MAIN SAN GABRIEL BASIN WATERMASTER
REPORT ON
PRELIMINARY DETERMINATION OF
OPERATING SAFE YIELD
FOR 2018-19 THROUGH 2022-23

APRIL 4, 2018

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF PLATES

LIST OF FIGURES

LIST OF APPENDICIES

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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[1], 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

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

two hundred (200)." Replacement Water is defined in Section 10 (cc) of the 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 may deliver Supplemental Water into their respective Cyclic Storage accounts as a pre-delivery of Replacement Water. Futhermore, Watermaster may make deliveries of Supplemental Water to augment the lack of local water replenishment through the Water Resources Development Assessment (RDA) stormwater augmentation program. 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 that is established in May of each year 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 that time frame, 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 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. 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 history 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 will use its Water Resource Development Assessment 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," but not Supplemental Water. Figure 1 shows the measured groundwater elevation at the Key Well and includes stored Supplemental Water (Cyclic Storage and Water Resource Development Assessment deliveries initially delivered to Cyclic Storage). The operational groundwater elevation at the Key Well excludes the stored Supplemental Water from the measured Key Well elevation and 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.

IMPACTS/RESPONSE TO (UNPRECEDENTED) SEVEN-YEAR DROUGHT CONDITIONS AND EXTREMELY LOW LOCAL RUNOFF

Seven-Year Drought Conditions

Rainfall in the San Gabriel Valley has been below the long-term annual average of about 18 inches between fiscal years 2011-12 and 2015-16, a period of five (5) consecutive years (2011-12, 2012-13, 2013-14, 2014-15, and 2015-16) and is again below the long-term annual average during fiscal year 2017-18. Local runoff in the San Gabriel Valley has been significantly below the long-term annual average of about 101,000 acre-feet since the beginning of fiscal year 2011-12 (see Table 2), a period of seven (7) consecutive years (2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 and 2017-18). Before this extended drought, as of June 24, 2011, rainfall was 19.45 inches, as measured at Puddingstone Dam, and the groundwater elevation of the Key Well was 233.5 feet, as shown on Table 1. As a result of this seven-year drought, the groundwater elevation at the Key Well decreased from 233.5 feet on June 24, 2011 to

182.8 feet on March 23, 2018, a decrease of 51 feet, as shown on Figure 1 and Tables 1 and 3. This represents a loss of nearly 410,000 acre-feet. Without Cyclic Storage, the Key Well would have decreased 66 feet, which represents a loss of nearly 550,000 acre-feet of Basin water. Without Cyclic Storage and the actions of the Watermaster and the Producers, Basin water supply conditions would have been much worse.

During this seven-year 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 other ways to help manage the Basin water supplies. 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 what the operational Key Well elevation would have been if the Stormwater Augmentation Program water was not implemented.

MWD Pre-Delivery Agreement

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.

During calendar year 2017, MWD delivered a total of 53,517.5 acre-feet of wet water through USG-3, 5,000 acre-feet was transferred from MWD Cyclic Storage, and 5,000 acre-feet was scheduled to be delivered in 2018 for a total of 63,517.5 acre-feet under the MWD Agreement. It is anticipated the balance of the 80,000 acre-feet will be delivered to the Main Basin in the future. During December 2017, Watermaster and Upper District purchased 16,000 acre-feet. The 16,000 acre-feet purchased by Watermaster was used for RDA II water (stormwater augmentation) and Producer Cyclic Storage water.

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 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. 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 September 30, 2016 at 172.2 feet at which time 87,000 acre-feet (about 11 feet) were in Cyclic Storage. Without Cyclic Storage, the Key Well elevation would have been 161.3 feet. On March 23, 2018 the groundwater elevation at the Key Well was 182.8 feet, at which time 166,000 acre-feet (about 21 feet) were in Cyclic Storage (about 128,500 acre-feet in Cyclic Storage accounts and about 37,500 acre-feet in MWD Cyclic Storage account, which is intended for RDA II). Without Cyclic Storage, the Key Well elevation would have been 162.4 feet on March 23, 2018, as shown on Figures 1 and 2. In addition, without RDA II Stormwater Augmentation water, the Key Well elevation would have been 161.0 feet on March 23, 2018, as shown on Figure 2.

As previously discussed, local runoff in the San Gabriel Valley has been significantly below the long-term annual average for seven consecutive years. As a result, the groundwater elevation at the Key Well decreased from 233.5 feet on June 24, 2011 to 182.8 feet on March 23, 2018, a decrease of 51 feet. This is a loss of about 408,000 acre-feet of water from Basin storage. 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 2017-18, rainfall at Puddingstone Dam has been about 6.76 inches (dry year) which is about 42 percent of average, through March 23, 2018.

The Key Well elevation was 182.8 feet on March 23, 2018. Assuming the below-average rainfall continues the rest of the year, the groundwater elevation at the Key Well could decrease by about seven feet from March 23, 2018 and fall to about 176 feet by September 2018, which is 24 feet (about 192,000 acre-feet) below the minimum Operating Criteria of 200 feet.

Other "Key Wells"

While the groundwater elevation at the Baldwin Park Key Well has increased by about 3 feet from 179.4 feet on July 1, 2017 to 182.8 feet on March 23, 2018, 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.

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 5.22 inches for the period July 1, 2017 through February 28, 2018, or about 24 percent of average for that period. Rainfall for the period of July 1, 2016 through March 31, 2018, is estimated to be about 10.9 inches, or about 41 percent of average. Assuming average rainfall for the remainder of the year, the total annual rainfall could be about 14 inches, or total about 47 percent of average. Fiscal year 2017-18 may be another below average rainfall year. Figure 4 shows the cumulative rainfall for 1) fiscal years 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 2) the period July 2017 through March 2018, and 3) the long-term average rainfall at San Gabriel Dam.

Pasadena City Hall - Station 610B

Rainfall at the Pasadena City Hall was 3.29 inches for the period July 1, 2017 through February 28, 2017, or about 22 percent of average for that period. Rainfall for the period of July 1, 2016 through March 31, 2018, is estimated to be about 7 inches, or about 40 percent of average. Assuming average rainfall for the remainder of the year, the total annual rainfall would be about 9 inches, or total about 45 percent of average. Fiscal year 2017-18 may be another below average rainfall year. Figure 5 shows the cumulative rainfall for 1) fiscal years 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 2) the period July 2017 through March 2018, and 3) the long-term average rainfall at the Pasadena City Hall.

Puddingstone Dam - Station 96C

Rainfall at Puddingstone Dam was 3.19 inches for the period July 1, 2017 through February 28, 2018, or about 24 percent of average for that period. Rainfall for the period of July 1, 2016 through March 31, 2018, is estimated to be about 6.8 inches, or about 42 percent of average. Assuming average rainfall for the remainder of the year, the total annual rainfall would be about 9 inches, or total about 50 percent of average. Fiscal year 2017-18 may be another below average rainfall year. Figure 6 shows the cumulative rainfall for 1) fiscal years 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2) the period July 2017 through March 2018, and 3) the long-term average rainfall at Puddingstone Dam.

Precipitation in the San Gabriel River watershed during fiscal year 2017-18, through the end of February 2018 was about 23 percent and through the end of March 2018 was about 40 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 March 28, 2017 and on March 19, 2018. Also shown are the current recorded inflow and outflow rates at the reservoirs on March 19, 2018. The total amount of local water stored in surface reservoirs in the San Gabriel Valley as of March 19, 2018, was about 27,500 acre-feet (about 25 percent of capacity), which is a decrease of about 35,200 acre-feet in storage compared to March 28, 2017 (27,500 – 62,700). 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 7,100 acre-feet)

is maintained for recreational purposes. Consequently, of the 27,500 acre-feet in storage, about 9,900 acre-feet (27,500 – 10,500 – 7,100) are available for direct use or groundwater replenishment. If entirely replenished in the Main Basin, the groundwater elevation at the Key Well might increase by about 1 foot solely from local water in storage. The low water supply conditions in local surface reservoirs is reflective of very low rainfall and runoff conditions in the San Gabriel River watershed.

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 2017-18 has been about 23 percent of average through February 28, 2018. Although DPW replenishment records are incomplete this time of year, preliminary data indicate approximately 16,000 acre-feet (only 16 percent of average) of local runoff was replenished in the Basin between October 1, 2017 and February 28, 2018. In addition, 11,000 acre-feet of RDA II water, as part of the Stormwater Augmentation Program, was replenished to supplement “local water” and included under “Local Runoff” in Table 2. Consequently, the total Local Runoff plus RDA II is 27,000 (16,000 + 11,000) acre-feet (27 percent of average). The average annual local water Basin replenishment is about 101,000 acre-feet. 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 24,200 acre-feet of untreated imported water (Supplemental Water) was replenished in the Basin for a total Basin replenishment of about 51,200 (27,000 + 24,200) acre-feet.

Table 2 summarizes the annual rainfall, local water plus RDA II water and imported water replenished, 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 State Water Project 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 (SWP) 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 February 28, 2018, the "8-station index" indicated average precipitation

of 20.31 inches or about 44 percent of average for that time of year, while rainfall in the San Gabriel Valley was about 23 percent of average (through February 28, 2018).

On November 30, 2017, DWR announced the 2018 initial allocation of SWP water was 15 percent of the contractors' Table A entitlement. On January 29, 2018, the SWP allocation was increased to 20 percent of the SWP entitlement. As stated in DWR's Notice to State Water Project Contractors, the increase in 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 20 percent SWP allocation, MWD would receive about 382,300 acre-feet. At this time, a significant increase of the SWP Allocation is not expected.

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 856,500 acre-feet of Colorado River water are available to MWD during calendar year 2018. 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 2018 allocation is 20 percent of its State Water Project Table A entitlement of 28,800 acre-

feet. Consequently, it is anticipated San Gabriel District will deliver about 5,760 acre-feet to the Basin during calendar year 2018.

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. The RDA II assessment is intended to increase to $175/AF within five years.

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 March 23, 2018, the groundwater elevation at the Key Well was 182.8 feet.) Typically, establishing a lower Operating Safe Yield results in decreased water rights, increased Replacement Water obligations and, consequently, increased deliveries 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.

Fiscal Year 2017-18 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 2017-18.

Following the conclusion of fiscal year 2016-17, it was determined Upper District had no Replacement Water requirement to be delivered during 2017-18 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 9,236 acre-feet to be delivered during 2017-18. As of February 28, 2108, a total of 2,067.9 acre-feet was delivered through USG-5 leaving a Replacement Water balance of 932.10 acre-feet. As of February 28, 2018, the full RDA II requirement of 9,236 acre-feet had been delivered.

Following the conclusion of fiscal year 2016-17, it was determined San Gabriel District had a Replacement Water requirement of 4,649.74 acre-feet to be delivered during 2017-18. As of February 28, 2018, San Gabriel District delivered the full

Replacement Water requirement of 4,649.74 acre-feet. In addition, San Gabriel District had a RDA II requirement of 1,492 acre-feet to be delivered during 2017-18. As of February 28, 2018, the full RDA requirement of 1,492 acre-feet had been delivered. (San Gabriel District also has a deferred Replacement Water account balance of about 10,200 acre-feet.)

Following the conclusion of fiscal year 2016-17, it was determined Three Valleys District had no Replacement Water requirement to be delivered during 2017-18. Three Valleys District had a RDA II requirement of 670 acre-feet to be delivered during 2017-18. As of February 28, 2018, the full RDA requirement of 670 acre-feet had been delivered.

Estimated 2018-19 Supplemental Water Delivery Requirements (Replacement Water) Plus Stormwater Augmentation Program Water

The estimated fiscal year 2017-18 over-production in the Basin is about 37,000 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 16,900 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 2018-19. In addition, Upper District has an estimated RDA II requirement of 15,200 acre-feet to be delivered during 2018-19 for a total estimated Supplemental Water delivery requirement of 18,200 acre-feet (0 + 3,000 + 15,200) during 2018-19.

It is estimated San Gabriel District Producers will have over-production of about 8,900 acre-feet and consequently a Replacement Water requirement of 8,900 acre-feet to be delivered in fiscal year 2017-18. In addition, San Gabriel District has an estimated RDA II requirement of 2,400 acre-feet to be delivered during 2018-19, for a total

estimated Supplemental Water delivery requirement of 11,300 acre-feet (8,900 + 2,400) during 2018-19. As previously discussed, San Gabriel District has an annual obligation of 5,000 acre-feet to MWD. Therefore, the total delivery requirement for San Gabriel District during 2018-19 is approximately 16,300 acre-feet (11,300 + 5,000). (San Gabriel District also has a deferred Replacement Water account balance of about 10,200 acre-feet.)

It is estimated Three Valleys District producers will have over-production of about 1,400 acre-feet and consequently a Replacement Water requirement of 1,400 acre-feet to be delivered in fiscal year 2017-18. Three Valleys District has an estimated RDA II requirement of 1,100 acre-feet to be delivered during 2018-19. The total delivery requirement for Three Valleys District during 2018-19 is approximately 2,500 acre-feet.

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 190,000 acre-feet of Supplemental (Replacement) Water in the Basin. This includes up to 50,000 acre-feet for San Gabriel District, up to 100,000 acre-feet for the MWD and Upper District, and up to 40,000 acre-feet for MWD and Three Valleys District. In addition, there are 21 producer Cyclic Storage agreements in which up to 142,000 acre-feet can be stored. The total amount of water that could be stored in existing Cyclic Storage accounts is up to 332,000 acre-feet. As of February 28, 2018 there was a total of about 166,200 acre-feet (about 128,500 acre-feet in cyclic storage accounts and about 37,500 acre-feet in

MWD Pre-Delivery account) in Basin cyclic storage (represents about 21 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, 2012. The storage balance in all of the Basin Cyclic Storage accounts on July 1, 2017, the balance as of February 28, 2018 and the estimated balance as of June 30, 2018, is shown below in acre-feet.

	Cyclic Storage as of July 1, 2017	Account Balance as of February 28, 2018	Estimated Balance as of June 30, 2018[1/]
San Gabriel Valley Municipal Water District	7,843	12,467	7,000
Upper San Gabriel Valley Municipal Water District	7,225	7,188	7,200
Three Valleys Municipal Water District	12,000	12,979	16,000
Producers in San Gabriel District	2,971	2,971	3,000
Producers in Upper District	48,366	56,473	48,000
Producers in Three Valleys District	2,715	3,979	4,000
Watermaster Pre-purchases	9,334	6,764	0
RDA I	12,756	12,756	12,800
Puente Basin Agency Storage and Export	13,962	13,098	13,100
MWD Cyclic Agreement (intended for RDA II)	0	37,530	37,500
	117,172	166,205	148,600

1/ It is assumed Replacement Water requirements will be deducted from Cyclic Storage accounts by the end of fiscal year 2017-18. It is assumed 2018 SWP water allocation is 20 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 2016-17 were approximately 39,300 acre-feet and decreased to 35,100 acre-feet at the beginning of fiscal year 2017-18. It is estimated the Carry-over Rights at the beginning of fiscal year 2018-19 will be about 33,700 acre-feet. Historical Carry-over Rights and lost Carry-over Rights are shown on Table 1.

BASIN CONDITIONS - ESTIMATED WATER PRODUCTION DURING 2017-18

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 2017-18 was about 117,000 acre-feet. Figure 7 shows quarterly production in the Basin for the past 10 years (fiscal years 2007-08 through 2016-17) and current fiscal year 2017-18. Anticipated groundwater production for fiscal year 2017-18 has been estimated below.

The reported production for the first two quarters of fiscal year 2017-18 was about 117,000 acre-feet. If production for the last two quarters of fiscal year 2017-18 is similar to the production for the last two quarters of the most recent three-year average (2014-15, 2015-16, 2016-17), which was about 89,000 acre-feet, total fiscal year 2017-18 production will be about 206,000 acre-feet (117,000 + 89,000). Based on this information, it is anticipated groundwater production during fiscal year 2017-18 will be about 205,000 acre-feet. This represents an increase from fiscal year 2016-17

production of 197,000 acre-feet. Direct treated water deliveries have remained the same, as described below. In addition, drought conservation activities have continued, which also have impacted production. Figure 7 shows production for the past ten years and the estimated groundwater production for fiscal year 2017-18.

The historical total demand in the Basin is met by local water production and direct treated imported water deliveries. During fiscal year 2016-17, direct treated imported water sales were about 12,300 acre-feet, as shown in Table 7. Estimated direct treated imported water sales for fiscal year 2017-18 is about 12,000 acre-feet. Total demand during fiscal year 2017-18 is estimated to be about 217,000 acre-feet (205,000 + 12,000) and is about 17,000 acre-feet below the 6-year average total water demand of 234,000 acre-feet, as shown in Table 7.

FISCAL YEAR 2017-18 OPERATING SAFE YIELD DETERMINATION

On May 3, 2017, Watermaster considered the Engineer's recommended Preliminary Operating Safe Yield of 150,000 acre-feet for fiscal year 2017-18. At that time, the total rainfall in the Basin from July 1, 2016 to April 30, 2017, as represented by the Puddingstone Dam station, was 20.26 inches or 103 percent of long-term average for that period. (The total annual rainfall at the Puddingstone Dam station for fiscal year 2016-17 was 21.27 inches, representing about 105 percent of average.) The groundwater elevation at the Key Well at the time of the May 2017 Watermaster meeting was 182.8 feet and decreasing at the rate of about 0.1 feet per week. Total water in local storage reservoirs was 64,700 acre-feet of which about 47,100 acre-feet were available for groundwater storage and/or for delivery for direct use.

At its May 3, 2017 meeting, Watermaster established the Operating Safe Yield at 150,000 acre-feet for fiscal year 2017-18 and an estimated Operating Safe Yield of 130,000 acre-feet for fiscal years 2018-19, 2019-20, 2020-21 and 2021-22.

CONCLUSIONS

Local replenishment from runoff in the San Gabriel Valley has been significantly below the long-term annual average of about 101,000 acre-feet since the beginning of fiscal year 2011-12 (see Table 2), a period of seven (7) consecutive years (2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 and 2017-18). In addition, rainfall in the San Gabriel Valley has been significantly below the long-term average of about 18 inches per year for the last seven years (see Table 1).

As a result of this seven-year drought, the groundwater elevation at the Key Well decreased from 233.5 feet on June 24, 2011 to 182.8 feet on March 23, 2018, a decrease of 51 feet. This represents a loss of nearly 410,000 acre-feet. Without Cyclic Storage, the Key Well would have decreased 66 feet, which represents a loss of nearly 550,000 acre-feet of Basin water. Without Cyclic Storage and the actions of the Watermaster and the Producers, Basin water supply conditions would have been much worse.

During this seven-year 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: 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 Water Supply Agreement.

On March 23, 2018 the groundwater elevation at the Key Well was 182.8 feet, at which time 166,000 acre-feet (about 21 feet) were in Cyclic Storage (about 128,500

acre-feet in cyclic storage accounts and about 37,500 acre-feet in MWD Pre-Delivery account). The use of Cyclic Storage helps increase water levels and increases Replacement Water delivery reliability, but reduces wet Replacement Water deliveries. Due to significant quality of Cyclic Storage water, setting "lower" Operating Safe Yields will have almost no short-term impacts on Basin water levels/supplies.

Thus far during fiscal year 2017-18, rainfall at Puddingstone Dam has been about 6.8 inches (dry year) which is about 42 percent of average, estimated through March 31, 2018. Assuming average rainfall continues the rest of the year, the operational groundwater elevation at the Key Well could decrease by about seven feet from March 23, 2018 and fall to about 155 feet (measured at 176 feet) by September 2018.

As of February 28, 2018, rainfall in the San Gabriel River watershed has been about 23 percent of average for that time of year. Preliminary data indicate approximately 16,000 acre-feet (only 16 percent of average) of local runoff was replenished in the Basin between October 1, 2017 and February 28, 2018. In addition, 11,000 acre-feet of RDA II water, as part of the Stormwater Augmentation Program, was replenished to supplement "local water" and included under "Local Runoff" in Table 2. Consequently, the total Local Runoff plus RDA II is 27,000 (16,000 + 11,000) acre-feet (27 percent of average). The average annual local water Basin replenishment is about 101,000 acre-feet. The Stormwater Augmentation Program helped keep Key Well elevation stable and not drop further, thus achieving its goal and purpose.

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. The implementation of the RDA II on all production provides additional Supplemental Water to the Basin, and does not support a lower Operating Safe Yield.

Based on the evaluation presented in this Report, the Engineer's recommended Operating Safe Yield should be maintained from fiscal year 2017-18 for fiscal year 2018-19 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, in accordance with the Judgment provisions. Setting the Operating Safe Yield lower than 150,000 acre-feet will not have a short-term material impact on Basin water levels, due to the significant amount of water in Cyclic Storage to meet Replacement Water Obligations. The RDA II Stormwater Augmentation Program water is applied directly to Basin replenishment and recovery.

The Judgment requires that on or before the first meeting in April each year, Watermaster makes a Preliminary Determination of the Operating Safe Yield for the Basin for each of the succeeding five fiscal years. Watermaster's Engineer recommends the following quantities as Operating Safe Yield for consideration by the Watermaster Board members.

Fiscal Year	Operating Safe Yield (Acre-feet)
2018-19	150,000
2019-20	130,000
2020-21	130,000
2021-22	130,000
2022-23	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. 96C-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	14,518.98	0.00	14,518.98
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	20,908.91	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	35,916.90	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	248.8	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	15.92	248.9	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	2,859.66	33,358.98
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	43,625.83
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	27,356.53
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	15,382.66	48,467.04
2011-12	12.06	226.4	210,000	21,657.47	166.96	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	42,864.86	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	33,508.84	45,827.97
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	22,443.64	29,969.85
2017-18	6.76 3/	182.8 4/	150,000	35,061.57	--	195,600 5/	205,000 6/	--	--	--
7-YEAR DROUGHT AVERAGE:	**10.34**	**--**	**170,000**	**--**	**--**	**--**	**216,272**	**--**	**--**	**--**
10-YEAR AVERAGE:	12.77	--	177,000	33,264.63	316.67	220,771.30	228,267.68	17,965.60	22,587.63	40,553.23
43-YEAR AVERAGE:	18.17	--	193,953	29,302.80	347.48	234,937.98	240,191.99	27,444.38	9,763.68	37,236.20

1/ Water Year
2/ End of Fiscal Year, July to June
3/ As of March 26, 2018
4/ As of March 23, 2018
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	167
2017-18	6.76 3/	27,000 4/	24,242 5/	51,242 5/	183	162 6/
7-Year Drought	10.34	36,357	50,916	87,273	--	--
10-Year Average	13.62	78,560	44,763	123,323	--	--
44-Year Average	18.11	100,818	39,243	140,061	--	--

1/ October 1 to September 30
2/ July 1 to June 30
3/ As of March 26, 2018
4/ Preliminary data as of February 28, 2018. Includes 11,000 AF of Stormwater Augmentation Program water.
5/ October 1, 2016 to February 28, 2018. Excludes deliveries through USG-5 and 11,000 AF of RDA II water.
6/ As of March 23, 2018

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	PUENTE BASIN WATER AGENCY	RESOURCE DEVELOPMENT (RDA I)				
Jul-12	0.00	20,356.14	8,600.3	--	35,926.74	64,883.2	--	--	--	64,883.18	8.11	209.6	217.7
Aug-12	0.00	23,164.06	8,600.3	--	35,926.74	67,691.1	--	--	--	67,691.10	8.46	206.0	214.5
Sep-12	0.00	25,908.32	8,600.3	--	35,926.74	70,435.4	--	--	--	70,435.36	8.80	203.6	212.4
Oct-12	0.00	29,265.59	8,716.3	--	45,495.74	83,477.6	--	--	--	83,477.63	10.43	200.7	211.1
Nov-12	0.00	7,641.19	11,371.2	--	55,495.74	74,508.1	--	--	--	74,508.13	9.31	204.1	213.4
Dec-12	0.00	9,273.89	13,348.6	--	55,495.74	78,118.2	--	--	--	78,118.23	9.76	203.8	213.6
Jan-13	0.00	11,303.77	13,348.6	--	55,495.74	80,148.1	--	--	--	80,148.11	10.02	203.0	213.0
Feb-13	0.00	11,226.13	13,348.6	--	55,495.74	80,070.5	--	--	--	80,070.47	10.01	201.9	211.9
Mar-13	0.00	11,143.18	13,828.5	--	55,495.74	80,467.4	--	--	--	80,467.42	10.06	200.1	210.2
Apr-13	0.00	11,064.94	13,411.50	--	55,495.74	79,972.2	--	--	--	79,972.18	10.00	198.3	208.3
May-13	0.00	13,399.46	13,545.80	--	55,495.74	82,441.0	--	--	--	82,441.00	10.31	194.9	205.2
Jun-13	0.00	15,683.07	13,545.80	--	55,495.74	84,724.6	--	--	--	84,724.61	10.59	192.2	202.8
Jul-13	0.00	17,890.48	13,655.80	--	31,464.49	63,010.8	4,555.70	--	--	67,566.47	8.45	191.9	200.3
Aug-13	0.00	17,801.32	14,491.60	--	31,464.49	63,757.4	5,034.70	--	--	68,792.11	8.60	188.8	197.4
Sep-13	0.00	17,714.22	14,189.60	--	32,464.49	64,368.3	4,672.74	--	--	69,041.05	8.63	187.4	196.0
Oct-13	0.00	17,622.55	14,147.40	--	44,821.46	76,591.4	4,672.74	--	--	81,264.15	10.16	184.7	194.9
Nov-13	0.00	14,984.50	14,391.40	--	48,454.61	77,830.5	4,672.74	--	--	82,503.25	10.31	186.8	197.1
Dec-13	0.00	14,903.04	14,546.40	--	49,206.58	78,656.0	4,672.74	--	--	83,328.76	10.42	187.1	197.5
Jan-14	0.00	14,817.43	14,807.70	--	45,169.74	74,794.9	4,672.74	--	--	79,467.61	9.93	187.0	196.9
Feb-14	0.00	14,744.65	14,820.90	--	43,448.81	73,014.4	4,672.74	--	--	77,687.10	9.71	186.0	195.7
Mar-14	0.00	14,659.90	14,876.90	--	42,132.17	71,669.0	4,672.74	--	--	76,341.71	9.54	184.7	194.3
Apr-14	5,000.00	6,811.13	14,876.90	--	38,344.74	65,032.8	4,672.74	--	--	69,705.51	8.71	183.9	192.6
May-14	5,000.00	6,719.84	14,876.90	--	34,307.90	60,904.6	4,672.74	--	--	65,577.38	8.20	181.7	189.9
Jun-14	5,000.00	6,601.88	14,876.90	--	30,271.07	56,749.9	4,672.74	--	--	61,422.59	7.68	180.1	187.8
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	3,166.58	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	6,972.74	--	--	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	78,630.8	6,972.74	--	6,940.00	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	--	6,940.00	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	6,940.00	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	6,940.00	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	6,940.00	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	6,940.00	95,889.38	11.99	163.5	175.5
Jun-16	7,539	5,312.04	2,277.00	--	51,771.12	66,898.7	10,122.74	14,578.30	6,940.00	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	6,940.00	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	6,940.00	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	6,940.00	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	6,940.00	97,774.20	12.22	161.9	174.1
Nov-16	7,539	7,279.09	4,265.90	--	64,345.63	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	163.0	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	103,564.3	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	13,654.51	12,756.00	162,494.43	20.31	162.0	182.3
Oct-17	7,225	9,215.56	12,000.00	41,203.80	62,122.19	131,766.7	1,264.14	13,654.51	12,756.00	159,441.34	19.93	163.4	183.3
Nov-17	7,225	11,006.89	12,000.00	26,547.10	62,122.19	118,901.3	1,264.14	13,654.51	12,756.00	146,575.97	18.32	165.0	183.3
Dec-17	7,225	7,391.04	13,329.10	37,530.40	62,716.33	128,192.0	0.00	13,097.91	12,756.00	154,045.92	19.26	161.9	181.2
Jan-18	7,188	9,445.40	13,329.10	37,530.40	62,753.23	130,246.4	6,764.00	13,097.91	12,756.00	162,864.28	20.36	161.9	182.3
Feb-18	7,188	9,445.40	12,978.70	37,530.40	63,423.23	130,566.0	6,764.00	13,097.91	12,756.00	163,183.88	20.40	163.2	183.6
Mar-18 2/	7,188	9,445.40	12,978.70	37,530.40	63,423.23	130,566.0	6,764.00	13,097.91	12,756.00	163,183.88	20.40	162.4	182.8

1/ ASSUMES 8,000 ACRE-FEET OF CYCLIC STORAGE EQUALS 1 VERTICAL FOOT AT THE BALDWIN PARK KEY WELL.
2/ ESTIMATED CYCLIC STORAGE AND KEY WELL ELEVATION AS OF MARCH 23, 2018.

TABLE 4

LOCAL WATER IN STORAGE
IN SURFACE RESERVOIRS

RESERVOIR	March 28, 2017 STORAGE (ACRE-FEET)	March 19, 2018 STORAGE (ACRE-FEET)	INFLOW (CFS)	OUTFLOW (CFS)	RESERVOIR CAPACITY (ACRE-FEET)	RESERVOIR STORAGE IN PERCENT
Cogswell Dam	6,746	643	13	6	10,438	6%
San Gabriel Dam	36,268	12,337	59	0	44,106	28%
Morris Dam	12,218	8,185	0	30	29,944	27%
Sub-Total:	**55,232**	**21,165**			**84,488**	**25%**
Santa Fe Dam [1/]	0	0	--	0	--	--
Big Dalton Dam	575	70	0	0	--	--
San Dimas Dam	555	123	3	0	--	--
Puddingstone Dam [2/]	6,342	6,158	0	0	--	--
TOTALS:	**62,704**	**27,516**				

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 WATER		CYCLIC	WATERMASTER	RESOURCE	PRODUCER CYCLIC	REPLACEMENT	CYCLIC	WATERMASTER	RESOURCE	PRODUCER CYCLIC	REPLACEMENT	USG-5 EXCHANGE	CYCLIC	WATERMASTER	TRANSFERS TO MWD	RESOURCE	
		USG-3	USG-5 2/	STORAGE	PRE-PURCHASES	DEVELOPMENT	STORAGE	WATER	STORAGE	PRE-PURCHASES	DEVELOPMENT	STORAGE	WATER	REPLACEMENT	STORAGE	PRE-PURCHASES	CYCLIC STORAGE	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		14,962.50	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	--		--	**8,995.60**
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	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		28,187.30	3,751.30	5,975.00	--	--	0.00	--	--	--	--	--	7,763.11	1,402.99	660.90	--		--	**47,740.60**
1988-89		39,100.00	3,726.60	110.70	--	--	0.00	--	--	--	--	--	5,320.25	1,393.75	0.00	--	--	--	**49,651.30**
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	--	--	13,112.70	--	--	--	--	--	9,485.43	1,022.57	0.00	--	--	--	**56,886.90**
1991-92		7,491.90	2,214.00	23,525.90	--	--	3,305.90	0.00	25,077.10	--	--	--	8,074.96	828.04	0.00	--	--	--	**70,517.80**
1992-93		16,077.97	2,478.10	10,214.60	--	--	18,916.73	0.00	3,737.50	--	--	--	11,418.17	1,202.03	1,064.80	--	--	--	**65,109.90**
1993-94		0.00	3,214.00	0.00	--	--	23,050.80	0.00	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	0.00	5,738.60	--	--	--	5,691.49	1,188.61	3,557.90	--	--	--	**25,531.80**
1995-96		15,467.80	3,149.90	85.20	--	--	0.00	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	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	953.10	--	--	--	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	--	--	--	6,158.61	1,254.19	2,621.20	--	--	--	**16,699.10**
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	--	--	--	3,938.39	1,128.84	15,027.77	--	--	--	**59,455.72**
2003-04		14,166.20	3,058.30	23,603.00	--	--	10,000.00	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	--	--	1,800.00	500.66	1,121.25	10,840.09	--	--	--	**24,718.70**
2005-06		48,069.20	2,815.50	9,400.80	--	--	7,500.00	357.10	0.00	--	--	0.00	0.00	1,052.99	12,658.01	--	--	--	**81,853.60**
2006-07		0.00	2,963.30	4,159.20	--	--	0.00	166.70	2,978.00	--	--	0.00	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	--	--	0.00	91.76	1,132.17	779.07	--	--	--	**10,754.60**
2008-09		0.00	3,064.90	0.00	--	--	0.00	0.00	0.00	--	--	0.00	788.73	1,146.29	4,671.98	--	--	--	**9,671.90**
2009-10		16,076.40	2,611.50	0.00	--	--	0.00	0.00	1,427.80	--	--	0.00	1,886.58	976.70	12,340.72	--	--	--	**35,319.70**
2010-11		23,737.90	2,428.20	0.00	--	--	11,646.50	0.00	12,264.60	--	--	0.00	14,655.86	908.13	5,211.01	--	--	--	**70,852.20**
2011-12		3,257.20	2,999.40	0.00	--	--	18,169.10	0.00	12,871.40	--	--	0.00	22,426.22	1,121.78	0.00	--	--	--	**60,845.10**
2012-13		2,034.70	3,037.40	0.00	--	--	10,000.00	0.00	10,098.80	--	--	0.00	16,269.22	1,135.98	5,138.80	--	--	--	**47,714.90**
2013-14		0.00	2,983.90	0.00	--	--	31,288.90	0.00	3,110.10	--	--	0.00	1,202.03	1,115.97	0.00	--	--	--	**39,700.90**
2014-15		0.00	2,711.70	4,031.54	5,000.00	--	29,809.36	0.00	471.00	--	--	1,000.00	192.83	1,014.17	0.00	--	--	--	**44,230.60**
2015-16		0.00	2,486.50	3,107.00	0.00	5,622.00	10,510.00	0.00	2,507.40	0.00	416.00	500.00	0.00	929.95	7,354.05	--	--	902.00	**34,334.90**
2016-17		0.00	2,876.90	0.00	0.00	4,713.00	35,786.60	0.00	12,000.00	0.00	118.10	500.00	14,029.70	1,075.95	8,132.95	--	0.00	761.00	**79,994.20**
2017-18	1/	0.00	2,067.90	0.00	6,764.00	0.00	56,473.22	0.00	979.10	0.00	0.00	1,264.14	4,649.74	773.40	4,624.26	--	5,000.00	0.00	**82,595.76**

1/ Estimated as of February 28, 2018.
2/ In-Lieu replenishment through CWEA.

TABLE 6

HISTORICAL WATER PRODUCTION
(ACRE-FEET)

FISCAL YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	TOTAL
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	63,939	52,634	--	--	205,000 1/
7-Year Drought	66,963	50,192	43,232	57,482	216,114
10-Year Average	70,215	52,197	45,052	60,593	228,057
44-Year Average	74,881	55,046	46,437	63,381	239,745

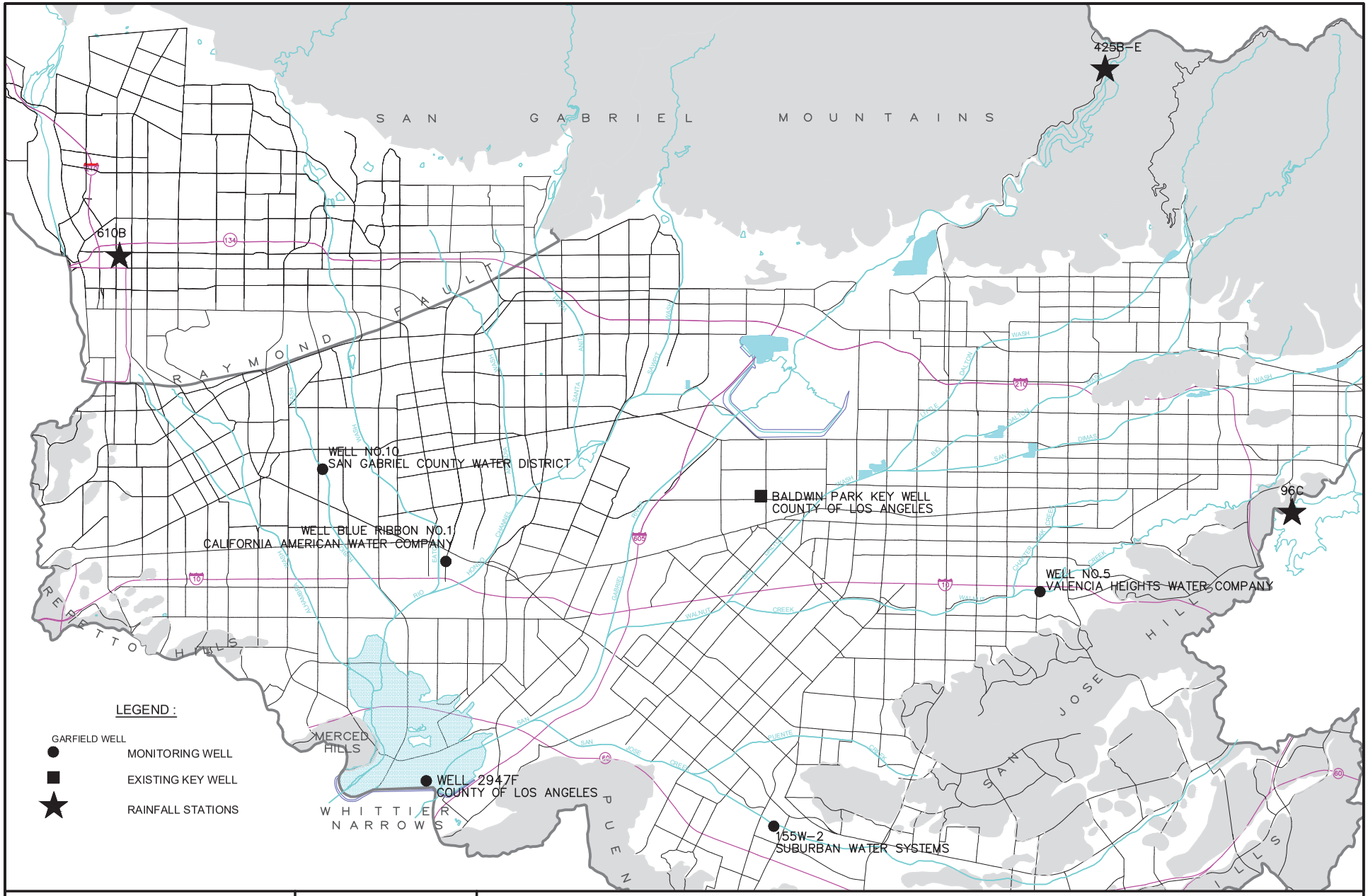
1/ ESTIMATED

TABLE 7

TOTAL HISTORICAL WATER DEMAND IN BASIN
(ACRE-FEET)

FISCAL YEAR		TREATED IMPORTED WATER	TOTAL PRODUCTION	TOTAL DEMAND
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	1/	12,000	205,000	217,000
Most Recent 7-Year Drought		15,233	216,272	231,505
10-Year Average		16,830	228,268	245,581
44-Year Average		19,426	240,084	259,679

1/ Estimated



STETSON ENGINEERS INC.
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San Rafael California 94901

2651 W Guadalupe Rd., Suite A209
Mesa Arizona 85202

N

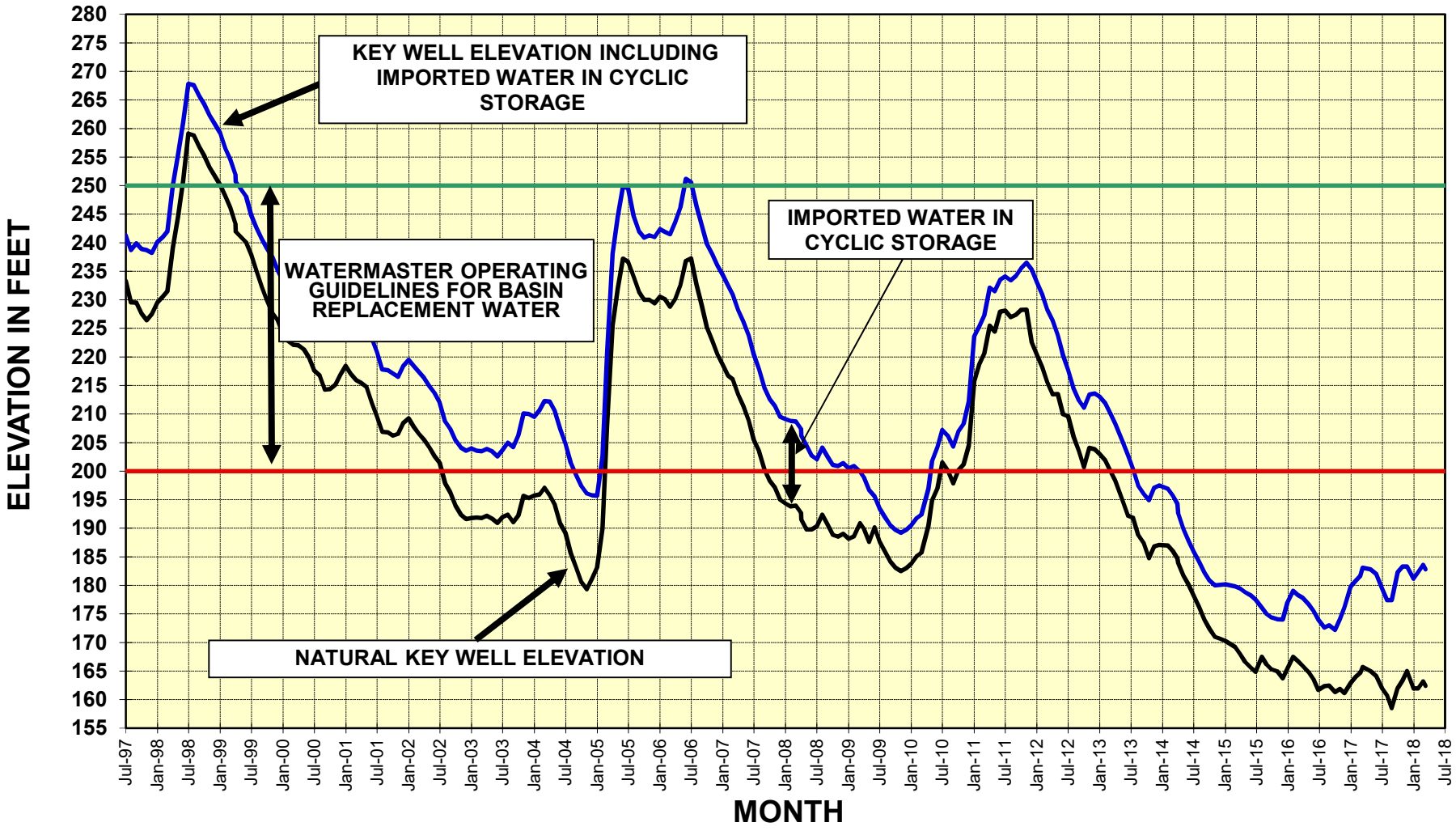
APPROXIMATE SCALE
1" = 12,000'

MAIN SAN GABRIEL BASIN WATERMASTER

WELL LOCATION MAP

PLATE 1

F:\JOBS\1205\1205-04\2014-15\PLATE 1.DWG
F:\JOBS\1205-04.CTB



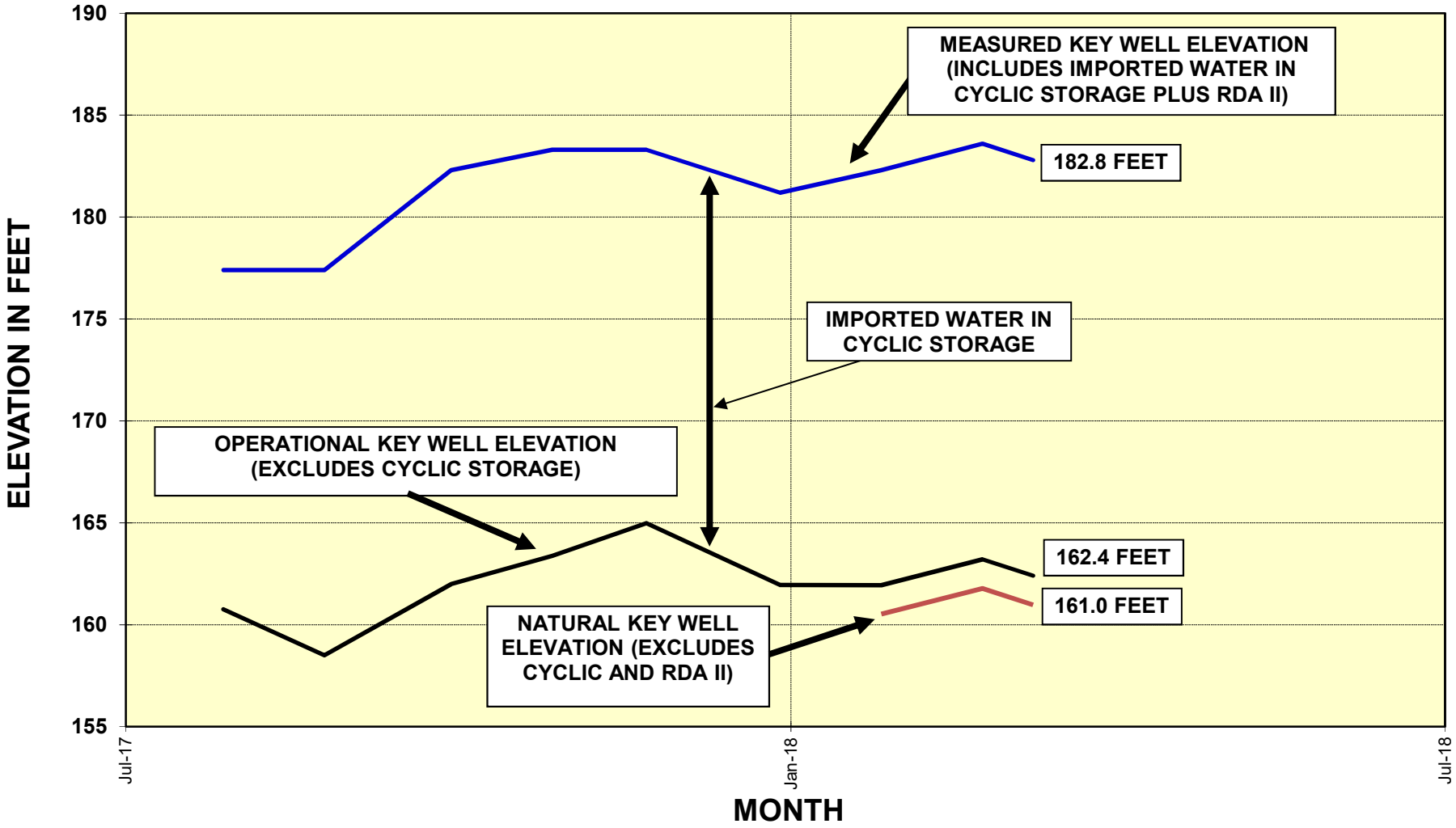
STETSON ENGINEERS INC.
Covina San Rafael Mesa, Arizona
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

BALDWIN PARK KEY WELL GROUNDWATER ELEVATION

FIGURE 1

Z:\Jobs\1205\1205-04\2018-19\Preliminary\18-19_PRE_TBL_3 and Figure 1



STETSON ENGINEERS INC.
Covina San Rafael Mesa, Arizona
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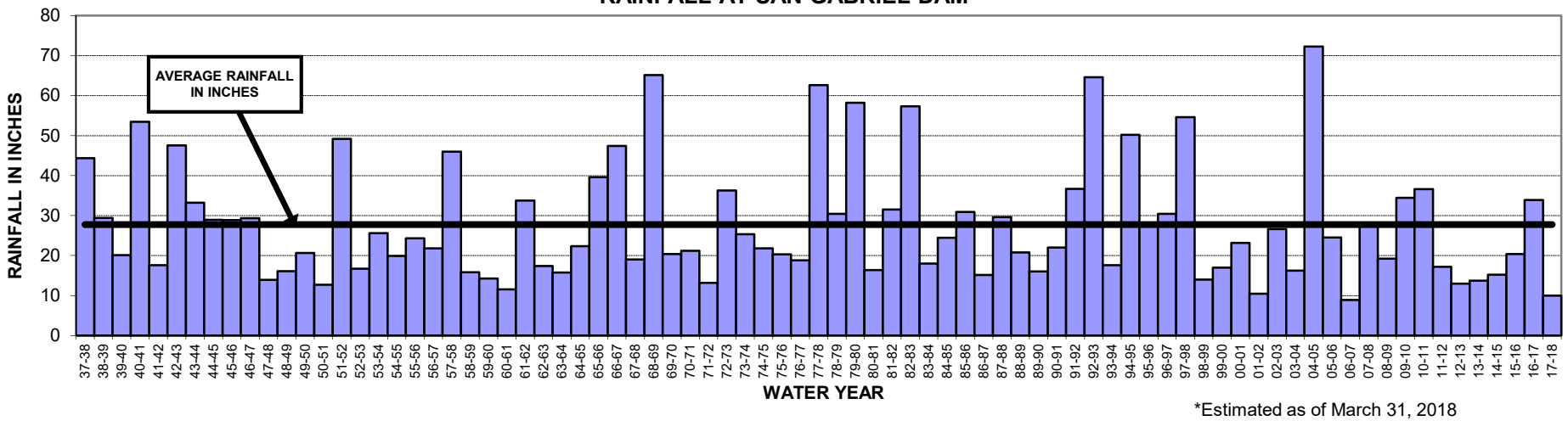
MAIN SAN GABRIEL BASIN WATERMASTER

BALDWIN PARK KEY WELL GROUNDWATER ELEVATION

FIGURE 2

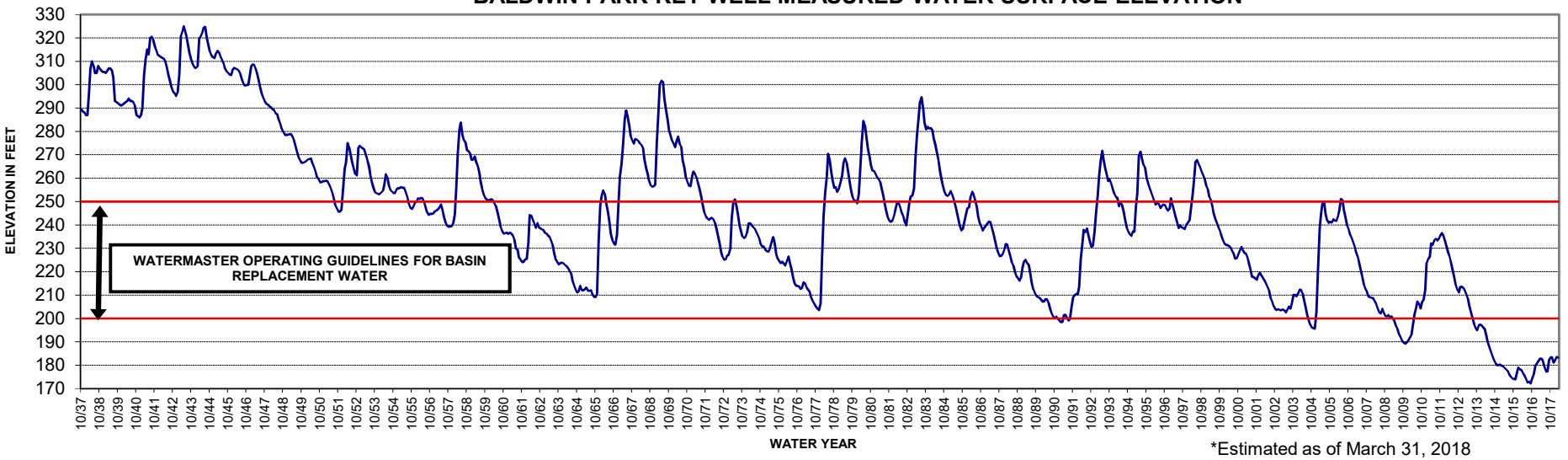
Z:\Jobs\1205\1205-04\2018-19\Preliminary\Figure 2 - RDA II

RAINFALL AT SAN GABRIEL DAM



*Estimated as of March 31, 2018

BALDWIN PARK KEY WELL MEASURED WATER SURFACE ELEVATION



*Estimated as of March 31, 2018

STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS

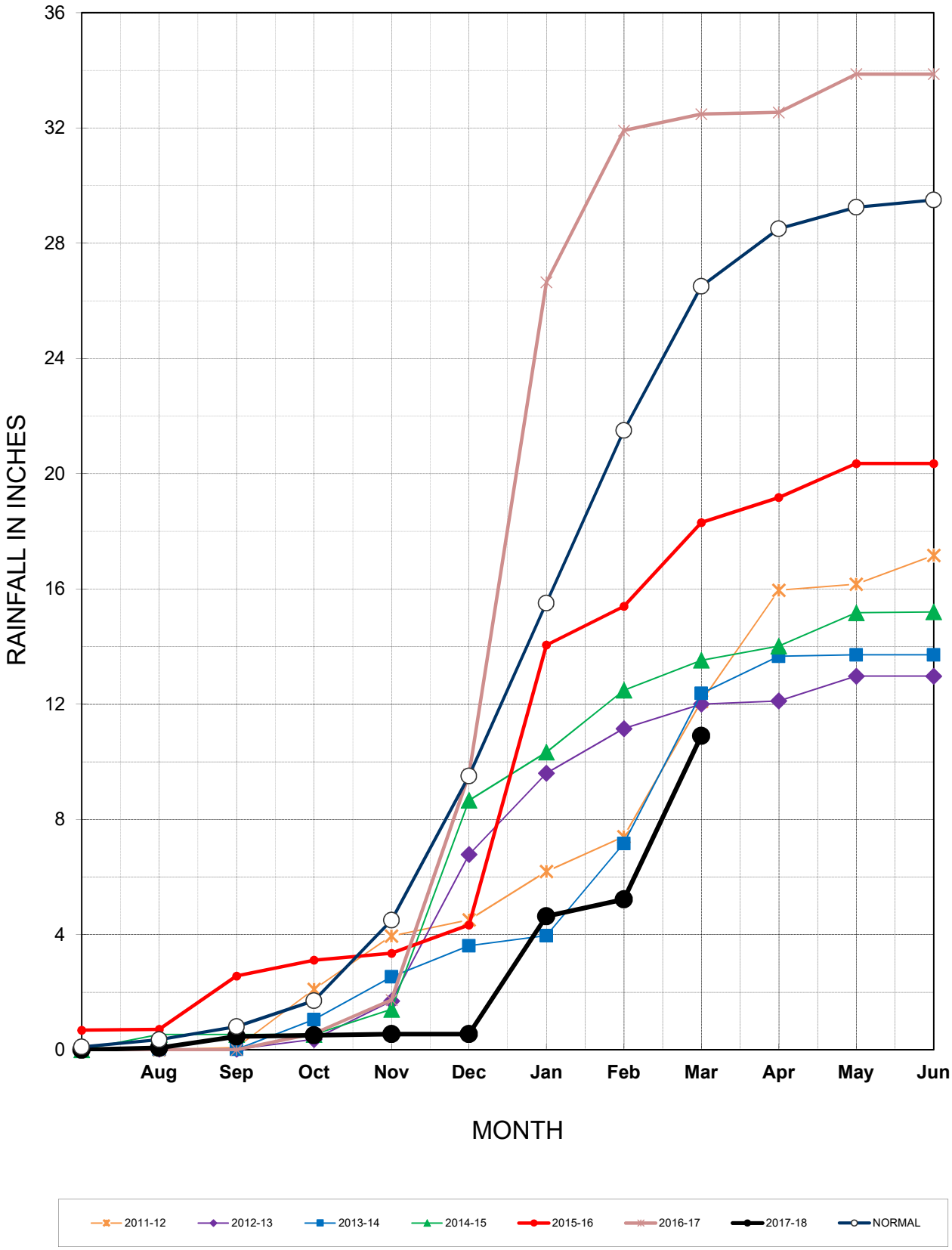
MAIN SAN GABRIEL BASIN WATERMASTER

SAN GABRIEL DAM RAINFALL AND BALDWIN PARK KEY WELL ELEVATION

FIGURE 3

Z:\Jobs\1205\1205-04\2018-19\Preliminary\18-19_PRE_Figure 3

FIGURE 4



STETSON ENGINEERS INC.

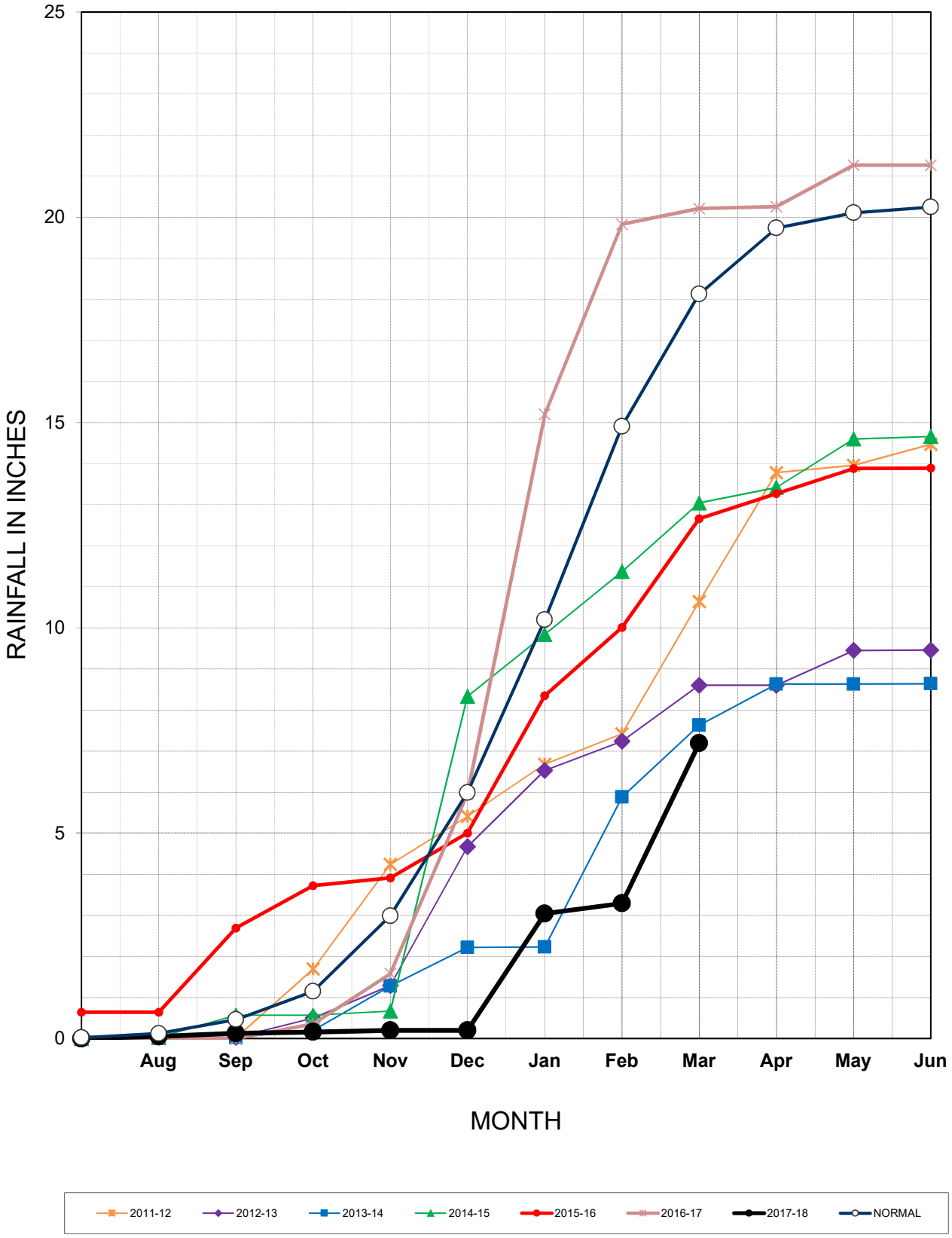
Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

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

FIGURE 5

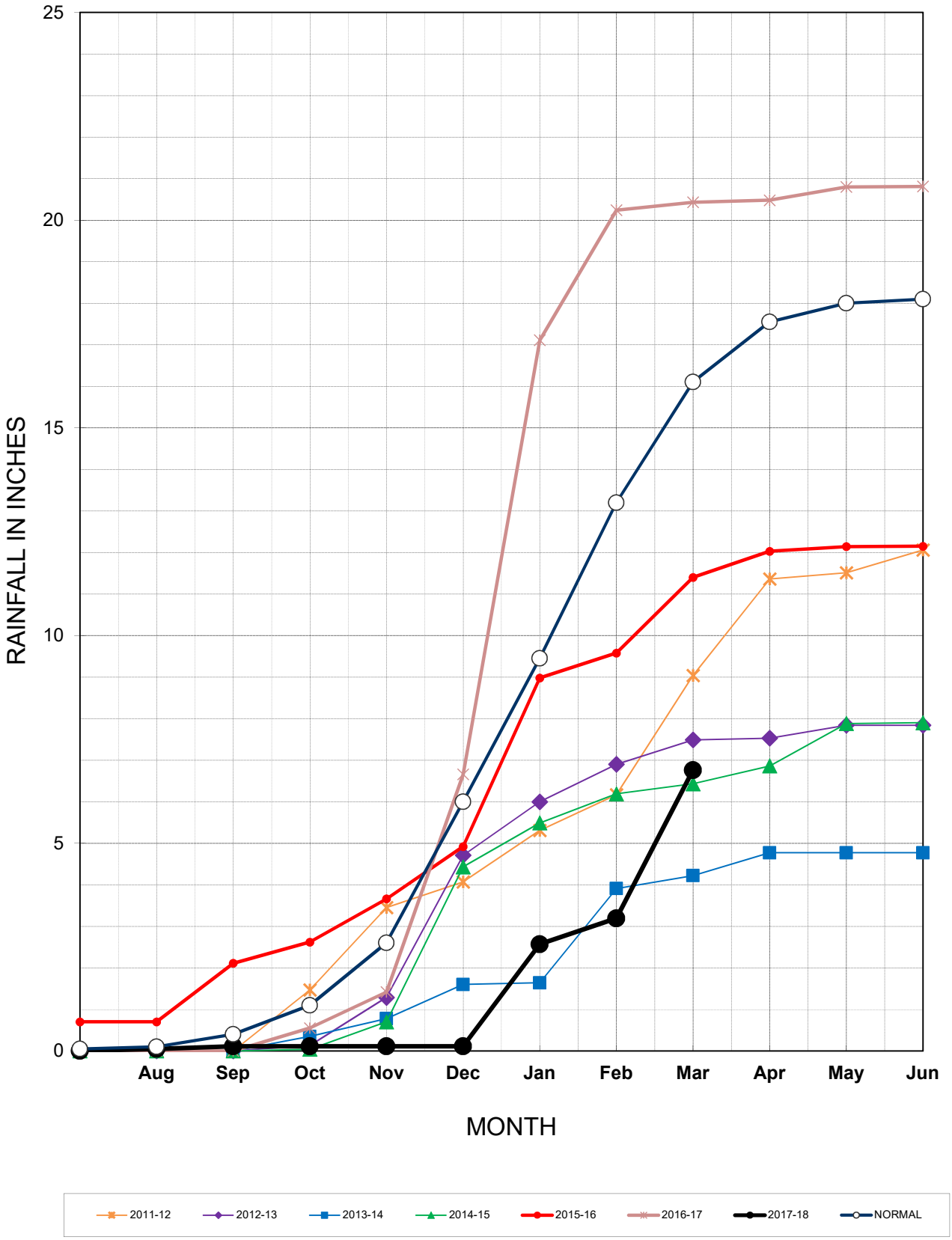


STETSON ENGINEERS INC.
Covina San Rafael Mesa, Arizona
WATER RESOURCE ENGINEERS

MAIN SAN GABRIEL BASIN WATERMASTER

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

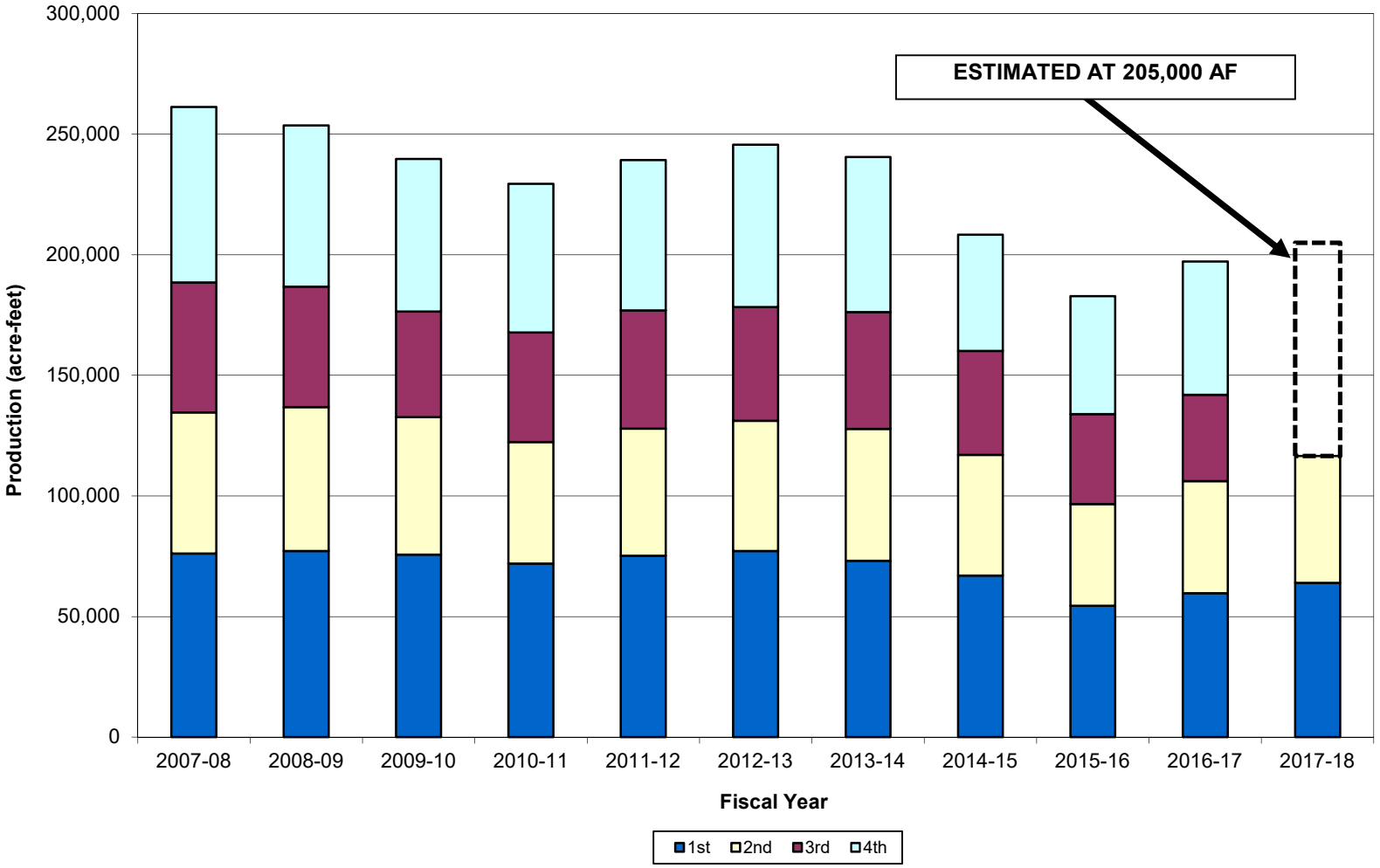
FIGURE 6



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



STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS

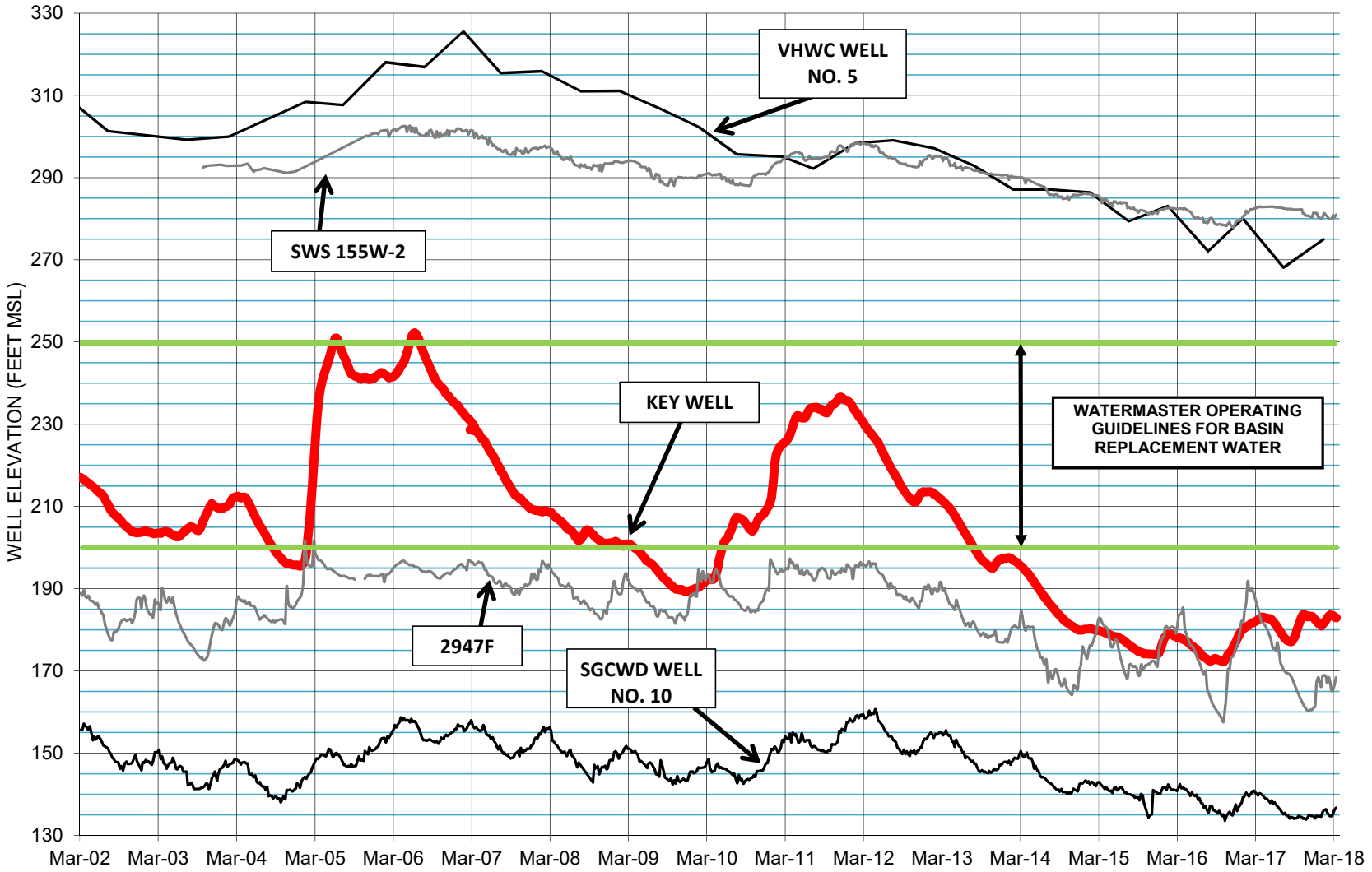
MAIN SAN GABRIEL BASIN WATERMASTER

PRODUCTION IN MAIN SAN GABRIEL BASIN

FIGURE 7

Z:\Jobs\1205\1205-04\2018-19\Preliminary\18-19_Pre_Figure 7 - Production graph

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 2018

Z:\Jobs\1205\1205-04\2018-19\Appendix A KeyWell_OtherKeyWells

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
Bandel Family Trust	0.00845	10.99	11.83	12.68	13.52
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
Brondino, Jeanne	0.01269	16.50	17.77	19.04	20.30
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	6.22093	8,087.21	8,709.30	9,331.40	9,953.49
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
Garnier, Ruth Elaine Ailor	0.02110	27.43	29.54	31.65	33.76
Golden State Water-S.G.V. Dist.	2.92105	3,797.37	4,089.47	4,381.58	4,673.68
Green, Walter	0.03628	47.16	50.79	54.42	58.05
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
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	0.07379	95.93	103.31	110.69	118.06
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
Miller Coors LLC	1.20047	1,560.61	1,680.66	1,800.71	1,920.75
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 Trust	0.01215	15.80	17.01	18.23	19.44
Nicholson Family Trust	0.00354	4.60	4.96	5.31	5.66
Pellissier Irrevocable QTIP Trust, et a	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
Polopolus, et al	0.01138	14.79	15.93	17.07	18.21
Rados, Alexander	0.02176	28.29	30.46	32.64	34.82
Rosemead Development Ltd.	0.00051	0.66	0.71	0.77	0.82
Rurban Homes Mutual	0.11018	143.23	154.25	165.27	176.29
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	10.31388	13,408.04	14,439.43	15,470.82	16,502.21
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
Southwest Water Company	0.05996	77.95	83.94	89.94	95.94
Sterling Mutual	0.06072	78.94	85.01	91.08	97.15
Suburban Water Systems	12.57888	16,352.54	17,610.43	18,868.32	20,126.21
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
Total of Pumpers	**76.46119**	**99,399.55**	**107,045.67**	**114,691.79**	**122,337.90**

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	0.14988	194.84	209.83	224.82	239.81
Azusa Valley Water Co.	6.76299	8,791.89	9,468.19	10,144.49	10,820.78
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.	0.08349	108.54	116.89	125.24	133.58
Monrovia, City of	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 Intergrated 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
TOTAL	**100.00000**	**130,000.00**	**140,000.00**	**150,000.00**	**160,000.00**