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**RESOLUTION NO. 05-21-307**

**A RESOLUTION OF THE MAIN SAN GABRIEL BASIN  
WATERMASTER DETERMINING OPERATING SAFE YIELD FOR  
SAID BASIN FOR FISCAL YEAR 2021-22 THROUGH 2025-26**

WHEREAS, Watermaster has caused a report on preliminary determination of the Operating Safe Yield for the Main San Gabriel Basin for Fiscal Years 2021-22 through 2025-26 to be prepared by its Consulting Engineer, and thereafter at its regular meeting of April 7, 2021, received said report; and

WHEREAS, a copy of said report was mailed to all Producers within said Basin, together with an appropriate notice of hearing thereon at 2:30 o'clock p.m. on Wednesday, May 5, 2021 via Zoom Meeting (web-based video conferencing); and

WHEREAS, pursuant to said notice, a hearing was duly and regularly held at said time and place on said report and at which time the engineer submitted updated information, testimony was taken and objections, suggested modifications and comments were solicited and heard; and

WHEREAS, at the close of said hearing, from the evidence presented, it appears appropriate to adopt said report;

NOW, THEREFORE, BE IT RESOLVED BY THE MAIN SAN GABRIEL BASIN WATERMASTER, as follows:

Section 1. The said preliminary report, as updated at the hearing, is hereby adopted as a final report, attached hereto as "Exhibit A," and by this reference incorporated herein and made a part hereof as though here fully set forth at length.

Section 2. It is hereby found and determined that the Operating Safe Yield for the Main San Gabriel Basin for the Fiscal Years 2021-22 through 2025-26 is as follows:


<u>Fiscal Year</u>	<u>Operating Safe Yield (Acre-Feet)</u>
2021-22	150,000
2022-23	130,000
2023-24	130,000
2024-25	130,000
2025-26	130,000

1           Section 3.       Within (30) days hereof, Watermaster's Secretary shall have mailed a copy of  
2 said final report, findings and determinations, together with a statement of each producer's entitlement  
3 thereunder in each such Fiscal Year, stated in acre-feet, to each Pumper and Integrated Producer  
4 within the Basin, in accordance with the provisions of Section 43(c) of the Amended Judgment in the  
5 Adjudication Action of the Water Rights in the Basin.

6           Dated: May 5, 2021

7  
8   
9 \_\_\_\_\_  
10 Chair

11 Attest:

12   
13 \_\_\_\_\_  
14 Secretary

MAIN SAN GABRIEL BASIN WATERMASTER  
REPORT ON  
FINAL DETERMINATION OF  
OPERATING SAFE YIELD  
FOR 2021-22 THROUGH 2025-26

MAY 5, 2021



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**MAIN SAN GABRIEL BASIN WATERMASTER  
REPORT ON FINAL DETERMINATION OF  
OPERATING SAFE YIELD  
FOR 2021-22 THROUGH 2025-26**

**May 5, 2021**

**INTRODUCTION**

Operating Safe Yield is the quantity of water which the Main San Gabriel Basin Watermaster (Watermaster) determines may be pumped from the Main San Gabriel Basin (Basin) in a fiscal year, free of Replacement Water assessments. In accordance with Section 43 of the amended Main San Gabriel Basin Judgment<sup>1</sup>, Watermaster at its regular meeting in May of each year determines the Operating Safe Yield applicable to the succeeding fiscal year and estimates the Operating Safe Yield for the next succeeding four fiscal years.

A Report on the "Preliminary Determination of Operating Safe Yield" is submitted by its Engineer to Watermaster at its regular meeting in April each year. On acceptance of that Report by Watermaster, a copy is distributed to each Pumper and Integrated Producer at least 10 days prior to a hearing, which is held at the regular meeting of Watermaster in May each year. Objections, comments or suggested modifications to the preliminary Operating Safe Yield are considered by Watermaster at that hearing and Watermaster, through vote of its Board members, adopts the final Operating Safe Yield.

**BASIN OPERATING CRITERIA**

Section 42 of the amended Judgment states in part, "... Watermaster shall recharge Replacement Water in accordance with the Watermaster Operating Criteria and, insofar as practicable, to maintain the water level at the Key Well above Elevation two hundred (200)." Replacement Water is defined in Section 10 (cc) of the amended Judgment as "Water purchased by Watermaster to replace: (1) Production in excess of a Pumper's Share of Operating Safe Yield; (2) The consumptive use portion resulting from the exercise of an Overlying Right; and (3) Production in excess of a Diverter's right to Divert for Direct Use". Producers and Responsible Agencies are allowed to deliver Supplemental Water into their respective Cyclic Storage accounts as a pre-delivery of Replacement Water. Furthermore, as a result of significant local drought conditions the Watermaster took unprecedented actions to supplement local water supplies, and, as part of 2012 amendments to the Judgment, Watermaster may

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<sup>1</sup> Upper San Gabriel Valley Municipal Water District vs. City of Alhambra, et al, Case No. 924128, Los Angeles County, as amended June 21, 2012.

make deliveries of Supplemental Water to augment the lack of local water replenishment through the Water Resources Development Assessment (RDA) stormwater augmentation program. The RDA has been recently used by the Watermaster to augment local water supplies. The Operating Safe Yield and delivery of Supplemental Water are the tools specified in the Judgment for management of Basin groundwater levels. The Operating Safe Yield which is established in May of each year, along with the prior year's carryover rights and the Diversion component of Integrated Producers, results in a Replacement Water requirement (net of any withdrawals from Producer Cyclic Storage accounts) that is delivered (at the earliest) in October of the second fiscal year, a span of about 17 months, and possibly not until the following June, a span of 26 months, assuming imported Supplemental Water is available. In the time frame between when the Operating Safe Yield is established and Supplemental Water is actually delivered, the actual hydrologic conditions experienced may have had significant impacts on the Basin groundwater levels. Therefore, it is prudent to conservatively manage the Basin groundwater levels and assure that Replacement Water assessment funds are appropriately collected and available for the purchase of available Supplemental Water to provide for Basin replenishment.

Watermaster evaluates numerous factors when determining the Operating Safe Yield. The most critical factors are the provisions of the Judgment and the current and projected groundwater elevation at the Baldwin Park Key Well (Key Well), which represents the water stored in the Basin. Importantly, Watermaster focuses on the "operational" groundwater elevation at the Key Well (which excludes the impacts of Supplemental Water held in Cyclic Storage accounts). Figure 1 shows the measured groundwater elevation at the Key Well, which includes stored Supplemental Water (Cyclic Storage and the initial Water Resource Development Assessment deliveries historically delivered to Cyclic Storage) and the operational groundwater elevation at the Key Well, which is used to characterize "natural" groundwater elevations for the purposes of establishing an Operating Safe Yield. However, for the purpose of this Report, the measured Key Well elevation is referenced throughout. Watermaster also reviews historical and current hydrologic conditions within the Basin, such as rainfall, storage of local runoff in surface reservoirs and conservation of local runoff; the availability of Supplemental Water; the quantity of water in Cyclic Storage; Carry-over Rights; and other information. Presented in Table 1 is the historical record of the annual Operating Safe Yield, Carry-over Rights, Lost Carry-over Rights, Production Rights, Water Production, and Replacement Water Requirement for each year of Watermaster operations beginning with fiscal year 1973-74.

During fiscal year 2015-16, the Watermaster developed a "Stormwater Augmentation Program," whereby Watermaster uses its Water Resource Development Assessment (RDA II) to purchase available untreated imported water to supplement the shortage of local stormwater replenishment (discussed in detail in the following section). Consequently, once the Stormwater Augmentation Program water is delivered to the Basin, and paid for, it is considered to be a supplement to "local water and available to all Basin pumpers," but not Supplemental Water. As a result of



just the RDA programs (includes all RDA actual water deliveries, including RDA water not yet paid for), Watermaster and the Producers have added over 165,000 acre-feet of replenishment water and increased the elevation of the Baldwin Park Key Well by about 21 feet, as shown in Figure 2. Other Watermaster and Producer actions have also contributed to maintaining the Basin water supply reliability.

## **IMPACTS/RESPONSE TO (UNPRECEDENTED) RECENT DROUGHT CONDITIONS AND EXTREMELY LOW LOCAL RUNOFF**

### **Fiscal Years 2011-12 through 2019-20**

Rainfall in the San Gabriel Valley has averaged about 12.52 inches between fiscal years 2011-12 and 2019-20 (about 9 years) which is significantly below the long-term annual average of about 18 inches for the entire San Gabriel Valley, as shown in Table 1. Furthermore, between fiscal years 2011-12 and 2019-20 the average annual stormwater replenishment has averaged about 57,000 acre-feet, as shown in Table 2, whereas the long-term stormwater replenishment in the San Gabriel Valley through the end of fiscal year 2010-11 averaged about 110,000 acre-feet per year. Consequently, over those 9 years the average annual deficit of stormwater replenishment has been about 53,000 acre-feet per year which represents a Basin deficit of about 477,000 acre-feet, representing about 60 feet at the Key Well. (Note: For fiscal year 2020-21, through end of March, rainfall for the San Gabriel Valley is about 6 inches and less than 40 percent of long-term average).

Prior to the recent drought, rainfall had averaged 19.23 inches, as measured at Puddingstone Dam, and the groundwater elevation of the Key Well was 233.5 feet as of June 24, 2011, as shown on Table 1 and Figure 2. As a result of the recent drought, the groundwater elevation at the Key Well decreased to a new historic low of 169.4 feet on November 21, 2018. This represents a loss of over 510,000 acre-feet. During this extended drought period, since November 21, 2018 the measured groundwater level has increased to about 207.7 feet, as of March 27, 2020, which was partially the result of the combined delivery from the three Responsible Agencies of about 109,000 acre-feet of imported water during fiscal year 2019-20. Also during this extended drought period, without Supplemental Water held in Cyclic Storage accounts, the groundwater elevation at Key Well would have been at 178 feet as of March 27, 2020. Without Cyclic Storage and the actions of the Watermaster and the Producers, Basin water supply conditions would have been much worse.

Production in the San Gabriel Valley has averaged about 211,000 acre-feet per year over the last nine years (2011-12 through 2019-20) during the extended drought period, as shown on Table 1. During this extended drought period, Producers have implemented water conservation measures in an effort to reduce groundwater production to help address drought conditions.

During this recent drought, the Watermaster has become more pro-active by implementing provisions of the Judgment, and developing and instituting new studies, programs and plans to address the drought conditions as they progressively worsened. The 2012 Judgment Amendments provided Watermaster with increased management flexibility and adaptability; and broad discretion in the making of Basin management decisions. Without the actions of the Watermaster and the Producers, Basin water supply conditions would have been much worse. The following are Watermaster and Producer Actions (which are discussed in detail in the Watermaster Annual Report): RDA, Storm Water Capture, Cyclic Storage, Conservation, Recycled Water for Replenishment, Basinwide Low Water Vulnerability Assessment, In-Lieu Program, Assist Drought Impacted Purveyors, Stormwater Augmentation Program (discussed below) and MWD Water Supply Agreement (discussed below).

### **Stormwater Augmentation Program**

During fiscal year 2015-16, the Watermaster evaluated new ways to help manage the Basin water supplies. At that time, the Watermaster determined that between fiscal years 2011-12 and 2015-16, the Basin did not receive nearly 400,000 acre-feet of local water replenishment compared to long-term average conditions. The Watermaster developed a conceptual "Stormwater Augmentation Program," whereby the RDA would be repurposed to purchase available untreated imported water to supplement the significant shortage of local stormwater replenishment (RDA II). Figure 2 shows the operational Key Well elevation would have been about 20 feet lower (about 174 feet) if the Stormwater Augmentation Program water was not implemented (includes all RDA water deliveries, including RDA water not yet paid for).

### **MWD Pre-Delivery Agreement**

During calendar year 2017, rainfall within the State Water Project (SWP) drainage area was about 200 percent of average, resulting in a SWP allocation of 85 percent (although rainfall in the San Gabriel Valley was only about average). Consequently, Metropolitan Water District of Southern California (MWD), Upper San Gabriel Valley Municipal Water District (Upper District), and the Watermaster entered into an Agreement (MWD Agreement) whereby MWD will deliver untreated imported water to the Main Basin initially for Cyclic Storage, and then applied to the stormwater augmentation. MWD proposed delivering 80,000 acre-feet of untreated imported water to replenish the Main Basin during calendar year 2017. Subsequently, the Watermaster and Upper District would purchase one-fifth of the delivery in each of the next five years, i.e. 16,000 acre-feet in December 2017, 16,000 acre-feet in December 2018, 16,000 acre-feet in December 2019, 16,000 acre-feet in December 2020, and 16,000 acre-feet in December 2021. Much of the purchased water would be applied to the Stormwater Augmentation Program.

MWD was unable to deliver the full 80,000 acre-feet during fiscal year 2017-18 but instead delivered 58,517.5 acre-feet during fiscal year 2017-18 (which includes 5,000 acre-feet transferred from San Gabriel Valley Municipal Water District (San

Gabriel District to MWD). Watermaster/Upper District made payment on 16,000 acre-feet in December 2017. The next scheduled payment on 16,000 acre-feet in December 2018 was deferred by one year so additional “wet” water could be delivered in 2018. As of June 30, 2018, MWD had 42,517.20 acre-feet in its Cyclic Storage account. Consequently, the remaining Pre-Delivery Agreement payments were adjusted to 16,000 acre-feet in December 2019, 16,000 acre-feet in December 2020 and 10,517.5 acre-feet in December 2021. In 2019, an extension to the Pre-Delivery Agreement was developed. Under the extension, MWD delivered about 97,000 acre-feet to its Cyclic Storage account during calendar year 2019. Total RDA deliveries in Cyclic Storage is now about 165,000 acre-feet.

## **BASIN CONDITIONS - GROUNDWATER ELEVATIONS**

Exhibit H, Section 2 of the amended Judgment states in part “Watermaster in determining Operating Safe Yield and the importation of Replacement Water shall be guided by water level elevations in the Basin.” The following describes the groundwater elevation at the Baldwin Park Key Well.

### **Baldwin Park Key Well**

The Key Well is located in the central portion of the Basin, as shown in Plate 1. It has been successfully used to generally represent basin-wide groundwater elevation trends. A one-foot groundwater elevation change at the Key Well is estimated to represent approximately 8,000 acre-feet of water in storage, under normal conditions (Basin operating conditions). Figure 3 is a hydrograph showing the groundwater elevation at the Key Well and annual rainfall at San Gabriel Dam since October 1, 1937. The highest groundwater elevation at the Key Well, since entry of the Judgment, occurred on July 20, 1983 at 295.3 feet at which time 9,900 acre-feet (about one foot) were in Cyclic Storage. The historical low groundwater elevation at the Key Well, since entry of the Judgment, occurred on November 21, 2018 at 169.4 feet at which time 161,000 acre-feet (about 20 feet) were in Cyclic Storage. Without Cyclic Storage, the groundwater elevation at the Key Well would have been about 150 feet on November 21, 2018. On April 30, 2021, the groundwater elevation at the Key Well was 194.8 feet, at which time about 202,000 acre-feet (about 25 feet) were in Cyclic Storage (about 126,000 acre-feet in Cyclic Storage accounts and about 76,000 acre-feet in the MWD Cyclic Storage account unpaid for RDA II water). Without Cyclic Storage, the Key Well elevation would have been about 170 feet on April 30, 2021, as shown on Figure 1. In addition, without all the RDA water programs, the Key Well elevation would have been about 174 feet on April 30, 2021, as shown on Figure 2.

As previously discussed, local runoff conserved in the San Gabriel Basin has been significantly below the long-term annual average during the extended drought period (2011-12 through 2019-20), and for the last 13 years. As a result, the measured groundwater elevation at the Key Well decreased from 233.5 feet on June 24, 2011 to a historical low of 169.4 feet on November 21, 2018, a decrease of 64

feet. This is a loss of about 510,000 acre-feet of water from Basin storage. Since the historical low on November 2018, the Key Well has since increased to a high of 212.5 feet in December 2019, partially due to significant replenishment of imported water. As specified in Section 42 of the amended Judgment, the Watermaster, to the extent practical, shall manage the Basin to maintain the groundwater elevation at the Key Well above 200 feet.

Thus far during fiscal year 2020-2021, rainfall at Puddingstone Dam has been about 6.20 inches (the long-term annual average is about 18 inches) which is about 35 percent of average for this time of year, as of April 30, 2021. The Key Well elevation decreased from 212.5 feet in December 2019 to about 194.8 feet on April 30, 2021. Typically, during the Summer and early Fall, the measured groundwater elevation at the Key Well decreases by about 10 feet. Consequently, it is likely the measured groundwater elevation at the Key Well will be below 190 feet by October 2021, below the minimum Operating Criteria of 200 feet.

#### **Other “Key Wells”**

While the groundwater elevation at the Baldwin Park Key Well has decreased by about 7 feet from 203.4 feet on July 2, 2020 to 194.8 feet on April 30, 2021, the change in groundwater elevations in other parts of the Basin has been less significant. A well location map showing other “Key Wells” is included as Plate 1 and hydrographs of groundwater elevations at four other wells located throughout the Basin (compared to the measured Baldwin Park Key Well groundwater elevation) are included in Appendix A. San Gabriel County Water District Well 10 is located westerly of the Baldwin Park Key Well, County of Los Angeles Well No. 2947F is located southerly of the Baldwin Park Key Well in the vicinity of Whittier Narrows, Suburban Water Systems Well 155W-2 is located in the vicinity of the Puente Narrows and Valencia Heights Water Company Well No. 5 is located southeasterly of the Baldwin Park Key Well. In general, groundwater elevations at each of the four monitoring wells in the Basin react (both upward and downward) in a comparable but less dramatic manner as the Baldwin Park Key Well. As shown on the hydrographs in Appendix A, the groundwater elevations at these wells generally do not increase as high as the Baldwin Park Key Well during wet periods (with significant groundwater replenishment), but also do not have as significant of a decrease during dry periods with less groundwater replenishment. Significant changes in the water level for the other “Key Wells” are not expected in the near future.

#### **BASIN CONDITIONS - RAINFALL**

Rainfall in the San Gabriel River watershed provides direct percolation and results in local stormwater runoff which is subsequently percolated in spreading facilities and contributes to Basin replenishment. Precipitation amounts vary throughout the San Gabriel River watershed and typically are highest in the foothills and mountains. Precipitation recorded at San Gabriel Dam, the City of Pasadena and

Puddingstone Dam, are described below. The locations of these rainfall stations are shown on Plate 1.

#### **San Gabriel Dam - Station 425B-E**

Rainfall at San Gabriel Dam, which is located in the upper watershed and not on the valley floor, was about 8.15 inches for the period July 1, 2020 through April 30, 2021, or about 29 percent of average for that period. Assuming average rainfall for the balance of the year, the annual rainfall is projected to be about 31 percent of average. Figure 4 shows the cumulative rainfall for 1) fiscal years 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20; 2) the period July 2020 through March 2021; and 3) the long-term average rainfall at San Gabriel Dam.

#### **Pasadena City Hall - Station 610B**

Rainfall at the Pasadena City Hall was 5.68 inches for the period July 1, 2020 through March 31, 2021, or about 32 percent of average for that period. Rainfall for the period of July 1, 2020 through April 30, 2021, is estimated to be about 6.2 inches, or about 32 percent of average. Assuming average rainfall for the balance of the year, the annual rainfall is projected to be about 33 percent of average. Figure 5 shows the cumulative rainfall for 1) fiscal years 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20; 2) the period July 2020 through March 2021; and 3) the long-term average rainfall at the Pasadena City Hall.

#### **Puddingstone Dam - Station 96C**

Rainfall at Puddingstone Dam was 6.20 inches for the period July 1, 2020 through April 30, 2021, or about 35 percent of average for that period. Assuming average rainfall for the balance of the year, the annual rainfall is projected to be about 37 percent of average. Figure 6 shows the cumulative rainfall for 1) fiscal years 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20; 2) the period July 2020 through March 2021; and 3) the long-term average rainfall at Puddingstone Dam.

Precipitation in the San Gabriel River watershed during fiscal year 2020-21, through the end of April 2021 was about 32 percent of average.

### **BASIN CONDITIONS - LOCAL WATER IN SURFACE STORAGE RESERVOIRS**

Local runoff water in surface reservoirs located on streams tributary to the Basin is stored by the DPW. This local runoff water is later released to the San Gabriel River system either for direct delivery to users or for replenishment of the groundwater Basin.

Table 4 shows the maximum reservoir storage capacity and the quantities of water in storage in surface reservoirs tributary to the San Gabriel Valley on April 28,

2020 and April 27, 2021. Also shown are the current recorded inflow and outflow rates at the reservoirs on April 27, 2021. The total amount of local water stored in surface reservoirs in the San Gabriel Valley as of April 27, 2021, was about 19,100 acre-feet (about 15 percent of capacity), which is a decrease of about 53,000 acre-feet in storage compared to April 28, 2020 (72,100 – 19,100). DPW indicates it maintains a minimum pool in Cogswell, San Gabriel and Morris Reservoirs representing about 10,500 acre-feet. In addition, water in Puddingstone Reservoir (about 6,600 acre-feet) is maintained for recreational purposes. Consequently, of the 19,100 acre-feet in storage, about 2,000 acre-feet (19,100 – 10,500 – 6,600) are available for direct use or groundwater replenishment.

### **BASIN CONDITIONS - LOCAL AND IMPORTED WATER CONSERVED**

The amount of local water conserved, which is typically the primary component of Basin replenishment, is dependent upon the amount of precipitation on the tributary watershed, resulting runoff, and the subsequent water replenishment activities of DPW. Historically, when the Basin experiences average to above-average precipitation, it results in a larger amount of local water available to replenish the Basin and the groundwater elevation increases. Examples of this relationship are shown on Figure 3 (see 1977-78, 1982-83, and 2004-05). The occurrence and duration of annual rainfall is also an important factor. For example, a large amount of rainfall over a short period of time may result in limited replenishment to the Basin due to surface flows exceeding water replenishment capabilities and even result in flow of local runoff to the ocean. Also, rainfall that follows severe dry periods will often result in lower runoff amounts due to dry soil absorbing effects in the watershed.

Rainfall in the Basin watershed during fiscal year 2020-21 has been about 32 percent of average through April 30, 2021. Although DPW replenishment records are incomplete this time of year, preliminary data indicate approximately 28,200 acre-feet (about 28 percent of average) of local runoff was replenished in the Basin between October 1, 2020 and March 31, 2021. In addition, about 31,400 acre-feet of RDA II water, as part of the Stormwater Augmentation Program, was replenished to supplement “local water”. Consequently, the total Local Runoff plus RDA II is 59,600 (28,200 + 31,400) acre-feet (59 percent of average). The average annual local water Basin replenishment has averaged about 110,000 acre-feet prior to the recent drought. The Stormwater Augmentation Program helped keep the Key Well elevation stable and not drop further, thus achieving its goal and purpose. In addition to local runoff, about 10,500 acre-feet of untreated imported water (Supplemental Water for Cyclic Storage) was replenished in the Basin.

Table 2 summarizes the annual rainfall, local water plus RDA II water and imported water replenished for Cyclic Storage, and measured and operational groundwater elevations at the Key Well since the inception of Watermaster operations.

## **BASIN CONDITIONS - SUPPLEMENTAL WATER AVAILABILITY**

Section 10 of the amended Judgment defines Supplemental Water as “Nontributary water imported through a Responsible Agency.” Upper District, Three Valleys Municipal Water District (Three Valleys District) and San Gabriel Valley Municipal Water District (San Gabriel District) are the Responsible Agencies which deliver Supplemental Water to the Basin. Upper District and Three Valleys District are member agencies of MWD. The San Gabriel District is a SWP contractor. The following describes the availability of Supplemental Water from MWD and San Gabriel District.

### **Metropolitan Water District of Southern California**

MWD primarily receives its water supply from the State Water Project and the Colorado River. Below is a description of the availability of water from MWD.

#### **Availability of Imported Water**

An “8-station index” is used by the California Department of Water Resources (DWR) to determine average precipitation in the Sacramento River hydrologic region of northern California, which is the source of much of the imported water supply to the Basin. Through April 30, 2021, the “8-station index” indicated average precipitation of 22.12 inches or about 48 percent of average for that time of year, while rainfall in the San Gabriel Valley was about 32 percent of average (through April 30, 2021).

On December 1, 2020, DWR announced the 2021 initial allocation of SWP water was 10 percent of the contractors’ Table A entitlement. On March 23, 2021, DWR announced the 2021 allocation of SWP water has decreased to 5 percent of the contractors’ Table A entitlement. As stated in DWR’s Notice to State Water Project Contractors, the allocation is based on “the recent precipitation, runoff, and current water supply conditions...” In general, every five percent of SWP allocation equates to about 100,000 acre-feet of supply for MWD. With a 5 percent SWP allocation, MWD would receive about 95,575 acre-feet.

Based on the Colorado River Compact, the seven basin states receive allocations to Colorado River water. Based on California’s allocation of Colorado River water, MWD staff has indicated about 1,067,000 acre-feet of Colorado River water are available to MWD during calendar year 2021. Although Colorado River water may be delivered as Supplemental Water to help replenish the Basin, there are issues which must be addressed prior to delivery. Quagga mussels are in Colorado River water and have the potential to negatively impact the replenishment facilities unless the Colorado River water is isolated and the replenishment facilities are allowed to dry out, which effectively eliminates the Quagga mussels. A second concern is the high Total Dissolved Solids (TDS) concentration in Colorado River water, which would need to be addressed through Watermaster’s “Criteria for Delivery

of Supplemental Water”. There are currently no planned deliveries of Colorado River water for Basin replenishment.

### **San Gabriel District**

San Gabriel District has a contract for State Water Project water (see description of State Water Project availability under MWD). San Gabriel District's current 2021 allocation is 5 percent of its State Water Project Table A entitlement of 28,800 acre-feet. Consequently, it is anticipated San Gabriel District will deliver about 1,440 acre-feet to the Basin during calendar year 2021.

### **Deliveries of Stormwater Augmentation Program Water (RDA II)**

Section 45(b)(7) of the amended Judgment allows Watermaster to “...levy an Assessment on all Pumping, as determined through Rules and Regulations ... to support the purchase, financing, and/or development of new or additional Supplemental Water sources, in cooperation with one or more Responsible Agencies as appropriate.” Section 45(b)(7) established the RDA for the purchase or development of additional Supplemental Water supplies.

As previously discussed, the “Stormwater Augmentation Program,” purchases available untreated imported water to supplement the shortage of local stormwater replenishment. The RDA II assessment is on all production and the purchased water is added to the natural Basin water supply, with no specific rights to recover the water. Production during fiscal year 2016-17 was the first year RDA II assessment was applied. At \$40/AF, about 11,400 acre-feet was purchased at the end of calendar year 2017. Production during fiscal year 2017-18 was the second year RDA II assessment was applied. At \$70, about 19,000 acre-feet was purchased at the end of calendar year 2018. For the third year, at \$105, about 23,800 acre-feet was purchased at the end of calendar year 2019. For the fourth year, at \$140, about 31,400 acre-feet was purchased at the end of calendar year 2020. The RDA II assessment is intended to increase to \$175/AF on fiscal year 2020-21 production. Assuming fiscal year 2020-21 production is about 190,000 acre-feet, about 38,000 acre-feet could be purchased with RDA II assessment at the end of calendar year 2021.

### **Deliveries of Supplemental Water**

In addition to Basin replenishment from local water supply, the groundwater elevation at the Key Well is impacted by the amount of Supplemental Water delivered as Replacement Water, RDA Water and for Cyclic Storage accounts. A summary of historical Supplemental Water deliveries is shown on Table 5. The following sections describe Supplemental Water deliveries, as 1) Replacement Water for Upper District, San Gabriel District and Three Valleys District; 2) MWD Agreement water; 3) Producer and other Cyclic Storage accounts and 4) Future Deliveries.



## **Replacement Water**

Section 42 of the amended Judgment states in part, "... Watermaster shall recharge Replacement Water in accordance with the Watermaster Operating Criteria and, insofar as practicable, to maintain the water level at the Key Well above Elevation two hundred (200)." (As of April 30, 2021, the groundwater elevation at the Key Well was 194.8 feet.) Typically, establishing a lower Operating Safe Yield results in reduced water rights, increased Replacement Water obligations and, consequently, increased deliveries and replenishment of imported water as Replacement Water. However, thus far, there is a lot of Cyclic Storage water in accounts, which can be deducted to meet Replacement Water obligations instead of delivering water to the Basin. Thus, lowering the Operating Safe Yield would have little or no impacts on the Basin water levels and groundwater supply management in the near term, but would help accelerate the withdrawal of water from Cyclic Storage and increase the opportunity to deliver Replacement Water in the future.

### **Fiscal Year 2020-21 Supplemental Water Deliveries (Replacement Water) Plus Stormwater Augmentation Program Water**

The following discusses Upper District, San Gabriel District and Three Valleys District deliveries during fiscal year 2020-21.

Following the conclusion of fiscal year 2019-20, it was determined Upper District had no Replacement Water requirement to be delivered during 2020-21 through USG-3 (due to Producer Cyclic Storage water) and 3,000 acre-feet will be delivered through USG-5. In addition, Upper District had a RDA II requirement of about 29,163 acre-feet to be delivered during 2020-21. As of March 31, 2021, a total of 2,268.30 acre-feet was delivered through USG-5 leaving a Replacement Water balance of 731.70 acre-feet. As of March, 2021, the RDA II requirement of 29,163 acre-feet had been fulfilled.

Following the conclusion of fiscal year 2019-20, it was determined San Gabriel District had a Replacement Water requirement of 12,151.86 acre-feet to be delivered during 2020-21. As of March 31, 2021, the Replacement Water requirement had not been delivered but will be fulfilled by June 30, 2021. In addition, San Gabriel District indicated it could not deliver its RDA II requirement during 2020-21. Consequently San Gabriel District's required RDA II would be delivered by Upper District and Three Valleys District and included in their RDA II requirement.

Following the conclusion of fiscal year 2019-2020, it was determined Three Valleys District had no Replacement Water requirement to be delivered during 2020-21. Three Valleys District had a RDA II requirement of 2,195 acre-feet to be delivered during 2020-21. As of March 31, 2021, the full RDA requirement of 2,195 acre-feet had been delivered.

## **Estimated 2021-22 Supplemental Water Delivery Requirements - Replacement Water Plus Stormwater Augmentation Program Water**

The estimated fiscal year 2020-21 over-production in the Basin is about 20,600 acre-feet. It is assumed much of the over-production will be satisfied by a deduction from water in Producers' Cyclic Storage accounts.

It is estimated Upper District Producers' over-production will be about 10,300 acre-feet. After deductions from Producer's Cyclic Storage accounts, it is anticipated there will be no Replacement Water requirement to be delivered through USG-3 and about 3,000 acre-feet of Replacement Water to be delivered through USG-5 in 2021-22. In addition, Upper District has an estimated RDA II requirement of about 31,000 acre-feet to be delivered during 2021-22 for a total estimated delivery requirement of about 34,000 acre-feet ( $0 + 3,000 + 31,000$ ) during 2021-22.

It is estimated San Gabriel District Producers will have over-production of about 7,600 acre-feet and consequently a Replacement Water requirement of about 7,600 acre-feet to be delivered in fiscal year 2021-22. In addition, San Gabriel District has an estimated RDA II requirement of about 5,000 acre-feet to be delivered during 2021-22, for a total estimated Supplemental Water delivery requirement of 12,600 acre-feet ( $7,600 + 5,000$ ) during 2021-22. In addition, San Gabriel District has an annual obligation of 5,000 acre-feet to MWD but may be reduced during 2021.

It is estimated Three Valleys District producers will have over-production of about 2,700 acre-feet and consequently (after use of Cyclic Storage) no Replacement Water requirement to be delivered in fiscal year 2021-22. Three Valleys District has an estimated RDA II requirement of about 2,300 acre-feet to be delivered during 2021-22. The total delivery requirement for Three Valleys District during 2021-22 is approximately 2,300 acre-feet ( $0 + 2,300$ ).

### **Cyclic Storage Water**

Cyclic Storage water is a pre-delivery of Replacement Water. Under the terms of Cyclic Storage agreements, the Individual Producers may make deliveries to Watermaster out of their Cyclic Storage accounts to satisfy Replacement Water requirements which are accounted for following June 30 of each year. The Responsible Agencies may make deliveries to Watermaster out of their Cyclic Storage accounts to satisfy Replacement Water requirements as of June 30 of each year.

There are Cyclic Storage agreements between Watermaster and each of the Responsible Agencies which provide for the total storage of up to 250,000 acre-feet of Supplemental (Replacement) Water in the Basin. This includes up to 50,000 acre-feet for San Gabriel District, up to 150,000 acre-feet for the MWD and Upper District, and up to 50,000 acre-feet for MWD and Three Valleys District. In addition, there are 21 producer Cyclic Storage agreements in which up to 175,525 acre-feet can be stored. The total amount of water that could be stored in existing Cyclic Storage accounts is

up to 425,525 acre-feet. As of March 31, 2021 there was a total of about 202,000 acre-feet (about 126,000 acre-feet in cyclic storage accounts and about 76,000 acre-feet in MWD Pre-Delivery account) in Basin cyclic storage (represents about 25 feet at the Key Well).

Water in Cyclic Storage is available to supply Replacement Water by transfer to Watermaster in-lieu of physically delivering Supplemental Water. This is typically done at the discretion of the storing party. Table 3 is a summary of the monthly Cyclic Storage account balances since July 1, 2014. The storage balance in all of the Basin Cyclic Storage accounts on July 1, 2020, the balance as of March 31, 2021 and the estimated balance as of June 30, 2021, is shown below in acre-feet.

	Cyclic Storage as of July 1, 2020	Account Balance as of March 31, 2021	Estimated Balance as of June 30, 2021 <sup>1/</sup>
San Gabriel Valley Municipal Water District	8,892	11,260	2,000
Upper San Gabriel Valley Municipal Water District	8,013	8,013	8,000
Three Valleys Municipal Water District	24,011	20,865	21,000
Producers in San Gabriel District	2,971	2,971	3,000
Producers in Upper District	34,964	56,057	34,000
Producers in Three Valleys District	795	3,987	1,000
Watermaster Pre-purchases	0	0	0
RDA I	12,756	12,756	13,000
Puente Basin Agency Storage and Export	9,566	9,896	10,000
MWD Cyclic Agreement (intended for RDA II)	<u>123,558</u>	<u>76,000</u>	<u>76,000</u>
	225,526	201,805	168,000

<sup>1/</sup> It is assumed Replacement Water requirements will be deducted from Cyclic Storage accounts following the end of fiscal year 2020-21. It is assumed 2021 SWP water allocation is 5 percent.

### **BASIN CONDITIONS - CARRY-OVER RIGHTS**

In accordance with the Judgment Section 49, "...Any Pumper's Share of the Operating Safe Yield and the Production Right of any Integrated Producer, which is not produced in a given fiscal year, may be carried over and accumulated for one fiscal year..." Establishing high operating safe yields will normally result in increased Carry-over Rights. These Carry-over Rights must be used by the Producer in the next year or can be leased to another Producer for use in that year. The first water produced in the succeeding fiscal year is deemed to be the Carry-over water. Leasing of water rights, including Carry-over Rights, also usually results in a reduction of the

amount of water subject to Replacement Water assessments and, thus a decrease in delivery of Replacement Water to the Basin.

The amount of Carry-over Rights is considered when recommending the Operating Safe Yield. The Carry-over Rights at the beginning of fiscal year 2019-20 were approximately 34,600 acre-feet and increased to 36,700 acre-feet at the beginning of fiscal year 2020-21. It is estimated the Carry-over Rights at the beginning of fiscal year 2021-22 will be about 25,000 acre-feet. Historical Carry-over Rights and lost Carry-over Rights are shown on Table 1.

### **BASIN CONDITIONS - ESTIMATED WATER PRODUCTION DURING 2020-21**

Historical water production under the Judgment since July 1, 1973, has been reported and recorded on a quarterly basis, as shown in Table 6. The preliminary total water production for the first two quarters of fiscal year 2020-21 was about 112,800 acre-feet. Figure 7 shows quarterly production in the Basin for the past 11 years (fiscal years 2009-10 through 2019-20) plus fiscal year 2020-21. Anticipated groundwater production for fiscal year 2020-21 has been estimated below.

The reported production for the first two quarters of fiscal year 2020-21 was about 113,000 acre-feet. This is similar to the first two quarters of fiscal years 2014-15 (117,000 acre-feet) and 2017-18 (117,000 acre-feet). Both fiscal years 2014-15 and 2017-18 had below average rainfall (10 inches and 7 inches, respectively). It appears fiscal year 20-21 may also be a below average rainfall year. Assuming production for the last two quarters of fiscal year 2020-21 is similar to the production for the last two quarters of fiscal years 2014-15 and 2017-18, which was about 90,000 acre-feet, total fiscal year 2020-21 production will be about 200,000 acre-feet (113,000 + 90,000). The first two quarters of fiscal year 2020-21 was about 3.5% less than the first two quarters of fiscal years 2014-15 and 2017-18. Consequently, total fiscal year 2020-21 production is about 190,000 acre-feet ( $200,000 \times 3.5\% - 200,000$ ). Based on this information, it is anticipated groundwater production during fiscal year 2020-21 will be about 190,000 acre-feet. Direct treated water deliveries have remained about the same, as described below. In addition, drought conservation activities have continued, which also have impacted production. Figure 7 shows production for the past 11 years and the estimated groundwater production for fiscal year 2020-21.

The historical total demand in the Basin is met by local water production and direct treated imported water deliveries. During fiscal year 2019-20, direct treated imported water sales were about 26,000 acre-feet, as shown in Table 7. Estimated direct treated imported water sales for fiscal year 2020-21 is about 20,000 acre-feet. Total demand during fiscal year 2020-21 is estimated to be about 210,000 acre-feet ( $190,000 + 20,000$ ) and is about 19,000 acre-feet below the 9-year average total water demand of 229,000 acre-feet, as shown in Table 7.

## FISCAL YEAR 2020-21 OPERATING SAFE YIELD DETERMINATION

On May 13, 2020, Watermaster considered the Engineer's recommended Preliminary Operating Safe Yield of 150,000 acre-feet for fiscal year 2020-21. At that time, the total rainfall in the Basin from July 1, 2019 to April 30, 2020, as represented by the Puddingstone Dam station, was 16.16 inches or 92 percent of long-term average for that period. (The total annual rainfall at the Puddingstone Dam station for fiscal year 2019-20 was 16.49 inches, representing about 91 percent of average.) The groundwater elevation at the Key Well at the time of the May 2020 Watermaster meeting was 205.5 feet and decreasing at the rate of about 0.4 feet per week. Total water in local storage reservoirs was 72,000 acre-feet of which about 55,000 acre-feet were available for groundwater storage and/or for delivery for direct use.

At its May 13, 2020 meeting, Watermaster established the Operating Safe Yield at 150,000 acre-feet for fiscal year 2020-21 and an estimated Operating Safe Yield of 130,000 acre-feet for fiscal years 2021-22, 2022-23, 2023-24, and 2024-25.

## CONCLUSIONS

It is very important to recognize that "local" water resources and supplies have been seriously impacted by unprecedented drought conditions, and fiscal year 2020-21 is already a very dry year. These local drought conditions include both rainfall and runoff, which normally provides a significant quantity of useable water supply for the San Gabriel Basin.

Prior to the current drought, the historical long-term annual average Basin replenishment from "local" water supplies is about 110,000 acre-feet. Since about fiscal year 2011-12, the average annual "local" water Basin replenishment has been reduced to about 57,000 acre-feet per year. This represents a shortage of about 477,000 acre-feet of water supply to the Basin for this recent period. Fiscal year 2020-21 is going to add another very dry year with very low local water supply to the continuing drought. This is a serious, and continuing deficit to Basin water supplies.

### Local Water Replenishment

1973-74 through 2010-11 (before drought)	about 110,000 AFY
1973-74 through 2019-20 (after drought)	about 100,000 AFY
2011-12 through 2019-20 (9 yrs)	about 57,000 AFY

### Local Rainfall

1973-74 through 2010-11 (before drought)	about 19.23 inches/yr
1973-74 through 2019-20 (after drought)	about 17.95 inches/yr
2011-12 through 2019-20 (9 yrs)	about 12.52 inches/yr

### Baldwin Park Key Well

Historic Low Elevation (November 21, 2018)	169.4 feet
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Current Elevation without RDA Replenishment (includes Cyclic Storage for Replacement Water)	176.0 feet
Current Elevation – Measured	194.8 feet

During this unprecedented drought, the Watermaster has taken significant steps by implementing provisions of the Judgment, and developing and instituting new studies, programs and plans to address the drought conditions as they progressively worsened. The 2012 Judgment Amendments provided Watermaster with increased management flexibility and adaptability; and broad discretion in making Basin management decisions. Without the actions of the Watermaster and the Producers, Basin water supply conditions would have been much worse. The following are Watermaster and Producer Actions: RDA, Storm Water Capture, Cyclic Storage, Conservation, Recycled Water for Replenishment, Basinwide Low Water Vulnerability Assessment, In-Lieu Program, Assist Drought Impacted Purveyors, Stormwater Augmentation Program and MWD Replenishment Water Supply Agreement.

As a result of just the RDA programs (includes all RDA water deliveries, including RDA water not yet paid for), Watermaster and the Producers have added over 165,000 acre-feet of replenishment water and increased the elevation of the Baldwin Park Key Well by about 21 feet. Other Watermaster and Producer actions have also contributed to maintaining the Basin water supply reliability.

As stated earlier in the Report, Section 42 of the amended Judgment states in part, "...Watermaster shall recharge Replacement Water in accordance with the Watermaster Operating Criteria and, in so far as practicable, to maintain the water level at the Key Well above Elevation two-hundred (200)". The Judgment criteria essentially establishes the Operating Safe Yield and delivery of Replacement Water as the primary Watermaster tool to manage groundwater supplies for the Basin. This management goal became not "practicable", as a result unprecedented local drought conditions, and resulted in the RDA II – Stormwater Augmentation Program. The Stormwater Augmentation Program has resulted in the important recovery of Basin water levels and an addition to Watermaster's Basin management approach under Section 42, of the amended Judgment. The RDA II Program will likely continue to be an additional management tool for Watermaster until Basin water levels fully recover and demonstrate sustainability, and annual Replacement Water requirements reduce the large quantity of water held in Cyclic Storage. In this regard, it should be noted, a lower Operating Safe Yield would expedite the reduction of water held in Cyclic Storage and in the long-term, result in more wet water delivered to the Basin as a Replacement Water requirement.

As of April 30, 2021, the Key Well elevation was about 194.8 feet. Typically, during the Summer and early Fall, the measured groundwater elevation at the Key Well decreases by about 10 feet. Consequently, it is possible the measured groundwater elevation at the Key Well will be below 190 feet by October 2021, below the minimum Operating Criteria of 200 feet.

### FY 2019-20 and FY 2020-21 Comparison

<u>Last Year's (FY 19-20) Condition</u>	<u>This Year's (as of April 30<sup>th</sup>) Condition</u>
Key Well June 30 <sup>th</sup> – 203.1 ft	Key Well – 194.8 ft
Rainfall – 16.49 inches	Rainfall – 6.20 inches
Local Runoff – 79,700 AF	Local Runoff – 28,200 AF
SWP Allocation – 20%	SWP Allocation – 5%
Engineer Rec. – 150,000 AF	Engineer Rec. – 150,000 AF
Watermaster Adopted – 150,000 AF	Watermaster Adopted – TBD

Based on the evaluation presented in this Report, the Engineer's recommended Operating Safe Yield should be maintained for fiscal year 2021-22 at 150,000 acre-feet. The Engineer also recommends the Watermaster should consider maintaining the Operating Safe Yield at no more than 150,000 acre-feet until such time the operational elevation at the Key Well is significantly above elevation 200 feet (currently about 170 feet, excluding about 25 feet of water from cyclic storage), in accordance with the Judgment provisions. Setting the Operating Safe Yield lower than 150,000 acre-feet may be considered to help reduce the large quantity of water held in Cyclic Storage. Additionally, the long-term reduction of cyclic storage may ultimately result in an increase in wet deliveries. In the short-term however, reduction in the Operating Safe Yield under current conditions would likely result in higher costs with little or no benefit to water levels.

### ADOPTED OPERATING SAFE YIELD

On May 5, 2021, Watermaster held a hearing on the preliminary determination of Operating Safe Yield, which was submitted to Watermaster on April 7, 2021, in accordance with Section 43(a) of the Judgment. After review by its Engineer and comments received by those at the hearing, Watermaster approved the establishment of the Operating Safe Yield of the Main San Gabriel Basin at 150,000 acre-feet for fiscal year 2021-22, as shown below.

<u>Operating Safe Yield</u>	
<u>Fiscal Year</u>	<u>(Acre-feet)</u>
2021-22	150,000
2022-23	130,000
2023-24	130,000
2024-25	130,000
2025-26	130,000

Attached, as Appendix "B", is a tabulation showing each Pumper's Share in percent and the number of acre-feet each Producer can produce from the Basin free

of Replacement Water assessments for quantities of Operating Safe Yield 130,000 acre-feet per year to 160,000 acre-feet per year. Those producers shown to have a share less than five acre-feet prior to June 21, 2012 are Minimal Producers and are allowed to produce up to five acre-feet free of Replacement Water assessments.

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TABLE 1

**ANNUAL OPERATING SAFE YIELD,  
PRODUCTION RIGHTS, WATER PRODUCTION  
AND REPLACEMENT WATER REQUIREMENTS  
(ACRE-FEET)**

FISCAL YEAR	RAINFALL AT PUDDINGSTONE STA. NO. 9&C-E (INCHES) 1/	MEASURED KEY WELL ELEVATION (FEET) 2/	OPERATING SAFE YIELD	CARRY OVER RIGHTS FROM PREVIOUS YEAR	LOST CARRY OVER RIGHTS	PRODUCTION RIGHTS	WATER PRODUCTION	BASIN OVER PRODUCTION		
								REPLACEMENT WATER REQUIREMENT	PRODUCER CYCLIC STORAGE	TOTAL
1973-74	15.05	238.4	226,800	—	—	238,132.94	235,460.40	14,518.88	0.00	14,518.88
1974-75	14.57	234.8	210,000	17,191.52	203.36	237,913.46	225,221.86	8,421.93	0.00	8,421.93
1975-76	7.77	221.1	200,000	20,808.91	131.06	231,391.95	242,246.36	24,744.88	0.00	24,744.88
1976-77	15.72	211.4	150,000	13,759.41	861.12	174,193.45	210,340.40	48,650.71	0.00	48,650.71
1977-78	40.08	270.4	150,000	9,980.67	1,198.54	170,473.30	195,275.53	36,818.25	0.00	36,818.25
1978-79	24.88	266.6	170,000	8,950.43	78.11	189,439.67	214,919.54	34,404.83	0.00	34,404.83
1979-80	33.76	282.4	220,000	6,745.88	81.54	237,226.13	223,088.89	9,896.39	0.00	9,896.39
1980-81	9.74	252.4	230,000	21,960.87	202.89	262,445.19	230,832.31	5,477.08	0.00	5,477.08
1981-82	19.94	245.5	210,000	35,642.01	380.30	255,281.37	220,391.54	10,582.35	0.00	10,582.35
1982-83	37.80	292.7	200,000	43,261.87	304.02	253,049.93	209,949.43	3,293.23	0.00	3,293.23
1983-84	12.09	267.1	230,000	45,378.26	80.10	287,394.98	236,679.19	2,151.85	1,573.60	3,725.45
1984-85	14.42	245.8	210,000	51,594.26	344.48	272,050.11	242,439.63	12,475.69	0.00	12,475.69
1985-86	23.33	250.8	190,000	40,395.40	198.50	240,319.81	246,223.58	33,774.82	0.00	34,774.82
1986-87	9.61	236.5	200,000	25,403.49	106.93	235,923.93	253,633.02	41,828.86	0.00	41,828.86
1987-88	16.79	224.0	190,000	22,457.73	143.63	222,985.31	248,101.54	51,989.89	0.00	51,989.89
1988-89	14.00	219.8	180,000	21,710.19	61.61	214,810.57	253,694.47	59,384.99	0.00	59,384.99
1989-90	12.11	206.5	180,000	19,741.33	282.28	210,268.35	252,135.76	62,582.49	0.00	62,582.49
1990-91	18.29	200.3	170,000	17,837.99	387.33	199,467.55	232,091.44	41,232.39	13,112.70	54,345.09
1991-92	23.93	236.9	140,000	18,796.02	345.83	169,575.74	221,476.83	31,214.19	35,916.80	67,131.09
1992-93	40.44	267.8	180,000	13,478.79	189.05	204,009.40	236,677.04	15,858.66	50,031.39	65,890.05
1993-94	12.44	246.8	220,000	31,718.29	462.81	262,029.85	243,616.55	8,915.59	25,422.42	34,338.01
1994-95	29.38	269.0	200,000	50,290.41	1,065.79	260,802.71	243,479.39	30,194.77	0.00	30,194.77
1995-96	15.82	246.9	220,000	44,262.41	737.28	274,608.47	268,950.50	32,526.05	0.00	32,526.05
1996-97	18.47	241.3	210,000	35,484.68	863.84	256,011.19	279,481.35	55,236.24	0.00	55,236.24
1997-98	35.84	267.8	220,000	28,965.55	704.70	263,725.27	253,921.28	26,362.42	4,331.64	30,694.06
1998-99	7.93	244.8	230,000	34,016.10	124.28	277,282.73	265,151.97	30,499.32	2,859.69	33,359.01
1999-00	14.65	228.5	220,000	40,633.83	592.51	274,824.14	278,687.14	39,749.83	3,663.84	43,413.67
2000-01	17.04	220.1	220,000	33,774.80	570.83	267,126.29	270,919.13	38,317.35	2,825.02	41,142.37
2001-02	6.41	208.7	210,000	32,015.15	532.59	258,992.70	264,328.17	40,773.50	6,450.10	47,223.60
2002-03	19.99	204.1	190,000	32,833.12	159.50	240,450.90	237,490.86	38,519.29	5,948.75	44,468.04
2003-04	12.77	204.2	170,000	38,370.38	79.24	224,691.75	252,811.50	51,416.73	8,870.23	60,286.96
2004-05	44.08	248.4	170,000	24,549.23	53.76	219,049.64	247,187.00	41,043.83	18,736.93	59,780.76
2005-06	16.82	249.7	240,000	17,402.45	156.28	268,418.02	259,807.52	12,065.12	6,908.92	18,974.04
2006-07	4.55	220.5	240,000	27,862.73	90.80	278,386.20	284,328.04	20,048.99	7,309.89	27,358.88
2007-08	16.17	202.7	210,000	29,374.42	182.17	249,433.95	258,167.00	28,777.98	9,157.53	37,935.51
2008-09	14.59	195.6	180,000	33,902.42	778.21	224,028.56	250,102.62	26,473.24	30,239.02	56,712.26
2009-10	20.04	204.2	170,000	28,729.17	236.31	210,117.25	237,846.31	35,129.38	14,929.92	50,059.30
2010-11	19.45	233.5	170,000	20,695.69	167.70	201,220.31	227,657.15	33,084.38	15,362.66	48,447.04
2011-12	12.06	226.4	210,000	21,657.47	160.96	242,181.86	237,028.57	19,685.04	20,704.45	40,389.49
2012-13	7.84	202.8	200,000	44,143.15	268.13	254,314.47	242,913.84	5,972.15	23,673.25	29,645.40
2013-14	4.77	187.8	180,000	42,864.88	377.39	233,389.45	240,552.41	3,779.32	36,325.98	40,105.30
2014-15	10.01	177.5	150,000	36,753.33	419.84	197,280.18	208,339.16	12,319.13	33,568.84	45,887.97
2015-16	10.04	174.0	150,000	35,226.32	284.47	195,752.95	182,826.49	6,909.20	19,510.99	26,420.19
2016-17	20.92	179.4	150,000	39,299.44	285.56	199,994.06	197,243.28	7,526.21	24,009.59	31,535.80
2017-18	6.92	178.5	150,000	34,893.57	144.60	195,420.20	209,489.70	12,520.95	27,409.88	39,930.83
2018-19	23.60	196.9	150,000	28,810.62	298.63	189,434.81	190,156.12	10,747.45	24,101.15	34,848.60
2019-20	16.49	203.1	150,000	34,603.48	640.76	194,608.18	192,583.66	12,911.67	21,913.85	34,825.52
2020-21	6.20	3/ 194.8 4/	150,000	36,743.32	—	197,300 5/	190,000 6/	—	—	—
9-YEAR AVERAGE:	12.52	—	165,556	—	—	—	211,238	—	—	—
10-YEAR AVERAGE:	13.21	—	166,090	33,894.79	305.40	210,359.65	212,880.04	12,545.55	24,654.07	37,199.62
47-YEAR AVERAGE:	17.95	—	191,847	29,528.87	348.38	232,338.92	237,360.75	26,187.40	10,528.28	36,714.42

1/ Water Year

2/ End of Fiscal Year, July to June

3/ As of April 30, 2021

4/ As of April 30, 2021

5/ Estimated value including Carry-over Rights and Diversion Rights

6/ Estimated value

TABLE 2

# **RAINFALL AND WATER REPLENISHMENT OF MAIN SAN GABRIEL BASIN**

WATER YEAR 1/	RAINFALL AT PUDDINGSTONE STA. NO. 96C-E (INCHES)	WATER REPLENISHED IN THE MAIN SAN GABRIEL BASIN			MEASURED BALDWIN PARK KEY WELL ELEV. AT END OF WATER YEAR (FT)	OPERATIONAL BALDWIN PARK KEY WELL ELEV. AT END OF WATER YEAR (FT)
		LOCAL RUNOFF (AF)	IMPORTED (AF) 2/	TOTAL (AF)		
1973-74	15.05	92,000	8,835	100,835	234	234
1974-75	14.57	62,000	14,564	76,564	226	226
1975-76	7.77	22,400	28,018	50,418	214	212
1976-77	15.72	21,000	18,335	39,335	206	203
1977-78	40.08	262,400	20,549	282,949	259	258
1978-79	24.88	160,000	30,968	190,968	254	253
1979-80	33.76	227,700	5,805	233,505	269	268
1980-81	9.74	49,100	0	49,100	243	242
1981-82	19.94	92,200	42,623	134,823	240	239
1982-83	37.80	298,800	28,345	327,145	284	283
1983-84	12.09	70,000	3,326	73,326	256	255
1984-85	14.42	32,700	66	32,766	240	239
1985-86	23.33	70,200	55,862	126,062	241	234
1986-87	9.61	26,700	55,943	82,643	238	228
1987-88	16.79	48,500	43,989	92,489	218	208
1988-89	14.00	33,000	45,925	78,925	211	201
1989-90	12.11	37,700	47,504	85,204	201	193
1990-91	18.29	95,500	54,153	149,653	205	199
1991-92	23.93	222,100	68,304	290,404	237	230
1992-93	40.44	220,000	62,632	282,632	268	265
1993-94	12.44	43,000	38,296	81,296	250	247
1994-95	29.38	210,500	22,354	232,854	266	261
1995-96	15.92	105,900	32,480	138,380	248	238
1996-97	18.47	34,700	55,075	89,775	239	228
1997-98	35.84	171,600	62,887	234,487	264	255
1998-99	7.93	48,200	13,346	61,546	239	230
1999-00	14.65	66,500	59,559	126,059	226	214
2000-01	17.04	84,900	34,998	119,898	217	206
2001-02	6.41	55,900	60,543	116,443	205	194
2002-03	19.99	55,200	63,508	118,708	203	189
2003-04	12.77	45,600	67,533	113,133	197	180
2004-05	44.08	398,000	19,921	417,921	248	237
2005-06	16.82	138,600	88,014	226,614	240	225
2006-07	4.50	47,800	24,780	72,580	213	199
2007-08	16.25	85,400	7,727	93,127	203	191
2008-09	14.82	73,800	6,607	80,407	191	185
2009-10	20.02	157,400	32,708	190,108	204	198
2010-11	19.45	241,500	68,424	309,924	234	227
2011-12	12.06	39,100	57,846	96,946	212	203
2012-13	7.84	24,600	44,678	69,278	196	188
2013-14	4.77	21,900	36,717	58,617	182	174
2014-15	10.01	14,500	41,519	56,019	174	165
2015-16	10.04	35,200	60,092 1/	95,292	172	161
2016-17	20.92	92,200	91,316 1/	183,516	182	163
2017-18	6.92	29,400	55,115	84,514	172	152
2018-19	23.60	173,500	99,265 1/	272,765	211	182
2019-20	16.49	79,700	54,736 1/	134,436	201	173
2020-21	6.20	3/ 28,200 4/	10,533 5/	38,733 5/	195	170 6/
9-Year Average	12.52	56,678	60,143	116,820	--	--
10-Year Average	13.21	75,160	60,971	136,131	--	--
47-Year Average	17.95	100,396	41,187	141,583	--	--

1/ October 1 to September 30

2/ July 1 to June 30

3/ As of April 30, 2021

4/ Preliminary data as of March 31, 2021.

5/ October 1, 2020 to March 31, 2021.

6/ As of April 30, 2021

**TABLE 3**  
**MONTHLY STORAGE ACCOUNTS**  
**AND EFFECT ON KEY WELL**

END OF MONTH	ACCUMULATED CYCLIC STORAGE ACCOUNTS (acre-feet)						ADDITIONAL STORAGE ACCOUNTS			TOTAL	ESTIMATED KEY WELL ELEVATION INCREASE DUE TO STORAGE ACCOUNTS (FT) 1/	OPERATIONAL KEY WELL ELEVATION (WITHOUT STORAGE ACCOUNTS) (FT)	MEASURED KEY WELL ELEVATION (FT)
	MWD/UD	SGVMWD	MWD/TV	MWD AGREEMENT	PRODUCER	TOTAL CYCLIC STORAGE	WATERMASTER PRE-PURCHASES	PUEANTE BASIN WATER AGENCY	RESOURCE DEVELOPMENT (RDA I)				
Jul-14	5,000.00	6,513.62	14,876.90	--	30,724.60	57,115.1	4,672.74	--	--	61,787.86	7.72	178.2	185.9
Aug-14	5,000.00	6,720.99	14,876.90	--	32,229.60	58,827.5	4,672.74	--	--	63,500.23	7.94	176.2	184.2
Sep-14	5,000.00	7,550.15	14,876.90	--	33,734.60	61,161.7	4,672.74	--	--	65,834.39	8.23	174.0	182.3
Oct-14	0.00	7,469.52	14,876.90	--	40,738.30	63,084.7	4,672.74	--	--	67,757.46	8.47	172.4	180.9
Nov-14	1,000.00	7,394.79	14,876.90	--	45,467.20	68,738.9	3,572.74	--	--	72,311.63	9.04	171.0	180.0
Dec-14	1,000.00	7,314.16	14,876.90	--	48,678.80	71,869.9	3,572.74	--	--	75,442.60	9.43	170.7	180.1
Jan-15	1,000.00	7,232.81	14,876.90	--	52,562.20	75,671.9	3,572.74	--	--	79,244.65	9.91	170.3	180.2
Feb-15	1,000.00	7,159.95	14,876.90	--	58,167.20	81,204.1	3,572.74	--	--	84,776.79	10.60	169.2	179.8
Mar-15	0.00	3,242.63	14,876.90	--	67,197.70	85,317.2	6,562.74	--	--	91,879.97	11.48	168.0	179.5
Apr-15	1,068.00	3,168.58	14,876.90	--	69,697.70	88,809.2	8,572.74	--	--	97,381.92	12.17	166.6	178.8
May-15	4,699.00	3,071.50	14,876.90	--	69,697.70	92,345.1	8,572.74	--	--	100,917.84	12.61	165.6	178.2
Jun-15	5,032.00	2,957.99	14,347.90	--	71,819.96	94,157.9	8,972.74	--	--	101,130.59	12.64	164.8	177.5
Jul-15	5,031.54	4,324.67	14,347.90	--	38,311.12	62,015.2	6,972.74	--	--	68,987.97	8.62	167.5	176.1
Aug-15	5,031.54	6,140.39	14,347.90	--	38,311.12	63,831.0	6,972.74	--	--	70,803.69	8.85	166.2	175.0
Sep-15	10,031.54	2,925.85	14,347.90	--	38,311.12	65,616.4	6,972.74	--	--	72,589.15	9.07	165.3	174.4
Oct-15	10,031.54	3,378.95	14,347.90	--	38,311.12	66,069.5	6,972.74	--	--	73,042.25	9.13	164.9	174.1
Nov-15	10,031.54	3,300.07	15,216.30	--	46,295.82	74,843.7	6,972.74	--	413.00	82,229.47	10.28	163.7	174.0
Dec-15	9,637.64	2,316.72	16,855.30	--	49,821.12	78,630.6	6,972.74	--	8,940.00	92,543.52	11.57	165.4	177.0
Jan-16	5,137.64	2,236.27	16,855.30	--	49,821.12	74,050.3	11,472.74	--	8,940.00	92,463.07	11.56	167.5	179.0
Feb-16	5,138	2,163.72	2,277.00	--	49,821.12	59,399.5	11,472.74	14,578.30	8,940.00	92,390.52	11.55	166.8	178.3
Mar-16	8,139	2,115.36	2,277.00	--	49,821.12	62,352.0	11,472.74	14,578.30	8,940.00	95,343.06	11.92	165.9	177.8
Apr-16	8,139	2,037.46	2,277.00	--	49,821.12	62,274.1	11,472.74	14,578.30	8,940.00	95,265.16	11.91	164.8	176.7
May-16	8,139	2,661.68	2,277.00	--	49,821.12	62,898.3	11,472.74	14,578.30	8,940.00	95,889.38	11.99	163.5	175.5
Jun-16	7,539	5,121.04	2,277.00	--	51,771.12	66,898.7	10,122.74	14,578.30	8,940.00	98,539.74	12.32	161.7	174.0
Jul-16	7,539	8,050.89	2,277.00	--	32,260.13	50,126.6	10,122.74	14,578.30	8,940.00	81,767.60	10.22	162.4	172.6
Aug-16	7,539	10,692.05	2,277.00	--	32,260.13	52,767.7	10,122.74	14,578.30	8,940.00	84,408.76	10.55	162.4	173.0
Sep-16	7,539	13,277.84	2,277.00	--	32,260.13	55,353.5	10,122.74	14,578.30	8,940.00	86,994.55	10.87	161.3	172.2
Oct-16	7,539	4,635.99	2,277.00	--	51,681.63	66,133.2	10,122.74	14,578.30	8,940.00	97,774.20	12.22	161.9	174.1
Nov-16	7,539	7,279.09	4,265.90	--	64,343.63	83,429.2	10,122.74	14,578.30	11,653.00	119,783.20	14.97	161.1	176.1
Dec-16	7,225	2,811.24	14,395.10	--	73,860.13	98,291.6	10,122.74	14,571.80	11,653.00	134,639.15	16.83	160.0	179.8
Jan-17	7,225	2,739.22	14,395.10	--	73,860.13	98,219.6	10,122.74	14,571.80	11,653.00	134,567.13	16.82	164.0	180.8
Feb-17	7,225	4,127.60	14,395.10	--	73,860.13	99,608.0	10,122.74	14,571.80	11,653.00	135,955.51	16.99	164.7	181.7
Mar-17	7,225	6,407.86	14,395.10	--	73,860.13	101,888.2	10,122.74	14,553.62	12,414.00	138,978.59	17.37	165.7	183.1
Apr-17	7,225	9,686.97	14,395.10	--	73,860.13	105,167.3	10,122.74	14,553.62	12,414.00	142,257.70	17.78	165.0	182.8
May-17	7,225	10,381.49	14,395.10	--	73,860.13	105,861.9	10,122.74	14,553.62	12,414.00	142,952.22	17.87	164.1	182.0
Jun-17	7,225	7,842.99	12,000.00	--	76,496.13	103,584.3	9,333.84	13,962.31	12,756.00	139,616.41	17.45	161.9	179.4
Jul-17	7,225	8,605.83	12,000.00	15,239.40	54,052.49	97,122.9	9,333.84	13,962.31	12,756.00	133,175.01	16.65	160.8	177.4
Aug-17	7,225	10,310.61	12,000.00	31,553.10	56,052.49	117,141.3	7,333.84	13,962.31	12,756.00	151,193.49	18.90	158.5	177.4
Sep-17	7,225	12,451.75	12,000.00	41,020.70	62,122.19	134,819.8	1,264.14	13,654.50	12,756.00	162,494.42	20.31	162.0	182.3
Oct-17	7,225	9,215.56	12,000.00	46,020.70	62,122.19	136,583.6	1,264.14	13,654.50	12,756.00	164,258.23	20.53	162.8	183.3
Nov-17	7,225	11,006.89	12,000.00	46,203.80	62,122.19	138,558.0	1,264.14	13,654.50	12,756.00	166,232.66	20.78	162.5	183.3
Dec-17	7,225	7,391.04	13,329.10	31,547.10	62,716.33	122,208.7	0.00	13,097.88	12,756.00	148,062.59	18.51	162.7	181.2
Jan-18	7,188	9,445.40	13,329.10	42,530.40	62,753.23	135,246.4	6,764.00	13,097.88	12,756.00	167,864.25	20.98	161.3	182.3
Feb-18	7,188	12,467.25	12,978.70	42,530.40	62,753.23	137,917.8	6,764.00	13,097.88	12,756.00	170,535.70	21.32	162.3	183.6
Mar-18	7,188	14,757.10	12,978.70	42,530.40	70,064.73	147,519.2	0.00	12,620.96	12,756.00	172,896.13	21.61	161.2	182.8
Apr-18	7,218	14,017.84	16,074.80	42,517.50	73,423.23	153,251.2	0.00	14,384.31	12,756.00	180,391.52	22.55	159.2	181.7
May-18	7,218	14,763.66	16,074.80	42,517.50	73,423.23	153,997.0	0.00	14,384.31	12,756.00	181,137.34	22.64	158.3	180.9
Jun-18	6,718	16,998.43	16,074.80	42,517.50	73,423.23	156,231.8	0.00	14,384.31	12,756.00	183,372.11	22.92	155.6	178.5
Jul-18	6,718	19,670.74	15,025.80	42,517.50	46,513.25	130,445.1	0.00	12,158.36	12,756.00	155,359.49	19.42	156.6	176.0
Aug-18	6,718	21,125.20	15,025.80	42,517.50	46,513.25	131,899.6	0.00	12,158.36	12,756.00	156,813.95	19.60	153.6	173.2
Sep-18	6,718	23,185.29	15,025.80	42,517.50	46,513.25	133,959.7	0.00	11,964.26	12,756.00	158,679.84	19.83	151.8	171.6
Oct-18	7,397	18,595.85	15,025.80	47,517.50	49,151.85	137,688.0	0.00	11,964.26	12,756.00	162,408.30	20.30	149.9	170.2
Nov-18	7,218	716.48	15,053.30	47,517.50	64,987.25	135,944.4	0.00	11,964.26	12,756.00	160,664.61	20.08	150.1	170.2
Dec-18	11,934	626.51	14,706.60	47,517.50	64,987.25	138,772.3	0.00	11,603.16	12,756.00	164,131.46	20.52	154.9	175.4
Jan-19	11,934	1,146.20	14,706.60	47,517.50	64,987.25	140,292.0	0.00	11,603.16	12,756.00	164,651.15	20.58	158.5	179.1
Feb-19	11,934	1,146.20	14,706.60	47,517.50	64,987.25	140,292.0	0.00	11,603.16	12,756.00	164,651.15	20.58	158.1	179.7
Mar-19	11,934	4,713.71	14,281.90	47,517.50	64,987.25	143,434.8	0.00	11,099.24	12,756.00	167,290.04	20.91	168.3	189.2
Apr-19	11,942	6,686.86	13,992.90	47,517.50	69,987.25	150,127.0	0.00	11,099.24	12,756.00	173,982.19	21.75	174.3	196.0
May-19	11,942	9,134.76	13,659.60	57,517.50	69,987.25	162,241.6	0.00	11,099.24	12,756.00	186,096.79	23.26	172.6	195.9
Jun-19	11,572	12,018.79	13,162.60	57,517.50	70,357.25	164,628.6	0.00	10,677.32	12,756.00	188,061.90	23.51	173.3	196.8
Jul-19	11,572	15,073.15	19,842.60	68,388.00	47,297.80	162,174.0	0.00	10,677.32	12,756.00	185,607.31	23.20	174.3	197.5
Aug-19	11,572	16,861.15	20,300.90	85,906.00	47,297.80	181,938.3	0.00	10,677.32	12,756.00	205,371.61	25.67	181.9	207.6
Sep-19	11,572	18,640.44	20,668.30	102,889.70	47,297.80	201,068.7	0.00	10,677.32	12,756.00	224,502.00	28.06	182.4	210.5
Oct-19	11,572	20,289.00	20,890.00	120,491.30	47,297.80	220,540.5	0.00	10,677.32	12,756.00	243,973.86	30.50	181.3	211.8
Nov-19	11,572	21,897.21	20,923.90	132,031.70	47,297.80	233,723.1	0.00	10,677.32	12,756.00	257,156.37	32.14	179.7	211.8
Dec-19	8,013	22,700.47	32,137.43	107,550.90	55,497.80	225,899.5	0.00	10,211.50	12,756.00	248,867.00	31.11	181.4	212.5
Jan-20	8,013	11,607.01	32,152.03	108,084.00	55,497.80	215,353.7	0.00	10,211.50	12,756.00	238,321.24	29.79	181.9	211.7
Feb-20	8,013	12,513.21	32,152.03	108,084.00	55,497.80	216,259.9	0.00	10,211.50	12,756.00	239,227.44	29.80	179.5	209.4
Mar-20	8,013	12,421.43	32,152.03	108,084.00	55,497.80	216,168.2	0.00	9,694.93	12,756.00	238,619.09	29.83	177.9	207.7
Apr-20	8,013	6,732.68	32,152.03	115,118.20	55,497.80	217,513.6	0.00	9,694.93	12,756.00	239,964.54	30.00	176.5	206.5
May-20	8,013	6,641.27	32,152.03	115,416.60	55,497.80	217,720.6	0.00	9,694.93					

TABLE 4

LOCAL WATER IN STORAGE  
IN SURFACE RESERVOIRS

RESERVOIR	April 28, 2020		April 27, 2021			
	STORAGE (ACRE-FEET)	STORAGE (ACRE-FEET)	INFLOW (CFS)	OUTFLOW (CFS)	RESERVOIR CAPACITY (ACRE-FEET)	RESERVOIR STORAGE IN PERCENT
Cogswell Dam	6,337	37	4	4	10,475	0%
San Gabriel Dam	39,775	2,373	23	60	44,044	5%
Morris Dam	18,038	10,344	62	25	28,736	36%
Sub-Total:	64,151	12,754			83,255	15%
Santa Fe Dam <sup>1/</sup>	0	0	--	0	--	--
Big Dalton Dam	0	0	0	0	--	--
San Dimas Dam	1,123	197	1	0	--	--
Puddingstone Dam <sup>2/</sup>	6,812	6,198	0	0	--	--
TOTALS:	72,085	19,149				

1/ Storage is typically zero. Reservoir used for Flood Control purposes only, not storage for water conservation purposes.

2/ Storage is typically about 6,600 acre-feet. Used for recreational purposes, not water conservation purposes.

TABLE 5

**SUPPLEMENTAL WATER DELIVERIES  
TO THE MAIN SAN GABRIEL BASIN  
FOR GROUNDWATER REPLENISHMENT  
(ACRE-FEET)**

FISCAL YEAR	UPPER DISTRICT					THREE VALLEYS DISTRICT					SAN GABRIEL DISTRICT					TOTALS	
	REPLACEMENT USG-3	USG-5 21	CYCLIC STORAGE	WATERMASTER PRE-PURCHASES	RESOURCE DEVELOPMENT	PRODUCER CYCLIC STORAGE	REPLACEMENT WATER	CYCLIC STORAGE	WATERMASTER PRE-PURCHASES	RESOURCE DEVELOPMENT	REPLACEMENT WATER	EXCHANGE REPLACEMENT	USG-5 CYCLIC STORAGE	WATERMASTER PRE-PURCHASES	TRANSFERS TO		
															MWD		RESOURCE DEVELOPMENT
1974-75	13,731.90	--	--	--	--	--	--	--	--	--	787.10	--	44.90	--	--	--	14,563.90
1975-76	7,121.40	--	12,621.10	--	--	--	--	--	--	--	1,302.90	--	6,972.10	--	--	--	28,017.50
1976-77	10,752.60	2,654.90	52.40	--	--	--	--	--	--	--	3,814.95	992.93	2,722.12	--	--	--	20,989.90
1977-78	14,962.60	2,981.70	0.00	--	--	--	--	--	--	--	4,470.85	1,115.15	0.00	--	--	--	23,530.20
1978-79	24,000.00	3,486.10	0.00	--	--	--	--	--	--	--	4,112.25	1,303.79	1,551.96	--	--	--	34,454.10
1979-80	4,740.60	3,191.00	0.00	--	--	--	--	--	--	--	0.00	1,064.00	0.00	--	--	--	8,996.60
1980-81	0.00	3,130.70	0.00	--	--	--	--	--	--	--	0.00	0.00	0.00	--	--	--	3,130.70
1981-82	40,824.70	2,853.70	0.00	--	--	--	--	--	--	--	81.84	1,067.28	648.88	--	--	--	45,476.40
1982-83	22,934.40	2,256.30	3,189.30	--	0.00	--	--	--	--	--	0.00	843.87	1,377.13	--	--	--	30,601.00
1983-84	0.00	1,907.10	3,246.70	--	0.00	--	--	--	--	--	0.00	79.00	0.00	--	--	--	5,232.80
1984-85	0.00	2,395.50	0.00	--	0.00	--	--	--	--	--	0.00	66.00	0.00	--	--	--	2,461.50
1985-86	3,000.00	2,600.80	47,405.40	--	0.00	--	--	--	--	--	4,484.30	972.70	0.00	--	--	--	58,463.20
1986-87	19,354.30	2,484.20	23,991.10	--	0.00	--	--	--	--	--	4,368.59	929.09	7,300.32	--	--	--	58,427.60
1987-88	26,187.30	3,751.30	5,975.00	--	0.00	--	--	--	--	--	7,763.11	1,492.99	660.90	--	--	--	47,740.50
1988-89	39,100.00	3,726.60	110.70	--	0.00	--	--	--	--	--	5,320.25	1,393.75	0.00	--	--	--	49,661.30
1989-90	32,740.20	1,716.10	0.00	--	0.00	--	--	--	--	--	11,296.63	641.82	2,825.55	--	--	--	49,220.30
1990-91	16,078.60	2,734.10	14,453.50	--	0.00	--	--	25,077.10	--	--	9,485.43	1,022.57	0.00	--	--	--	56,886.90
1991-92	7,491.90	2,214.00	23,525.90	--	0.00	--	--	3,737.50	--	--	8,074.96	828.04	0.00	--	--	--	70,517.80
1992-93	16,077.97	2,478.10	10,214.60	--	0.00	--	--	0.00	--	--	11,418.17	1,202.03	1,064.80	--	--	--	85,109.90
1993-94	0.00	3,214.00	0.00	--	23,050.80	--	--	0.00	--	--	8,620.14	1,205.80	5,419.06	--	--	--	41,509.80
1994-95	0.00	3,178.10	6,177.10	--	0.00	--	--	5,691.49	--	--	5,691.49	1,188.61	3,557.90	--	--	--	25,531.80
1995-96	15,467.80	3,149.90	85.20	--	0.00	--	--	3,832.00	--	--	8,484.59	1,178.05	3,432.36	--	--	--	35,629.90
1996-97	3,934.10	3,304.50	32,229.90	--	0.00	--	--	1,451.10	--	--	14,525.94	1,235.89	1,698.17	--	--	--	58,379.60
1997-98	21,409.60	3,392.70	24,870.20	--	0.00	--	--	0.00	--	--	14,061.60	1,268.85	323.55	--	--	--	66,279.60
1998-99	0.00	3,353.40	0.00	--	0.00	--	3,311.70	0.00	--	--	6,198.61	1,254.19	2,621.20	--	--	--	16,599.10
1999-00	13,645.60	3,508.30	24,416.20	--	0.00	--	4,418.60	0.00	--	--	9,286.01	1,312.09	8,605.90	--	--	--	65,192.70
2000-01	10,412.80	3,285.30	14,624.30	--	0.00	--	5,583.70	675.20	--	--	10,464.30	1,228.70	0.00	--	--	--	46,274.30
2001-02	25,246.02	3,438.90	1,944.90	--	0.00	--	4,944.10	570.20	--	--	10,929.17	1,286.13	1,172.70	--	--	--	49,532.12
2002-03	33,551.42	3,018.30	0.00	--	0.00	--	2,791.00	0.00	--	--	3,939.39	1,128.84	15,027.77	--	--	--	59,455.72
2003-04	14,166.20	3,058.30	23,603.00	--	0.00	--	1,920.40	0.00	--	--	672.60	1,143.80	16,815.60	--	--	--	71,379.90
2004-05	5,744.20	2,998.00	0.00	--	0.00	--	1,714.50	0.00	--	--	500.66	1,121.25	10,840.09	--	--	--	24,718.70
2005-06	48,069.20	2,815.50	9,400.80	--	0.00	--	357.10	0.00	--	--	0.00	1,052.99	12,658.01	--	--	--	81,853.60
2006-07	0.00	2,863.30	4,159.20	--	0.00	--	166.70	2,978.00	--	--	573.59	1,108.29	15,794.12	--	--	--	27,743.20
2007-08	0.00	3,027.20	5,724.40	--	0.00	--	0.00	0.00	--	--	91.76	1,132.17	779.07	--	--	--	10,754.60
2008-09	0.00	3,054.90	0.00	--	0.00	--	0.00	0.00	--	--	788.73	1,146.29	4,871.98	--	--	--	9,571.90
2009-10	16,076.40	2,611.50	0.00	--	0.00	--	0.00	1,427.80	--	--	1,886.58	976.70	12,340.72	--	--	--	35,319.70
2010-11	23,737.90	2,428.20	0.00	--	0.00	--	0.00	12,284.60	--	--	14,655.86	908.13	5,211.01	--	--	--	70,852.20
2011-12	3,257.20	2,999.40	0.00	--	0.00	--	0.00	12,871.40	--	--	22,426.22	1,121.78	0.00	--	--	--	60,845.10
2012-13	2,034.70	3,037.40	0.00	--	0.00	--	0.00	10,098.80	--	--	16,269.22	1,135.98	5,138.80	--	--	--	47,714.90
2013-14	0.00	2,983.90	0.00	--	0.00	--	0.00	3,110.10	--	--	1,202.03	1,115.97	0.00	--	5,000.00	--	39,700.90
2014-15	0.00	2,711.70	4,031.54	--	0.00	--	0.00	471.00	--	--	182.83	1,014.17	0.00	--	0.00	--	44,230.60
2015-16	0.00	2,486.50	3,107.00	--	5,622.00	--	0.00	2,507.40	0.00	416.00	14,079.70	929.95	7,354.05	5,000.00	902.00	--	39,334.90
2016-17	0.00	2,876.90	0.00	--	4,713.00	--	0.00	12,284.60	0.00	118.10	14,079.70	1,075.95	7,265.75	5,000.00	761.00	--	84,391.60
2017-18	0.00	2,987.20	44,310.10	--	0.00	--	0.00	5,332.20	0.00	0.00	4,649.74	1,117.22	12,898.64	--	5,000.00	1,492.00	90,929.10
2018-19	0.00	2,943.90	14,854.60	--	0.00	--	0.00	2,126.50	0.00	1,110.00	0.00	1,101.03	11,965.97	--	5,000.00	2,471.00	80,715.00
2019-20	0.00	2,983.20	57,299.10	--	0.00	--	90.07	17,959.73	0.00	1,455.00	0.00	1,115.73	14,021.27	--	5,600.00	0.00	120,580.62
2020-21	0.00	2,968.30	0.00	--	29,163.00	--	0.00	0.00	0.00	2,195.07	0.00	848.35	2,367.65	--	0.00	0.00	47,195.77

1/ Estimated as of March 31, 2021.

2/ In-Lieu replenishment through CWEA.

**TABLE 6**  
**HISTORICAL WATER PRODUCTION**  
**(ACRE-FEET)**

<u>FISCAL YEAR</u>	<u>FIRST QUARTER</u>	<u>SECOND QUARTER</u>	<u>THIRD QUARTER</u>	<u>FOURTH QUARTER</u>	<u>TOTAL</u>
1973-74	76,455	51,809	40,649	65,397	234,310
1974-75	77,392	48,530	40,887	56,644	223,454
1975-76	77,811	51,274	47,542	63,439	240,066
1976-77	66,731	52,977	41,987	48,645	210,340
1977-78	59,996	47,251	33,189	54,839	195,275
1978-79	69,708	46,610	36,010	62,593	214,920
1979-80	75,291	51,799	37,496	58,522	223,108
1980-81	73,516	54,159	40,262	62,896	230,832
1981-82	77,656	50,996	39,071	51,819	219,541
1982-83	71,346	46,704	37,995	53,904	209,950
1983-84	69,443	44,463	51,157	69,616	234,679
1984-85	77,766	50,832	45,153	68,689	242,440
1985-86	77,193	53,773	46,083	69,175	246,223
1986-87	77,425	55,643	49,330	71,235	253,633
1987-88	76,057	51,642	53,093	67,319	248,111
1988-89	77,997	57,325	49,245	69,127	253,694
1989-90	77,509	60,257	50,941	63,412	252,118
1990-91	73,887	59,330	43,472	55,384	232,073
1991-92	65,688	54,633	40,696	60,461	221,477
1992-93	74,132	54,047	41,534	66,427	236,139
1993-94	76,624	57,381	47,652	61,949	243,606
1994-95	80,506	57,787	43,202	61,984	243,479
1995-96	81,408	63,428	50,931	73,184	268,950
1996-97	84,588	60,760	56,428	77,705	279,481
1997-98	84,624	60,585	46,940	61,890	254,039
1998-99	83,626	62,349	54,000	65,176	265,152
1999-00	82,395	69,076	53,697	73,519	278,687
2000-01	83,293	65,227	51,776	70,623	270,919
2001-02	82,434	61,691	55,724	64,480	264,328
2002-03	69,276	55,906	49,811	57,797	232,791
2003-04	71,337	56,815	54,740	69,957	252,850
2004-05	77,021	55,480	46,456	68,310	247,266
2005-06	79,323	62,977	53,745	63,894	259,940
2006-07	83,160	66,532	61,808	72,828	284,329
2007-08	75,251	57,898	53,327	71,691	258,167
2008-09	76,053	59,007	49,458	66,029	250,547
2009-10	74,867	56,356	43,456	62,445	237,123
2010-11	71,179	50,002	44,881	60,877	226,939
2011-12	74,369	51,922	48,340	61,659	236,290
2012-13	76,217	53,359	46,418	66,550	242,545
2013-14	73,131	54,706	48,357	64,359	240,552
2014-15	66,954	50,046	43,168	48,171	208,339
2015-16	54,430	42,182	37,364	48,850	182,826
2016-17	59,704	46,491	35,748	55,300	197,243
2017-18	63,580	53,479	41,816	50,625	209,500
2018-19	60,022	46,919	34,434	48,780	190,155
2019-20	58,198	44,615	40,766	49,005	192,584
2020-21	60,048	52,674	--	--	190,000 1/
9-Year Average	65,178	49,302	41,823	54,811	207,968
10-Year Average	65,778	49,372	42,129	55,418	212,697
47-Year Average	73,969	54,618	45,962	62,493	237,043

1/ ESTIMATED

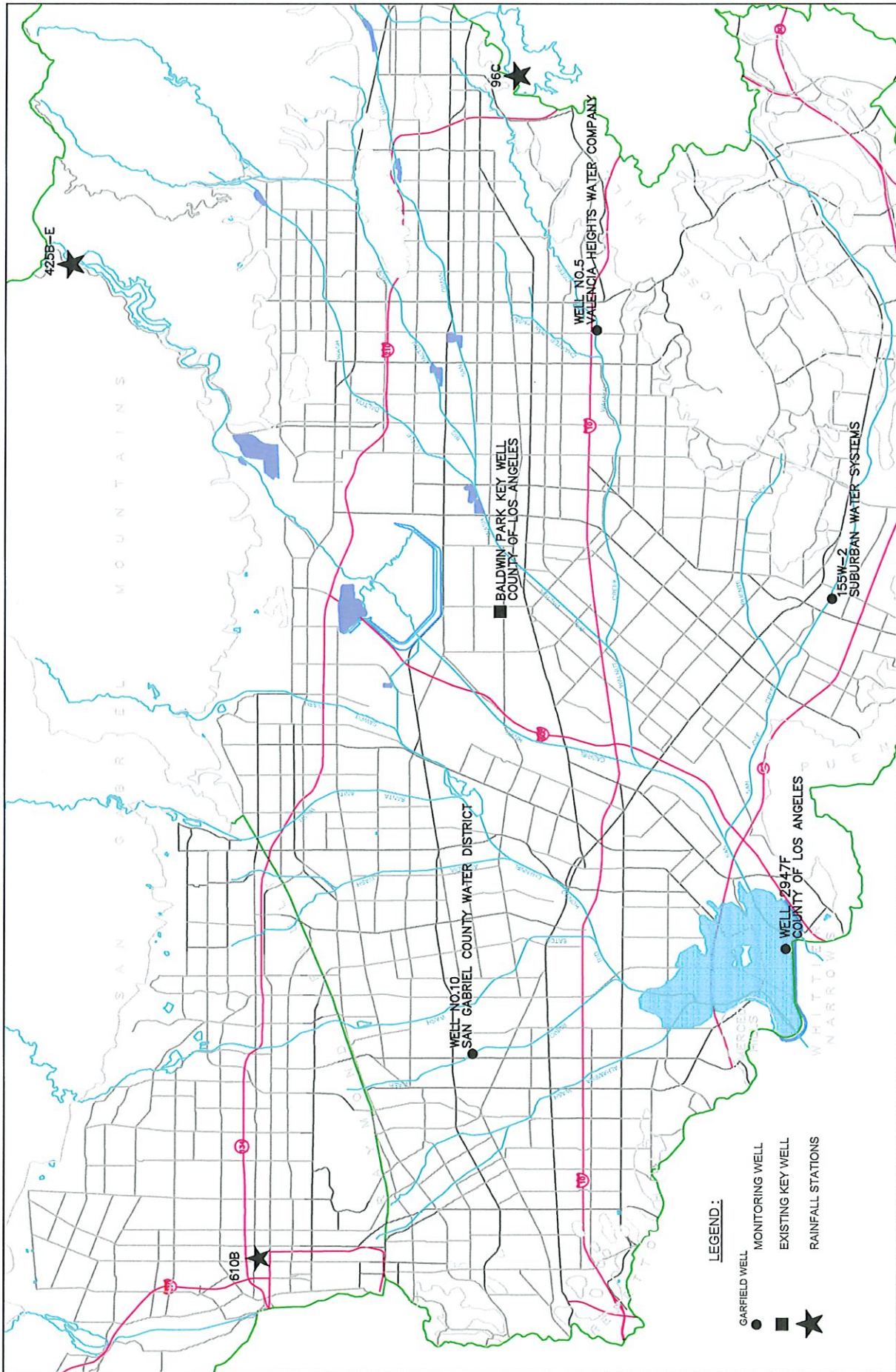
TABLE 7

**TOTAL HISTORICAL WATER DEMAND IN BASIN  
(ACRE-FEET)**

<u>FISCAL YEAR</u>	<u>TREATED IMPORTED WATER</u>	<u>TOTAL PRODUCTION</u>	<u>TOTAL DEMAND</u>
1973-74	630	235,460	236,090
1974-75	1,036	225,222	226,258
1975-76	3,539	242,246	245,785
1976-77	9,471	210,340	219,811
1977-78	11,427	195,276	206,702
1978-79	11,724	214,920	226,643
1979-80	13,032	223,089	236,121
1980-81	16,799	230,832	247,631
1981-82	17,402	220,392	237,793
1982-83	14,208	209,949	224,158
1983-84	18,298	236,679	254,977
1984-85	21,676	242,440	264,116
1985-86	20,872	246,224	267,095
1986-87	22,575	253,633	276,208
1987-88	28,537	248,102	276,638
1988-89	25,799	253,694	279,494
1989-90	31,478	252,136	283,614
1990-91	29,922	232,091	262,014
1991-92	18,606	221,477	240,083
1992-93	18,948	236,677	255,625
1993-94	18,412	243,617	262,029
1994-95	19,517	243,479	262,996
1995-96	16,931	268,951	285,881
1996-97	17,205	279,481	296,686
1997-98	14,208	253,921	268,129
1998-99	13,846	265,152	278,998
1999-00	21,062	278,687	299,749
2000-01	19,971	270,919	290,890
2001-02	35,153	264,328	299,481
2002-03	40,982	237,491	278,472
2003-04	50,758	252,812	303,570
2004-05	35,979	247,187	283,166
2005-06	23,125	259,808	282,932
2006-07	25,904	284,328	310,232
2007-08	30,174	258,167	288,341
2008-09	21,683	250,103	271,785
2009-10	16,329	237,846	254,176
2010-11	10,316	227,657	237,973
2011-12	10,561	237,029	247,590
2012-13	14,344	242,914	257,258
2013-14	22,216	240,552	262,768
2014-15	22,517	208,339	230,856
2015-16	12,740	182,826	195,566
2016-17	12,251	197,243	209,495
2017-18	13,576	209,500	223,076
2018-19	24,953	190,156	215,109
2019-20	26,335	192,584	218,919
2020-21	1/ 20,000	190,000	210,000
9-Year Average	17,722	211,238	228,960
10-Year Average	16,981	212,880	229,861
47-Year Average	19,724	237,361	257,085

1/ Estimated





# MAIN SAN GABRIEL BASIN WATERMASTER

## WELL LOCATION MAP

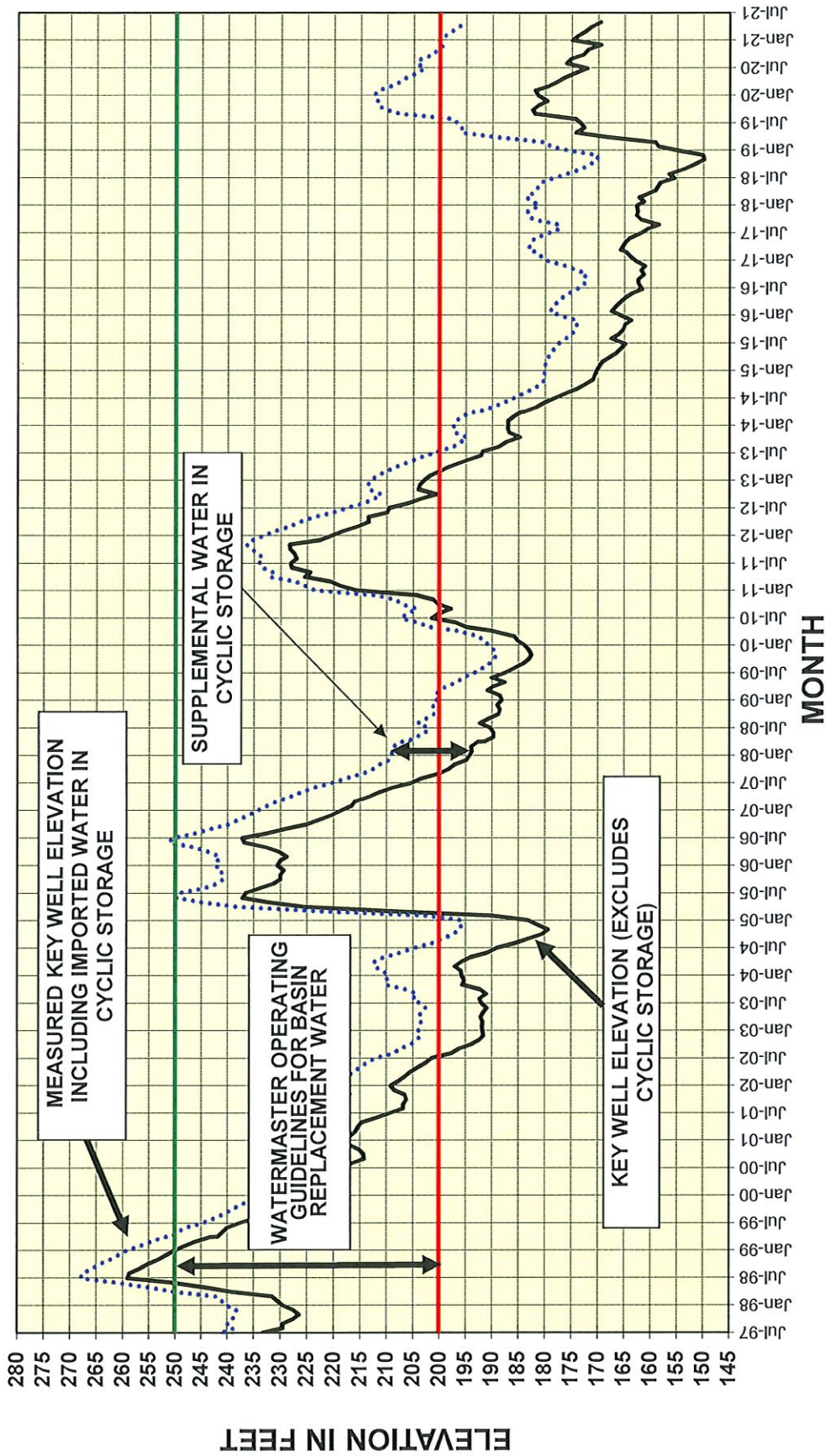
APPROXIMATE SCALE  
1" = 12,000'

861 VILLAGE OAKS DRIVE, SUITE 100  
COVINA, CALIFORNIA 91724  
TEL: (626) 967-4202  
FAX: (626) 331-7065





FIGURE 1



MAIN SAN GABRIEL BASIN WATERMASTER

BALDWIN PARK KEY WELL  
GROUNDWATER ELEVATION



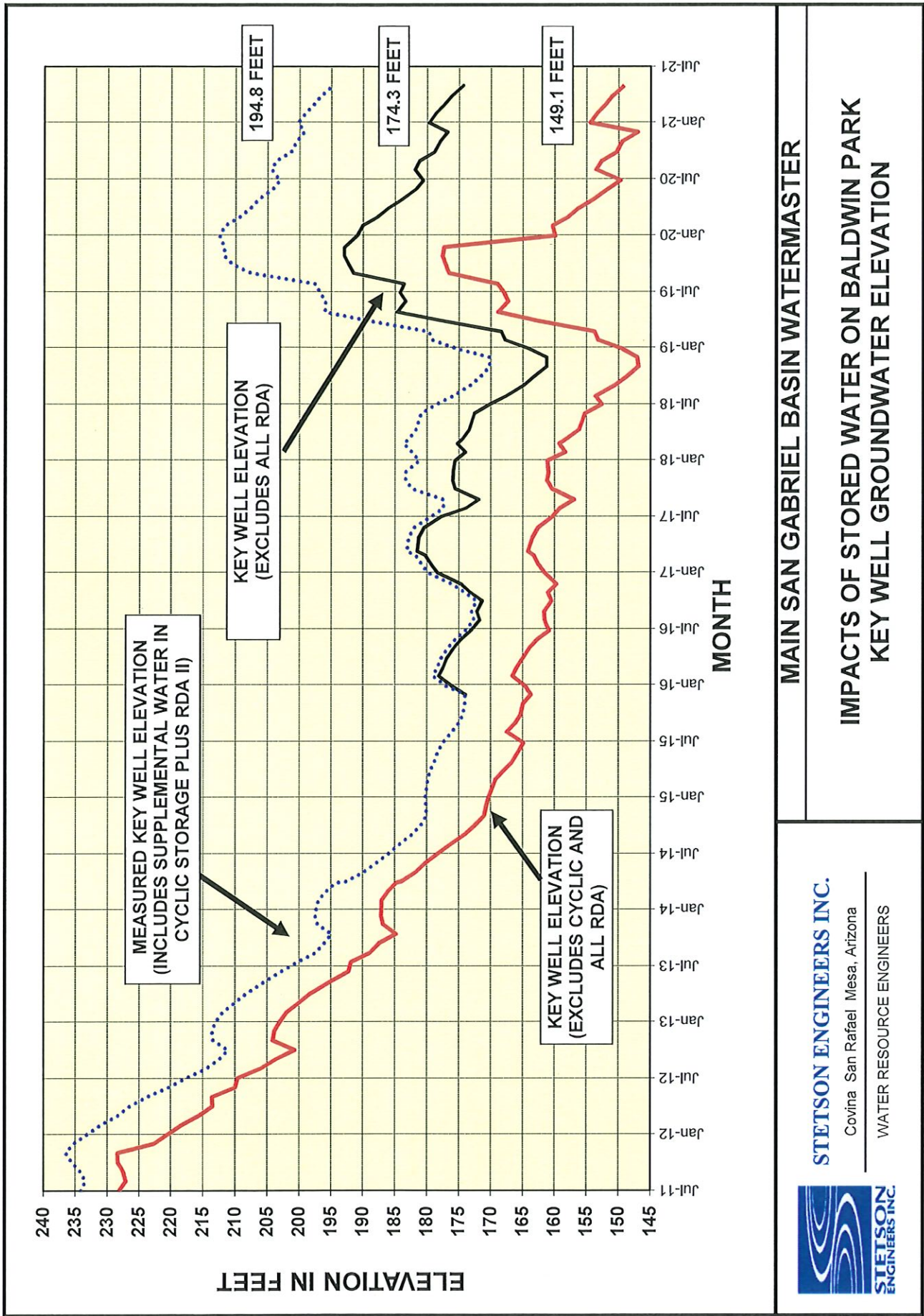
STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS



FIGURE 2



MAIN SAN GABRIEL BASIN WATERMASTER

IMPACTS OF STORED WATER ON BALDWIN PARK  
KEY WELL GROUNDWATER ELEVATION

STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS





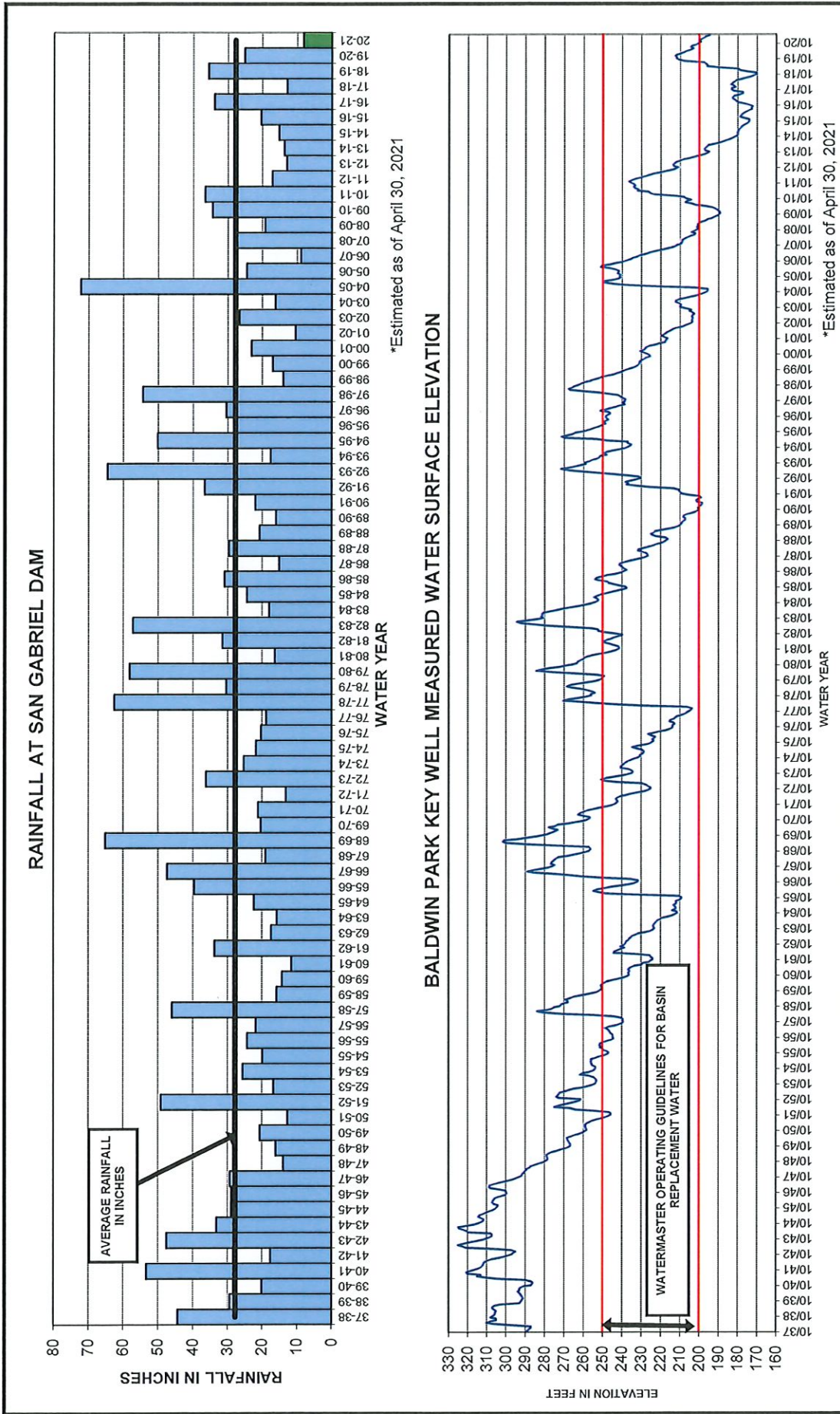


FIGURE 3

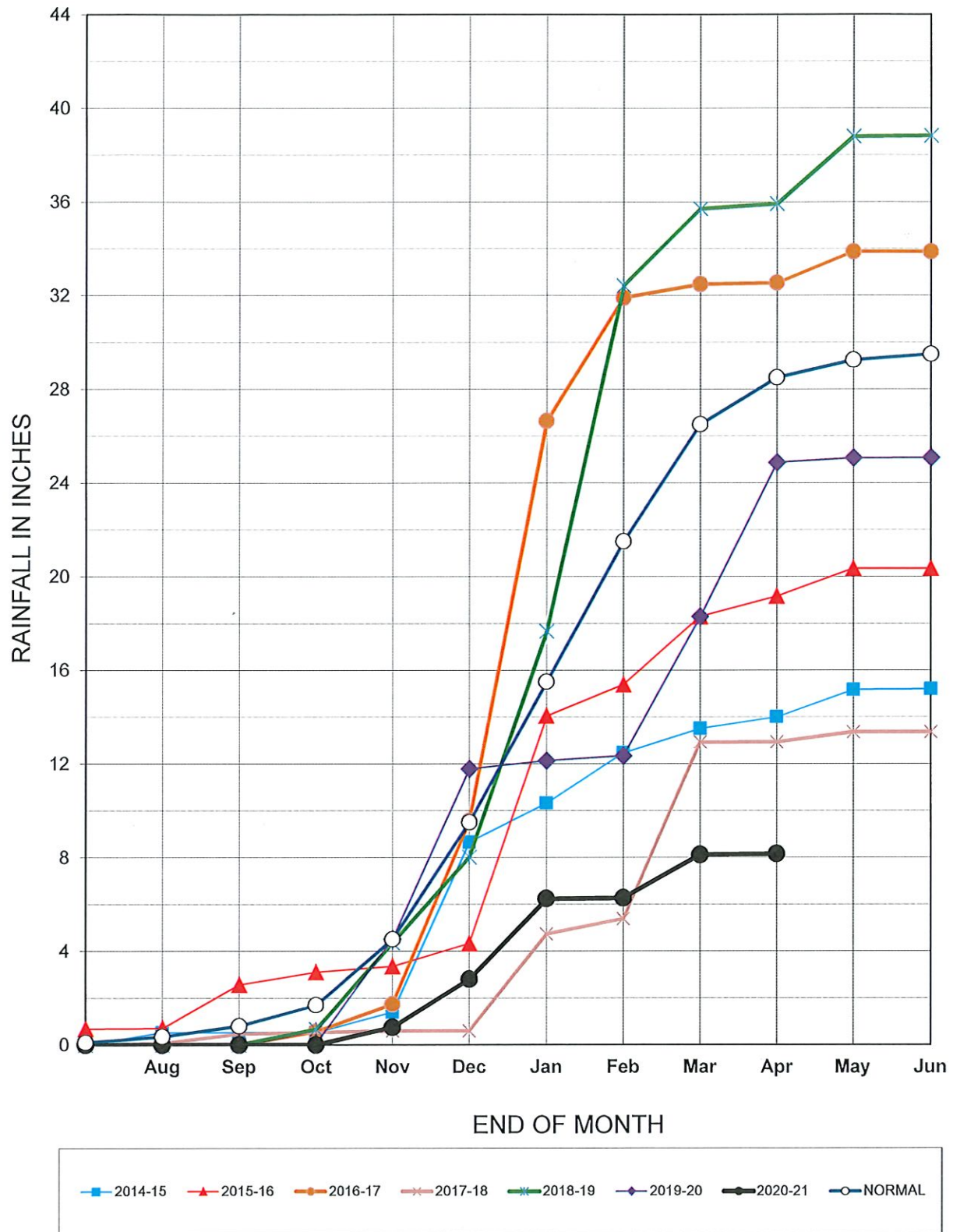
MAIN SAN GABRIEL BASIN WATERMASTER

SAN GABRIEL DAM RAINFALL AND  
BALDWIN PARK KEY WELL ELEVATION

**STETSON ENGINEERS INC.**  
Covina San Rafael Mesa, Arizona

**WATER RESOURCE ENGINEERS**

FIGURE 4



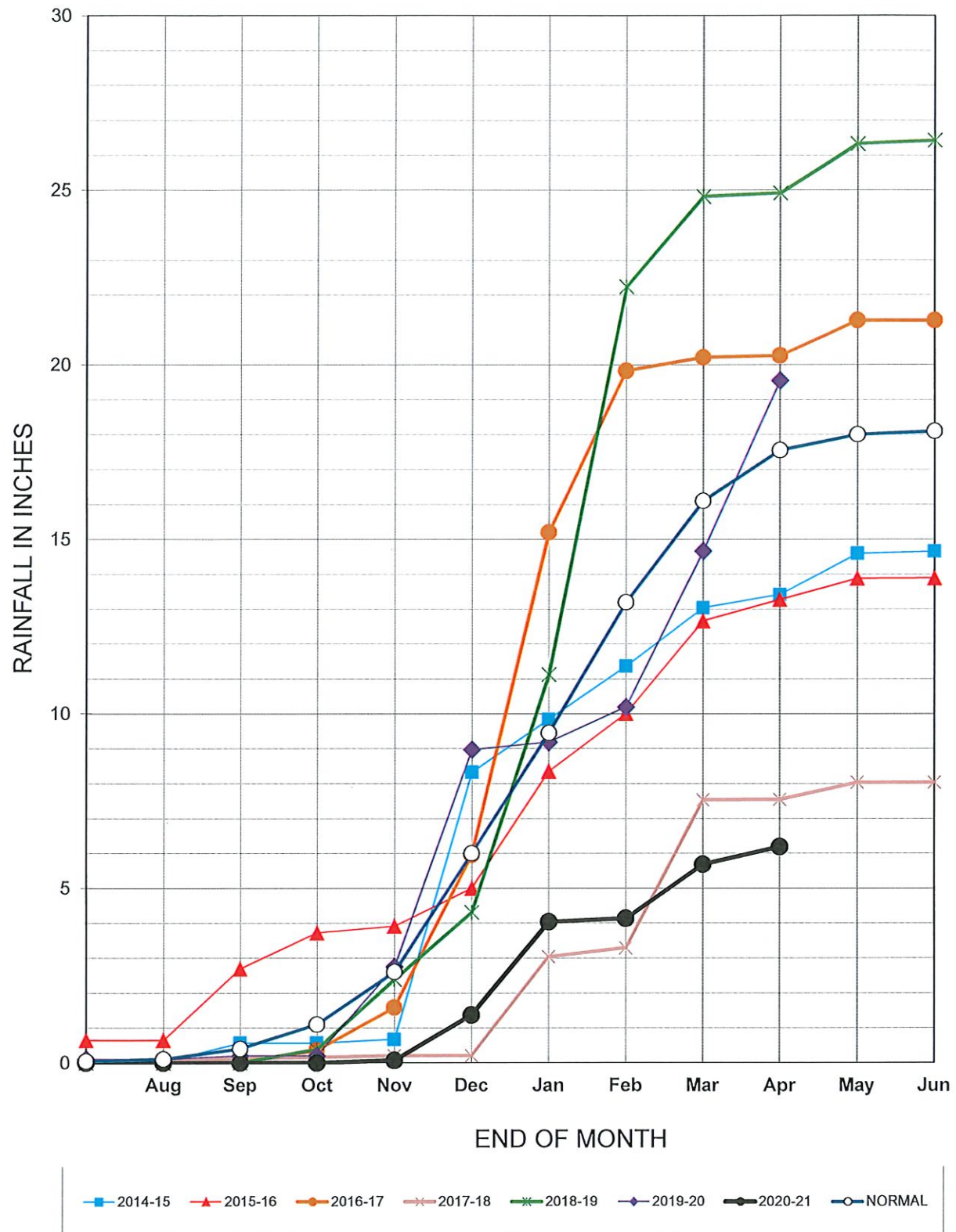
**STETSON ENGINEERS INC.**  
Covina San Rafael Mesa, Arizona  
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

ACCUMULATED RAINFALL AT SAN GABRIEL DAM  
RAINFALL STATION NO. 425B-E



FIGURE 5

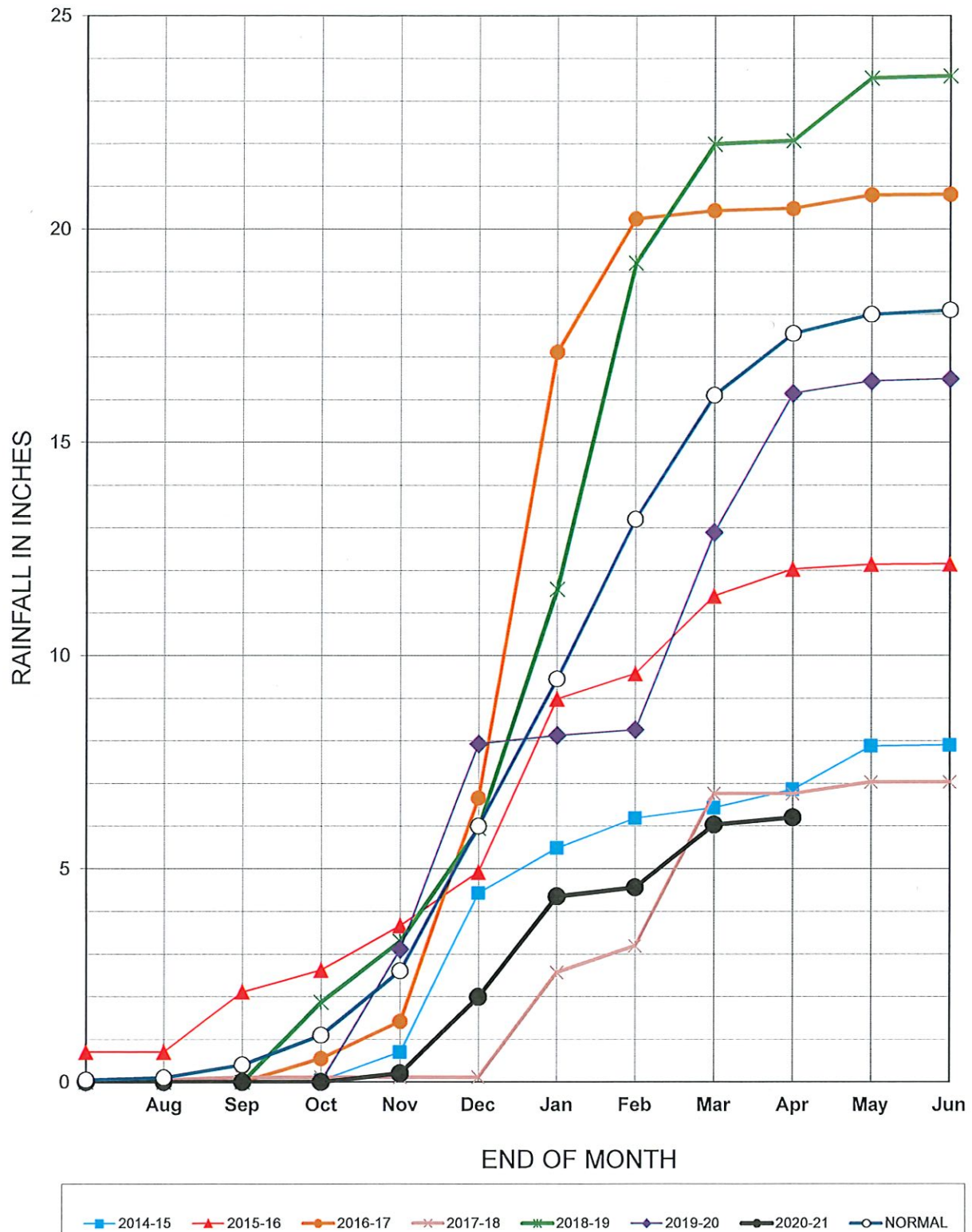


**STETSON ENGINEERS INC.**  
Covina San Rafael Mesa, Arizona  
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

ACCUMULATED RAINFALL AT PASADENA - CITY HALL  
RAINFALL STATION NO. 610B

FIGURE 6

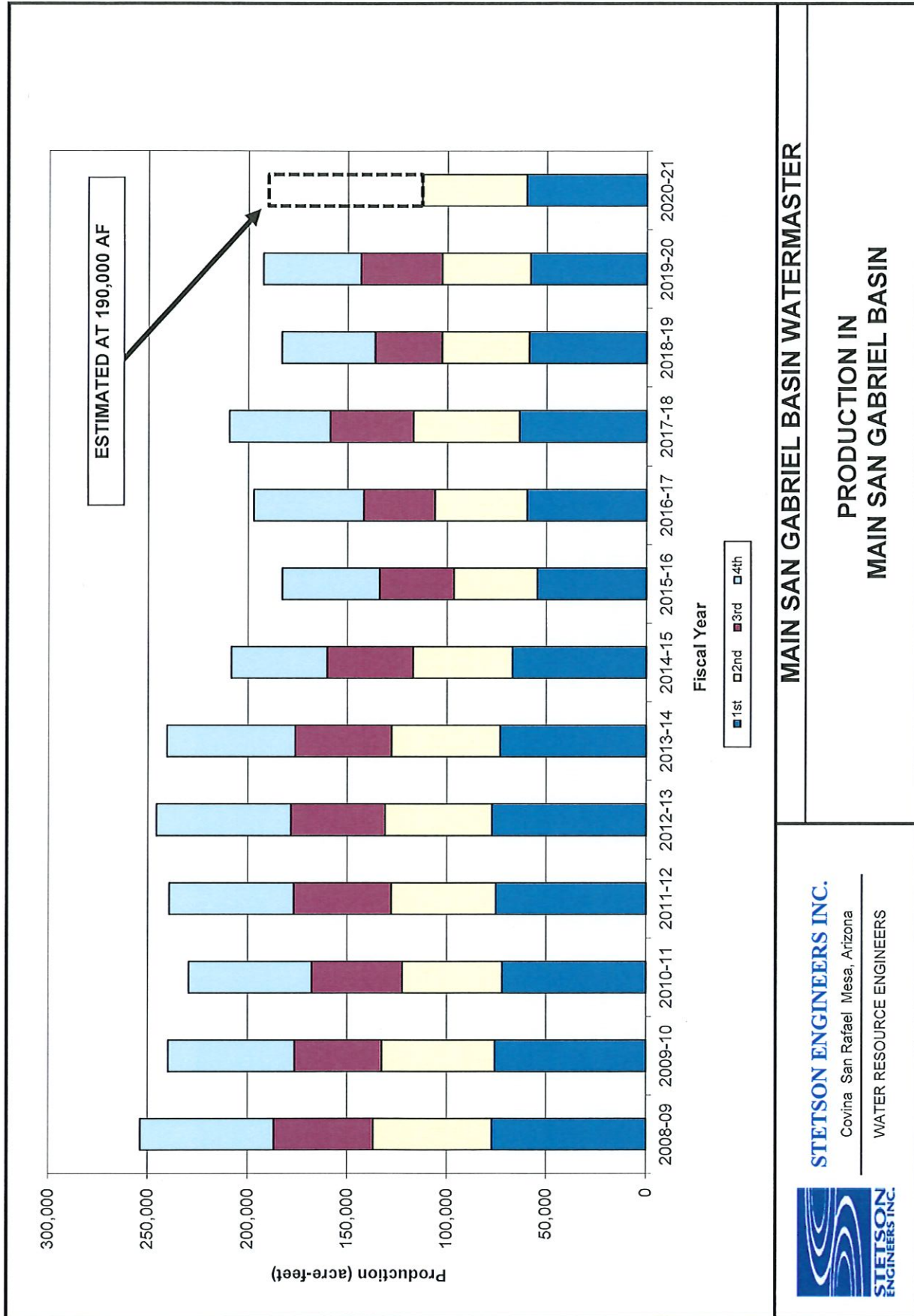


**STETSON ENGINEERS INC.**  
Covina San Rafael Mesa, Arizona  
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

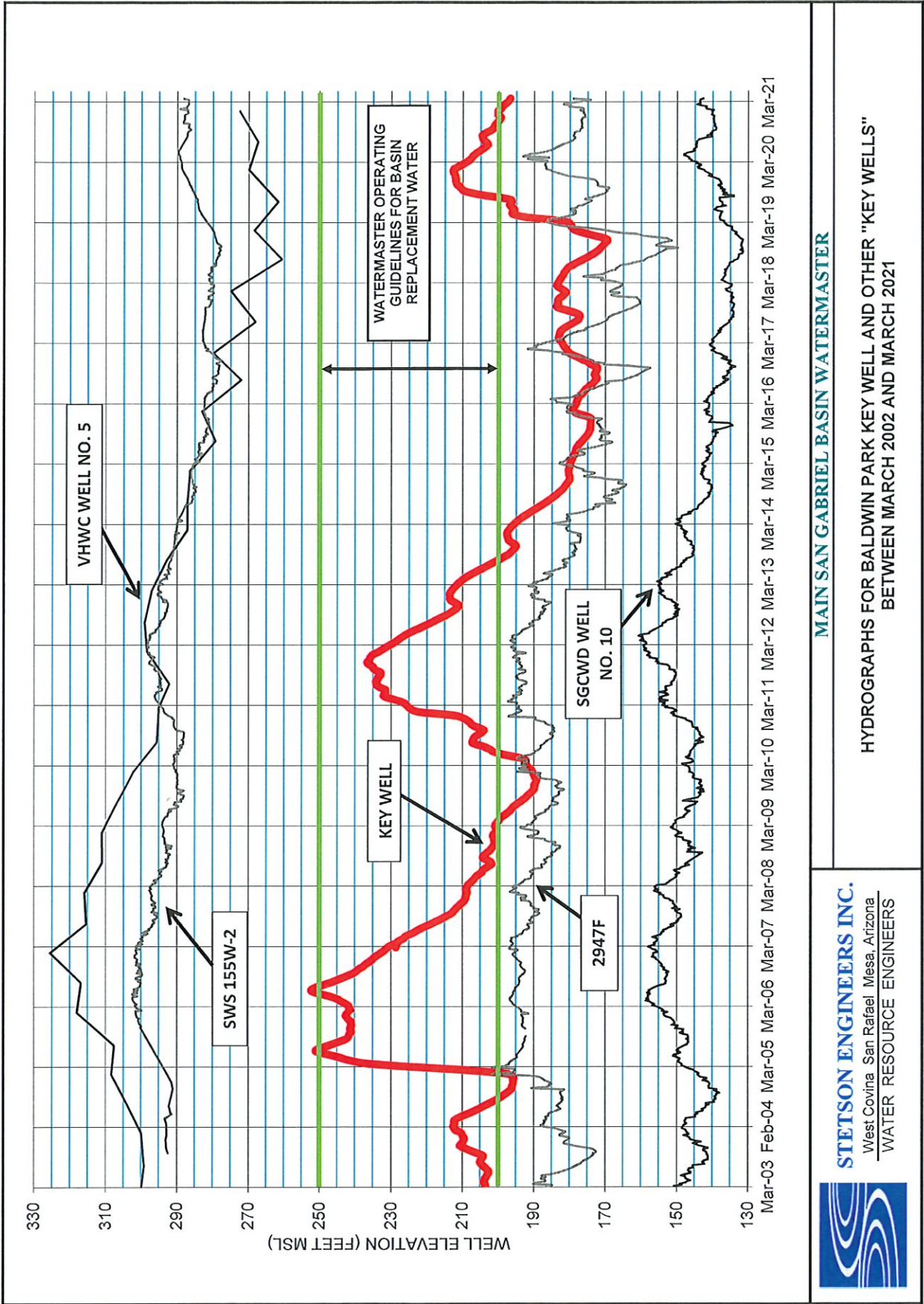
ACCUMULATED RAINFALL AT PUDDINGSTONE DAM  
RAINFALL STATION NO. 96-C

FIGURE 7



## **APPENDIX A**





**STETSON ENGINEERS INC.**  
West Covina San Rafael Mesa, Arizona  
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

HYDROGRAPHS FOR BALDWIN PARK KEY WELL AND OTHER "KEY WELLS"  
BETWEEN MARCH 2002 AND MARCH 2021

## **APPENDIX B**

## APPENDIX B

### RANGE OF OPERATING SAFE YIELDS AND PUMPER'S SHARES THEREOF (Acre-feet)

Quantities which may be pumped free of Replacement Water Assessment

Pumper	Pumper's Share %	OSY of 130,000	OSY of 140,000	OSY of 150,000	OSY of 160,000
Alhambra, City of	4.45876	5,796.39	6,242.26	6,688.14	7,134.02
Amarillo Mutual	0.35874	466.36	502.24	538.11	573.98
Andrade, Susan	0.00423	5.50	5.92	6.35	6.77
Arcadia, City of	4.23099	5,500.29	5,923.39	6,346.49	6,769.58
Banks, Gale C.	0.02530	32.89	35.42	37.95	40.48
Brea, City of	0.76035	988.46	1,064.49	1,140.53	1,216.56
Cadway, Inc.	0.32545	423.09	455.63	488.18	520.72
Calif. American-San Marino	4.03204	5,241.65	5,644.86	6,048.06	6,451.26
California Domestic	6.26154	8,140.00	8,766.16	9,392.31	10,018.46
Canyon Water Company	0.00051	0.66	0.71	0.77	0.82
Chevron	0.00101	1.31	1.41	1.52	1.62
County Sanitation Dist. 18	0.00228	2.96	3.19	3.42	3.65
Covina, City of	0.23979	311.73	335.71	359.69	383.66
Crevolin, A.J.	0.00114	1.48	1.60	1.71	1.82
Dawes, Mary Kay	0.22359	290.67	313.03	335.39	357.74
Del Rio Mutual	0.10069	130.90	140.97	151.04	161.10
East Pasadena Water Co.	0.71227	925.95	997.18	1,068.41	1,139.63
El Monte, City of	1.40888	1,831.54	1,972.43	2,113.32	2,254.21
El Monte Cemetery	0.00936	12.17	13.10	14.04	14.98
Fox Family Trust Michael Edward Fox and Crystal Marie Fox, Trustees	0.07378	95.91	103.29	110.67	118.05
Garnier, Anton and Anita	0.10843	140.96	151.80	162.65	173.49
Golden State Water-S.G.V. Dist.	2.92105	3,797.37	4,089.47	4,381.58	4,673.68
Green, Walter	0.02419	31.45	33.87	36.29	38.70
Hansen, Alice	0.00038	0.49	0.53	0.57	0.61
Hanson Aggregates West, Inc.	1.17094	1,522.22	1,639.32	1,756.41	1,873.50
Heinrich, Carolyn	0.01269	16.50	17.77	19.04	20.30
Hemlock Mutual	0.08399	109.19	117.59	125.99	134.38
IBY Property Owner, LLC	1.20047	1,560.61	1,680.66	1,800.71	1,920.75
Industry, City of	0.55810	725.53	781.34	837.15	892.96
Irwindale, City of	0.19025	247.33	266.35	285.38	304.40
Kirklen, Jeffery	0.05665	73.65	79.31	84.98	90.64
Knight, William J., Living Trust	0.11530	149.89	161.42	172.95	184.48
Landeros, John	0.00038	0.49	0.53	0.57	0.61
La Puente Valley CWD	0.57197	743.56	800.76	857.96	915.15
Loucks, David	0.00152	1.98	2.13	2.28	2.43

## APPENDIX B

### RANGE OF OPERATING SAFE YIELDS AND PUMPER'S SHARES THEREOF (Acre-feet)

Quantities which may be pumped free of Replacement Water Assessment

Pumper	Pumper's Share %	OSY of 130,000	OSY of 140,000	OSY of 150,000	OSY of 160,000
Lovelady, June G.	0.09386	122.02	131.40	140.79	150.18
The Maggiore Family Trust	0.07379	95.93	103.31	110.69	118.06
Martinez, Frances	0.00038	0.49	0.53	0.57	0.61
McIntyre, William	0.01467	19.07	20.54	22.01	23.47
Monterey Park, City of	3.39216	4,409.81	4,749.02	5,088.24	5,427.46
NCL Co, LLC	0.00050	0.65	0.70	0.75	0.80
Nick Tomovich	0.00001	0.01	0.01	0.02	0.02
Nicholson Family Trust - Marital Trust	0.01569	20.40	21.97	23.54	25.10
Pellissier Irrevocable QTIP Trust, et al	3.28384	4,268.99	4,597.38	4,925.76	5,254.14
Pico County Water Dist.	0.00038	0.49	0.53	0.57	0.61
Rados, Alexander	0.02176	28.29	30.46	32.64	34.82
Rana Living Trust, Jeanne	0.01269	16.50	17.77	19.04	20.30
Rosemead Development Ltd.	0.00051	0.66	0.71	0.77	0.82
Ruth, Roy	0.00038	0.49	0.53	0.57	0.61
San Gabriel Country Club	0.14476	188.19	202.66	217.14	231.62
San Gabriel County WD	2.73019	3,549.25	3,822.27	4,095.29	4,368.30
San Gabriel Valley WC	10.49247	13,640.21	14,689.46	15,738.71	16,787.95
Sonoco Products	0.15766	204.96	220.72	236.49	252.26
So. Calif. Edison Co.	0.08690	112.97	121.66	130.35	139.04
South Pasadena, City of	1.80520	2,346.76	2,527.28	2,707.80	2,888.32
Sterling Mutual	0.06072	78.94	85.01	91.08	97.15
Suburban Water Systems	12.59998	16,379.97	17,639.97	18,899.97	20,159.97
Sunny Slope Water Co.	1.12770	1,466.01	1,578.78	1,691.55	1,804.32
Tate, Phillip P. & Sieglinde A., et al	0.02926	38.04	40.96	43.89	46.82
Tyler Nursery	0.00162	2.11	2.27	2.43	2.59
United Rock Products	0.23253	302.29	325.54	348.80	372.05
Valencia Heights Water Co.	0.53685	697.91	751.59	805.28	858.96
Valley County Water District	3.01517	3,919.72	4,221.24	4,522.76	4,824.27
Valley View Mutual	0.31169	405.20	436.37	467.54	498.70
Vulcan Materials Company	0.90690	1,178.97	1,269.66	1,360.35	1,451.04
Whittier, City of	4.18519	5,440.75	5,859.27	6,277.79	6,696.30
Wilmott, Erma	0.00038	0.49	0.53	0.57	0.61
Workman Mill Invest. Comp.	0.87839	1,141.91	1,229.75	1,317.59	1,405.42
<b>Total of Pumps</b>	<b>76.46119</b>	<b>99,399.55</b>	<b>107,045.67</b>	<b>114,691.79</b>	<b>122,337.90</b>

## APPENDIX B

### RANGE OF OPERATING SAFE YIELDS AND PUMPER'S SHARES THEREOF (Acre-feet)

Quantities which may be pumped free of Replacement Water Assessment

Pumper	Pumper's Share %	OSY of 130,000	OSY of 140,000	OSY of 150,000	OSY of 160,000
Azusa, City of	1.84988	2,404.84	2,589.83	2,774.82	2,959.81
Azusa Valley Water Co.	5.06299	6,581.89	7,088.19	7,594.49	8,100.78
Calif. American (Duarte)	1.84634	2,400.24	2,584.88	2,769.51	2,954.14
Covina Irrigating Co.	3.22577	4,193.50	4,516.08	4,838.66	5,161.23
Glendora, City of	4.75261	6,178.39	6,653.65	7,128.92	7,604.18
Golden State Water Co. - San Dimas District	1.73984	2,261.79	2,435.78	2,609.76	2,783.74
Los Angeles, County of	1.88292	2,447.80	2,636.09	2,824.38	3,012.67
Metropolitan Water Dist. Monrovia, City of	0.08349	108.54	116.89	125.24	133.58
	3.09472	4,023.14	4,332.61	4,642.08	4,951.55
Phillips, Alice B., et al	0.00025	0.33	0.35	0.37	0.40
Total of Integrated Producers	23.53881	30,600.45	32,954.33	35,308.21	37,662.10
Total of Pumpers	76.46119	99,399.55	107,045.67	114,691.79	122,337.90
<b>TOTAL</b>	<b>100.00000</b>	<b>130,000.00</b>	<b>140,000.00</b>	<b>150,000.00</b>	<b>160,000.00</b>