# APPENDIX 4

# Evaluation of the CBP / Water Storage Investment Program Technical Memorandum

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# TECHNICAL MEMORANDUM

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SUBJECT: Evaluation of the Chino Basin Program/Water Storage Investment Program




## INTRODUCTION

Groundwater pumping rights in the Chino Basin were adjudicated in the 1970s and settled in the 1978 stipulated agreement (Judgment).[1] Figure 1 shows the location of the Chino Basin, the Chino Basin Optimum Basin Management Program (OBMP) defined groundwater management zones, and the Areas of Subsidence Concern.

The Inland Empire Utilities Agency (IEUA) is investigating the feasibility of conducting a Storage and Recovery Program in the Chino Basin called the Chino Basin Program (CBP). They have submitted the CBP for the Proposition 1 Water Storage Investment Program (WSIP) funding. The CBP would produce a total exchange of up to 375,000 acre-feet (af) of water over 25 years for the California Department of Fish and Wildlife to use to improve the habitat for native fish populations in the Bay-Delta watershed.

The IEUA retained Brown and Caldwell to conduct an engineering feasibility analysis of the CBP. The IEUA retained West Yost to use the Chino Basin Watermaster (Watermaster) 2020 Chino Valley Model (CVM) to evaluate the potential hydrologic impacts from various CBP alternatives within the Chino Basin. Impacts of the CBP project were evaluated based on methods and metrics that Watermaster traditionally uses to evaluate Storage and Recovery Programs, which are required by the Peace Agreement and documented in Watermaster's Storage Management Plan (WEI, 2020a).

[1] Original Judgment in Chino Basin Municipal Water District vs. City of Chino, et al., signed by Judge Howard B. Weiner, Case No. 164327. File transferred August 1989, by order of the Court, and assigned new case number RCV51010. The Restated Judgment can be found here: Link

Since the CBP alternatives investigated the injection of recycled water into the basin, the CBP alternatives must also be evaluated to determine compliance with the Title 22 Regulations for Groundwater Replenishment Reuse Project (Title 22). Brown and Caldwell (2020) summarized Title 22 requirements in their siting criteria for the planned injection wells in the CBP:

> *"Injection well locations need to consider nearby groundwater extraction well locations to confirm that there is sufficient travel time between the injection well and groundwater extraction well to meet regulatory requirements. Under the Title 22 Regulations for Groundwater Replenishment Using Recycled Water, purified recycled water must have a minimum response retention time (i.e., minimum period of time recycled water is retained underground, or travel time) of at least two months as demonstrated with tracer study after construction (see TM1 Appendix A, Summary of Title 22 Regulations for Groundwater Replenishment Using Recycled Water). Also in accordance with the Title 22 regulations, numerical modeling is granted 50% credit of a tracer test and must demonstrate four months of travel time between injection and extraction wells."*

This Technical Memorandum (TM) documents the West Yost application of the CVM to evaluate impacts to the Chino Basin, including impacts related to Title 22 compliance, that could be attributable to the implementation of one of the six CBP alternatives that the IEUA developed based on the two identified in Brown and Caldwell's feasibility study (2020). West Yost modeled these six scenarios to evaluate their impacts on the Chino Basin relative to a baseline scenario. The baseline scenario is based on the project scenario documented in the *Evaluation of the Local Storage Limitation Solution* (WY, 2021a) with updated locations of three planned wells owned by the Cucamonga Valley Water District (CVWD). West Yost used the CVM to estimate the travel time between water recharged at proposed injection wells and water extracted at CBP extraction wells and other nearby wells to evaluate Title 22 compliance. The results of this work will be used by the IEUA to assess the feasibility of the CBP and as a resource in the subsequent environmental review prepared by the IEUA pursuant to the California Environmental Quality Act.

# DESCRIPTION OF THE CHINO BASIN PROGRAM PLANNING SCENARIOS

Brown and Caldwell (2020) documented four potential CBP alternatives in their feasibility study. The IEUA chose two alternatives for further review and refinement. Based on these alternatives and subsequent discussions with IEUA stakeholders, six potential CBP scenarios were developed and chosen for analysis. This TM documents the projected impacts of these scenarios on the Chino Basin using the CVM. The impacts of the six CBP scenarios are evaluated relative to a baseline scenario, which is the planning scenario simulated in the *Evaluation of the Local Storage Limitation Solution* (WY, 2021a) with updated locations of three planned wells operated by the Cucamonga Valley Water District (CVWD).

## Climate Projections

For use in SGMA-related water budget development and groundwater modeling, the California Department of Water Resources (DWR, 2018) provides climate change datasets in the form of change factors of precipitation, ET0, and surface runoff for the years 2030 and 2070. To account for climate change, the future climate and hydrology simulated in the baseline scenario were adjusted using these change factors. The specific methodology is described in the 2020 Safe Yield Recalculation Report (WEI, 2020b).

## Put/Take Cycles

The CBP is assumed to operate from January 1, 2029 through December 31, 2053 (referenced herein as the program period). Table 1 shows the schedule of the operational cycles of injection (put) and extraction (take) volumes through the planned CBP facilities for the six CBP scenarios.

Scenarios 1 through 4 are characterized by continuous 15,000 acre-feet per year (afy) puts during the program period, for a total injection of 375,000 af. Scenarios 5 and 6 are characterized by continuous 12,000 afy puts during the program period, for a total injection of 300,000 af.

The take cycles for each of the scenarios follow a late or early call schedule. The late call takes occur during the following years:

- Cycle 1: January 1, 2036 to January 1, 2039
- Cycle 2: January 1, 2046 to January 1, 2049
- Cycle 3: January 1, 2052 to January 1, 2054

The early call takes occur during the following years:

- Cycle 1: January 1, 2029 to January 1, 2032
- Cycle 2: January 1, 2039 to January 1, 2042
- Cycle 3: January 1, 2049 to January 1, 2052

Scenarios 1 and 2 follow late and early call schedules, respectively. Take cycles consist of pumping 50,000 afy, except for the final year of Cycle 3 where the take is 25,000 af. The total take volume is 375,000 af over the program period.

Scenarios 3 and 4 follow late and early call schedules, respectively. Take cycles consist of pumping 40,000 afy, except for the final year of Cycle 3 where the take is 20,000 af. The total take volume during the eight call years is 300,000 af. During the 17 non-call years, pumping occurs at a constant rate of about 4,400 afy in Scenario 4 to increase the total take volume to equal the total injection of 375,000 af. The late call in Scenario 3 causes an increase in storage and a reduction in net recharge. To address this, the non-call year pumping was reduced by an amount approximately equal to the total reduction in net recharge over the program period. Since pumping affects net recharge, West Yost conducted multiple iterations of Scenario 3 until the discrepancy between total reduction in the non-call year pumping and the total reduction in net recharge was less than 0.1 percent of the total injection over the program period. The non-call year pumping in the final iteration was reduced by about 420 afy, which leaves a net balance of +7,140 af in the Chino Basin at the end of the program period. As a result, the total take volume in Scenario 3 is 367,860 af. The non-call year pumping in Scenario 4 was not reduced since the early call results in an increase in net recharge over the program period compared to the baseline.

The takes in Scenario 5 and 6 are identical to the takes in Scenarios 3 and 4, respectively, except there is no additional pumping in non-call years, reducing the total take volume to 300,000 af. The total injection and extraction over the program period for Scenarios 5 and 6 is 300,000 af.

**Table 1. Summary of Put/Take Cycles for the CBP Scenarios**

*values in 1,000 afy*

| | Scenario 1 | | Scenario 2 | | Scenario 3 | | Scenario 4 | | Scenario 5 | | Scenario 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calendar Year | Put | Take | Put | Take | Put | Take | Put | Take | Put | Take | Put | Take |
| 2029 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2030 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2031 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2032 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2033 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2034 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2035 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2036 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2037 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2038 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2039 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2040 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2041 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2042 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2043 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2044 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2045 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2046 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2047 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2048 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2049 | 15 | - | 15 | 50 | 15 | 4.0 | 15 | 40 | 12 | - | 12 | 40 |
| 2050 | 15 | - | 15 | 25 | 15 | 4.0 | 15 | 20 | 12 | - | 12 | 20 |
| 2051 | 15 | - | 15 | - | 15 | 4.0 | 15 | 4.4 | 12 | - | 12 | - |
| 2052 | 15 | 50 | 15 | - | 15 | 40 | 15 | 4.4 | 12 | 40 | 12 | - |
| 2053 | 15 | 25 | 15 | - | 15 | 20 | 15 | 4.4 | 12 | 20 | 12 | - |
| **Total** | **375** | **375** | **375** | **375** | **375** | **367.8** | **375** | **375** | **300** | **300** | **300** | **300** |

Figure 2 is a map of the Chino Basin that shows the assumed locations of the injection and extraction wells that will facilitate the puts and the takes in the CBP scenarios.[2] Each of the injection wells is assumed to have an injection capacity of 1,250 afy, exercised every year of the program. Each of the extraction wells is assumed to have a pumping rate ranging from 2,400 to 3,200 afy fully exercised during the years of 50,000 afy takes in Scenarios 1 and 2.

## Managed Storage

The term managed storage as used herein refers to water stored by the Parties to the Judgment and other entities and includes Carryover, Local Storage, and Supplemental Water held in storage accounts by the Parties and Storage and Recovery Programs. The water injected and extracted from the Chino Basin in the CBP is assumed to be a credit and a debit to the managed storage accounts, respectively. Figure 3 shows the planned end-of-year managed storage account balances for the baseline scenario and the six CBP scenarios from fiscal year (FY) 2019 through 2054. The program period spans FY 2029 through FY 2054. The current Safe Storage Capacity (SSC) for the Chino Basin[3] is superimposed on Figure 3 in the blue dotted line. The late call scenarios (Scenarios 1, 3, and 5) result in managed storage that exceeds the SSC after 2030. The CBP proposes an increase in SSC up to 700,000 af through June 30, 2039, and to 580,000 af from July 1, 2039 through June 30, 2048, with the SSC decreasing to 500,000 af thereafter (shown in the red dotted line).

The projected managed storage in the early call scenarios (Scenarios 2, 4, and 6) is less than in the baseline scenario over the program period. Conversely, the projected managed storage in the late call scenarios (Scenarios 1, 3, and 5) is greater than in the baseline scenario over the program period. Scenario 1 results in the greatest increase in managed storage compared to the baseline scenario, reaching 690,000 af at the end of FY2035, about 100,000 af greater than in the baseline scenario. The projected managed storage at the end of the program period in Scenario 3 is 7,140 af greater than in the baseline scenario, which is the leftover balance at the end of the program to offset the reduction in net recharge.

# PROJECTED BASIN RESPONSE TO THE CBP PLANNING SCENARIOS

This section describes the hydrologic impacts to the basin and the Parties from the implementation of the CBP planning scenarios. Evaluated impacts include changes in net recharge, groundwater levels, pumping sustainability, new land subsidence, state of Hydraulic Control, the speed and direction of significant contaminant plumes. Transit time of the injected water to the nearest extraction well(s) was also evaluated for Title 22 compliance.

## Net Recharge

Net recharge, as used herein, is the exploitable inflow to a groundwater basin over a specified period, either under historical conditions or in a future projection under prescribed operating conditions. Net recharge is influenced by the hydrology, cultural conditions, and water management practices of the period. Net recharge is equal to recharge minus uncontrolled discharge and excludes the recharge of supplemental water. Algebraically:

[2] Several additional wells are planned to be constructed for the CBP to provide redundant capacity. In this evaluation, these wells are assumed to be inactive and are not shown on Figure 2.

[3] See the Notice of Order Re: Motion Regarding Implementation of the Local Storage Limitation Solution here: link

$$Net\ recharge = \Delta S/\Delta t + O_p - I_{ar}$$

Where $\Delta S$ is change in storage over a base period, $\Delta t$ is the duration of a base period, and $O_p$ and $I_{ar}$ are the average groundwater pumping and average supplemental water recharge over the base period, respectively.

Figure 4 shows the time series of net recharge for the baseline scenario and the CBP planning scenarios for the period of fiscal year (FY) 2029 through 2054. The scenarios with late calls (Scenarios 1, 3, and 5) result in a decrease of net recharge compared to the baseline scenario. The scenarios with early calls (Scenarios 2, 4, and 6) result in an increase in net recharge compared to the baseline scenario. The projected net recharge in Scenario 1 averages about 410 afy less than the projected net recharge in the baseline scenario—the greatest negative difference of all six scenarios. The projected net recharge in Scenario 2 averages about 840 afy greater than the projected net recharge in the baseline scenario—the greatest positive difference of all six scenarios. The projected net recharge in Scenario 3 averages about 260 afy less than the projected net recharge in the baseline scenario, totaling -6,760 af over the program period, which is 380 af less than the leftover balance at the end of the program.

## Groundwater Elevations

To evaluate the impacts of the CBP operations on groundwater levels, we show maps of the difference in groundwater levels between each of the six CBP scenarios and the baseline scenario for three different years:

1. The year with the greatest positive difference in average groundwater levels (i.e., CBP groundwater levels are higher than in the baseline scenario).
2. The year with the greatest negative difference in average groundwater levels (i.e., CBP groundwater levels are lower than in the baseline scenario).
3. The final year of the program period (January 1, 2054).

Table 2 summarizes, for each of the six CBP scenarios, the groundwater level differences compared to the baseline scenario for the three years specified above. For each of the three years, Table 2 shows the greatest groundwater-level difference at any point in the Chino Basin and the average groundwater-level difference across the Chino Basin. Figures 5 through 22 are maps that show the differences in groundwater levels for each of the combinations of scenarios and years as indicated in Table 2. A review of Table 2 and the groundwater-level difference maps shows the following:

- Scenario 1 results in the greatest positive difference in average groundwater levels compared to the baseline scenario (+5.0 ft on January 1, 2036). Figure 5 shows that positive differences of almost +30 feet occur near the injection wells where the puts are assumed to occur.
- Scenario 2 results in the greatest negative difference in average groundwater levels compared to the baseline scenario (-4.5 ft on January 1, 2049). Figure 9 shows that negative differences of over -35 feet occur near the extraction wells where the takes are assumed to occur.

- For Scenarios 3 through 6 (Figures 11 through 22), the differences in groundwater levels compared to the baseline scenario are less than the differences in Scenarios 1 and 2 due to the lower magnitude of the takes in Scenarios 3 through 6.
- By the end of the program period in all six scenarios, the average differences in groundwater levels compared to the baseline scenario range from -0.5 to +1.2 feet.

**Table 2. Summary of Differences in Groundwater Levels between the CBP Scenarios and the Baseline Scenario [(a)]**

| Scenario | Maximum Positive Difference in Groundwater Levels over the Program Period | | | Maximum Negative Difference in Groundwater Levels over the Program Period | | | Difference in Groundwater Levels at the End of the Program Period | | |
|---|---|---|---|---|---|---|---|---|---|
| | Figure | Year | Average Difference in Groundwater Levels Compared to the Baseline Scenario (ft) | Figure | Year | Average Difference in Groundwater Levels Compared to the Baseline Scenario (ft) | Figure | Year | Average Difference in Groundwater Levels Compared to the Baseline Scenario (ft) |
| 1 | 5 | 2036 | 5.0 | 6 | 2049 | -0.5 | 7 | 2054 | -0.5 |
| 2 | 8 | 2049 | 1.1 | 9 | 2042 | -4.5 | 10 | 2054 | 1.2 |
| 3 | 11 | 2046 | 3.6 | 12 | 2049 | -0.1 | 13 | 2054 | 0.1 |
| 4 | 14 | 2049 | 0.8 | 15 | 2042 | -3.2 | 16 | 2054 | 1.0 |
| 5 | 17 | 2036 | 4.0 | 18 | 2049 | -0.4 | 19 | 2054 | -0.4 |
| 6 | 20 | 2049 | 0.9 | 21 | 2042 | -3.6 | 22 | 2054 | 1.0 |

(a) Groundwater level changes are calculated as the difference from the baseline groundwater level on January 1st of each year during the program period.

### *Pumping Sustainability*

The term *pumping sustainability*, as used herein, refers to the ability to produce water from a specific well at a desired production rate, given the groundwater level at that well and its well construction and current pumping equipment details. The projected groundwater-elevation time-series charts at individual wells (Attachment A) includes a pumping sustainability metric if provided by the Appropriator. Pumping sustainability metrics are defined by each well owner. Groundwater pumping at a well is assumed to be sustainable if the groundwater elevation at that well remains above the pumping sustainability metric. If the projected groundwater elevation declines below the sustainability metric, the owner will either lower the pumping equipment in their well, reduce pumping, or a combination of the two.

Figure 23 shows the wells that have pumping sustainability metrics. Table 3 shows a subset of these wells with projected groundwater levels that decline below the sustainability metric under the baseline scenario or any CBP scenario during the program period. These wells are labeled in red on Figure 23. The wells in Table 3 are sorted in order of magnitude of groundwater-level impact of the CBP scenarios. As shown in Table 3, there are 17 wells that are projected to experience pumping sustainability challenges in the baseline scenario. One or more CBP scenarios cause two additional wells (City of Ontario Well 39 and Jurupa Community Services District Well 16) to experience pumping sustainability challenges. One or more CBP scenarios are projected to exacerbate existing pumping sustainability challenges by 10 feet or more at the City of Ontario Wells 38, 37, and 31, and CVWD Well CB-5.

These projected effects on pumping sustainability are localized and temporary. As shown in the hydrographs in Attachment A, the minimum groundwater levels occur at the end of a take cycle and generally recover to near the baseline groundwater level three to four years after the take cycle ends. Potential actions to mitigate these pumping sustainability challenges include, but are not limited to: (1) modifying the put and take cycles, (2) strategically increasing supplemental water recharge near the affected wells, (3) modifying a party's affected well (lowering pump bowls), (4) providing an alternate supply to the affected party to ensure it can meet its demands, (5) a combination of (1) through (4), and (6) the implementation of a monitoring program to verify the effectiveness of the mitigation actions.

### *New Land Subsidence*

To evaluate the risk of the occurrence of new land subsidence across MZ1 in the *Evaluation of the Local Storage Limitation Solution* (WY, 2021a), minimum historical groundwater elevations at wells were used to develop a groundwater elevation control surface (new land subsidence metric) across MZ1 that defined the likelihood of initiating new subsidence: if groundwater levels are higher than the new land subsidence metric, then new land subsidence should not occur; if groundwater levels decline below the new land subsidence metric, then new land subsidence could occur.

The *Evaluation of the Local Storage Limitation Solution*, which used a planning scenario identical to the baseline scenario except for the updated locations of the planned CVWD wells in MZ2, indicated that groundwater levels were projected to remain higher than the new land subsidence metric "except for two small areas centered on wells where groundwater pumping can be modified to ensure no new land subsidence." Hence, the same conclusion can be assumed for the baseline scenario in this investigation.

**Table 3. Projected Pumping Sustainability Challenges at Wells in the Chino Basin[a]**

| Well Owner | Well Name | Pumping Sustainability Metric (ft-amsl) | Minimum Water Level Minus Pumping Sustainability Metric (ft)[b] | | | | | | | Greatest negative difference in water levels compared to baseline | Smallest negative difference in water levels compared to baseline | New pumping sustainability challenges due to one or more CBP scenarios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | | | |
| City of Ontario | 38 | 589 | -3 | -23 | -24 | -17 | -17 | -18 | -18 | -21 | -14 | |
| City of Ontario | 39 | 609 | 2 | -17 | -19 | -11 | -11 | -13 | -13 | -20 | -13 | x |
| City of Ontario | 37 | 609 | -1 | -20 | -21 | -14 | -14 | -15 | -15 | -20 | -13 | |
| Cucamonga Valley Water District | CB-5 | 613 | -17 | -33 | -35 | -28 | -29 | -30 | -30 | -18 | -11 | |
| City of Ontario | 31 | 635 | -5 | -19 | -20 | -14 | -14 | -15 | -15 | -16 | -9 | |
| Jurupa Community Services District | 13 | 627 | -41 | -46 | -46 | -44 | -43 | -45 | -43 | -5 | -2 | |
| Jurupa Community Services District | 20 | 580 | -2 | -7 | -6 | -6 | -4 | -6 | -4 | -5 | -2 | |
| Jurupa Community Services District | 18 | 580 | -5 | -9 | -8 | -8 | -7 | -8 | -7 | -4 | -2 | |
| Fontana Water Company | F26A | 765 | -73 | -70 | -72 | -70 | -70 | -71 | -71 | - | - | |
| Fontana Water Company | F24A | 769 | -57 | -55 | -56 | -54 | -55 | -55 | -56 | - | - | |
| Fontana Water Company | F44B | 703 | -14 | -13 | -13 | -12 | -11 | -13 | -12 | - | - | |
| Jurupa Community Services District | 14 | 560 | -6 | -9 | -8 | -8 | -7 | -8 | -7 | -3 | -1 | |
| City of Pomona | 21 | 613 | -32 | -31 | -35 | -31 | -34 | -31 | -34 | -2 | -2 | |
| Jurupa Community Services District | 16 | 552 | 2 | -1 | 0 | 0 | 0 | 0 | 1 | -2 | -1 | x |
| Fontana Water Company | F23A | 723 | -17 | -18 | -18 | -17 | -16 | -18 | -16 | -0.5 | -0.5 | |
| Jurupa Community Services District | 8 | 581 | -2 | -3 | -3 | -3 | -3 | -3 | -3 | -1 | -1 | |
| Chino Basin Desalter Authority | II-1 | 574 | -64 | -64 | -65 | -64 | -65 | -64 | -65 | -1 | -0.4 | |
| Chino Basin Desalter Authority | I-14 | 533 | -26 | -26 | -27 | -26 | -27 | -26 | -27 | -1 | -0.2 | |
| Chino Basin Desalter Authority | I-15 | 528 | -18 | -18 | -19 | -18 | -19 | -18 | -19 | -1 | -0.2 | |

(a) Wells are sorted in order of magnitude of groundwater-level impact of the CBP scenarios.

(b) Determined over the program period.

To determine the risk of new land subsidence, projected minimum groundwater levels for the CBP scenarios and the baseline scenario were compared at each of the locations in MZ1 that were used to develop the new land subsidence metric in the *Evaluation of the Local Storage Limitation Solution*. The CBP scenarios are not projected to initiate new land subsidence in any location in MZ1 that was not already projected to initiate new land subsidence in the baseline scenario. Scenario 2 results in the greatest negative difference in minimum groundwater levels compared to the baseline scenario (about -2.5 feet). The location of the greatest negative difference is an area where new subsidence was already projected to occur in the *Evaluation of the Local Storage Limitation Solution*. These projected additional declines in groundwater levels (by up to -2.5 ft) have the potential to exacerbate the occurrence of new subsidence in these areas. The minimum groundwater levels in MZ1 in Scenarios 3 and 5 are always greater than or equal to the groundwater levels in MZ1 in the baseline scenario; therefore, there is no increased risk of new land subsidence in these scenarios.

Watermaster regularly monitors pumping, groundwater levels, and ground motion in the Areas of Subsidence Concern pursuant to its adaptive Subsidence Management Plan under the guidance and supervision of the Ground Level Monitoring Committee (GLMC). Participation in the GLMC process could be an appropriate monitoring and mitigation measure to ensure that the CBP does not result in MPI related to land subsidence in the Chino Basin.

## State of Hydraulic Control

The projected state of Hydraulic Control was estimated with the CVM by simulating the Chino Basin response to the baseline and CBP scenarios. The attainment of Hydraulic Control is measured by demonstrating, from groundwater elevation data, either that all groundwater north of the Chino Desalter Authority (CDA) well field cannot pass through the CDA well field (total hydraulic containment standard) or that groundwater discharge through the CDA well field is, in aggregate, less than 1,000 afy (the de minimus discharge standard). The Regional Board has agreed that compliance with the de minimus discharge standard will be determined from groundwater monitoring data and the results of periodic calibration of the Watermaster groundwater model (currently the CVM) and interpretations of the calibration results. The modeling results indicate that the CDA well field is a complete barrier to all groundwater flow towards the Santa Ana River except in the Chino Creek Well Field (CCWF) where some discharge past the CCWF is projected to occur.

Figure 24 shows the time series of groundwater discharge through the CCWF for the baseline and the CBP scenarios and compares them to the de minimus discharge standard of 1,000 afy. The discharge through the CCWF in the baseline scenario and all CBP scenarios declines over time, never exceeds more than about 450 afy, and is always less than the de minimus discharge standard. Discharge past the CCWF is greatest under Scenario 1, where the discharge averages 10 afy more than the baseline scenario over the program period.

## Movement of Water Quality Anomalies

The Chino Basin has seven major volatile organic compound (VOC) plumes which have been documented in recent Watermaster reports (WY, 2021b). To assess the impact of the CBP planning scenarios on the movement of these plumes, we used MT3D-USGS (Bedekar, 2016) to simulate their movement over time compared to the baseline. Figures 25 through 27 show the projected locations of the plumes at the end of the program period for the baseline scenario compared to Scenarios 1 and 2, 3 and 4, and 5 and 6, respectively. A review of Figures 25 through 27 show that none of the CBP scenarios are projected to accelerate the southern (downgradient) boundaries of the plumes compared to the baseline scenario. The

plume displacements due to the CBP scenarios are minor compared to the magnitude of the projected movement of the plumes in the baseline scenario. None of the CBP scenarios are projected to result in any plume impacting a well operated by an Appropriative Pool party that is not already projected to be impacted under the baseline scenario.

# Travel Time of Injected Water

## *Methodology*

The particle-tracking model MODPATH (Pollock, 2016) was used to calculate travel time between the injection wells and extraction wells. In a particle-tracking simulation, tracer particles are inserted into the groundwater model around injection wells at specific times, then MODPATH calculates the flow paths and travel times of the inserted particles based on the simulated flow fields of the groundwater-flow model.

To estimate the residence time of the treated recycled water injected at the CBP injection wells, a cluster of 21 particles were inserted at each of the model grid cells corresponding to the planned injection wells. New clusters of particles were inserted each quarter during the program period to capture the changes in the groundwater flow field over time. The travel time of particles that reach CBP extraction wells or the Parties' extraction wells can be used as a metric to evaluate compliance with Title 22 regulations.

As mentioned in the introduction and Brown and Caldwell (2020), numerical modeling methods must demonstrate four months of travel time between injection and extraction wells. Brown and Caldwell (2020) use the conservative estimate of six months of travel time as a threshold for determining compliance with Title 22 regulations.

## *Results*

Figure 28 shows the locations of particles at six months (light blue) and two years (dark blue) after their release from the injection wells during the program period for Scenario 1. Six months after particles are released, all particles are located within 0.2 miles of their original location. Two years after particles are released, all particles are still within one mile of their initial locations. Scenarios 2 through 6 show similar patterns of particle migration.

Table 4 lists the five extraction wells that are projected to extract particles with travel times of less than three years in one or more CBP scenarios. For each of these extraction wells, Table 4 shows the shortest travel time of a particle to the well under each of the CBP scenarios and lists the injection wells from where the particles originated. The minimum travel time from an injection well to an extraction well occurs at CBP well EW-04 in Scenarios 1 and 2, where the minimum travel times are 8.3 months and 8.4 months, respectively. No Appropriator wells are projected to extract particles within one year of release from an injection well. All CBP scenarios meet the Brown and Caldwell six-month threshold for travel time of injected water.

**Table 4. Summary of Extraction Wells Projected to Extract Particles with Travel Times of Less Than Three Years**

| Well Name | Well Owner | Existing/ Planned Well | Shortest Travel Time to Extraction Well (months) | | | | | | CBP Injection Well Source(s) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | |
| CB-43 | CVWD | Existing | 19.4 | 19.3 | 20.5 | 20.6 | 23.5 | 23.5 | CBP-IW-15 |
| CB-50 | CVWD | Planned | 13.8 | 13.7 | 14.7 | 14.8 | 15.5 | 15.7 | CBP-IW-10[(a)], CBP-IW-6, CBP-IW-7, CBP-IW-9 |
| EW-02 | CBP | Planned | 14.8 | 14.7 | 16.4 | 16.4 | 17.0 | 17.1 | CBP-IW-4, CBP-IW-3, CBP-IW-2, |
| EW-03 | CBP | Planned | 9.1 | 9.1 | 10.2 | 10.3 | 10.8 | 10.9 | CBP-IW-12[(b)], CBP-IW-7 |
| EW-04 | CBP | Planned | 8.3 | 8.4 | 10.0 | 10.1 | 13.2 | 13.2 | CBP-IW-15, CBP-IW-16, CBP-IW-11 |

(a) Only a source in Scenarios 1,3,5, and 6.

(b) Only a source in Scenario 2.

# SUMMARY OF POTENTIAL IMPACTS AND TITLE 22 COMPLIANCE

Table 5 below summarizes the potential impacts to the Chino Basin and the Parties from implementation of the CBP scenarios.

**Table 5. Summary of Potential MPI and Adverse Impacts**

| Potential Impact Category | Projected Impacts of the CBP Scenarios |
|---|---|
| Net recharge and Safe Yield | Net recharge is projected to decrease in the late call scenarios (Scenarios 1, 3, and 5) by an average of 260 to 410 afy during the program period. Net recharge is projected to increase in the early call scenarios (Scenarios 2, 4, and 6) by an average of 680 to 840 afy during the program period. |
| Pumping sustainability | Under the baseline scenario, 17 wells are projected to experience pumping sustainability challenges. One or more of the CBP scenarios are expected to cause pumping sustainability challenges at two additional wells and exacerbate the existing pumping sustainability challenges at several wells identified under the baseline scenario. |
| New land subsidence | New land subsidence is projected to be minor and only occur in areas already identified under the baseline scenario. |
| State of Hydraulic Control | Hydraulic Control is projected to be maintained through 2053. |
| Direction and speed of known plumes | Plume displacement is projected to be minor and is not projected to impact any previously unimpacted Appropriator wells through 2053. |
| Title 22 Compliance | No compliance challenges with minimum travel times are expected to occur with currently active wells and assumed locations for future wells. |

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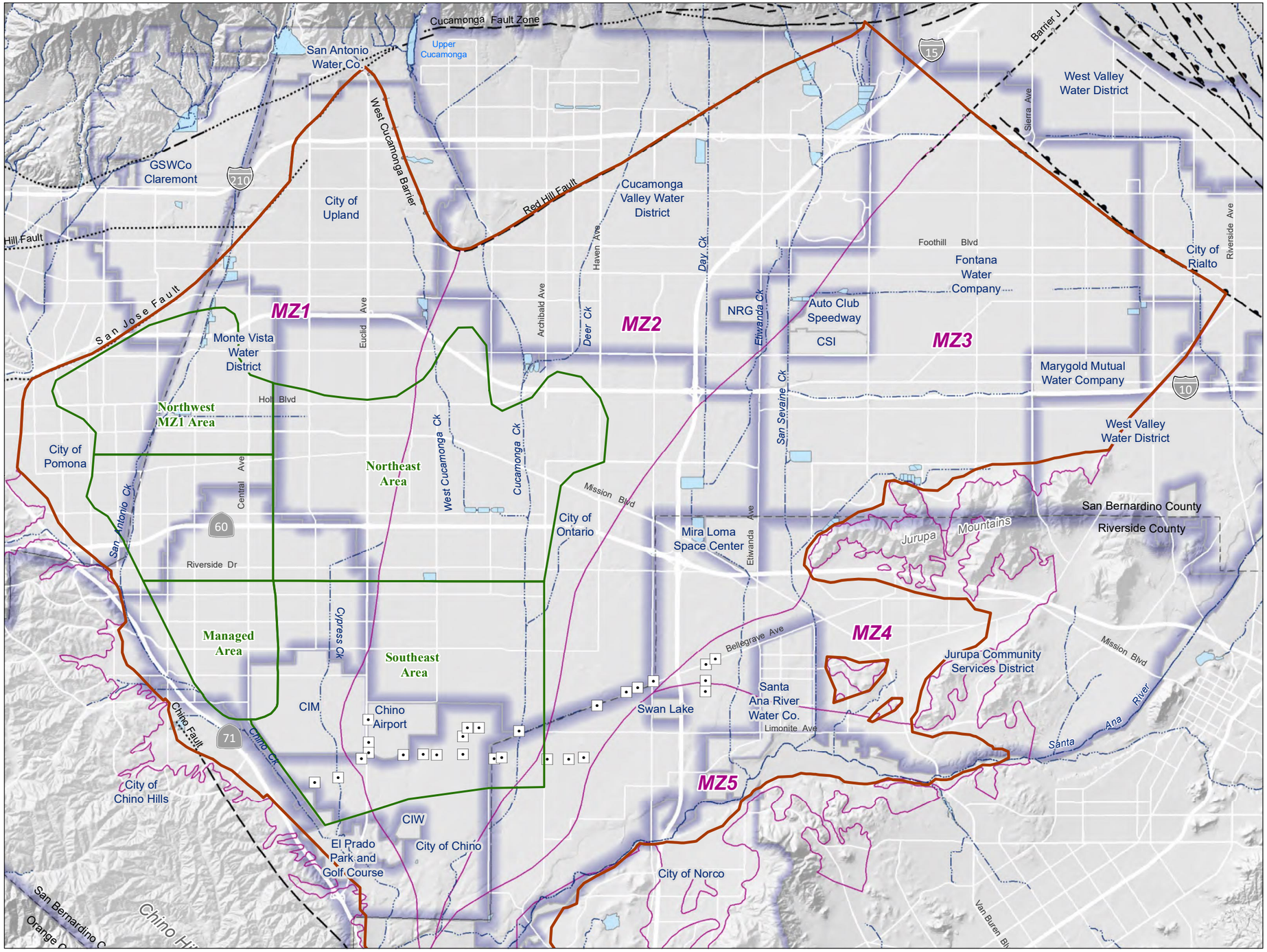






OBMP Management Zones

Water Service Areas

Chino Basin Part of the Active CVM MODFLOW Domain

Areas of Subsidence Concern

Streams & Flood Control Channels

Flood Control & Conservation Basins

Chino Desalter Wells




Prepared by:

WEST YOST

Author: TA
Date: 10/4/2021
File: Figure 1 Chino Basin.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

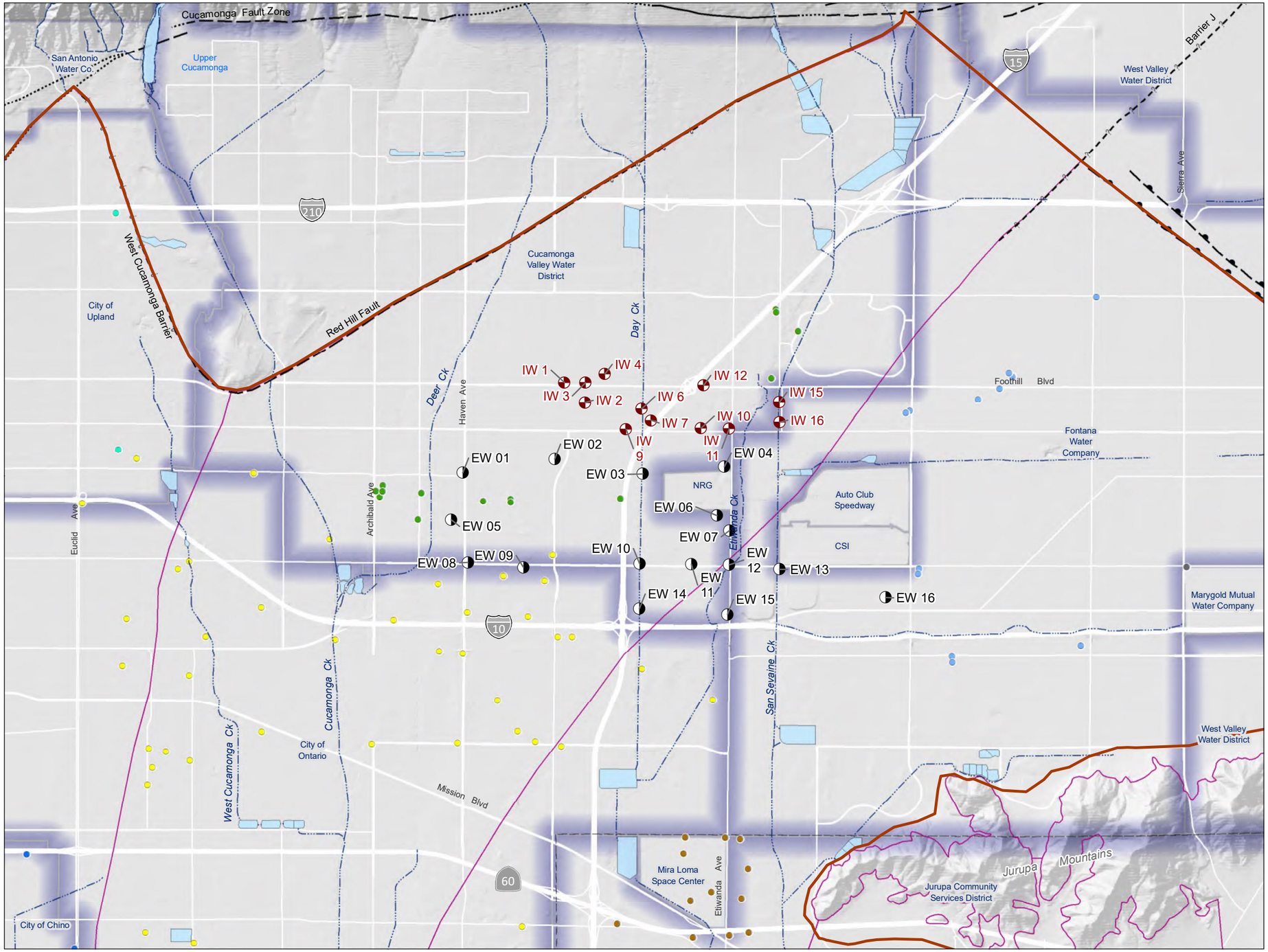
**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Chino Groundwater Basin**

**Figure 1**




## Facilities for Conducting Puts and Takes in CBP Scenarios

- Injection Well
- Extraction Well

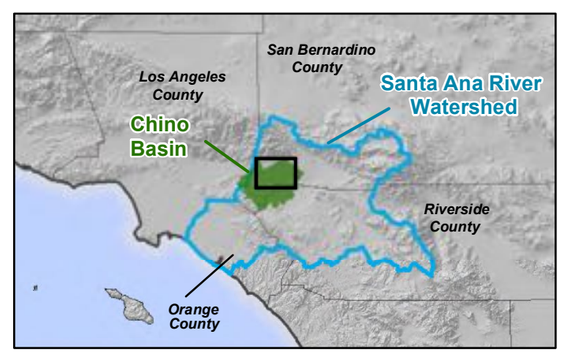
### Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

- Chino Desalter Wells
- Streams & Flood Control Channels
- Chino Basin Part of the Active CVM MODFLOW Domain
- OBMP Management Zones
- Water Service Areas
- Flood Control & Conservation Basins

### *Faults*

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain




Prepared by:

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Author: TA
Date: 10/4/2021
File: Figure 2 CBP Facilities.mxd

0 1 2 Miles
0 2 4 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Chino Basin and Facilities used in CBP Scenarios**

**Figure 2**

Figure 3. Planned End-of-Year Volume in Managed Storage for the Baseline and CBP Scenarios

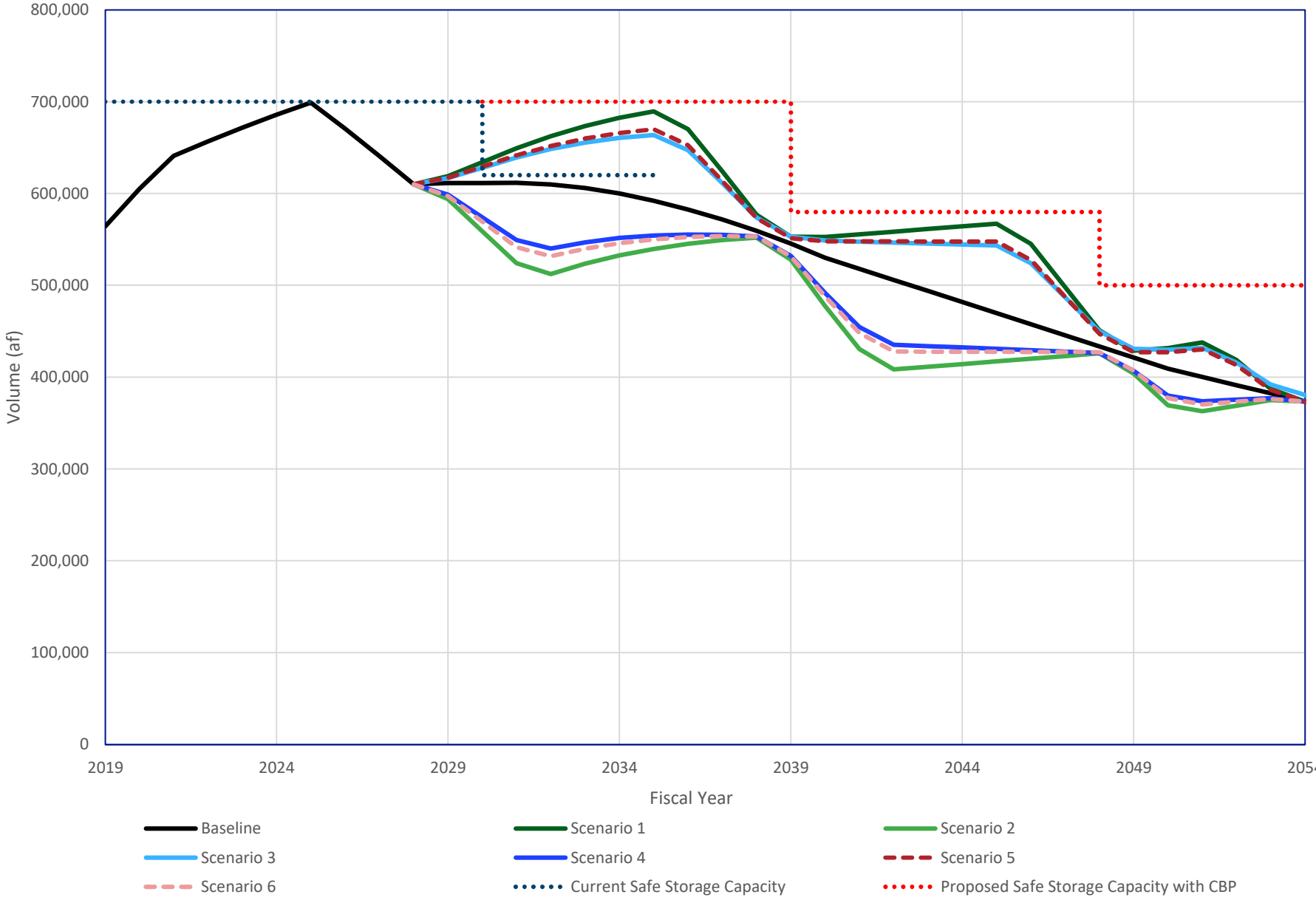
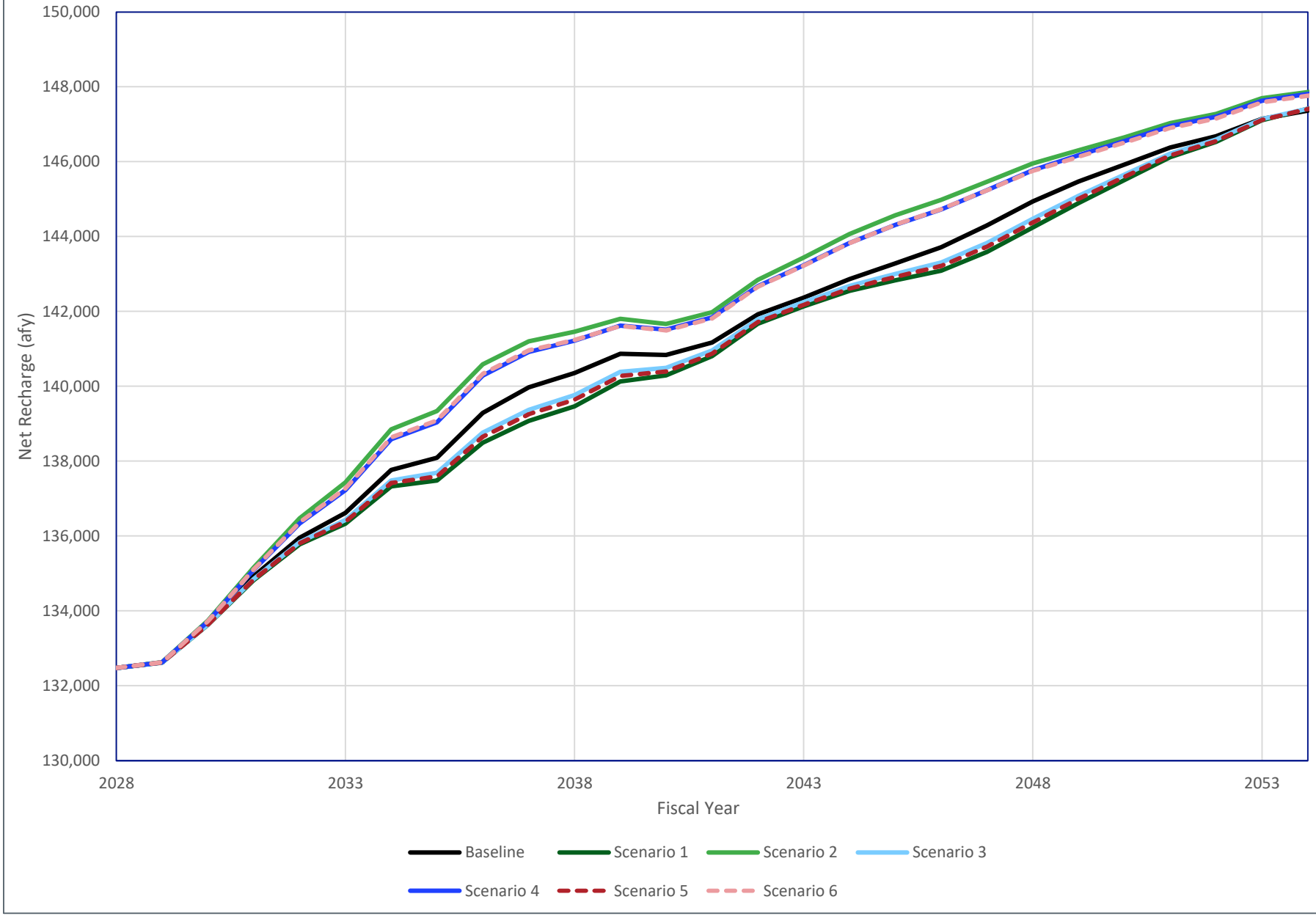


Figure 4. Projected Net Recharge for the Baseline and CBP Scenarios



Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 1 minus Baseline (Jan. 2036)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 1 minus Baseline (Jan. 2036)*

Difference in Groundwater Level (ft)
*January 2036 - Scenario 1 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones

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Author: GR
Date: 10/4/2021
File: Fig5 GWLch S1-BL 2036.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 1 minus Baseline (January 2036)*

**Figure 5**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 1 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 1 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 1 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Author: GR
Date: 10/4/2021
File: Fig6 GWLch S1-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 1 minus Baseline (January 2049)*

**Figure 6**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 1 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 1 minus Baseline (Jan. 2054)*

**Difference in Groundwater Level (ft)**
*January 2054 - Scenario 1 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

**Appropriative Pool Pumping Wells**

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Author: GR
Date: 10/4/2021
File: Fig7 GWLch S1-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 1 minus Baseline (January 2054)*

**Figure 7**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 2 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 2 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 2 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Author: GR
Date: 10/4/2021
File: Fig8 GWLch S2-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 2 minus Baseline (January 2049)*

**Figure 8**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 2 minus Baseline (Jan. 2042)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 2 minus Baseline (Jan. 2042)*

Difference in Groundwater Level (ft)
*January 2042 - Scenario 2 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Author: GR
Date: 10/4/2021
File: Fig9 GWLch S2-BL 2042.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 2 minus Baseline (January 2042)*

**Figure 9**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 2 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 2 minus Baseline (Jan. 2054)*

Difference in Groundwater Level (ft)
*January 2054 - Scenario 2 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Date: 10/4/2021
File: Fig10 GWLch S2-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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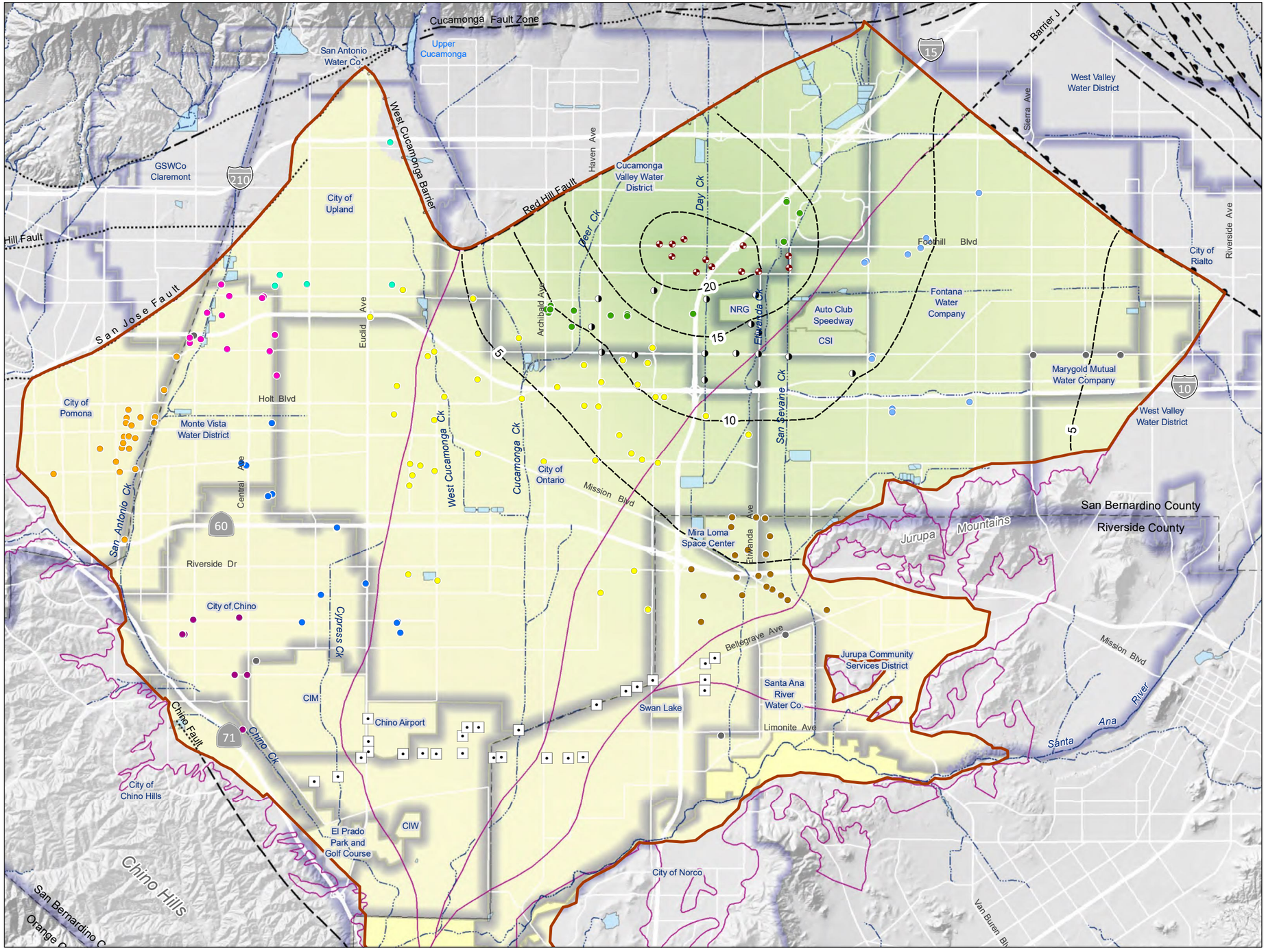
**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 2 minus Baseline (January 2054)*

**Figure 10**




Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 3 minus Baseline (Jan. 2046)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 3 minus Baseline (Jan. 2046)*

Difference in Groundwater Level (ft)
*January 2046 - Scenario 3 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones

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Author: GR
Date: 10/4/2021
File: Fig11 GWLch S3-BL 2046.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

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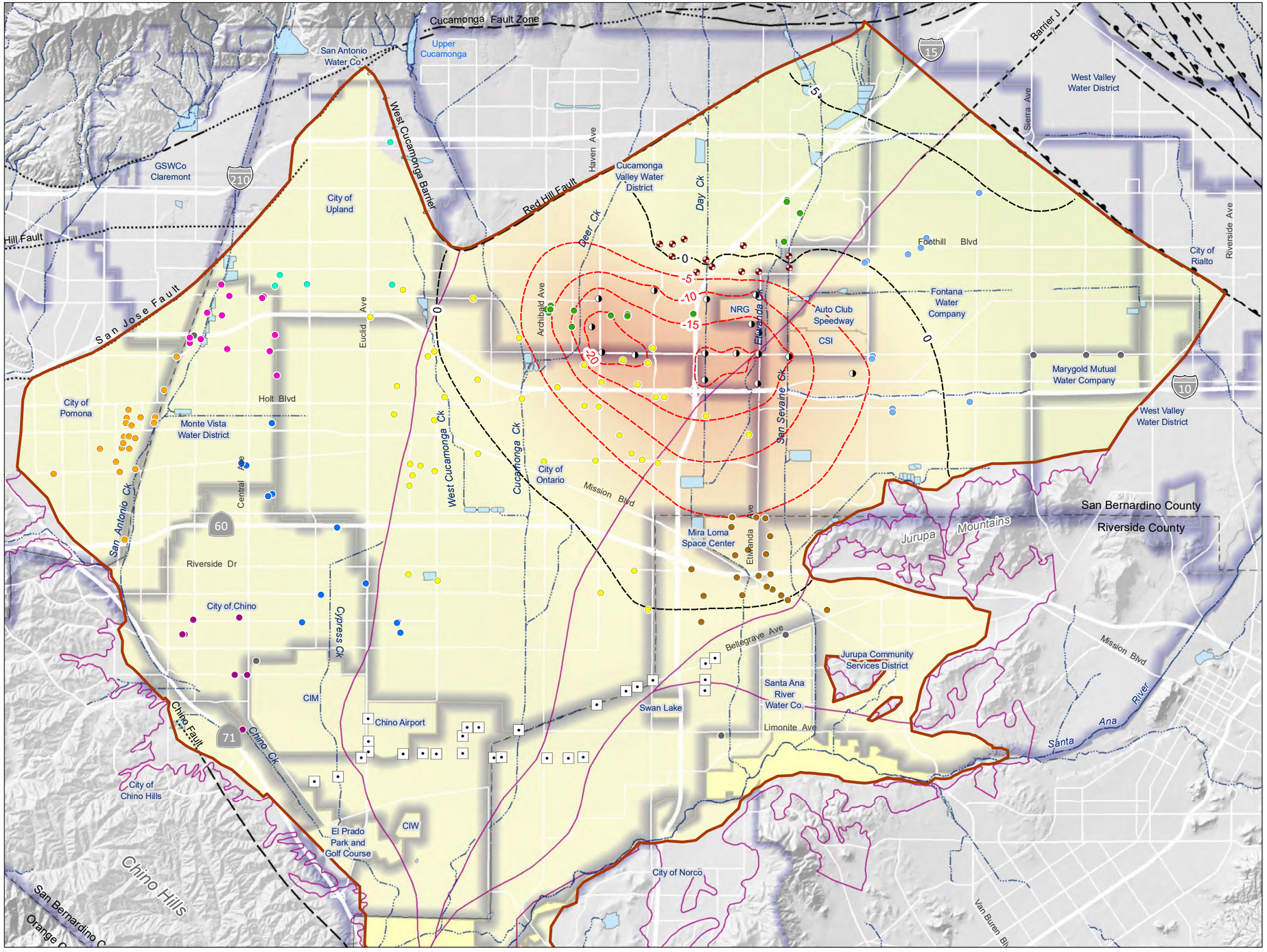
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 3 minus Baseline (January 2046)*

**Figure 11**




Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 3 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 3 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 3 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones

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Date: 10/4/2021
File: Fig12 GWLch S3-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 3 minus Baseline (January 2049)*

**Figure 12**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 3 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 3 minus Baseline (Jan. 2054)*

Difference in Groundwater Level (ft)
*January 2054 - Scenario 3 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




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Date: 10/4/2021
File: Fig13 GWLch S3-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 3 minus Baseline (January 2054)*

**Figure 13**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 4 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 4 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 4 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:
WEST YOST

Author: GR
Date: 10/4/2021
File: Fig14 GWLch S4-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 4 minus Baseline (January 2049)*

**Figure 14**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 4 minus Baseline (Jan. 2042)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 4 minus Baseline (Jan. 2042)*

**Difference in Groundwater Level (ft)**
*January 2042 - Scenario 4 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

**Appropriative Pool Pumping Wells**

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig15 GWLch S4-BL 2042.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 4 minus Baseline (January 2042)*

**Figure 15**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 4 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 4 minus Baseline (Jan. 2054)*

Difference in Groundwater Level (ft)
*January 2054 - Scenario 4 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig16 GWLch S4-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 4 minus Baseline (January 2054)*

**Figure 16**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 5 minus Baseline (Jan. 2036)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 5 minus Baseline (Jan. 2036)*

Difference in Groundwater Level (ft)
*January 2036 - Scenario 5 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig17 GWLch S5-BL 2036.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

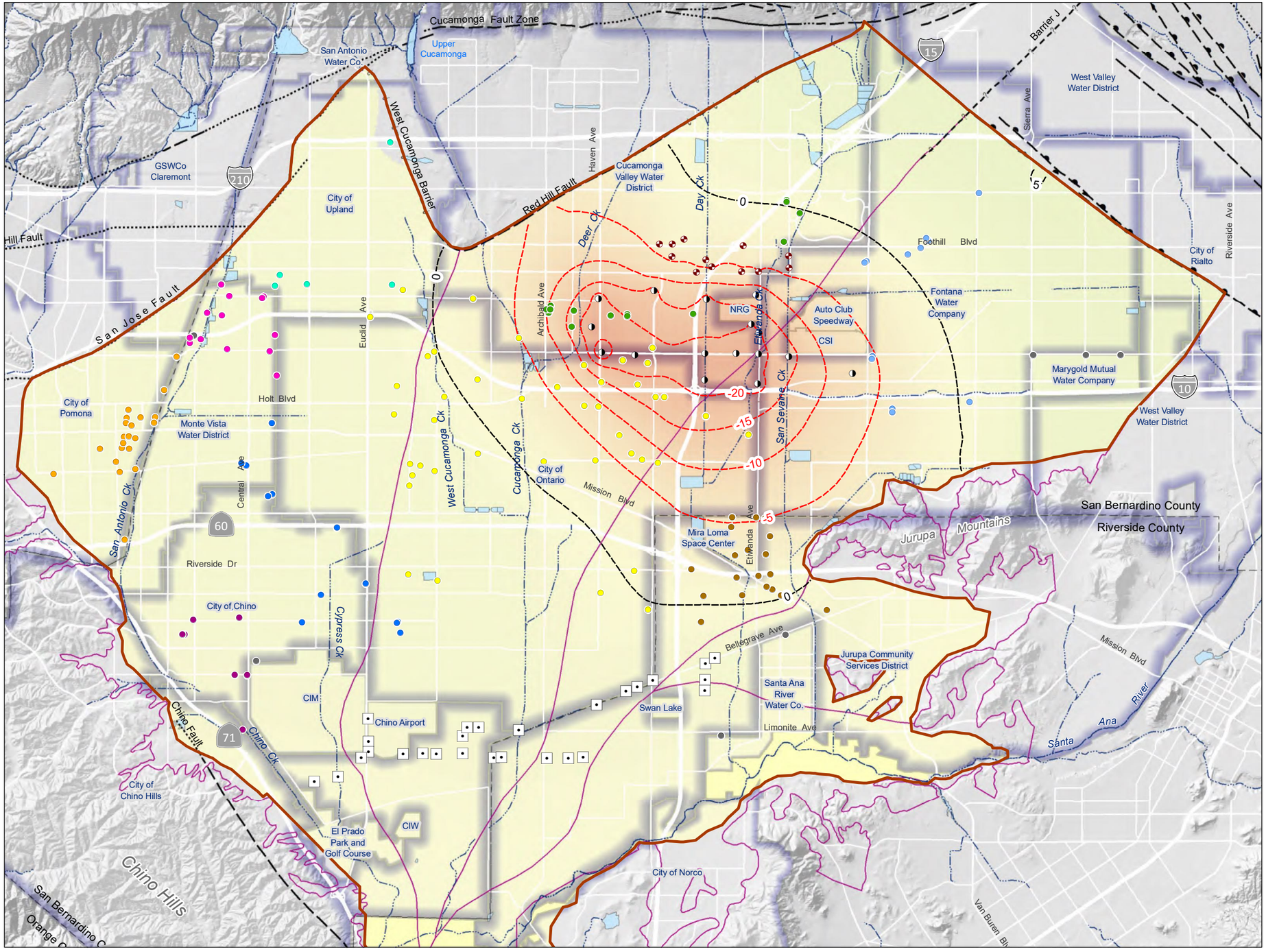
**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 5 minus Baseline (January 2036)*

**Figure 17**




Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 5 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 5 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 5 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig18 GWLch S5-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 5 minus Baseline (January 2049)*

**Figure 18**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 5 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 5 minus Baseline (Jan. 2054)*

Difference in Groundwater Level (ft)
*January 2054 - Scenario 5 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig19 GWLch S5-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 5 minus Baseline (January 2054)*

**Figure 19**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 6 minus Baseline (Jan. 2049)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 6 minus Baseline (Jan. 2049)*

Difference in Groundwater Level (ft)
*January 2049 - Scenario 6 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:
WEST YOST

Author: GR
Date: 10/4/2021
File: Fig20 GWLch S6-BL 2049.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 6 minus Baseline (January 2049)*

**Figure 20**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 6 minus Baseline (Jan. 2042)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 6 minus Baseline (Jan. 2042)*

**Difference in Groundwater Level (ft)**
*January 2042 - Scenario 6 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

**Appropriative Pool Pumping Wells**

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/4/2021
File: Fig21 GWLch S6-BL 2042.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 6 minus Baseline (January 2042)*

**Figure 21**

Contour of Difference in Groundwater Level (ft)
Positive Difference *Scenario 6 minus Baseline (Jan. 2054)*

Contour of Difference in Groundwater Level (ft)
Negative Difference *Scenario 6 minus Baseline (Jan. 2054)*

Difference in Groundwater Level (ft)
*January 2054 - Scenario 6 minus Baseline*

50
0
-50

Areas where Scenario will result in higher groundwater levels than the Baseline

Areas where Scenario will result in lower groundwater levels than the Baseline

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Wells

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:
WEST YOST

Author: GR
Date: 10/4/2021
File: Fig22 GWLch S6-BL 2054.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Projected Difference in Groundwater Levels for Layer 1**
*Scenario 6 minus Baseline (January 2054)*

**Figure 22**

Wells with Pumping Sustainability Metric[1]

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Marygold Mutual Water Company
- Monte Vista Water District
- Chino Basin Desalter Authority

[1] Wells labeled in red are projected to have groundwater levels below the pumping sustainability metric under the baseline or CBP scenario during the program period. These wells are shown in Table 3.

Well with projected groundwater levels above the sustainability metric in the baseline scenario but below the sustainability metric in one or more CBP scenarios

Active CBP Injection Well

Active CBP Extraction Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Water Service Area

Chino Basin Part of the Active CVM MODFLOW Domain

OBMP Management Zones




Prepared by:

WEST YOST

Author: LS
Date: 10/4/2021
File: Figure 23 PSME Map.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

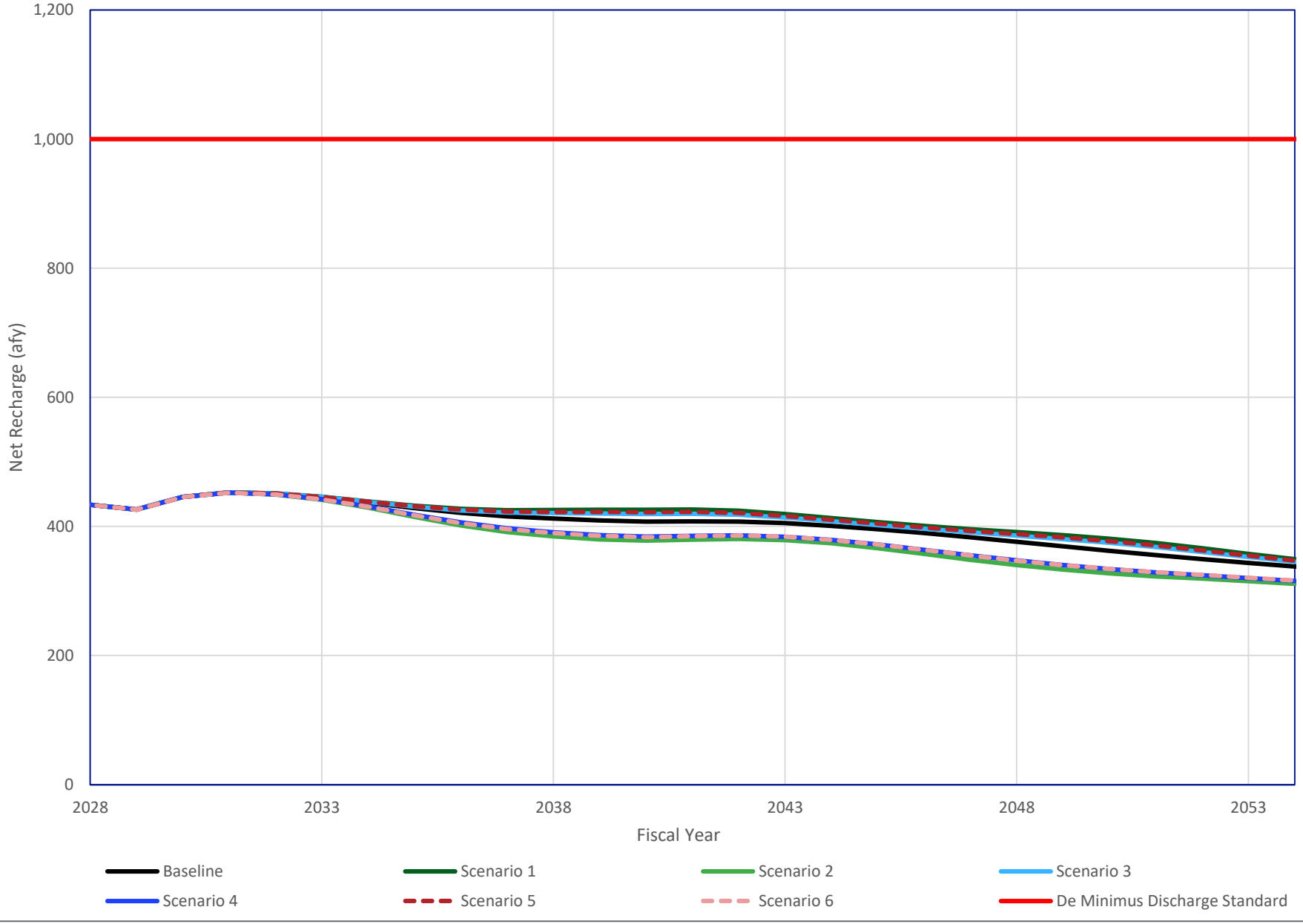
Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Wells with Pumping Sustainability Metric**

**Figure 23**

Figure 24. Projected Discharge through the Chino Creek Wellfield for the Baseline and CBP Scenarios



TCE concentrations in the Pomona Area plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

TCE concentrations in the Milliken Landfill plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the CIM plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the South Archibald plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

City of Upland
Cucamonga Valley Water District
Red Hill Fault
Indian Hill Fault
San Jose Fault
City of Pomona
Monte Vista Water District
City of Ontario
City of Chino
Jurupa Community Services District
Santa Ana River Water Co.
CIM
Chino Fault
Chino Airport
City of Chino Hills
CIW
City of Norco
10
15
60
71

**Estimated Initial TCE Concentration (µg/L)**

- 0.01 to 5
- > 5

**Projected Boundary of TCE Plume in January 2054**

- Baseline (TCE > 5 µg/L)
- Scenario 1 (TCE > 5 µg/L)
- Scenario 2 (TCE > 5 µg/L)

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

- Active CBP Injection Well
- Active CBP Extraction Well
- Chino Desalter Wells
- Streams & Flood Control Channels
- Flood Control & Conservation Basins
- Water Service Area
- Chino Basin Part of the Active CVM MODFLOW Domain
- OBMP Management Zones




Prepared by:

WEST YOST

Author: LS
Date: 10/15/2021
File: Figure 25 WQ_Anomalies_2054.mxd

0 1 2 3 Miles
0 1 2 3 4 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Estimated Location of Water Quality Anomalies, Baseline and CBP Scenarios**
*Scenarios 1 and 2 - January 2054*

**Figure 25**

TCE concentrations in the Pomona Area plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

TCE concentrations in the Milliken Landfill plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the CIM plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the South Archibald plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

City of Upland
Cucamonga Valley Water District
Red Hill Fault
Indian Hill Fault
San Jose Fault
City of Pomona
Monte Vista Water District
City of Ontario
City of Chino
CIM
Chino Airport
Chino Fault
City of Chino Hills
CIW
Jurupa Community Services District
Santa Ana River Water Co.
City of Norco
10
15
60
71

**Estimated Initial TCE Concentration (µg/L)**

- 0.01 to 5
- > 5

**Projected Boundary of TCE Plume in January 2054**

- Baseline (TCE > 5 µg/L)
- Scenario 3 (TCE > 5 µg/L)
- Scenario 4 (TCE > 5 µg/L)

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

- Active CBP Injection Well
- Active CBP Extraction Well
- Chino Desalter Wells
- Streams & Flood Control Channels
- Flood Control & Conservation Basins
- Water Service Area
- Chino Basin Part of the Active CVM MODFLOW Domain
- OBMP Management Zones




Prepared by:

WEST YOST

Author: LS
Date: 10/15/2021
File: Figure 26 WQ_Anomalies_2054.mxd

0 1 2 3 Miles
0 1 2 3 4 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Estimated Location of Water Quality Anomalies, Baseline and CBP Scenarios**
*Scenarios 3 and 4 - January 2054*

**Figure 26**

TCE concentrations in the Pomona Area plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

TCE concentrations in the Milliken Landfill plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the CIM plume are projected to be less than 5 µg/L by 2054 through dispersion and natural degradation.

TCE concentrations in the South Archibald plume are projected to be less than 5 µg/L by 2054 through groundwater production, dispersion, and natural degradation.

City of Upland
Cucamonga Valley Water District
Red Hill Fault
Indian Hill Fault
San Jose Fault
City of Pomona
Monte Vista Water District
City of Ontario
City of Chino
CIM
Chino Airport
Chino Fault
City of Chino Hills
CIW
Jurupa Community Services District
Santa Ana River Water Co.
City of Norco
10
15
60
71

**Estimated Initial TCE Concentration (µg/L)**

- 0.01 to 5
- > 5

**Projected Boundary of TCE Plume in January 2054**

- Baseline (TCE > 5 µg/L)
- Scenario 5 (TCE > 5 µg/L)
- Scenario 6 (TCE > 5 µg/L)

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

- Active CBP Injection Well
- Active CBP Extraction Well
- Chino Desalter Wells
- Streams & Flood Control Channels
- Flood Control & Conservation Basins
- Water Service Area
- Chino Basin Part of the Active CVM MODFLOW Domain
- OBMP Management Zones




Prepared by:

WEST YOST

Author: LS
Date: 10/15/2021
File: Figure 27 WQ_Anomalies_2054.mxd

0 1 2 3 Miles
0 1 2 3 4 Km

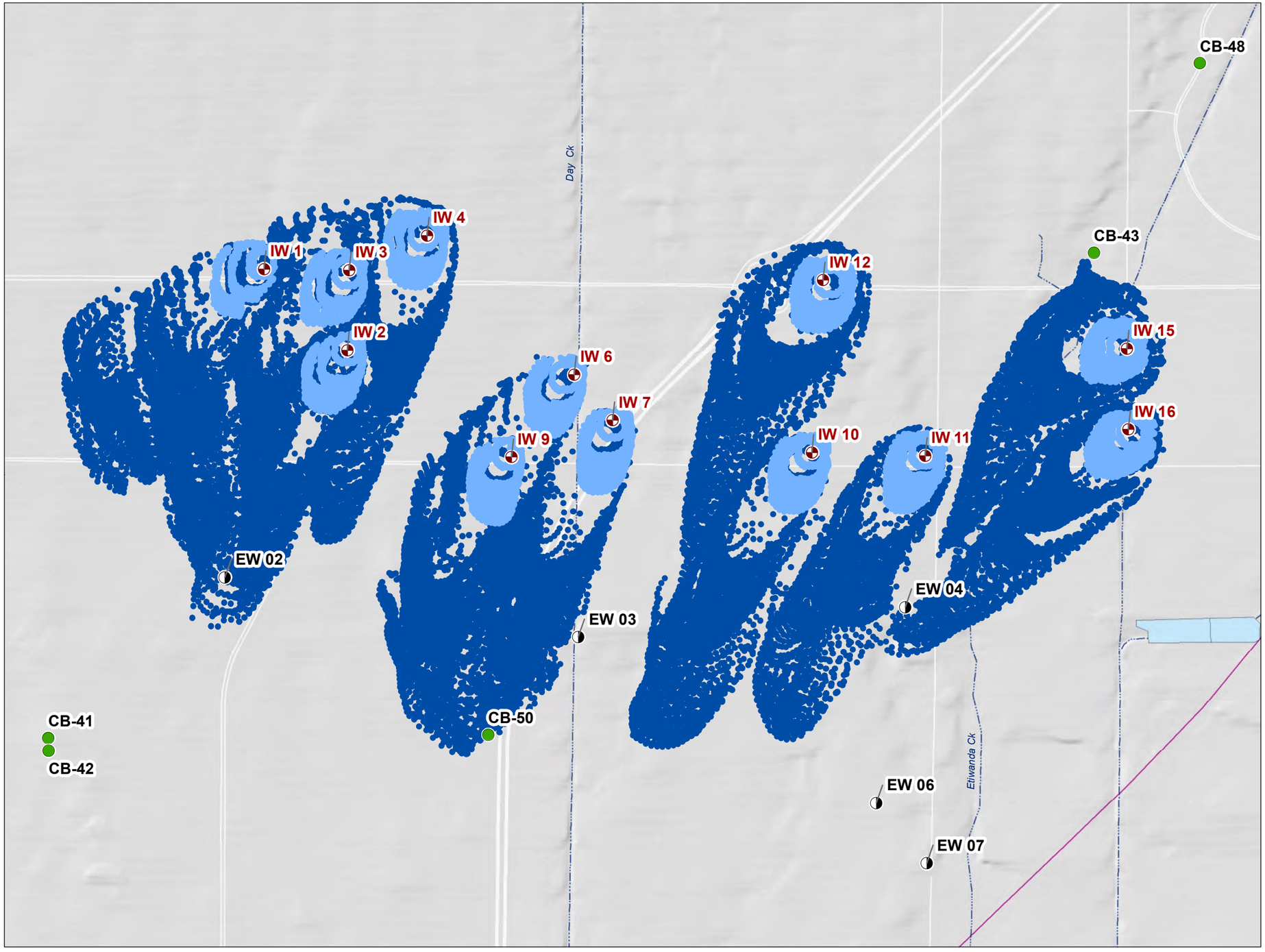
**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Estimated Location of Water Quality Anomalies, Baseline and CBP Scenarios**
*Scenarios 5 and 6 - January 2054*

**Figure 27**




**Locations of Injected Particles**

- 6 Months after Release
- 2 Years after Release

- Active CBP Injection Well
- Active CBP Extraction Well
- Cucamonga Valley Water District Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins
- OBMP Management Zones




Prepared by:

WEST YOST

Author: GR
Date: 10/15/2021
File: Fig_28 Particles.mxd

0 0.25 0.5 Miles
0 0.5 1 Km

**Evaluation of the Chino Basin Program**

Prepared for:

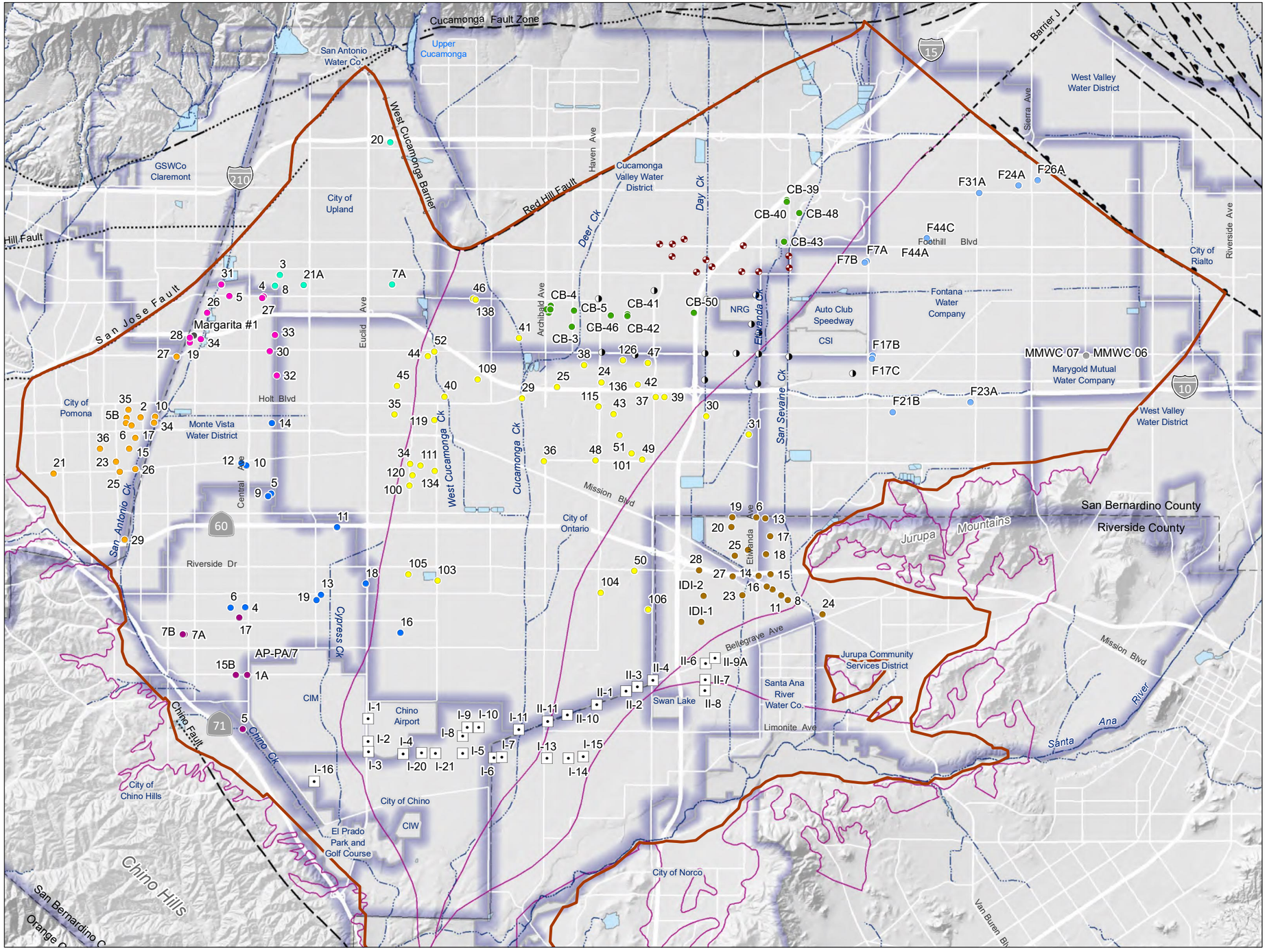
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Locations of Injected Particles 6 Months and 2 Years after Continuous Quarterly Releases *Scenario 1***

**Figure 28**

# Attachment A

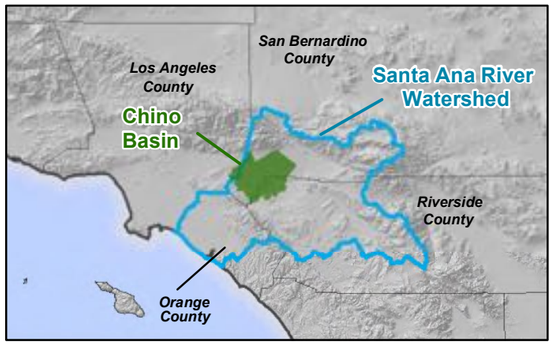
## Hydrographs




## Hydrograph Well Locations

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Golden State Water Company
- Jurupa Community Services District
- Marygold Mutual Water Company
- Monte Vista Water District
- Chino Basin Desalter Authority

- Active CBP Injection Well
- Active CBP Extraction Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins
- Water Service Area
- Chino Basin Part of the Active CVM MODFLOW Domain
- OBMP Management Zones




Prepared by:

WEST YOST

Author: LS
Date: 10/4/2021
File: Figure A-1 Hydrograph Map.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Hydrograph Well Locations**

**Figure A-1**

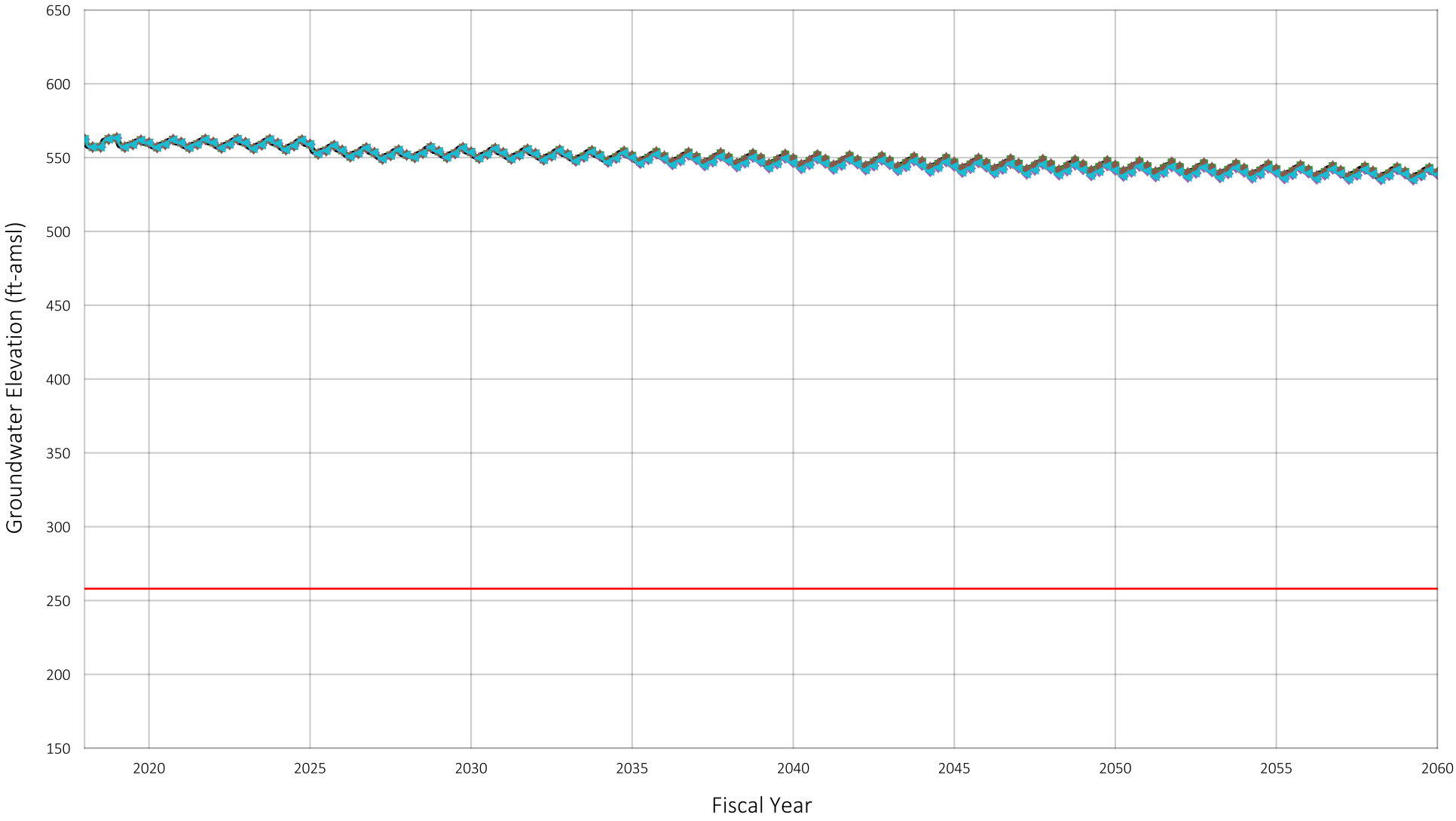
| Table A-1. List of Wells with Hydrographs | | | | | |
|---|---|---|---|---|---|
| Well ID | Well_name | Well Owner | Latitude | Longitude | Pumping Sustainability Metric Elevation (ft-amsl) |
| 1004280 | 1A | City of Chino Hills | 33.9899 | -117.6894 | 258 |
| 1207336 | 5 | City of Chino Hills | 33.9752 | -117.6908 | - |
| 1004215 | 7A | City of Chino Hills | 34.0007 | -117.7098 | 241 |
| 1004216 | 7B | City of Chino Hills | 34.0008 | -117.7105 | 241 |
| 1203214 | 15B | City of Chino Hills | 33.9898 | -117.6932 | 471 |
| 1004179 | 17 | City of Chino Hills | 34.0053 | -117.6922 | 394 |
| 1004178 | 4 | City of Chino | 34.0081 | -117.6903 | - |
| 1002741 | 5 | City of Chino | 34.0389 | -117.6821 | 545 |
| 1004176 | 6 | City of Chino | 34.0081 | -117.6950 | 489 |
| 1002743 | 9 | City of Chino | 34.0382 | -117.6831 | 493 |
| 1203283 | 10 | City of Chino | 34.0464 | -117.6902 | 475 |
| 1003741 | 11 | City of Chino | 34.0299 | -117.6607 | 455 |
| 1002739 | 12 | City of Chino | 34.0471 | -117.6919 | - |
| 1004185 | 13 | City of Chino | 34.0117 | -117.6657 | 348 |
| 1002645 | 14 | City of Chino | 34.0580 | -117.6820 | - |
| 1208673 | 16 | City of Chino | 34.0015 | -117.6399 | - |
| 1234063 | 19 | City of Chino | 34.0103 | -117.6671 | - |
| 1224773 | 18 | City of Chino | 34.0147 | -117.6513 | - |
| 1002309 | CB-1 | Cucamonga Valley Water District | 34.0882 | -117.5924 | 543 |
| 1002312 | CB-3 | Cucamonga Valley Water District | 34.0845 | -117.5849 | 553 |
| 1002307 | CB-4 | Cucamonga Valley Water District | 34.0901 | -117.5918 | 493 |
| 1002311 | CB-5 | Cucamonga Valley Water District | 34.0888 | -117.5843 | 613 |
| 1002308 | CB-30 | Cucamonga Valley Water District | 34.0891 | -117.5931 | 489 |
| 1206753 | CB-38 | Cucamonga Valley Water District | 34.0891 | -117.5918 | 509 |
| 1207928 | CB-39 | Cucamonga Valley Water District | 34.1189 | -117.5154 | 655 |
| 1207929 | CB-40 | Cucamonga Valley Water District | 34.1185 | -117.5153 | 441 |
| 1207936 | CB-41 | Cucamonga Valley Water District | 34.0879 | -117.5669 | 475 |
| 1207937 | CB-42 | Cucamonga Valley Water District | 34.0874 | -117.5668 | 511 |
| 1220079 | CB-43 | Cucamonga Valley Water District | 34.1077 | -117.5162 | 434 |
| 1220080 | CB-46 | Cucamonga Valley Water District | 34.0875 | -117.5722 | 501 |
| Projected | CB-48 | Cucamonga Valley Water District | 34.1155 | -117.5113 | - |
| Projected | CB-50 | Cucamonga Valley Water District | 34.0884 | -117.5453 | - |
| 1002211 | F7A | Fontana Water Company | 34.1026 | -117.4892 | 646.7 |
| 1221726 | F7B | Fontana Water Company | 34.1022 | -117.4899 | 646.37 |
| 1002237 | F17B | Fontana Water Company | 34.0770 | -117.4872 | 639.1 |
| 1201069 | F17C | Fontana Water Company | 34.0762 | -117.4875 | 551.8 |
| 1232847 | F21B | Fontana Water Company | 34.0619 | -117.4806 | 675.43 |
| 1002239 | F23A | Fontana Water Company | 34.0646 | -117.4554 | 722.8 |
| 1200218 | F24A | Fontana Water Company | 34.1232 | -117.4402 | 768.9 |
| 1200219 | F26A | Fontana Water Company | 34.1247 | -117.4340 | 765.3 |
| 1002081 | F31A | Fontana Water Company | 34.1212 | -117.4529 | 684.4 |
| 1206933 | F44A | Fontana Water Company | 34.1083 | -117.4691 | 652.8 |
| 1207340 | F44B | Fontana Water Company | 34.1082 | -117.4692 | 702.8 |
| 1207341 | F44C | Fontana Water Company | 34.1088 | -117.4699 | 662.8 |
| 1002554 | Margarita #1 | Golden State Water Company | 34.0814 | -117.7075 | - |
| 1003470 | 6 | Jurupa Community Services District | 34.0332 | -117.5247 | 610 |
| 1003507 | 8 | Jurupa Community Services District | 34.0110 | -117.5144 | 581 |
| 1003506 | 11 | Jurupa Community Services District | 34.0122 | -117.5165 | 559 |
| 1003505 | 12 | Jurupa Community Services District | 34.0137 | -117.5193 | 557 |
| 1003466 | 13 | Jurupa Community Services District | 34.0330 | -117.5218 | 627 |

| Well ID | Well_name | Well Owner | Latitude | Longitude | Pumping Sustainability Metric Elevation (ft-amsl) |
|---|---|---|---|---|---|
| 1003501 | 14 | Jurupa Community Services District | 34.0174 | -117.5239 | 560 |
| 1003498 | 15 | Jurupa Community Services District | 34.0179 | -117.5200 | 565 |
| 1003502 | 16 | Jurupa Community Services District | 34.0146 | -117.5213 | 552 |
| 1003467 | 17 | Jurupa Community Services District | 34.0282 | -117.5202 | 566 |
| 1003469 | 18 | Jurupa Community Services District | 34.0233 | -117.5215 | 580 |
| 1003471 | 19 | Jurupa Community Services District | 34.0332 | -117.5325 | 546 |
| 1003472 | 20 | Jurupa Community Services District | 34.0306 | -117.5328 | 580 |
| 1220154 | 22 | Jurupa Community Services District | 34.0244 | -117.5274 | 537 |
| 1220155 | 23 | Jurupa Community Services District | 34.0122 | -117.5291 | 492 |
| 1003515 | 24 | Jurupa Community Services District | 34.0071 | -117.5031 | 547 |
| 1220158 | 25 | Jurupa Community Services District | 34.0229 | -117.5317 | 525 |
| 1233787 | 27 | Jurupa Community Services District | 34.0172 | -117.5322 | 490 |
| 1233788 | 28 | Jurupa Community Services District | 34.0189 | -117.5432 | 496 |
| 1207942 | IDI-1 | Jurupa Community Services District | 34.0049 | -117.5424 | - |
| 999902 | IDI-2 | Jurupa Community Services District | 34.0120 | -117.5417 | - |
| 1221751 | MMWC 06 | Marygold Mutual Water Company | 34.0774 | -117.4179 | 563.9 |
| 1221752 | MMWC 07 | Marygold Mutual Water Company | 34.0773 | -117.4179 | 656.4 |
| 1002541 | 4 | Monte Vista Water District | 34.0921 | -117.6850 | 511 |
| 1002544 | 5 | Monte Vista Water District | 34.0922 | -117.6962 | 442 |
| 1002563 | 19 | Monte Vista Water District | 34.0795 | -117.7088 | 433 |
| 1206744 | 26 | Monte Vista Water District | 34.0876 | -117.7032 | 444 |
| 1206745 | 27 | Monte Vista Water District | 34.0917 | -117.6854 | 498 |
| 1206746 | 28 | Monte Vista Water District | 34.0808 | -117.7088 | 303 |
| 1208781 | 30 | Monte Vista Water District | 34.0774 | -117.6829 | 499 |
| 1208782 | 31 | Monte Vista Water District | 34.0953 | -117.6988 | 326 |
| 1208771 | 32 | Monte Vista Water District | 34.0708 | -117.6806 | 442 |
| 1220173 | 33 | Monte Vista Water District | 34.0818 | -117.6812 | 489 |
| 1224765 | 34 | Monte Vista Water District | 34.0804 | -117.7053 | 372 |
| 1002339 | 24 | City of Ontario | 34.0695 | -117.5752 | 581 |
| 1002337 | 25 | City of Ontario | 34.0682 | -117.5896 | 517 |
| 1002333 | 29 | City of Ontario | 34.0650 | -117.6009 | 541 |
| 1002253 | 30 | City of Ontario | 34.0605 | -117.5411 | 558 |
| 1002254 | 31 | City of Ontario | 34.0556 | -117.5274 | 635 |
| 1002367 | 34 | City of Ontario | 34.0471 | -117.6371 | 451 |
| 1002350 | 35 | City of Ontario | 34.0605 | -117.6423 | 498 |
| 1002372 | 36 | City of Ontario | 34.0481 | -117.5937 | 517 |
| 1002230 | 37 | City of Ontario | 34.0656 | -117.5576 | 609 |
| 1006998 | 38 | City of Ontario | 34.0741 | -117.5809 | 589 |
| 1206945 | 39 | City of Ontario | 34.0657 | -117.5548 | 609 |
| 1207502 | 40 | City of Ontario | 34.0654 | -117.6261 | 492 |
| 1207503 | 41 | City of Ontario | 34.0813 | -117.6021 | 483 |
| 1220168 | 42 | City of Ontario | 34.0689 | -117.5634 | - |
| 1220169 | 43 | City of Ontario | 34.0610 | -117.5713 | - |
| 1220170 | 44 | City of Ontario | 34.0763 | -117.6316 | 573 |
| 1207950 | 45 | City of Ontario | 34.0682 | -117.6415 | 500 |
| 1207946 | 46 | City of Ontario | 34.0919 | -117.6169 | 541 |
| 1207948 | 47 | City of Ontario | 34.0747 | -117.5602 | 559 |
| 1220171 | 48 | City of Ontario | 34.0484 | -117.5770 | - |
| 1207952 | 49 | City of Ontario | 34.0486 | -117.5618 | 538 |
| 1208387 | 50 | City of Ontario | 34.0186 | -117.5642 | 519 |
| 1220172 | 51 | City of Ontario | 34.0553 | -117.5692 | - |
| 1221753 | 52 | City of Ontario | 34.0775 | -117.6294 | 485 |

| Well ID | Well_name | Well Owner | Latitude | Longitude | Pumping Sustainability Metric Elevation (ft-amsl) |
|---|---|---|---|---|---|
| Projected | 100 | City of Ontario | 34.0413 | -117.6373 | - |
| Projected | 101 | City of Ontario | 34.0503 | -117.5653 | - |
| Projected | 103 | City of Ontario | 34.0157 | -117.6280 | - |
| Projected | 104 | City of Ontario | 34.0127 | -117.5750 | - |
| Projected | 105 | City of Ontario | 34.0173 | -117.6375 | - |
| Projected | 106 | City of Ontario | 34.0081 | -117.5596 | - |
| Projected | 109 | City of Ontario | 34.0701 | -117.6153 | - |
| Projected | 111 | City of Ontario | 34.0467 | -117.6338 | - |
| Projected | 119 | City of Ontario | 34.0590 | -117.6293 | - |
| Projected | 115 | City of Ontario | 34.0629 | -117.5760 | - |
| Projected | 120 | City of Ontario | 34.0441 | -117.6363 | - |
| Projected | 126 | City of Ontario | 34.0755 | -117.5682 | - |
| Projected | 134 | City of Ontario | 34.0452 | -117.6291 | - |
| Projected | 136 | City of Ontario | 34.0695 | -117.5752 | - |
| Projected | 138 | City of Ontario | 34.0916 | -117.6162 | - |
| 1002653 | 2 | City of Pomona | 34.0592 | -117.7247 | 465.7 |
| 1205314 | 5B | City of Pomona | 34.0591 | -117.7292 | 460.3 |
| 1002650 | 6 | City of Pomona | 34.0577 | -117.7293 | 424 |
| 1002656 | 10 | City of Pomona | 34.0594 | -117.7199 | 525.8 |
| 1002664 | 15 | City of Pomona | 34.0508 | -117.7282 | 494 |
| 1002654 | 16 | City of Pomona | 34.0571 | -117.7275 | 494.6 |
| 1002659 | 17 | City of Pomona | 34.0537 | -117.7263 | 491 |
| 1002678 | 21 | City of Pomona | 34.0439 | -117.7527 | 612.8 |
| 1002704 | 23 | City of Pomona | 34.0472 | -117.7326 | 472.2 |
| 1002706 | 25 | City of Pomona | 34.0445 | -117.7313 | 509 |
| 1002703 | 26 | City of Pomona | 34.0453 | -117.7262 | 543.6 |
| 1201236 | 27 | City of Pomona | 34.0757 | -117.7131 | 466 |
| 1203062 | 29 | City of Pomona | 34.0262 | -117.7296 | 497.9 |
| 1201247 | 34 | City of Pomona | 34.0579 | -117.7203 | 494.1 |
| 1201246 | 35 | City of Pomona | 34.0612 | -117.7286 | 464 |
| 1205309 | 36 | City of Pomona | 34.0507 | -117.7377 | 467.2 |
| 1002535 | 3 | City of Upland | 34.0979 | -117.6798 | - |
| 1006997 | 7A | City of Upland | 34.0956 | -117.6433 | - |
| 1002531 | 8 | City of Upland | 34.0950 | -117.6813 | - |
| 1206654 | 20 | City of Upland | 34.1339 | -117.6441 | - |
| 1207956 | 21A | City of Upland | 34.0952 | -117.6720 | - |
| 1206675 | I-1 | Chino Basin Desalter Authority | 33.9782 | -117.6502 | 402 |
| 1206676 | I-2 | Chino Basin Desalter Authority | 33.9721 | -117.6501 | 304 |
| 1206677 | I-3 | Chino Basin Desalter Authority | 33.9693 | -117.6500 | 353 |
| 1206678 | I-4 | Chino Basin Desalter Authority | 33.9688 | -117.6387 | 356 |
| 1206679 | I-5 | Chino Basin Desalter Authority | 33.9690 | -117.6195 | 410 |
| 1206684 | I-6 | Chino Basin Desalter Authority | 33.9680 | -117.6094 | 496 |
| 1206685 | I-7 | Chino Basin Desalter Authority | 33.9682 | -117.6068 | 491 |
| 1206680 | I-8 | Chino Basin Desalter Authority | 33.9739 | -117.6195 | 390 |
| 1206681 | I-9 | Chino Basin Desalter Authority | 33.9762 | -117.6180 | 499 |
| 1206682 | I-10 | Chino Basin Desalter Authority | 33.9762 | -117.6143 | 511 |
| 1206683 | I-11 | Chino Basin Desalter Authority | 33.9756 | -117.6013 | 409 |
| 1206958 | I-13 | Chino Basin Desalter Authority | 33.9679 | -117.5921 | 476 |
| 1206959 | I-14 | Chino Basin Desalter Authority | 33.9679 | -117.5852 | 533 |
| 1206960 | I-15 | Chino Basin Desalter Authority | 33.9684 | -117.5803 | 528 |
| 1222970 | I-16 | Chino Basin Desalter Authority | 33.9612 | -117.6675 | - |
| 1224801 | I-20 | Chino Basin Desalter Authority | 33.9692 | -117.6328 | - |

| Well ID | Well_name | Well Owner | Latitude | Longitude | Pumping Sustainability Metric Elevation (ft-amsl) |
|---|---|---|---|---|---|
| 1224812 | I-21 | Chino Basin Desalter Authority | 33.9691 | -117.6283 | - |
| 1206961 | II-1 | Chino Basin Desalter Authority | 33.9825 | -117.5761 | 574 |
| 1206962 | II-2 | Chino Basin Desalter Authority | 33.9861 | -117.5666 | 458 |
| 1206963 | II-3 | Chino Basin Desalter Authority | 33.9873 | -117.5629 | 457 |
| 1206964 | II-4 | Chino Basin Desalter Authority | 33.9891 | -117.5580 | 468 |
| 1206966 | II-6 | Chino Basin Desalter Authority | 33.9937 | -117.5409 | 477 |
| 1206967 | II-7 | Chino Basin Desalter Authority | 33.9894 | -117.5410 | 461 |
| 1206968 | II-8 | Chino Basin Desalter Authority | 33.9864 | -117.5411 | 472 |
| 1206969 | II-9A | Chino Basin Desalter Authority | 33.9952 | -117.5378 | 510 |
| 1234064 | II-10 | Chino Basin Desalter Authority | 33.9796 | -117.5856 | - |
| 1234065 | II-11 | Chino Basin Desalter Authority | 33.9779 | -117.5920 | - |
| 1206952 | AP-PA/7 | Chino Basin Water Master | 33.9938 | -117.6869 | 400[1] |

[1] Well AP-PA/7 is a monitoring well. The value of 400 ft represents a minimum water level regarding subsidence not pumping.




Location of Well in Chino Basin



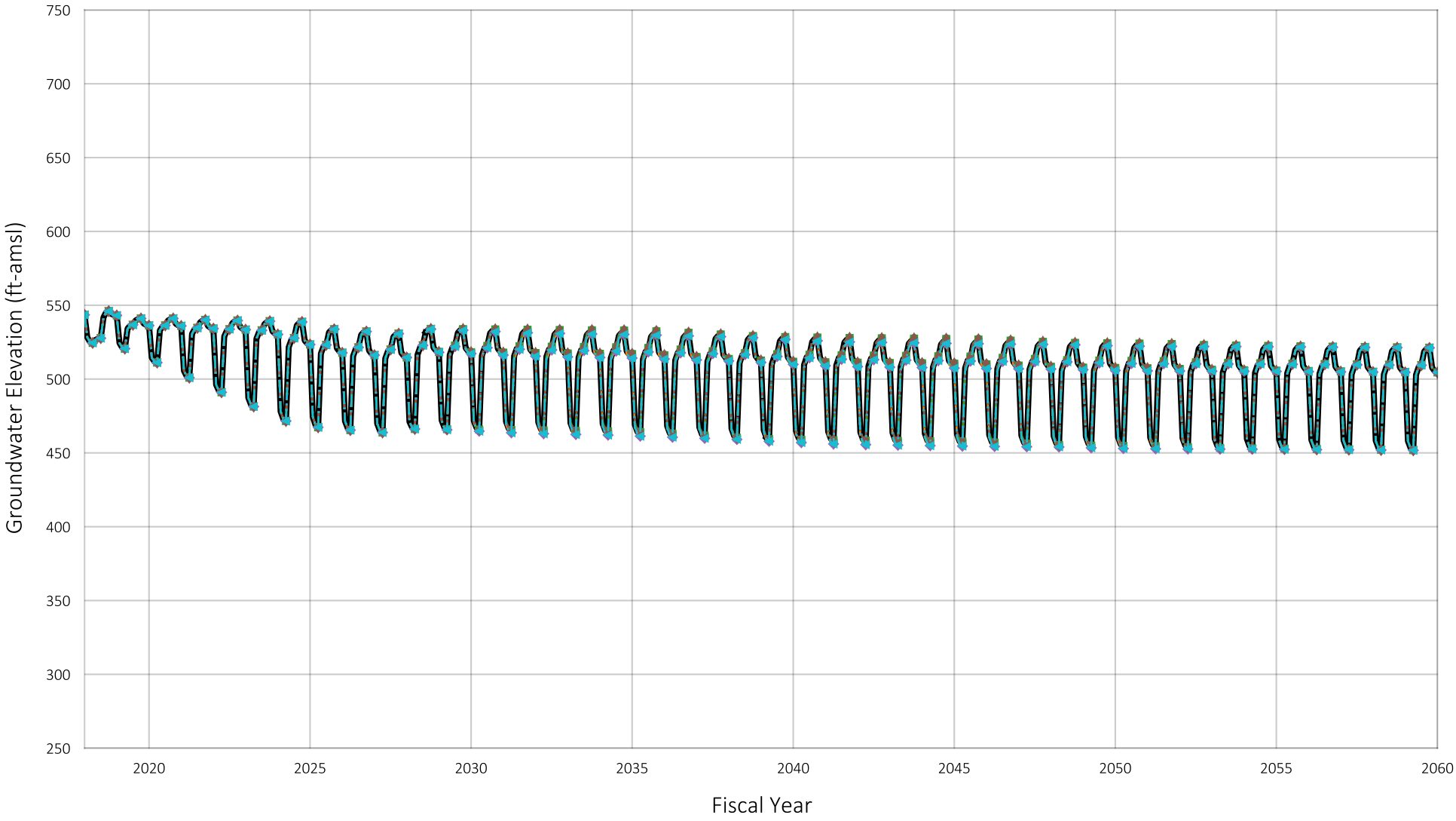
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1004280
Owner: City of Chino Hills
Well Name: 1A

Figure A-2

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



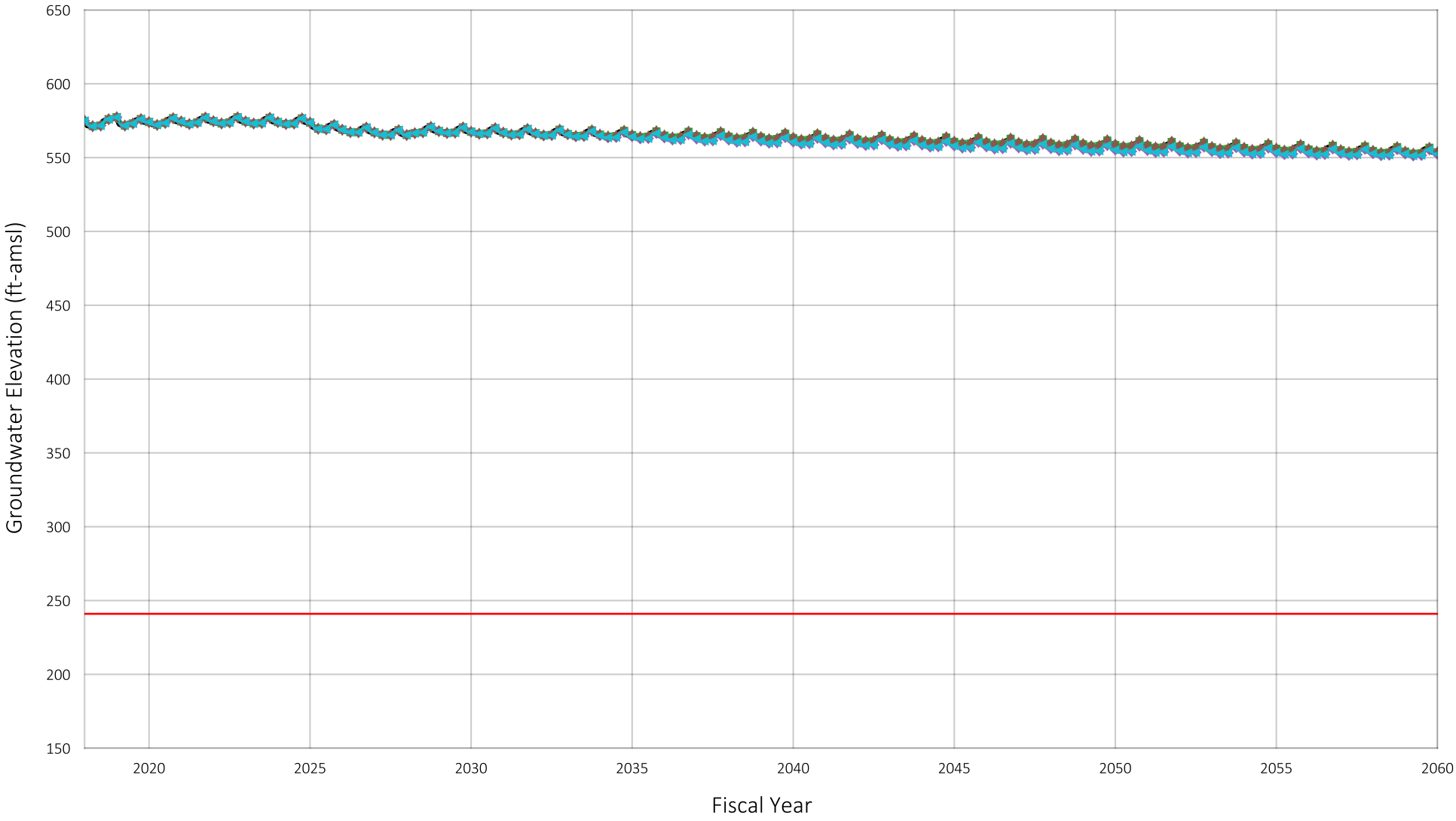
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207336
Owner: City of Chino Hills
Well Name: 5

Figure A-3




Location of Well in Chino Basin



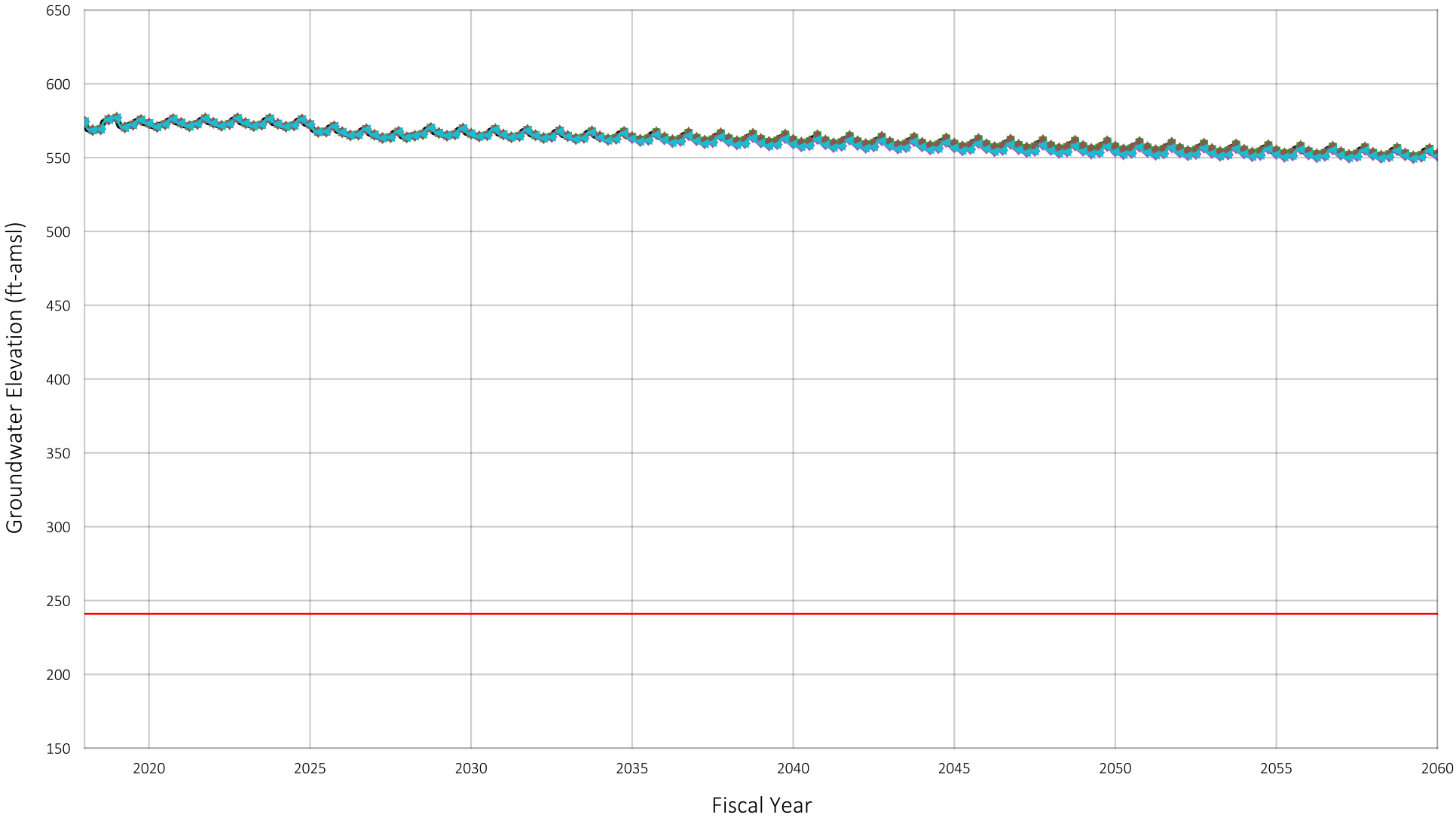
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1004215
Owner: City of Chino Hills
Well Name: 7A

Figure A-4

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



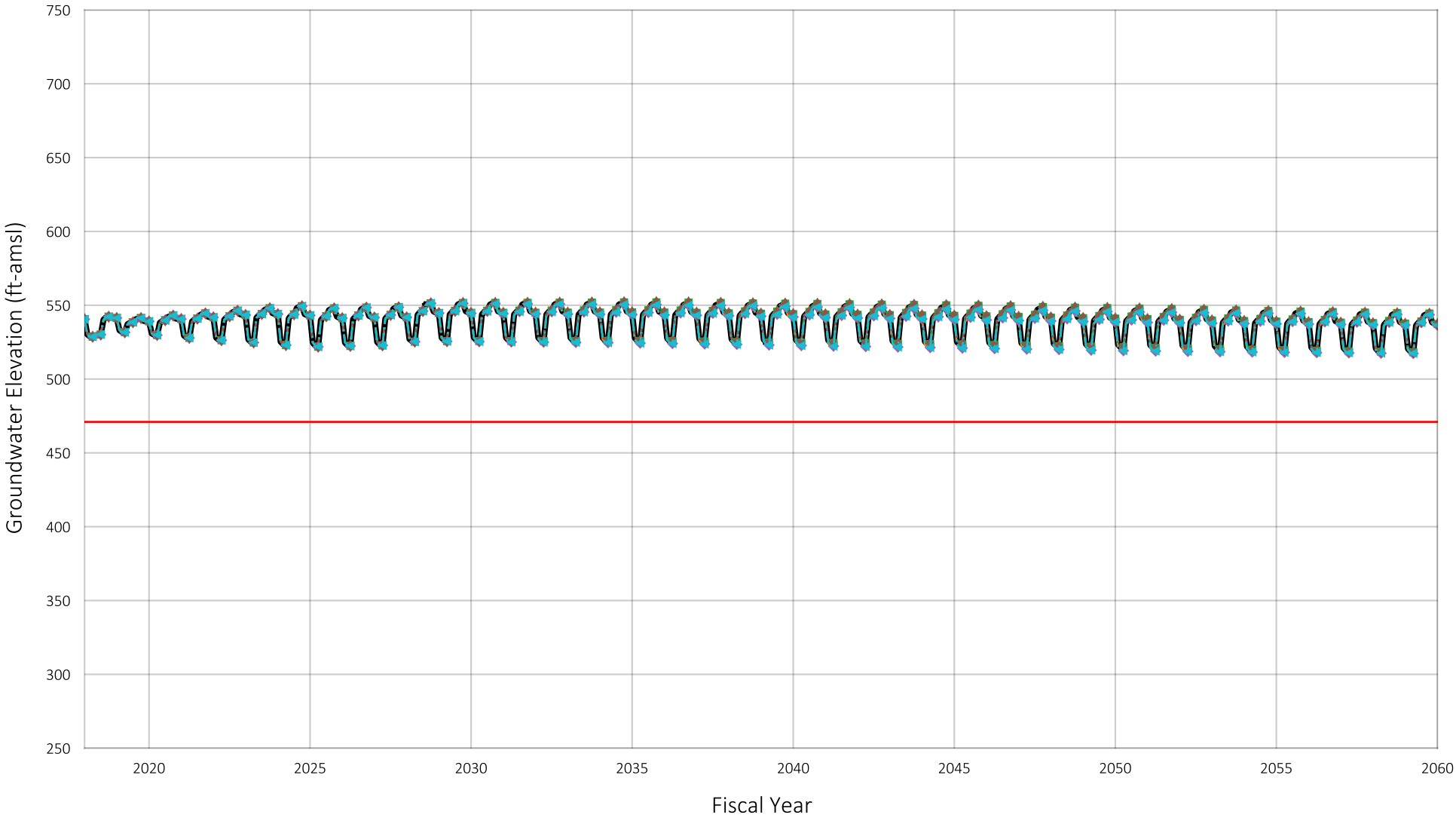
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1004216
Owner: City of Chino Hills
Well Name: 7B

Figure A-5

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



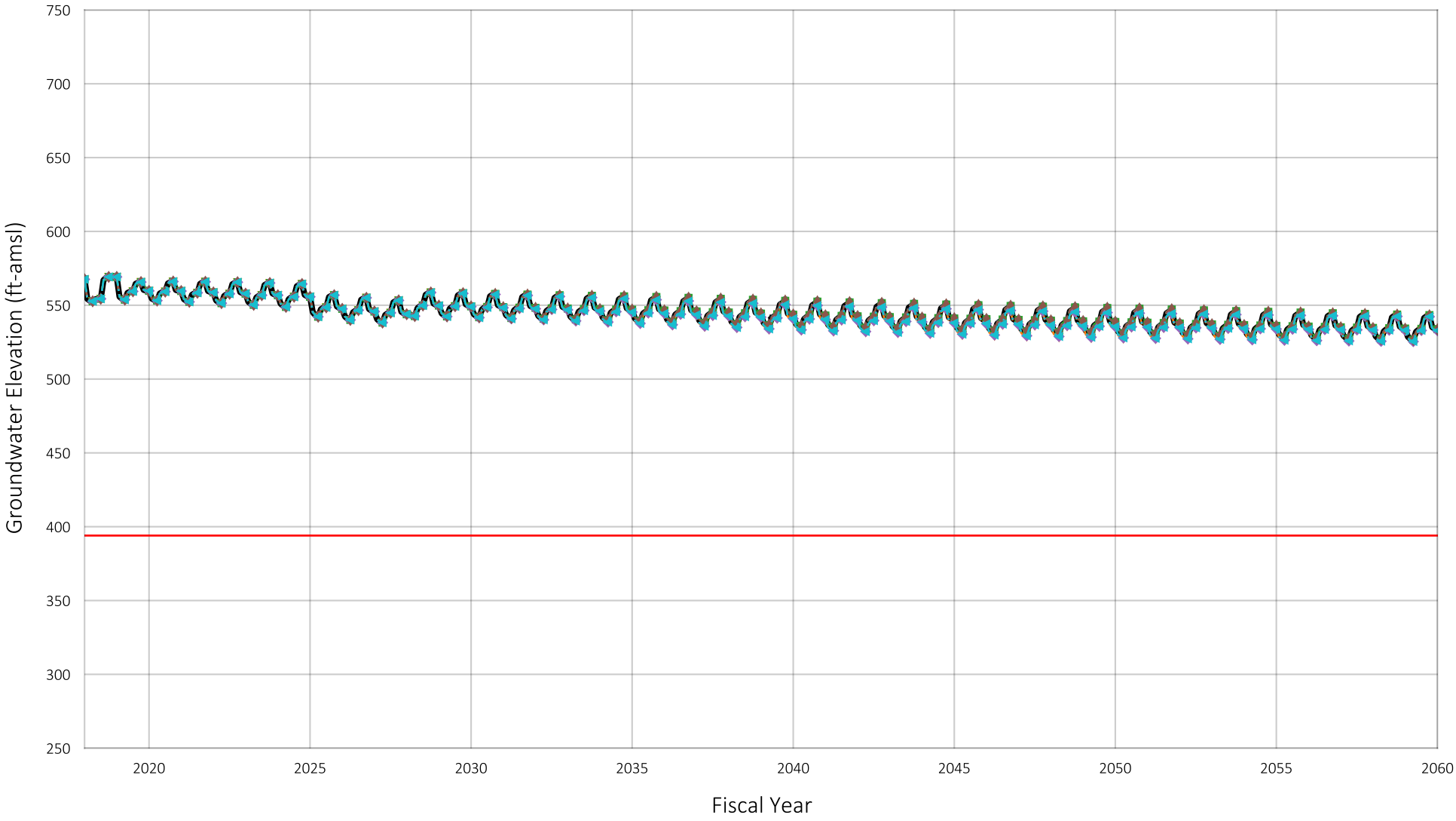
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1203214
Owner: City of Chino Hills
Well Name: 15B

Figure A-6

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



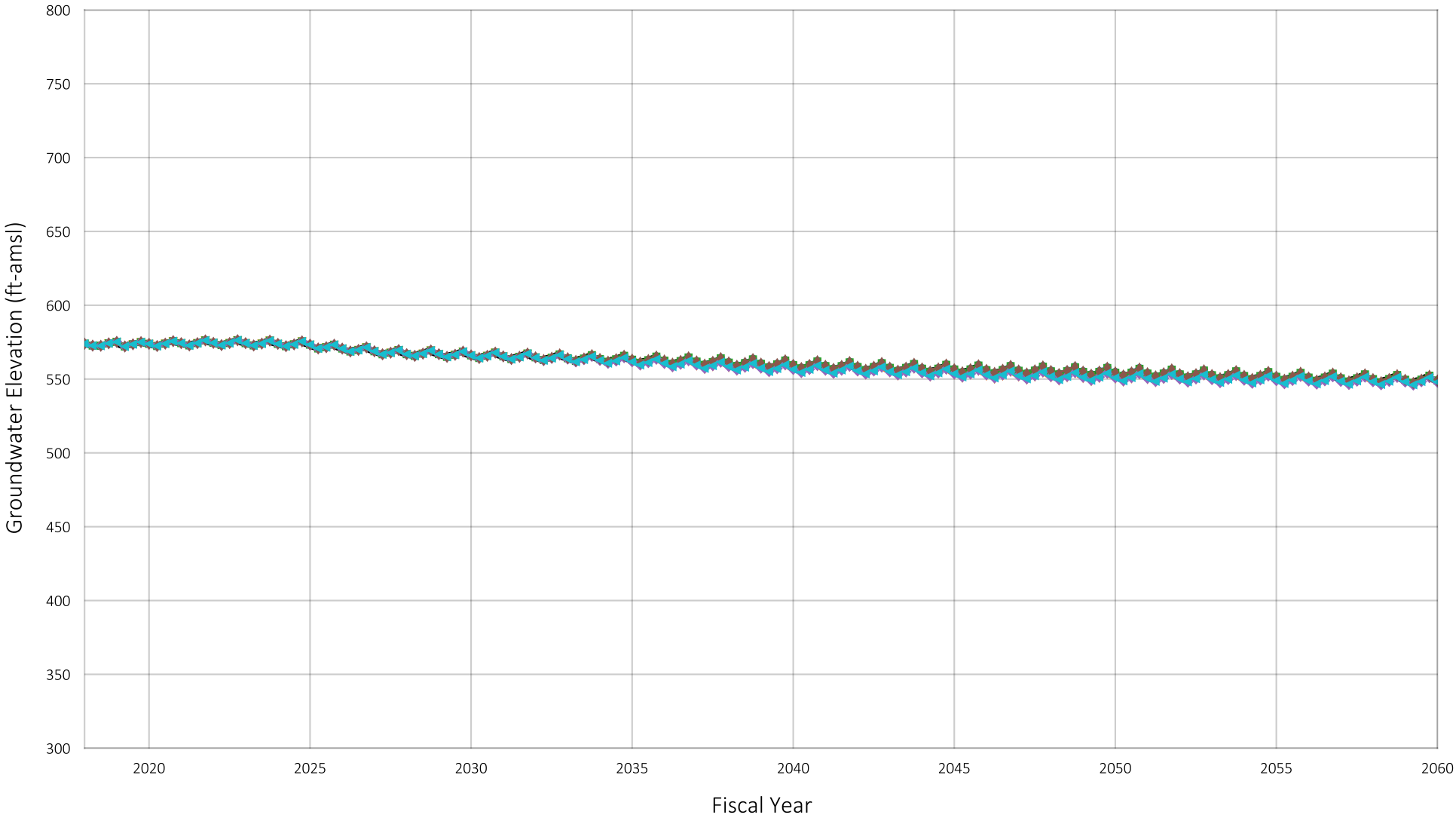
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1004179
Owner: City of Chino Hills
Well Name: 17

Figure A-7

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



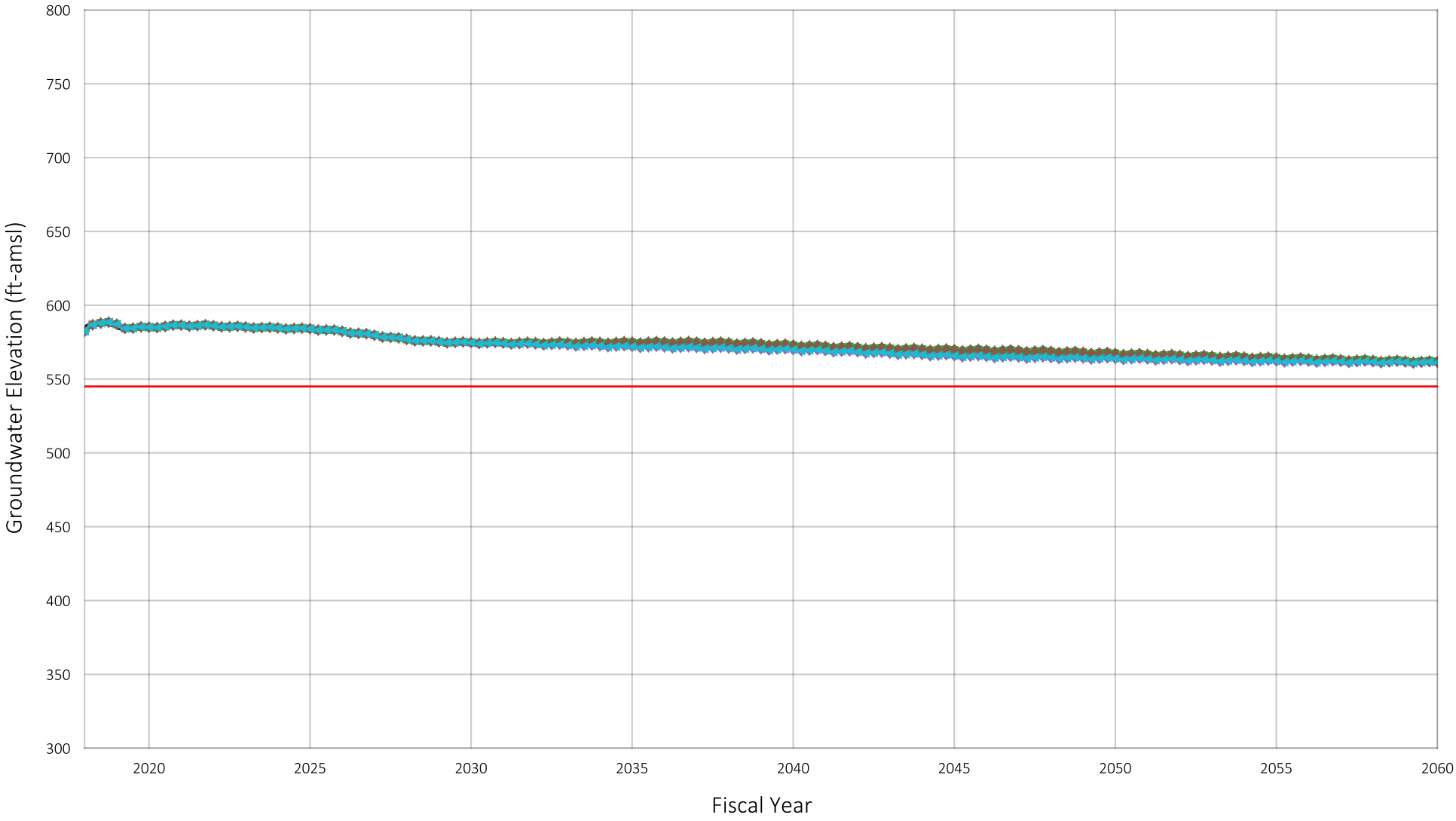
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1004178
Owner: City of Chino
Well Name: 4

Figure A-8




Location of Well in Chino Basin



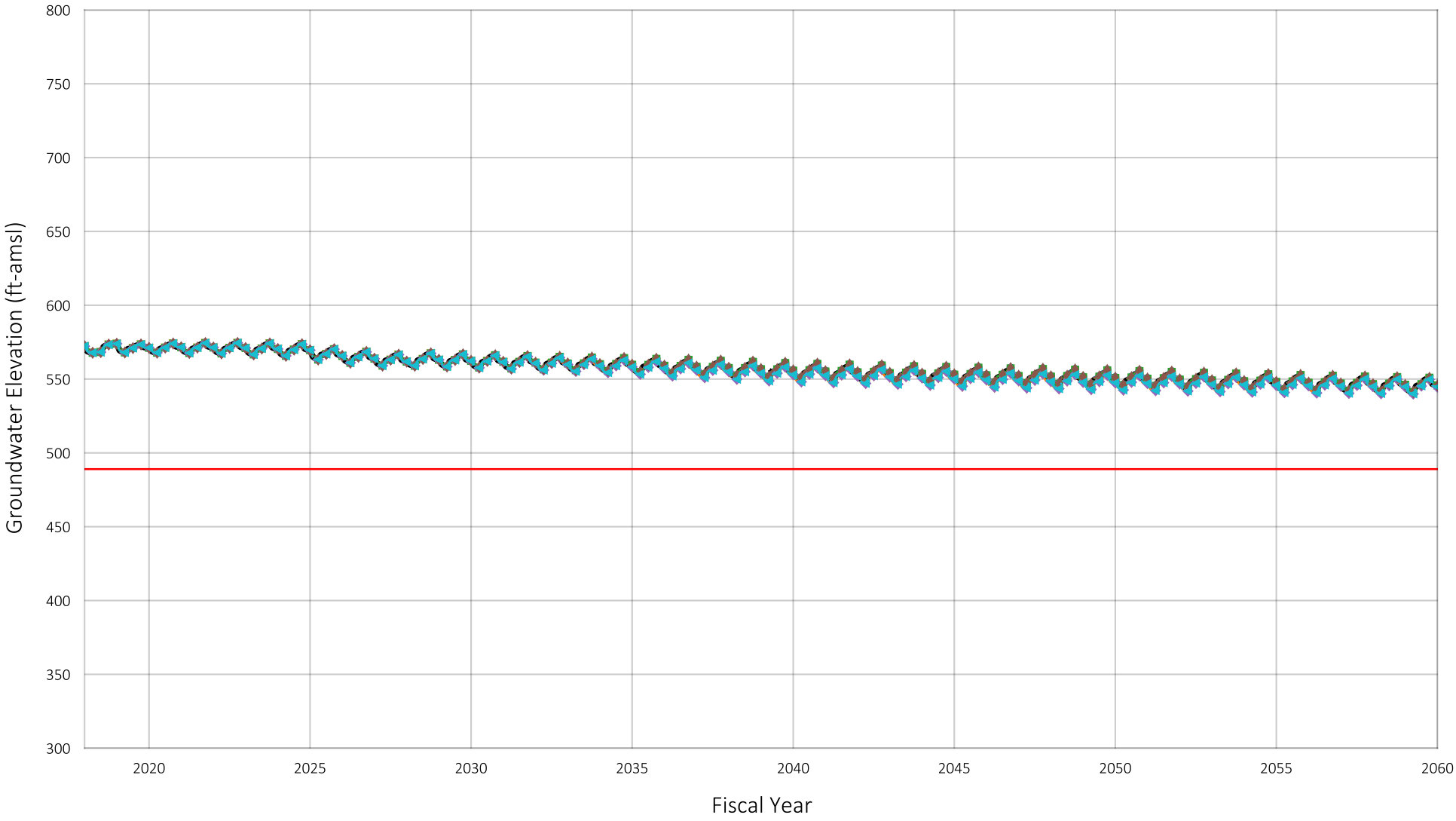
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002741
Owner: City of Chino
Well Name: 5

Figure A-9




Location of Well in Chino Basin



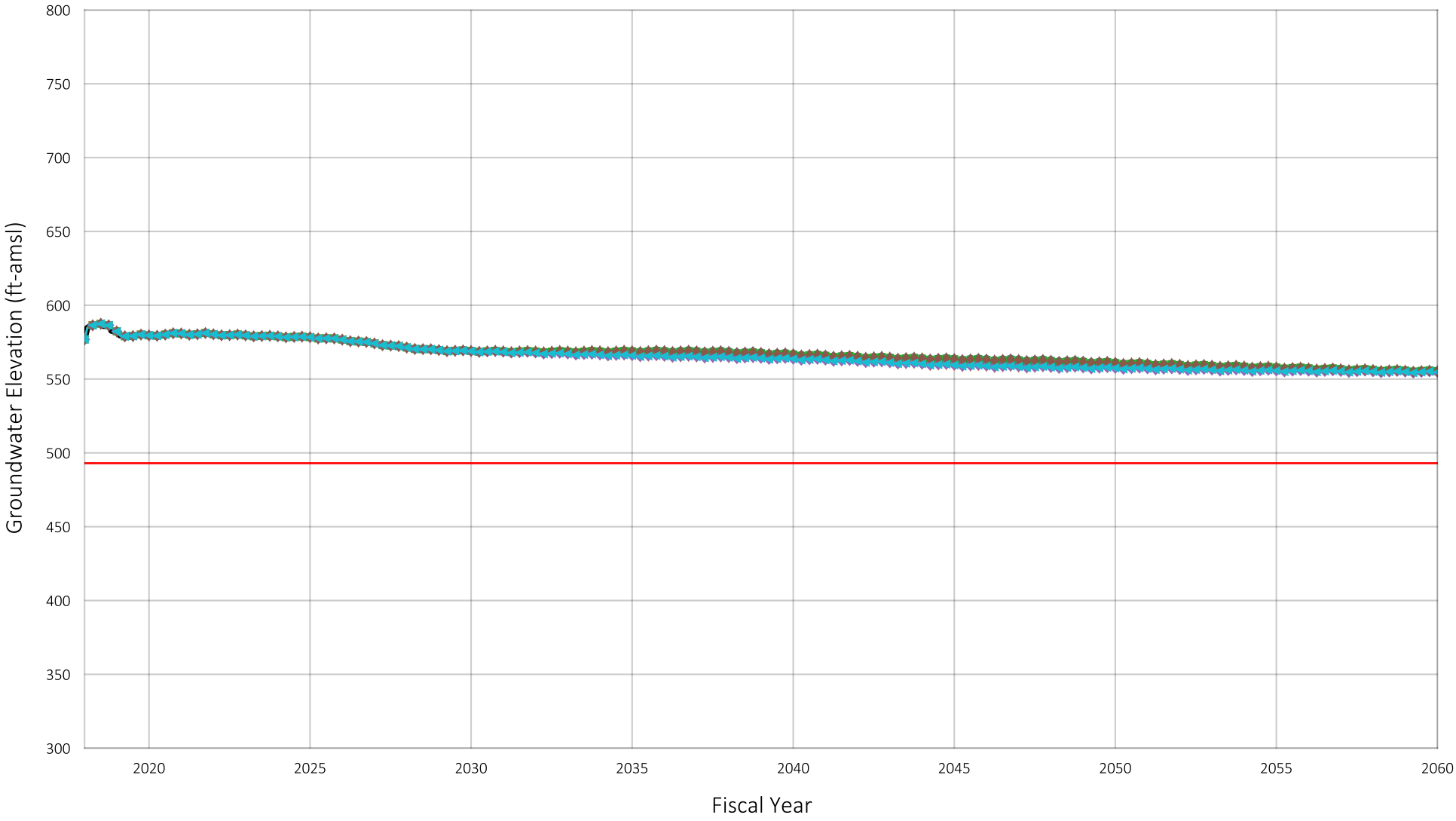
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1004176
Owner: City of Chino
Well Name: 6

Figure A-10




Location of Well in Chino Basin



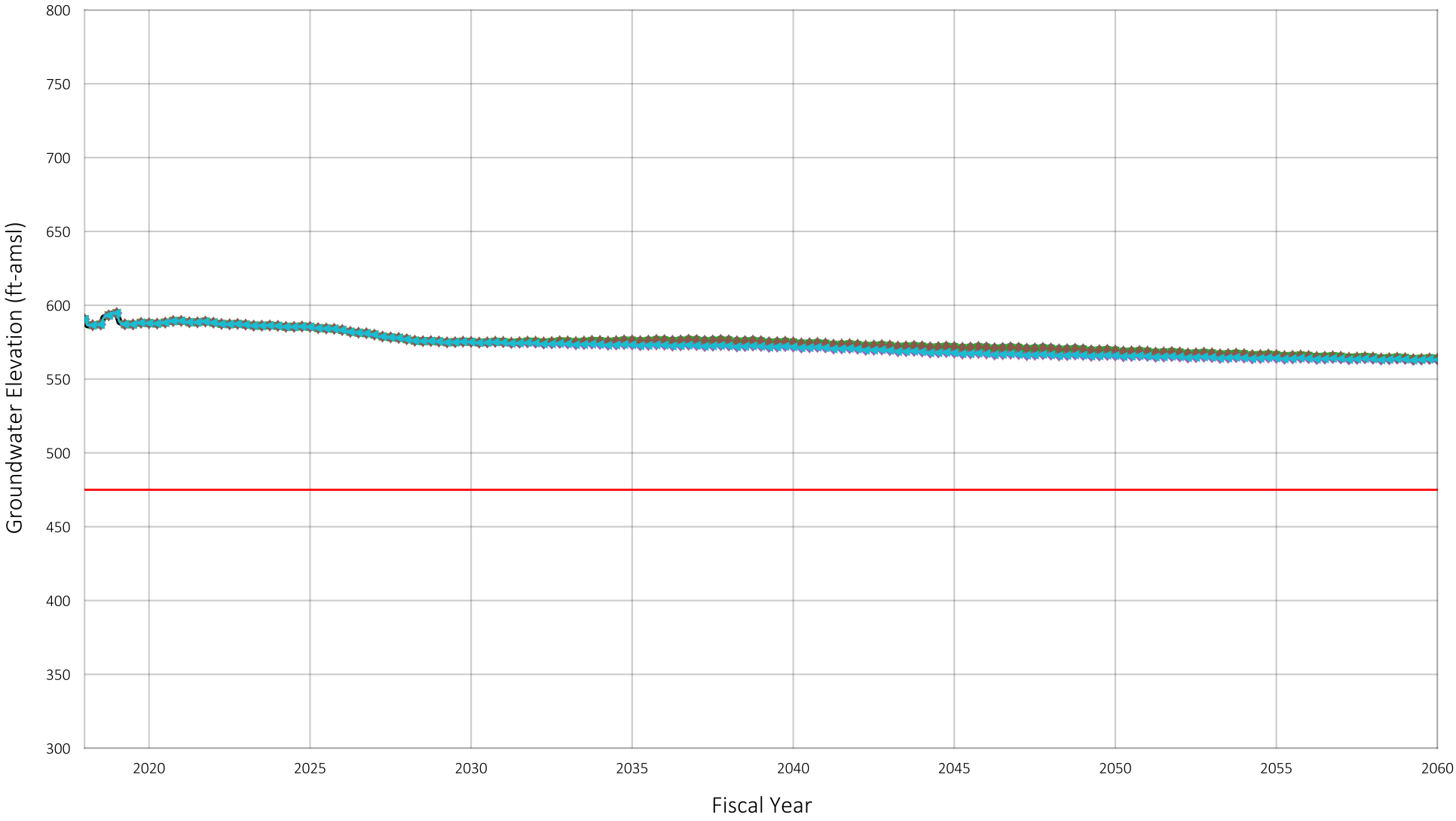
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002743
Owner: City of Chino
Well Name: 9

Figure A-11




Location of Well in Chino Basin



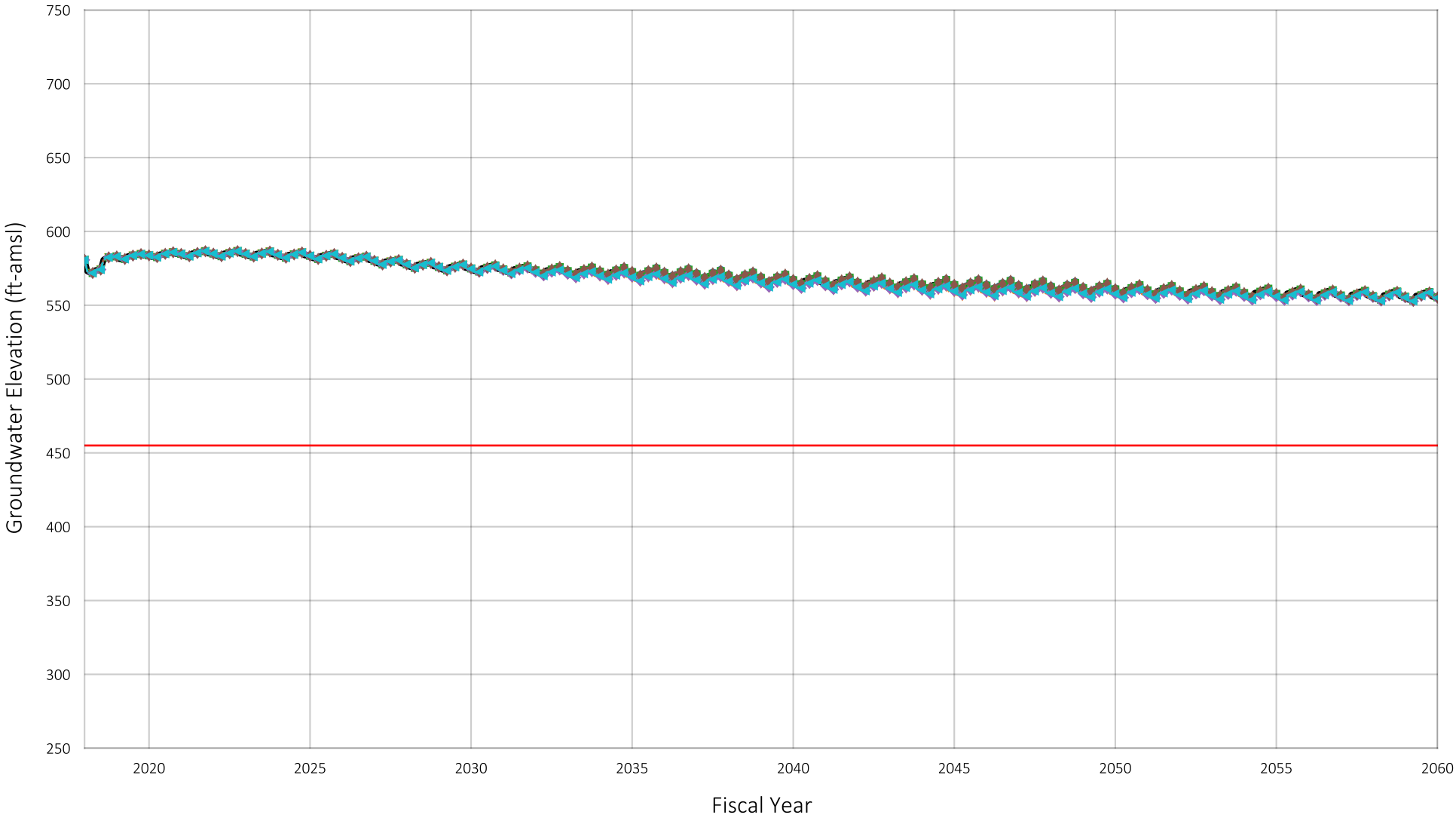
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1203283
Owner: City of Chino
Well Name: 10

Figure A-12

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



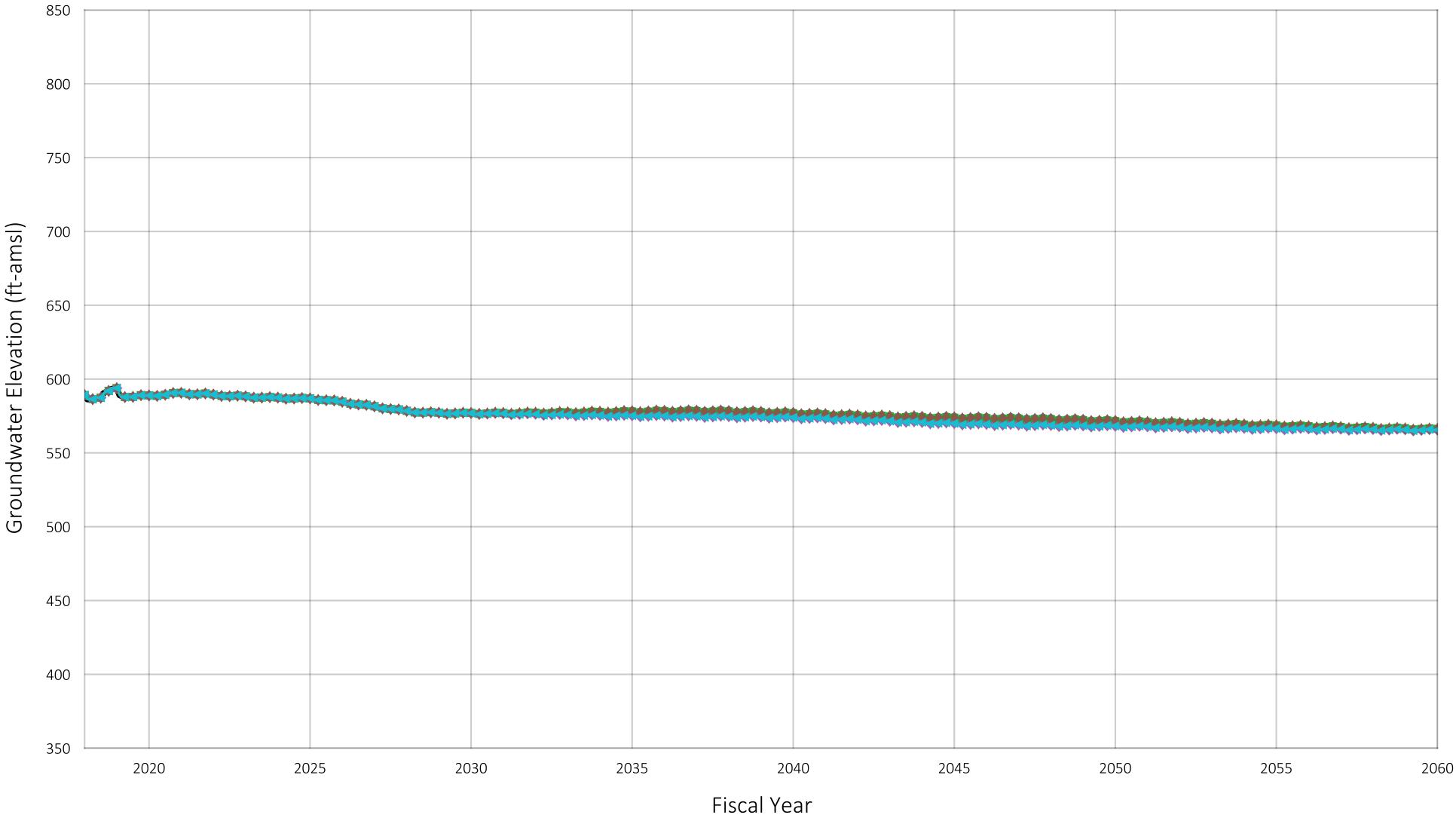
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003741
Owner: City of Chino
Well Name: 11

Figure A-13

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



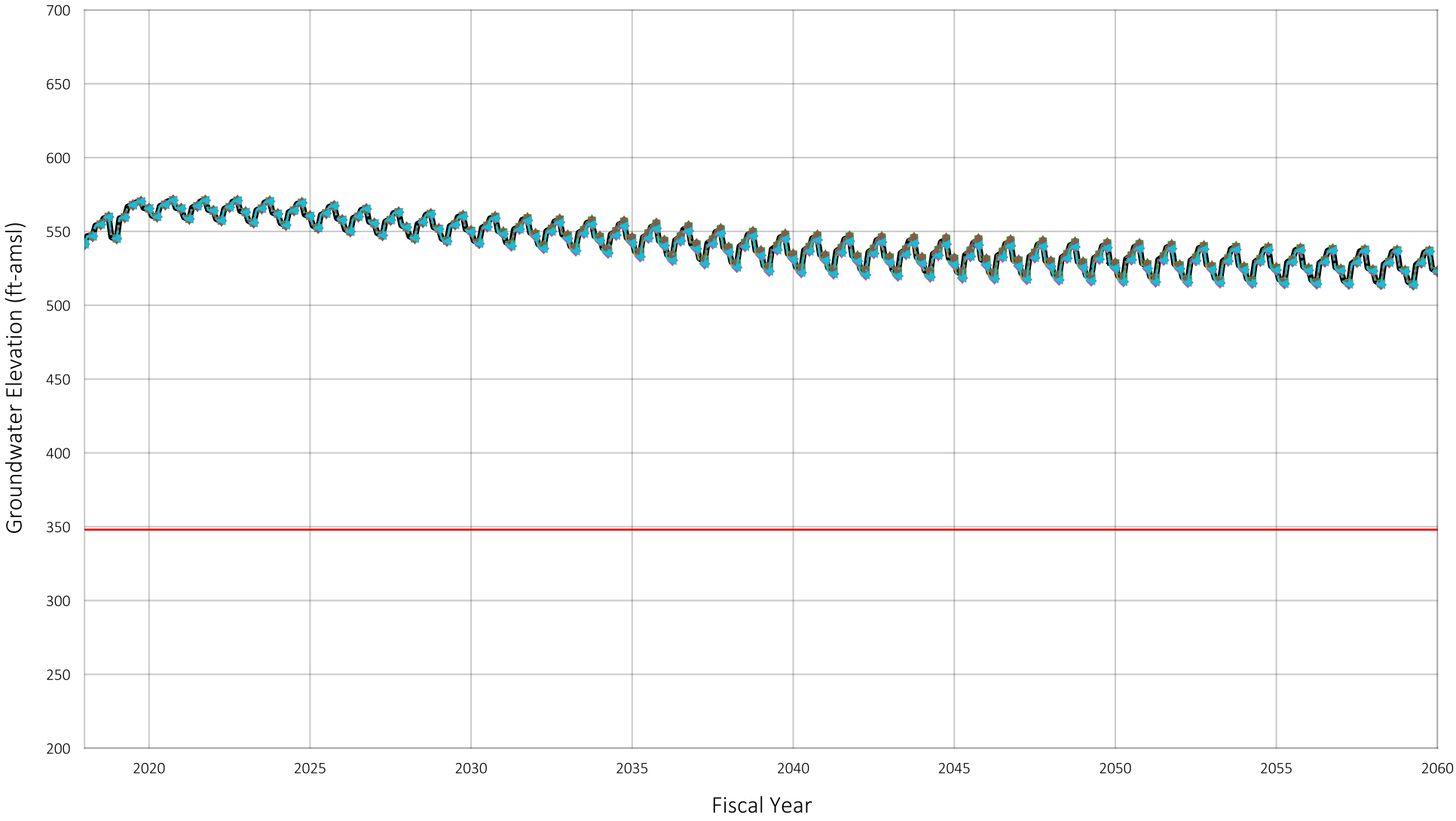
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002739
Owner: City of Chino
Well Name: 12

Figure A-14




Location of Well in Chino Basin



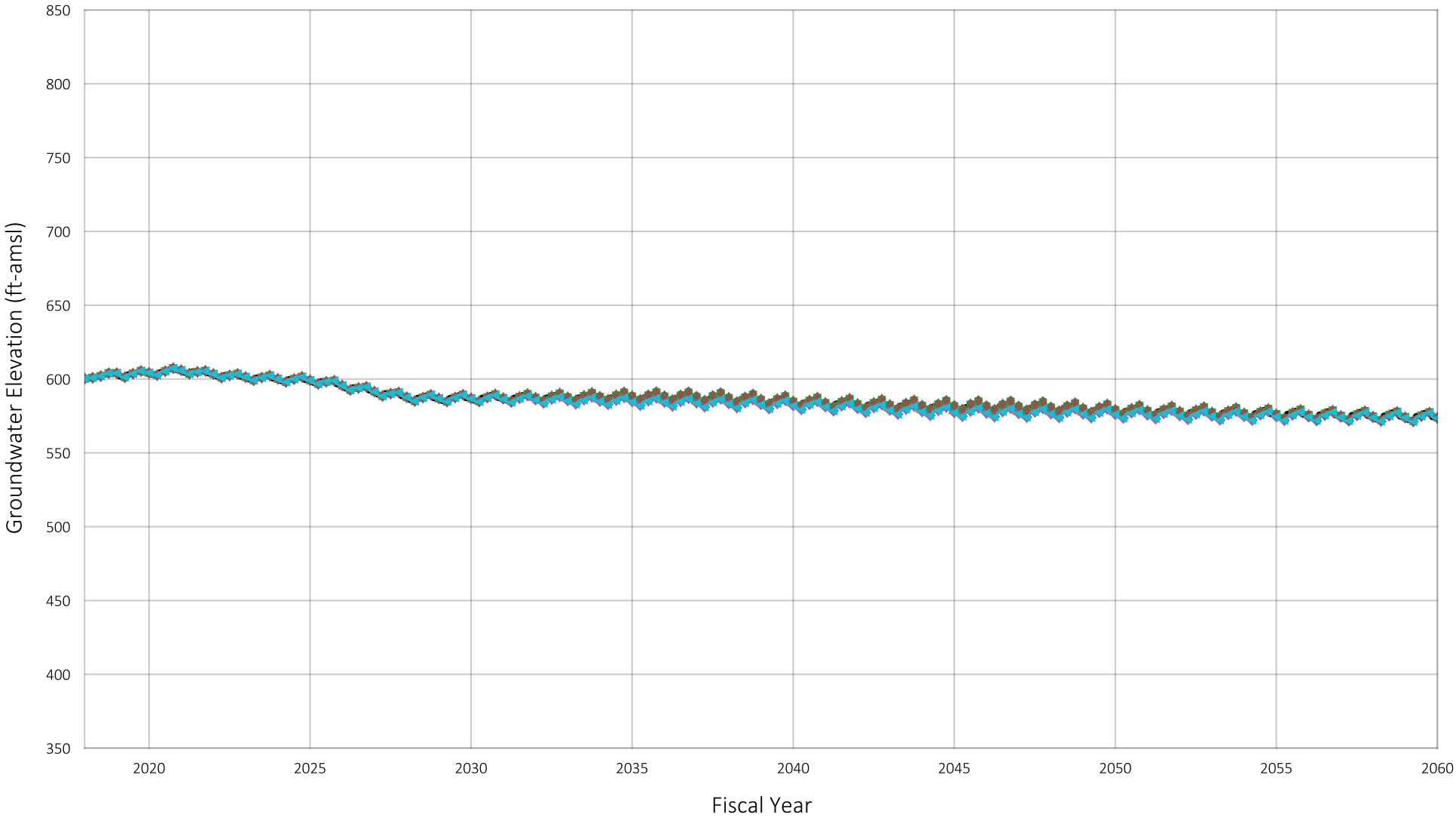
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1004185
Owner: City of Chino
Well Name: 13

Figure A-15

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



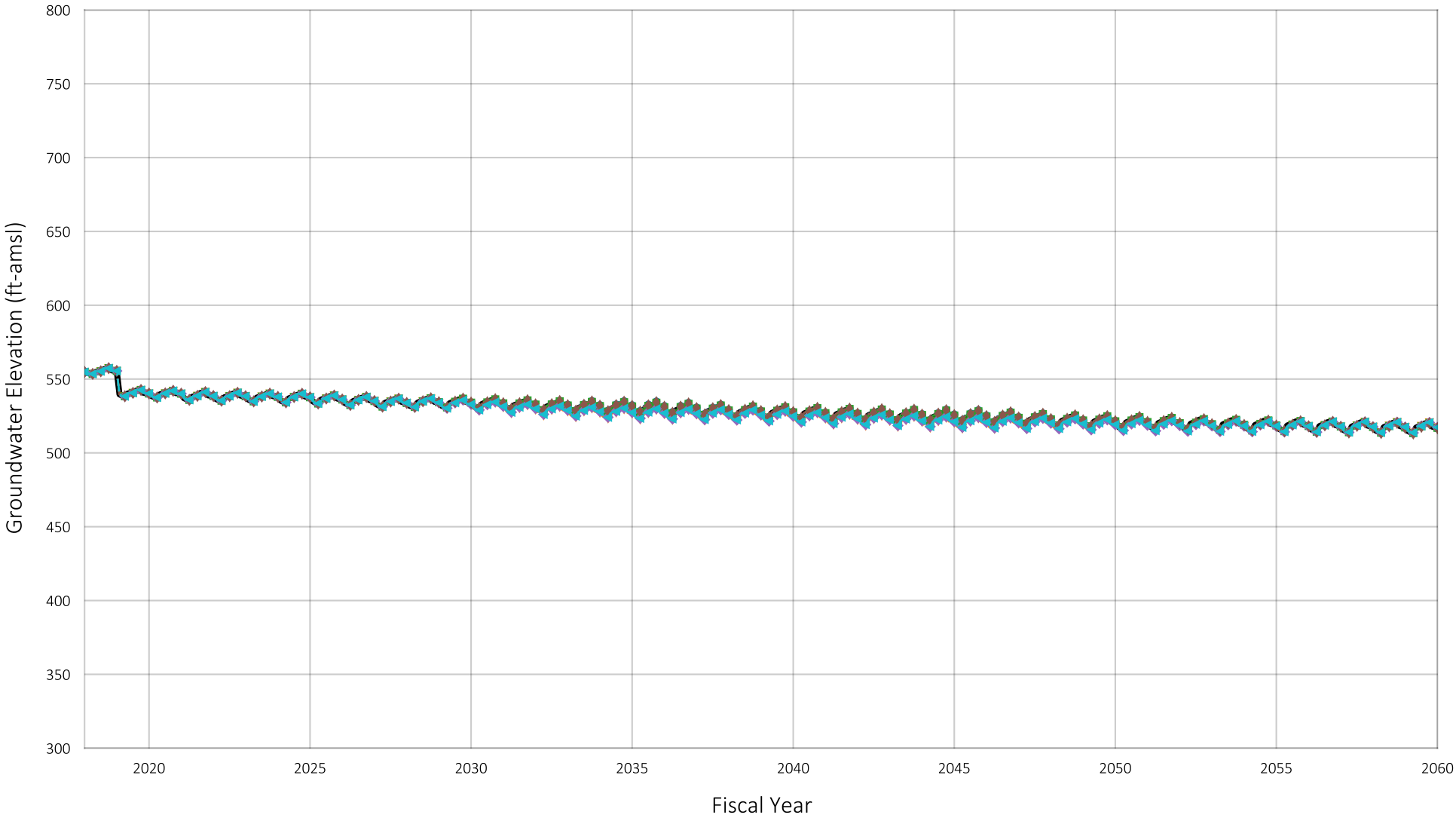
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002645
Owner: City of Chino
Well Name: 14

Figure A-16




Location of Well in Chino Basin



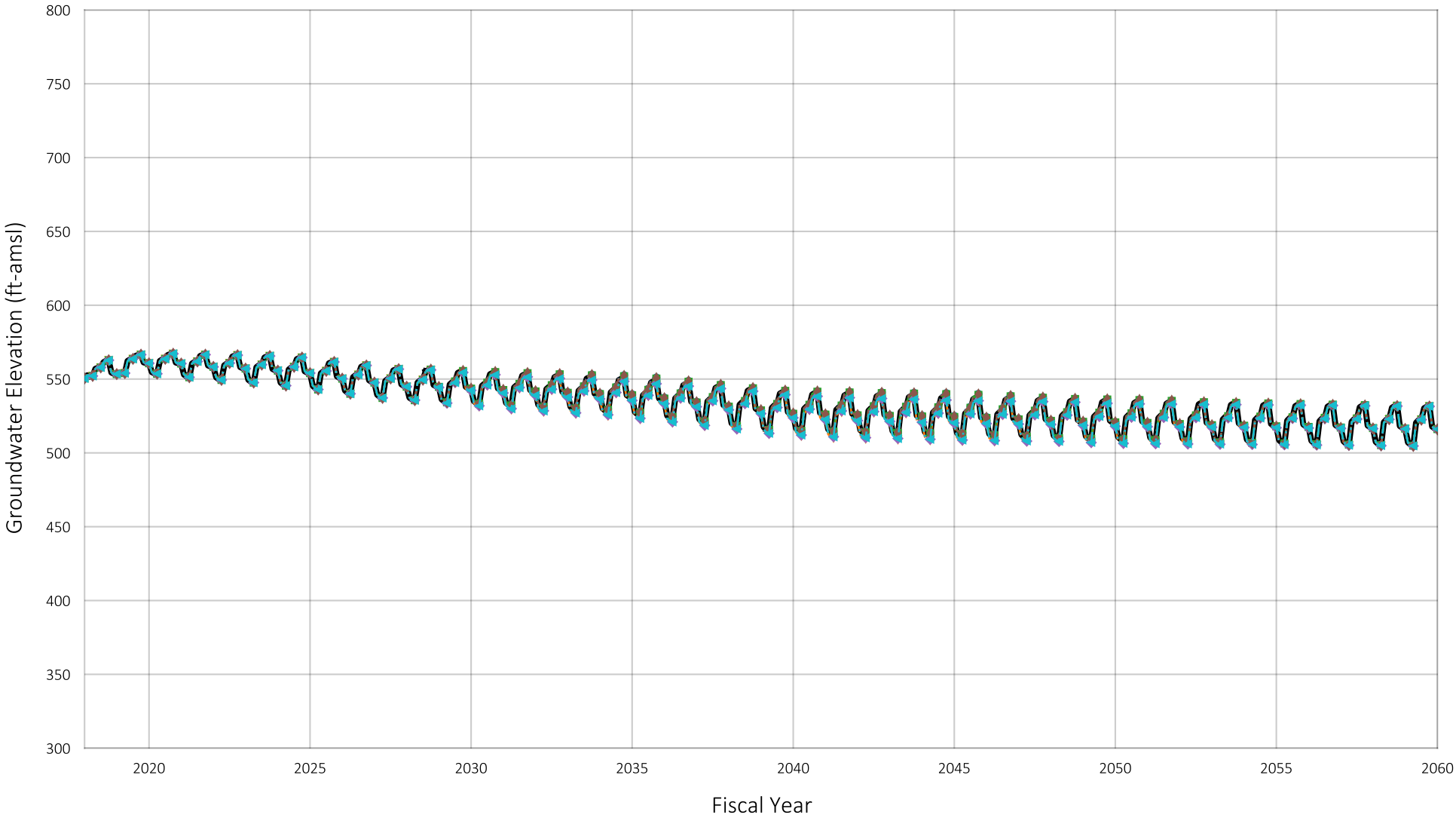
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1208673
Owner: City of Chino
Well Name: 16

Figure A-17




Location of Well in Chino Basin



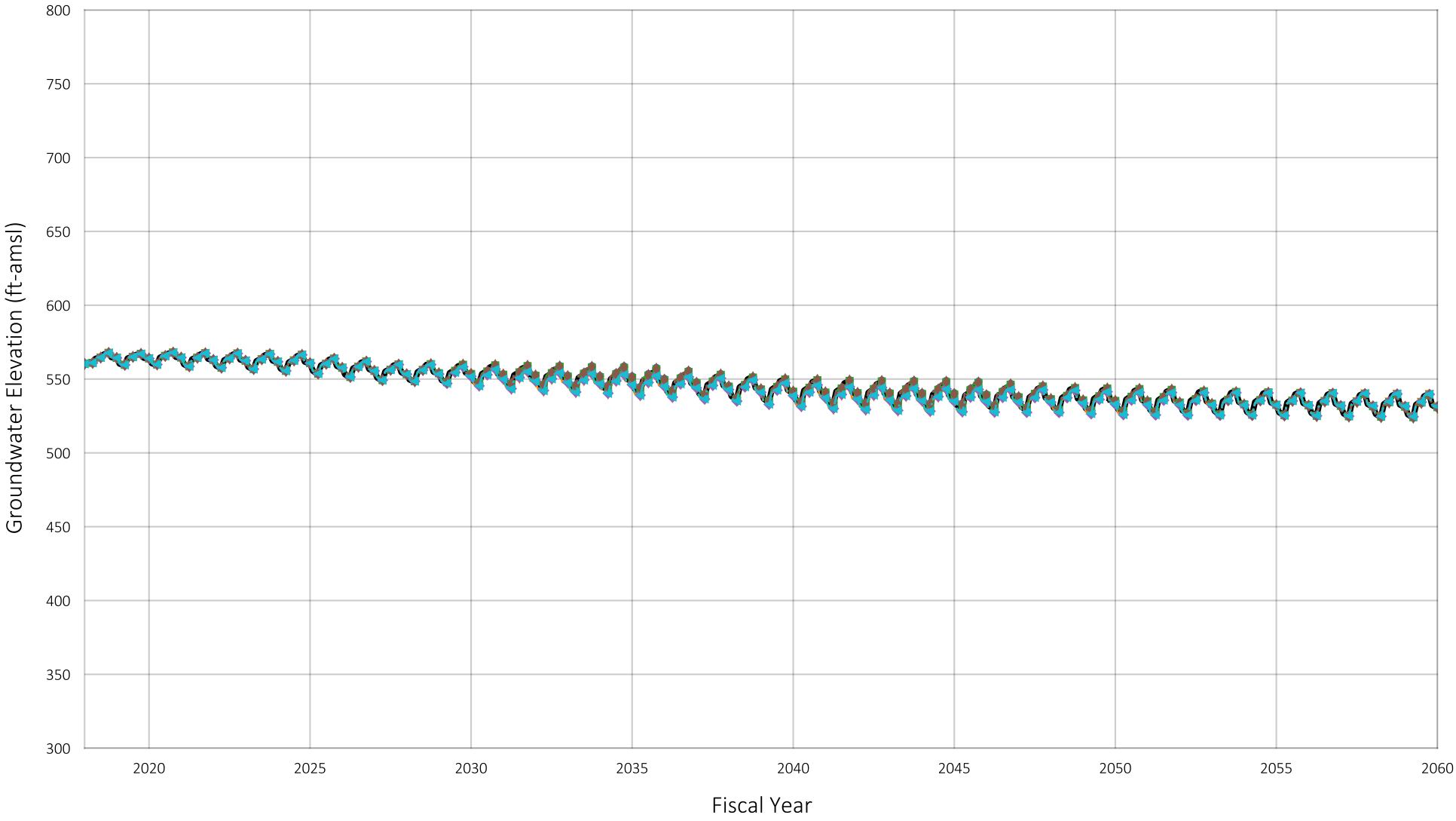
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1234063
Owner: City of Chino
Well Name: 19

Figure A-18




Location of Well in Chino Basin



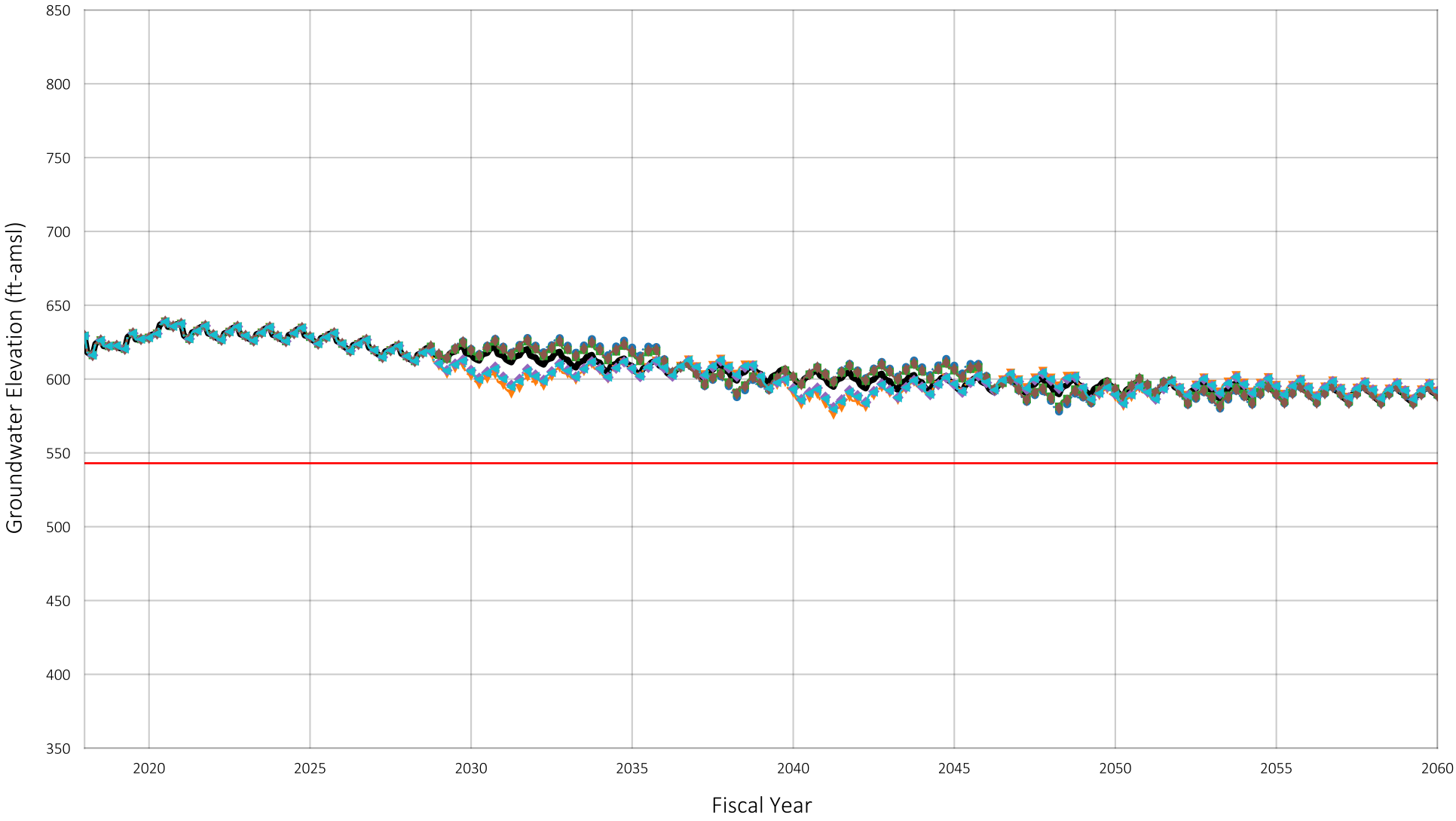
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1224773
Owner: City of Chino
Well Name: 18

Figure A-19




Location of Well in Chino Basin



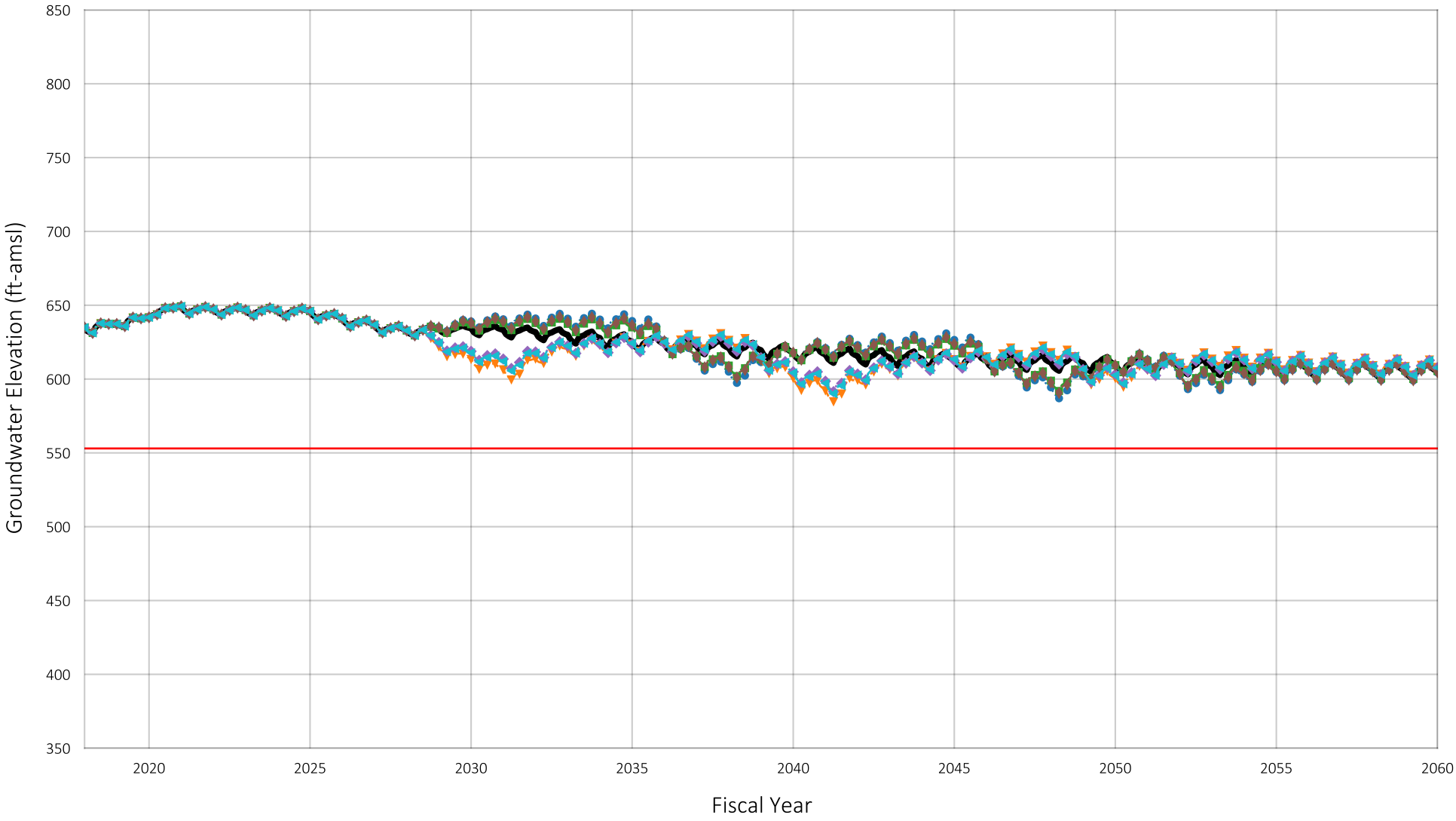
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002309
Owner: Cucamonga Valley Water District
Well Name: CB-1

Figure A-20




Location of Well in Chino Basin



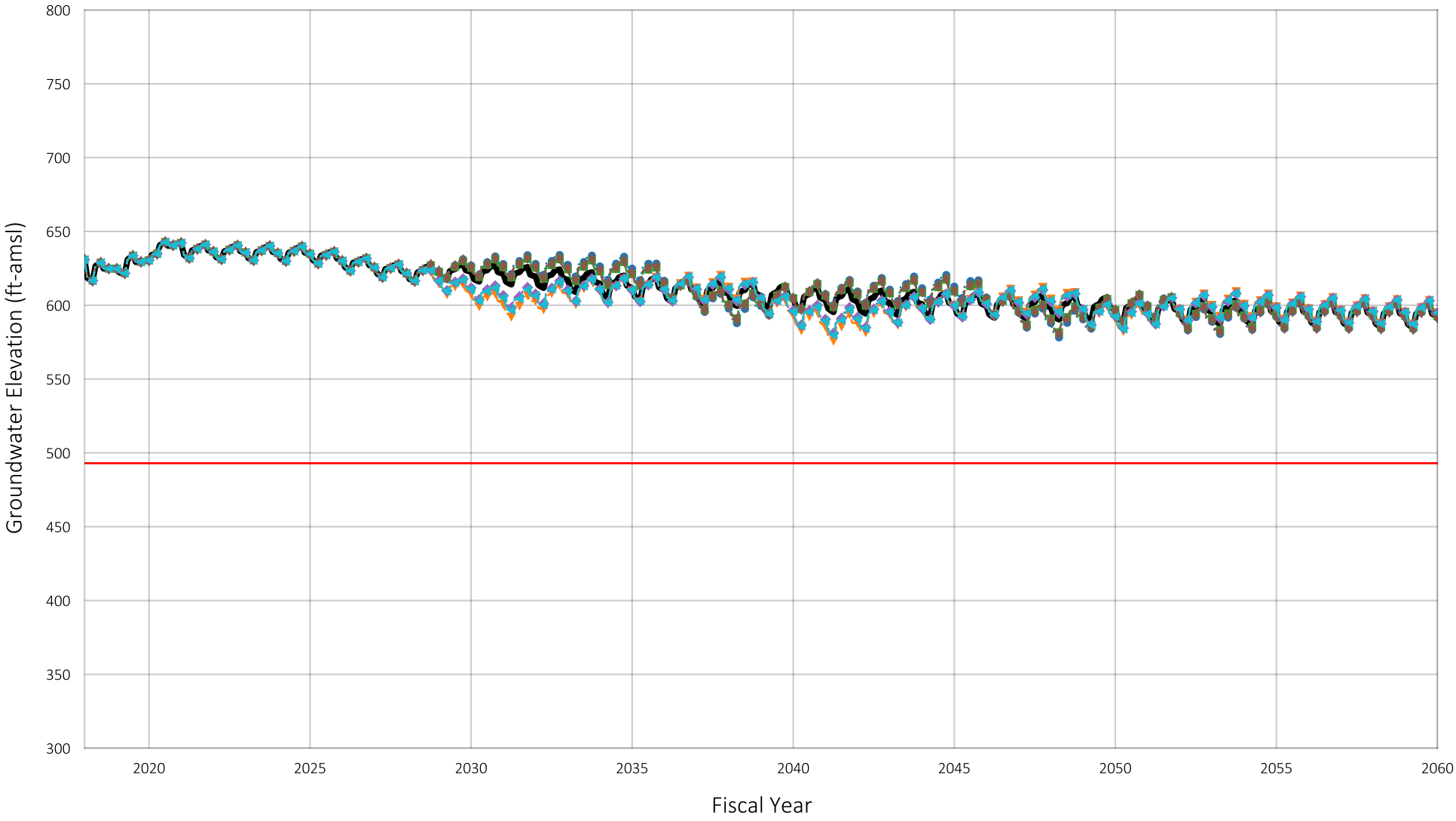
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002312
Owner: Cucamonga Valley Water District
Well Name: CB-3

Figure A-21

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



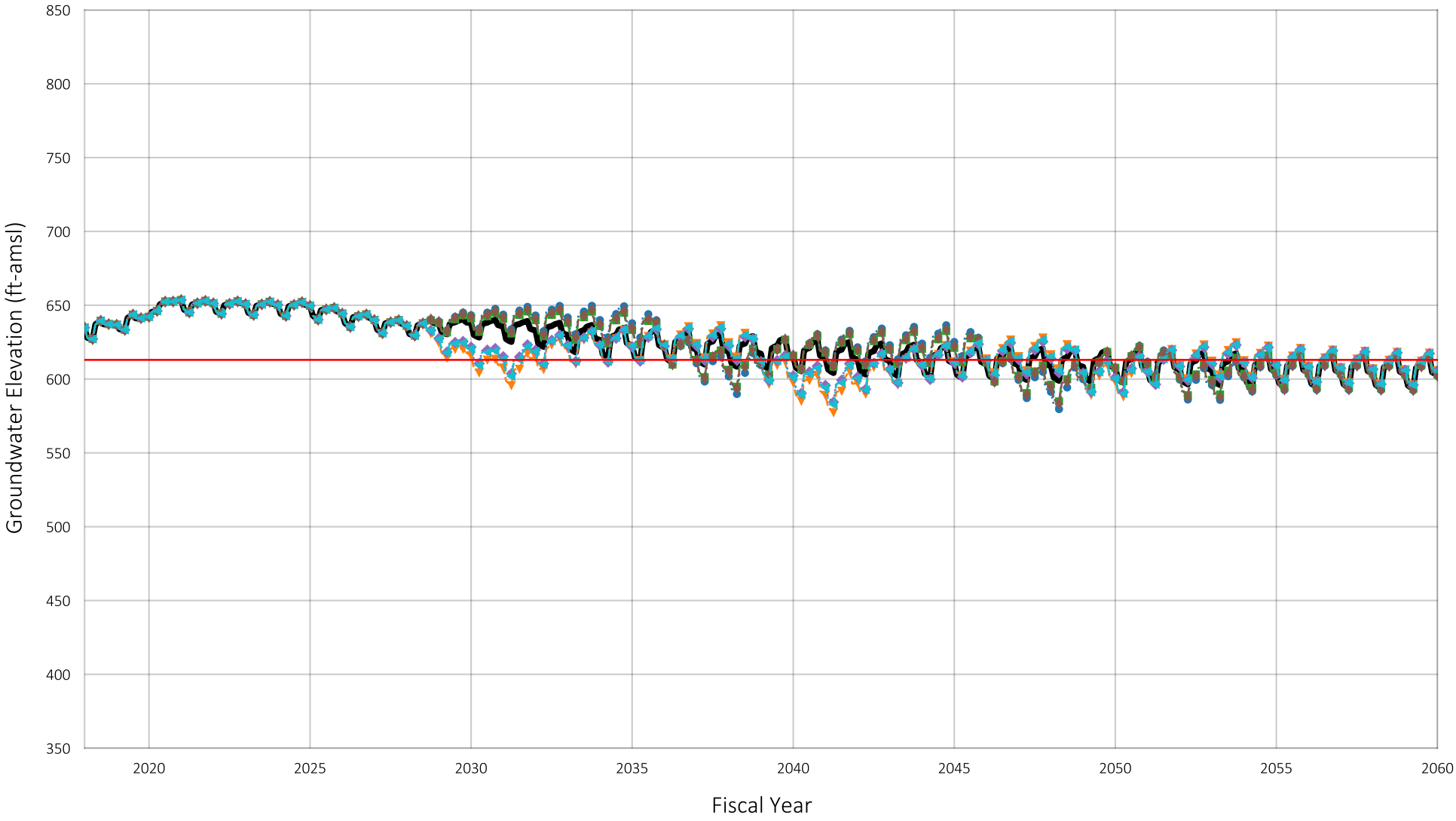
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002307
Owner: Cucamonga Valley Water District
Well Name: CB-4

Figure A-22

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



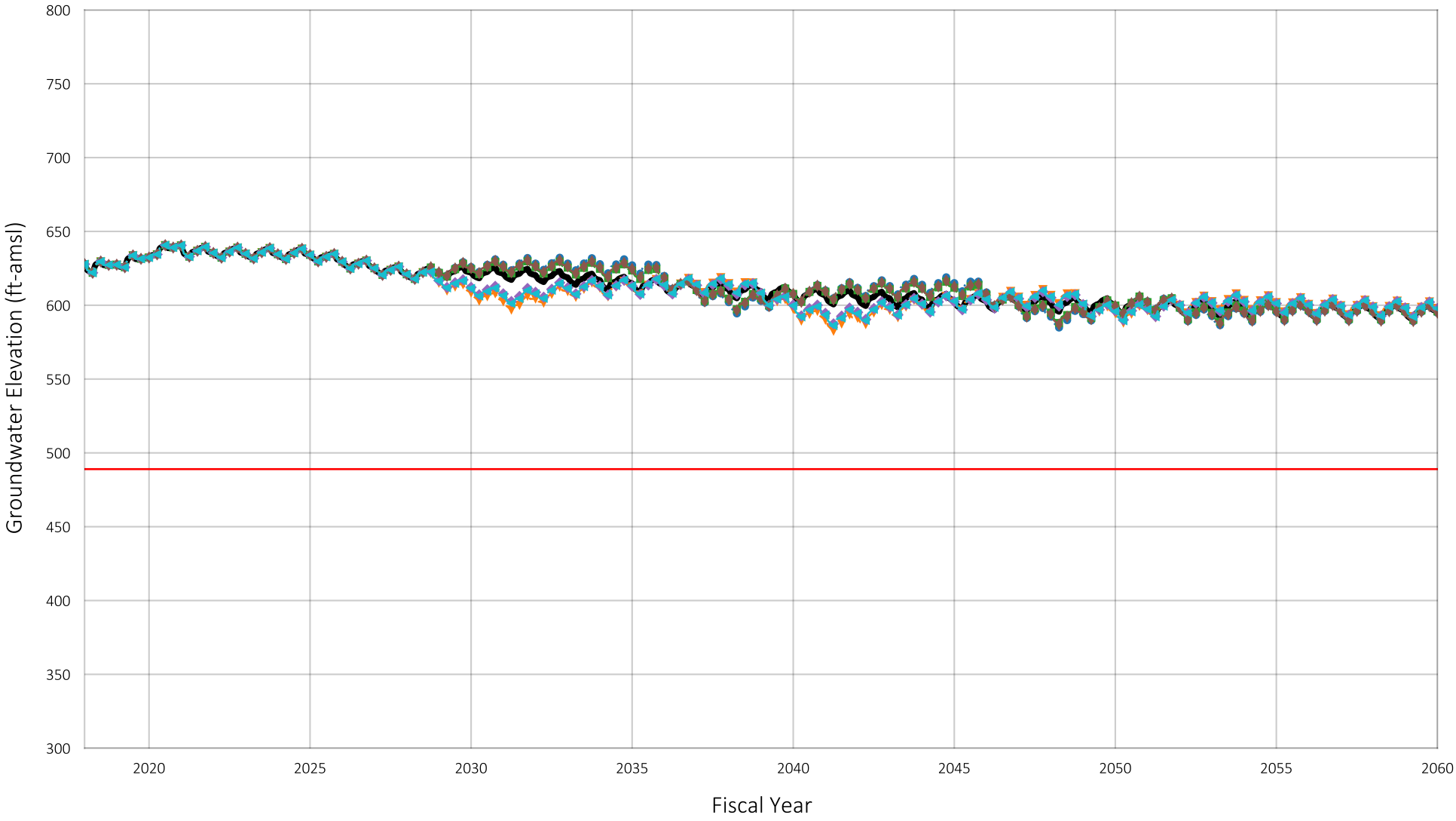
- Baseline
- Scenario 1
- Scenario 2
- Scenario 3
- Scenario 4
- Scenario 5
- Scenario 6
- Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002311
Owner: Cucamonga Valley Water District
Well Name: CB-5

Figure A-23




Location of Well in Chino Basin



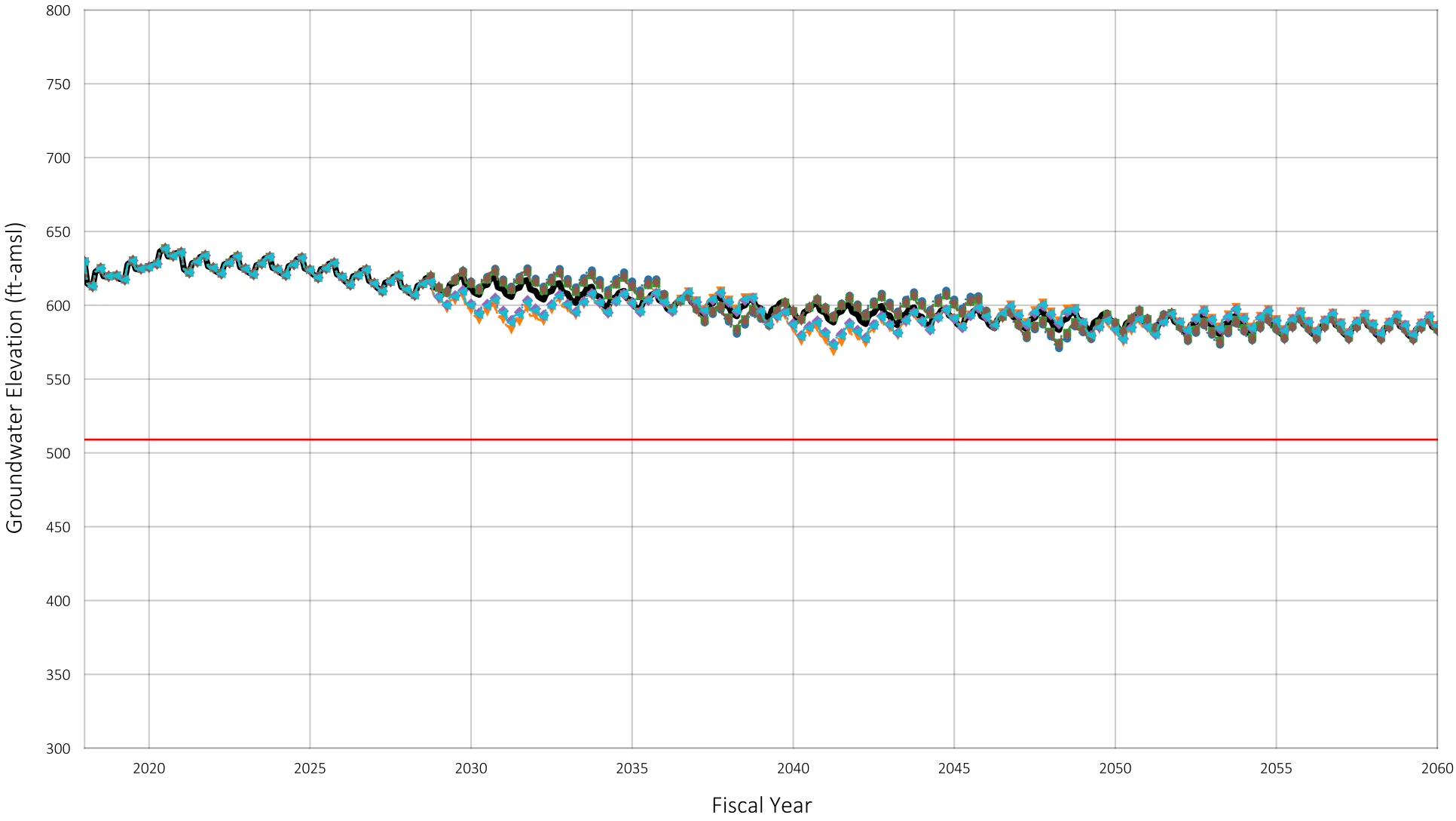
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002308
Owner: Cucamonga Valley Water District
Well Name: CB-30

Figure A-24

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



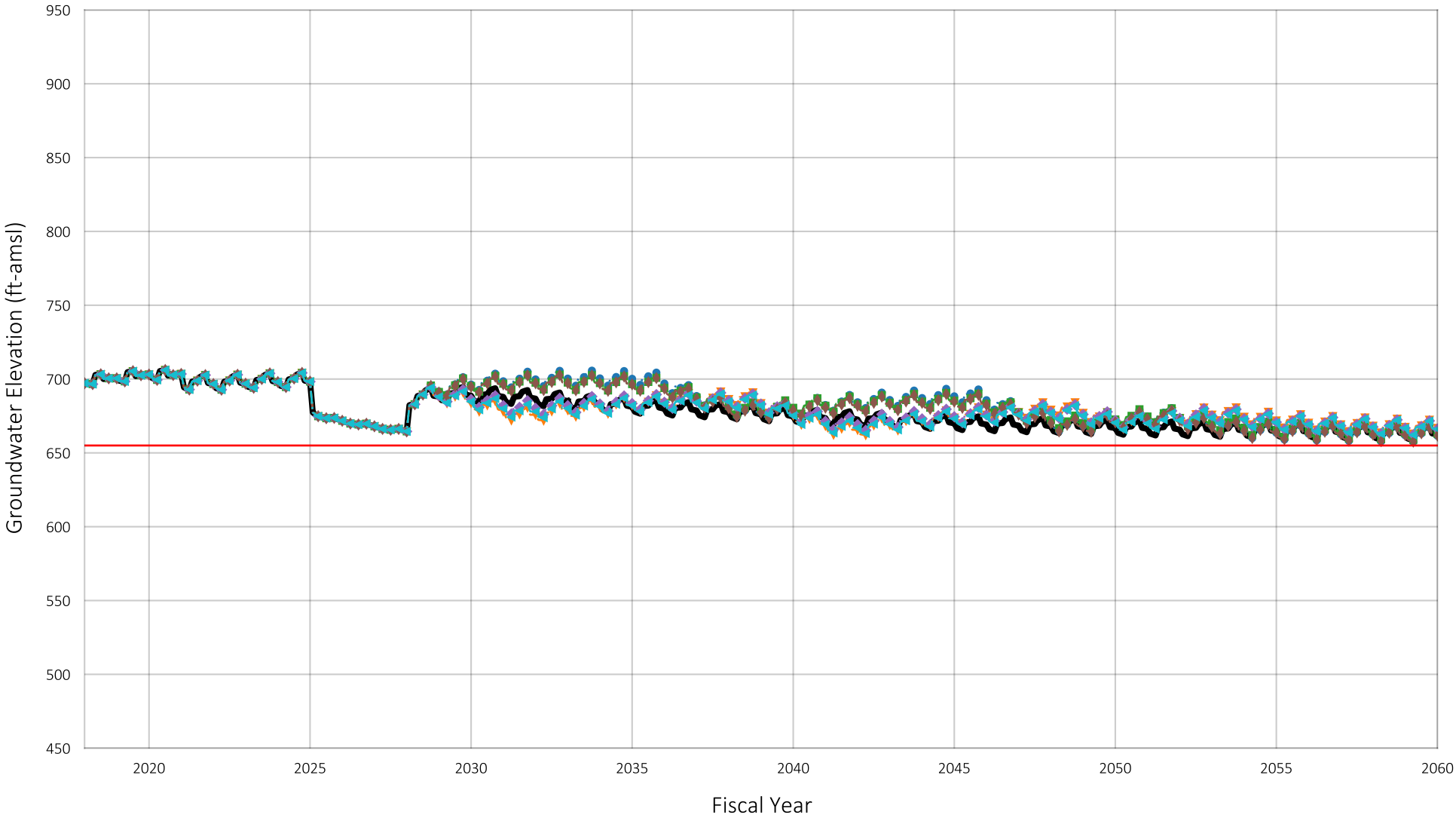
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206753
Owner: Cucamonga Valley Water District
Well Name: CB-38

Figure A-25

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



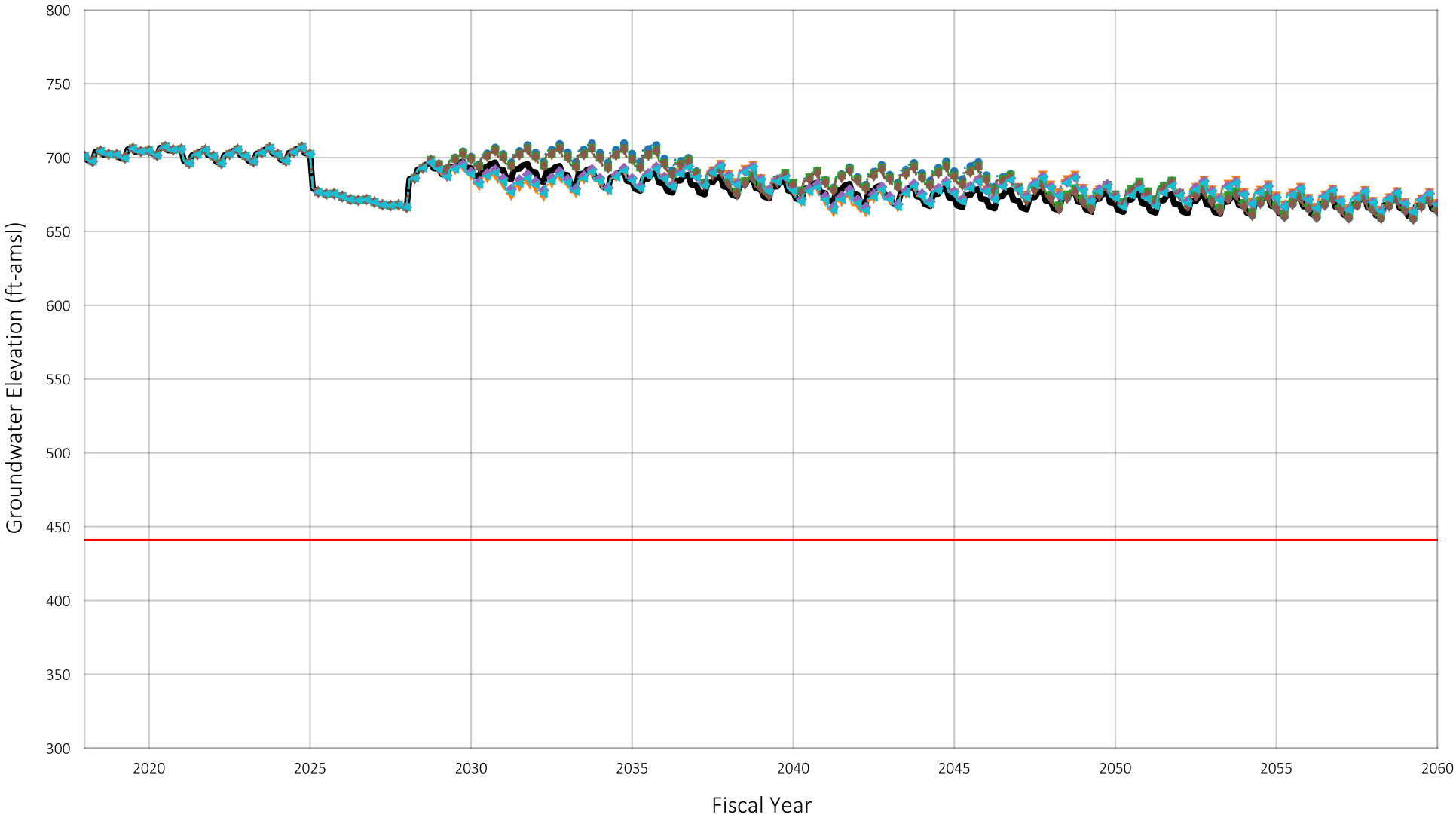
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207928
Owner: Cucamonga Valley Water District
Well Name: CB-39

Figure A-26

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



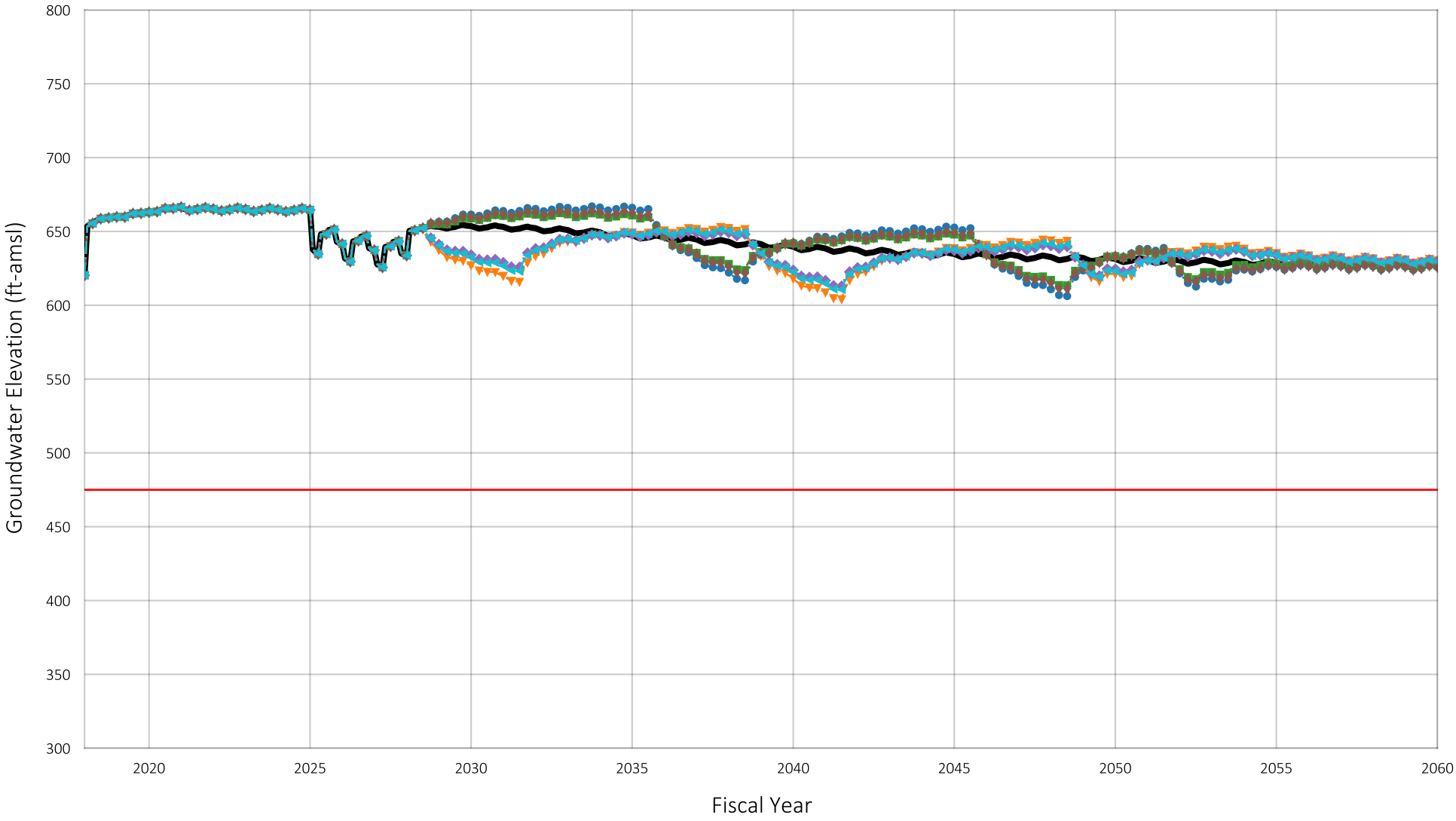
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207929
Owner: Cucamonga Valley Water District
Well Name: CB-40

Figure A-27

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



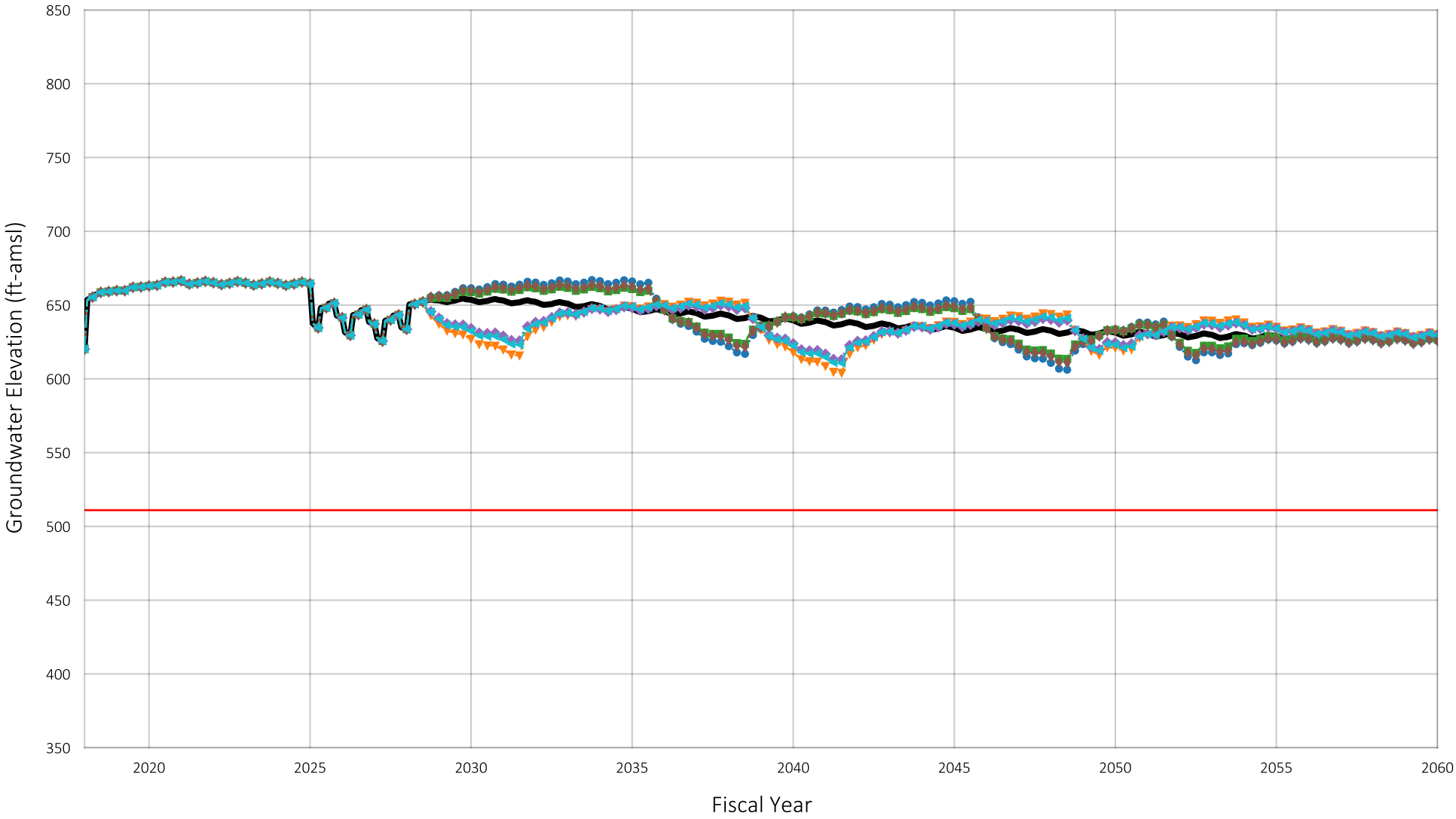
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207936
Owner: Cucamonga Valley Water District
Well Name: CB-41

Figure A-28




Location of Well in Chino Basin



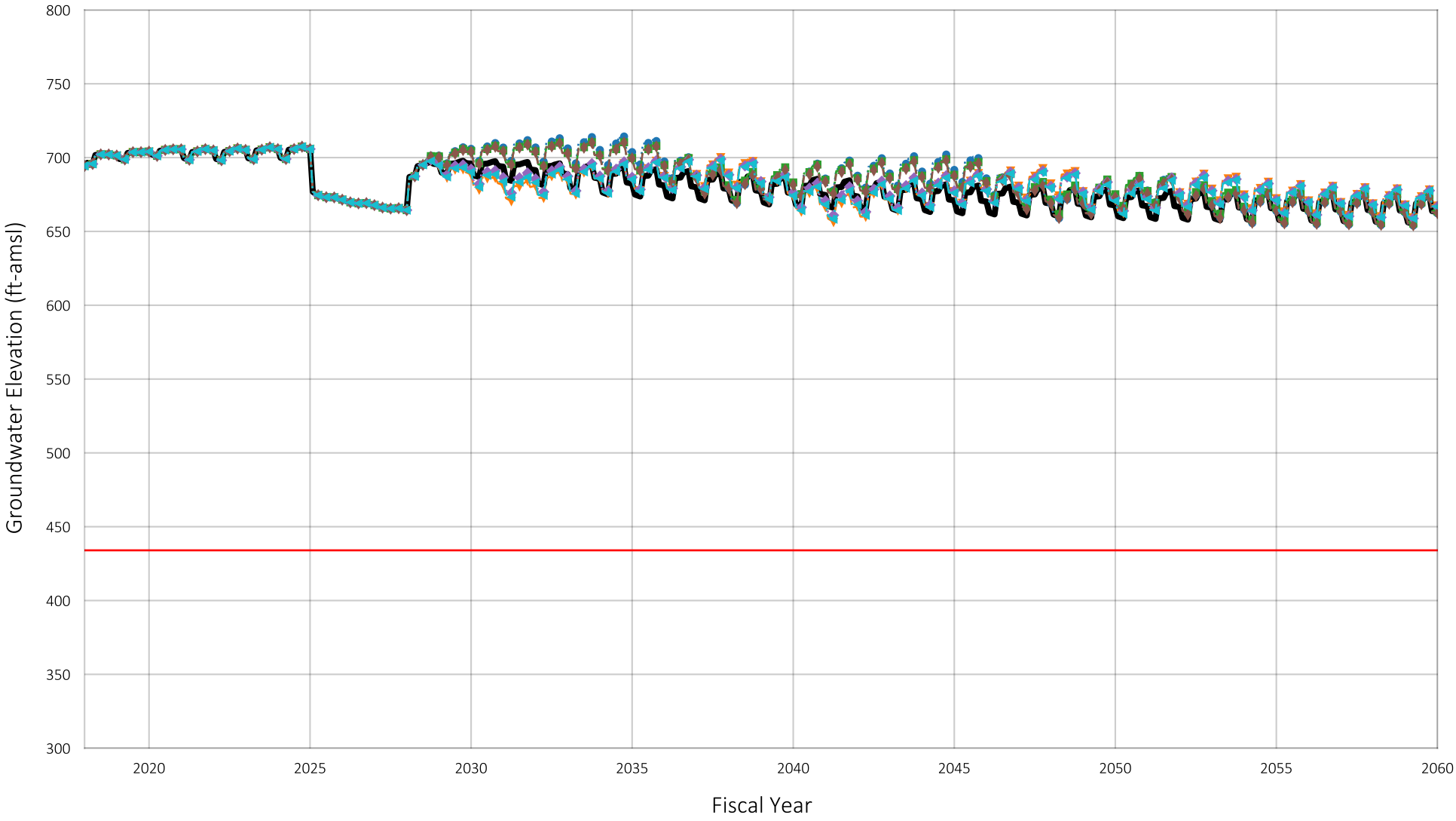
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207937
Owner: Cucamonga Valley Water District
Well Name: CB-42

Figure A-29

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



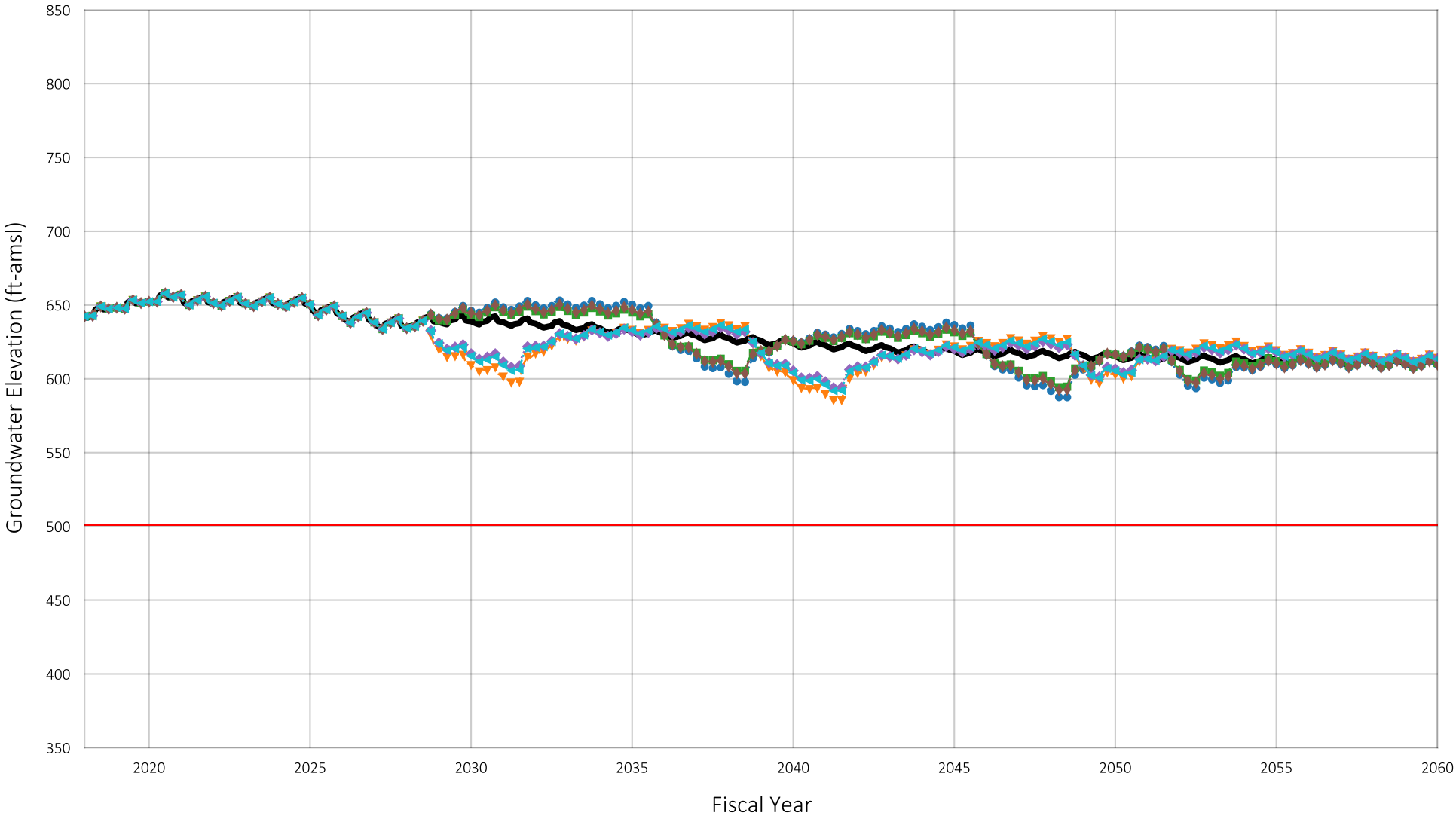
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220079
Owner: Cucamonga Valley Water District
Well Name: CB-43

Figure A-30




Location of Well in Chino Basin



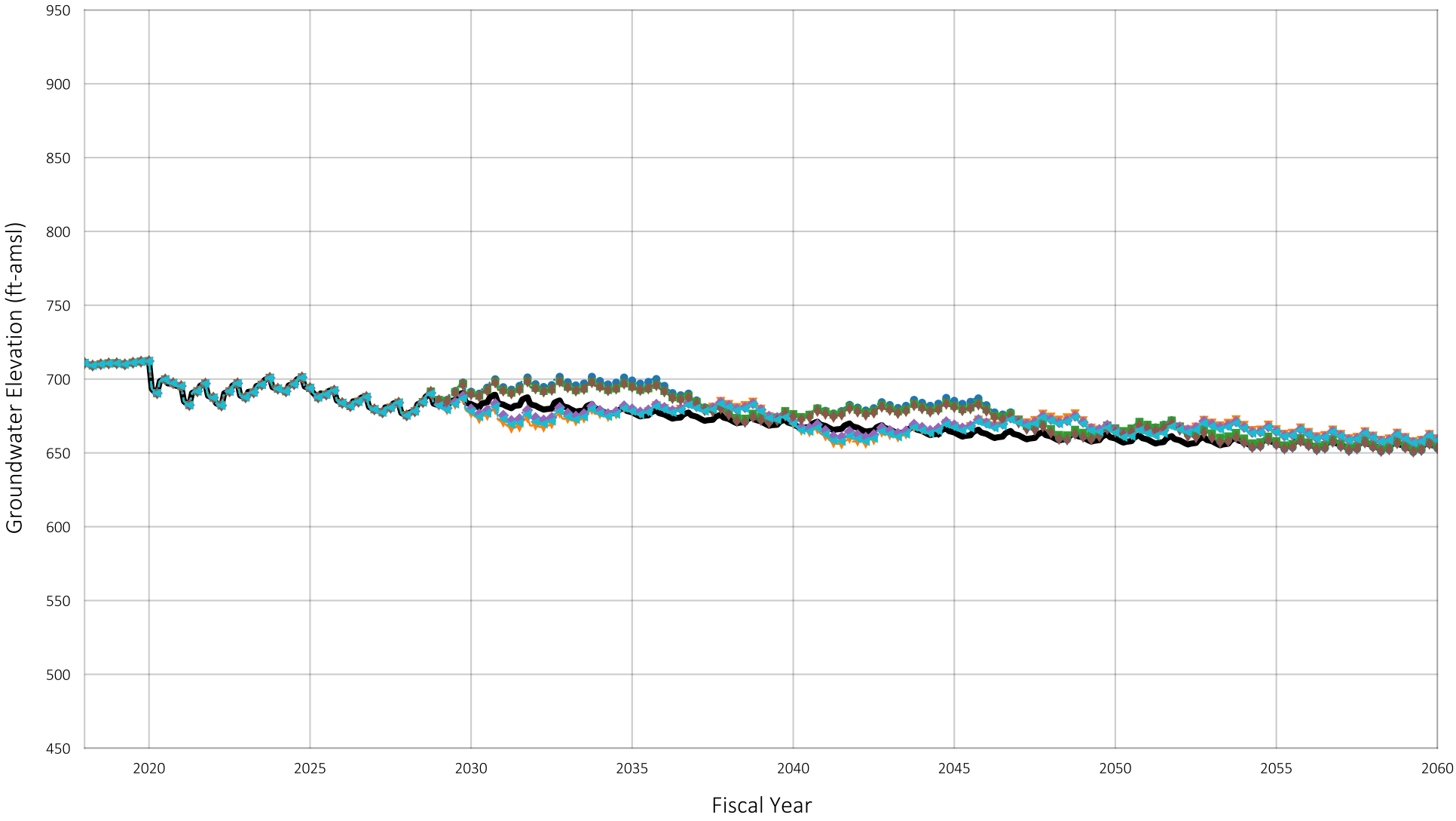
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220080
Owner: Cucamonga Valley Water District
Well Name: CB-46

Figure A-31




Location of Well in Chino Basin



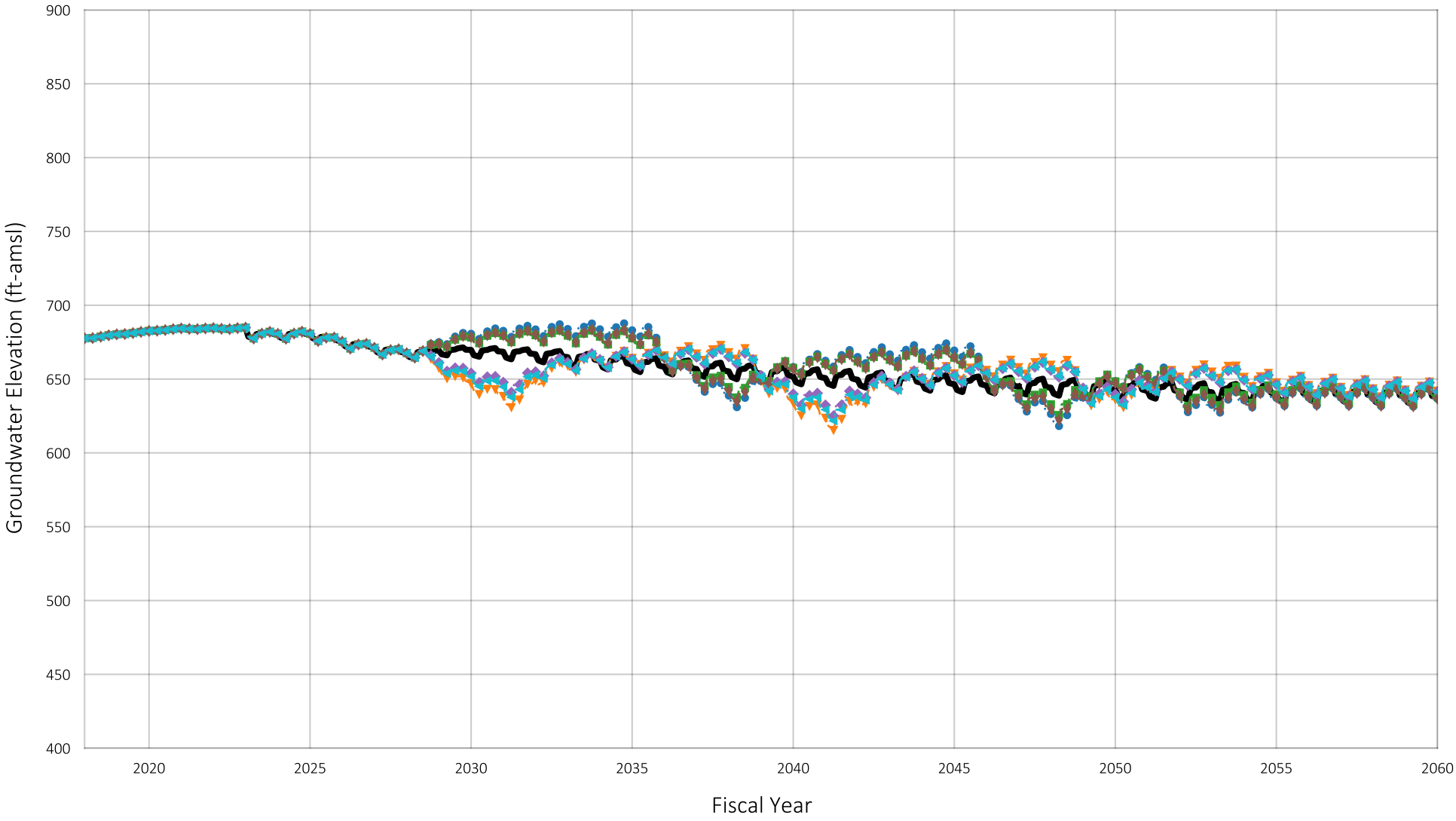
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 999948
Owner: Cucamonga Valley Water District
Well Name: CB-48

Figure A-32




Location of Well in Chino Basin



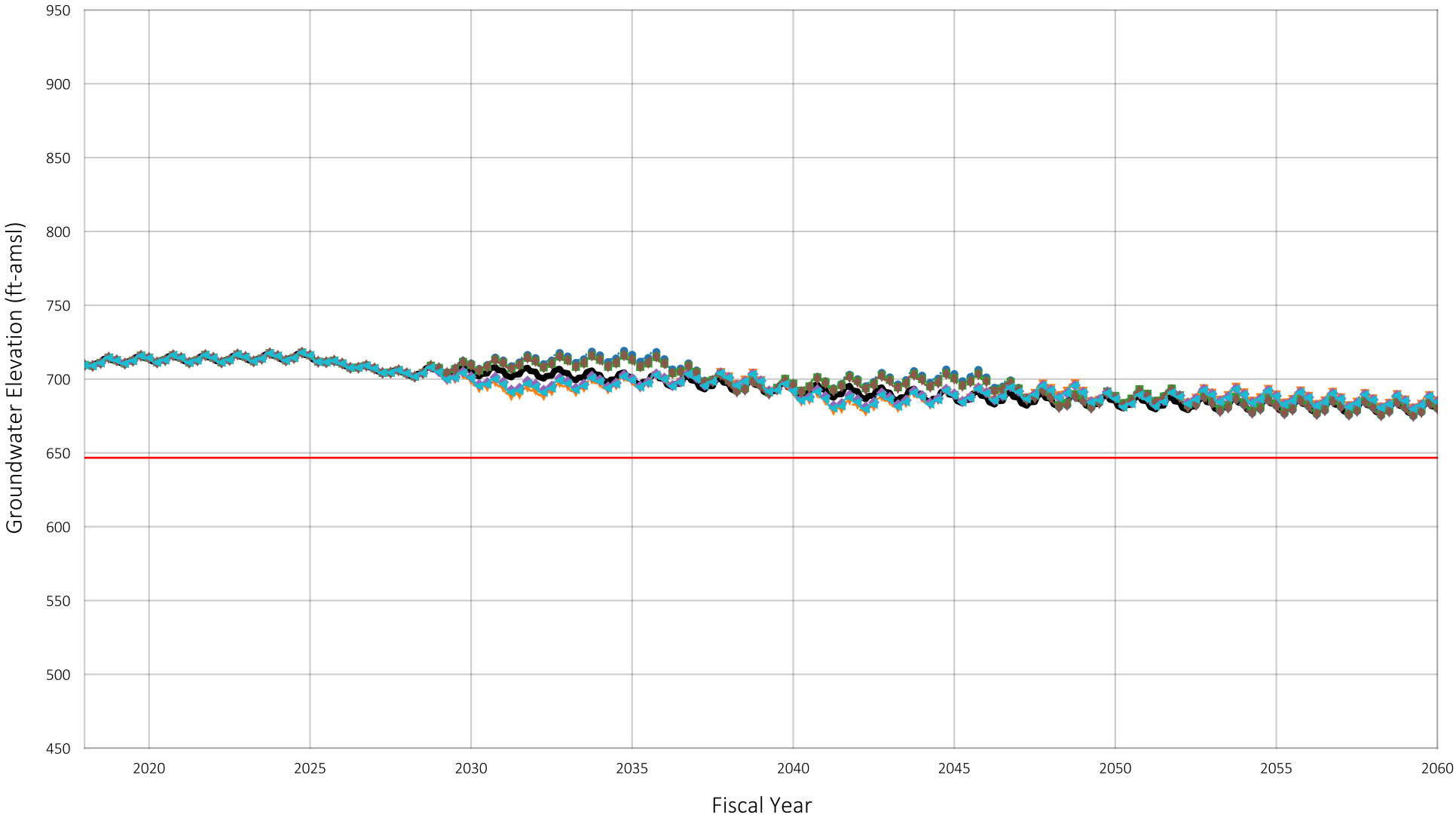
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 999950
Owner: Cucamonga Valley Water District
Well Name: CB-50

Figure A-33




Location of Well in Chino Basin



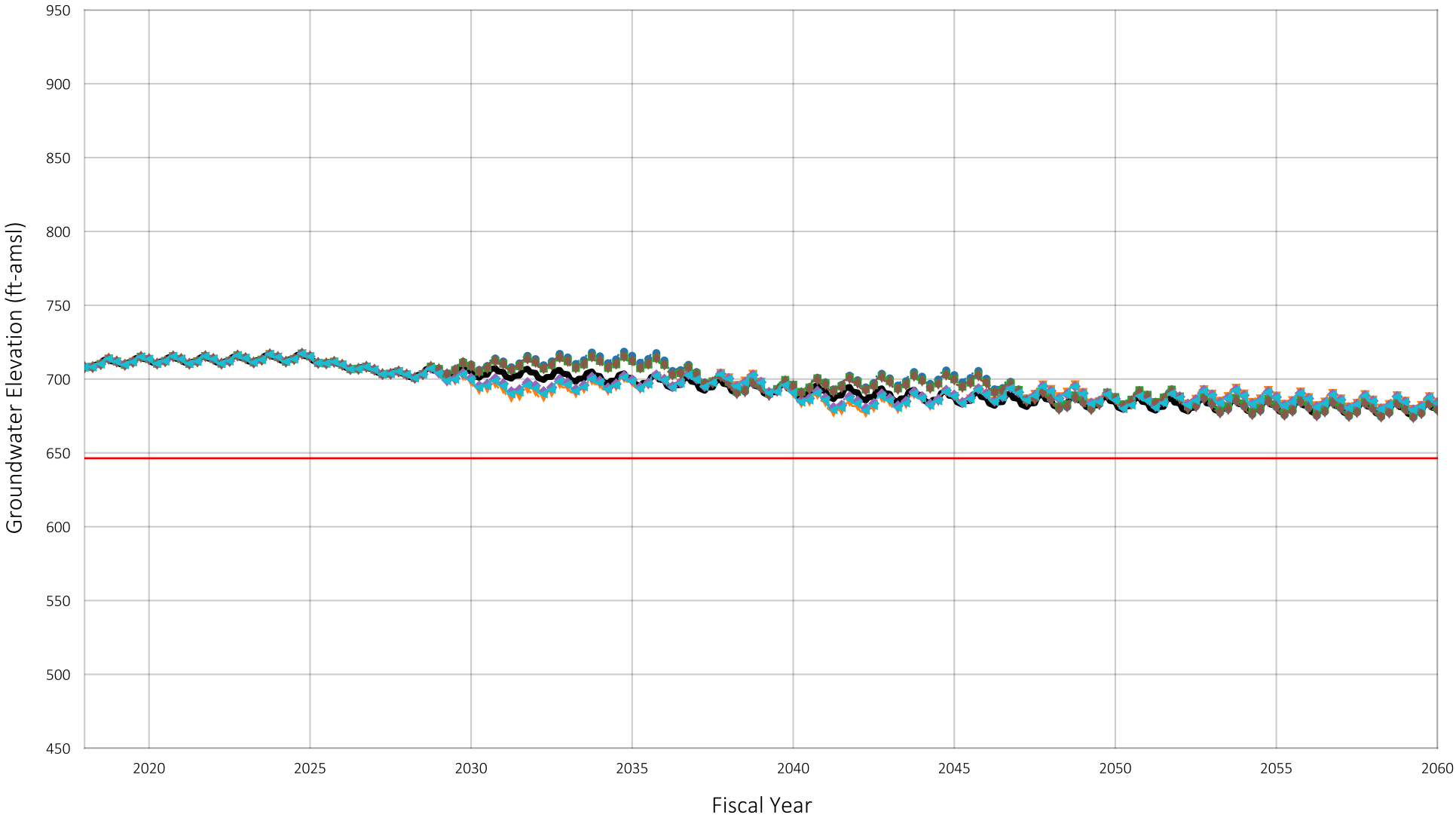
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002211
Owner: Fontana Water Company
Well Name: F7A

Figure A-34

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



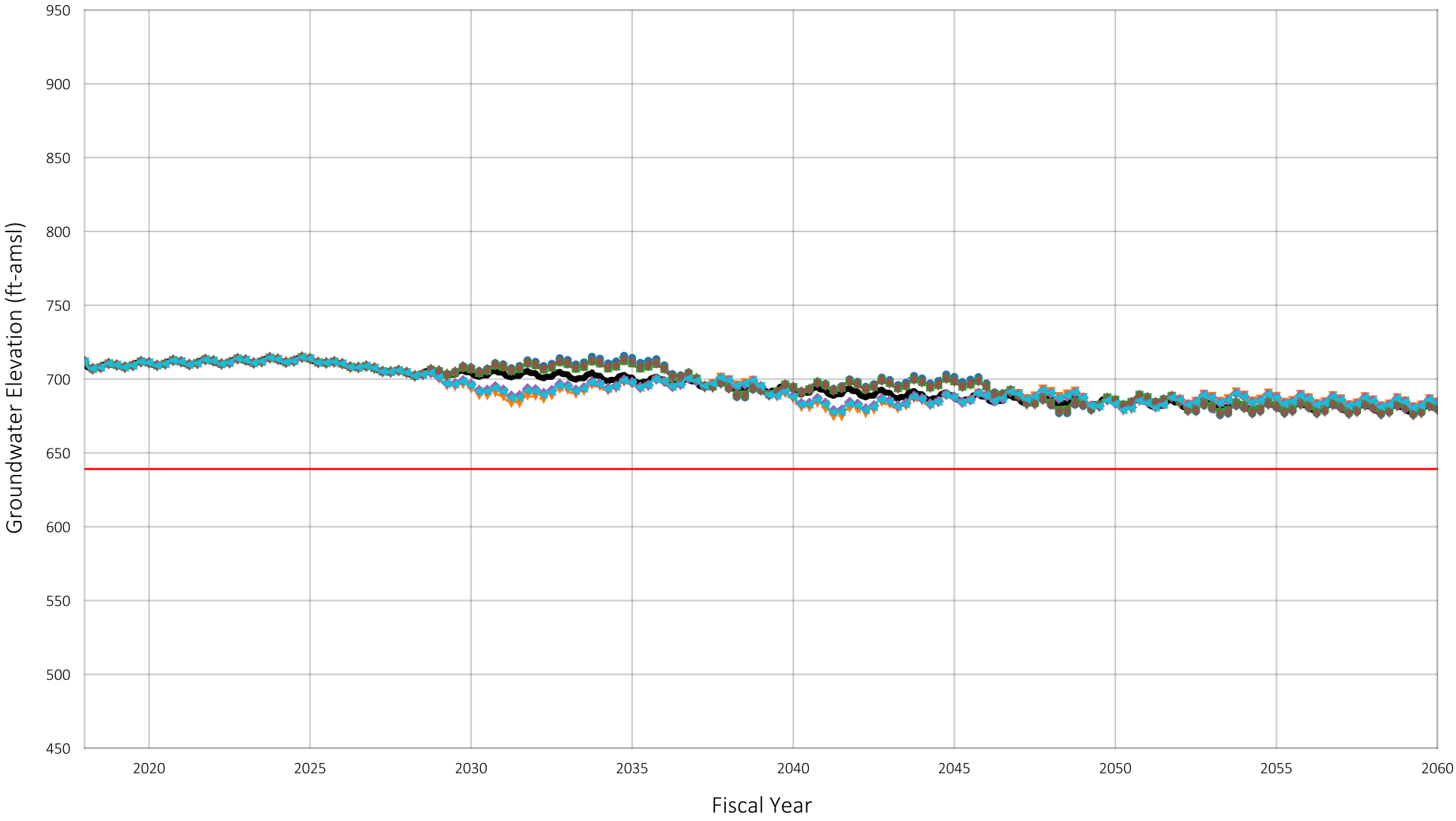
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1221726
Owner: Fontana Water Company
Well Name: F7B

Figure A-35

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



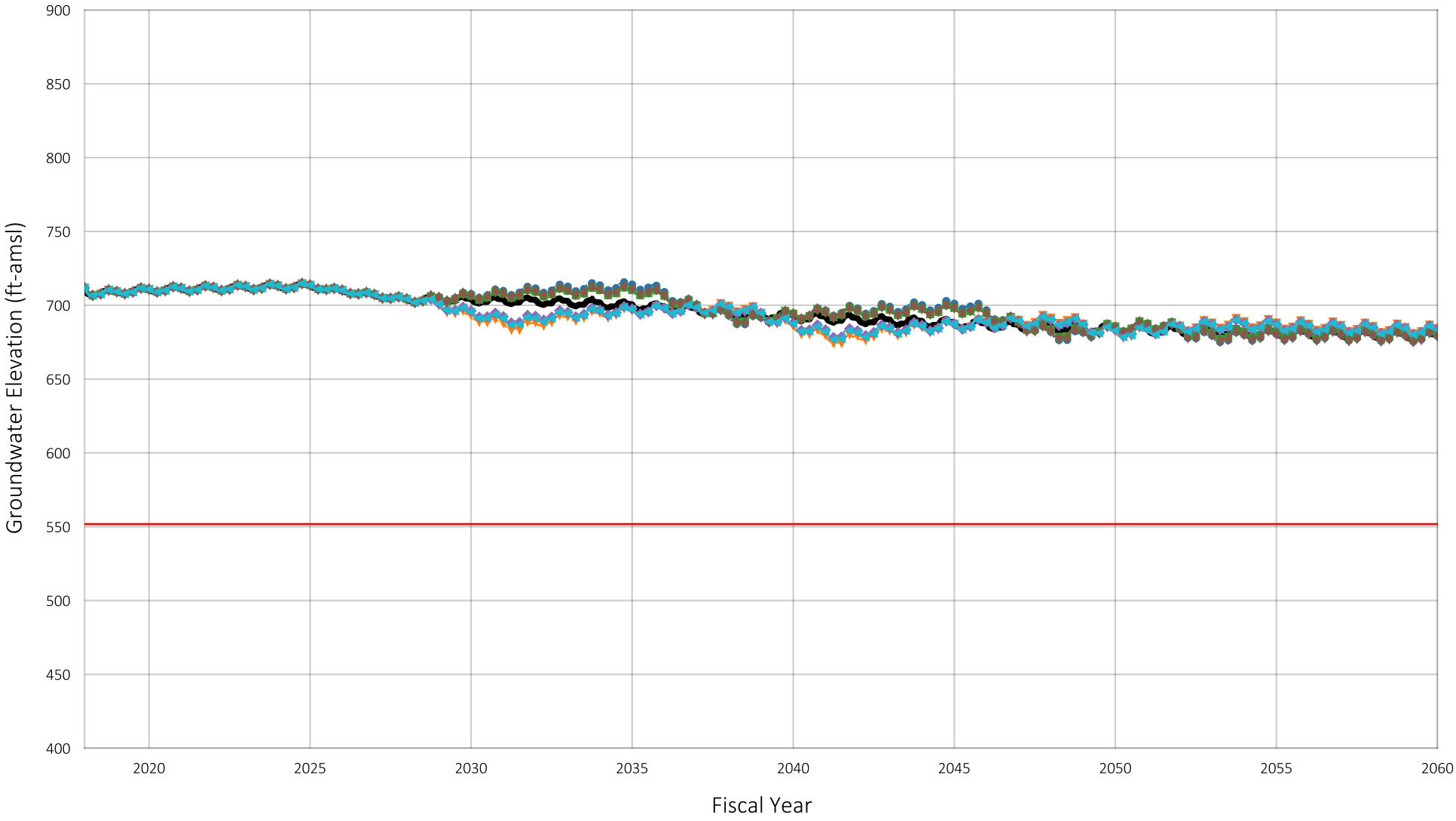
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002237
Owner: Fontana Water Company
Well Name: F17B

Figure A-36

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



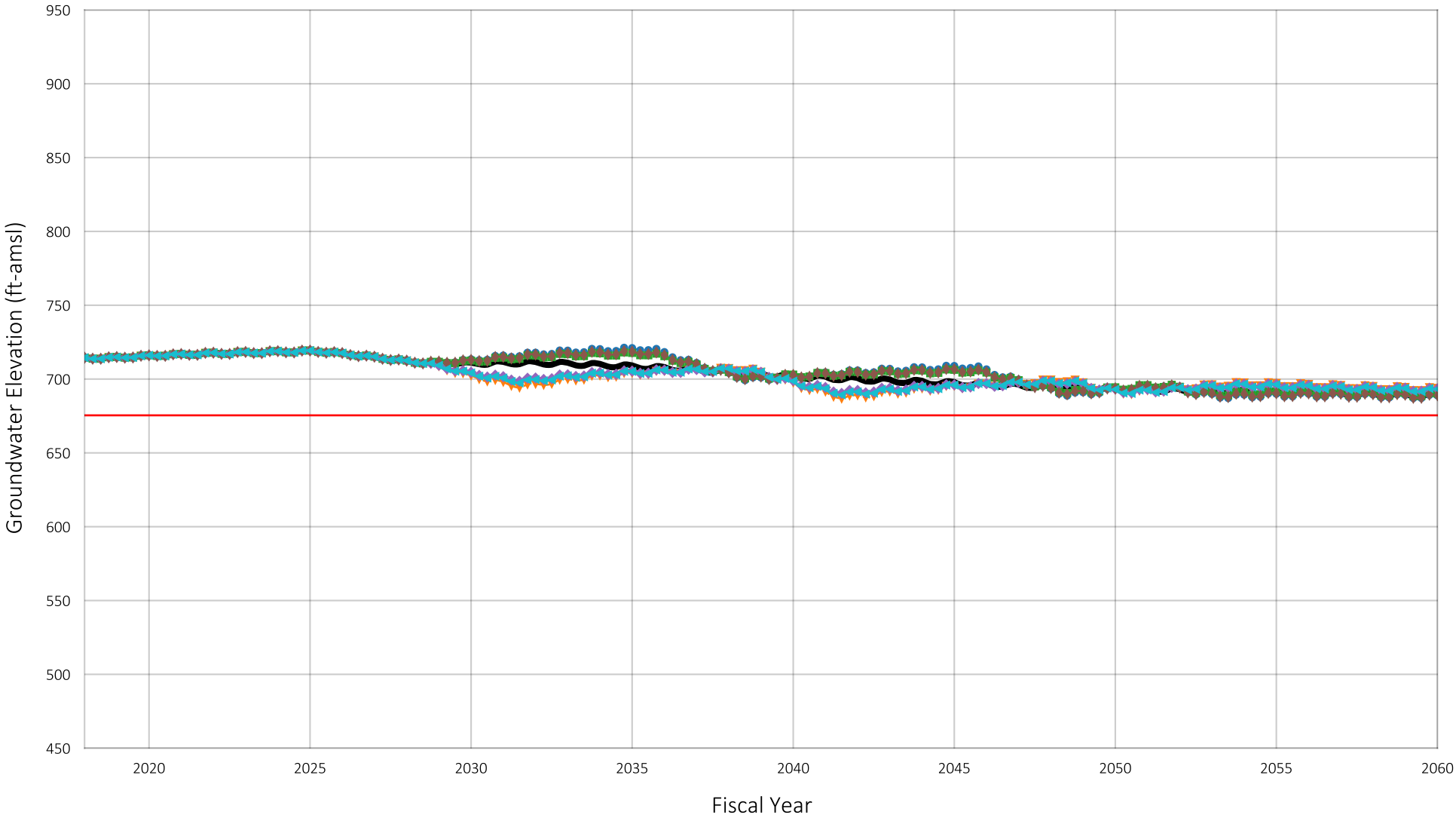
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1201069
Owner: Fontana Water Company
Well Name: F17C

Figure A-37




Location of Well in Chino Basin



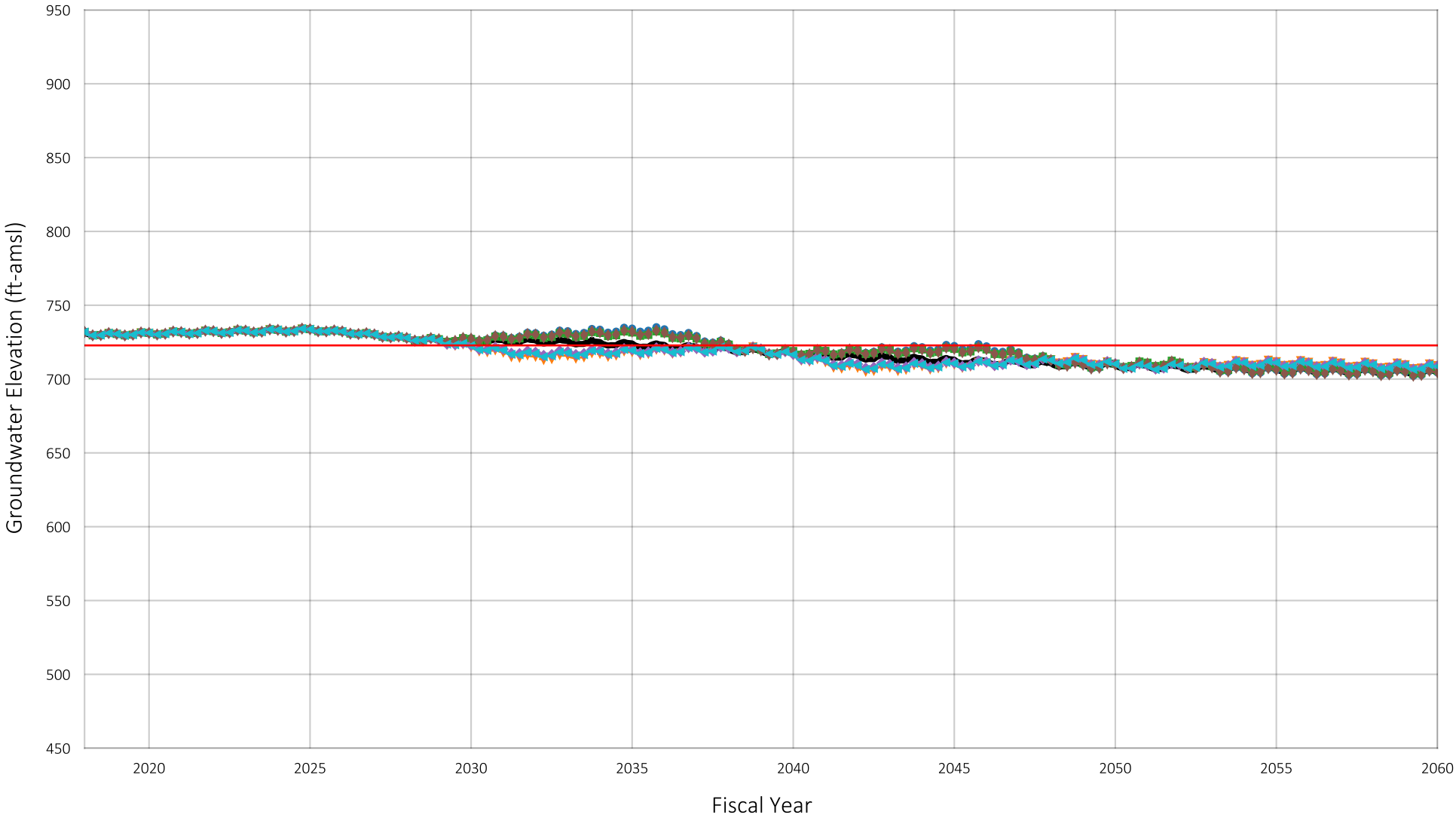
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1232847
Owner: Fontana Water Company
Well Name: F21B

Figure A-38

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



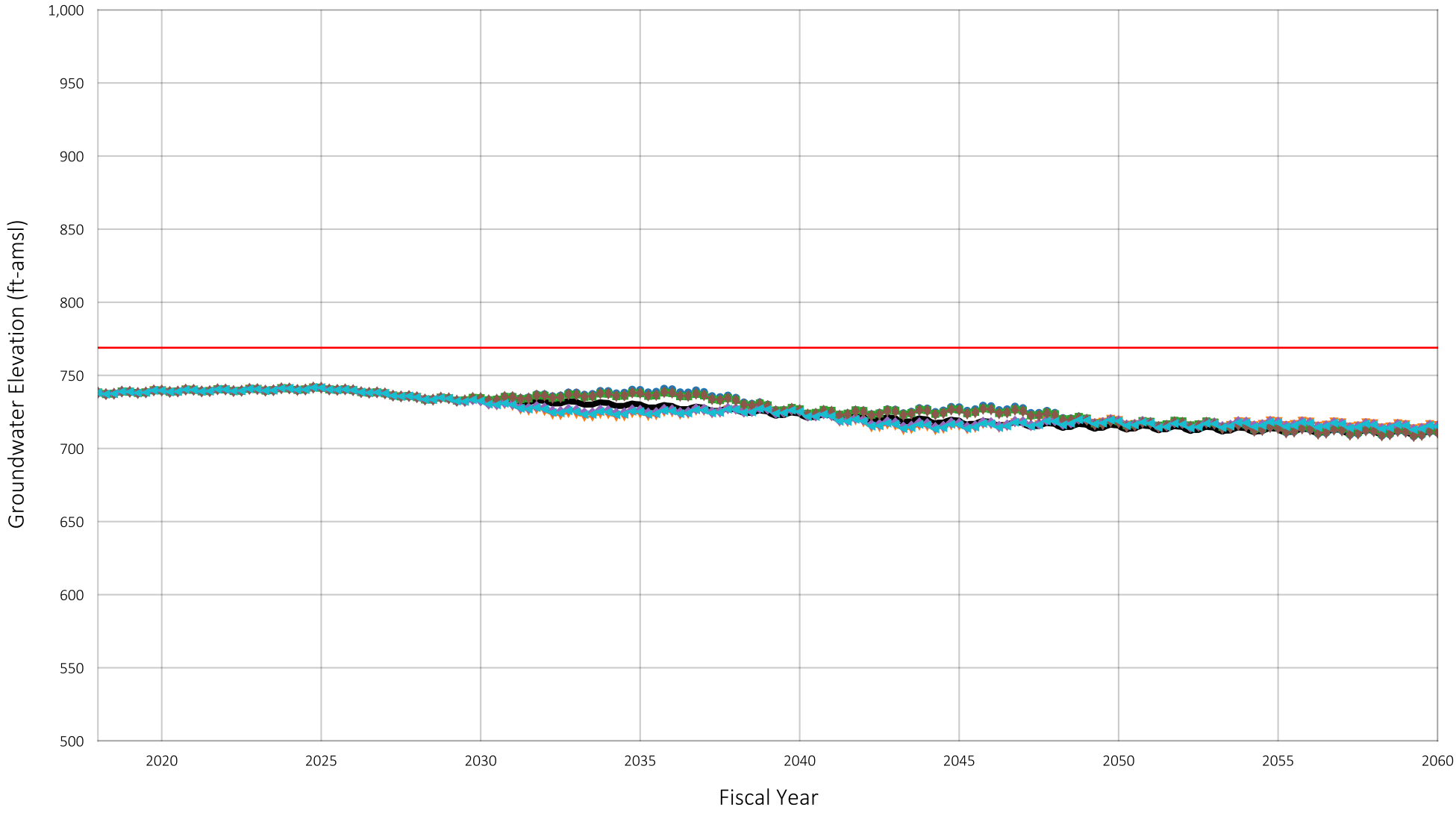
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002239
Owner: Fontana Water Company
Well Name: F23A

Figure A-39

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



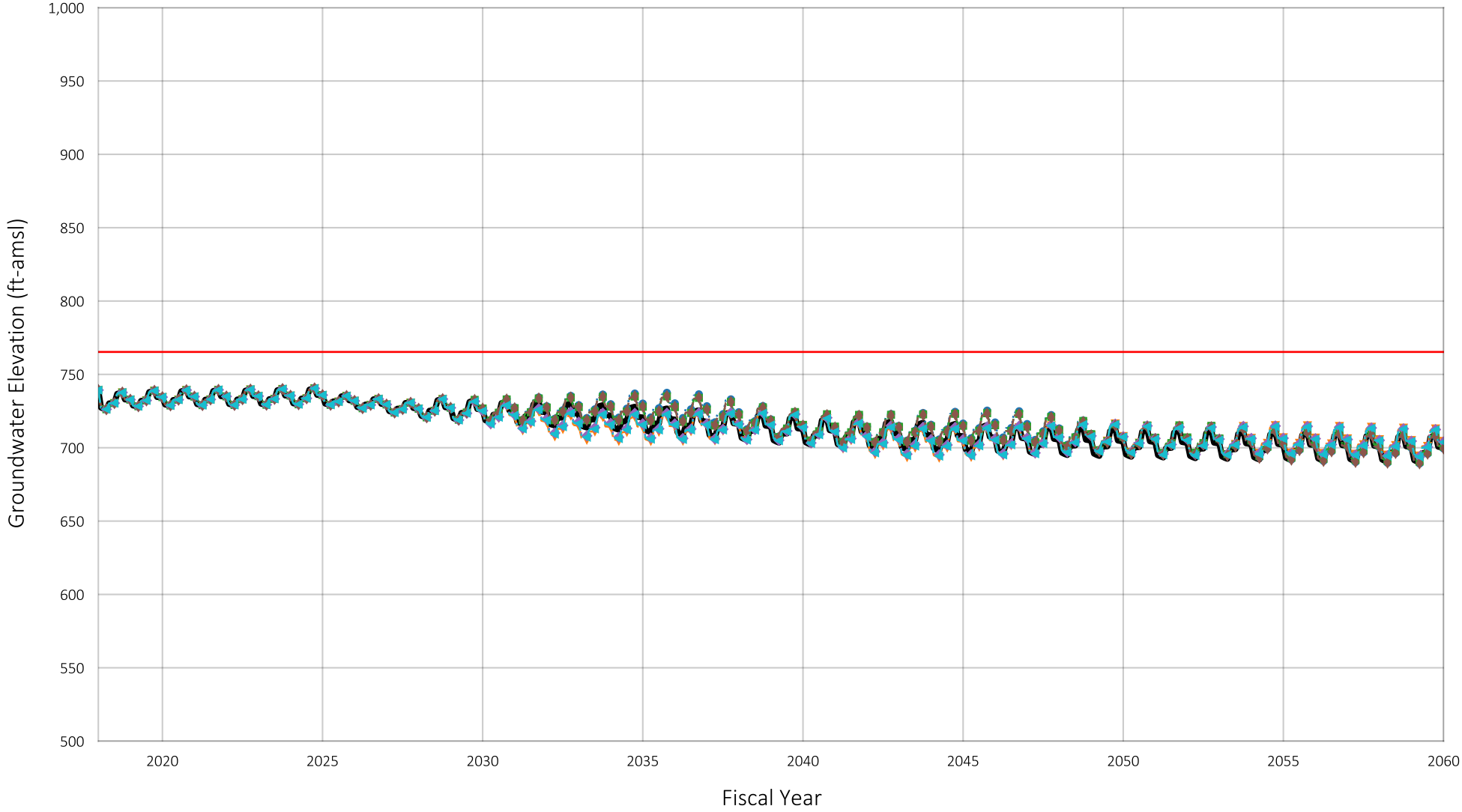
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1200218
Owner: Fontana Water Company
Well Name: F24A

Figure A-40




Location of Well in Chino Basin



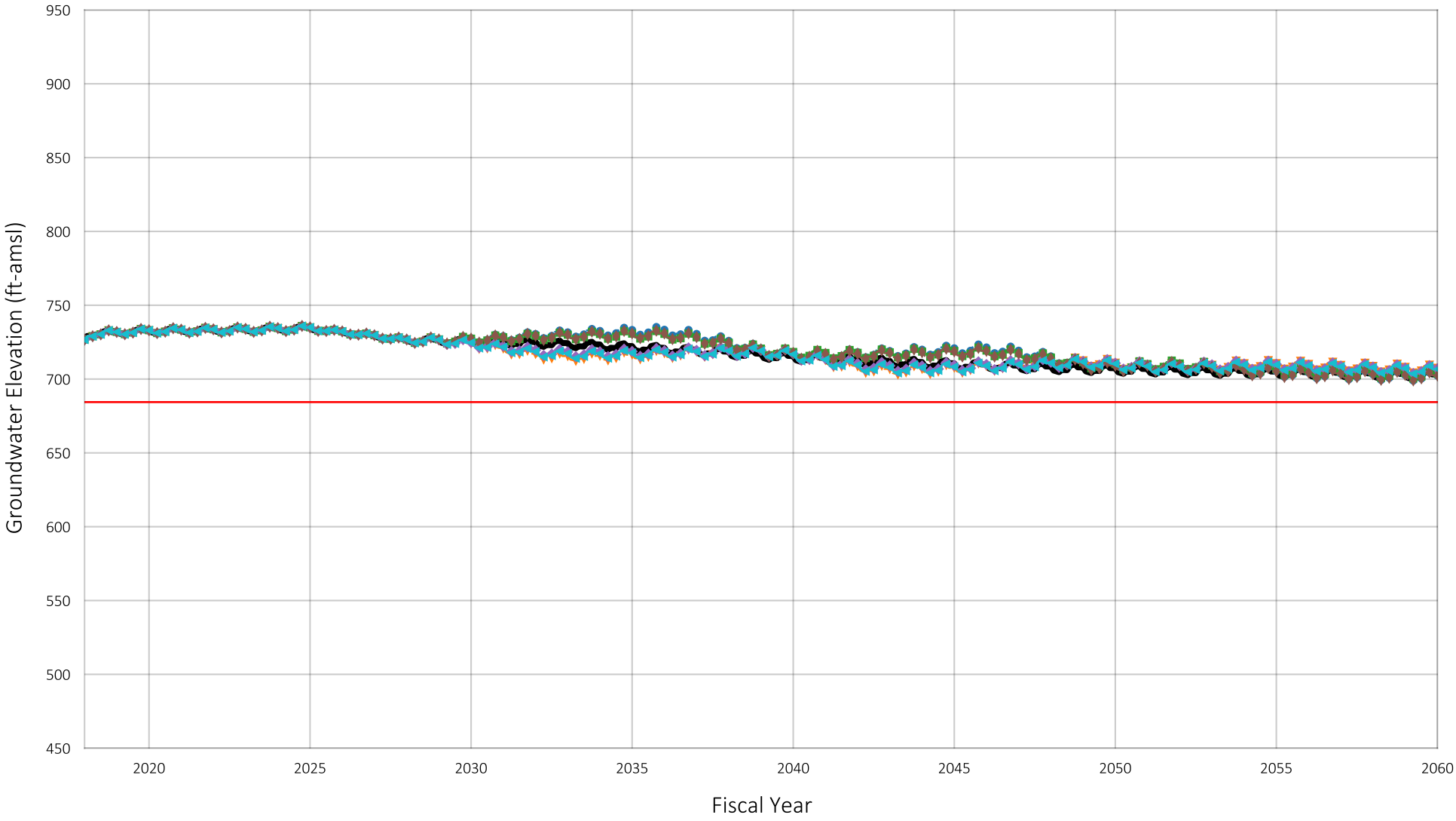
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1200219
Owner: Fontana Water Company
Well Name: F26A

Figure A-41




Location of Well in Chino Basin



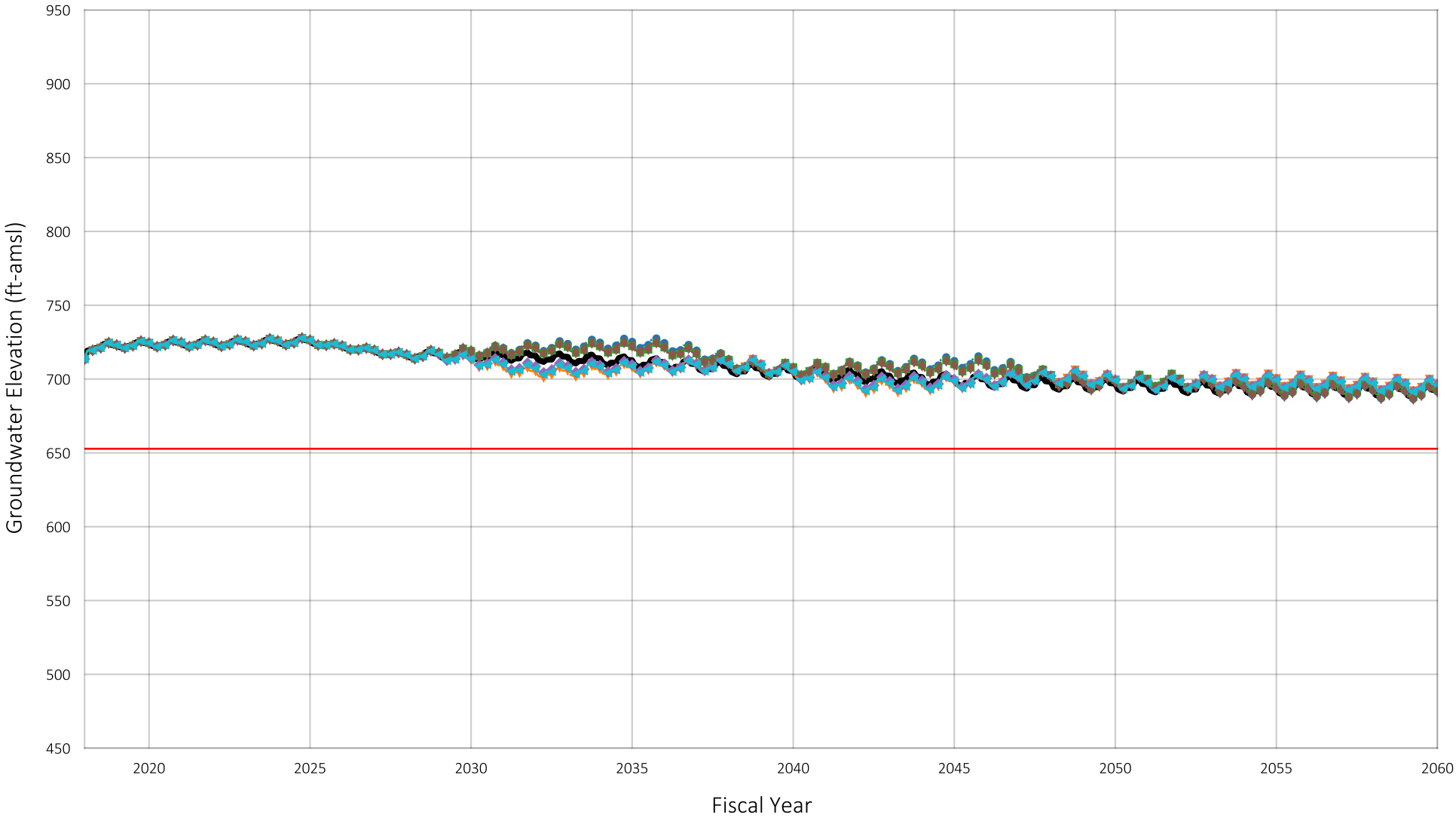
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002081
Owner: Fontana Water Company
Well Name: F31A

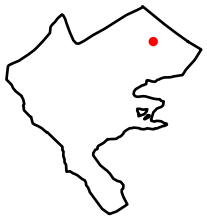
Figure A-42

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



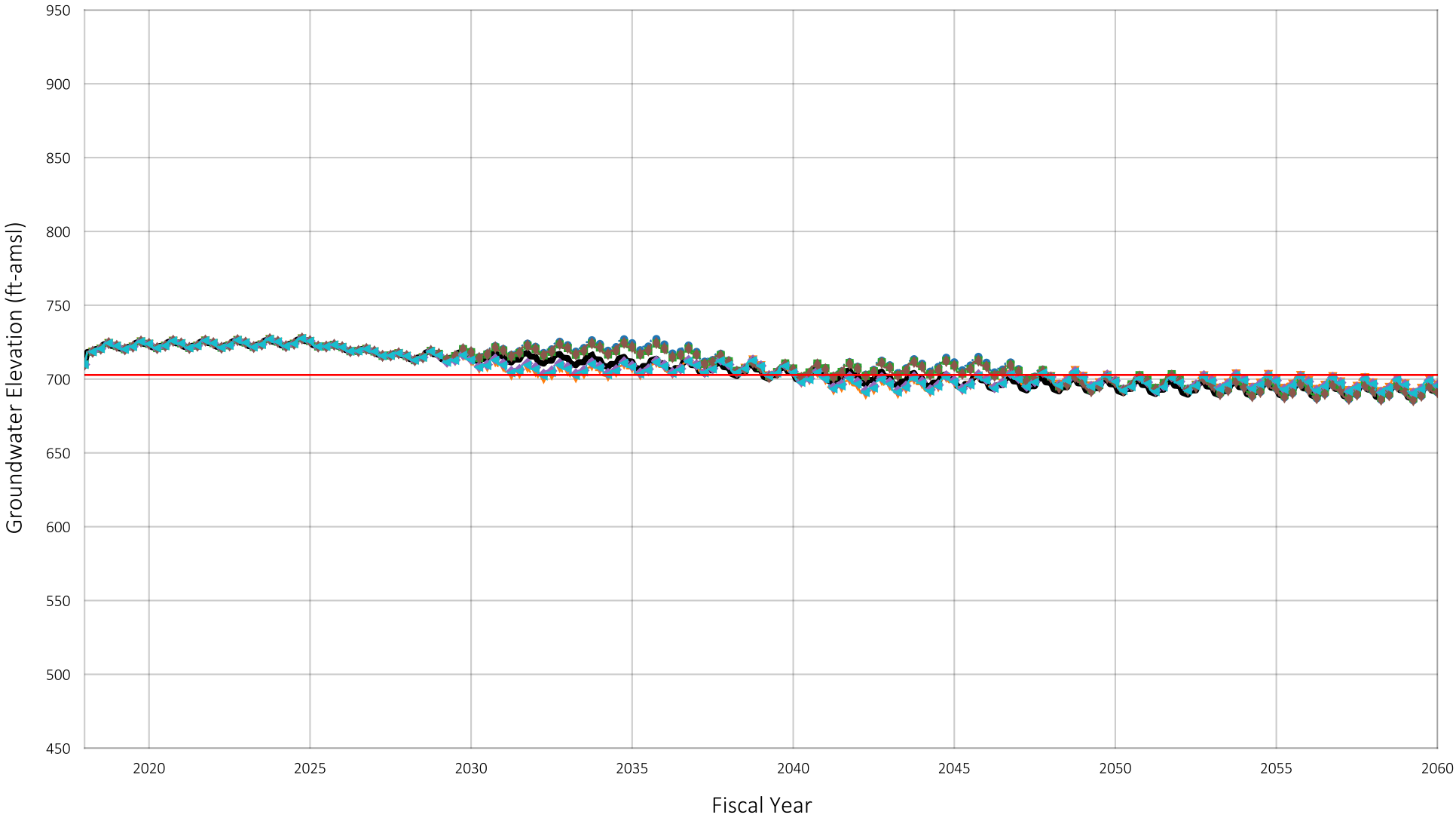
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

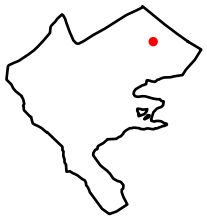
WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206933
Owner: Fontana Water Company
Well Name: F44A

Figure A-43




Location of Well in Chino Basin



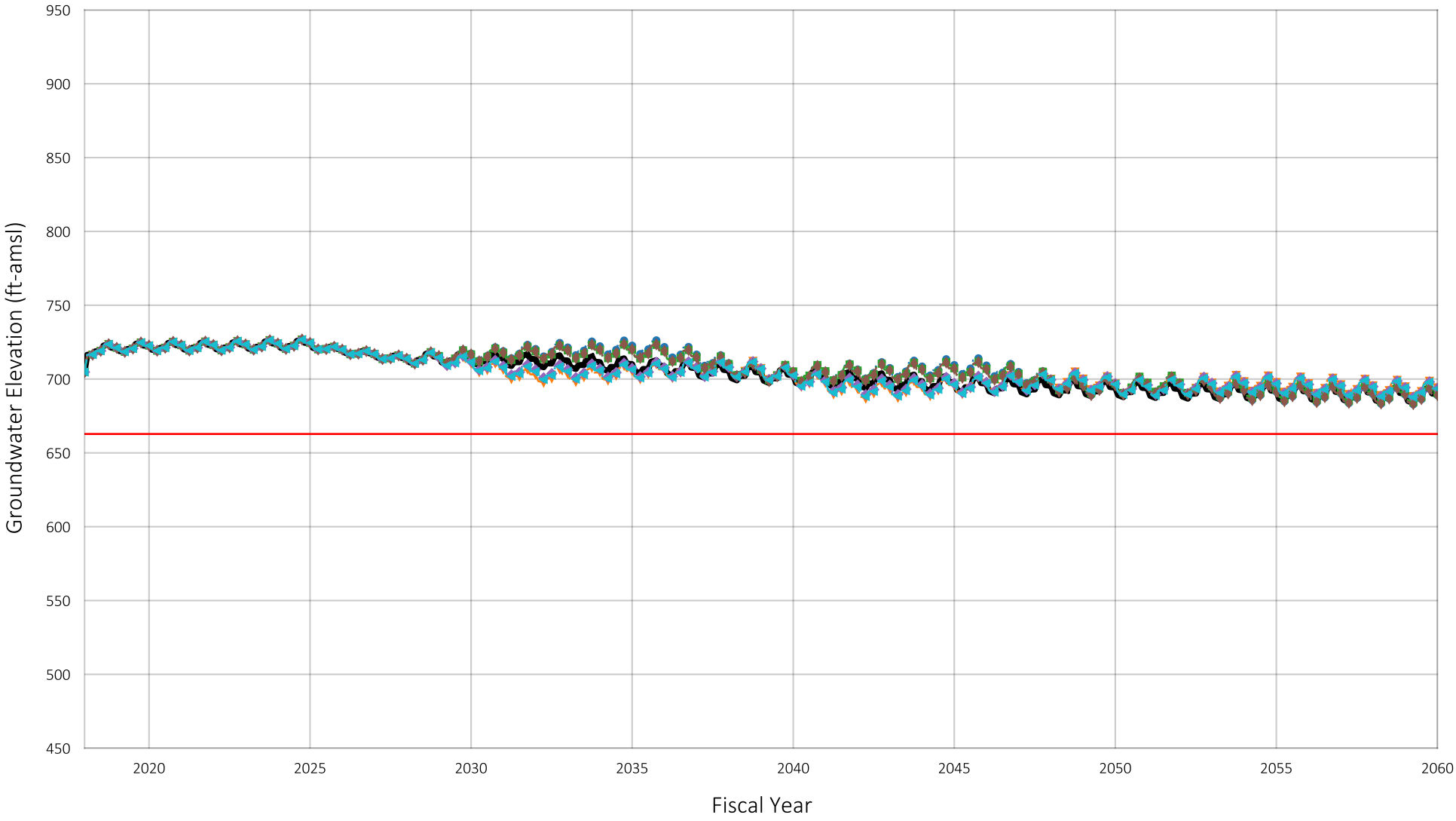
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207340
Owner: Fontana Water Company
Well Name: F44B

Figure A-44

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



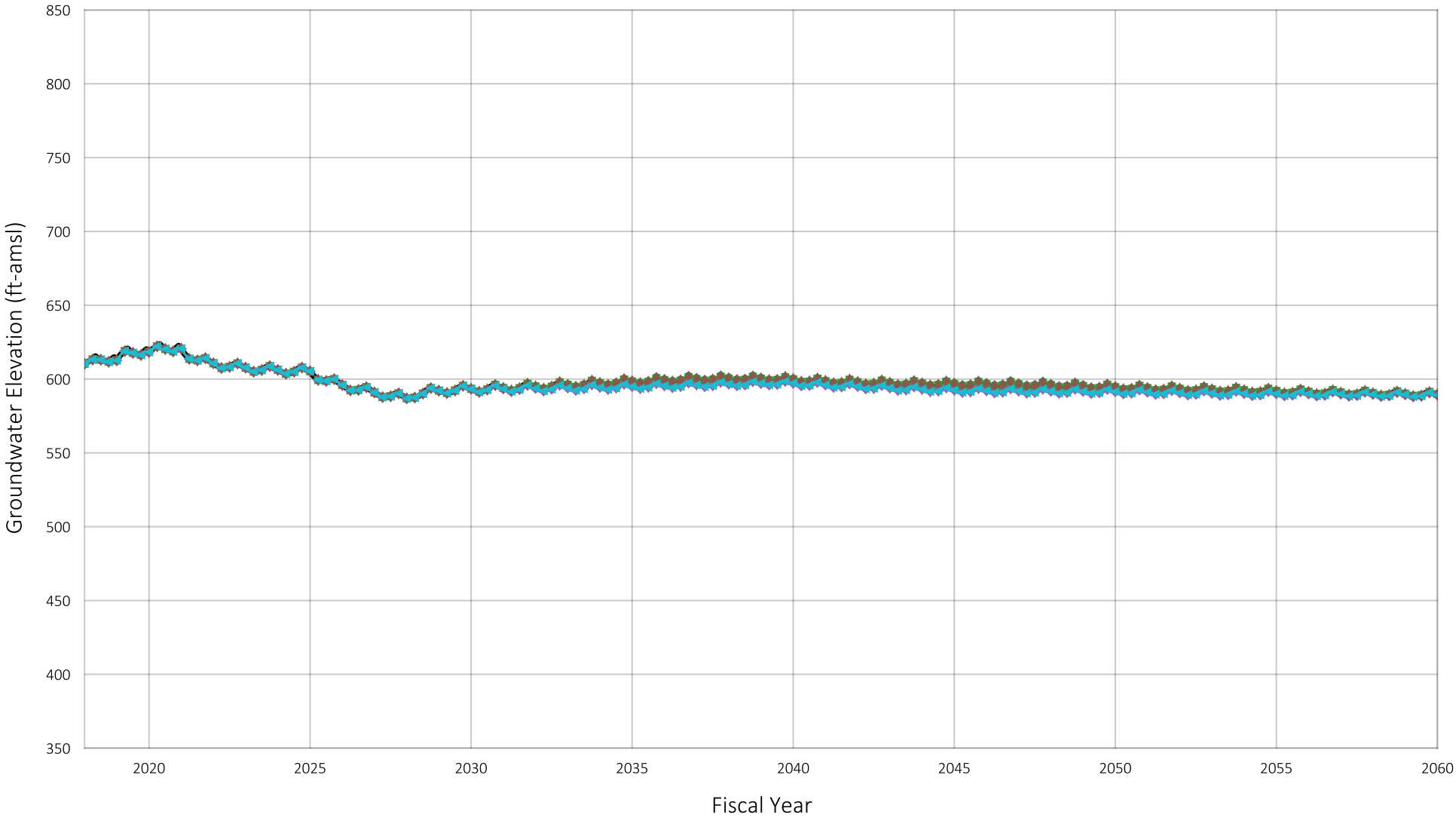
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207341
Owner: Fontana Water Company
Well Name: F44C

Figure A-45

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



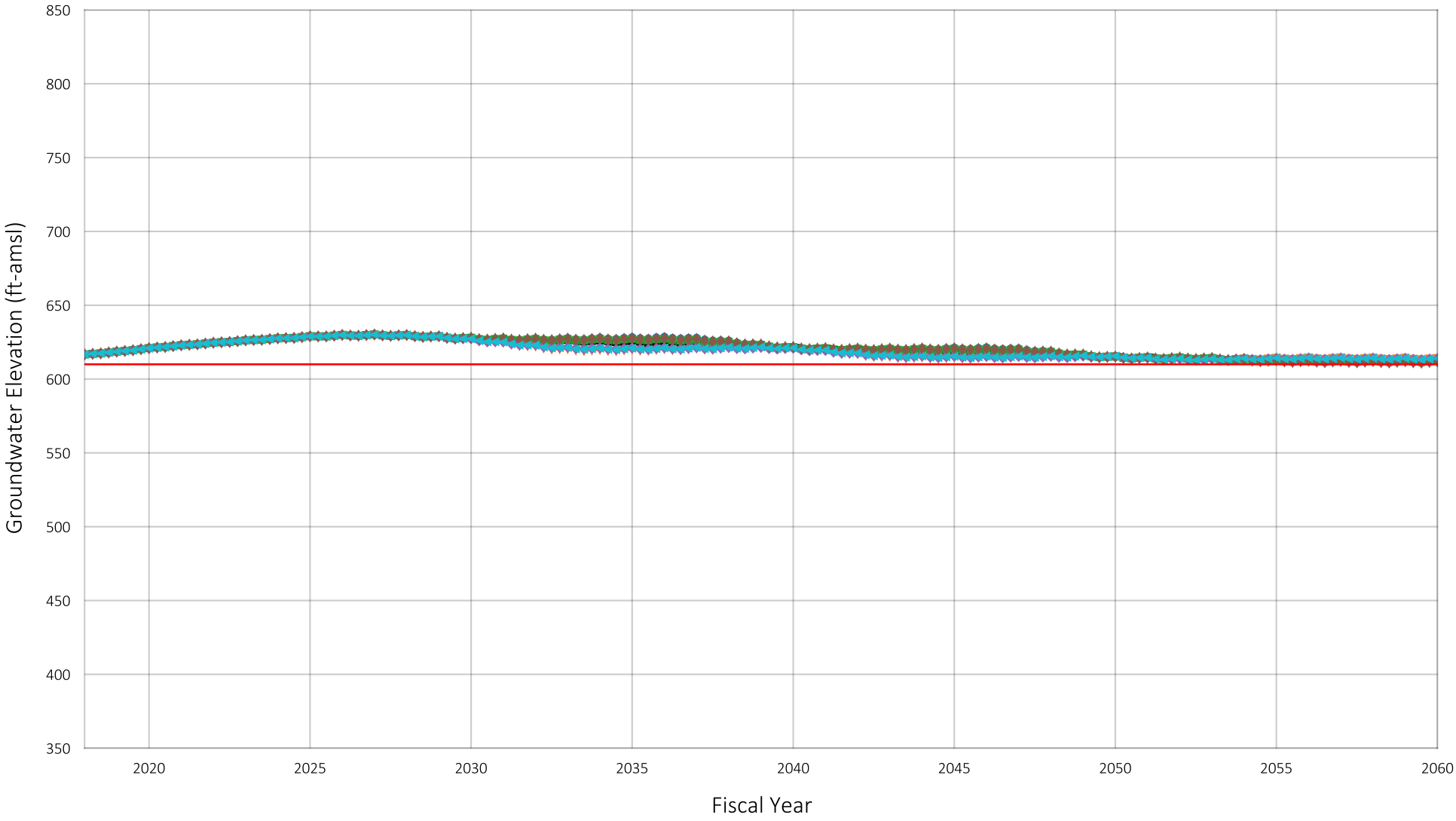
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002554
Owner: Golden State Water Company
Well Name: Margarita #1

Figure A-46




Location of Well in Chino Basin



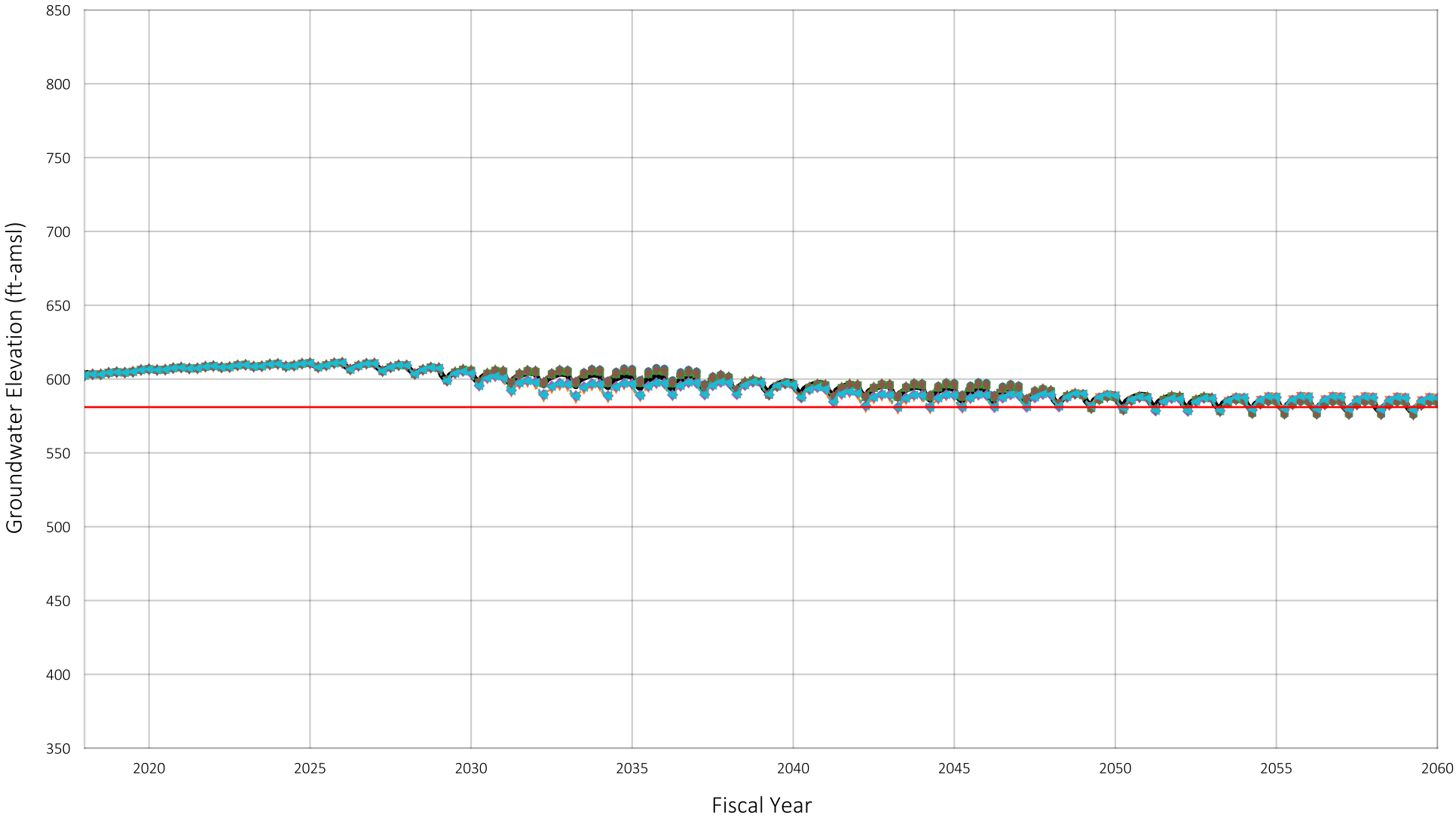
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003470
Owner: Jurupa Community Services District
Well Name: 6

Figure A-47




Location of Well in Chino Basin



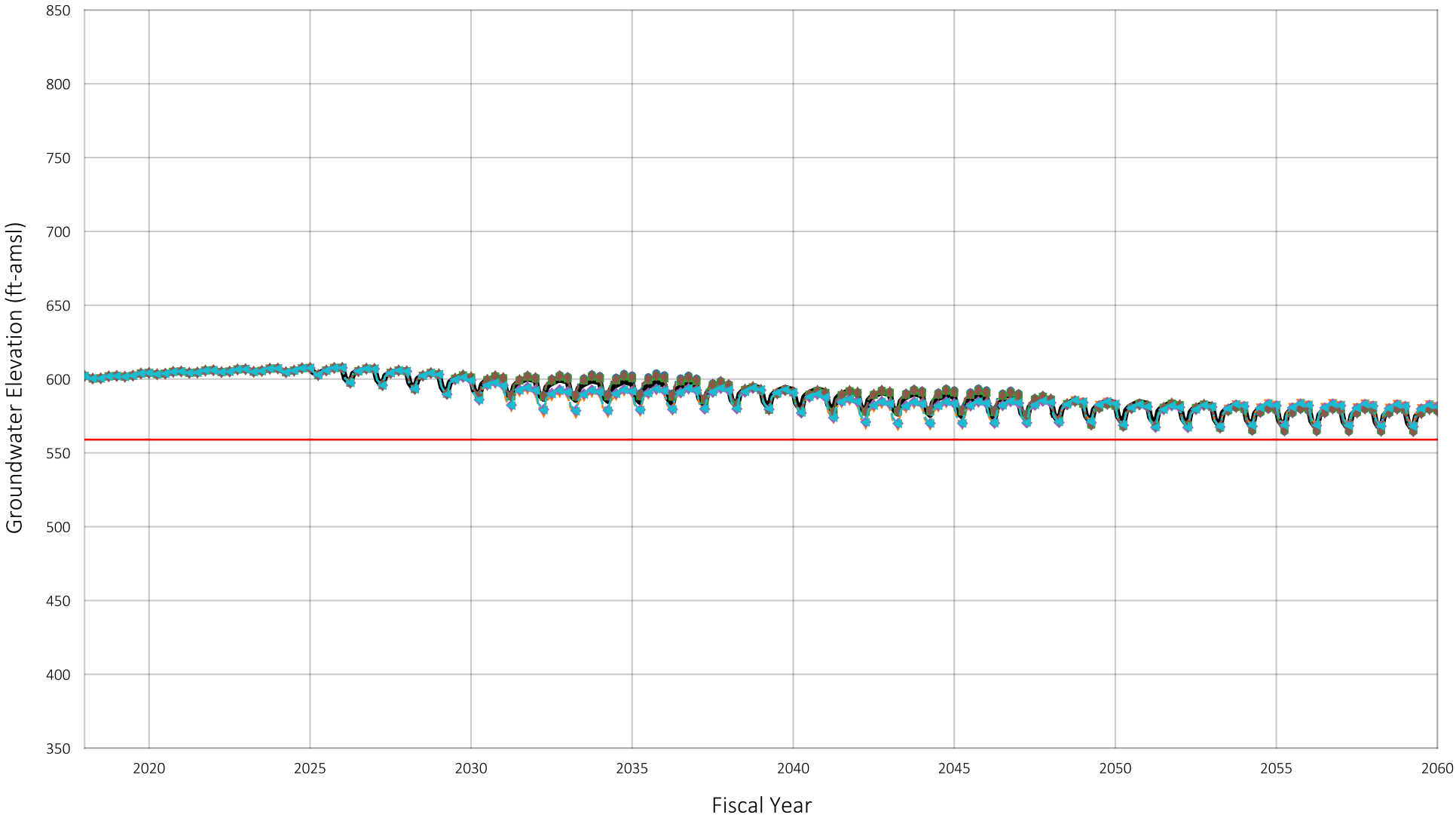
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003507
Owner: Jurupa Community Services District
Well Name: 8

Figure A-48

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



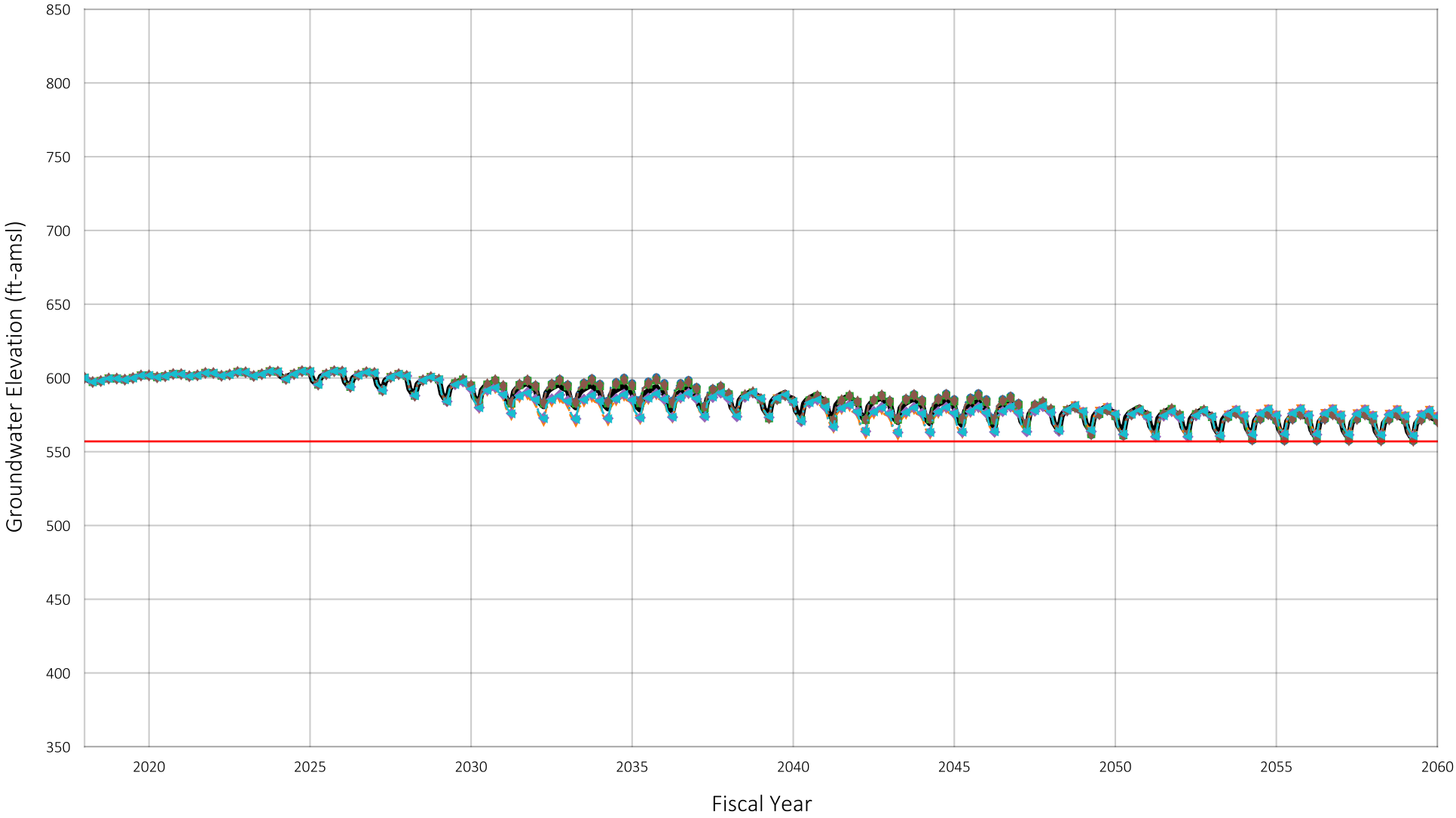
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003506
Owner: Jurupa Community Services District
Well Name: 11

Figure A-49

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



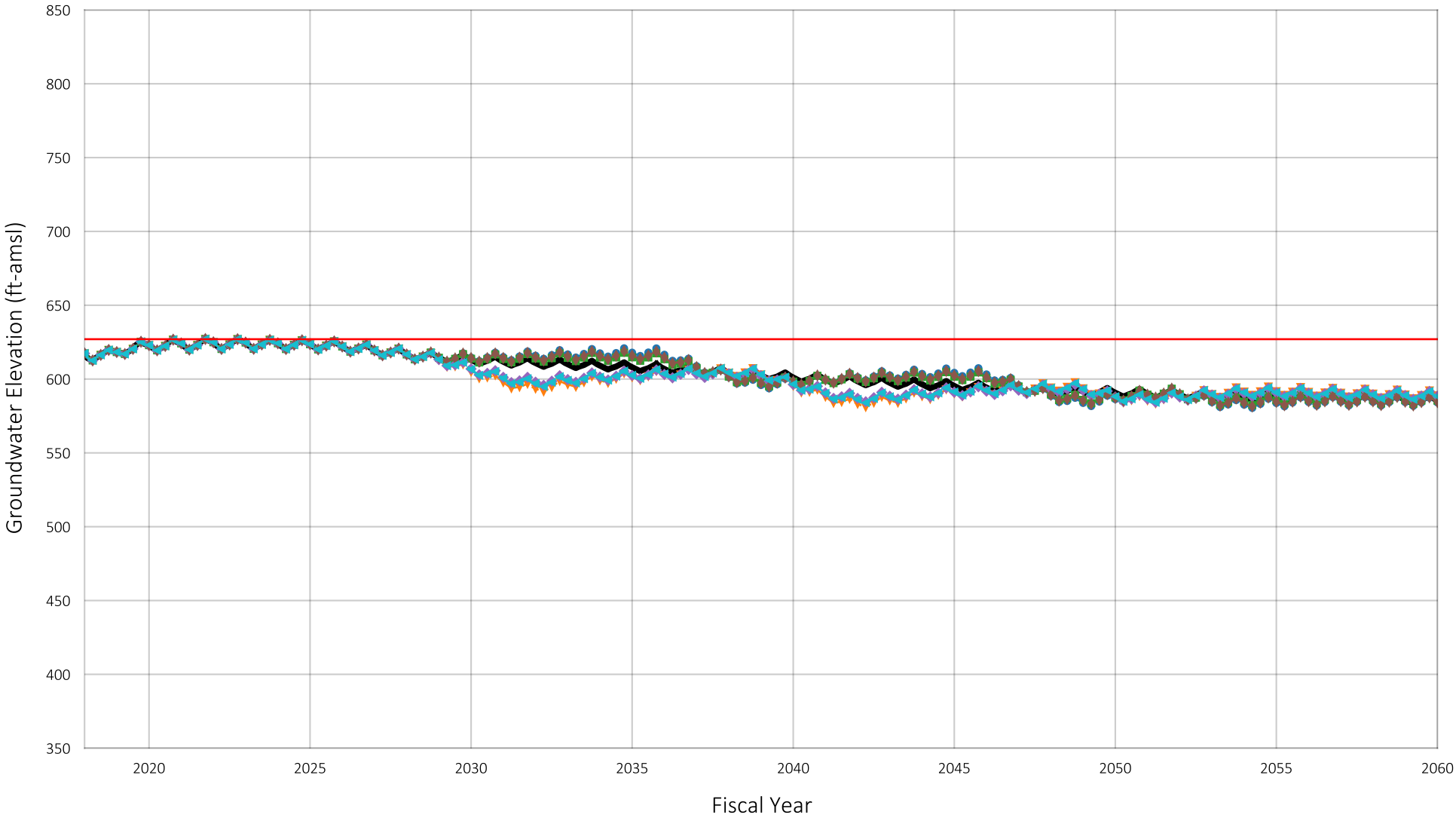
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003505
Owner: Jurupa Community Services District
Well Name: 12

Figure A-50

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



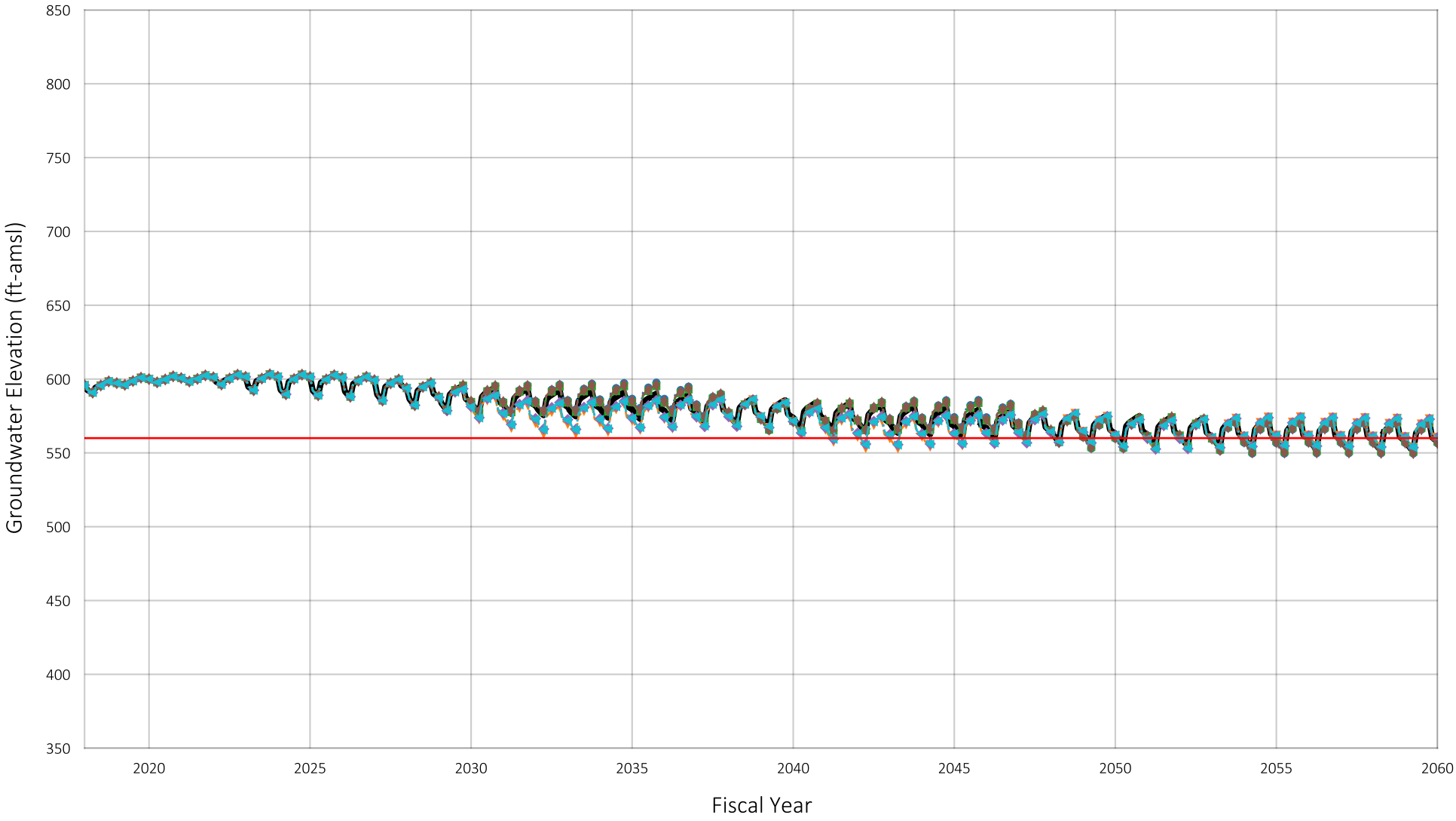
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003466
Owner: Jurupa Community Services District
Well Name: 13

Figure A-51




Location of Well in Chino Basin



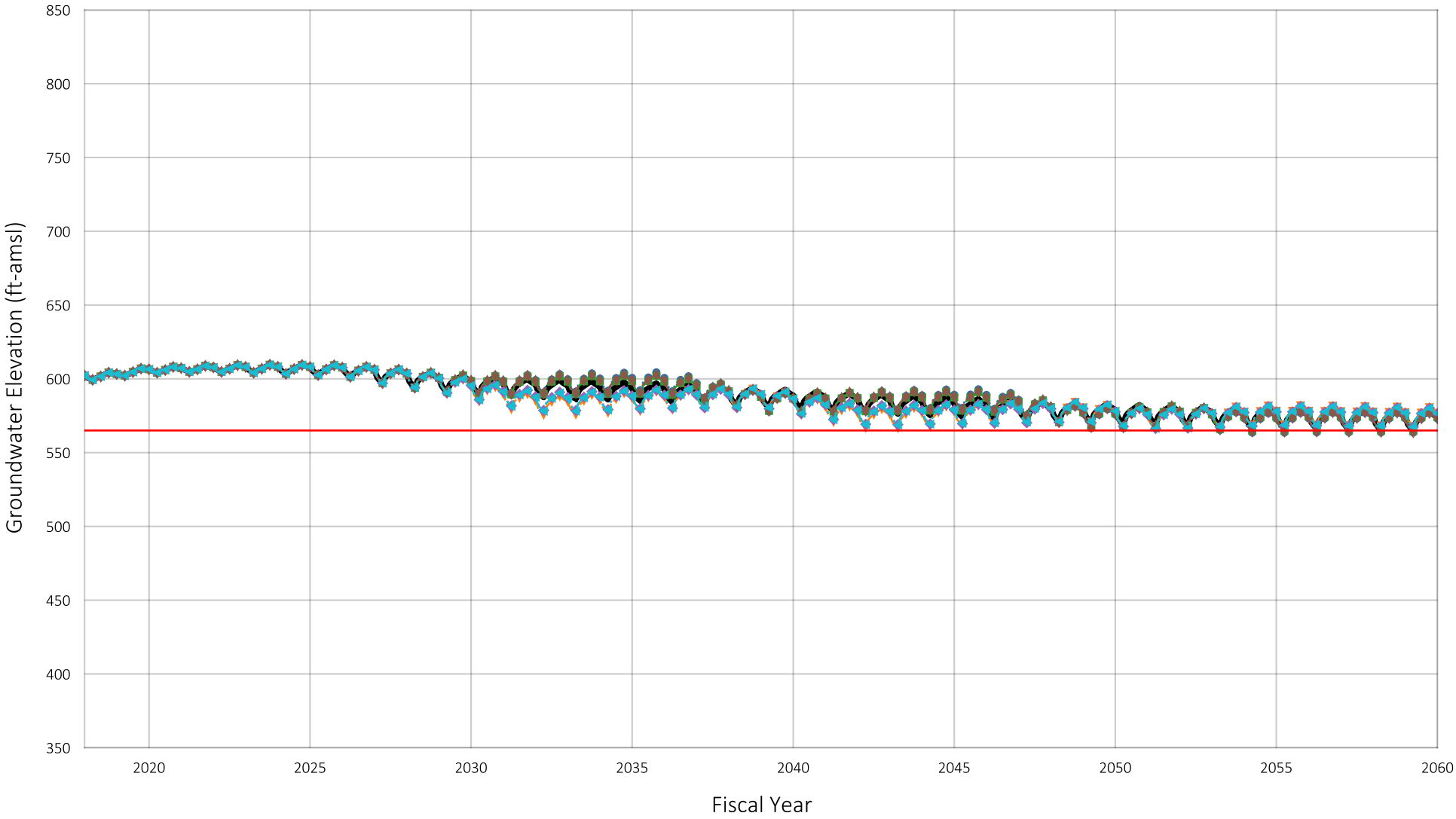
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003501
Owner: Jurupa Community Services District
Well Name: 14

Figure A-52




Location of Well in Chino Basin



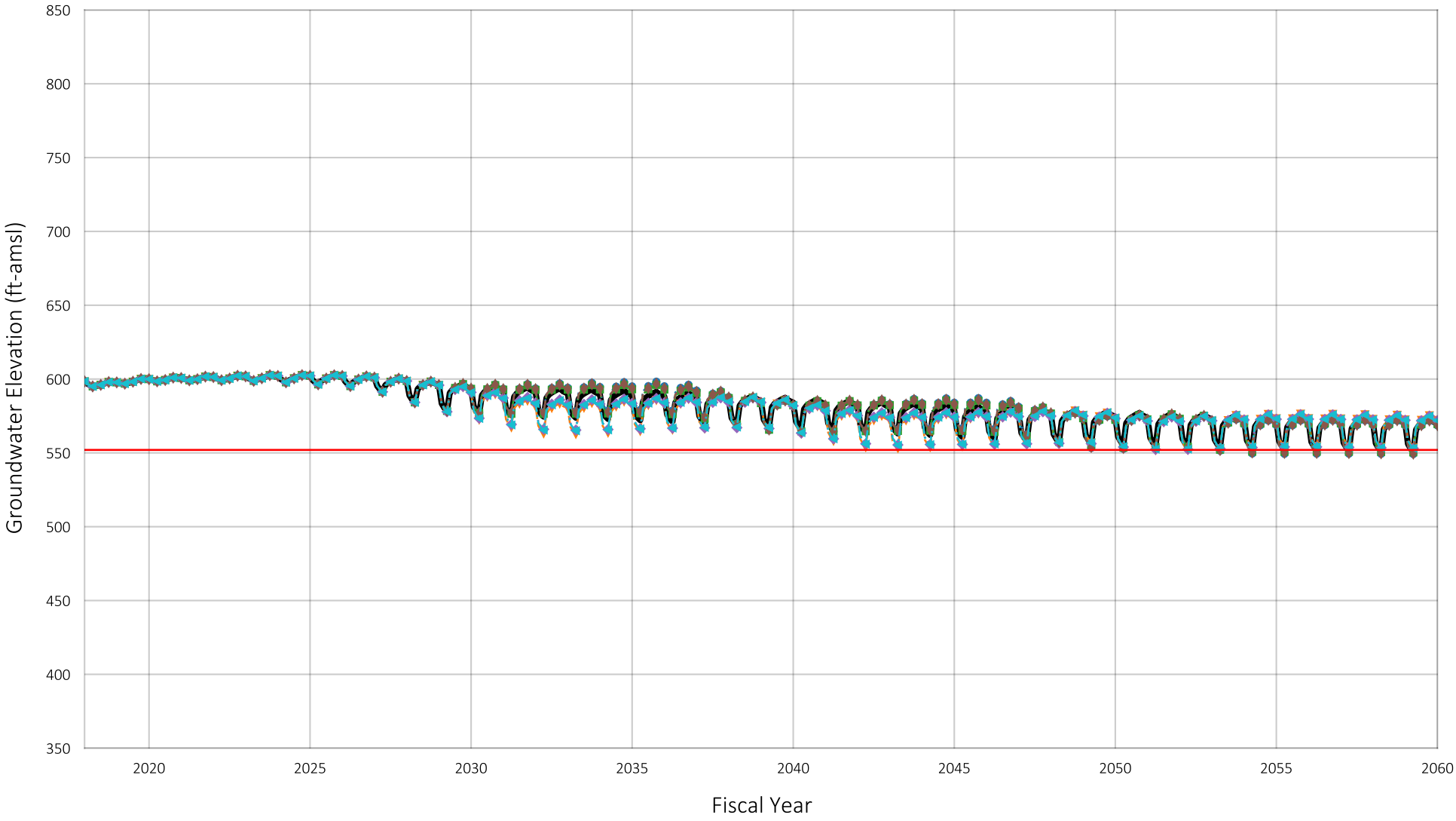
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003498
Owner: Jurupa Community Services District
Well Name: 15

Figure A-53




Location of Well in Chino Basin



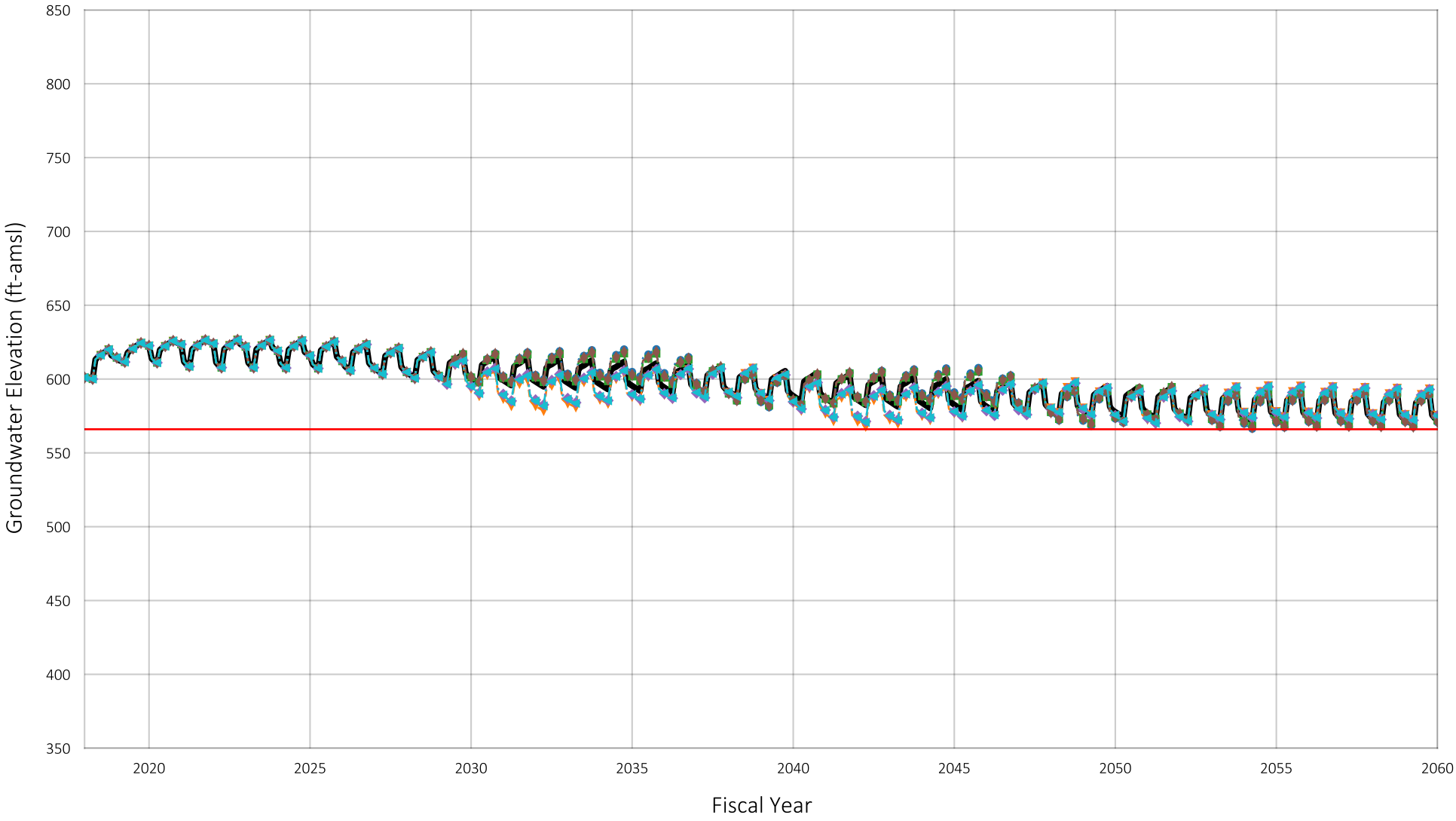
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003502
Owner: Jurupa Community Services District
Well Name: 16

Figure A-54

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



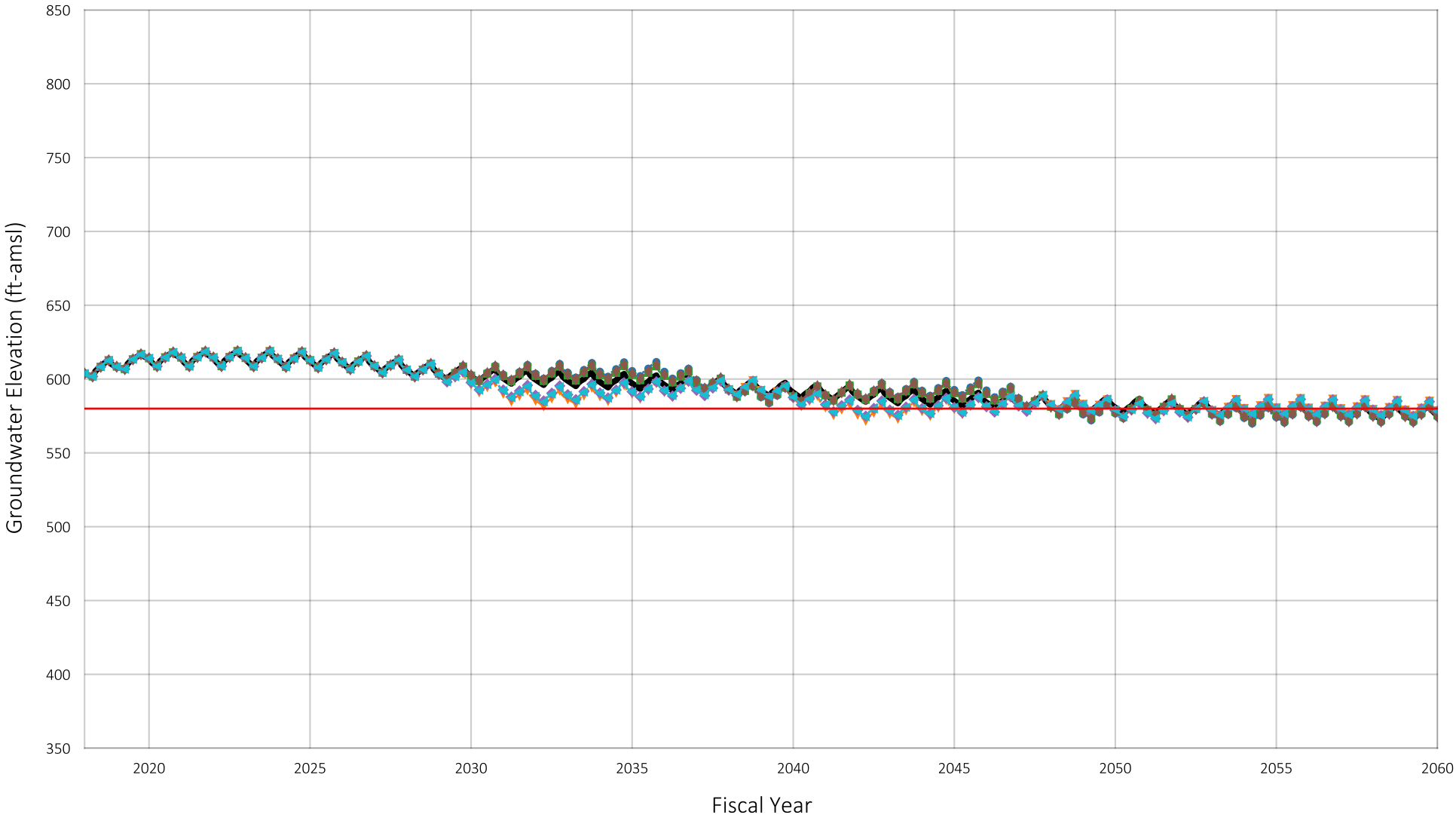
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003467
Owner: Jurupa Community Services District
Well Name: 17

Figure A-55




Location of Well in Chino Basin



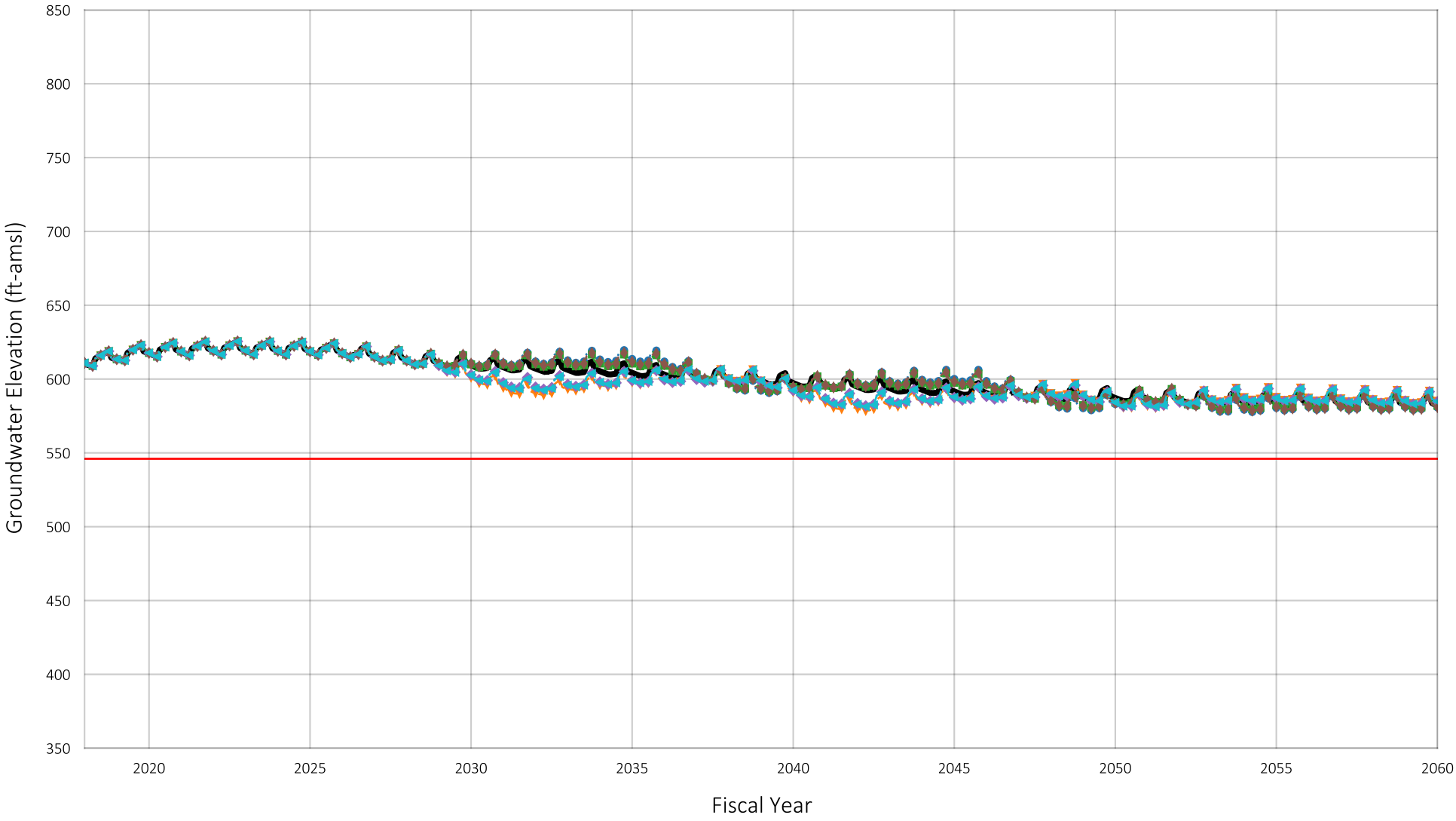
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1003469
Owner: Jurupa Community Services District
Well Name: 18

Figure A-56

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



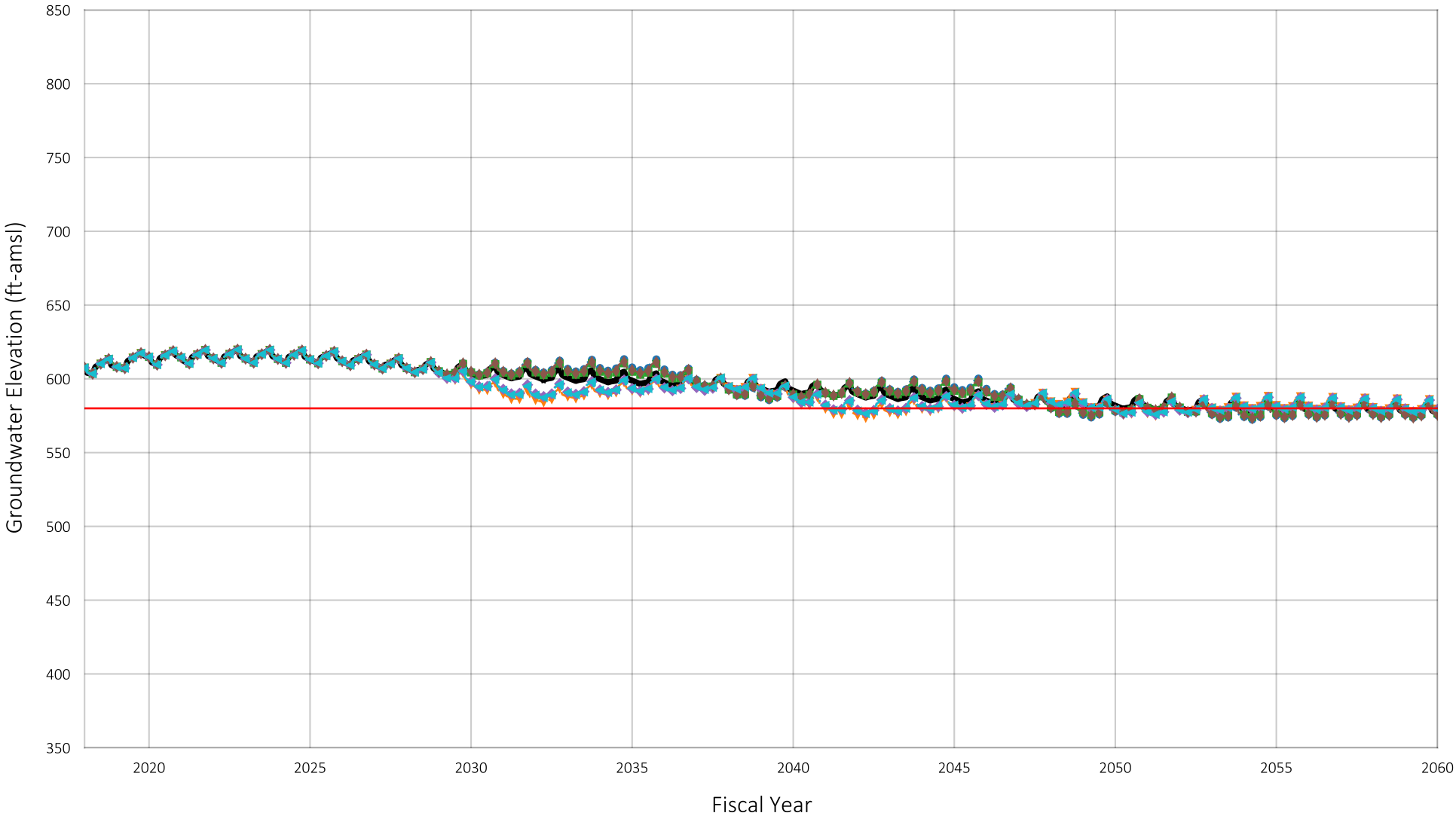
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003471
Owner: Jurupa Community Services District
Well Name: 19

Figure A-57




Location of Well in Chino Basin



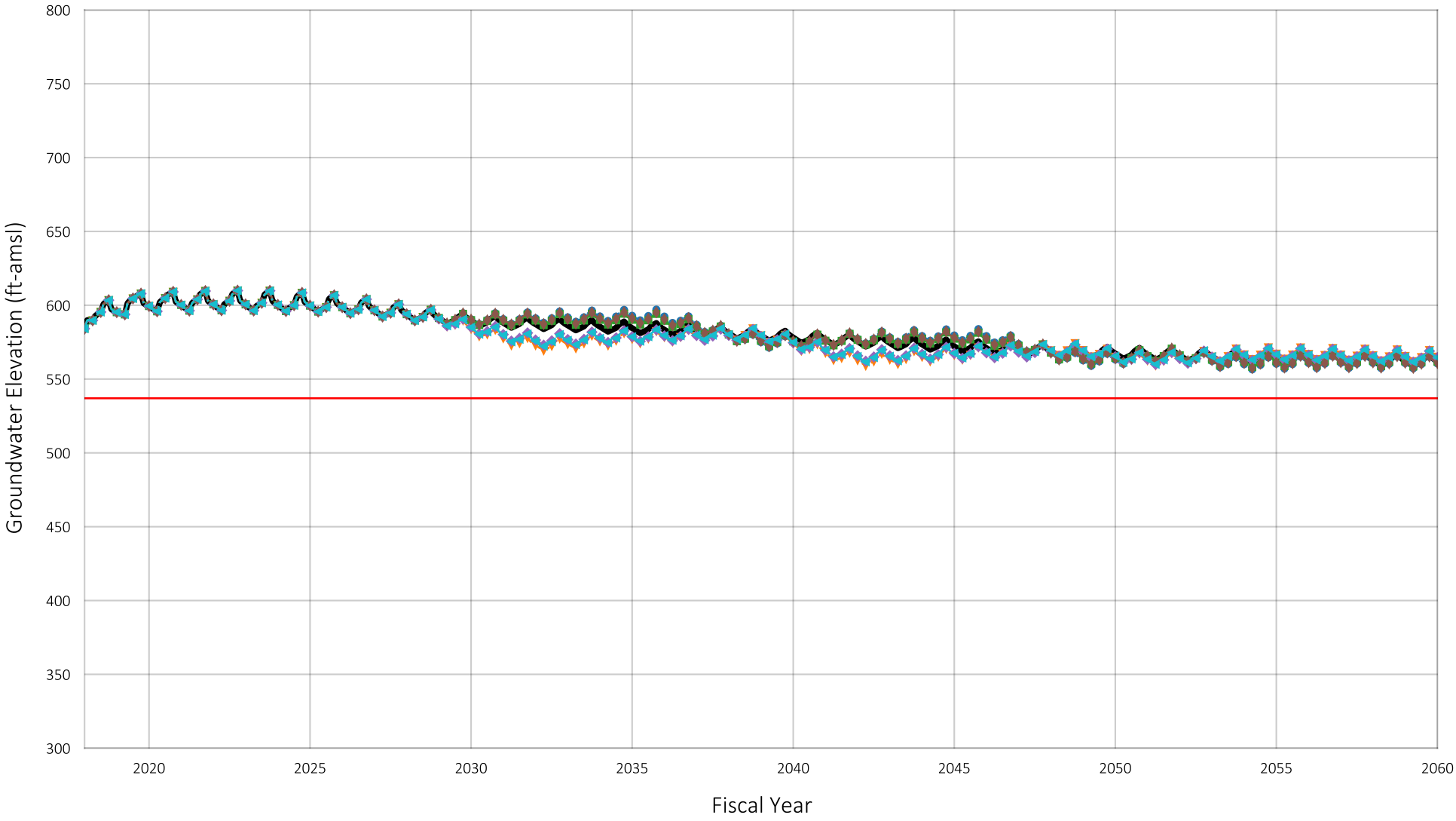
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003472
Owner: Jurupa Community Services District
Well Name: 20

Figure A-58




Location of Well in Chino Basin



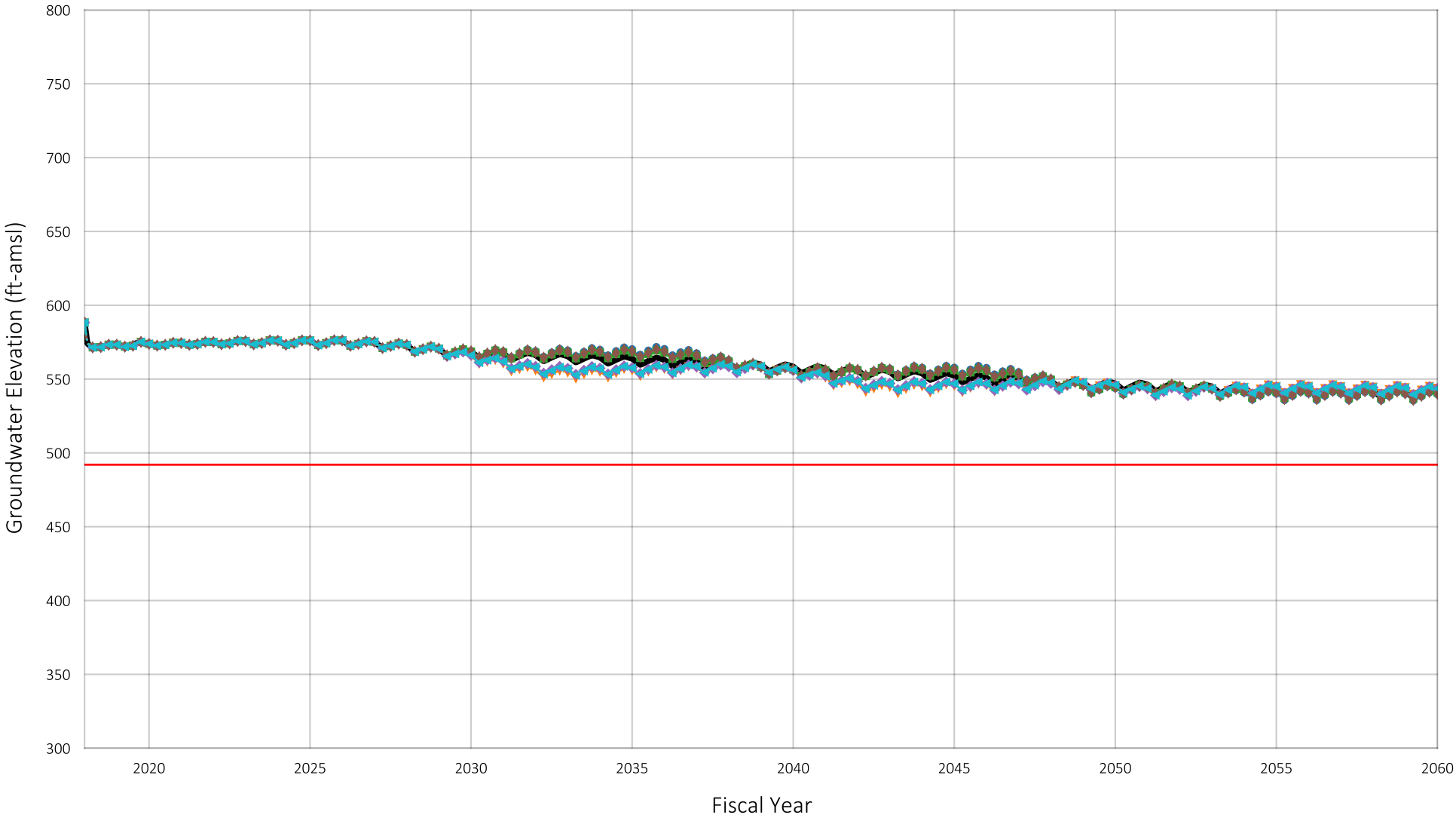
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220154
Owner: Jurupa Community Services District
Well Name: 22

Figure A-59




Location of Well in Chino Basin



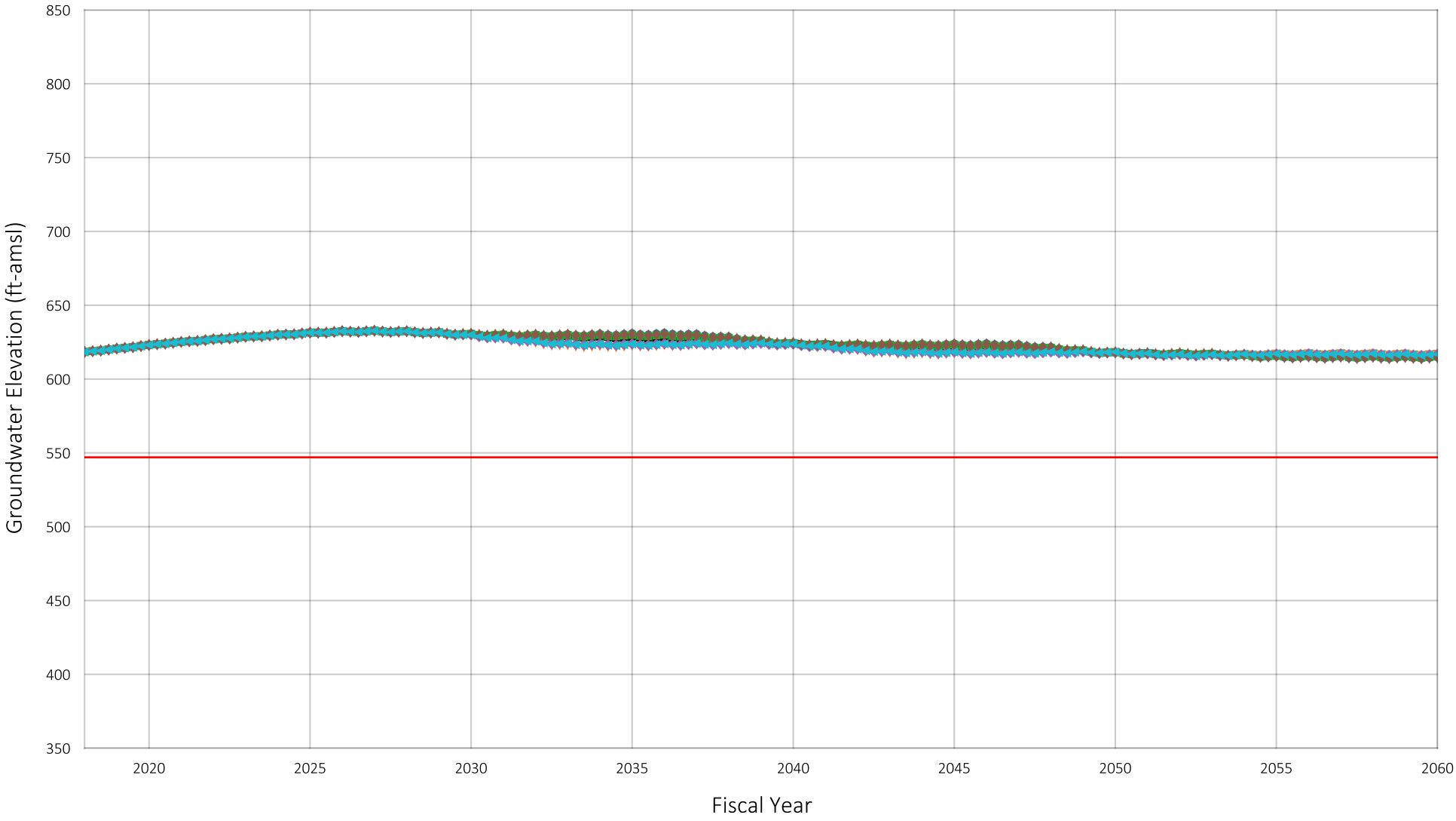
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220155
Owner: Jurupa Community Services District
Well Name: 23

Figure A-60




Location of Well in Chino Basin



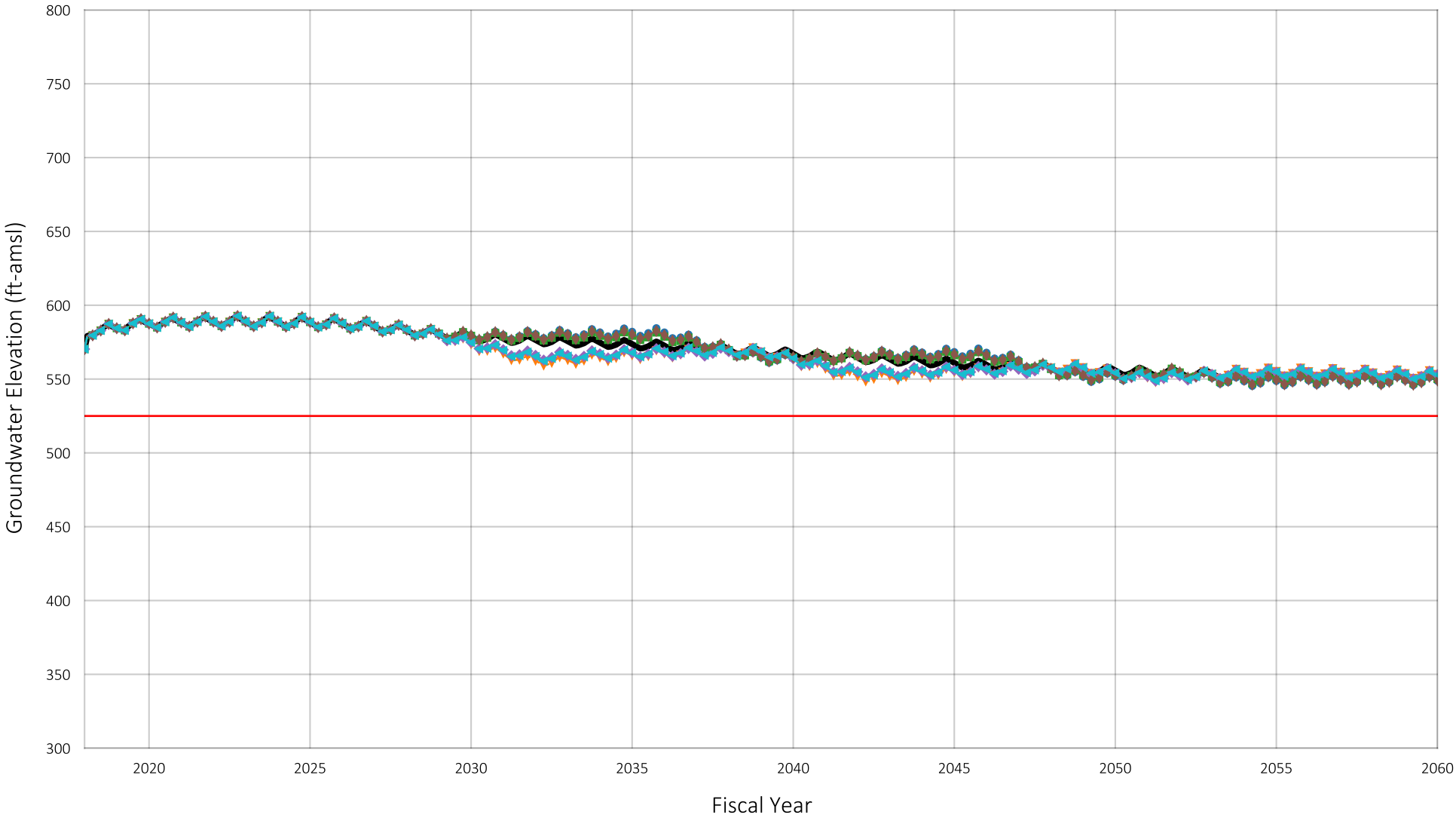
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1003515
Owner: Jurupa Community Services District
Well Name: 24

Figure A-61




Location of Well in Chino Basin



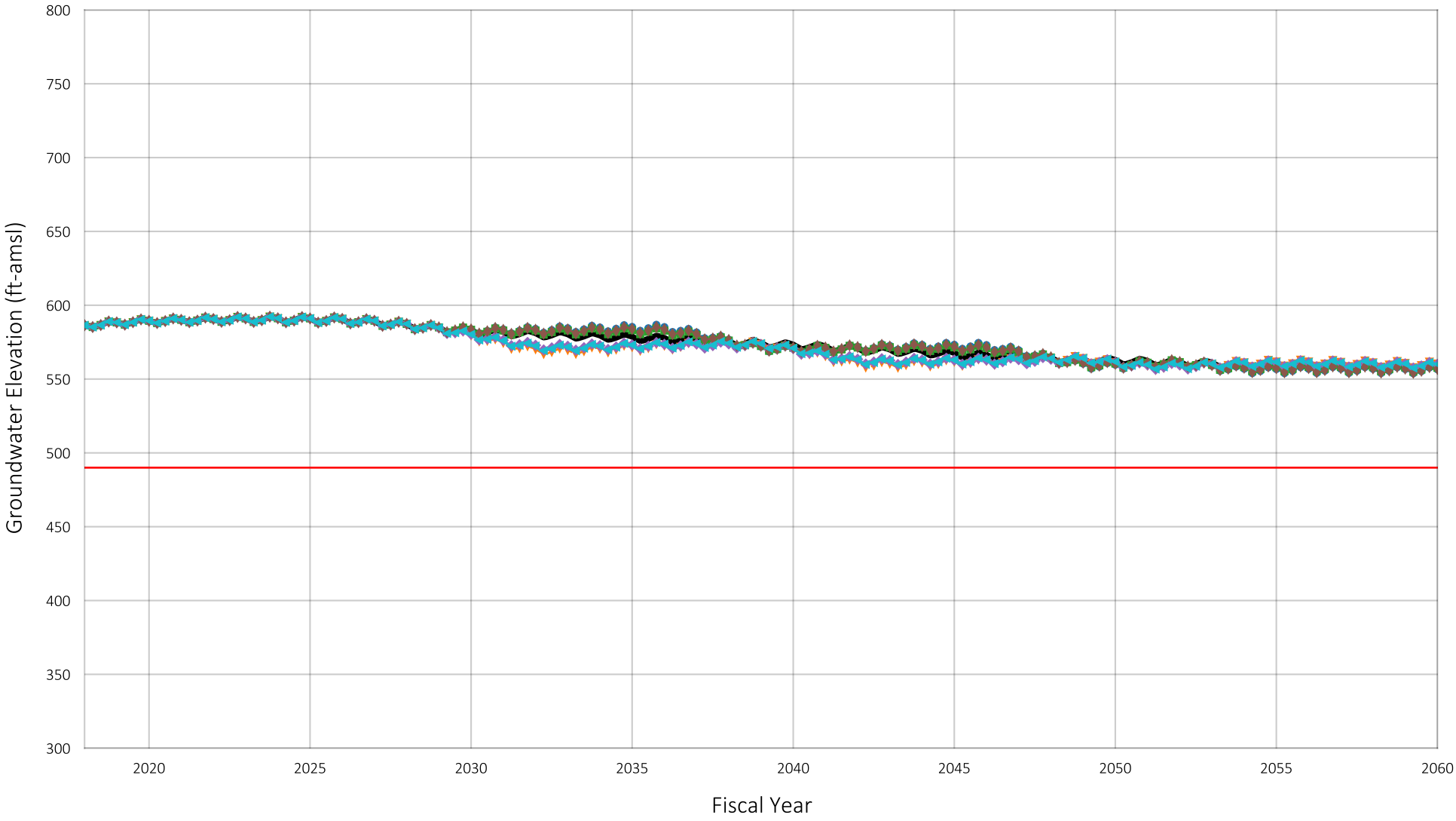
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220158
Owner: Jurupa Community Services District
Well Name: 25

Figure A-62




Location of Well in Chino Basin



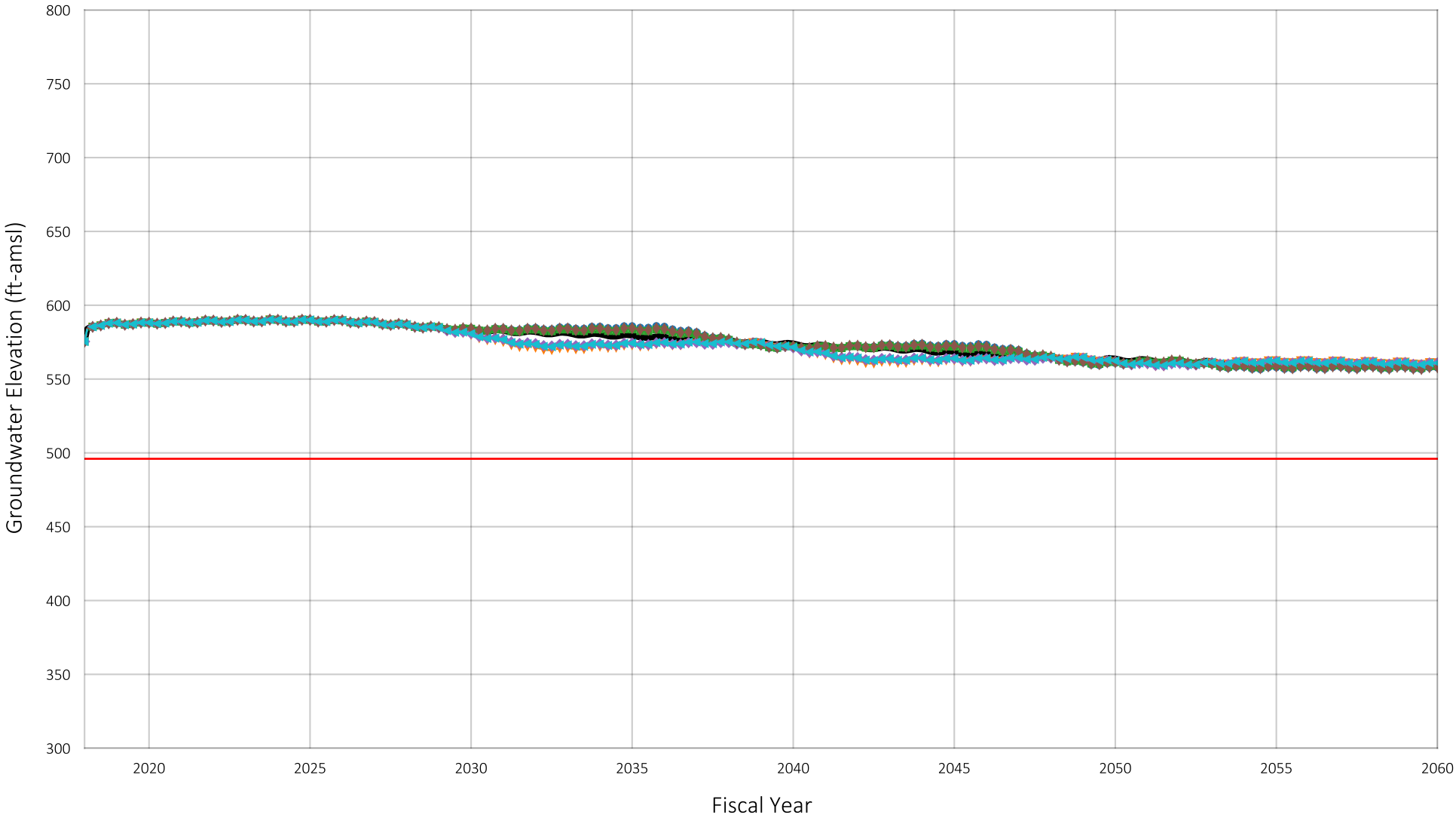
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1233787
Owner: Jurupa Community Services District
Well Name: 27

Figure A-63




Location of Well in Chino Basin



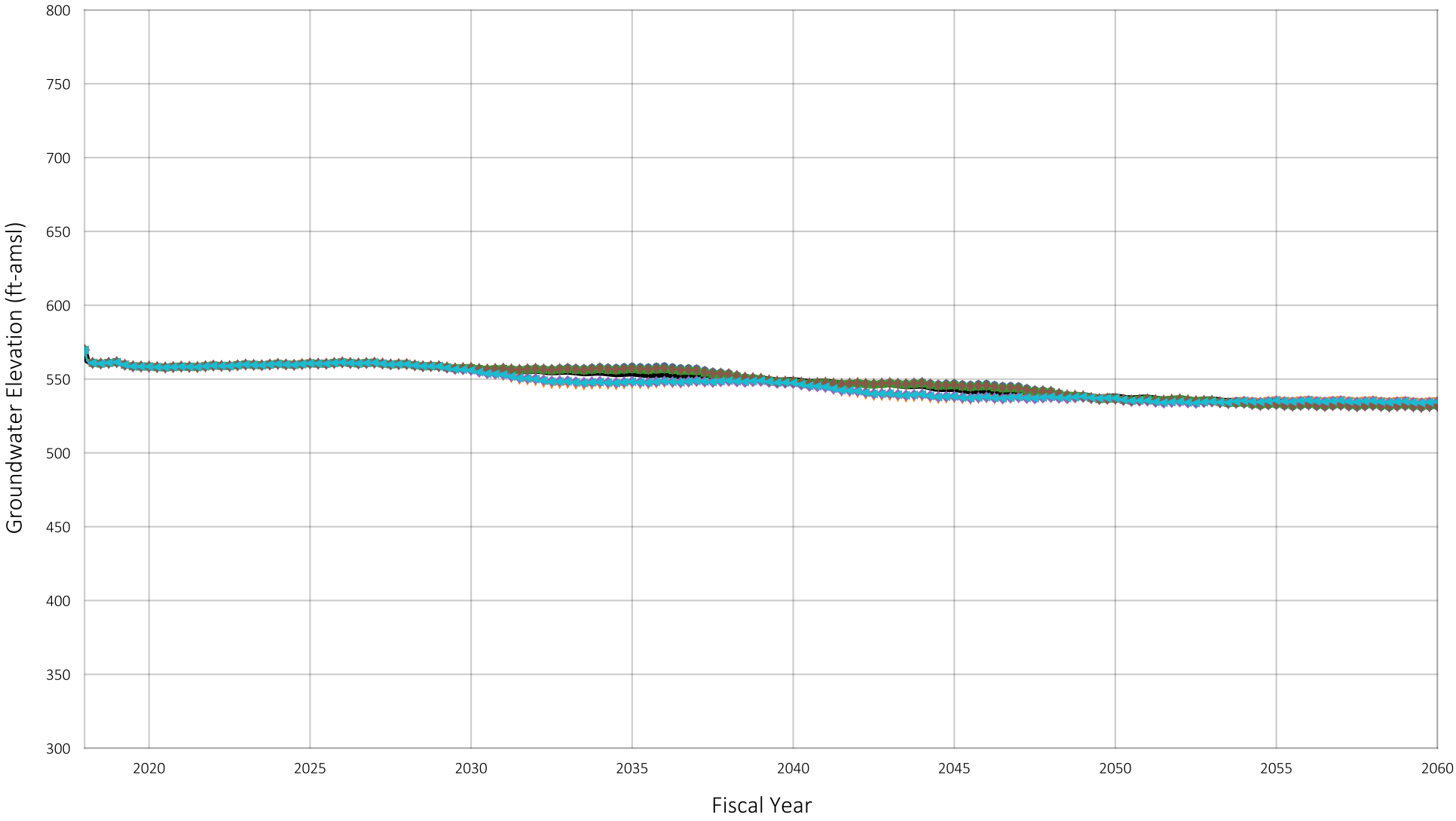
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1233788
Owner: Jurupa Community Services District
Well Name: 28

Figure A-64

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



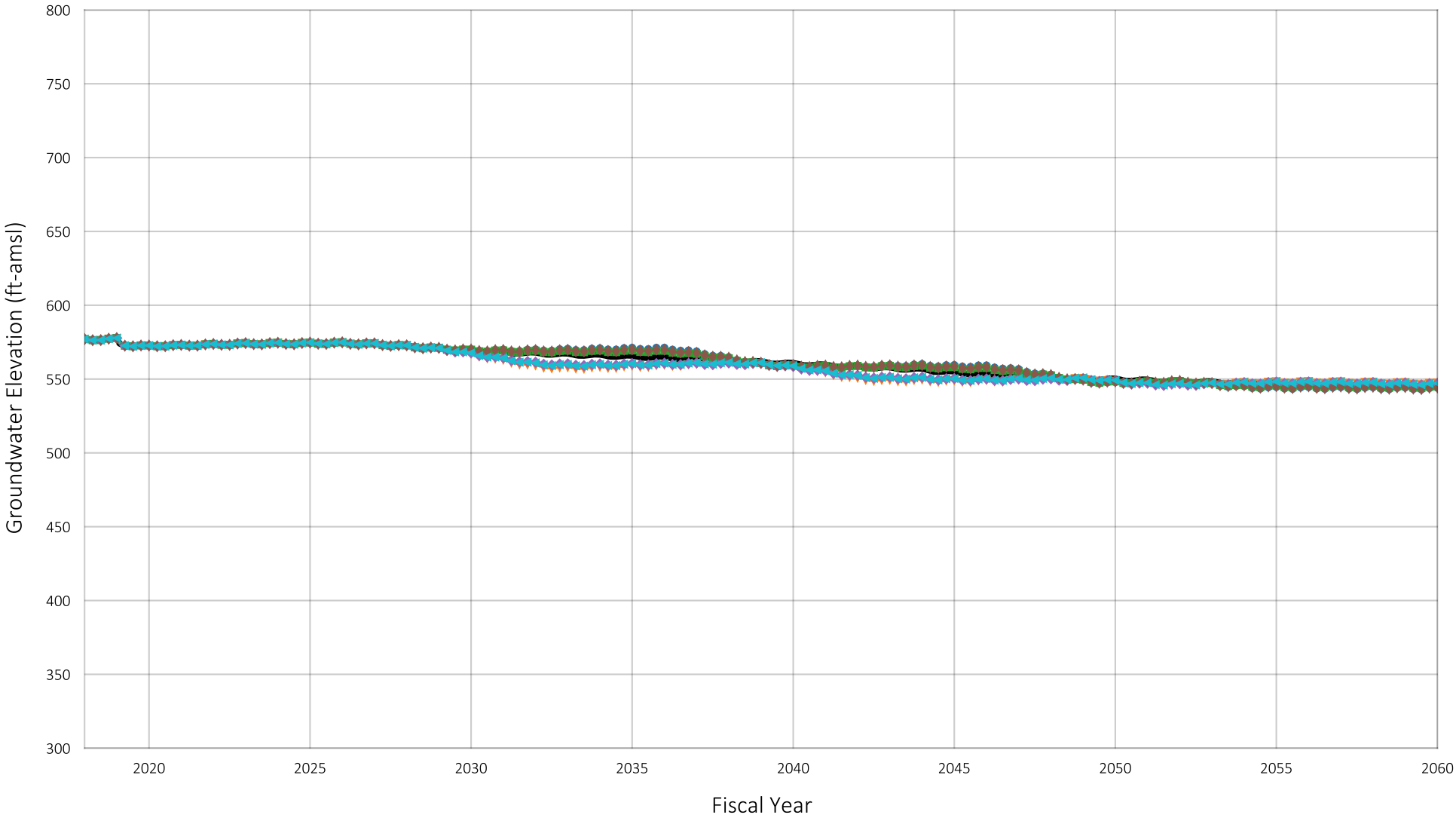
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207942
Owner: Jurupa Community Services District
Well Name: IDI-1

Figure A-65




Location of Well in Chino Basin



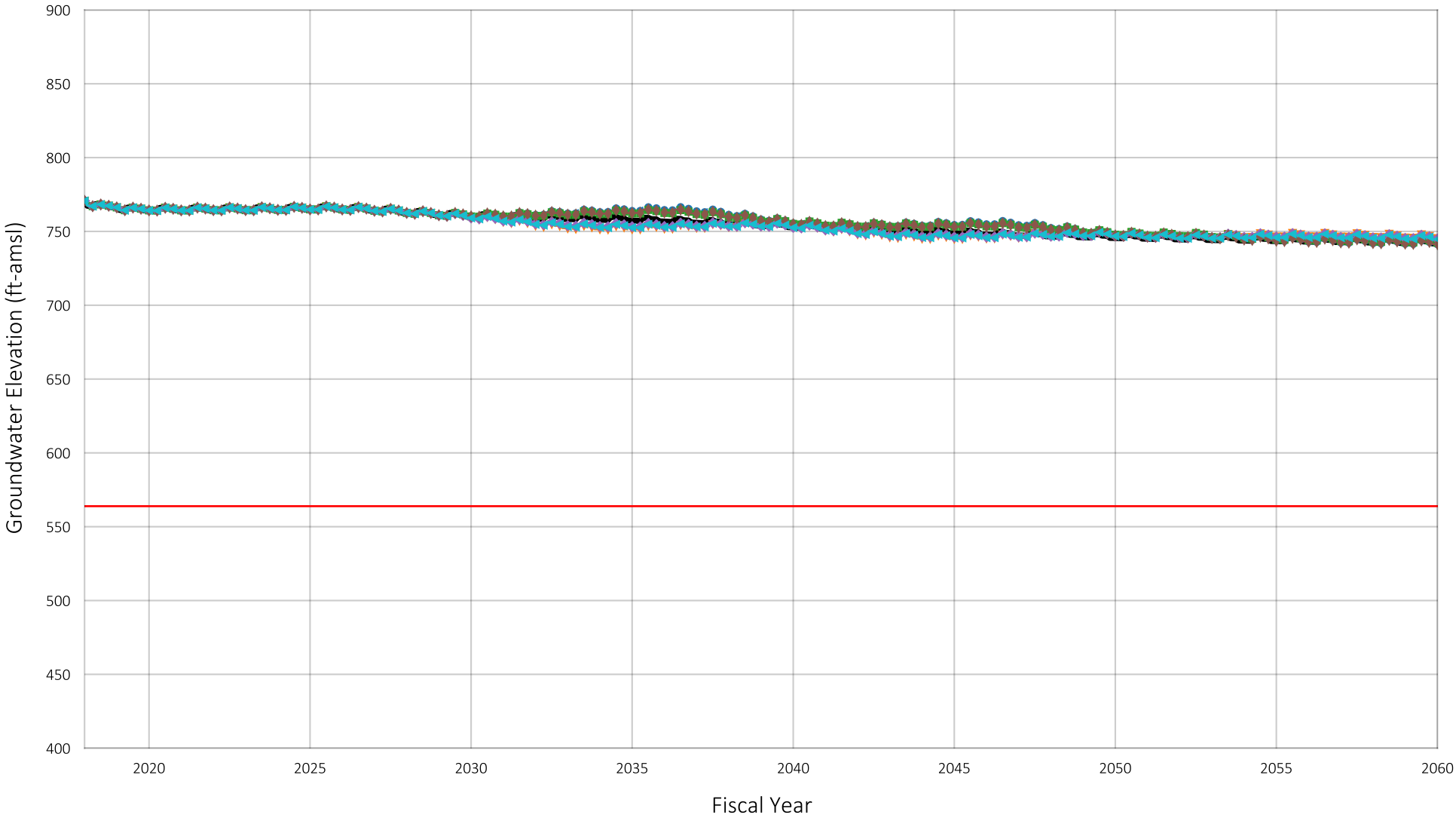
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 999902
Owner: Jurupa Community Services District
Well Name: IDI-2

Figure A-66




Location of Well in Chino Basin



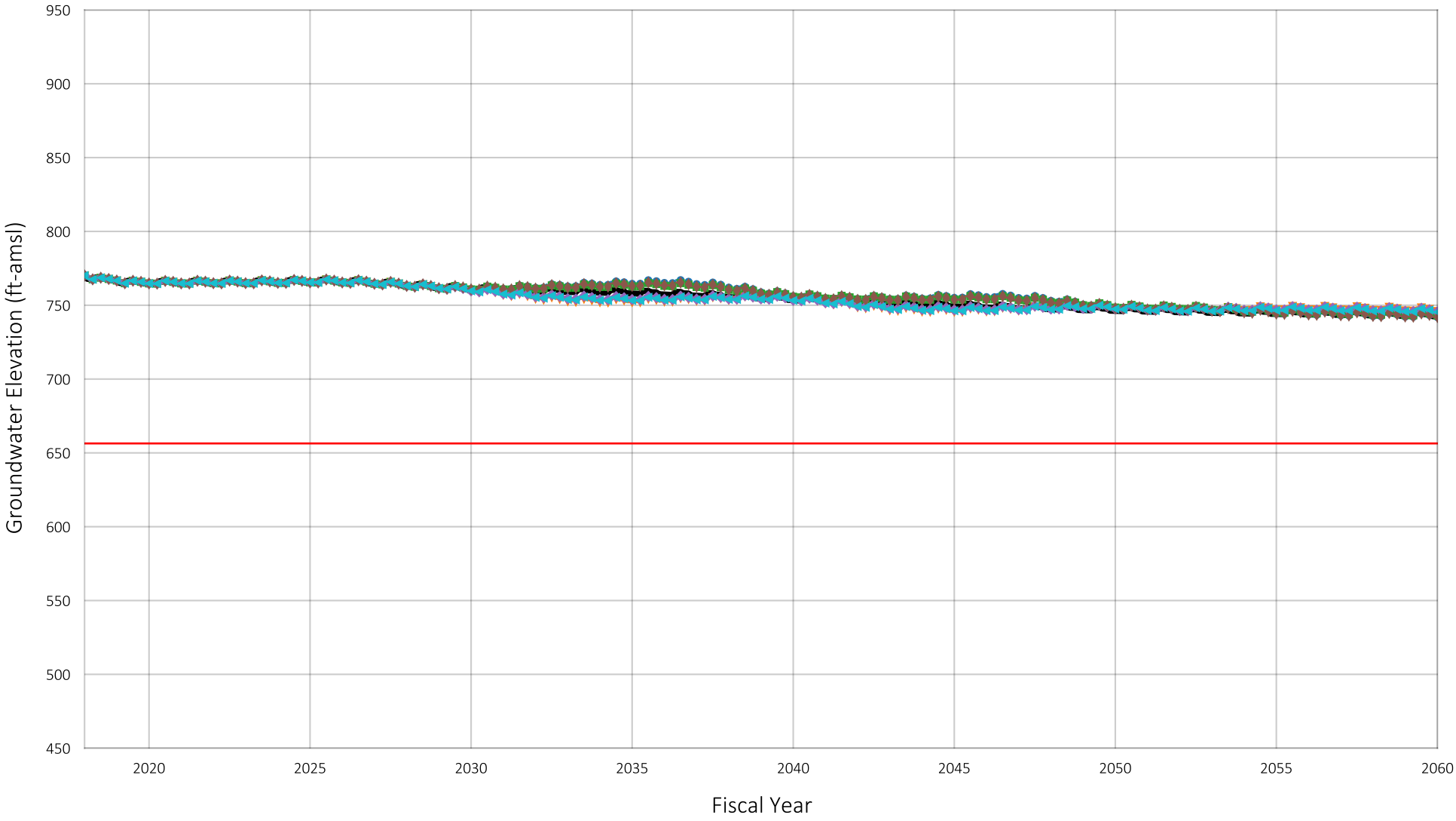
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1221751
Owner: Marygold Mutual Water Company
Well Name: MMWC 06

Figure A-67




Location of Well in Chino Basin



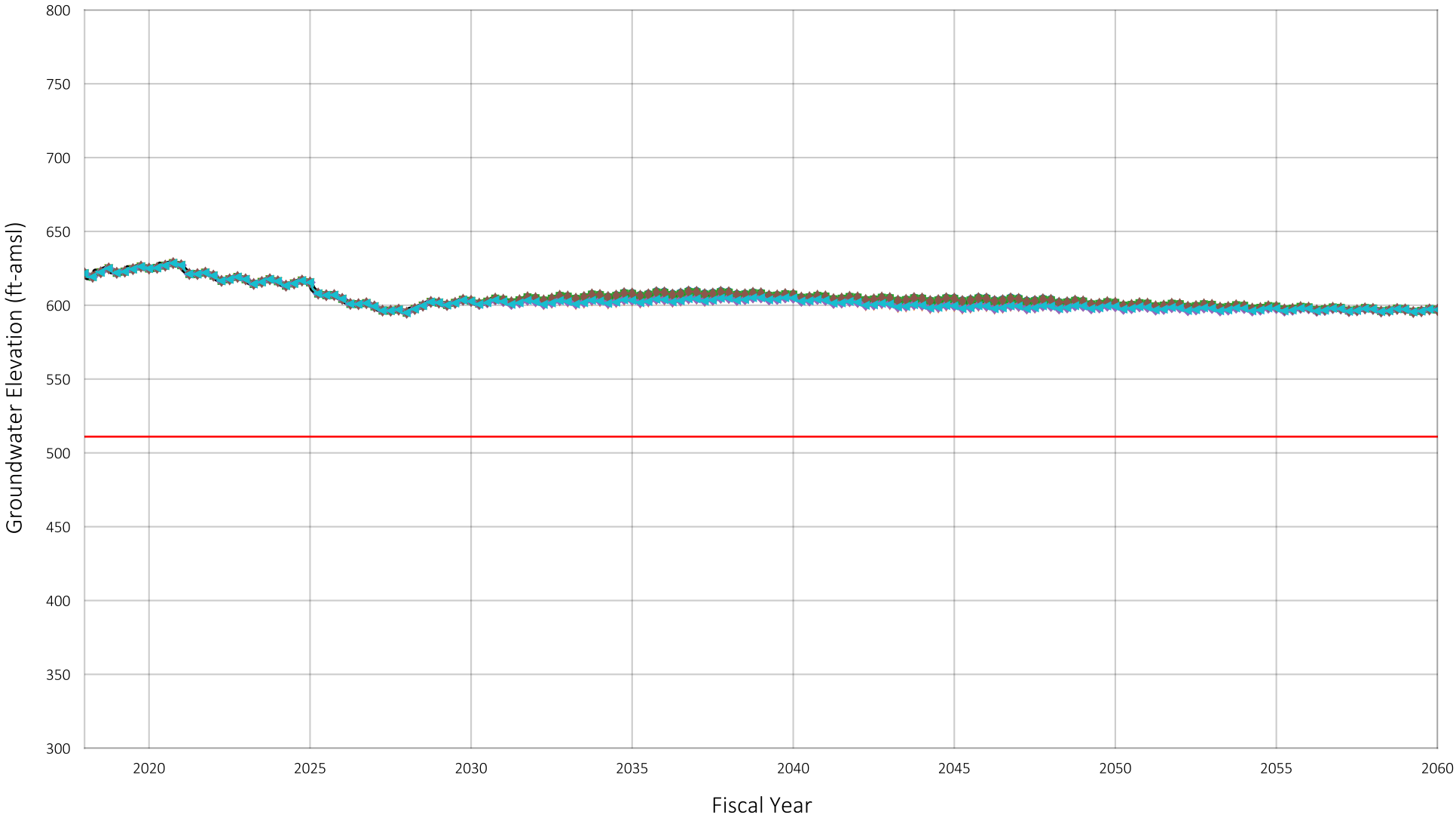
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1221752
Owner: Marygold Mutual Water Company
Well Name: MMWC 07

Figure A-68

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



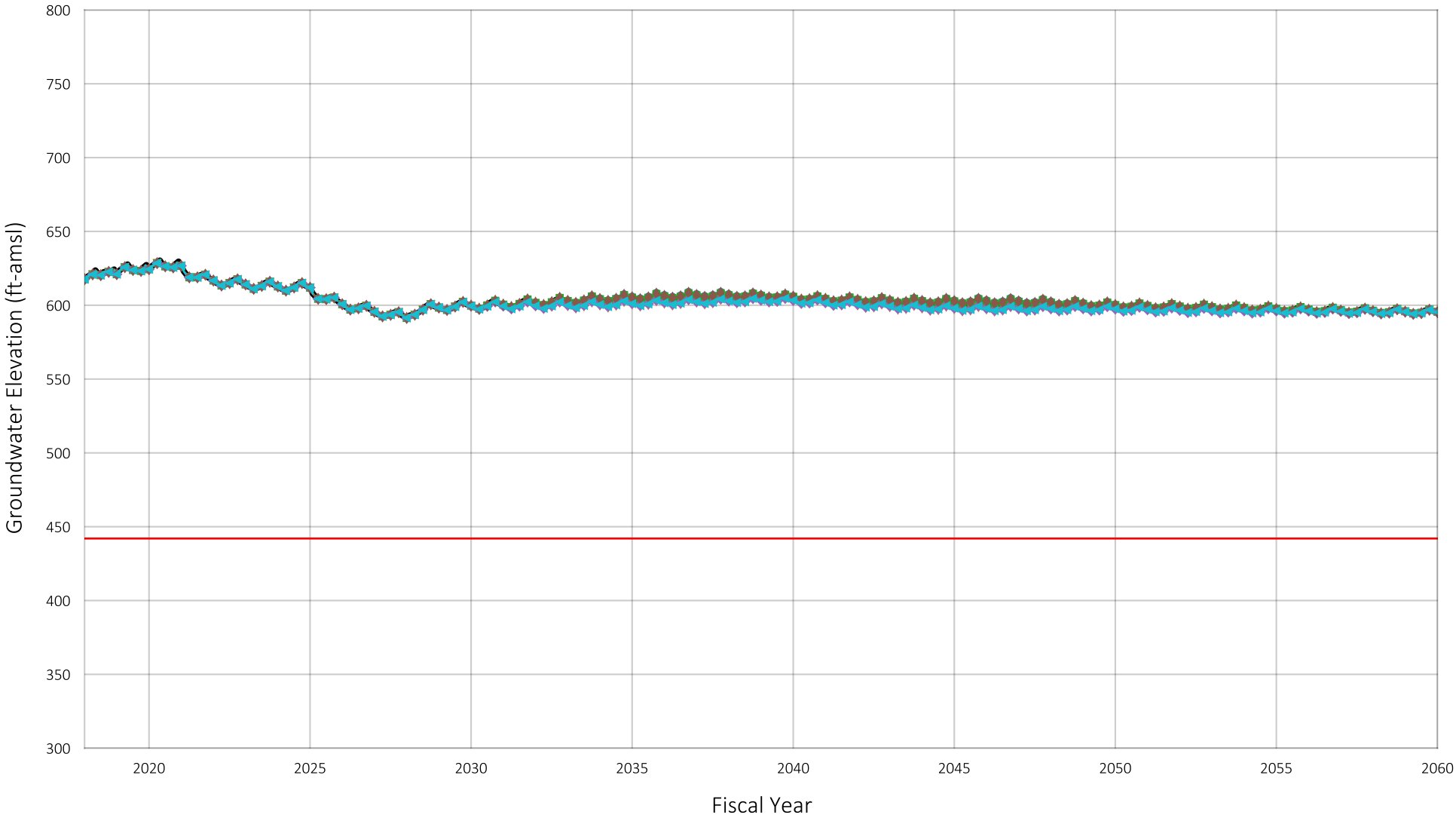
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002541
Owner: Monte Vista Water District
Well Name: 4

Figure A-69




Location of Well in Chino Basin



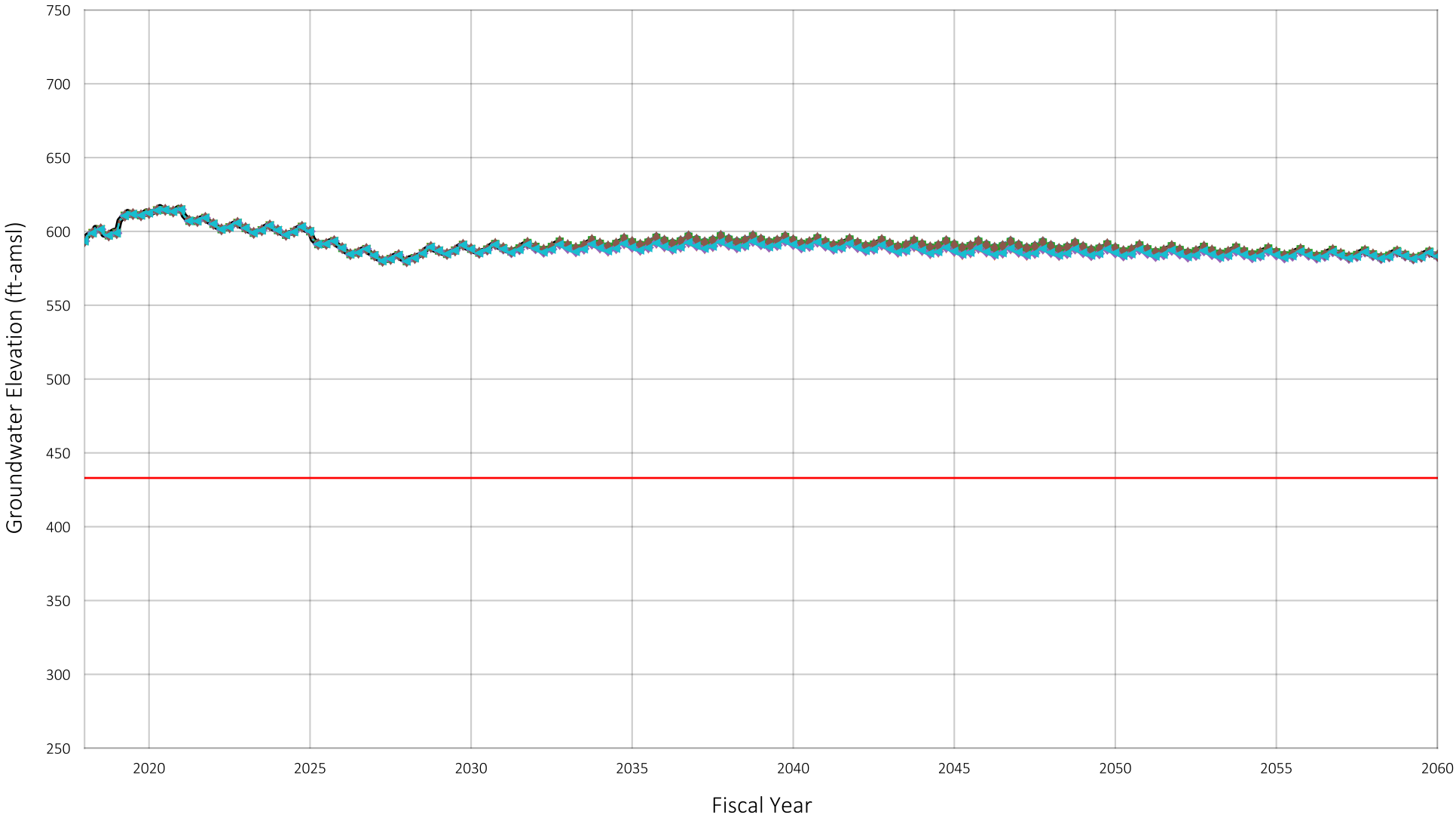
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002544
Owner: Monte Vista Water District
Well Name: 5

Figure A-70




Location of Well in Chino Basin



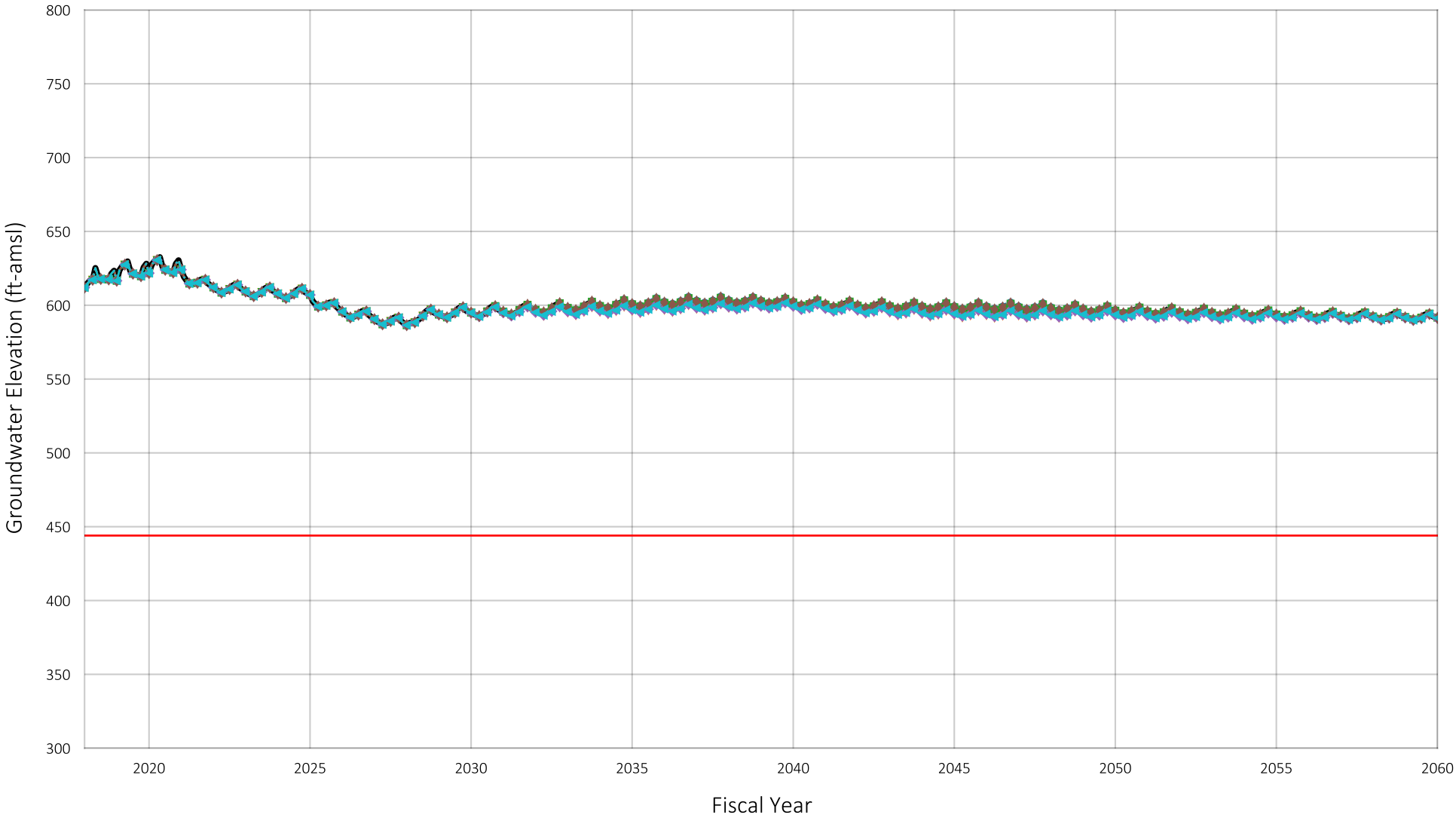
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002563
Owner: Monte Vista Water District
Well Name: 19

Figure A-71




Location of Well in Chino Basin



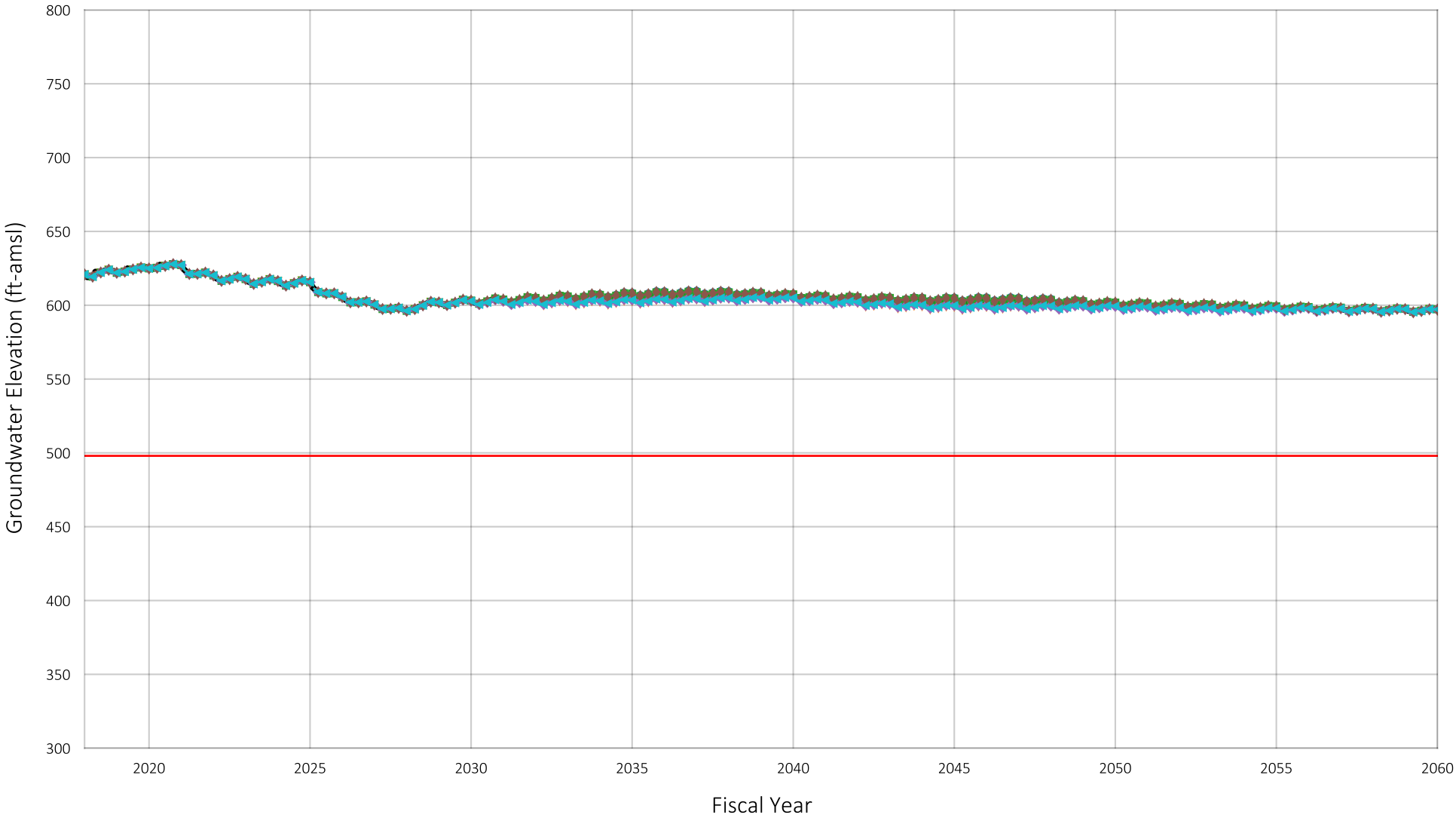
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206744
Owner: Monte Vista Water District
Well Name: 26

Figure A-72




Location of Well in Chino Basin



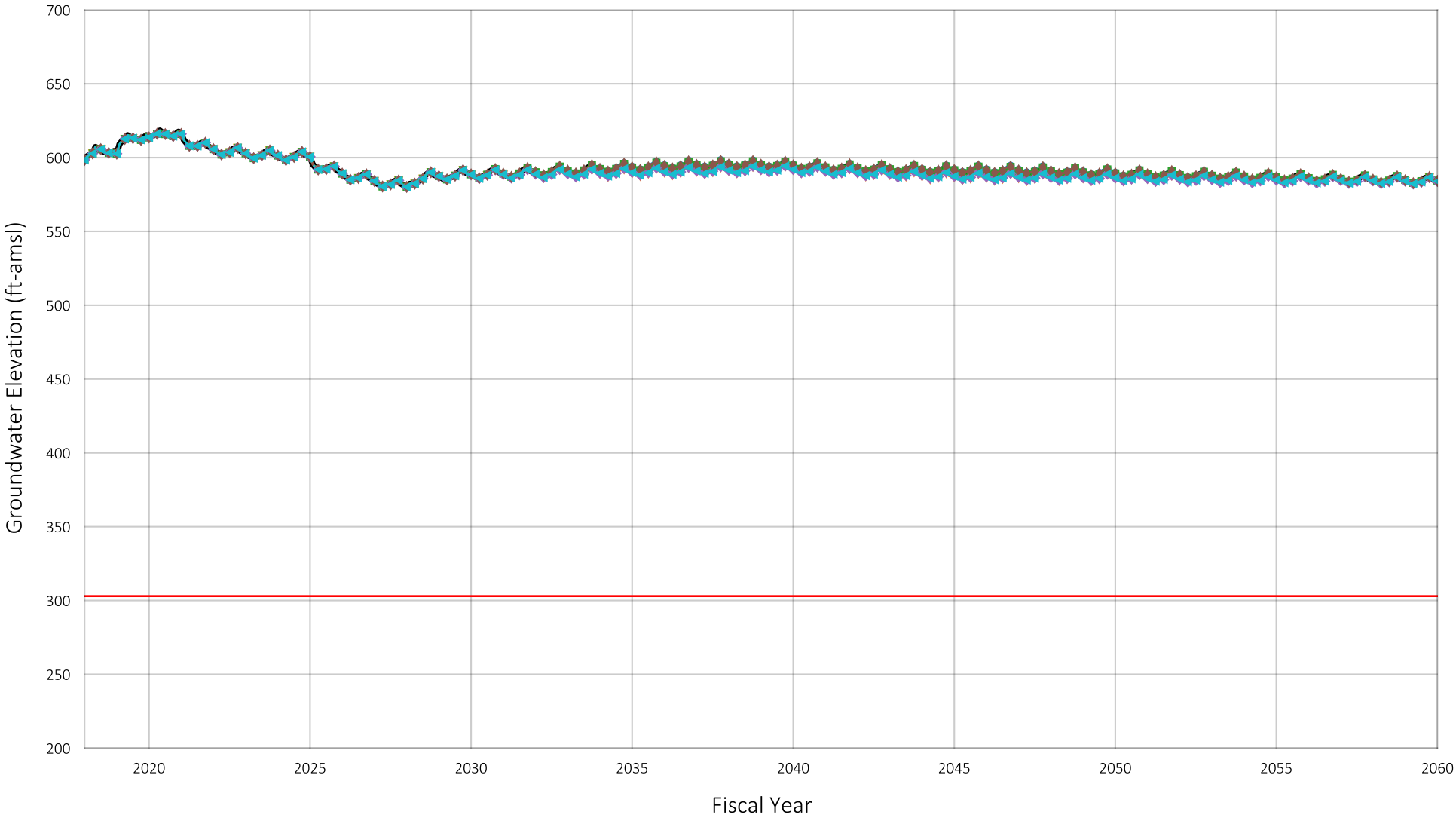
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206745
Owner: Monte Vista Water District
Well Name: 27

Figure A-73




Location of Well in Chino Basin



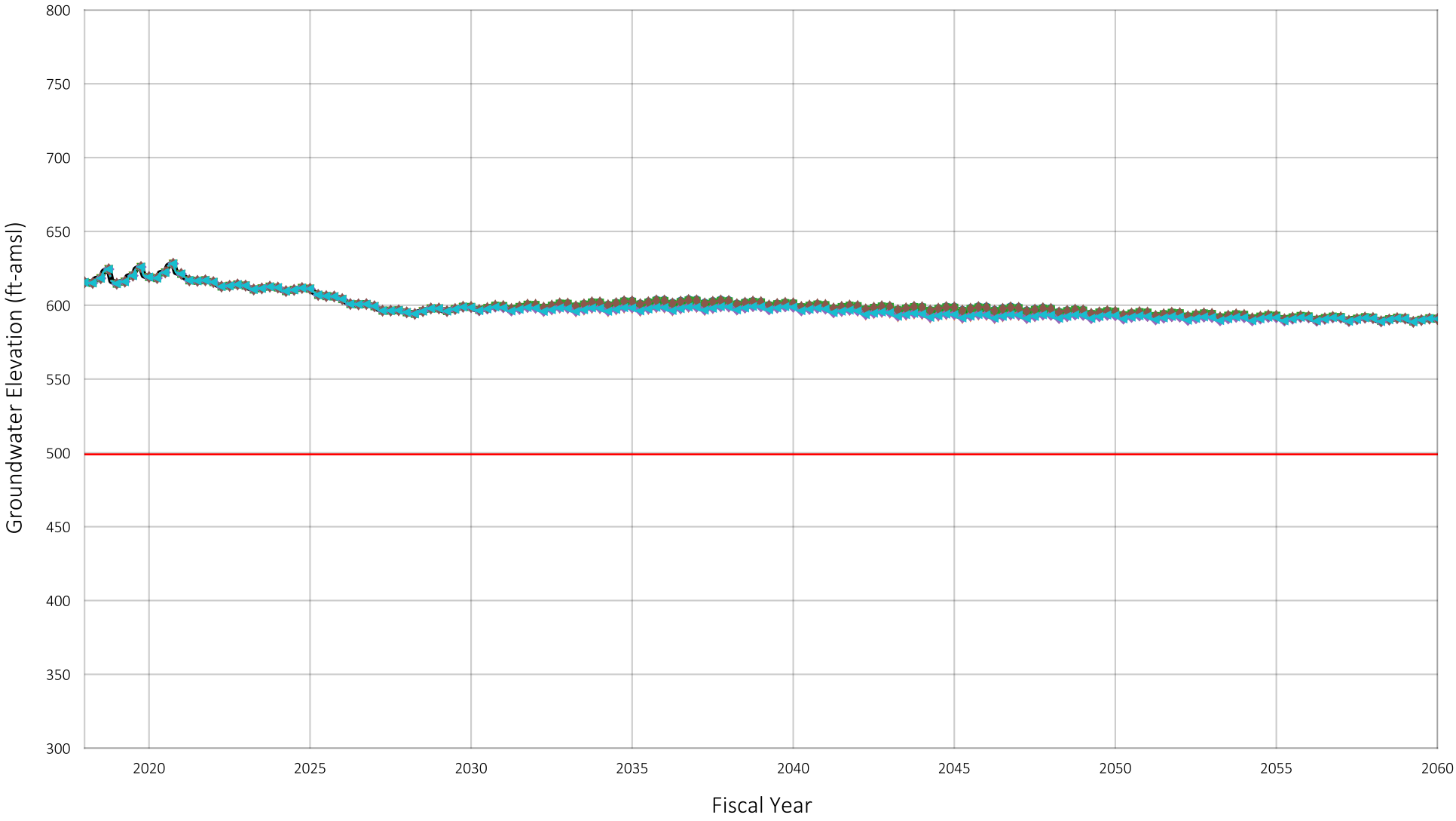
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206746
Owner: Monte Vista Water District
Well Name: 28

Figure A-74




Location of Well in Chino Basin



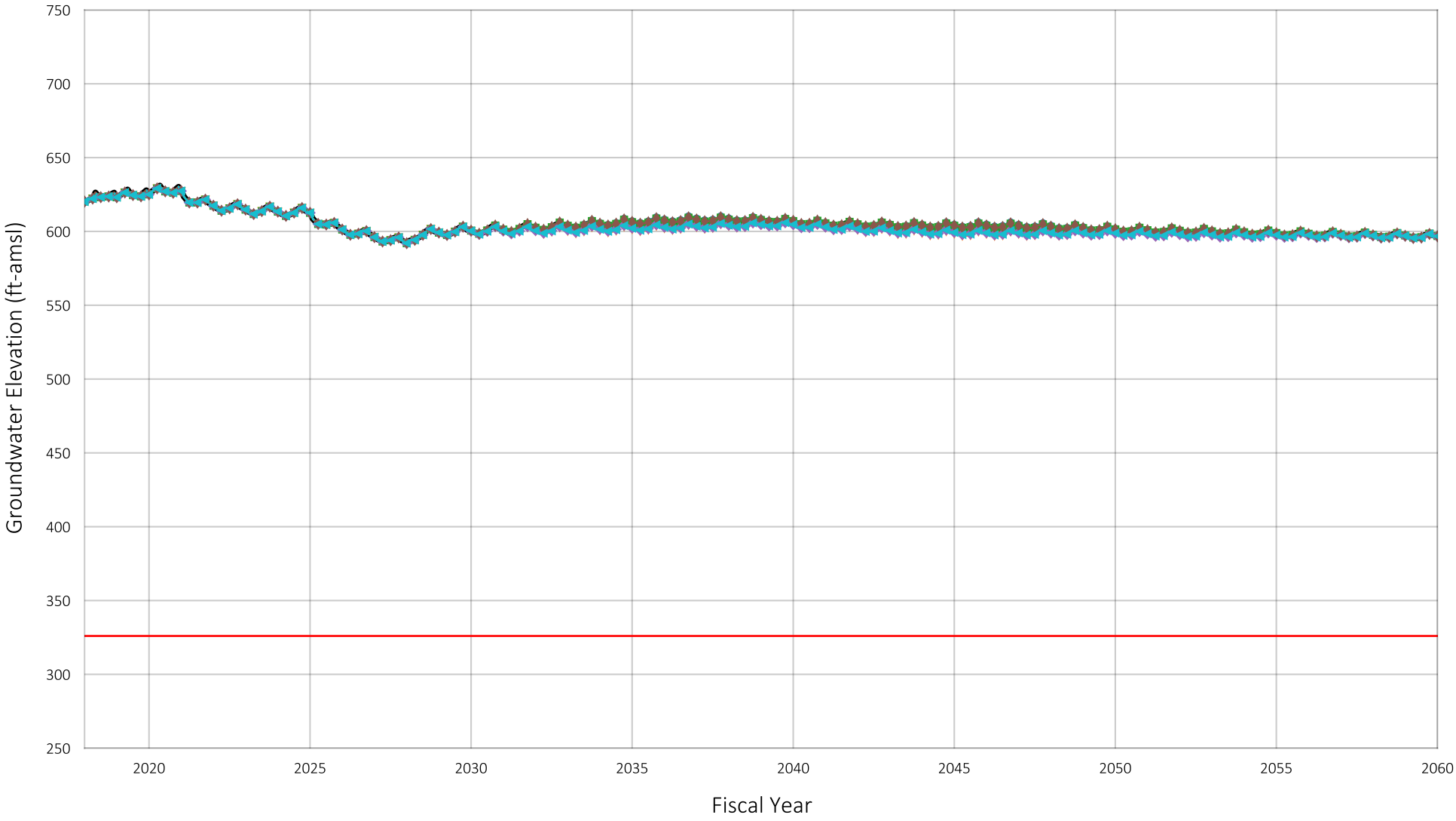
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1208781
Owner: Monte Vista Water District
Well Name: 30

Figure A-75




Location of Well in Chino Basin



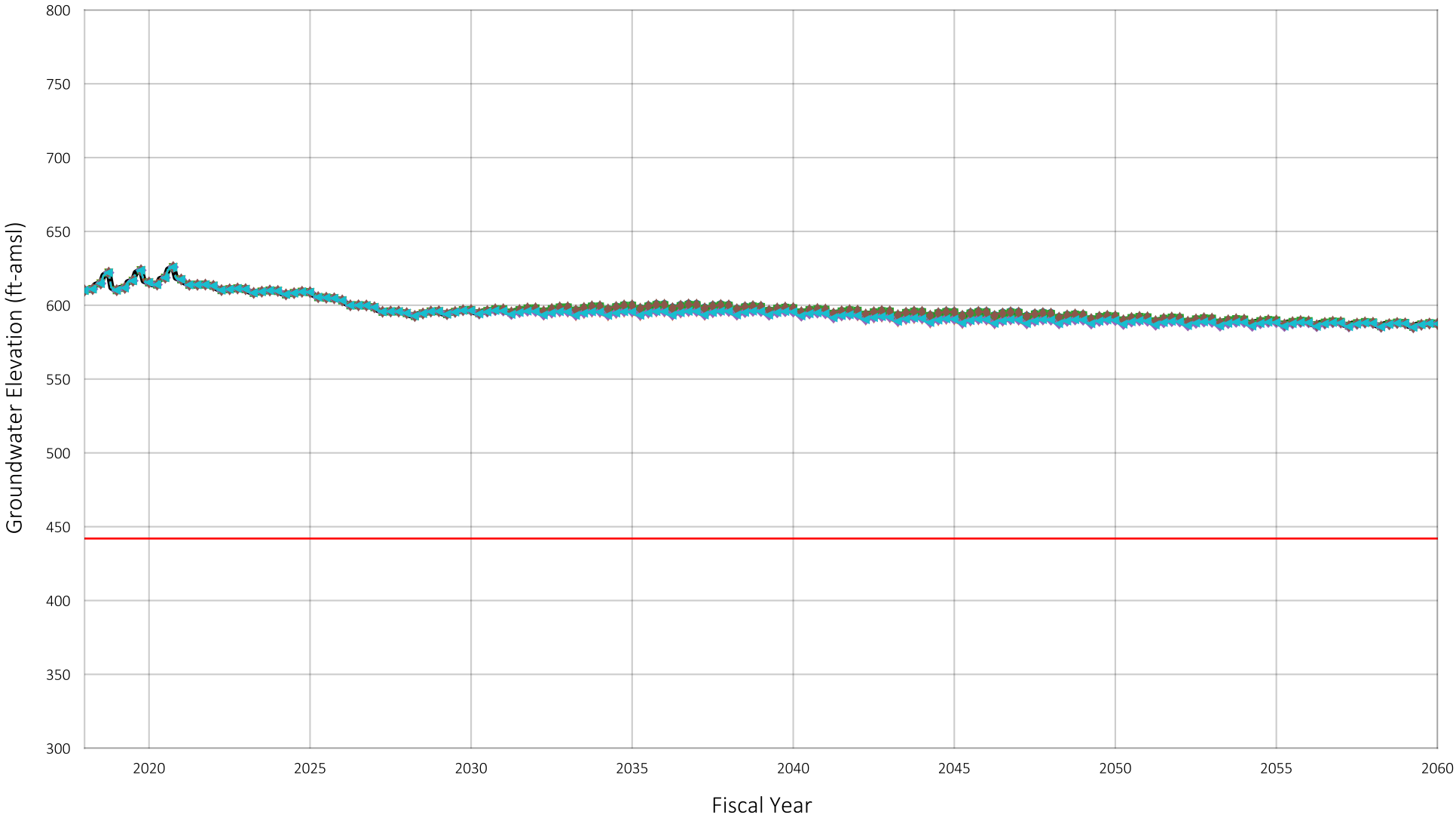
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1208782
Owner: Monte Vista Water District
Well Name: 31

Figure A-76

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



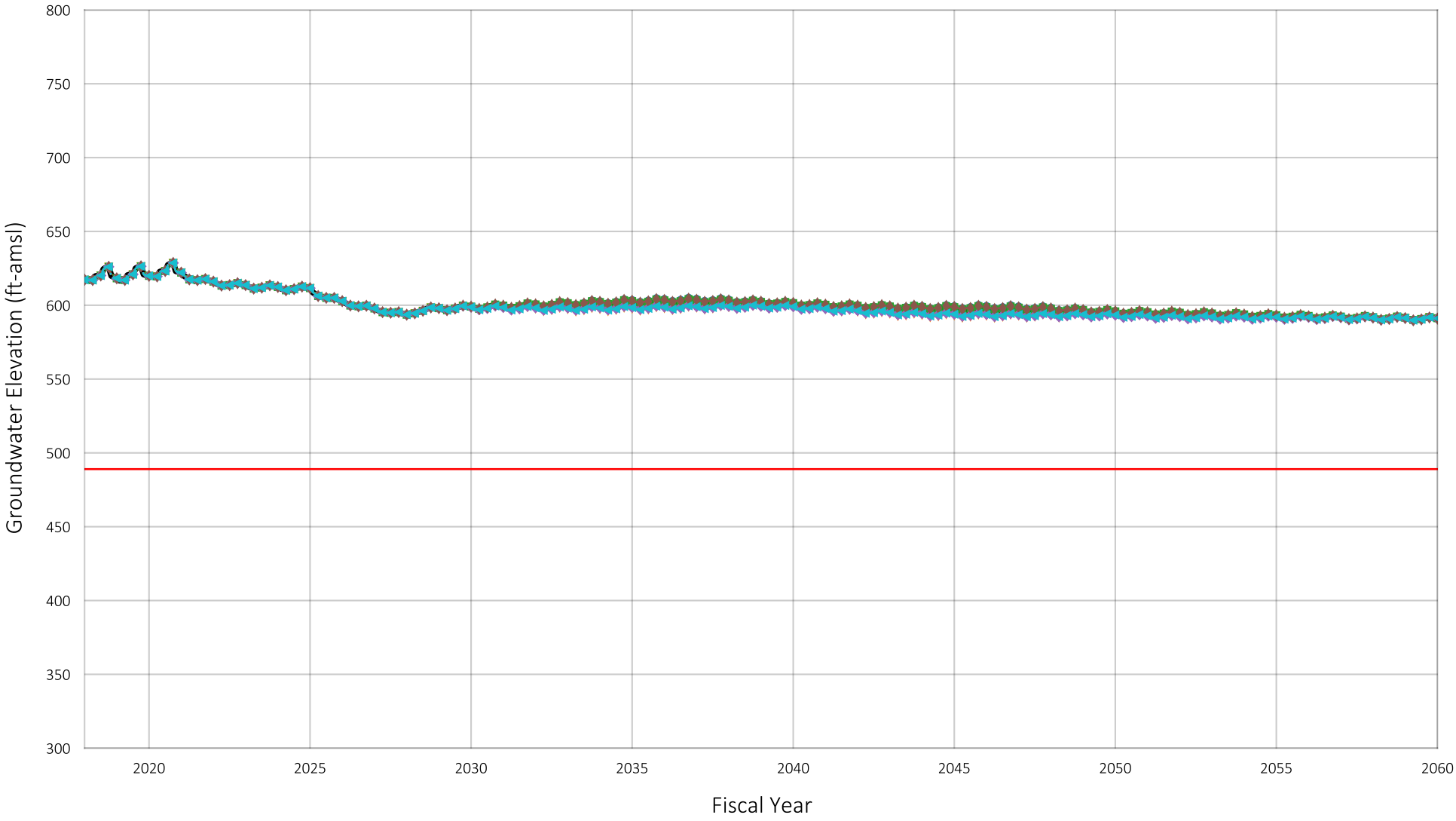
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1208771
Owner: Monte Vista Water District
Well Name: 32

Figure A-77

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



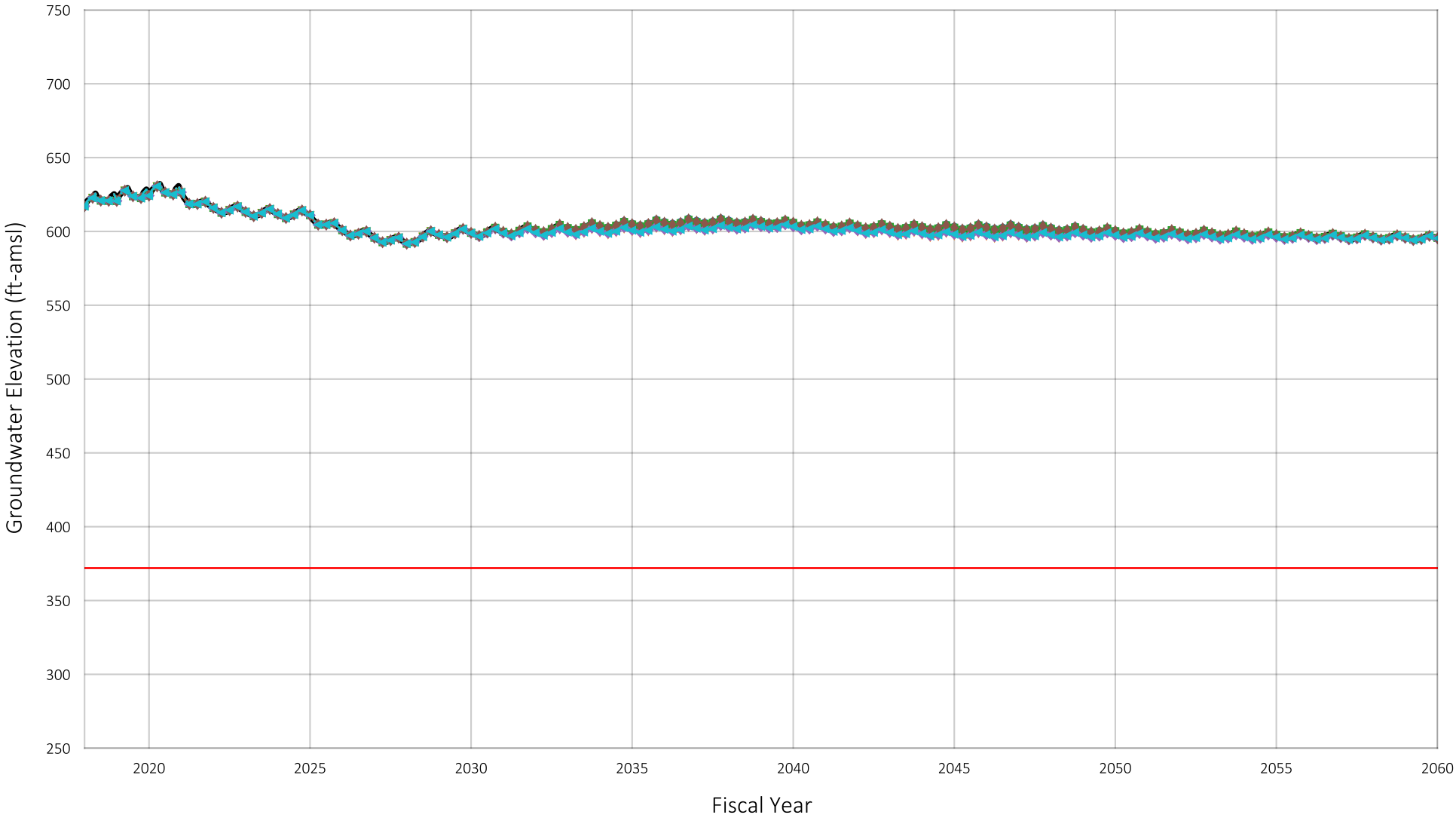
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1220173
Owner: Monte Vista Water District
Well Name: 33

Figure A-78

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



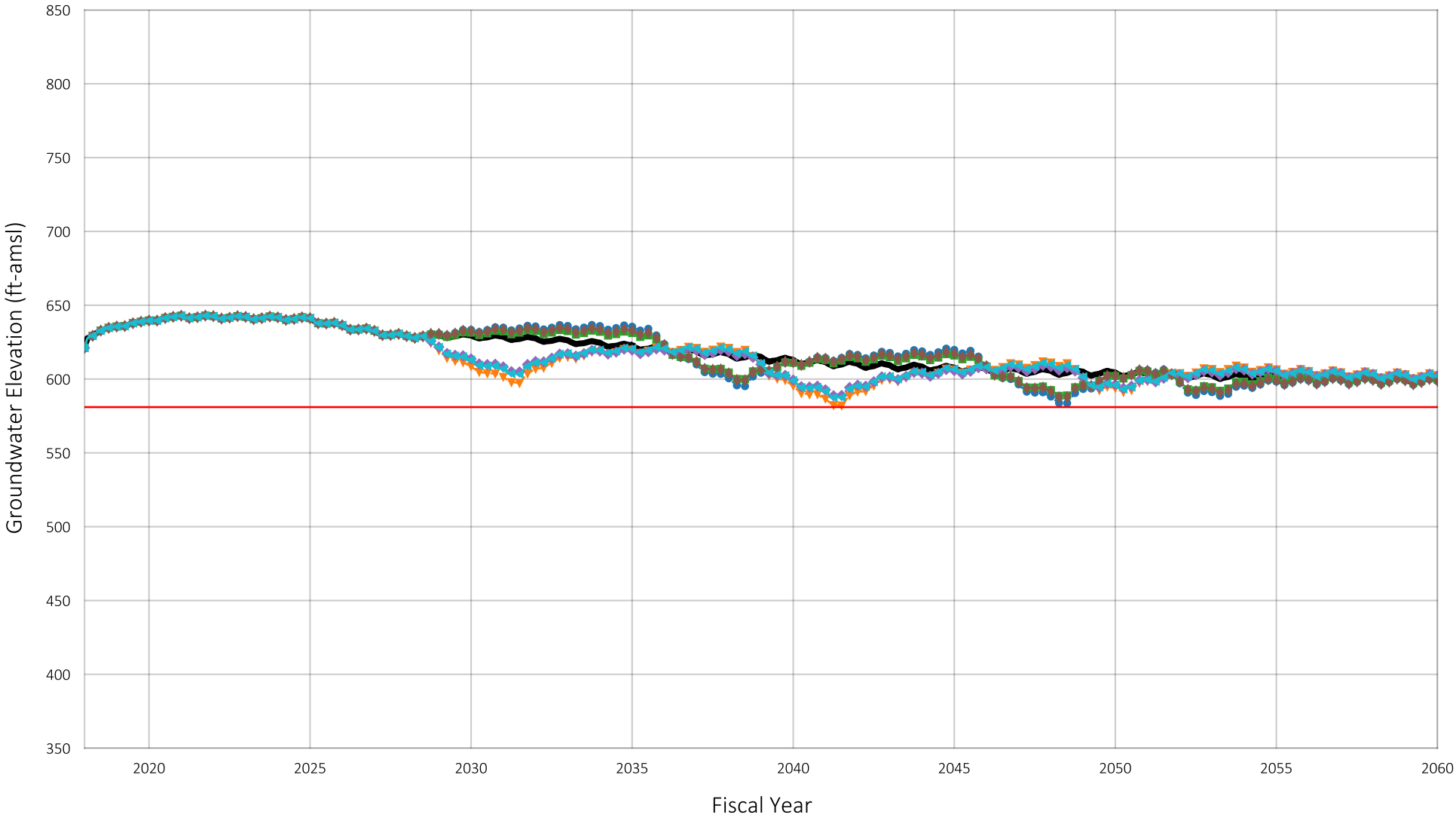
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1224765
Owner: Monte Vista Water District
Well Name: 34

Figure A-79




Location of Well in Chino Basin



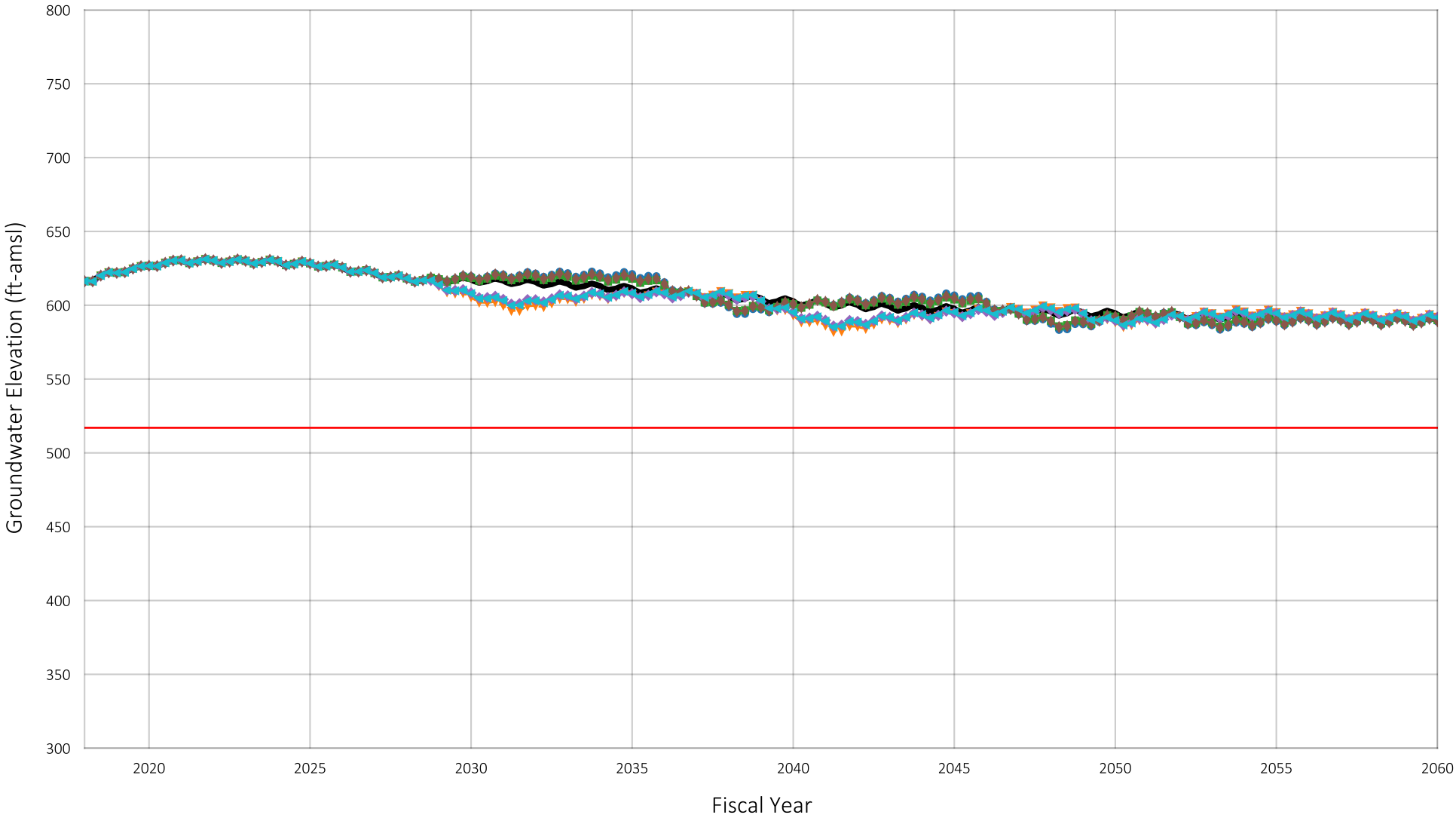
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002339
Owner: City of Ontario
Well Name: 24

Figure A-80




Location of Well in Chino Basin



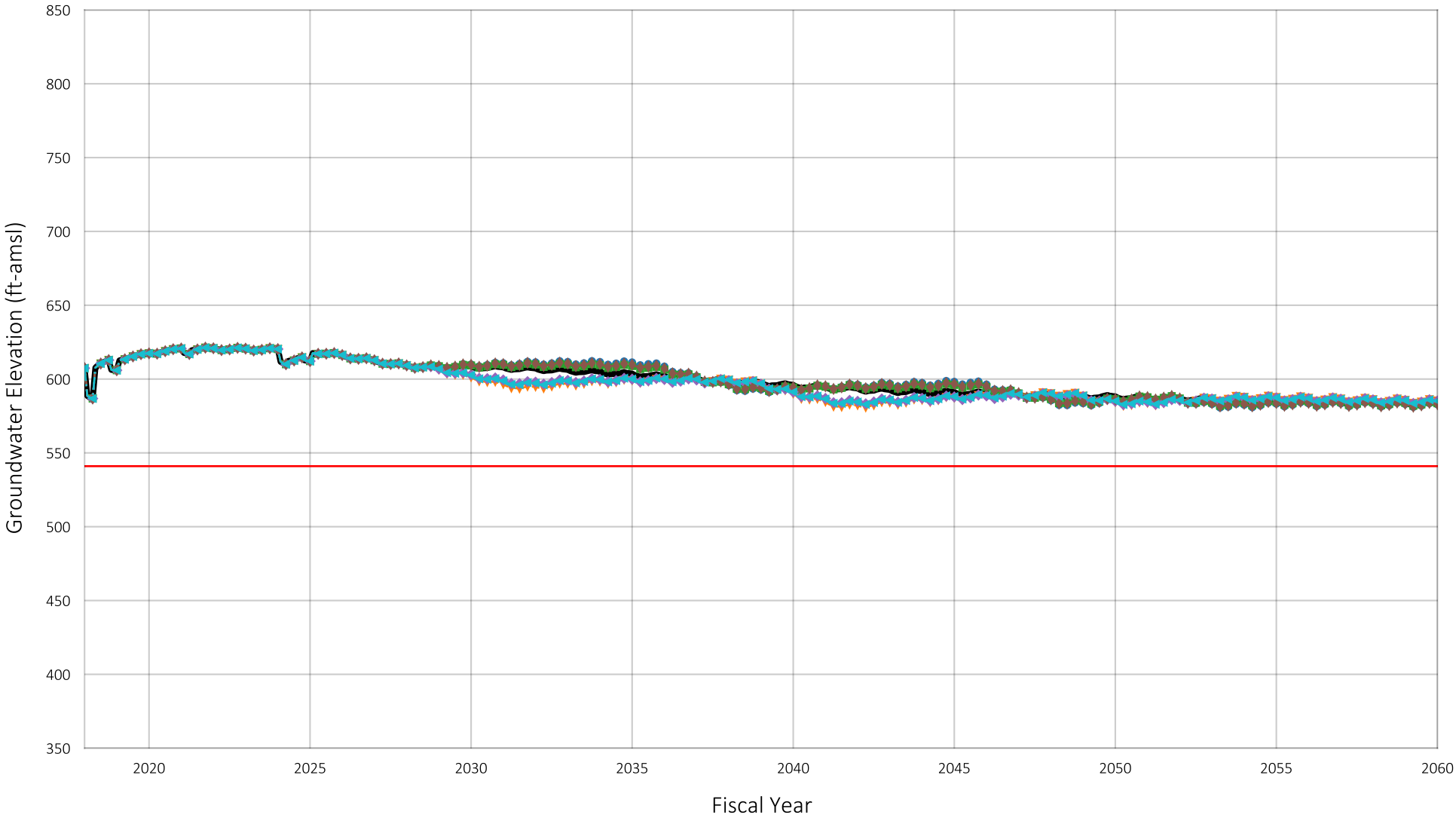
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002337
Owner: City of Ontario
Well Name: 25

Figure A-81

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



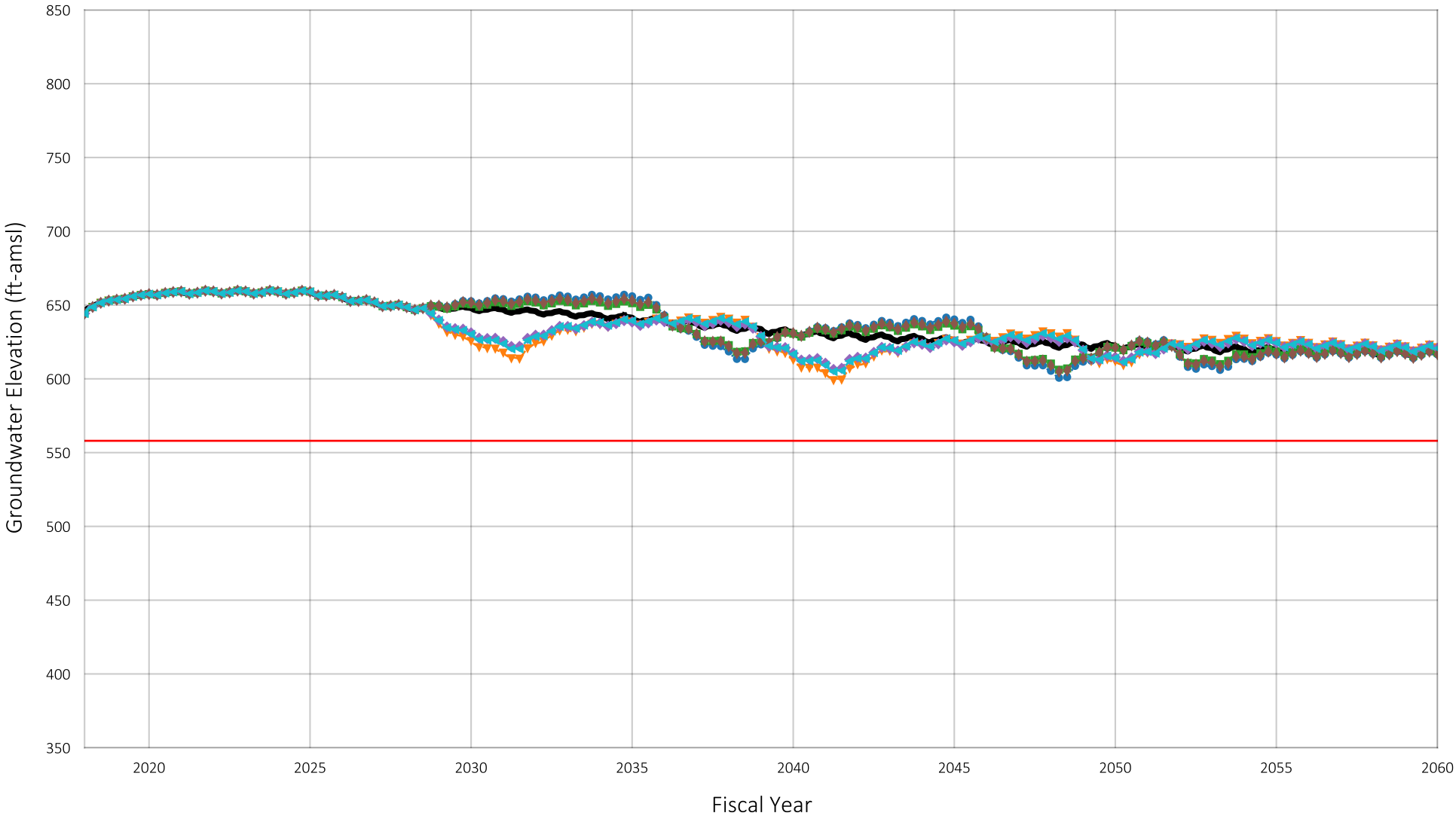
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002333
Owner: City of Ontario
Well Name: 29

Figure A-82




Location of Well in Chino Basin



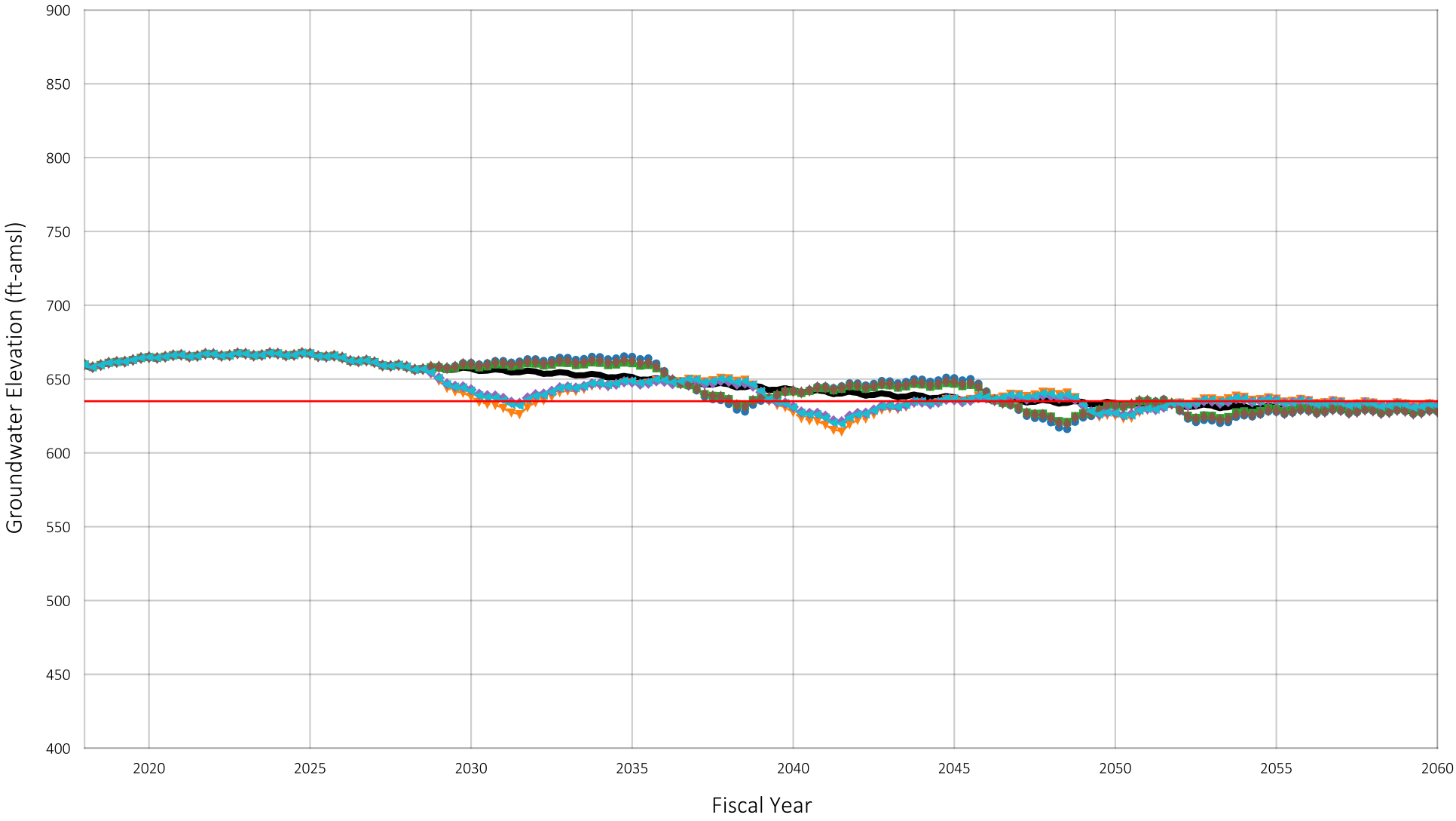
- Baseline
- Scenario 1
- Scenario 2
- Scenario 3
- Scenario 4
- Scenario 5
- Scenario 6
- Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002253
Owner: City of Ontario
Well Name: 30

Figure A-83




Location of Well in Chino Basin



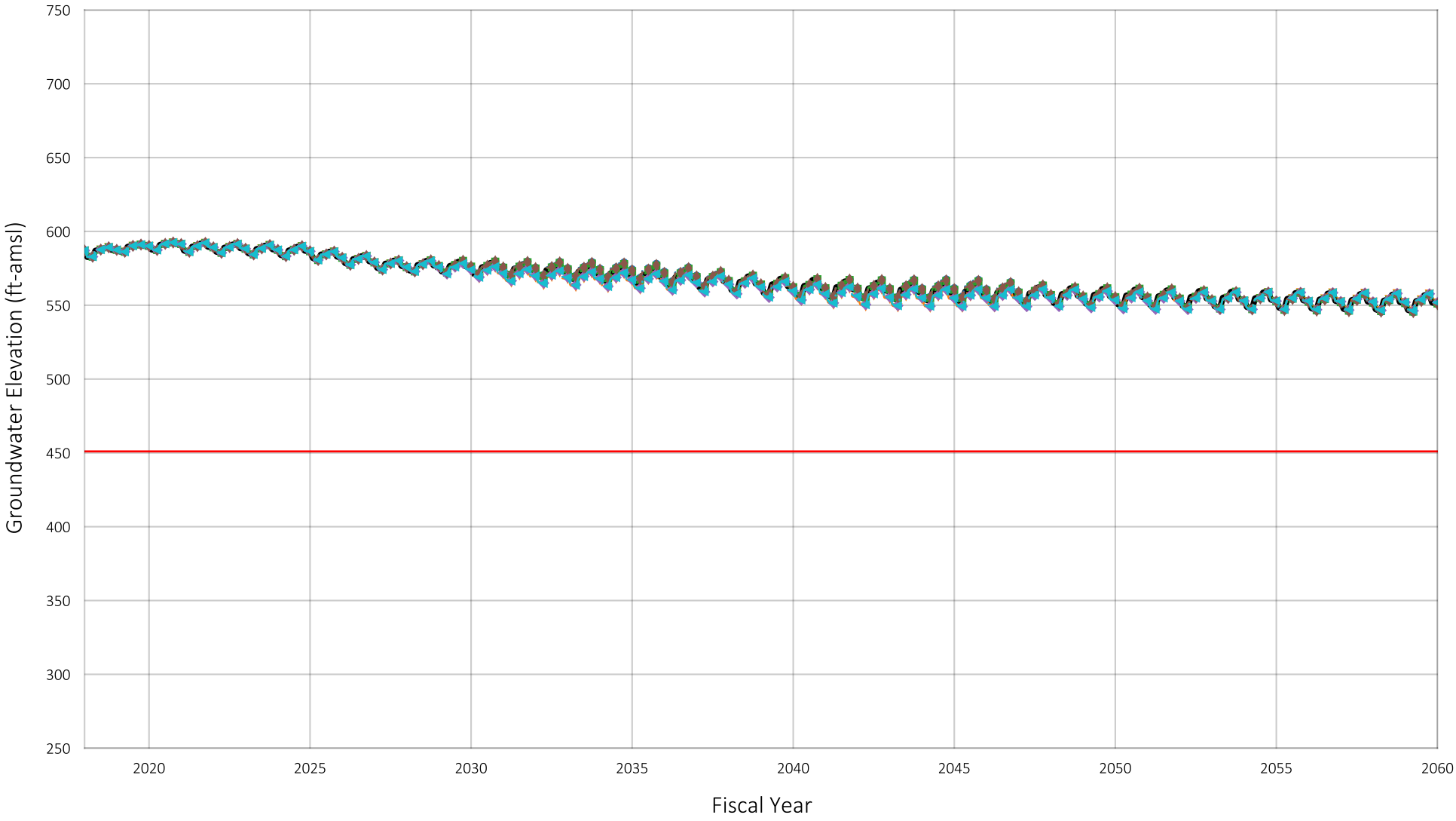
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002254
Owner: City of Ontario
Well Name: 31

Figure A-84

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



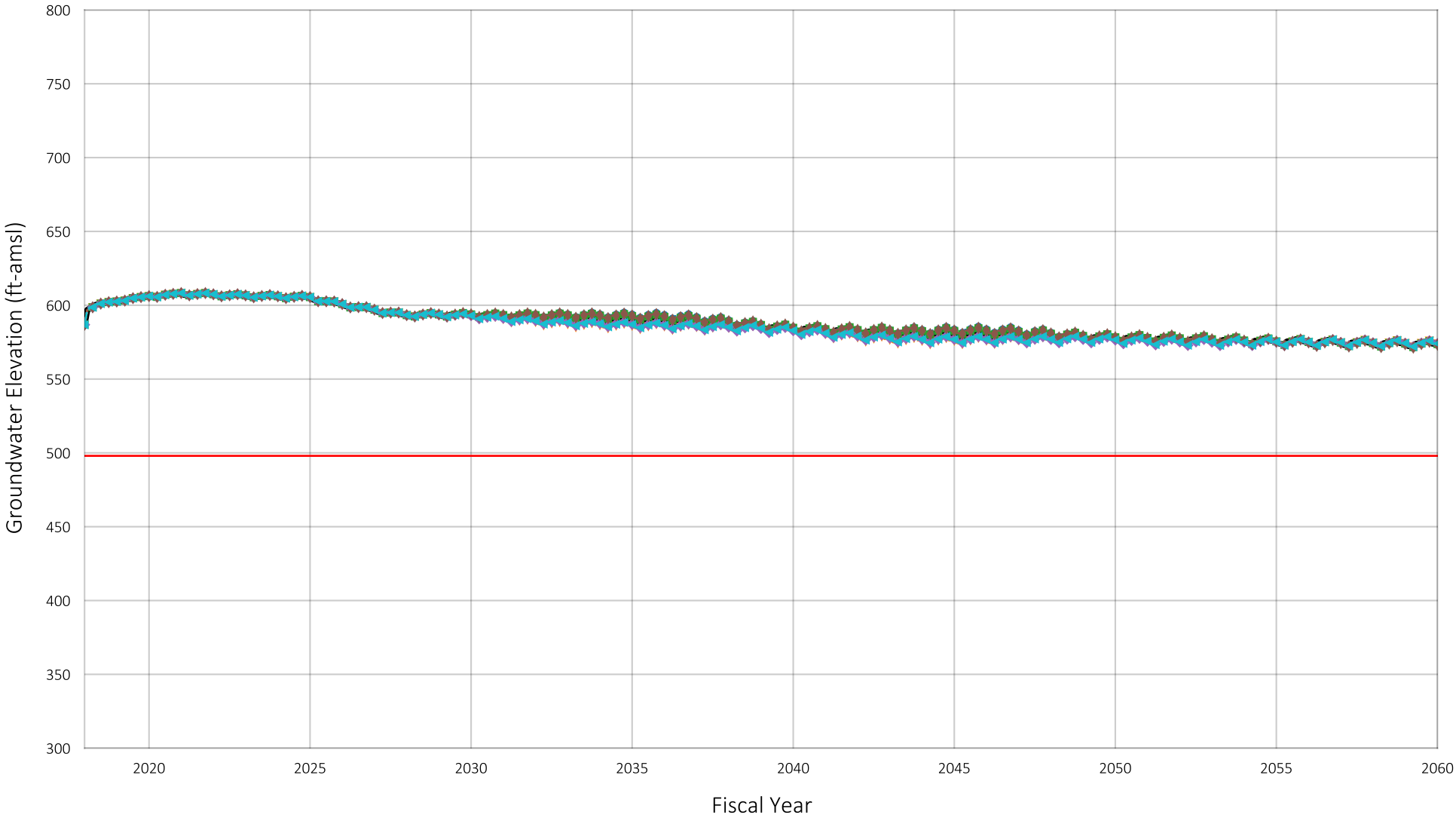
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002367
Owner: City of Ontario
Well Name: 34

Figure A-85

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



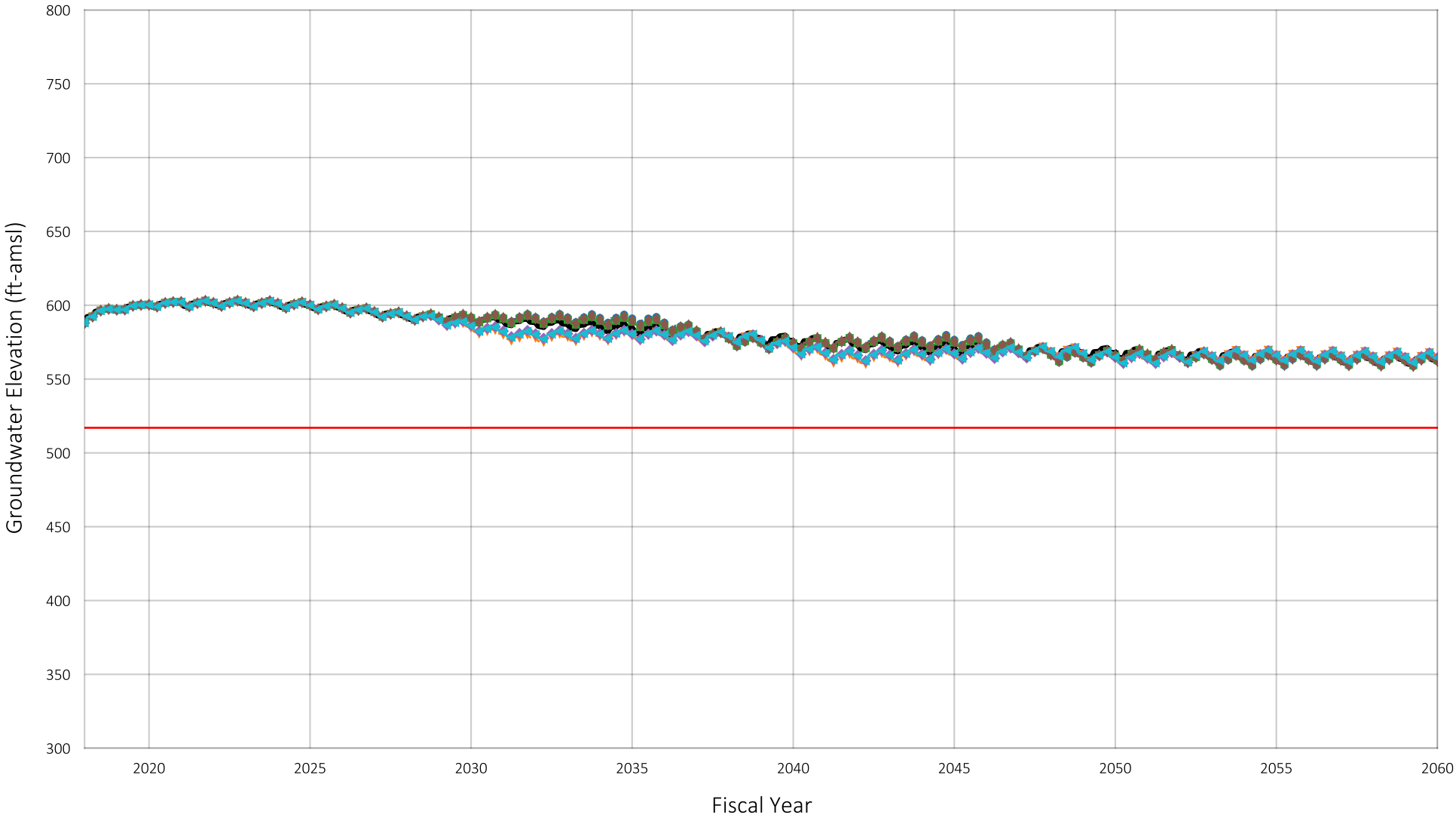
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002350
Owner: City of Ontario
Well Name: 35

Figure A-86




Location of Well in Chino Basin



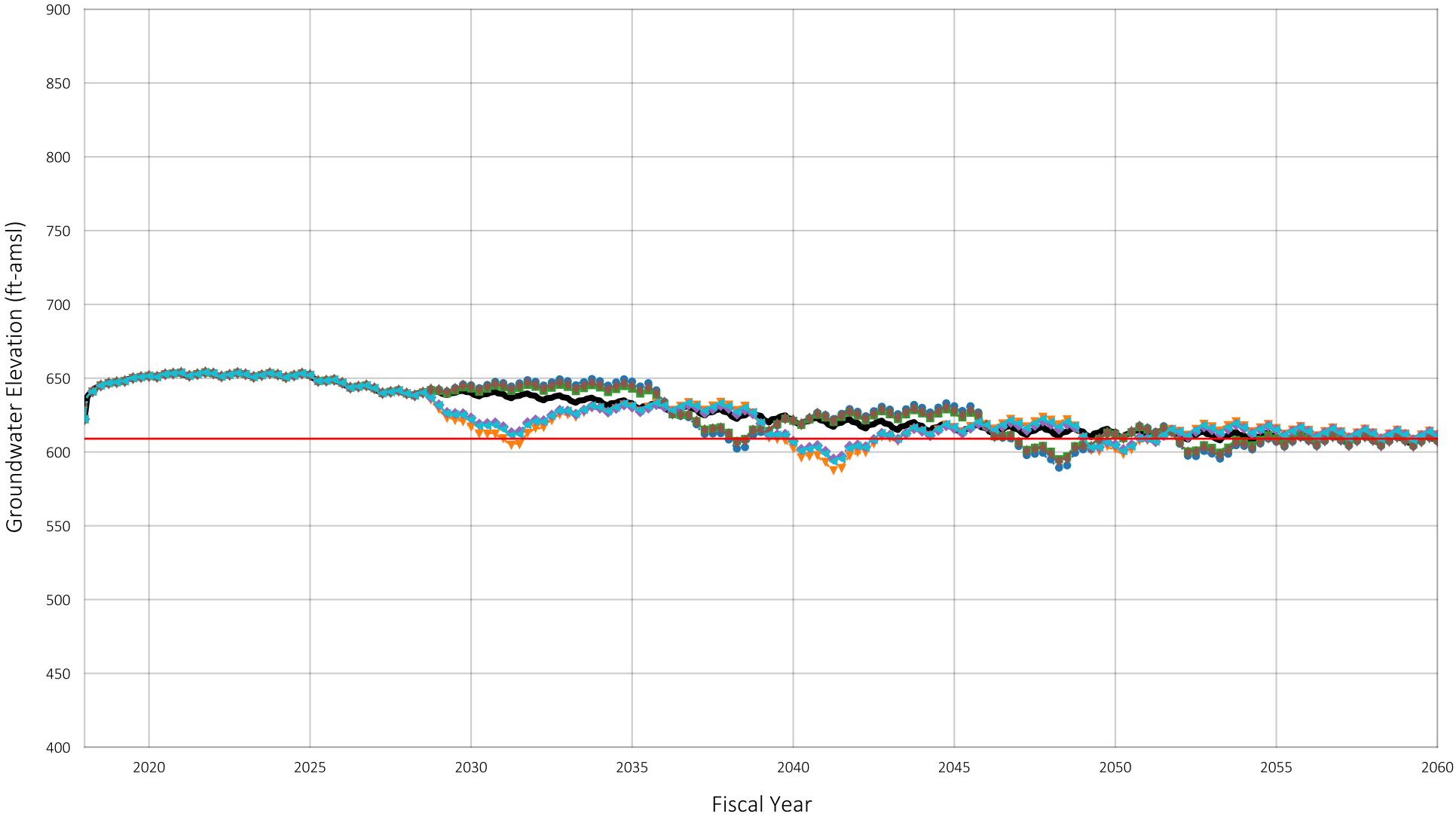
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002372
Owner: City of Ontario
Well Name: 36

Figure A-87




Location of Well in Chino Basin



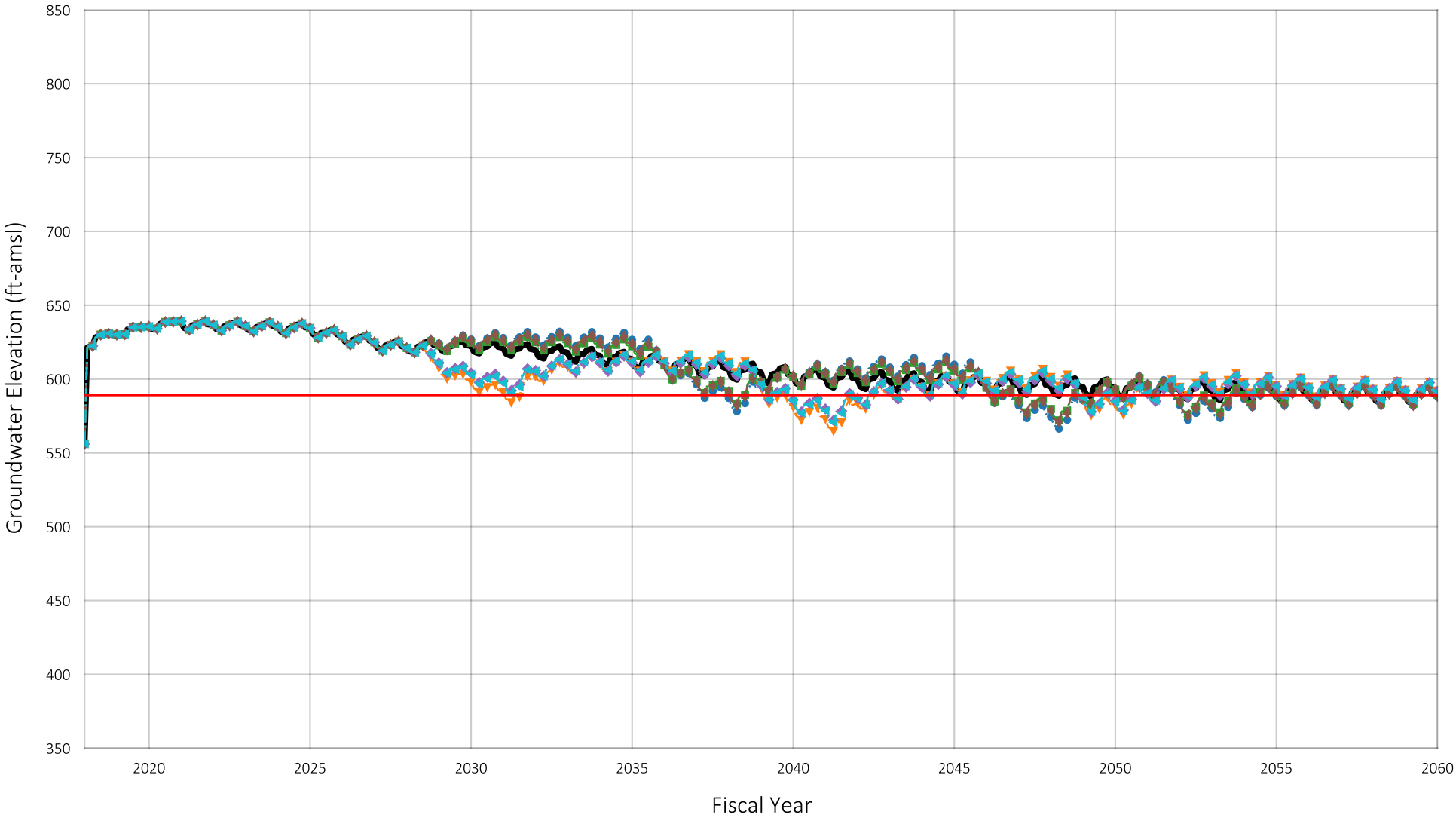
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002230
Owner: City of Ontario
Well Name: 37

Figure A-88




Location of Well in Chino Basin



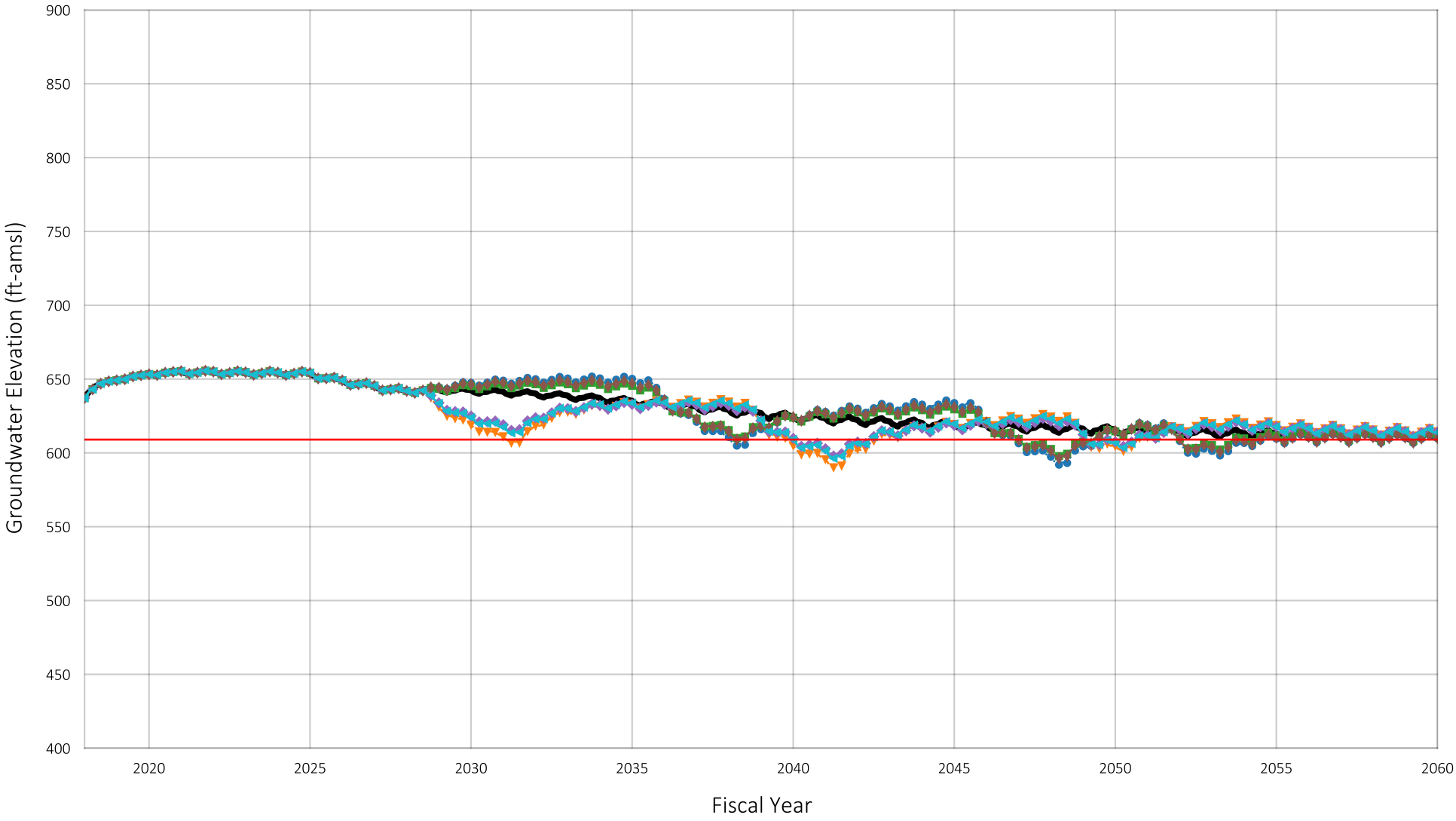
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1006998
Owner: City of Ontario
Well Name: 38

Figure A-89

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



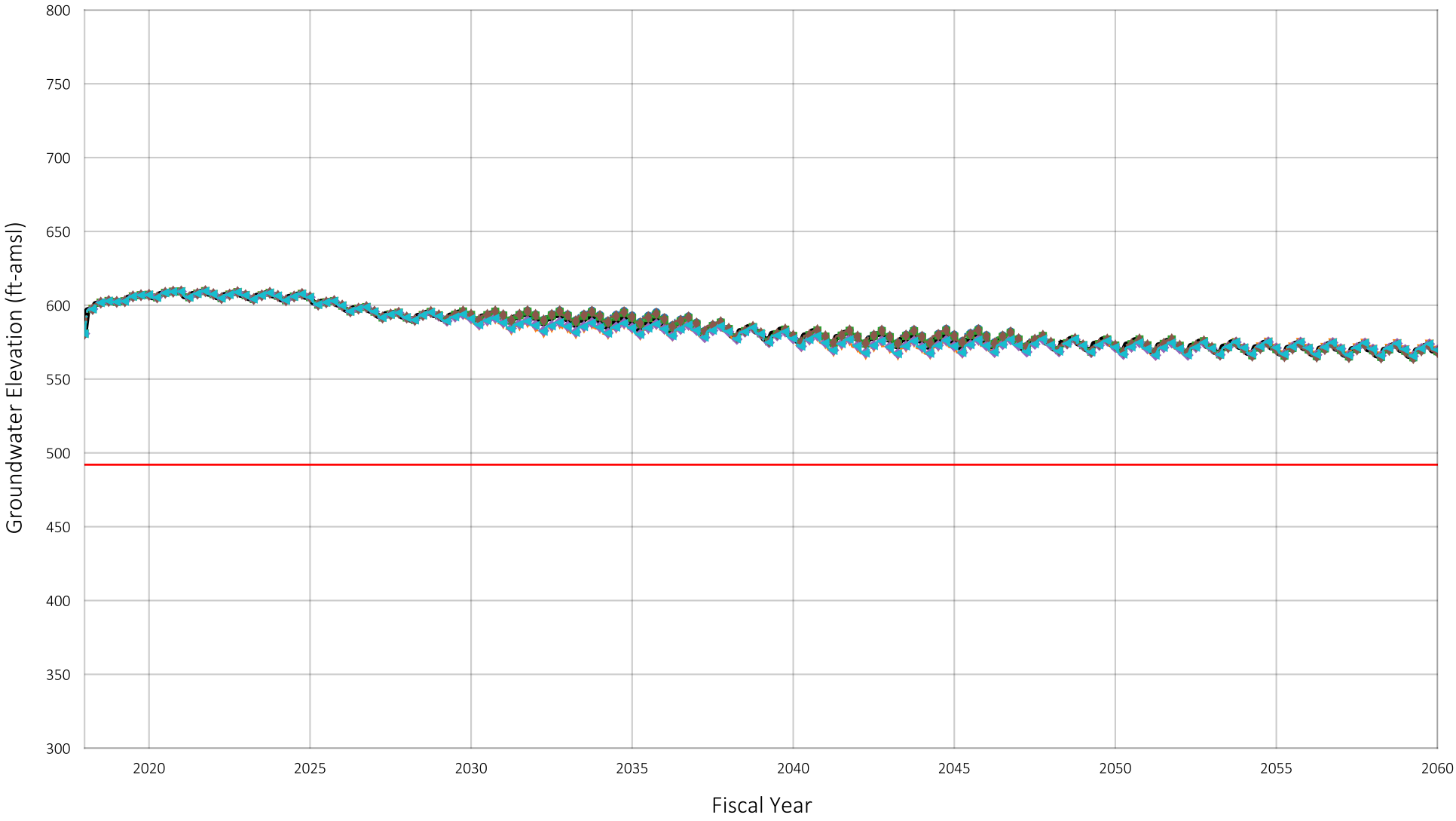
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206945
Owner: City of Ontario
Well Name: 39

Figure A-90




Location of Well in Chino Basin



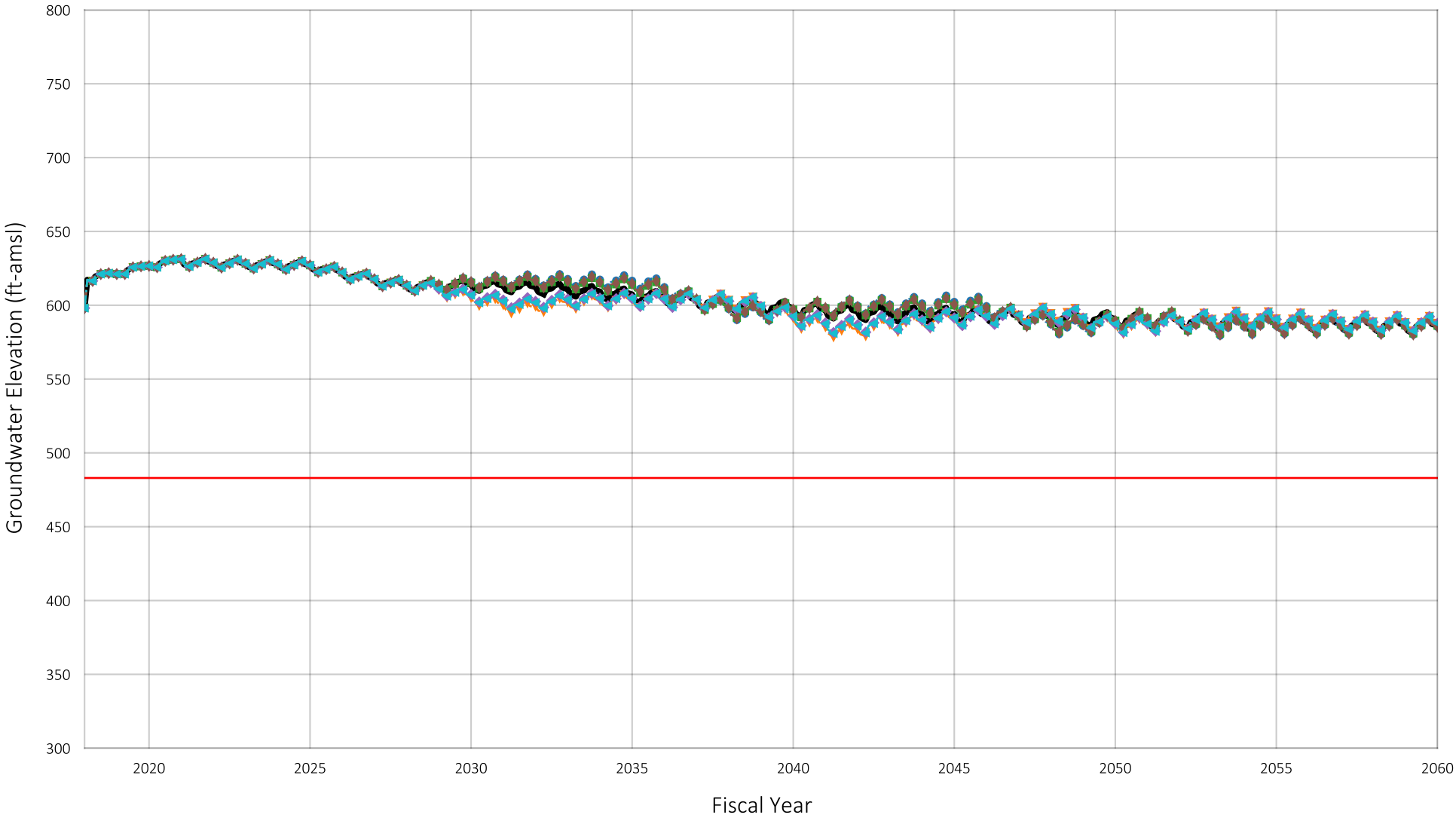
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207502
Owner: City of Ontario
Well Name: 40

Figure A-91




Location of Well in Chino Basin



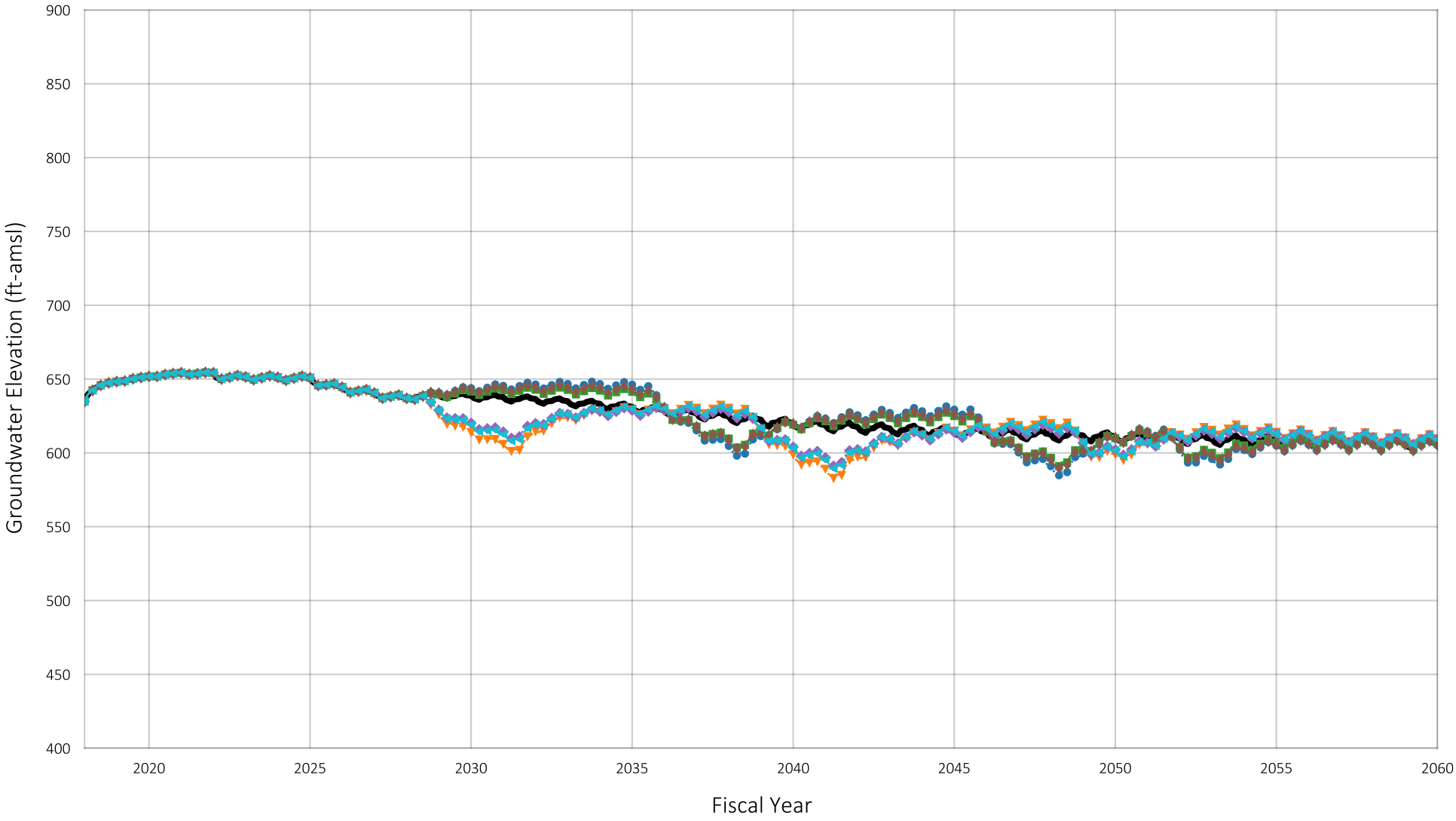
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1207503
Owner: City of Ontario
Well Name: 41

Figure A-92

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



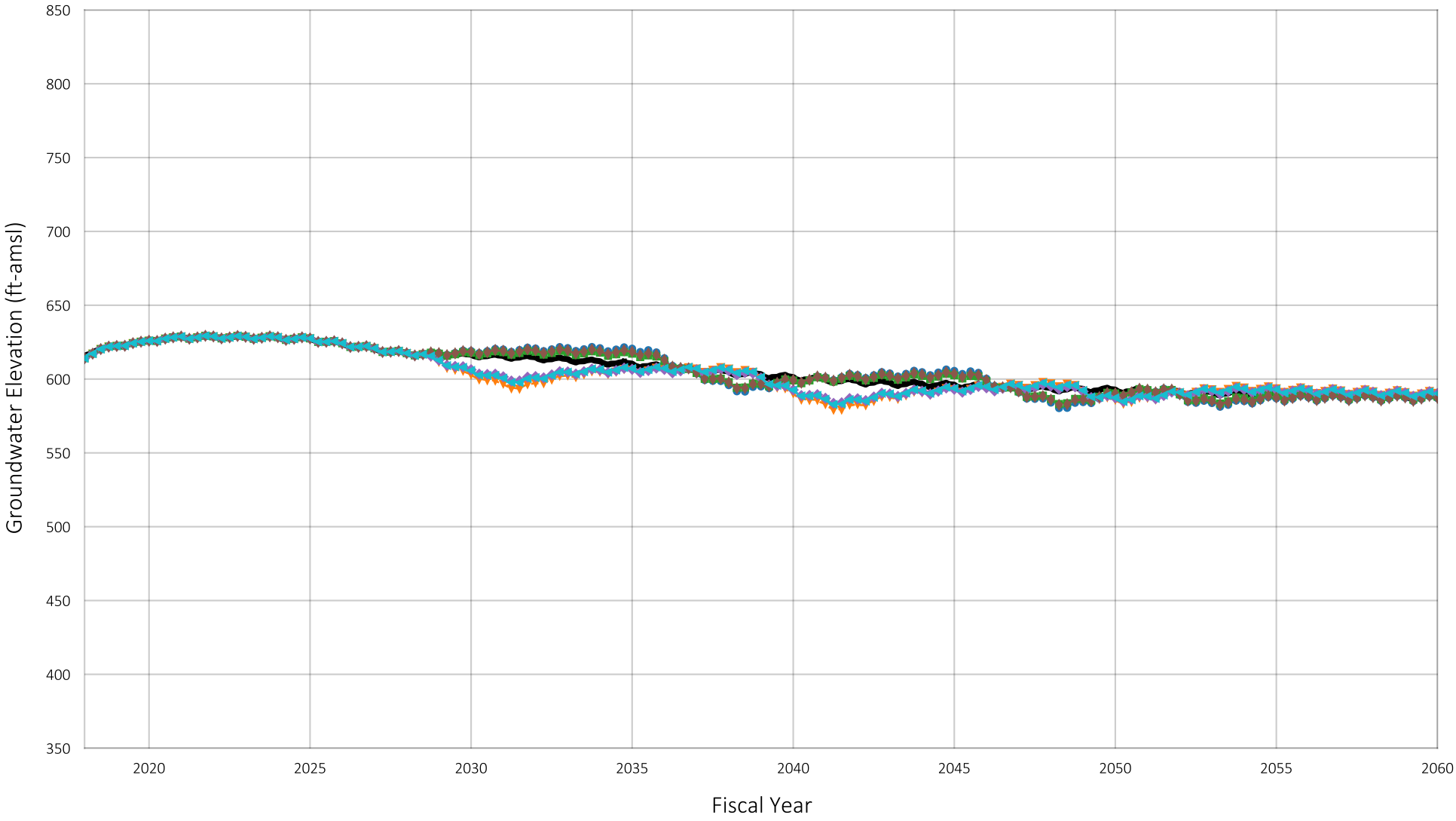
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220168
Owner: City of Ontario
Well Name: 42

Figure A-93




Location of Well in Chino Basin



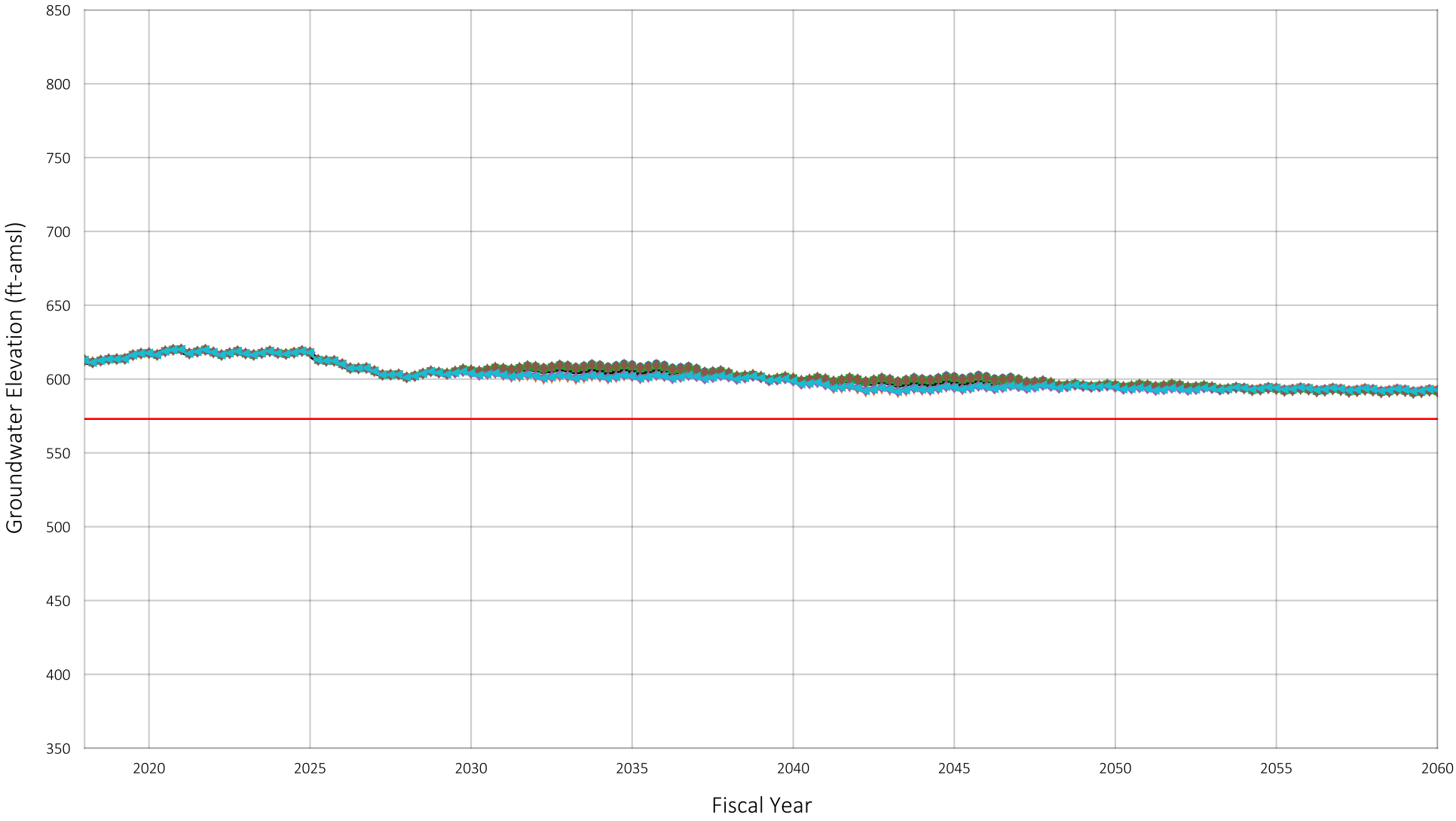
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220169
Owner: City of Ontario
Well Name: 43

Figure A-94




Location of Well in Chino Basin



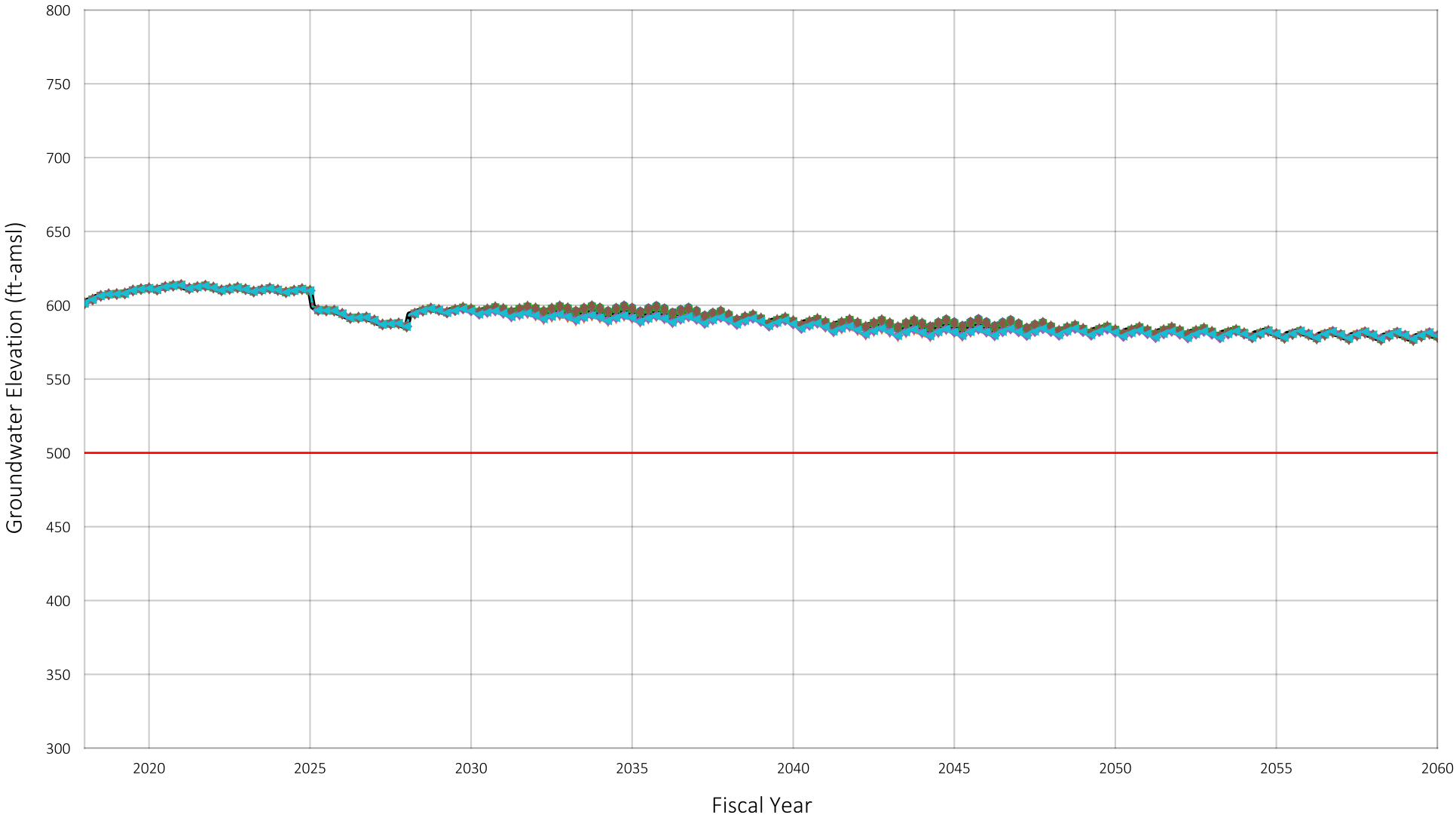
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1220170
Owner: City of Ontario
Well Name: 44

Figure A-95

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



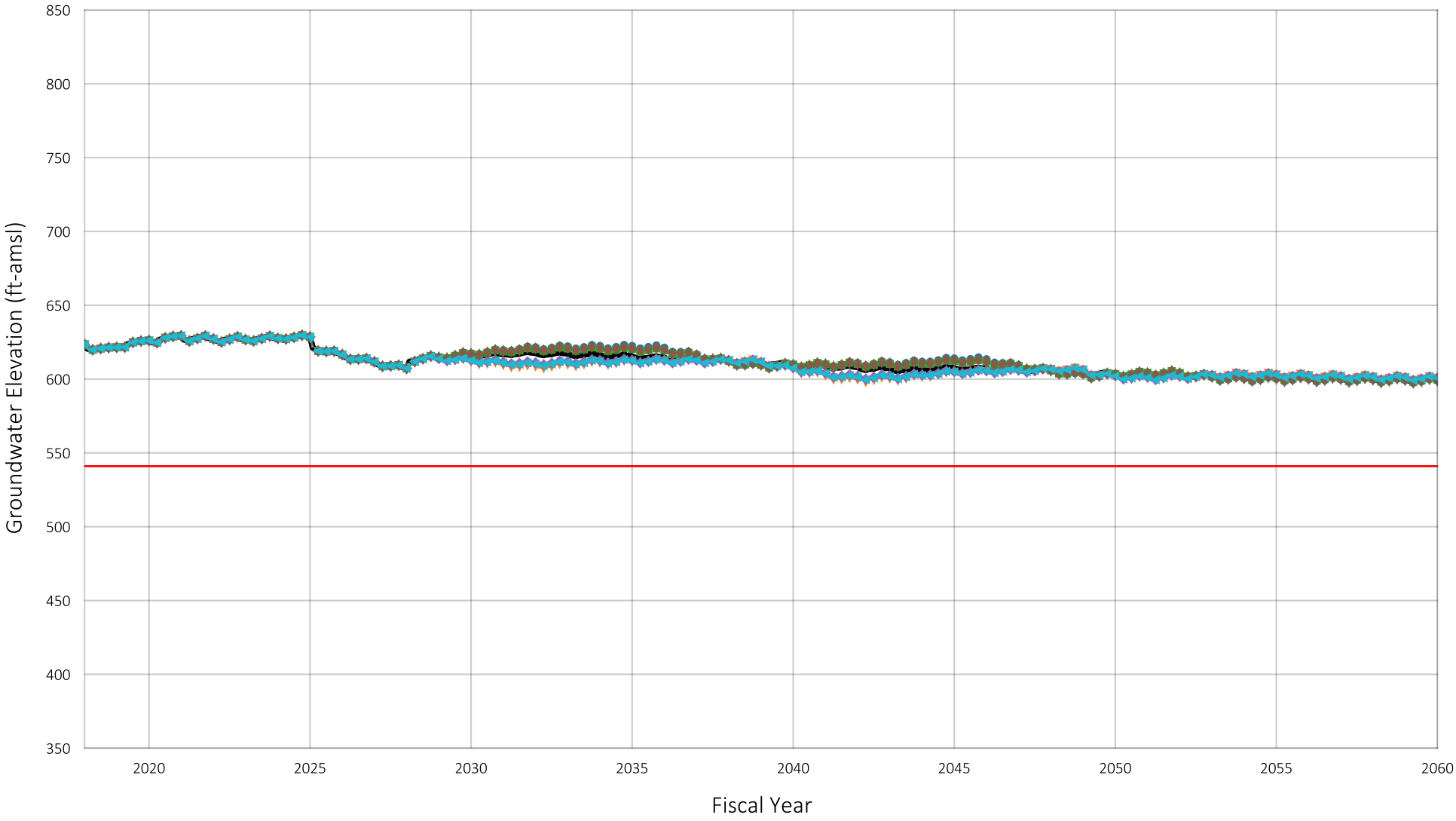
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207950
Owner: City of Ontario
Well Name: 45

Figure A-96




Location of Well in Chino Basin



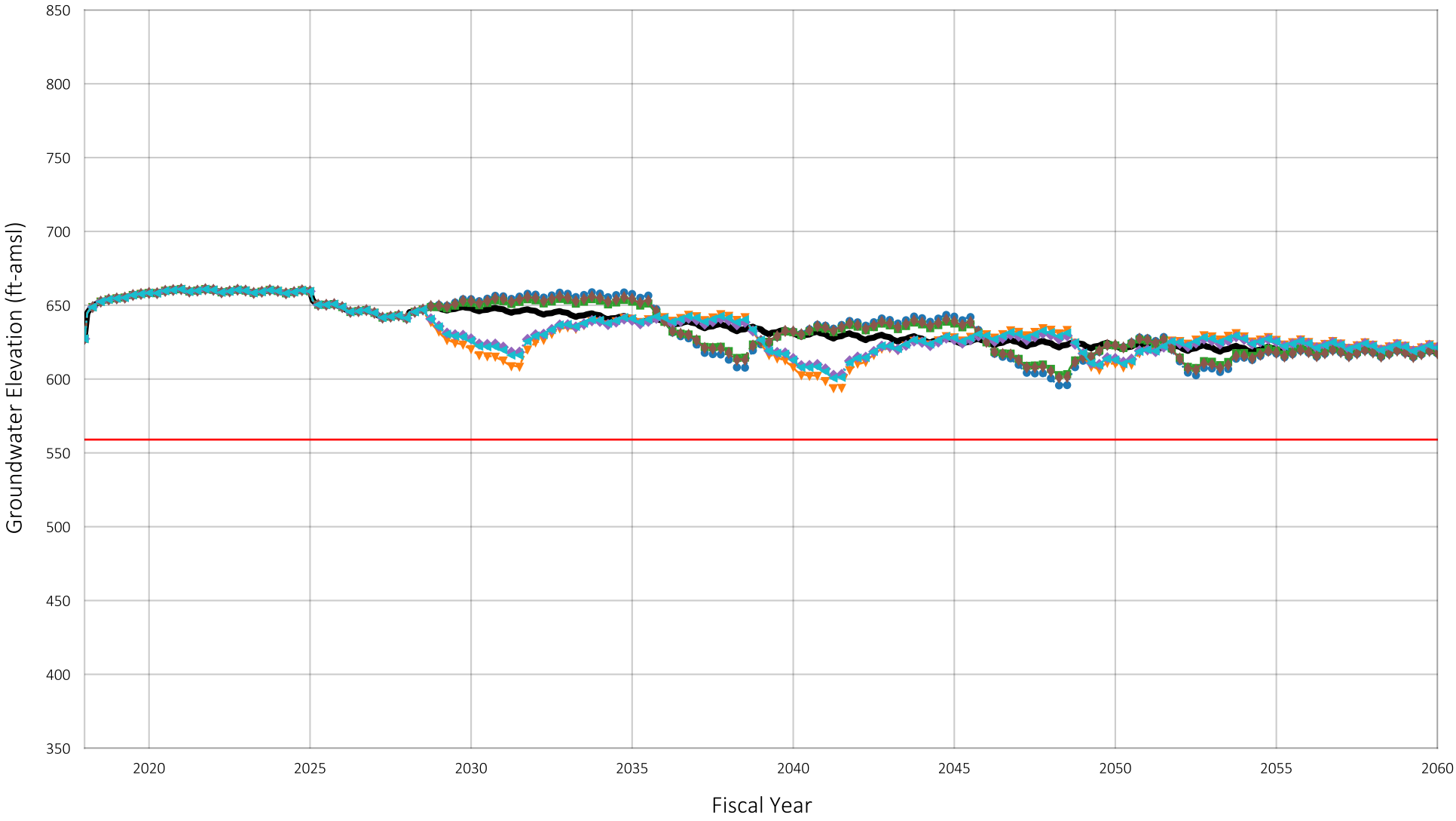
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207946
Owner: City of Ontario
Well Name: 46

Figure A-97




Location of Well in Chino Basin



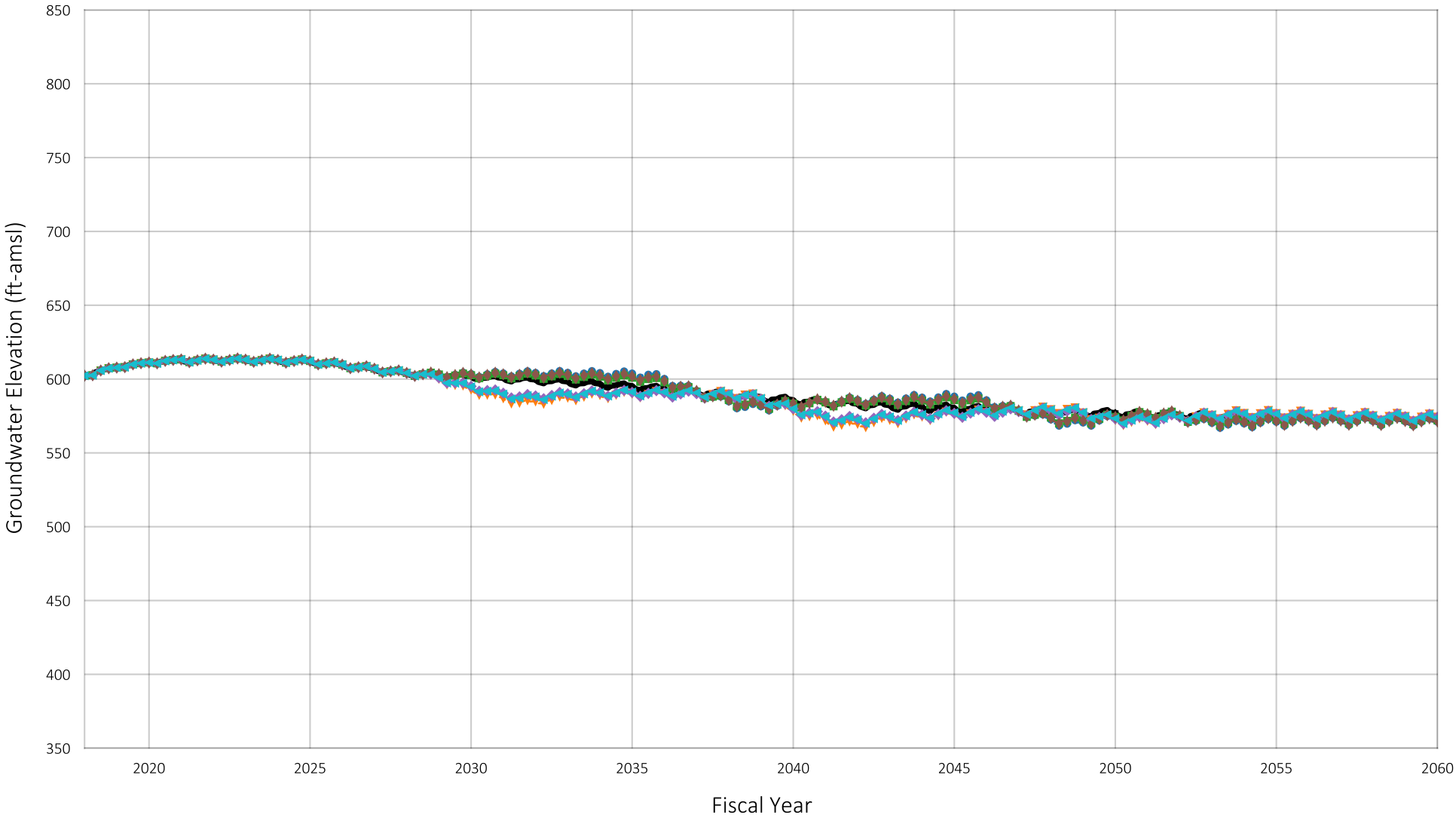
- Baseline
- Scenario 1
- Scenario 2
- Scenario 3
- Scenario 4
- Scenario 5
- Scenario 6
- Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207948
Owner: City of Ontario
Well Name: 47

Figure A-98




Location of Well in Chino Basin



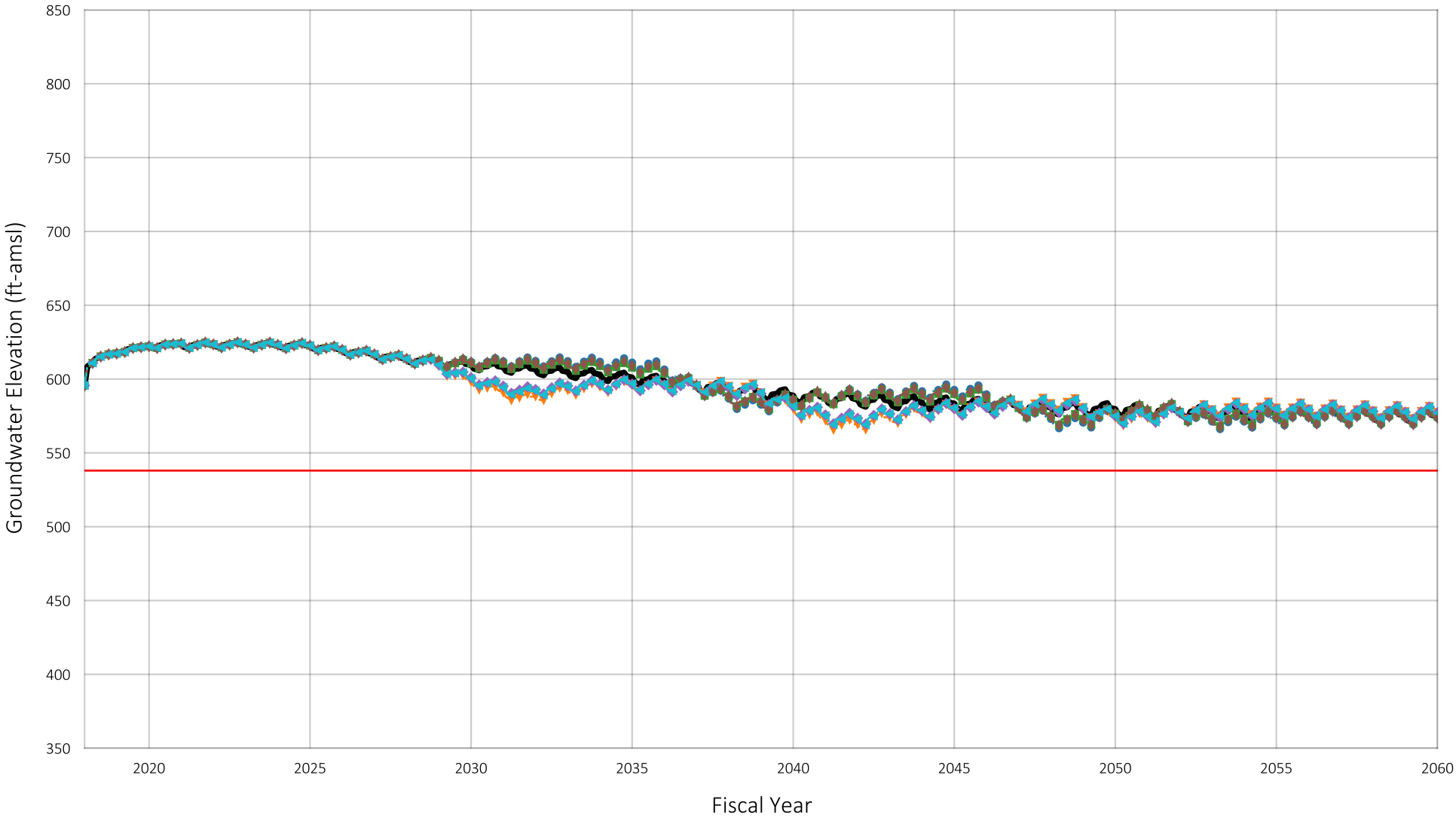
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220171
Owner: City of Ontario
Well Name: 48

Figure A-99




Location of Well in Chino Basin



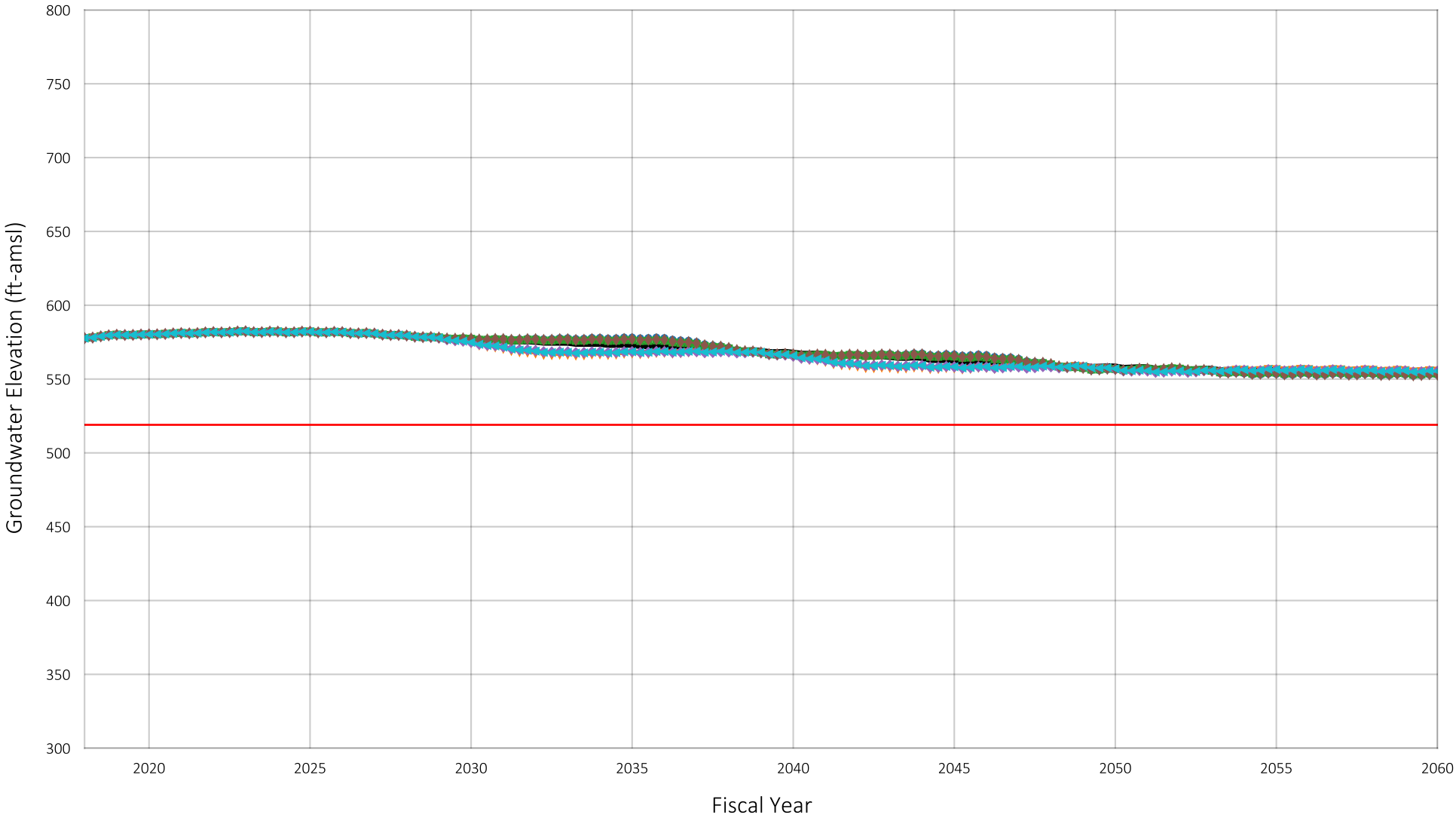
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207952
Owner: City of Ontario
Well Name: 49

Figure A-100




Location of Well in Chino Basin



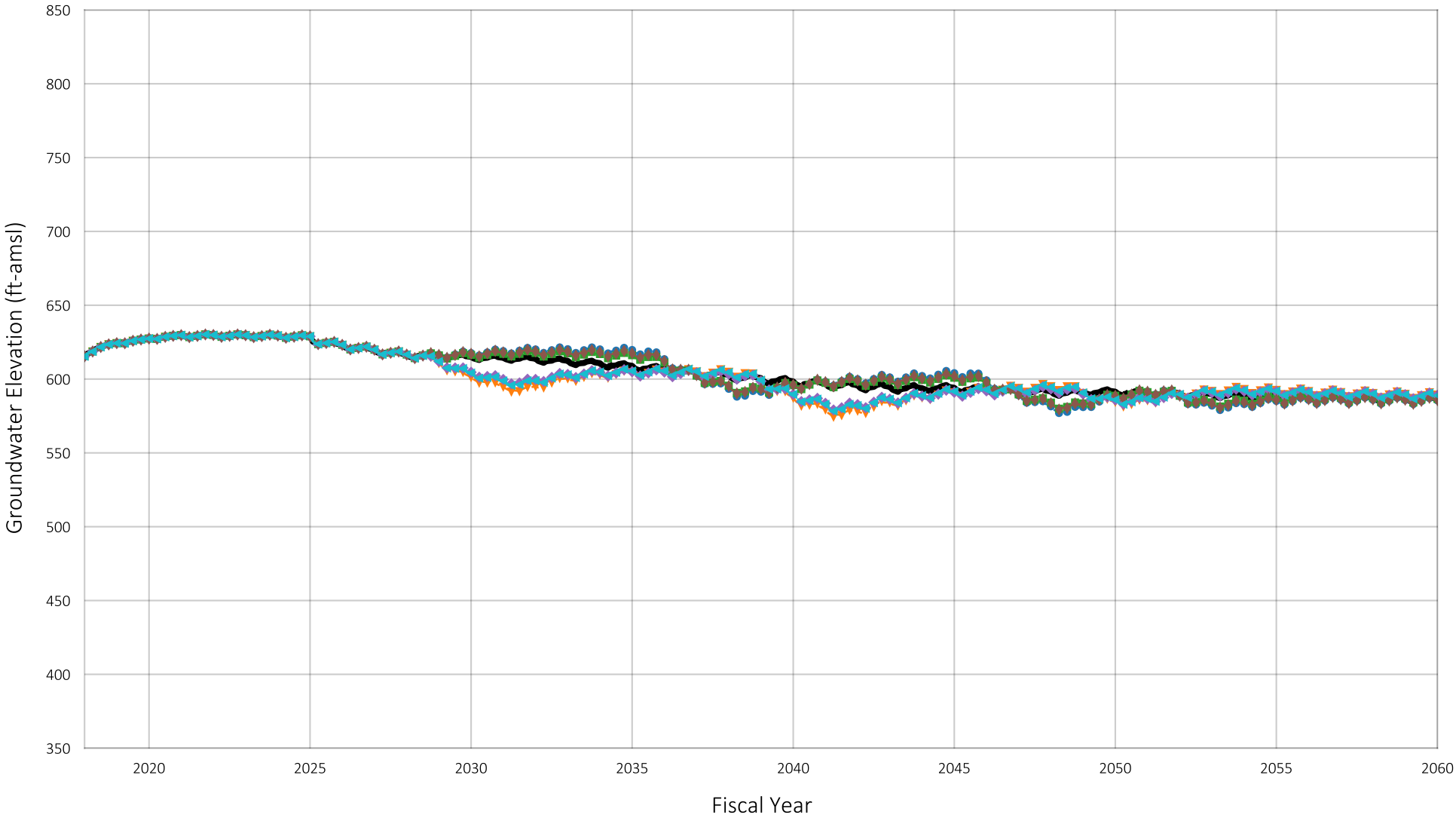
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1208387
Owner: City of Ontario
Well Name: 50

Figure A-101




Location of Well in Chino Basin



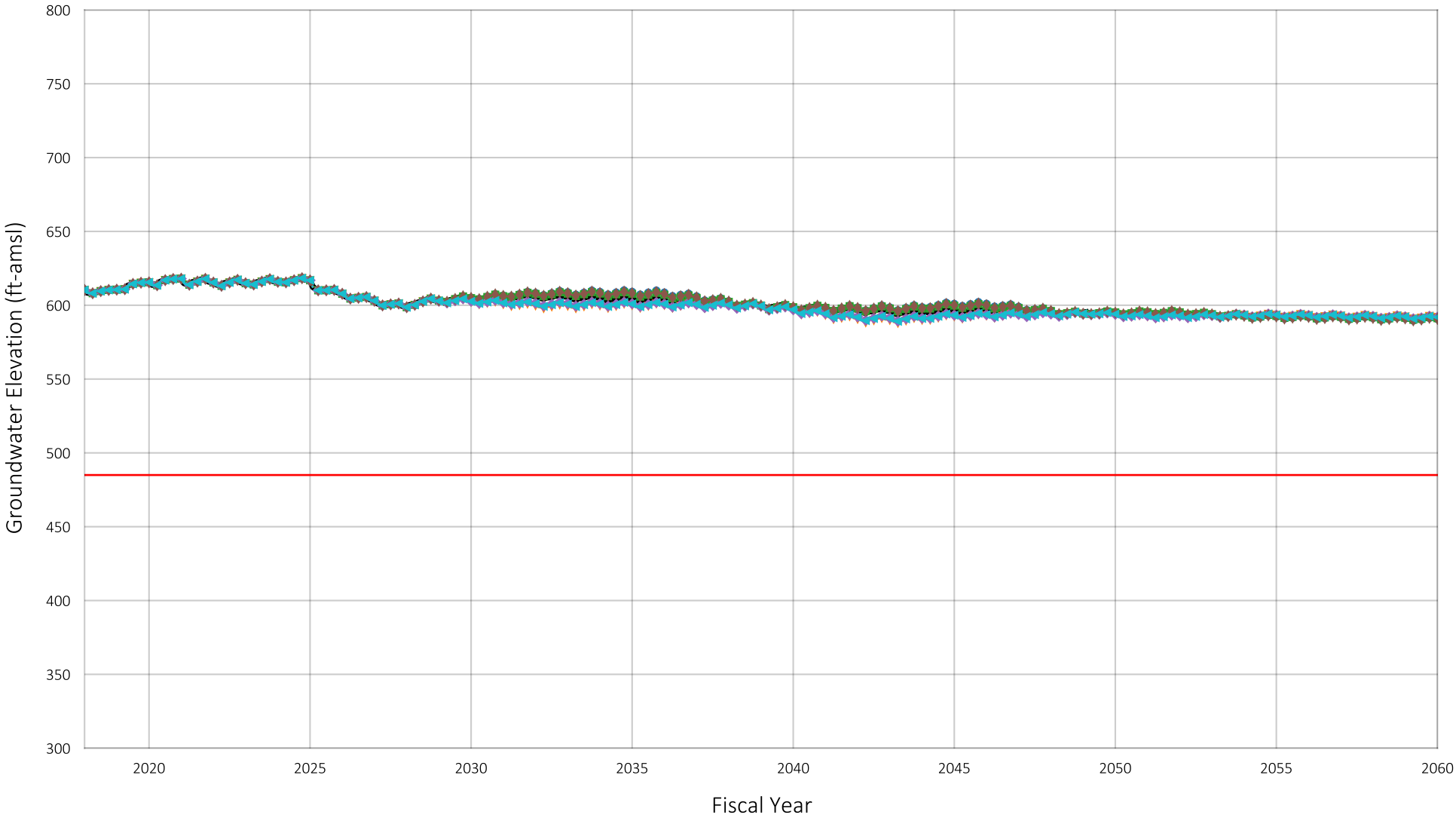
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1220172
Owner: City of Ontario
Well Name: 51

Figure A-102




Location of Well in Chino Basin



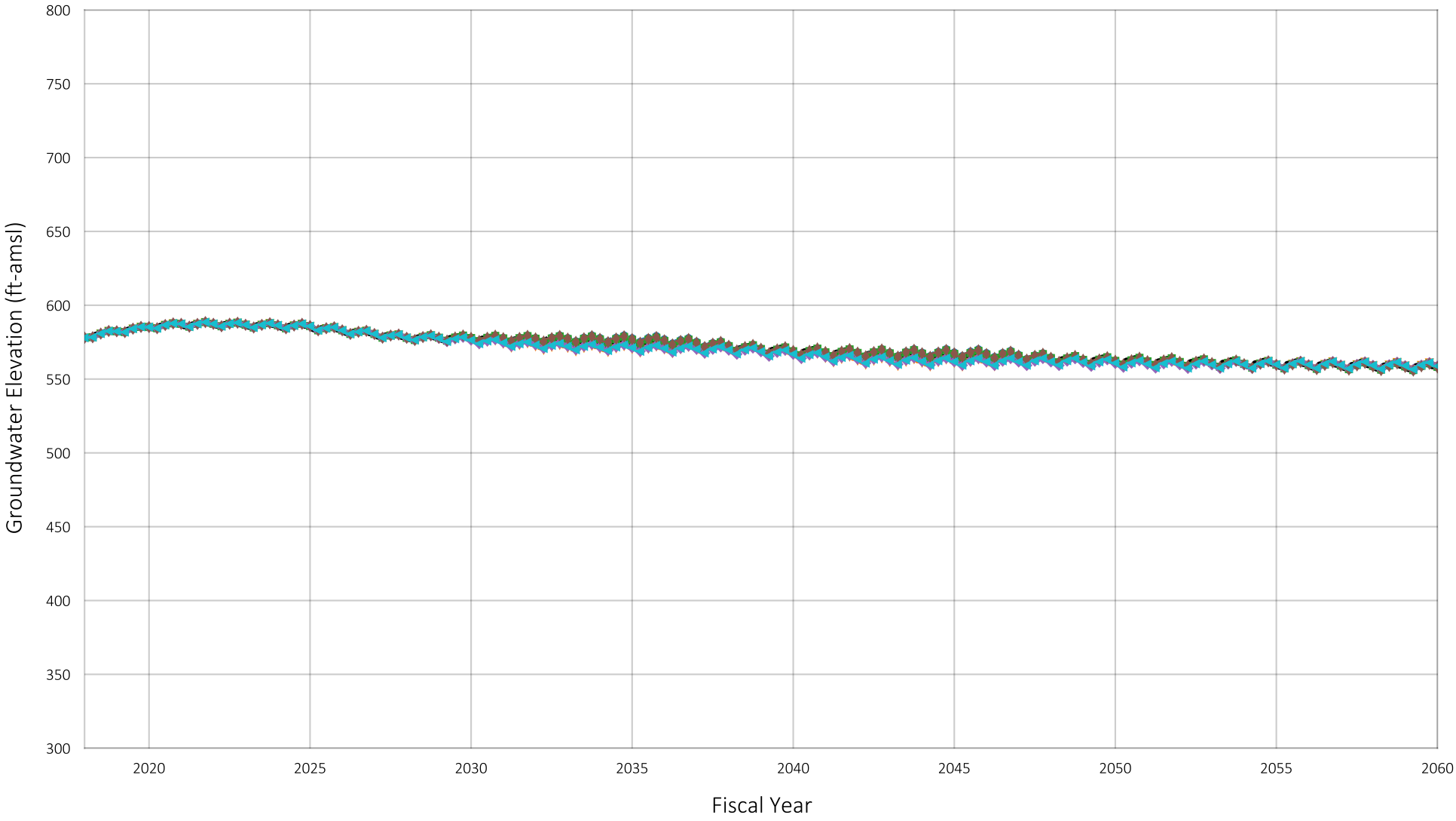
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1221753
Owner: City of Ontario
Well Name: 52

Figure A-103




Location of Well in Chino Basin



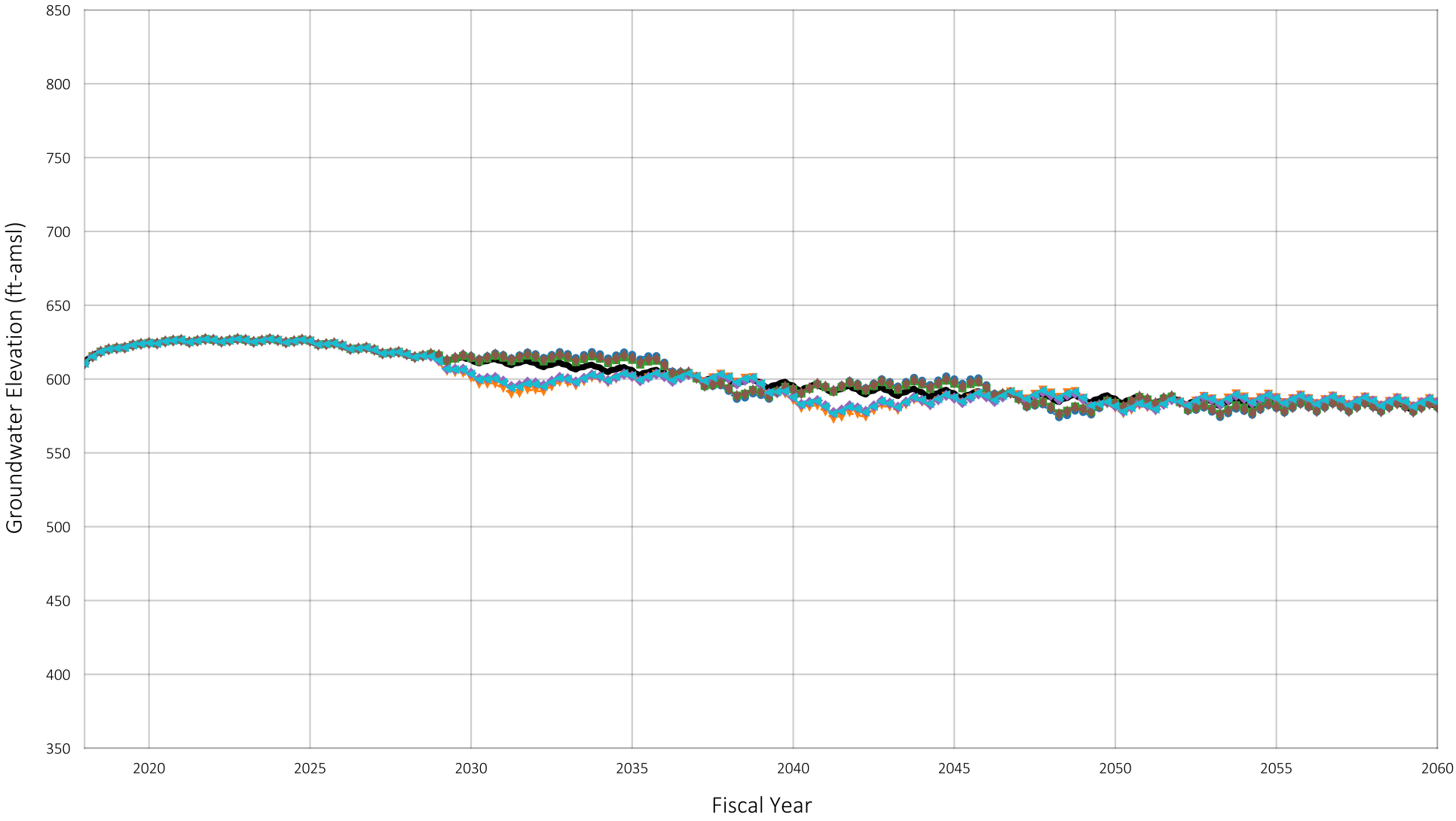
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 100
Owner: City of Ontario
Well Name: 100

Figure A-104




Location of Well in Chino Basin



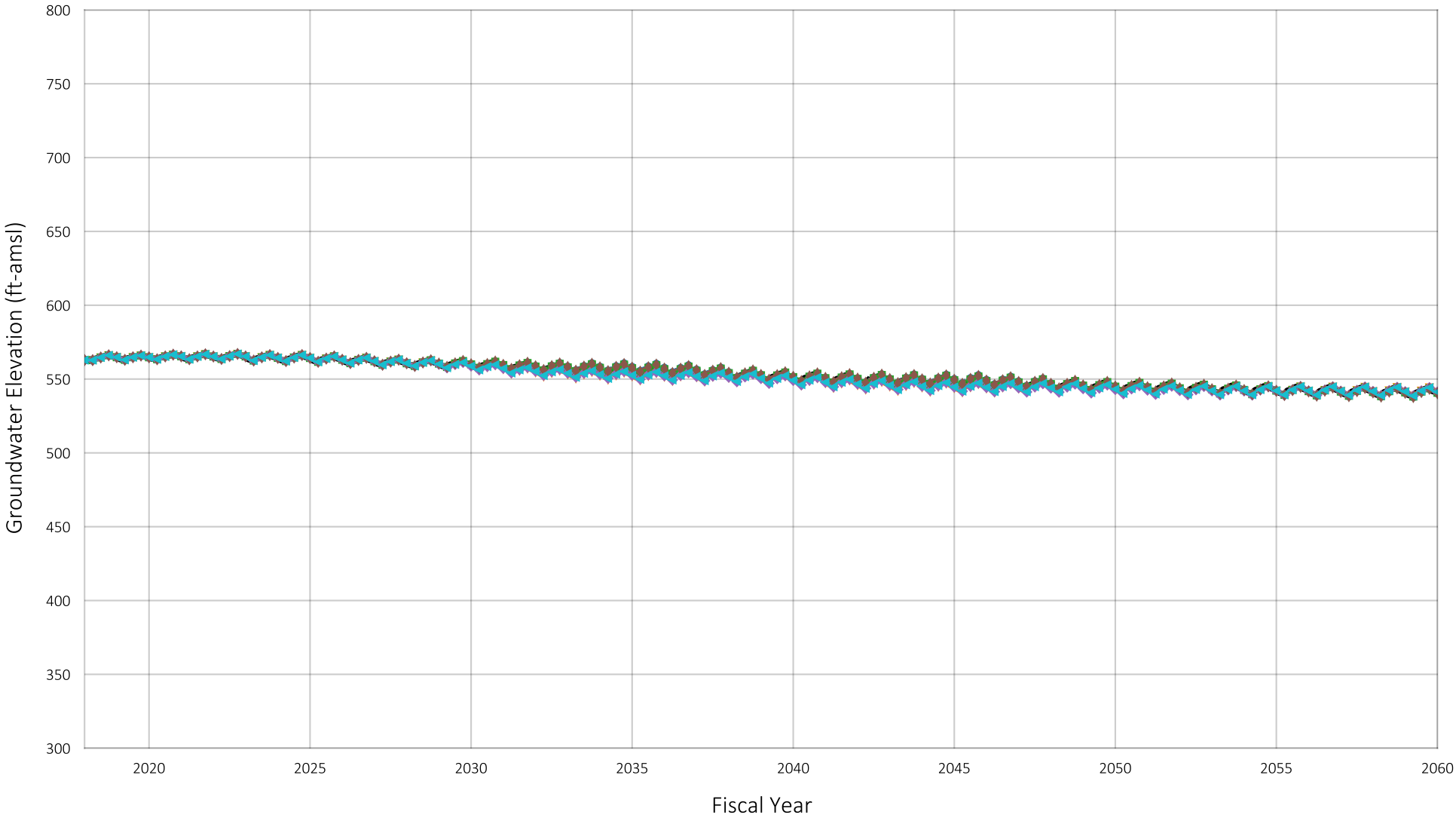
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 101
Owner: City of Ontario
Well Name: 101

Figure A-105




Location of Well in Chino Basin



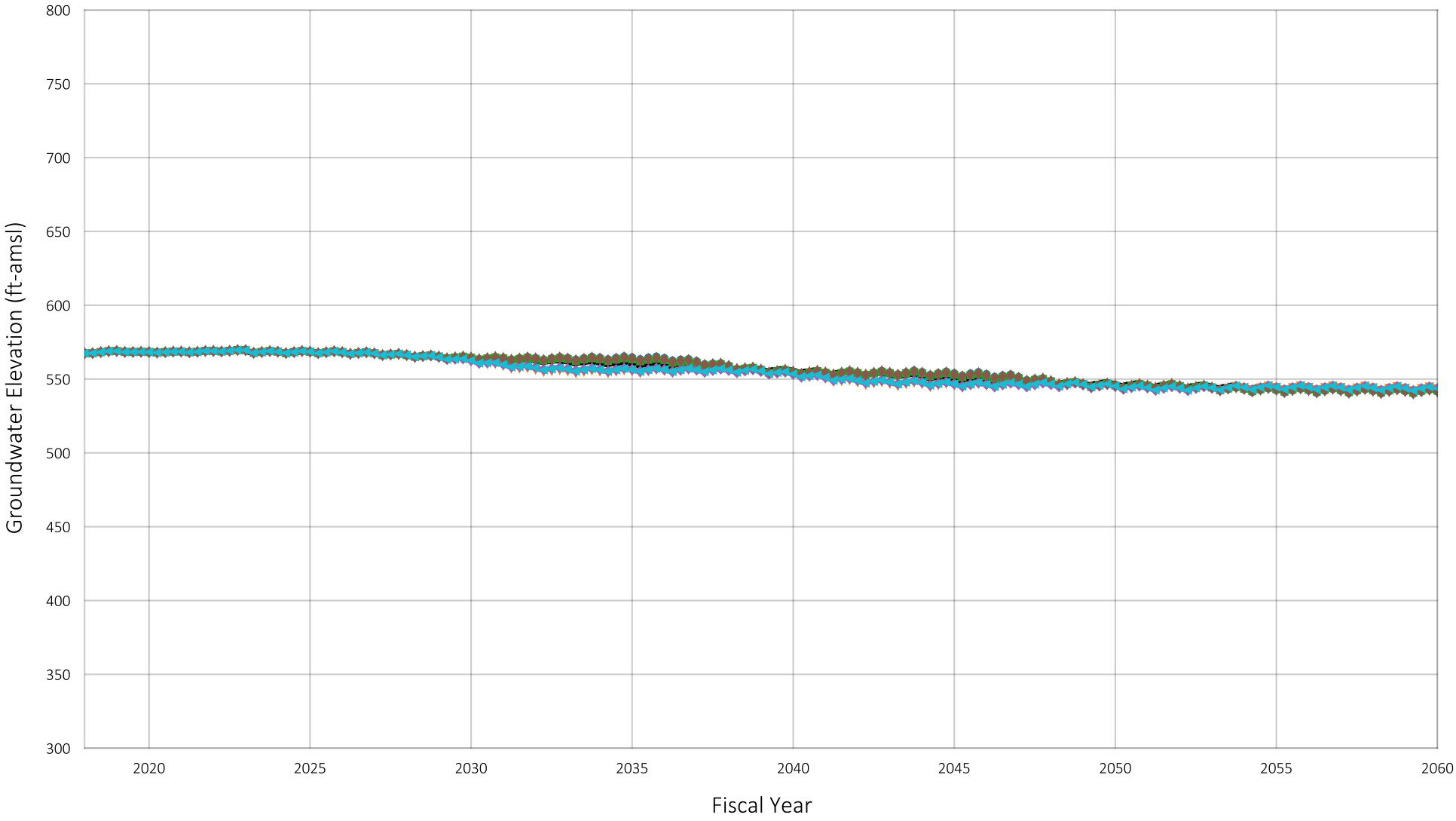
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 103
Owner: City of Ontario
Well Name: 103

Figure A-106




Location of Well in Chino Basin



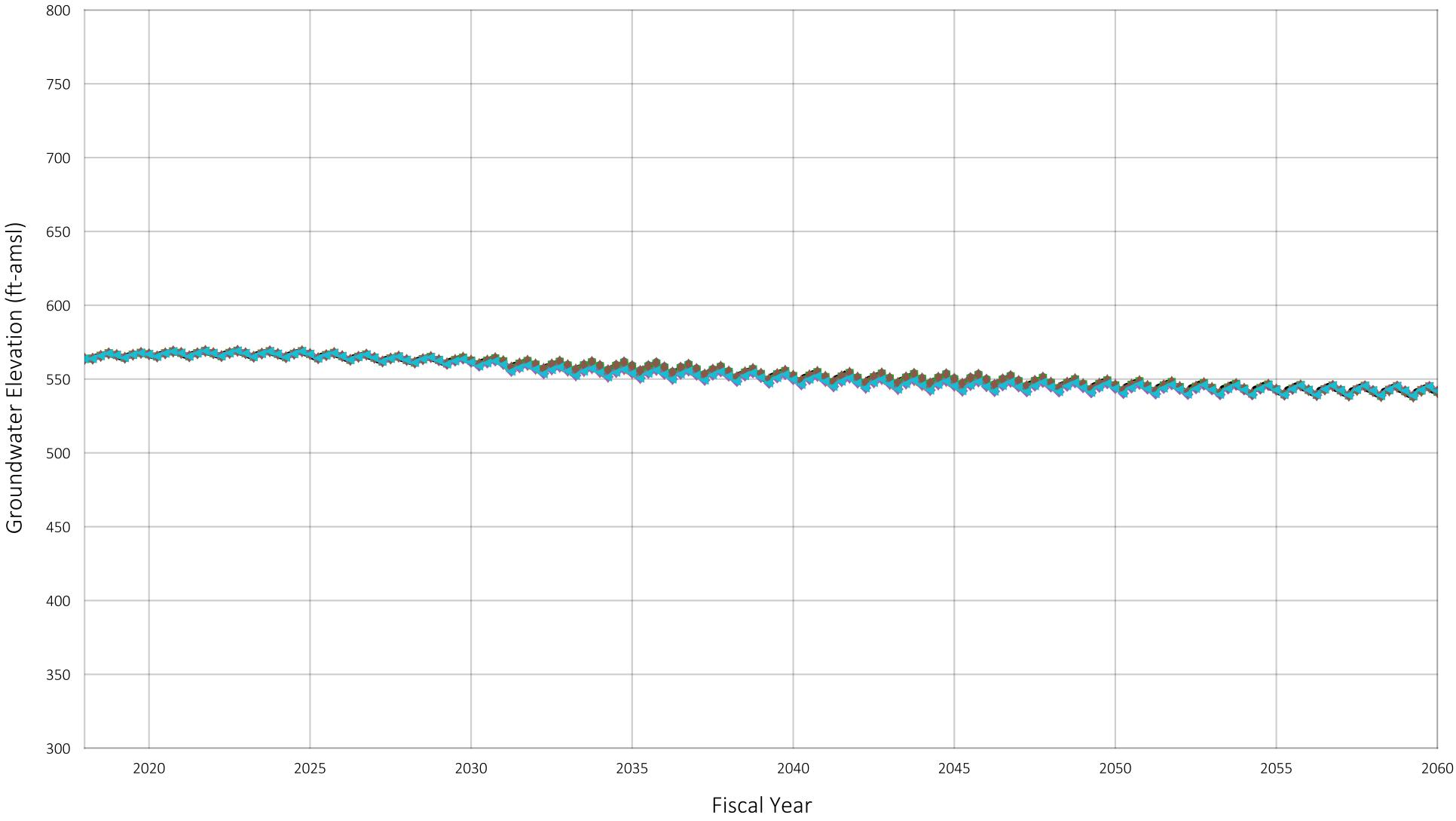
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 104
Owner: City of Ontario
Well Name: 104

Figure A-107




Location of Well in Chino Basin



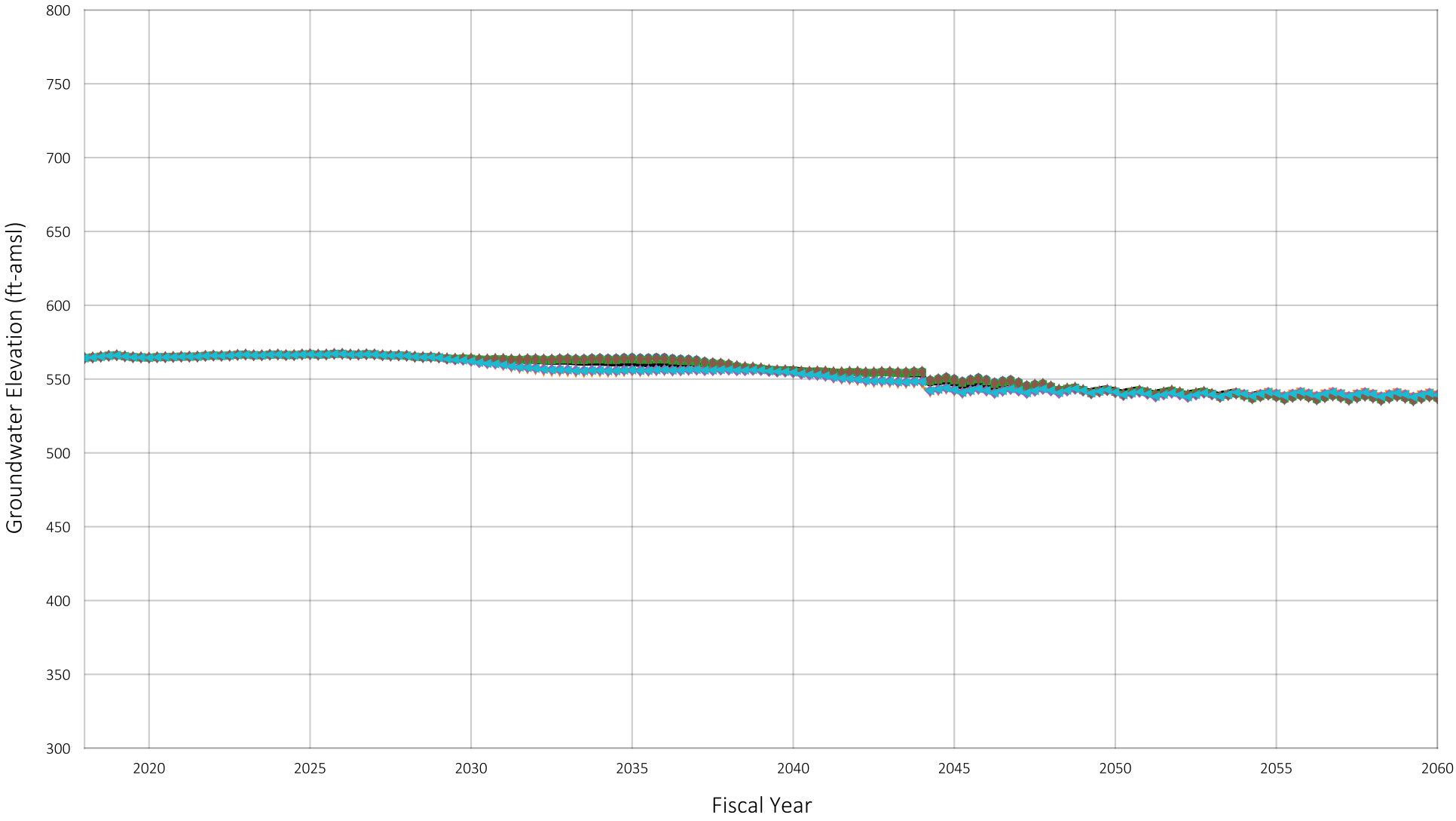
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 105
Owner: City of Ontario
Well Name: 105

Figure A-108




Location of Well in Chino Basin



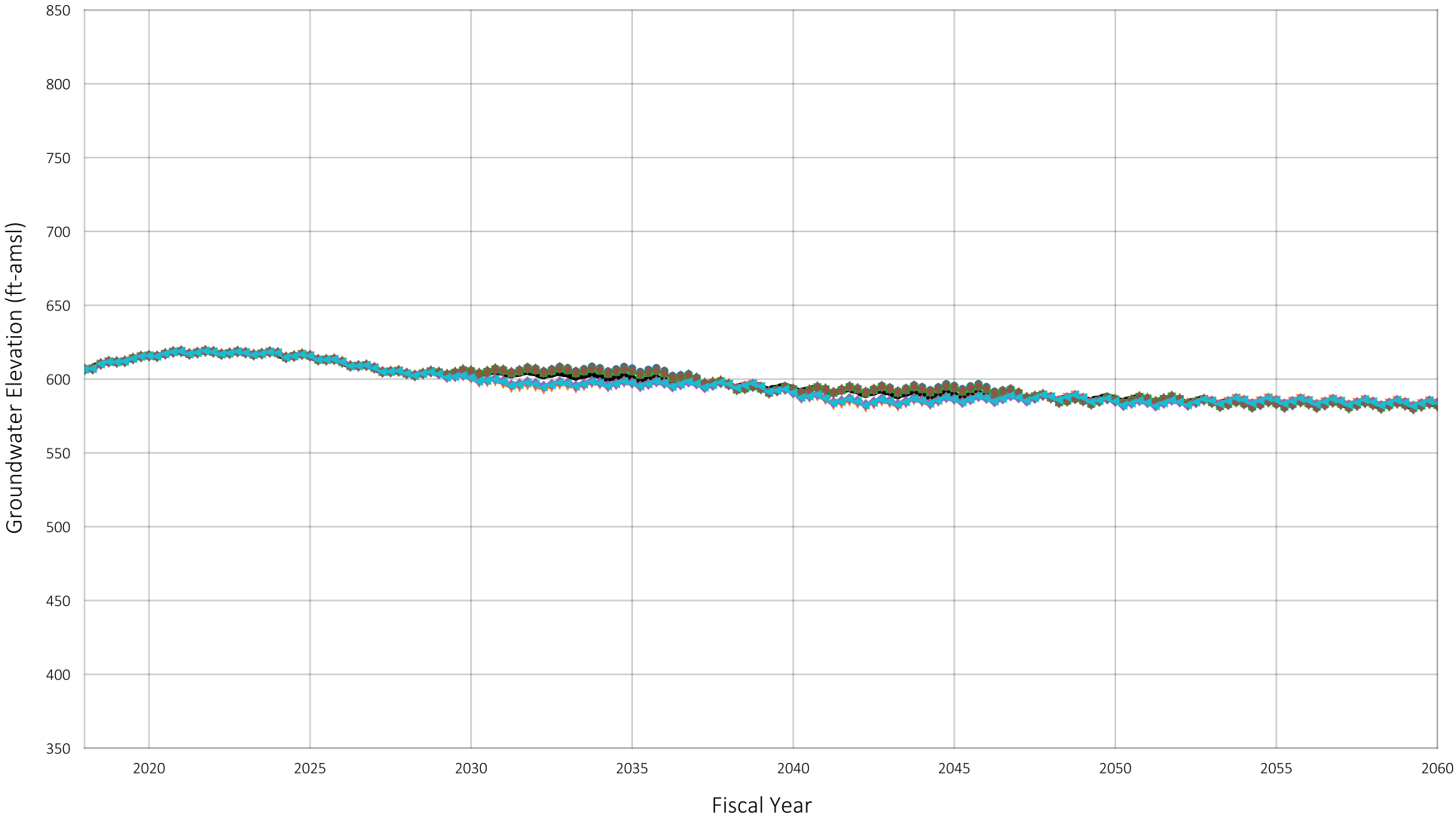
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 106
Owner: City of Ontario
Well Name: 106

Figure A-109




Location of Well in Chino Basin



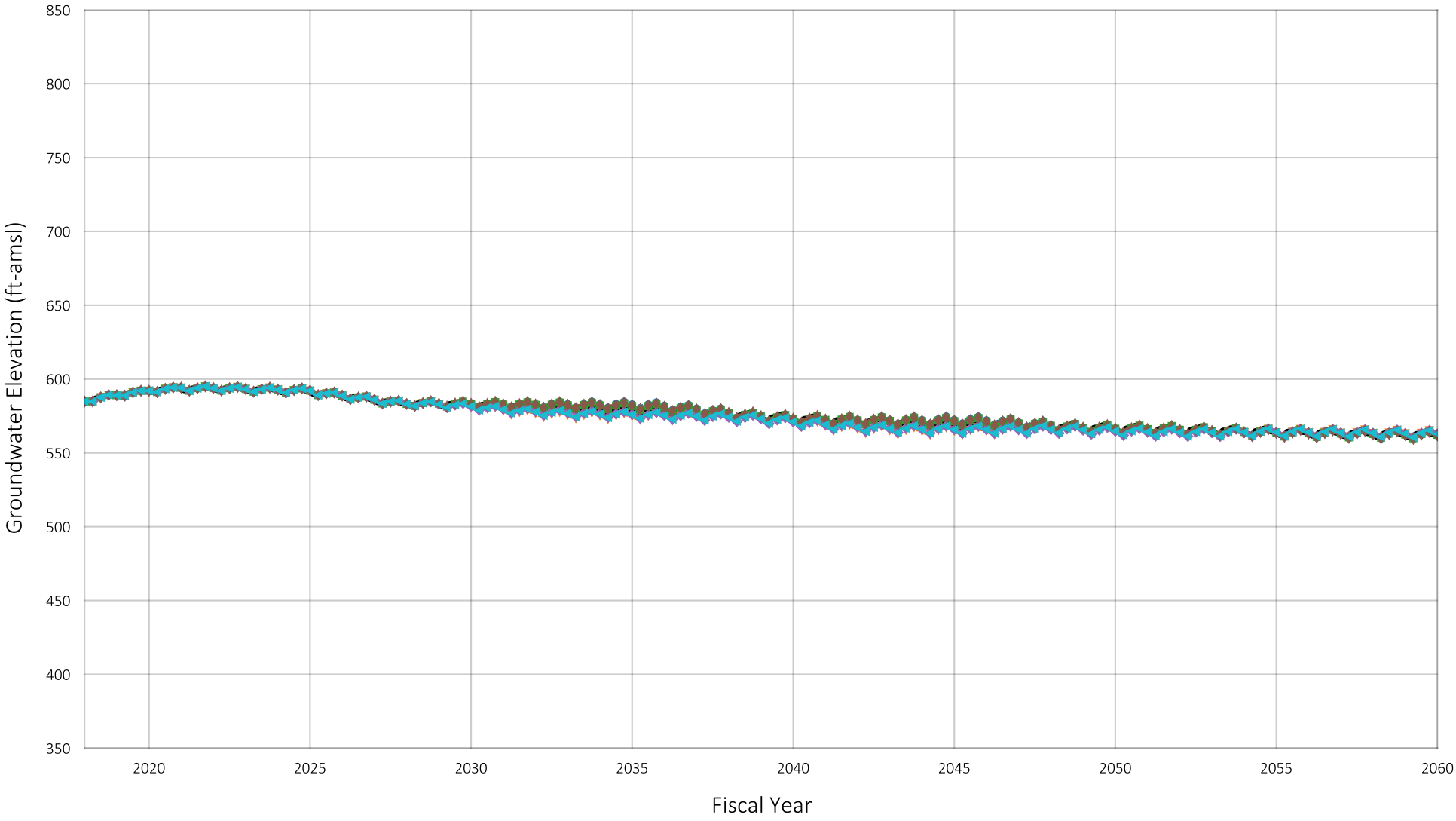
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 109
Owner: City of Ontario
Well Name: 109

Figure A-110




Location of Well in Chino Basin



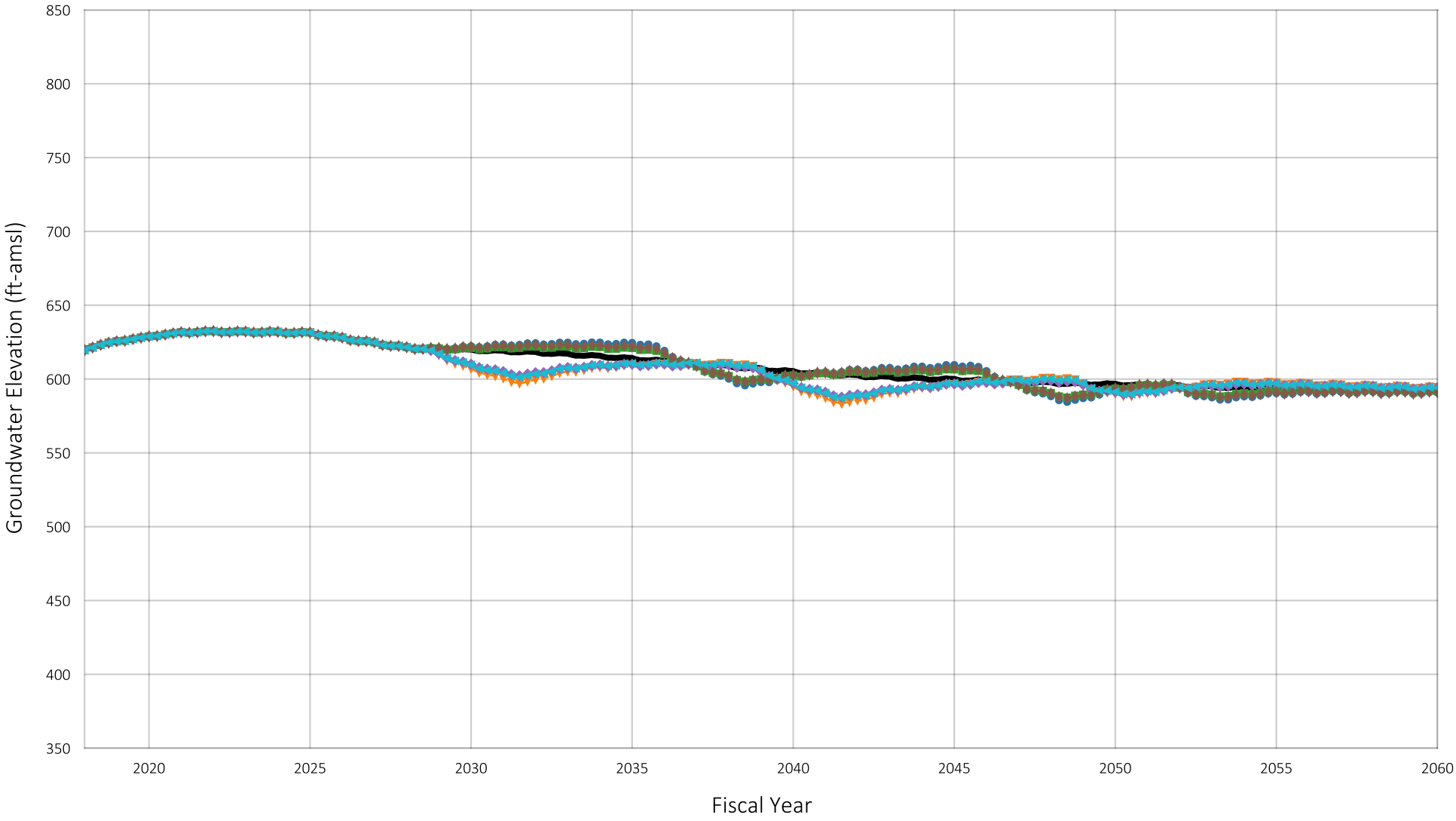
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 111
Owner: City of Ontario
Well Name: 111

Figure A-111




Location of Well in Chino Basin



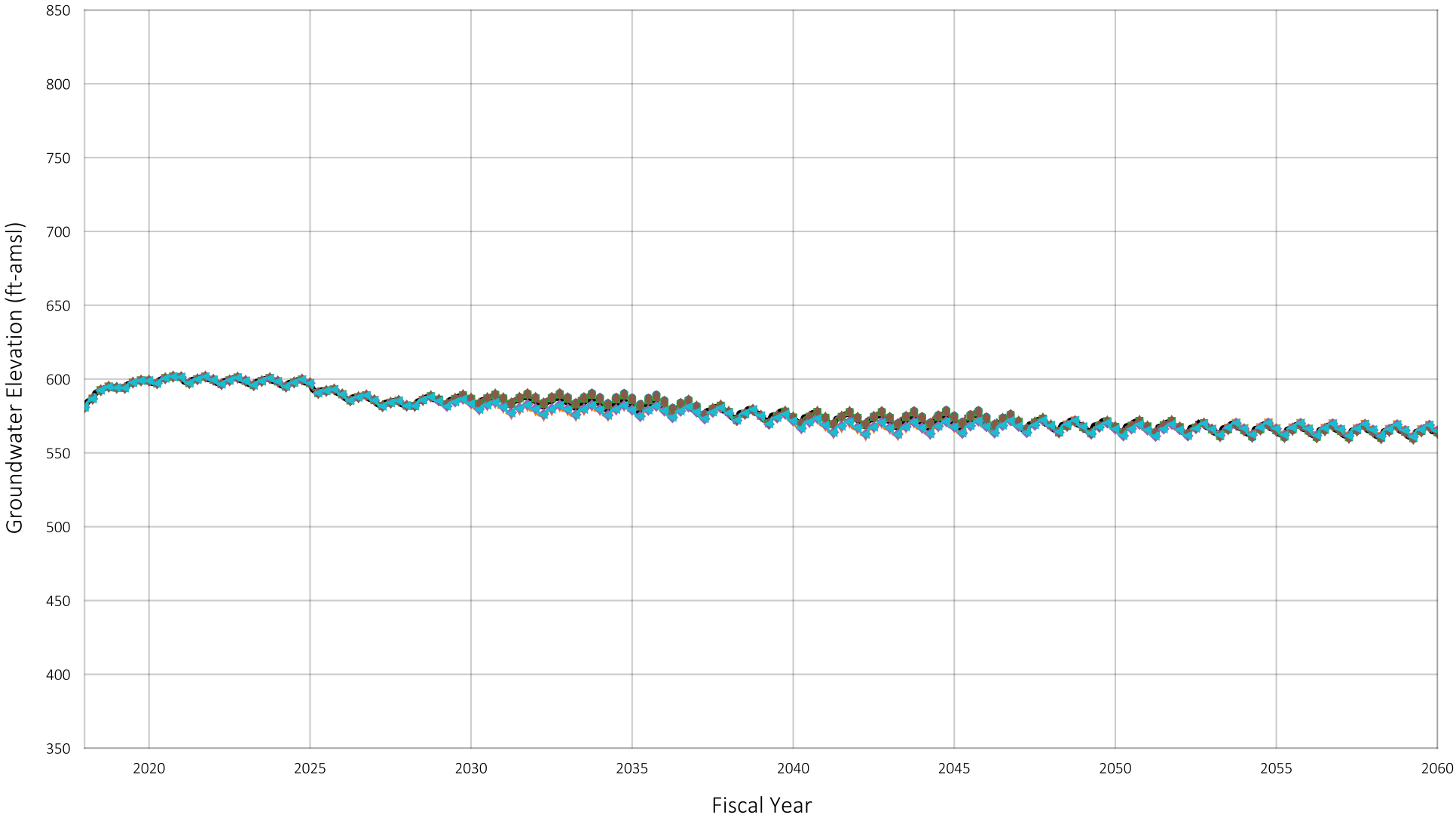
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 119
Owner: City of Ontario
Well Name: 119

Figure A-112




Location of Well in Chino Basin



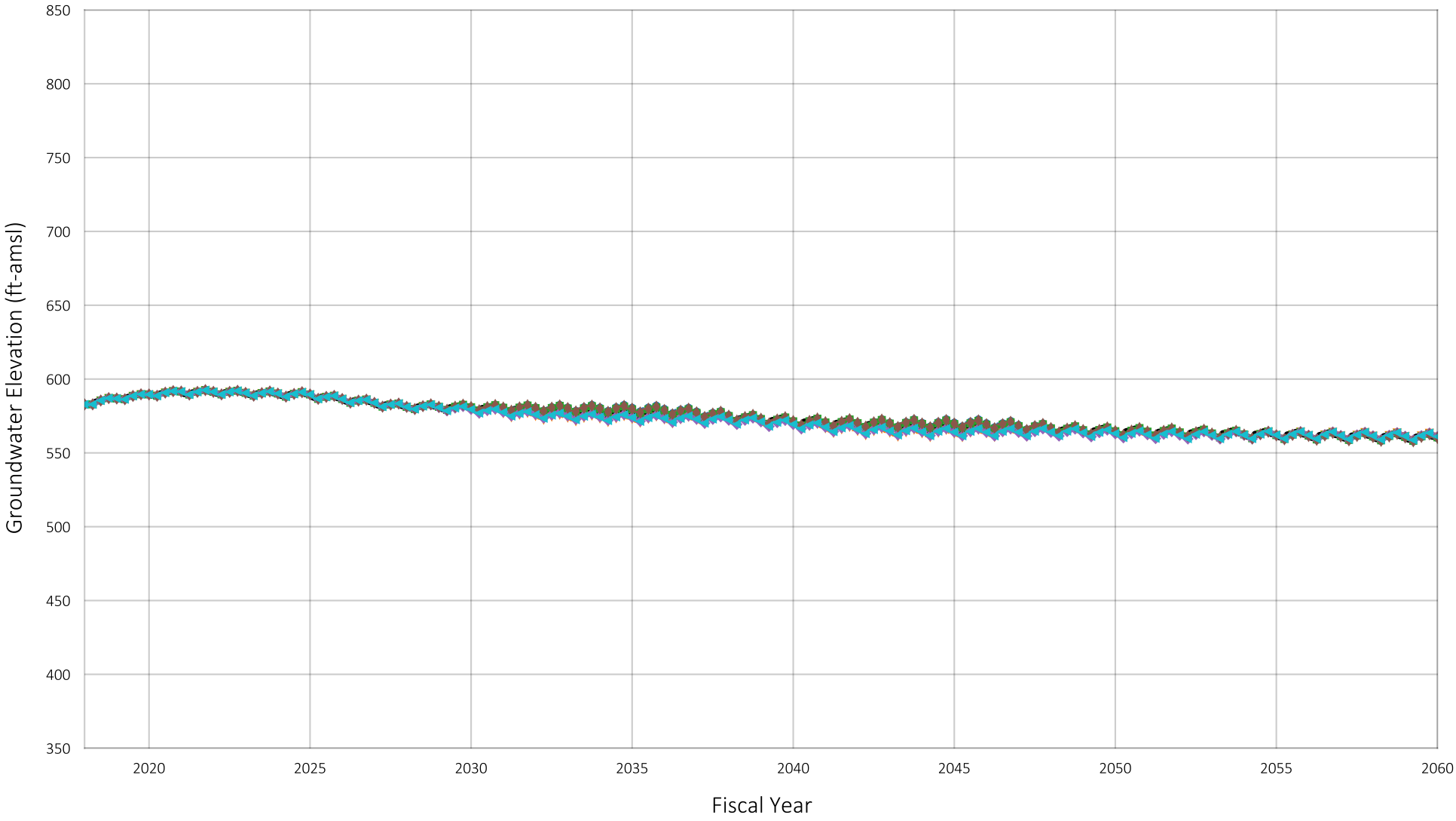
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 115
Owner: City of Ontario
Well Name: 115

Figure A-113




Location of Well in Chino Basin



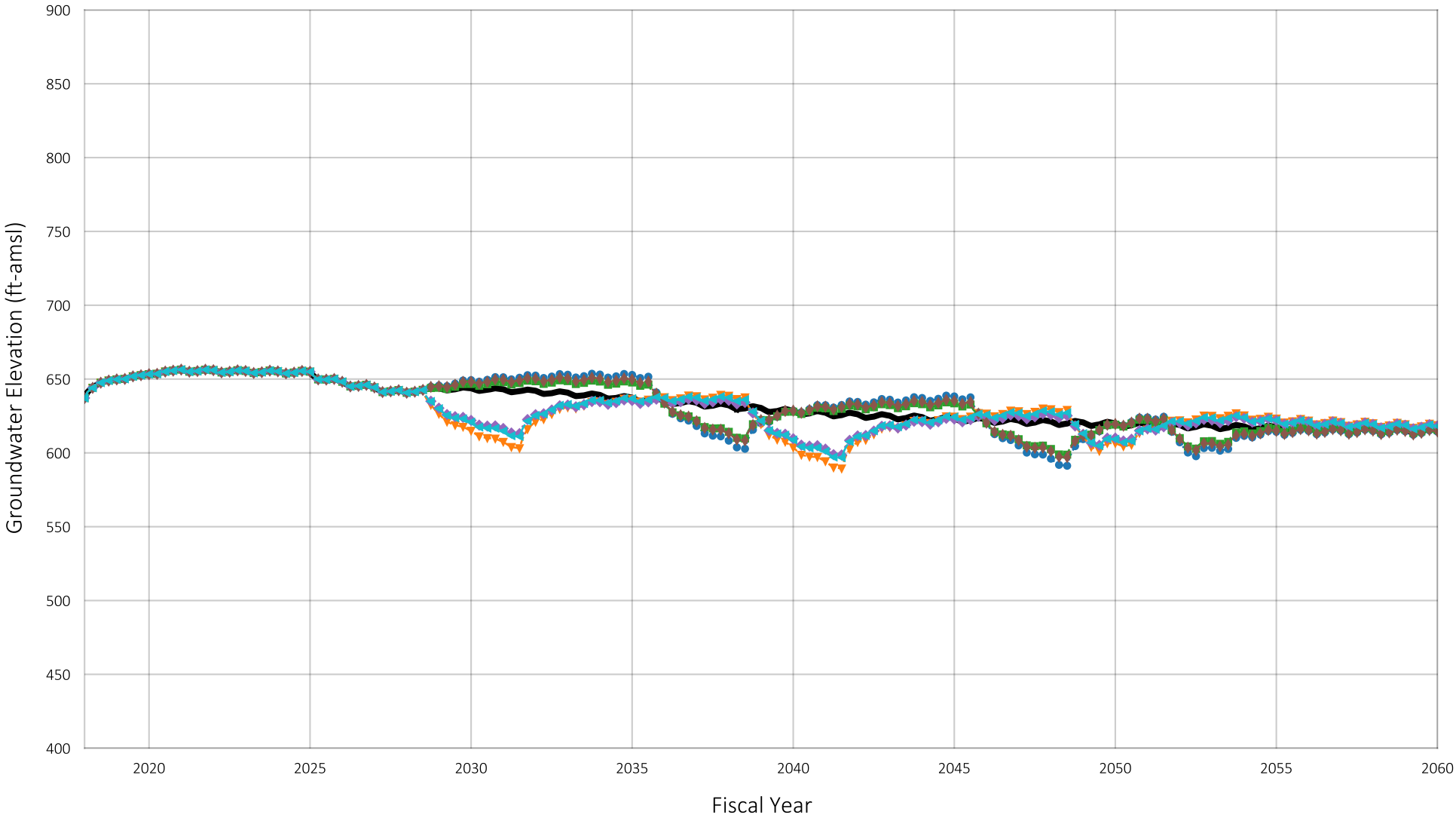
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 120
Owner: City of Ontario
Well Name: 120

Figure A-114




Location of Well in Chino Basin



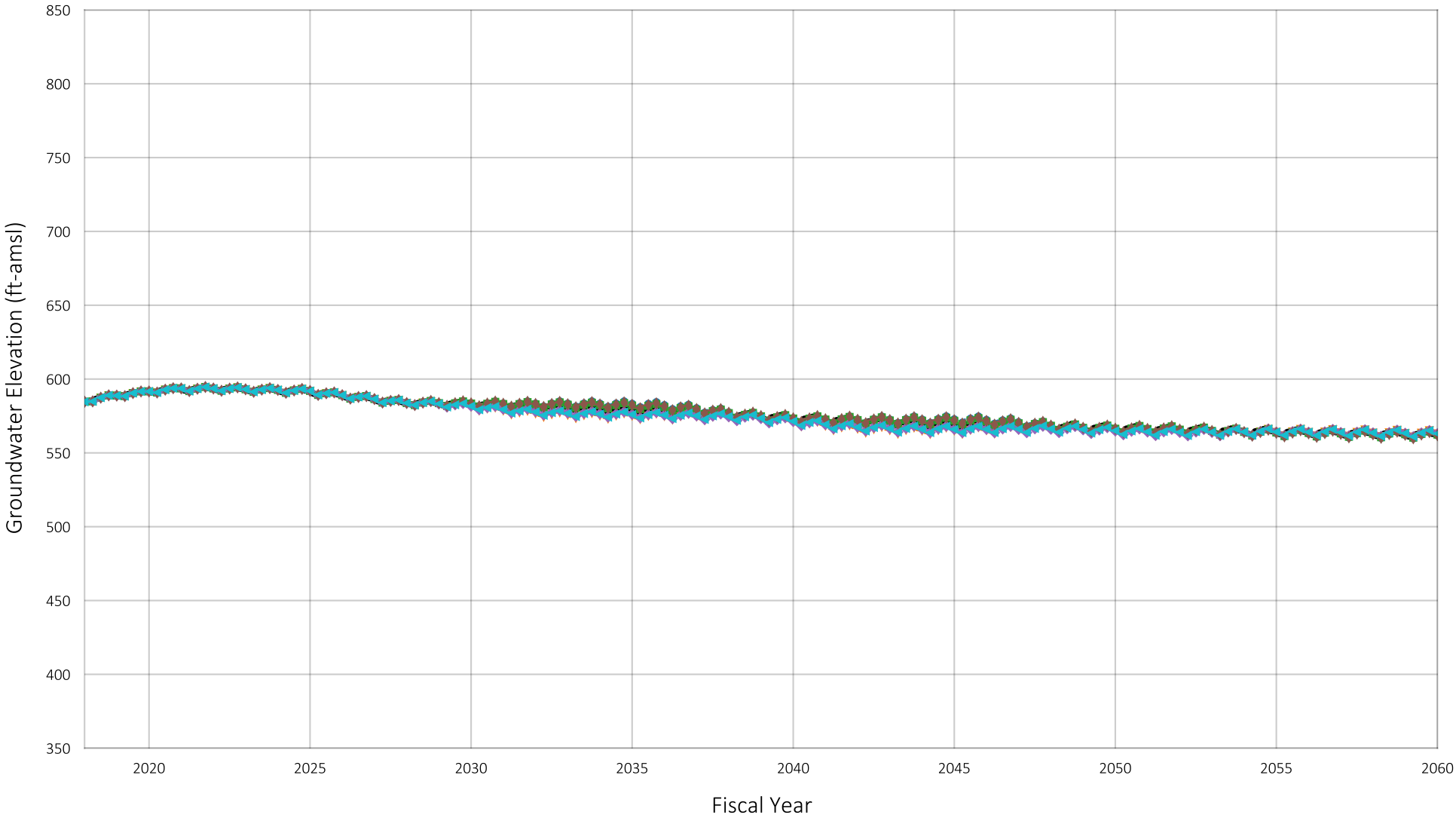
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 126
Owner: City of Ontario
Well Name: 126

Figure A-115




Location of Well in Chino Basin



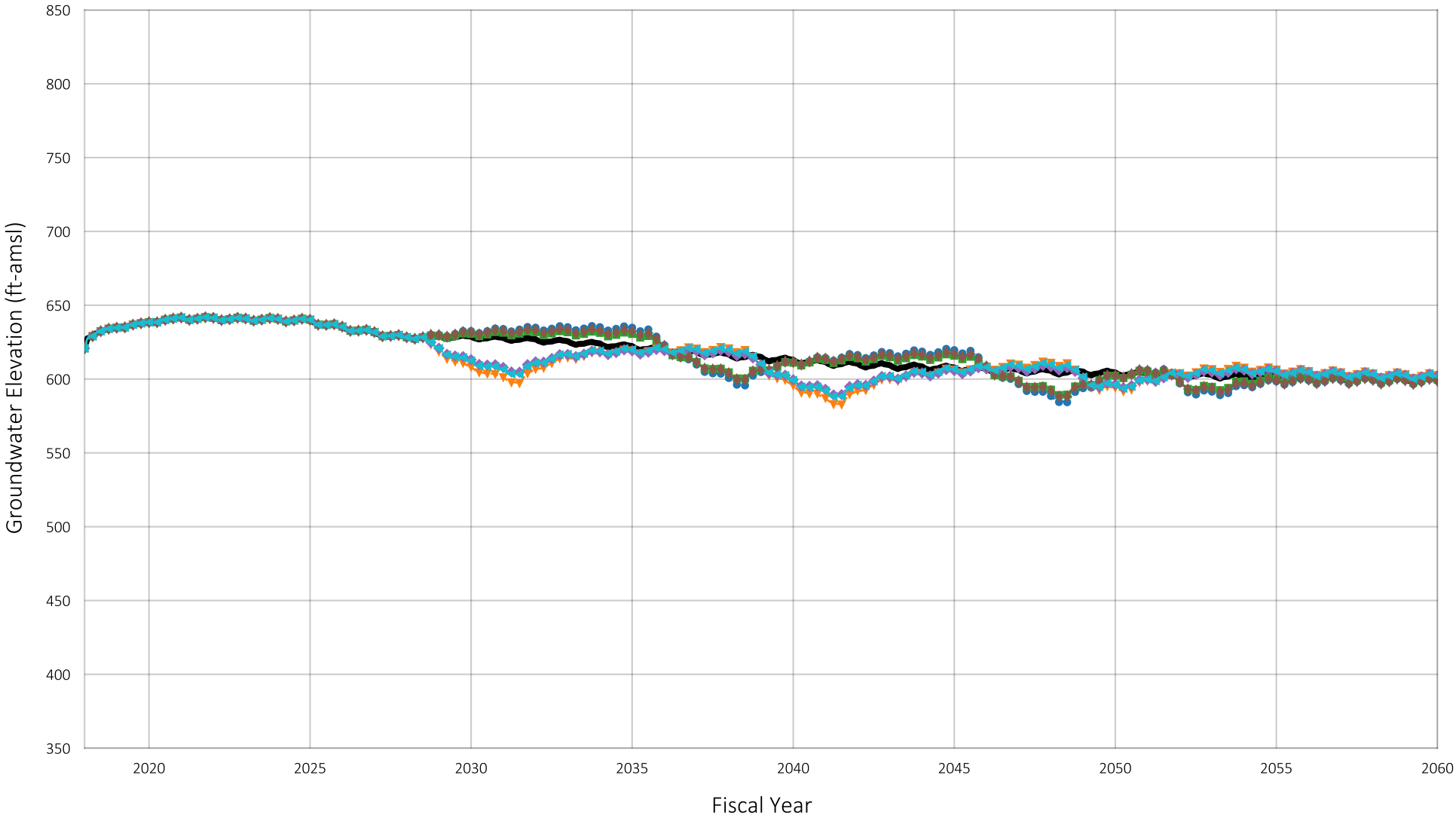
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 134
Owner: City of Ontario
Well Name: 134

Figure A-116




Location of Well in Chino Basin



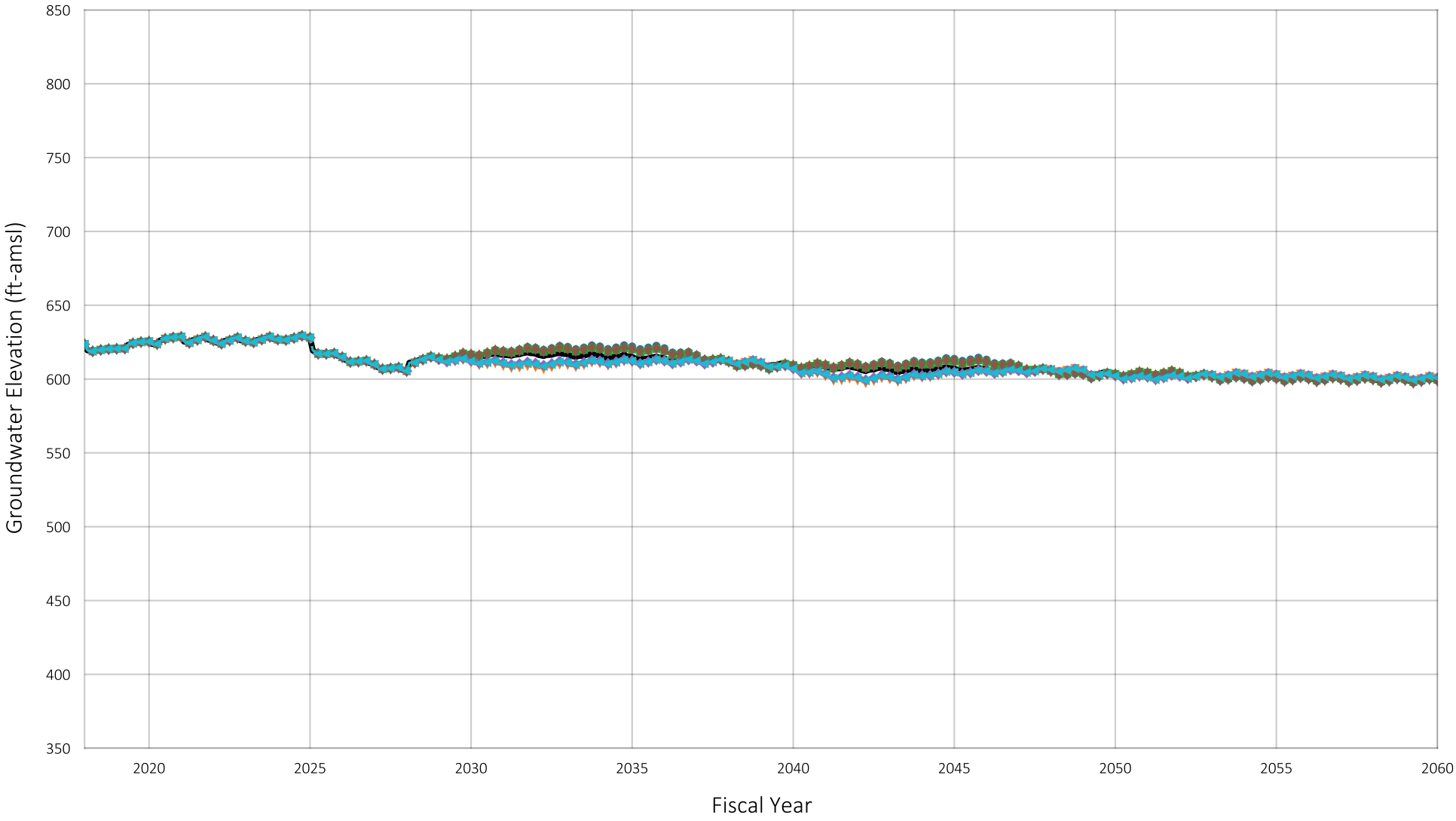
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 136
Owner: City of Ontario
Well Name: 136

Figure A-117




Location of Well in Chino Basin



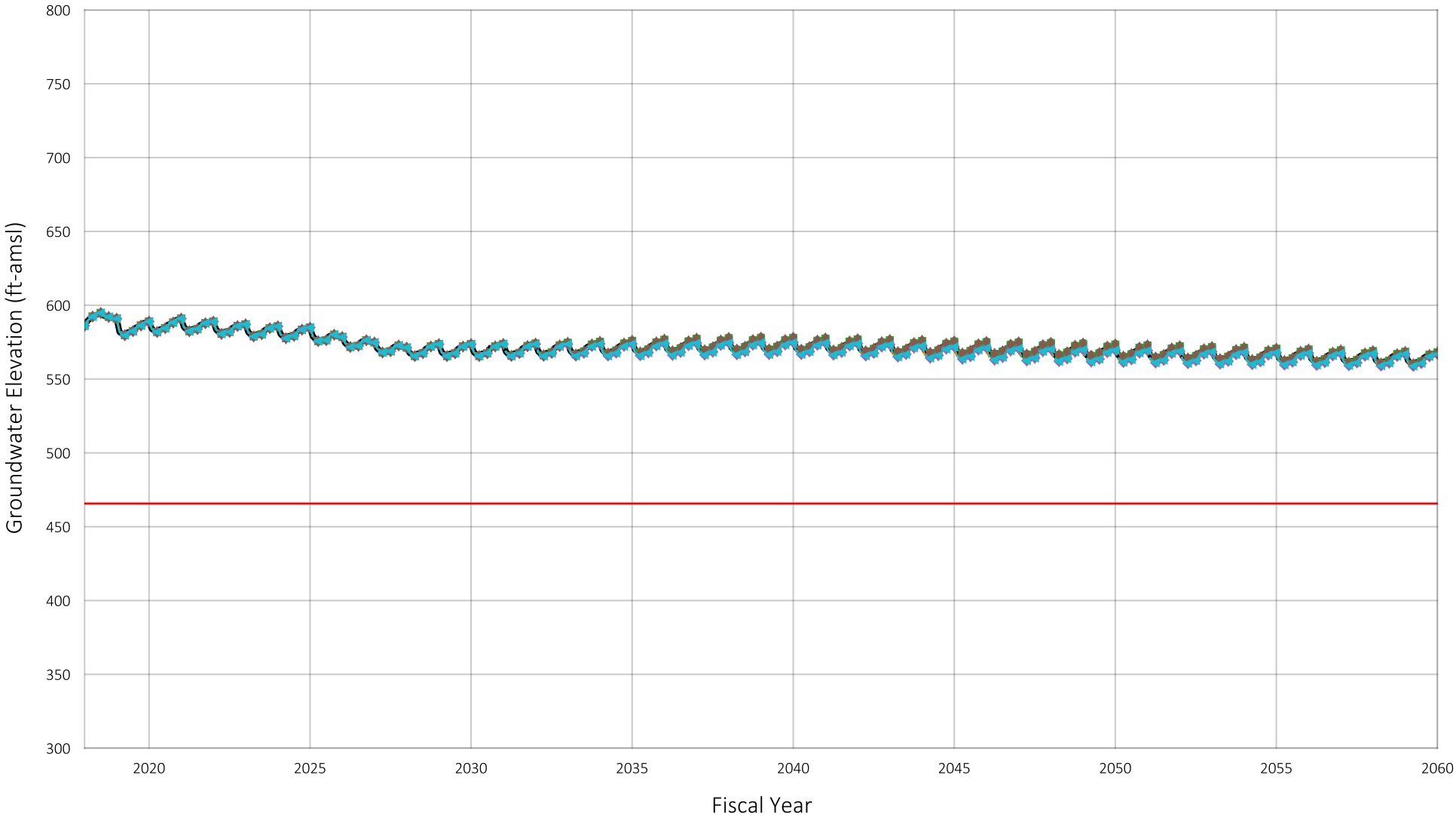
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 138
Owner: City of Ontario
Well Name: 138

Figure A-118




Location of Well in Chino Basin



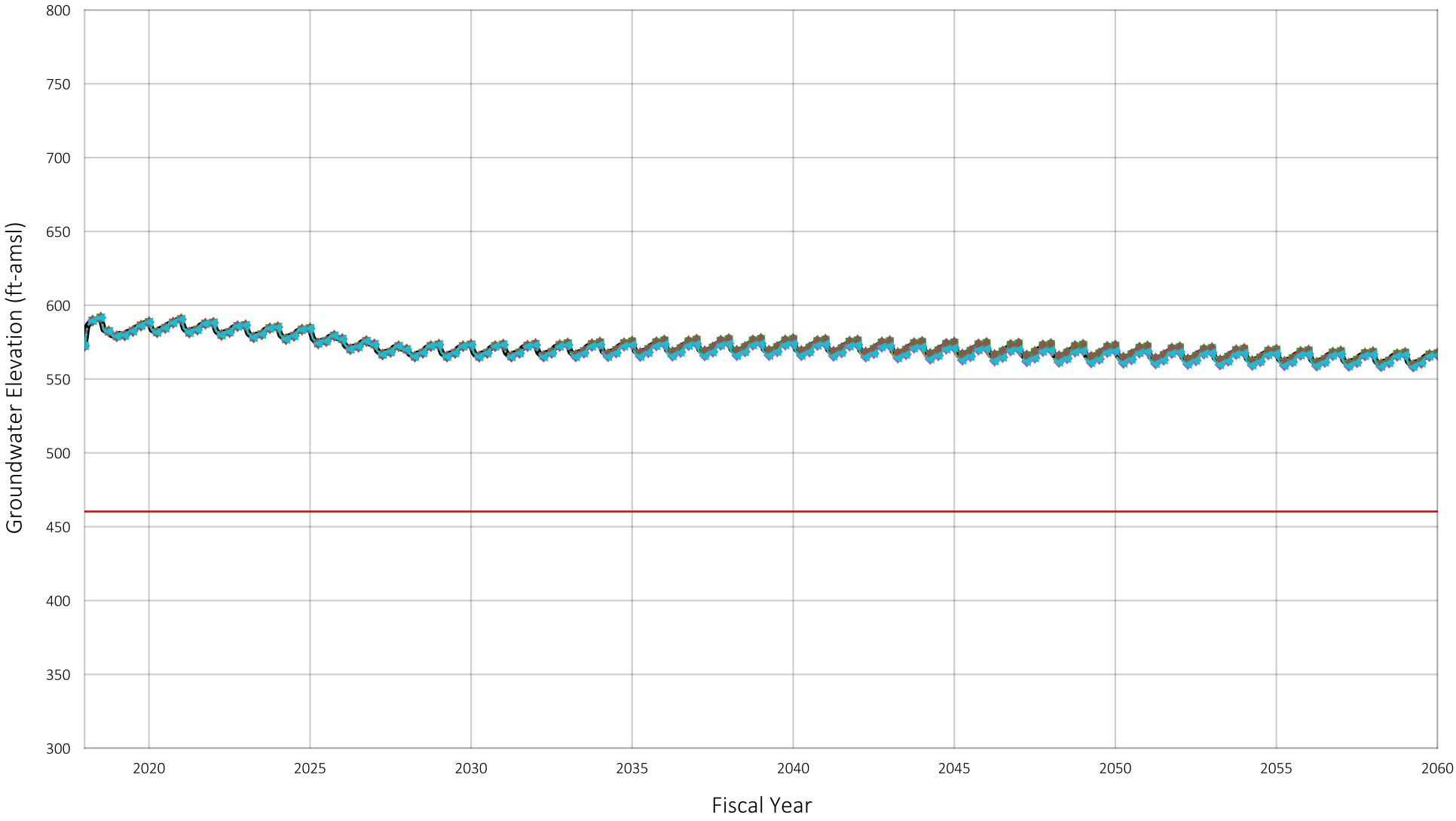
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002653
Owner: City of Pomona
Well Name: 2

Figure A-119




Location of Well in Chino Basin



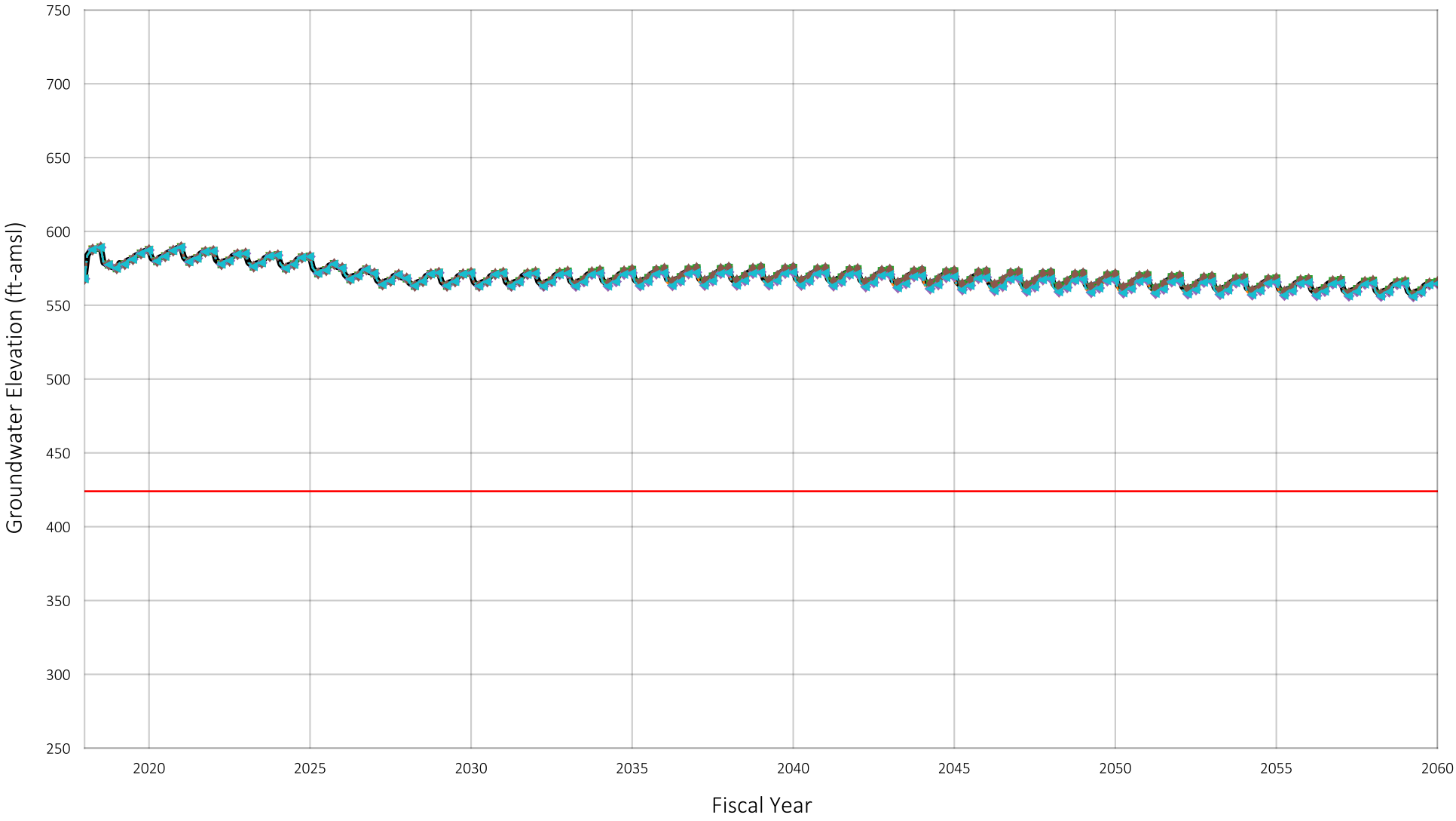
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1205314
Owner: City of Pomona
Well Name: 5B

Figure A-120




Location of Well in Chino Basin



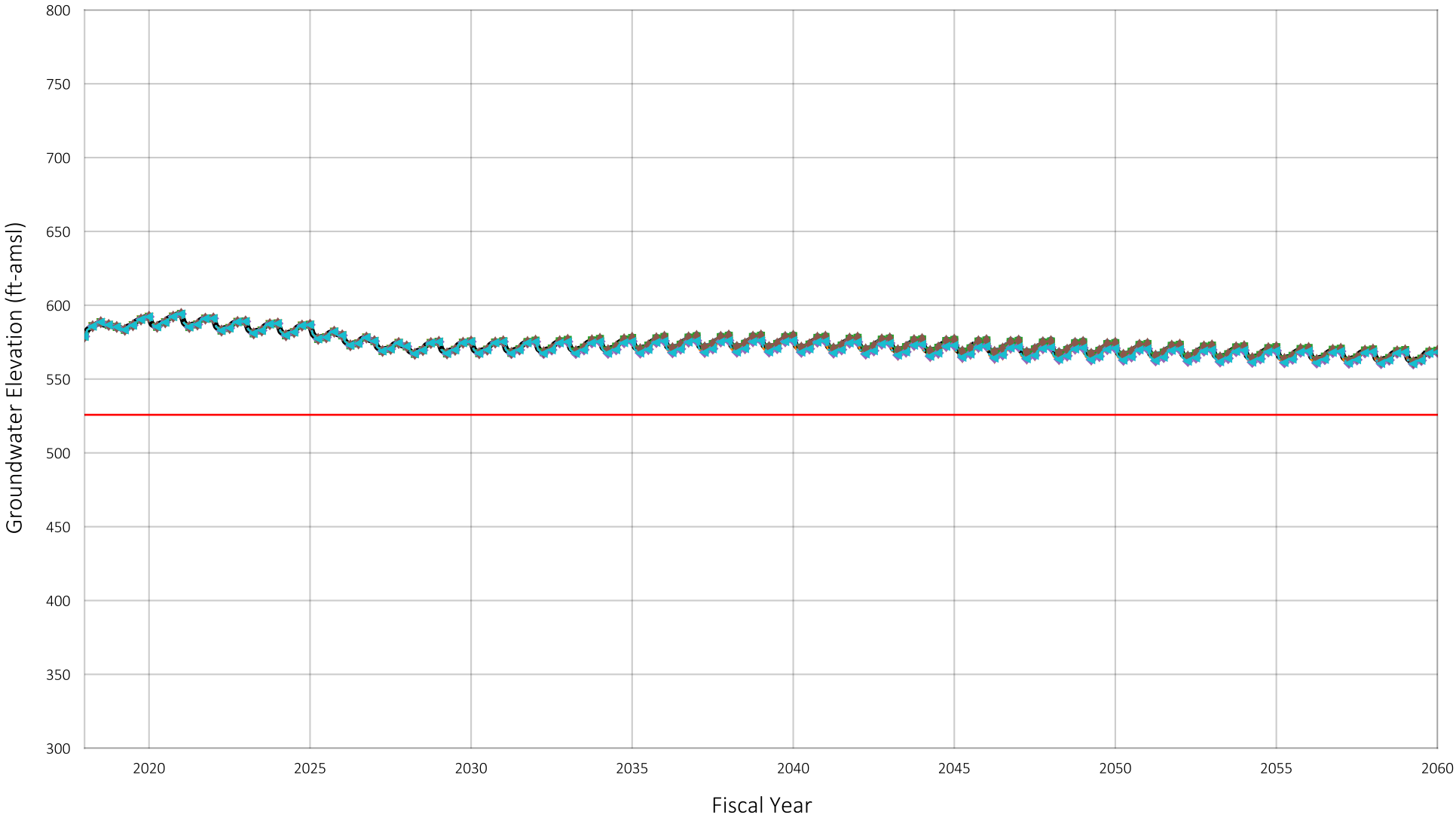
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1002650
Owner: City of Pomona
Well Name: 6

Figure A-121

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



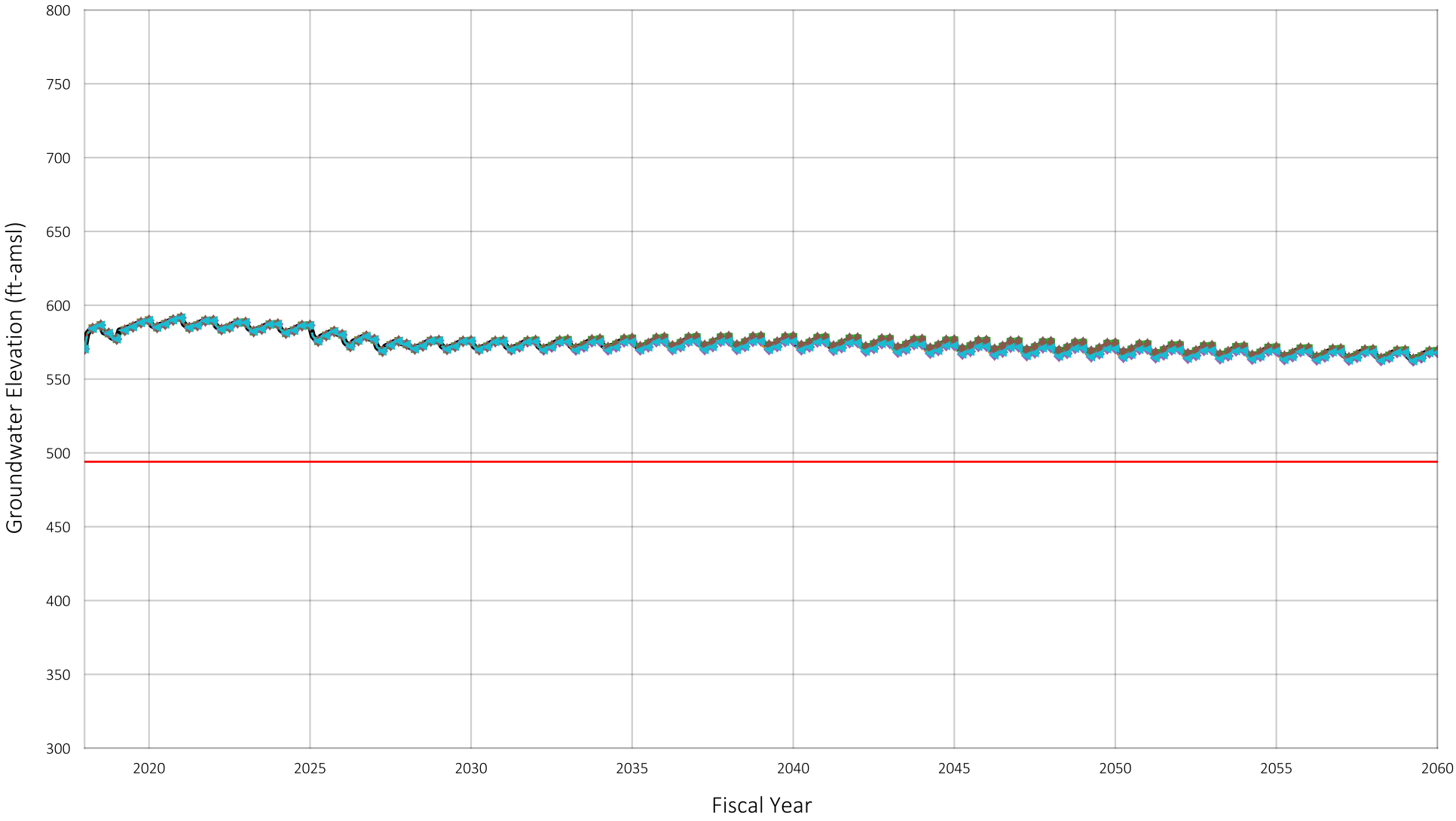
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002656
Owner: City of Pomona
Well Name: 10

Figure A-122




Location of Well in Chino Basin



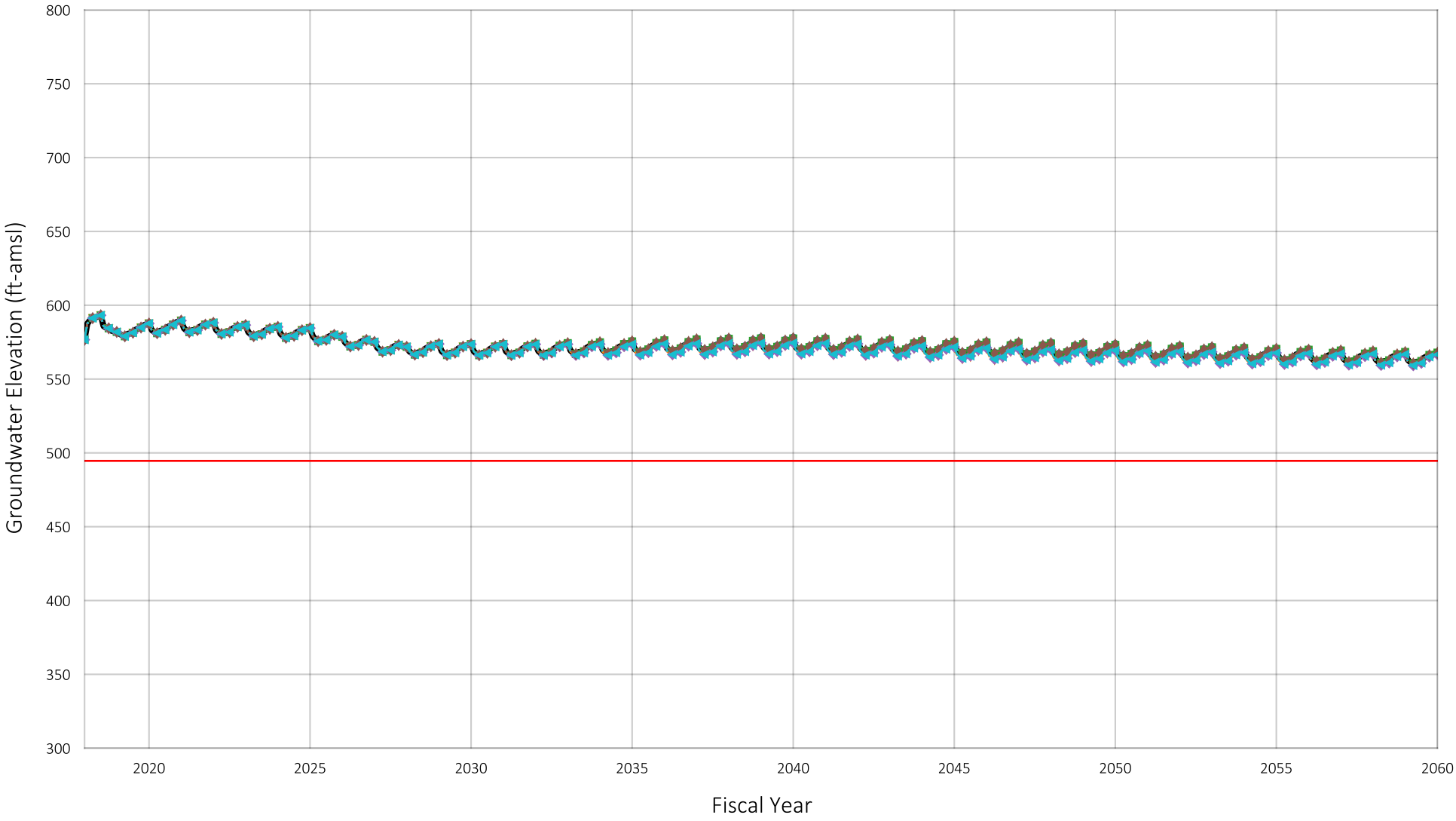
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002664
Owner: City of Pomona
Well Name: 15

Figure A-123




Location of Well in Chino Basin



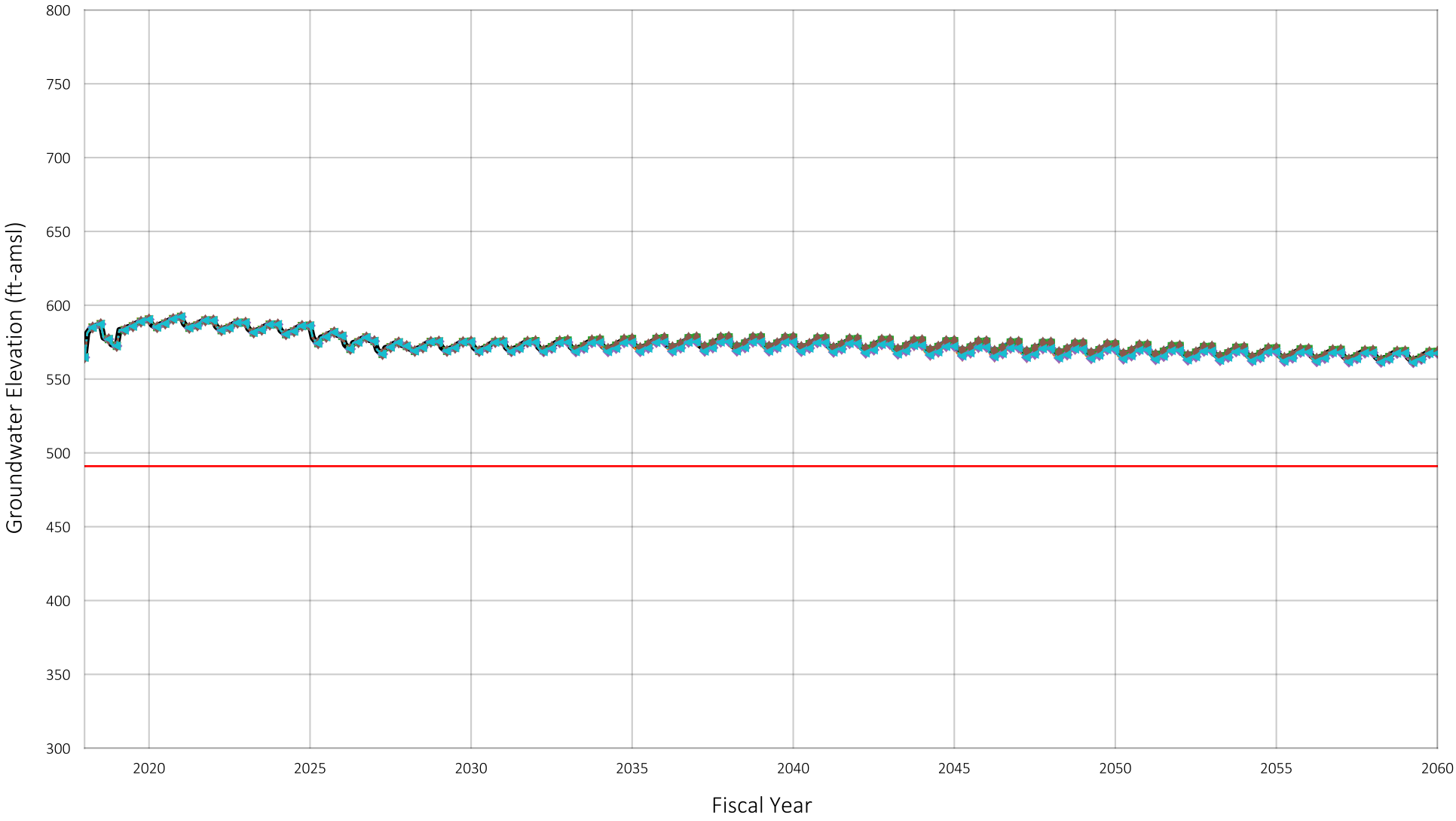
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002654
Owner: City of Pomona
Well Name: 16

Figure A-124




Location of Well in Chino Basin



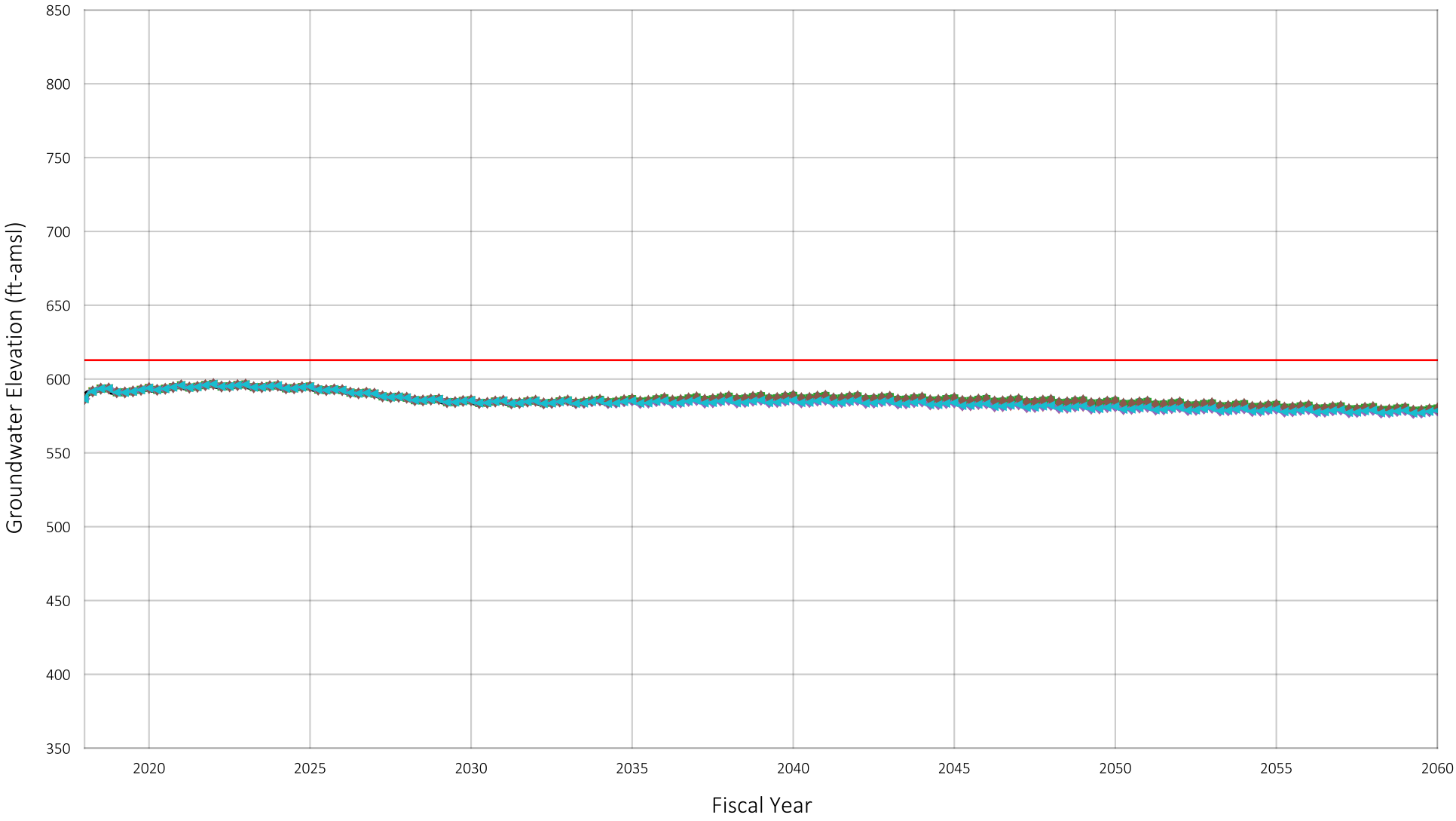
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002659
Owner: City of Pomona
Well Name: 17

Figure A-125




Location of Well in Chino Basin



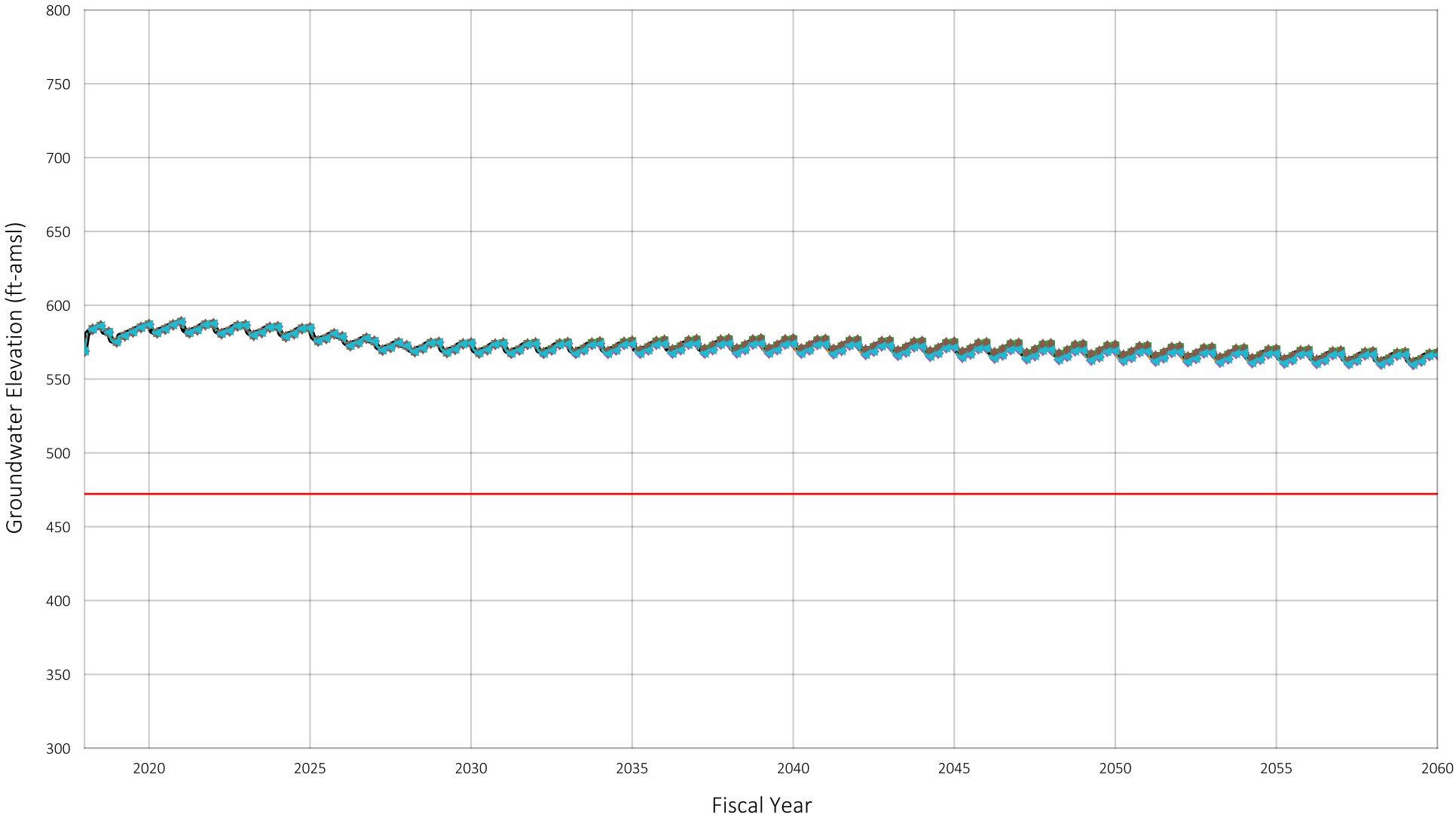
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002678
Owner: City of Pomona
Well Name: 21

Figure A-126




Location of Well in Chino Basin



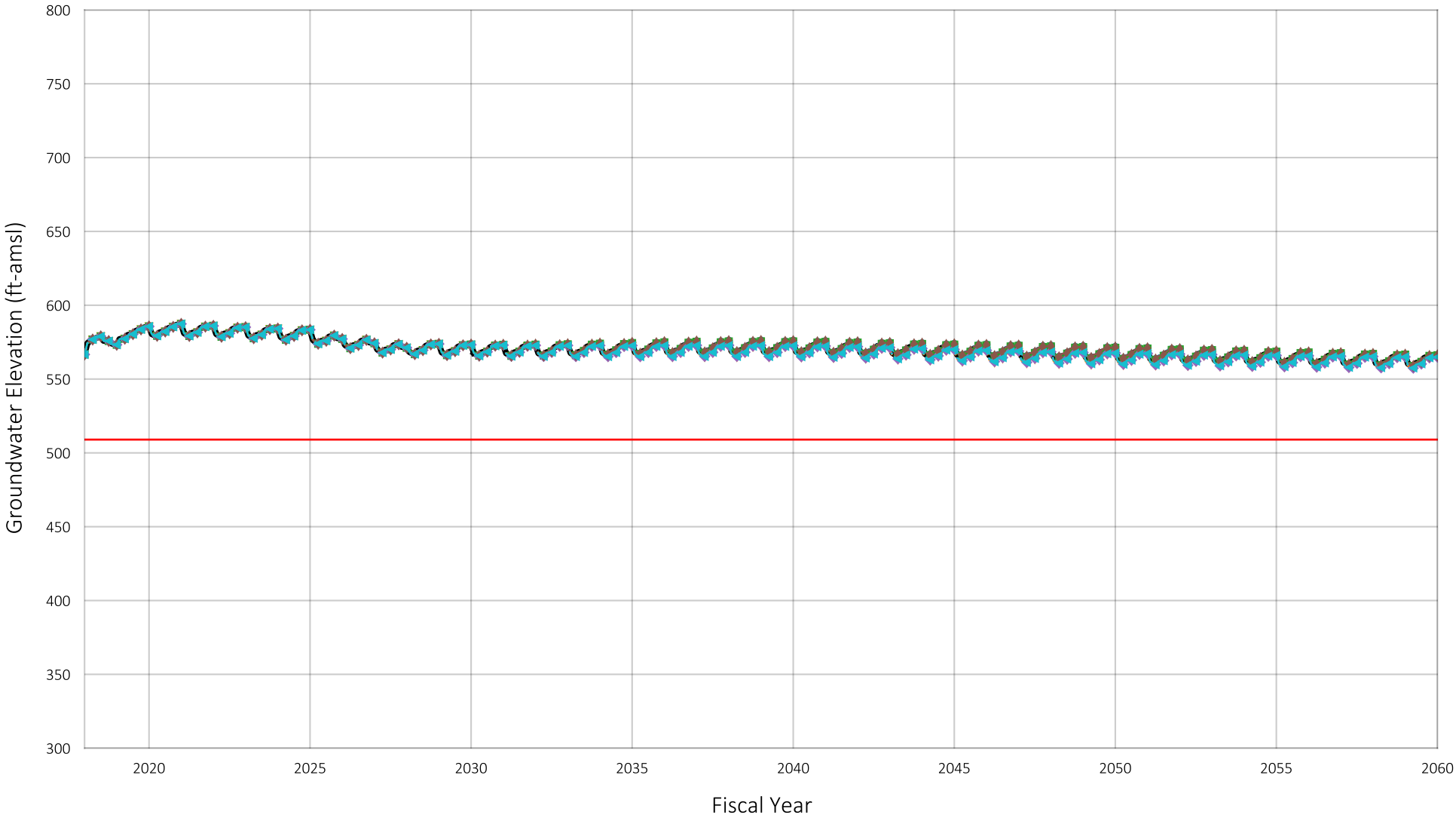
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002704
Owner: City of Pomona
Well Name: 23

Figure A-127




Location of Well in Chino Basin



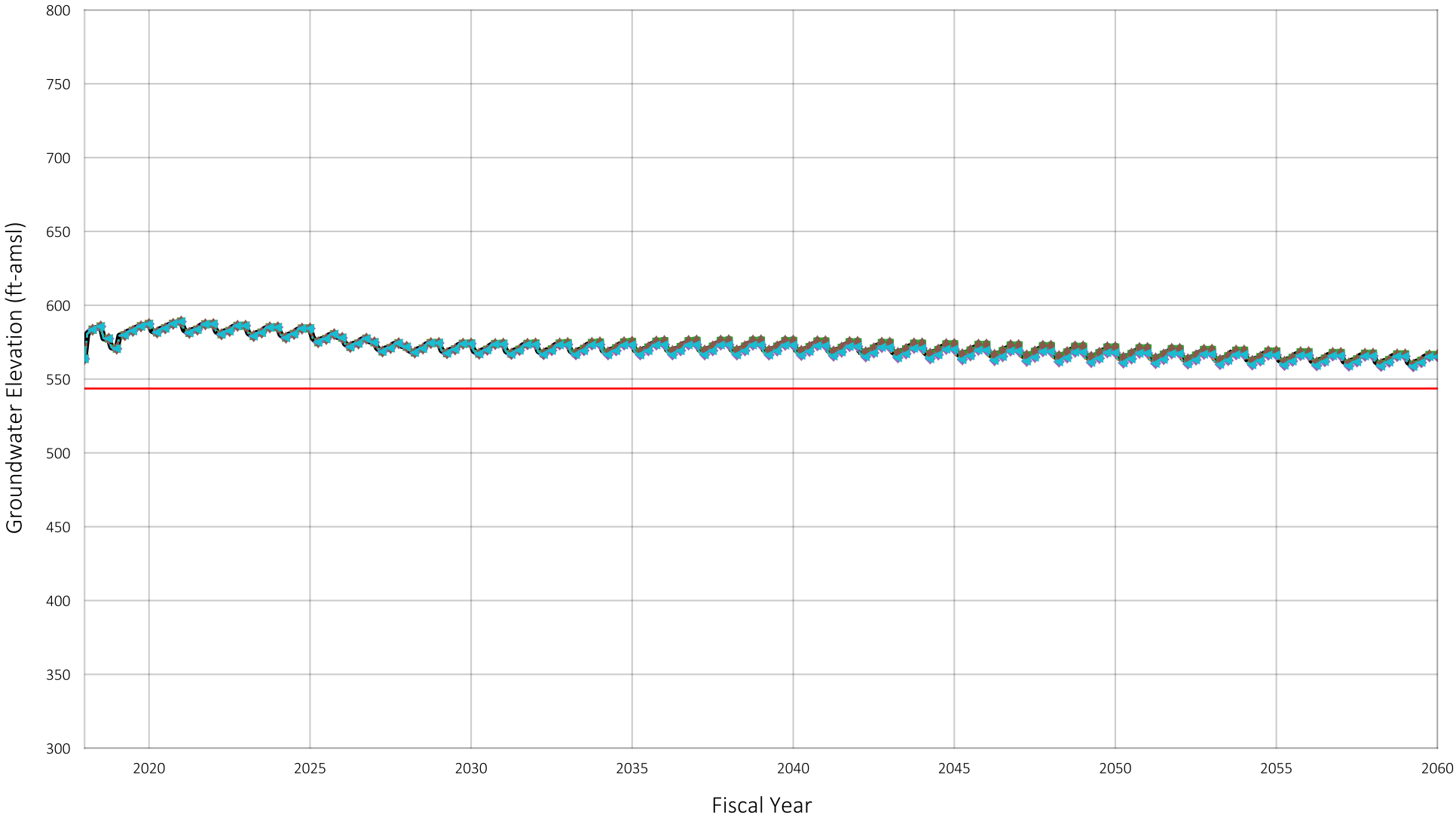
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002706
Owner: City of Pomona
Well Name: 25

Figure A-128




Location of Well in Chino Basin



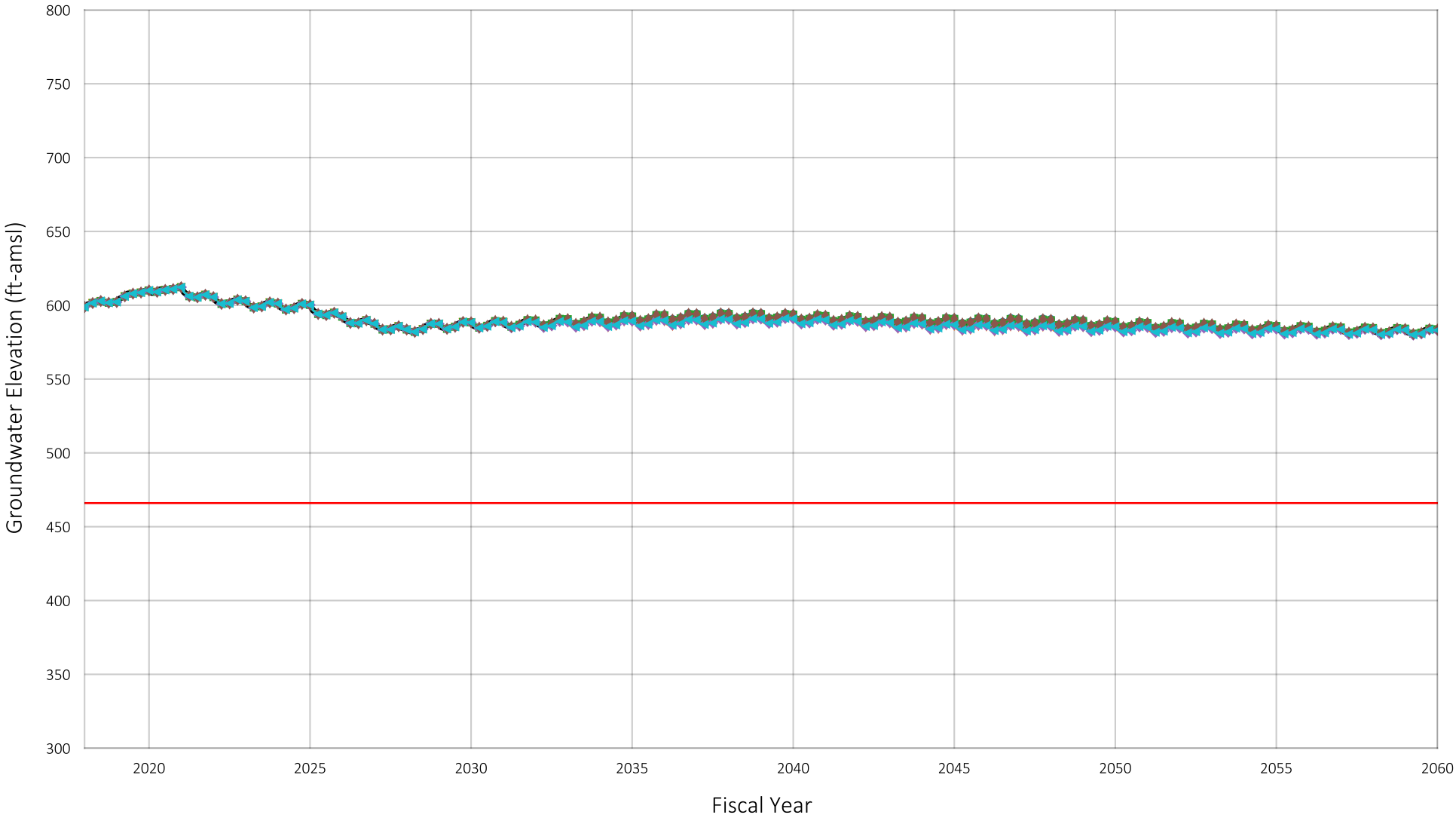
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002703
Owner: City of Pomona
Well Name: 26

Figure A-129




Location of Well in Chino Basin



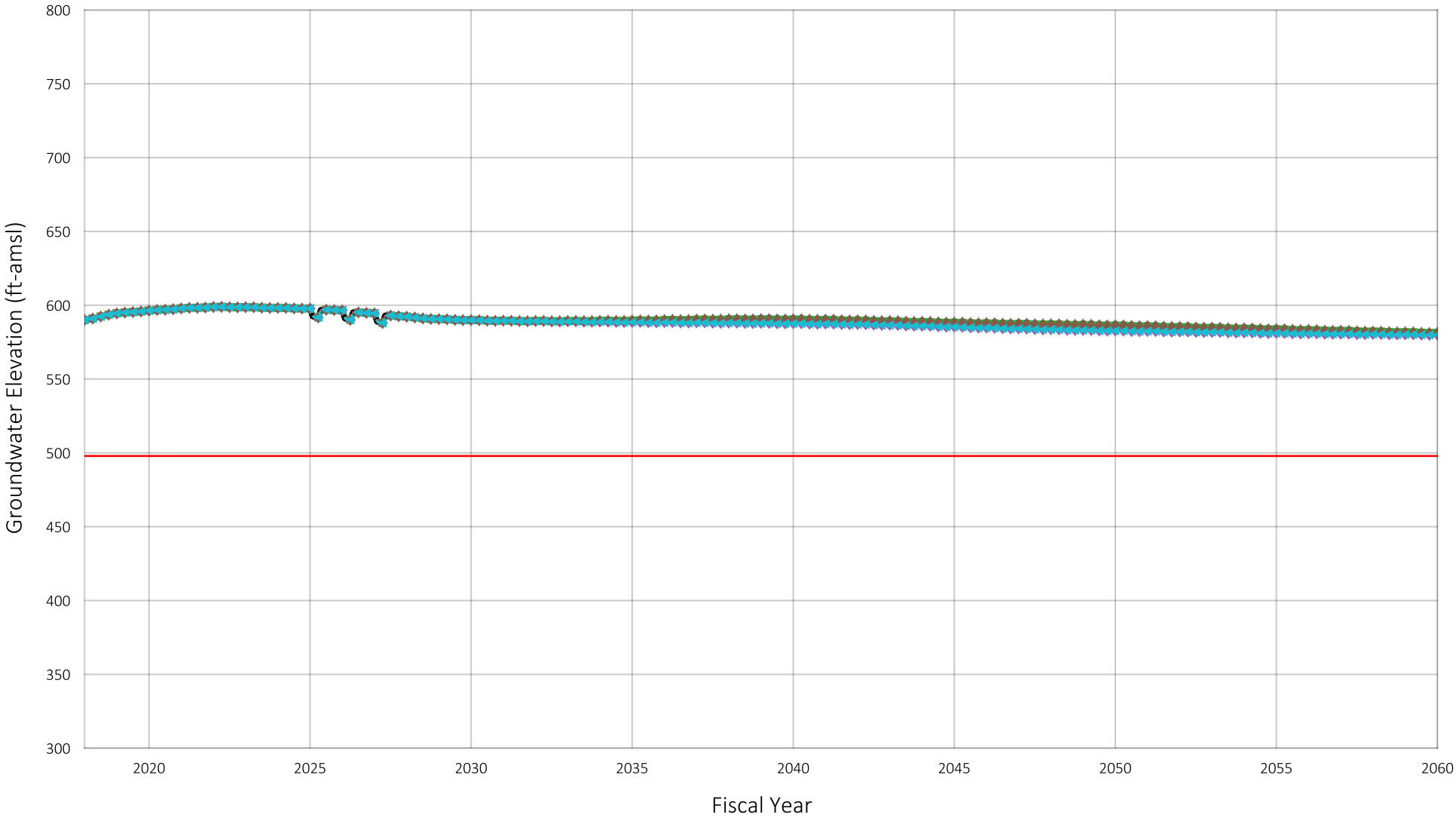
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1201236
Owner: City of Pomona
Well Name: 27

Figure A-130




Location of Well in Chino Basin



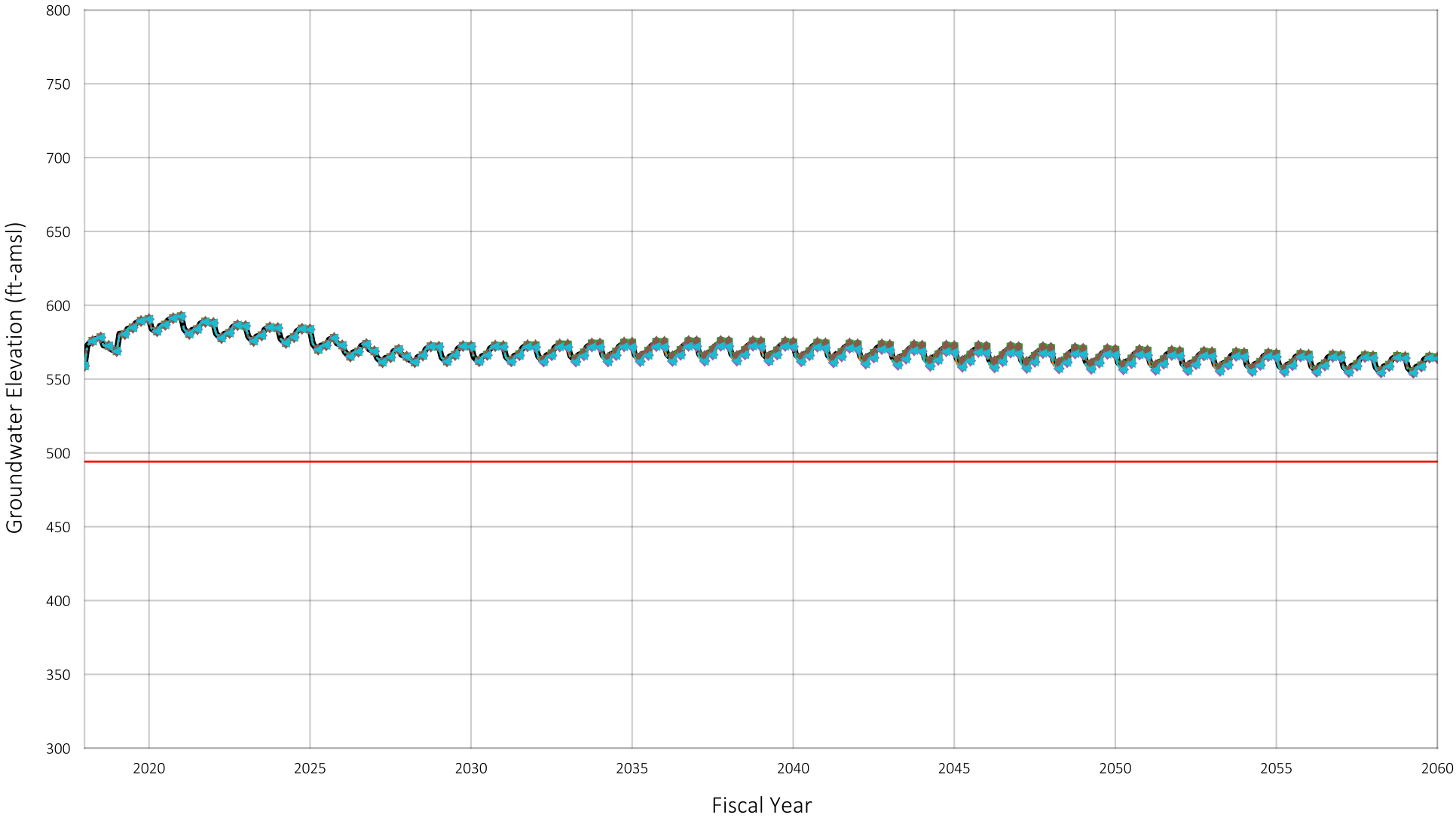
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1203062
Owner: City of Pomona
Well Name: 29

Figure A-131




Location of Well in Chino Basin



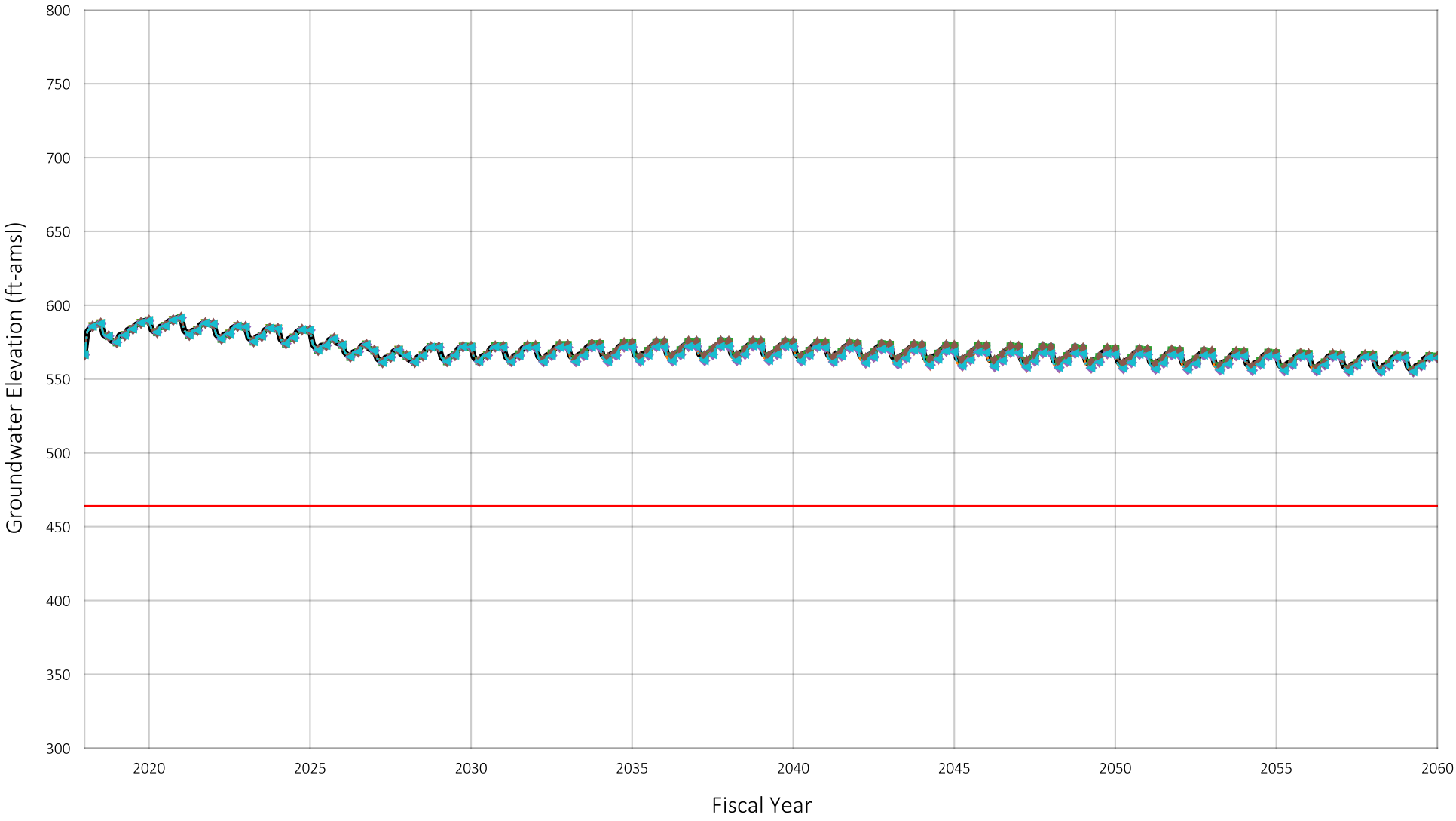
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1201247
Owner: City of Pomona
Well Name: 34

Figure A-132




Location of Well in Chino Basin



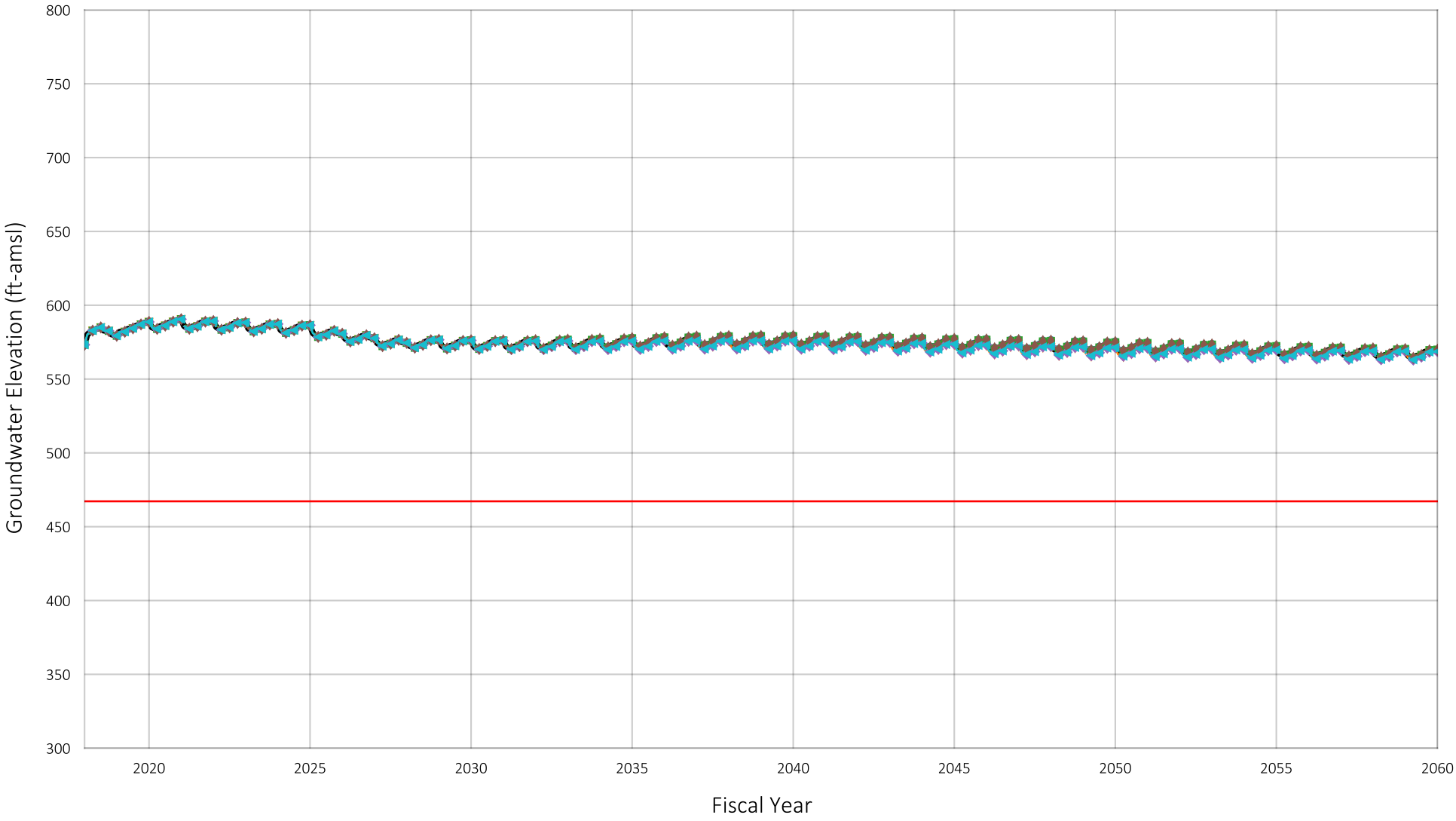
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1201246
Owner: City of Pomona
Well Name: 35

Figure A-133




Location of Well in Chino Basin



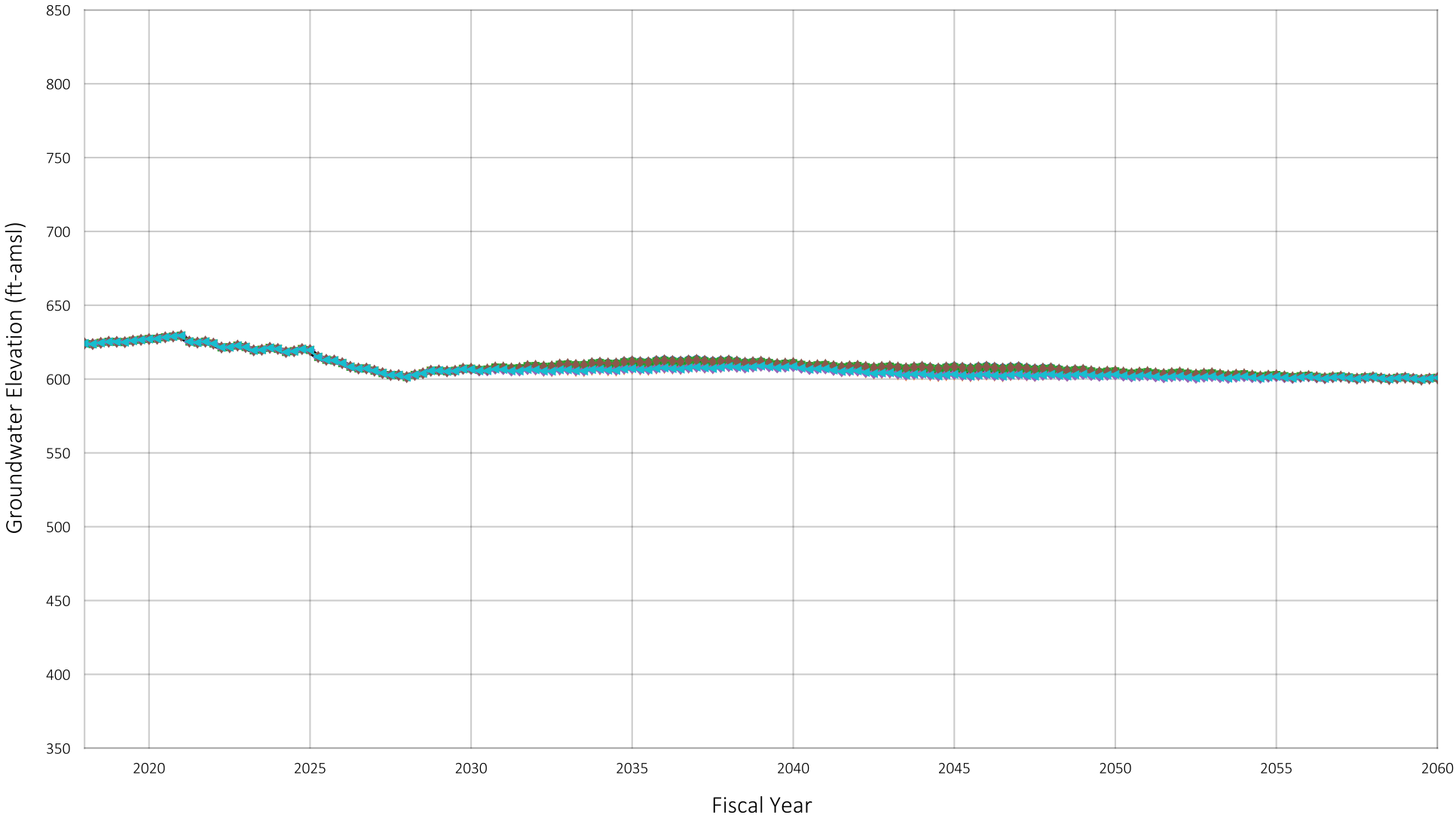
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1205309
Owner: City of Pomona
Well Name: 36

Figure A-134




Location of Well in Chino Basin



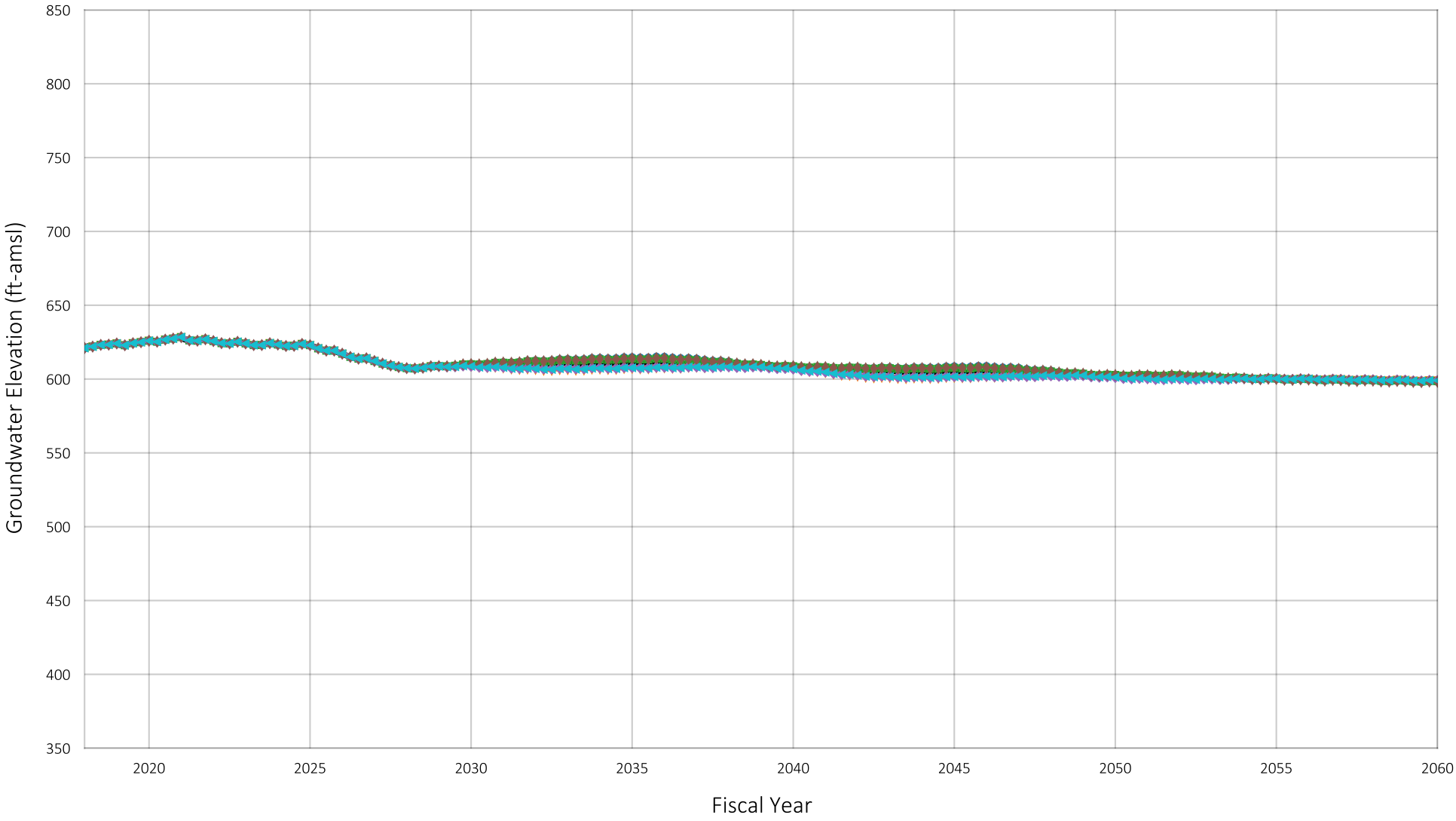
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002535
Owner: City of Upland
Well Name: 3

Figure A-135




Location of Well in Chino Basin



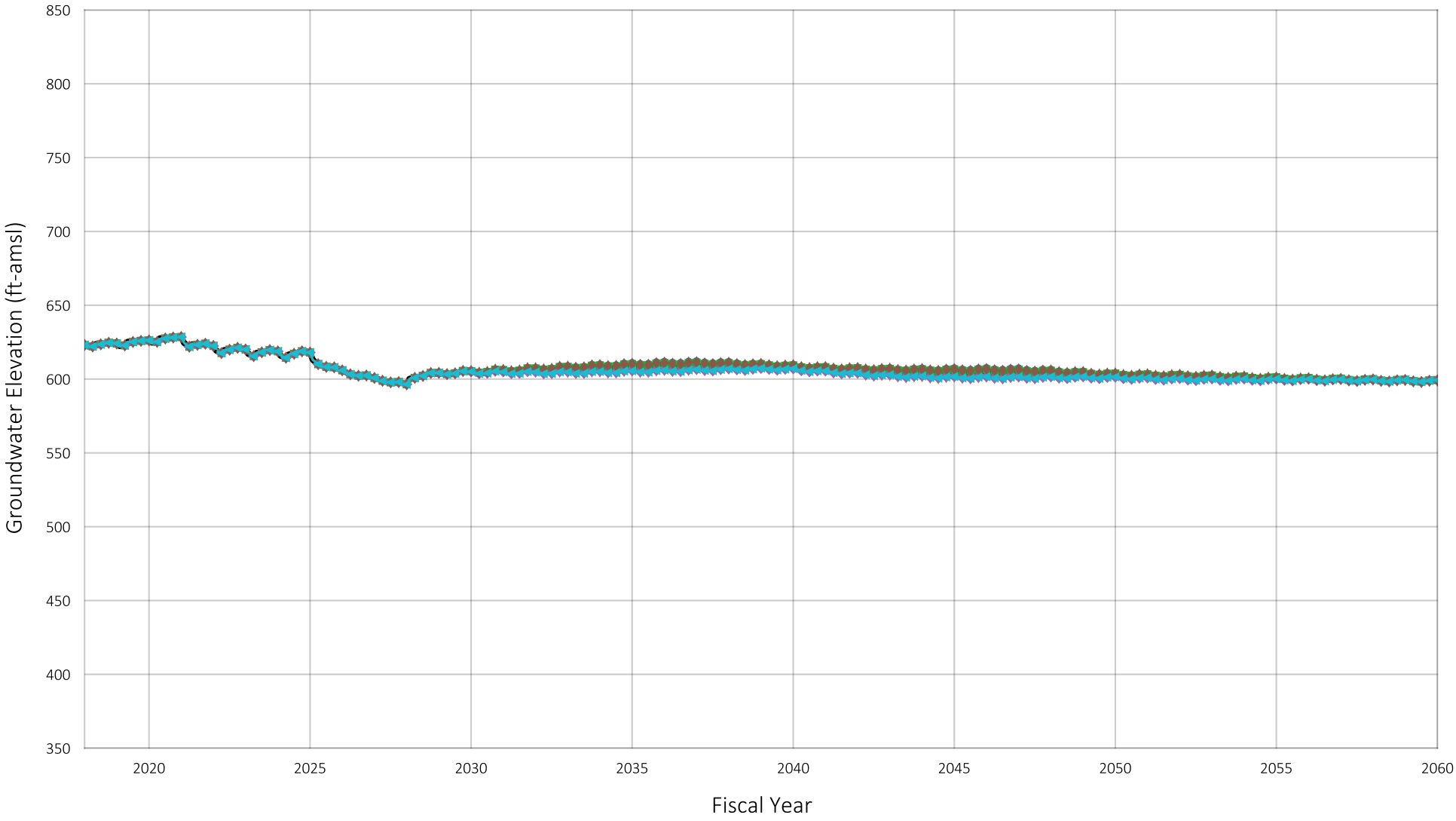
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1006997
Owner: City of Upland
Well Name: 7A

Figure A-136




Location of Well in Chino Basin



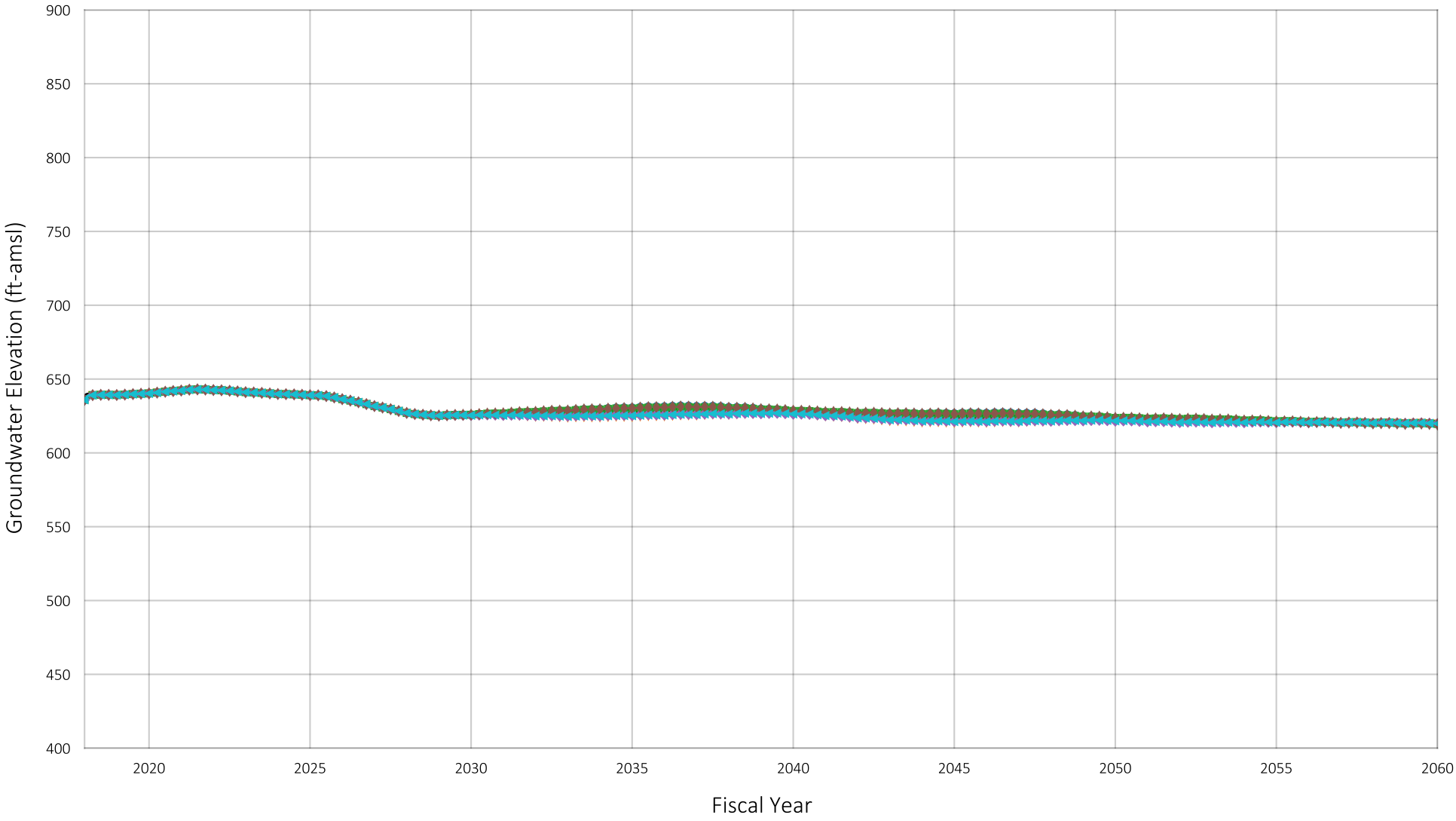
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1002531
Owner: City of Upland
Well Name: 8

Figure A-137




Location of Well in Chino Basin



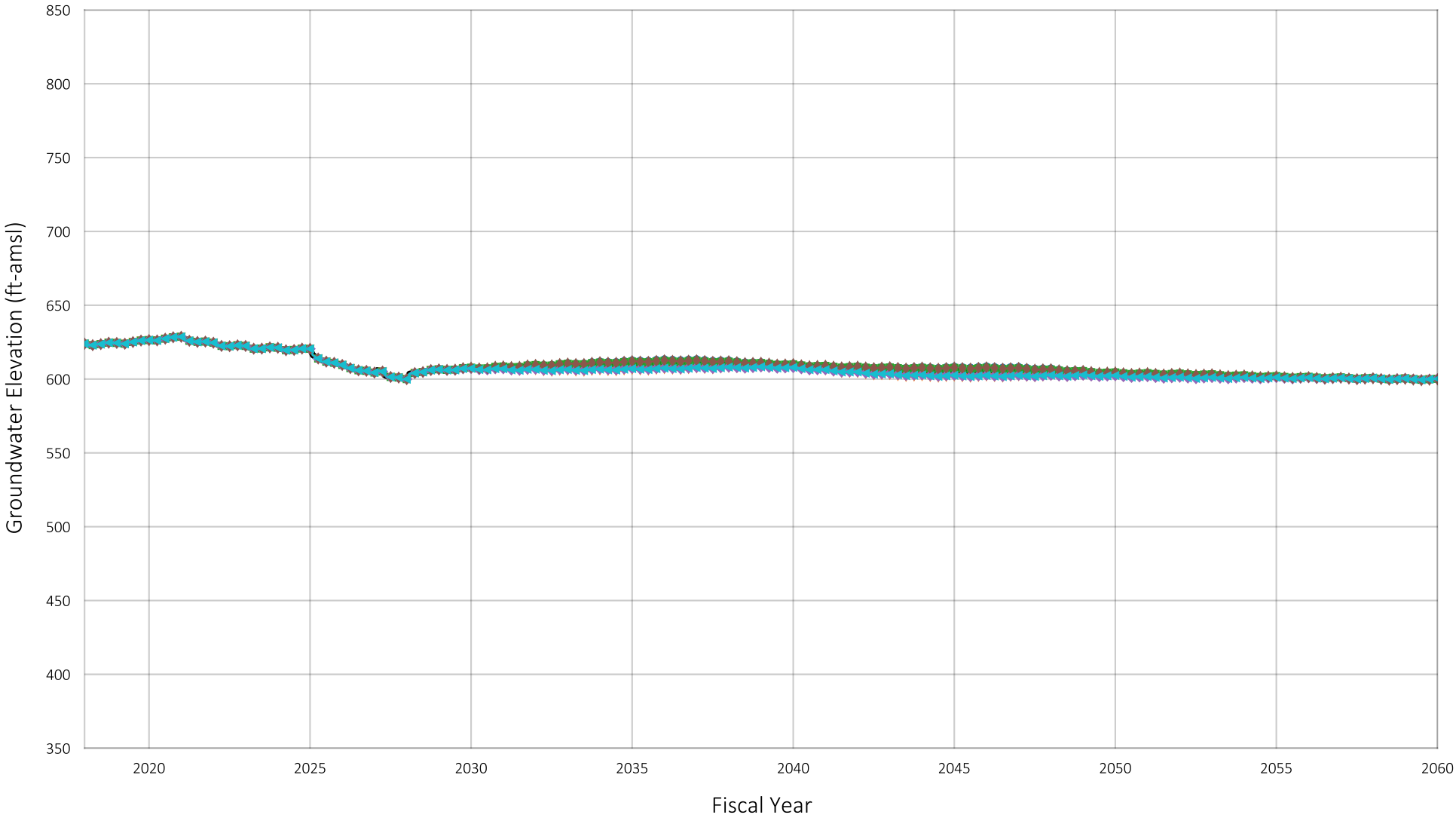
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206654
Owner: City of Upland
Well Name: 20

Figure A-138




Location of Well in Chino Basin



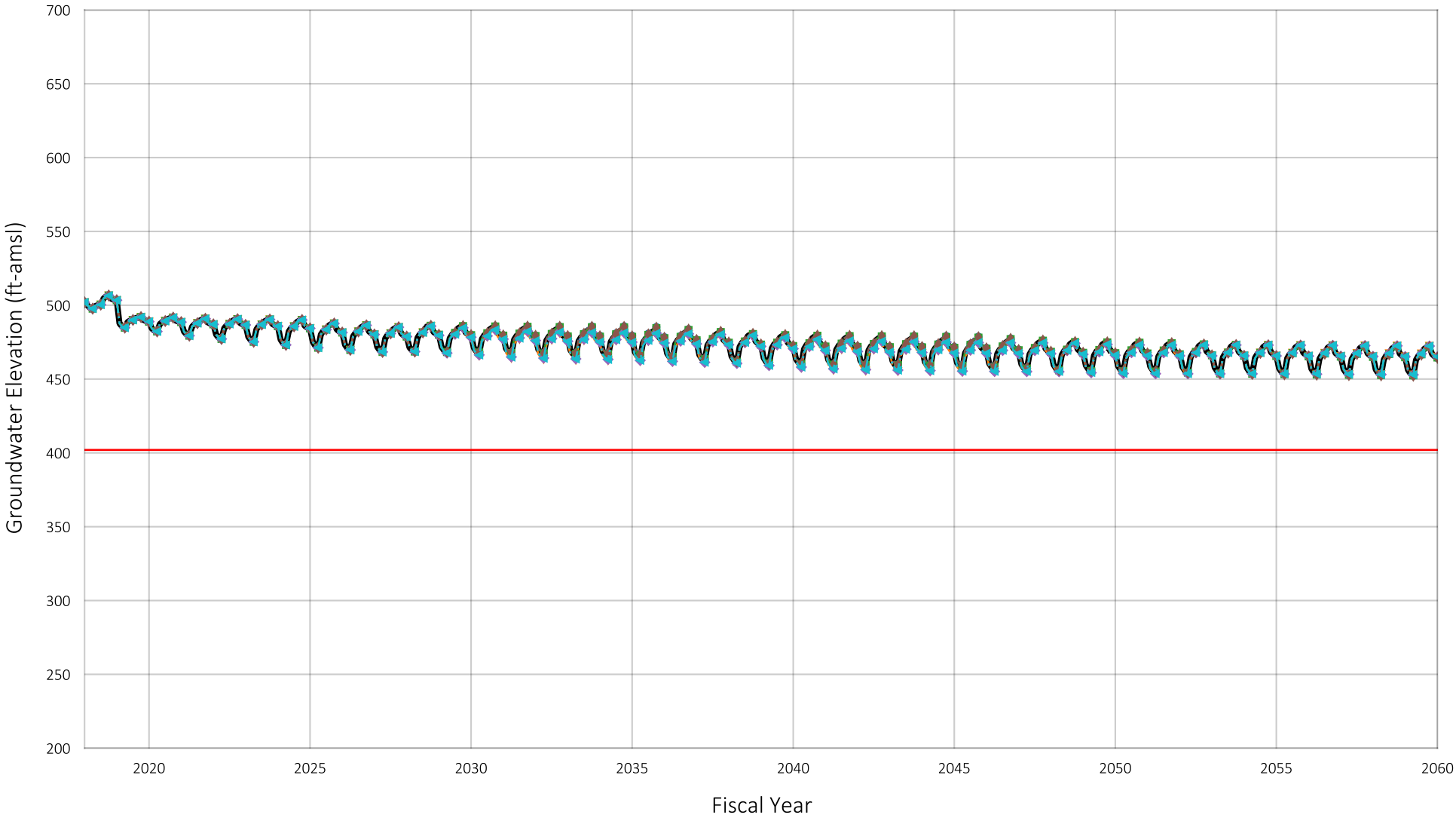
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1207956
Owner: City of Upland
Well Name: 21A

Figure A-139




Location of Well in Chino Basin



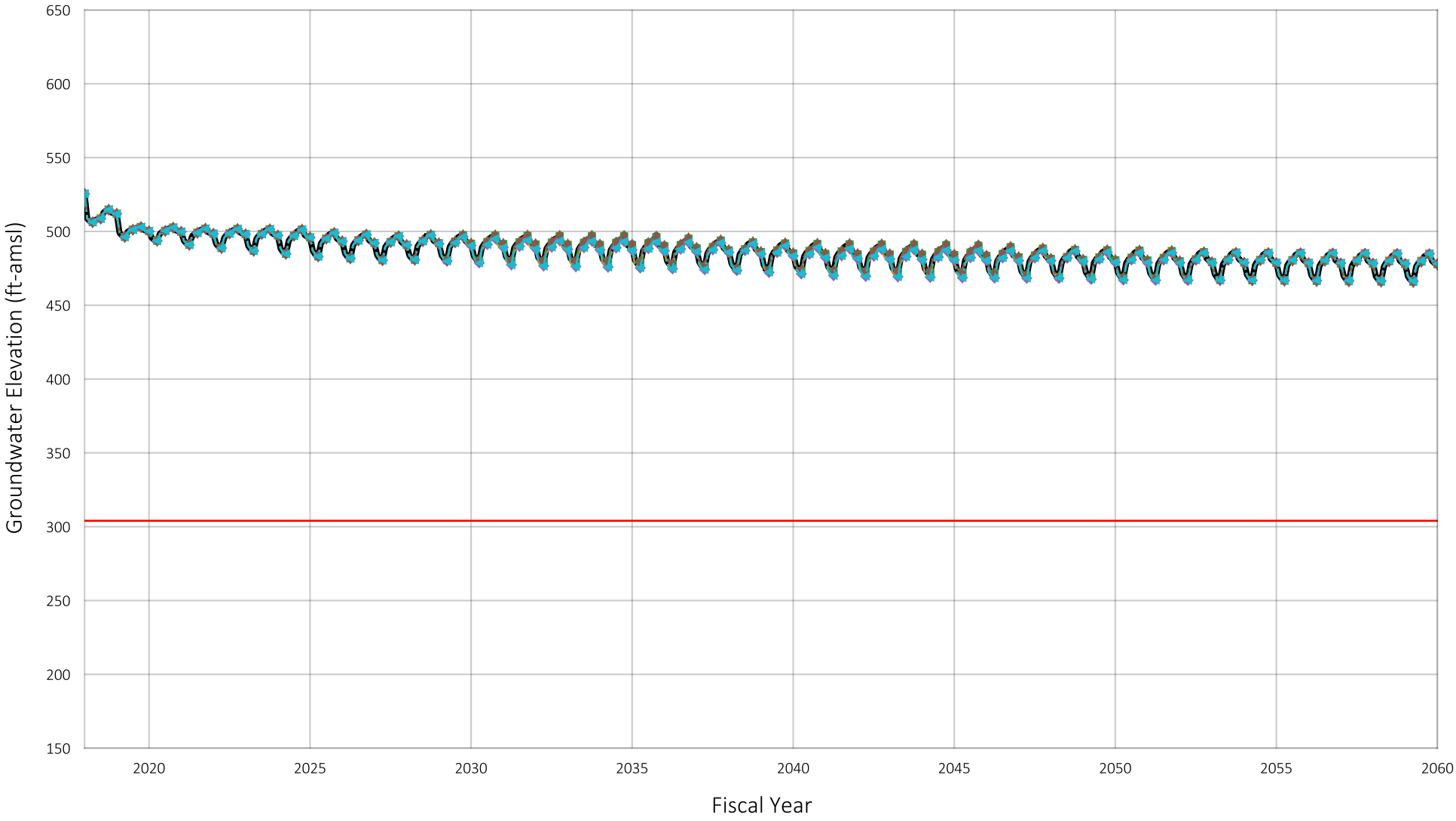
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206675
Owner: Chino Basin Desalter Authority
Well Name: I-1

Figure A-140




Location of Well in Chino Basin



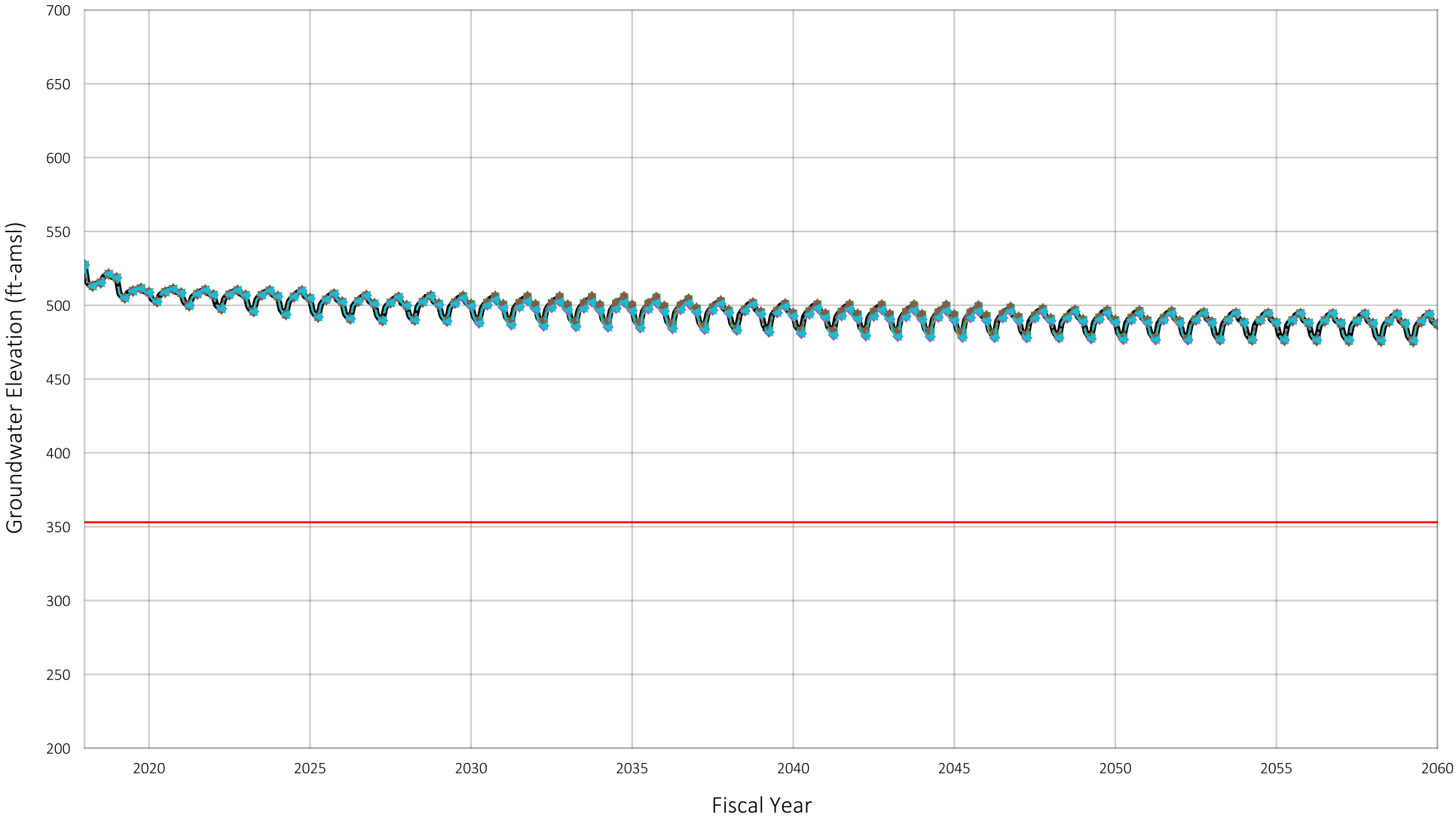
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206676
Owner: Chino Basin Desalter Authority
Well Name: I-2

Figure A-141




Location of Well in Chino Basin



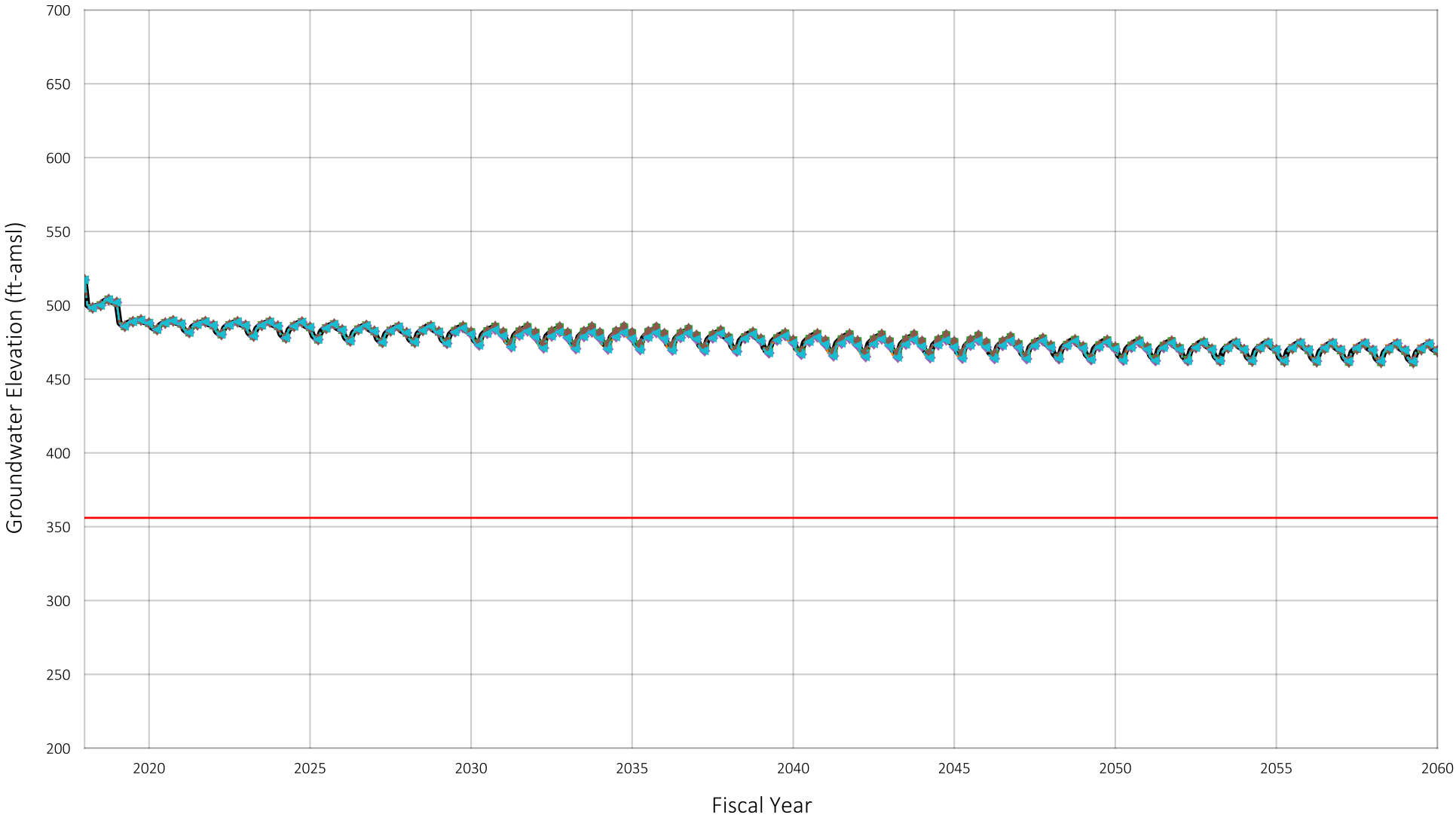
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206677
Owner: Chino Basin Desalter Authority
Well Name: I-3

Figure A-142




Location of Well in Chino Basin



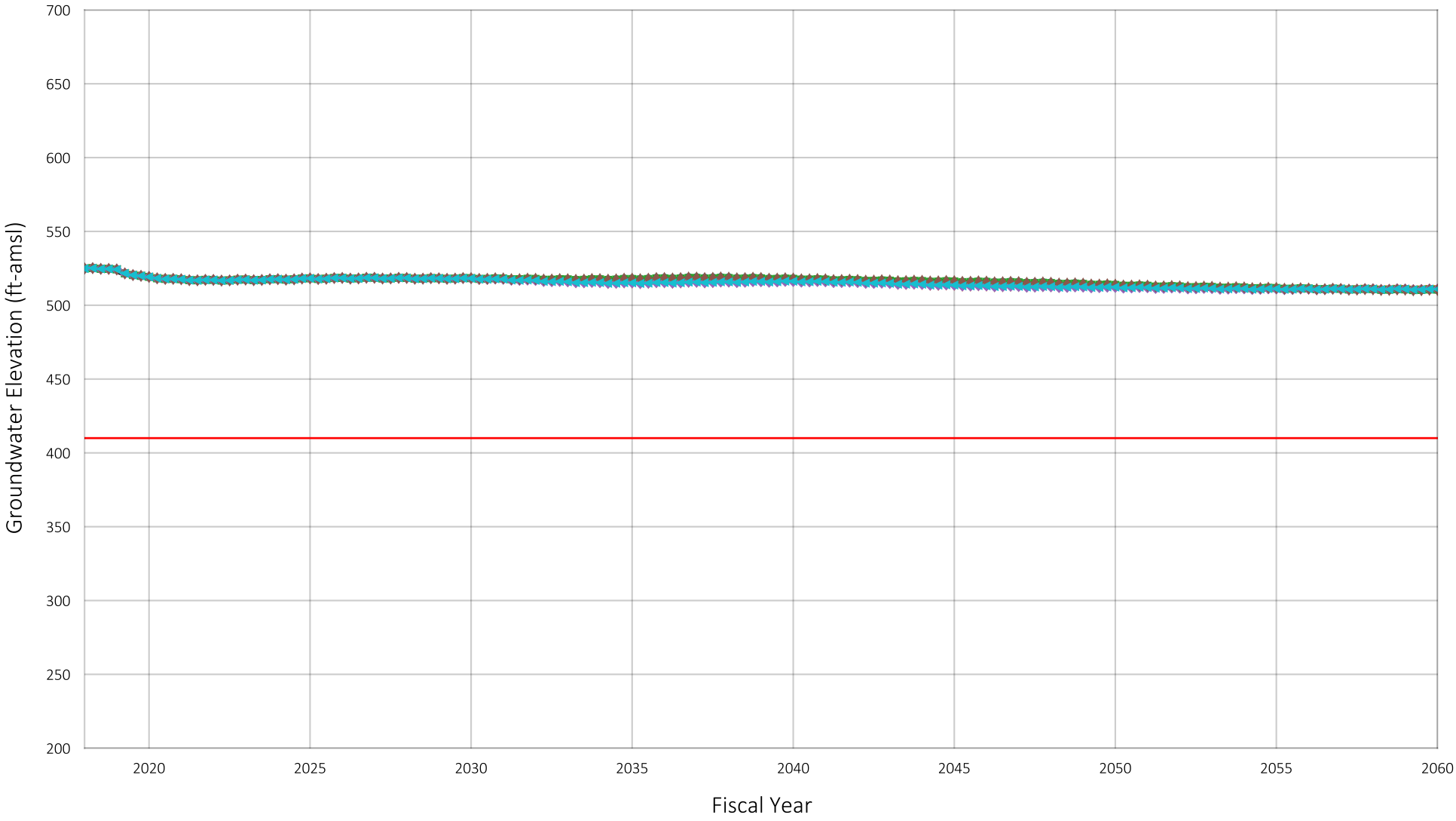
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206678
Owner: Chino Basin Desalter Authority
Well Name: I-4

Figure A-143




Location of Well in Chino Basin



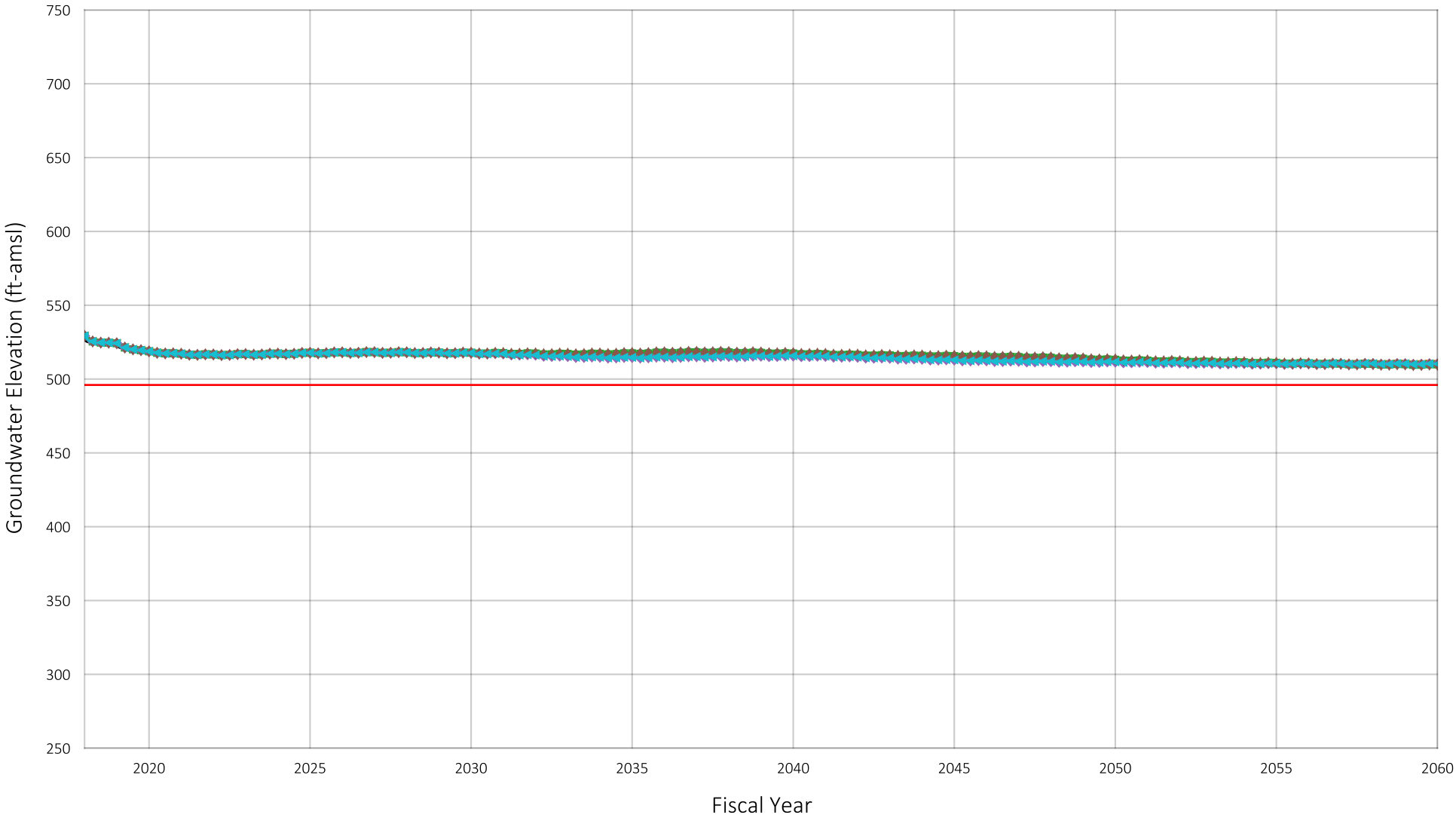
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206679
Owner: Chino Basin Desalter Authority
Well Name: I-5

Figure A-144




Location of Well in Chino Basin



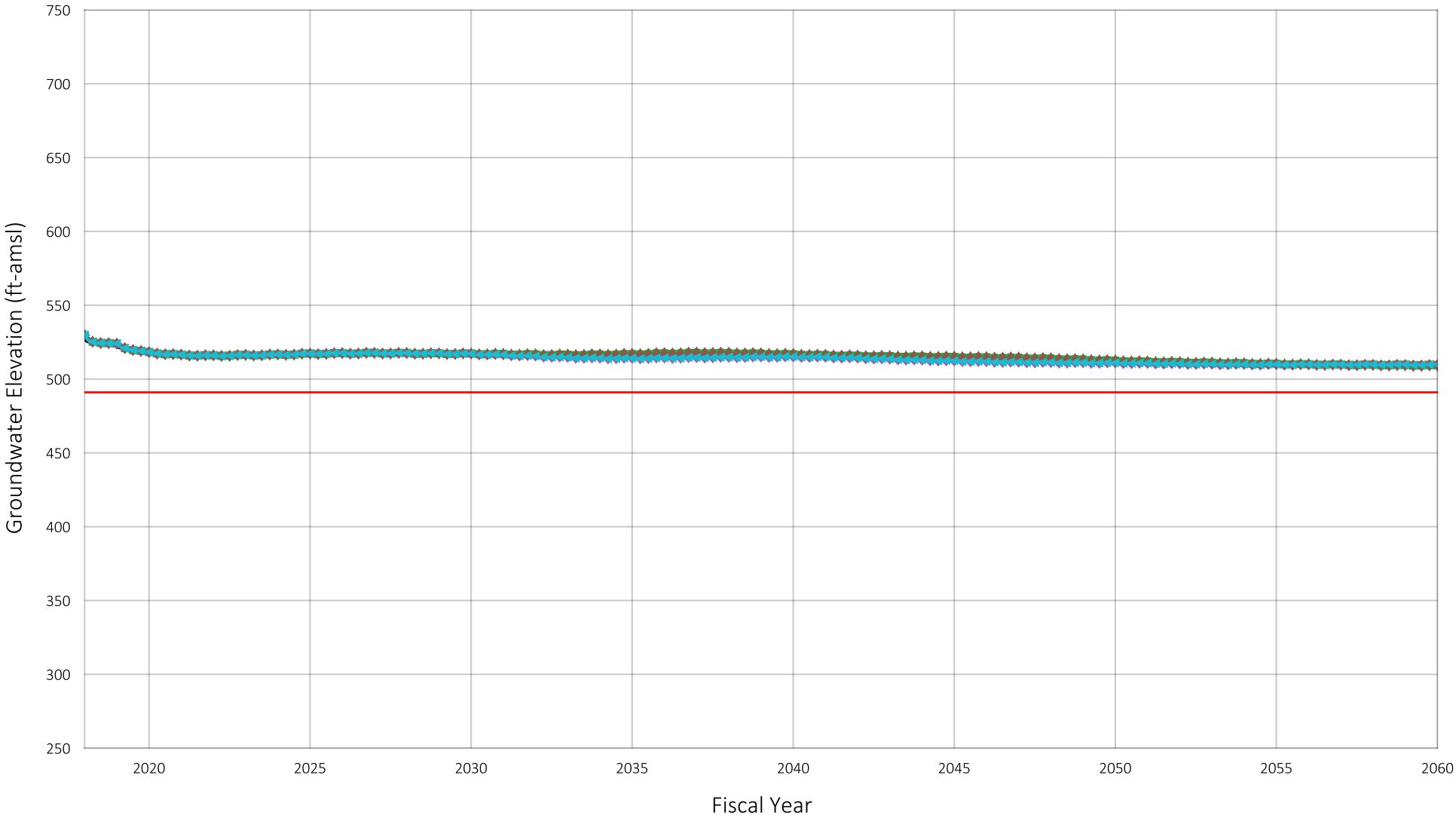
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206684
Owner: Chino Basin Desalter Authority
Well Name: I-6

Figure A-145

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



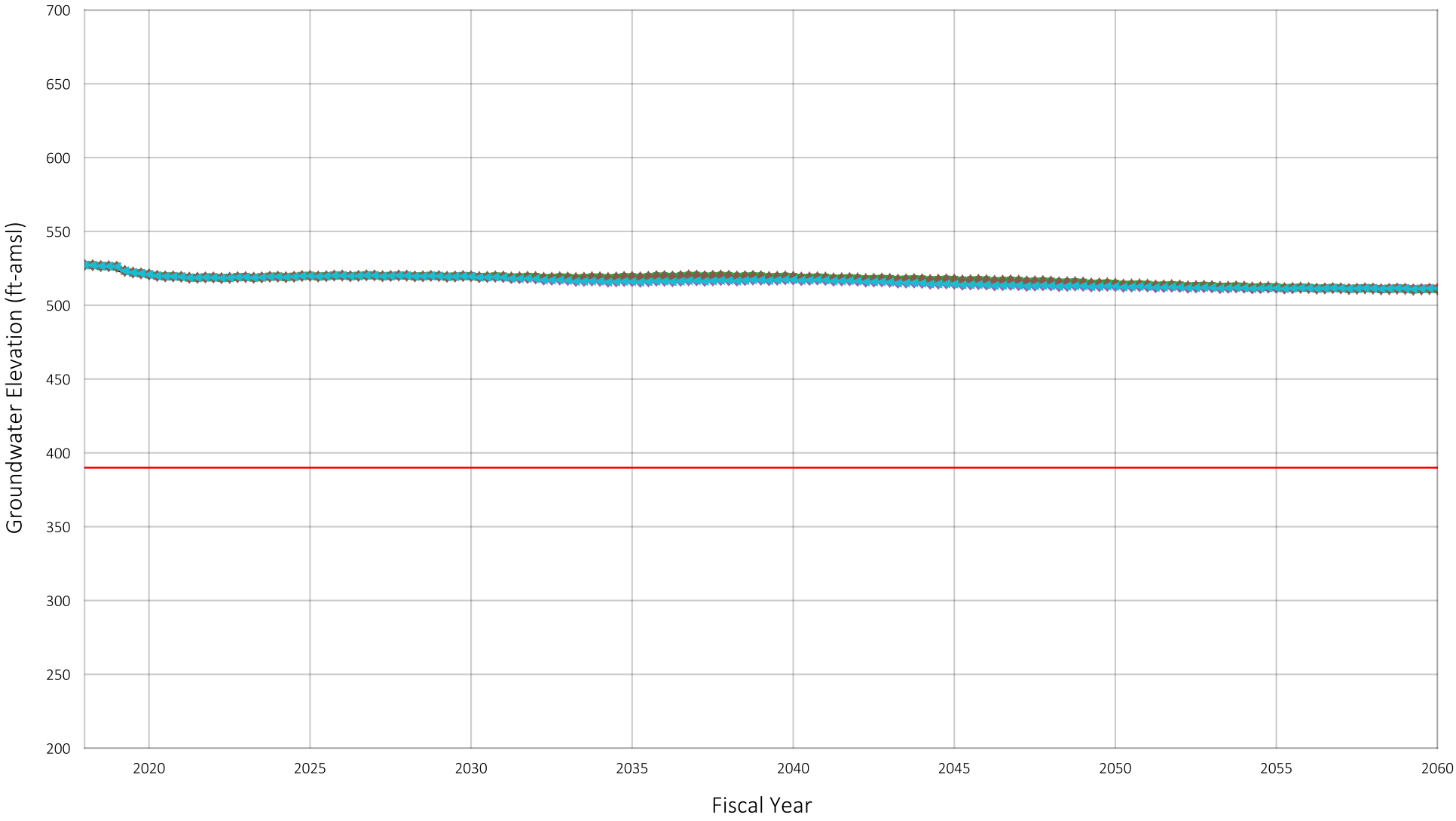
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206685
Owner: Chino Basin Desalter Authority
Well Name: I-7

Figure A-146




Location of Well in Chino Basin



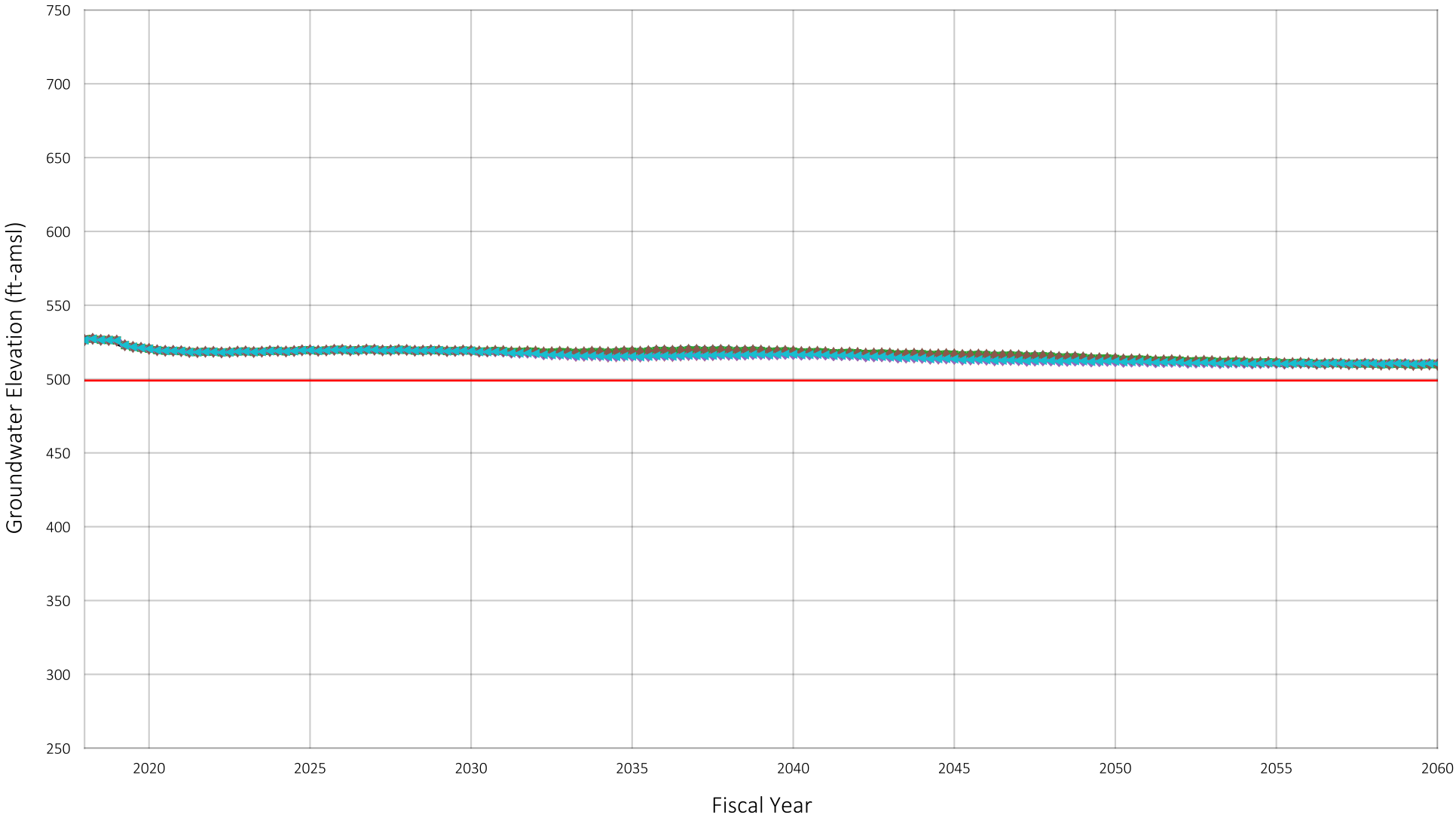
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206680
Owner: Chino Basin Desalter Authority
Well Name: I-8

Figure A-147




Location of Well in Chino Basin



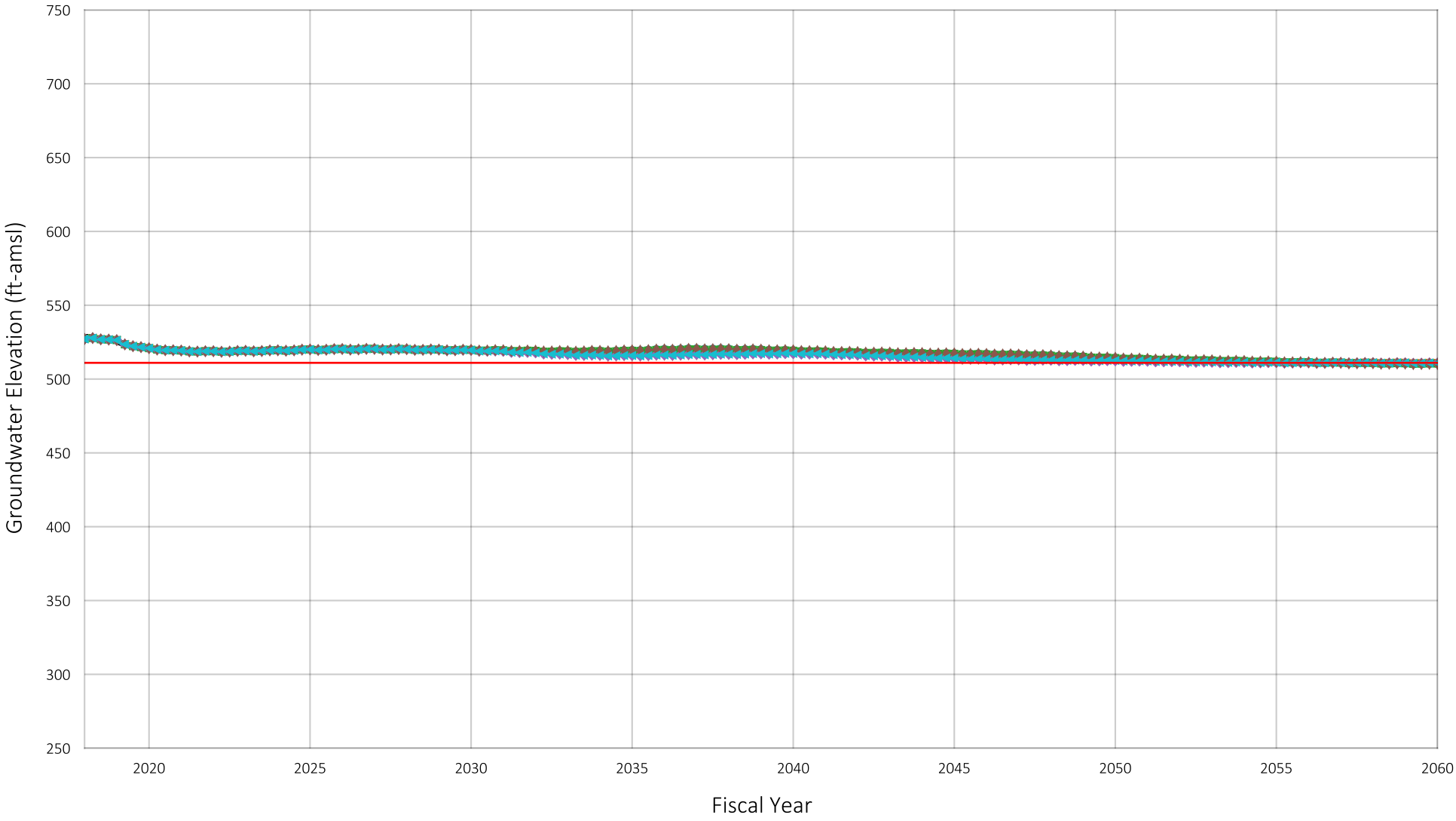
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206681
Owner: Chino Basin Desalter Authority
Well Name: I-9

Figure A-148




Location of Well in Chino Basin



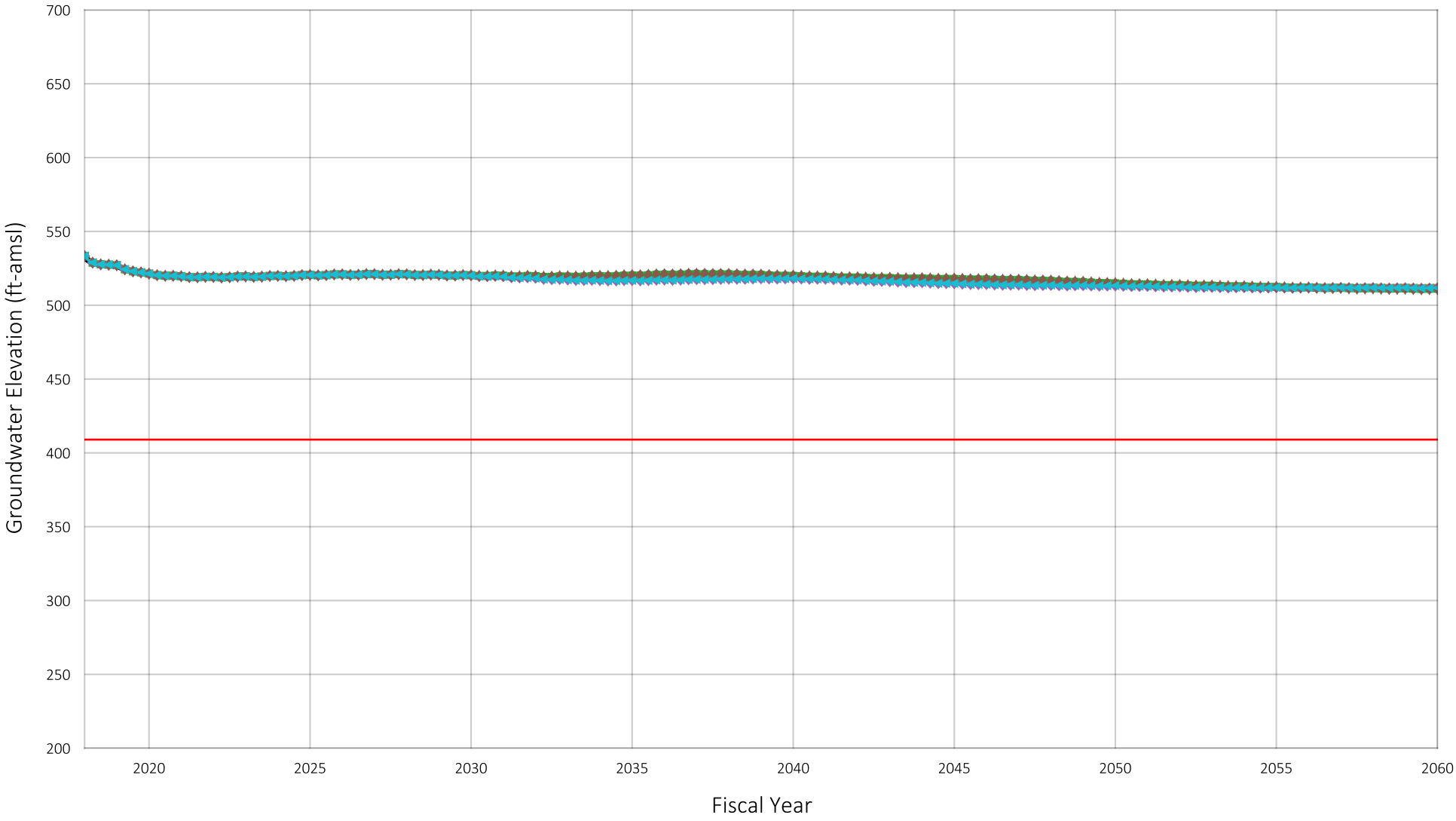
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206682
Owner: Chino Basin Desalter Authority
Well Name: I-10

Figure A-149

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



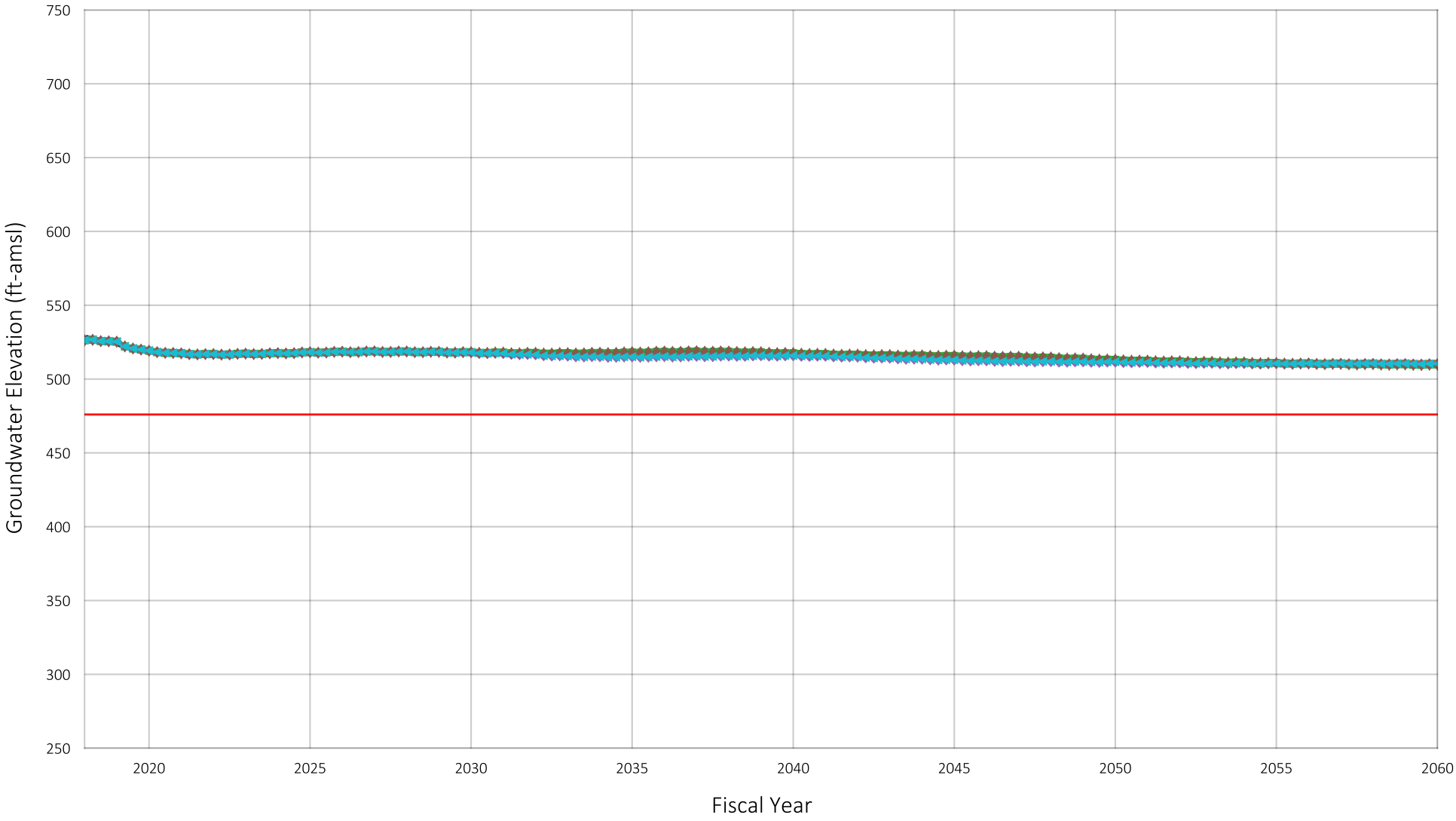
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206683
Owner: Chino Basin Desalter Authority
Well Name: I-11

Figure A-150




Location of Well in Chino Basin



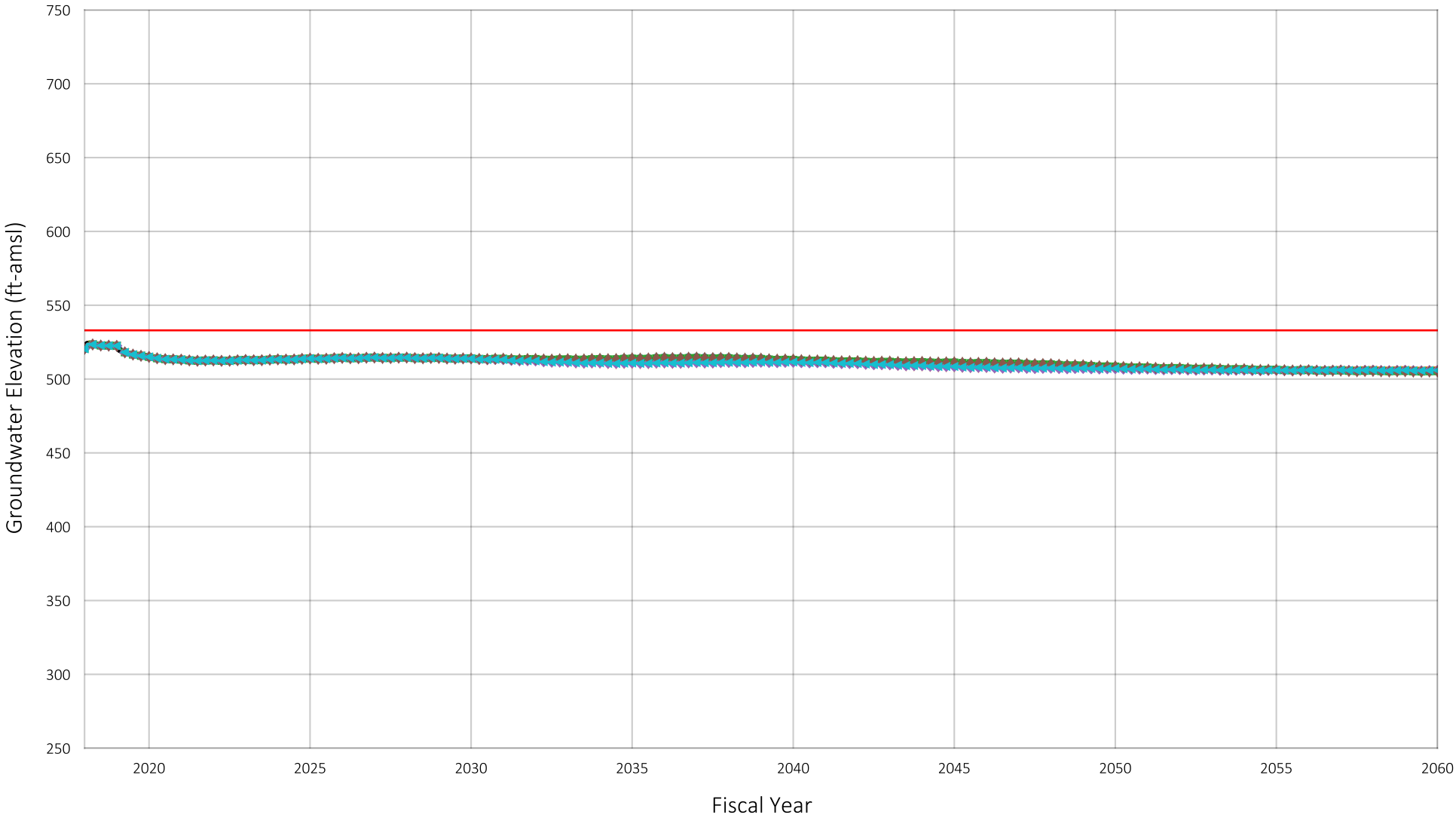
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206958
Owner: Chino Basin Desalter Authority
Well Name: I-13

Figure A-151

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



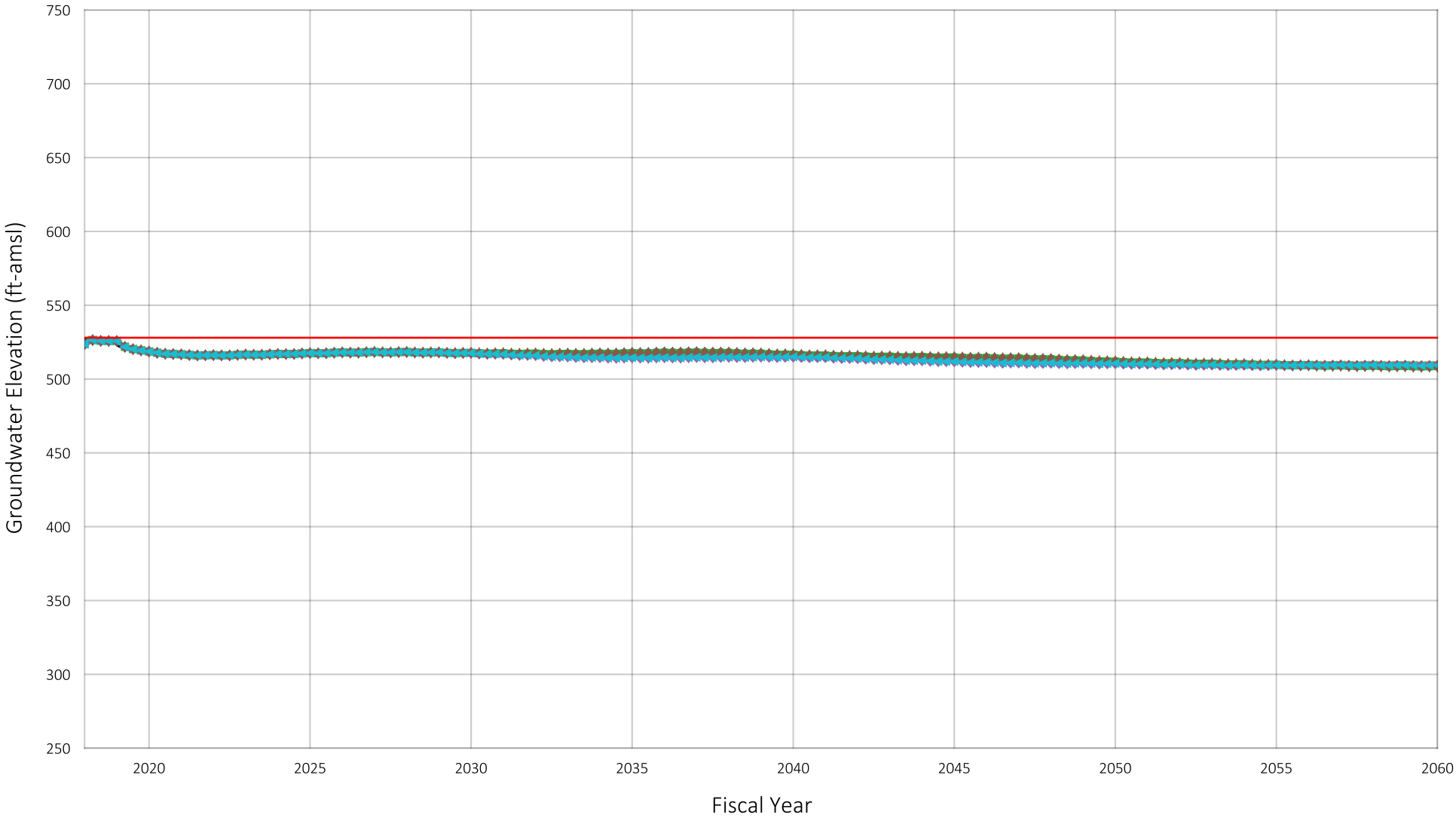
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206959
Owner: Chino Basin Desalter Authority
Well Name: I-14

Figure A-152

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



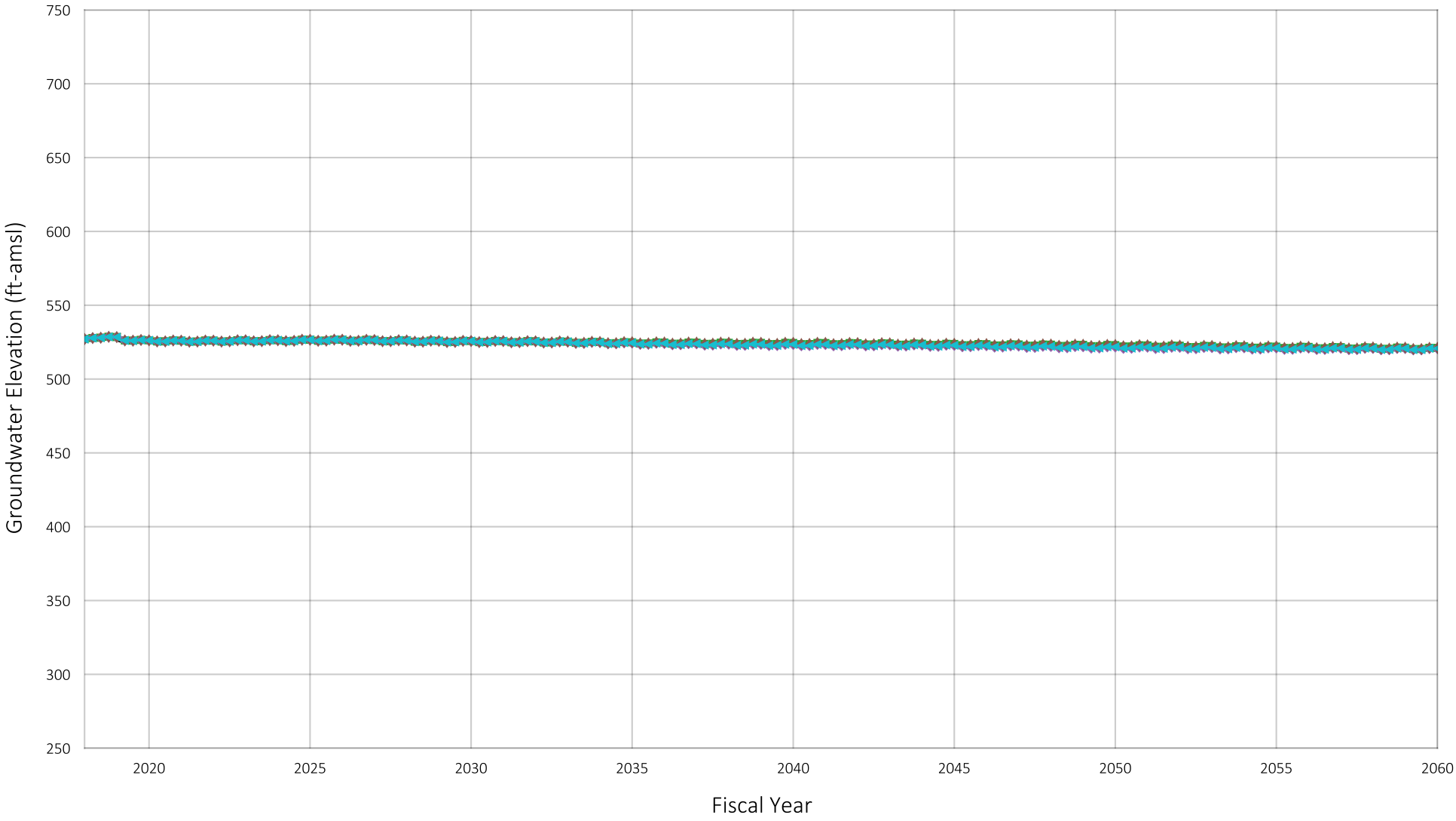
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Projected Groundwater Elevation
Well ID#: 1206960
Owner: Chino Basin Desalter Authority
Well Name: I-15

Figure A-153

Prepared by:

WEST YOST
Water. Engineered.




Location of Well in Chino Basin



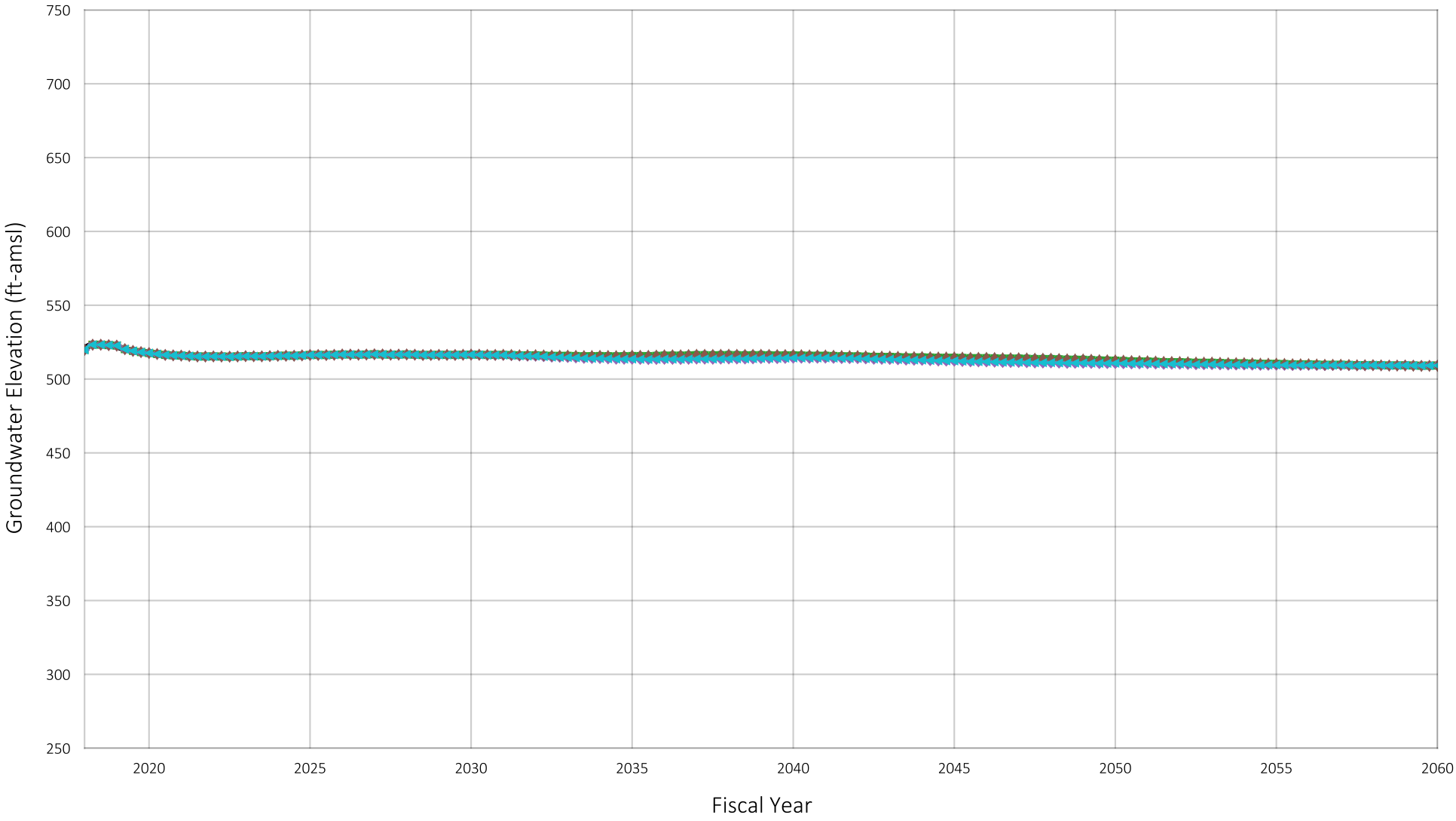
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1222970
Owner: Chino Basin Desalter Authority
Well Name: I-16

Figure A-154




Location of Well in Chino Basin



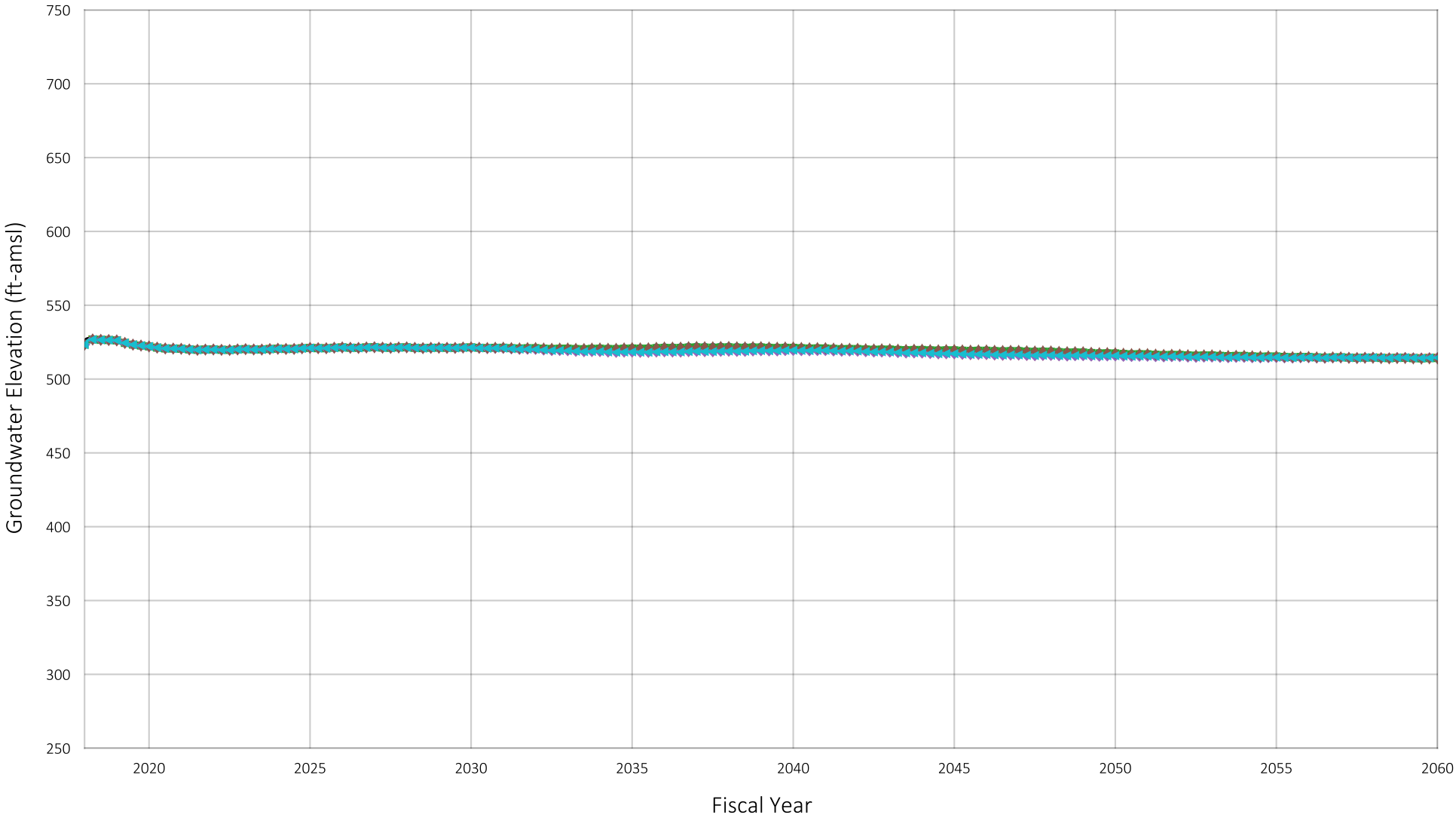
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1224801
Owner: Chino Basin Desalter Authority
Well Name: I-20

Figure A-155




Location of Well in Chino Basin



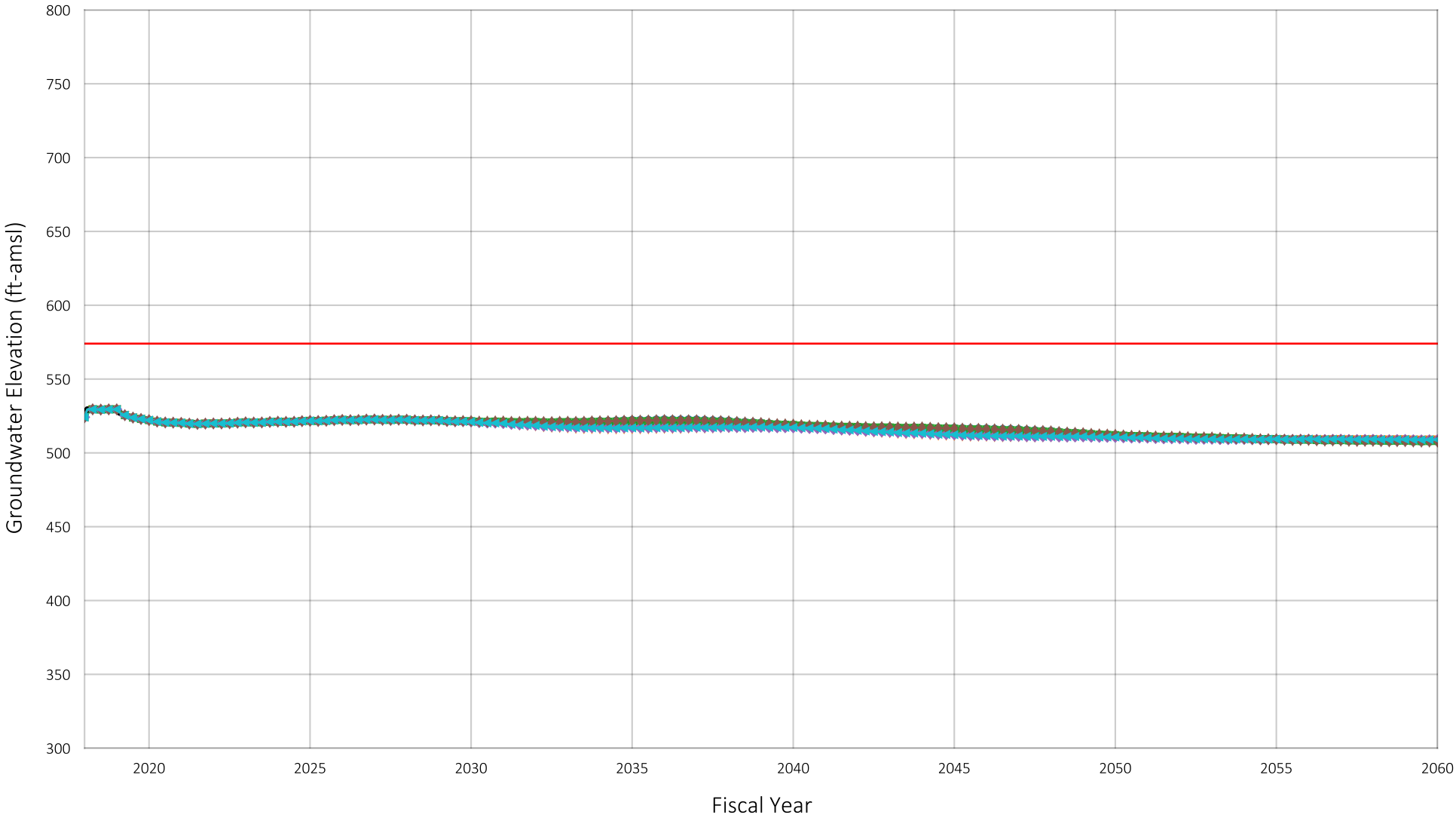
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1224812
Owner: Chino Basin Desalter Authority
Well Name: I-21

Figure A-156




Location of Well in Chino Basin



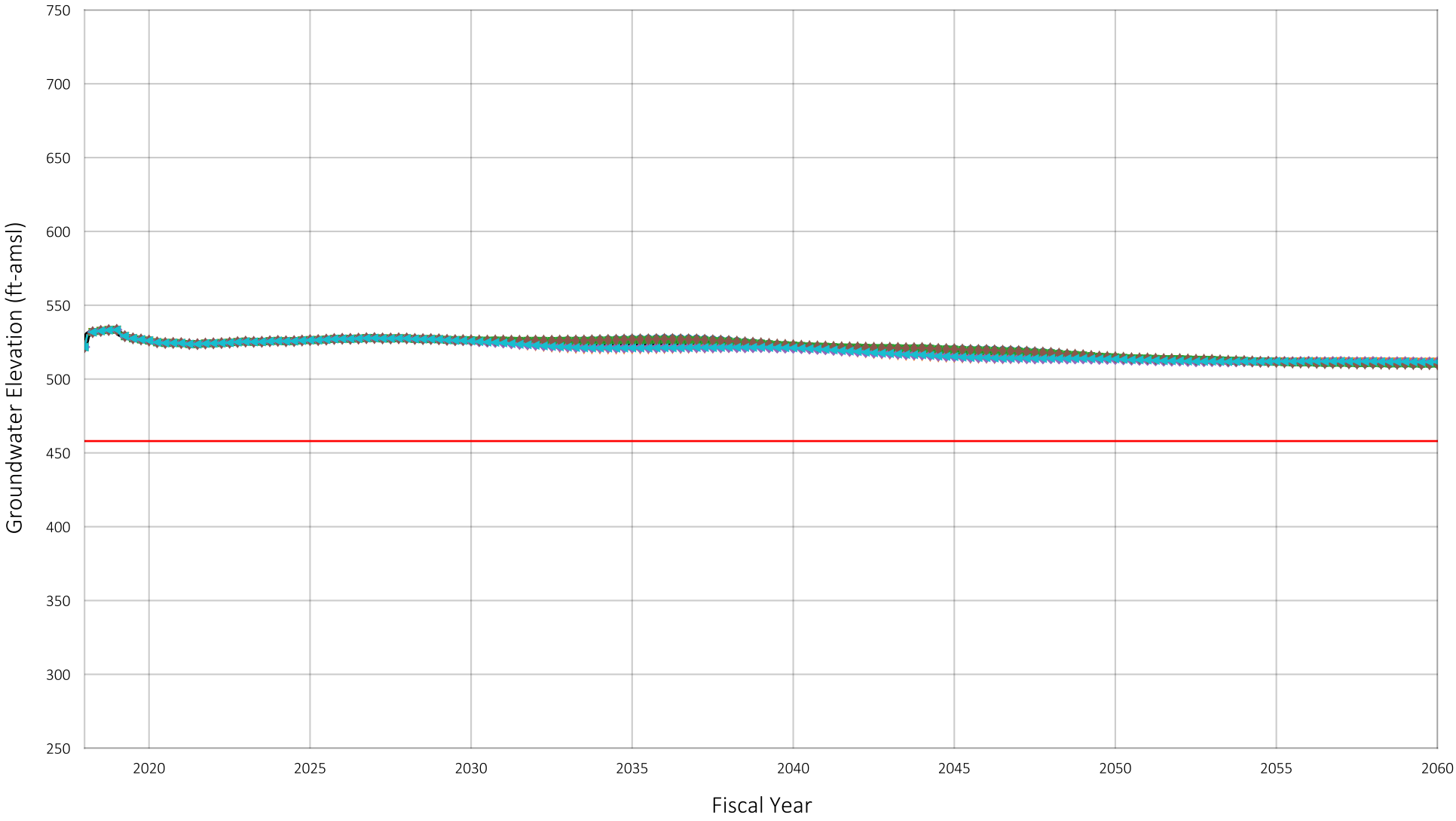
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206961
Owner: Chino Basin Desalter Authority
Well Name: II-1

Figure A-157




Location of Well in Chino Basin



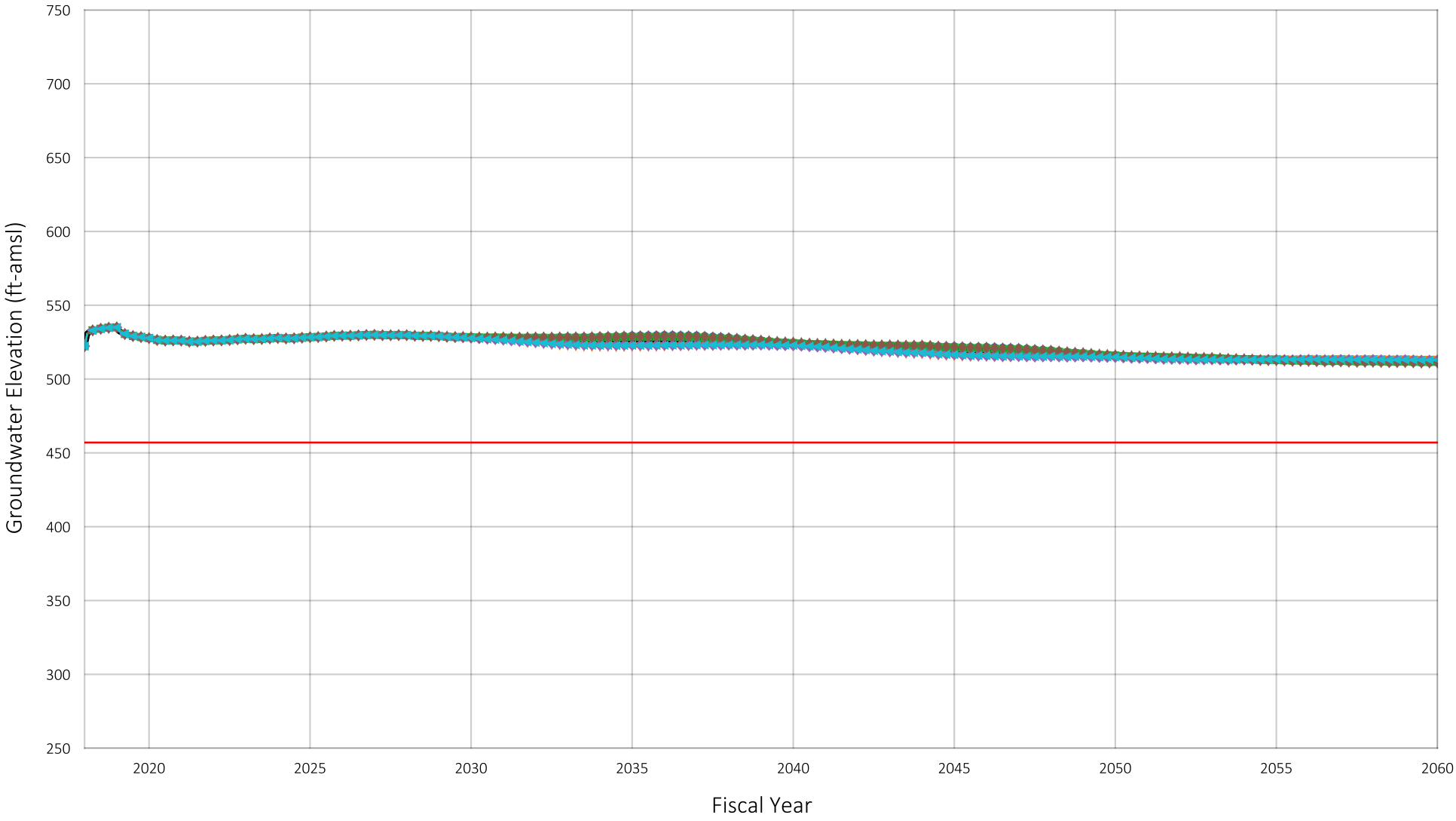
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206962
Owner: Chino Basin Desalter Authority
Well Name: II-2

Figure A-158




Location of Well in Chino Basin



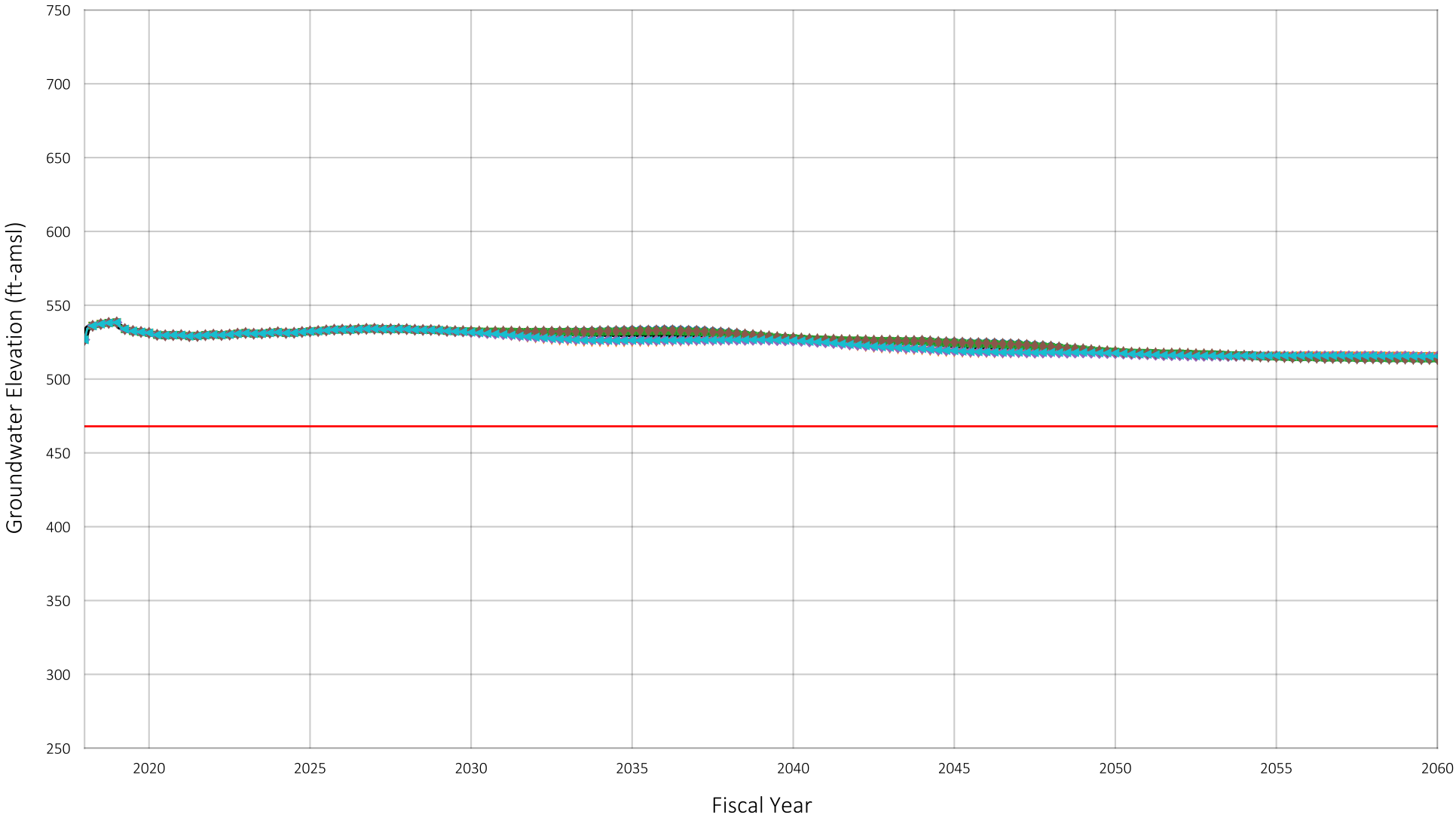
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206963
Owner: Chino Basin Desalter Authority
Well Name: II-3

Figure A-159




Location of Well in Chino Basin



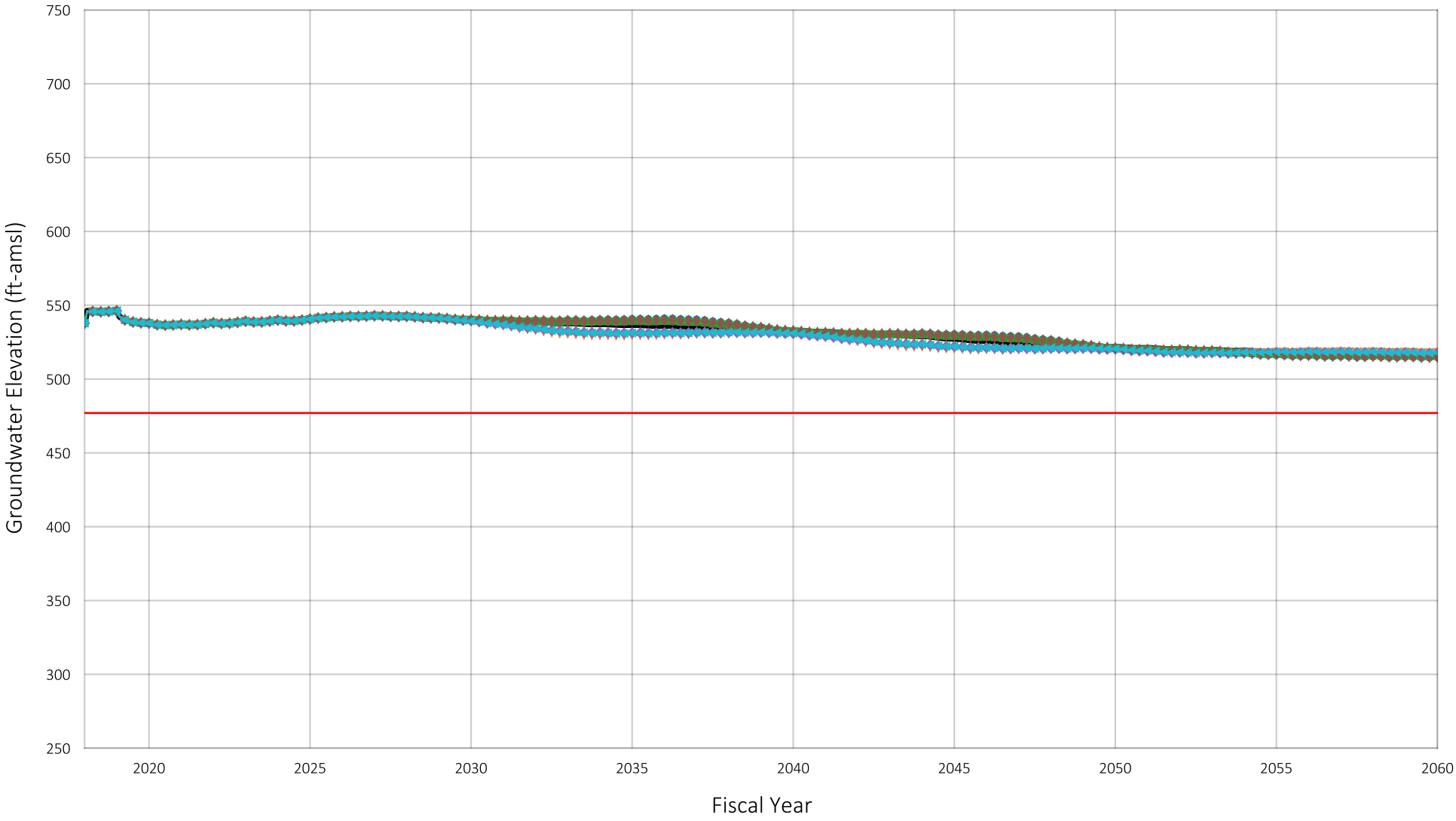
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206964
Owner: Chino Basin Desalter Authority
Well Name: II-4

Figure A-160




Location of Well in Chino Basin



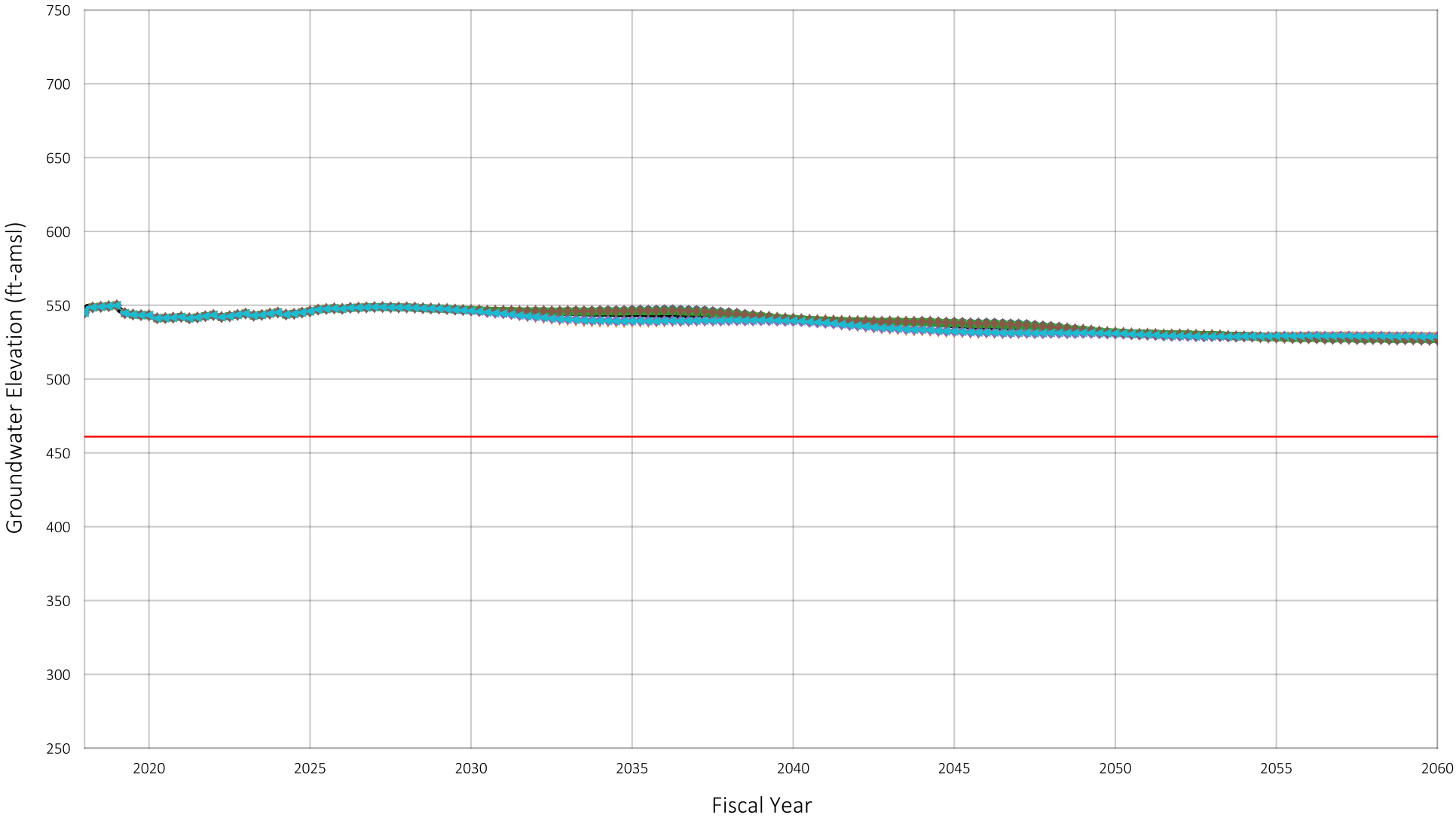
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206966
Owner: Chino Basin Desalter Authority
Well Name: II-6

Figure A-161




Location of Well in Chino Basin



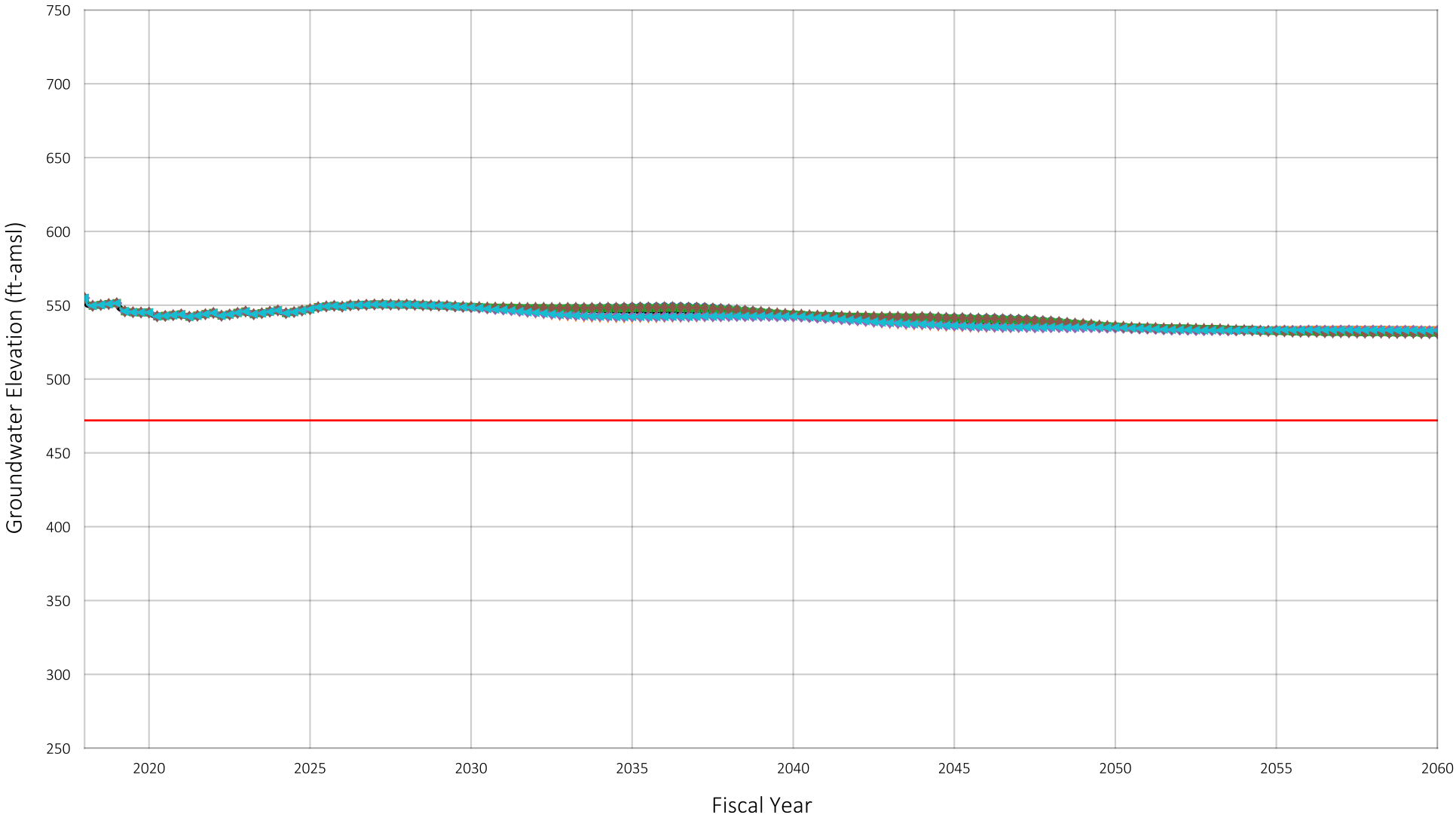
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206967
Owner: Chino Basin Desalter Authority
Well Name: II-7

Figure A-162




Location of Well in Chino Basin



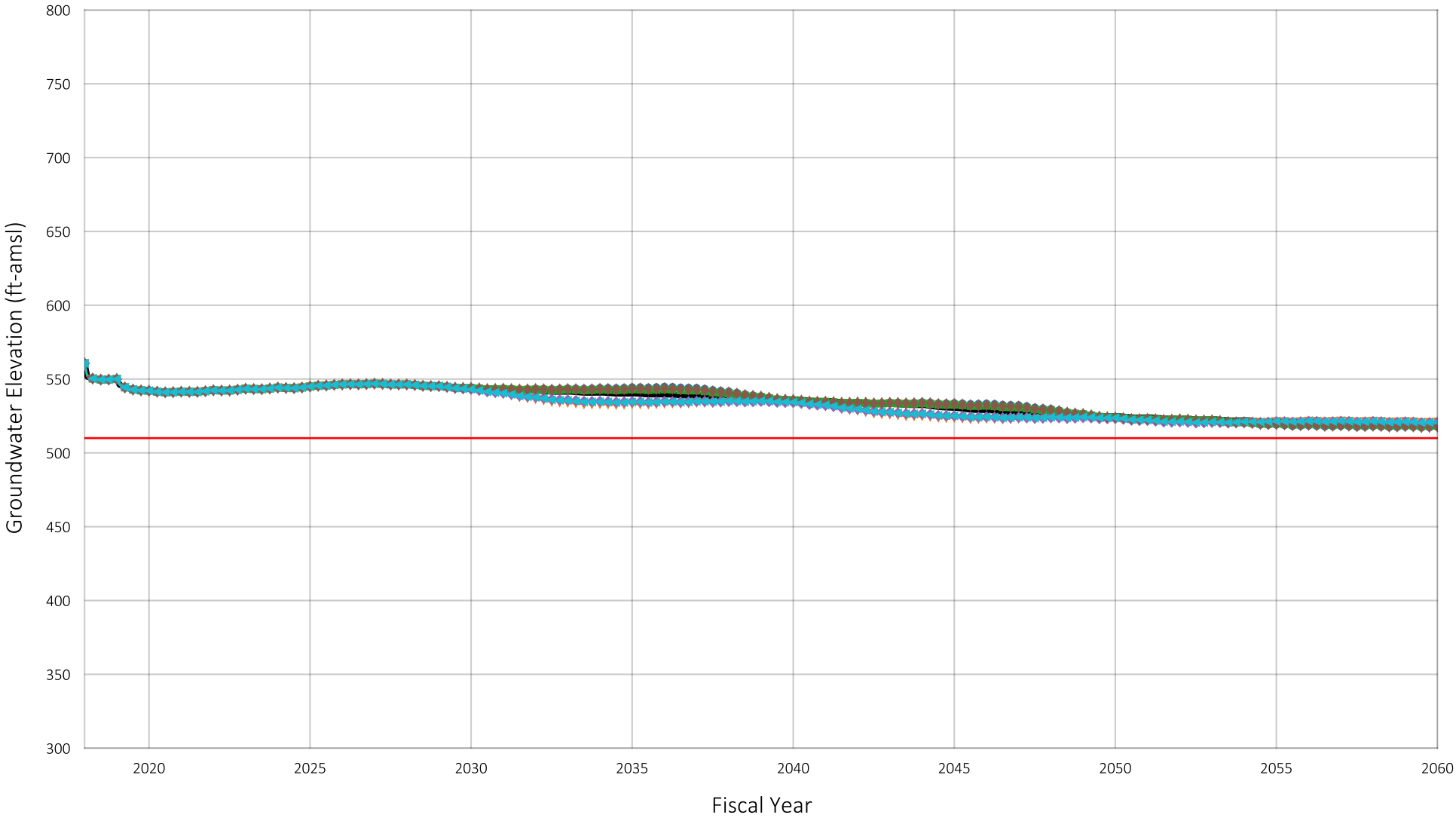
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206968
Owner: Chino Basin Desalter Authority
Well Name: II-8

Figure A-163




Location of Well in Chino Basin



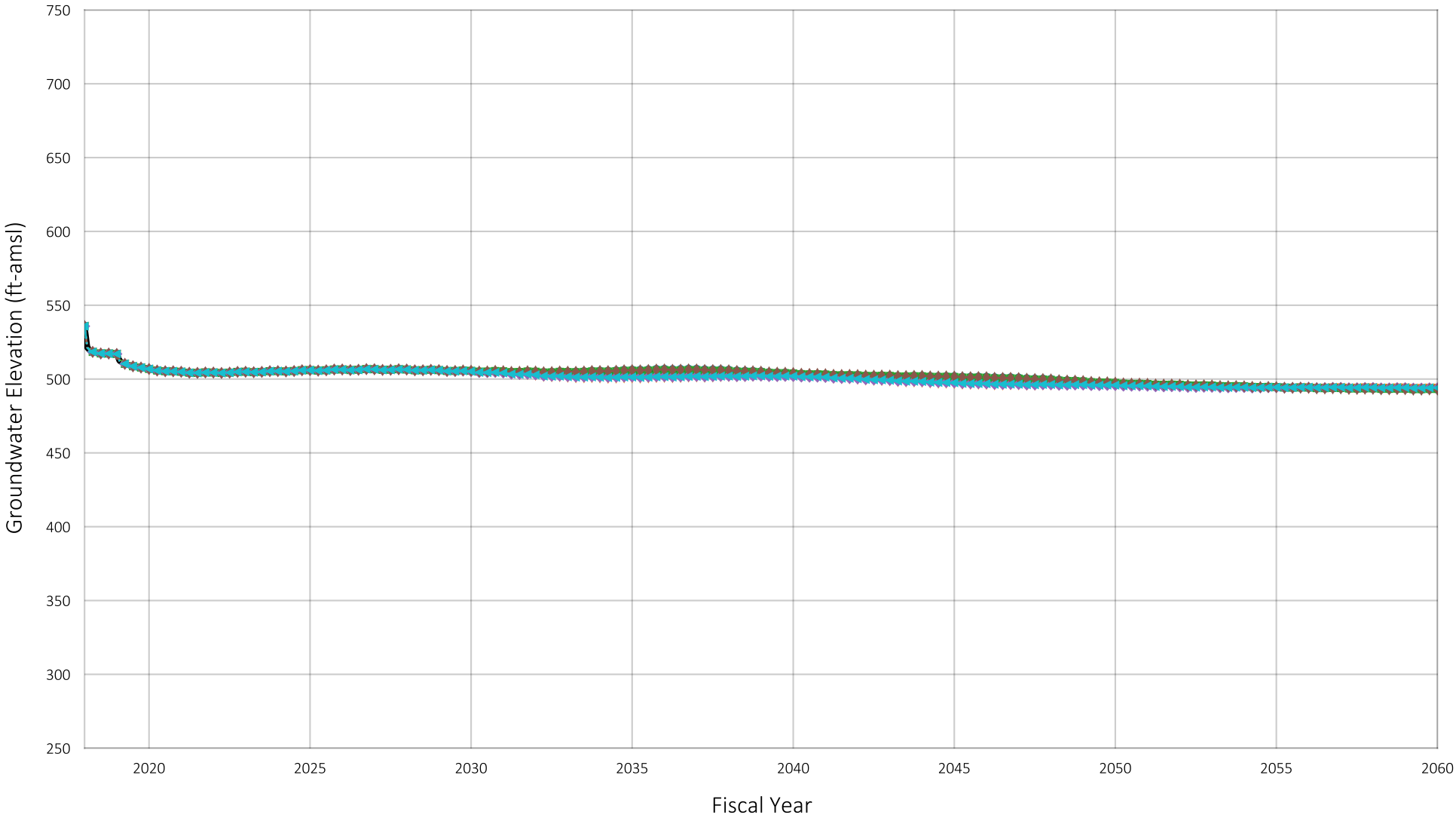
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Pumping Sustainability Metric Elevation

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1206969
Owner: Chino Basin Desalter Authority
Well Name: II-9A

Figure A-164




Location of Well in Chino Basin



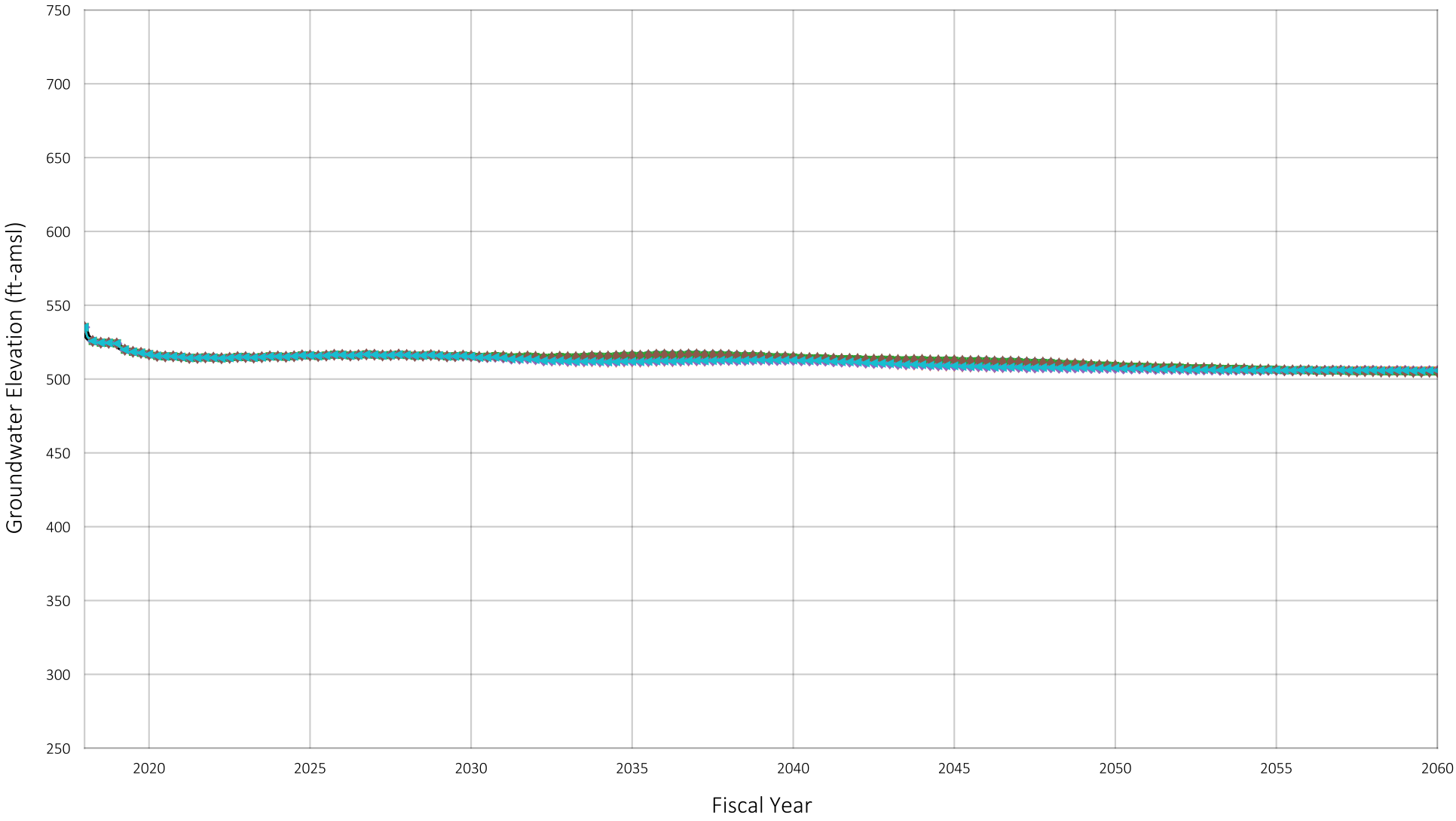
Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

WEST YOST
Water. Engineered.

Projected Groundwater Elevation
Well ID#: 1234064
Owner: Chino Basin Desalter Authority
Well Name: II-10

Figure A-165




Location of Well in Chino Basin



Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6

Prepared by:

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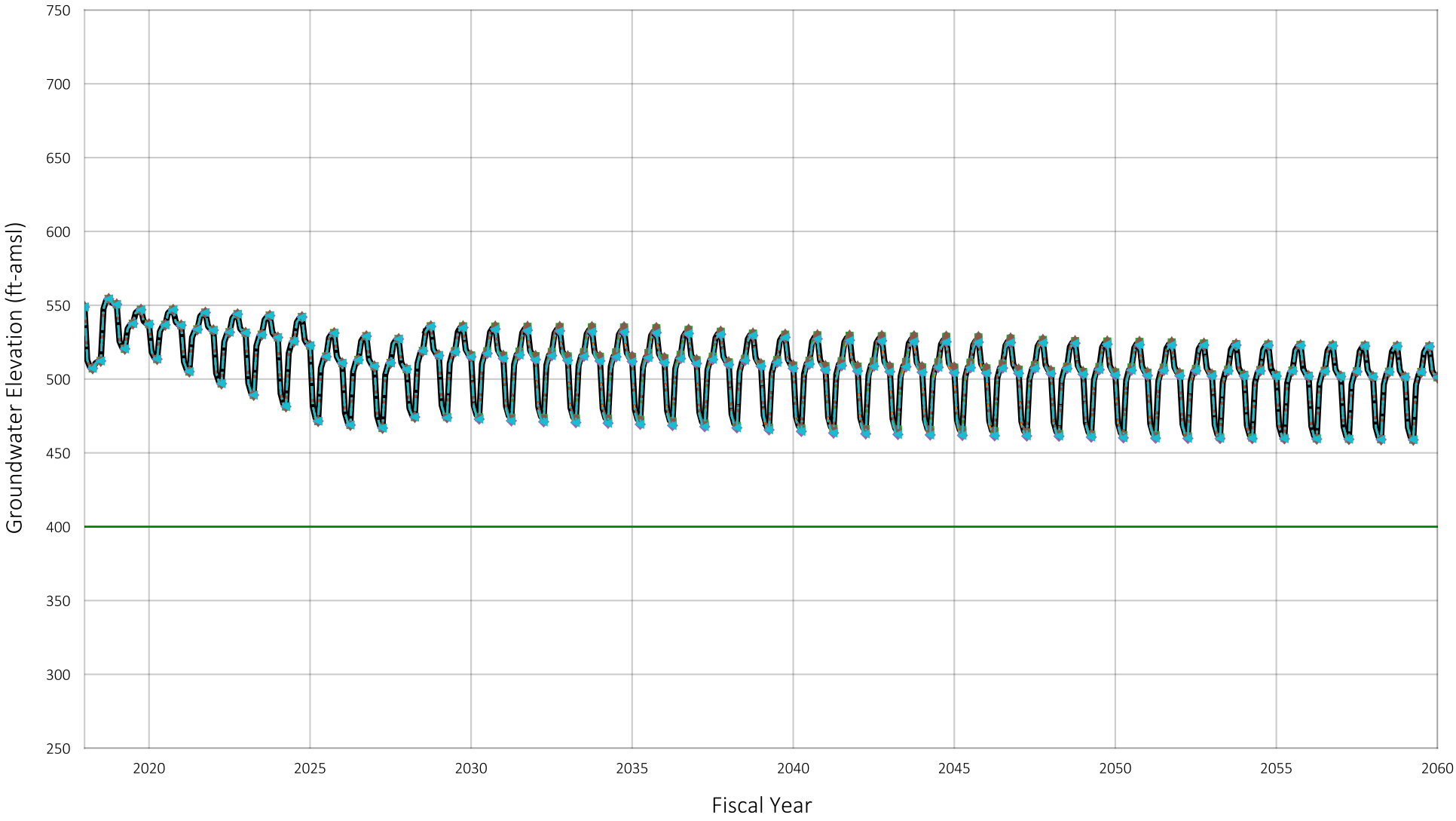
Projected Groundwater Elevation
Well ID#: 1234065
Owner: Chino Basin Desalter Authority
Well Name: II-11

Figure A-166




Location of Well in Chino Basin



Baseline
Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
New Land Subsidence Elevation

Projected Groundwater Elevation
Well ID#: 1206952
Owner: Chino Basin Water Master
Well Name: AP-PA/7

Figure A-167

Prepared by:

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October 15, 2021

Project No.: 941-80-21-69
SENT VIA: EMAIL

Liza Muñoz, PE
Senior Engineer
Inland Empire Utilities Agency
Chino, CA 91708

**SUBJECT: Addendum to the Evaluation of the Chino Basin Program/ Water Storage Investment Program**

Dear Ms. Muñoz:

West Yost performed a hydrologic evaluation of the Chino Basin Program (CBP) for the Inland Empire Utilities Agency (IEUA). The evaluation utilized model runs of the Chino Valley Model (CVM) and was documented in the technical memorandum (TM) *Evaluation of the Chino Basin Program/Water Storage Investment Program* (referenced herein as the Main TM).

Thereafter, IEUA requested that West Yost perform additional evaluations of certain hydrologic, biologic, and water-quality impacts that could be attributable to the diversion of wastewater discharge that would serve as the source water under CBP operations. The work included: (i) performing additional modeling of the CBP scenarios to characterize potential impacts on flow in the Santa Ana River (SAR) and the riparian habitat in Prado Basin; (ii) providing commentary on model uncertainty as it applies to the evaluation of the CBP; and (iii) estimating the impacts of the CBP scenarios on TDS concentrations in the SAR.

This letter documents the results of these additional evaluations, which will be used by the IEUA to assess the feasibility of the CBP and support its subsequent environmental review pursuant to the California Environmental Quality Act.

## DESCRIPTION OF BASELINE AND DIVERSION SCENARIO ASSUMPTIONS

The impacts of the wastewater diversions necessary to facilitate the CBP are evaluated relative to a baseline scenario, which is identical to the baseline scenario described in the Main TM, except as noted below. The CBP is assumed to operate from January 1, 2029 through December 31, 2053 (referenced herein as the program period). During the program period, up to 17,000 acre-feet per year (afy) of wastewater is planned to be routed through an Advanced Water Purification Facility (AWPF), resulting in up to 15,000 afy of water for artificial recharge at CBP injection wells. The source of the wastewater is assumed to be effluent from multiple wastewater treatment plants that is currently discharged to the SAR or its tributaries or directly reused in the Chino Basin.

Figure 1 shows the boundary of the Chino Basin portion of the CVM, the modeled locations of wastewater discharge, and the boundary of the Prado Basin Groundwater Management Zone (PBMZ). The wastewater discharge locations shown in red are where the discharge is reduced in the CBP diversion scenarios. Table 1 below summarizes the assumptions for wastewater discharge under the baseline scenario and the CBP diversion scenarios for fiscal years (FYs) 2030 and 2040. The IEUA provided monthly estimates for the wastewater discharges in the CBP diversion scenarios. All wastewater discharges were assumed constant after 2040.

**Table 1. Wastewater Discharge Assumptions for the CBP Diversion Baseline and CBP Diversion Scenarios[1], afy**

| Agency | Facility/ Discharge Point | Baseline | | CBP Diversion Scenarios | | Baseline minus CBP Diversion Scenarios | |
|---|---|---|---|---|---|---|---|
| | | 2030 | 2040 | 2030 | 2040 | 2030 | 2040 |
| IEUA | 001 (Prado) | 1,569 | 1,569 | 1,151 | 1,151 | 418 | 418 |
| IEUA | 002 (Cucamonga Creek) | 9,079 | 9,079 | 3,637 | 3,637 | 5,443 | 5,443 |
| IEUA | RP-5 (Chino Creek) | 2,802 | 2,802 | 1,519 | 1,519 | 1,283 | 1,283 |
| IEUA | CCWRF (Chino Creek) | 3,587 | 3,587 | 737 | 737 | 2,850 | 2,850 |
| | Subtotal (IEUA) | 17,038 | 17,038 | 7,043 | 7,043 | 9,995 | 9,995 |
| SBMWD | RIX | 20,275 | 20,625 | 20,275 | 20,625 | 0 | 0 |
| City of Rialto | Rialto | 10,137 | 13,115 | 6,637 | 9,615 | 3,500 | 3,500 |
| City of Riverside | RWQCP | 26,604 | 25,221 | 26,604 | 25,221 | 0 | 0 |
| WRCRWA | WRCRWTP | 2,500 | 2,500 | 0 | 0 | 2,500 | 2,500 |
| City of Corona | WWTP #1 | 1,681 | 1,681 | 1,681 | 1,681 | 0 | 0 |
| | Subtotal (Non-IEUA) | 61,197 | 63,141 | 55,197 | 57,141 | 6,000 | 6,000 |
| | **Total** | **78,235** | **80,179** | **62,240** | **64,185** | **15,995** | **15,995** |

The only difference between the baseline scenario in the Main TM and for this evaluation is the increase of discharge at the Western Riverside County Recycled Water Treatment Plant (WRCRWTP) from zero to 2,500 afy (to accommodate the proposed diversions in this evaluation).

The CBP diversion scenarios are the six CBP planning scenarios documented in the Main TM but include the assumed wastewater diversions as shown in Table 1. The CBP diversion scenarios are called D1 through D6 and correspond to Scenarios 1 through 6 as documented in the Main TM. The CBP diversion scenarios will reduce wastewater discharges by about 16,000 afy compared to the baseline scenario throughout the program period. An additional 1,000 afy is necessary to facilitate the CBP and is assumed to come from reduced demand of wastewater for direct use.

[1] Acronyms are defined as follows: Recycling Plant No. 5 (RP-5); Carbon Canyon Water Recycling Facility (CCWRF); San Bernardino Municipal Water Department (SBMWD); Rapid Infiltration and Extraction Facility (RIX); Riverside Water Quality Control Plant (RWQCP); Western Riverside County Regional Wastewater Authority (WRCWRA); Western Riverside County Recycled Water Treatment Plant (WRCRWTP); Wastewater Treatment Plant (WWTP)

# PROJECTED IMPACTS ON SAR DISCHARGE AND RIPARIAN HABITAT

This section describes the impacts of Scenarios D1 through D6 on the discharge of the SAR at below Prado Dam and the riparian vegetation in the PBMZ compared to the baseline scenario.

## SAR Discharge at below Prado Dam

Figure 2 is a time series of the annual SAR discharge at below Prado Dam under the baseline scenario and CBP diversion scenarios D1 and D2. Of the six CBP diversion scenarios, D1 and D2 have the greatest and least discharge at below Prado Dam, respectively. The other four CBP diversion scenarios have discharges ranging between D1 and D2 and are omitted from Figure 2 for clarity. The average discharge at below Prado Dam during the program period under the baseline scenario is 167,400 afy, compared to 152,200 afy in D1 and 151,000 afy in D2.

The reductions in discharge of about 15,200 afy and 16,400 afy under scenarios D1 and D2, respectively, are caused by the reduced wastewater discharge and model-projected changes in groundwater/surface-water interactions in the PBMZ and the SAR. Scenario D1 includes the late call schedule for CBP operations, resulting in an increase in groundwater levels and reduced net recharge (see Scenario 1 in the Main TM). Most of this reduced net recharge is due higher groundwater levels that result in increased rising groundwater discharge to the SAR. This increase in rising groundwater offsets some of the reduced wastewater discharge—the reduced discharge in the SAR at below Prado Dam in scenario D1 (15,200 afy) is less than the average reduction in wastewater discharge (16,000 afy). Conversely, the early call schedule in scenario D2 results in lower groundwater levels and an increase in net recharge (see Scenario 2 in the Main TM). Scenario D2 results in a reduction in rising groundwater discharge to the SAR and a reduction in SAR discharge at Prado Dam (16,400 afy) that exceeds the average reduction in wastewater discharge (16,000 afy).

Pursuant to the SAR Judgment,[2] the IEUA and Western Municipal Water District (WMWD) are required to maintain a base flow[3] of 34,000 afy at Prado Dam for the foreseeable future. The discharges shown in Figure 2 represent the total of storm flow and base flow at Prado Dam. The differences in SAR discharge at below Prado Dam between the baseline scenario and the CBP diversion scenarios are almost entirely attributable to differences in base flow.

In addition to the wastewater discharges tributary to the SAR between Riverside Narrows and Prado Dam, the following sources of gain or loss influence the base flow in the SAR at Prado Dam:

- **Base Flow at Riverside Narrows**. The base flow at Riverside Narrows is determined by the SAR Watermaster each water year (WY) for the purpose of determining compliance with the SAR Judgment. SBMWD is required to maintain a base flow of 12,420 afy at Riverside Narrows for the foreseeable future. Over the period from WY 1971 through 2020, the average base flow at Riverside Narrows was about 43,000 afy. This base flow comprises

[2] Orange County Water District v. City of Chino, et al., Superior Court of the State of California for the County of Orange, 1969.

[3] Base Flow at Prado is defined in the SAR Judgment as "the portion of the total surface flow passing a point of measurement, which remains after deduction of Storm Flow, and … shall: (i) include any water caused to be delivered by [IEUA] or WMWD directly to OCWD, pursuant to its direction and control and not measured at the gages at Prado; (ii) exclude any nontributary water or reclaimed sewage water purchased by OCWD and delivered into the river upstream and which subsequently passes Prado, and (iii) exclude water salvaged from evapo-transpiration losses by OCWD on lands presently owned by it above Prado."

discharges from multiple wastewater treatment plants, including the City of Rialto's, which is planned to contribute about 3,500 afy to the CBP (see Table 1).

- **SAR Streambed Infiltration**. Downstream of the Riverside Narrows, streambed infiltration occurs in the SAR overlying the Chino Basin. Over the planning period, the CVM estimates streambed infiltration to fluctuate between 35,400 and 38,800 afy over all scenarios. This streambed infiltration comprises storm flow and base flow and causes reduced base flow in the SAR at Prado Dam.
- **Rising Groundwater Discharge**. Shallow groundwater can discharge to the SAR and its unlined tributaries in the southern Chino Basin and the northern Temescal Basin. This rising groundwater contributes to the base flow in the SAR at Prado Dam. Over the planning period, the CVM estimates the rising groundwater discharge to fluctuate between 14,100 and 16,400 afy over all scenarios.
- **Other minor sources of gains/losses**. This includes any wastewater discharges that infiltrate before reaching the SAR and dry-weather discharges tributary to the SAR.

MODFLOW-NWT (the groundwater and surface-water flow code used in the CVM) does not allow for the exact accounting of base flow and storm flow components. The planning hydrology used in the CVM is an expected-value monthly hydrology based on the period of 1950 through 2011 adjusted with climate change factors.[4] However, the simulated flows in the SAR at below Prado Dam in the summer months (July through September) can aid in understanding the impacts on the base flow under the conditions when wastewater allocated to direct use is maximized and the historical and planned discharges are generally at a minimum. This is consistent with the assumption used to determine compliance of the TDS water quality objectives in the Water Quality Control Plan for the Santa Ana River Basin[5] (Basin Plan), which assumes that August and September represent a base flow condition in the SAR. July is added to our analysis since the projected average discharge is almost identical to August and September, and some the projected wastewater discharges with the CBP diversions are zero in these months.

Figure 3 is a time series of the average projected discharge SAR discharge at below Prado Dam for July through September under the baseline scenario and CBP diversion scenarios D1 and D2. The average monthly discharge at below Prado Dam during the program period over the summer months under the baseline scenario is 5,200 acre-feet per month (afm), compared to 3,700 afm in D1 and 3,650 afm in D2. The minimum average summer discharge over all scenarios occurs in FY 2055 in D2, where the average monthly summer discharge is 3,570 afm. Extrapolated over the entire year, the minimum base flow would be 42,800 afy, 8,800 afy greater than the 34,000 afy base flow obligation. This suggests that the CBP diversions will not violate the base flow obligation under the assumptions incorporated into the CBP diversion scenario (e.g., expected-value hydrology, upstream wastewater discharges). Further analysis of the potential risk of the CBP diversion scenarios violating the SAR base flow obligation at Prado Dam would require simulating alternative hydrology and upstream wastewater discharges and is beyond the scope of this study.

[4] See Section 7 of the *2020 Safe Yield Recalculation Final Report* (WEI, 2020) for more information on assumptions used in the CVM planning scenario: link

[5] California Regional Water Quality Control Board, Santa Ana Region. (2011). *Water Quality Control Plan, Santa Ana River Basin (8)*. January 24, 1995 (Updated February 2008 and June 2011).

## Riparian Vegetation

The riparian vegetation in the Prado Basin is supported by a combination of shallow groundwater and streamflow. The reduction of discharge to the SAR and its tributaries in the CBP diversion scenarios can affect the extent and health of the riparian vegetation. The model-calculated evapotranspiration (ET) flux from groundwater in PBMZ[6] is used as a proxy for the health of the riparian habitat.

Figure 4 is a time series of the annual ET in the PBMZ for the baseline scenario and CBP diversion scenarios D1 and D2. Of the six CBP diversion scenarios, D1 and D2 have the greatest and least ET in the Prado Basin, respectively. The other four CBP diversion scenarios have ET ranging between D1 and D2 and are omitted from Figure 4 for clarity. The average ET in the PBMZ during the program period in the baseline scenario is 14,150 afy, compared to 14,110 afy in scenario D1 and 14,080 afy in scenario D2. The maximum difference in ET between the baseline and CBP scenarios is 70 afy, which is less than 0.5 percent of the average ET over the period. Therefore, the CBP diversion scenarios are projected to have a negligible impact on the riparian habitat in the PBMZ. Note that the CVM calculates ET as a function of the depth to saturated groundwater and therefore only simulates the effect of surface water changes on ET based on the effect of the surface water on groundwater. The CVM does not directly simulate the interaction of surface water and ET.

The IEUA participates in an existing monitoring and mitigation program for habitat in the Prado Basin[7] pursuant to the Peace II Agreement that is currently set to expire in 2030. The IEUA may consider a similar monitoring and mitigation program (or a continuation of the existing monitoring and mitigation program) to address any potential adverse impacts to riparian habitat due to the CBP.

## Summary

The reductions in SAR discharge at below Prado Dam due to the CBP diversion scenarios range from 15,200 afy to 16,400 afy over the program period, a reduction of about 9.1 to 9.8 percent of total projected discharge under the baseline scenario. Based on the assumptions incorporated into the CBP diversion scenarios, the reductions in SAR discharge at below Prado Dam will not cause a violation of the base flow obligation at Prado.

Reductions in ET in the PBMZ due to the CBP diversion scenarios range from 40 to 70 afy, or less than 0.5 percent of the projected ET under the baseline scenario.

# MODEL UNCERTAINTY IN THE CVM

The CVM was originally used to calculate the Safe Yield of the Chino Basin pursuant to the Court-ordered methodology (WEI, 2020). Two major types of uncertainty are inherent in the CVM: 1) uncertainty in the parameterization of the model domain developed through calibration and 2) uncertainty in the future cultural conditions used in the projection scenario, which serves as the foundation for the baseline scenario to which the CBP operations are compared.

[6] See Section 5.2.6.5 of the *2020 Safe Yield Recalculation Final Report* for more information on ET in the CVM.

[7] The *2016 Adaptive Management Plan for the Prado Basin Habitat Sustainability Program* can be found here: link

As documented in the *2020 Safe Yield Recalculation Final Report* (WEI, 2020), the CVM is a well-calibrated model. The parameters and representation of the domain in the CVM are only one of multiple combinations of parameters that would result in a calibrated model. Given the high degree of calibration of the CVM, the independent peer-review process that supported the Court's approval of the CVM, and the Watermaster Engineer's extensive experience working in the Chino Basin, the Watermaster and the Watermaster Engineer have a high degree of confidence in the use of the CVM to estimate the Safe Yield and evaluate the potential for MPI and adverse impacts of proposed Storage and Recovery Programs including the CBP.

Predictive uncertainty in the CVM is primarily driven by estimates of future pumping, artificial recharge, and the deep infiltration of precipitation and applied water. The planning data used in the CVM is based on the best-available planning data when the CVM was developed. Pursuant to the April 28, 2017 Court Order, Watermaster is required to collect data annually to evaluate changes in cultural conditions. If the data indicate that changes in cultural conditions are significant, then Watermaster is required to update its model (i.e., the CVM) to project the response of the Chino Basin to update the Safe Yield. It is within this process that Watermaster will evaluate the Storage and Recovery Program application that the IEUA is required to submit prior to initiation of the construction and operations of the CBP.

## PROJECTED IMPACTS ON TDS CONCENTRATION IN THE SAR

The water quality of the SAR is regulated pursuant to the Basin Plan. The Basin Plan contains TDS concentration objectives for the SAR and a plan to manage TDS concentrations to achieve these objectives. Figure 1 shows the location of the SAR, its regulatory reaches as specified in the Basin Plan, and wastewater discharge locations specifying where discharge is planned to be reduced to supply water for the CBP.

Reach 3 of the SAR runs from Mission Boulevard in Riverside to Prado Dam. The primary components of stream discharge in Reach 3 include storm discharge (i.e., runoff resulting from rainfall), non-tributary discharge (e.g., imported water or other water originating from outside the watershed), and base flow. Base flow comprises dry-weather runoff, rising groundwater, and wastewater discharge from Publicly Owned Treatment Works (POTWs).[8]

The Basin Plan specifies a TDS objective of 700 milligrams per liter (mgl) for the base flow in Reach 3 of the SAR. Compliance is determined based on the TDS concentration of the SAR at below Prado Dam in August and September. The influence of storm flow and non-tributary flow is at a minimum during these months, and the flow in the SAR is assumed to be entirely base flow.

The CVM does not simulate surface-water quality. To determine the potential impacts of the wastewater diversions for CBP operations on TDS in the SAR, a simple mass-balance analysis was conducted using historical TDS and discharge data. This analysis is documented below.

[8] See footnote 3 for the SAR Judgment definition of base flow at Prado.

## Methodology

This analysis employed a mass-balance analysis like that conducted for the Basin Monitoring Program Task Force in 2015 to characterize the causes of TDS concentrations in Reach 3 that were exceeding the Reach 3 TDS objective.[9]

First, West Yost compiled available discharge and associated TDS data for the historical period from FY 2004 through FY 2020 at the POTW discharge points shown in Figure 1 and two of the stream gages operated by the United States Geological Survey: SAR at below Prado Dam and the SAR at MWD Crossing. Other inflows and outflows for Reach 3 of the SAR were either not measured (e.g., rising groundwater, streambed recharge, evapotranspiration) or have limited available data (e.g., data from the Reach 3 tributaries in the Chino Basin). These other inflows and outflows were aggregated into a residual term (Residual) and estimated from a mass-balance equation. To limit the influence of storm flow, only the summer months (July through September) were analyzed. The combined datasets from the POTW monitoring and the USGS stream gages were used to calculate the discharge and TDS concentration of the Residual by solving the following mass-balance equations:

$$Q_P = Q_X + Q_{RIV} + Q_{C1} + Q_{C3} + Q_{RC} + Q_{RP} + Q_{CC} + Q_{R5} + Q_{WR} + R_Q \quad (1)$$

$$Q_P * C_P = (Q_X * C_X) + (Q_{RIV} * C_{RIV}) + (Q_{C1} * C_{C1}) + (Q_{C3} * C_{C3}) + (Q_{RC} * C_{RC}) + (Q_{RP} * C_{RP}) + (Q_{CC} * C_{CC}) + (Q_{RP5} * C_{RP5}) + (Q_{WR} * C_{WR}) + (R_Q * R_C) \quad (2)$$

Where:

- Q = discharge (acre-feet per month [afm])
- C = TDS concentration (mgl)
- $R_Q$ = calculated Residual discharge (afm)
- $R_C$ = calculated TDS concentration of the Residual discharge (mgl)

The subscripts refer to the stream gages and POTW discharge locations as follows:

- P = SAR below Prado Dam (USGS station 11074000)
- X = Santa Ana River at MWD Crossing (USGS station 11066460)
- RIV = Riverside Regional Water Quality Control Plant - DP-001
- C1 = Corona Wastewater Treatment Plant No. 1B
- C3 = Corona Wastewater Treatment Plant No. 3
- RC = IEUA effluent from Regional Water Recycling Plant No. 1 to Cucamonga Creek
- RP = IEUA effluent from Regional Water Recycling Plant No. 1 to Prado Basin
- CC = IEUA effluent from Carbon Canyon Water Reclamation Facility (CCWRF) to Chino Creek
- RP5 = IEUA effluent from Regional Water Recycling Plant No. 5 to Chino Creek
- WR = Western Riverside County Regional Wastewater Treatment Plant - DP-001

[9] WEI, 2015. Investigation and Characterization of the Cause(s) of Recent Exceedances of the TDS Concentration Objective for Reach 3 of the Santa Ana River. Prepared for the Basin Monitoring Program Task Force.

The mass-balance equations were solved for each of the summer months over the period. At each measured discharge point in Equation 1, monthly discharge was estimated by averaging the daily discharges during days that had TDS measurements and applying the daily average across the days with nonzero discharge. The monthly volume-weighted TDS was calculated over the days with concurrent TDS and discharge measurements. 2011 was not evaluated due to the influence of the imported water discharged to San Antonio Creek at OC-59 for the Orange County Water District. The monthly discharge and TDS calculated at below Prado Dam based on historical data is meant to represent the baseline condition.

Second, to estimate the impacts of the CBP diversion scenarios on the TDS concentration of the SAR at below Prado Dam, the historical wastewater discharges were reduced to remove the projected monthly CBP diversions of wastewater (see Table 1). Table 2 below summarizes the projected monthly (July through September) wastewater discharges for the five discharge points where the discharge was assumed to be reduced due to implementation of the CBP. The projected wastewater discharge for the baseline and the CBP diversion scenario were provided by the IEUA.

**Table 2. Recycled Water Discharge Assumptions for Baseline and CBP Diversion Scenarios - July, August, and September, af**

| Scenario | Month | IEUA RP1, Cucamonga | IEUA RP1, Prado | IEUA CCWRF | IEUA RP5[(a)] | WRCRWTP |
|---|---|---|---|---|---|---|
| Baseline Discharge (2030) | July | 281 | 106 | 350 | 28 | 500 |
| | August | 237 | 119 | 238 | 26 | 500 |
| | September | 451 | 136 | 149 | 50 | 500 |
| Discharge with Diversions (2030) | July | 46 | 46 | 0 | 46 | 0 |
| | August | 46 | 46 | 0 | 46 | 0 |
| | September | 92 | 92 | 0 | 46 | 0 |
| Baseline minus Discharge with Diversions | July | 235 | 60 | 350 | -18 | 500 |
| | August | 191 | 73 | 238 | -20 | 500 |
| | September | 359 | 44 | 149 | 4 | 500 |

(a) The apparent increases in discharge at the RP5 outfall are due to a redistribution of discharge across months. As shown in Table 1, the annual RP5 discharge is projected to be reduced from 2,802 afy to 1,519 afy in 2030.

For July through September, the wastewater discharge at each of the five discharge locations listed in Table 1 was reduced using Equation 3:

$$Q_{reduced} = \min\left(Q_{hist}, \max[Q_{hist} - \Delta Q_{CBP}, Q_{div}]\right) \quad (3)$$

Where:

$Q_{reduced}$ = projected discharge after diversion

$Q_{hist}$ = historical discharge

$\Delta Q_{CBP}$ = volume of projected diversion (Baseline minus CBP diversion scenario in Table 1)

$Q_{div}$ = projected discharge in CBP diversion scenario

Equation 3 accommodates historical discharges that are far greater or less than what was assumed in the baseline scenario and results in reductions in historical discharge that are within the range of the assumptions in the modeled CBP diversion scenario. The monthly discharge and TDS calculated at below Prado Dam based on the projected discharge with diversions is meant to represent the CBP diversion scenario.

## Results

Table 3 shows the mass-balance calculation of the discharge and TDS concentration Residuals for the historical data without diversions. The negative discharge Residuals (column 10), calculated by solving Equation 1, indicate that there is a cumulative loss of water between the measured discharge points upstream of the SAR below Prado Dam (columns 1 through 9) and at the SAR below Prado Dam (column 11). The TDS concentration Residuals were calculated by solving Equation 2 and are shown in column 21. Three months of data (July 2006, July and August 2016) were removed from the analysis due to anomalous Residual values.

Table 4 shows the mass-balance calculation of the discharge and TDS concentration in the SAR at below Prado Dam with the assumed diversions. The discharge and TDS concentration Residuals were held constant from those calculated in Table 3, and Equations 1 and 2 were used to solve for the SAR discharge at below Prado Dam (column 11) and the TDS concentration of the SAR at below Prado Dam (column 24). Column 12 shows the change in discharge in the SAR at below Prado Dam due to the diversions after Equation 3 is applied (i.e., column 11 in Table 4 minus column 11 in Table 3). The change in discharge due to the diversions ranges from 740 to 1,140 afm, averaging about 930 afm. Column 13 expresses this change as a percentage. The reductions in discharge range from 3 percent to 28 percent compared to the historical discharge without diversions.

Column 24 shows the change in TDS concentration due to diversions (i.e., column 24 in Table 4 minus column 22 in Table 3). The changes in TDS concentration due to diversions range from -14 to +74 mgl. The percent change in TDS concentration due to diversions (column 26) ranges from -3.2 percent to +10.3 percent.

Figure 5 shows an annual comparison of the monthly average discharges and the volume-weighted TDS concentrations with and without diversions. This is meant to indicate the potential effects of the diversions for the CBP on the TDS at below Prado Dam. For every year, the volume-weighted TDS concentration is greater with diversions than without diversions. In 2010, 2012, 2017, and 2019, the diversions are projected to result in an exceedance of the SAR Reach 3 TDS objective of 700 mgl (shown in red on Figure 5). As shown on Figure 5, the volume-weighted annual TDS without diversions fluctuates between 560 (2005) and 720 mgl (2018), and the volume-weighted annual TDS with diversions fluctuates between 560 (2005) and 760 mgl (2018). Over the 15 years of data analyzed, the volume-weighted TDS without and with diversions is 623 and 636 mgl, respectively, an increase of 13 mgl. Over the period from 2012 through 2019, when wastewater discharges were generally lower than before 2011, the volume-weighted TDS without and with diversions is 660 and 692 mgl, respectively, an increase of 32 mgl.

## Summary

These results indicate that the diversions of wastewater for the CBP will, in most years, result in higher TDS concentrations in the SAR at below Prado Dam, potentially causing a violation of the Reach 3 TDS objective. In 4 out of the 15 years analyzed the diversions were projected to cause a violation of the Reach 3 TDS objective.

Assumptions were made to account for incomplete discharge and TDS data sets as discussed in the methodology. The calculated Residual is reported as one value in the mass-balance calculation. The Residual incorporates unknown and unmeasured gains or losses to the SAR between MWD Crossing and below Prado Dam that include rising groundwater, storm and dry-weather runoff, streambed infiltration and direct evaporation. Assuming that the discharge and TDS concentration Residuals are identical with and without diversions may overstate the impact of the diversions on the discharge and TDS concentrations in the SAR at below Prado Dam, since a reduction in wastewater discharge may reduce the amount of surface water losses (via streambed percolation or ET).

We appreciate the opportunity to assist the IEUA with this important work. Please contact me if you have any questions.

Sincerely,
WEST YOST

Garrett Rapp, PE
Associate Engineer II
RCE #86007

cc: Sylvie Lee, PE

Attachment(s): Figures 1 through 4; Tables 3 and 4

Chino and Temescal Basin Part of the Active CVM MODFLOW Domain

Groundwater Management Zone Boundaries

Prado Basin Groundwater Management Zone

Wastewater Discharge Point with Proposed Diversions for CBP

Other Wastewater Discharge Point used in TDS analysis

Discharge Point used in CVM Calibration

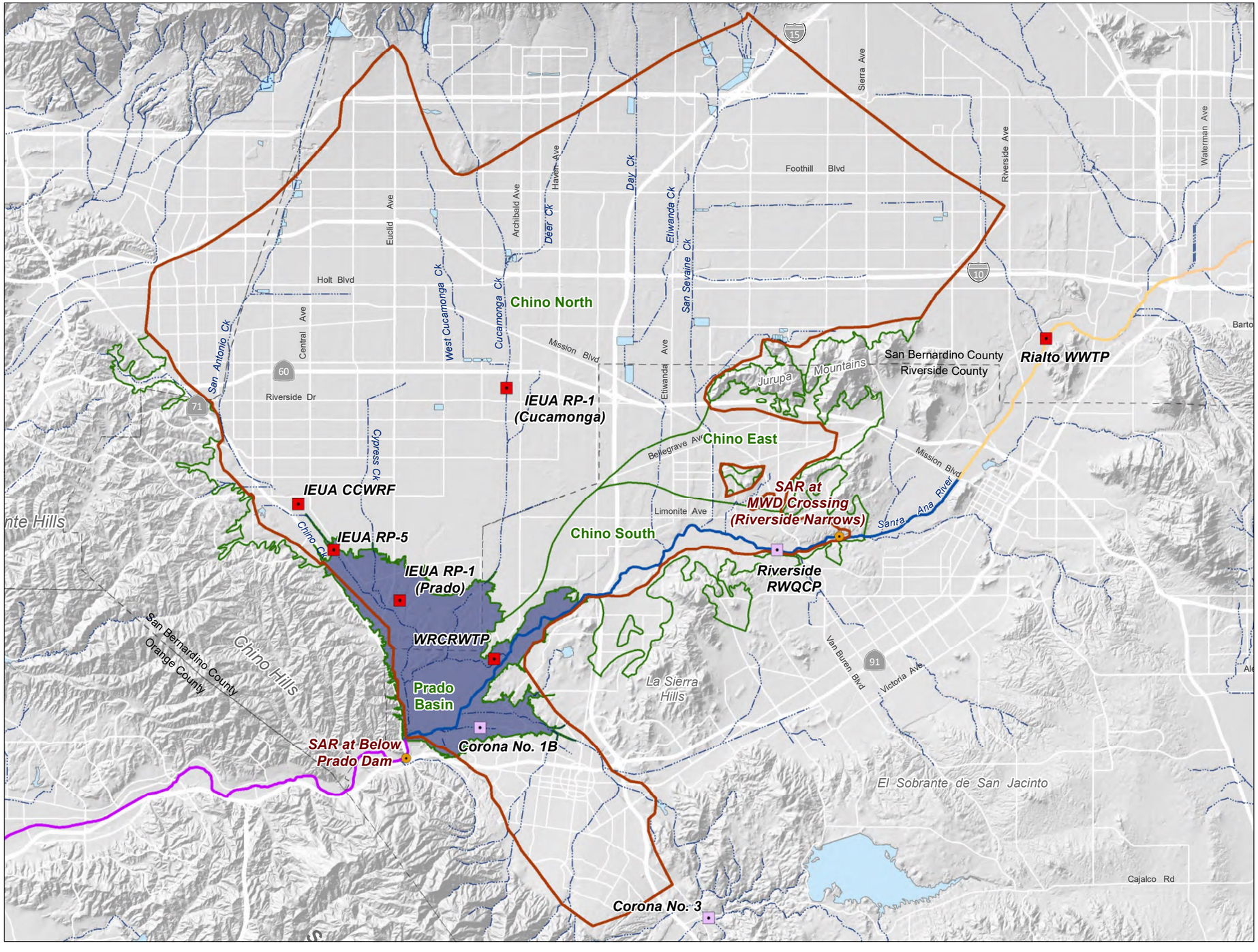
Santa Ana River Reach 2

Santa Ana River Reach 3

Santa Ana River Reach 4

Streams & Flood Control Channels

Flood Control & Conservation Basins







Prepared by:

WEST YOST

Author: GR
Date: 10/14/2021
File: Figure 1 Chino Basin.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

**Evaluation of the Chino Basin Program**

Prepared for:

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**Modeled Wastewater Discharge Points, Locations of Measured Discharge in the Santa Ana River, and Groundwater Management Zones in the Chino Basin**

**Figure 1**

Figure 2. Projected SAR Discharge Below Prado Dam under the CBP Diversion Baseline and CBP Diversion Scenarios

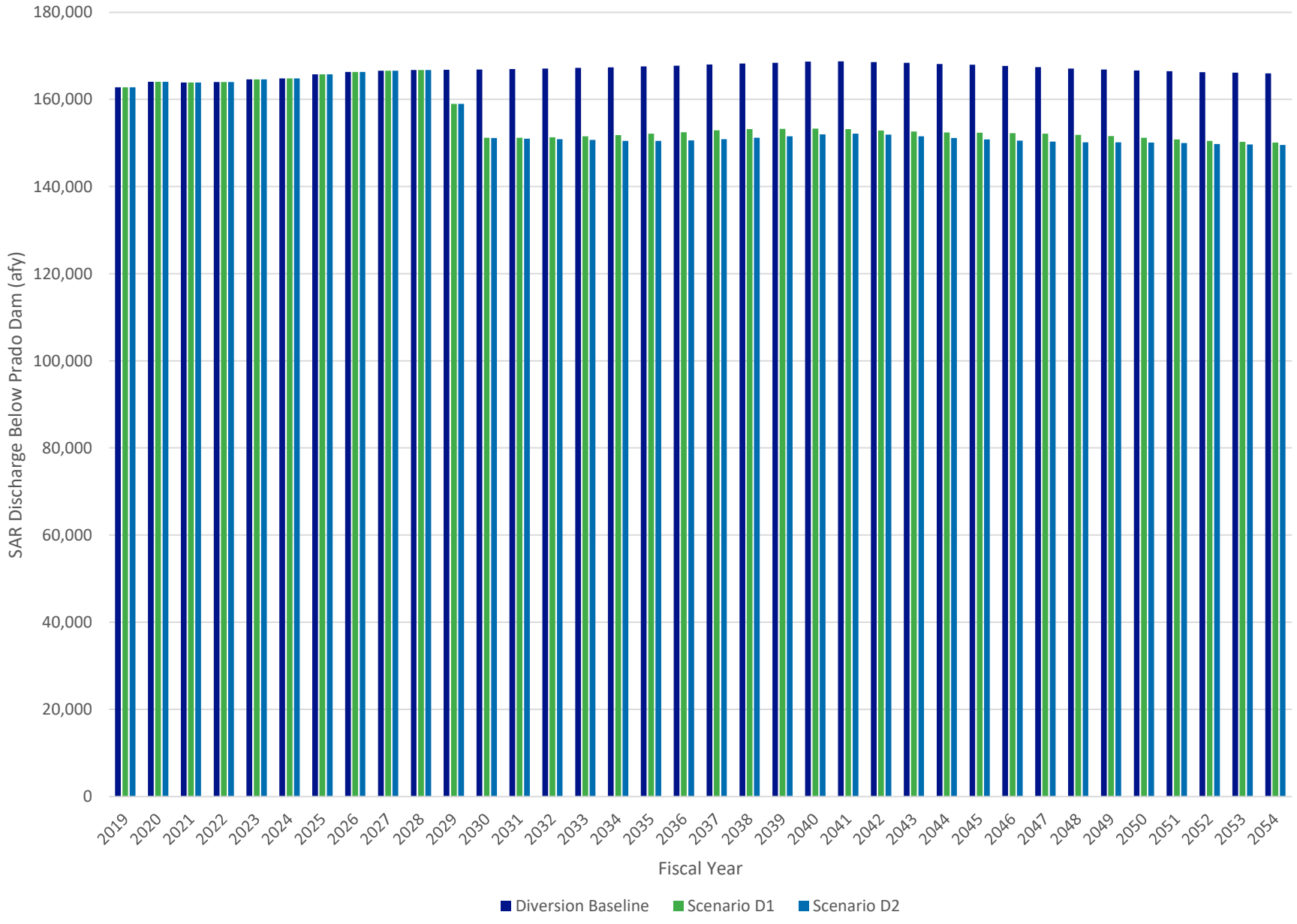


Figure 3. Projected Average Monthly Summer (July through September) SAR Discharge at Below Prado Dam under the CBP Diversion Baseline and CBP Diversion Scenarios

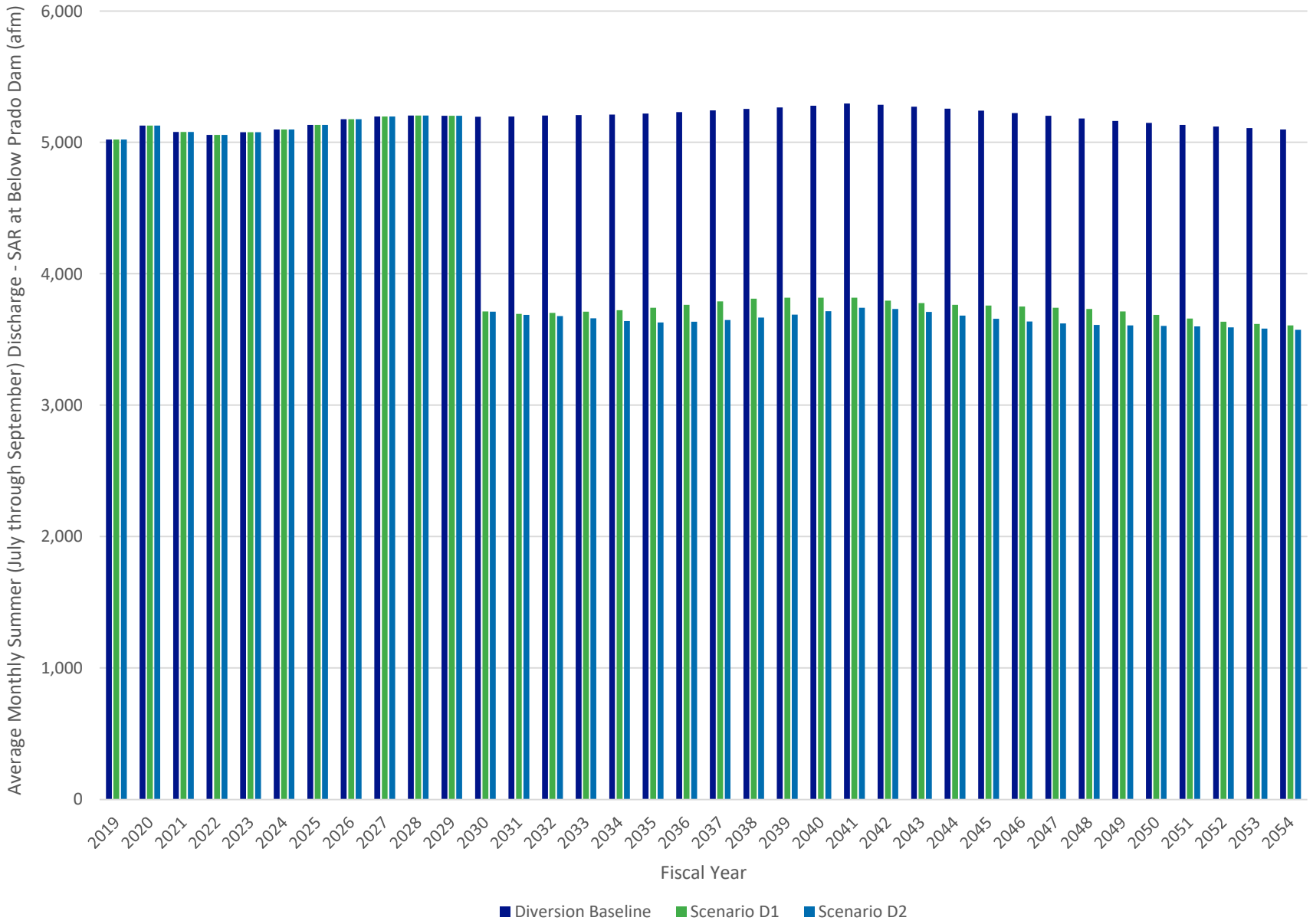


Figure 4. Projected ET in Prado Basin under the Baseline and CBP Diversion Scenarios

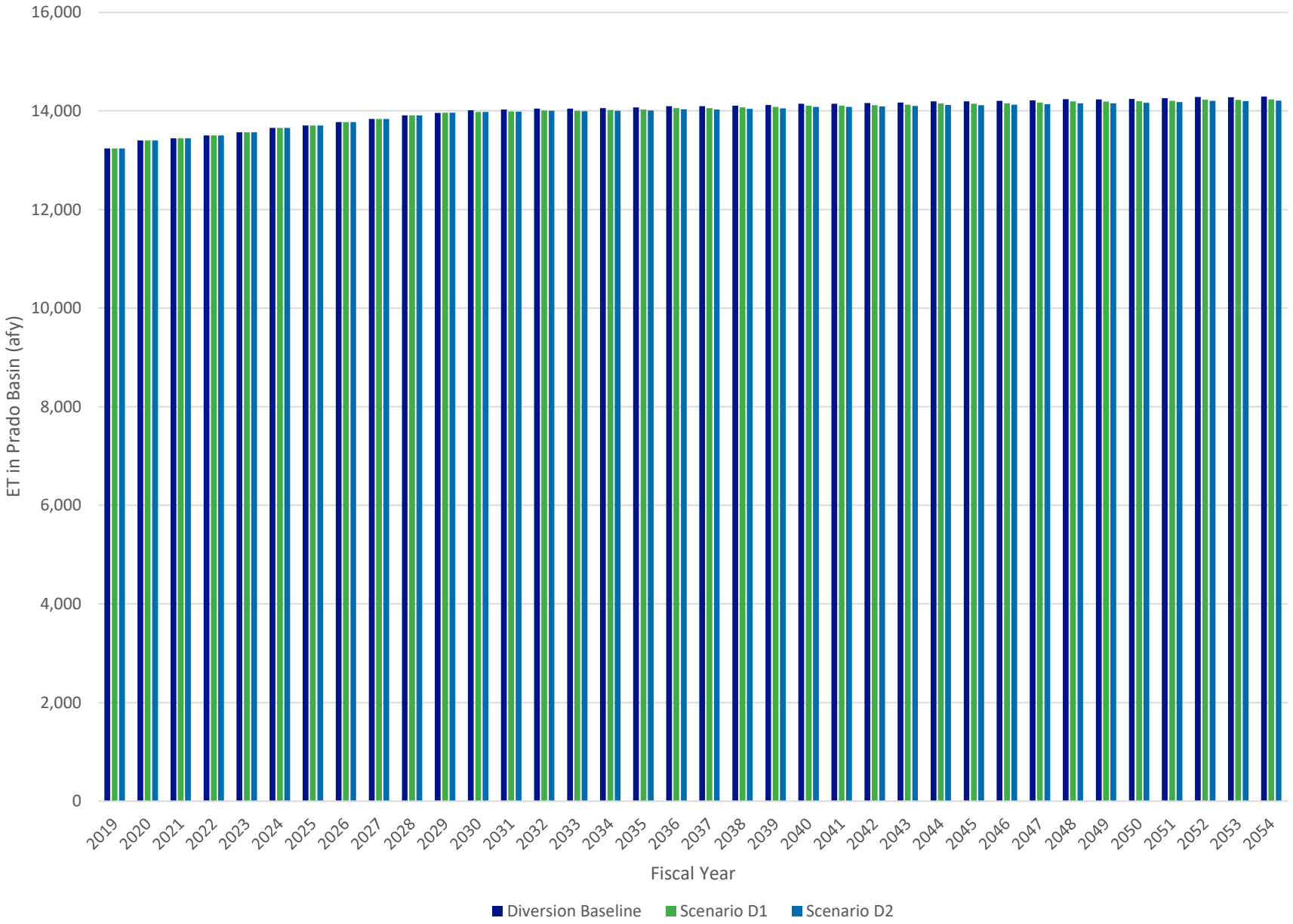


Figure 5. SAR Discharge and TDS at Below Prado Dam with and without Diversions

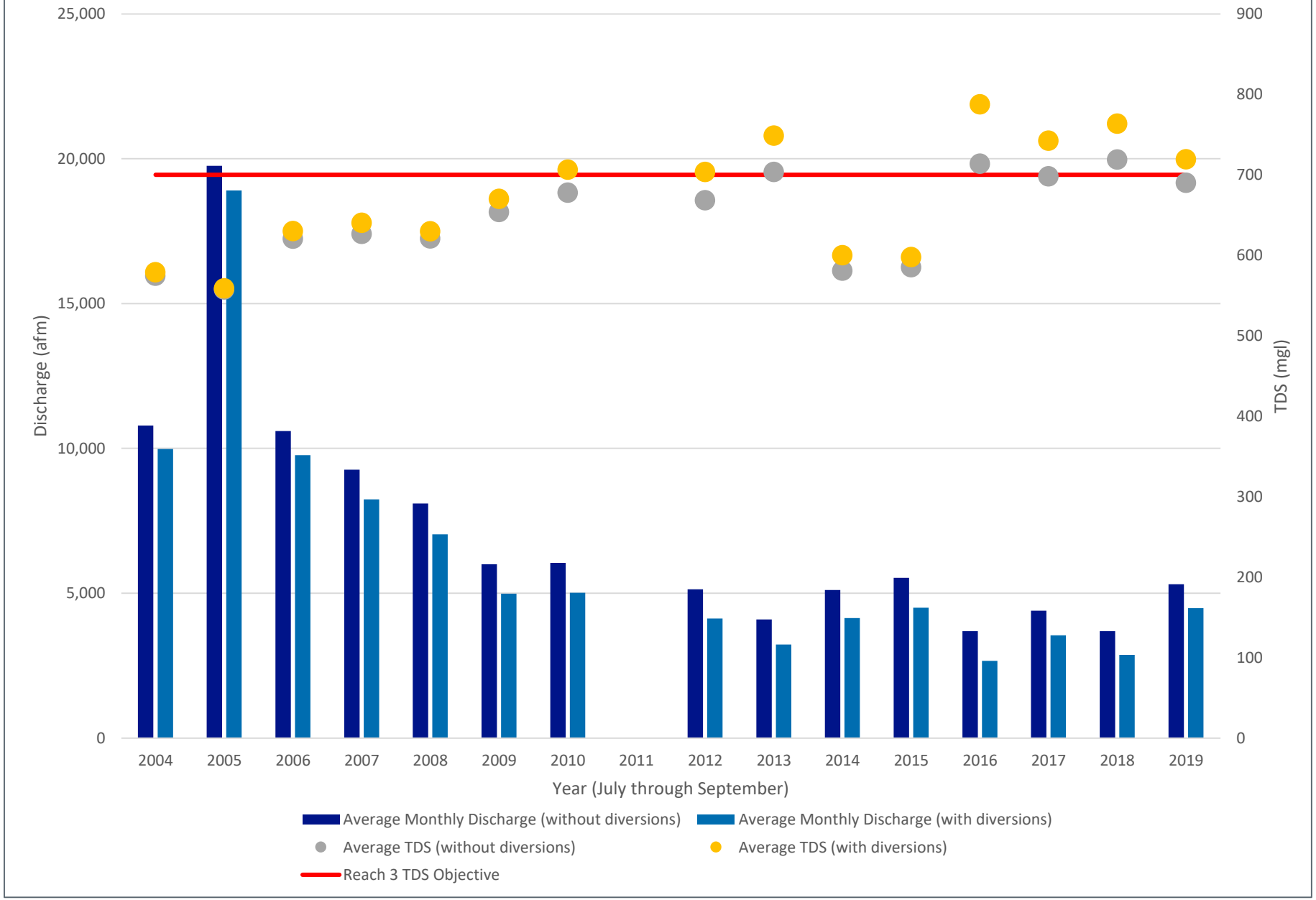


**Table 3. Mass-Balance Computation of the Discharge and TDS Computation of the Residual without Diversions[1]**

| Year | Month | Discharge (af) | | | | | | | | | | | TDS (mgl) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (1) SAR at MWD Xing | (2) RWQCP DP-001 | (3) Corona WWTP No. 1B | (4) Corona WWTP No. 3 | (5) IEUA RP1 (Cucamonga) | (6) IEUA RP1 (Prado) | (7) IEUA CCWRF | (8) IEUA RP5 | (9) WRCRWTP | (10) Residual | (11) SAR Below Prado Dam | (12) SAR at MWD Xing | (13) RWQCP DP-001 | (14) Corona WWTP No. 1B | (15) Corona WWTP No. 3 | (16) IEUA RP1 (Cucamonga) | (17) IEUA RP1 (Prado) | (18) IEUA CCWRF | (19) IEUA RP5 | (20) WRCRWTP | (21) Residual | (22) SAR Below Prado Dam |
| 2004 | July | 3,853 | 3,043 | 199 | 0 | 5,756 | 645 | 478 | 773 | 247 | -3,701 | 11,293 | 629 | 603 | 728 | - | 494 | 505 | 508 | 511 | 614 | 509 | 574 |
| | August | 3,837 | 3,073 | 278 | 0 | 5,994 | 727 | 531 | 713 | 238 | -6,105 | 9,285 | 628 | 561 | 708 | - | 476 | 483 | 492 | 504 | 602 | 436 | 607 |
| | September | 3,749 | 3,032 | 264 | 0 | 5,984 | 592 | 611 | 721 | 246 | -3,402 | 11,797 | 625 | 564 | 676 | - | 475 | 483 | 492 | 491 | 589 | 494 | 550 |
| 2005 | July | 9,551 | 3,234 | 470 | 0 | 15,150 | 965 | 626 | 662 | 285 | -10,083 | 20,860 | 478 | 575 | 770 | - | 455 | 446 | 471 | 481 | 645 | 301 | 569 |
| | August | 12,617 | 3,143 | 465 | 0 | 18,494 | 820 | 599 | 622 | 288 | -13,481 | 23,568 | 431 | 593 | 810 | - | 448 | 431 | 471 | 465 | 674 | 349 | 525 |
| | September | 5,088 | 3,045 | 538 | 0 | 7,964 | 916 | 630 | 596 | 280 | -4,224 | 14,832 | 601 | 577 | 810 | - | 464 | 437 | 484 | 483 | 655 | 320 | 591 |
| 2006 | July | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | August | 5,595 | 3,089 | 681 | 0 | 8,029 | 479 | 561 | 874 | 310 | -8,537 | 11,083 | 614 | 622 | 747 | - | 460 | 456 | 500 | 494 | 603 | 441 | 624 |
| | September | 4,076 | 2,966 | 621 | 0 | 6,015 | 299 | 555 | 1,058 | 298 | -5,773 | 10,116 | 617 | 608 | 777 | - | 449 | 383 | 479 | 469 | 578 | 402 | 616 |
| 2007 | July | 3,782 | 2,837 | 377 | 5 | 5,851 | 575 | 351 | 984 | 452 | -5,867 | 9,346 | 703 | 615 | 853 | 750 | 485 | 481 | 532 | 508 | 543 | 496 | 628 |
| | August | 4,284 | 2,991 | 288 | 18 | 6,850 | 528 | 444 | 1,047 | 451 | -7,408 | 9,494 | 672 | 600 | 835 | 780 | 475 | 470 | 521 | 489 | 540 | 508 | 595 |
| | September | 4,641 | 2,938 | 321 | 25 | 7,826 | 492 | 569 | 995 | 465 | -9,317 | 8,956 | 583 | 591 | 830 | 690 | 463 | 463 | 505 | 490 | 542 | 398 | 658 |
| 2008 | July | 3,167 | 2,892 | 249 | 0 | 4,693 | 410 | 343 | 828 | 533 | -4,802 | 8,313 | 675 | 672 | 614 | - | 485 | 490 | 557 | 512 | 625 | 545 | 607 |
| | August | 3,382 | 2,918 | 359 | 18 | 5,328 | 401 | 394 | 852 | 512 | -5,986 | 8,178 | 675 | 652 | 726 | 740 | 489 | 488 | 540 | 503 | 569 | 515 | 625 |
| | September | 3,719 | 2,902 | 207 | 0 | 5,938 | 388 | 267 | 1,015 | 500 | -7,141 | 7,795 | 595 | 648 | 736 | - | 506 | 516 | 543 | 518 | 641 | 494 | 631 |
| 2009 | July | 3,136 | 2,821 | 172 | 0 | 4,995 | 362 | 197 | 797 | 487 | -7,208 | 5,759 | 680 | 683 | 758 | - | 528 | 504 | 563 | 505 | 593 | 546 | 673 |
| | August | 2,890 | 2,813 | 239 | 22 | 4,376 | 337 | 321 | 909 | 562 | -6,115 | 6,354 | 661 | 651 | 711 | 710 | 517 | 489 | 552 | 509 | 646 | 531 | 647 |
| | September | 2,460 | 2,833 | 108 | 0 | 3,452 | 400 | 181 | 667 | 606 | -4,831 | 5,875 | 650 | 633 | 685 | - | 523 | 494 | 544 | 499 | 611 | 517 | 642 |
| 2010 | July | 3,597 | 2,855 | 5 | 12 | 8,245 | 320 | 228 | 863 | 530 | -10,608 | 6,046 | 674 | 603 | 778 | 750 | 526 | 481 | 511 | 513 | 572 | 503 | 691 |
| | August | 3,136 | 2,795 | 164 | 0 | 4,757 | 285 | 271 | 70 | 619 | -6,465 | 5,632 | 714 | 613 | 752 | - | 509 | 517 | 498 | 528 | 575 | 527 | 670 |
| | September | 3,312 | 2,711 | 373 | 9 | 5,202 | 368 | 534 | 0 | 527 | -6,580 | 6,456 | 649 | 602 | 734 | 700 | 490 | 505 | 494 | - | 579 | 459 | 673 |
| 2012 | July | 2,244 | 2,556 | 273 | 0 | 3,330 | 165 | 248 | 51 | 521 | -4,562 | 4,827 | 728 | 681 | 794 | 640 | 461 | 519 | 528 | 564 | 577 | 481 | 721 |
| | August | 2,398 | 2,616 | 246 | 0 | 3,710 | 238 | 177 | 30 | 511 | -5,223 | 4,704 | 669 | 664 | 743 | - | 463 | 509 | 523 | 535 | 555 | 513 | 654 |
| | September | 4,046 | 2,734 | 173 | 0 | 5,156 | 259 | 153 | 0 | 520 | -7,167 | 5,874 | 580 | 622 | 700 | 590 | 476 | 542 | 519 | - | 539 | 471 | 637 |
| 2013 | July | 2,367 | 2,752 | 143 | 0 | 3,496 | 162 | 138 | 71 | 578 | -5,485 | 4,222 | 664 | 674 | 790 | - | 518 | 536 | 545 | 555 | 540 | 532 | 698 |
| | August | 3,197 | 2,696 | 143 | 0 | 2,521 | 145 | 0 | 157 | 576 | -5,346 | 4,089 | 554 | 642 | 810 | - | 508 | 545 | - | 575 | 580 | 470 | 706 |
| | September | 2,112 | 2,794 | 177 | 0 | 3,130 | 192 | 0 | 173 | 558 | -5,169 | 3,967 | 633 | 624 | 780 | - | 513 | 531 | - | 552 | 520 | 485 | 707 |
| 2014 | July | 1,845 | 2,475 | 143 | 0 | 2,806 | 182 | 81 | 36 | 620 | -4,847 | 3,341 | 640 | 631 | 760 | - | 497 | 523 | 575 | 576 | 510 | 479 | 719 |
| | August | 13,404 | 2,651 | 143 | 0 | 12,201 | 257 | 205 | 0 | 628 | -22,830 | 6,658 | 448 | 644 | 750 | - | 505 | 525 | 576 | - | 570 | 489 | 515 |
| | September | 5,474 | 2,552 | 184 | 0 | 5,303 | 209 | 163 | 0 | 557 | -9,118 | 5,326 | 466 | 627 | 710 | - | 507 | 538 | 583 | - | 330 | 471 | 576 |
| 2015 | July | 12,082 | 2,478 | 143 | 0 | 6,992 | 269 | 245 | 0 | 580 | -17,235 | 5,554 | 296 | 649 | 760 | - | 500 | 530 | 574 | - | 510 | 323 | 683 |
| | August | 2,152 | 2,460 | 143 | 0 | 3,539 | 185 | 331 | 0 | 613 | -5,651 | 3,771 | 608 | 646 | 760 | - | 524 | 531 | 595 | - | 500 | 498 | 703 |
| | September | 5,593 | 2,436 | 138 | 0 | 3,522 | 295 | 262 | 107 | 571 | -5,645 | 7,279 | 536 | 659 | 790 | - | 499 | 535 | 597 | 555 | 540 | 688 | 449 |
| 2016 | July | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | August | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | September | 1,749 | 2,392 | 601 | 0 | 2,617 | 239 | 127 | 0 | 643 | -4,677 | 3,691 | 637 | 640 | 710 | - | 517 | 506 | 522 | - | 530 | 495 | 714 |
| 2017 | July | 1,934 | 2,482 | 143 | 0 | 2,218 | 191 | 143 | 46 | 428 | -3,291 | 4,294 | 642 | 636 | 700 | - | 482 | 465 | 503 | 538 | 570 | 437 | 693 |
| | August | 2,171 | 2,484 | 143 | 0 | 2,733 | 196 | 0 | 0 | 624 | -4,116 | 4,235 | 638 | 633 | 710 | - | 459 | 463 | - | - | 540 | 420 | 711 |
| | September | 2,187 | 2,466 | 138 | 0 | 3,381 | 361 | 0 | 56 | 600 | -4,542 | 4,647 | 636 | 632 | 700 | - | 456 | 458 | - | 516 | 530 | 417 | 690 |
| 2018 | July | 1,888 | 2,396 | 500 | 0 | 2,867 | 291 | 0 | 0 | 610 | -4,917 | 3,636 | 623 | 662 | 770 | - | 509 | 516 | - | - | 630 | 500 | 737 |
| | August | 1,906 | 2,485 | 55 | 0 | 2,899 | 359 | 0 | 0 | 578 | -5,053 | 3,230 | 638 | 650 | 760 | - | 499 | 511 | - | - | 620 | 501 | 721 |
| | September | 1,824 | 2,425 | 138 | 0 | 2,764 | 354 | 0 | 218 | 609 | -4,126 | 4,205 | 627 | 633 | 760 | - | 493 | 513 | - | 511 | 560 | 444 | 701 |
| 2019 | July | 2,238 | 2,346 | 143 | 0 | 3,565 | 155 | 0 | 388 | 622 | -3,611 | 5,846 | 623 | 643 | 770 | - | 458 | 500 | - | 518 | 560 | 340 | 692 |
| | August | 2,260 | 2,409 | 143 | 0 | 3,613 | 124 | 0 | 699 | 646 | -4,918 | 4,974 | 631 | 665 | 750 | - | 470 | 470 | - | 512 | 580 | 427 | 709 |
| | September | 1,931 | 2,312 | 140 | 0 | 2,995 | 166 | 0 | 720 | 661 | -3,820 | 5,106 | 624 | 672 | 770 | - | 449 | 525 | - | 530 | 580 | 431 | 670 |

[1] 2011 was excluded from the analysis due to the influence of OCWD imported water at the OC-59 outfall. July 2006, July 2016, and August 2016 were removed from the analysis due to anomalous values.

**Table 4. Mass-Balance Computation of the Discharge and TDS Computation of the Residual with Diversions[1]**

| Year | Month | Discharge (af) | | | | | | | | | | | | | TDS (mgl) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) |
| | | SAR at MWD Xing | RWQCP DP-001 | Corona WWTP No. 1B | Corona WWTP No. 3 | **IEUA RP1 (Cucamonga)** | **IEUA RP1 (Prado)** | **IEUA CCWRF** | **IEUA RP5** | **WRCRWTP** | Residual | **SAR Below Prado Dam** | **Change in discharge due to Diversions** | **Percent change in discharge with diversions** | SAR at MWD Xing | RWQCP DP-001 | Corona WWTP No. 1B | Corona WWTP No. 3 | IEUA RP1 (Cucamonga) | IEUA RP1 (Prado) | IEUA CCWRF | IEUA RP5 | WRCRWTP | Residual | **SAR Below Prado Dam** | **Change in TDS concentration due to Diversions** | **Percent change in TDS concentration due to diversions** |
| 2004 | July | 3,853 | 3,043 | 199 | 0 | 5,521 | 585 | 128 | 773 | 0 | -3,701 | 10,401 | -892 | -7.9% | 629 | 603 | 728 | - | 494 | 505 | 508 | 511 | 614 | 509 | 577 | 3 | 0.6% |
| | August | 3,837 | 3,073 | 278 | 0 | 5,802 | 654 | 293 | 713 | 0 | -6,105 | 8,544 | -741 | -8.0% | 628 | 561 | 708 | - | 476 | 483 | 492 | 504 | 602 | 436 | 615 | 7 | 1.2% |
| | September | 3,749 | 3,032 | 264 | 0 | 5,626 | 548 | 462 | 717 | 0 | -3,402 | 10,995 | -802 | -6.8% | 625 | 564 | 676 | - | 475 | 483 | 492 | 491 | 589 | 494 | 552 | 3 | 0.5% |
| 2005 | July | 9,551 | 3,234 | 470 | 0 | 14,915 | 905 | 277 | 662 | 0 | -10,083 | 19,931 | -929 | -4.5% | 478 | 575 | 770 | - | 455 | 446 | 471 | 481 | 645 | 301 | 571 | 2 | 0.4% |
| | August | 12,617 | 3,143 | 465 | 0 | 18,303 | 747 | 361 | 622 | 0 | -13,481 | 22,777 | -791 | -3.4% | 431 | 593 | 810 | - | 448 | 431 | 471 | 465 | 674 | 349 | 525 | 0 | -0.1% |
| | September | 5,088 | 3,045 | 538 | 0 | 7,605 | 871 | 480 | 592 | 0 | -4,224 | 13,995 | -836 | -5.6% | 601 | 577 | 810 | - | 464 | 437 | 484 | 483 | 655 | 320 | 595 | 4 | 0.6% |
| 2006 | July | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | August | 5,595 | 3,089 | 681 | 0 | 7,838 | 406 | 323 | 874 | 0 | -8,537 | 10,270 | -813 | -7.3% | 614 | 622 | 747 | - | 460 | 456 | 500 | 494 | 603 | 441 | 632 | 8 | 1.2% |
| | September | 4,076 | 2,966 | 621 | 0 | 5,656 | 255 | 406 | 1,054 | 0 | -5,773 | 9,261 | -855 | -8.4% | 617 | 608 | 777 | - | 449 | 383 | 479 | 469 | 578 | 402 | 627 | 11 | 1.8% |
| 2007 | July | 3,782 | 2,837 | 377 | 5 | 5,616 | 515 | 1 | 984 | 0 | -5,867 | 8,250 | -1,096 | -11.7% | 703 | 615 | 853 | 750 | 485 | 481 | 532 | 508 | 543 | 496 | 641 | 14 | 2.2% |
| | August | 4,284 | 2,991 | 288 | 18 | 6,659 | 455 | 206 | 1,047 | 0 | -7,408 | 8,540 | -954 | -10.1% | 672 | 600 | 835 | 780 | 475 | 470 | 521 | 489 | 540 | 508 | 604 | 9 | 1.5% |
| | September | 4,641 | 2,938 | 321 | 25 | 7,467 | 448 | 420 | 991 | 0 | -9,317 | 7,935 | -1,021 | -11.4% | 583 | 591 | 830 | 690 | 463 | 463 | 505 | 490 | 542 | 398 | 678 | 20 | 3.0% |
| 2008 | July | 3,167 | 2,892 | 249 | 0 | 4,458 | 350 | 0 | 828 | 33 | -4,802 | 7,175 | -1,138 | -13.7% | 675 | 672 | 614 | - | 485 | 490 | 557 | 512 | 625 | 545 | 613 | 6 | 1.0% |
| | August | 3,382 | 2,918 | 359 | 18 | 5,137 | 327 | 156 | 852 | 12 | -5,986 | 7,175 | -1,003 | -12.3% | 675 | 652 | 726 | 740 | 489 | 488 | 540 | 503 | 569 | 515 | 637 | 12 | 1.9% |
| | September | 3,719 | 2,902 | 207 | 0 | 5,580 | 343 | 118 | 1,011 | 0 | -7,141 | 6,739 | -1,056 | -13.6% | 595 | 648 | 736 | - | 506 | 516 | 543 | 518 | 641 | 494 | 639 | 9 | 1.4% |
| 2009 | July | 3,136 | 2,821 | 172 | 0 | 4,760 | 302 | 0 | 797 | 0 | -7,208 | 4,781 | -979 | -17.0% | 680 | 683 | 758 | - | 528 | 504 | 563 | 505 | 593 | 546 | 695 | 22 | 3.3% |
| | August | 2,890 | 2,813 | 239 | 22 | 4,185 | 263 | 83 | 909 | 62 | -6,115 | 5,351 | -1,003 | -15.8% | 661 | 651 | 711 | 710 | 517 | 489 | 552 | 509 | 646 | 531 | 658 | 11 | 1.7% |
| | September | 2,460 | 2,833 | 108 | 0 | 3,094 | 355 | 32 | 663 | 106 | -4,831 | 4,819 | -1,056 | -18.0% | 650 | 633 | 685 | - | 523 | 494 | 544 | 499 | 611 | 517 | 658 | 17 | 2.6% |
| 2010 | July | 3,597 | 2,855 | 5 | 12 | 8,010 | 260 | 0 | 863 | 30 | -10,608 | 5,023 | -1,023 | -16.9% | 674 | 603 | 778 | 750 | 526 | 481 | 511 | 513 | 572 | 503 | 721 | 30 | 4.4% |
| | August | 3,136 | 2,795 | 164 | 0 | 4,566 | 212 | 33 | 70 | 119 | -6,465 | 4,630 | -1,003 | -17.8% | 714 | 613 | 752 | - | 509 | 517 | 498 | 528 | 575 | 527 | 698 | 28 | 4.2% |
| | September | 3,312 | 2,711 | 373 | 9 | 4,843 | 324 | 385 | 0 | 27 | -6,580 | 5,404 | -1,052 | -16.3% | 649 | 602 | 734 | 700 | 490 | 505 | 494 | - | 579 | 459 | 700 | 27 | 4.0% |
| 2012 | July | 2,244 | 2,556 | 273 | 0 | 3,095 | 105 | 0 | 51 | 21 | -4,562 | 3,784 | -1,043 | -21.6% | 728 | 681 | 794 | 640 | 461 | 519 | 528 | 564 | 577 | 481 | 771 | 51 | 7.1% |
| | August | 2,398 | 2,616 | 246 | 0 | 3,519 | 164 | 0 | 30 | 11 | -5,223 | 3,762 | -942 | -20.0% | 669 | 664 | 743 | - | 463 | 509 | 523 | 535 | 555 | 513 | 685 | 32 | 4.9% |
| | September | 4,046 | 2,734 | 173 | 0 | 4,797 | 215 | 3 | 0 | 20 | -7,167 | 4,822 | -1,052 | -17.9% | 580 | 622 | 700 | 590 | 476 | 542 | 519 | - | 539 | 471 | 664 | 27 | 4.2% |
| 2013 | July | 2,367 | 2,752 | 143 | 0 | 3,261 | 102 | 0 | 71 | 78 | -5,485 | 3,289 | -933 | -22.1% | 664 | 674 | 790 | - | 518 | 536 | 545 | 555 | 540 | 532 | 745 | 46 | 6.6% |
| | August | 3,197 | 2,696 | 143 | 0 | 2,330 | 72 | 0 | 157 | 76 | -5,346 | 3,325 | -764 | -18.7% | 554 | 642 | 810 | - | 508 | 545 | - | 575 | 580 | 470 | 740 | 34 | 4.8% |
| | September | 2,112 | 2,794 | 177 | 0 | 2,772 | 148 | 0 | 169 | 58 | -5,169 | 3,060 | -907 | -22.9% | 633 | 624 | 780 | - | 513 | 531 | - | 552 | 520 | 485 | 763 | 56 | 7.9% |
| 2014 | July | 1,845 | 2,475 | 143 | 0 | 2,572 | 122 | 0 | 36 | 120 | -4,847 | 2,465 | -876 | -26.2% | 640 | 631 | 760 | - | 497 | 523 | 575 | 576 | 510 | 479 | 792 | 73 | 10.2% |
| | August | 13,404 | 2,651 | 143 | 0 | 12,010 | 184 | 0 | 0 | 128 | -22,830 | 5,689 | -969 | -14.6% | 448 | 644 | 750 | - | 505 | 525 | 576 | - | 570 | 489 | 509 | -7 | -1.3% |
| | September | 5,474 | 2,552 | 184 | 0 | 4,944 | 165 | 14 | 0 | 57 | -9,118 | 4,273 | -1,052 | -19.8% | 466 | 627 | 710 | - | 507 | 538 | 583 | - | 330 | 471 | 611 | 35 | 6.0% |
| 2015 | July | 12,082 | 2,478 | 143 | 0 | 6,757 | 209 | 0 | 0 | 80 | -17,235 | 4,515 | -1,040 | -18.7% | 296 | 649 | 760 | - | 500 | 530 | 574 | - | 510 | 323 | 720 | 37 | 5.4% |
| | August | 2,152 | 2,460 | 143 | 0 | 3,348 | 111 | 93 | 0 | 113 | -5,651 | 2,769 | -1,003 | -26.6% | 608 | 646 | 760 | - | 524 | 531 | 595 | - | 500 | 498 | 765 | 63 | 8.9% |
| | September | 5,593 | 2,436 | 138 | 0 | 3,163 | 250 | 113 | 103 | 71 | -5,645 | 6,223 | -1,056 | -14.5% | 536 | 659 | 790 | - | 499 | 535 | 597 | 555 | 540 | 688 | 434 | -14 | -3.2% |
| 2016 | July | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | August | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | September | 1,749 | 2,392 | 601 | 0 | 2,258 | 195 | 0 | 0 | 143 | -4,677 | 2,662 | -1,029 | -27.9% | 637 | 640 | 710 | - | 517 | 506 | 522 | - | 530 | 495 | 787 | 74 | 10.3% |
| 2017 | July | 1,934 | 2,482 | 143 | 0 | 1,983 | 131 | 0 | 46 | 0 | -3,291 | 3,428 | -866 | -20.2% | 642 | 636 | 700 | - | 482 | 465 | 503 | 538 | 570 | 437 | 735 | 42 | 6.0% |
| | August | 2,171 | 2,484 | 143 | 0 | 2,542 | 122 | 0 | 0 | 124 | -4,116 | 3,470 | -764 | -18.1% | 638 | 633 | 710 | - | 459 | 463 | - | - | 540 | 420 | 755 | 44 | 6.2% |
| | September | 2,187 | 2,466 | 138 | 0 | 3,023 | 317 | 0 | 52 | 100 | -4,542 | 3,740 | -907 | -19.5% | 636 | 632 | 700 | - | 456 | 458 | - | 516 | 530 | 417 | 737 | 47 | 6.8% |
| 2018 | July | 1,888 | 2,396 | 500 | 0 | 2,632 | 231 | 0 | 0 | 110 | -4,917 | 2,841 | -795 | -21.9% | 623 | 662 | 770 | - | 509 | 516 | - | - | 630 | 500 | 780 | 42 | 5.8% |
| | August | 1,906 | 2,485 | 55 | 0 | 2,708 | 286 | 0 | 0 | 78 | -5,053 | 2,466 | -764 | -23.7% | 638 | 650 | 760 | - | 499 | 511 | - | - | 620 | 501 | 765 | 44 | 6.1% |
| | September | 1,824 | 2,425 | 138 | 0 | 2,405 | 309 | 0 | 214 | 109 | -4,126 | 3,298 | -907 | -21.6% | 627 | 633 | 760 | - | 493 | 513 | - | 511 | 560 | 444 | 748 | 47 | 6.7% |
| 2019 | July | 2,238 | 2,346 | 143 | 0 | 3,330 | 95 | 0 | 388 | 122 | -3,611 | 5,051 | -795 | -13.6% | 623 | 643 | 770 | - | 458 | 500 | - | 518 | 560 | 340 | 718 | 26 | 3.8% |
| | August | 2,260 | 2,409 | 143 | 0 | 3,422 | 50 | 0 | 699 | 146 | -4,918 | 4,210 | -764 | -15.4% | 631 | 665 | 750 | - | 470 | 470 | - | 512 | 580 | 427 | 739 | 30 | 4.3% |
| | September | 1,931 | 2,312 | 140 | 0 | 2,637 | 121 | 0 | 716 | 161 | -3,820 | 4,199 | -907 | -17.8% | 624 | 672 | 770 | - | 449 | 525 | - | 530 | 580 | 431 | 701 | 31 | 4.7% |

[1] 2011 was excluded from the analysis due to the influence of OCWD imported water at the OC-59 outfall. July 2006, July 2016, and August 2016 were removed from the analysis due to anomalous values.