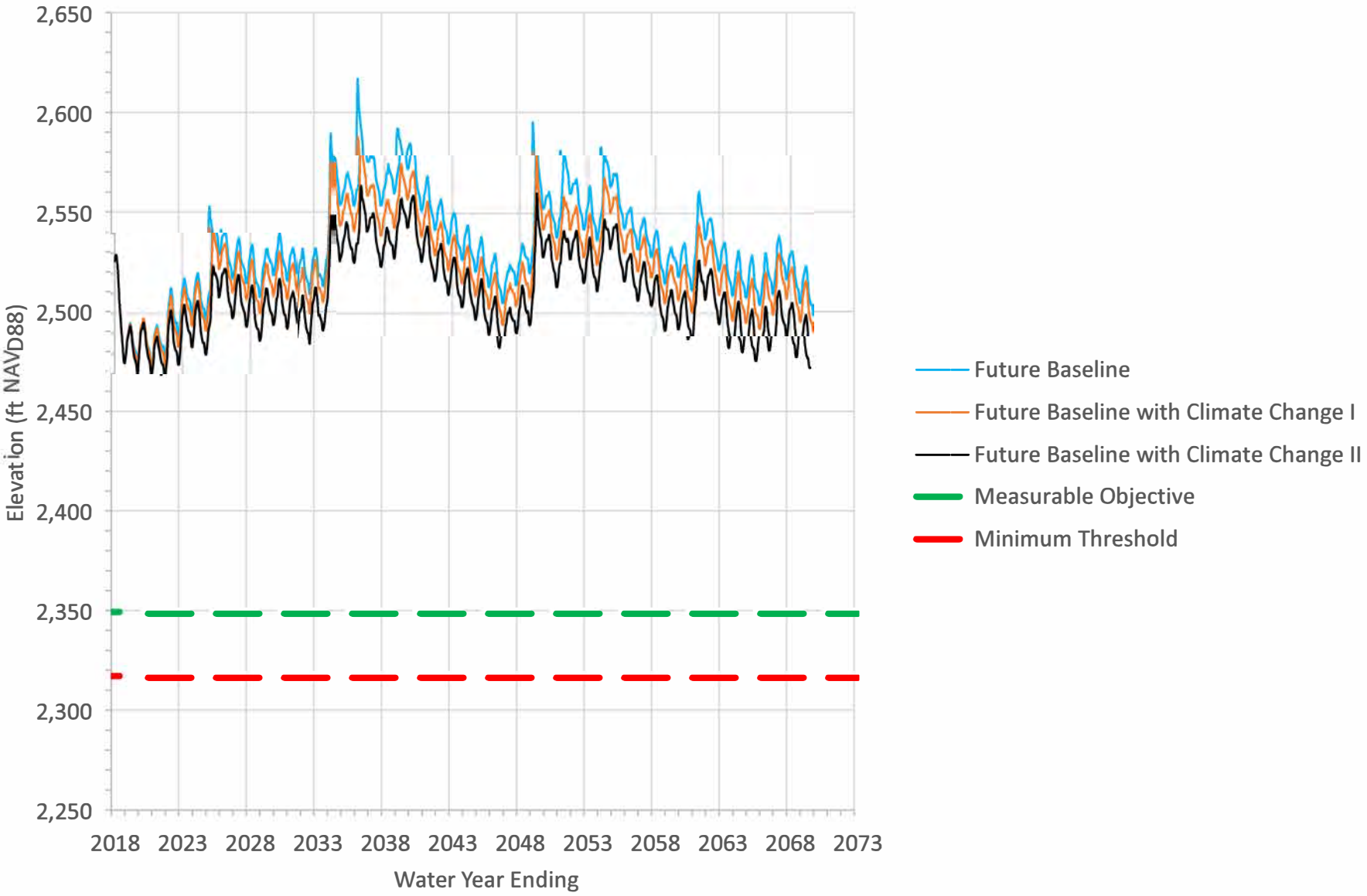

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Figure 3-15. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the North Bench Management Area

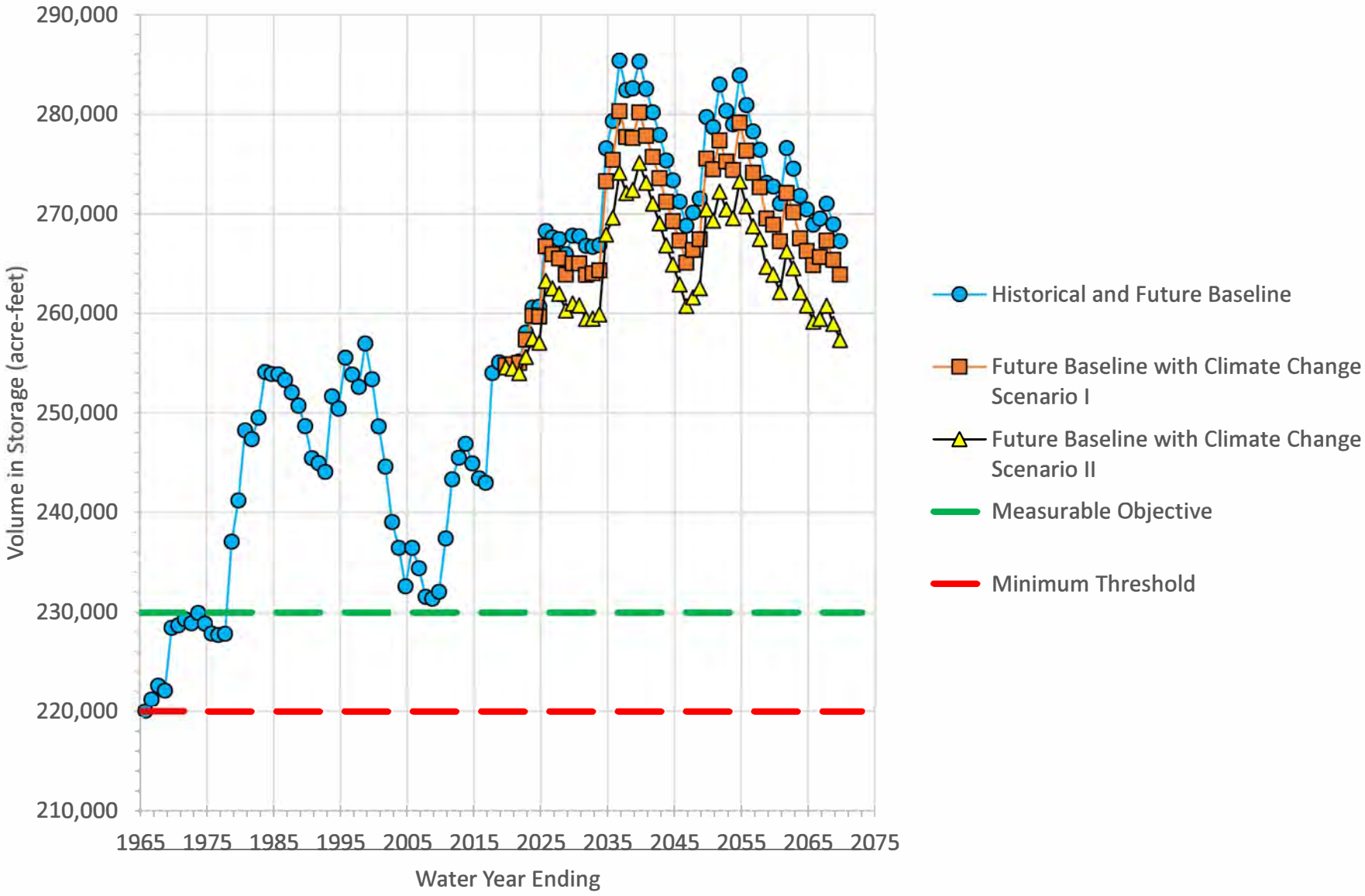

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Figure 3-16. Depths-to-Groundwater at the Chlorinator Well and YVWD-25 in the North Bench Management Area

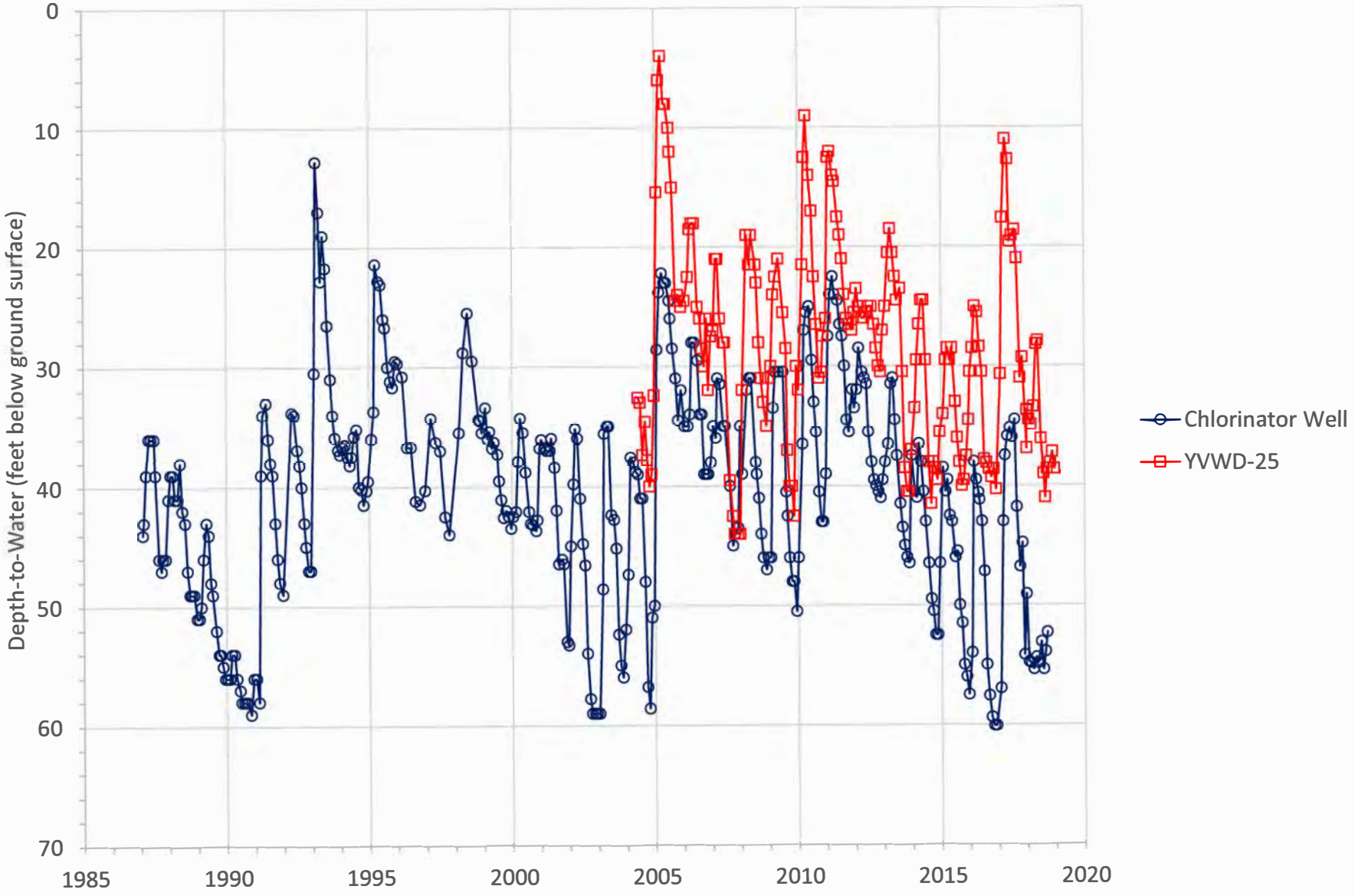

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Figure 3-17. Static Depths-to-Groundwater at YVWD-28
in the North Bench Management Area

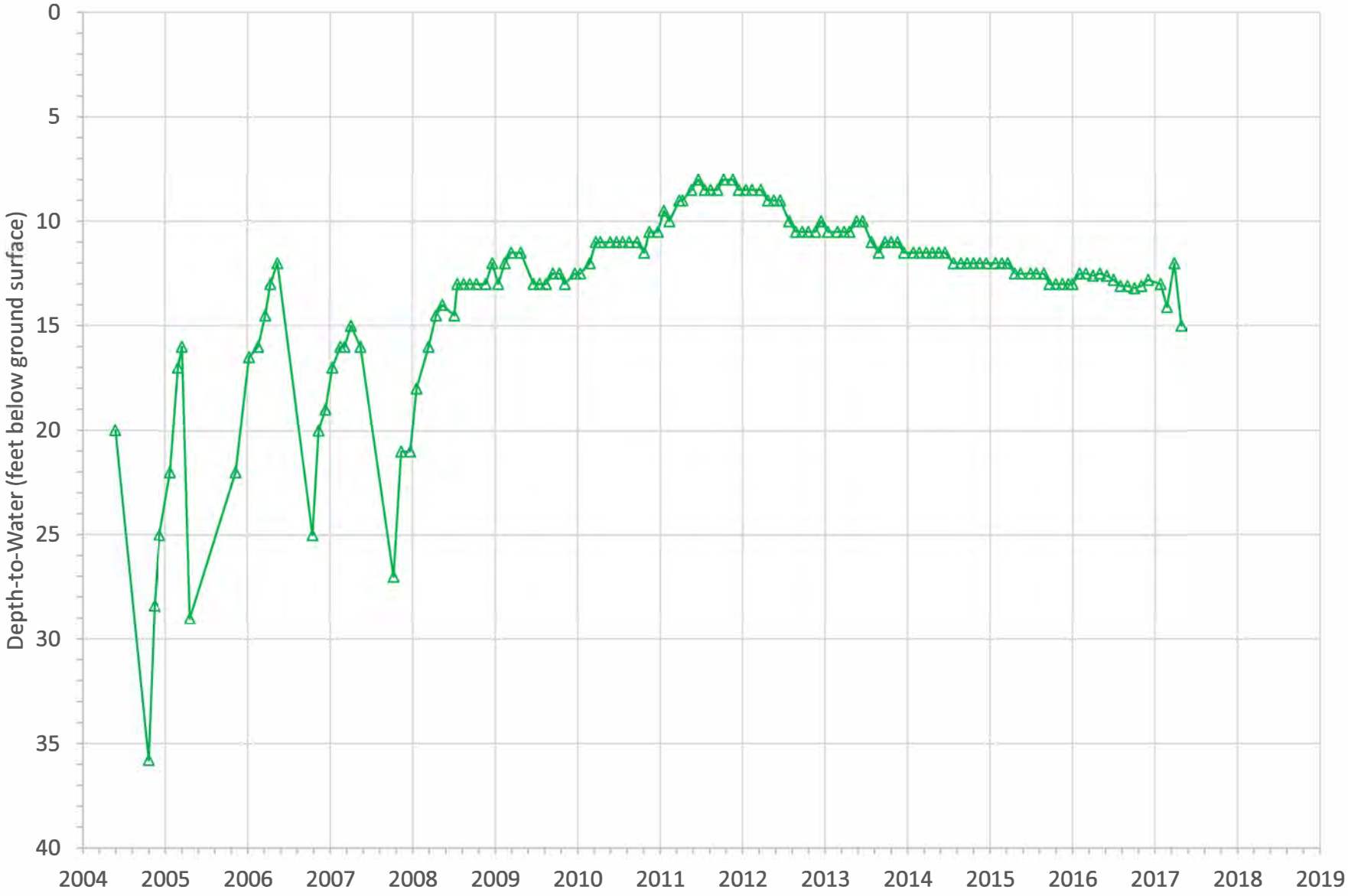

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Figure 3-18. Drought Buffer in the Calimesa Management Area

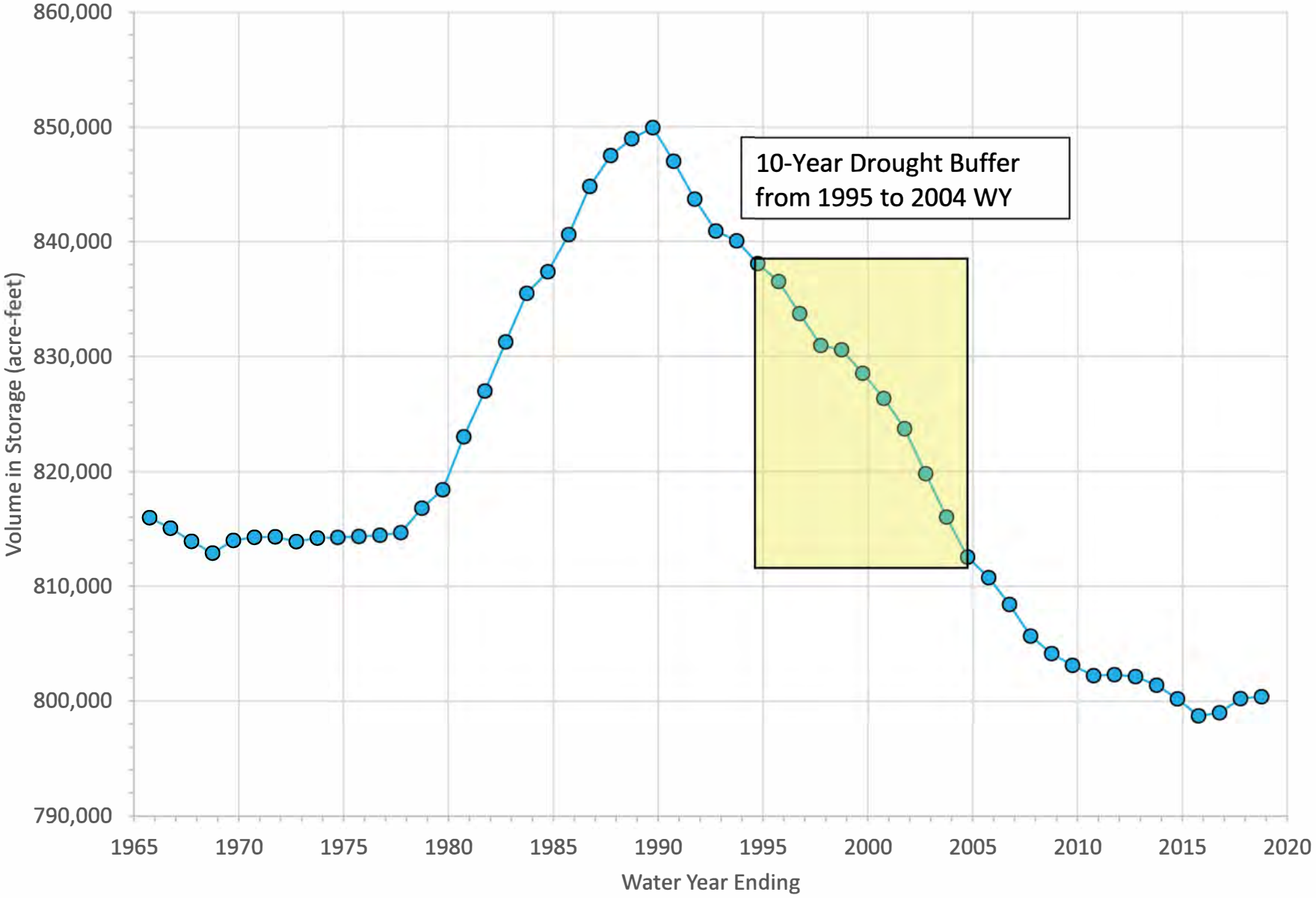

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Figure 3-19. Historical and Current Volume of Groundwater in Storage in the Calimesa Management Area

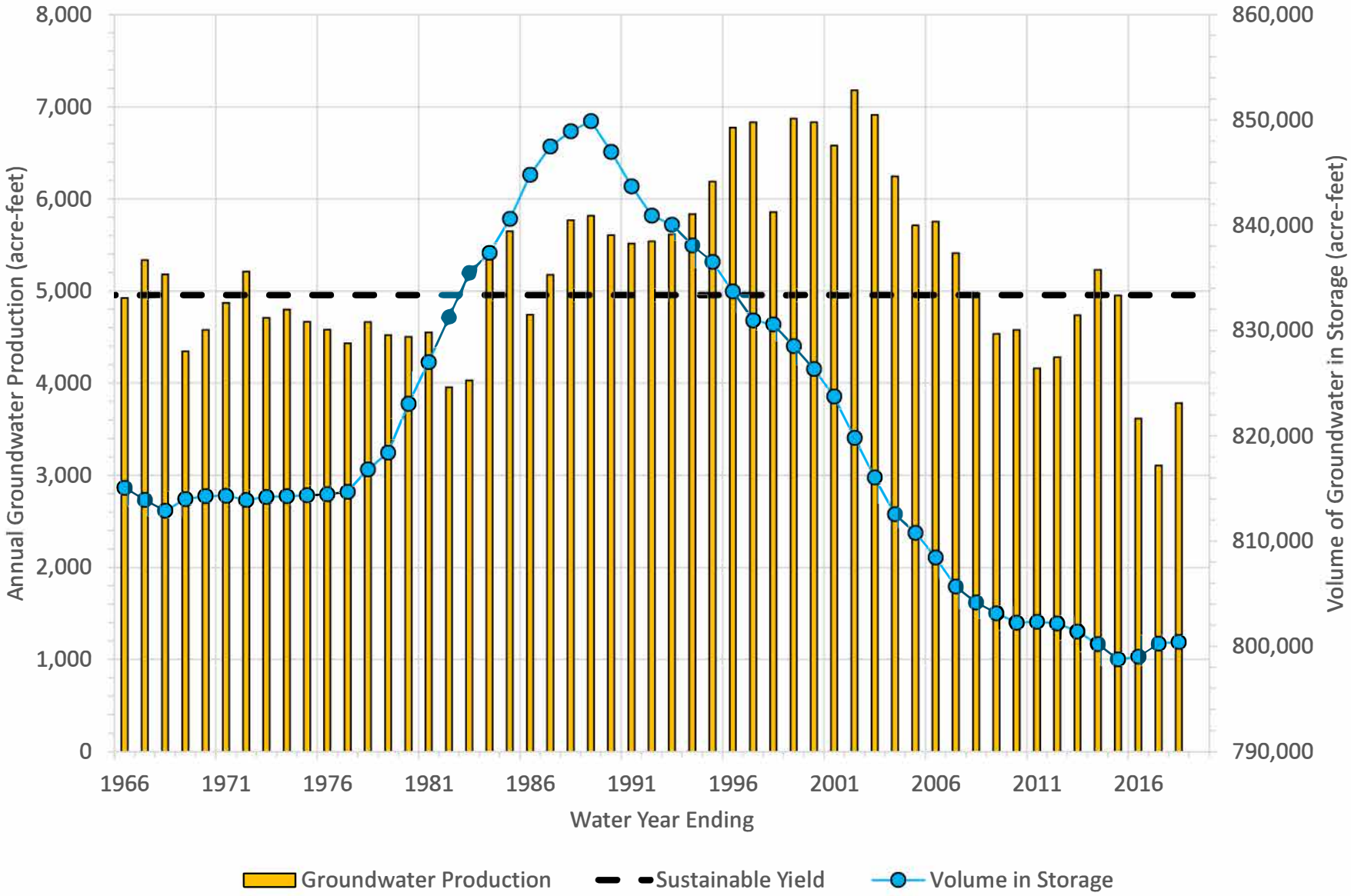

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Figure 3-20. Minimum Threshold and Measurable Objective in the Calimesa Management Area

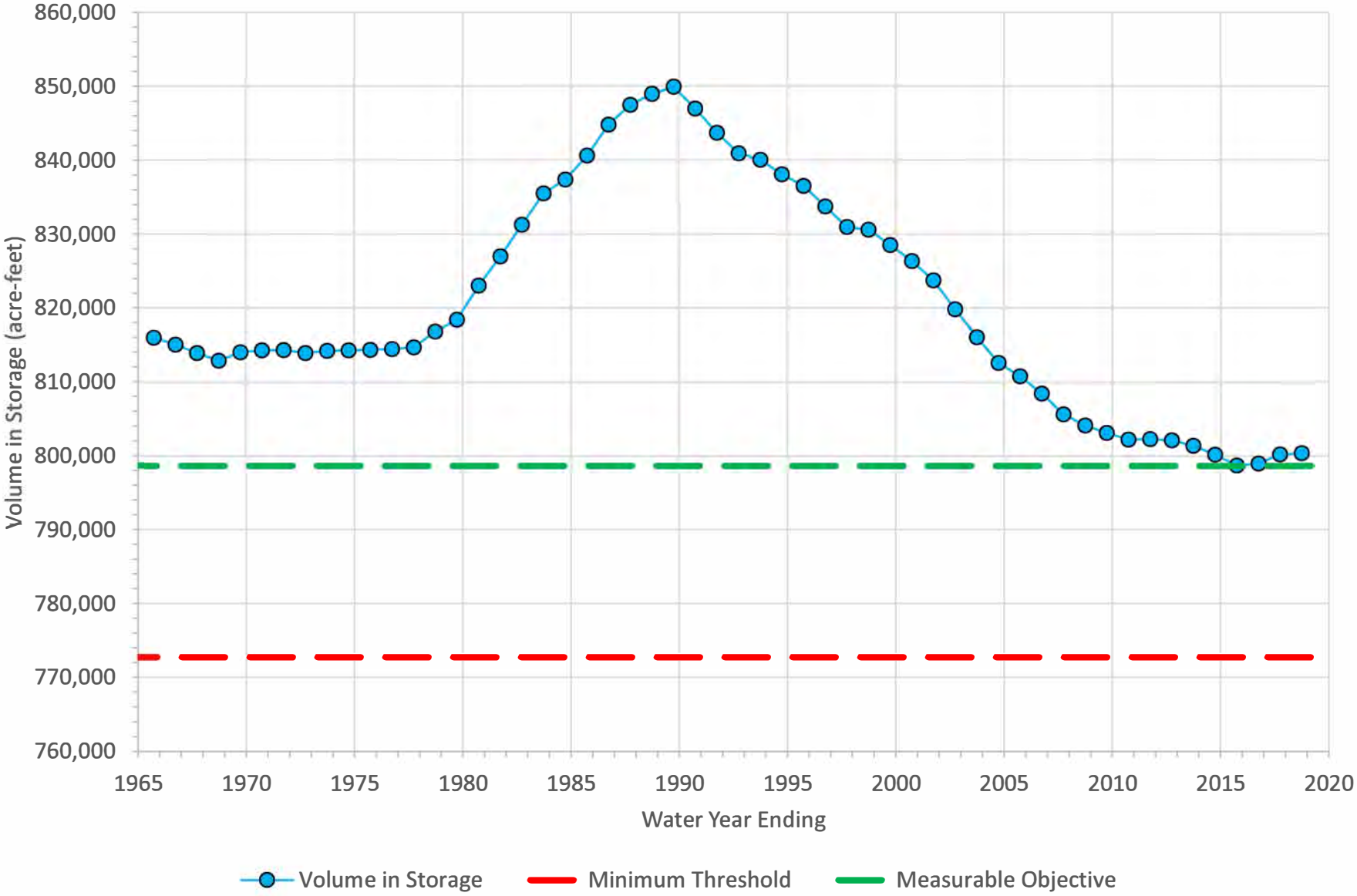

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Figure 3-21. Annual Groundwater Production and Historical Groundwater Elevations in the Calimesa Management Area

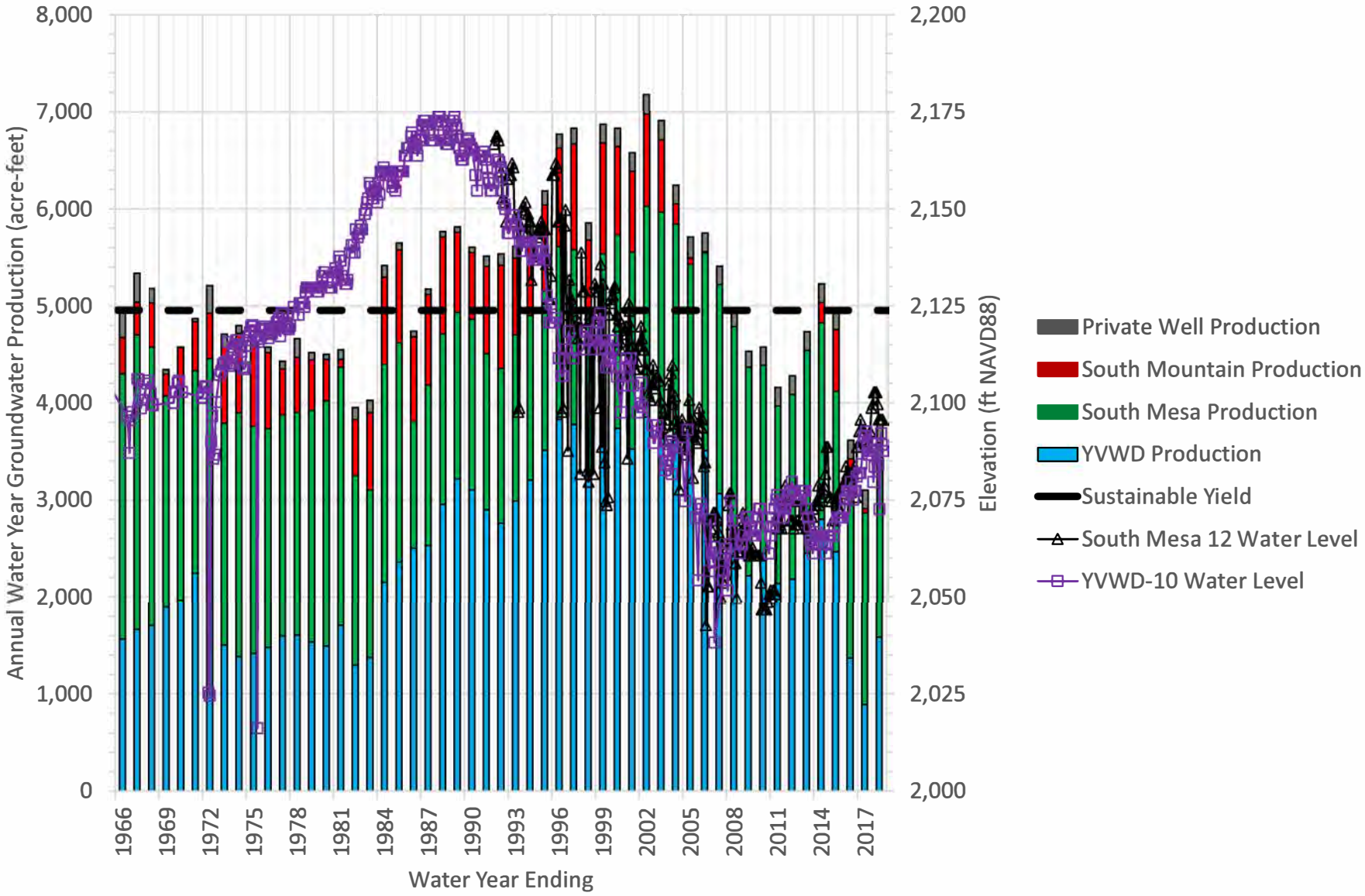

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Figure 3-22. Predicted Hydraulic Heads at South Mesa 7 in the Calimesa Management Area

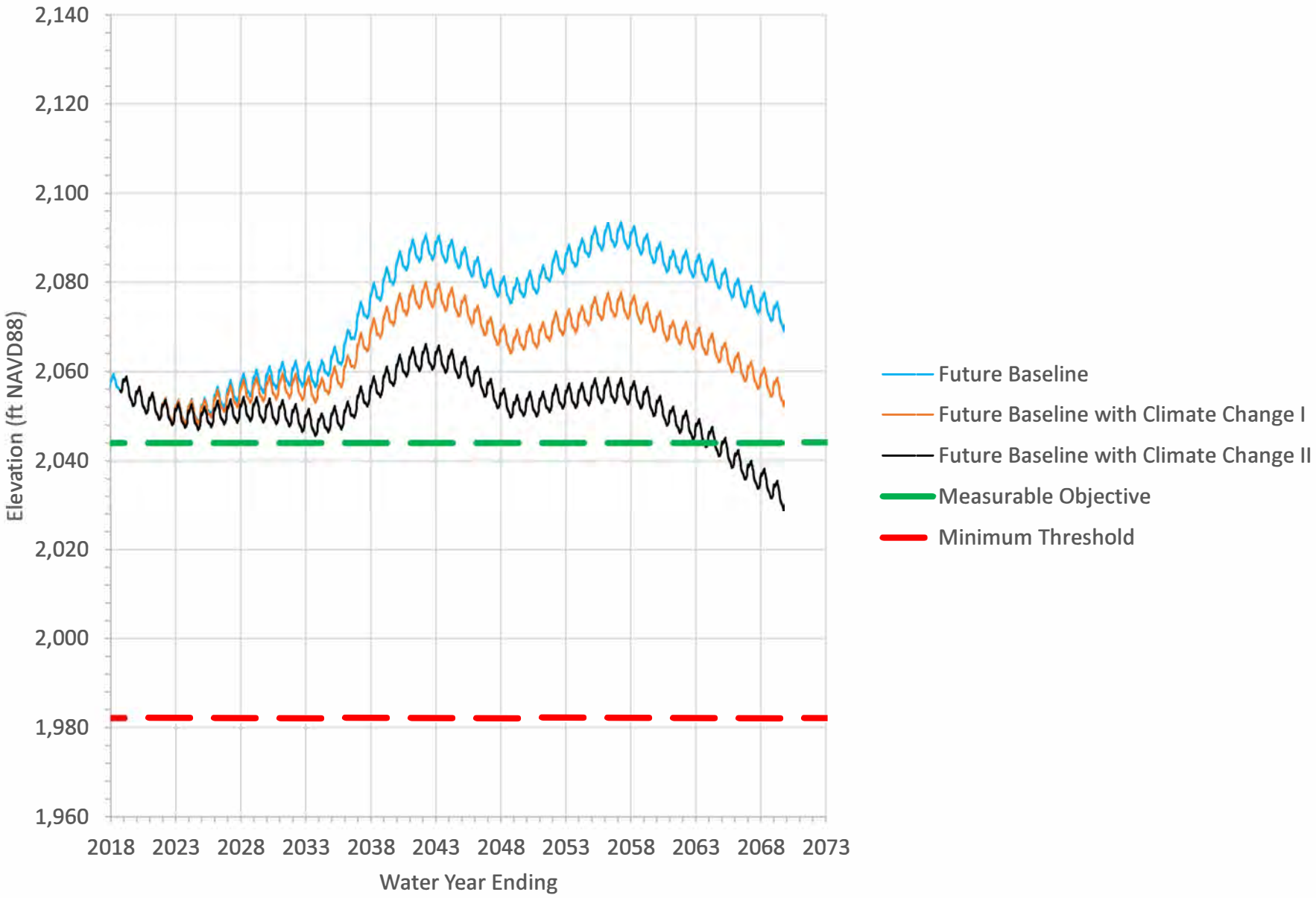

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Figure 3-23. Predicted Hydraulic Heads at South Mesa 9 in the Calimesa Management Area

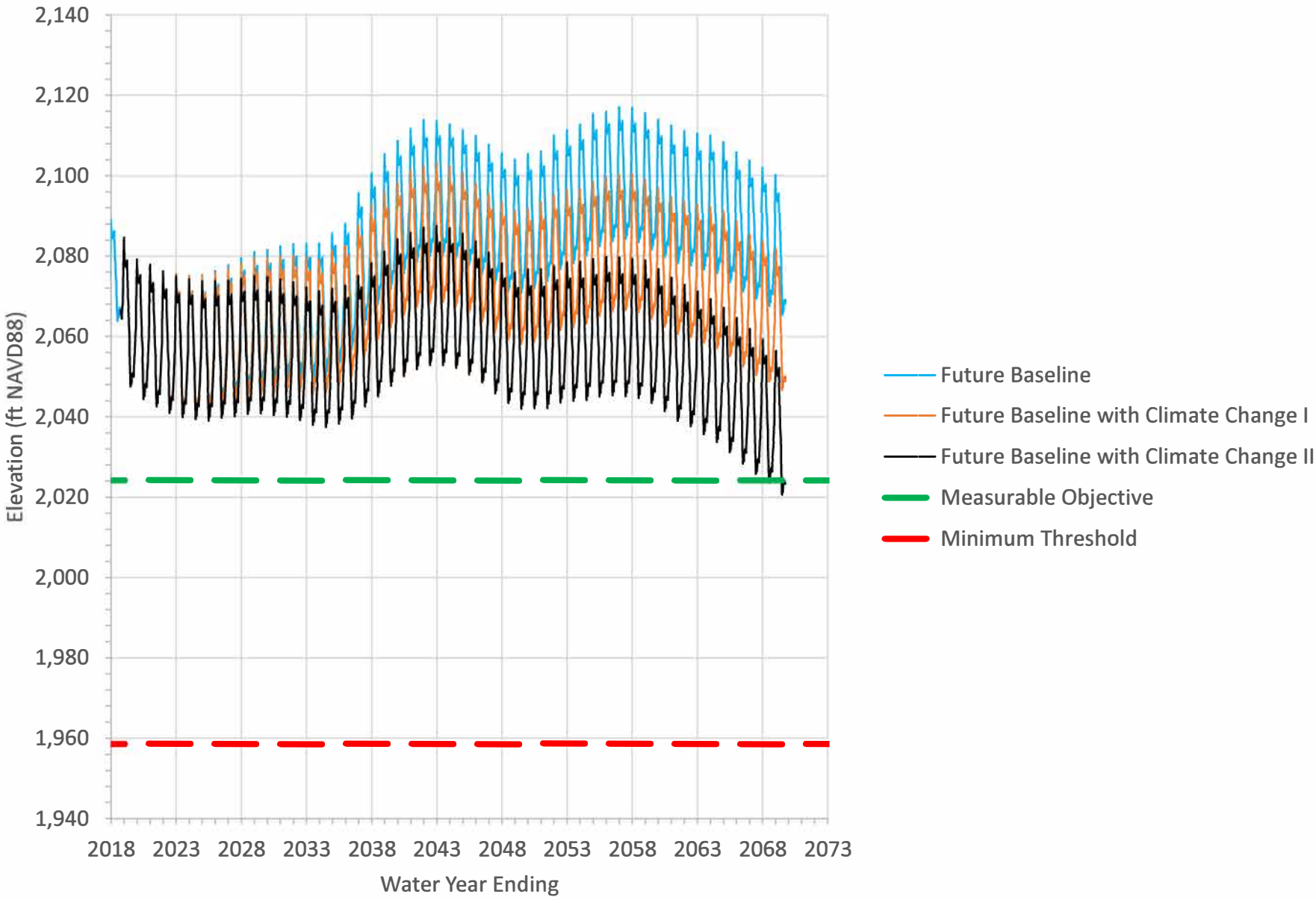

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Figure 3-24. Predicted Hydraulic Heads at South Mesa 12 in the Calimesa Management Area

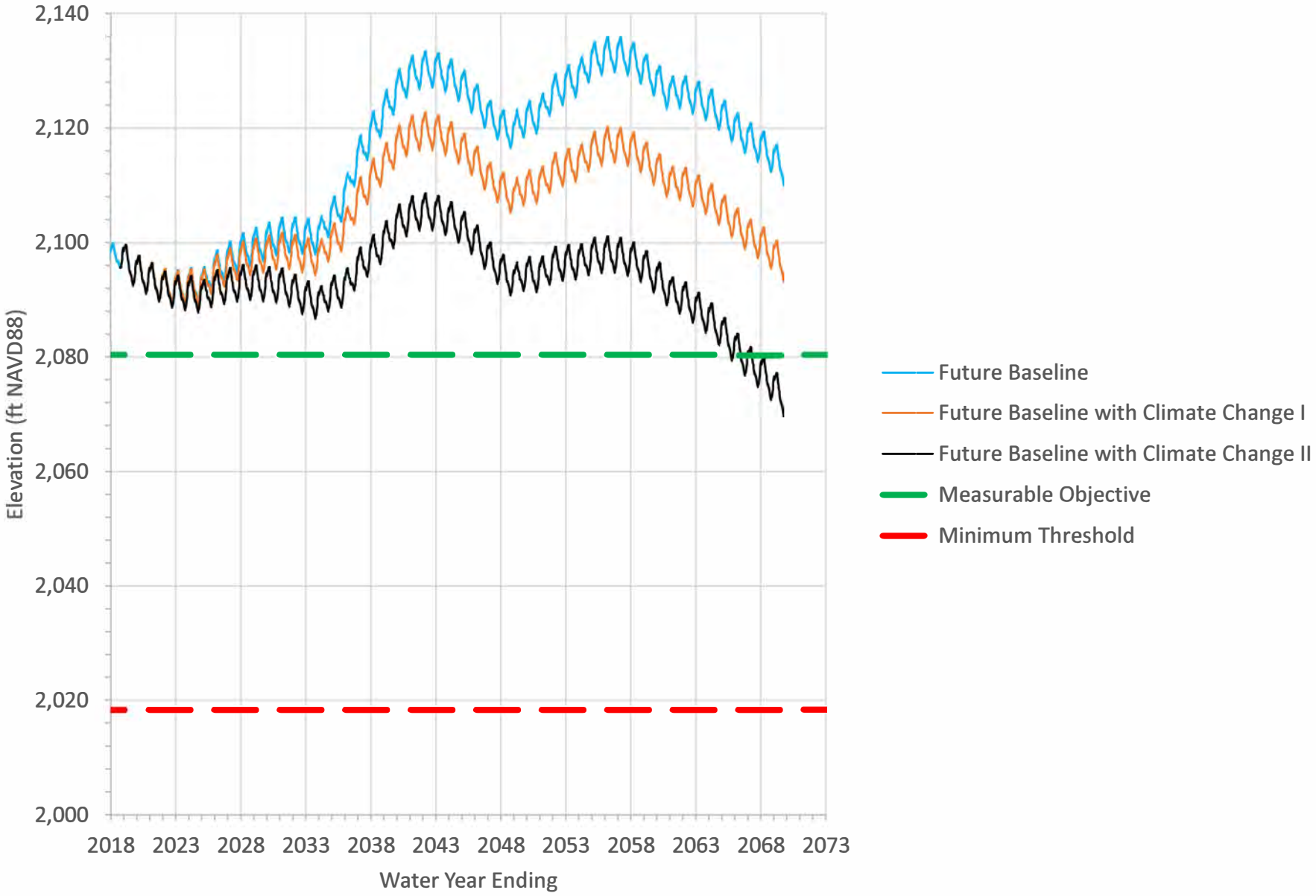

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Figure 3-25. Predicted Hydraulic Heads at South Mesa 17 in the Calimesa Management Area

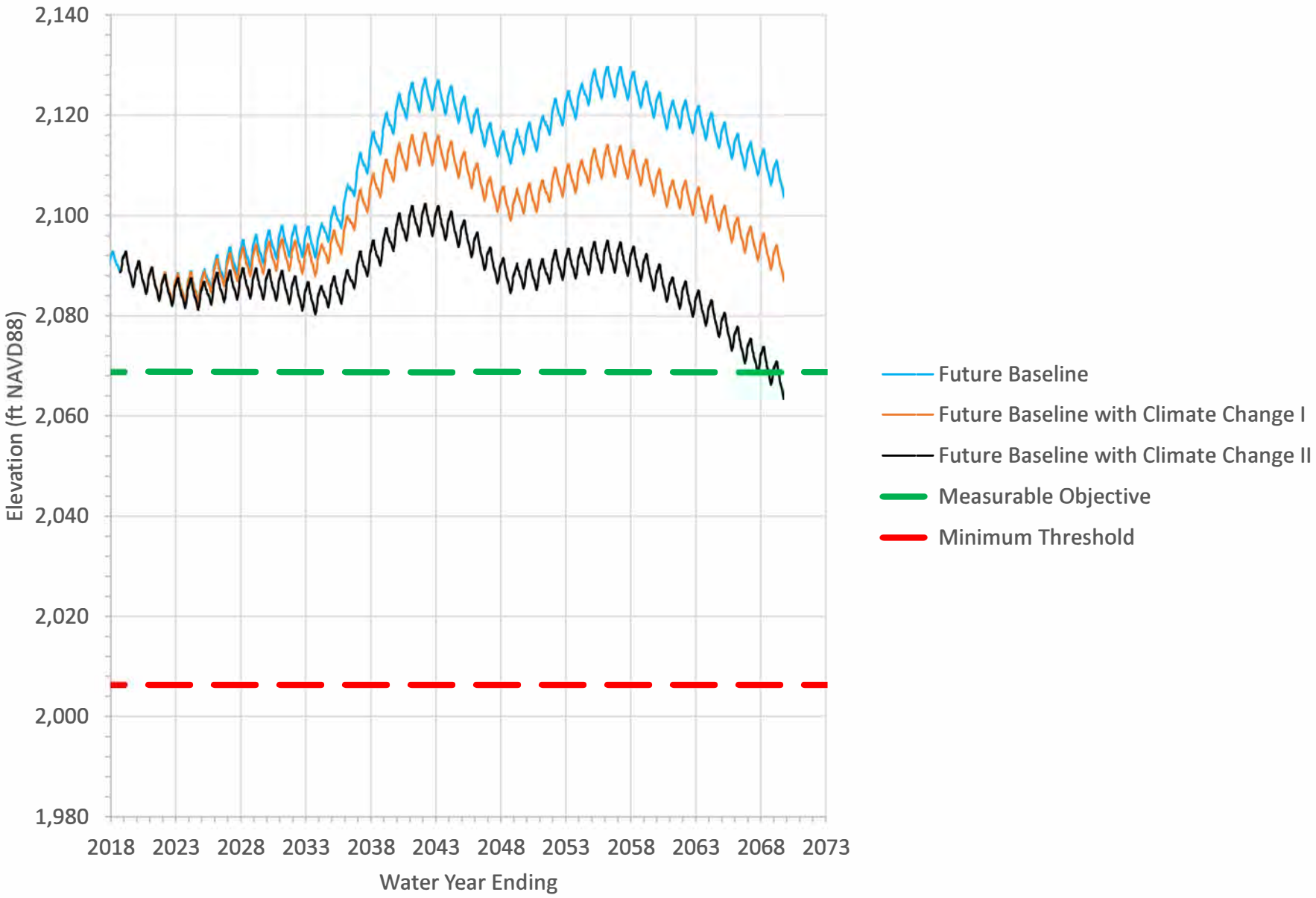

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Figure 3-26. Predicted Hydraulic Heads at YVWD-10 in the Calimesa Management Area

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Figure 3-27. Predicted Hydraulic Heads at YVWD-12 in the Calimesa Management Area

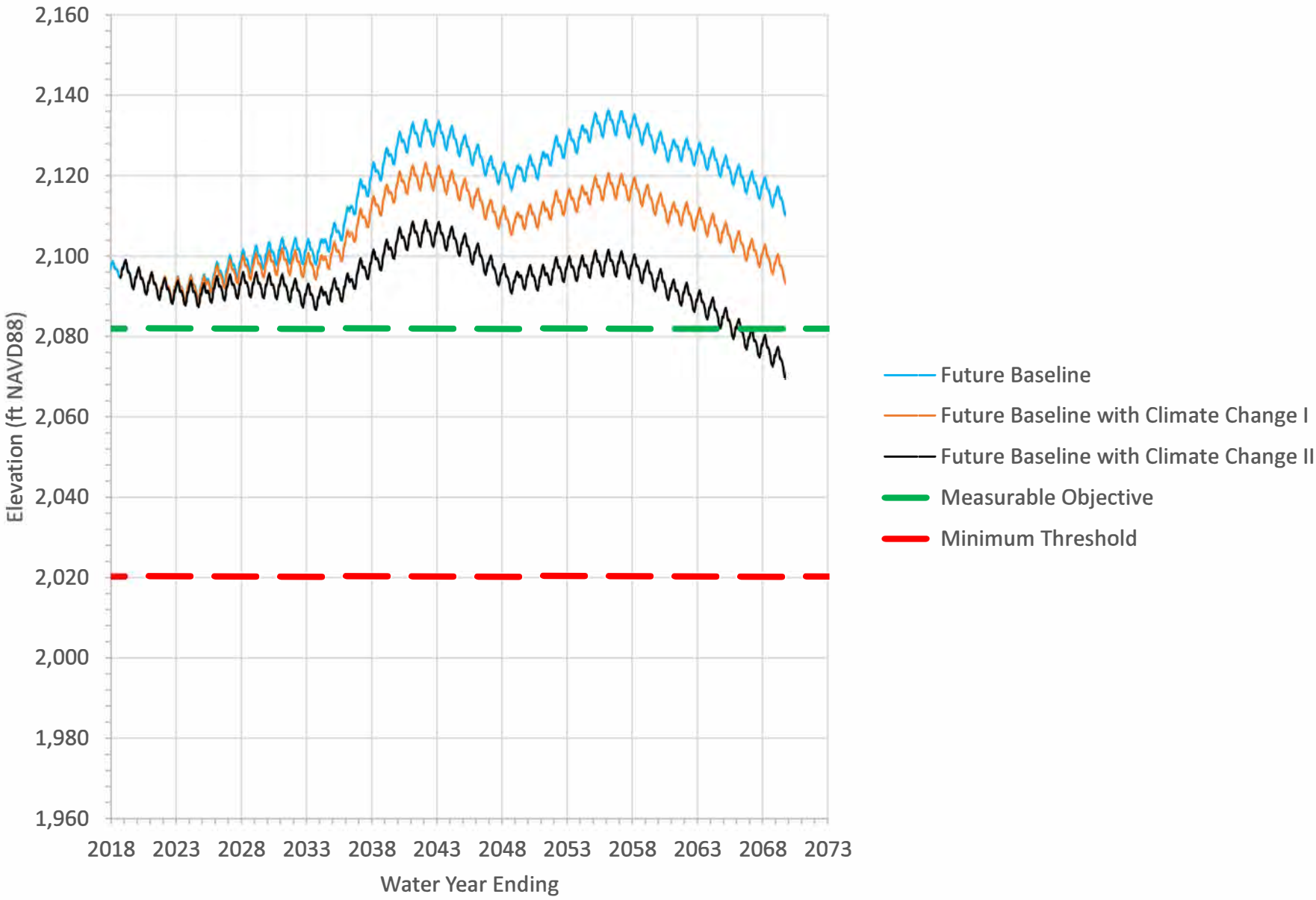

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Figure 3-28. Predicted Hydraulic Heads at YVWD-24 in the Calimesa Management Area

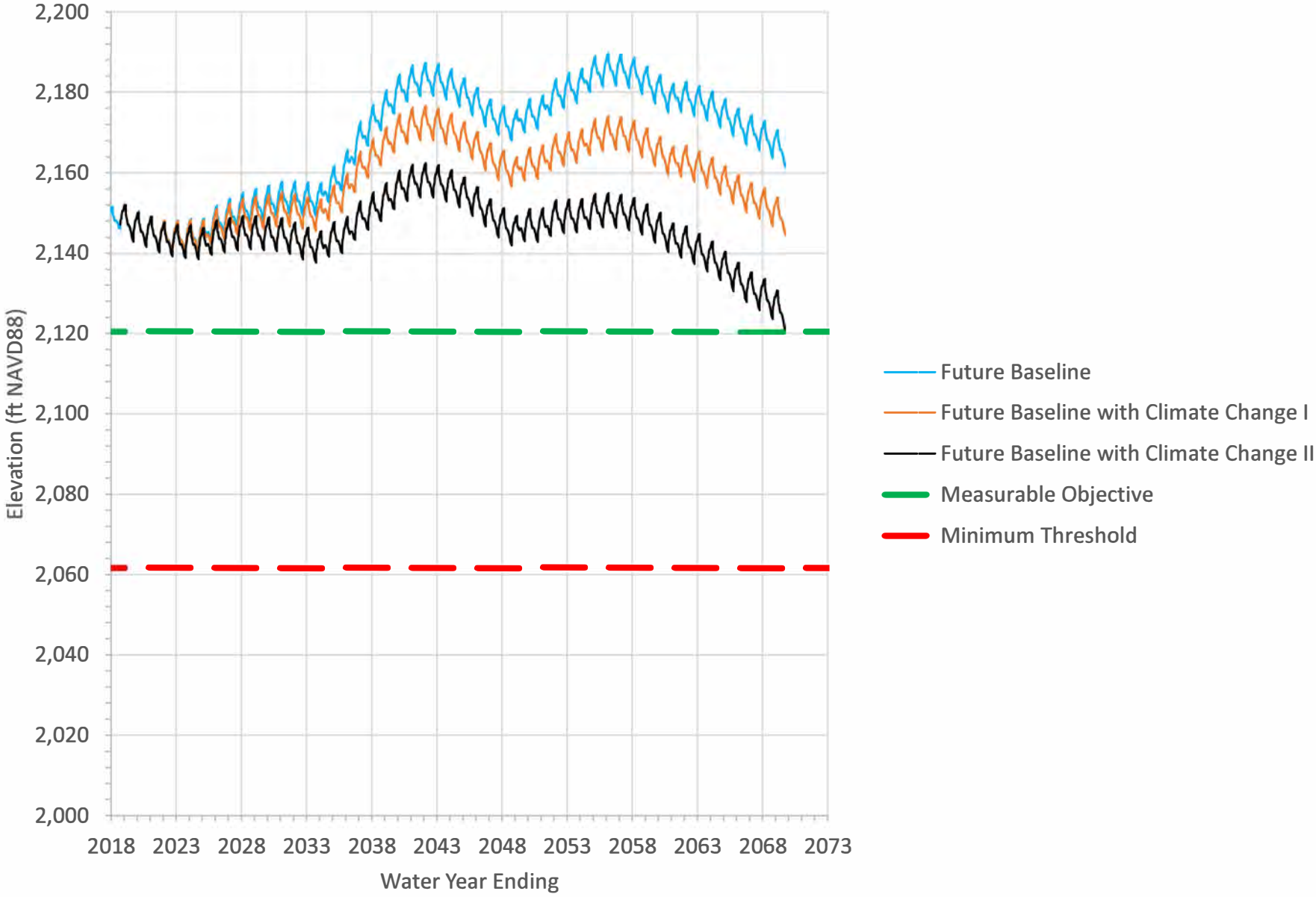

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Figure 3-29. Predicted Hydraulic Heads at YVWD-49 in the Calimesa Management Area

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Figure 3-30. Predicted Hydraulic Heads at Hog Canyon 2 in the Calimesa Management Area

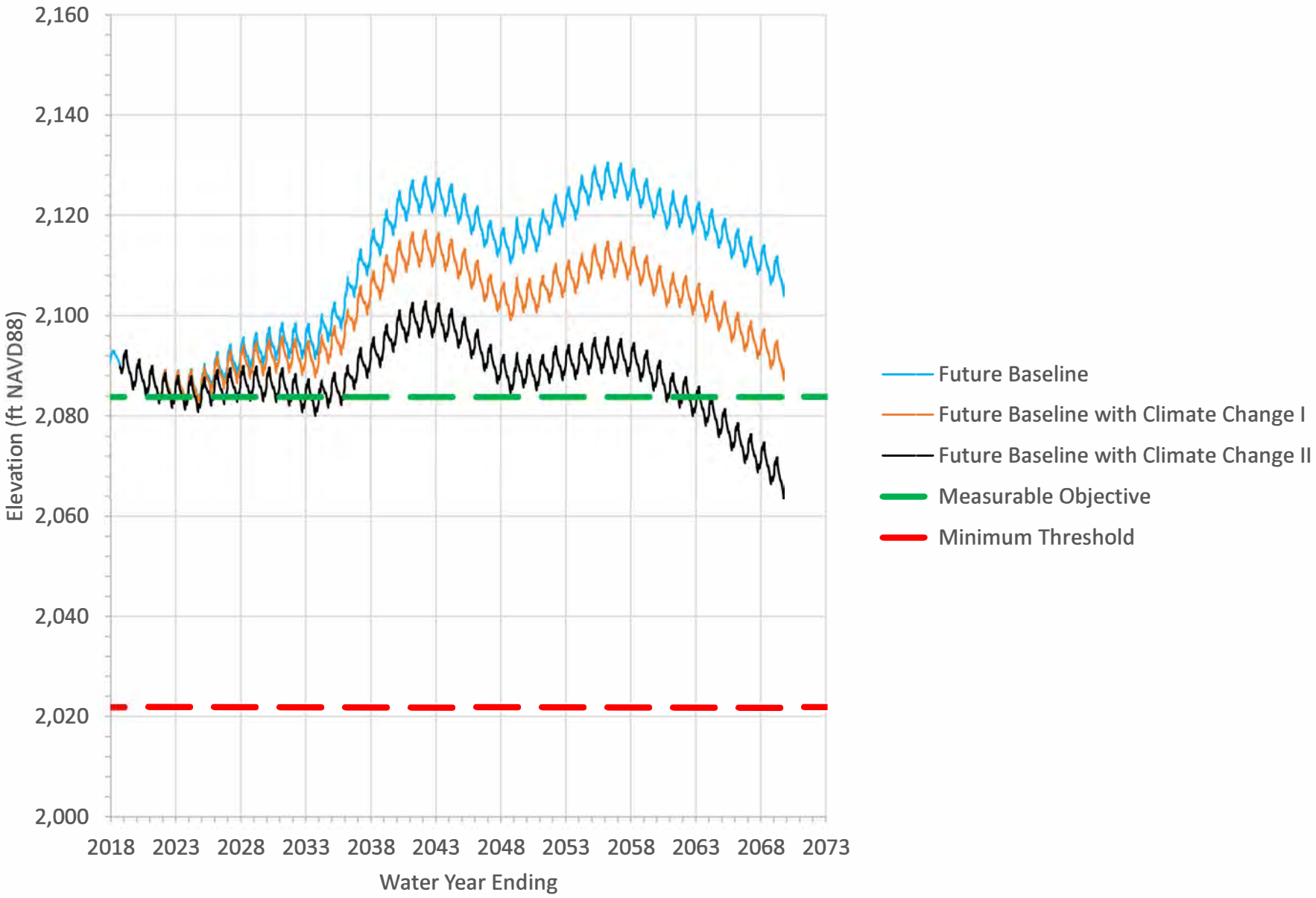

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Figure 3-31. Predicted Hydraulic Heads at USGS Equestrian Park #1 Well in the Calimesa Management Area

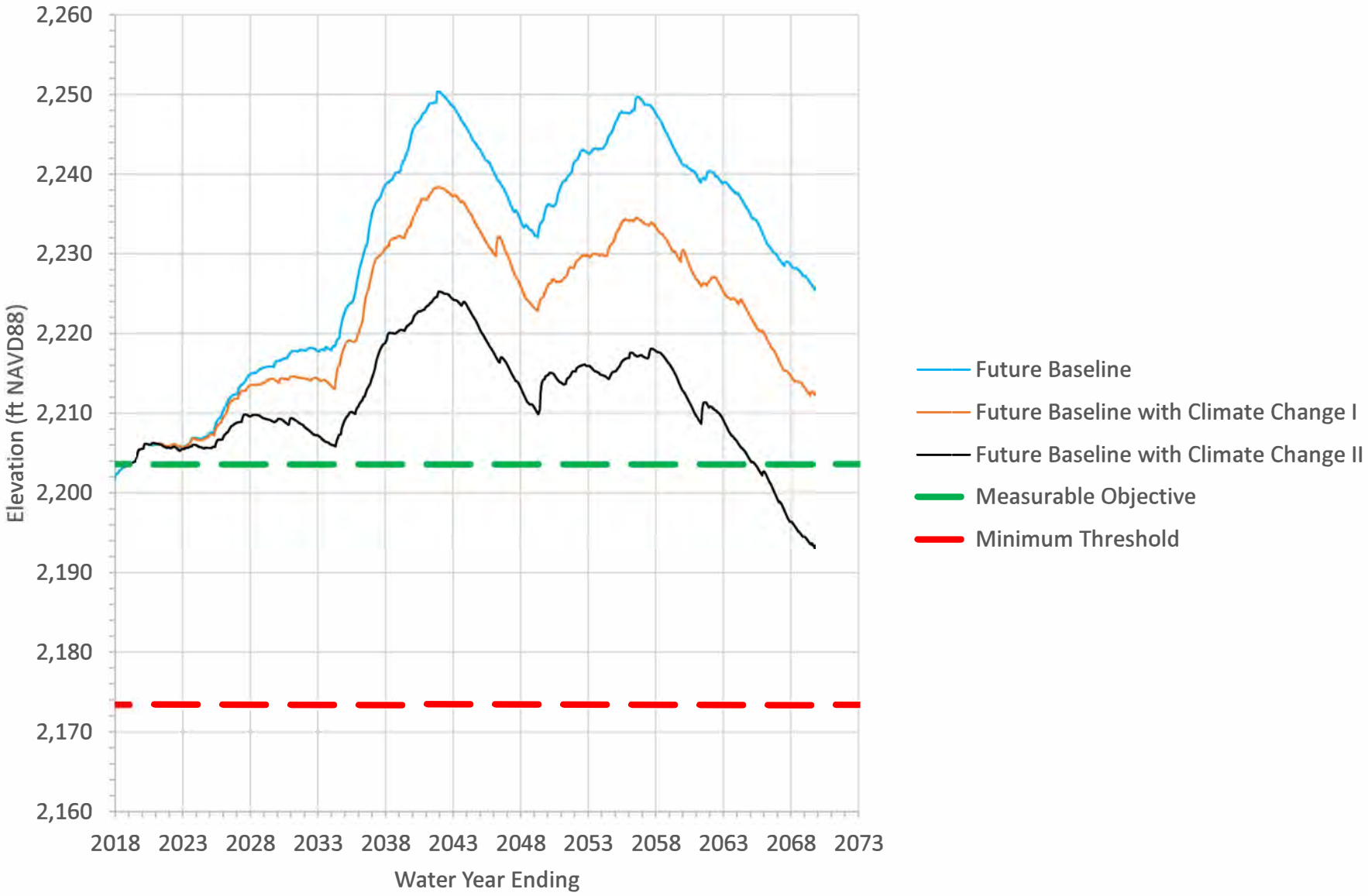

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Figure 3-32. Predicted Hydraulic Heads at USGS Equestrian Park #4 Well in the Calimesa Management Area

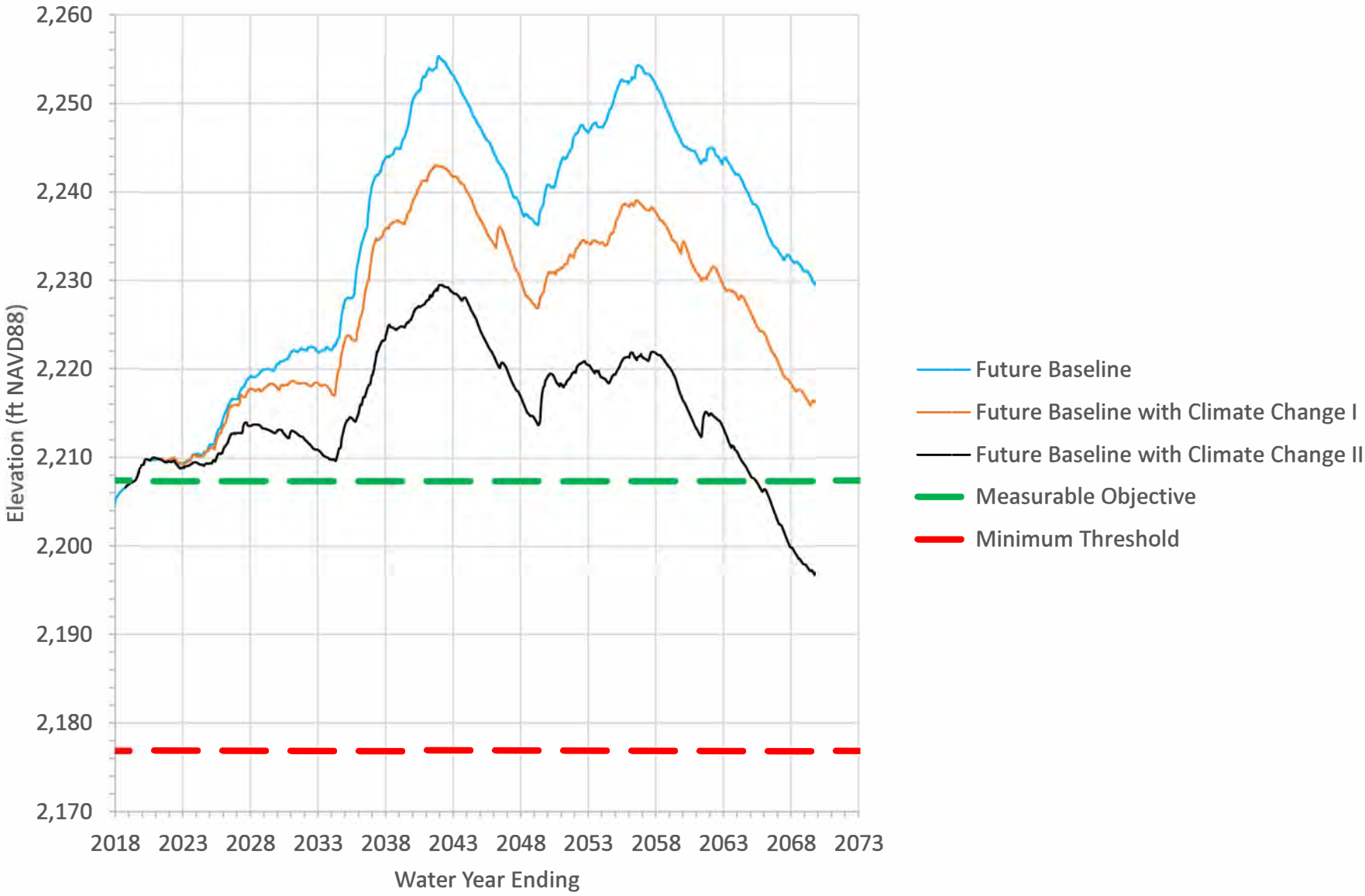

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Figure 3-33. Predicted Hydraulic Heads at USGS 6th Street #1 Well in the Calimesa Management Area

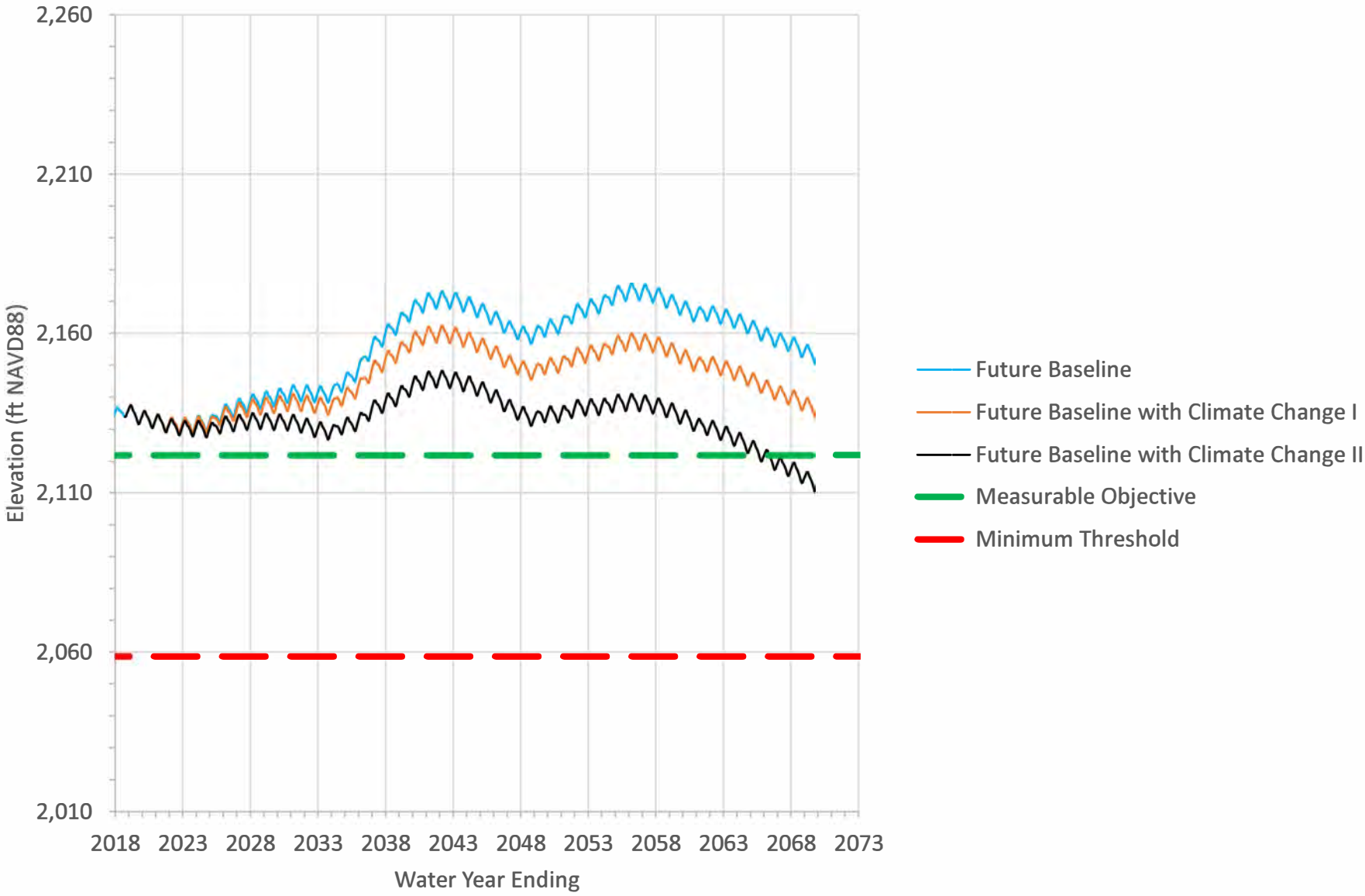

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Figure 3-34. Predicted Hydraulic Heads at USGS 6th Street #4 Well in the Calimesa Management Area

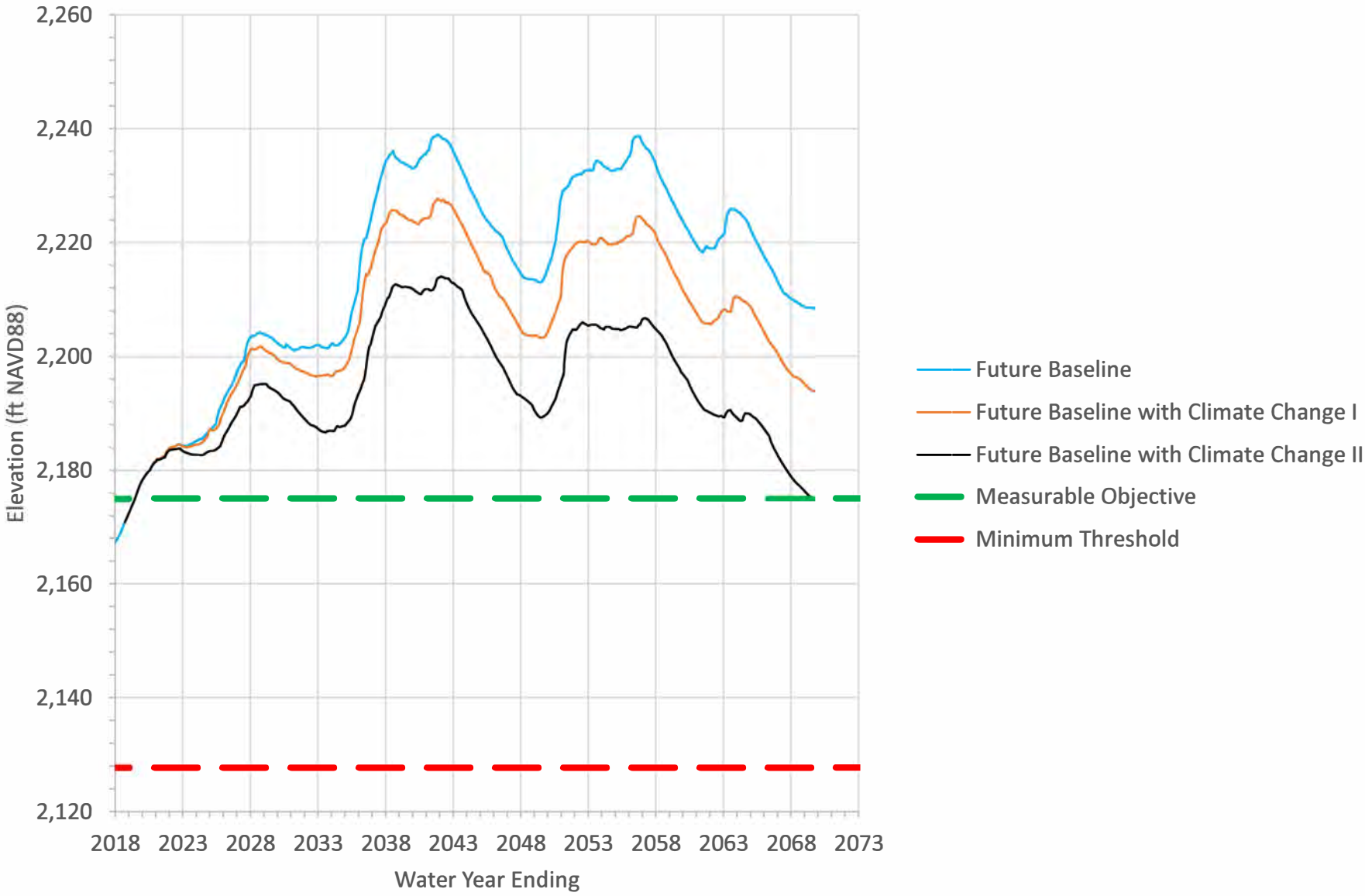

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Figure 3-35. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the Calimesa Management Area

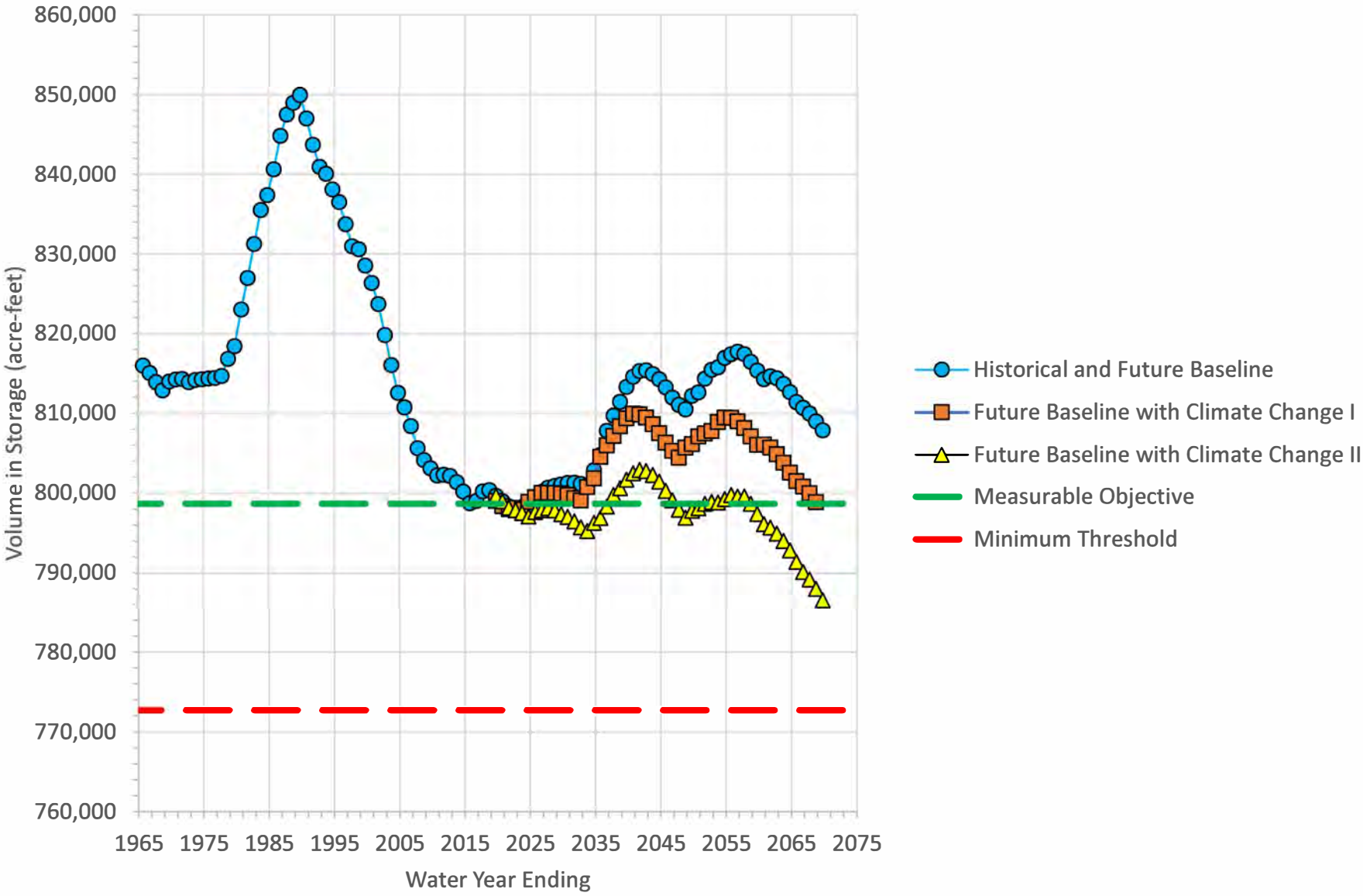

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Figure 3-36. Drought Buffer in the Western Heights Management Area

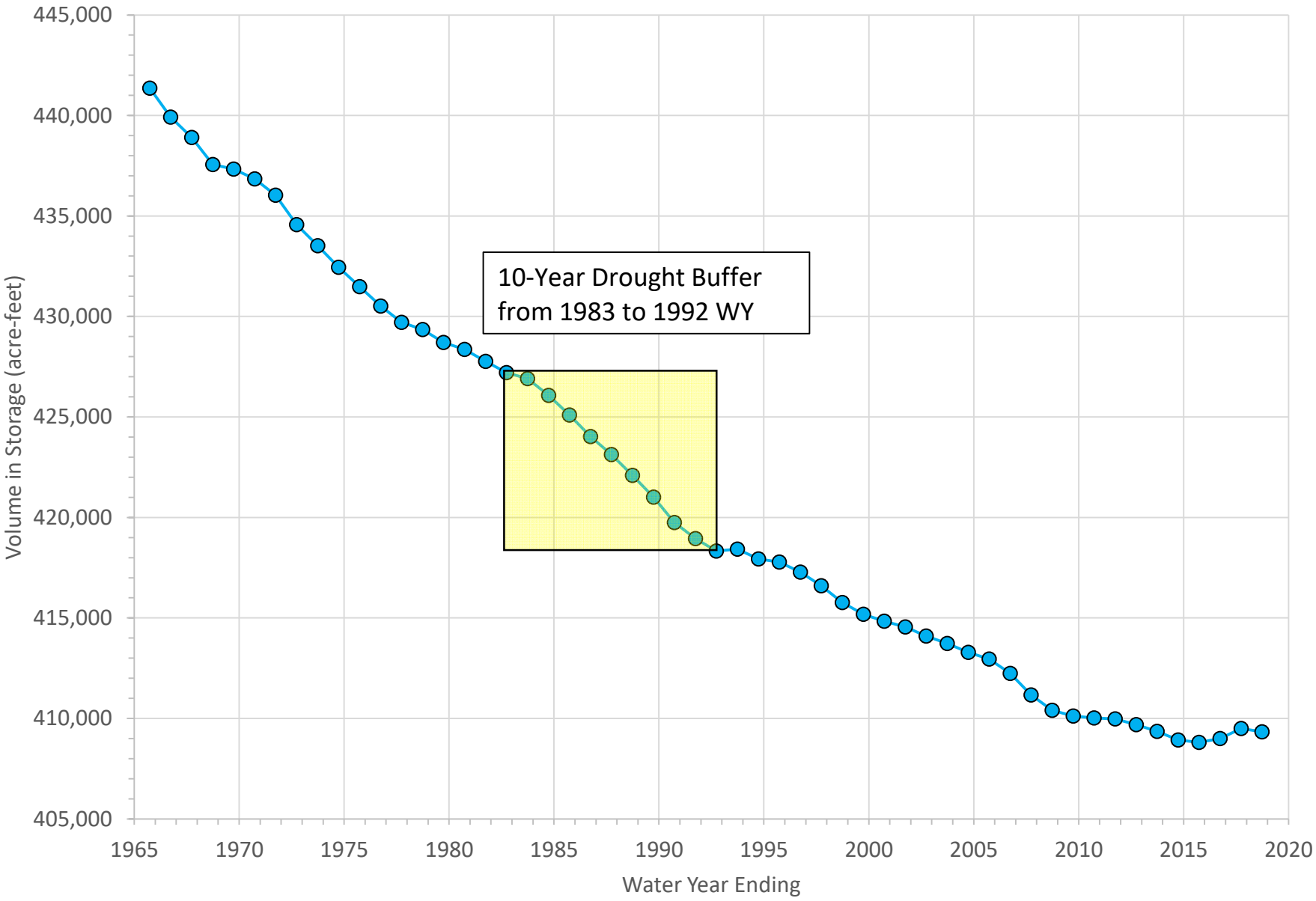

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Figure 3-37. Annual Groundwater Production and Historical Groundwater Elevations in the Western Heights Management Area

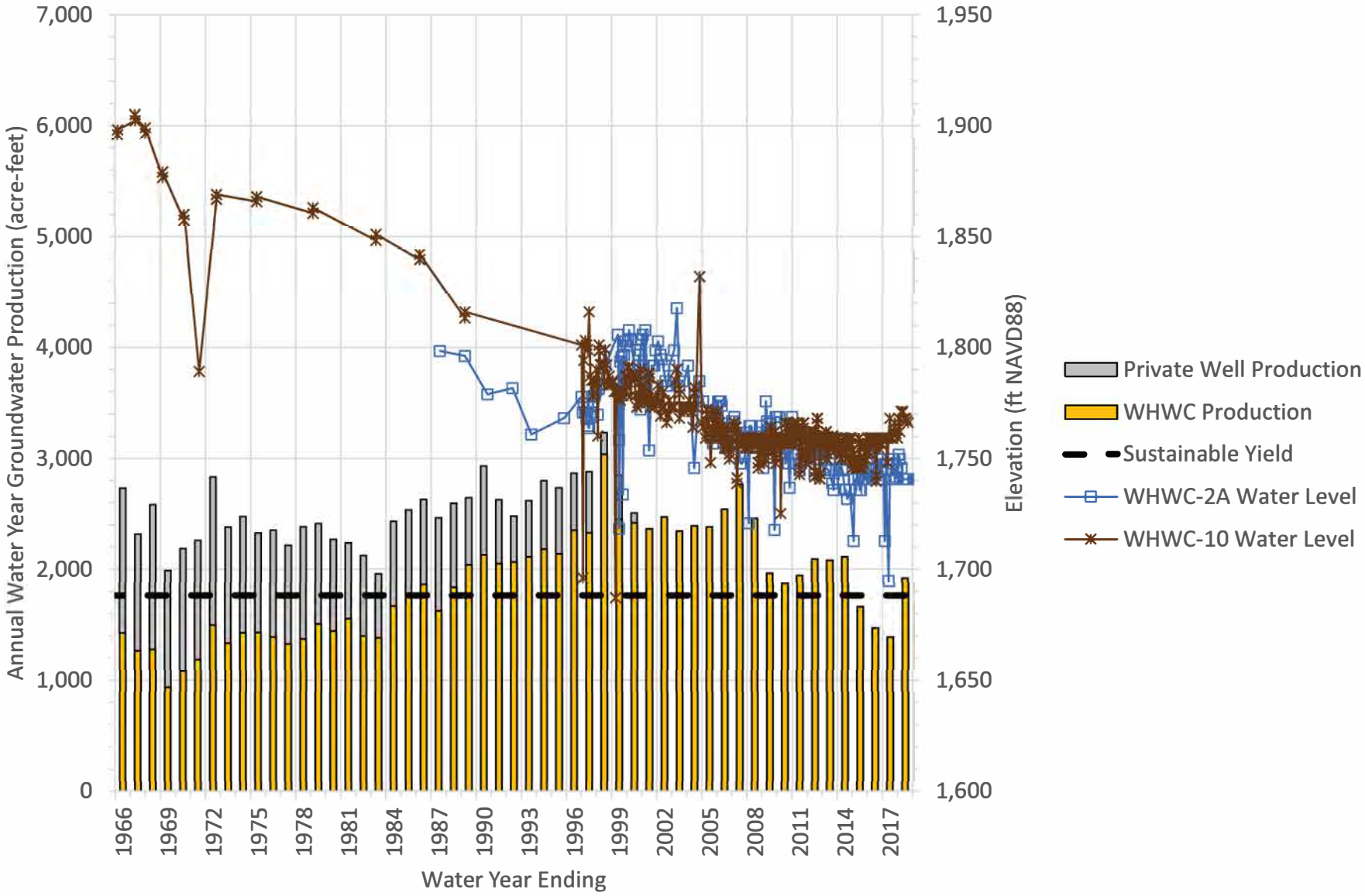

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Figure 3-38. Minimum Threshold and Measurable Objective
in the Western Heights Management Area

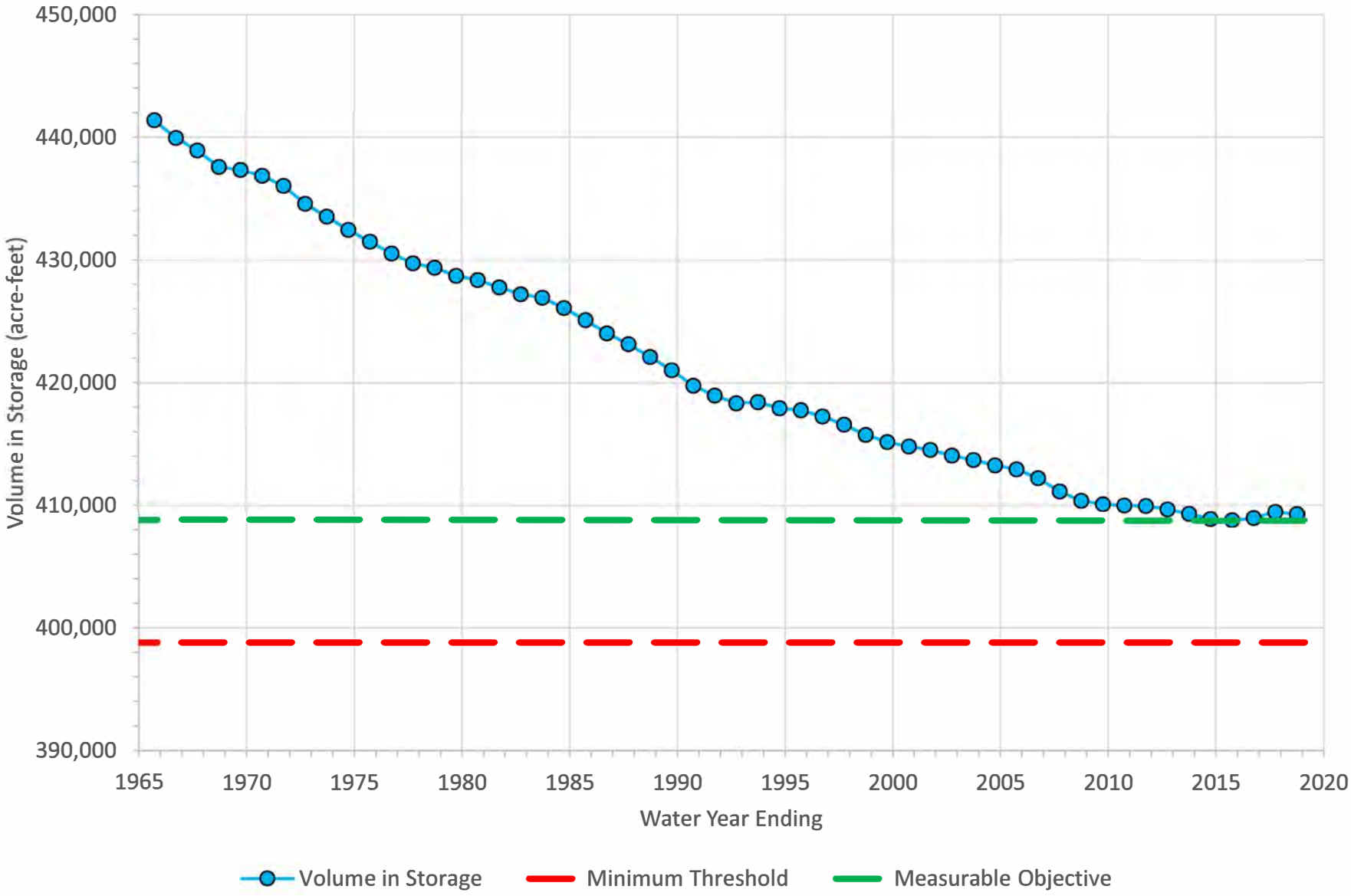

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Figure 3-39. Groundwater Production and Supplemental Water Purchased in the Western Heights Management Area

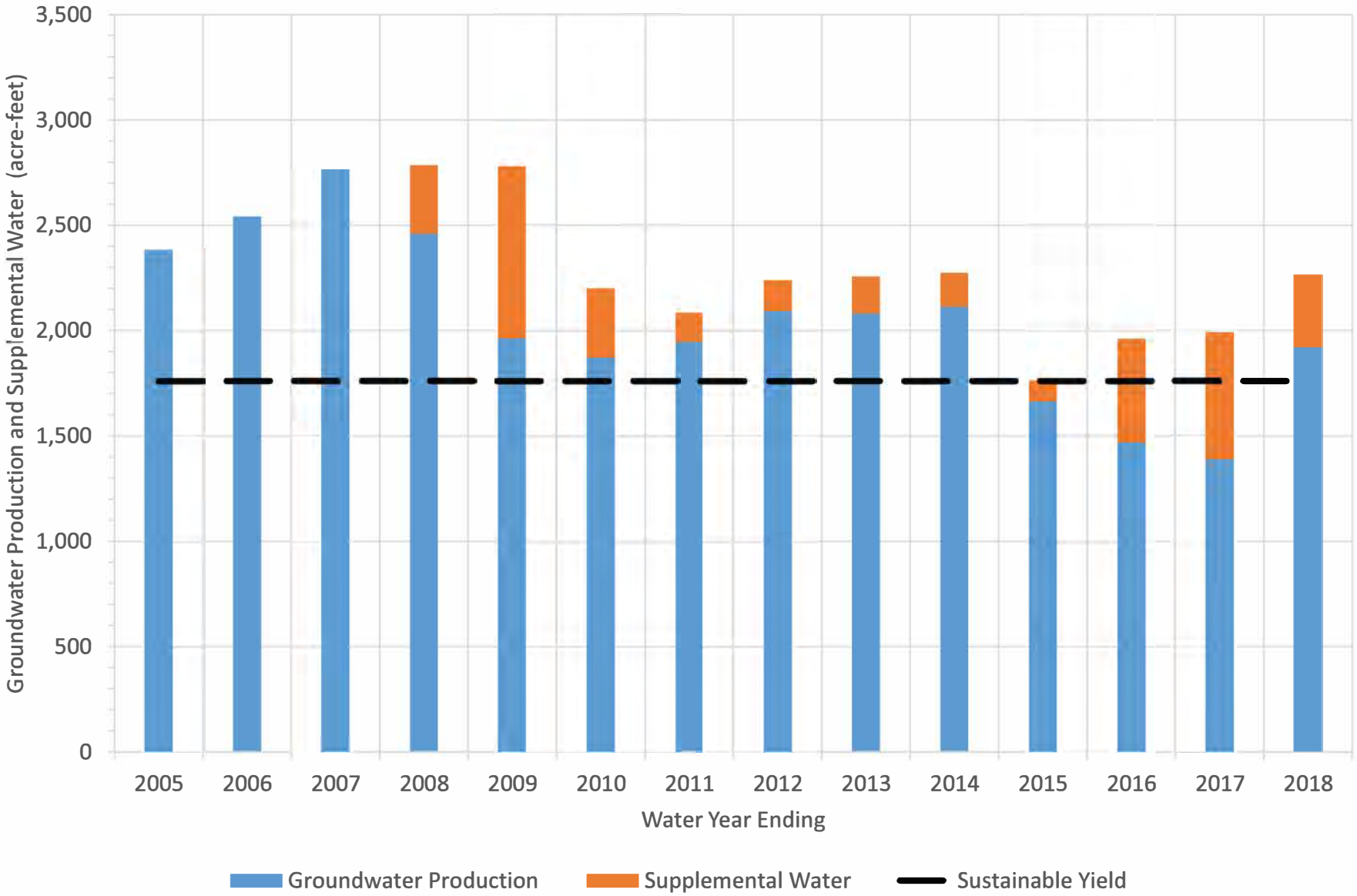

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Figure 3-40. Predicted Simulated Hydraulic Heads at WHWC-02A in the Western Heights Management Area

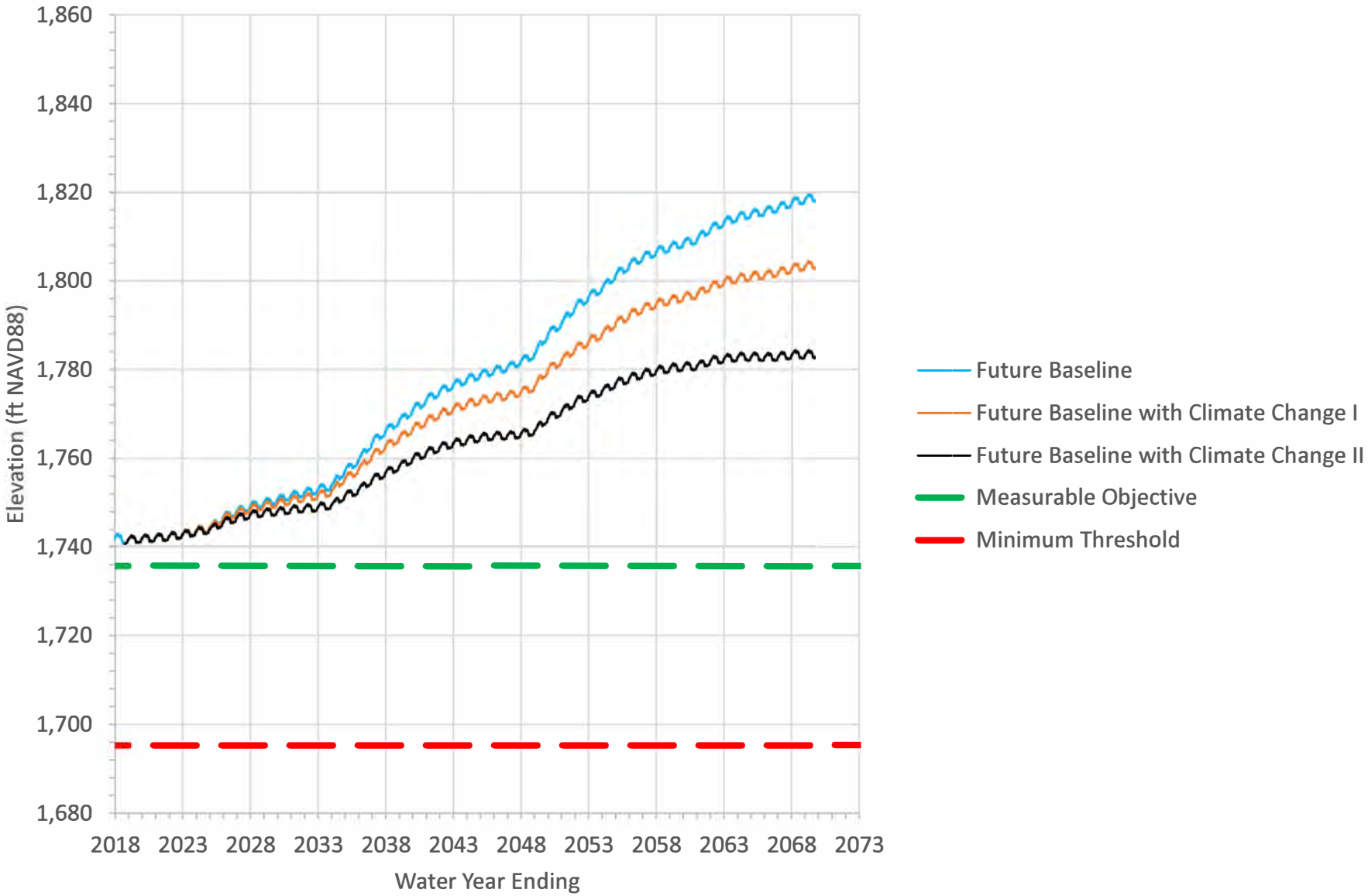

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Figure 3-41. Predicted Simulated Hydraulic Heads at WHWC-10
in the Western Heights Management Area

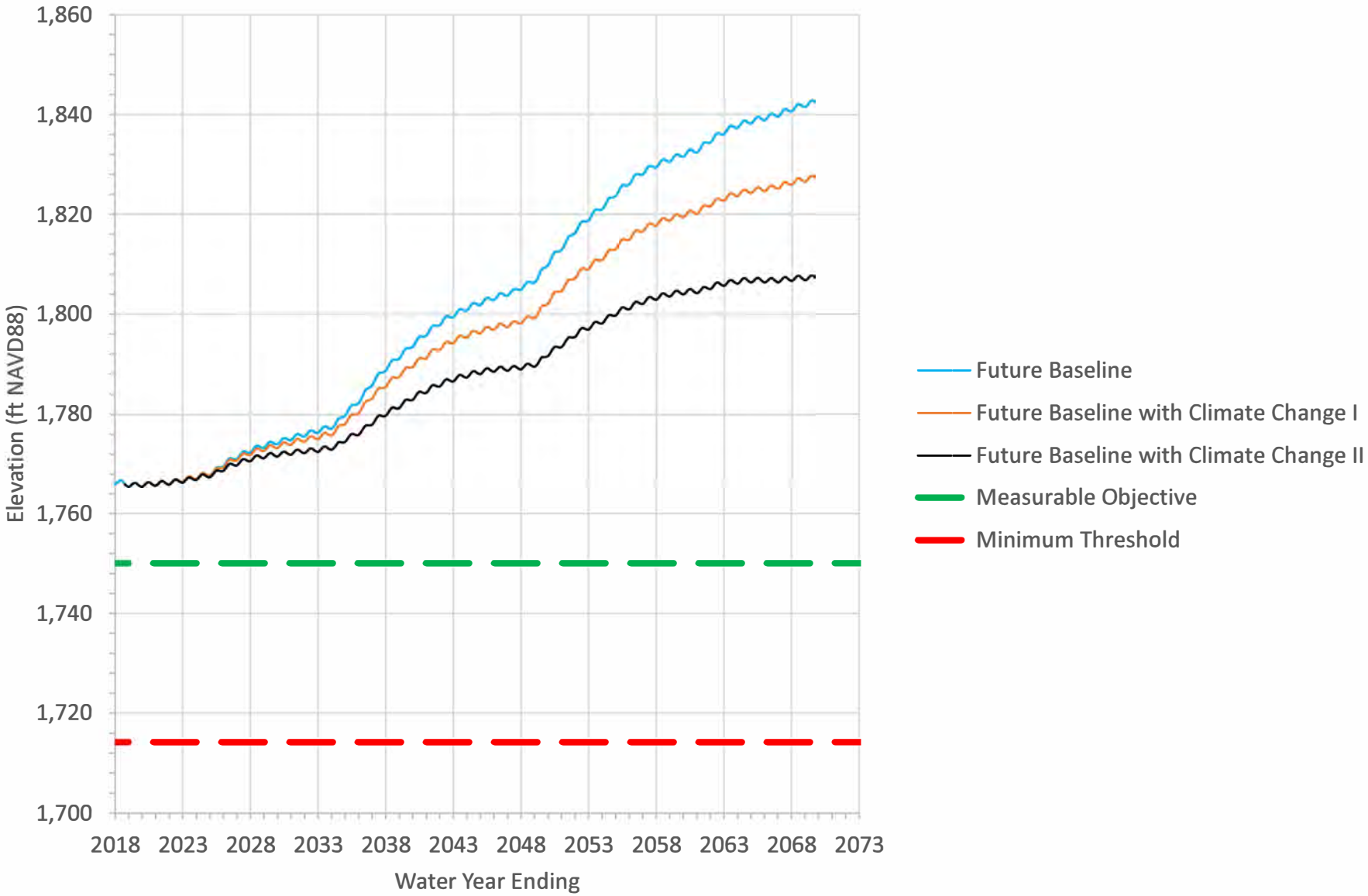

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Figure 3-42. Predicted Simulated Hydraulic Heads at WHWC-11
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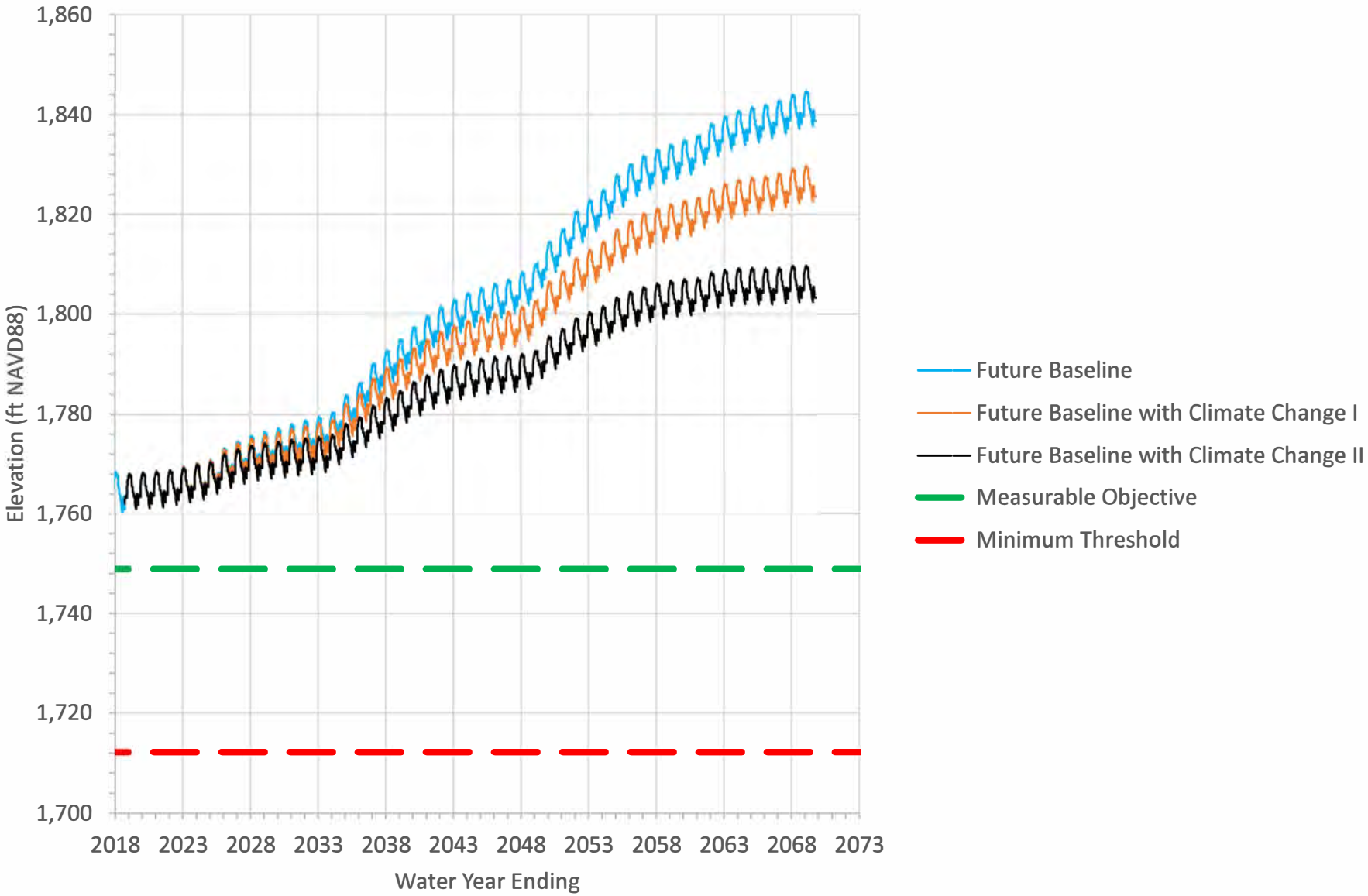

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Figure 3-43. Predicted Simulated Hydraulic Heads at WHWC-12
in the Western Heights Management Area

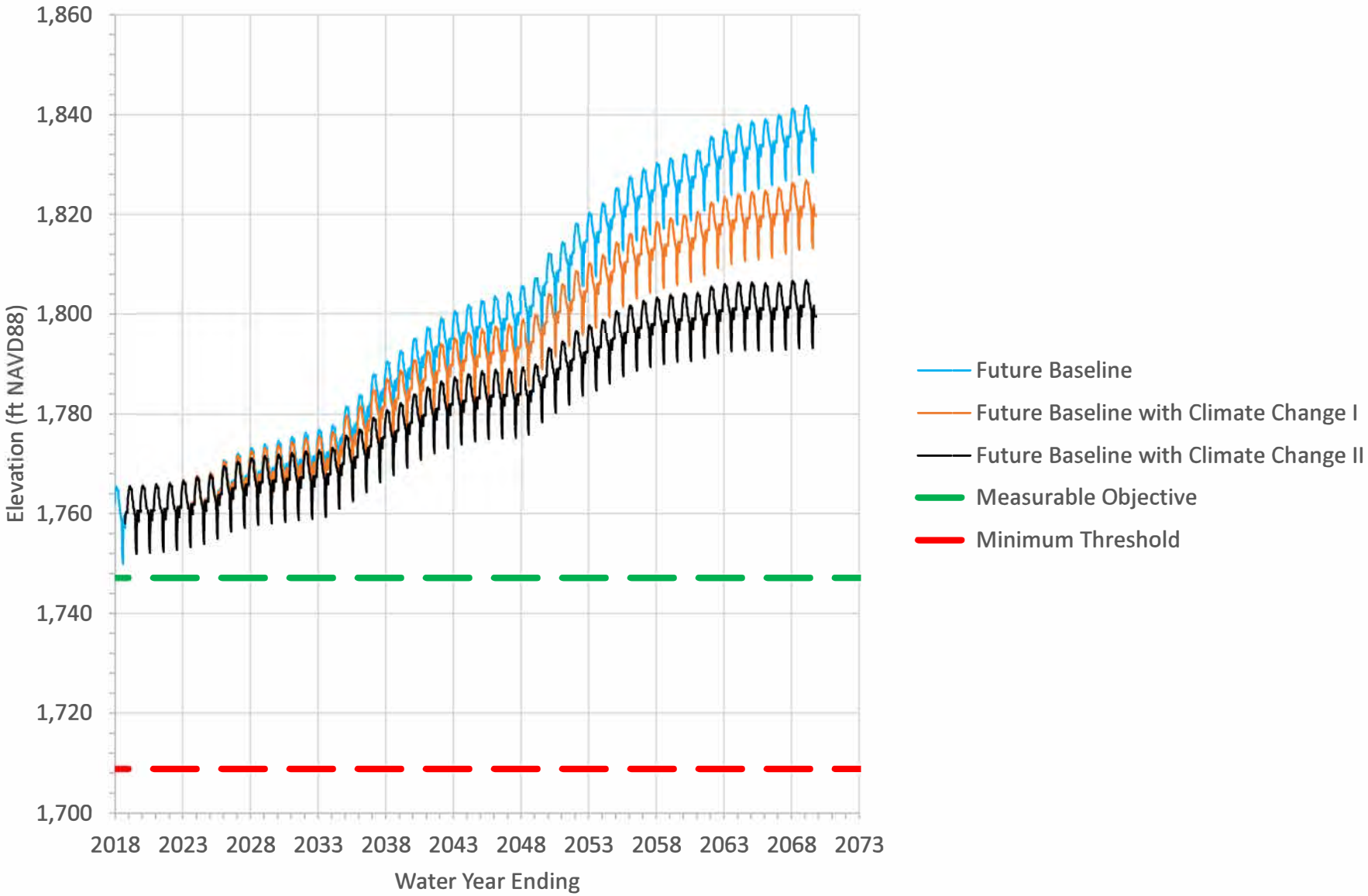

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Figure 3-44. Predicted Simulated Hydraulic Heads at WHWC-14
in the Western Heights Management Area

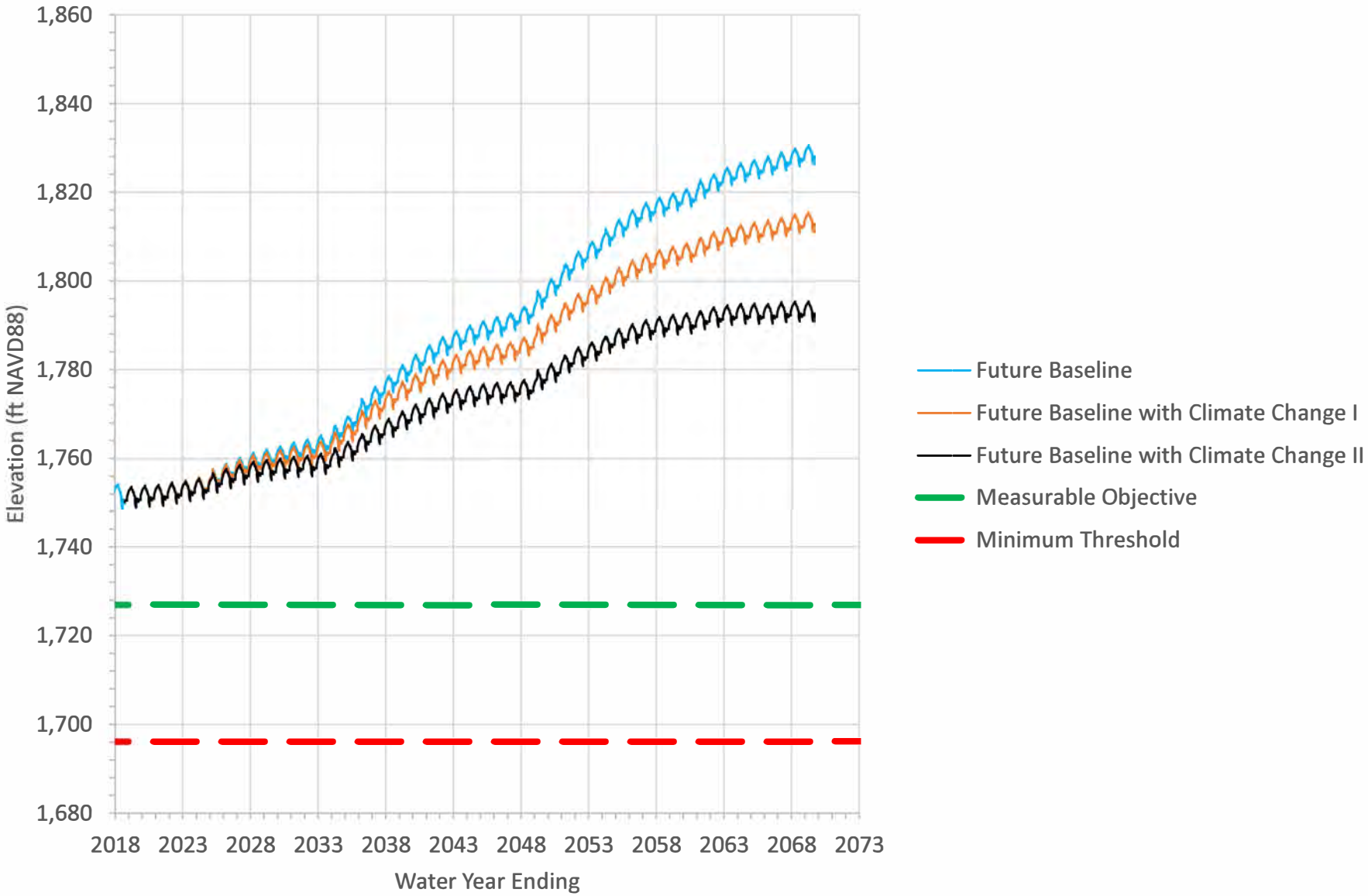

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Figure 3-45. Predicted Simulated Hydraulic Heads at USGS Dunlap #2 Well in the Western Heights Management Area

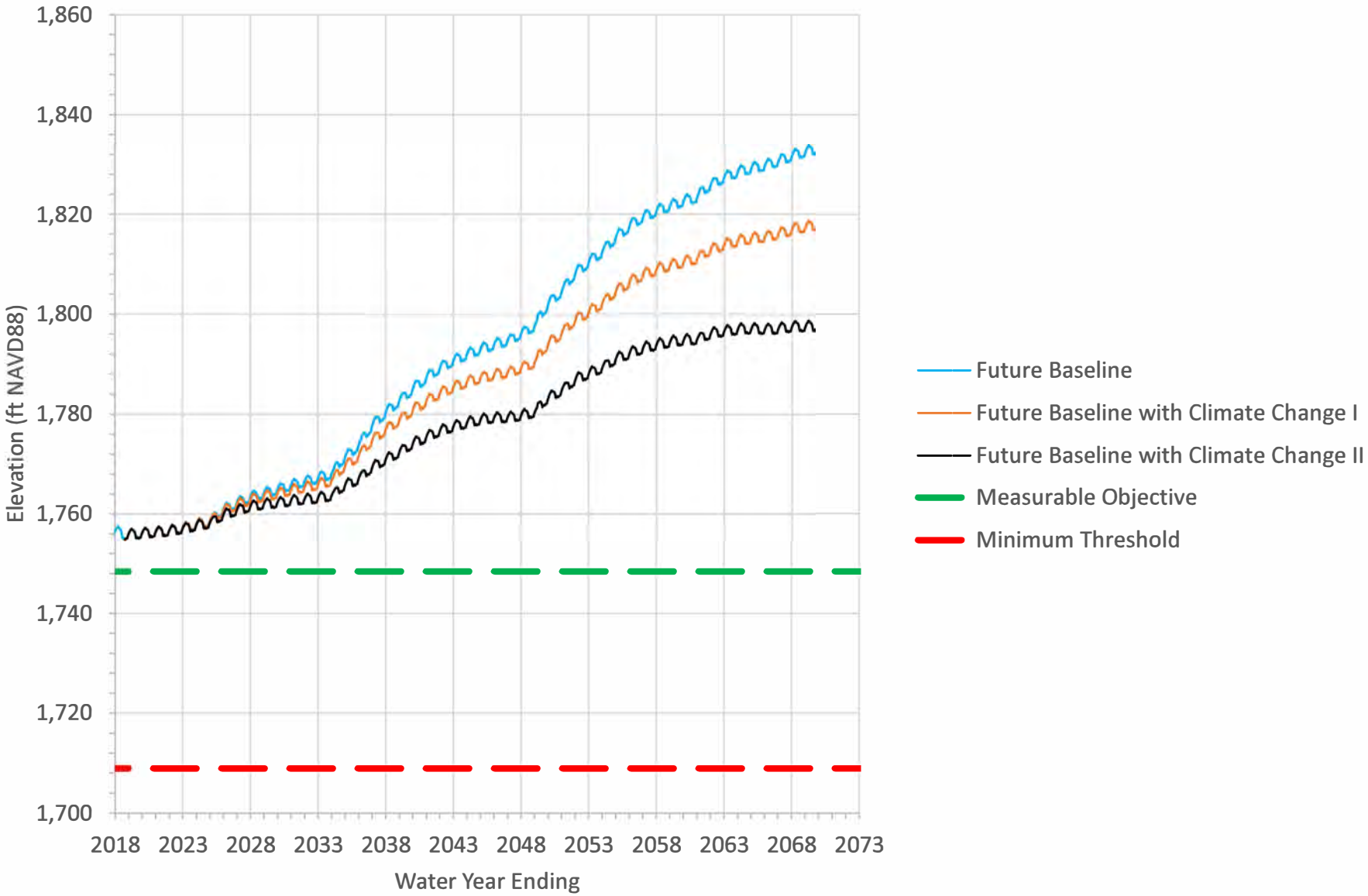

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Figure 3-46. Predicted Simulated Hydraulic Heads at USGS Dunlap #4 Well in the Western Heights Management Area

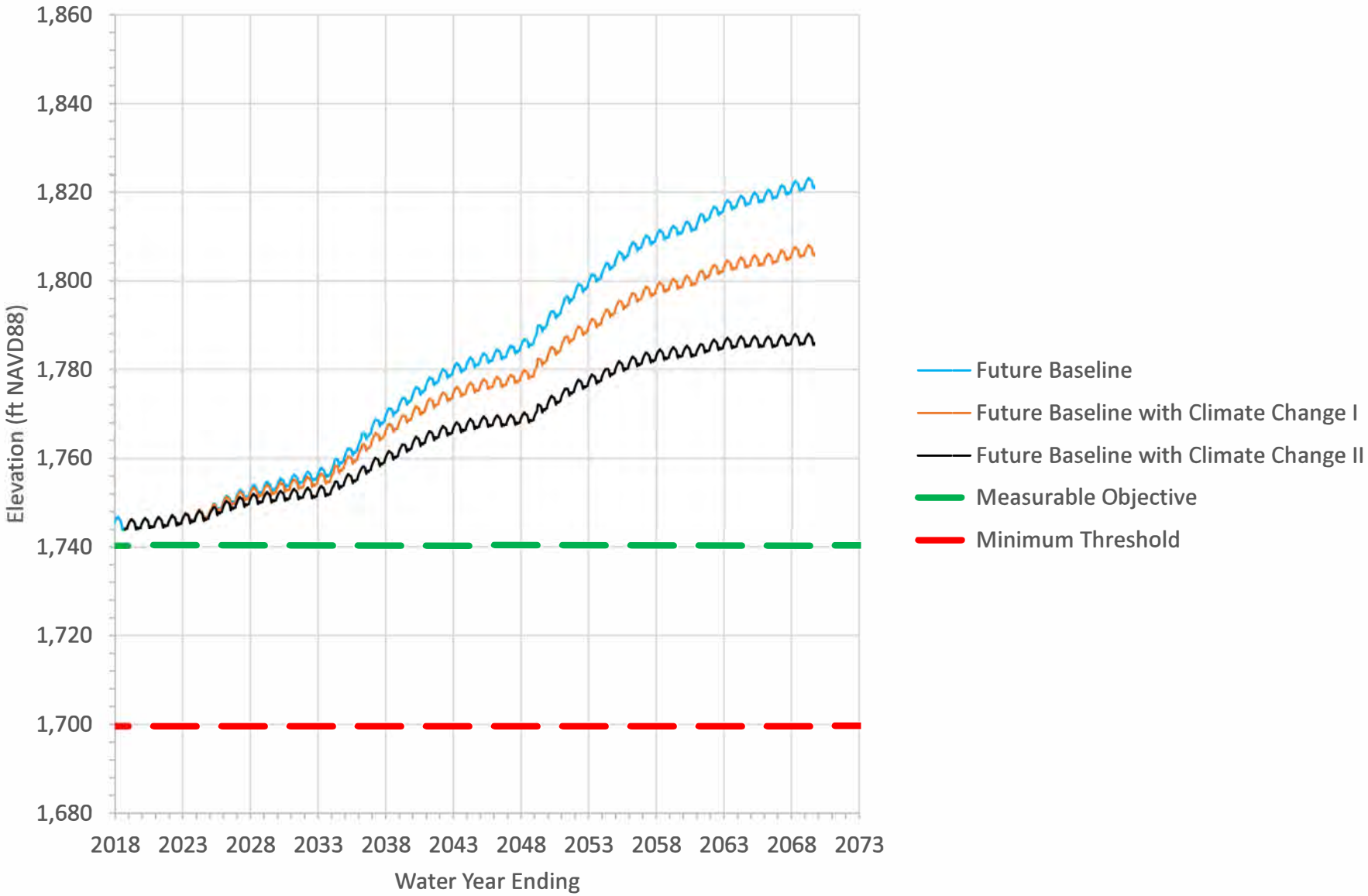

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Figure 3-47. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the Western Heights Management Area

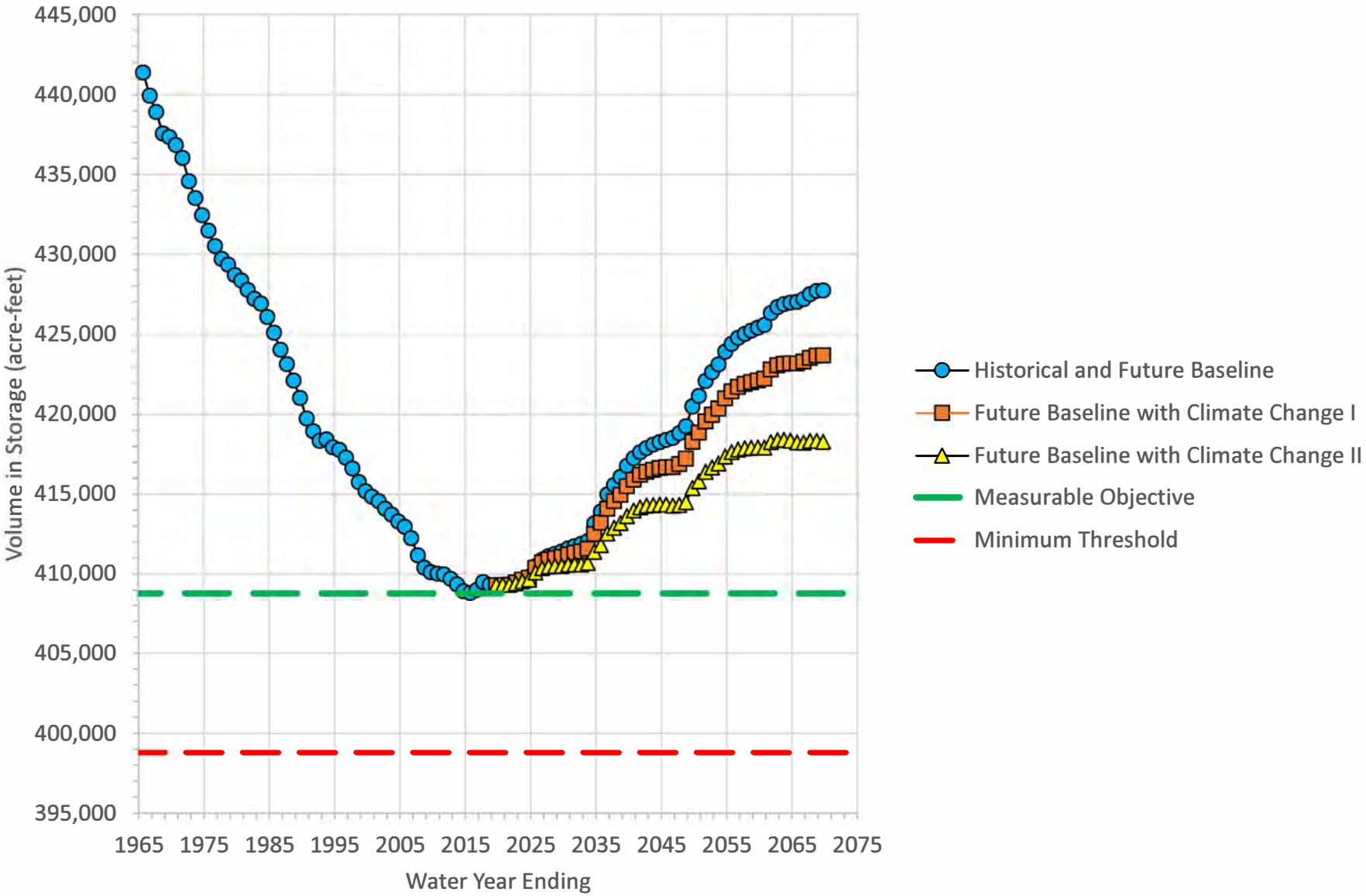

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Figure 3-48. Groundwater Elevations and Sustainability Criteria for the San Timoteo Management Area

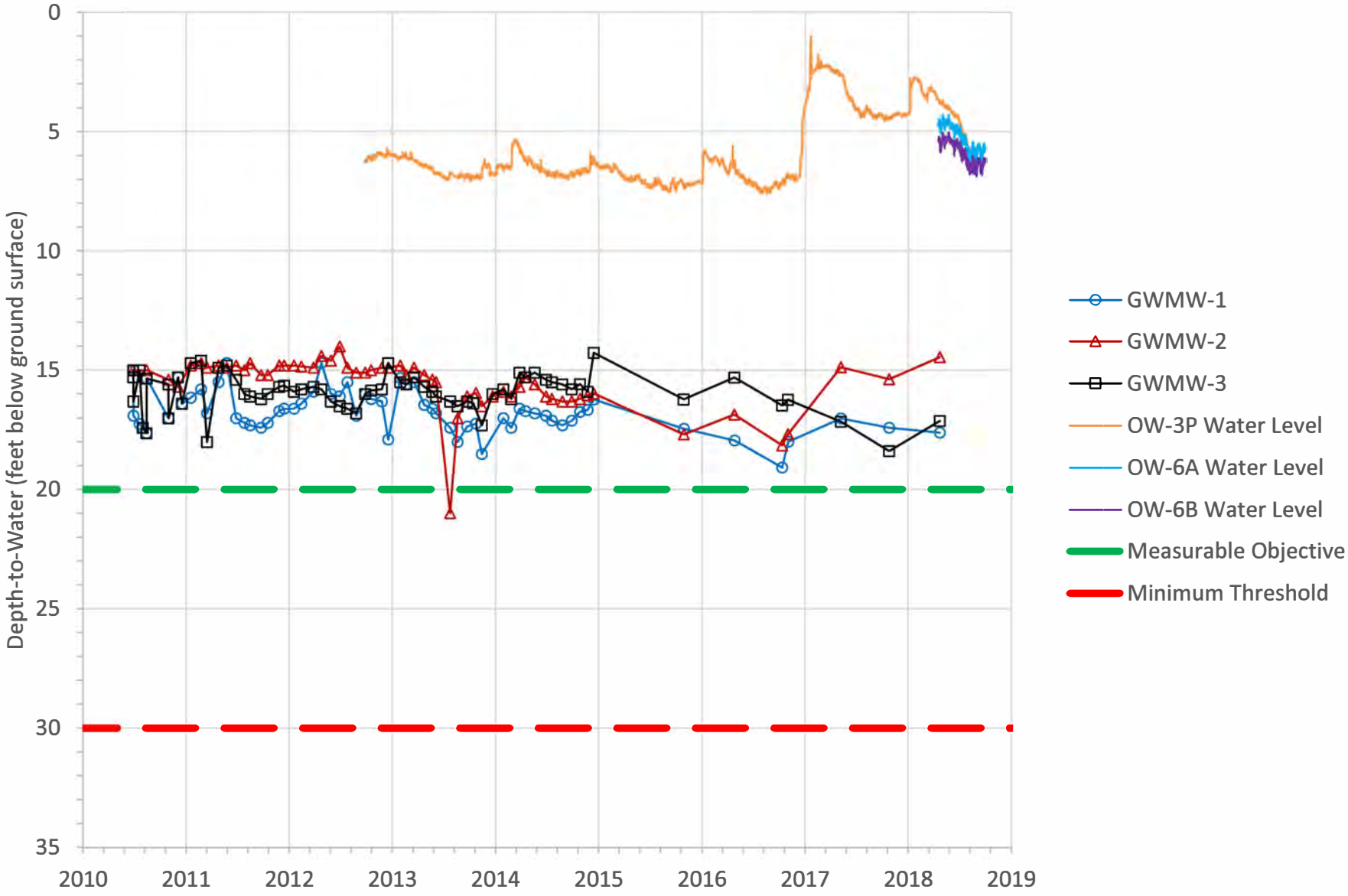

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Figure 3-49. Historical Groundwater Elevations Measured in the San Timoteo Management Area

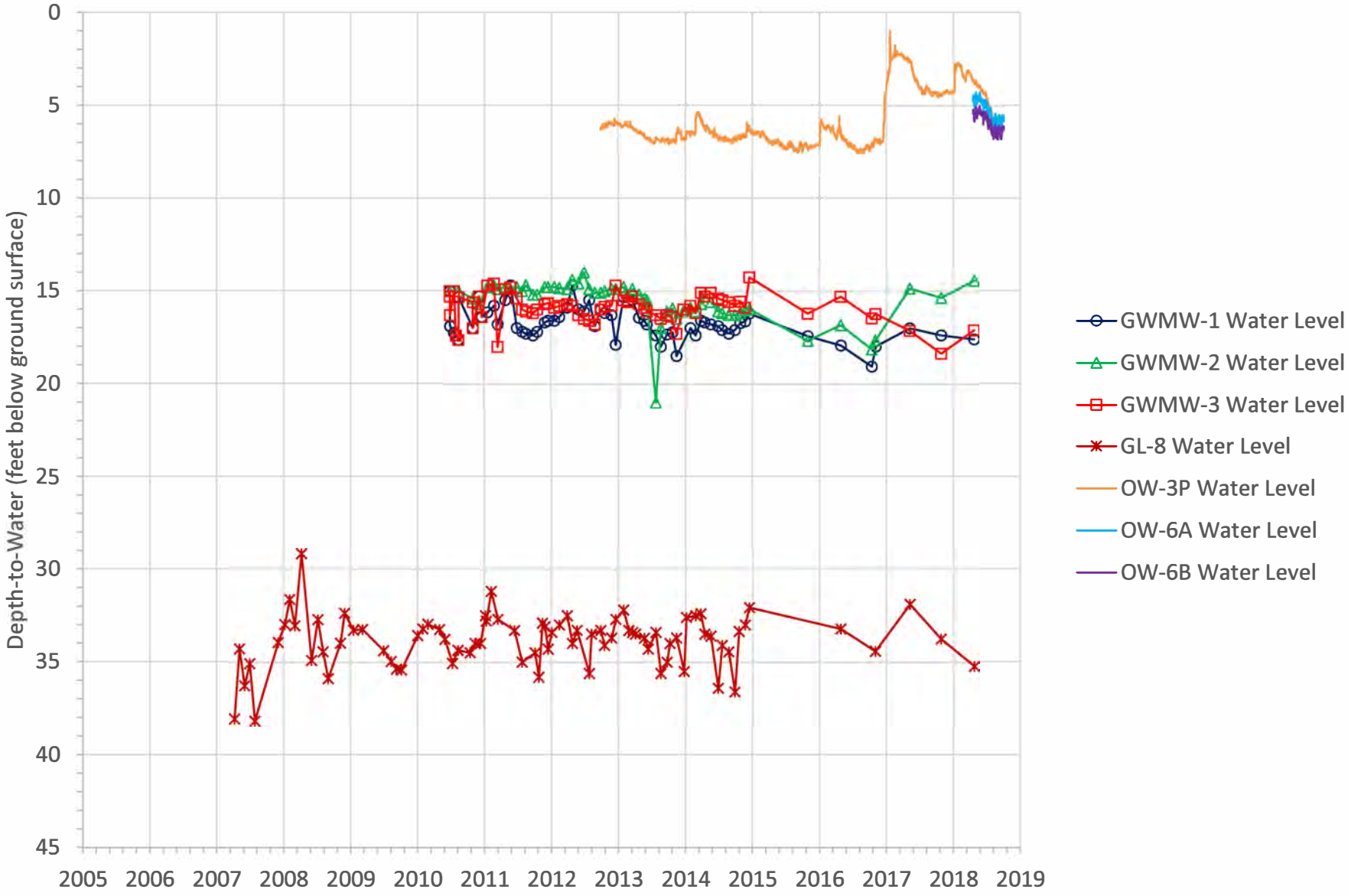

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Figure 3-50. Groundwater Elevations at Nested Well GWMW-5
in the San Timoteo Management Area

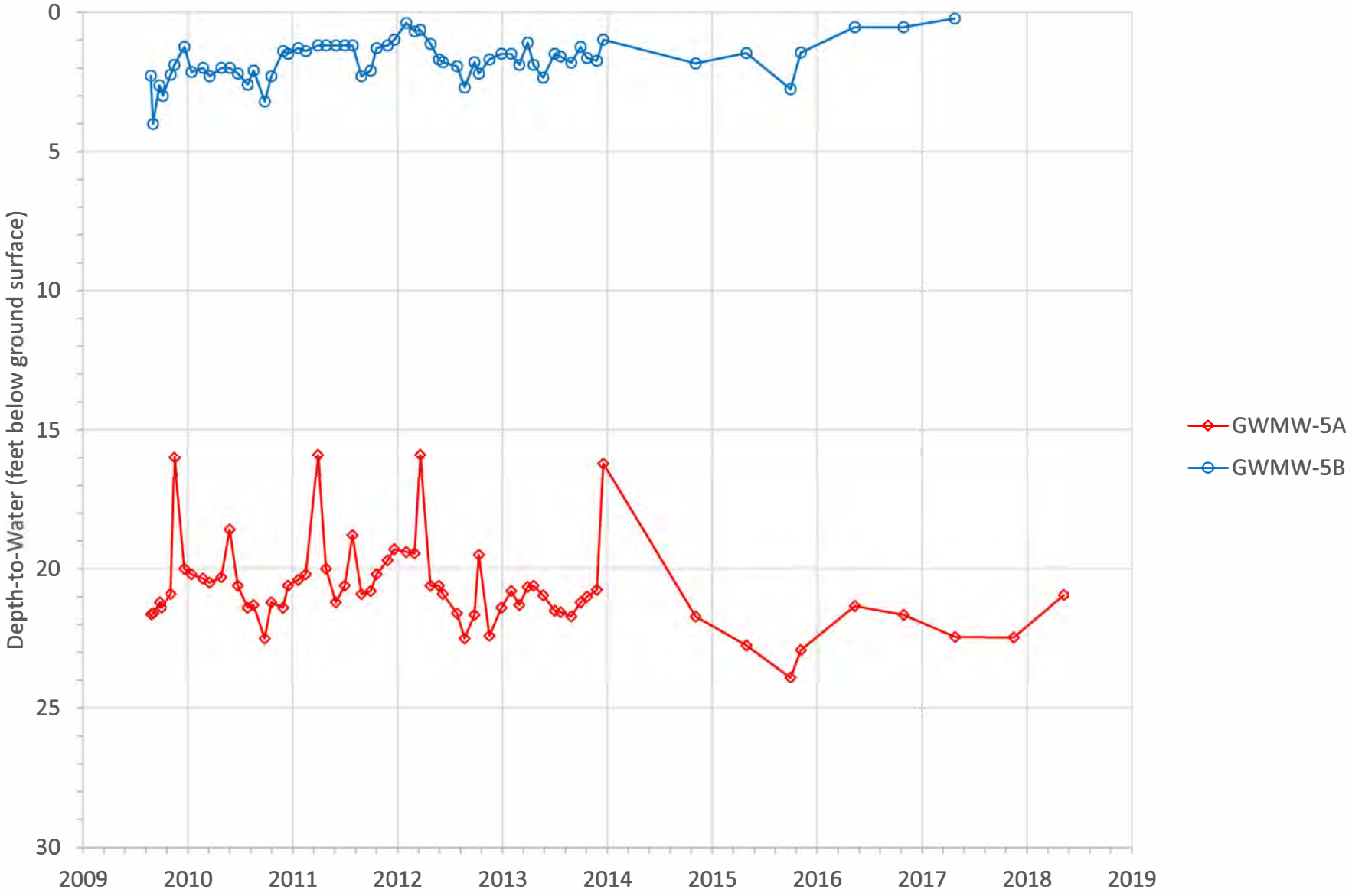

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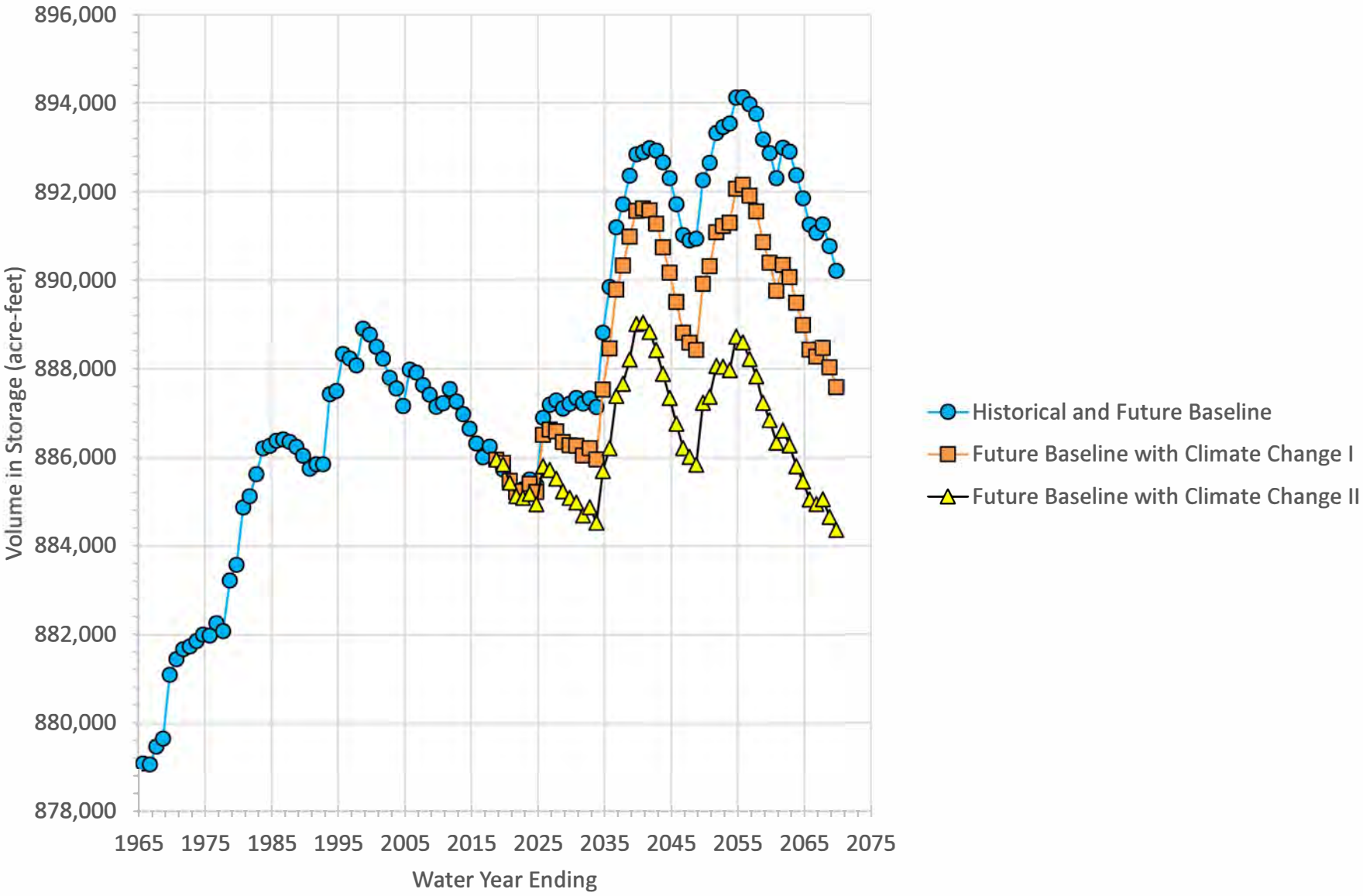
Figure 3-51. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios in the San Timoteo Management Area



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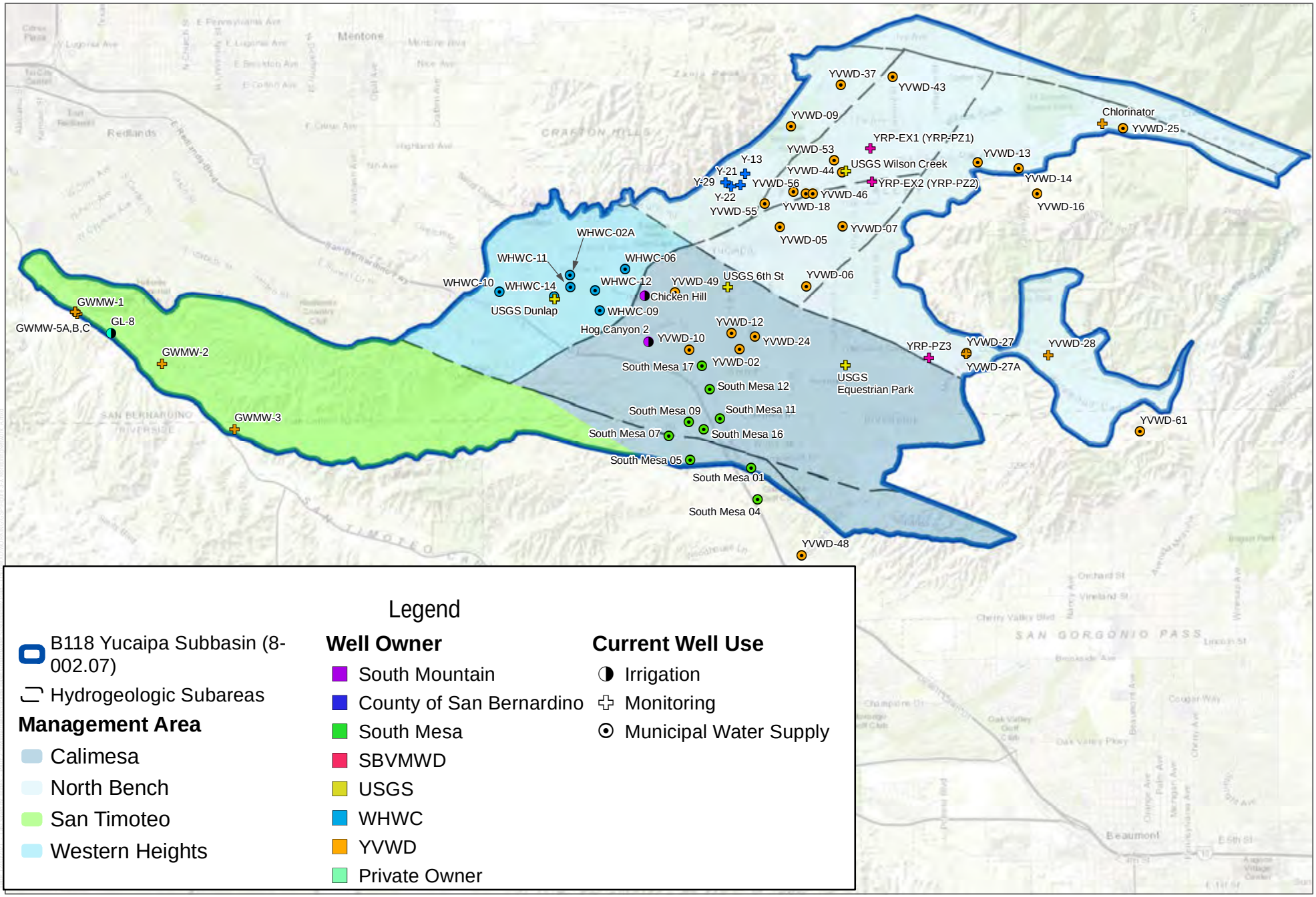

SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

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FIGURE 3-52

Yucaipa Subbasin Groundwater Monitoring Network

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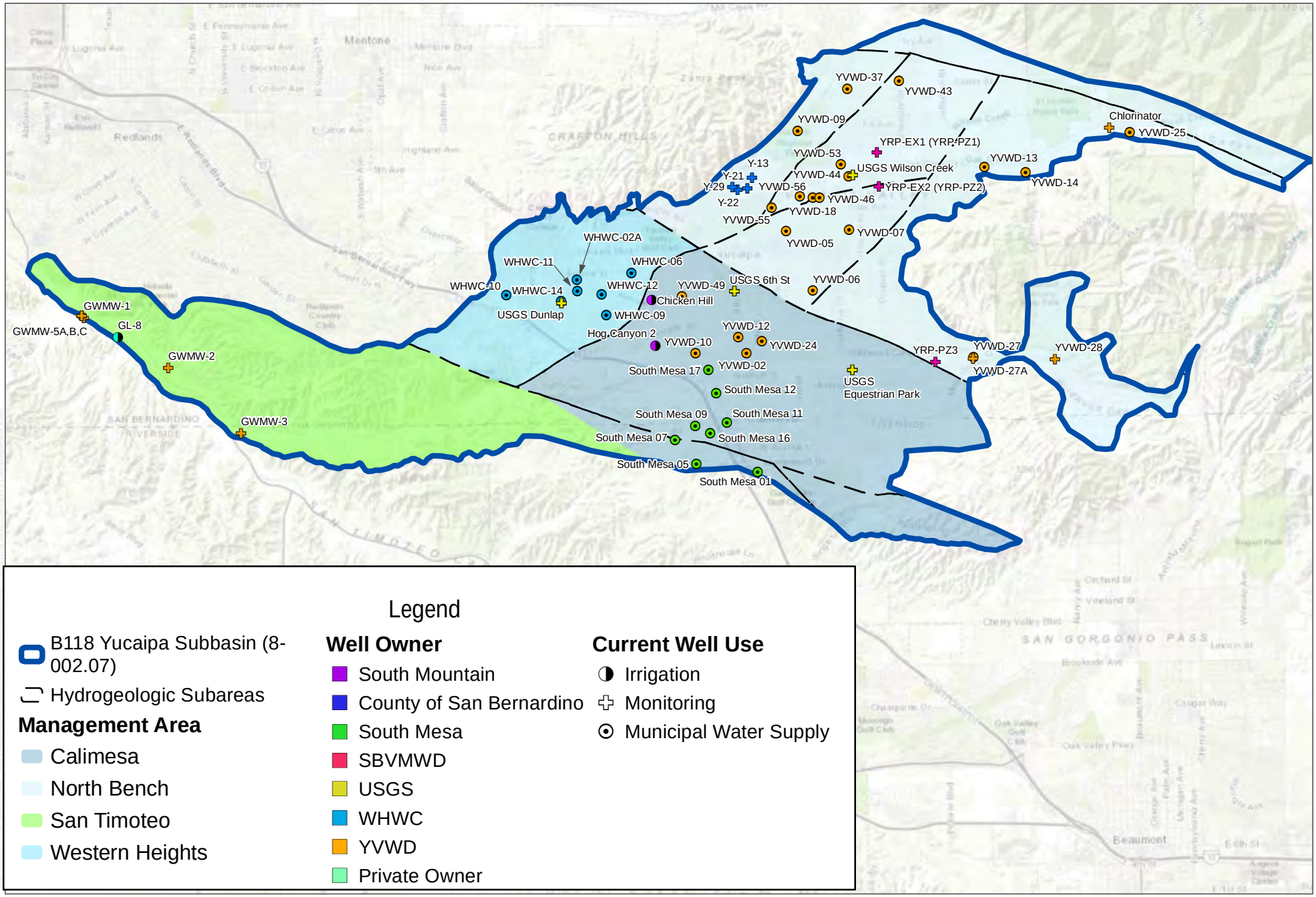

SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

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0 0.5 1 Miles

FIGURE 3-53

Monitoring Network Wells Designated to Measure Groundwater Elevations

Yucaipa Subbasin Groundwater Sustainability Plan

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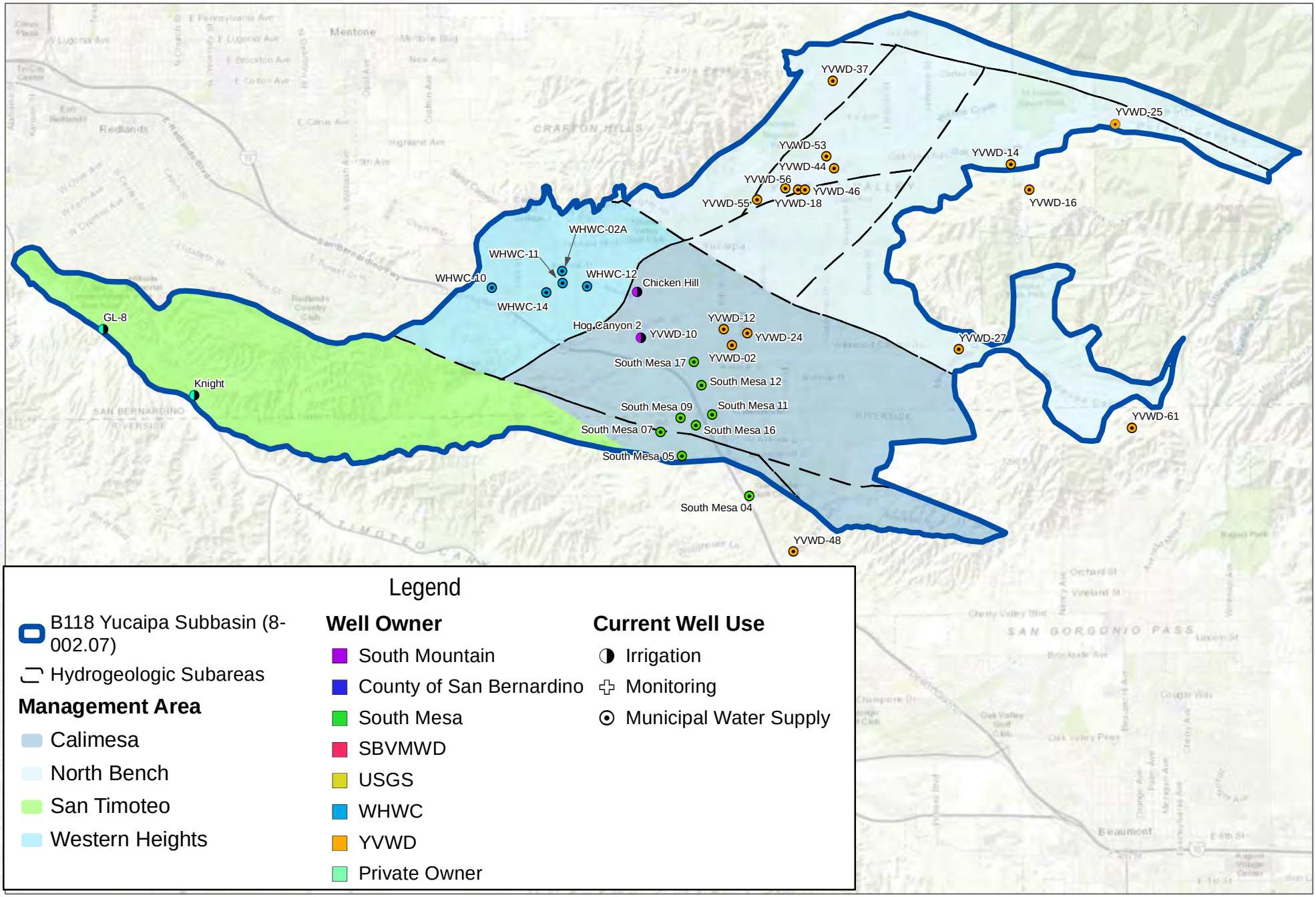

SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

FIGURE 3-54

Monitoring Network Wells Designated to Measure Groundwater Production

Yucaipa Subbasin Groundwater Sustainability Plan

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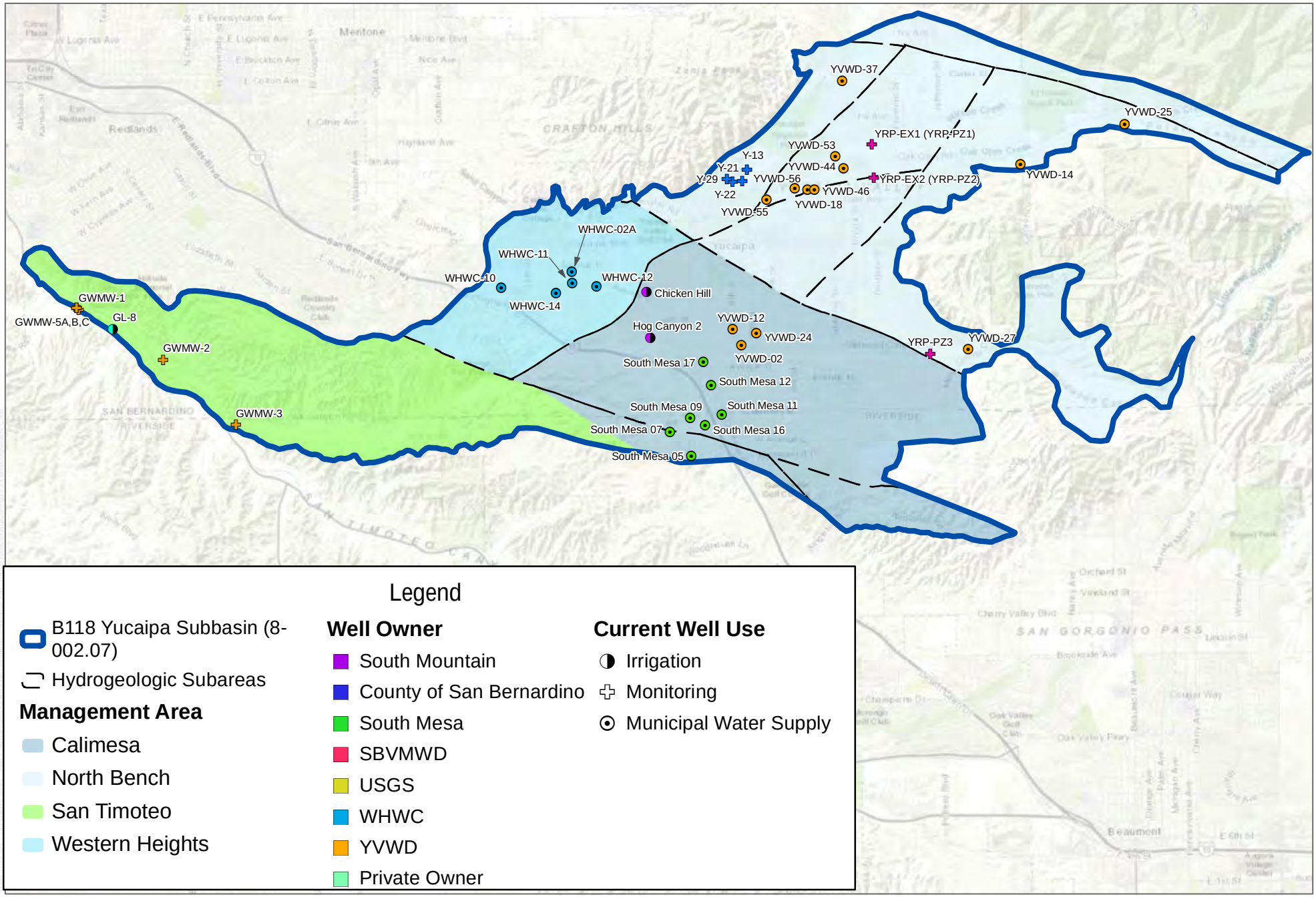

SOURCE: SBVMWD, YVWD, WHWC, SMWC, City of Redlands, USGS

FIGURE 3-55

Monitoring Network Wells Designated to Measure Groundwater Quality

Yucaipa Subbasin Groundwater Sustainability Plan

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4 Projects and Management Actions

4.1 Introduction to Projects and Management Actions

Sub-article 5 of Article 5 of the California Code of Regulations (CCR) Division 2 Chapter 1.5 (23 CCR, Section 354.42–354.44) describes the criteria for projects and management actions to be included in a Groundwater Sustainability Plan (GSP) that will help achieve the sustainability goal established for the Plan Area over the planning and implementation horizon. Currently, the Yucaipa Subbasin is being managed sustainably. The importation of State Water Project (SWP) water as a supplemental source of water has allowed the water purveyors to reduce groundwater production in the Subbasin to below the estimated sustainable yield. Consequently, groundwater levels have recovered 50 to 200 feet in the past 10 years with groundwater storage increasing by approximately 18,000 acre-feet (AF) (Section 2.8, Water Budget Analysis).

Future projections with groundwater production constrained to the estimated sustainable yield of 10,980 acre-feet per year (AFY), which is higher than the average annual extraction of 9,100 AFY observed from the 2014 water year (WY) to the-2018 WY period, indicate that the Yucaipa Subbasin will not experience undesirable results over the 50-year planning and implementation period. The simulated Future Baseline with Climate Change II scenario using the U.S. Geological Survey (USGS) Yucaipa Integrated Hydrologic Model (YIHM) indicated that conditions in the Calimesa Management Area may decline below the measurable objective and trend toward the minimum threshold (Figure 3-35). Under such conditions that may be experienced in the Calimesa Management Area and throughout the Subbasin, the Yucaipa Groundwater Sustainability Agency (GSA) has defined management actions that will be implemented to prevent undesirable results.

The management actions included in this chapter document the actions that the Yucaipa GSA will implement in the event that groundwater elevations in one or more management areas decline below their respective measurable objectives and minimum thresholds. The management actions are not currently necessary to achieve sustainability in the Plan Area, which has experienced rising groundwater levels and increased groundwater in storage since 2008 (Section 2.7, Current and Historical Groundwater Conditions). However, the following management actions will be implemented, as necessary, to respond to declining conditions that deviate from the future predictions by the YIHM.

Currently, no new projects have been identified as necessary to achieve groundwater sustainability in the Plan Area during the 50-year planning and implementation period. Member agencies of the Yucaipa GSA have constructed spreading basins and stormwater capture basins and are in the process of designing and constructing new ones to enhance recharge to the Subbasin, thereby reducing dependence on imported water. The Wilson Creek and Oak Glen Creek spreading basins were designed to receive SWP water from the East Branch Extension and to capture major stormwater flows. Storage of imported water during wet years helps to achieve the objective of importing all of Valley District's SWP entitlement water into the basin.

4.2 Management Actions

Minimum thresholds and measurable objectives were defined for the four management areas in the Plan 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 groundwater-dependent ecosystems (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.

4.2.1 Management Action No. 1 – Reduce Net Use of Groundwater When Groundwater Levels Decline below Measurable Objectives

The drought buffers established for the North Bench, Calimesa, and Western Heights Management Areas provide operational flexibility to implement management actions when groundwater conditions decline below their respective measurable objectives (Section 3.4, Minimum Thresholds). The drought buffers were developed based on observed historical conditions and the uncertainty in model predictions (see Section 2.8.8, Characterization of Model Sensitivity and Predictive Uncertainty). The following management actions for these three management areas will prevent undesirable results related to the chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence. The management action implemented when groundwater levels decline below the measurable objective for the San Timoteo Management Area will prevent significant and unreasonable effects resulting in a loss in surface water interconnected with shallow groundwater that sustain GDEs.

4.2.1.1 North Bench Management Area

The North Bench Management Area includes eight representative monitoring points (RMPs), each associated with a groundwater elevation representing the measurable objective at 230,000 AF in storage and the minimum threshold at 220,000 AF in storage (Table 3-3). Currently, groundwater levels are 50 feet to 130 feet above the measurable objective levels designated at the RMPs (Table 4-1).

Table 4-1. Groundwater Elevations Pertaining to Management Actions for the North Bench Management Area

Representative Monitoring Point	Current Groundwater Elevations (feet NAVD88)	Groundwater Elevations at the Minimum Threshold (feet NAVD88)	Groundwater Elevations at the Measurable Objective (feet NAVD88)
YVWD-06	2,359.99	2,255.47	2,276.91
YVWD-07	2,435.42	2,239.38	2,318.07
YVWD-37	2,585.64	2,503.91	2,527.68
YVWD-46	2,357.42	2,209.32	2,228.73
YVWD-53	2,446.53	2,315.55	2,337.17
YVWD-56	2,426.23	2,269.24	2,291.03
USGS Wilson Creek #1 (820′–840′)	2,455.55	2,300.24	2,329.25
USGS Wilson Creek #4 (350′–370′)	2,482.04	2,317.09	2,349.27
Average	**2,443.60**	**2,301.27**	**2,332.26**

The YIHM predicts that future groundwater elevations with groundwater production constrained to the estimated sustainable yield of 3,940 AFY will remain above the measurable objective levels associated with each RMP (Figures 3-7 to 3-14). However, the following conditions will trigger management actions to be implemented by the Yucaipa GSA:

1) If groundwater elevations decline below the measurable objective levels at 50% or more of the RMPs (Table 4-1) for 2 consecutive years, then the following management action will be implemented:
   a) The net use of groundwater from the North Bench Management Area will decrease by 25% of the estimated sustainable yield of 3,940 AFY, or by 990 AFY. The Yucaipa GSA will implement this management action by either reducing groundwater production by 990 AFY, artificially recharging the aquifer with an additional 990 AFY of supplemental water, enacting water conservation programs or other programs that result in a net reduction of groundwater use by 990 AFY, or any combination of these actions that result in a net reduction of groundwater use by 990 AFY. Because the management area is not experiencing or is expected to experience conditions below the measurable objective through the 50-year planning and implementation horizon, no interim milestones are defined in this GSP. However, if conditions do develop and this management action is implemented, then the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.
   b) The 25% net reduction in groundwater use, which may be achieved with a reduction in groundwater production from 3,940 AFY to 2,950 AFY, was selected because historical data indicated that, when groundwater production was at 3,000 AFY or less, groundwater levels and the volume in storage were stable or increased during periods of "below normal" to "wet" water year types (Figures 2-3, 3-3, and 3-6). The Yucaipa GSA, at its discretion, may modify the 25% reduction (e.g., implement a higher percentage of reduction) if this rate is not sufficient to improve conditions in the management area and avoid undesirable results.
   c) Implementing this management action will also require the Yucaipa GSA to reevaluate and, possibly, recalibrate the YIHM to improve the accuracy of the model in predicting future conditions. This action will be implemented if the occurrence is outside the scheduled 5-year evaluation, which already includes a reevaluation of the YIHM.
2) If conditions continue to decline and groundwater elevations at 50% or more of the RMPs fall below their respective minimum threshold levels (Table 4-1) for 2 consecutive years, then the following management action will be implemented:
   a) The net use of groundwater from the North Bench Management Area will decrease by 35% of the estimated sustainable yield of 3,940 AFY, or by 1,380 AFY. The Yucaipa GSA will achieve this management action by either reducing groundwater production by 1,380 AFY, artificially recharge the aquifer with an additional 1,390 AFY of supplemental water, enact water conservation programs or other programs that result in a net reduction of groundwater withdrawal by 1,380 AFY, or any combination of these actions that result in a net reduction of groundwater withdrawal by 1,380 AFY. Because the management area is not experiencing or is expected to experience conditions below the minimum threshold through the 50-year planning and implementation horizon, no interim milestones are defined in this GSP. However, if conditions do fall below the minimum threshold and this management action is implemented, then the Yucaipa GSA will identify interim milestones at that time to evaluate progress in improving conditions to achieve groundwater sustainability.
   b) The 35% net reduction in groundwater use, which may represent a reduction in groundwater production to 2,560 AFY, was selected because historical data indicated that, when groundwater production was at 2,600 AFY or less, groundwater levels and the volume in storage were stable or increased during periods

of "dry" to "wet" water year types (Figures 2-3, 3-3, and 3-6). The Yucaipa GSA, at its discretion, may modify the 35% reduction (e.g., implement a higher percentage of reduction) if this rate is not sufficient to improve conditions in the management area.

4.2.1.1.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action. The goal of the management action is to reduce the net use of groundwater from the management area by 25% to 35% of the estimated sustainable yield until conditions improve to the measurable objective where the management area is managed sustainably.

4.2.1.1.2 Expected Benefits and Evaluation

The sustainability criteria established for the North Bench Management Area were designed to protect the long-term groundwater supply and maintain production for the existing wells operated by YVWD and private users. The establishment of a drought buffer, represented by a range in the volume in storage from 220,000 to 230,000 AF, provides operational flexibility for the Yucaipa GSA to implement these management actions to avoid or improve conditions from undesirable results. These actions allow the management area to recover during "dry" to "wet" water year types when recharge, either naturally or artificially, or both, will exceed the net withdrawal of groundwater.

Groundwater in storage will increase and chronic declines in groundwater elevation will cease or reverse with a net reduction in groundwater withdrawal from the management area. Groundwater in storage will be measured using groundwater elevations as a proxy. If groundwater elevations stabilize, or rise at the groundwater level RMPs, the management action will have succeeded in increasing the volume of groundwater in storage and prevented the chronic decline in groundwater levels. Conditions at the measurable objective or higher are at or above the historical low, which will negate the undesirable result of land subsidence potentially occurring due to a long-term groundwater level decline below the historical low.

4.2.1.1.3 Circumstances for Implementation

This management action would be implemented under the following circumstances:

1. When groundwater levels measured at 50% or more of the RMPs fall below their respective measurable objective levels for 2 consecutive years, or
2. When groundwater levels measured at 50% or more of the RMPs fall below their respective minimum threshold levels for 2 consecutive years.

4.2.1.1.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater withdrawals from the Plan Area, including the North Bench Management Area. The Yucaipa GSA will notify private well owners that will be affected by the implementation of this management action if it requires a reduction in their respective groundwater production.

4.2.1.1.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per the California Water Code, Section 10726.4.

4.2.1.1.6 Implementation Schedule

There is no specific implementation schedule for this management action as projected groundwater levels indicate this management action will not be required. The Yucaipa GSA will implement this management action within 6 months of determining that one of the criteria for implementation described in Section 4.2.1.1.3, Circumstances for Implementation has been met.

4.2.1.1.7 Legal Authority

The Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water to artificially recharge the Subbasin per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.1.1.8 Estimated Costs

The costs associated with the implementation of this management action have not yet been estimated. However, if this management action is implemented and groundwater production is decreased, then additional costs may be incurred by YVWD (the only water purveyor operating in the North Bench Management Area), or its respective customers, to supply additional supplemental water, enact water conservation programs, or other actions to meet water demands.

4.2.1.2 Calimesa Management Area

The Calimesa Management Area includes 13 RMPs; each is associated with groundwater elevations representing the measurable objective at 798,700 AF and the minimum threshold at 772,700 AF in storage (Table 3-4; Table 4-2). The measurable objective is represented by the historical low condition and indicates that no undesirable results are occurring in the management area.

Table 4-2. Groundwater Elevations Pertaining to Management Actions for the Calimesa Management Area

Representative Monitoring Point	Current Groundwater Elevations (feet NAVD88)	Groundwater Elevations at the Measurable Objective (Tier 1 in the Drought Buffer) (feet NAVD88)	Groundwater Elevations at Tier 2 in the Drought Buffer (feet NAVD88)	Groundwater Elevations at Tier 3 in the Drought Buffer (feet NAVD88)	Estimated Measured Groundwater Elevations at the Minimum Threshold (feet NAVD88)
Hog Canyon 2	2,090.13	2,083.77	2,063.66	2,040.10	2,021.82
South Mesa 07	2,062.73	2,044.08	2,022.66	2,000.74	1,982.14
South Mesa 09	2,068.70	2,024.19	1,993.77	1,972.09	1,958.58

Table 4-2. Groundwater Elevations Pertaining to Management Actions for the Calimesa Management Area

Representative Monitoring Point	Current Groundwater Elevations (feet NAVD88)	Groundwater Elevations at the Measurable Objective (Tier 1 in the Drought Buffer) (feet NAVD88)	Groundwater Elevations at Tier 2 in the Drought Buffer (feet NAVD88)	Groundwater Elevations at Tier 3 in the Drought Buffer (feet NAVD88)	Estimated Measured Groundwater Elevations at the Minimum Threshold (feet NAVD88)
South Mesa 12	2,095.74	2,080.33	2,059.58	2,036.88	2,018.27
South Mesa 17	2,092.77	2,068.72	2,048.20	2,024.96	2,006.30
USGS 6th St #1 (870′–930′)	2,133.89	2,121.89	2,101.45	2,078.07	2,058.61
USGS 6th Street #4 (380′–400′)	2,170.93	2,175.05	2,165.66	2,146.93	2,127.70
USGS Equestrian Park #1 (830′–850′)	2,203.28	2,203.61	2,197.82	2,186.96	2,173.37
USGS Equestrian Park #4 (380′–400′)	2,206.59	2,207.39	2,201.74	2,190.86	2,176.87
YVWD-10	2,087.74	2,076.79	2,056.62	2,033.14	2,014.16
YVWD-12	2,094.66	2,081.92	2,062.26	2,037.96	2,020.26
YVWD-24	2,184.66	2,120.42	2,100.29	2,075.90	2,061.63
YVWD-49	2,082.24	2,076.94	2,056.68	2,033.31	2,014.03
Average	**2,121.08**	**2,105.01**	**2,086.95**	**2,065.99**	**2,048.75**

The YIHM predicts that future groundwater elevations with groundwater production constrained to the estimated sustainable yield of 4,955 AFY will remain above the minimum threshold levels associated with each RMP, but will fall below the measurable objective levels under the Future Baseline with Climate Change II scenario (Figures 3-22 to 3-34). The following conditions will trigger management actions to be implemented by the Yucaipa GSA:

1) If groundwater elevations decline at 50% or more of the RMPs below their respective measurable objective levels for two consecutive years, then the following management action will be implemented:
    a) The net use of groundwater from the Calimesa Management Area will be reduced under a three-tier structure depending on the volume of groundwater in storage below the historical low of 798,700 AF. Actions to be implemented under the three-tier structure are as follows:
        i) The first tier extends from 798,700 to 790,700 AF, or the top 8,000 AF in the drought buffer (Figure 4-1). Groundwater elevations at the RMPs that represent the historical low (i.e., the top of tier 1) range from 2,024 to 2,204 feet NAVD88 (Table 4-2). If groundwater elevations decline at 50% or more of the RMPs below their respective tier 1 levels for two consecutive years, then a net reduction in groundwater use by 5% of the estimated sustainable yield of 4,955 AFY, or by 250 AFY, is required. The Yucaipa GSA

will implement this management action by either reducing groundwater production by 250 AFY, artificially recharging the aquifer with an additional 250 AFY of supplemental water, enacting water conservation programs or other programs that result in a net reduction of groundwater use by 250 AFY, or any combination of these actions that result in a net reduction of groundwater use by 250 AFY. Currently, no interim milestones are defined because the management area is managed sustainably and conditions are at or above the measurable objective. However, if conditions decline to this first tier in the drought buffer, then this management action would be implemented and the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.

ii) The second tier extends from 790,700 to 781,700 AF, or for 9,000 AF below the first tier in the drought buffer (Figure 4-1). Groundwater elevations at the RMPs that represent the top of tier 2 range from 1,994 to 2,202 feet NAVD88 (Table 4-2). If groundwater elevations decline at 50% or more of the RMPs below their respective tier 2 levels for two consecutive years, then a net reduction in groundwater use by 10% of the estimated sustainable yield of 4,955 AFY, or by 500 AFY, is required. The Yucaipa GSA will implement this management action by either reducing groundwater production by 500 AFY, artificially recharge the aquifer with an additional 500 AFY of supplemental water, enact water conservation programs or other programs that result in a net reduction of groundwater use by 500 AFY, or any combination of these actions that result in a net reduction of groundwater use by 500 AFY. Currently, no interim milestones are defined because the management area is managed sustainably and conditions are at or above the measurable objective. However, if conditions decline to this second tier in the drought buffer, then this management action would be implemented and the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.

iii) The third tier extends from 781,700 to 772,700 AF, or the bottom 9,000 AF in the drought buffer (Figure 4-1). Groundwater elevations at the RMPs that represent the top of tier 3 range from 1,972 to 2,191 feet NAVD88 (Table 4-2). If groundwater elevations decline at 50% or more of the RMPs below their respective tier 3 levels for two consecutive years, then a net reduction in groundwater use by 15% of the estimated sustainable yield of 4,955 AFY, or by 750 AFY, is required. The Yucaipa GSA will implement this management action by either reducing groundwater production by 750 AFY, artificially recharge the aquifer with an additional 750 AFY of supplemental water, enact water conservation programs or other programs that result in a net reduction of groundwater use by 750 AFY, or any combination of these actions that result in a net reduction of groundwater use by 750 AFY. Currently, no interim milestones are defined because the management area is managed sustainably and conditions are at or above the measurable objective. However, if conditions decline to this third tier in the drought buffer, then this management action would be implemented and the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.

b) The 5% to 15% net reduction in groundwater use was selected because historical data indicated that, when groundwater production was at these rates or less, groundwater levels and the volume in storage were stable or increased during periods of "dry" to "wet" water year types (Figures 2-3, 3-19 and 3-21). The Yucaipa GSA, at its discretion, may modify the 5% to 15% reduction (e.g., implement a higher percentage of reduction) if these rates are not sufficient to improve conditions in the management area and avoid undesirable results.

c) Implementing this management action will also require the Yucaipa GSA to reevaluate and, possibly, recalibrate the YIHM to improve the accuracy of the model in predicting future conditions. This action will be implemented if the occurrence is outside the scheduled 5-year evaluation, which already includes a reevaluation of the YIHM.

2) If conditions continue to decline and groundwater elevations at 50% or more of the RMPs fall below their respective minimum threshold levels for two consecutive years, then the following management action will be implemented:
    a) Groundwater elevations at the RMPs that represent the minimum threshold range from 1,959 to 2,177 feet NAVD88 (Table 4-2). The net use of groundwater from the Calimesa Management Area will be reduced by 20% of the estimated sustainable yield of 4,955 AFY, or by 990 AFY. The Yucaipa GSA will achieve this management action by either reducing groundwater production by 990 AFY, artificially recharging the aquifer with an additional 990 AFY of supplemental water, enacting water conservation programs or other programs that result in a net reduction of groundwater use by 990 AFY, or any combination of these actions that result in a net reduction of groundwater use by 990 AFY. Because the management area is not experiencing or is expected to experience conditions below the minimum threshold through the 50-year planning and implementation horizon, no interim milestones are defined in this GSP. However, if conditions do fall below the minimum threshold and this management action is implemented, then the Yucaipa GSA will identify interim milestones at that time to evaluate progress in improving conditions to achieve groundwater sustainability.
    b) The 20% net reduction in groundwater use, which may be achieved with a reduction in groundwater production by 990 AFY to 3,955 AFY, was selected because historical data indicated that, when groundwater production was at 4,000 AFY or less, groundwater levels and the volume in storage were stable or increased during periods of "dry" to "wet" water year types (Figures 2-3, 3-19 and 3-21). The Yucaipa GSA, at its discretion, may modify the 20% reduction (e.g., implement a higher percentage of reduction) if this rate is not sufficient to improve conditions in the management area.

4.2.1.2.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action. The goal of the management action is to reduce the net use of groundwater from the management area by 5% to 20% of the estimated sustainable yield until conditions improve to the measurable objective where the management area is managed sustainably and no undesirable results are experienced. Currently, groundwater conditions in the Calimesa Management Area are managed sustainably.

4.2.1.2.2 Expected Benefits and Evaluation

The sustainability criteria established for the Calimesa Management Area were designed to protect the long-term groundwater supply and maintain production for the existing wells operated by South Mountain, South Mesa, YVWD, and private users. The establishment of a drought buffer, represented by a range in the volume in storage from 798,700 to 772,700 AF, provides operational flexibility for the Yucaipa GSA to implement these management actions to avoid or improve conditions from undesirable results. These actions allow the management area to recover during "dry" to "wet" water year types when recharge will exceed the net withdrawal of groundwater.

Groundwater in storage will increase and chronic declines in groundwater elevations will cease or reverse with a net reduction in groundwater use from the management area. Groundwater in storage will be measured using groundwater elevations as a proxy. If groundwater elevations stabilize, or rise at the groundwater level RMPs, the management action will have succeeded in increasing the volume of groundwater in storage and prevented the chronic decline in groundwater levels. Conditions at the measurable objective or higher are at or above the historical

low, which will negate the undesirable result of land subsidence potentially occurring due to a long-term groundwater level decline below the historical low.

4.2.1.2.3 Circumstances for Implementation

This management action would be implemented under the following circumstances:

1. When groundwater levels measured at 50% or more of the RMPs fall below their respective measurable objective levels and drought buffer tiers for 2 consecutive years, or
2. When groundwater levels measured at 50% or more of the RMPs fall below their respective minimum threshold levels for 2 consecutive years.

4.2.1.2.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater withdrawals from the Calimesa Management Area. The Yucaipa GSA will notify private well owners that will be affected by the implementation of this management action if it requires a reduction in their respective groundwater production.

4.2.1.2.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per the California Water Code, Section 10726.4.

4.2.1.2.6 Implementation Schedule

The YIHM predicts long-term fluctuations of groundwater elevations at the RMPs above the measurable objective until approximately 2058 when drier conditions prevail and groundwater levels experience a declining trend to the end of the 50-year planning and implementation horizon (Figures 4-2 to 4-14). The circumstance for implementing this management action when groundwater elevations at 50% or more of the RMPs decline below their respective tier 1 levels is predicted in 2066. This is based on predicted groundwater elevations at Hog Canyon 2, South Mesa 7, YVWD-10, YVWD-12, YVWD-49, USGS Equestrian Park #1, and USGS 6th Street #1 falling below their respective tier 1 levels by 2065 and remaining below those levels into 2067 (Figures 4-2, 4-6, 4-7, 4-9, 4-10, 4-11, and 4-13). The Yucaipa GSA will implement this management action within 6 months from confirming the predicted declines in groundwater levels by reducing the net use of groundwater from the management area by 5%.

4.2.1.2.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water to artificially recharge the Subbasin per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.1.2.8 Estimated Costs

The costs associated with the implementation of this management action have not yet been estimated. However, if this management action is implemented, then additional costs may be incurred by South Mountain, South Mesa,

YVWD, or their respective customers, and private users to supply additional supplemental water, enact water conservation programs, or other actions to meet water demands. The responsibilities for covering costs between the water purveyors and private users, if applicable, will be determined at the time of implementation and will depend on their respective action and/or program implemented to achieve the overall goal of reducing the net use of groundwater from the management area.

4.2.1.3 Western Heights Management Area

The Western Heights Management Area includes seven RMPs, each associated with groundwater elevations representing the measurable objective at 408,800 AF and the minimum threshold at 398,800 AF in storage (Table 3-5; Table 4-3). The measurable objective is represented by the historical low condition and indicates that no undesirable results are occurring in the management area.

Table 4-3. Groundwater Elevations Pertaining to Management Actions for the Western Heights Management Area

Representative Monitoring Point	Current Groundwater Elevations (feet NAVD88)	Groundwater Elevations at the Measurable Objective (Tier 1 of Drought Buffer) (feet NAVD88)	Groundwater Elevations at Tier 2 of Drought Buffer (feet NAVD88)	Groundwater Elevations at the Minimum Threshold (feet NAVD88)
WHWC-2A	1,740.68	1,735.68	1,716.00	1,695.24
WHWC-10	1,766.04	1,750.04	1,734.04	1,714.26
WHWC-11	1,723.93	1,748.93	1,735.76	1,712.24
WHWC-12	1,757.11	1,747.11	1,732.52	1,708.84
WHWC-14	1,749.90	1,726.90	1,717.20	1,696.12
USGS Dunlap #2 (830′–850′)	1,754.85	1,748.40	1,729.36	1,708.97
USGS Dunlap #4 (440′–460′)	1,743.89	1,740.32	1,720.05	1,699.54
Average	**1,748.06**	**1,742.48**	**1,726.42**	**1,705.03**

The YIHM predicts that future groundwater elevations with groundwater production constrained to the estimated sustainable yield of 1,760 AFY will remain above the measurable objective levels associated with each RMP (Figures 3-40 to 3-46). However, the following conditions will trigger management actions to be implemented by the Yucaipa GSA should conditions decline below the measurable objective:

1) If groundwater elevations decline at 50% or more of the RMPs below their respective measurable objective levels for two consecutive years, then the following management action will be implemented:
   a) The net use of groundwater from the Western Heights Management Area will be reduced under a two-tier structure depending on the volume of groundwater in storage below the historical low of 408,800 AF. Actions to be implemented under the two-tier structure are as follows:
      i) The first tier, which begins at the historical low, extends from 408,800 to 403,800 AF, or the top 5,000 AF in the drought buffer (Figure 4-15). Groundwater elevations at the RMPs that represent the historical

low (i.e., the top of tier 1) range from 1,727 to 1,750 feet NAVD88 (Table 4-3). If groundwater elevations decline at 50% or more of the RMPs below their respective tier 1 levels for two consecutive years, then a net reduction in groundwater use by 5% of the estimated sustainable yield of 1,760 AFY, or 90 AFY, is required. The Yucaipa GSA will implement this management action by either reducing groundwater production by 90 AFY, artificially recharging the aquifer with an additional 90 AFY of supplemental water, enacting water conservation programs or other programs that result in a net reduction of groundwater use by 90 AFY, or any combination of these actions that result in a net reduction of groundwater use by 90 AFY. Currently, no interim milestones are defined because the management area is managed sustainably and conditions are at the measurable objective. However, if conditions decline to this first tier in the drought buffer, then this management action would be implemented and the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.

ii) The second tier extends from 403,800 to 398,800 AF, or the bottom 5,000 AF in the drought buffer (Figure 4-15). Groundwater elevations at the RMPs that represent the top of tier 2 range from 1,716 to 1,736 feet NAVD88 (Table 4-3). If groundwater elevations decline at 50% or more of the RMPs below their respective tier 2 levels for two consecutive years, then a net reduction in groundwater use by 10% of the estimated sustainable yield of 1,760 AFY, or by 180 AFY, is required. The Yucaipa GSA will implement this management action by either reducing groundwater production by 180 AFY, artificially recharging the aquifer with an additional 180 AFY of supplemental water, enacting water conservation programs or other programs that result in a net reduction of groundwater use by 180 AFY, or any combination of these actions that result in a net reduction of groundwater use by 180 AFY. Currently, no interim milestones are defined because the management area is managed sustainably and conditions are at the measurable objective. However, if conditions decline to this second tier in the drought buffer, then this management action would be implemented and the Yucaipa GSA will identify interim milestones at that time to evaluate progress in achieving groundwater sustainability.

b) The 5% to 10% net reduction in groundwater use, which may be achieved with a reduction in groundwater production from 1,760 AFY to 1,670 AFY (5% less) or 1,580 AFY (10% less), was selected because historical data indicated that when groundwater production was at these rates or less groundwater levels and the volume in storage were stable or increased during periods of "dry" to "wet" water year types (Figures 2-35, 3-37, and 3-38). The Yucaipa GSA, at its discretion, may modify the 5% to 10% reduction (e.g., implement a higher percentage of reduction) if these rates are not sufficient to improve conditions in the management area and avoid undesirable results.

c) Implementing this management action will also require the Yucaipa GSA to reevaluate and, possibly, recalibrate the YIHM to improve the accuracy of the model in predicting future conditions. This action will be implemented if the occurrence is outside the scheduled 5-year evaluation, which already includes a reevaluation of the YIHM.

2) If conditions continue to decline and groundwater elevations at 50% or more of the RMPs fall below their respective minimum threshold levels for two consecutive years, then the following management action will be implemented:

a) The net use of groundwater from the Western Heights Management Area will be reduced by 15% of the estimated sustainable yield of 1,760 AFY, or by 260 AFY. Groundwater elevations at the RMPs that represent the minimum threshold range from 1,695 to 1,714 feet NAVD88 (Table 4-3). The Yucaipa GSA will achieve this management action by either reducing groundwater production by 260 AFY, artificially recharge the aquifer with an additional 260 AFY of supplemental water, enact water conservation

programs or other programs that result in a net reduction of groundwater use by 260 AFY, or any combination of these actions that result in a net reduction of groundwater use by 260 AFY. Because the management area is not experiencing or is expected to experience conditions below the minimum threshold through the 50-year planning and implementation horizon, no interim milestones are defined in this GSP. However, if conditions do fall below the minimum threshold and this management action is implemented, then the Yucaipa GSA will identify interim milestones at that time to evaluate progress in improving conditions to achieve groundwater sustainability.

b) The 15% net reduction in groundwater use, which may be achieved with a reduction in groundwater production by 260 AFY from 1,760 AFY to 1,500 AFY, was selected because historical data indicated that, when groundwater production was at 1,500 AFY or less, groundwater levels and the volume in storage were stable or increased during periods of "dry" to "wet" water year types (Figures 2-35, 3-37, and 3-38). The Yucaipa GSA, at its discretion, may modify the 15% reduction (e.g., implement a higher percentage of reduction) if this rate is not sufficient to improve conditions in the management area.

4.2.1.3.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action. The goal of the management action is to reduce the net use of groundwater from the management area by 5% to 15% of the estimated sustainable yield until conditions improve to the measurable objective where the management area is managed sustainably and no undesirable results are experienced. Currently, groundwater conditions in the Western Heights Management Area are managed sustainably.

4.2.1.3.2 Expected Benefits and Evaluation

The sustainability criteria established for the Western Heights Management Area were designed to protect the long-term groundwater supply and maintain production for the existing wells operated by WHWC and private users. The establishment of a drought buffer, represented by a range in the volume in storage from 408,800 to 398,800 AF, provides operational flexibility for the Yucaipa GSA to implement these management actions to avoid or improve conditions from undesirable results. These actions allow the management area to recover during "dry" to "wet" water year types when recharge will exceed the net withdrawal of groundwater.

Groundwater in storage will increase and chronic declines in groundwater elevation will cease or reverse with a net reduction in groundwater use from the management area. Groundwater in storage will be measured using groundwater elevations as a proxy. If groundwater elevations stabilize, or rise at the groundwater level RMPs, the management action will have succeeded in increasing the volume of groundwater in storage and prevented a chronic decline in groundwater levels. Conditions at the measurable objective or higher are at or above the historical low, which will negate the undesirable result of land subsidence potentially occurring due to a long-term groundwater level decline below the historical low.

4.2.1.3.3 Circumstances for Implementation

This management action would be implemented under the following circumstances:

1. when groundwater levels measured at 50% or more of the RMPs fall below their respective measurable objective levels and drought buffer tiers for two consecutive years, or
2. when groundwater levels measured at 50% or more of the RMPs fall below their respective minimum threshold levels for two consecutive years.

4.2.1.3.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater withdrawals from the Western Heights Management Area. The Yucaipa GSA will notify private well owners that will be affected by the implementation of this management action if it requires a reduction in their respective groundwater production.

4.2.1.3.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per the California Water Code, Section 10726.4.

4.2.1.3.6 Implementation Schedule

The YIHM predicts that groundwater elevations at the RMPs will not decline to tier 1 of the drought buffer through the 50-year planning and implementation horizon (Figures 4-16 to 4-22). Predicted groundwater elevations will not decline to tier 1 levels at more than 50% of the RMPs; therefore, there is no specific implementation schedule for this management action. However, the Yucaipa GSA will implement this management action within 6 months of determining that one of the criteria for implementation described in Section 4.2.1.3.3, Circumstances for Implementation, has been met.

4.2.1.3.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water to artificially recharge the Subbasin per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.1.3.8 Estimated Costs

The costs associated with the implementation of this management action have not yet been estimated. However, if this management action is implemented, then additional costs may be incurred by WHWC, or its respective customers, to supply additional supplemental water, enact water conservation programs, or other actions to meet water demands while reducing the net use of groundwater from the management area.

4.2.1.4 San Timoteo Management Area

The San Timoteo Management Area includes six RMPs to characterize shallow groundwater elevations and evaluate whether groundwater production from the principal aquifer will cause significant and unreasonable effects on the interconnection between surface water and groundwater. GDEs have been identified along the reach of San Timoteo Creek in the Plan Area and the following management actions are intended to protect the habitat sustained by surface water in the creek and the underlying shallow groundwater. No management actions were developed for the chronic lowering of groundwater elevations, reduction in groundwater storage, and land subsidence because no sustainability criteria were developed for these indicators (Sections 3.4.4 and 3.5.4).

A measurable objective was established for shallow groundwater levels at 20 feet below ground surface (bgs) (Figure 3-48). The following management action will be implemented to prevent the significant and unreasonable effects to the interconnection of surface water and groundwater and to protect the GDEs sustained in the management area:

1) If groundwater levels decline at 50% or more of the RMPs below 20 feet bgs for two consecutive years, then the following management action will be implemented:
    a) Confirm that the decline in the water table is a result of groundwater production from the principal aquifer. This may include observing groundwater levels at the RMPs and measuring stream flow when the principal aquifer well(s) is operating, or designing and implementing an aquifer test to confirm the influence of groundwater production from the principal aquifer on stream flow and the groundwater table. Currently, only private users are extracting groundwater from this management area. The Yucaipa GSA will contact the private well owners to obtain information to assess whether pumping at a private well is the cause for the observed surface water flow and/or groundwater level declines. The Yucaipa GSA will request historical and projected pumping demands to better characterize conditions in this subarea and determine the extent of influence of pumping at the private well(s) on stream flow and shallow groundwater.
    b) If an aquifer test is conducted and confirms the influence of production from the principal aquifer on the surface water/groundwater interconnection and a subsequent drawdown of the water table, then production from the principal aquifer will be reduced to the extent that it no longer causes a significant and unreasonable effect.

4.2.1.4.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicator of surface water/groundwater interconnection would benefit from the implementation of this management action. The goal of the management action is to prevent significant and unreasonable effects on GDEs sustained by the interaction of surface water and the underlying shallow groundwater. Currently, groundwater conditions in the San Timoteo Management Area are not experiencing undesirable results.

4.2.1.4.2 Expected Benefits and Evaluation

The sustainability criteria established for the San Timoteo Management Area were designed to protect the GDEs along San Timoteo Creek. This includes reducing groundwater production from the principal aquifer that directly influences stream flow in the creek and the underlying shallow groundwater that sustains the GDEs. YVWD monitors stream flow and shallow groundwater conditions along this reach of San Timoteo Creek as part of the HMP

implemented in 2011 (Section 1.5.1). Monitoring includes collecting groundwater elevation data at shallow wells and evaluating habitat conditions via NDVI analysis along this reach of the creek. To date, HMP monitoring has indicated that significant fluctuations in groundwater levels and habitat conditions result from climatic conditions (i.e., prolong drought, large storm events) rather than by other potential factors like local groundwater production.

4.2.1.4.3 Circumstances for Implementation

This management action would be implemented under the following circumstances:

1. when groundwater levels measured at 50% of the RMPs fall below the measurable objective for two consecutive years.

4.2.1.4.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater withdrawals from the principal aquifer in the San Timoteo Management Area. The Yucaipa GSA will notify private well owners that will be affected by the implementation of this management action.

4.2.1.4.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per the California Water Code, Section 10726.4.

4.2.1.4.6 Implementation Schedule

There is no specific implementation schedule for this management action. There is no indication of declining groundwater levels and stress on GDEs from the extraction of groundwater from the principal aquifer. The Yucaipa GSA will reach out to known and potential private well owners to obtain information on pumping schedules and volumes to better characterize conditions in this management area. This information will help inform the management action taken should groundwater elevations at three or more of the RMPs decline below the measurable objective.

4.2.1.4.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water to artificially recharge the Subbasin per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.1.4.8 Estimated Costs

The costs associated with the implementation of this management action have not yet been estimated. Costs may be incurred by the Yucaipa GSA to reach out to the private well owners to collect the necessary information to better characterize conditions in this management area. If aquifer tests are required, then additional costs will be incurred by the Yucaipa GSA to conduct the tests, collect and analyze the test data, and develop an appropriate action or response based on the test data to ensure that no undesirable results occur in the management area. These costs will be assessed at the time such action is identified.

4.2.2 Management Action No. 2 –Sustainable Yield Pumping Allocations and Groundwater Replenishment

Groundwater sustainable yield pumping allocations will be assigned to YVWD and private water users in the North Bench Management Area, to South Mountain, South Mesa, YVWD and private water users in the Calimesa Management Area, and to WHWC in the Western Heights Management Area per the subsections below when this GSP is adopted. No sustainable yield pumping allocations were assigned in the San Timoteo management area at this time because the Yucaipa GSA needs to confirm the location and volume of private pumping from the principal aquifer and determine whether sustainable yield pumping allocations are appropriate to manage groundwater production in this management area. The pumping allocations are designed to regulate the annual volume of groundwater produced by each groundwater user and maintain the total groundwater produced at or below the estimated sustainable yields for these management areas. The sustainable yield pumping allocations will be reevaluated within three months (i.e., every December) of the end of a water year.

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. For example, if water purveyor A pumped 1,000 AF in a water year and the sustainable yield pumping allocation is 1,200 AFY, then water purveyor A earned a 200 AF pumping credit. The Yucaipa GSA will apply a 5-year rolling pumping credit system to keep account of the pumping credits earned by each water purveyor, meaning pumping credits that are earned and not used after 5 years will be lost. Pumping credits, if available, may be used to offset the volume of groundwater produced in excess of the sustainable yield pumping allocation to the extent that the credits equal the pumping exceedance. Any remaining deficit will be charged a replenishment fee. Any pumping credits remaining will carry over into the next water year under the 5-year rolling pumping credit system.

The assessment for pumping credits will begin with the 2022 WY. The volume of water pumped per user will be accounted for on a monthly basis beginning October 1, 2021. Pumping credits will be earned by users that pump less than their respective sustainable yield pumping allocations for the 2022 WY. The Yucaipa GSA is continuing discussions on implementing a policy that will allow the transferability of pumping credits between groundwater users within a given management area or within the Subbasin.

As an alternative to using pumping credits to offset a pumping exceedance, a water purveyor may use surplus supplemental water that directly recharged the Subbasin (see Management Action No. 3, Section 4.2.3). If such water is available and accessible to the water purveyor, then this water may be used instead of pumping credits to offset the pumping exceedance.

The following provides a description of how the pumping allocations were assigned to each purveyor, and the management actions that will be implemented when a groundwater user exceeds their respective sustainable yield pumping allocation.

4.2.2.1 North Bench Management Area

YVWD and private users are the two groundwater users in the North Bench Management Area. From the 1966 WY to the 2018 WY, the average annual production rates for YVWD and private users were 2,647 AFY and 778 AFY, respectively (Figure 4-23, Table 4-4). Groundwater production by YVWD accounted for 77.3% of the total production,

private users accounted for 22.7%. Applying these allocations to the estimated sustainable yield of 3,940 AFY for the North Bench Management Area, the sustainable yield pumping allocations for YVWD and private users are 3,045 AFY and 895 AFY, respectively (Table 4-4).

Table 4-4. Sustainable Yield Pumping Allocations in the North Bench Management Area

Groundwater User	Average Historical Pumping (AFY)	Historical Pumping Allocation (%)	Sustainable Yield Pumping Allocation (AFY)
YVWD	2,647	77.3%	3,045
Private	778	22.7%	895
Total	**3,425**	**100.0%**	**3,940**

Notes: AFY = acre-feet per year; YVWD = Yucaipa Valley Water District.

The volume of groundwater produced will be quantified per water year (October 1 to September 30) with the total volumes reported to the Yucaipa GSA by the end of the calendar year. If a groundwater user exceeds their respective sustainable yield pumping allocation, then the groundwater user will be charged a replenishment fee equivalent to the volume of groundwater that exceeds the sustainable yield pumping allocation multiplied by the rate per AF to purchase supplemental water at San Bernardino Valley Municipal Water District (SBVMWD) rates for imported SWP water. If the groundwater user has accrued pumping credits or has surplus supplemental water available in the aquifer, then the pumping credits or surplus supplemental water may be applied up to the pumping exceedance. If there continues to be a deficit, then a replenishment fee will be charged to the groundwater user. The supplemental water required under this management action will be purchased in the subsequent water year, if available, and used to artificially recharge and replenish the Subbasin at the Wilson Creek spreading basins.

The historical production by private users was based on data from the USGS that was incorporated into the YIHM. Figure 4-23 indicates that groundwater production by private users has been steadily declining since the early 1980s to where the average rate over the last 10 years has been approximately 160 AFY. The Yucaipa GSA will make efforts to contact private well users in this management area to confirm the estimated rate of groundwater production per private user. This will provide the Yucaipa GSA with information to characterize the influence of each individual private user on conditions in the management area, and to apply the appropriate pumping allocation. The sustainable yield pumping allocations between YVWD and private users will be reassessed when data on the current and projected usage by private users is collected and analyzed.

4.2.2.1.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action.

4.2.2.1.2 Expected Benefits and Evaluation

The goal of this management action is to replenish the management area when groundwater withdrawals exceed the sustainable yield pumping allocation assigned to a groundwater user. This action will prevent long-term declines in groundwater elevations and storage due to groundwater production above the sustainable yield, and help prevent conditions from falling below the historical low in groundwater levels that potentially cause significant and

unreasonable effects due to land subsidence. Currently, groundwater extractions from the North Bench Management Area are below the estimated sustainable yield of 3,940 AFY (Figure 3-3).

The benefit of this management action will be evaluated after the purchase of replenishment water and subsequent discharge to the Wilson Creek and Oak Glen Creek spreading basins to replenish the Subbasin.

4.2.2.1.3 Circumstances for Implementation

This management action would be implemented when the volume of groundwater produced by a water purveyor and/or private user per water year exceeds their respective sustainable yield pumping allocation, and the use of pumping credits and/or surplus supplemental water (Section 4.2.3) was insufficient to offset the pumping exceedance. The groundwater user will be required to purchase supplemental water in the subsequent water year for replenishment purposes via the Wilson Creek and Oak Glen Creek spreading basins. If no supplemental water is available, then the volume to replenish will be held in account for up to 5 years until water is available or the groundwater user has earned pumping credits to offset this exceedance. If after 5 years there is no supplemental water available to replenish the management area and the groundwater user has not earned pumping credits to offset the exceedance, then a reassessment of the sustainable yield and pumping allocations will be conducted for the management area.

4.2.2.1.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater production from the North Bench Management Area and acquire surface water to direct to spreading basins and/or other purposes per the California Water Code Sections 10726.2 and 10726.4.

4.2.2.1.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per the California Water Code Sections 10726.2 and 10726.4.

4.2.2.1.6 Implementation Schedule

This management action requires the purchase of supplemental water for replenishment purposes in the subsequent water year after the management action is implemented and the application of pumping credits and/or surplus supplemental water, if any, do not offset the pumping exceedance. If no supplemental water is available to replenish the Subbasin in the subsequent water year, then the replenishment water volume will be held in account for up to 5 years until there is supplemental water available or pumping credits are earned to offset the pumping exceedance.

4.2.2.1.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.2.1.8 Estimated Costs

The costs associated with the implementation of this management action are based on the volume of groundwater in excess of the sustainable yield pumping allocation and the rate of SWP water by SBVMWD per acre-foot. Additional costs may be incurred for the distribution and delivery to the Wilson Creek and Oak Glen Creek spreading basins. The estimated costs may vary annually depending on the rate charged by SBVMWD for supplemental water to replenish the Subbasin.

4.2.2.2 Calimesa Management Area

The four groundwater users in the Calimesa Management Area are South Mountain, South Mesa, YVWD and private users. From the 1966 WY to the 2018 WY, the average annual production rates for South Mountain, South Mesa, YVWD and private users were 544 AFY, 2,056 AFY, 2,457 AFY and 143 AFY, respectively (Figure 4-24; Table 4-5). Historically, groundwater production by South Mountain, South Mesa, YVWD and private users accounted for 10.5%, 39.5%, 47.2%, and 2.8%, respectively, of the average annual production of 5,200 AFY. Applying these allocations to the estimated sustainable yield of 4,955 AFY for the Calimesa Management Area, the sustainable yield pumping allocations for South Mountain, South Mesa, YVWD and private users are 518 AFY, 1,959 AFY, 2,341 AFY, and 137 AFY, respectively[1] (Table 4-5).

Table 4-5. Sustainable Yield Pumping Allocations in the Calimesa Management Area

Groundwater User	Average Historical Pumping (AFY)	Historical Pumping Allocation (%)	Sustainable Yield Pumping Allocation (AFY)
YVWD	2,457	47.2%	2,341
South Mesa	2,056	39.5%	1,959
South Mountain	544	10.5%	518
Private	143	2.8%	137
Total	**5,200**	**100.0%**	**4,955**

Notes: AFY = acre-feet per year; YVWD = Yucaipa Valley Water District.

The volume of groundwater produced will be quantified per water year (October 1 to September 30) with the total volumes reported to the Yucaipa GSA by the end of the calendar year. If a groundwater user exceeds their respective sustainable yield pumping allocation, then the groundwater user will be charged a fee equivalent to the volume of groundwater that exceeds their respective sustainable yield pumping allocation multiplied by the rate per AF of supplemental water supplied by SBVMWD and/or San Gorgonio Pass Water Agency (SGPWA) depending on the availability of supplemental water for purchase. The Calimesa Management Area straddles the boundary between San Bernardino County and Riverside County, which includes the service areas of SBVMWD and SGPWA. SWP water supplied by these two regionals may be available as a supplemental water source under this management action. If a groundwater user has accrued pumping credits and/or surplus supplemental water that directly recharged the Calimesa Management Area, then the pumping credits and/or surplus supplemental water may be applied to offset the pumping exceedance. If there continues to be a deficit, then a fee will be charged to the groundwater user to purchase supplemental water. The supplemental water will be purchased in the subsequent water year, if available, and used to artificially replenish the Calimesa Management Area, if applicable, or as in lieu use to offset the

[1] In accordance with Water Code Section 10720.5, the sustainable yield allocations set forth in Management Action No. 2 are neither intended to nor actually comprise any determination of water rights.

pumping exceedance. If no supplemental water is available, then the groundwater user may reduce pumping, implement programs (e.g., water conservation programs) and/or projects that will reduce the net use of groundwater from the Calimesa Management Area to offset the pumping exceedance above their respective sustainable yield pumping allocation.

Currently, there are no spreading basins in the Calimesa Management Area, but the Yucaipa GSA member agencies are evaluating two potential sites to develop surface water spreading basins for the purposes of artificially recharging the Subbasin. The Yucaipa GSA will utilize the YIHM as a tool to evaluate the feasibility of operating spreading basis at the two proposed sites. The feasibility studies will evaluate the beneficial impact of recharging the aquifer at these two potential locations.

The historical production by private users was based on data from the USGS that was incorporated into the YIHM. Figure 4-24 indicates that groundwater production by private users has been steady at approximately 200 AFY since 2000. The Yucaipa GSA will make efforts to contact private well users in this management area to confirm the locations and estimated rates of groundwater extraction for the active private groundwater users. The sustainable yield pumping allocations between the water purveyors and individual private users will be reassessed when data on the current and projected usage by private users is collected and analyzed.

4.2.2.2.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action.

4.2.2.2.2 Expected Benefits and Evaluation

The goal of this management action is to replenish the management area or reduce groundwater withdrawals when groundwater production exceeds the sustainable yield pumping allocation assigned to a groundwater user. This action will prevent long-term declines in groundwater elevations and storage due to groundwater production above the sustainable yield, and help prevent conditions from falling below the historical low in groundwater levels that potentially cause significant and unreasonable effects due to land subsidence. Currently, groundwater extractions from the Calimesa Management Area are below the sustainable yield of 4,955 AFY (Figure 3-19). Because there are no spreading basins in the Calimesa Management Area, the supplemental water may be used as in lieu use to offset the pumping exceedance. If no supplemental water is available, then the groundwater user may reduce pumping, implement programs (e.g., water conservation programs) and/or projects that will reduce the net use of groundwater from the Calimesa Management Area to offset the pumping exceedance above their respective sustainable yield pumping allocation.

4.2.2.2.3 Circumstances for Implementation

This management action would be implemented when the volume of groundwater produced by a water purveyor and/or private user per water year exceeds their respective sustainable yield pumping allocation. The groundwater user will be assessed a fee to purchase supplemental water if the application of pumping credits and/or surplus supplemental water, if available, do not offset the production exceedance. If no supplemental water is available to replenish the aquifer, then the volume to replenish will be held in account for up to 5 years until water is available or the groundwater user has earned pumping credits to offset this exceedance. If after 5 years there is no

supplemental water available and the groundwater user has not earned pumping credits to offset the exceedance, then a reassessment of the sustainable yield and pumping allocations will be conducted for the management area.

4.2.2.2.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater production from the Calimesa Management Area and acquire surface water to import into the Plan Area per California Water Code Sections 10726.2 and 10726.4.

4.2.2.2.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per California Water Code Sections 10726.2 and 10726.4.

4.2.2.2.6 Implementation Schedule

This management action requires the purchase of supplemental water in the subsequent water year after the management action is implemented and the application of pumping credits and/or surplus supplemental water, if any, do not offset the pumping exceedance. If no supplemental water is available in the subsequent water year to replenish the aquifer, then the supplemental water volume will be held in account for up to 5 years until there is supplemental water available or pumping credits are earned to offset the pumping exceedance.

4.2.2.2.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.2.2.8 Estimated Costs

The costs associated with the implementation of this management action are based on the volume of supplemental water required to offset the pumping exceedance after pumping credits and/or surplus supplemental water, if any, have been applied. The cost for supplying supplemental water for replenishment purposes or as in lieu water will be based on the rate of SWP water per AF by SBVMWD and/or SGPWA. Additional costs may be incurred for the distribution and delivery of supplemental water to the management area. The estimated costs may vary annually depending on the rate charged by the Regionals for supplemental water.

4.2.2.3 Western Heights Management Area

WHWC is the only groundwater user in the Western Heights Management Area. The sustainable yield pumping allocation to WHWC is the sustainable yield of 1,760 AFY. The volume of groundwater produced will be quantified per water year (October 1 to September 30) with the total volume reported to the Yucaipa GSA by the end of the calendar year. If WHWC exceeds the sustainable yield, then WHWC will be charged a fee equivalent to the volume of groundwater that exceeds the sustainable yield multiplied by the rate per AF to purchase supplemental water at SBVMWD rates for imported SWP water. The supplemental water will be purchased in the subsequent water year, if available, and used as in lieu water to offset the pumping exceedance in the subsequent water year. There are no spreading basins in the Western Heights Management Area to receive SWP water.

4.2.2.3.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action.

4.2.2.3.2 Expected Benefits and Evaluation

The goal of this management action is to replenish the management area or reduce groundwater withdrawals when groundwater production exceeds the sustainable yield. This action will prevent long-term declines in groundwater elevations and storage due to groundwater production above the sustainable yield, and help prevent conditions from falling below the historical low in groundwater levels that potentially cause significant and unreasonable effects due to land subsidence. Currently, groundwater extractions from WHWC in the Western Heights Management Area are below the sustainable yield of 1,760 AFY (Figure 3-37).

4.2.2.3.3 Circumstances for Implementation

This management action would be implemented when the volume of groundwater produced by WHWC per water year exceeds the sustainable yield. WHWC will be assessed a fee to purchase supplemental water if WHWC cannot apply pumping credits to offset the production exceedance. If no supplemental water is available, then the volume of supplemental water will be held in account for up to 5 years until water is available or the groundwater user has earned pumping credits to offset this exceedance. If after 5 years there is no supplemental water available and the groundwater user has not earned pumping credits to offset the exceedance, then a reassessment of the sustainable yield and pumping allocations will be conducted for the management area.

4.2.2.3.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to control groundwater production and acquire surface water to import into the Plan Area per California Water Code Sections 10726.2 and 10726.4.

4.2.2.3.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action, which would be undertaken under the Yucaipa GSA's authority per California Water Code Sections 10726.2 and 10726.4.

4.2.2.3.6 Implementation Schedule

This management action requires the purchase of supplemental water as in lieu water in the subsequent water year after the management action is implemented. If no supplemental water is available, then the volume of supplemental water will be held in account for up to 5 years until there is supplemental water available or a reevaluation of the sustainable yield is conducted at the end of the 5-year limit.

4.2.2.3.7 Legal Authority

Yucaipa GSA has the legal authority to operate and regulate the production from water supply wells in the Plan Area per the California Water Code, Section 10726.4; and to import surface water (e.g., SWP water) or other supplemental water per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.2.3.8 Estimated Costs

The costs associated with the implementation of this management action are based on the volume of groundwater produced in excess of the sustainable yield and the rate of SWP water by SBVMWD per acre-foot. Additional costs may be incurred for the distribution and delivery to the Western Heights Management Area. The estimated costs may vary annually depending on the rate charged by SBVMWD for supplemental water to replenish the Subbasin.

4.2.2.4 San Timoteo Management Area

This management action does not apply to the San Timoteo Management Area.

4.2.3 Management Action No. 3 – Surplus Supplemental Water Spreading

YVWD has purchased SWP water, when available, to artificially recharge the Subbasin via the Wilson Creek and Oak Glen Creek spreading basins (Section 2.5.4; Figure 2-21). This water has helped contribute to the recovery of the North Bench Management Area since it was first used to artificially recharge the Subbasin in 2009. The Yucaipa GSA will continue to obtain, when available, surplus supplemental water to artificially recharge the Subbasin to help maintain groundwater in storage above historical lows.

Surplus supplemental water discharged directly to a spreading basin to facilitate the artificial recharge of the Subbasin will have a separate accounting by the Yucaipa GSA. 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 Yucaipa GSA will conduct a study within the first year of adopting the GSP to estimate the amount of water lost from the point of discharge at a spreading basin to the water table. This study will estimate monthly losses due to evaporation of water from a spreading basin to water retained in the soil column between the bottom of a spreading basin and the underlying water table. The estimate of water loss will be applied to the volume of surplus supplemental water discharged on a monthly basis to a spreading basin. Monthly estimates of water loss are appropriate because evaporative losses in the summer are higher than in the winter. The remaining water will directly recharge the aquifer and be available to the water purveyor that purchased the water. The study will include the existing spreading basins and stormwater capture basins, and proposed basins that may be constructed in the Subbasin. Potential basins in the Calimesa Management Area would be evaluated to assess the effect of artificial recharge on the projected declines in groundwater in storage under the Future Baseline with Climate Change II scenario.

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 period. The YIHM also indicated that water originating at the locations of two potential basins in the Calimesa Management Area would remain in the management area. Consequently, the accounting of surplus supplemental water that directly recharges the aquifer does not include additional losses when the water is in the aquifer.

4.2.3.1 Measurable Objective Expected to Benefit

The measurable objective established for the sustainability indicators of chronic lowering of groundwater levels, reduction in groundwater storage, and land subsidence would benefit from the implementation of this management action.

4.2.3.2 Expected Benefits and Evaluation

This management action provides the Yucaipa GSA with an accounting methodology to purchase surplus supplemental water and directly recharge the Subbasin. This water will be accessible to the water purveyor that purchased the water and directed it to a spreading basin. The water may be used to help offset pumping exceedances over the sustainable yield pumping allocation.

4.2.3.3 Circumstances for Implementation

This management action will be implemented when a water purveyor purchases surplus supplemental water and directly recharges the Subbasin. This management action already applies to YVWD in that YVWD has discharged surplus SWP to the Wilson Creek and/or Oak Glen Creek spreading basins in the North Bench Management Area since 2009 (Figure 2-21). The amount of surplus water available to YVWD will be calculated following the study estimating water losses from the point of discharge to the water table and retroactively applied to the initial discharge of 48 AF to the Oak Glen Creek spreading basin in 2009.

4.2.3.4 Public Noticing

Public noticing is not required for this management action, which would be undertaken under the Yucaipa GSA's authority to acquire surface water to import into the Plan Area per the California Water Code Section 10726.2.

4.2.3.5 Permitting and Regulatory Process

No additional permitting or regulatory oversight is necessary to implement this management action at existing spreading basins, which would be undertaken under the Yucaipa GSA's authority per the California Water Code Section 10726.2. New spreading basins or direct injection wells would require permitting and regulatory process services before installation and use. The Yucaipa GSA will complete the appropriate permitting and regulatory requirements to facilitate the design, installation, and operation of new facilities to enhance the recharge of surplus supplemental water in the Subbasin.

4.2.3.6 Implementation Schedule

This management action will be implemented when surplus supplemental water is available and purchased to directly recharge the Subbasin.

4.2.3.7 Legal Authority

Yucaipa GSA has the legal authority to import surface water (e.g., SWP water) or other supplemental water per the California Water Code, Section 10726.2. No additional legal authority is required.

4.2.3.8 Estimated Costs

The costs associated with the implementation of this management action are based on the volume of surplus supplemental water purchased from the regionals and the costs for directing the water to spreading basins to artificially recharge the Subbasin. The estimated costs may vary annually depending on the rate charged by SBVMWD and/or SGPWA for surplus supplemental water to replenish the Subbasin.

4.3 Projects

Currently, the Plan Area is not experiencing undesirable results with regard to the chronic lowering of groundwater elevations, reduction of groundwater in storage, land subsidence, and depletion of surface water as a result of groundwater production from the principal aquifer that threatens GDEs. The importation of SWP water as a supplemental source of water, both as direct use and through artificial recharge in the various spreading basins, has allowed the Yucaipa GSA member agencies to reduce groundwater production in the North Bench, Calimesa, and Western Heights Management Areas to levels below their respective estimated sustainable yields. Groundwater production by private well owners in the San Timoteo Management Area has not caused significant and unreasonable effects related to the sustainability indicators per the Sustainable Groundwater Management Act. The Subbasin is currently managed sustainably.

Measurable objectives defined for the North Bench, Calimesa, and Western Heights Management Areas were based on volumes of groundwater in storage that represent historical low conditions in the Calimesa and Western Heights Management Areas or conditions that are above historical lows in the North Bench Management Area. The measurable objective defined for the San Timoteo Management Area was based on the presence of GDEs and maintaining a water table elevation within 20 feet bgs to sustain the GDEs.

Management actions (Section 4.2) were defined to achieve sustainable management of the groundwater resources in the Plan Area should groundwater elevations decline below measurable objectives. These actions will be implemented if groundwater levels decline to the drought buffers established for the North Bench, Calimesa, and Western Heights Management Areas. The drought buffers provide operational flexibility for the Yucaipa GSA to implement these management actions and/or other programs to prevent undesirable results.

Some of the member agencies of the Yucaipa GSA have constructed stormwater capture basins to enhance recharge to the Subbasin (Table 4-6). The Wilson Creek and Oak Glen Creek spreading basins are designed to capture stormwater and are used to artificially recharge the Subbasin using surplus SWP water delivered by the SWP East Branch Extension. These basins are included in the YIHM to simulate their contributions to recharge to the Subbasin. The Wilson Creek and Oak Glen Creek basins have contributed an average 1,900 AFY and 170 AFY, respectively, of SWP water since 2011 (Table 2C-5). The other existing stormwater capture basins are estimated to capture approximately 1,800 AFY. Recharge at these basins was not included in the future water budget analyses for the North Bench and Western Heights Management Areas using the YIHM, because these management areas are sustainably managed and are projected to not experience undesirable results over the 50-year planning and implementation horizon. However, these planned projects will provide additional opportunities to capture and recharge stormwater flows, thereby reducing the reliance on imported water to meet the basin measurable objectives.

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 (Table 4-7). These basins are designed to capture stormwater flows and enhance recharge to the Subbasin. The estimated average annual recharge contribution is approximately 1,500 AF. These basins will be located in the North Bench Management Area. As with the existing basins, these planned basins were not included in the future water budget analyses for the North Bench Management Area using the YIHM, because the North Bench Management Area is not projected to experience undesirable results over the 50-year planning and implementation horizon.

The Yucaipa GSA is evaluating potential sites to construct and operate spreading basins to enhance recharge 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. Therefore, in addition to the management actions described in Section 4.2.1.2, Calimesa Management Area, the potential construction of one or two spreading basins will benefit users in this management area. The Yucaipa GSA will evaluate the proposed basin(s) after more details of their construction and operation are developed. The basins will be included in the YIHM and evaluated during the 5-year evaluation study after this GSP is adopted.

Table 4-6. Existing Surface Water Spreading Basins in the Yucaipa Subbasin

Existing Projects	Lead Agency/ Designer	Latitude	Longitude	Management Area	Hydrogeologic Subarea	Source Water	Estimated Annual Increase in Groundwater Recharge (AFY)
Tennessee St. Basins	City of Yucaipa	34.034215°	−117.105489°	Western Heights	Western Heights	Stormwater	300
Fremont Avenue Low Water Crossing	City of Yucaipa	34.051403°	−117.026008°	North Bench	Gateway	Stormwater	300
Dunlap Channel Basins	City of Yucaipa	34.030576°	−117.096333°	Western Heights	Western Heights	Stormwater	600
Oak Glen Creek Basins	City of Yucaipa	34.044545°	−117.031828°	North Bench	Wilson Creek/ Gateway	Stormwater	170
Wildwood Creek Basins	City of Yucaipa	34.014461°	−117.018201°	North Bench	Oak Glen	Stormwater	600
Wildwood Channel	City of Yucaipa	34.01292°	−117.04551°	Calimesa	Calimesa	Stormwater	
Wilson Creek Spreading Basins	City of Yucaipa	34.05°	−117.03°	North Bench	Gateway	Stormwater/ SWP Water	1,900

Notes: AFY = acre-feet per year; SWP = State Water Project.

Table 4-7. Planned Surface Water Spreading Basins in the Yucaipa Subbasin

Existing/ Proposed Projects	Lead Agency/ Designer	Latitude	Longitude	Management Area	Hydrogeological Subarea	Source Water	Estimated Annual Increase in Groundwater Recharge (AFY)	Estimated Decrease in Annual Groundwater Production (AF)
Wilson Creek III Basins	City of Yucaipa	34.044446°	−117.042468°	North Bench	Gateway	SWP Water / Stormwater	750	—
Pendleton Avenue Low Water Crossing	City of Yucaipa	34.046855°	−117.018298°	North Bench	Oak Glen	Stormwater	500	—
Upper Wildwood Creek Basin	City of Yucaipa	34.014126°	−116.999070°	North Bench	Oak Glen	Stormwater	250	—
Salinity and Groundwater Enhancement	YVWD	34.006887°	−117.095094°	—	—	Recycled Water	—	5,000

Notes: AFY = acre-feet per year; AF = acre-feet; SWP = State Water Project; YVWD = Yucaipa Valley Water District.

Figure 4-1. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios and Drought Buffer in the Calimesa Management Area

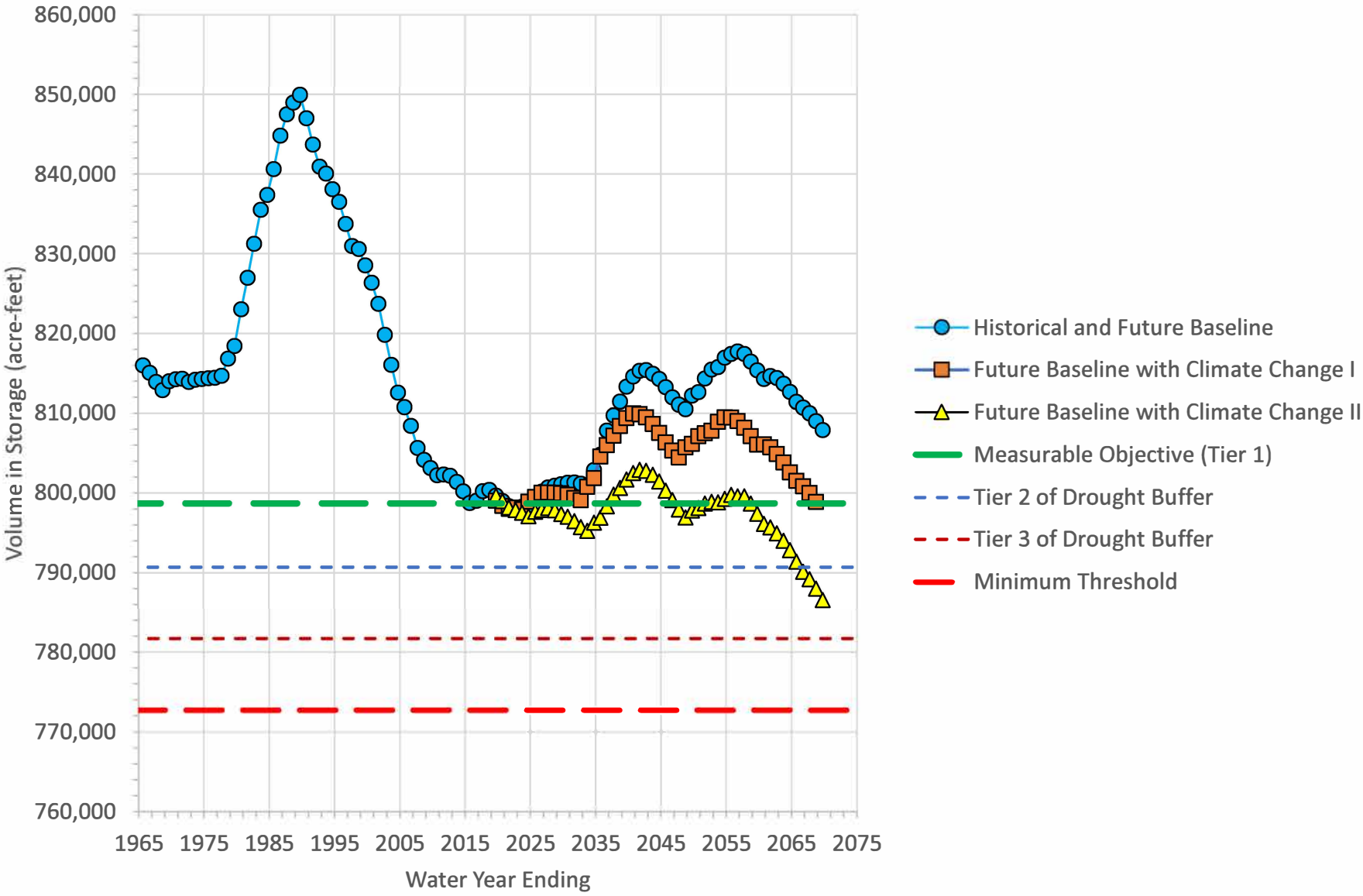

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Figure 4-2. Predicted Hydraulic Heads and Management Action Tiers at South Mesa 7 in the Calimesa Management Area

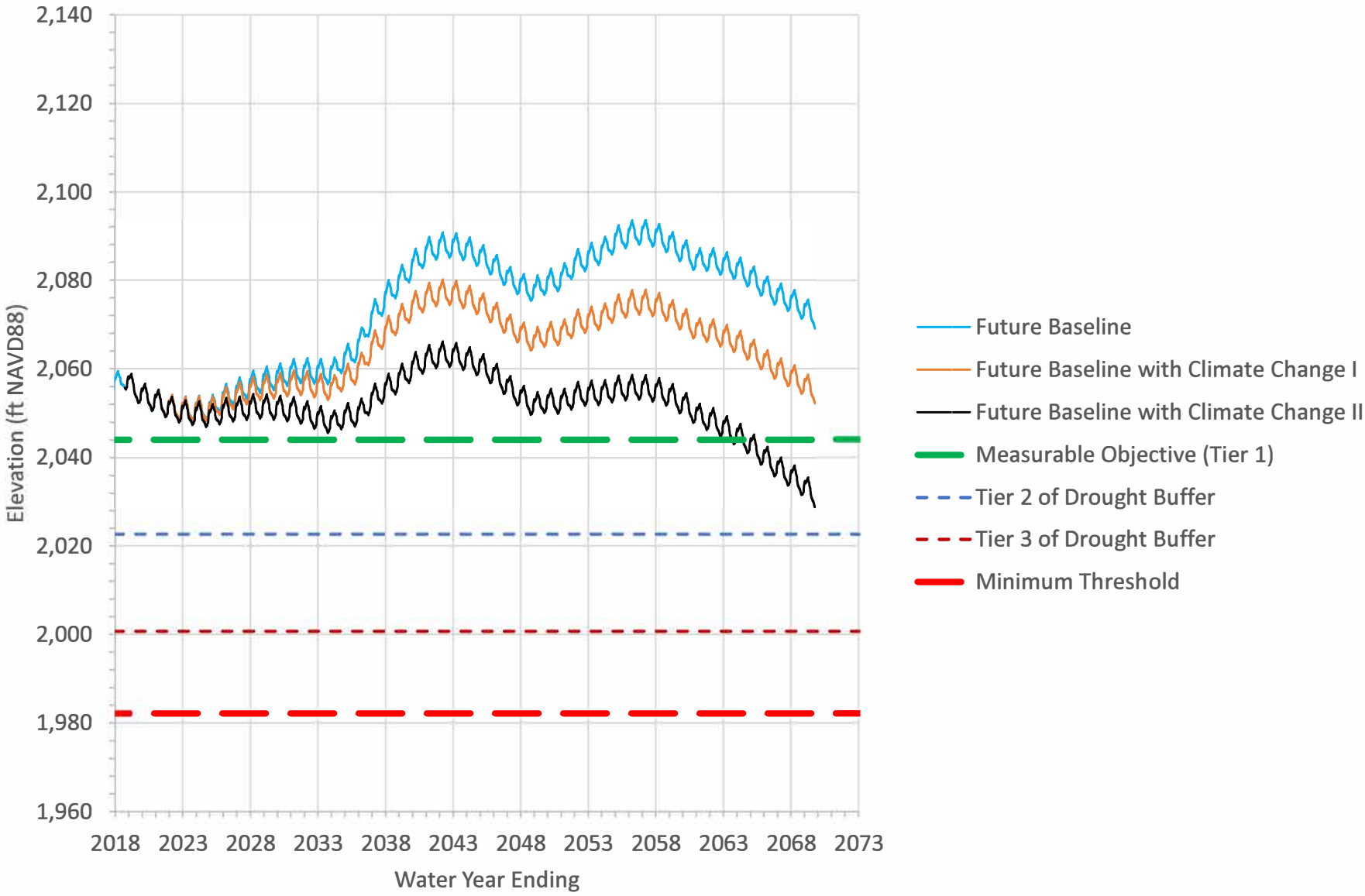

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Figure 4-3. Predicted Hydraulic Heads and Management Action Tiers at South Mesa 9 in the Calimesa Management Area

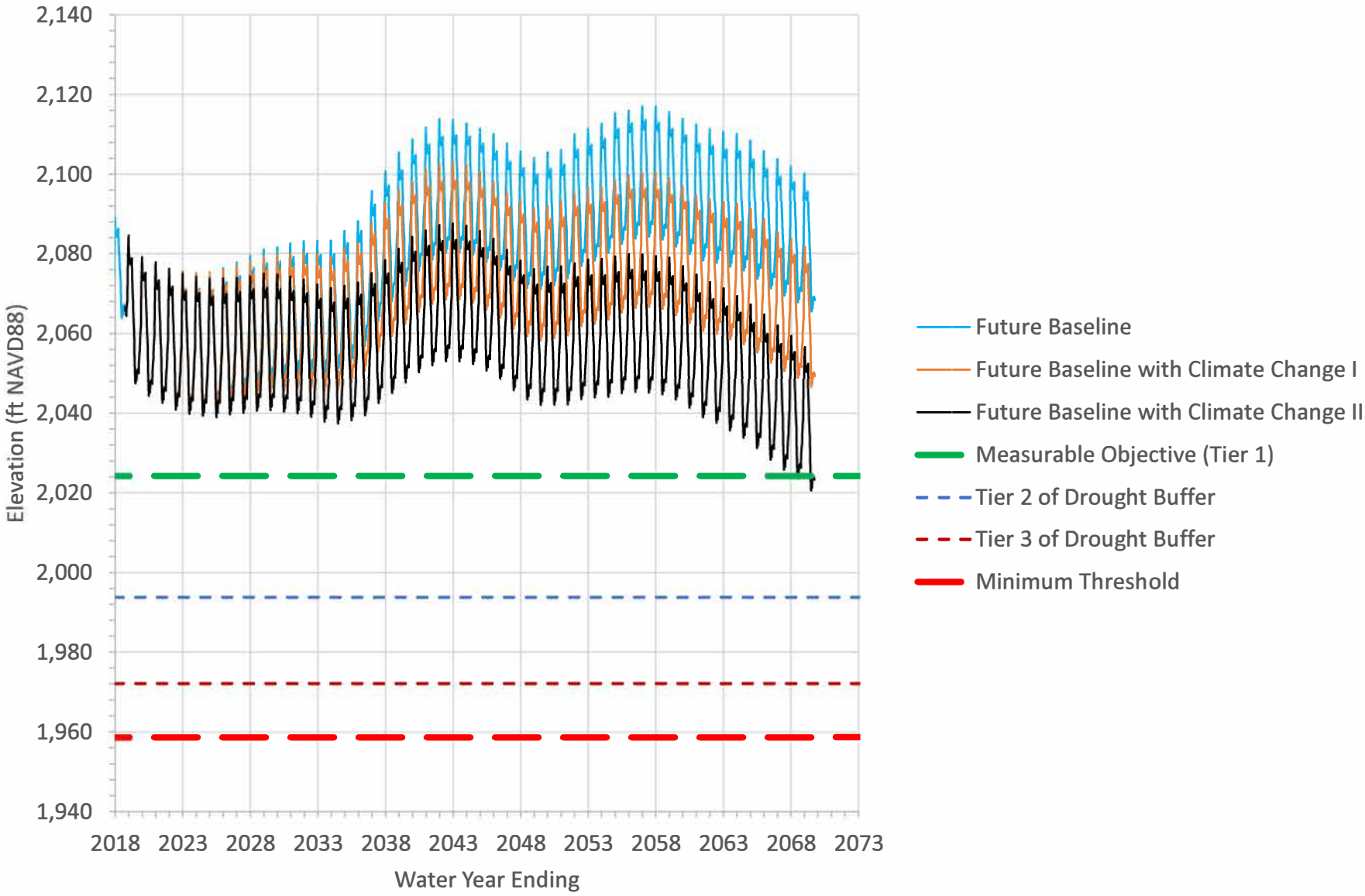

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Figure 4-4. Predicted Hydraulic Heads and Management Action Tiers at South Mesa 12 in the Calimesa Management Area

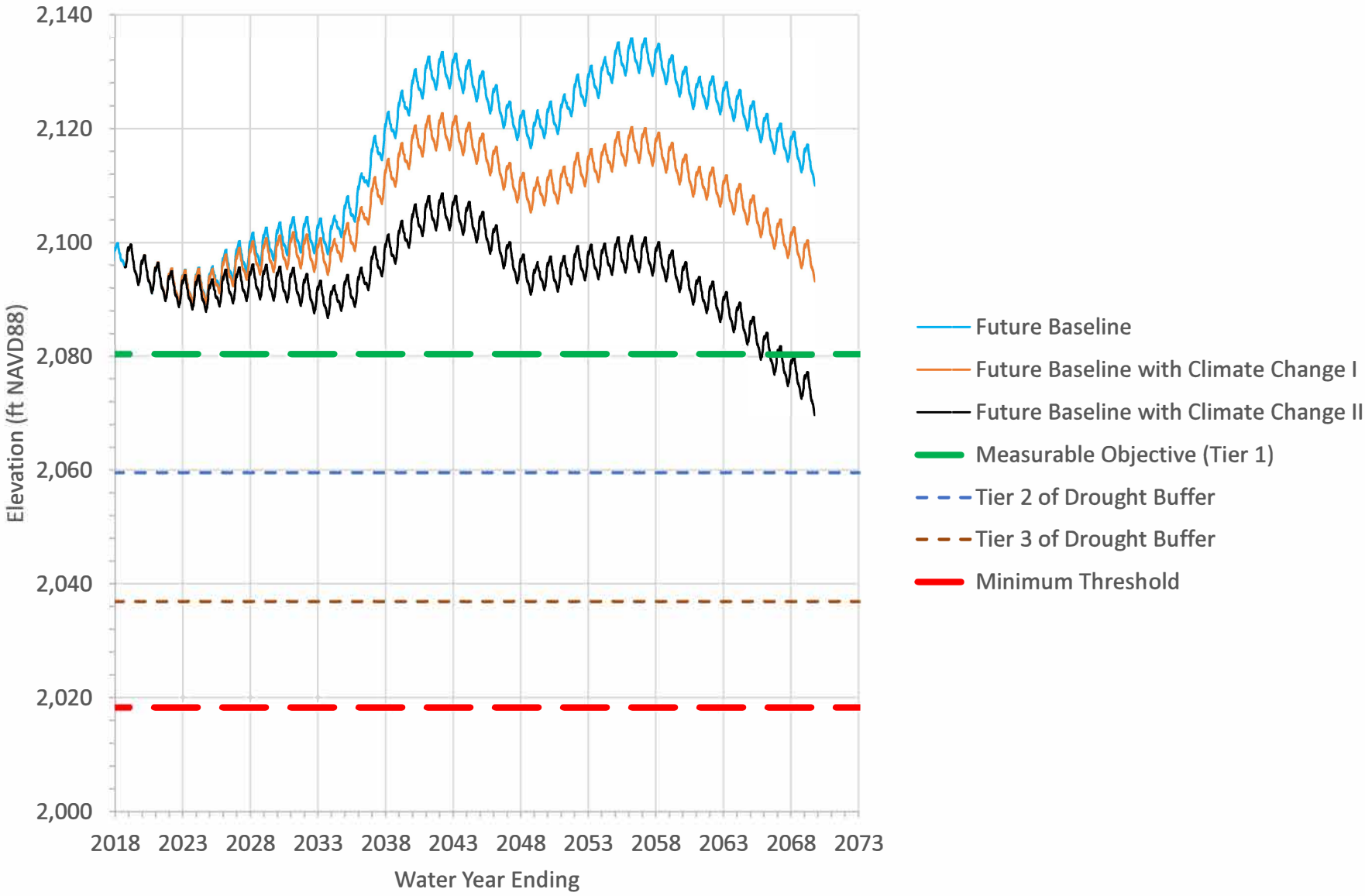

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Figure 4-5. Predicted Hydraulic Heads and Management Action Tiers at South Mesa 17 in the Calimesa Management Area

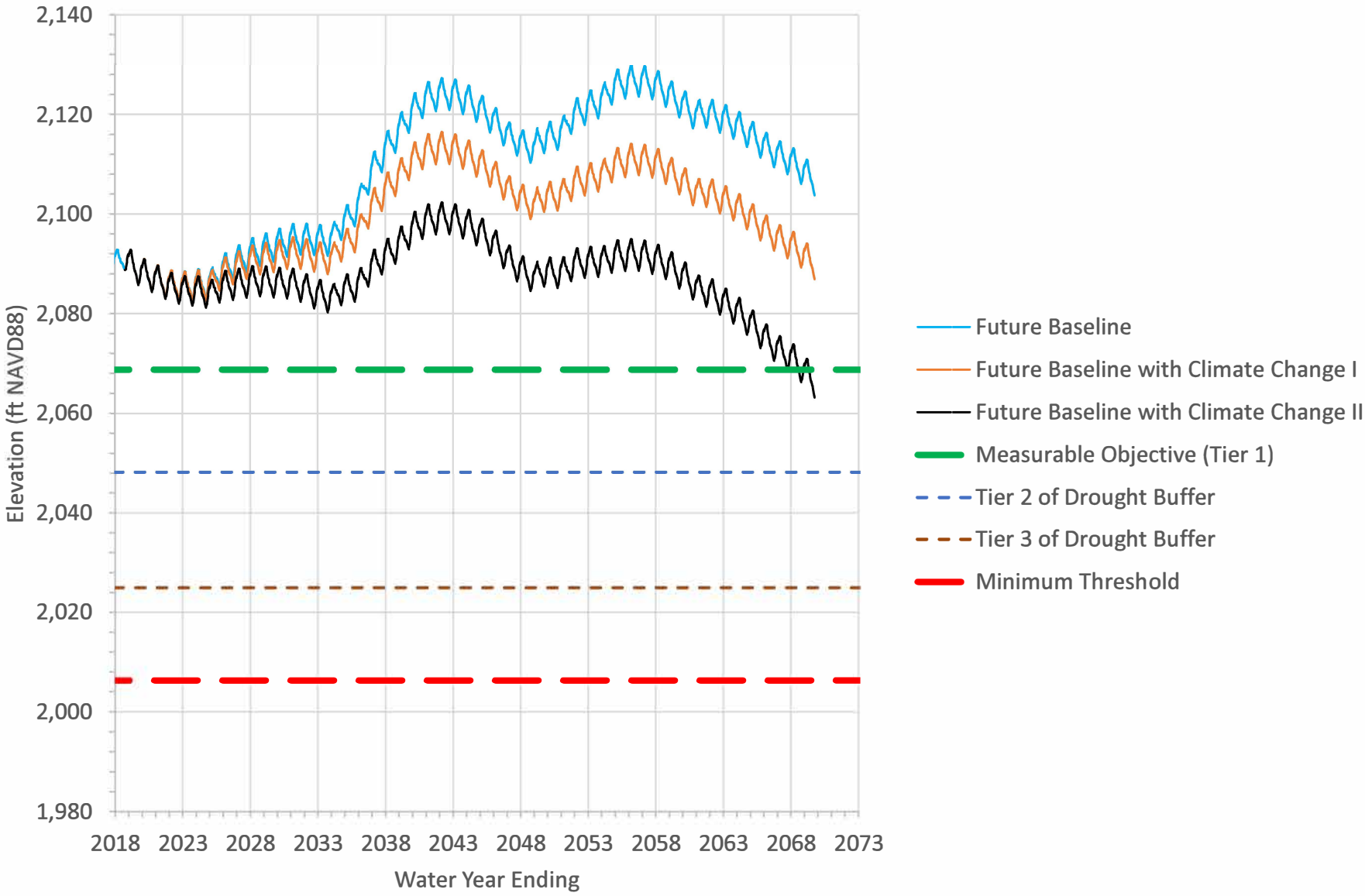

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Figure 4-6. Predicted Hydraulic Heads and Management Action Tiers at YVWD-10 in the Calimesa Management Area

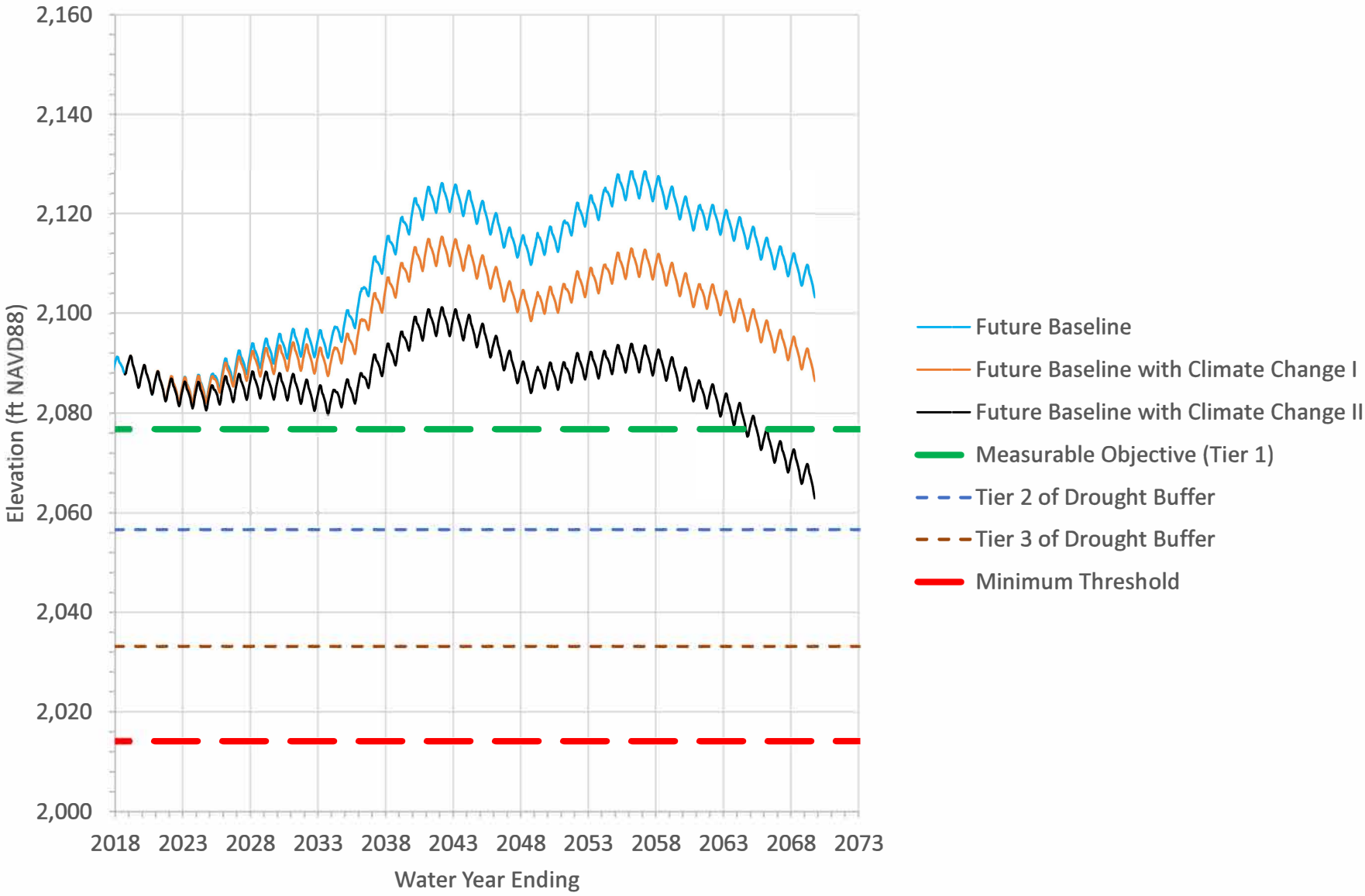

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Figure 4-7. Predicted Hydraulic Heads and Management Action Tiers at YVWD-12 in the Calimesa Management Area

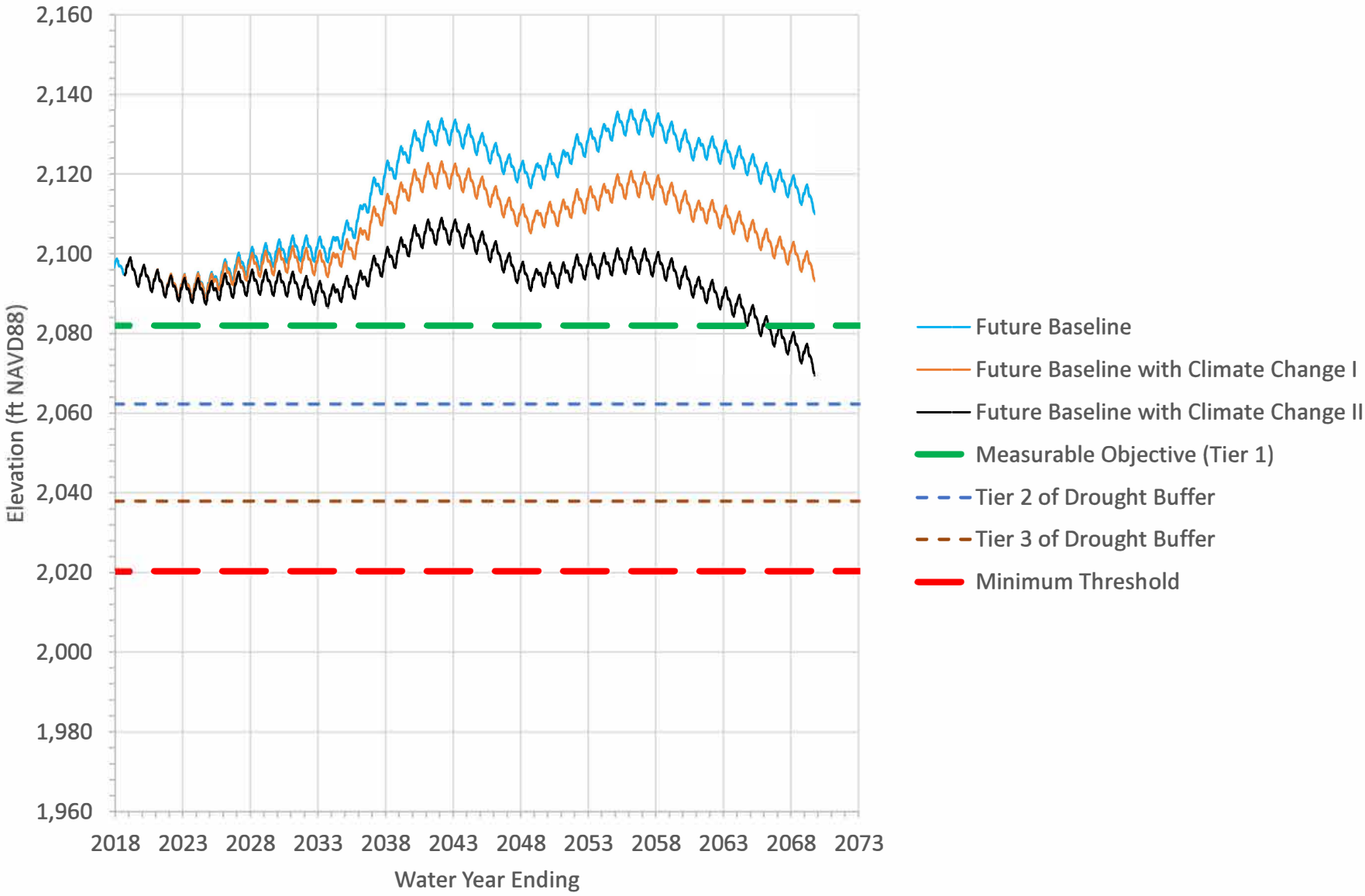

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Figure 4-8. Predicted Hydraulic Heads and Management Action Tiers at YVWD-24 in the Calimesa Management Area

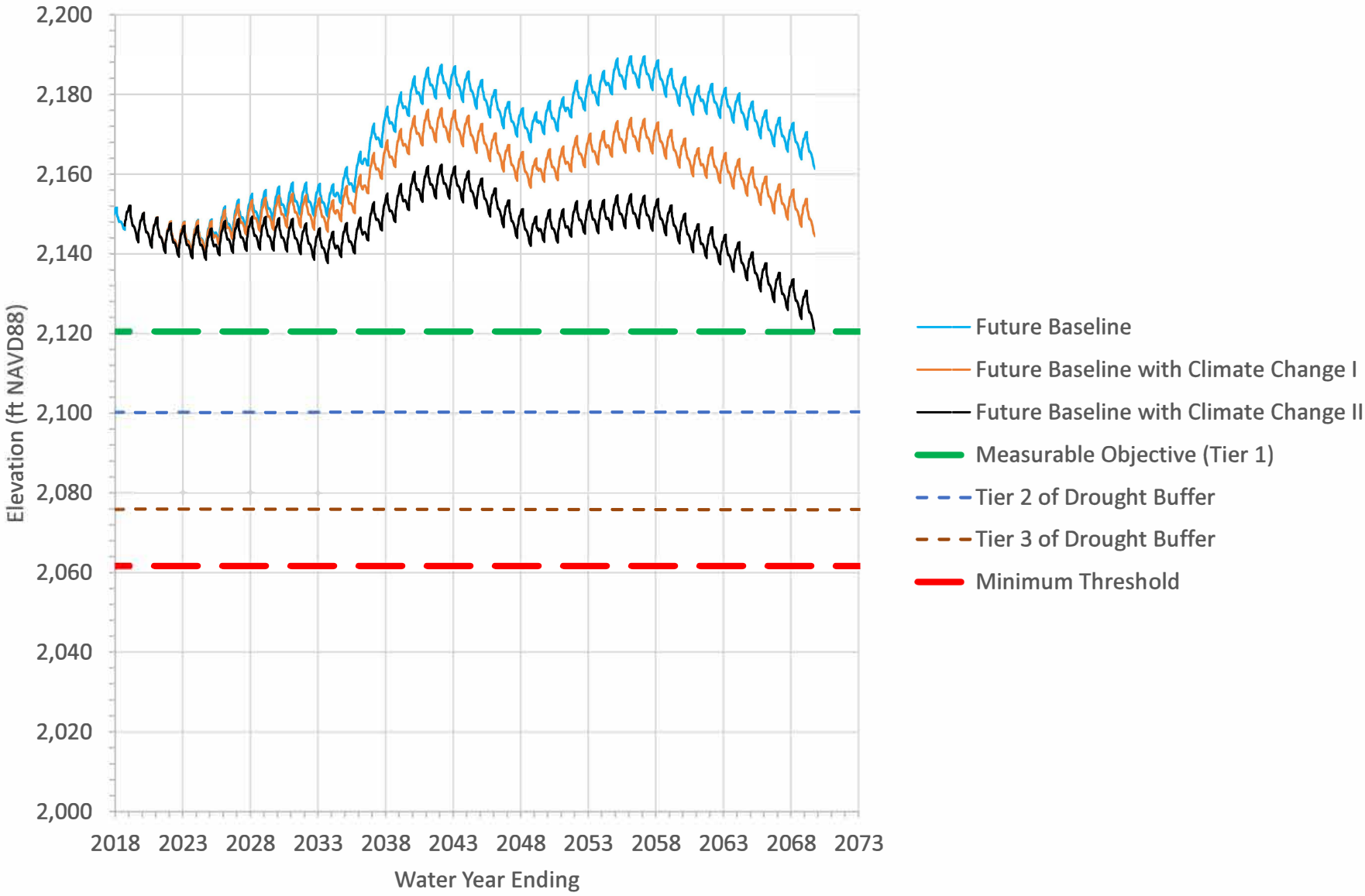

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Figure 4-9. Predicted Hydraulic Heads and Management Action Tiers at YVWD-49 in the Calimesa Management Area

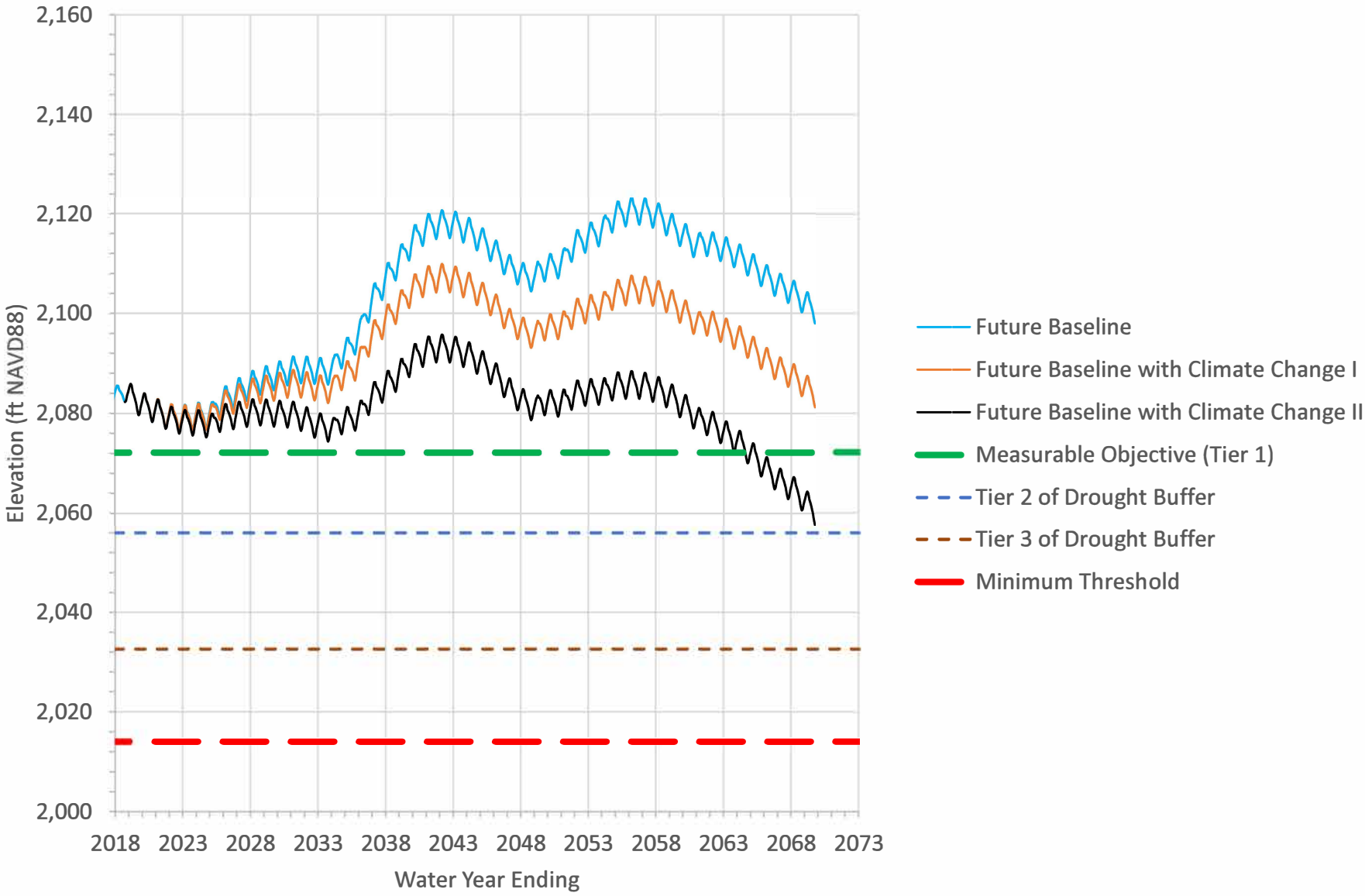

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Figure 4-10. Predicted Hydraulic Heads and Management Action Tiers at Hog Canyon 2 in the Calimesa Management Area

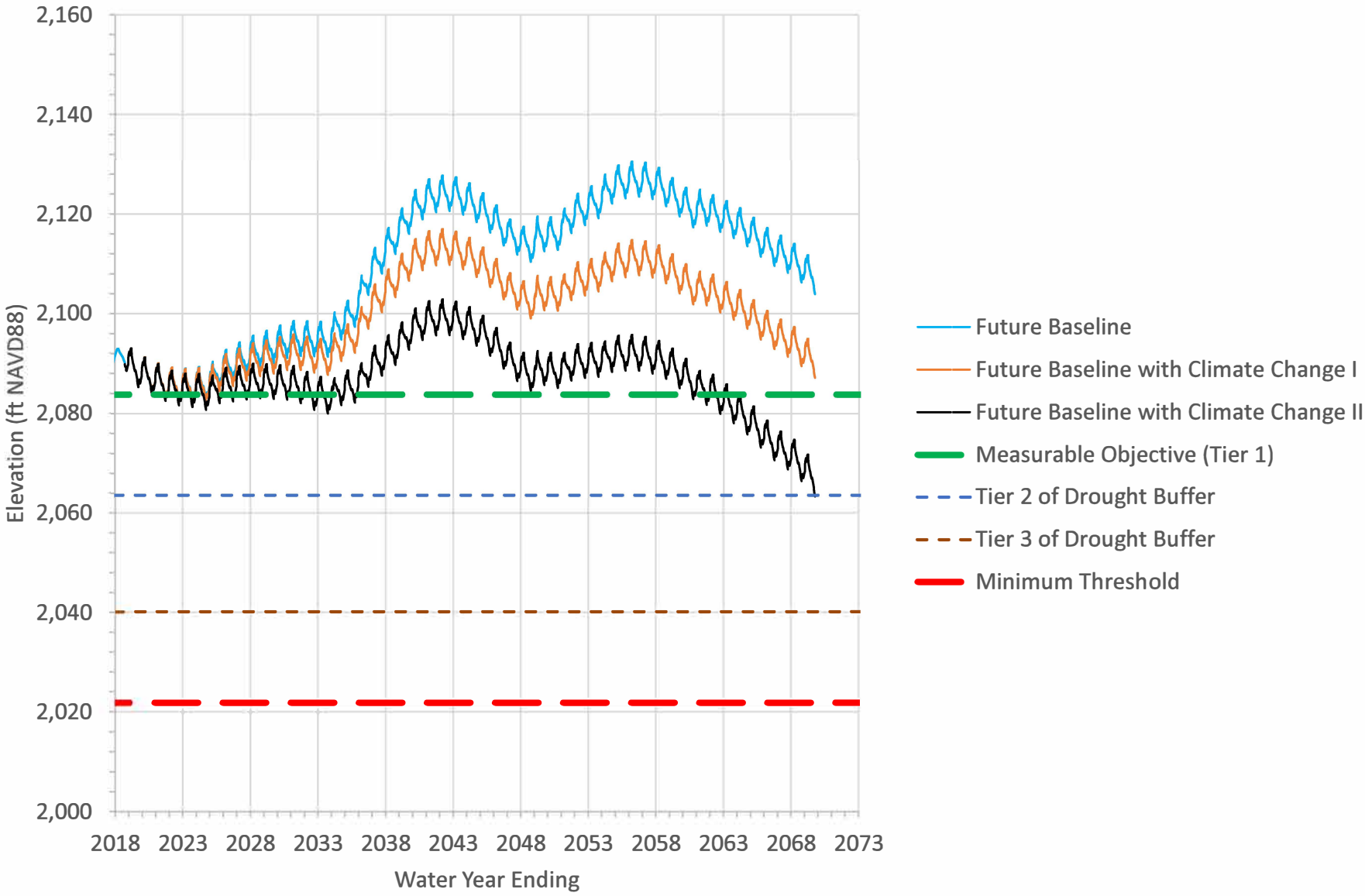

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Figure 4-11. Predicted Hydraulic Heads and Management Action Tiers at USGS Equestrian Park #1 Well in the Calimesa Management Area

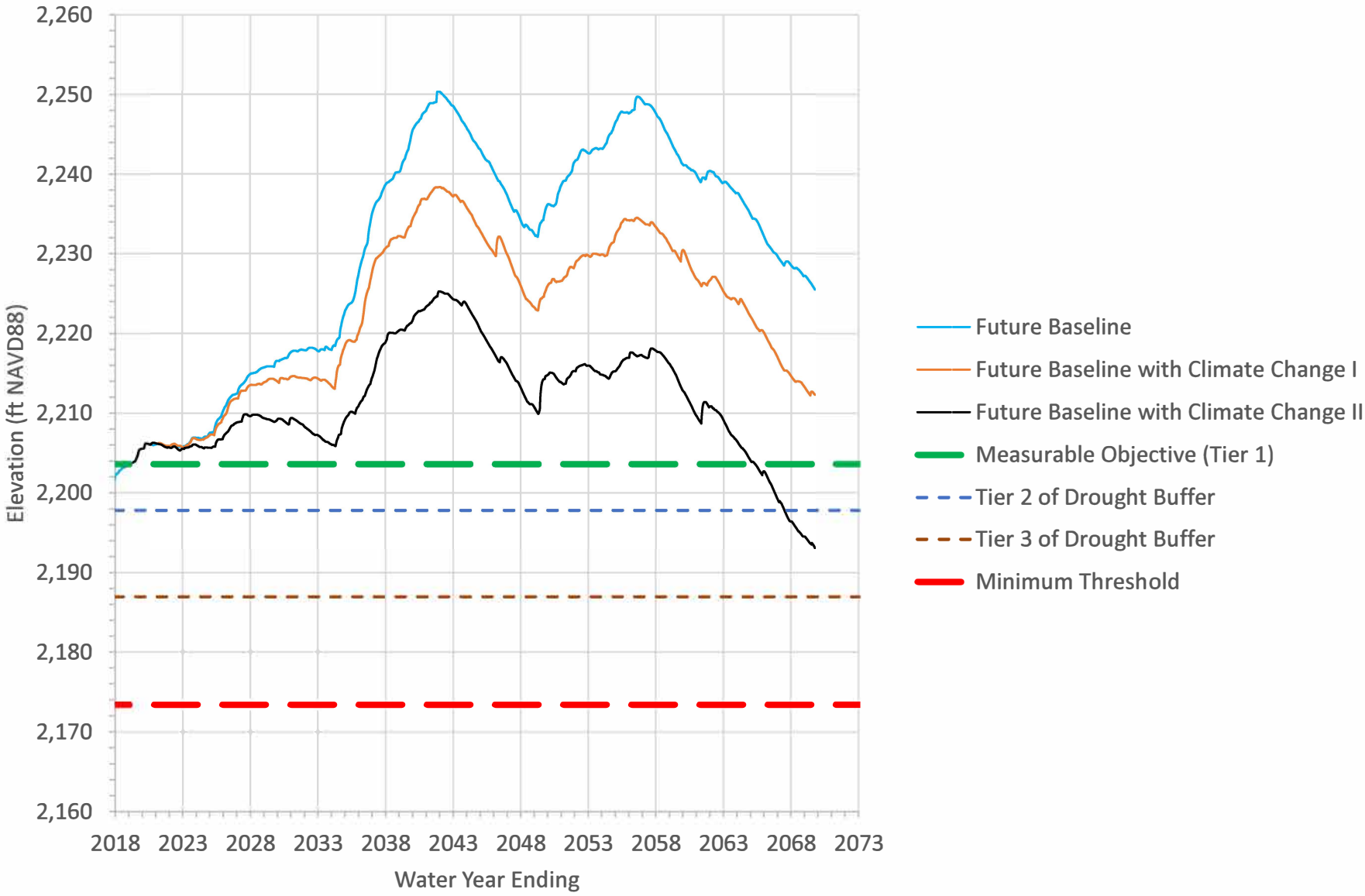

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Figure 4-12. Predicted Hydraulic Heads and Management Action Tiers at USGS Equestrian Park #4 Well in the Calimesa Management Area

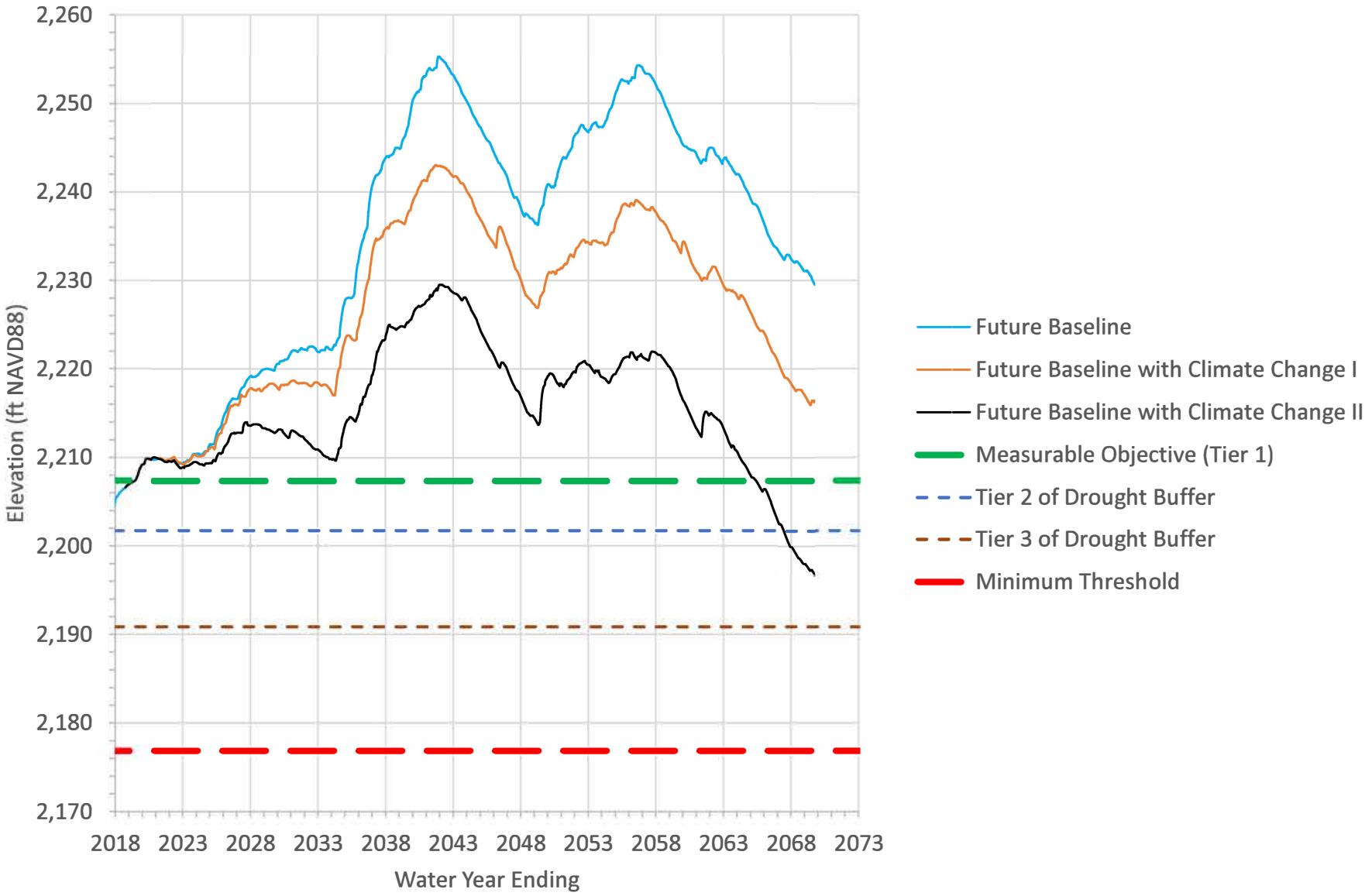

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Figure 4-13. Predicted Hydraulic Heads and Management Action Tiers at USGS 6th Street #1 Well in the Calimesa Management Area

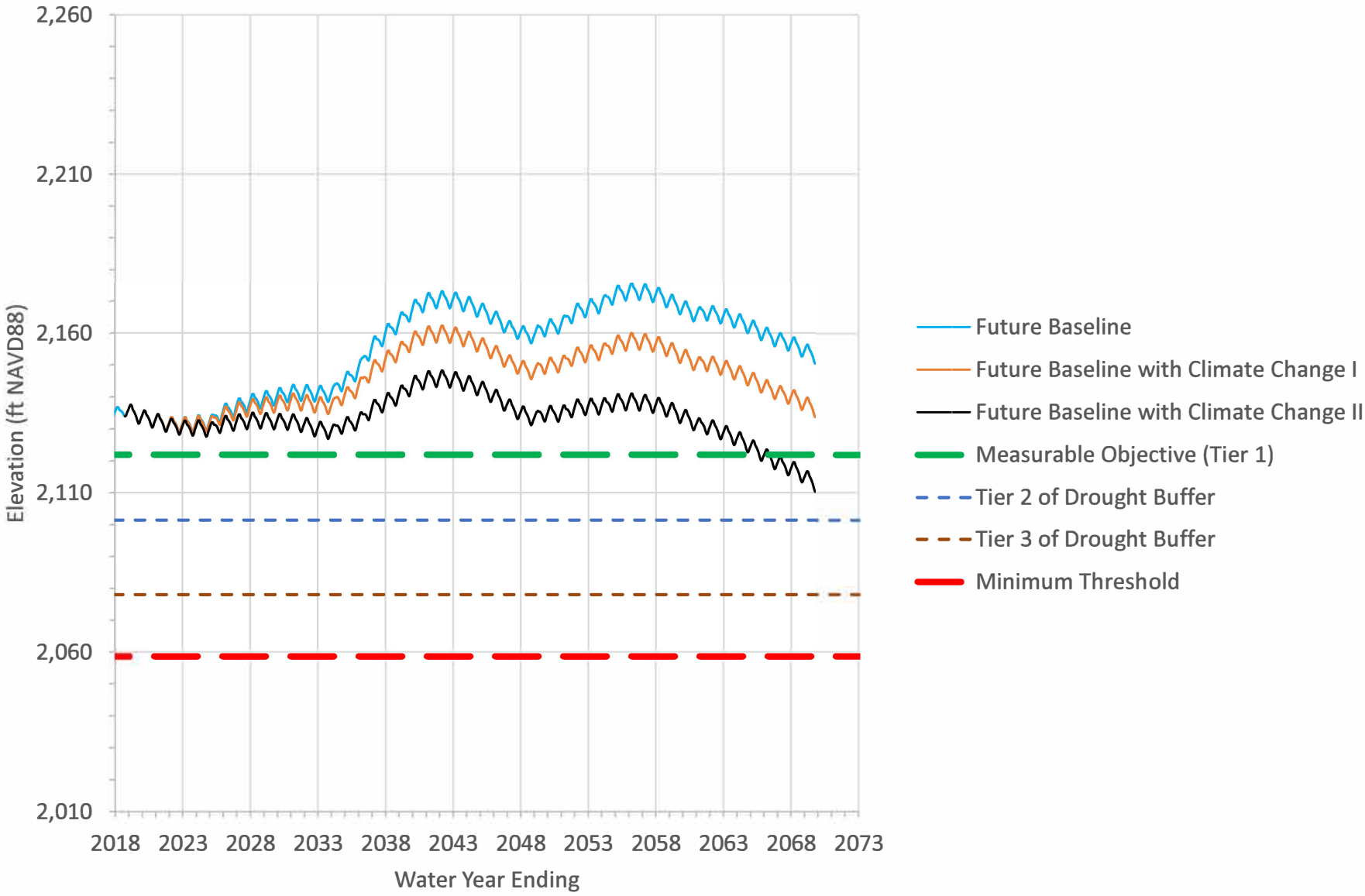

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Figure 4-14. Predicted Hydraulic Heads and Management Action Tiers
at USGS 6th Street #4 Well in the Calimesa Management Area

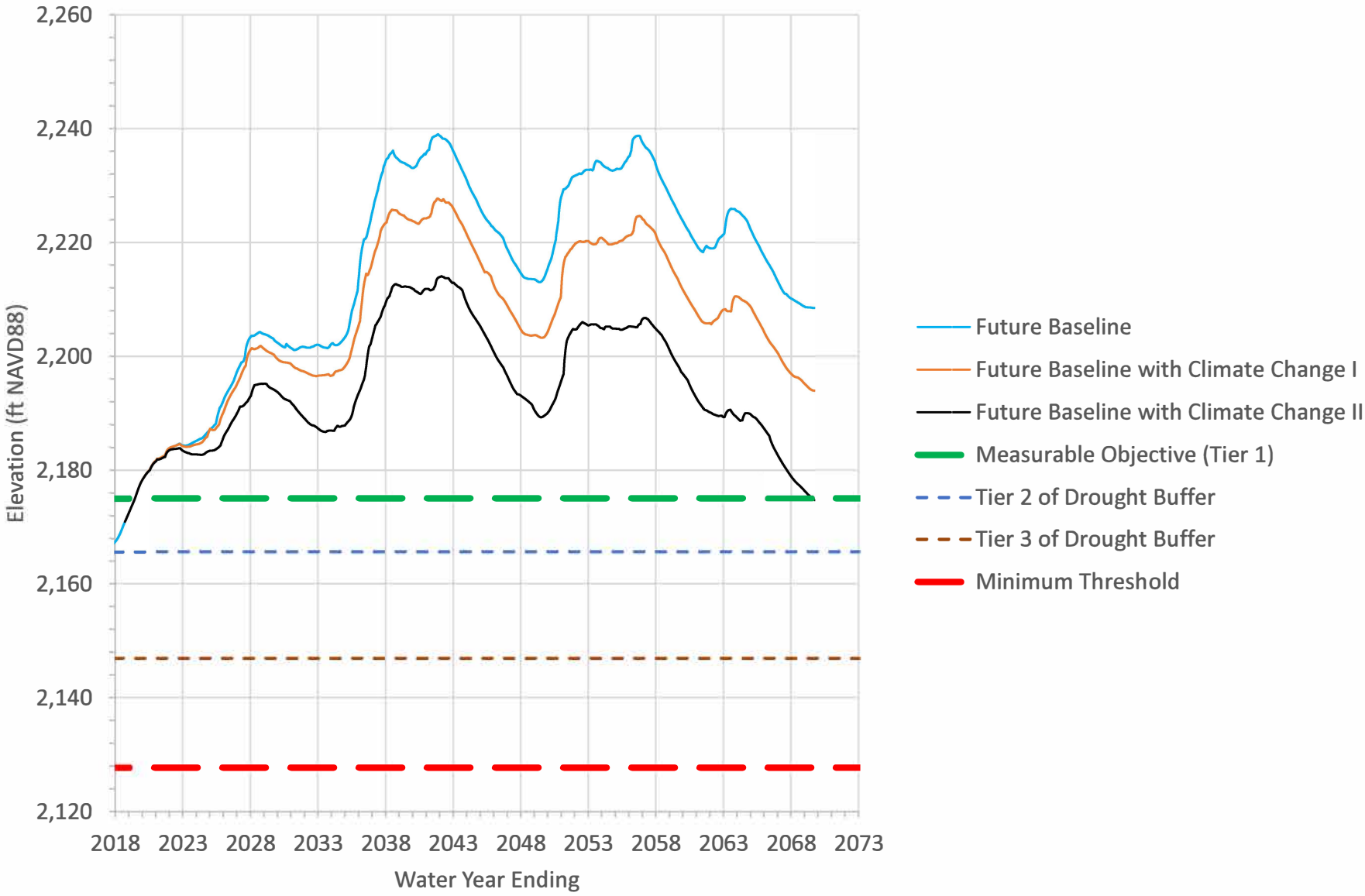

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Figure 4-15. Predicted Volume in Storage by the Future Baseline and Future Baseline with Climate Change I and II Scenarios and Management Action Tiers in the Western Heights Management Area

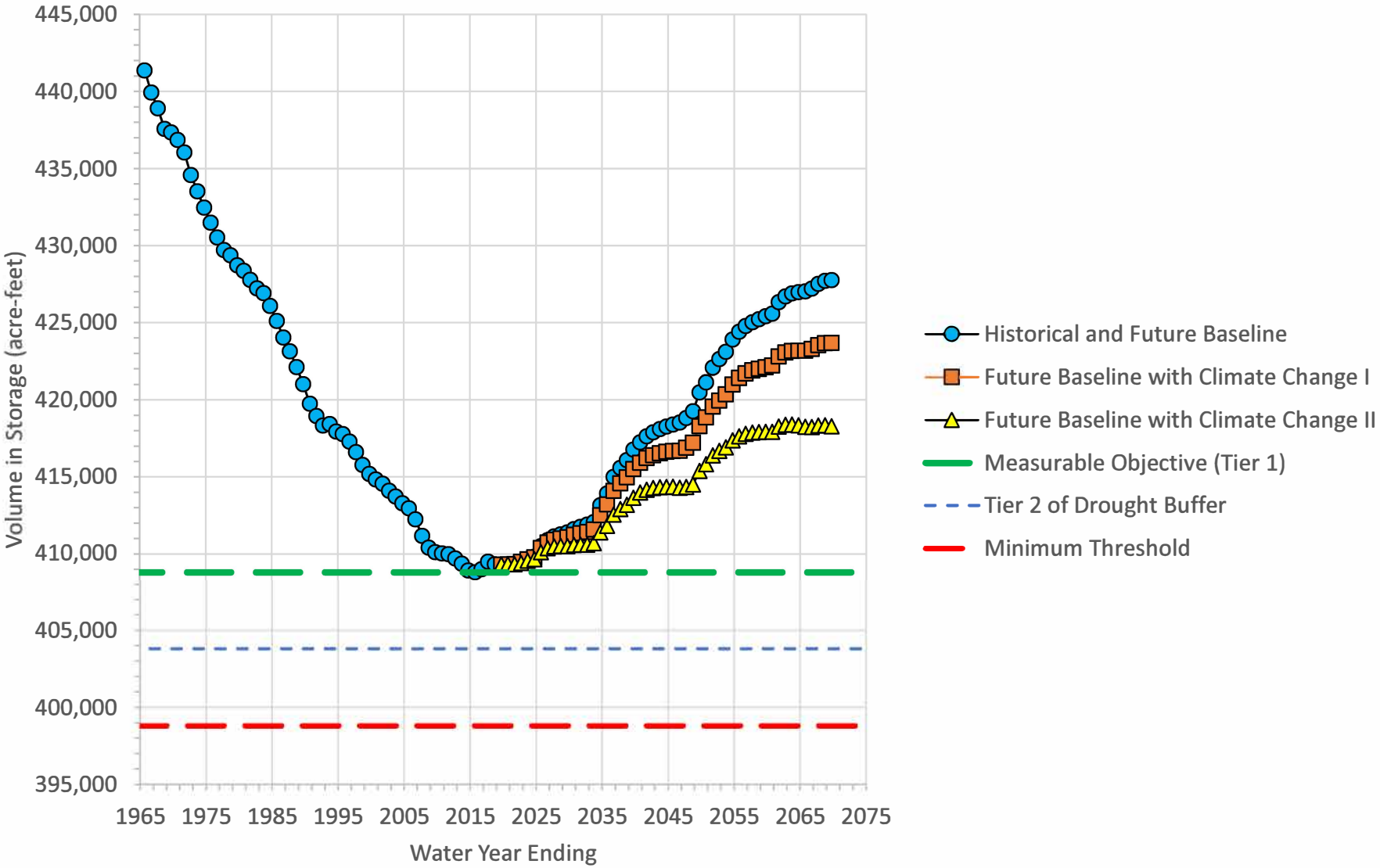

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Figure 4-16. Predicted Simulated Hydraulic Heads and Management Action Tiers at WHWC-02A in the Western Heights Management Area

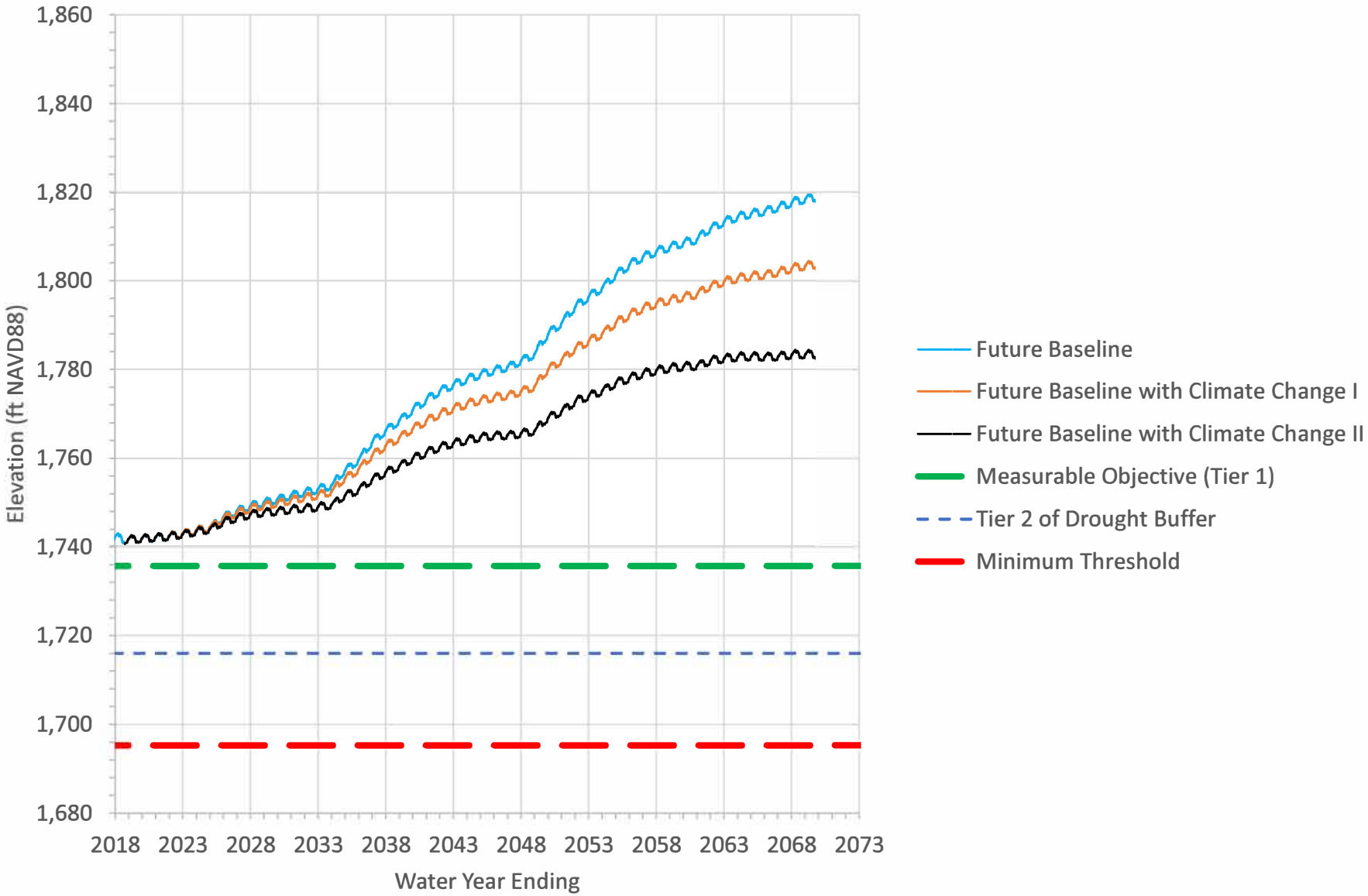

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Figure 4-17. Predicted Simulated Hydraulic Heads and Management Action Tiers at WHWC-10 in the Western Heights Management Area

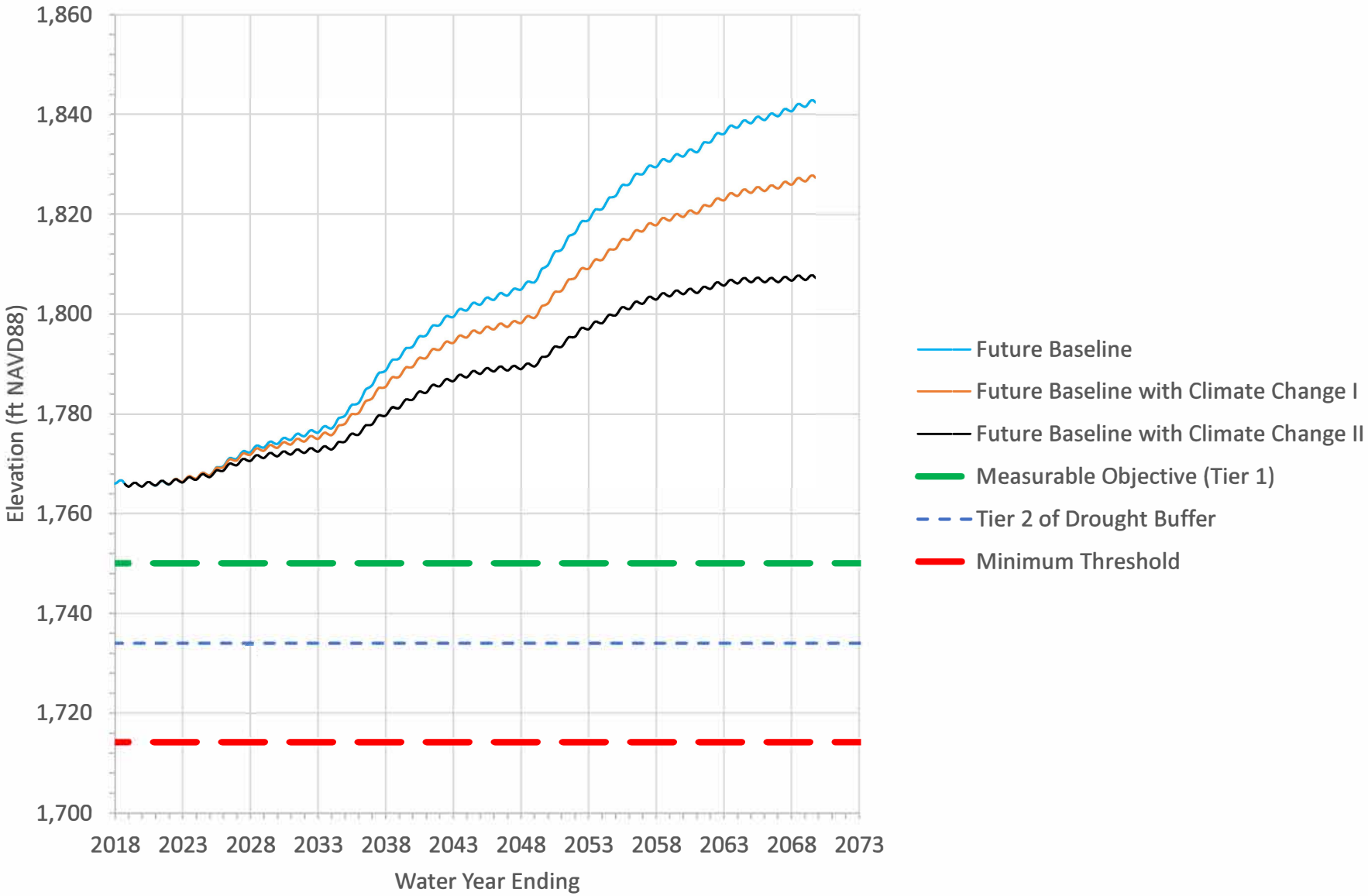

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Figure 4-18. Predicted Simulated Hydraulic Heads and Management Action Tiers at WHWC-11 in the Western Heights Management Area

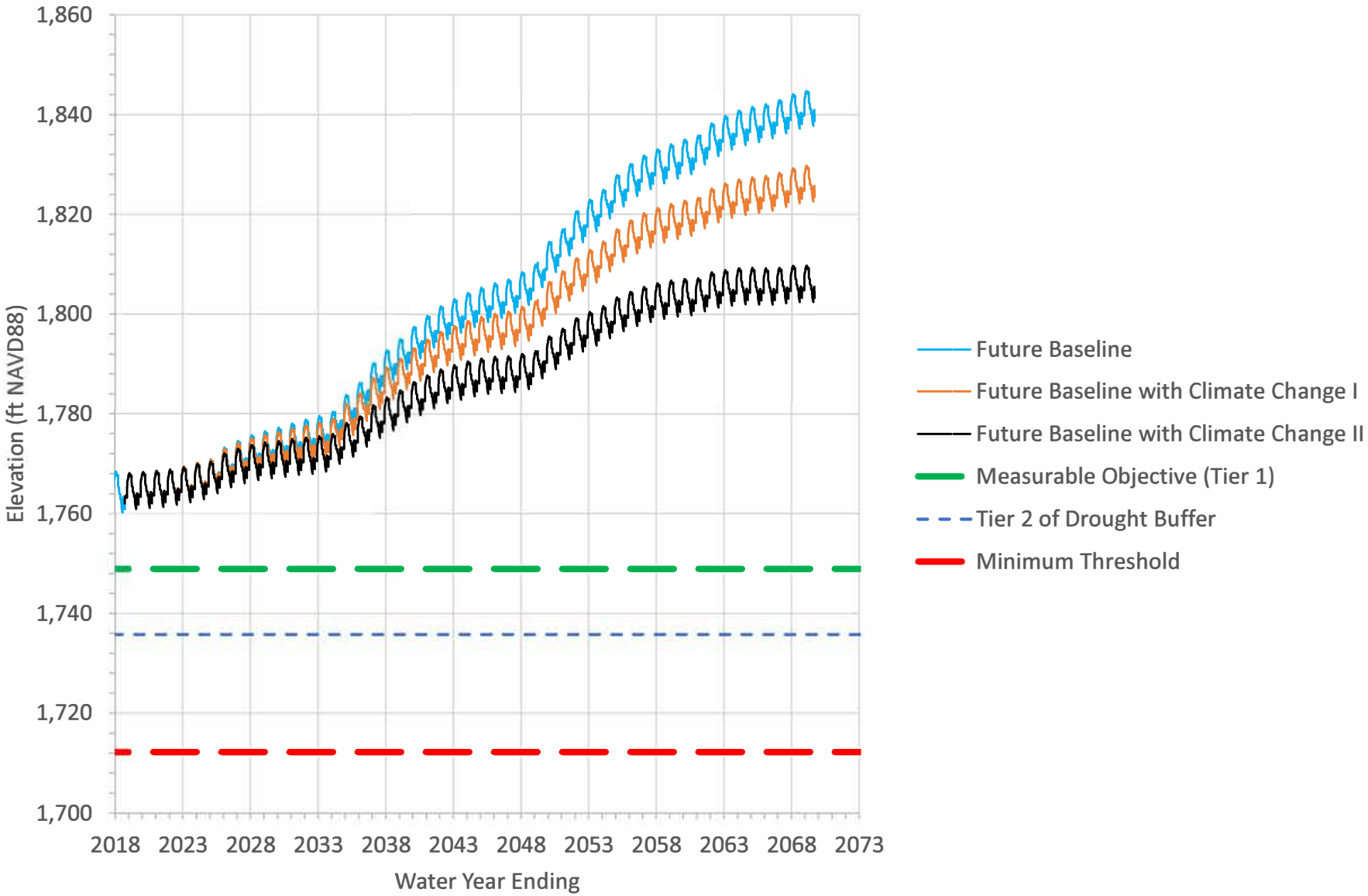

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Figure 4-19. Predicted Simulated Hydraulic Heads and Management Action Tiers at WHWC-12 in the Western Heights Management Area

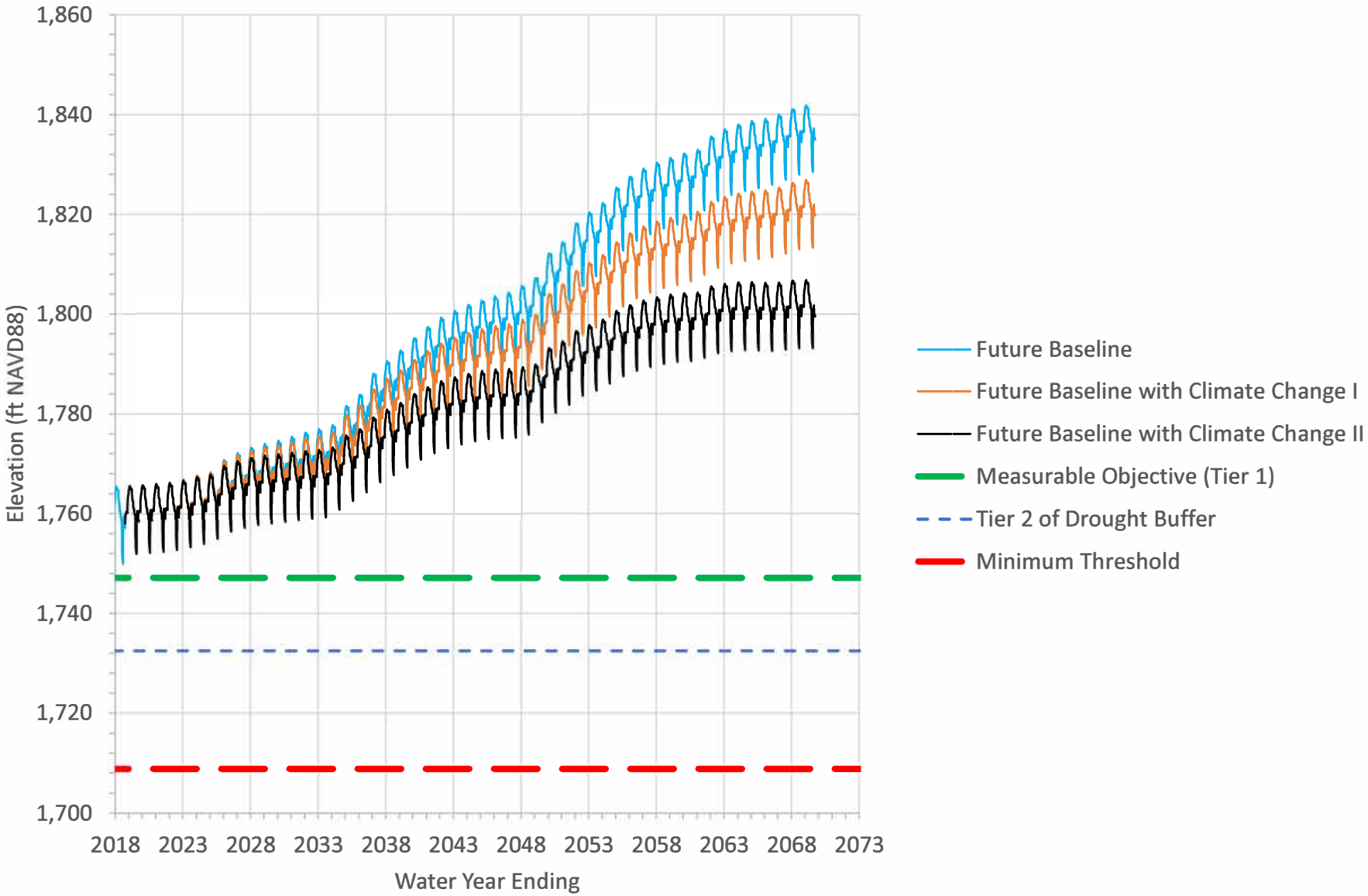

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Figure 4-20. Predicted Simulated Hydraulic Heads and Management Action Tiers at WHWC-14 in the Western Heights Management Area

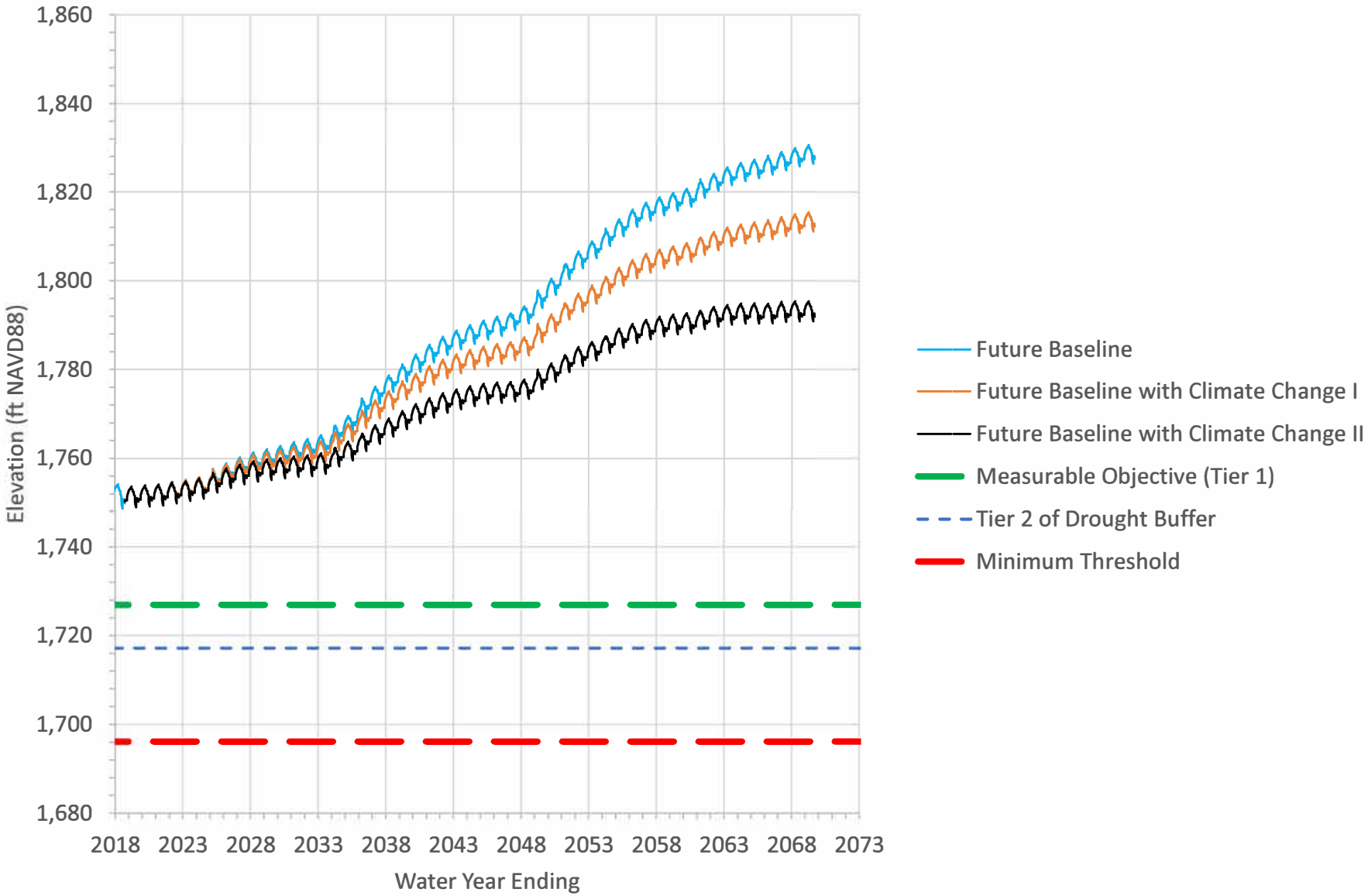

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Figure 4-21. Predicted Simulated Hydraulic Heads and Management Action Tiers at USGS Dunlap #2 Well in the Western Heights Management Area

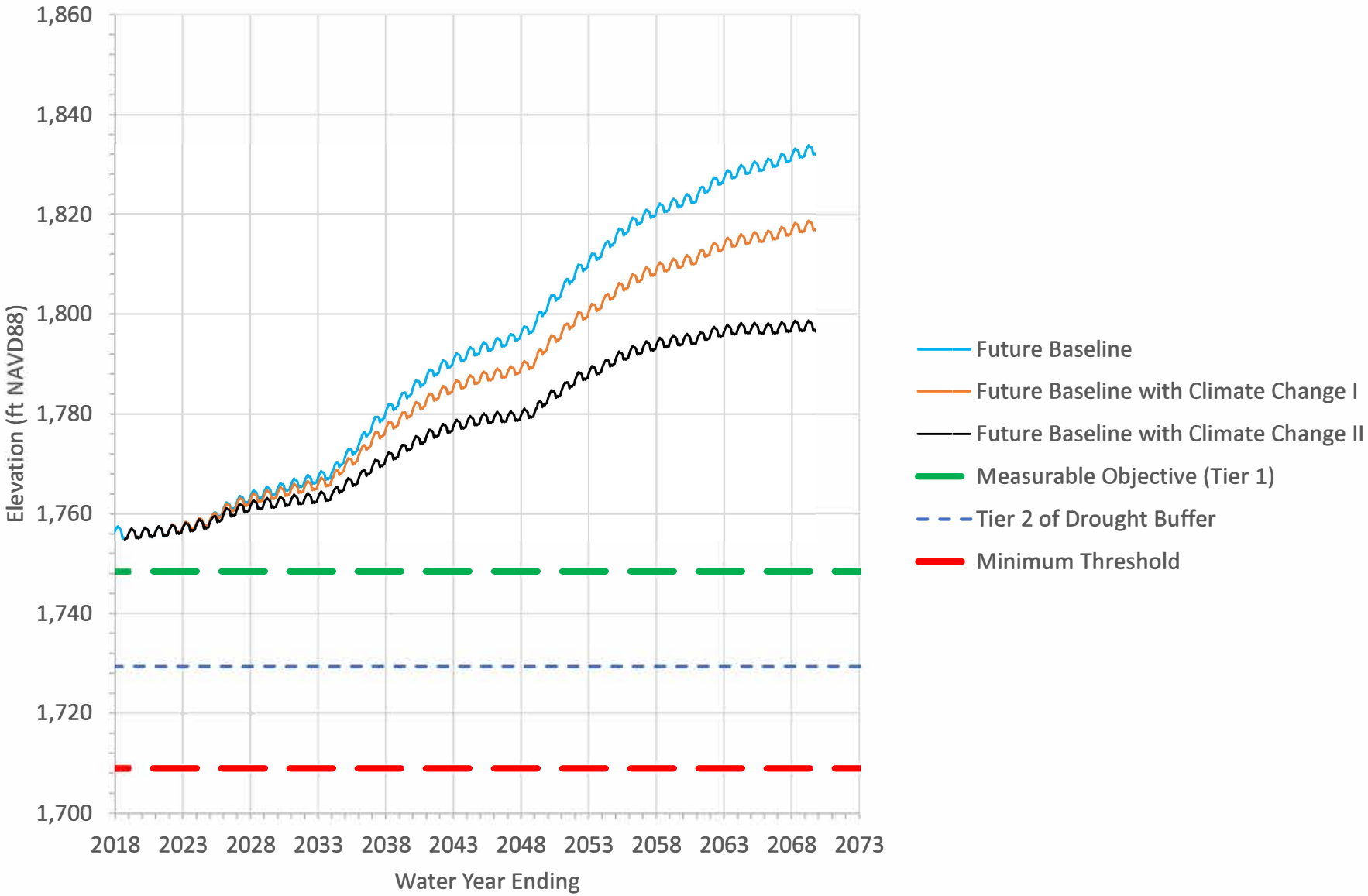

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Figure 4-22. Predicted Simulated Hydraulic Heads and Management Action Tiers at USGS Dunlap #4 Well in the Western Heights Management Area

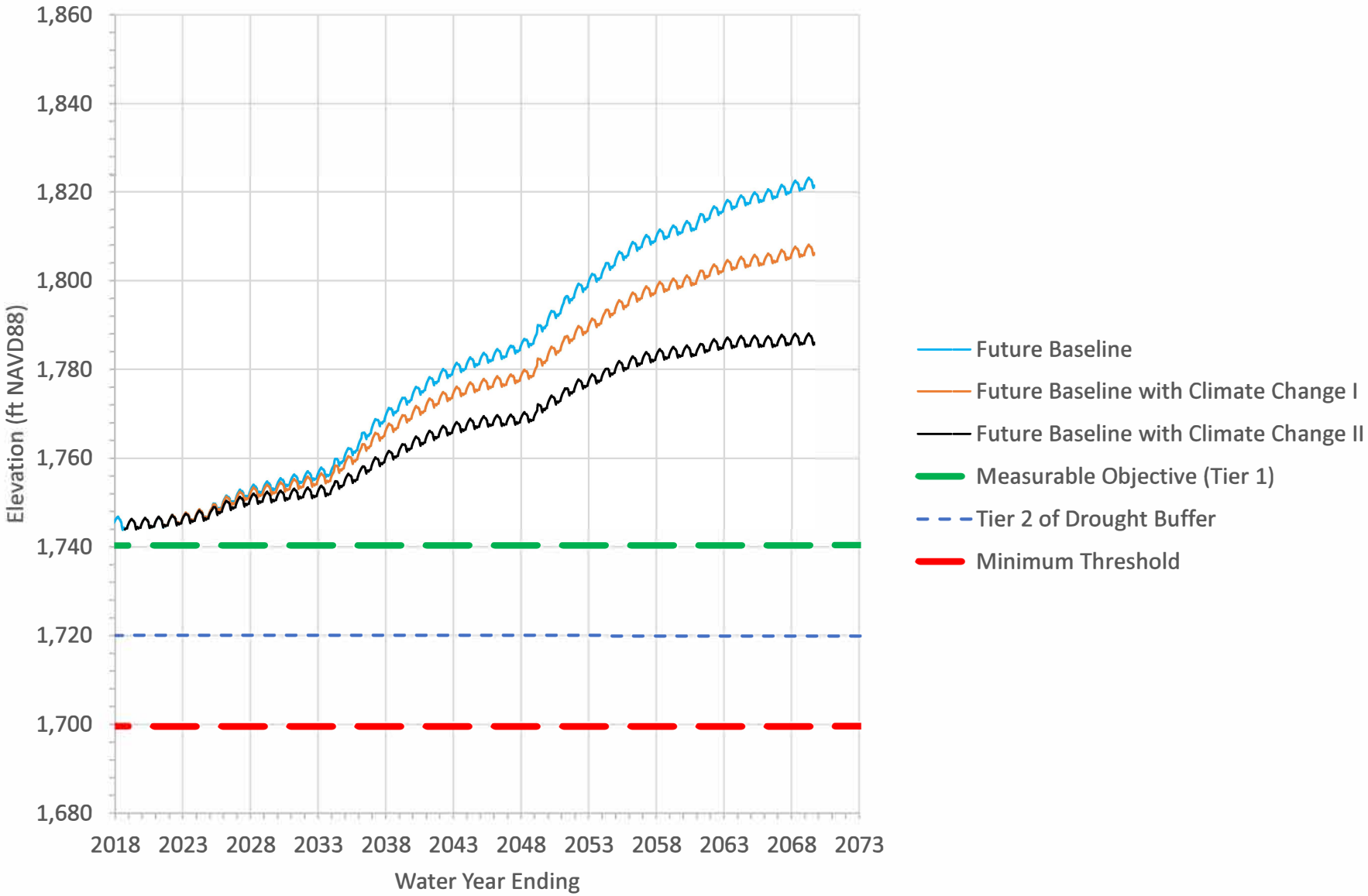

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Figure 4-23. Historical Groundwater Production by Agency in the North Bench Management Area

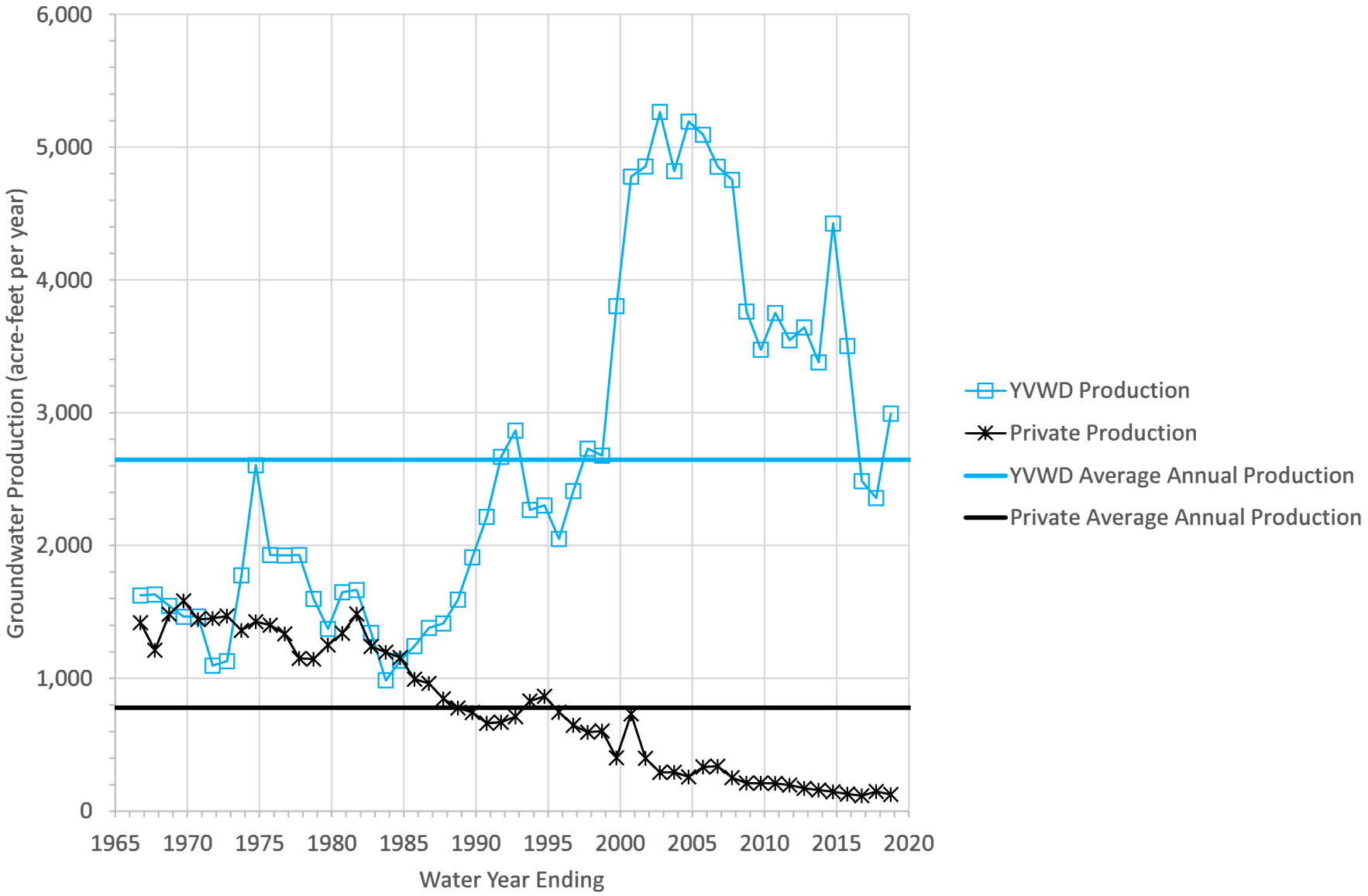

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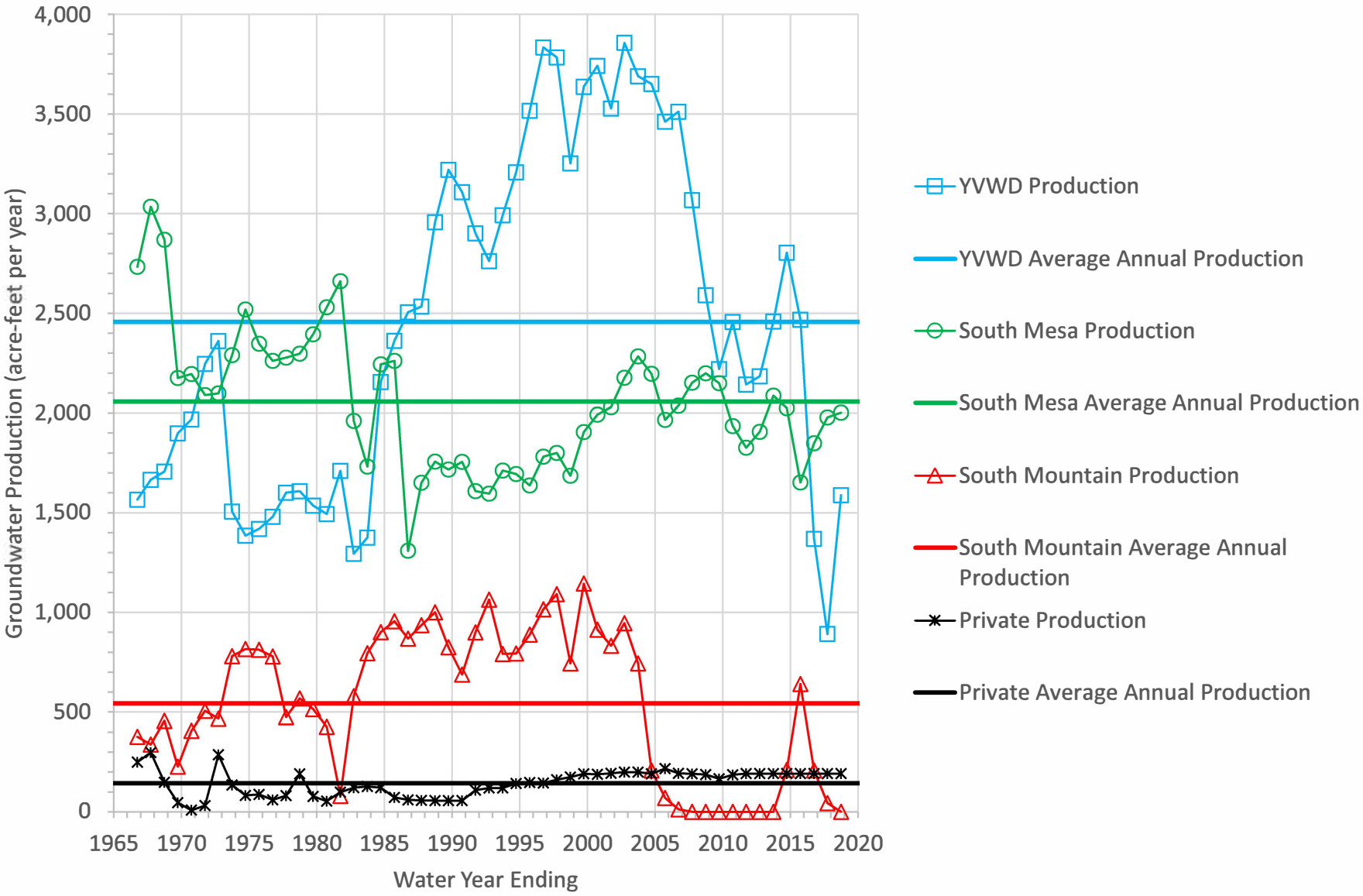
Figure 4-24. Historical Groundwater Production by Agency in the Calimesa Management Area



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5 Plan Implementation

5.1 Introduction to Plan Implementation

Upon adoption of this Groundwater Sustainability Plan (GSP) by the Yucaipa Groundwater Sustainability Agency (GSA), the primary activities associated with implementing the GSP include administrative duties by the member agencies of the Yucaipa GSA, the management of data collection, data validation, and analysis to evaluate conditions in the Subbasin, the preparation and submittal of annual reports and periodic evaluations, with associated data, to the California Department of Water Resources (DWR), and an assessment of conditions in the Subbasin and determination if management actions need to be implemented. During the initial 5-year period after the GSP is adopted, the Yucaipa GSA will evaluate options to address data gaps identified in Section 2.6.3, and conduct feasibility studies to evaluate the effectiveness of potential spreading basins and other programs that would maintain or achieve sustainability in the Subbasin.

Resolutions by the Board of Directors for the Yucaipa GSA member agencies approving the GSP and instructing the Yucaipa GSA to adopt and submit the GSP to DWR are included in Appendix 5-A.

5.2 GSP Administration

The Yucaipa GSA is responsible for implementing the GSP after it is adopted. The administrative duties of the Yucaipa GSA include, at a minimum, the following:

- Adhering to the implementation schedule (Figure 5-1) to ensure that the Yucaipa GSA conducts the required minimum data collection periods in the spring and fall every year, the annual reports are prepared and submitted to DWR by April 1, and the periodic evaluation reports are submitted at least every 5 years or when the GSP is amended.
- Facilitate access to all wells and stream flow gauging stations in the monitoring network, including the representative monitoring points in each management area, to ensure the collection of representative data by following the monitoring protocols presented in Section 3.6.4.
- Validate and upload data to the data management system (DMS) for the purposes of evaluating conditions in the Plan Area.
- Facilitate the submission of annual reports and periodic evaluation reports per Sub-Article 7 of Article 5 of the California Code of Regulations (CCR) Division 2, Chapter 1.5 (23 CCR, Section 356). This section describes the procedures and requirements for preparing and submitting the annual reports and periodic evaluations to DWR.
- Facilitate public engagement.

The costs associated with administering the GSP will be shared per the Memorandum of Agreement (Appendix 1-B). The Memorandum of Agreement established a cost share structure with the water purveyors responsible for 75% and the San Bernardino Valley Municipal Water District and San Gorgonio Pass Water Agency (Regionals) and the Municipalities responsible for 25% of the costs associated with the administration of the Yucaipa GSA and the development and implementation of the GSP. In general, Yucaipa GSA plans to fund operating costs by using general operating funds, charging its customers through water rates, and/or fees assessed to new developments to connect to existing water services (public water supply, sanitary sewer). The estimated annual costs for

implementing the GSP, including the estimated share in costs for each water purveyor and each Municipality and Regional, are summarized in Table 5-1.

Table 5-1. Estimated Annual Costs for Implementing the GSP

GSP Implementation Task	Estimated Annual Cost	Each Water Purveyor	Each Municipality and Regional
GSA Administrative Costs	$20,000.00	$3,750.00	$1,250.00
Public Engagement	$5,000.00	$937.50	$312.50
GSP Annual Reports	$30,000.00	$5,625.00	$1,875.00
GSP Periodic Evaluations[a]	$40,000.00	$7,500.00	$2,500.00
DMS Management	$5,000.00	$937.50	$312.50
Subtotal for Administrative Tasks	*$100,000.00*	*$18,750.00*	*$6,250.00*
Groundwater Level Monitoring[b]	$15,000.00	$2,812.50	$937.50
Groundwater Production Monitoring[c]	$10,000.00	$1,875.00	$625.00
Groundwater Quality Monitoring[d]	$15,000.00	$2,812.50	$937.50
Installation and Maintenance of Wells in the Monitoring Network	$15,000.00	$2,812.50	$937.50
Installation and Maintenance of Surface Water Gauging Stations	$15,000.00	$2,812.50	$937.50
Subtotal for Monitoring and Data Collection Tasks	*$70,000.00*	*$13,125.00*	*$4,375.00*
Total	**$170,000.00**	**$31,875.00**	**$10,625.00**

Notes: GSP = Groundwater Sustainability Plan; GSA = Groundwater Sustainability Agency; DMS = data management system.
[a] Includes updating, refining, and recalibrating numerical model.
[b] Includes installation/maintenance to obtain data, QA/QC, measuring devices.
[c] Includes installation/maintenance to obtain data, QA/QC, meter calibration.
[d] Includes installation/maintenance to obtain data, QA/QC, field meters.

The first five GSP Implementation tasks listed in Table 5-1 are categorized as administrative tasks, in which each member agency of the Yucaipa GSA will provide funds at the beginning of each calendar year to cover their estimated annual costs. The last five GSP Implementation tasks listed in Table 5-1 are categorized as monitoring and data collection tasks, in which each member agency of the Yucaipa GSA will provide funds as costs are incurred when implementing these tasks. The annual costs listed in Table 5-1 are estimated based on an understanding of current conditions and anticipation of the level of effort in implementing the GSP. These estimated costs will be reevaluated every year and may be modified based on actual costs incurred after the GSP is adopted and implemented.

Table 5-2 provides a summary of the estimated annual costs for each water purveyor and each Municipality and Regional of the Yucaipa GSA.

Table 5-2. Estimated Annual Costs for Each Water Purveyor and Each Municipality and Regional

Yucaipa GSA Member Agency		Estimated Annual Upfront Costs	Estimated Annual Incurred Costs	Estimated Total Annual Cost
Water Purveyors	South Mesa	$18,750.00	$13,125.00	$31,875.00
	South Mountain	$18,750.00	$13,125.00	$31,875.00
	WHWC	$18,750.00	$13,125.00	$31,875.00

Table 5-2. Estimated Annual Costs for Each Water Purveyor and Each Municipality and Regional

Yucaipa GSA Member Agency		Estimated Annual Upfront Costs	Estimated Annual Incurred Costs	Estimated Total Annual Cost
	YVWD	$18,750.00	$13,125.00	$31,875.00
Municipality and Regional	City of Redlands	$6,250.00	$4,375.00	$10,625.00
	City of Yucaipa	$6,250.00	$4,375.00	$10,625.00
	SBVMWD	$6,250.00	$4,375.00	$10,625.00
	SGPWA	$6,250.00	$4,375.00	$10,625.00
Estimated Total Annual Cost		**$100,000.00**	**$70,000.00**	**$170,000.00**

Notes: GSA = Groundwater Sustainability Agency; WHWC = Western Heights Water Company; YVWD = Yucaipa Valley Water District; SBVMWD = San Bernardino Valley Municipal Water District; SGPWA = San Gorgonio Pass Water Agency.

5.3 Data Collection, Validation, and DMS

Member agencies of the Yucaipa GSA will continue participating in monitoring programs already implemented (Section 1.5.1) to collect groundwater elevation, groundwater quality, and production data to characterize conditions in the Subbasin. The member agencies will follow the monitoring protocols presented in Section 3.6.4 to collect data that is accurate and representative of conditions in the Subbasin, and will upload the data to the DMS. As discussed in Section 3.6 (Monitoring Network), the monitoring schedule to collect static groundwater elevation data, at a minimum, is March 9 to 22 for the spring and October 9 to 22 for the fall. The recommended frequency to collect static groundwater elevation data is monthly. Water quality data is collected per the monitoring requirements under Title 22 for municipal water supply wells and the Maximum Benefits Monitoring Program, and water quality sampling will follow the monitoring protocols presented in Section 3.6.4.3, Groundwater Quality Monitoring.

The water purveyors use calibrated flow meters and totalizers to track the volume of groundwater extracted at their respective municipal and irrigation water supply wells. Production data is collected on a monthly basis. Precipitation gauges have been maintained and monitored by the San Bernardino County Flood Control District and the U.S. Geological Survey, both of which are public agencies that provide their respective data in the public domain. The Yucaipa GSA will access this data and upload it to the DMS.

During the initial 5-year period after the GSP is adopted, the Yucaipa GSA will evaluate options for filling data gaps identified in this GSP. The primary data gaps identified were a lack of knowledge of existing private well users operating in the Subbasin, spatial gaps in groundwater elevation data in the eastern section of the Calimesa management area, and stream flow gauging stations to measure low to normal flows. As discussed in Section 3.6.6 (Monitoring Network Improvements), the Yucaipa GSA will make efforts to obtain information on private well users, improve existing or install new stream flow gauging stations to enhance the characterization of stream flow in the Plan Area, and improve the spatial and temporal monitoring coverage of the Subbasin. For instance, pressure transducers may be installed at some wells in the monitoring network to reduce the time window during which groundwater elevations are manually collected. The costs of obtaining information from private well users, improving the monitoring of surface water flows, and addressing data gaps in the monitoring network are associated with GSP implementation.

5.4 Annual Reports

Sub-article 7 of Article 5 of the California Code of Regulations Division 2 Chapter 1.5 (23 CCR, Section 356.2) describes the general requirements for the annual reports to be submitted to DWR after the GSP is adopted by the Yucaipa GSA. Annual reports are due to DWR by April 1 of each year following the adoption of the GSP. Each annual report shall include the following components:

- General information, including an executive summary and a location map depicting the basin, jurisdictional boundaries, and Plan Area covered by the report
- A detailed description and graphical representation of the following:
  - Groundwater elevation data from wells identified in the monitoring network
  - Groundwater elevation contour maps depicting, at a minimum, the seasonal high and seasonal low groundwater elevations observed in the preceding year
  - Groundwater elevation hydrographs depicting historical trends updated with data collected in the preceding year
  - Groundwater extractions for the preceding water year
  - An accounting of surface water supply, including imported SWP water, imported groundwater from outside the Plan Area, and surface water diversions
  - An accounting of total water use and identity of the water use sector
  - Change in groundwater in storage
- A description of progress toward implementing the GSP, including implementation of projects or management actions since the previous annual report

The description and graphical representation of the change in groundwater storage will include a graph depicting water year type, based on the annual precipitation in the Plan Area compared to the mean annual rainfall (Section 2.2.1.4, Water Year Type), groundwater production, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the Plan Area based on the simulated annual change in storage by the YIHM. The annual reports will conclude with an overview of the implementation of the GSP, including an evaluation of groundwater conditions against the sustainability criteria established in Chapter 3. The annual report will include a descriptive summary of any management actions that were implemented in the Plan Area.

5.5 Periodic Evaluations

Every fifth year of GSP implementation and whenever the GSP is amended, the Yucaipa GSA is required to prepare and submit an Agency Evaluation and Assessment Report to DWR together with the annual report for that year (23 CCR, Section 356.4). The tasks associated with preparing this report include evaluating any new information that has been made available since the GSP adoption and assessing whether changes to assumptions or descriptions in the GSP are required. The following components are required in the periodic evaluation reports:

- A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives and minimum thresholds.
- A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.

- A review and evaluation of the Plan Area setting, management areas, sustainability criteria and management actions described in the GSP, and proposed revisions to the GSP based on information obtained since the adoption of the Plan.
- A description and evaluation of the monitoring network within the Plan Area. The evaluation will determine if data gaps identified in the GSP have been addressed, and if new data gaps are identified. The periodic evaluation will include proposed actions by the Yucaipa GSA to address data gaps, which may include modifications to or expansion of the existing monitoring network.
- A description of significant new information that has been made available since the adoption of the GSP, an amendment to the GSP, or the last 5-year assessment.
- A description of relevant actions taken by the Yucaipa GSA, including a summary of regulations or ordinances related to management of the Plan Area or the GSP.
- Information describing any enforcement or legal actions taken by the Yucaipa GSA in furtherance of the sustainability goal for the Plan Area.
- A description of completed or proposed GSP amendments.
- A reevaluation of the estimated sustainable yield of the Subbasin and the management areas by updating the YIHM with data collected since the last periodic evaluation.

5.6 GSP Implementation Schedule

The Yucaipa GSA has developed a schedule that outlines the approximate times at which the various monitoring and reporting components of the GSP will be implemented over the next 5 years (Figure 5-1). The actual start dates may vary from those shown in the schedule.

Management Actions Nos. 1, 2, and 3, described in Section 4.2, will go into effect at the adoption of the GSP. Implementation of Management Action No. 1 will be evaluated, at a minimum, every spring and fall when groundwater elevation data is collected and compared to the measurable objective and minimum thresholds established for the representative monitoring points described in Chapter 3. Implementation of Management Action No. 2 will be evaluated at the end of every water year when comparing water year pumping totals to sustainable yield pumping allocations. Implementation of Management Action No. 3 will occur when a groundwater user applies supplemental water stored in a management area to offset pumping exceedances identified when evaluating Management Action No. 2. Each management action will be reassessed every water year.

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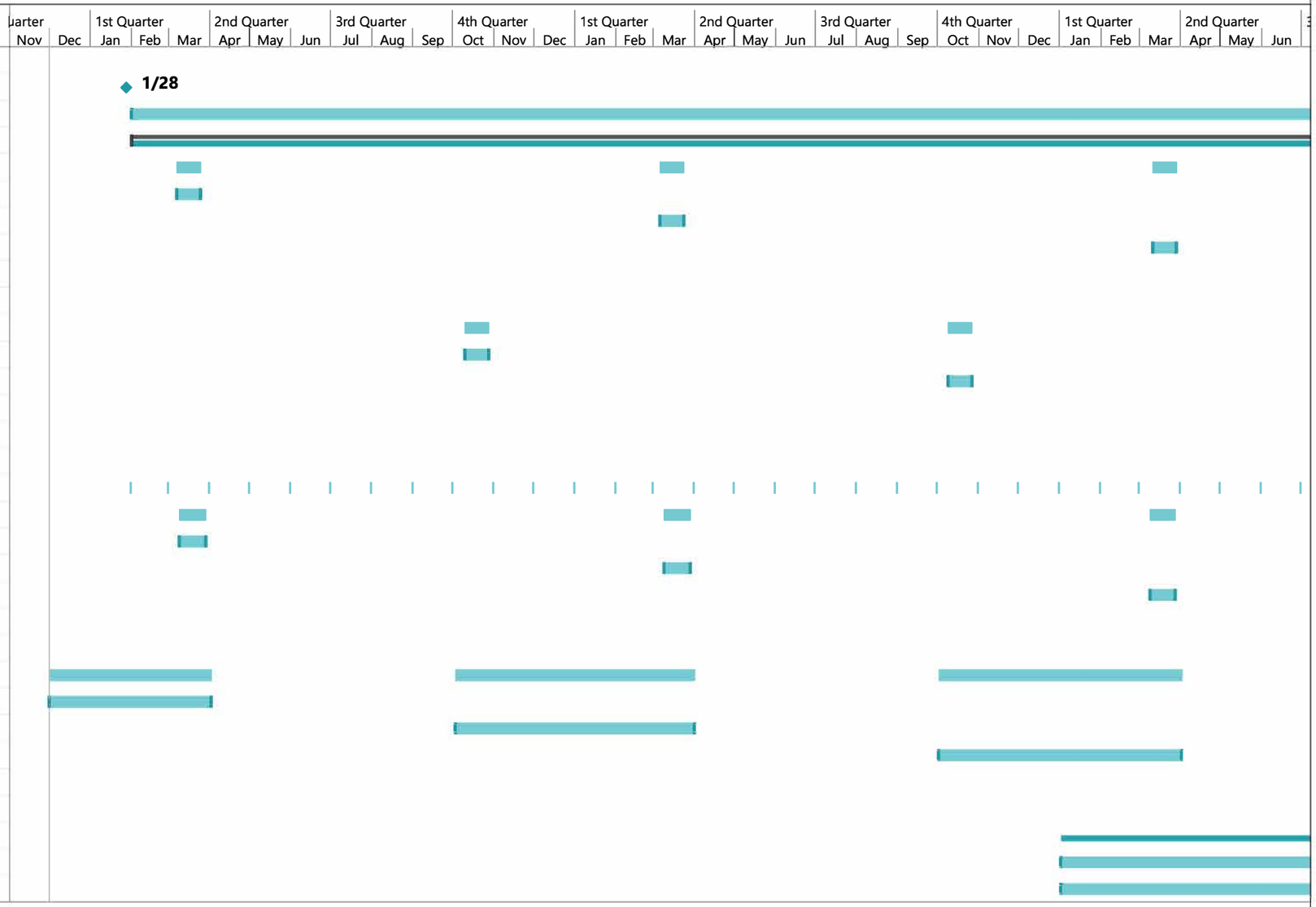
Figure 5-1. 5-Year Plan Implementation Schedule

ID	Task Name	Start	Finish
1			
2	GSP Submitted to DWR	Fri 1/28/22	Fri 1/28/22
3	GSP Administration	Tue 2/1/22	Thu 12/31/26
4	**Monitoring Program**	**Tue 2/1/22**	**Thu 12/31/26**
5	**Spring Groundwater Elevations**	**Mon 3/7/22**	**Thu 3/26/26**
6	Spring Groundwater Elevations 2022	Mon 3/7/22	Thu 3/24/22
7	Spring Groundwater Elevations 2023	Mon 3/6/23	Thu 3/23/23
8	Spring Groundwater Elevations 2024	Mon 3/11/24	Thu 3/28/24
9	Spring Groundwater Elevations 2025	Mon 3/10/25	Thu 3/27/25
10	Spring Groundwater Elevations 2026	Mon 3/9/26	Thu 3/26/26
11	**Fall Groundwater Elevations**	**Mon 10/10/22**	**Thu 10/29/26**
12	Fall Groundwater Elevations 2022	Mon 10/10/22	Thu 10/27/22
13	Fall Groundwater Elevations 2023	Mon 10/9/23	Thu 10/26/23
14	Fall Groundwater Elevations 2024	Mon 10/7/24	Thu 10/24/24
15	Fall Groundwater Elevations 2025	Mon 10/6/25	Thu 10/23/25
16	Fall Groundwater Elevations 2026	Mon 10/12/26	Thu 10/29/26
17	**Groundwater Production**	**Mon 1/31/22**	**Thu 12/31/26**
78	**Groundwater Quality**	**Wed 3/9/22**	**Thu 3/26/26**
79	Groundwater Quality 2022	Wed 3/9/22	Mon 3/28/22
80	Groundwater Quality 2023	Thu 3/9/23	Tue 3/28/23
81	Groundwater Quality 2024	Sat 3/9/24	Wed 3/27/24
82	Groundwater Quality 2025	Sun 3/9/25	Wed 3/26/25
83	Groundwater Quality 2026	Mon 3/9/26	Thu 3/26/26
84	**GSP Annual Report**	**Wed 12/1/21**	**Wed 4/1/26**
85	GSP Annual Report 2022	Wed 12/1/21	Fri 4/1/22
86	GSP Annual Report 2023	Mon 10/3/22	Fri 3/31/23
87	GSP Annual Report 2024	Mon 10/2/23	Mon 4/1/24
88	GSP Annual Report 2025	Tue 10/1/24	Tue 4/1/25
89	GSP Annual Report 2026	Wed 10/1/25	Wed 4/1/26
90	**Periodic Evaluation Report 2026**	**Sun 6/1/25**	**Wed 4/1/26**
91	Refine, Update and Calibrate YIHM	Tue 1/2/24	Tue 9/30/25
92	Evaluation Report Preparation	Tue 1/2/24	Wed 4/1/26



Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone

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Figure 5-1. 5-Year Plan Implementation Schedule

ID	Task Name	Start	Finish
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6	Spring Groundwater Elevations 2022	Mon 3/7/22	Thu 3/24/22
7	Spring Groundwater Elevations 2023	Mon 3/6/23	Thu 3/23/23
8	Spring Groundwater Elevations 2024	Mon 3/11/24	Thu 3/28/24
9	Spring Groundwater Elevations 2025	Mon 3/10/25	Thu 3/27/25
10	Spring Groundwater Elevations 2026	Mon 3/9/26	Thu 3/26/26
11	**Fall Groundwater Elevations**	**Mon 10/10/22**	**Thu 10/29/26**
12	Fall Groundwater Elevations 2022	Mon 10/10/22	Thu 10/27/22
13	Fall Groundwater Elevations 2023	Mon 10/9/23	Thu 10/26/23
14	Fall Groundwater Elevations 2024	Mon 10/7/24	Thu 10/24/24
15	Fall Groundwater Elevations 2025	Mon 10/6/25	Thu 10/23/25
16	Fall Groundwater Elevations 2026	Mon 10/12/26	Thu 10/29/26
17	**Groundwater Production**	**Mon 1/31/22**	**Thu 12/31/26**
78	**Groundwater Quality**	**Wed 3/9/22**	**Thu 3/26/26**
79	Groundwater Quality 2022	Wed 3/9/22	Mon 3/28/22
80	Groundwater Quality 2023	Thu 3/9/23	Tue 3/28/23
81	Groundwater Quality 2024	Sat 3/9/24	Wed 3/27/24
82	Groundwater Quality 2025	Sun 3/9/25	Wed 3/26/25
83	Groundwater Quality 2026	Mon 3/9/26	Thu 3/26/26
84	**GSP Annual Report**	**Wed 12/1/21**	**Wed 4/1/26**
85	GSP Annual Report 2022	Wed 12/1/21	Fri 4/1/22
86	GSP Annual Report 2023	Mon 10/3/22	Fri 3/31/23
87	GSP Annual Report 2024	Mon 10/2/23	Mon 4/1/24
88	GSP Annual Report 2025	Tue 10/1/24	Tue 4/1/25
89	GSP Annual Report 2026	Wed 10/1/25	Wed 4/1/26
90	**Periodic Evaluation Report 2026**	**Sun 6/1/25**	**Wed 4/1/26**
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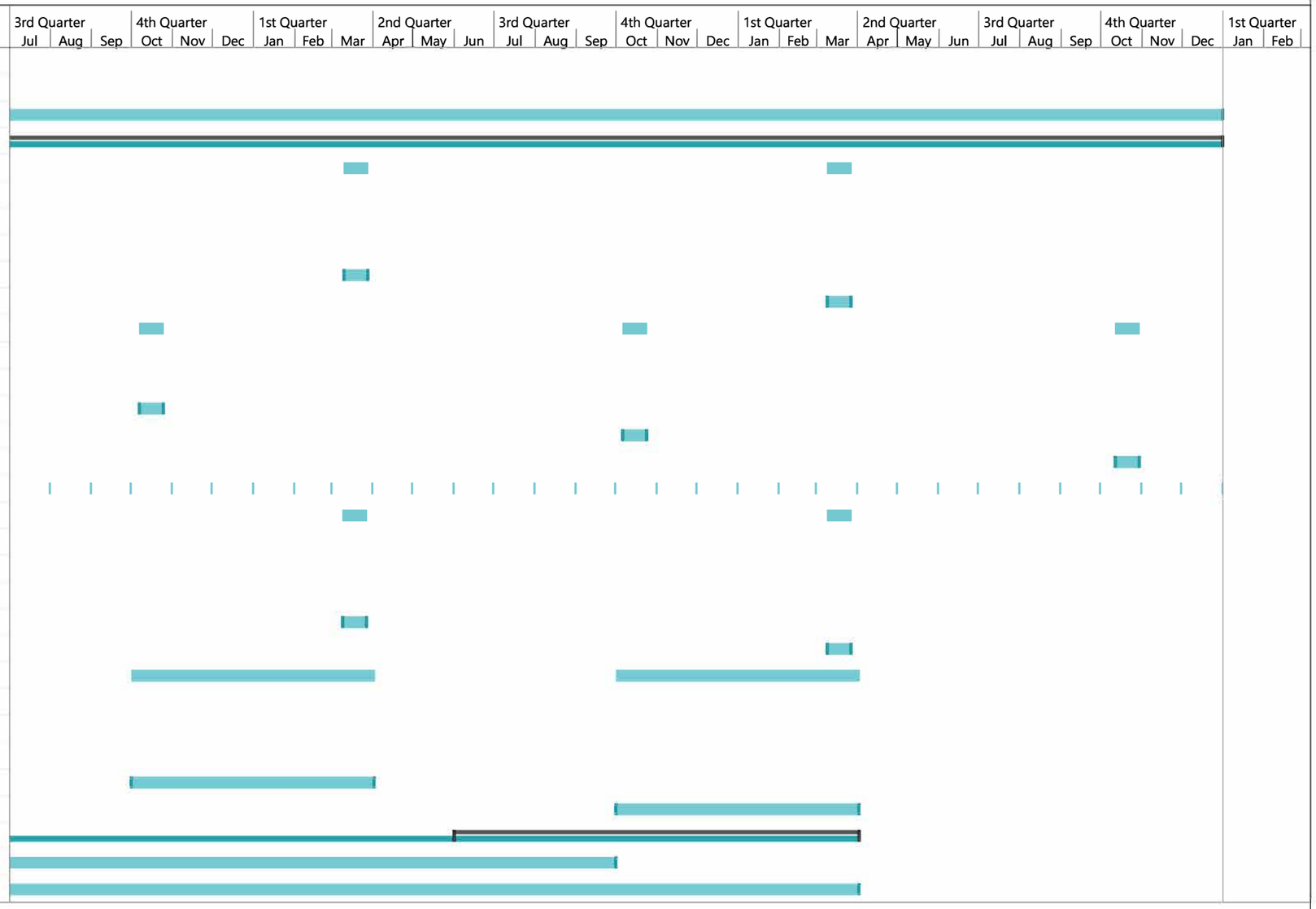

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone

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