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ENGINEER'S REPORT

GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM FOR THE WHITEWATER RIVER, MISSION CREEK, AND GARNET HILL SUBBASINS

DESERT WATER AGENCY 2016/2017

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EXECUTIVE SUMMARY

Since 1973, Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) have been using Colorado River water exchanged for State Water Project (SWP) water to replenish groundwater in the Whitewater River Subbasin and Mission Creek Subbasin of the Coachella Valley Groundwater Basin.

Through the 2015/2016 Engineer's Reports, each subbasin within DWA's Area of Benefit was described in its own separate report. Beginning with this 2016/2017 Engineer's Report, all subbasins (Whitewater River, Mission Creek, and Garnet Hill Subbasins) will be included in a single report.

If groundwater replenishment with imported water (artificial replenishment) is excluded, gross groundwater overdraft (defined herein as groundwater extractions or water production in excess of natural groundwater replenishment or recharge) within the Whitewater River, Mission Creek, and Garnet Hill Subbasins of the Coachella Valley Groundwater Basin (see **Figure 1**) would continue to increase at a steady rate. Gross overdraft in the Upper Whitewater River Subbasin is currently estimated to be about 84,000 acre feet per year (AF/Yr), while gross overdraft in the Mission Creek Subbasin is currently estimated at about 5,000 AF/Yr, depending upon actual non-consumptive return flows. Supplementing natural groundwater recharge resulting from rainfall runoff with artificial replenishment using imported water supplies is therefore necessary to offset annual and cumulative gross overdraft.

Increases in cumulative overdraft, without artificial replenishment, will result in declining groundwater levels and increasing pump lifts, thereby increasing energy consumption for groundwater extraction. Extreme cumulative overdraft has the potential of causing ground surface settlement, and could also have an adverse impact upon groundwater quality and storage volume. Artificial replenishment offsets annual groundwater overdraft and the concerns associated therewith and arrests or reduces the effects of cumulative groundwater overdraft.

The Area of Benefit for DWA's portion of the groundwater replenishment program is that portion of the Whitewater River, Mission Creek, and Garnet Hill Subbasins and tributaries--including subbasins (San Gorgonio Pass Subbasin), rivers, or streams--which lie within the boundaries of DWA (**Figure 2**). The costs involved in carrying out DWA's groundwater replenishment program are essentially recovered through water replenishment assessments applied to all groundwater and surface water production within the Area of Benefit, aside from specifically exempted production. Production is defined as either extraction of groundwater from the Whitewater River, Mission Creek, and Garnet Hill Subbasins and

upstream tributaries, or diversion of surface water that would otherwise naturally replenish the subbasins and upstream tributaries, all within the Area of Benefit.

As a result of the implementation of the Mission Creek Groundwater Replenishment Agreement, dated April 8, 2003, between CVWD and DWA to replenish and jointly manage groundwater in the Mission Creek Subbasin, the Mission Springs Water District (MSWD) filed an action in the Superior Court of California challenging the replenishment assessments levied on MSWD groundwater extractions or production. The three parties settled the dispute as documented in a Settlement Agreement and Addendum in December 2004. The Settlement Agreement stipulated that the three parties would form the Mission Creek/Garnet Hill Subbasin Management Committee to collectively discuss water management in the Whitewater River, Mission Creek, and Garnet Hill Subbasins. The three parties also agreed to investigate whether the Garnet Hill Subbasin was in fact benefitting from the artificial recharge programs within the Whitewater River and Mission Creek Subbasins and to prepare a water management plan (WMP) for the Mission Creek and Garnet Hill Subbasins.

The WMP determined that, since artificial recharge activities began, the Garnet Hill Subbasin has benefitted from artificial recharge in both the Whitewater River and Mission Creek Subbasins: the former by means of infiltration from the Whitewater River channel, from subsurface flow across the Garnet Hill Fault from the Whitewater River Subbasin into the upper and central portions of the Garnet Hill Subbasin, and by retardation of subsurface outflow from the lower portion of the Garnet Hill Subbasin during high groundwater levels resulting from recharge operations within the Whitewater River Spreading Basins; and the latter by means of subsurface flow across the Banning Fault from the Mission Creek Subbasin resulting from recharge operations within the Mission Creek Spreading Basins, as evidenced by the groundwater contours observed on either side of the Banning Fault.

The WMP did not specifically quantify the recharge contributions to the Garnet Hill Subbasin from either the Whitewater River Subbasin or the Mission Creek Subbasin, and stated that hydrologic data for such a determination is currently lacking and, based on data available, it is unclear and uncertain as to the exact relative contribution from these sources to the replenishment of the Garnet Hill Subbasin. Regardless, the Garnet Hill Subbasin is dependent on both the Whitewater River Subbasin and the Mission Creek Subbasin for its groundwater replenishment, both natural and artificial.

The benefits resulting from artificial groundwater infiltration from the Whitewater River channel and subsurface flow of groundwater from the Mission Creek Subbasin and from the Whitewater River

Subbasin is evidenced by the response observed by groundwater levels in wells within the Garnet Hill Subbasin. Historic groundwater levels within the Garnet Hill Subbasin and historic quantities of imported water delivered to the spreading grounds within the Whitewater River and Mission Creek Subbasins are shown in **Exhibit 3**. The rising groundwater levels correlate with the large quantities of groundwater recharge, particularly in those groundwater wells located in the westerly and central portions of the Garnet Hill Subbasin, especially for the periods 1983 through 1987, 1995 through 2000, and 2009 through 2012.

Since the Garnet Hill Subbasin benefits from CVWD's and DWA's recharge programs in the Whitewater River and Mission Creek Subbasins, CVWD and DWA have the authority to levy replenishment assessment charges on production within the Garnet Hill Subbasin under the provisions set forth in the Settlement Agreement.

The following producers are specifically exempted from assessment: producers extracting groundwater from the all three subbasins and upstream tributaries at rates of 10 AF/Yr or less; and producers diverting surface water without diminishing stream flow and groundwater recharge of the subbasins and upstream tributaries by 10 AF/Yr or less.

Because groundwater production continues to exceed natural groundwater replenishment and cumulative groundwater overdraft persists within each subbasin, continued artificial replenishment in the Whitewater River and Mission Creek Subbasins is necessary to either eliminate or reduce the effects of cumulative overdraft, and to reduce the resultant threat to the groundwater supply. There are currently no artificial replenishment activities within the Garnet Hill Subbasin.

DWA has requested its maximum 2016 Table A SWP water allocation of 55,750 AF pursuant to its SWP Contract, which was increased from 38,100 AF in 2004 to 50,000 AF in 2005 and to 55,750 in 2010, for the purpose of groundwater replenishment. CVWD plans to do the same with its maximum 2016 Table A water allocation, which was increased in quantity from 23,100 AF in 2003 to 33,000 AF in 2004, to 121,100 AF in 2005, and to 138,350 AF in 2010.

By virtue of the 2003 Exchange Agreement, The Metropolitan Water District of Southern California (MWD) assigned 11,900 AF of its annual Table A allocation to DWA and 88,100 AF of its annual Table A allocation to CVWD; however, MWD retained the option to call-back or recall the assigned annual Table A water allocations, in accordance with specific conditions, in any year. In implementing

the 2003 Exchange Agreement, MWD advised CVWD and DWA that it would probably recall the 100,000 AF assigned to the two Coachella Valley agencies from 2005 through 2009. In fact, MWD did recall 100,000 AF in 2005 but has not recalled any water since then. According to communications with MWD management, it is unlikely that MWD will recall any water in 2016 or in future years.

According to current (as of April 21, 2016) projections for 2016, California Department of Water Resources (CDWR) will deliver 60% of Table A water allocation requests, resulting in deliveries of 87,345 AF of Table A water to the Coachella Valley agencies. The state's historic drought condition and lower than normal reservoir levels have been the cause of lower allocations delivered from CDWR in the last two calendar years. Ordinarily, DWA requests SWP surplus water under the Turn-Back Water Pool Program (Pool A and Pool B) in March of each year, but it is currently unknown if any surplus water will be made available. In addition, the availability of water under the Yuba River Accord is uncertain for 2016.

The maximum replenishment assessment rate permitted by Desert Water Agency Law for Table A water for the 2016/2017 fiscal year is $209.80/AF. The $209.80 rate is based on estimated Applicable SWP Charges of $8,981,669 (see **Table 5** for DWA applicable charges for 2016 and 2017) and estimated combined assessable production of 42,810 AF for the Whitewater River, Mission Creek, and Garnet Hill Subbasins (estimated based on the production for 2014 minus 10% for implementation of permanent conservation measures: 33,760 AF within the Whitewater River Subbasin, 8,710 AF within the Mission Creek Subbasin, and 340 AF within the Garnet Hill Subbasin).

The effective replenishment assessment rate for Table A water is based on DWA's estimated Allocated SWP Charges for the current year (based on CDWR's projections for the assessment period) divided by the estimated assessable production for the assessment period, as set forth in **Table 6**. Historically, the estimated assessable production has been based on the assessable production for the previous year; however, the production during 2015 was unusually low due to mandatory water conservation measures imposed as a result of the Governor's April 1, 2015 executive order mandating water restrictions on urban water use statewide, and demanding a 32% reduction in water use within Desert Water Agency. Only a portion of the effects of these severe water restrictions are anticipated to be permanent; therefore, for 2016/2017, DWA has elected to estimate assessable groundwater production based on the 2014 assessable groundwater production minus a factor of 10% to account for the effects of permanent water conservation measures.

For the 2012/2013 fiscal year, DWA's effective replenishment assessment rate was based on the actual payments made to the SWP by DWA for the previous calendar year divided by the assessable production for that calendar year. This change was made due to a history of variability in the estimated charge projections published by CDWR in Appendix B of Bulletin 132, which have occasionally diverged significantly from the amounts actually charged by CDWR. However, due to significant quantities of surplus and carryover water from 2011 delivered in 2012, DWA paid significantly higher SWP charges in 2012 than in 2011. It became clear that the variability in the actual payment of effective replenishment assessment rates was no less than the variability previously observed in CDWR's estimated charge projections. Therefore, beginning in 2013/2014, DWA's estimated effective replenishment assessment rate used has been based on CDWR's projected charges, since carryover and surplus water quantities cannot be projected.

Pursuant to the terms of the Water Management Agreement between CVWD and DWA, and based on DWA's allocated SWP charges amount of $6,043,943 and estimated assessable production of 42,810 AF for the 2016 calendar year (shown in **Table 6** as the estimated assessable production for the 2016/2017 fiscal year), the effective replenishment assessment rate component for Table A water is $144/AF for the 2016/2017 fiscal year.

Since 1996, DWA and CVWD have purchased surplus SWP water, when available, to supplement deliveries of Table A (see **Chapter II, Section B.5.d**). Historically, DWA obtained funds for its applicable charges for surplus water payments from its Unscheduled State Water Project Deliveries Reserve Account, rather than from funds raised directly through the collection of replenishment assessments. In 2004/2005, DWA began levying a separate charge to reimburse the aforementioned reserve account to restore funds available for payment for future surplus SWP supplies, when they become available. Said charge was only implemented for three years due to discretionary reduction, and will not likely be implemented again in the future due to increasing costs for Table A water.

Due to the Proposition 218 proceedings scheduled to be held in Fall 2016, DWA has elected to postpone increasing the replenishment assessment rate until the 2017/2018 fiscal year. Therefore, DWA has elected to set the replenishment assessment for the 2016/2017 fiscal year at the 2015/2016 rate of $102.00. At that rate, DWA's replenishment assessment for the entire Replenishment Program will be about $4,366,620, based on estimated assessable production of 42,810 AF (33,760 AF for the Whitewater River Subbasin, 8,710 AF for the Mission Creek Subbasin, and 340 AF for the Garnet Hill Subbasin).

Accordingly, DWA will bill approximately $3,443,520 for the Whitewater River Subbasin, approximately $888,420 for the Mission Creek Subbasin, and approximately $34,680 for the Garnet Hill Subbasin.

Due to recent significant increases in the Delta Water Charge that could result in a large increase in the replenishment assessment rate, DWA has elected to transfer the existing cumulative deficit in the Replenishment Assessment Account to reserve account(s), rather than continue to attempt to recover past deficits by future increases in the replenishment assessment rate. Deficits that result from future assessments will be recovered by addition of surcharges, as shown in the "Other Charges and Costs" column for each subbasin in **Table 7**.

It should be noted that there is currently no independent replenishment program for the Garnet Hill Subbasin. Assessment of the Garnet Hill Subbasin production began in the 2015/2016 fiscal year as a result of the 2013 Mission Creek/Garnet Hill Water Management Plan findings that the Garnet Hill Subbasin benefits from artificial replenishment activities in the Whitewater River and Mission Creek Subbasins. The estimated assessable production for the 2016 calendar year is 340 AF, yielding $34,680 in replenishment assessments.

In summary, gross overdraft persists in the Coachella Valley Groundwater Basin even though groundwater levels have generally stabilized (cumulative gross overdraft offset by artificial replenishment is estimated to be 783,000 AF in the Whitewater River Subbasin and 114,000 AF in the Mission Creek Subbasin); thus, there is a continuing need for groundwater replenishment. Even though DWA has requested of the CDWR its full SWP Table A allocation of 55,750 AF, the CDWR expects to deliver 60% of this allocation during the coming year, and DWA has elected to maintain the groundwater replenishment assessment rate for 2016/2017 at $102.00/AF.

CHAPTER II
INTRODUCTION

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A. THE COACHELLA VALLEY AND ITS GROUNDWATER

1. The Coachella Valley

The Coachella Valley is a desert valley in Riverside County, California. It extends approximately 45 miles southeast from the San Bernardino Mountains to the northern shore of the Salton Sea. Cities of the Coachella Valley include Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage. The Coachella Valley is bordered on the north by Mount San Gorgonio of the San Bernardino Mountains, on the west by the San Jacinto and Santa Rosa Mountains, on the east by the Little San Bernardino Mountains, and on the south by the Salton Sea.

The Coachella Valley lies within the northwesterly portion of California's Colorado Desert, an extension of the Sonoran Desert. The San Bernardino, San Jacinto, and Santa Rosa Mountains provide an effective barrier against coastal storms, and greatly reduce the contribution of direct precipitation to replenish the Coachella Valley's groundwater basin, resulting in an arid climate. The bulk of natural groundwater replenishment comes from runoff from the adjacent mountains.

Climate in the Coachella Valley is characterized by low humidity, high summer temperatures, and mild dry winters. Average annual precipitation in the Coachella Valley varies from 4 inches on the Valley floor to more than 30 inches in the surrounding mountains. Most of the precipitation occurs during December through February (except for summer thundershowers). The low rainfall is inadequate to supply sufficient water supply for the valley, thus the need for the importation of Colorado River water. Precipitation data recorded at nine rain gauge stations in the Upper Coachella Valley by the Riverside County Flood Control and Water Conservation District is included in **Appendix A**.

Prevailing winds in the area are usually gentle, but occasionally increase to velocities of 30 miles per hour or more. Midsummer temperatures commonly exceed 100 degrees Fahrenheit (°F), frequently reach 110°F, and periodically reach 120°F. The average winter temperature is approximately 60°F.

2. The Coachella Valley Groundwater Basin

The Coachella Valley Groundwater Basin, as described in CDWR Bulletins 108 and 118, is bounded on the north and east by non-water-bearing crystalline rocks of the San Bernardino and Little San Bernardino Mountains and on the south and west by the crystalline rocks of the Santa Rosa and San Jacinto Mountains. At the west end of the San Gorgonio Pass, between Beaumont and Banning, the basin boundary is defined by a surface drainage divide separating the Coachella Valley Groundwater Basin from the Beaumont Groundwater Basin of the Upper Santa Ana Drainage Area.

The southern boundary is formed primarily by the watershed of the Mecca Hills and by the northwest shoreline of the Salton Sea running between the Santa Rosa Mountains and Mortmar. Between the Salton Sea and Travertine Rock, at the base of the Santa Rosa Mountains, the lower boundary coincides with the Riverside/Imperial County Line.

Southerly of the southern boundary, at Mortmar and at Travertine Rock, the subsurface materials are predominantly fine grained and low in permeability; although groundwater is present, it is not readily extractable. A zone of transition exists at these boundaries; to the north the subsurface materials are coarser and more readily yield groundwater.

Although there is interflow of groundwater throughout the groundwater basin, fault barriers, constrictions in the basin profile, and areas of low permeability limit and control movement of groundwater. Based on these factors, the groundwater basin has been divided into subbasins and subareas as described by CDWR in 1964 and the United States Geological Survey (USGS) in 1971.

3. Subbasins and Subareas

The San Andreas Fault drives a complex pattern of branching fault lines within the Coachella Valley which define the boundaries of the subbasins that make up the Coachella Valley Groundwater Basin (CDWR 2003). There are five subbasins within the Coachella Valley Groundwater Basin: the Whitewater River, Mission Creek, San Gorgonio Pass, Desert Hot Springs, and Garnet Hill Subbasins (USGS 1974).

The subbasins, with their groundwater storage reservoirs, are defined without regard to water quantity or quality. They delineate areas underlain by formations which readily yield the stored water through water wells and offer natural reservoirs for the regulation of water supplies.

The boundaries between subbasins within the groundwater basin are generally defined by faults that serve as effective barriers to the lateral movement of groundwater. Minor subareas have also been delineated, based on one or more of the following geologic or hydrologic characteristics: type of water bearing formations, water quality, areas of confined groundwater, forebay areas, groundwater divides and surface drainage divides.

The following is a list of the subbasins and associated subareas, based on the CDWR and USGS designations:

- Mission Creek Subbasin (Subbasin 7-21.02 per CDWR Bulletin 118, 2003)
- Desert Hot Springs Subbasin (Subbasin 7-21.03 per CDWR Bulletin 118, 2003)
    - Miracle Hill Subarea
    - Sky Valley Subarea
    - Fargo Canyon Subarea
- Garnet Hill Subbasin (considered a subarea of the Indio Subbasin in DWR Bulletin 118, 2013)
- San Gorgonio Pass Subbasin (Subbasin 7-21.04 per CDWR Bulletin 118, 2003)
- Whitewater River Subbasin (Subbasin 7-21.01 per CDWR Bulletin 118, 2003, referred to therein as the Indio Subbasin)
    - Palm Springs Subarea
    - Thermal Subarea

- Thousand Palms Subarea
- Oasis Subarea

DWA's groundwater replenishment program encompasses portions of four of the five subbasins (Whitewater River, Mission Creek, San Gorgonio Pass, and Garnet Hill). DWA's boundary does not include the Desert Hot Springs Subbasin. **Figure 2** illustrates the subbasin boundaries per the Mission Creek/Garnet Hill Water Management Plan (Montgomery Watson Harza (MWH) 2003) and DWA's Areas of Benefit of the replenishment program.

B. THE GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM

Desert Water Agency's (DWA's) Groundwater Replenishment and Assessment Program was established to augment groundwater supplies and arrest or retard declining water table conditions within the Coachella Valley Groundwater Basin, specifically within the Whitewater River, Mission Creek, and Garnet Hill Subbasins (see **Figure 1**).

1. Water Management Areas

Pursuant to the Water Management Agreements between CVWD and DWA, the Water Management Areas encompass the Palm Springs Subarea (westerly portion) of the Whitewater River Subbasin, a portion of the San Gorgonio Pass Subbasin, and the entire Mission Creek and Garnet Hill Subbasins within the Coachella Valley Groundwater Basin (see **Figure 1**).

2. Areas of Benefit

The Areas of Benefit for DWA's replenishment program consist of the northwesterly portion of the Coachella Valley Groundwater Basin including portions of the Whitewater River Subbasin, Mission Creek Subbasin, Garnet Hill Subbasin, and tributaries thereto, situated within DWA's service area boundary (see **Figure 2**). The Area of Benefit for CVWD's replenishment program consists of the portions of the east and west portion of the Whitewater River Subbasin, Mission Creek Subbasin, and Garnet Hill Subbasin within CVWD's boundary.

Within DWA's Area of Benefit, there are six stream diversions on the Whitewater River and its tributaries, five by DWA (two on Chino Creek, one on Snow Creek, one on Falls Creek, and one by the former Whitewater Mutual Water Company, which has been acquired by DWA) and one by the former Whitewater Trout Farm (now owned by the Wildlands Conservancy for conservation and educational purposes), the latter two being on the Whitewater River itself. There are no stream diversions within the Mission Creek or Garnet Hill Subbasins.

While the replenishment assessments outlined on the following pages are based on and limited to water production within DWA's Area of Benefit, available water supply, estimated water requirements, and groundwater replenishment are referenced herein to the entire Whitewater River (Palm Springs Subarea), Mission Creek, and Garnet Hill Subbasins. The Whitewater River and Mission Creek Subbasins are utilized jointly by CVWD and DWA for water supply purposes, and the two agencies jointly manage water supplies within said subbasins.

3. Water Management Agreements

The Program was implemented pursuant to a joint Water Management Agreement for the Whitewater River Subbasin (executed July 1, 1976 and amended December 15, 1992 and July 15, 2014) between CVWD and DWA. Later, a similar program was implemented within the Mission Creek Subbasin pursuant to a similar joint Water Management Agreement (executed April 8, 2003 and amended July 15, 2014). Currently, there is no Water Management Agreement between CVWD and DWA for the Garnet Hill Subbasin because direct artificial groundwater replenishment has not been implemented within the subbasin.

CVWD and DWA entered into a Settlement Agreement with MSWD in December 2004, which affirmed the water allocation procedure that had been established earlier by CVWD and DWA, and which established a Management Committee, consisting of the General Managers of CVWD, DWA, and MSWD, to review production and recharge activities. An Addendum to the Settlement Agreement states that the water available for recharge each year shall be divided among the management areas proportionate to the previous year's production from within each management area (see **Appendix B)**.

Conditions of the Settlement Agreement and Addendum between DWA, CVWD, and MSWD state that DWA and CVWD have the authority to levy replenishment assessments on water produced from subbasins of the Upper Coachella Valley Groundwater Basin within DWA and CVWD's Areas of Benefit, if found that recharge activities benefit those subbasins.

The Management Committee engaged Montgomery Watson Harza (MWH) to prepare the Mission Creek/Garnet Hill Water Management Plan (WMP), which was completed in January 2013. According to the WMP, the Garnet Hill Subbasin benefits from the recharge activities in both the Mission Creek and Whitewater River Subbasin. It benefits from the recharge activities in the Mission Creek Subbasin via subsurface flow across the Banning Fault, and from the recharge activities in the Whitewater River Subbasin via: (a) infiltration from the Whitewater River channel, which carries imported water from the Colorado River Aqueduct to the spreading basins within the Whitewater River Subbasin, and (b) from subsurface flow across the Garnet Hill Fault at the northerly end of the Garnet Hill Subbasin during major recharge events that significantly raise the groundwater level in the vicinity of the Whitewater River Spreading Basins. Exact quantities of replenishment benefit from the Mission Creek and Whitewater River Subbasins to the Garnet Hill Subbasin cannot be ascertained at this time with currently available hydrologic data.

The Water Management Agreements call for maximum importation of SWP Contract Table A water allocations (formerly "entitlements") by CVWD and DWA for replenishment of groundwater basins or subbasins within defined Water Management Areas. The Agreement also requires collection of data necessary for sound management of water resources within these same Water Management Areas.

4. Groundwater Overdraft

CDWR Bulletin 160-09 (2009 California Water Plan Update) defines "Groundwater overdraft" as:

> *"...the condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin*

over a period of years, during which the water supply conditions approximate average conditions."

According to CDWR Bulletin 118-80 (Groundwater Basins in California):

"Overdraft is characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years. Overdraft can lead to increased extraction costs, land subsidence, water quality degradation, and environmental impacts."

For purposes of this report, the term "gross overdraft" refers to groundwater extractions or water production in excess of natural groundwater replenishment or recharge, as an annual rate in AF/Yr, and "cumulative overdraft" refers to the cumulative gross overdraft in AF over the history of an aquifer.

The initial Water Management Agreement was developed following numerous investigations regarding the groundwater supply within the Coachella Valley; said investigations are addressed in DWA's previous reports (*Engineer's Report on Groundwater Replenishment and Assessment Program for the Whitewater River Subbasin* for the years 1978/1979 through 1983/1984). These investigations all concluded that gross overdraft (groundwater extractions or water production in excess of natural groundwater replenishment or recharge) existed within the Coachella Valley Groundwater Basin and its subbasins.

5. Groundwater Replenishment

a. Summary

Since 1973, CVWD and DWA have been using Colorado River water exchanged for SWP water (Table A water allocations and supplemental water as available) to replenish groundwater in the Coachella Valley Groundwater Basin within the Whitewater River Subbasin and Mission Creek Subbasin Water Management Areas. The two agencies are permitted by law to replenish the groundwater basins and to levy and collect water replenishment assessments from any

groundwater extractor or surface water diverter (aside from exempt producers) within their jurisdictions who benefits, such as those within the Garnet Hill Subbasin, from replenishment of groundwater.

b. History

DWA and CVWD completed construction of the Whitewater River Spreading Basins in 1973 and the Mission Creek Spreading Basins in 2002, and recharge activities commenced within each respective subbasin upon completion of the facilities. Annual recharge quantities are set forth in **Exhibit 9**.

From 1973 through 2015, CVWD and DWA have replenished the Whitewater River and Mission Creek Subbasins with approximately 3,022,451 AF (2,896,489 AF to Whitewater River Subbasin and 141,963 AF to Mission Creek Subbasin). Of this total, 2,898,193 AF consisted of exchange deliveries (Colorado River water exchanged for SWP water, including advance deliveries) and 2,698,986 AF consisted of exchange deliveries and advance deliveries converted to exchange deliveries, but excluding advance deliveries not yet converted to exchange deliveries. See **Exhibits 5 through 7** and **Exhibits 8 and 9**.

Between October 1984 and December 1986, MWD initially provided about 466,000 AF of advance delivered water for future exchange with CVWD and DWA that was used to replenish the Whitewater River Subbasin. This initial quantity of advanced delivered water has been augmented several times since then, and the total quantity of advance delivered water is currently 907,516 AF. During drought conditions, MWD has periodically met exchange delivery obligations with water from its advance delivery account. By December 2015, MWD had converted approximately 708,309 AF of advance delivered water to exchange water deliveries, leaving a balance of approximately 199,207 AF in MWD's advance delivery account (see **Exhibits 5 through 7**, included at the end of this report, for an accounting of exchange and advance deliveries).

c. Table A Water Allocations and Deliveries

SWP Table A water allocations are based primarily on hydrologic conditions and legal constraints, and vary considerably from year to year. In 2015, Table A water deliveries were approximately 20% of maximum Table A allocations. As of April 21, 2016, Table A water deliveries in 2016 are projected to be 60% of maximum Table A allocations. Long-term average Table A allocations are currently predicted to be approximately 58% of maximum Table A allocations.

A portion of Table A allocations for a given year are occasionally carried over into the following year under Article 56 of the SWP Contract.

Even though CVWD and DWA have requested and will continue to request their maximum annual Table A allocations, the "Probable Table A Water Allocations" and "Probable Table A Water Deliveries" have been adjusted herein for long-term reliability for estimating purposes. The Probable Table A Water Allocations are herein assumed to be equal to the maximum Table A Water allocations with the MWD transfer portion reduced to 35% to represent a long-term average transfer quantity with possible recalls by MWD pursuant to the 2003 Exchange Agreement and its implementation, and "Probable Table A Water Deliveries" are herein assumed to be 58% of the aforementioned Probable Table A Water Allocations.

From 1973 through 2003, CVWD and DWA had SWP maximum annual Table A allocations of 23,100 AF and 38,100 AF, respectively. To meet projected water demands and to alleviate cumulative overdraft conditions, CVWD and DWA have secured additional SWP Table A water allocations, increasing their combined maximum Table A water allocations from 61,200 AF/Yr in 2003 to 194,100 AF/Yr beginning in 2010. CVWD and DWA's current Table A allocations are described in additional detail in the following paragraphs.

1) Tulare Lake Purchase

CVWD obtained an additional 9,900 AF/Yr of Table A water allocation from Tulare Lake Basin Water Storage District, another State Water Project Contractor (State Water Contractor), thus increasing its annual Table A water allocation to 33,000 AF/Yr, effective January 1, 2004.

2) 2003 Exchange Agreement

In 2003, CVWD and DWA obtained a further 100,000 AF/Yr (88,100 AF/Yr for CVWD and 11,900 AF/Yr for DWA) of Table A water allocation through a new exchange agreement (the 2003 Exchange Agreement) among CVWD, DWA, and MWD (all State Water Contractors). The new exchange agreement, which became effective January 1, 2005, permits MWD to call-back or recall the assigned annual Table A water allocation of 100,000 AF/Yr in 50,000 AF/Yr increments during periods of constrained, limited, or low water supply conditions; however, it gives CVWD and DWA the opportunity to secure increased quantities of surplus water in addition to increased quantities of Table A water during normal or high water supply conditions. MWD must notify CVWD and DWA of its intentions regarding call-back or recall of the 100,000 AF or 50,000 AF increment thereof.

In implementing the 2003 Exchange Agreement, MWD advised CVWD and DWA that it would probably recall the 100,000 AF/Yr assigned to the two Coachella Valley agencies from 2005 through 2009. In fact, it did recall the full 100,000 AF/Yr in 2005, but it has not recalled any water since that time. According to communications with MWD management, it is unlikely that MWD will recall any water in 2016.

3) Kern County/Tulare Lake Purchase

In 2010, CVWD and DWA negotiated transfer of an additional 16,000 AF/Yr (12,000 AF/Yr for CVWD and 4,000 AF/Yr for DWA) of Table

A water allocation from Kern County Water Agency and an additional 7,000 AF/Yr (5,250 AF/Yr for CVWD and 1,750 AF/Yr for DWA) from Tulare Lake Basin Water Storage District, both State Water Contractors.

d. Supplemental Water

Any surplus water secured by CVWD and DWA is exchanged for a like quantity of Colorado River Water. Charges for surplus water are allocated between CVWD and DWA in accordance with the terms of the Water Management Agreements. DWA secures funds for its allocated charges for surplus water payments from its Unscheduled State Water Project Deliveries Reserve Account.

1) Turn-Back Water Pool Water

From 1996 through 2015, CVWD and DWA jointly obtained 296,710 AF of water under CDWR's Turn-Back Water Pool Program, which was exchanged for a like quantity of Colorado River Water and delivered to the Whitewater River Recharge Basins.

Turn-Back Water Pool water was originally Table A water scheduled for delivery to other State Water Contractors, but those Contractors subsequently determined that the water was surplus to their needs. Surplus water in the Turn-Back Water Pool Program is allocated between two pools based on time: Pool A water must be secured by March 1 of each year and Pool B water must be secured between March 1 and April 1 of each year. The charge for Pool A water is higher than the charge for Pool B water.

Since fiscal year 1999/2000, requests for Turn-Back Water Pool water have exceeded water available. Quantities of Pool A and Pool B water purchased by CVWD and DWA are shown in **Exhibit 9**.

In 2015, DWA and CVWD were allocated 0 AF of SWP surplus water under the Turn-Back Water Pool Program. Based on current projections,

CVWD and DWA do not expect to receive any Pool A or Pool B water in 2016.

2) Flood Water

In 1997 and 1998, CVWD and DWA also jointly obtained 47,286 AF of Kaweah River, Tule River, and Kings River flood flow water, which was also exchanged for a like quantity of Colorado River water delivered to the Whitewater River Recharge Basins. Currently, availability of flood water in 2016 is uncertain and unlikely due to the existing drought conditions.

3) Article 21 Surplus Water

From 2000 through 2011, CVWD and DWA obtained 42,272 AF of Article 21 surplus water and, similarly, that water was also exchanged for a like quantity of Colorado River water which was delivered to the Whitewater River Recharge Basins. No Article 21 water has been delivered to the Coachella Valley since 2011. Currently, availability of Article 21 water in 2016 is uncertain and unlikely, and no decision to purchase Article 21 water has been made as of the date of this report.

4) Yuba River Accord and Other Water

In 2008, CVWD and DWA obtained 1,836 AF of water under the terms of the Yuba River Accord (then newly-ratified). In 2009 and 2012, CVWD and DWA obtained 3,482 AF and 1,188 AF, respectively, of water under the Yuba River Accord and other conservation/transfer agreements. No water was obtained in 2010 or 2011 under the Yuba River Accord. In 2014 and 2015, respectively, CVWD and DWA jointly obtained 1,213 AF and 426 AF of water under the Yuba River Accord. Currently, availability of water under the Yuba River Accord in 2016 is uncertain, and no decision to purchase Yuba River water has been made as of the date of this report.

5) Multi-Year Water Pool

In 2012, the State Water Contractors began discussions regarding options for expanding the water market within the confines of the existing SWP Contracts. The Contractors and DWR developed a demonstration program called the 2013-2014 Multi-Year Water Pool ("MYWP") Demonstration Program, whereby participating buyers and sellers would commit to buying water from the pool or selling water into the pool during calendar years 2013 and 2014. This MYWP Demonstration Program was designed to allow water-short SWP contractors to purchase SWP water from other willing SWP contractors, for two consecutive years, at a reasonable cost. Price and acre-foot amounts would vary as a function of the June 1 SWP allocation of water available each year.

The MYWP Demonstration Program is separate from the single year Turn-Back Pool program, and was developed to address issues with the single year Turn-Back Pool program resulting from low pricing.

In February 2015, in response to continuing dry conditions statewide, DWR began administering a 2015-2016 MYWP Demonstration Program.

MWD requested that DWA participate in the 2015-2016 MYWP Demonstration Program on their behalf. They requested that DWA request up to 1,000 AF in 2015 and 5,000 AF in 2016. MWD will accept delivery of this water and DWA will pay DWR the cost of the water and its delivery (transportation). If MWD chooses to keep this water and not exchange it, they will reimburse DWA the cost of the water and the cost of transportation. If MWD chooses to credit the water against the advanced delivery account balance, or deliver the water to the recharge basins, they will reimburse DWA only the cost of the water, and DWA will be responsible for the typical costs associated with Table A water deliveries.

In 2015, 67 AF of water was delivered to MWD under the 2015-2016 MYWP Demonstration Program, and DWA was reimbursed by MWD for same.

e. Past Year Water Deliveries

Total artificial recharge (to both the Whitewater River and Mission Creek Subbasins) for 2015 was 1,036 AF (including CVWD's DMB Pacific and MWD Quantitative Settlement Agreement purchases). Of that amount, 865 AF was delivered to the Whitewater River Subbasin (under CVWD's Second Supplemental Agreement to their Delivery and Exchange Agreement for the Delivery of 35,000 AF, dated June 14, 2013), and 171 AF to the Mission Creek Subbasin in 2015 (see **Exhibit 9**).

f. Water Available in Current Year

The estimated total quantity of water available for artificial recharge in the Upper Coachella Valley during 2016, including delivery of 60% of the maximum Table A allocation and approximately 0 AF of Turn-Back Pool water, is approximately 116,460 AF.

g. Historic Effects of Artificial Replenishment on Aquifer

Prior to recharge activities in the Whitewater River and Mission Creek Subbasins, water levels were declining steadily in those subbasins as well as the Garnet Hill Subbasin. As shown in **Exhibits 1, 2, and 3**, after recharge activities commenced in 1973, and specifically after the three large recharge events listed below, groundwater levels in all three subbasins have risen substantially.

- 1985 - 1987: 655,000 AF Recharged
- 1995 - 2000: 609,000 AF Recharged
- 2009 - 2012: 760,000 AF Recharged

Exhibit 1 includes hydrographs for a collection of groundwater wells within the Whitewater River Subbasin in comparison with the total annual quantities of water delivered to the Whitewater Spreading Basins. This comparison clearly indicates that the recharge program has benefitted wells within the subbasin.

MSWD's Wells 25 and 26 are located upstream of the spreading grounds overlying the portion of the San Gorgonio Pass Subbasin, a tributary to the Whitewater River Subbasin, within the management area. Similar to other wells in the management area, water levels in these wells were also declining prior to groundwater recharge, and water levels in these wells rose by about 80 AF each after recharge commenced in the 1980s, and also rose following the other significant recharge events.

Exhibit 2 includes hydrographs for a selection of groundwater wells owned and operated by MSWD and the Mission Creek Monitoring Well within the Mission Creek Subbasin, in comparison with the total annual quantities of water delivered to the Mission Creek Spreading Basins. The comparison clearly indicates that the recharge program has benefitted the wells within the subbasin, especially in the wells near the spreading basins. The magnitude of the response to the groundwater recharge is inversely proportional to the distance the wells are located from the spreading basins.

Exhibit 3 includes hydrographs from a collection of groundwater wells within the Garnet Hill Subbasin including one well owned by MSWD in comparison with both the replenishment quantities replenished by the Whitewater and Mission Creek Spreading Basins. Groundwater levels in the Garnet Hill Subbasin responded rapidly when replenishment activities commenced at the Whitewater Spreading Grounds in the 1970s.

Water levels in the wells closest to the Whitewater River Spreading Basins rose approximately 400 feet in the late 1980s and nearly 200 feet following each significant recharge event to the Whitewater River Subbasin. The most significant response to groundwater recharge in the Whitewater River Subbasin is observed in the wells located closest to the spreading grounds. The degree of

benefit observed from recharge decreases the further the well is from the spreading grounds. Well locations are shown on **Figure 2**.

Although artificial replenishment with imported water, augmenting natural replenishment, has met increasing average annual groundwater demands during the past 30 years, it has not, for all practical purposes, reduced or diminished cumulative groundwater overdraft within the Coachella Valley Groundwater Basin, which existed prior to artificial replenishment of the groundwater basin. In effect, the groundwater overdraft condition that existed prior to imported water becoming available for groundwater replenishment has not been significantly altered, but the trend has been arrested. Although current groundwater levels have generally stabilized in the subbasins within the management areas, current cumulative gross overdraft (not yet offset by cumulative artificial recharge) is estimated at roughly 3,661,000 AF in the Whitewater River Subbasin and 244,000 AF in the Mission Creek Subbasin. Cumulative net overdraft, (overdraft offset by artificial replenishment) is currently estimated at 783,000 AF in the Whitewater River Subbasin and 102,000 AF in the Mission Creek Subbasin.

CDWR has been unable to deliver full annual Table A water allocations for the past decade, with the exception of 2006 where 100% was delivered to Contractors. Had CVWD and DWA been able to obtain and exchange their maximum Table A quantities during that time period, cumulative groundwater overdraft would be significantly less and groundwater levels would be correspondingly higher.

h. Meeting Future Water Requirements

Historic and projected water supplies and water requirements for the Whitewater River and Mission Creek Subbasins are set forth in **Figures 3 and 4**. Projected water supplies include SWP supplies, estimated natural inflow, and estimated non-consumptive use. Historic and projected water requirements include historic and projected groundwater production, and estimated natural outflow.

The projected water supply curves shown in **Figures 3 and 4**, are based on the estimates for the natural inflow to the Whitewater River and Mission Creek Subbasins, continuing artificial recharge, non-consumptive return, and groundwater in storage, if necessary. Artificial recharge is based on the 2013 SWP reliability projections (based on existing conditions) excluding all potential surplus water deliveries which may become available during any particular year.

In contrast to the data presented in past Engineer's Reports, which relied primarily on the linear regression of the previous 10-year period of recorded groundwater production, projected water requirements (demands) through 2035 for the Whitewater River and Mission Creek Subbasins (also shown in **Figures 3 and 4**) are based on the water balance model utilized in the 2010 Update to the Coachella Valley Water Management Plan and the 2014 Status Report prepared by MWH (and others), and the Groundwater Flow Model for the Mission Creek and Garnet Hill Subbasins Water Management Plan prepared by Psomas. As shown in the figures, the projected requirements are largely offset by probable supplies; however, the cumulative annual change in storage will remain in the negative through 2035 under currently projected conditions.

Based on the production relationship between the Whitewater River Subbasin and the Mission Creek Subbasin, in accordance with the Mission Creek Groundwater Replenishment Agreement, about 92% of imported water deliveries in 2016 will be directed to the Whitewater River Subbasin and 8% to the Mission Creek Subbasin based on 2015 production (see **Exhibit 8**). For future years, the percentage of the total production is expected to range from 88% to 81% in the Whitewater River Subbasin and 12% to 19% in the Mission Creek Subbasin through 2035 due to increased production (increased demands) in the Mission Creek Subbasin due to anticipated population growth (MWH 2011, MWH 2013).

i. Adequacy of Current Supplies and Future Prospects

Continuous availability of SWP allocations will require complete development of the SWP, which currently has only about half of the water supply capacity needed to meet maximum Table A Amount obligations during times of drought;

available water supplies are being further threatened by new and increasing constraints on the development of new water supply facilities and on the operation of existing facilities.

In particular, the Wanger decisions regarding protection of the Delta smelt, concerns about reliability of the Delta levees, and other concerns led the CDWR to issue a revision in June 2012 of *The State Water Project Reliability Report 2009,* dated August 2010, wherein the long-term reliability of SWP supplies was reduced to approximately 60 percent of maximum allocations (later reduced to 58 percent). Without the construction of additional Sacramento-San Joaquin Delta facilities and certain water storage reservoirs, the water supply capability of the SWP will remain limited and SWP Contractors will have to share reduced quantities of available supplies, especially during droughts.

With continued progress in the completion of California WaterFix (formerly known as the Bay Delta Conservation Plan (BDCP)), the balance between more reliable SWP water supplies and ecosystem restoration will be increased.

The BDCP was a long-term conservation strategy designed to set forth actions required for a healthy Delta that will be implemented over the next 50 years, with an estimated cost of about $20 billion. California WaterFix is a refinement of the BDCP that involves a shorter term of implementation and incidental take authorization, and a narrowing of scope: the principal habitat restoration effort of the BDCP has been isolated as a separate program called "California EcoRestore."

California WaterFix itself involves the construction and operation of new water diversion facilities near Courtland to convey water from the Sacramento River through two tunnels to the existing state and federal pumping facilities near Tracy. In addition to other federal, state, and local approvals, California WaterFix requires changes to the water rights permits for the SWP and the federal Central Valley Project to authorize the proposed new points of water diversion and rediversion.

Currently, the cost of California WaterFix is estimated at about $15 billion. Eventually, SWP water supply reliability, quality, and delivered quantities and the overall health of the Delta may improve; however, it is unlikely that the costs for Delta improvements will be allocated to the SWP Contractors before 2020.

In addition to the existing restrictions on water supplies from the SWP, California is in its fourth consecutive year of severe drought. Beginning in 2012, the State has experienced the driest three years on record. In response to another dry winter in 2014/2015, the Governor of California issued an executive order on April 1, 2015, mandating water restrictions on urban water use statewide, and demanding 25 percent reduction in water use. As of the date of this report, the effect this executive order will have on water deliveries from the SWP is uncertain.

The *State Water Project Final Reliability Report 2013*, dated December 2014, estimated the long-term reliability of SWP supplies at 58 percent of maximum Table A Allocations through 2033. Last year, CDWR issued the *2015 State Water Project Deliverability Capability Report*, dated July 2015. Said report estimated the median deliverability of SWP supplies at approximately 64 percent, and long-term deliverability (82-year average value) at 62 percent of maximum Table A Amounts, 50 percent of the time over the historic long-term. However, said report's estimates are qualified as being based on existing and historical conditions, and are not intended as future projections. Furthermore, the extremely dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in historical record, and resulted in a low SWP supply allocation in 2013 (35 percent of SWP Table A amounts), and an extremely low SWP water supply allocation in 2014 (5 percent of Table A Amounts). The dry hydrologic conditions that led to the low 2014 SWP water supply allocation were extremely unusual, and to date have not been included in the SWP delivery estimates presented in CDWR's *2015 Delivery Capability Report*. It is anticipated that the hydrologic record used in the CDWR model will be extended to include the period through 2014 during the next update of the model, which is expected to be completed prior to issuance of the next update to the biennial SWP Delivery Capability Report. Given these factors, the older,

more conservative 58 percent reliability figure has been used for future projections in this report.

In conclusion, the Coachella Valley Groundwater Basin (and its subbasins) is in an overdraft condition and will most likely remain so, even with the importation and exchange of available SWP water, until a higher proportion of the maximum SWP Table A allocations becomes available. With maximum Table A allocations, recharge in the Whitewater River and Mission Creek Subbasins would offset the current annual overdraft, although overdraft in future years is virtually unpredictable, due to the difficulty of projecting long-term growth and reliability of SWP supplies.

6. Replenishment Assessment

For the Whitewater River Subbasin, DWA began its groundwater assessment program in fiscal year 1978/1979 and CVWD began its groundwater assessment program in fiscal year 1980/1981. For the Mission Creek Subbasin, the two agencies initiated their groundwater assessment programs simultaneously in fiscal year 2003/2004. The two agencies are not required to implement the assessment procedure jointly or identically; however, they have each continuously levied an annual assessment on water produced within their respective jurisdictions since inception of their groundwater assessment programs.

Since the 2013 Mission Creek / Garnet Hill Water Management Plan (WMP) demonstrates that the Garnet Hill Subbasin benefits from the groundwater replenishment activities in the two adjacent subbasins, pursuant to the 2003 Settlement Agreement between CVWD, DWA, and MSWD, DWA and CVWD have the authority establish a groundwater assessment program for the Garnet Hill Subbasin. DWA's replenishment assessment program was initiated in this subbasin in fiscal year 2015/2016. Currently, there is no assessable production in the Garnet Hill Subbasin within CVWD's Area of Benefit.

Desert Water Agency Law requires the filing of an engineer's report regarding the Replenishment Program before DWA can levy and collect groundwater replenishment assessments. The report must address the condition of groundwater supplies, the need for groundwater replenishment, the Areas of Benefit, water production within said Areas of Benefit, and replenishment assessments to be levied upon said water production. It must also contain recommendations regarding the replenishment program. This report has been prepared in accordance with these requirements.

CHAPTER III
WHITEWATER RIVER SUBBASIN
PRODUCTION AND REPLENISHMENT

CHAPTER III
WHITEWATER RIVER SUBBASIN
PRODUCTION AND REPLENISHMENT

A. GROUNDWATER PRODUCTION

Annual water production (groundwater extractions plus surface water diversions) within the Palm Springs Subarea of the Whitewater River Subbasin (herein referred to simply as the Whitewater River Subbasin) averaged about 93,000 AF from 1965 through 1967, and then increased to approximately 187,000 AF in 1990. It then decreased to approximately 174,000 AF in 1991, coincident with the initiation of significant deliveries of recycled water by CVWD and DWA to irrigation users within the Water Management Area (which had the effect of temporarily reversing the trend toward steadily increasing production of groundwater therein).

Due to development, production increased sharply to about 187,000 AF in 1997 and to about 208,000 AF in 1999. It then averaged about 211,000 AF during the three year period 2000 through 2002 and remained relatively stable through 2007, probably as a result of water conservation and increased use of recycled water, and (within CVWD's service area) conversion of agricultural land to residential development, which leveled off in 2000. Production has decreased following 2007 due to poor economic conditions reducing demands for construction water and water conservation programs implemented by both agencies.

During the past five calendar years (2011 through 2015), average annual water production within the Whitewater River Subbasin has been about 174,000 AF/Yr, approximately three-fourths of which took place within CVWD and approximately one-fourth within DWA. Current (2015 calendar year) and historic groundwater production and surface water diversion data for the Whitewater River Subbasin is set forth in **Table 1**.

B. NATURAL RECHARGE

Natural recharge includes precipitation, surface water runoff, and subsurface inflow. It is estimated that natural inflow into the Whitewater River Subbasin has averaged 52,000 AF/Yr, while natural outflow is currently estimated to average 24,000 AF/Yr (MWH 2011). Thus, approximately 28,000 AF (natural inflow less natural outflow) of natural, or native, groundwater is available for water supply each year.

C. NON-CONSUMPTIVE RETURN

Consumptive use in the Upper Coachella Valley has long been estimated to be about 65% of water production (per USGS Water Resources Investigation 91-4142). Total annual reported production in the Upper Coachella Valley has averaged about 188,000 AF/Yr for the past five years. Considering the reported production, an estimated 1,000 AF/Yr for production from exempt minimal pumpers (500 AF each in Whitewater and Mission Creek Subbasins), and annual importation of between 1,100 AF and 7,100 AF of Colorado River water for golf course irrigation via CVWD's Mid-Valley Pipeline, the average non-consumptive return was about 62,000 AF/Yr during the same period.

Non-consumptive return water is water returned to the aquifer after use (for example, irrigation water, and treated wastewater discharged to percolation ponds, infiltrating and percolating into the ground) or water used for public parks or golf course irrigation (wastewater recycled for irrigation use). Although non-consumptive return in the Whitewater River Subbasin has been estimated at approximately 35% (per USGS Water Resources Investigation 91-4142), CVWD's 2010 Update to the Coachella Valley Water Management Plan (and 2014 Status Report to that plan) projects that non-consumptive return may decrease from 35% to approximately 30% through 2035 based on the effects of implementing water conservation measures such as turf removal, and more efficient irrigation practices in the Whitewater River Subbasin Area of Benefit. Non-consumptive return for 2015 has been estimated herein at 34%.

D. ARTIFICIAL RECHARGE

Total artificial recharge (throughout both the Whitewater River and Mission Creek Subbasins) for 2015 was 1,036 AF (including CVWD's DMB Pacific and MWD Quantitative Settlement Agreement purchases). Of that quantity, 865 AF was delivered to the Whitewater River Subbasin in 2015 (see **Exhibit 9**).

E. GROUNDWATER IN STORAGE

Average annual reported production within the Whitewater River Subbasin of 174,000 AF for the past five years has been met with approximately 28,000 AF of net natural recharge, approximately 62,000 AF of non-consumptive return, and 105,000 AF from artificial recharge, resulting in a net increase in groundwater in storage of about 21,000 AF/Yr over the past five years.

F. OVERDRAFT STATUS

Based on information contained in USGS Water Resources Investigations 77-29 and 91-4142, average annual groundwater overdraft within the Whitewater River Subbasin of the Coachella Valley Groundwater Basin was estimated to be 30,000 AF/Yr during the late 1960s and early 1970s. It is now estimated to be as much as three and one half times greater. Gross groundwater overdraft within the Whitewater River Subbasin (excluding artificial recharge) is now estimated to have averaged up to 84,000 AF/Yr (174,000 AF water produced - 28,000 AF net inflow - 62,000 AF non-consumptive return = 84,000 AF of groundwater overdraft) during the last five years. Cumulative net overdraft (offset by artificial recharge) is currently estimated to be about 783,000 AF.

CHAPTER IV
MISSION CREEK SUBBASIN
PRODUCTION AND REPLENISHMENT

CHAPTER IV
MISSION CREEK SUBBASIN
PRODUCTION AND REPLENISHMENT

A. GROUNDWATER PRODUCTION

Annual water production (groundwater extractions) within the Mission Creek Subbasin increased from an average of approximately 500 AF/Yr in the late 1950s and 1960s to approximately 2,300 AF/Yr in 1978. It increased relatively steadily since then to approximately 17,400 AF/Yr in 2006, then began dropping slightly as a result of declining economic conditions to about 16,400 AF/Yr in 2007, 15,800 AF/Yr in 2008, 15,100 AF/Yr in 2009, 14,300 in 2010, and 14,200 in 2011. Annual groundwater production within the Mission Creek Subbasin resulted in cumulative long-term groundwater overdraft, as evidenced by the steady decline of groundwater levels within the Mission Creek Subbasin prior to commencement of recharge activities.

During the past five calendar years (2011 through 2015), average annual water production within the Mission Creek Subbasin has been about 14,000 AF/Yr; approximately two-thirds of which took place within DWA and approximately one-third within CVWD. Current (2015 calendar year) and historic groundwater production and surface water diversion data for the Mission Creek Subbasin is set forth in **Table 1**.

B. NATURAL RECHARGE

Natural recharge includes precipitation, surface water runoff, and subsurface inflow. As discussed in past reports, it is currently estimated that natural inflow and surface recharge of the Mission Creek Subbasin has averaged approximately 3,500 to 10,800 AF/Yr over the long-term. Most estimates of natural outflow from the Mission Creek Subbasin equal or exceed the corresponding estimates of natural inflow.

The most recent estimate for natural inflow into the Mission Creek Subbasin was prepared by Psomas for the Mission Creek/Garnet Hill Water Management Plan prepared by MWH in January 2013. Psomas estimated said natural inflow at approximately 9,340 AF/Yr, consisting of approximately 7,500 AF/Yr from mountain front runoff and precipitation under average conditions and approximately 1,840 AF/Yr from flows across the Mission Creek Fault from the

Desert Hot Springs Subbasin. This estimate falls within the range of average natural inflow previously cited herein.

Psomas estimated natural outflow at approximately 6,000 AF/Yr, consisting of 4,000 AF/Yr of subsurface flow from the Banning Fault to the Garnet Hill Subbasin, 900 AF/Yr of evapotranspiration, and 1,100 AF/Yr of flow through semi-water bearing rocks, known as the Indio Hills, at the southeastern end of the Mission Creek Subbasin. However, water level data in that part of the Garnet Hill Subbasin does not appear to support an outflow of this magnitude. For purposes of this report, natural outflow from the Mission Creek Subbasin is currently estimated at about 5,700 AF/Yr.

C. NON-CONSUMPTIVE RETURN

Consumptive use and non-consumptive return are discussed in **Chapter III, Section C**. Within the Mission Creek Subbasin, non-consumptive return is currently estimated at approximately 5,000 AF/Yr (average for the past five years)

D. ARTIFICIAL RECHARGE

Total artificial recharge (throughout both the Whitewater River and Mission Creek Subbasins) for 2015 was 1,036 AF (including CVWD's DMB Pacific and MWD Quantitative Settlement Agreement purchases). Of that quantity, 171 AF was delivered to the Mission Creek Subbasin (see **Exhibit 9**).

E. GROUNDWATER IN STORAGE

Average annual reported production within the Mission Creek Subbasin of 14,000 AF for the past five years has been met with approximately 3,000 AF of net natural recharge, approximately 5,000 AF of non-consumptive return, and 10,000 AF from artificial recharge from artificial recharge, resulting in a net increase in groundwater in storage of about 4,000 AF/Yr over the past five years.

Average annual reduction in stored groundwater was 3,300 AF/Yr from 1955 through 2015, and 1,300 AF/Yr from 1998 through 2015 (see **Exhibit 4**). Annual metered production and non-

consumptive return are plotted on **Figure 4**, which provides an indication of consumptive use and cumulative overdraft.

F. OVERDRAFT STATUS

Gross groundwater overdraft within the Mission Creek Subbasin (excluding artificial recharge) is now estimated at approximately 6,000 AF/Yr (14,000 AF water produced – 3,000 AF natural recharge - 5,000 AF non-consumptive return = 6,000 AF of gross groundwater overdraft) during the last five years. Cumulative net overdraft (offset by artificial recharge) is estimated to be roughly 114,000 AF.

CHAPTER V
GARNET HILL SUBBASIN
PRODUCTION AND REPLENISHMENT

CHAPTER V
GARNET HILL SUBBASIN
PRODUCTION AND REPLENISHMENT

A. GROUNDWATER PRODUCTION

During the past five calendar years (2011 through 2015), average annual water production within the Garnet Hill Subbasin has been about 290 AF/Yr; most, if not all, of which took place within DWA's service area. There are no reporting groundwater pumpers within CVWD's service area in the Garnet Hill Subbasin. Current (2015 calendar year) and historic groundwater production and surface water diversion data for the Garnet Hill Subbasin are set forth in **Table 1**.

B. NATURAL RECHARGE

Natural recharge includes precipitation, surface water runoff, and subsurface inflow. The Garnet Hill Subbasin is separated from the Whitewater River Subbasin to the south by the Garnet Hill Fault and from the Mission Creek Subbasin to the north by the Banning Fault.

As stated in the WMP, the principle form of natural recharge within the Garnet Hill Subbasin comes from mountain-front runoff derived from precipitation and snow melt, as well as return flow from water use.

The Garnet Hill Subbasin receives no direct artificial recharge; however, it does receive artificial recharge via infiltration from the Whitewater River channel on the west end of the subbasin, subsurface flows from the Mission Creek Subbasin, and subsurface flows from the Whitewater River Subbasin when water levels are high due to large volumes of artificial recharge at the Whitewater Artificial Recharge Area (MWH 2013).

The estimated flow across the Banning Fault from the Mission Creek Subbasin to the Garnet Hill Subbasin ranges from approximately 2,000 AF/Yr (Tyley 1974) to 8,250 AF/Yr (Psomas, 2010, based on pre-development, steady-state conditions). The outflow to the Whitewater River Subbasin is estimated to be approximately 4,000 AF/Yr (Psomas 2012, based on current conditions).

C. NON-CONSUMPTIVE RETURN

Consumptive use and non-consumptive return are discussed in **Chapter III, Section C**.

D. ARTIFICIAL RECHARGE

Direct artificial groundwater replenishment has not yet been implemented within the Garnet Hill Subbasin. However, the 2013 Mission Creek / Garnet Hill Water Management Plan (WMP) has shown that the Garnet Hill Subbasin benefits from replenishment activities within both the Whitewater River Subbasin and the Mission Creek Subbasin.

E. GROUNDWATER IN STORAGE

The quantity of groundwater in storage within the Garnet Hill Subbasin in 1974 was estimated to be approximately 1,520,000 AF (USGS 1974). Production in the subbasin has been limited, so groundwater in storage has not decreased significantly.

With minimal pumping occurring within the subbasin, cumulative groundwater storage in the Garnet Hill Subbasin was generally based on wet and dry periods and the introduction of imported water to the Coachella Valley. Changes in storage can be attributed to the rise and fall in the recorded groundwater levels observed in wells throughout the Garnet Hill Subbasin.

The recharge program in the Whitewater River Subbasin began in 1973, which resulted in rising water levels within the Garnet Hill Subbasin in rough proportion to the quantities recharged. Higher water levels in the Whitewater River Subbasin reduce the outflow from the Garnet Hill Subbasin across the Garnet Hill Fault, increasing storage volume in the Garnet Hill Subbasin.

F. OVERDRAFT STATUS

As part of the Coachella Valley Groundwater Basin, the Garnet Hill Subbasin is presumed to be in a state of overdraft since it is reliant on flows from the Whitewater River and Mission Creek Subbasins for replenishment, in accordance with the conclusions set forth in the WMP.

CHAPTER VI
REPLENISHMENT ASSESSMENT

CHAPTER VI
REPLENISHMENT ASSESSMENT

Desert Water Agency Law, in addition to empowering DWA to replenish groundwater basins and to levy and collect water replenishment assessments within its areas of jurisdiction, defines production and producers for groundwater replenishment purposes as follows:

> Production: The extraction of groundwater by pumping or any other method within the Agency, or the diversion within the Agency of surface supplies which naturally replenish the groundwater supplies within the Agency and are used therein.
>
> Producer: Any individual, partnership, association, group, lessee, firm, private corporation, public corporation, or public agency including, but not limited to, the DWA, that extracts or diverts water as defined above.

Producers that extract or divert 10 AF of water or less in any one year are considered minimal producers, and their production is exempt from assessment.

Desert Water Agency Law also states that assessments may be levied upon all water production within an Area of Benefit, provided assessment rates are uniform throughout. Pursuant to Desert Water Agency Law, the amount of any replenishment assessment cannot exceed the sum of certain SWP charges, specifically, the Delta Water Charge, the Variable OMP&R Component of the SWP Transportation Charge (Variable Transportation Charge), and the Off-Aqueduct Power Component of the SWP Transportation Charge (Off-Aqueduct Power Charge), pursuant to the Contract between DWA and the State of California. The aforesaid charges are set forth in each year's CDWR *Bulletin on the State Water Project* (CDWR Series 132, Appendix B, Tables B-16B, B-18, and B-21).

Prior to 2002, groundwater replenishment with Colorado River Water (exchanged for SWP water) had been limited to recharge of the Whitewater River Subbasin. In 2002, DWA and CVWD commenced recharge activities in the Mission Creek Subbasin, in addition to continuing their ongoing activities in the Whitewater River Subbasin. The Areas of Benefit for Groundwater Replenishment and Assessment herein consist of those portions of the Whitewater River Subbasin, Mission Creek Subbasin, and Garnet Hill Subbasin, and tributaries thereto, situated within DWA's service area boundary (**Figure 2**).

The groundwater replenishment assessment and replenishment assessment rate for 2016/2017 are based on the following:

1. All groundwater production within DWA and MSWD, with certain exceptions, is metered, and all assessable surface water diversions within DWA are metered or measured. There are no surface water diversions within the Mission Creek or Garnet Hill Subbasin Areas of Benefit.

2. The Delta Water Charge, the Variable Transportation Charge, and the Off-Aqueduct Power Charge, as set forth in Appendix B of CDWR Bulletin 132 and hereafter referred to as Applicable SWP Charges.

3. The proportionate share of the Applicable SWP Charges allocable to CVWD and DWA in accordance with the Water Management Agreements between CVWD and DWA (Water Management Agreement for the Whitewater River Subbasin executed July 1, 1976 and amended December 15, 1992, and the Water Management Agreement for the Mission Creek Subbasin executed April 8, 2003; both amended July 15, 2014), hereafter referred to as Allocated State Water Project Charges. (The applicable charges are essentially apportioned between CVWD and DWA in accordance with relative water production within those portions of each entity lying within the applicable Water Management Areas, either the Whitewater River Subbasin, the Mission Creek Subbasin, or the Garnet Hill Subbasin.)

4. Certain charges or costs other than those derived pursuant to items 1, 2, and 3 above. Such additional charges may be offset from time to time by discretionary reductions.

The replenishment assessment rate comprises two components: (1) the Allocated State Water Project Charges attributable to the estimated annual Table A allocation, and (2) certain other charges or costs related to groundwater recharge, such as those for reimbursement of past surplus water charges for which assessments had not been levied.

The replenishment assessment rate, when applied to estimated assessable production (all production, excluding that which is exempt, within the Area of Benefit), results in a replenishment assessment which must not exceed the maximum permitted by Desert Water Agency Law (the Applicable SWP Charges). Due to the interdependent nature of the imported water supply for the Whitewater River, Mission Creek, and Garnet Hill Subbasins, the Allocated State Water Project Charges component of the replenishment

assessment rate is uniform throughout the Whitewater River, Mission Creek, and Garnet Hill Areas of Benefit; however, due to the independent and separate nature of various other aspects of the groundwater replenishment program within the Whitewater River, Mission Creek, and Garnet Hill Subbasins, the other charges and costs component need not be uniform; they are specific to each subbasin.

A. ACTUAL 2015 WATER PRODUCTION AND ESTIMATED 2016/2017 ASSESSABLE WATER PRODUCTION

Estimated assessable production within DWA's Whitewater River Subbasin, Mission Creek Subbasin, and Garnet Hill Subbasin Areas of Benefit consist of groundwater extractions from the groundwater subbasins and diversions from streams (Snow, Falls, and Chino Creeks) in the tributary watersheds. Estimated assessable groundwater production is based on water production which, with the exception of Bel Air Greens, is metered or measured. DWA staff read and record metered water production quantities with the exception of the wells owned by MSWD and the Indigo Power Plant, which are reported to DWA. As discussed in previous reports, the water production for Bel Air Greens has been estimated at 127 AF/yr.

Estimated assessable groundwater production has historically been based on the previous year's water production; however, production during 2015 was unusually low due to mandatory water conservation measures imposed as a result of the Governor's April 1, 2015 executive order mandating water restrictions on urban water use statewide, and demanding a 32% reduction in water use within Desert Water Agency. The effects of these severe water restrictions are not anticipated to be permanent; therefore, for 2016/2017, DWA has elected to estimate assessable groundwater production based on 2014 assessable groundwater production minus a factor of 10% to account for the effects of permanent water conservation measures.

Estimated assessable water production is set forth in **Table 2**.

DWA acquired the Whitewater Mutual Water Company in 2009. The former Whitewater Trout Farm (now owned by the Wildlands Conservancy) has historically been a minimal producer because it has and continues to produce and consumptively use less than 10 AF/Yr.

In 2015, actual production within CVWD's Area of Benefit within the Whitewater River Subbasin was about 3.6 times that within DWA's Area of Benefit, 115,558 AF versus 31,861 AF,

whereas actual production within DWA's Area of Benefit within the Mission Creek Subbasin was about 2.1 times that within CVWD's Area of Benefit, 8,580 AF versus 4,090 AF. Production within DWA's Garnet Hill Subbasin Area of Benefit accounts for 100% of the total production at 340 AF. DWA's 2015 actual production accounts for approximately 25.4% of the 160,430 AF combined total of water produced within the Whitewater River, Mission Creek, and Garnet Hill Subbasins that year.

B. WATER REPLENISHMENT ASSESSMENT RATES

The water replenishment assessment rates consist of two components, one being attributable to SWP annual Table A water allocations, and the other being attributable to other charges or costs necessary for groundwater replenishment. Each component is discussed below.

1. Component Attributable to SWP Table A Water Allocation Charges

In accordance with the current 2014 Water Management Agreement, CVWD and DWA combine their SWP Table A water allocations, exchange them for Colorado River water, and replenish the Whitewater River and Mission Creek Subbasins with exchanged Colorado River water. CVWD and DWA each assume the full burden for portions of their respective Fixed State Water Project Charges (Capital Cost Component and Minimum Operating Component of Transportation Charge); however, the two agencies share their Applicable SWP Charges (Delta Water, Variable Transportation, and Off-Aqueduct Power Charges) on the basis of relative production.

Although DWA could base its replenishment assessment rate on its Applicable SWP Charges, it only needs to recover its share (based on relative production) of the combined Applicable SWP Charges for both CVWD and DWA (i.e. its Allocated State Water Project Charges). CVWD makes up the difference in accordance with the Water Management Agreement.

The Applicable SWP Charges for CVWD and DWA for Table A water are set forth in **Tables 3 and 4**, respectively. Unit Charges for Delta Water, Variable Transportation, and Off-Aqueduct Power Charges are based on estimates presented in Appendix B of CDWR Bulletin 132-15.

Since MWD can call-back or recall the 100,000 AF of Table A allocation it transferred to CVWD and DWA and since CDWR has been unable to deliver maximum Table A allocations for twelve of the past thirteen years, the amounts of the Applicable SWP Charges for 2016/2017 and future years are being computed based on long-term reliability factors; effectively 58% of maximum SWP allocations with the MWD transfer portion being further reduced to 35% to account for possible future recalls pursuant to the 2003 Exchange Agreement.

The derivations of the Applicable SWP Charges are set forth in **Tables 3 and 4**. The "Maximum Table A Water Allocation" shown in **Tables 3 and 4** is the currently existing Table A Water Allocation per CDWR Bulletin 132-15, Appendix B, Table B-4 (contractual quantities based on requests for same by CVWD and DWA) with no reliability factors being applied. The "Probable Table A Water Allocation" is the currently existing Table A Water Allocation with the MWD transfer portion reduced to 35% to reflect the long-term average with probable recalls by MWD, pursuant to the 2003 Exchange Agreement and its implementation. The "Probable Table A Water Delivery" is based on 58% reliability of the probable Table A Water allocation including MWD transfer reduced to 35% for long-term average pursuant to the 2003 Exchange Agreement and its implementation.

Applicable SWP Charges proportioned in accordance with the Water Management Agreement, more particularly in accordance with relative production within CVWD and DWA, yield Allocated SWP Charges. Over the past five years, 2011 through 2015, DWA has been responsible for approximately 22.2% of the water produced within the Whitewater River Subbasin, and 67.8% of water produced from the Mission Creek Subbasin.

In the past, Allocated SWP Charges have been apportioned to CVWD and DWA based on production from the Whitewater River Subbasin Management Area. Since 2003/2004, Allocated SWP Charges have been apportioned to CVWD and DWA based on production from the combined Whitewater River Subbasin and Mission Creek Subbasin Management Areas. In 2015, DWA was responsible for approximately 25.4% of the combined water production within the Whitewater River, Mission Creek, and Garnet Hill

Subbasins combined. On the assumption that DWA's relative production for 2016 and thereafter will be about the same as for 2015, DWA's share of the combined Applicable SWP Charges (i.e. Allocated Charges) for the next 19 years will be as set forth in **Table 5**.

Table 5 shows that DWA's estimated Allocated Charges (its share of combined Applicable Charges for Table A water) are anticipated to decrease by about 1% between 2015 and 2016, increase by about 11% between 2016 and 2017 and increase by about 8% between 2017 and 2018. DWA's estimated Allocated Charges will change as estimates presented in future annual editions of CDWR Bulletin 132 change.

Table 5 also shows that DWA's estimated 2016 Allocated Charges are about 68% of DWA's estimated Applicable Charges. Since water replenishment assessments must be used for groundwater replenishment purposes only, implementation of the maximum permissible replenishment assessment rate based on DWA's Applicable Charges would result in the collection of excess funds that would have to be applied to replenishment charges during subsequent years.

Rather than collect excess funds one year and apply the excess funds to replenishment charges in subsequent years, DWA attempts to establish from year to year the replenishment assessment rate that will result in collection of essentially the funds necessary to meet its annual groundwater replenishment charges. DWA therefore bases the Table A portion of its replenishment assessment on estimated Allocated Charges, rather than estimated Applicable Charges.

Pursuant to current Desert Water Agency Law, the maximum permissible replenishment assessment rate that can be established for fiscal year 2016/2017 is $209.80/AF, based on DWA's estimated Applicable Charges (Delta Water Charge, Variable Transportation Charge, and Off-Aqueduct Power Charge) of $8,981,669 (average of estimated 2016 and 2017 Applicable Charges) and estimated 2016/2017 combined assessable production of 42,810 AF within the Whitewater River, Mission Creek, and Garnet Hill Subbasins.

The effective replenishment rate is based on DWA's estimated Allocated SWP Charges for the current year, as computed using CDWR's projected Applicable SWP Charges,

divided by the estimated assessable production for the assessment period (based on the assessable production for the previous calendar year), as set for in **Table 6**.

According to the terms of the Water Management Agreement between DWA and CVWD, and based on DWA's estimated 2016/2017 Allocated Charges of $6,043,943 and 2015 calendar year assessable production (shown in **Table 6** as estimated 2016/2017 assessable production) of 42,810 AF within the Whitewater River, Mission Creek, and Garnet Hill Subbasins, the effective replenishment assessment rate component for Table A water for the 2016/2017 fiscal year is $144/AF. **Table 7** includes DWA's historical estimated and actual effective replenishment assessment rates.

2. Component Attributable to Other Charges and Costs Necessary for Groundwater Replenishment

Charges and costs necessary for groundwater replenishment could include the costs for reimbursement for past SWP Table A water allocations and surplus water allocations for which insufficient assessments had been levied, acquisition or purchases of water from sources other than the SWP, the cost of importing and recharging water from sources other than the SWP, and the cost of treatment and distribution of reclaimed water.

Currently, other charges and costs are being limited to past SWP water payments for which assessments have not been levied. Due to increases in SWP costs, DWA has elected to transfer the deficit resulting from past payments for which assessments have not been levied to reserve account(s).

Since 1996, CVWD and DWA have obtained surplus SWP water, when available, to supplement deliveries of Table A water (see **Chapter II, Section B.5.d**). DWA currently pays charges for surplus water with funds from its Unscheduled State Water Project Deliveries Reserve Account, rather than from funds raised directly through replenishment assessment levies.

The charges levied on the Garnet Hill Subbasin are assessed as part of the Whitewater River and Mission Creek Subbasin replenishment programs based on the proportional production, in accordance with the Mission Creek Subbasin Settlement Agreement

discussed in **Chapter II, Section B.3**. As shown in **Exhibit 8**, the portion of total production within the Whitewater River and Mission Creek Subbasins was approximately 92% and 8% respectively for 2015. Therefore, since there is no direct replenishment program for the Garnet Hill Subbasin, and since it benefits from both replenishment programs, the total production within the Garnet Hill Subbasin will be assessed as a proportion of the total production within those subbasins. For example, the total reported production within the Garnet Hill Subbasin was 340 AF in 2015. Of that 340 AF, 92% (313 AF) is assessed as part of the Whitewater River Subbasin, and 8% (27 AF) as part of the Mission Creek Subbasin.

3. Proposed 2016/2017 Replenishment Assessment Rates

Proposition 218 Proceedings

DWA held Proposition 218 proceedings on October 19, 2010. During this public hearing, the proposed replenishment assessment rate that can be established for fiscal years 2012/2013 and 2013/2014 was $92/AF, and $102 beginning fiscal year 2014/2015. The motivation behind the assessment rate increases came as a result of increased costs in conveying and delivering Colorado River Aqueduct water, exchanged for SWP water supplies, to the Coachella Valley. Based on the results of these Proposition 218 proceedings, the proposed replenishment assessment rate for the 2015/2016 fiscal year was $102/AF. The next Proposition 218 proceeding is scheduled for Fall 2016. Since Desert Water Agency Law stipulates that any new replenishment assessment be levied by July 1 for the following fiscal year, the replenishment assessment rate will remain at $102.00/AF until the following fiscal year. During the upcoming Proposition 218 proceedings, the following ranges for increased replenishment assessment rates will be established beginning in fiscal years 2017/2018 through 2021/2022. Ranges are being proposed rather than specific rates due to the uncertainty regarding future groundwater production demands and SWP charges.

Fiscal Year	Anticipated Rate ($/AF)	Rate Range ($/AF)
2017/2018	$115.00	$110.00 to $130.00
2018/2019	$126.00	$120.00 to $140.00
2019/2020	$136.00	$125.00 to $155.00
2020/2021	$150.00	$130.00 to $165.00
2021/2022	$153.00	$130.00 to $175.00

As shown in **Table 7**, the recommended replenishment assessment rates proposed for 2016/2017 are $102.00/AF for the Whitewater River Area of Benefit, $102.00/AF for the Mission Creek Area of Benefit, and $102.00/AF for the Garnet Hill Area of Benefit. Historic replenishment assessment rates for both DWA and CVWD within the Whitewater River Subbasin are set forth in **Exhibit 10**.

C. ESTIMATED WATER REPLENISHMENT ASSESSMENTS FOR 2016/2017

The maximum replenishment assessment that can be levied by DWA for combined estimated production of 42,810 AF (see **Table 2**) within the Whitewater River, Mission Creek and Garnet Hill Subbasins based on a replenishment assessment rate of $102/AF is approximately $4,366,620 ($3,443,520 in the Whitewater River Subbasin, $888,420 in the Mission Creek Subbasin, and $34,680 in the Garnet Hill Subbasin).

DWA will continue to be the major producer within the Whitewater River Subbasin Area of Benefit, with assessable production of approximately 32,160 AF; seven other producers will be responsible for the remaining 1,600 AF of estimated assessable production. DWA will also be the major assessee with an estimated replenishment assessment of $3,280,320. The seven other producers will be responsible for the remaining $163,200. DWA will therefore be responsible for approximately 95% of both the estimated assessable water production and the estimated replenishment assessment for the Whitewater River Subbasin; the other fourteen producers will be responsible for the remaining 5%.

MSWD will be the major producer within the Mission Creek Subbasin Area of Benefit, with assessable production of approximately 6,900 AF; three other producers will be responsible for the remaining 1,810 AF of estimated assessable production. MSWD will also be the major assessee with an estimated replenishment assessment of $703,800. The three other producers will

be responsible for the remaining $184,620. MSWD will be responsible for approximately 79% of both the estimated assessable water production and the estimated replenishment assessment in the Mission Creek Subbasin Area of Benefit; the other three producers will be responsible for the other 21%.

MSWD and the Indigo Power Plant are the major producers in the Garnet Hill Subbasin Area of Benefit, with assessable production of approximately 320 AF and 20 AF, respectively. MSWD will also be the major assessee with an estimated replenishment assessment of $32,640, while the Indigo Power Plant is responsible for the remaining $2,040. MSWD will be responsible for approximately 94% of both the estimated assessable water production and the estimated replenishment in the Garnet Hill Subbasin Area of Benefit; Indigo Power Plant will be responsible for the other 6%.

CHAPTER VII
BIBLIOGRAPHY

CHAPTER VII
BIBLIOGRAPHY

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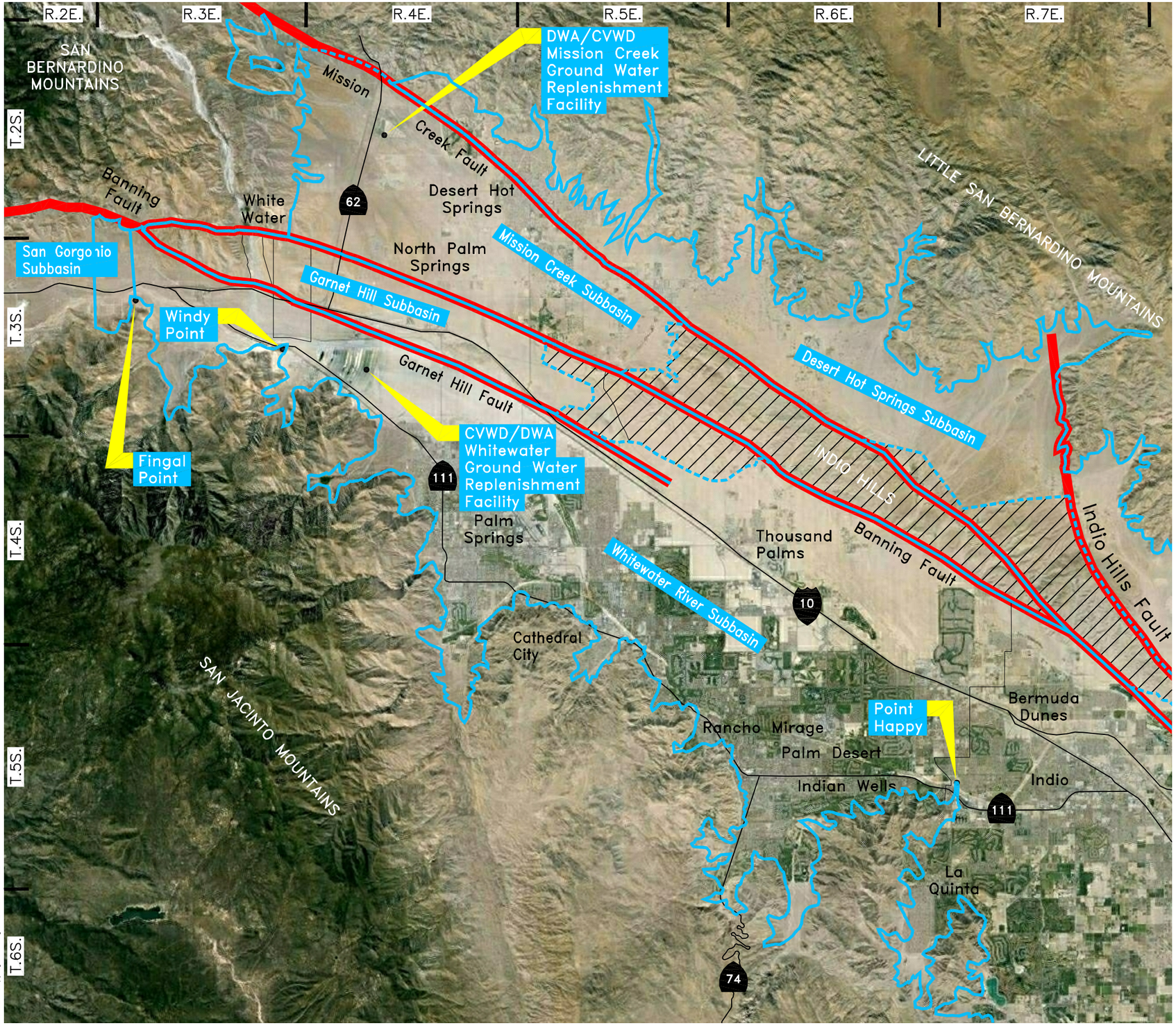
FIGURES

DESERT WATER AGENCY

GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM

2016–2017

GROUNDWATER SUBBASIN MAP
SHOWING
PORTION OF UPPER COACHELLA VALLEY
GROUNDWATER BASIN
AND
SUBBASINS THEREIN



LEGEND

- UPPER COACHELLA VALLEY GROUNDWATER SUBBASIN BOUNDARIES
- FAULTS
- INDIO HILLS (LOW PERMEABILITY)

NOTE:

THE MANAGEMENT AREAS WITHIN THE UPPER COACHELLA VALLEY GROUNDWATER BASIN ARE DEFINED BY THE SUBBASIN BOUNDARIES SHOWN HEREON FOR THE WHITEWATER RIVER, MISSION CREEK, AND GARNET HILL SUBBASINS.

MAP SOURCE:

2016 GOOGLE EARTH PRO (AERIAL PHOTOGRAPHY), MISSION CREEK AND GARNET HILL SUBBASINS WATER MANAGEMENT PLAN FINAL REPORT, JANUARY 2013 (SUBBASIN BOUNDARIES)

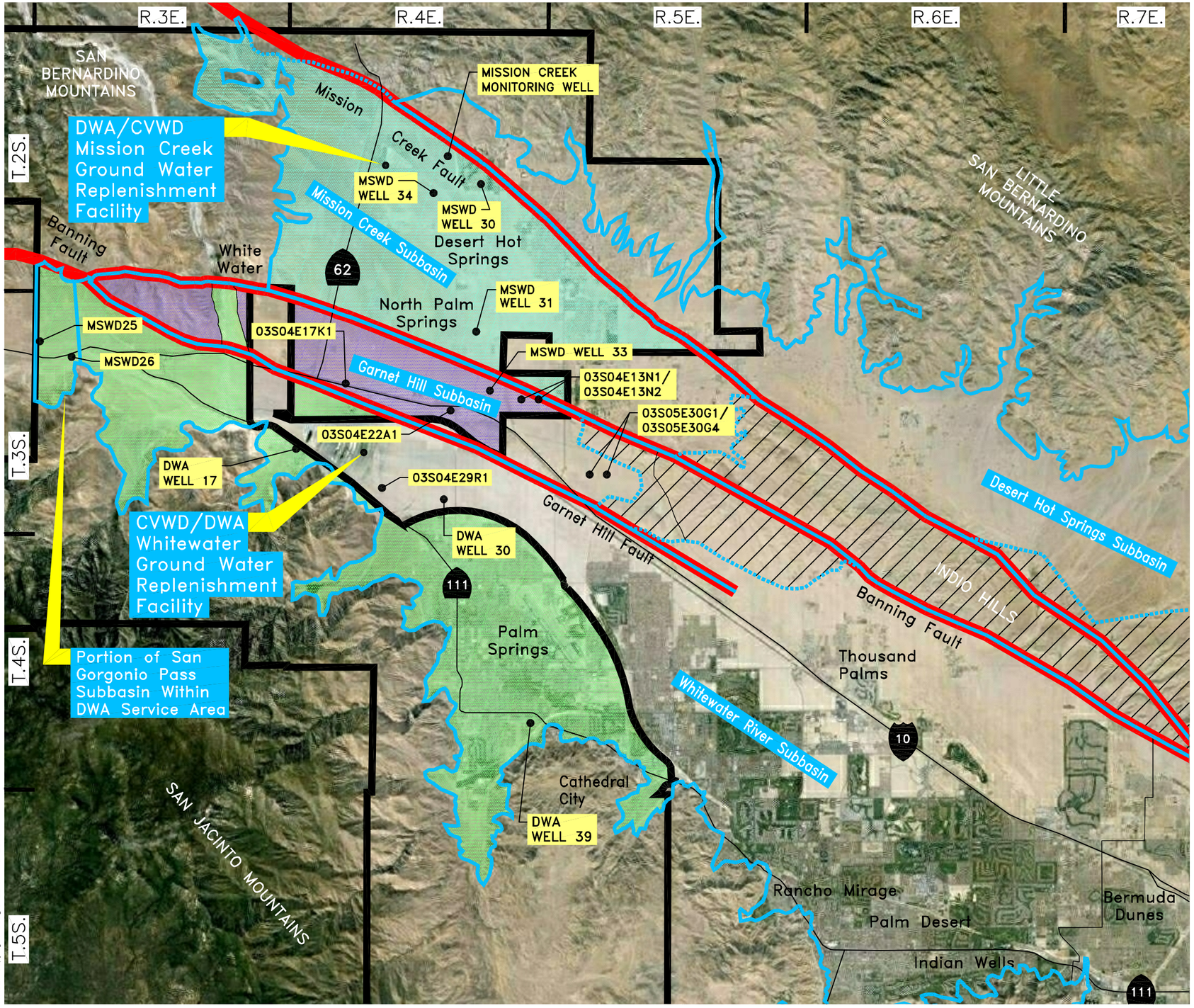
SCALE: 1"=3 MILES

Figure 1

DESERT WATER AGENCY
GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM

2016–2017

GROUNDWATER SUBBASIN MAP SHOWING GROUNDWATER RECHARGE AREAS OF BENEFIT (EITHER DIRECT OR INDIRECT) AND SELECTED GROUNDWATER WELLS



LEGEND

- DWA BOUNDARY
- UPPER COACHELLA VALLEY GROUNDWATER SUBBASIN BOUNDARIES
- FAULTS

UPPER COACHELLA VALLEY GROUNDWATER SUBBASIN AREAS OF BENEFIT WITHIN DWA

- DWA WHITEWATER RIVER SUBBASIN AREA OF BENEFIT
- DWA MISSION CREEK SUBBASIN AREA OF BENEFIT
- DWA GARNET HILL SUBBASIN AREA OF BENEFIT
- INDIO HILLS (LOW PERMEABILITY)
- GROUNDWATER WELL

NOTE:

THE MANAGEMENT AREAS WITHIN THE UPPER COACHELLA VALLEY GROUNDWATER BASIN ARE DEFINED BY THE SUBBASIN BOUNDARIES SHOWN HEREON FOR THE WHITEWATER RIVER, MISSION CREEK, AND GARNET HILL SUBBASINS.

MAP SOURCE:

2016 GOOGLE EARTH PRO (AERIAL PHOTOGRAPHY), MISSION CREEK AND GARNET HILL SUBBASINS WATER MANAGEMENT PLAN FINAL REPORT, JANUARY 2013 (SUBBASIN BOUNDARIES)

SCALE: 1"=2.5 MILES

Figure 2

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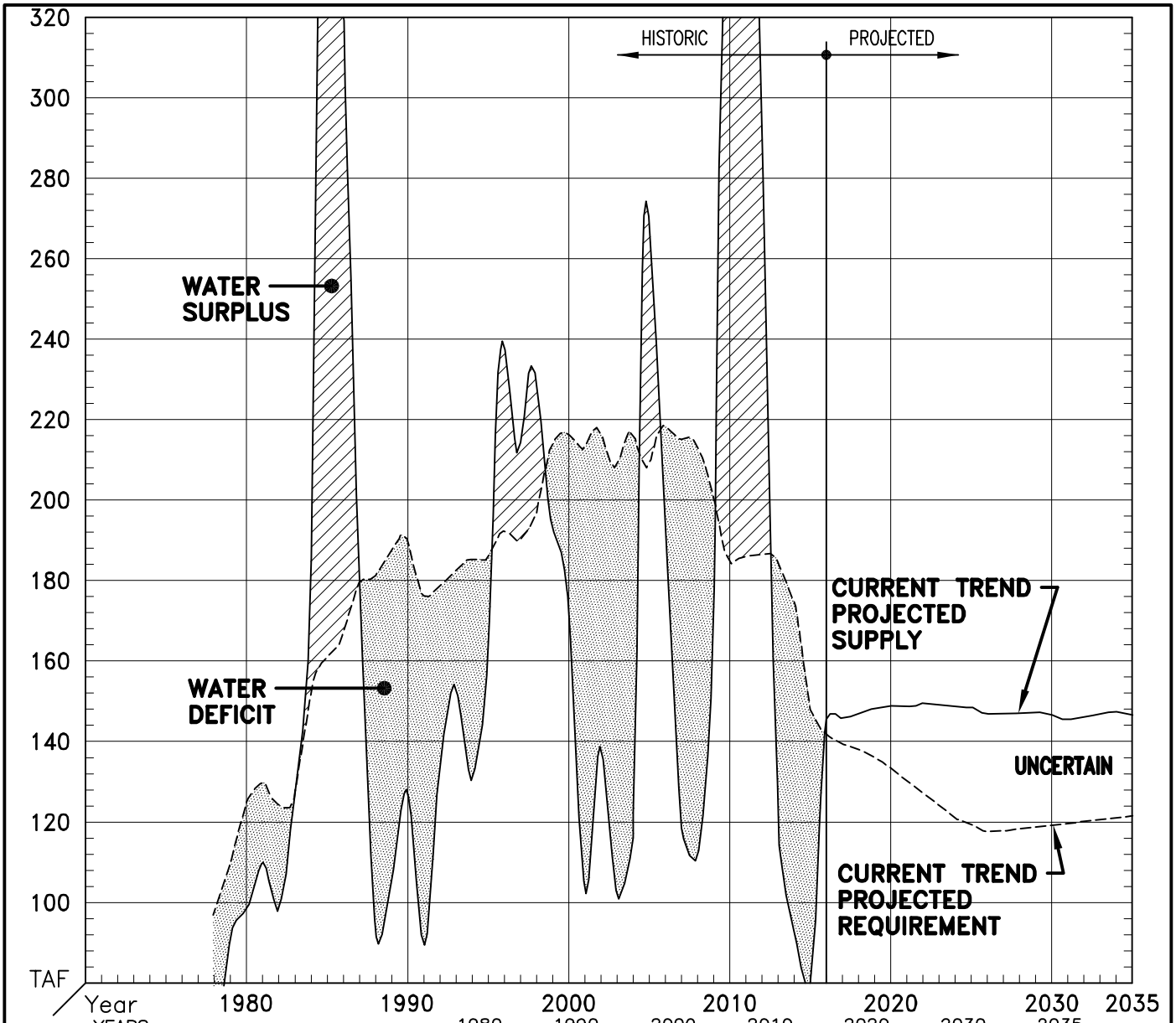

YEARS	1980	1990	2000	2010	2020	2030	2035
NET INFLOW (ACRE FEET)	98,500	126,300	175,900	320,800	148,600	146,700	146,500
NONCONSUMPTIVE RETURN	43,200	65,600	74,400	63,800	51,000	50,000	48,000
ARTIFICIAL RECHARGE	26,300	31,700	72,500	228,000	64,000	61,000	60,000
NATURAL INFLOW	36,000	36,000	36,000	36,000	52,000	52,000	52,000
NATURAL OUTFLOW	(7,000)	(7,000)	(7,000)	(7,000)	(18,400)	(16,300)	(13,500)

NOTES:

1. PROJECTED WATER REQUIREMENTS ARE BASED ON THE PROJECTIONS SET FORTH IN THE 2010 UPDATE TO THE COACHELLA VALLEY WATER MANAGEMENT PLAN, AND THE 2014 STATUS UPDATE (CVWD & MWH).
2. PROJECTED ARTIFICIAL RECHARGE IS BASED ON PROBABLE DELIVERIES ESTIMATED USING 62% RELIABILITY OF STATE WATER PROJECT WATER BASED ON DRAFT 2013 STATE WATER PROJECT RELIABILITY REPORT AND 35% LONG-TERM AVERAGE OF MWD TRANSFERS PURSUANT TO THE 2003 EXCHANGE AGREEMENT AND ITS IMPLEMENTATION.
3. WATER SUPPLY IS BASED ON NON CONSUMPTIVE RETURN NATURAL INFLOW AND PROBABLE DELIVERIES DESCRIBED ABOVE.

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DESERT WATER AGENCY

HISTORIC AND PROJECTED WATER REQUIREMENTS AND WATER SUPPLIES FOR THE WHITEWATER RIVER SUBBASIN

FIGURE 3

SCALE: N/A DATE: 04/13/16 DRAWN BY: MRN CHECKED BY: DFS W.O.: 101-33.40

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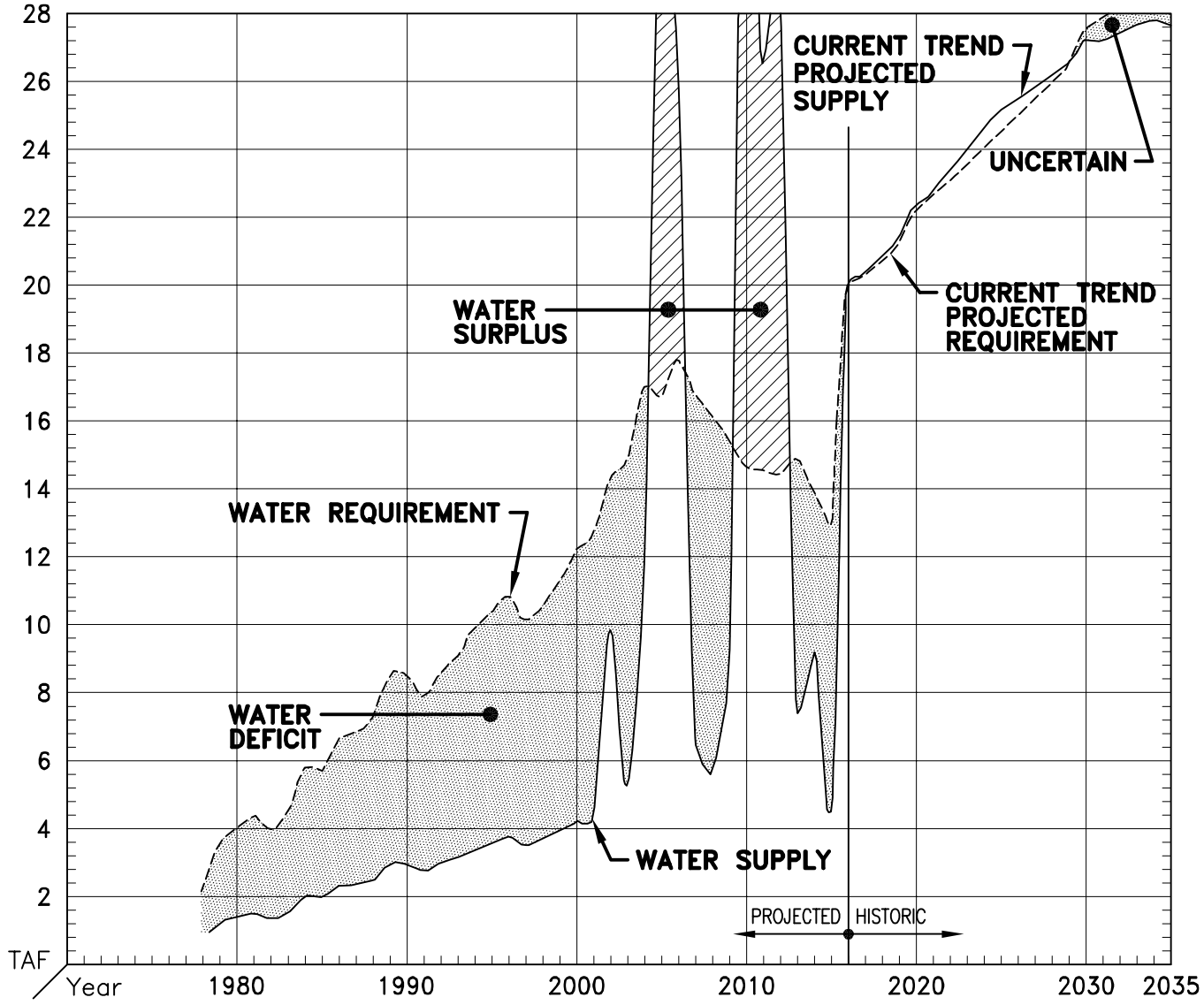

YEARS	1980	1990	2000	2010	2020	2030	2035
NET INFLOW (ACRE FEET)	1,400	2,900	4,100	37,500	21,940	26,340	27,340
NONCONSUMPTIVE RETURN	1,400	2,900	4,100	6,000	7,000	8,000	9,000
ARTIFICIAL RECHARGE	0	0	0	31,500	11,000	14,000	14,000
NATURAL INFLOW	5,500	5,500	5,500	5,500	9,340	9,340	9,340
NATURAL OUTFLOW	(5,500)	(5,500)	(5,500)	(5,500)	(5,400)	(5,000)	(5,000)

NOTES:

1. PROJECTED WATER REQUIREMENTS ARE BASED ON PROJECTIONS PER THE 2013 MISSION CREEK/GARNET HILL SUBBASIN WATER MANAGEMENT PLAN BY MWH.
2. NONCONSUMPTIVE RETURN IS BASED ON 65% CONSUMPTIVE USE AND 35% NONCONSUMPTIVE RETURN FOR ALL EXTRACTED WATER.
3. PROJECTED ARTIFICIAL RECHARGE IS BASED ON PROBABLE DELIVERIES ESTIMATED USING 62% RELIABILITY OF STATE WATER PROJECT WATER BASED ON DRAFT 2013 STATE WATER PROJECT RELIABILITY REPORT AND 35% LONG-TERM AVERAGE OF MWD TRANSFERS PURSUANT TO THE 2003 EXCHANGE AGREEMENT AND ITS IMPLEMENTATION.
4. WATER SUPPLY IS BASED ON 35% NON CONSUMPTIVE RETURN NATURAL INFLOW AND PROBABLE DELIVERIES DESCRIBED ABOVE.

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DESERT WATER AGENCY

HISTORIC AND PROJECTED WATER REQUIREMENTS AND WATER SUPPLIES FOR THE MISSION CREEK SUBBASIN

FIGURE 4

SCALE: N/A DATE: 04/13/16 DRAWN BY: MRN CHECKED BY: DFS W.O.: 101-33.40

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TABLES

TABLE 1
DESERT WATER AGENCY
HISTORIC WATER PRODUCTION FOR REPLENISHMENT ASSESSMENT FOR
DESERT WATER AGENCY AND COACHELLA VALLEY WATER DISTRICT
WHITEWATER RIVER SUBBASIN (WRS) AND MISSION CREEK SUBBASIN (MCS) , AND GARNET HILL SUBBASIN (GHS) WATER MANAGEMENT AREAS

	CVWD PRODUCTION		DWA PRODUCTION					COMBINED CVWD & DWA PRODUCTION						WRS PRODUCTION PERCENTAGES		COMBINED WRS, MCS, GHS PRODUCTION PERCENTAGES		MCS PRODUCTION PERCENTAGES	
	GWE		GWE			SWD		WRS			MCS	GHS							
YEAR	WRS AF	MCS AF	WRS AF	MCS AF	GHS AF	WRS AF	COMB AF	GWE AF	SWD AF	TOTAL AF	TOTAL AF	TOTAL AF	COMB AF	CVWD	DWA	CVWD	DWA	CVWD	DWA
1978	61,172		28,100			8,530	36,630	89,272	8,530	97,802			97,802	62.55%	37.45%				
1979	72,733		29,393			7,801	37,194	102,126	7,801	109,927			109,927	66.16%	33.84%				
1980	84,142		32,092			7,303	39,395	116,234	7,303	123,537			123,537	68.11%	31.89%				
1981	86,973		33,660			7,822	41,482	120,633	7,822	128,455			128,455	67.71%	32.29%				
1982	83,050		33,382			6,512	39,894	116,432	6,512	122,944			122,944	67.55%	32.45%				
1983	84,770		33,279			6,467	39,746	118,049	6,467	124,516			124,516	68.08%	31.92%				
1984	104,477		38,121			7,603	45,724	142,598	7,603	150,201			150,201	69.56%	30.44%				
1985	111,635		39,732			7,143	46,875	151,367	7,143	158,510			158,510	70.43%	29.57%				
1986	115,185		40,965			6,704	47,669	156,150	6,704	162,854			162,854	70.73%	29.27%				
1987	125,229		44,800			5,644	50,444	170,029	5,644	175,673			175,673	71.29%	28.71%				
1988	125,122		47,593			5,246	52,839	172,715	5,246	177,961			177,961	70.31%	29.69%				
1989	129,957		47,125			5,936	53,061	177,082	5,936	183,018			183,018	71.01%	28.99%				
1990	136,869		45,396			5,213	50,609	182,265	5,213	187,478			187,478	73.01%	26.99%				
1991	126,360		42,729			4,917	47,646	169,089	4,917	174,006			174,006	72.62%	27.38%				
1992	128,390		42,493			4,712	47,205	170,883	4,712	175,595			175,595	73.12%	26.88%				
1993	131,314		41,188			6,363	47,551	172,502	6,363	178,865			178,865	73.42%	26.58%				
1994	134,223		42,115			5,831	47,946	176,338	5,831	182,169			182,169	73.68%	26.32%				
1995	134,580		41,728			5,809	47,537	176,308	5,809	182,117			182,117	73.90%	26.10%				
1996	137,410		45,342			5,865	51,207	182,752	5,865	188,617			188,617	72.85%	27.15%				
1997	137,406		43,658			5,626	49,284	181,064	5,626	186,690			186,690	73.60%	26.40%				
1998	142,620		41,385			7,545	48,930	184,005	7,545	191,550			191,550	74.46%	25.54%				
1999	157,148		44,350			6,941	51,291	201,498	6,941	208,439			208,439	75.39%	24.61%				
2000	161,834		44,458			6,297	50,755	206,292	6,297	212,589			212,589	76.13%	23.87%				
2001	159,767		44,112			4,928	49,040	203,879	4,928	208,807			208,807	76.51%	23.49%				
2002	163,185	4,371	46,004	9,597		4,221	59,822	209,189	4,221	213,410	13,968		227,378	76.47%	23.53%	73.69%	26.31%	31.29%	68.71%
2003	156,185	4,425	43,463	10,073		4,627	58,163	199,648	4,627	204,275	14,498		218,773	76.46%	23.54%	73.41%	26.59%	30.52%	69.48%
2004	159,849	4,628	48,093	11,920		4,758	64,771	207,942	4,758	212,700	16,548		229,248	75.15%	24.85%	71.75%	28.25%	27.97%	72.03%
2005	153,462	4,247	46,080	12,080		4,799	62,959	199,542	4,799	204,341	16,327		220,668	75.10%	24.90%	71.47%	28.53%	26.01%	73.99%
2006	160,239	4,757	48,967	12,608		4,644	66,219	209,206	4,644	213,850	17,365		231,215	74.93%	25.07%	71.36%	28.64%	27.39%	72.61%
2007	157,487	4,547	50,037	11,862		3,490	65,389	207,524	3,490	211,014	16,409		227,423	74.63%	25.37%	71.25%	28.75%	27.71%	72.29%
2008	161,695	4,543	45,405	11,232		3,593	60,230	207,100	3,593	210,693	15,775		226,468	76.74%	23.26%	73.40%	26.60%	28.80%	71.20%
2009	155,793	4,813	41,913	10,295		1,443	53,651	197,706	1,443	199,149	15,108		214,257	78.23%	21.77%	74.96%	25.04%	31.86%	68.14%
2010	141,481	4,484	39,352	9,820		1,582	50,754	180,833	1,582	182,415	14,304		196,719	77.56%	22.44%	74.20%	25.80%	31.35%	68.65%
2011	141,028	4,653	40,071	9,550		1,724	51,345	181,099	1,724	182,823	14,203		197,026	77.14%	22.86%	73.94%	26.06%	32.76%	67.24%
2012	141,379	4,582	39,507	9,500		2,222	51,229	180,886	2,222	183,108	14,082		197,189	77.21%	22.79%	74.02%	25.98%	32.54%	67.46%
2013	143,108	4,415	37,730	10,080		1,802	49,612	180,838	1,802	182,640	14,495		197,135	78.36%	21.64%	74.83%	25.17%	30.46%	66.78%
2014	136,027	4,154	36,372	9,680	240	1,787	48,079	172,399	1,787	174,186	13,834	240	188,261	78.09%	21.91%	74.46%	25.54%	30.03%	69.97%
2015	115,558	4,090	30,332	8,577	334	1,539	40,782	145,890	1,539	147,429	12,667	334	160,430	78.38%	21.62%	74.58%	25.42%	32.29%	67.71%

NOTES:

CUMULATIVE CVWD AND DWA WHITEWATER RIVER SUBBASIN PRODUCTION 2011 THROUGH 2015: 870,186 AF
CUMULATIVE CVWD AND DWA MISSION CREEK SUBBASIN PRODUCTION 2011 THROUGH 2015: 69,281 AF
AVERAGE ANNUAL CVWD AND DWA WHITEWATER RIVER SUBBASIN PRODUCTION 2011 THROUGH 2015: 174,040 AF
AVERAGE ANNUAL CVWD AND DWA MISSION CREEK SUBBASIN PRODUCTION 2011 THROUGH 2015: 13,860 AF
AVERAGE ANNUAL DWA WHITEWATER RIVER SUBBASIN PRODUCTION 2011 THROUGH 2015: 46,804 AF
AVERAGE ANNUAL DWA MISSION CREEK SUBBASIN PRODUCTION 2011 THROUGH 2015: 11,441 AF
AVERAGE DWA WHITEWATER RIVER SUBBASIN PRODUCTION PERCENTAGE 2011 THROUGH 2015: 22.16%
AVERAGE DWA MISSION CREEK SUBBASIN PRODUCTION PERCENTAGE 2011 THROUGH 2015: 67.83%

ABBREVIATIONS:

GWE = GROUNDWATER EXTRACTIONS
SWD = SURFACE WATER DIVERSIONS
COMB = COMBINED

TABLE 2
DESERT WATER AGENCY
GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM
ESTIMATED WHITEWATER RIVER, MISSION CREEK, AND GARNET HILL SUBBASINS MANAGEMENT AREAS
WATER PRODUCTION AND ESTIMATED WATER REPLENISHMENT ASSESSMENTS
2016/2017

ESTIMATED COMBINED MANAGEMENT AREA
ASSESSABLE WATER PRODUCTION AND WATER REPLENISHMENT ASSESSMENTS

Management Area	Estimated Assessable Water Production AF	Water Replenishment Assessment Rate $/AF	Water Replenishment Assessment $	Percent
Whitewater River Subbasin	33,760	$102.00	$3,443,520	79%
Mission Creek Subbasin	8,710	$102.00	$888,420	20%
Garnet Hill Subbasin	340	$102.00	$34,680	1%
Combined Subbasins	42,810		$4,366,620	100%

ESTIMATED WHITEWATER RIVER, MISSION CREEK, AND GARNET HILL SUBBASINS MANAGEMENT AREA
WATER PRODUCTION AND WATER REPLENISHMENT ASSESSMENTS

Producer	2015 Water Production (1) Groundwater Extraction AF	Surface Water Diversion AF	Combined Water Production AF	Estimated 2016/2017 Assessable Water Production AF[4]	Estimated Water Replenishment Assessment @ $102/AF $	Percent
Whitewater River Subbasin						
Desert Water Agency	28,849	882	29,731	32,160	$3,280,320	95.26%
Desert Water Agency (Exempt)	0	657 [2]	657 [2]	0	$0	0.00%
Caltrans Rest Stop	86	0	86	90	$9,180	0.27%
Desert Oasis Golf Management - Welk Resort	349	0	349	380	$38,760	1.13%
Los Compadres	17	0	17	20	$2,040	0.06%
Mission Springs Water District (Wells 25 & 25A and 26 &26A)	145	0	145	150	$15,300	0.44%
Seven Lakes Country Club	126	0	126	140	$14,280	0.41%
Bel Air Greens	127 [3]	0	127 [3]	140	$14,280	0.41%
Escena	632	0	632	680	$69,360	2.01%
Subtotal	30,332	1,539	31,871	33,760	$3,443,520	100.00%
Mission Creek Subbasin						
Mission Springs Water District	6,790.45	0	6,790	6,900	$703,800	79.22%
Hidden Springs Country Club	469.86	0	470	480	$48,960	5.51%
Mission Lakes Country Club	1,007.12	0	1,007	1,020	$104,040	11.71%
Sands RV Resort	309.47	0	309	310	$31,620	3.56%
Subtotal	8,576.90	-	8,577	8,710	$888,420	100.00%
Garnet Hill Subbasin						
Mission Springs Water District	316	0	316	320	$32,640	94.12%
Indigo Power Plant	18	0	18	20	$2,040	5.88%
Subtotal	334	0	334	340	$34,680	100.00%
Total	39,244	1,539	40,782	42,810	$4,366,620	

[1] 2015 Metered water production rounded to nearest acre foot, except for Exempt Production and Estimated Production.
[2] Exempt Production (Desert Water Agency).
[3] Estimated Production (estimate based on applied water rates, past and comparable, for Bel Air Greens).
[4] Proportioned to 2014 Production - 10% conservation, Rounded to nearest 10 AF.
* Exempt Production (10 AF or less).

TABLE 3
COACHELLA VALLEY WATER DISTRICT
APPLICABLE STATE WATER PROJECT CHARGES[1]

	Table A Water Allocation		Probable Table A Water Delivery[3]	Delta Water Charge		Variable Transportation Charge		Off-Aqueduct Power Charge		CVWD Applicable Table A Charges	
Year	Maximum AF	Probable[2] AF	AF	Amount[4] $	Unit $/AF	Amount[5] $	Unit $/AF	Amount[6] $	Unit $/AF	Amount $	Unit[7] $/AF
2015	138,350	81,085	47,029	6,099,214	75.22	7,521,348	159.93	1,070,380	22.76	14,690,942	312.38
2016	138,350	81,085	47,029	6,099,214	75.22	7,819,512	166.27	364,004	7.74	14,282,730	303.70
2017	138,350	81,085	47,029	6,969,256	85.95	8,554,105	181.89	429,845	9.14	15,953,206	339.22
2018	138,350	81,085	47,029	6,969,256	85.95	10,162,967	216.10	102,523	2.18	17,234,746	366.47
2019	138,350	81,085	47,029	6,969,256	85.95	8,999,940	191.37	102,053	2.17	16,071,248	341.73
2020	138,350	81,085	47,029	6,969,256	85.95	9,012,638	191.64	97,820	2.08	16,079,714	341.91
2021	138,350	81,085	47,029	6,969,256	85.95	9,271,297	197.14	144,379	3.07	16,384,932	348.40
2022	138,350	81,085	47,029	6,969,256	85.95	9,173,947	195.07	136,854	2.91	16,280,057	346.17
2023	138,350	81,085	47,029	6,969,256	85.95	9,208,748	195.81	100,172	2.13	16,278,176	346.13
2024	138,350	81,085	47,029	6,969,256	85.95	9,017,340	191.74	75,246	1.60	16,061,843	341.53
2025	138,350	81,085	47,029	6,969,256	85.95	9,300,925	197.77	12,228	0.26	16,282,409	346.22
2026	138,350	81,085	47,029	6,969,256	85.95	8,721,998	185.46	15,049	0.32	15,706,303	333.97
2027	138,350	81,085	47,029	6,969,256	85.95	9,326,321	198.31	22,574	0.48	16,318,151	346.98
2028	138,350	81,085	47,029	6,969,256	85.95	9,114,220	193.80	15,520	0.33	16,098,996	342.32
2029	138,350	81,085	47,029	6,969,256	85.95	9,177,709	195.15	15,049	0.32	16,162,014	343.66
2030	138,350	81,085	47,029	6,969,256	85.95	8,938,332	190.06	4,703	0.10	15,912,290	338.35
2031	138,350	81,085	47,029	6,969,256	85.95	9,867,625	209.82	4,703	0.10	16,841,583	358.11
2032	138,350	81,085	47,029	6,969,256	85.95	8,597,371	182.81	5,173	0.11	15,571,800	331.11
2033	138,350	81,085	47,029	6,969,256	85.95	9,687,974	206.00	5,173	0.11	16,662,403	354.30
2034	138,350	81,085	47,029	6,969,256	85.95	8,745,983	185.97	4,703	0.10	15,719,942	334.26
2035	138,350	81,085	47,029	6,969,256	85.95	11,148,695	237.06	5,173	0.11	18,123,124	385.36

(1) As set forth in CDWR Bulletin 132-15, Appendix B (Appendix B).

(2) Probable Table A water allocation is based on currently existing CVWD allocation augmented by TLBWSD, KCWA, and MWD transfers, the latter reduced to 35% to reflect long-term average pursuant to the 2003 Exchange Agreement and its implementation.

(3) Probable Table A water delivery is based on 58% reliability of CVWD allocation augmented by TLBWSD, KCWA, and MWD transfers, the latter reduced to 35% for long-term average, pursuant to the 2003 Exchange Agreement and its implementation.

(4) Amount is based on probable Table A water allocation and Delta Water Charge per Table B-20 (A & B) of Appendix B. From 2017 through 2035, amount is based on State Water Contractors estimated unit charge of $85.95.

(5) Amount is based on probable Table A water delivery and applicable Variable Transportation Unit Charge per Table B-17 of Appendix B.

(6) Amount is based on probable Table A water delivery and Off-Aqueduct Power Unit Charge derived by dividing data in Table B-16B by data in Table B-5B of Appendix B.

(7) Amount of applicable Table A charges divided by probable Table A water delivery.

TABLE 4
DESERT WATER AGENCY
APPLICABLE STATE WATER PROJECT CHARGES[1]

	Table A Water Allocation		Probable Table A Water Delivery[3]	Delta Water Charge		Variable Transportation Charge		Off-Aqueduct Power Charge		DWA Applicable Table A Charges	
Year	Maximum AF	Probable[2] AF	AF	Amount[4] $	Unit $/AF	Amount[5] $	Unit $/AF	Amount[6] $	Unit $/AF	Amount $	Unit[7] $/AF
2015	55,750	48,015	27,849	2,580,806	53.75	4,453,891	159.93	1,276,320	45.83	8,311,016	298.43
2016	55,750	48,015	27,849	3,611,688	75.22	4,630,453	166.27	274,313	9.85	8,516,454	305.81
2017	55,750	48,015	27,849	4,126,889	85.95	5,065,455	181.89	254,540	9.14	9,446,884	339.22
2018	55,750	48,015	27,849	4,126,889	85.95	6,018,169	216.10	60,711	2.18	10,205,769	366.47
2019	55,750	48,015	27,849	4,126,889	85.95	5,329,463	191.37	60,432	2.17	9,516,785	341.73
2020	55,750	48,015	27,849	4,126,889	85.95	5,336,982	191.64	57,926	2.08	9,521,798	341.91
2021	55,750	48,015	27,849	4,126,889	85.95	5,490,152	197.14	85,496	3.07	9,702,538	348.40
2022	55,750	48,015	27,849	4,126,889	85.95	5,432,504	195.07	81,041	2.91	9,640,434	346.17
2023	55,750	48,015	27,849	4,126,889	85.95	5,453,113	195.81	59,318	2.13	9,639,320	346.13
2024	55,750	48,015	27,849	4,126,889	85.95	5,339,767	191.74	44,558	1.60	9,511,215	341.53
2025	55,750	48,015	27,849	4,126,889	85.95	5,507,697	197.77	7,241	0.26	9,641,827	346.22
2026	55,750	48,015	27,849	4,126,889	85.95	5,164,876	185.46	8,912	0.32	9,300,676	333.97
2027	55,750	48,015	27,849	4,126,889	85.95	5,522,735	198.31	13,368	0.48	9,662,992	346.98
2028	55,750	48,015	27,849	4,126,889	85.95	5,397,136	193.80	9,190	0.33	9,533,216	342.32
2029	55,750	48,015	27,849	4,126,889	85.95	5,434,732	195.15	8,912	0.32	9,570,533	343.66
2030	55,750	48,015	27,849	4,126,889	85.95	5,292,981	190.06	2,785	0.10	9,422,655	338.35
2031	55,750	48,015	27,849	4,126,889	85.95	5,843,277	209.82	2,785	0.10	9,972,951	358.11
2032	55,750	48,015	27,849	4,126,889	85.95	5,091,076	182.81	3,063	0.11	9,221,028	331.11
2033	55,750	48,015	27,849	4,126,889	85.95	5,736,894	206.00	3,063	0.11	9,866,847	354.30
2034	55,750	48,015	27,849	4,126,889	85.95	5,179,079	185.97	2,785	0.10	9,308,753	334.26
2035	55,750	48,015	27,849	4,126,889	85.95	6,601,884	237.06	3,063	0.11	10,731,837	385.36

(1) As set forth in CDWR Bulletin 132-15, Appendix B (Appendix B).

(2) Probable Table A water allocation is based on currently existing DWA allocation augmented by TLBWSD, KCWA, and MWD transfers, the latter reduced to 35% to reflect long-term average pursuant to the 2003 Exchange Agreement and its implementation.

(3) Probable Table A water delivery is based on 58% reliability of DWA allocation augmented by TLBWSD, KCWA, and MWD transfers, the latter reduced to 35% for long-term average, pursuant to the 2003 Exchange Agreement and its implementation.

(4) Amount is based on probable Table A water allocation and Delta Water Charge per Table B-20 (A & B) of Appendix B. From 2017 through 2035, amount is based on State Water Contractors estimated unit charge of $85.95.

(5) Amount is based on probable Table A water delivery and applicable Variable Transportation Unit Charge per Table B-17 of Appendix B.

(6) Amount is based on probable Table A water delivery and Off-Aqueduct Power Unit Charge derived by dividing data in Table B-16B by data in Table B-5B of Appendix B.

(7) Amount of applicable Table A charges divided by probable Table A water delivery.

TABLE 5
DESERT WATER AGENCY
ESTIMATED ALLOCATED STATE WATER PROJECT CHARGES FOR TABLE A WATER
(PROPORTIONED APPLICABLE CHARGES)[1]

Year	CVWD Applicable Table A Charges[2] $	DWA Applicable Table A Charges[3] $	Combined Applicable Table A Charges $	CVWD Allocated Table A Charges $	DWA Allocated Table A Charges $	DWA Incremental Increase/(Decrease) $	DWA Incremental Increase/(Decrease) %
2015	14,690,942	8,311,016	23,001,958	17,127,258	5,874,700		
						(51,788)	(1)
2016	14,282,730	8,516,454	22,799,184	16,976,273	5,822,912		
						664,271	11
2017	15,953,206	9,446,884	25,400,089	18,912,907	6,487,183		
						521,124	8
2018	17,234,746	10,205,769	27,440,515	20,432,207	7,008,307		
						(473,123)	(7)
2019	16,071,248	9,516,785	25,588,033	19,052,849	6,535,184		
						3,442	0
2020	16,079,714	9,521,798	25,601,511	19,062,885	6,538,626		
						124,114	2
2021	16,384,932	9,702,538	26,087,469	19,424,730	6,662,740		
						(42,646)	(1)
2022	16,280,057	9,640,434	25,920,491	19,300,398	6,620,094		
						(765)	0
2023	16,278,176	9,639,320	25,917,496	19,298,168	6,619,329		
						(87,970)	(1)
2024	16,061,843	9,511,215	25,573,058	19,041,699	6,531,359		
						89,691	1
2025	16,282,409	9,641,827	25,924,235	19,303,186	6,621,050		
						(234,267)	(4)
2026	15,706,303	9,300,676	25,006,980	18,620,197	6,386,783		
						248,801	4
2027	16,318,151	9,662,992	25,981,143	19,345,559	6,635,584		
						(89,117)	(1)
2028	16,098,996	9,533,216	25,632,211	19,085,744	6,546,467		
						25,626	0
2029	16,162,014	9,570,533	25,732,548	19,160,455	6,572,093		
						(101,548)	(2)
2030	15,912,290	9,422,655	25,334,945	18,864,400	6,470,545		
						377,887	6
2031	16,841,583	9,972,951	26,814,535	19,966,103	6,848,432		
						(516,344)	(8)
2032	15,571,800	9,221,028	24,792,829	18,460,740	6,332,088		
						443,482	7
2033	16,662,403	9,866,847	26,529,250	19,753,679	6,775,570		
						(383,241)	(6)
2034	15,719,942	9,308,753	25,028,694	18,636,366	6,392,329		
						977,228	15
2035	18,123,124	10,731,837	28,854,960	21,485,403	7,369,557		

(1) Proportioned in accordance with 2015 Water Management Area production percentages; CVWD is responsible for 74.46% and DWA is responsible for 25.54% of total combined production for the Whitewater River, Mission Creek, and Garnet Hill Subbasins (see **Table 1**).
(2) From Table 3.
(3) From Table 4.

TABLE 6
DESERT WATER AGENCY
PROJECTED EFFECTIVE REPLENISHMENT ASSESSMENT RATES
PURSUANT TO WATER MANAGEMENT AGREEMENTS BETWEEN
COACHELLA VALLEY WATER DISTRICT AND DESERT WATER AGENCY

Year	DWA Allocated Table A Charges [1] $	Estimated Assessable Production[2] AF	Estimated Effective Table A Assessment Rate[3] Fiscal Year $/AF	Rounded Table A Assessment Rate $/AF
2016/2017	6,155,048	42,810	143.78	144.00
2017/2018	6,747,745	44,773	150.71	151.00
2018/2019	6,771,746	44,677	151.57	152.00
2019/2020	6,536,905	44,642	146.43	146.00
2020/2021	6,600,683	44,506	148.31	148.00
2021/2022	6,641,417	44,159	150.40	150.00
2022/2023	6,619,712	43,811	151.10	151.00
2023/2024	6,575,344	43,463	151.29	151.00
2024/2025	6,576,205	43,248	152.06	152.00
2025/2026	6,628,317	43,169	153.54	154.00
2026/2027	6,511,184	43,355	150.18	150.00
2027/2028	6,591,026	43,803	150.47	150.00
2028/2029	6,559,280	44,250	148.23	148.00
2029/2030	6,521,319	44,889	145.28	145.00
2030/2031	6,659,489	45,482	146.42	146.00
2031/2032	6,590,260	45,835	143.78	144.00
2032/2033	6,553,829	46,187	141.90	142.00
2033/2034	6,583,950	46,538	141.47	141.00
2034/2035	6,880,943	46,888	146.75	147.00

(1) From Table 5.
(2) Projections based on model runs for Coachella Valley 2010 Water Management Plan and 2014 Water Management Plan Status Update.
(3) Necessary to pay DWA's estimated Allocated Table A Charges.

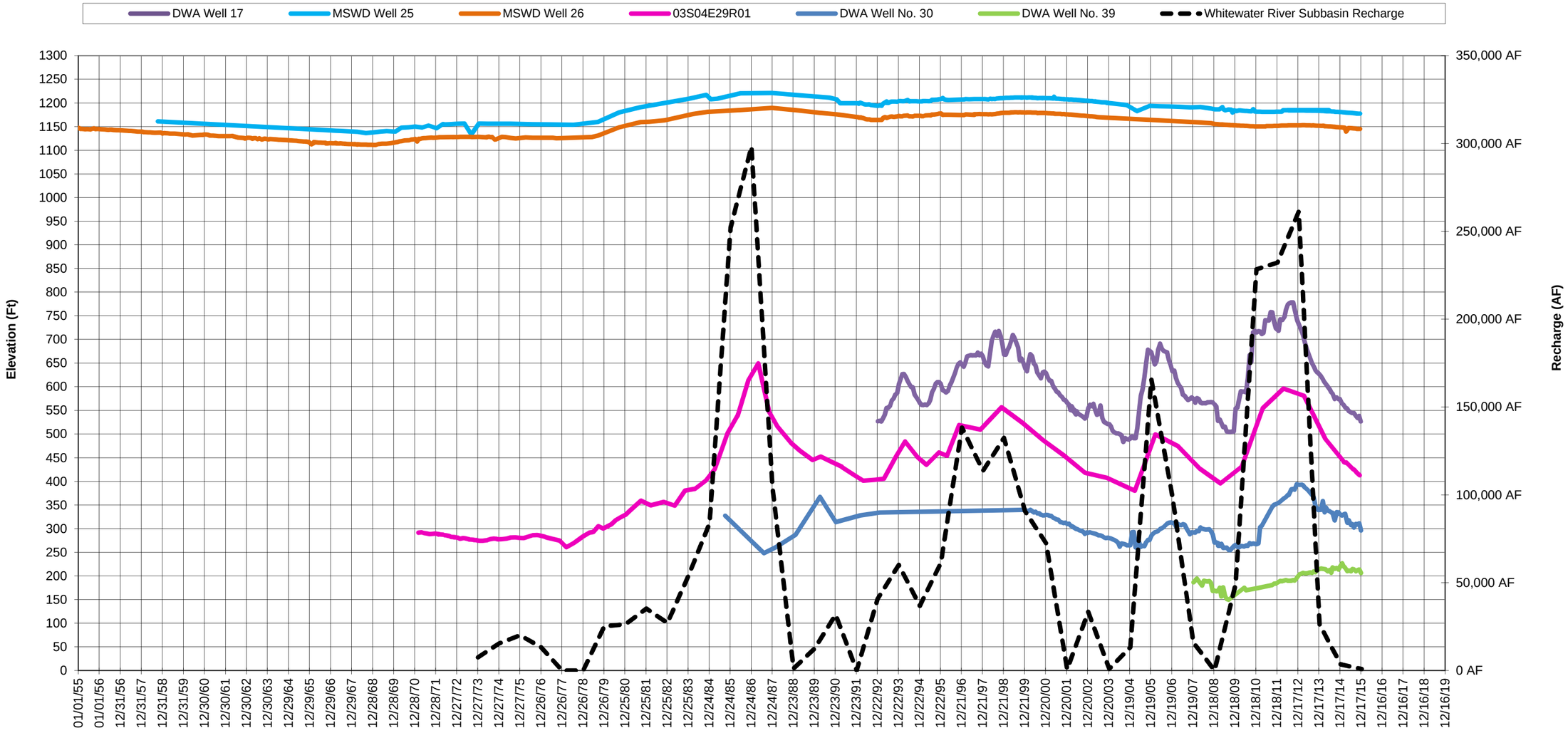
TABLE 7
DESERT WATER AGECY
WHITEWATER RIVER, MISSION CREEK AND GARNET HILL SUBBASINS
HISTORIC AND PROPOSED REPLENISHMENT ASSESSMENT RATES

	Assessment Rate							Assessments												Payments Made	Surplus (Deficit)	
		WRS		MCS		GHS		Estimated[3] $			Levied[4] $			Collected[5] $				Delinquent[6] $					
Fiscal Year	Table A Allocation $/AF	Other Charges or Costs[1] $/AF	Total[2] $/AF	Other Charges or Costs[1] $/AF	Total[2] $/AF	Other Charges or Costs[1] $/AF	Total[2] $/AF	WRS	MCS	GHS	WRS	MCS	GHS	WRS	MCS	GHS	TOTAL	WRS	MCS	GHS	Table A $	Annual $	Cumulative[7] $
78/79	6.81	0.00	6.81					226,245			199,004			199,004			199,004	0			267,193	(68,189)	(68,189)
79/80	9.00	0.00	9.00					282,405			309,225			309,225			309,225	0			267,125	42,100	(26,089)
80/81	9.50	0.00	9.50					317,482			355,925			355,925			355,925	0			347,491	8,434	(17,655)
81/82	10.50	0.00	10.50					378,838			406,160			406,160			406,160	0			414,086	(7,926)	(25,581)
82/83	21.00	0.00	21.00					800,499			770,871			770,871			770,871	0			891,544	(120,673)	(146,254)
83/84	36.50	0.00	36.50					1,331,374			1,452,317			1,452,317			1,452,317	0			492,329	959,988	813,734
84/85	37.50	0.00	37.50					1,375,762			1,577,125			1,577,125			1,577,125	0			381,713	1,195,412	2,009,146
85/86	31.00	0.00	31.00					1,309,750			1,363,239			1,363,239			1,363,239	0			637,841	725,398	2,734,544
86/87	21.00	0.00	21.00					911,673			912,583			912,583			912,583	0			876,544	36,039	2,770,583
87/88	22.50	0.00	22.50					994,749			1,099,130			1,099,130			1,099,130	0			934,920	164,210	2,934,793
88/89	20.00	0.00	20.00					970,000			965,811			965,811			965,811	0			748,195	217,616	3,152,409
89/90	23.50	0.00	23.50					1,175,002			1,105,446			1,105,446			1,105,446	0			888,979	216,467	3,368,876
90/91	26.00	0.00	26.00					1,313,000			1,207,593			1,207,593			1,207,593	0			784,369	423,224	3,792,100
91/92	31.75	0.00	31.75					1,524,000			1,408,108			1,408,108			1,408,108	0			439,549	968,559	4,760,659
92/93	31.75	0.00	31.75					1,412,875			1,389,641			1,389,641			1,389,641	0			902,273	487,368	5,248,027
93/94	31.75	0.00	31.75					1,397,000			1,411,406			1,411,406			1,411,406	0			1,508,408	(97,002)	5,151,025
94/95	31.75	0.00	31.75					1,412,875			1,384,996			1,384,996			1,384,996	0			2,291,661	(906,665)	4,244,360
95/96	31.75	0.00	31.75					1,425,575			1,434,798			1,434,798			1,434,798	0			2,282,379	(847,581)	3,396,779
96/97	31.75	0.00	31.75					1,409,700			1,517,690			1,517,690			1,517,690	0			1,153,620	364,070	3,760,849
97/98	31.75	0.00	31.75					1,527,175			1,368,789			1,368,789			1,368,789	0			1,560,592	(191,803)	3,569,046
98/99	31.75	0.00	31.75					1,463,675			1,510,078			1,510,078			1,510,078	0			2,663,096	(1,153,018)	2,416,028
99/00	31.75	0.00	31.75					1,436,370			1,530,344			1,530,344			1,530,344	0			2,137,145	(606,801)	1,809,227
00/01	33.00	0.00	33.00					1,576,080			1,506,011			1,506,011			1,506,011	0			1,993,058	(487,047)	1,322,180
01/02	33.00	0.00	33.00					1,563,870			1,559,325			1,559,325			1,559,325	0			273,679	1,285,646	2,607,826
02/03	35.00	0.00	35.00					1,627,500			1,636,783			1,636,783			1,636,783	0			1,226,335	410,448	3,018,274
03/04	35.00	0.00	35.00	0.00	35.00			1,679,300	336,000		1,719,646	397,708		1,719,646	397,708		2,117,354	0	0		4,199,358	(2,082,004)	936,270
04/05	34.00	11.00	45.00	12.00	46.00			2,069,100	464,140		2,160,536	529,108		2,160,536	529,108		2,689,644	0	0		3,813,947	(1,124,303)	(188,033)
05/06	38.00	12.00	50.00	12.00	50.00			2,527,500	596,000		2,463,500	635,562		2,463,500	635,562		3,099,062	0	0		5,791,887	(2,692,825)	(2,880,858)
06/07	51.00	12.00	63.00	12.00	63.00			3,058,020	761,040		3,350,191	789,471		3,343,330	789,471		4,132,801	6,861	0		6,087,627	(1,954,826)	(4,835,684)
07/08	83.00	(34.00)	63.00	(34.00)	49.00			3,230,010	794,430		3,049,824	720,025		3,043,745	720,025		3,763,770	6,079	0		9,131,044	(5,367,274)	(10,202,958)
08/09	65.00	(6.00)	72.00	(6.00)	59.00			3,682,800	876,240		3,074,133	778,029		3,040,146	778,029		3,818,175	33,987	0		6,936,896	(3,118,721)	(13,321,679)
09/10	72.00	0.00	72.00	0.00	72.00			3,605,140	802,800		3,007,319	718,452		2,932,949	718,452		3,651,401	74,370	0		6,236,894	(2,585,493)	(15,907,172)
10/11	99.00	(17.00)	82.00	(17.00)	82.00			3,527,640	828,200		3,376,216	616,632		3,297,080	616,632		3,913,712	79,136	0		4,174,012	(260,300)	(16,167,472)
11/12	115.00	(33.00)	82.00	(33.00)	82.00			3,302,140	805,240		3,347,596	820,179		3,275,308	820,179		4,095,487	72,288	0		7,005,049	(2,909,562)	(19,077,034)
12/13	117.00	(25.00)	92.00	(25.00)	92.00			3,788,326	878,600		3,690,594	888,405		3,689,937	888,405		4,578,342	656	0		8,169,744	(3,591,402)	(22,668,436)
13/14	111.00	(19.00)	92.00	(19.00)	92.00			3,779,360	785,587		3,809,930[8]	785,587		3,809,930	785,587		4,595,517	0	0		6,078,542[11]	(1,483,025)	(24,151,461)
14/15	106.00	(4.00)	102.00	(4.00)	102.00			3,679,360	756,041		3,679,360	561,213		3,679,360	561,213		4,240,573	19,924[10]	0		3,798,705	441,868	(23,709,593)
15/16	112.00	(10.00)	102.00	(10.00)	102.00	(10.00)	102.00	3,850,489	989,318	24,480	3,850,489	989,318	24,480	3,850,489	989,318	24,480	4,864,287	0	0	0	5,848,806	(984,519)	(24,694,112)
16/17	144.00	(42.00)	102.00	(42.00)	102.00	(42.00)	102.00	3,443,520	888,420	34,680	3,443,520	888,420	34,680	3,443,520	888,420	34,680	4,366,620	0			6,155,048	(1,788,428)	(1,788,428)
17/18	151.00	(36.00)	115.00	(36.00)	115.00	(36.00)	115.00	3,498,951	1,614,781	35,190	3,498,951	1,614,781	35,190	3,498,951	1,614,781	35,190	5,148,922	0			6,747,745	(1,598,823)	(3,387,250)
18/19	152.00	(26.00)	126.00	(26.00)	126.00	(26.00)	126.00	3,784,572	1,806,115	38,556	3,784,572	1,806,115	38,556	3,784,572	1,806,115	38,556	5,629,243	0			6,771,746	(1,142,502)	(4,529,753)
19/20	146.00	(10.00)	136.00	(10.00)	136.00	(10.00)	136.00	4,014,019	2,015,630	41,616	4,014,019	2,015,630	41,616	4,014,019	2,015,630	41,616	6,071,265	0			6,536,905	(465,640)	(4,995,393)
20/21	148.00	0.00	148.00	0.00	148.00	0.00	148.00	4,274,196	2,267,403	45,288	4,274,196	2,267,403	45,288	4,274,196	2,267,403	45,288	6,586,887	0			6,600,683	(13,796)	(5,009,189)
21/22	150.00	2.82	152.82	2.82	152.82	2.82	152.82	4,311,777	2,389,927	46,764	4,311,777	2,389,927	46,764	4,311,777	2,389,927	46,764	6,748,468	0			6,641,417	107,051	(4,902,138)
22/23	151.00	2.82	153.82	2.82	153.82	2.82	153.82	4,237,613	2,454,468	47,070	4,237,613	2,454,468	47,070	4,237,613	2,454,468	47,070	6,739,151	0			6,619,712	119,439	(4,782,698)
23/24	151.00	2.82	153.82	2.82	153.82	2.82	153.82	4,135,205	2,503,369	47,070	4,135,205	2,503,369	47,070	4,135,205	2,503,369	47,070	6,685,645	0			6,575,344	110,301	(4,672,397)
24/25	152.00	2.82	154.82	2.82	154.82	2.82	154.82	4,079,486	2,568,911	47,376	4,079,486	2,568,911	47,376	4,079,486	2,568,911	47,376	6,695,773	0			6,576,205	119,568	(4,552,829)
25/26	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,068,709	2,653,207	47,988	4,068,709	2,653,207	47,988	4,068,709	2,653,207	47,988	6,769,904	0			6,628,317	141,587	(4,411,242)
26/27	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,045,624	2,705,524	47,988	4,045,624	2,705,524	47,988	4,045,624	2,705,524	47,988	6,799,135	0			6,511,184	287,952	(4,123,290)
27/28	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,063,485	2,757,841	47,988	4,063,485	2,757,841	47,988	4,063,485	2,757,841	47,988	6,869,313	0			6,591,026	278,288	(3,845,002)
28/29	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,081,284	2,810,158	47,988	4,081,284	2,810,158	47,988	4,081,284	2,810,158	47,988	6,939,430	0			6,559,280	380,150	(3,464,853)
29/30	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,098,821	2,892,881	47,988	4,098,821	2,892,881	47,988	4,098,821	2,892,881	47,988	7,039,689	0			6,521,319	518,370	(2,946,482)
30/31	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,116,095	2,968,509	47,988	4,116,095	2,968,509	47,988	4,116,095	2,968,509	47,988	7,132,591	0			6,659,489	473,102	(2,473,380)
31/32	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,133,290	3,006,636	47,988	4,133,290	3,006,636	47,988	4,133,290	3,006,636	47,988	7,187,914	0			6,590,260	597,654	(1,875,726)
32/33	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,150,424	3,044,764	47,988	4,150,424	3,044,764	47,988	4,150,424	3,044,764	47,988	7,243,176	0			6,553,829	689,347	(1,186,379)
33/34	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,167,326	3,082,892	47,988	4,167,326	3,082,892	47,988	4,167,326	3,082,892	47,988	7,298,206	0			6,583,950	714,256	(472,123)
34/35	154.00	2.82	156.82	2.82	156.82	2.82	156.82	4,184,058	3,121,019	47,988	4,184,058	3,121,019	47,988	4,184,058	3,121,019	47,988	7,353,066	0			6,880,943	472,123	(0)

(1) Includes discretionary reductions and charges for recovery of past shortfalls.
(2) Recommended assessment rate based on two components: 1) State Water Project Table A water Allocation, and 2) Other Charges or Costs.
(3) Assessments Estimated are based on applicable assessment rate and estimated assessable production from annual report for that year.
(4) Assessments Levied are based on applicable assessment rate and actual assessable production, except for the previous year, current year, and subsequent years where amounts remain estimated.
(5) Assessments Collected are based on payments made for Assessments Levied, except for the previous year, current year, and subsequent years where amounts remain estimated.
(6) Assessments Delinquent are based on Assessments Levied less payments made.
(7) Cumulative assessment balance to be used for future Delta improvements. Estimates of future assessment rates may need to be adjusted in the furure to accommodate unknown charges for expanded State Water Project Facilities.
(8) For 2013/2014 and beyond, Assessments Estimated are based on Proposed Assessment Rate and Estimated Assessable Production.
(9) Assessments Levied and Collected are estimated based on first, second and third quarters of assessment period.
(10) Delinquent assessment is estimated based on first, second and third quarters of assessment period.
(11) For 2013/2014 and beyond, Payments Made are estimated based on estimated allocated Table A charges, proportioned to Estimated Assessable Production (see Note 1).

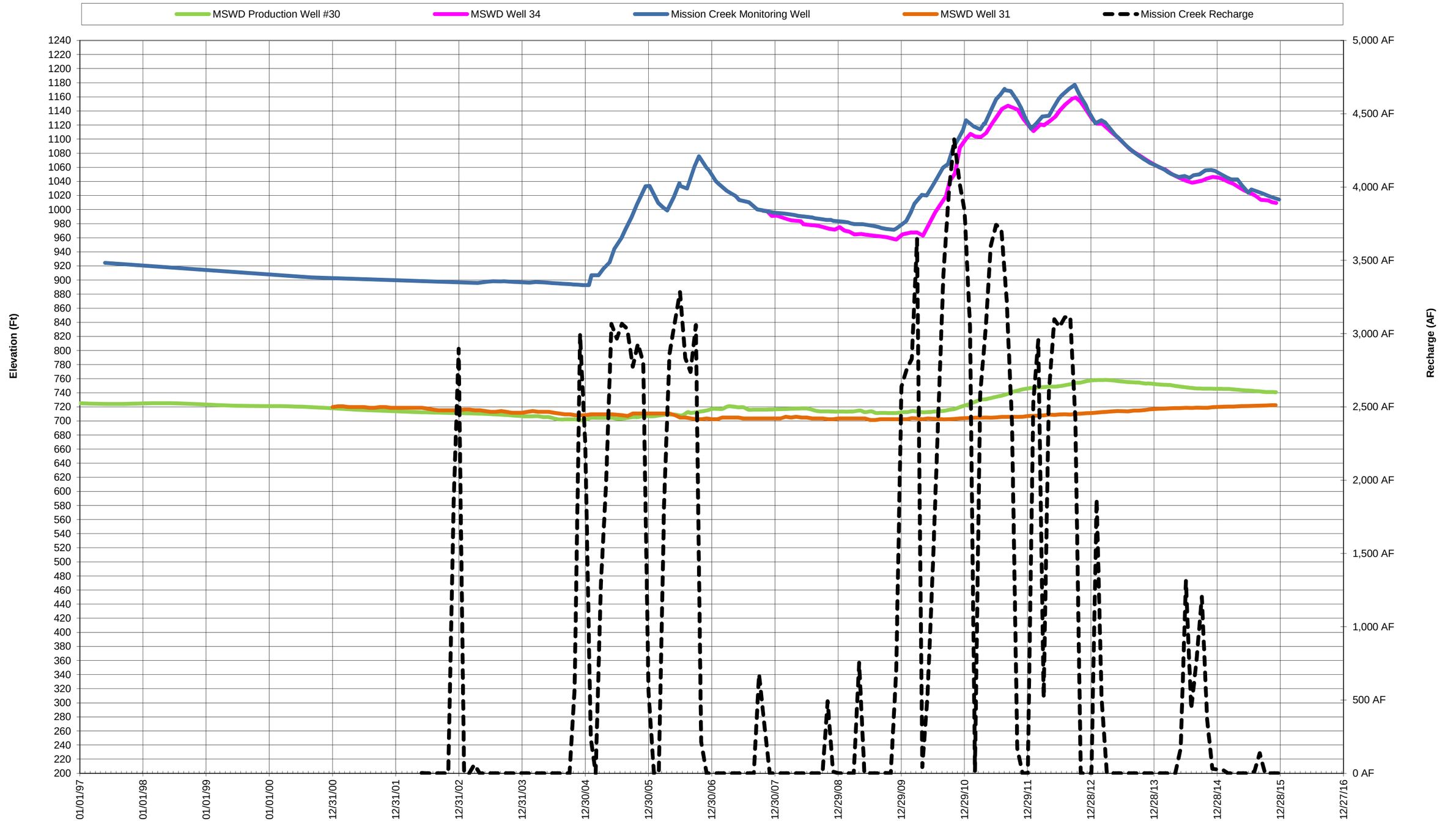
EXHIBITS

EXHIBIT 1
DESERT WATER AGENCY
WHITEWATER RIVER SUBBASIN
RECHARGE QUANTITIES AND GROUNDWATER WELL HYDROGRAPHS



/DFS
101-33P40TBLS.xlsx/Exhibit1
(5/4/2016)

EXHIBIT 2
DESERT WATER AGENCY
MISSION CREEK SUBBASIN
RECHARGE QUANTITIES AND WATER WELL HYDROGRAPHS



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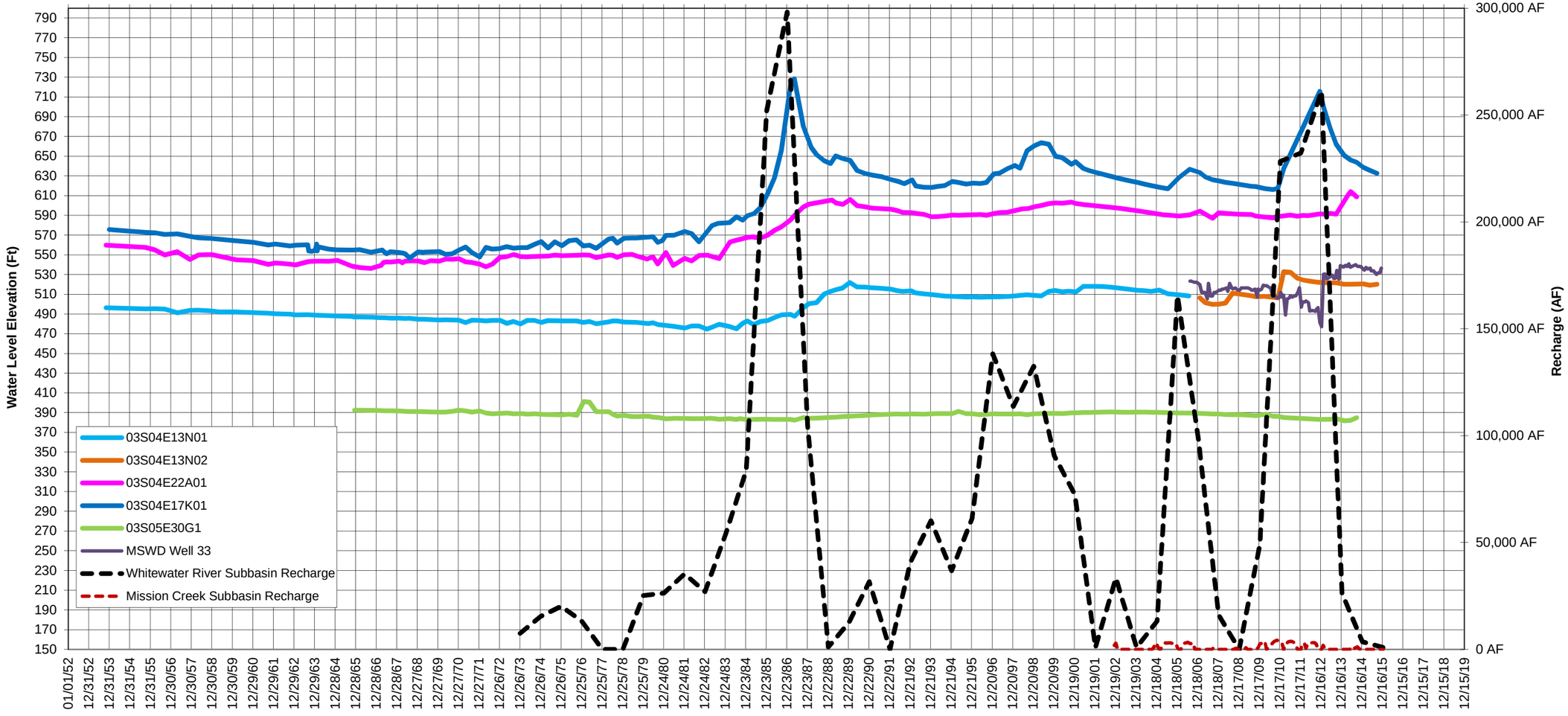
101-33P40TBLS.xlsx/Exhibit2
(5/4/2016)

EXHIBIT 3
GARNET HILL SUBBASIN WATER LEVEL ELEVATIONS AND
GROUNDWATER RECHARGE QUANTITIES AT WHITEWATER RIVER AND MISSION CREEK SUBBASINS



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(5/4/2016)

EXHIBIT 4
DESERT WATER AGENCY
MISSION CREEK SUBBASIN[1]
HISTORIC VOLUME OF GROUNDWATER IN STORAGE[2]

TIME PERIOD	PRE-1955	1955 - 1978	1979 - 1997	1998 - 2015	**1955 - 2015**
NUMBER OF YEARS		24	19	17	**60**
WATER LEVEL DECLINE, FT[3]		20	30	6	**56**
PERIOD REDUCTION IN STORAGE, AF		71,200	106,800	21,360	**199,360**
ANNUAL REDUCTION IN STORAGE, AF/Yr		3,000	5,600	1,300	**3,300**
CHANGE IN STORAGE		0.047	0.074	0.016	**0.132**
REMAINING STORAGE, AF	1,511,800	1,440,600	1,333,800	1,312,440	**1,312,440**

(1) NORTHWEST THREE-QUARTERS OF SUBBASIN: GTC (1979) & SLADE (2000)
(2) STORAGE LOSS OF 3,560 AF/FT OF WATER LEVEL DECLINE: GTC (1979) & SLADE (2000)
(3) MISSION SPRINGS WATER DISTRICT DATA

EXHIBIT 5
METROPOLITAN WATER DISTRICT/COACHELLA VALLEY WATER DISTRICT/DESERT WATER AGENCY
WATER EXCHANGE AGREEMENT AND ADVANCE DELIVERY AGREEMENT
SUMMARY OF EXCHANGE AND ADVANCE DELIVERIES, JULY 1973 THROUGH DECEMBER 1999[1]

A. JULY 1973 THROUGH JUNE 1984

YEAR	COMBINED CVWD/DWA SWP ENTITLEMENT	CVWD/DWA DELIVERIES TO MWD (SWP)	MWD DELIVERIES TO TO CVWD/DWA (SPREADING GROUNDS)	ANNUAL MWD DELIVERY SURPLUS (DEFICIT)	CUMULATIVE MWD DELIVERY SURPLUS (DEFICIT)
1973 (JUL-DEC)	14,800	14,800	7,475	(7,325)	(7,325)
1974	16,400	16,400	15,396	(1,004)	(8,329)
1975	18,000	18,000	20,126	2,126	(6,203)
1976	19,600	19,600	13,206	(6,394)	(12,597)
1977	21,421	0	0	0	(12,597)
1978	23,242	25,384	0	(25,384)	(37,981)
1979	25,063	25,063	25,192	129	(37,852)
1980	27,884	27,884	26,341	(1,543)	(39,395)
1981	31,105	31,105	35,251	4,146	(35,249)
1982	34,326	34,326	27,020	(7,306)	(42,555)
1983	37,547	37,547	53,732	16,185	(26,370)
1984 (JAN-JUN)[2]	N/A	25,849	50,912	25,063	(1,307)
TOTALS:	269,388	275,958	274,651		

B. JULY 1984 THROUGH DECEMBER 1999

YEAR	COMBINED CVWD/DWA SWP ENTITLEMENT DELIVERY	TOTAL CVWD/DWA DELIVERY TO MWD (SWP)	MWD DELIVERY TO CVWD/DWA (SPREADING GROUNDS)	MWD ADVANCE DELIVERY	MWD ADVANCE DELIVERY CONVERTED TO EXCHANGE DELIVERY
1984 (JUL-DEC)[3]	40,768	14,919	32,796	16,570	---
1985	43,989	43,989	251,994	208,005	---
1986	47,210	47,210	298,201	240,991	---
1987	50,931	50,931	104,334	53,403	---
1988	54,652	54,652	1,096	---	53,556
1989	58,373	58,374	12,478	---	45,896
1990	61,200	61,200	31,721	---	29,479
1991	61,200	18,360	14	---	19,111
1992	61,200	27,624	40,870	13,330	---
1993	61,200	61,200	60,153	---	1,047
1994	61,200	37,359	36,763	---	596
1995	61,200	61,200	61,318	118	---
1996[4]	61,200	164,841	138,266	---	26,575
1997[5]	61,200	138,330	113,677	---	24,653
1998[6]	61,200	156,356	132,455	---	23,901
1999[7]	61,200	108,580	90,601	---	17,979
TOTALS:	907,923	1,105,125	1,406,737	532,417	242,793

(1) AS REPORTED BY METROPOLITAN WATER DISTRICT IN ITS MONTHLY "EXCHANGE WATER DELIVERY IN ACRE-FEET" REPORTS.

(2) ADVANCE DELIVERY AGREEMENT BETWEEN MWD AND CVWD/DWA BECAME EFFECTIVE 7/1/84; DISCREPANCIES IN EXCHANGE DELIVERIES BETWEEN MWD AND CVWD/DWA AFTER 7/1/84 ADJUSTED PER SAID AGREEMENT.

(3) EFFECTIVE DATE OF ADVANCE DELIVERY AGREEMENT BETWEEN MWD AND CVWD/DWA WAS 7/1/84; 16,570 AF ADVANCE DELIVERY FIGURE REFLECTS 7/84 - 12/84 DELIVERIES TO MWD OF 14,919 AF AND 7/84 - 12/84 DELIVERIES TO CVWD/DWA OF 32,796 AF, LESS CUMULATIVE MWD DELIVERY DEFICIENCY OF 1,307 AF AS OF 7/1/84.

(4) 1996 COMBINED CVWD/DWA ENTITLEMENT AND EXCHANGE DELIVERIES INCREASED BY PURCHASE OF 103,641 AF THROUGH DWR'S 1996 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B WATER).

(5) 1997 COMBINED CVWD/DWA ENTITLEMENT AND EXCHANGE DELIVERIES INCREASED BY PURCHASE OF 50,000 AF THROUGH DWR's 1997 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B WATER) AND BY PURCHASE OF 27,130 AF OF KAWEAH RIVER AND TULE RIVER FLOOD FLOW WATER.

(6) 1998 COMBINED CVWD/DWA ENTITLEMENT AND EXCHANGE DELIVERIES INCREASED BY PURCHASE OF 75,000 AF THROUGH DWR's 1998 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B WATER) AND BY PURCHASE OF 20,156 AF OF KAWEAH, TULE, AND KINGS RIVERS RIVER FLOOD FLOW WATER.

(7) 1999 COMBINED CVWD/DWA ENTITLEMENT AND EXCHANGE DELIVERIES INCREASED BY PURCHASE OF 47,380 AF THROUGH DWR's 1999 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B WATER).

NOTE: ALL FIGURES ARE IN ACRE FEET

EXHIBIT 6
METROPOLITAN WATER DISTRICT/COACHELLA VALLEY WATER DISTRICT/DESERT WATER AGENCY
WATER EXCHANGE AGREEMENT AND ADVANCE DELIVERY AGREEMENT
SUMMARY OF EXCHANGE AND ADVANCE DELIVERIES, JANUARY 2000 THROUGH DECEMBER 2011[1]

YEAR	TOTAL CVWD/DWA EXCHAGE DELIVERY TO MWD (SWP) AF	MWD EXCHANGE DELIVERY TO CVWD/DWA RECHARGE BASINS AF	MWD ADVANCE DELIVERY TO CVWD/DWA RECHARGE BASINS AF	MWD ADVANCE DELIVERY CONVERTED TO EXCHANGE DELIVERY TO CVWD/DWA AF
2000[2]	100,557	72,450	---	28,107
2001[3]	24,110	707	---	23,403
2002[4]	44,395	38,168	---	6,227
2003[5]	38,262	961	---	37,301
2004[6]	36,655	18,788	---	17,867
2005[7]	91,608	190,277	98,669	0
2006[8]	171,100	118,860	---	52,240
2007[9]	103,462	17,020	---	102,442
2008[10]	64,872	0	---	64,872
2009[11]	64,285	52,368	---	11,917
2010[12]	108,382	241,404	133,022	0
2011[13]	132,458	148,102	25,644	0
TOTALS:	980,146	899,105	257,335	344,376
			CUMULATIVE MWD ADVANCE DELIVERIES, 7/84 THROUGH 12/11:	789,752
			CUMULATIVE MWD ADVANCE DELIVERIES CONVERTED TO EXCHANGE DELIVERIES, 7/84 THROUGH 12/11:	587,169

(1) AS REPORTED BY METROPOLITAN WATER DISTRICT IN ITS MONTHLY "EXCHANGE DELIVERY SUMMARY IN ACRE-FEET" REPORTS AND ANNUAL SCHEDULES OF WATER DELIVERED TO DWA AND CVWD.

(2) 2000 CVWD/DWA EXCHANGE DELIVERY TO MWD CONSISTS OF 55,080 AF OF TABLE A WATER (90% ALLOCATION), 9,837 AF OF DWR'S 2000 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B) WATER AND 35,640 AF OF INTERRUPTIBLE (ARTICLE 21) WATER.

(3) 2001 CVWD/DWA EXCHANGE DELIVERY TO MWD CONSISTS OF 23,868 AF OF TABLE A WATER (39% ALLOCATION), AND 242 AF OF DWR'S 2001 TURN-BACK WATER POOL PROGRAM (SPECIFICALLY POOL B) WATER.

(4) 2002 CVWD/DWA EXCHANGE DELIVERY TO MWD CONSISTS OF 42,840 AF OF TABLE A WATER (70% ALLOCATION), 1,255 AF OF DWR'S 2002 TURN-BACKWATER POOL PROGRAM (436 AF OF POOL A AND 819 AF OF POOL B) WATER, AND 300 AF OF ARTICLE 21 WATER.

(5) 2003 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 37,213 AF OF TABLE A WATER (90% ALLOCATION = 55,080 AF. LESS 17,867 NOT DELIVERED BY MWD AND CREDITED TO DWA AND CVWD IN 2004), 515 AF OF DWR'S 2003 TURN-BACK WATER POOL PROGRAM (457 AF OF POOL A AND 58 AF OF POOL B) WATER, AND 532 AF OF ARTICLE 21 WATER.

(6) 2004 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 18,597 AF OF TABLE A WATER (30% ALLOCATION), 191 AF OF DWR'S 2004 TURN-BACK WATER POOL PROGRAM WATER (ALL FROM POOL B). 17,867 AF CREDITED TO DWA/CVWD FOR QUANTITY NOT DELIVERED BY MWD IN 2003.

(7) 2005 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 87,770 AF OF TABLE A WATER (50% ALLOCATION), AND 3,838 AF OF DWR'S 2005 TURN-BACK WATER POOL PROGRAM (585 AF OF POOL A AND 3,253 AF OF POOL B) WATER.

(8) 2006 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 171,100 AF OF TABLE A WATER (100% ALLOCATION).

(9) 2007 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 102,660 AF OF TABLE A WATER (60% ALLOCATION), AND 802 AF OF DWR'S 2007 TURN-BACK WATER POOL PROGRAM WATER (ALL FROM POOL A). MWD DELIVERED AN ADDITIONAL 16,000 AF TO THE WHITEWATER SPREADING BASINS PER ITS 12/23/03 QUANTIFICATION SETTLEMENT WITH CVWD.

(10) 2008 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 59,885 AF OF TABLE A WATER (35% ALLOCATION), AND 151 AF OF DWR'S 2008 TURN-BACK WATER POOL PROGRAM WATER (ALL FROM POOL A), 3,000 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN MWD AND CVWD, AND 1,836 AF OF WATER PURSUANT TO THE YUBA ACCORD. MWD DELIVERED 8,008 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO CVWD'S PVID CREDIT AND 503 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, NEITHER OF WHICH PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND ARE THEREFORE NOT INCLUDED HEREIN.

(11) 2009 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 57,710 AF OF TABLE A WATER (34% ALLOCATION), AND 93 AF OF DWR'S 2009 TURN-BACK WATER POOL PROGRAM WATER (35 AF OF POOL A AND 58 AF OF POOL B), 3,000 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN MWD AND CVWD, AND 3,482 AF OF WATER PURSUANT TO THE YUBA ACCORD AND OTHERS. MWD DELIVERED 7,992 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO CVWD'S PVID CREDIT AND 754 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, NEITHER OF WHICH PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND ARE THEREFORE NOT INCLUDED HEREIN.

(12) 2010 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 97,050 AF OF TABLE A WATER (57% ALLOCATION), 10,730 AF OF CARRYOVER WATER FROM 2009, AND 602 AF OF DWR'S 2010 TURN-BACK WATER POOL PROGRAM WATER (66 AF OF POOL A AND 536 AF OF POOL B). MWD DELIVERED 18,393 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO THE DMB PACIFIC LLC AND MWD QSA PURCHASES, AND 1,743 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, NONE OF WHICH PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND ARE THEREFORE NOT INCLUDED HEREIN.

(13) 2011 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 124,156 AF OF TABLE A WATER (64% ALLOCATION), 0 AF OF CARRYOVER WATER FROM 2010, AND 2,502 AF OF DWR'S 2011 TURN-BACK WATER POOL PROGRAM WATER (836 AF OF POOL A AND 1,666 AF OF POOL B), AND 5,800 AF OF ARTICLE 21 WATER. MWD DELIVERED 105,000 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO THE DMB PACIFIC LLC AND MWD QSA PURCHASES, AND 5,350 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, NONE OF WHICH PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND ARE THEREFORE NOT INCLUDED HEREIN.

EXHIBIT 7
METROPOLITAN WATER DISTRICT/COACHELLA VALLEY WATER DISTRICT/DESERT WATER AGENCY
WATER EXCHANGE AGREEMENT AND ADVANCE DELIVERY AGREEMENT
SUMMARY OF EXCHANGE AND ADVANCE DELIVERIES, JANUARY 2012 THROUGH DECEMBER 2015 (1)

YEAR	TOTAL CVWD/DWA EXCHANGE DELIVERY TO MWD (SWP) AF	MWD EXCHANGE DELIVERY TO CVWD/DWA RECHARGE BASINS AF	MWD ADVANCE DELIVERY TO CVWD/DWA RECHARGE BASINS AF	MWD ADVANCE DELIVERY CONVERTED TO EXCHANGE DELIVERY TO CVWD/DWA AF
2012[2]	158,909	280,673	117,764	0
2013[3]	70,879	28,998	0	60,889
2014[4]	10,919	7,858	0	11,609
2015[5]	48,813	171	0	48,642
TOTALS:	289,520	317,700	117,764	121,140

CUMULATIVE MWD ADVANCE DELIVERIES, 7/84 THROUGH 12/15:	907,516
CUMULATIVE MWD ADVANCE DELIVERIES CONVERTED TO EXCHANGE DELIVERIES, 7/84 THROUGH 12/15:	708,309
BALANCE OF MWD ADVANCE DELIVERIES AVAILABLE TO BE CONVERTED TO EXCHANGE DELIVERIES:	199,207
ARTIFICIAL RECHARGE THROUGH EXCHANGE DELIVERIES AND ADVANCE DELIVERIES SINCE 1973:	2,898,193
ARTIFICIAL RECHARGE THROUGH EXCHANGE DELIVERIES SINCE 1973:	2,698,986

(1) AS REPORTED BY METROPOLITAN WATER DISTRICT IN ITS MONTHLY "EXCHANGE DELIVERY SUMMARY IN ACRE-FEET" REPORTS AND ANNUAL SCHEDULES OF WATER DELIVERED TO DWA AND CVWD.

(2) 2012 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 126,166 AF OF TABLE A WATER (65% ALLOCATION), 31,124 AF OF CARRYOVER WATER FROM 2011, AND 431 AF OF DWR'S 2011 TURN-BACK WATER POOL PROGRAM WATER (431 AF OF POOL A AND 0 AF OF POOL B), 0 AF OF ARTICLE 21 WATER, 4,000 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN CVWD AND MWD, AND 1,188 AF OF WATER PURSUANT TO THE YUBA ACCORD AND OTHERS. MWD DELIVERED 134 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, WHICH DOES NOT PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND IS THEREFORE NOT INCLUDED HEREIN.

(3) 2013 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 26,824 AF OF TABLE A WATER (35% ALLOCATION), AND 230 AF OF DWR'S 2013 TURN-BACK WATER POOL PROGRAM WATER (230 AF OF POOL A AND 0 AF OF POOL B), 16,500 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN CVWD AND MWD, 2,508 AF OF THE SECOND SUPPLENMENT AGREEMENT BETWEEN CVWD AND MWD, AND 2,713 AF OF WATER PURSUANT TO THE YUBA ACCORD AND OTHERS.

(4) 2014 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 9,706 AF OF TABLE A WATER (5% ALLOCATION), 5,000 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN CVWD AND MWD, 3,549 AF OF THE SECOND SUPPLENMENT AGREEMENT .BETWEEN CVWD AND MWD, AND 1,213 AF OF WATER PURSUANT TO THE YUBA ACCORD AND OTHERS. MWD DELIVERED 0 AF OF WATER TO THE MISSION CREEK SPREADING BASIN PURSUANT TO THE CPV-SENTINEL AGREEMENT, WHICH DOES NOT PERTAIN TO THE ADVANCE DELIVERY ACCOUNT AND IS THEREFORE NOT INCLUDED HEREIN.

(5) 2015 CVWD/DWA EXCHANGE DELIVERIES TO MWD CONSIST OF 38,820 AF OF TABLE A WATER (20% ALLOCATION), 9,500 AF OF WATER PURSUANT TO THE GLORIOUS LAND AGREEMENT BETWEEN CVWD AND MWD, 67 AF OF THE MULTI-YEAR POOL WATER, AND 426 AF OF WATER PURSUANT TO THE YUBA ACCORD AND OTHERS.

EXHIBIT 8
DESERT WATER AGENCY
COMPARISON OF WATER PRODUCTION AND GROUNDWATER REPLENISHMENT
WHITEWATER RIVER SUBBASIN (WRS) AND MISSION CREEK SUBBASIN (MCS)

PRODUCTION[(1)]

	WRS AF		MCS AF		TOTAL AF		RATIO OF PRODUCTION	
YEAR	ANNUAL	CUMULATIVE	ANNUAL	CUMULATIVE	ANNUAL	CUMULATIVE	WRS/TOTAL	MCS /TOTAL
2002	213,410	213,410	13,968	13,968	227,378	227,378	93.9%	6.1%
2003	204,275	417,685	14,498	28,466	218,773	446,151	93.4%	6.6%
2004	212,700	630,385	16,548	45,014	229,248	675,399	92.8%	7.2%
2005	204,341	834,726	16,327	61,341	220,668	896,067	92.6%	7.4%
2006	213,850	1,048,576	17,365	78,706	231,215	1,127,282	92.5%	7.5%
2007	211,014	1,259,590	16,409	95,115	227,423	1,354,705	92.8%	7.2%
2008	210,693	1,470,283	15,775	110,890	226,468	1,581,173	93.0%	7.0%
2009	199,149	1,669,432	15,108	125,998	214,257	1,795,430	92.9%	7.1%
2010	182,415	1,851,847	14,304	140,302	196,719	1,992,149	92.7%	7.3%
2011	182,823	2,034,670	14,203	154,505	197,026	2,189,175	92.8%	7.2%
2012	183,108	2,217,778	14,082	168,587	197,189	2,386,364	92.9%	7.1%
2013	182,640	2,400,418	14,495	183,082	197,135	2,583,499	92.6%	7.4%
2014	174,186	2,574,604	13,834	196,916	188,021	2,771,520	92.6%	7.4%
2015	147,429	2,722,033	12,667	209,583	160,096	2,931,616	92.1%	7.9%

RECHARGE

	WRS AF		MCS AF		TOTAL AF		RATIO OF RECHARGE	
YEAR	ANNUAL	CUMULATIVE	ANNUAL	CUMULATIVE	ANNUAL	CUMULATIVE	WRS/TOTAL	MCS/TOTAL
2004	9,788	30,917	5,564	23,564	15,352	54,481	63.8%	36.2%
2005	181,277	212,194	24,723	48,287	206,000	260,481	88.0%	12.0%
2006	109,860	322,054	19,901	68,188	129,761	390,242	84.7%	15.3%
2007	8,020	330,074	1,011	69,199	9,031	399,273	88.8%	11.2%
2008	8,008	338,082	0	69,199	8,008	407,281	100.0%	0.0%
2009	60,024	398,106	3,336	72,535	63,360	470,641	94.7%	5.3%
2010	228,330	626,436	31,467	104,002	259,797	730,438	87.9%	12.1%
2011	232,214	858,650	20,888	124,890	253,102	983,540	91.7%	8.3%
2012	261,267	1,119,917	23,406	148,296	284,673	1,268,213	91.8%	8.2%
2013	26,619	1,146,536	2,379	150,675	28,998	1,297,211	91.8%	8.2%
2014	3,533	1,150,069	4,325	155,000	7,858	1,305,069	45.0%	55.0%
2015	865	1,150,934	171	155,171	1,036	1,306,105	83.5%	16.5%

(1) PRODUCTION IN BOTH DWA AND CVWD SERVICE AREAS.

EXHIBIT 9
DESERT WATER AGENCY
SUMMARY OF DELIVERIES TO METROPOLITAN WATER DISTRICT (MWD)
AND TO GROUNDWATER RECHARGE BASINS (AF)

	DELIVERY TO MWD									DELIVERY TO RECHARGE BASINS		
	TABLE A	SURPLUS WATER										
YEAR	ALLOCATION[1]	POOL A	POOL B	ARTICLE 21	FLOOD	YUBA	OTHER	TOTAL	TOTAL	WRS[1]	MCS[2]	TOTAL
1973	14,800								14,800	7,475		7,475
1974	16,400								16,400	15,396		15,396
1975	18,000								18,000	20,126		20,126
1976	19,600								19,600	13,206		13,206
1977	0								0	0		0
1978	25,384								25,384	0		0
1979	25,063								25,063	25,192		25,192
1980	27,884								27,884	26,341		26,341
1981	31,105								31,105	35,251		35,251
1982	34,326								34,326	27,020		27,020
1983	37,547								37,547	53,732		53,732
1984	40,768								40,768	83,708		83,708
1985	43,989								43,989	251,994		251,994
1986	47,210						10,000	10,000	47,210	298,201		298,201
1987	50,931								50,931	104,334		104,334
1988	54,652								54,652	1,096		1,096
1989	58,374								58,374	12,478		12,478
1990	61,200								61,200	31,721		31,721
1991	19,125								19,125	14		14
1992	27,540								27,540	40,870		40,870
1993	61,200								61,200	60,153		60,153
1994	37,359								37,359	36,763		36,763
1995	61,200								61,200	61,318		61,318
1996	61,200		103,641					103,641	164,841	138,266		138,266
1997	61,200		50,000		27,130			77,130	138,330	113,677		113,677
1998	61,200		75,000		20,156			95,156	156,356	132,455		132,455
1999	61,200		47,380					47,380	108,580	90,601		90,601
2000	55,080		9,837	35,640				45,477	100,557	72,450		72,450
2001	23,868		242					242	24,110	707		707
2002	42,840	436	819	300				1,555	44,395	33,435	4,733	38,168
2003	37,213	457	58	532				1,047	38,260	902	59	961
2004	36,464		191					191	36,655	13,224	5,564	18,788
2005	87,770	585	3,253					3,838	91,608	165,554	24,723	190,277
2006	171,100	0	0					0	171,100	98,959	19,901	118,860
2007	102,660	802	0					802	103,462	16,009	1,011	17,020
2008	59,885	151	0			1,836	3,000	4,987	64,872	8,008 [4]	0	0
2009	57,710	35	58			3,482	3,000	6,575	64,285	57,024 [5]	3,336	52,368
2010	107,780	66	536				18,393	18,995	126,775	228,330	31,467	259,797
2011	124,156	836	1,666	5,800			105,000	113,302	237,458	232,214	20,888	253,102
2012	157,290	431				1,188	4,000	5,619	162,909	257,267	23,406	280,673
2013	67,936	230				2,713	19,008	21,951	89,887	26,620	2,379	28,998
2014	9,706					1,213	8,549	9,762	19,468	3,533 [6]	4,325	7,858
2015	38,820					426	9,567	9,993	48,813	865 [7]	171	1,036
TOTAL[3]	2,238,735	4,029	292,681	42,272	47,286	10,858	180,517	577,643	2,806,378	2,896,489	141,963	3,022,451

(1) INCLUDING ARTICLE 56 CARRY-OVER
(2) WHITEWATER RIVER SUBBASIN.
(3) MISSION CREEK SUBBASIN. DELIVERIES PERTAINING TO CPV-SENTINEL ARE NOT SHOWN.
(4) SINCE 1973.
MWD DELIVERED 8,008 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO CVWD'S PVID CREDIT, WHICH DOES NOT PERTAIN TO THE ADVANCE
(5) DELIVERY ACCOUNT; THEREFORE THIS QUANTITY IS NOT ACCOUNTED FOR IN EXHIBIT 4.
MWD DELIVERED 7,992 AF OF WATER TO THE WHITEWATER SPREADING BASINS PURSUANT TO CVWD'S PVID CREDIT, WHICH DOES NOT PERTAIN TO THE ADVANCE DELIVERY ACCOUNT; THEREFORE THIS QUANTITY IS NOT ACCOUNTED FOR IN EXHIBIT 4.
(6) MWD DELIVERED 3,549 AF OF WATER TO THE WHITEWATER RIVER SPREADING BASINS PURSUANT TO CVWD'S SECOND SUPPLEMENTAL AGREEMENT TO THEIR DELIVERY AND EXCHANGE AGREEMENT FOR THE DELIVERLY OF 35 TAF, DATED JUNE 14, 2013. THIS DELIVERY IS ACCOUNTED FOR IN "OTHER" SURPLUS WATER IN THIS EXHIBIT.
(7) MWD DELIVERED 865 AF OF WATER TO THE WHITEWATER RIVER SPREADING BASINS PURSUANT TO CVWD'S SECOND SUPPLEMENTAL AGREEMENT TO THEIR DELIVERY AND EXCHANGE AGREEMENT FOR THE DELIVERLY OF 35 TAF, DATED JUNE 14, 2013. THIS DELIVERY IS ACCOUNTED FOR IN "OTHER" SURPLUS WATER IN THIS EXHIBIT.

EXHIBIT 10
DESERT WATER AGENCY AND COACHELLA VALLEY WATER DISTRICT
COMPARISON OF HISTORIC AND PROPOSED GROUNDWATER REPLENISHMENT
ASSESSMENT RATE FOR THE WHITEWATER RIVER AND MISSION CREEK SUBBASIN MANAGEMENT AREA

	DWA		CVWD WHITEWATER		CVWD MISSION CREEK	
YEAR	$/AF	% INCREASE	$/AF	% INCREASE	$/AF	% INCREASE
78/79	$6.81	---	No Assessment	---	No Assessment	---
79/80	$9.00	32%	No Assessment	---	No Assessment	---
80/81	$9.50	6%	$5.66	---	No Assessment	---
81/82	$10.50	11%	$7.43	31%	No Assessment	---
82/83	$21.00	100%	$19.82	167%	No Assessment	---
83/84	$36.50	74%	$33.23	68%	No Assessment	---
84/85	$37.50	3%	$34.24	3%	No Assessment	---
85/86	$31.00	-17%	$21.81	-36%	No Assessment	---
86/87	$21.00	-32%	$19.02	-13%	No Assessment	---
87/88	$22.50	7%	$19.55	3%	No Assessment	---
88/89	$20.00	-11%	$15.96	-18%	No Assessment	---
89/90	$23.50	18%	$19.66	23%	No Assessment	---
90/91	$26.00	11%	$23.64	20%	No Assessment	---
91/92	$31.75	22%	$25.66	9%	No Assessment	---
92/93	$31.75	0%	$28.23	10%	No Assessment	---
93/94	$31.75	0%	$31.05	10%	No Assessment	---
94/95	$31.75	0%	$34.16	10%	No Assessment	---
95/96	$31.75	0%	$37.58	10%	No Assessment	---
96/97	$31.75	0%	$37.58	0%	No Assessment	---
97/98	$31.75	0%	$42.09	12%	No Assessment	---
98/99	$31.75	0%	$47.14	12%	No Assessment	---
99/00	$31.75	0%	$52.80	12%	No Assessment	---
00/01	$33.00	4%	$59.14	12%	No Assessment	---
01/02	$33.00	0%	$66.24	12%	No Assessment	---
02/03	$35.00	6%	$72.86	10%	$59.80	---
03/04	$35.00	0%	$72.86	0%	$59.80	0%
04/05	$45.00	29%	$78.86	8%	$59.80	0%
05/06	$50.00	11%	$78.86	0%	$59.80	0%
06/07	$63.00	26%	$83.34	6%	$65.78	10%
07/08	$63.00	0%	$91.67	10%	$72.36	10%
08/09	$72.00	14%	$93.78	2%	$76.60	6%
09/10	$72.00	0%	$102.45	9%	$87.56	14%
10/11	$82.00	14%	$102.45	0%	$89.75	3%
11/12	$82.00	0%	$107.57	5%	$98.73	10%
12/13	$92.00	12%	$110.26	3%	$98.73	0%
13/14	$92.00	0%	$110.26	0%	$98.73	0%
14/15	$102.00	11%	$110.26	0%	$98.73	0%
15/16	$102.00	0%	$112.00	2%	$112.00	13%
16/17	$102.00 *	0%	$145.60 *	30%	$123.20	10%

* PROPOSED REPLENISHMENT ASSESSMENT RATE

APPENDIX A

APPENDIX A
UPPER COACHELLA VALLEY
MONTHLY AND ANNUAL RECORDED PRECIPITATION DATA
(INCHES)
2015

STATION NAME	WHITEWATER NORTH	SNOW CREEK	DESERT HOT SPRINGS	TACHEVAH DAM	TRAM VALLEY	CATHEDRAL CITY	THOUSAND PALMS	PALM SPRINGS SUNRISE	EDOM HILL	OASIS	MECCA LANDFILL III	THERMAL AIRPORT
STATION NUMBER	**233**	**207**	**57**	**216**	**224**	**34**	**222**	**442**	**436**	**431**	**432**	**443**
JANUARY	0.66	0.50	0.36	0.15	1.14	0.19	0.22	0.20	0.29	0.15	0.22	0.27
FEBRUARY	1.14	1.16	0.14	0.19	0.76	0.09	1.35	0.17	0.12	0.00	0.00	0.03
MARCH	0.72	1.18	0.48	0.46	1.05	0.57	0.50	0.57	0.45	0.30	0.29	0.34
APRIL	0.52	0.32	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAY	0.62	1.30	0.11	0.10	0.39	0.11	0.12	0.17	0.09	0.25	0.20	0.06
JUNE	0.01	0.00	0.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JULY	1.20	1.80	0.48	0.38	0.92	0.44	0.42	0.50	0.54	0.17	0.09	0.91
AUGUST	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.28	0.01	0.00
SEPTEMBER	1.31	1.09	0.33	0.20	0.58	0.06	0.07	0.16	0.17	0.08	0.11	0.03
OCTOBER	0.69	0.54	0.23	0.08	0.55	0.15	0.32	0.22	0.18	0.28	0.39	0.42
NOVEMBER	0.65	1.23	0.02	0.00	0.03	0.00	0.00	0.02	0.00	0.06	0.00	0.00
DECEMBER	1.52	1.53	0.29	0.02	0.46	0.02	0.04	0.07	0.04	0.00	0.00	0.02
TOTAL	**9.04**	**10.67**	**2.62**	**1.58**	**5.91**	**1.63**	**3.05**	**2.08**	**1.88**	**1.57**	**1.31**	**2.08**

NOTE: DATA SHOWN HEREIN WAS PROVIDED BY RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.

APPENDIX B

ADDENDUM TO SETTLEMENT AGREEMENT
MANAGEMENT AREA DELIVERIES

The Settlement Agreement between Coachella Valley Water District (CVWD), Desert Water Agency (DWA) and Mission Springs Water District (MSWD) dated December 7, 2004 shall be supplemented by the following Addendum, and thus shall be deemed a part thereof:

The Mission Creek Groundwater Replenishment Agreement provides for the delivery to the Mission Creek Subbasin, for groundwater replenishment, of a proportionate share of the imported water delivered to CVWD and DWA for replenishment of the Upper Coachella Valley Groundwater Basin. To ensure that the Mission Creek Subbasin receives its proportionate share of that water, as set forth in the Mission Creek Replenishment Agreement, and to provide for the monitoring thereof, the following procedures shall be applied:

Each year CVWD and DWA shall calculate the combined total quantity of water produced during the previous year from the Whitewater River Management Area and the Mission Creek Management Area, and from sources tributary to those Management Areas, and shall determine from that the percentages of the total production from those Management Areas and their sources.

Water supplies available to CVWD and DWA each year, through their respective State Water Project Contracts, for the replenishment of those Management Areas will be allocated and delivered to the Management Areas for groundwater replenishment in the same percentages, subject to delivery capability and operational constraints in any particular year.

In the event that additional subbasins benefit from recharge programs within CVWD and DWA boundaries, the respective production and recharge delivery percentages from those management areas in those subbasins shall be included in the above described calculations, allocations, and deliveries.

Production and recharge quantities shall be reviewed by the parties to the Management Committee (MSWD, CVWD and DWA) through the Management Committee process. CVWD and DWA will endeavor to accomplish annual proportionate management area deliveries; however, when constrained by operating limitations, they may over deliver or under deliver water to the management areas from year to year as necessary to obtain as much imported water as may be available. Cumulative water deliveries between or among management areas shall be balanced as and when determined by the Management Committee, but no later than 20 years from the date of the settlement agreement and each 20 years thereafter.

The provisions of this Addendum may be enforced by any party hereto.

IN WITNESS WHEREOF, The Parties have caused this Addendum to be executed by their duly authorized representatives on the date first above written.

MSWD:

Mission Springs Water District,
a California county water district

By _____

Its: President

By _____

Its: Vice President

DWA:

Desert Water Agency,
a public agency of the State of California

By _____

Its: President

By _____

Its: Vice President

CVWD:

Coachella Valley Water District,
a California county water district

By _____

Its: President

By _____

Its: Vice President