*PREPARED FOR*
Coachella Valley
Water District

# 2015 URBAN WATER MANAGEMENT PLAN

## Final Report

**July 1, 2016**

MWH

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# EXECUTIVE SUMMARY

The Coachella Valley Water District (CVWD) was formed in 1918 under the County Water District Act provisions of the California Water Code. In 1937, CVWD absorbed the responsibilities of the Coachella Valley Stormwater District that had been formed in 1915. CVWD now encompasses approximately 640,000 acres, mostly within Riverside County, but also extending into northern Imperial and northeastern San Diego counties. While a large part of the district's history is in agricultural irrigation, today it meets the water-related needs of more than 107,000 homes and businesses throughout its service area.

CVWD provides water-related services for its customers in the areas of urban water supply, wastewater collection and treatment, recycled water, agricultural irrigation, drainage management, imported water supply, groundwater replenishment, stormwater management and flood control, and water conservation.

## ES.1 Background

As an urban water supplier, CVWD is required to prepare an Urban Water Management Plan (UWMP) every five years in response to the requirements of the Urban Water Management Planning Act (UWMP Act), California Water Code Sections 10610 through 10656. This report has been prepared to comply with the requirements of the UWMP Act and is based on the recommended organization in the California Department of Water Resources (DWR) *Guidebook to Assist Urban Water Suppliers to Prepare a 2015 UWMP*, dated March 2016 (Guidebook).

CVWD's 2015 UWMP is a planning tool that documents actions in support of long-term water resources planning and ensures adequate water supplies are available to meet existing and future urban water demands. The UWMP:

- Accomplishes water supply planning over a 25-year period in five-year increments;
- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years; and
- Implements conservation and efficient use of urban water supplies.

## ES.2 Plan Preparation

CVWD reports all values and figures in its 2015 UWMP on a calendar-year basis in units of acre-feet (AF). Although CVWD's 2015 UWMP is an individual UWMP, CVWD has coordinated with other local agencies and the community. CVWD and the other participants in the Coachella Valley Regional Water Management Group (CVRWMG) held a coordination meeting on April 12, 2016 at Mission Springs Water District to discuss assumptions and approaches used in developing population and water demand forecasts, water supply assumptions, and conservation reporting. CVWD further notified cities and counties within their service area more than 60 days before the public hearing of the UWMP.

## ES.3 System Description

CVWD's agency boundary and urban water service area are shown on **Figure ES-1**. In 2015, CVWD's domestic water system provided 92,974 AF of water per year to 216,861 residents through 107,358 active meters. The pressurized pipeline distribution system has 30 pressure zones and consists of approximately 96 deep wells, over 2,000 miles of pipe, and 135 million gallons of storage in 61 enclosed reservoirs. The domestic water system consists of three separate public systems designated the Cove Community serving the valley floor from Cathedral City to the Salton Sea; Improvement District No. 8 (ID-8) serving the unincorporated Desert Edge, Sky Valley, and Indio Hills communities near the City of Desert Hot Springs; and Improvement District No. 11 (ID-11) serves the unincorporated communities of Bombay Beach, Desert Shores, Salton Sea Beach, and Salton City in northern Imperial County.

### ES.3.1 Climate

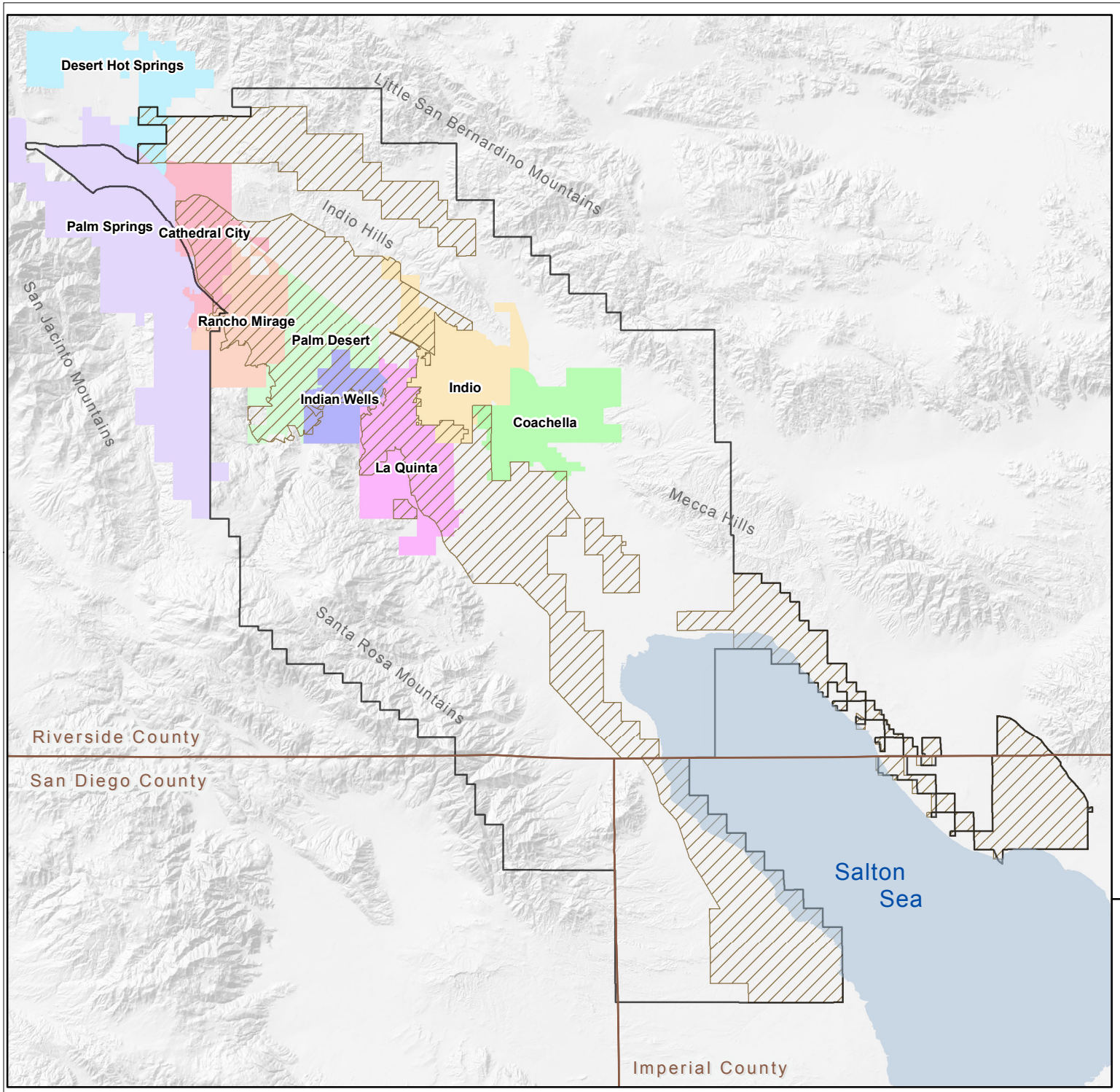
Most of the Colorado River region has a subtropical desert climate with hot summers and short, mild winters. Monthly average temperature reaches as high as 108 degrees Fahrenheit (F) and monthly average low temperatures 38 degrees F. The mountain ranges on the northern and western borders, in particular the San Bernardino and San Jacinto Mountains, create a rain shadow effect for most of the region. Annual average rainfall amounts on the Valley floor range from a little over 6 inches to less than 3 inches. Most of the precipitation for the region occurs in the winter and spring. However, monsoonal thunderstorms, spawned by the movement of subtropical air from the south, occur in the summer and can generate significant rainfall in some years.

### ES.3.2 Service Area Population

CVWD's service area includes the cities of Cathedral City, Indian Wells, La Quinta, Palm Desert, Rancho Mirage, portions of the City of Indio, and unincorporated land in Riverside and Imperial counties. The current and projected populations for the CVWD urban water service area are based on the following data sources:

- 2010 U. S. Census.
- 2015 California Department of Finance
- 2012 Southern California Association of Governments (SCAG) Adopted Growth Forecast
- DWR Population Tool

CVWD's urban water service area population for 2010 is estimated to be 212,029 and the 2015 population is estimated to be 216,900. The 2010 service area population was previously estimated to be 202,660 in the 2010 UWMP. The urban water service area population is projected to increase to 527,100 by 2040 if development occurs consistent with the SCAG growth forecasts. **Figure ES-2** illustrates the historical and projected urban water service area population estimates.




# Coachella Valley Water District Urban Water Service Area

## Key to Features

- CVWD Boundary
- CVWD Urban Water Service Area

Source: CVWD, Caltrans

Basemap Source:

N

0 2 4 8 Miles

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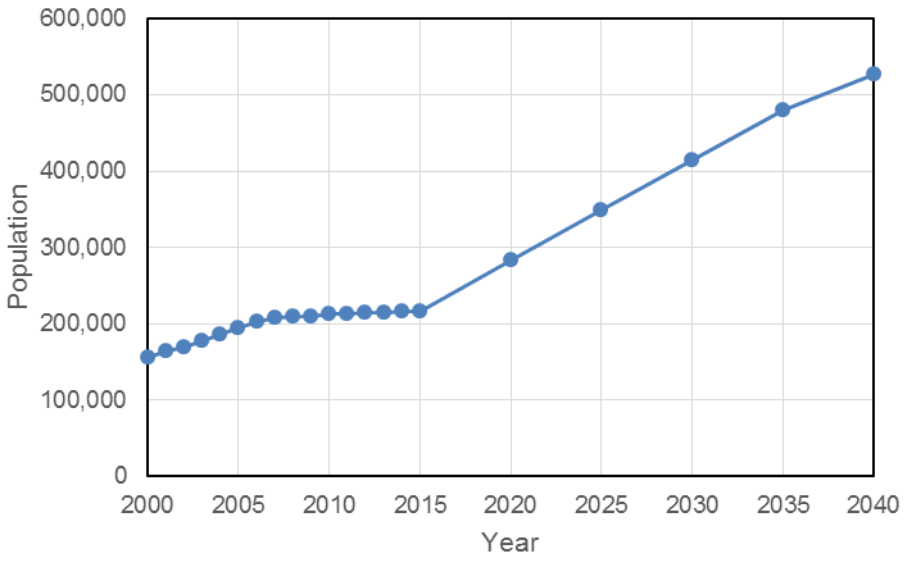
**Figure ES-1**

*Figure ES-2*
*Historical and Projected CVWD Service Area Population*




The Coachella Valley has some unique demographic characteristics that affect water use. An important consideration affecting per capita water use in the Coachella Valley is the region's large seasonal population, which is not counted by the federal census or other demographic data. The exclusion of the visitor population from per capita use calculations results in higher per capita values than would be observed in an area of predominantly permanent residents.

Due to its mild winter climate and recreational opportunities, the Valley is a popular destination for "snowbirds," people whose primary residence is outside the Valley but may live in the Valley for three to six months during the winter period. In addition, there are people who maintain second homes in the Valley and use them for shorter periods of time throughout the year to participate in the Valley's various sports, entertainment, and recreational activities.

For this UWMP, CVWD has estimated the seasonal/tourist of the Valley to be the equivalent of about 100,000 – 109,000 permanent residents. Of this amount, there are about 69 percent or about 70,000 seasonal visitors in the CVWD urban water service area.

## ES.4 System Water Use

CVWD's urban water system supplied 92,974 AF of groundwater during 2015 as shown in **Table ES-1**. This amount is about 18 percent less than the average use for the previous five years. Annual urban water demands are projected to increase to 194,300 AF by 2040 based on the estimated population growth.

In addition to urban water, CVWD operates several separate non-potable water systems that do not serve urban water customers. The Coachella Canal water distribution system was constructed to deliver Colorado River water for agricultural uses in the East Valley. Currently, Canal water supplies agricultural, golf course irrigation, fish farming operations, duck clubs, and recreational lake uses. CVWD operates two recycled water systems supplied by two water reclamation plants (WRPs): WRP-7

in north Indio and WRP-10 in Palm Desert. CVWD also operates one groundwater recharge facility in the East Valley and jointly operates two other recharge facilities with DWA, one located north of Palm Springs and the other in the Mission Creek Subbasin.

CVWD projects a wholesale of Canal water to Indio Water Authority (IWA) for urban use starting in 2020. These projected wholesale demands are also shown in **Table ES-1**. Total retail and wholesale demands are summarized in **Table ES-2** and include recycled water demands. Note that recycled water is reported in the tables with urban water demands to be consistent with the DWR standard tables, but recycled water is not a part of the urban water system.

*Table ES-1*
*Current and Projected CVWD Retail and Wholesale Demand*

| Use Type | Additional Description | Actual (AF) | Projected (AF) | | | | |
|---|---|---|---|---|---|---|---|
| | | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
| Single Family | Potable | 48,543 | 59,800 | 71,000 | 82,300 | 93,400 | 101,400 |
| Multi-Family | Potable | 6,490 | 8,000 | 9,500 | 11,000 | 12,500 | 13,600 |
| Commercial | Potable | 5,195 | 6,400 | 7,600 | 8,800 | 10,000 | 10,900 |
| Industrial | Potable | 0 | 0 | 0 | 0 | 0 | 0 |
| Institutional/ Governmental | Potable | 868 | 1,100 | 1,300 | 1,500 | 1,700 | 1,800 |
| Landscape | Potable | 21,513 | 26,500 | 31,500 | 36,500 | 41,400 | 44,900 |
| Other | Potable: construction | 799 | 1,000 | 1,200 | 1,400 | 1,500 | 1,700 |
| Losses | Potable: non-revenue water | 9,566 | 11,800 | 14,000 | 16,200 | 18,400 | 20,000 |
| **Total Retail Demand** | | **92,974** | **114,600** | **136,100** | **157,700** | **178,900** | **194,300** |
| Sales to other agencies | Canal water to IWA | 0 | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| **Total Wholesale Demand** | | **0** | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

NOTE: Potable system losses are conservatively assumed to scale linearly with demand as a result of system expansion.

*Table ES-2*
*Total Water Demands*

| | | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
|---|---|---|---|---|---|---|---|
| Retail | Potable and Raw Water (AF) | 92,974 | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Recycled Water Demand (AF) | 8,749 | 14,300 | 27,700 | 30,800 | 33,900 | 36,300 |
| | **Total Water Demand (AF)** | **101,723** | **128,900** | **163,800** | **188,500** | **212,800** | **230,600** |
| Wholesale | Potable and Raw Water (AF) | 0 | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Recycled Water Demand (AF) | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Total Water Demand (AF)** | **0** | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

Note:
Recycled water does not currently and is not projected to offset urban water demands, but is used to offset private groundwater pumping. Recycled water is reported in the tables with urban water demands to be consistent with the DWR standard tables, but recycled water is not a part of the urban water system.

## ES.5 Water Use Baselines and Targets

State law (SB 7-X7) required CVWD to reduce its per capita urban water use by 20 percent by the year 2020 compared to a ten-year baseline. CVWD evaluated its baseline per capita water use in the 2010 UWMP and determined it to be 591 GPCD. The 2020 per capita water use target was determined to be 473 GPCD. These values are high compared to other water systems in California because of CVWD's desert environment and the significant number of seasonal residents and tourists that visit the Coachella Valley each year.

The CVWD service population has been updated in this 2015 UWMP using the 2010 Census data. CVWD updated its baseline per capita water use and determined it to be 606 GPCD. The updated 2020 target is 485 GPCD; however, CVWD has elected to retain the lower 473 GPCD target for SB 7-X7 compliance.

CVWD is required to report its progress toward achieving its 2020 target in this 2015 UWMP. CVWD's urban per capita water use for 2015 was 383 GPCD, 19 percent lower than its 473 GPCD target for 2020.

## ES.6 System Water Supplies

Groundwater is the principal source of municipal water supply in the Coachella Valley. CVWD obtains groundwater from both Whitewater River and the Mission Creek subbasins. CVWD's non-urban, non-potable water supplies are comprised of recycled water and imported Colorado River water. Future urban supplies are projected to include treated and untreated Colorado River water and desalinated water from CVWD's agricultural drain system.

CVWD anticipates using treated Canal water as an urban potable supply starting in 2025 to reduce the amount of groundwater pumping; by 2040 Canal water is projected to meet 28 percent of total urban potable demand, while the rest is met by groundwater. CVWD also intends to supply untreated Canal water and desalinated agricultural drain water for urban landscaping to offset groundwater pumping. Recycled water currently serves golf customers, with a small portion of the total recycled water supply serving HOAs and minor landscapers totaling less than 400 AFY. The projected growth in recycled water supplies consists of golf and agriculture customers that are currently served by private groundwater wells.

Summaries of the existing and planned urban water supply volumes by source are presented on **Table ES-3**.

*Table ES-3*
*Current and Projected CVWD Retail and Wholesale Supply*

| Water Supply | Additional Detail on Water Supply | Actual (AF) | Projected (AF) | | | | |
|---|---|---|---|---|---|---|---|
| | | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
| Groundwater | Potable urban use | 92,974 | 113,400 | 102,100 | 112,700 | 106,600 | 101,000 |
| Purchased or Imported Water | Treated Canal water for potable urban use in East Valley [1] | 0 | 0 | 18,000 | 18,000 | 31,000 | 40,000 |
| **Urban Potable Subtotal** | | **92,974** | **113,400** | **120,100** | **130,700** | **137,600** | **141,000** |
| Purchased or Imported Water | Untreated Canal water for non-potable urban use in East Valley [1] | 0 | 1,200 | 11,000 | 17,000 | 26,300 | 33,300 |
| Desalinated Water | Desalinated drain water for non-potable urban use | 0 | 0 | 5,000 | 10,000 | 15,000 | 20,000 |
| **Urban Non-potable Subtotal** | | **0** | **1,200** | **16,000** | **27,000** | **41,300** | **53,300** |
| Recycled Water | WRP-7 [2] | 1,773 | 3,400 | 3,700 | 4,000 | 4,300 | 4,600 |
| Recycled Water | WRP-9 [2,3] | 80 | 0 | 0 | 0 | 0 | 0 |
| Recycled Water | WRP-10 [2] | 6,896 | 10,900 | 11,300 | 11,700 | 12,100 | 12,500 |
| Recycled Water | WRP-4 [2,4] | 0 | 0 | 12,700 | 15,100 | 17,500 | 19,200 |
| **Recycled Water Subtotal** | | **8,749** | **14,300** | **27,700** | **30,800** | **33,900** | **36,300** |
| **Total Retail Supply** | | **101,723** | **128,900** | **163,800** | **188,500** | **212,800** | **230,600** |
| Purchased or Imported Water | Sale of Canal water to IWA for potable use | 0 | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| **Total Wholesale Supply** | | **0** | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

NOTES:
[1] Total Colorado River allotment will increase from 397,000 AF in 2016 to 459,000 AF in 2026. Colorado River water supply does not sum to total right because of nonurban supply not shown on this table and projected wholesale to other agencies.
[2] Recycled water safe yield is based on total projected flows at each WWTP; surface discharge and percolated wastewater effluent is not included in the reasonably available supply estimates.
[3] WRP-9 was taken offline on July 15, 2015 and has been decommissioned.
[4] Assumes tertiary treatment is not available until after 2020 at WRP-4.

## ES.7 Water Supply Reliability Assessment

The available water supplies and demands for CVWD's service area are analyzed to understand the region's ability to satisfy demands during three scenarios: an average water year, single dry year, and multiple dry years. The historical supply availability during these years is used as an assumption for future reliability. Groundwater, Colorado River water from the Coachella Canal, recycled water, and

future desalinated drain water supplies are assumed to be fully reliable. SWP Exchange water reliability, which is not used as an urban supply, is based on the final allocations for the representative dry years selected: 35% of total Table A allocation for 2013, 5% for 2014, and 20% for 2015. **Table ES-4** and **Table ES-5** summarize the water year types and the urban supply and demand comparison for all year types, respectively.

*Table ES-4*
*Basis of Water Year Data*

| Year Type | Base Year | Available Supplies if Year Type Repeats | |
|---|---|---|---|
| | | Volume Available | % of Average Supply |
| Average Year | N/A[1] | | 100% |
| Single-Dry Year | 2014 | | 100% |
| Multiple-Dry Years 1st Year | 2013 | | 100% |
| Multiple-Dry Years 2nd Year | 2014 | | 100% |
| Multiple-Dry Years 3rd Year | 2015 | | 100% |
| NOTES: Groundwater, Colorado River water, recycled water, and desalinated drain water supplies assumed to remain at 100% of average year supply during dry years. [1] Average year is not applicable as supply amounts vary based on the QSA. | | | |

*Table ES-5*
*Supply and Demand Comparison for All Year Types – Urban Only*

| | | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
|---|---|---|---|---|---|---|
| **Retail** | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

## ES.8 Water Shortage Contingency Planning

Following the governor's drought emergency declaration, CVWD implemented its water shortage contingency plan through a series of ordinances with phased water use restrictions and a drought penalty rate structure:

- Ordinance 1414 – Stage 2 – 10% Mandatory Reduction;
- Ordinance 1419 – Stage 3 – 36% Mandatory Reduction;
- Ordinance 1422 – Stage 3 – Adopt Additional Watering Restrictions; 36% Mandatory Reduction
- Ordinance 1426 – Stage 3 – Replace Previous Ordinances, 32% Mandatory Reduction

After the SWRCB's adoption of revised regulations in May 2016, CVWD repealed these ordinances and adopted Ordinance 1422.3 which establishes Stage 2 restrictions that remains in effect until the SWRCB rescinds its emergency regulations.

Based on the experiences from the current drought, the domestic water shortage contingency plan provides the stages and action levels summarized in **Table ES-6**.

*Table ES-6*
*Stages of Urban Water Shortage Contingency Plan*

| Stage | Percent Supply Reduction | Water Supply Condition |
|---|---|---|
| 1 | 10% | Normal water supplies |
| 2 | 10% | 10% reduction in total groundwater and imported supplies relative to long-term average conditions |
| 3 | 25% | 25% reduction in total groundwater and imported supplies relative to long-term average conditions |
| 4 | 50% | 50% reduction in total groundwater and imported supplies relative to long-term average conditions |
| NOTES:<br>Stage 1 is voluntary reduction, stages 2 through 4 are mandatory reductions.<br>The Stage 2 and 3 reduction targets are flexible and may be adjusted by CVWD Board action based on actual supply conditions. | | |

CVWD currently implements the following consumption reduction methods in each respective water shortage contingency stage summarized in **Table ES-7**. The primary method for implementing water use reduction is through the water budget-based tiered rates structures and drought penalty charges for use in excess of the required reductions.

*Table ES-7*
*Stages of Water Shortage Contingency Plans – Consumption Reduction Methods*

| Stage | Consumption Reduction Methods by Water Supplier | Additional Explanation or Reference |
|---|---|---|
| Varies | Other | Voluntary Rationing - 10% projected reduction |
| Varies | Implement or Modify Drought Rate Structure or Surcharge | Demand Reduction Program - % reduction varies with stage |
| Varies | Expand Public Information Campaign | 10% projected reduction |
| Varies | Provide Rebates on Plumbing Fixtures and Devices | 10% projected reduction |
| Varies | Other | Mandatory Rationing - up to 50% projected reduction |
| Varies | Other | Flow Restrictions - up to 50% projected reduction |
| Varies | Other | Use Prohibitions - up to 50% projected reduction |

## ES.9 Demand Management Measures

CVWD has implemented a number of demand management measures (DMMs) to restrict water use and rebate programs to promote water use reductions. DMMs include:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system losses
- Landscape conservation programs and rebates
- Residential conservation programs and rebates
- Golf course and agricultural conservation programs and rebates

DMM implementation over the past five years is summarized in **Table ES-8** below.

*Table ES-8*
*Demand Management Measure Implementation Summary*

| Program | Completed Since Program Inception | Competed Since 2010 | Competed This Year |
|---|---|---|---|
| Landscape Plan Check | 704 | 504 | 67 |
| Residential Smart Controller Installations | 15,883 | 14,710 | 3,594 |
| Large Landscape Smart Controller Rebates | 1,321 | 1,211 | 416 |
| Residential turf conversions | 2,496 (3,537,632 sq. ft.) | 2,436 (3,457,851 sq. ft.) | 1,273 (1,674,695 sq. ft.) |
| Commercial/HOA turf conversions | 552 (5,500,549 sq. ft.) | 552 (5,500,549 sq. ft.) | 161 (1,448,967 sq. ft.) |
| Water Waste Investigations | 2,261 | 2,208 | 1,205 |
| Toilet Rebates | 1,183 | 1,183 | 603 |

## ES.10 Plan Adoption and Implementation

CVWD's 2015 UWMP includes the water use and planning data for the entire year of 2015. CVWD has notified cities, counties, and other stakeholders of their intent to update the UWMP (April 11, 2016) and the notice of public hearing (May 26, 2016). The list of stakeholders notified is shown on **Table ES-9**. Following adoption by board resolution and submittal to DWR, the 2015 UWMP will be made publicly available on CVWD's website.

*Table ES-9*
*Notification to Cities and Counties*

| City Name | 60 Day Notice | Notice of Public Hearing |
|---|---|---|
| La Quinta | x | x |
| Indio (Indio Water Authority) | x | x |
| Coachella (Coachella Water Authority) | x | x |
| Palm Desert | x | x |
| Cathedral City | x | x |
| Indian Wells | x | x |
| Rancho Mirage | x | x |
| Desert Water Agency | x | x |
| Mission Springs Water District | x | x |
| County of Riverside Transportation and Land Management Agency - Planning Department | x | x |
| Riverside County Flood Control and Water Conservation District | x | x |
| Riverside County Department of Public Health | x | x |
| Imperial County Planning and Development Services | x | x |
| Native American Tribes | x | x |
| **County Name** | **60 Day Notice** | **Notice of Public Hearing** |
| Riverside County | x | x |
| Imperial County | x | x |

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# SECTION 1 INTRODUCTION AND OVERVIEW

The Coachella Valley Water District (CVWD) was formed in 1918 under the County Water District Act provisions of the California Water Code. In 1937, CVWD absorbed the responsibilities of the Coachella Valley Stormwater District that had been formed in 1915. CVWD now encompasses approximately 640,000 acres, mostly within Riverside County, but also extending into northern Imperial and northeastern San Diego counties. While a large part of the district's history is in agricultural irrigation, today it meets the water-related needs of more than 107,000 homes and businesses throughout its service area.

CVWD provides water-related services for its customers in the areas of urban water supply, wastewater collection and treatment, recycled water, agricultural irrigation, drainage management, imported water supply, groundwater replenishment, stormwater management and flood control, and water conservation.

As an urban water supplier, Coachella Valley Water District (CVWD) is required to prepare an Urban Water Management Plan (UWMP) every five years in response to the requirements of the Urban Water Management Planning Act (UWMP Act), California Water Code Sections 10610 through 10656. This section provides an overview of the UWMP Act and recent legislative changes to the UWMP Act. The section further describes the coordination effort undertaken by CVWD during the preparation of its 2015 UWMP with other Coachella Valley agencies. The section concludes with an overview of the report organization.

Each section and subsection in this report is organized to follow the outline presented in the California Department of Water Resources (DWR) *Guidebook to Assist Urban Water Suppliers to Prepare a 2015 UWMP*, dated March 2016 (Guidebook).

## 1.1 Background and Purpose

An UWMP is a planning tool that documents the actions of urban water agencies to support long-term resources planning and ensure adequate water supplies are available to meet existing and future urban water demands. While the conservation and efficient use of urban water supplies are statewide and regional concerns, developing and implementing plans for efficient use can best be accomplished at the local level. Thus, an UWMP provides both managers and the public with a broad perspective of the water supply issues that may affect their service area. Furthermore, while a UWMP may specify a strategic plan for reliable water supplies, it is not a substitute for project-specific planning documents. The identification of opportunities within a UWMP are non-binding such that it neither commits a water management agency to pursue a particular opportunity, nor precludes a water management agency from exploring opportunities that were not identified in the plan. Additionally, should a project be approved for implementation within a service area, the appropriate detailed project plans and analyses must be prepared separate from the UWMP. In short, this UWMP is a planning tool, providing a framework for action, but not requiring specific project development or action. Water resources management in California is not a matter of certainty and planning projections may change in response to a number of factors. Thus, it is important that this UWMP be viewed as a long-term, general planning

document, rather than as an exact blueprint for supply and demand management. Development of this UWMP is intended to answer a series of planning questions including:

- What are the potential sources of water supply and what are their probable yields?
- What is the probable urban water demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How comparable are the supply and demand figures, assuming that the various probable supplies will be pursued by the implementing agency?
- How reliable are the water supplies under a range of hydrologic conditions?

The CVWD UWMP addresses these questions by identifying feasible and cost-effective opportunities to meet existing and future demands. CVWD will explore enhancements to supplies from traditional sources such as groundwater as well as other options, including water exchanges, water recycling, utilizing Colorado River water from the Coachella Canal, desalination, and water banking/conjunctive use. Each opportunity that is identified as a feasible option within the service area will further undergo specific, detailed evaluations to determine how each option would fit into the overall supply/demand framework, how each option would impact the environment, and how each option would affect urban water customers. The objective of these more detailed evaluations is to find the optimum combination of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five-year increments.
- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

In 2009, an amendment to the UWMP Act was passed (Senate Bill 7, or SB X7-7). This amendment requires a 20 percent reduction in per capita urban water use statewide by year 2020. SB X7-7 provides water conservation targets by region and requires each urban water supplier to develop interim (2015) and 2020 urban water use targets consistent with the requirements of the bill. CVWD's urban water use targets are presented in **Section 5** of this UWMP.

Additional recent changes and amendments to the UWMP Act that impact urban water suppliers include:

- Quantify and report on distribution system water losses.
- Submit the plan and standardized tables electronically to DWR.
- Provide narratives describing water demand management measures.

In summary, the Plan answers the questions: Will there be enough water to meet CVWD's projected urban water demands in future years? What combination of programs should be explored for making this water available?

It is the stated goal of CVWD to deliver a reliable and high quality water supply to their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

## 1.2 Urban Water Management Planning and the California Water Code

Below are a summary of the California Water Code (CWC) sections that are applicable to UWMPs and some of the major changes in the UWMP since its creation in 1983. Full detail of the CWC sections that are applicable to the UWMPs are found in Appendix A and Appendix C of the 2015 UWMP Guidebook.

### 1.2.1 Urban Water Management Planning Act of 1983

Assembly Bill (AB) 797 established the UWMP Act on September 21, 1983. Passage of this law by the California Legislature recognized that water is a limited resource and that efficient water use and conservation would be actively pursued throughout the State. Conservation and efficient water use is a statewide concern, but the planning of water use and implementation of water conservation is best accomplished at the local level. The UWMP Act requires water suppliers in California, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water, to prepare and adopt a plan every five years which defines their current and future water use, sources of supply, source reliability, and existing conservation measures over the next 25 years. Although not required by the Act, a 25-year planning period is often used because the UWMP is an important source document for water supply assessments for large developments that may be prepared over the five years after the UWMP is adopted. The UWMP Act requires that each water supplier prepare or update its UWMP every five years in years ending in five and zero. The plan is to be submitted to Department of Water Resources (DWR). The UWMP Act has been amended a number of times since its original adoption to incorporate new requirements that enhance the reporting requirements.

### 1.2.2 Applicable Changes to the California Water Code since 2010 UWMPs

The CWC is constantly being adapted to reflect the current water environment. SB X7-7 was added in 2009 to address the existing drought. Since 2010, eight changes to the UWMP sections of the CWC have been adopted and are described below:

1) Demand Management Measures: Requires water suppliers to provide a narrative of their existing demand management measures, the actions completed over the past five years to meet their demand management measures, and required tasks to meet their water use targets.
2) Submittal Date: The 2015 UWMP must be submitted to the DWR by July 1, 2016.
3) Electronic Submittal: The plan, or amendments, are to be electronically submitted to DWR.
4) Standardized Forms: DWR created standardized UWMP forms that are to be included in the Plan.
5) Water Loss: Requires the plan to report on water loss within the distribution system.

6) Estimating Future Water Savings: Allows for water use projections to take into account water savings estimated from adopted codes, standards, or ordinances when the information is available.

7) Voluntary Reporting of Energy Intensity: A supplier can include energy related information, such as estimates of energy to provide water.

8) Defining Water Features: Water features artificially supplied with water (such as ponds, lakes, waterfalls, and fountains) shall be defined separately from swimming pools and spas.

A more detailed description of these changes are included in Appendix C of the 2015 UWMP Guidebook.

The 2010 UWMP used population projections based on 2000 census data and population growth models developed in 2008 before the recent economic recession. These population projections were then used to develop the per capita 2020 water use goals. After the 2010 census data was released in 2011, the actual service area population was lower than the projected population, thus affecting the 2020 water use goals. Therefore, as part of the 2015 UWMP, the population used in calculating the 2020 water use goals in the 2010 UWMP is updated to reflect the population derived from the 2010 census data. New 2020 water use goals are established in the 2015 UWMP.

### 1.2.3 Water Conservation Act of 2009 (SB X7-7)

The most significant amendment to the UWMP Act was Senate Bill 7 of the 7th Extraordinary Session (SB X7-7 Steinberg) passed in late 2009, which requires a 20 percent reduction in per capita use by the year 2020. The California 20x2020 Program (Program) is a statewide municipal water conservation program. In February 2008, Governor Arnold Schwarzenegger established a statewide goal of 20 percent reduction in urban per capita use of potable water by the year 2020. When the Bill was established, urban water users in California consumed 8.7 million AFY of potable water; under the Program, Californians would save enough water (approximately 1.74 million AFY) to serve more than two million families each year. The California State Water Resources Control Board (SWRCB) in concert with DWR and five other state agencies prepared the *20x2020 Water Conservation Plan,* which sets forth a statewide road map to maximize the state's urban water efficiency and conservation opportunities between 2009 and 2020, and beyond (SWRCB, 2010).

SB X7-7 requires a statewide reduction in urban per capita water usage of 20 percent by December 31, 2020. The bill also requires that the state achieve incremental progress toward the goal by reducing the per capita usage by 10 percent by December 31, 2015. The bill requires each urban water supplier to develop interim and final urban water use targets consistent with the requirements of the bill. Urban water suppliers are required to comply with the requirements established by the bill on or before July 1, 2016 in order to be eligible for state water grants or loans.

DWR has developed specific guidelines to address the SB X7-7 requirements in the 2015 UWMP. These requirements are addressed in the subsequent sections of this report.

Methods to calculate baseline demands and water use targets have been developed by DWR in accordance with the law, and are provided in the DWR Guidebook. The law provides flexibility to the

agency preparing the UWMP to develop baseline demands and water use targets using methodologies of their choice.

There are currently two methods listed in the DWR Guidebook in accordance with SB X7-7 on how to establish a baseline demand (designated as *base daily per capita water use*):

- 10-year average per capita use for periods ranging from 1995-2004 to 2001-2010, or
- 15-year average if recycled water use is greater than or equal to 10 percent of the demand

The law requires each retail water supplier to develop urban water use targets by July 1, 2011 using one of the following methods:

1. Eighty (80) percent of the urban retail water supplier's base daily per capita water use.
2. The per capita daily water use that is estimated using the sum of the following performance standards:
    a. For indoor residential water use, 55 gallons per capita daily (GPCD) water use as a provisional standard. Upon completion of the DWR's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.
    b. For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the state's Model Water Efficient Landscape Ordinance.
    c. For commercial, industrial, and institutional (CII) uses, a 10-percent reduction in water use from the baseline CII water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). For the South Coast hydrologic region, this target is 142 GPCD.
4. The difference between the base daily per capita water use and the estimated water savings from indoor residential use, unmetered water deliveries, CII use, landscape use, and system water loss.

A more detailed description of these methodologies is provided in **Section 5**.

## 1.3 Urban Water Management Plans in Relation to Other Planning Efforts

Water resources planning encompasses more than just the most recent UWMP. CVWD utilizes other documents and planning processes as necessary in order to develop a more complete and effective UWMP. Some of these documents include:

- 2010 Coachella Valley Water Management Plan Update (adopted in January 2012)
- 2010 Mission Creek/Garnet Hill Water Management Plan (adopted in January 2013)
- 2010 CVWD Urban Water Management Plan (adopted in June 2011)

- 2014 Report Card for the 2010 Coachella Valley Water Management Plan Update
- 2014 Coachella Valley Integrated Regional Water management Plan Update

## 1.4 Funding Eligibility

California law requires urban retail water suppliers must comply with water conservation requirements established by the Water Conservation Act of 2009 in order to be eligible for State water grants or loans beginning in 2016. This Act also requires a retail water agency to meet its 2015 Interim Urban Water Use Target and report compliance in the 2015 UWMP. As described in Section 5, CVWD's 2015 Interim Water Use Target as established in its 2010 UWMP was 532 gpcd and its 2020 Water Use Target was 470 gpcd, while its actual per capita water use was 387 gpcd, significantly exceeded both its interim 2015 target and its 2020 target. Therefore, CVWD has met the water conservation requirements to be eligible for State water grants or loans.

## 1.5 UWMP Organization

The 2015 UWMP follows the organizational guidance suggested in DWR's 2015 UWMP Guidebook. Each report section and/or subsection includes the relevant CWC section in *italics*.

**Section 1 - Introduction and Overview.** Provides a discussion on the importance and extent of CVWD's water management planning efforts.

**Section 2 - Plan Preparation.** Provides information on CVWD's process for developing the UWMP, including efforts in coordination and outreach.

**Section 3 - System Description.** Includes maps of the service area, a description of the service area and climate, public water system(s), and the CVWD's organizational structure and history.

**Section 4 - System Water Use.** Describes and quantifies the current and projected urban water uses within CVWD's service area.

**Section 5 - Baselines and Targets.** Describe CVWD's methods for calculating baseline and target urban water consumption. Demonstrates achievement of the 2015 interim water use target and CVWD's plans for achieving their 2020 water use target.

**Section 6 - System Supplies.** Describes and quantifies current and projected sources of urban water available to CVWD. Also includes discussion of potential recycled water uses and supply availability.

**Section 7 - Water Supply Reliability.** Describes the reliability of CVWD's water supply and projects the reliability for the next 25 years. This description includes an analysis for normal, single dry years, and multiple dry years.

**Section 8 - Water Shortage Contingency Planning.** Provides CVWD's staged plan for dealing with water shortages, including a catastrophic supply interruption.

**Section 9 - Demand Management Measures.** Describes CVWD's efforts to promote conservation and to reduce demand on their water supply and addresses several demand management measures.

**Section 10 - Plan Adoption, Submittal, and Implementation.** Describes the steps taken by CVWD to adopt and submit the UWMP and to make it publicly available. Includes a discussion of CVWD's plan to implement the UWMP.

**Section 11 – References**. Listing of references used in the preparation of this UWMP.

The following appendices support the information presented in this UWMP.

**Appendix A – UWMP Checklist**

**Appendix B – 2015 UWMP Standardized Tables**

**Appendix C – SB X7-7 Standardized Tables**

**Appendix D – Population and Demand Forecasts for the Coachella Valley**

**Appendix E – CVWD Water Shortage Contingency Plan Ordinance (Ordinance No. 1422.3)**

**Appendix F – CVWD Landscape Ordinance (Ordinance No. 1302.2)**

**Appendix G – CVWD Board Resolution of Adoption, Proof of Publication Affidavits, and Public Notices**

**Appendix H – 2014-15 Annual Review and Water Quality Report**

**Appendix I – Coachella Valley Water Management Plan Update – Executive Summary**

**Appendix J – Mission Creek-Garnet Hill Water Management Plan – Executive Summary**

**Appendix K – AB 1420 Self-Certification**

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# SECTION 2 PLAN PREPARATION

This section provides information on CVWD's process for developing this UWMP, including efforts in coordination and outreach.

## 2.1 Basis for Preparing a Plan

***CWC §10617***

*"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems …*

***CWC §10620***

*(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

***CWC §10621***

***(a)** Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).*

***(d)** Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*

In accordance with the cited sections of the California Water Code (CWC), urban water suppliers must develop a UWMP every five years. An "urban water supplier" is a supplier providing water for municipal purposes to more than 3,000 service connections or supplying 3,000 or more acre-feet (AF) of water per year. CVWD has 107,358 municipal service connections and, therefore, surpasses the 3,000 service connection threshold and has prepared a 2015 UWMP.

### 2.1.1 Public Water Systems

***CWC §10644***

***(a)(2)** The plan, or amendments to the plan, submitted to the department … shall include any standardized forms, tables, or displays specified by the department.*

***CWC §10608.52***

***(a)** The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.*

***(b)** At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24. … The form*

*shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.*

***California Health and Safety Code §116275***

***(h)** "Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

CVWD operates a Public Water System (PWS) that meets the definition of the Water Code and the Health and Safety Code and, therefore, is required to prepare and submit a 2015 UWMP. CVWD has used the standardized forms and tables described in the 2015 UWMP Guidebook (California Department of Water Resources, 2016).

### 2.1.2 Agencies Serving Multiple Service Areas/Public Water Systems

CVWD serves municipal customers through three public water systems, summarized in **Table 2-1** below. CVWD has elected to submit a single UWMP for its entire service area,

*Table 2-1*
*Public Water Systems (DWR Table 2-1 R)*

| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 (AF) |
|---|---|---|---|
| CA3310001 | CVWD - Cove Community | 103,076 | 89,050 |
| CA1310011 | CVWD - ID No. 11 | 2,740 | 1,357 |
| CA3310048 | CVWD - ID No. 8 | 1,542 | 2,567 |
| **TOTAL** | | 107,358 | 92,974 |

Reference: (Coachella Valley Water District, 2016)

## 2.2 Regional Planning

Regional planning can deliver multiple benefits for individual agencies by reducing costs and managing water supply on a geographical basis rather than by political boundaries. The five principal water supply agencies that exist in the Coachella Valley include:

- Coachella Valley Water District (CVWD)
- Desert Water Agency (DWA)
- Mission Springs Water District (MSWD)
- Indio Water Authority (IWA)
- Coachella Water Authority (CWA)

Together, with Valley Sanitary District, this group formed the Coachella Valley Regional Water Management Group (CVRWMG) and completed the Coachella Valley Integrated Regional Water Management Plan to derive benefits of regional planning that include water supply reliability, improved water quality, increased regional self-reliance, and reduced conflict over resources. Agencies

coordinate monthly and together have successfully secured over $18 million in Proposition 84 funding for the Coachella Valley Region.

Although the Coachella Valley water agencies coordinate as a group, each agency is unique in purpose, funding, demographics, water use, and services provided. Therefore, CVWD and the other water agencies develop their UWMPs individually, but include much of the same water management actions and objectives developed through regional planning.

## 2.3 Individual or Regional Planning and Compliance

The UWMP Act allows water agencies to prepare their plans either individually or by participation in an area wide, regional, watershed, or basin-wide urban water management plan. In addition, the Water Conservation Act of 2009 allows agencies to report progress toward achieving water conservation targets on an individual or regional basis. CVWD has elected the individual reporting method for this UWMP. CVWD has developed an UWMP that reports solely on its service area. This UWMP addresses all requirements of the CWC. DWR Table 2-2 is presented in **Appendix B**.

## 2.4 Fiscal or Calendar Year and Units of Measure

***CWC §10608.20***

***(a)(1)*** *Urban retail water suppliers … may determine the targets on a fiscal year or calendar year basis.*

***CWC §10608.40***

*Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.*

The 2015 UWMP Guidebook requests The 2015 UWMP reports water use on a calendar year basis and all volumes are expressed in units of acre-feet (AF), unless otherwise indicated. CVWD's progress toward meeting its urban water use targets are described in Section 5. DWR Table 2-3 is presented in **Appendix B**.

## 2.5 Coordination and Outreach

***CWC §10631***

***(j)*** *An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

# Section 2
# Plan Preparation

According to CWC §10631, an urban water supplier that relies on water from a wholesaler must provide the wholesaler with water use projections for that supplier for the next 20 years. However, CVWD receives no water from a wholesale supplier and meets all their water demands through their own supplies.

## 2.5.1 Wholesale and Retail Coordination

CVWD is a regional water supplier and is not supplied by a wholesale supplier to meet its water demands. CVWD does not currently provide wholesale water to other water agencies; however, CVWD may provide water to other water agencies in the future. Relevant DWR wholesale tables are included for demand and supply projections with projected future sales of water to other water agencies. DWR Table 2-4 is presented in **Appendix B**.

## 2.5.2 Coordination with Other Agencies and the Community

***CWC §10620***

***(d)(2)*** *Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

***CWC §10642***

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan ...*

CWC §10620 requires urban water suppliers to coordinate their plans with other appropriate agencies in within the area. CVWD sent out a letter to the following stakeholders and adjacent agencies to ask for input into their 2015 UWMP.

- Desert Water Agency
- Mission Springs Water District
- City of La Quinta
- City of Indio (Indio Water Authority)
- City of Coachella (Coachella Water Authority)
- City of Palm Desert
- City of Cathedral City
- City of Indian Wells
- City of Rancho Mirage
- Myoma Dunes Mutual Water Company
- County of Riverside Transportation and Land Management Agency - Planning Department

- Riverside County Flood Control and Water Conservation District
- Riverside County Department of Public Health
- Imperial County Planning and Development Services
- Native American Tribes

CVWD and the other participants in the CVRWMG held a coordination meeting on April 12, 2016 at Mission Springs Water District to discuss assumptions and approaches used in developing population and water demand forecasts, water supply assumptions, and conservation reporting.

### 2.5.3 Notice to Cities and Counties

***CWC §10621***

***(b)*** *Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

CWC §10621 requires the urban water supplier to notify the cities and counties that are within their service area 60 days before the public hearing of the UWMP. CVWD's urban water service area is located within Riverside County and Imperial counties, overlying a large part of the Coachella Valley, and has sent a letter to the cities and agencies mentioned above. A copy of the letter and the list of is presented in **Appendix G**. The CVWD agency boundary also includes the northeastern portion of San Diego County; however, CVWD provides no urban water services in this area.

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# SECTION 3 SYSTEM DESCRIPTION

This section describes the CVWD urban water service area and population.

## 3.1 General Description

***CWC §10631***

*A plan shall be adopted in accordance with this chapter that shall do all of the following:*

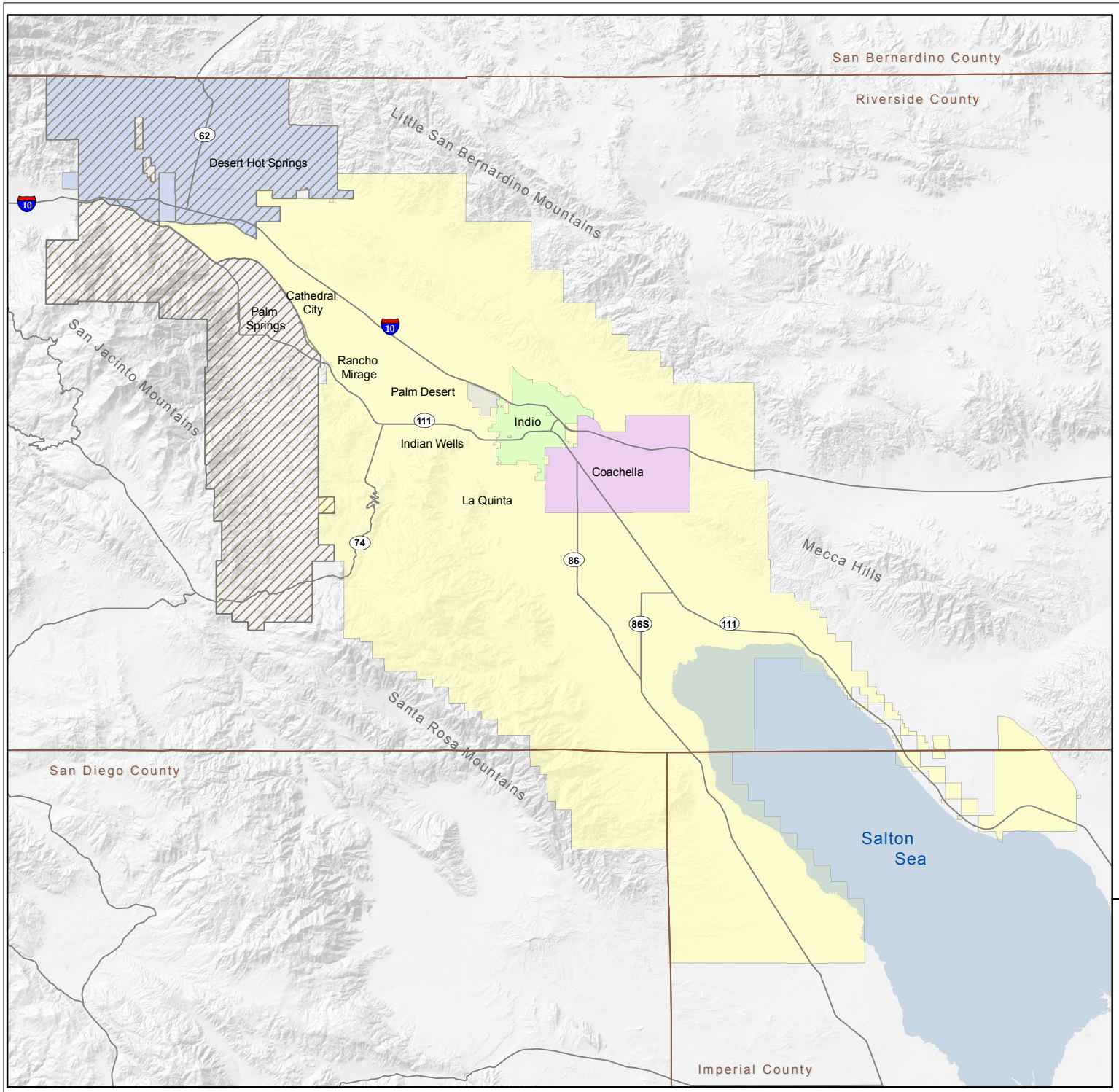
***(a)*** *Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

The Coachella Valley lies in the northwestern portion of a great valley, the Salton Trough, which extends from the Gulf of California in Mexico northwesterly to the Cabazon area. This area lies primarily in Riverside County but also extends into northern San Diego County and northeastern Imperial County. The Colorado River enters this trough, and its delta has formed a barrier between the Gulf of California and the Coachella Valley. The Coachella Valley is ringed with mountains on three sides. On the west and north sides are the Santa Rosa, San Jacinto, and San Bernardino Mountains, which rise more than 10,000 feet above mean sea level (ft msl). To the northeast and east are the Little San Bernardino Mountains, which attain elevations of 5,500 ft msl (CVWD, 2011). The Whitewater River and its tributaries, including the San Gorgonio River, Mission Creek, and Little and Big Morongo Creeks, and Box Canyon Wash, drain the major portion of the Valley.

The Coachella Valley is geographically divided into the West Valley and the East Valley. Generally, the West Valley, which includes the cities of Palm Springs, Cathedral City, Rancho Mirage, Indian Wells and Palm Desert, has a predominately resort/recreation-based economy that relies on groundwater as its principal water source. The East Valley, which includes the cities of Coachella, Indio and La Quinta and the communities of Bermuda Dunes, Mecca, and Thermal, has an agricultural-based economy utilizing groundwater and Colorado River water imported through the Coachella Canal. The East Valley lies southeast of a line generally extending from Point Happy (a rocky outcrop of the Santa Rosa Mountains near Washington Street and Highway 111) northeast to the Indio Hills near Jefferson Street, and the West Valley is northwest of this line. The CVWD institutional area also includes the western and eastern shores of the Salton Sea which relies on groundwater pumped from the Whitewater River Subbasin.

### 3.1.1 Water Service Agencies in the Region

In addition to providing background information on CVWD, this section also presents background information on the other agencies in the Valley, as all of the agencies are working together towards the implementation of an integrated regional water management plan. **Figure 3-1** illustrates the boundaries of the largest water service agencies in the Coachella Valley.




# Coachella Valley Water Agency Boundaries

## Key to Features

- Coachella Valley Water District
- Coachella Water Authority
- Desert Water Agency
- Mission Springs Water
- Myoma Dunes Water District
- Indio Water Authority
- Highway
- County Boundary
- Waterbody

Source: CVWD, Caltrans, DWR, CalAtlas

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MWH

**Figure 3-1**

#### 3.1.1.1 Coachella Valley Water District

CVWD was formed in 1918 under the County Water District Act provisions of the California Water Code. In 1937, CVWD absorbed the responsibilities of the Coachella Valley Stormwater District that had been formed in 1915. CVWD now encompasses approximately 640,000 acres, mostly within Riverside County, but also extending into northern Imperial and northeastern San Diego counties. CVWD is governed by a board of five directors, elected by district voters to four-year terms. Each director lives in and represents one of five directorial divisions in the district, and is elected by voters who also reside in that division.

CVWD is a Colorado River water importer and a California State Water Project contractor. The water-related services provided by CVWD include irrigation water delivery and agricultural drainage, domestic water delivery, wastewater reclamation and recycling, stormwater protection, and groundwater recharge. CVWD is the largest urban water supplier in the Coachella Valley with 113,003 municipal connections serving 92,974 AF of potable water in 2015.

**Domestic Water Delivery**

In 2015, CVWD's domestic water system provided 92,974 acre-feet of water per year to 212,871 residents through 107,358 active meters. The pressurized pipeline distribution system has 30 pressure zones and consists of approximately 96 groundwater production wells, 2,000 miles of pipe, and 135 million gallons of storage in 61 enclosed reservoirs.

**Irrigation Water Delivery and Agricultural Drainage**

CVWD's irrigation system provides approximately 392,000 acre-feet per year (AFY) of Colorado River water to over 1,100 customers covering 76,354 acres via the 123-mile, concrete-lined, Coachella Branch of the All American Canal. The irrigation distribution system consists of 485 miles of buried pipe, 19 pumping plants, and 1,300 acre-feet (AF) of storage.

Due to a high perched groundwater table and concentration of salts in irrigated soils within CVWD's service area, an agricultural drainage system is necessary. CVWD operates and maintains an agricultural drainage system consisting of 166 miles of buried pipe ranging in size from 18 inches to 72 inches in diameter and 21 miles of open channels to serve as a drainage network for irrigated lands. The system receives water from on-farm drainage lines. In most areas, the drainage system flows to the Coachella Valley/Whitewater River Stormwater Channel; however, in areas near the Salton Sea, a number of open channels convey flows directly to the sea.

**Wastewater Reclamation and Recycling**

CVWD's wastewater reclamation system collects and treats approximately 18.3 million gallons per day (MGD) from approximately 98,000 user accounts. The system consists of approximately 1,100 miles of collection piping and five water reclamation plants. Some areas within the CVWD service area remain on septic systems. In addition, two of the water reclamation plants recycle an average of about 8 MGD for golf course and municipal irrigation. The recycled water distribution system serves a total of 16 customer accounts through 15 miles of pressurized distribution pipelines. The main focus of the recycled water system is to provide non-potable water to golf customers.

In 2009, CVWD completed Phase 1 of the Mid-Valley Pipeline Project, a $75 million non-potable pipeline distribution system that will expand its existing recycled water distribution system to serve approximately 50 golf courses that currently use groundwater for irrigation purposes. The Mid-Valley Pipeline will deliver Coachella Canal water to the expanded recycled water system as a secondary source of supply. This project will help maximize the use of recycled water and reduce groundwater pumping by as much as 50,000 AFY. Currently, 16 golf courses receive recycled and Canal water from the Mid-Valley Pipeline system.

**Stormwater Protection**

CVWD provides regional flood protection for its stormwater unit within the Coachella Valley. CVWD's stormwater unit extends from the Whitewater River Spreading area to Salton City, encompassing approximately 378,000 acres. CVWD's regional flood control system consists of a series of debris basins, levees, and stormwater channels that divert floodwaters from the canyons and alluvial fans surrounding the Coachella Valley to the 49-mile Whitewater River/Coachella Valley Stormwater Channel (CVSC) that flows to the Salton Sea.

**Groundwater Recharge**

CVWD operates and maintains groundwater recharge facilities at two locations in the Coachella Valley: the Whitewater River Spreading area and the Thomas E. Levy Groundwater Replenishment Facility. Also, CVWD and the Desert Water Agency (DWA) jointly operate and maintain the Mission Creek Recharge Facility to replenish the aquifer underneath the western Valley since 2003.

CVWD has operated and maintained recharge facilities at the Whitewater River Spreading area since 1919, first with local surface runoff and, since 1973, with imported State Water Project water. The Whitewater River Spreading area facilities cover 700 acres and consist of two diversion dikes and a series of 19 ponds adjacent to the Whitewater River. Local runoff and State Water Project water deliveries are transported to the ponds via the Whitewater River, and then diverted into the recharge ponds at two locations by diversion dikes. Since its introduction in 1973, over three million acre-feet of water have been recharged at this facility.

The Thomas E. Levy Recharge Facility has been operational since June 2009 with a capacity of 40,000 AFY. The Martinez Canyon Pilot Recharge Facility is a 3,000 AFY recharge project to replenish the East Valley's aquifer that is currently off-line. The source of recharge water for both the Thomas E. Levy Replenishment Facility and Martinez Canyon Pilot Recharge Facility is Colorado River water delivered by CVWD's irrigation system.

#### 3.1.1.2 Desert Water Agency

Desert Water Agency (DWA) serves an area of about 325 square miles, including outlying county areas, part of Cathedral City, and most of Palm Springs. The DWA was formed in 1961 to import water from the State Water Project in an effort to provide a reliable local water supply to its customers. DWA is a public agency of the State of California. In 1968, the DWA entered the retail water business by purchasing the Cathedral City and Palm Springs water companies. The DWA is governed by a five-person Board of Directors, elected by citizens within DWA boundaries. Additionally, the DWA produces

and sells electrical power produced by two hydroelectric generating plants and, in 2005, it began using solar power for the DWA Operation Center.

The DWA employs an extensive system network, including: a domestic water delivery system, an irrigation water delivery system, wastewater collection system, and water reuse and groundwater recharge systems.

#### 3.1.1.3 Mission Springs Water District

The Mission Springs Water District (MSWD) began as a mutual water company in the late 1940s. By 1953, it had evolved into an incorporated entity, the Desert Hot Springs County Water District. That name was changed to Mission Springs Water District in 1987. MSWD's service area consists of 135 square miles, including the City of Desert Hot Springs, 10 smaller communities in Riverside County, and communities in the City of Palm Springs. MSWD is governed by a five-member board, elected from at-large representation to four-year terms. MSWD provides water services to residential and commercial customers through three independent distribution systems.

#### 3.1.1.4 Indio Water Authority

Incorporated in 1930, the City of Indio (City) was the first city in the Coachella Valley. The City encompasses approximately 38 square miles with a sphere of influence that adds approximately 22 square miles north of Interstate 10. The existing land uses include commercial, limited industrial, and residential. The majority of land use can be classified as residential, varying in density from equestrian and country estates to high-density multi-family dwellings. The proposed future land uses within the sphere of influence include open space, residential, resource recovery, specific plans (assumed mixed use), business park, and a small amount of community commercial.

The Indio Water Authority (IWA) was formed as a Joint Powers Authority in 2000, wholly owned by the City and Indio Redevelopment Agency, to be the legislative and policy entity responsible for delivering water to residents of the City for all municipal water programs and services.

#### 3.1.1.5 City of Coachella

The City of Coachella was incorporated in 1946 and encompasses approximately 32 square miles in the eastern Coachella Valley. The City of Coachella's sphere of influence encompasses 53 square miles. The water-related services provided by the City of Coachella include domestic water delivery, wastewater collection and reclamation, and local drainage control. The City of Coachella also manages the Coachella Sanitary District that operates a 2.4 MGD secondary treatment wastewater facility. The City also plans to develop a recycled water system in the future.

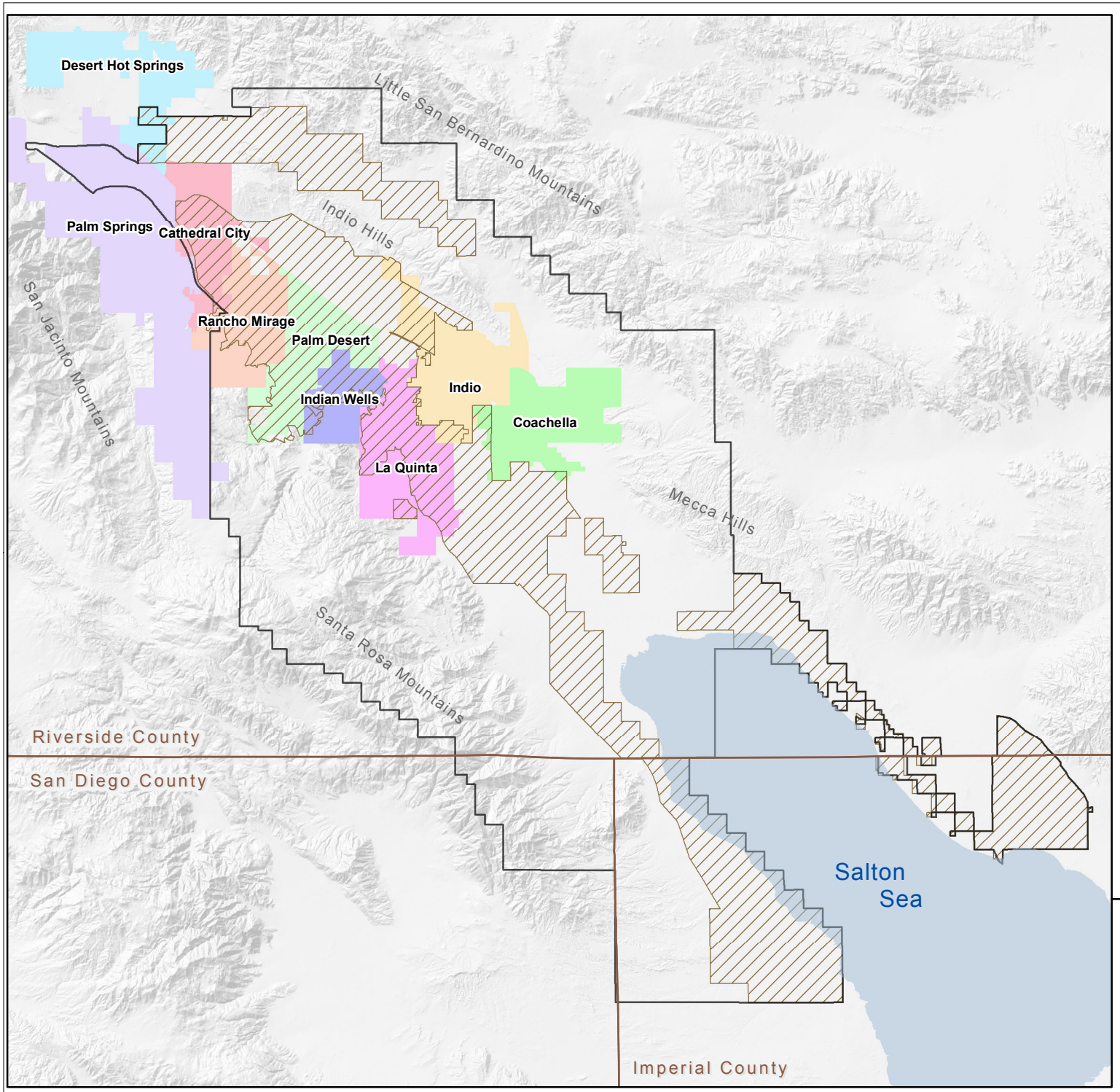
#### 3.1.1.6 Valley Sanitary District

The Valley Sanitary District (VSD) is a California Special District governed by a locally elected Board of Directors and was founded in 1925 and is governed by the California Sanitary Act of 1923. Although not a water supplier, VSD provides wastewater collection and treatment service for the City of Indio and the majority of IWA customers. Currently VSD discharges treated wastewater to the Coachella Valley Stormwater Channel and provides a small amount of treated wastewater for on-site irrigation and

agricultural irrigation for local tribes. IWA is currently pursuing opportunities with VSD to serve recycled water to golf and other customers from VSD's plant in the future. VSD treated 6,324 AF of wastewater in 2015.

## 3.2 Service Area Boundary Maps

**Figure 3-2** shows the current CVWD urban water service area boundary together with their entire service area boundary. See **Section 3.4.1** for discussion on how the urban water service area boundary is determined.




# Coachella Valley Water District Urban Water Service Area

## Key to Features

- CVWD Boundary
- CVWD Urban Water Service Area

Source: CVWD, Caltrans

Basemap Source:

N

0 2 4 8 Miles

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MWH

**Figure 3-2**

## 3.3 Service Area Climate

***CWC §10631***

*Describe the service area of the supplier, including… climate…*

Most of the Colorado River region has a subtropical desert climate with hot summers and short, mild winters. The mountain ranges on the northern and western borders, in particular the San Bernardino and San Jacinto Mountains, create a rain shadow effect for most of the region. Annual average rainfall amounts on the Valley floor range from a little over 6 inches to less than 3 inches. Most of the precipitation for the region occurs in the winter and spring (DWR, 2013). However, monsoonal thunderstorms, spawned by the movement of subtropical air from the south, occur in the summer and can generate significant rainfall in some years. Higher annual rainfall amounts and milder summer temperatures occur in the mountains to the north and west. Clear and sunny conditions typically prevail, and the region receives 85 to 90 percent of the maximum possible sunshine each year: the highest value in the United States (DWR, 2013).

### 3.3.1 Average Climate Data

The CVWD service area is located in the Colorado River Hydrologic Region as defined by DWR. Data from climate stations in Palm Springs and Thermal (Desert Resorts Regional Airport) can be used as an indicator of climate in the Coachella Valley. Monthly average temperature reaches as high as 108 degrees Fahrenheit (F) and monthly average low temperatures 38 degrees F. Precipitation typically occurs during the winter months with an annual mean rainfall of approximately 5.5 inches in Palm Springs and 3.0 inches in Thermal. Average minimum and maximum temperature, total precipitation, and evapotranspiration for Palm Springs and Thermal are summarized in **Table 3-1** and **Table 3-2**, respectively.

*Table 3-1*
*Monthly Average Climate Data for Palm Springs*

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average Max. Temp.[1] (F)** | 70 | 74 | 79 | 87 | 95 | 103 | 108 | 107 | 102 | 91 | 79 | 70 | 89 |
| **Average Min. Temp.[1] (F)** | 42 | 46 | 49 | 54 | 60 | 67 | 75 | 74 | 68 | 59 | 49 | 42 | 57 |
| **Average Total Precip.[1] (in)** | 1.13 | 1.00 | 0.58 | 0.18 | 0.05 | 0.05 | 0.20 | 0.27 | 0.29 | 0.29 | 0.42 | 1.01 | 5.5 |
| **Evapo-transpiration, ETo [2] (in)** | 2.54 | 3.27 | 5.47 | 6.94 | 8.2 | 8.94 | 8.7 | 7.87 | 6.5 | 4.81 | 3.02 | 2.28 | 68.54 |

[1] Monthly Climate Summary for Palm Springs, March 1906 to January 2015. Western Regional Climate Center. http://www.wrcc.dri.edu/
[2] Reference: CIMIS Monthly Average ETo Report for Cathedral City – Station 118 (disconnected October 2014). (California Department of Water Resources, 2016)

*Table 3-2*
*Monthly Average Climate Data for Thermal*

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average Max. Temp.[1] (F)** | 71 | 75 | 80 | 87 | 94 | 103 | 107 | 106 | 101 | 91 | 79 | 71 | 89 |
| **Average Min. Temp.[1] (F)** | 39 | 43 | 48 | 55 | 63 | 69 | 76 | 75 | 69 | 57 | 45 | 38 | 56 |
| **Average Total Precip.[1] (in)** | 0.52 | 0.50 | 0.32 | 0.07 | 0.04 | 0.01 | 0.17 | 0.27 | 0.32 | 0.15 | 0.28 | 0.31 | 3.0 |
| **Evapo-transpiration, ETo [2] (in)** | 2.4 | 3.33 | 5.45 | 7.64 | 9.05 | 9.57 | 9.5 | 8.61 | 7.01 | 5.17 | 3.11 | 2.18 | 73.02 |

[1] Monthly Climate Summary for Thermal (Desert Resorts Regional Airport), May 1950 to January 2015. Western Regional Climate Center. http://www.wrcc.dri.edu/
[2] Reference: CIMIS Monthly Average ETo Report for Thermal South – Station 218 (connected January 2010). (California Department of Water Resources, 2016)

The Valley's high summer temperatures combined with low annual precipitation creates a unique situation compared to other regions of California. High summer evapotranspiration results in very high water demands for agricultural and landscape irrigation. Consequently, water supplies must be capable of meeting these high summer peak demands. The Coachella Valley has a large groundwater basin that provides sufficient storage to buffer variations between supplies and demands.

The Whitewater River drainage area is approximately 65 percent mountainous and 35 percent typical desert valley with alluvial fan topography buffering the valley floor from the steep mountain slopes. The mean annual precipitation ranges from 44 inches in the San Bernardino Mountains to less than 3 inches at the Salton Sea. Three types of storms produce precipitation in the drainage area: general winter storms, general summer storms, and local thunderstorms. Longer duration, lower intensity rainfall events tend to have higher recharge rates, but runoff and flash flooding can result from all three types of storms. Otherwise, there is little or no flow in most of the streams in the drainage area. Long-term average natural runoff from the surrounding mountains contributes about 56,000 AFY to the local groundwater basin supply (MWH, 2012).

### 3.3.2 Climate Change

Climate plays a central role in the operation, planning, and management of water resource systems for water supply, flood management, and environmental stewardship. Expectations of the timing and form of precipitation; the timing, magnitude, and distribution of runoff; and the availability of water for beneficial use are based on understanding of the climate system and experience with historical meteorological and hydrological events.

The potential impacts of climate change on water resources may be felt through changes in temperature, precipitation, and runoff. Particularly, the Colorado River Hydrologic Region is subject to the following climate vulnerabilities (California Department of Water Resources [DWR], 2015):

- Magnitude and frequency of extreme precipitation events may increase, resulting in greater flood risk and debris flows.
- More frequent and longer droughts would reduce imported water supply reliability and decrease local water quality and habitat.

The implications of climate change regionally and nationally may adversely impact the following Valley water resources:

**Groundwater** – The Coachella Valley groundwater basins obtain water primarily from local mountain runoff and imported water deliveries. Projected potential changes in temperature or evapotranspiration for the Coachella Valley due to climate change are not currently available. However, based on larger scale studies, it can be inferred that increased temperatures in the Coachella Valley would increase water demands for crop and landscape irrigation, municipal water use, and evaporative losses from canals and open reservoirs. It has been suggested that increased summer temperatures could draw increased monsoonal flow resulting in more frequent summer thunderstorms. Increasing temperatures could also change the distribution and form of precipitation from snow at higher elevations to rain, shifting the timing of runoff earlier in the year. The large groundwater basins of the Coachella Valley offer a substantial buffer to absorb changes in climate variability.

**State Water Project (SWP) "Table A" Deliveries** – Reductions to the Sierra snowpack would reduce the availability of water during late spring and early summer and may make it more difficult to fill reservoirs, while increased sea levels would increase salinity intrusion, which could degrade available freshwater supplies. This could require the State to further reduce SWP "Table A" deliveries to the Valley.

**Colorado River** – Coachella Valley Colorado River water supplies are protected from impacts of climate change and corresponding shortages by: 1) California's priority for Colorado River supplies in the lower Colorado River basin, and 2) Coachella's high priority for Colorado River supplies among California users of Colorado River water. Climate change impacts were evaluated in the Environmental Impact Study (EIS) on the "Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead" (U.S. Bureau of Reclamation [USBR], 2007). These shortage sharing guidelines are crafted to include operational elements that would respond if potential impacts of climate change and increased hydrologic variability occur. The guidelines include coordinated operation elements that allow for adjustment of Lake Powell releases to respond to low storage conditions in Lake Powell or Lake Mead. In addition, the guidelines enhance conservation opportunities in the lower Colorado River basin and retention of water in Lake Mead. While impacts from climate change cannot be quantified at this time, the interim guidelines provide additional protection against impacts of shortage sharing.

The U. S. Bureau of Reclamation's Upper Colorado and Lower Colorado Regions, in collaboration with representatives of the seven Colorado River Basin States (non-federal Cost Share Partners), funded the "Colorado River Basin Water Supply and Demand Study" under Reclamation's Basin Study Program. The Study was completed in December 2012. It defined current and future imbalances in water supply and demand in the Colorado River Basin and the adjacent areas of the Basin States that

receive Colorado River water for approximately the next 50 years, and developed and analyzed adaptation and mitigation strategies to resolve those imbalances.

With regard to climate change, the study indicated the median of the mean natural flow at Lees Ferry over the next 50 years is projected to decrease by approximately nine percent, along with a projected increase in both drought frequency and duration (Reclamation, 2012). The potential effect of climate change on deliveries is uncertain based on the current Law of the River.

Under the Law of the River and current operational guidelines, both California's and CVWD's Colorado River water supplies have relatively high priorities compared to other Lower Basin states and California agencies. Colorado River water deliveries would need to be reduced by more than 1.7 million AFY before California experienced any supply reductions (USBR, 2007).

## 3.4 Service Area Population and Demographics

***CWC §10631***

*Describe the service area of the supplier, including current and projected population …The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

### 3.4.1 Methodology for Determining Service Area Population

CVWD's service area includes Cathedral City, Indian Wells, La Quinta, Palm Desert, Rancho Mirage cities, portions of the City of Indio, and unincorporated county land.

Current and historical service area population is estimated using DWR's Population Tool (DWR, 2016). The tool utilizes up-loaded water agency service area maps and computes the population by tabulating the census blocks that overlay the service area.

The boundary representing CVWD's urban water service area is developed by spatially joining the potable water system piping as of 2010 to the 2010 census blocks. A similar approach was taken for 1990 and 2000, producing three service area maps. The DWR Population Tool (2016) outputs the total population and the populations living in single and multi-family housing. Using the historical number of single- and multi-family connections from CVWD billing data, the populations per single- and multi-family connection are determined. These per-connection values are linearly interpolated between the 2000 and 2010 census years to determine population for the intermediate years. Population in 2015 is determined by using the population per single- and multi-family connection from the 2010 year. The 2010 service area population was determined to be 212,029 and the 2015 population was calculated to be 216,900.

### 3.4.2 Population Projections

The population growth forecasts for the CVWD area are based on the following data sources:

- 2010 U. S. Census broken down by city, unincorporated census designated place (CDP), and unincorporated not within a CDP.

- 2015 California Department of Finance (DOF) Report E-5 Population and Housing Estimates for Cities, Counties, and the State, January 1, 2011-2015, with 2010 Benchmark.
- 2012 Southern California Association of Governments (SCAG) Adopted Growth Forecast by City and Unincorporated County.

The Valley population is evaluated in three regions corresponding to groundwater subbasins and areas of benefit for replenishment assessment: Mission Creek/Garnet Hill, West Whitewater, and East Whitewater. Population is also allocated to water agency based on the cities, CDPs, or unincorporated regions served. Several Census reports are used to determine the Coachella Valley population and assign population to regions and water districts within the Valley including population by CDP, city population, county subdivision, and in a few cases census tract. Population in areas not assigned to a CDP are allocated to regions and water agency by overlaying water service area, CDP, and groundwater basin maps. Areas served by multiple water agencies are allocated based on relative percentages of developed land.

Growth is allocated to regions and water agencies separately for city and unincorporated areas. Future city populations are based on the SCAG forecasts for 2020 and 2035. If the 2015 city population is not consistent with the forecasts, the 2020 forecast is adjusted to produce a linear trend. This was done only for Desert Hot Springs and for the total Valley population, because the forecasts indicated extreme growth would be needed in the next five years to match the original forecasts. Population growth beyond 2035 is based on linear growth trends for the period of 2010 through 2035.

Within the Coachella Valley including areas outside CVWD's urban water service area, the Mission Creek/Garnet Hill area is expected growth from about 44,600 people in 2010 to almost 110,000 by 2045. The West Valley area is expected to grow from 181,900 in 2010 to 248,200 by 2045. The East Valley will grow from 197,300 in 2010 to almost 654,000 by 2045. In total about 635,000 people could be added to the Valley by 2045.

To accommodate this level of growth, a significant amount of agricultural and vacant land will be need to be developed. Assuming roughly 4 dwelling units per acre and a Riverside County-wide occupancy of 3.2 people per dwelling unit, at least 50,000 acres of land will be required. The 2010 Coachella Valley Water Management Plan Update assumed the growth would occur half on vacant land and half on existing agricultural land. Tables summarizing the population forecasts for the entire Coachella Valley are included in **Appendix C**.

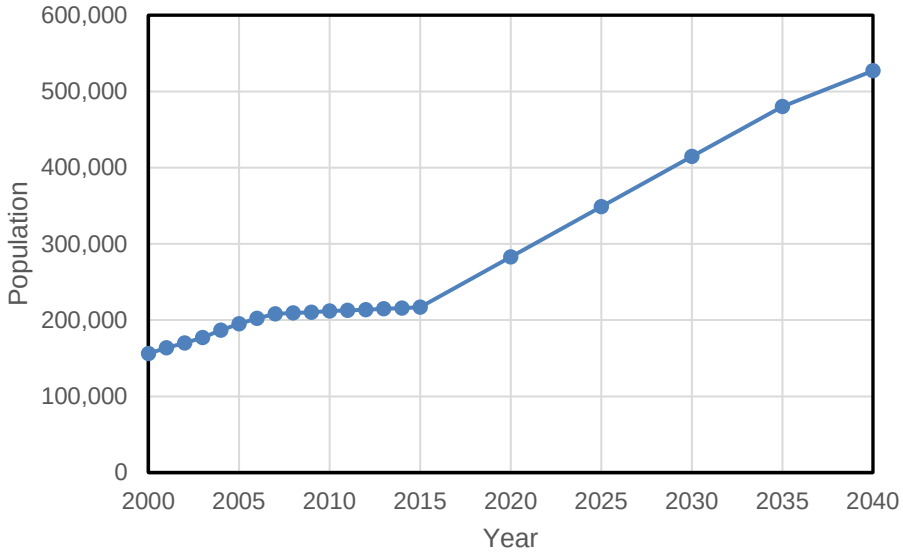
Projected population in the CVWD urban water service area increases at an average annual rate of 3.7 percent. The current and projected population within CVWD's service area is presented in **Table 3-3**. Historical and projected population within CVWD's service area is illustrated on **Figure 3-3**. It should be noted the SCAG population projections may not reflect the relatively slow growth observed since the 2008 recession ended. Consequently, the population projections are conservative.

*Table 3-3*
*CVWD Service Area Population – Current and Projected (adapted from DWR Table 3-1 R)*

| Population Served | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040*(opt)* |
|---|---|---|---|---|---|---|---|
| | 212,029 | 216,900 | 282,900 | 348,900 | 414,800 | 480,200 | 527,100 |

Note: Population for 2010 and 2015 are based on the DWR Population Tool. Projections for 2035 are based on SCAG, 2012 projections. Other values are interpolated.

*Figure 3-3*
*Historical and Projected CVWD Service Area Population*




### 3.4.3 Other Demographic Factors Affecting Urban Water Use

***CWC §10631***

*Describe the service area of the supplier, including ... other demographic factors affecting the supplier's water management planning.*

The U. S. Census Bureau regularly collects socioeconomic data using statistical surveys through the American Community Survey. Data collected is available by geographic area from the Census Bureau's American Fact Finder website. Data for the Coachella Valley was collected and summarized in **Table 3-4**.

The Coachella Valley has some unique demographic characteristics that affect water use. A relatively high percentage of the Valley population (over 25%) is over age 60 years. The Valley is a popular retirement location with many communities catering to people older than 55 years. About 28 percent of the household income in the Valley is derived from retirement plans and Social Security (Coachella Valley Economic Partnership, 2015).

*Table 3-4*
*Coachella Valley Demographic Data*

| Age distribution (2010-2014) | | Race/Ethnicity Distribution (2010-2014) | | Income (2014) | |
|---|---|---|---|---|---|
| **Age** | **Percent** | **Race/Ethnicity** | **Percent** | **Category** | **Amount** |
| 19 years and under: | 27.2% | White | 39.7% | Median household income | $47,700 |
| 20-39 years: | 22.7% | Black | 2.4% | Average household income | $71,800 |
| 40-59 years | 24.7% | Native American | 0.3% | Per capita Income | $27,200 |
| 60-64 years | 5.9% | Asian/Pacific Islander | 2.8% | Percent of Population Below Poverty Level | 16% |
| Over 65 years | 19.6% | Hispanic | 53.3% | | |
| | | Other | 1.5% | | |

Reference: American Community Survey 2010-2014 (United States Census Bureau, 2016)

An important consideration affecting per capita water use in the Coachella Valley is the region's large seasonal population, which is not counted by the federal census or other demographic data. These visitors use water while staying in the Valley and the properties they own or visit are irrigated year-around. The exclusion of the visitor population from per capita use calculations results in higher per capita values than would be observed in an area of predominantly permanent residents.

Due to its mild winter climate and recreational opportunities, the Valley is a popular destination for "snowbirds," people whose primary residence is outside the Valley but may live in the Valley for three to six months during the winter period. In addition, there are people who maintain second homes in the Valley and use them for shorter periods of time throughout the year to participate in the Valley's various sports, entertainment, and recreational activities. The Coachella Valley Economic Partnership (CVEP) states that about 60 percent of single family homes are owner-occupied and 40 percent are remotely owned. The visitor population also makes use of the Valley's hotel/motel/time-share resorts as well as mobile home parks. These properties use water year-around for irrigation even when not occupied during the summer month. Per capita water use calculations only consider the permanent population but include all water uses (permanent and seasonal) leading to higher gallon per capita per day (GPCD) estimates.

Quantification of the seasonal population of the Valley is not a straightforward task as there are no direct measurement methods. A variety of studies have conducted surveys and economic analyses to estimate the seasonal population in tourist regions. Other studies have used housing and hotel occupancy data or sales tax revenue to infer seasonal population. Previous estimates of the seasonal visitor population are in excess of 150,000 (Wheeler's, 2009). However, no recent updated values are available.

For this report, CVWD developed estimates of the seasonal population using several data sources including 2010 federal census data on housing occupancy, hotel occupancy, mobile home parks, and sales tax revenue. This evaluation is presented in **Appendix C**.

The Coachella Valley had 221,018 housing units in the Valley in 2010 based on the federal census. Of these, 71.3 percent were occupied. Vacant units totaled 62,197, of which 41,367 dwelling units were vacant for seasonal, recreational, or occasional use (about 80 percent of the Riverside County total). Most of these seasonal units are second homes. If all of these units were occupied year-around at the average Valley occupancy of 2.71 people per dwelling unit, the Valley population would increase by more than 112,000 people, primarily during the winter months. Because some occupancy occurs even in the hot summer months, it is estimated that seasonally occupied housing could account for about 75,000 people on average, with higher occupancy in the winter and spring months.

Annual hotel occupancy rates in the Valley averaged about 68 percent in 2015. Hotel occupancy rates vary from 70-80 percent in the winter months to about 40 percent in the summer months (Saritvanich, 2015). Assuming average occupancy of two people per room, the Valley's 15,000 hotel rooms accommodate about 20,000 people each day.

There are more than 40 recreational vehicle (RV) parks with an estimated 10,000 spaces. Assuming similar occupancy to hotels during winter months, approximately 14,000 people may stay at RV parks on average.

The State Board of Equalization documents taxable sales by city and county on a quarterly and annual basis. The sales are broken down by category on a statewide basis and summarized by retail and food service sales and total sales. The most recent full year of data is available for 2013. Taxable sales for retail and food service sales in all Valley cities totaled $4.69 billion in 2013. The average per capita retail and food service sales in the Valley was $12,850 per person compared to $10,492 per person for the entire state. The California Department of Finance population estimated for the Valley cities of 364,987 in January 2014 (California Department of Finance, 2016). Based on these sales amounts, the Valley cities generates the equivalent sales of a population of 447,000. Therefore, the visitor population to the Valley cities could be approximately 82,000 people. Adjusting for unincorporated areas of the Valley could increase the estimated visitor population to as much as 100,000.

Considering these numbers, it is estimated that uncounted seasonal population adds the equivalent of about 100,000 to 109,000 people to the Valley's permanent population of about 453,000, a 25 percent increase. Based on the locations of seasonally vacant properties, about 69 percent or about 70,000 seasonal visitors are estimated to be within the CVWD service area. Incorporating seasonal/transient population in the per capita water use calculations would reduce the per capita water use by about 20 percent.

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# SECTION 4 SYSTEM WATER USE

Water resources planning requires reasonably accurate estimates of future water needs. This section presents CVWD's baseline and project urban water system demands. To provide an adequate long-range view of future water needs, this report uses a 25-year planning period from 2015 to 2040. This longer planning period allows the UWMP to serve as a source document for future water supply assessments and written supply verifications for the next five years before the next UWMP update. The applicable laws governing the requirements for the UWMP in regards to system demands is provided below.

## 4.1 Recycled versus Potable and Raw Water Demand

Section 4 addresses potable water demand and also provides for the reporting of raw water demand delivered for urban use for the year 2015. Future recycled water demand and supply is discussed in Section 6 and only includes customers not currently supplied by CVWD's potable water system. CVWD does not currently utilize raw water (Colorado River water) and recycled water supplies to augment urban water system demands. These supplies are delivered to non-urban customers through separate non-potable distribution systems to reduce groundwater pumping and overdraft.

There are approximately 95 golf courses in CVWD's District boundary. CVWD serves untreated Canal water and tertiary-treated recycled water to approximately 42 golf courses from the Coachella Canal and the Mid-Valley Pipeline system for irrigation in-lieu of pumping from private groundwater wells. CVWD is actively expanding the Mid-Valley Pipeline Project program, with the goal of fully utilizing its available recycled water supplemented with Canal water. CVWD is also coordinating with other water purveyors in the Valley to deliver their recycled water to golf courses located within their respective service areas, where feasible. These in-lieu delivery programs help reduce groundwater overdraft and the need for direct groundwater replenishment.

## 4.2 Water Uses by Sector

***CWC §10631***

***(e)(1)*** *Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:*

***(A)*** *Single-family residential.*

***(B)*** *Multifamily.*

***(C)*** *Commercial.*

***(D)*** *Industrial.*

***(E)*** *Institutional and governmental.*

***(F)*** *Landscape.*

***(G)** Sales to other agencies…*

***(2)** The water use projections shall be in the same five-year increments described in subdivision (a).*

Water use is broken down by sector as discussed in the following subsections. Currently, all potable urban water use is supplied by groundwater. **Table 4-1** summarizes the potable water use by sector in the 2015 calendar year.

*Table 4-1*
*Demands for Potable and Raw Water – Actual (DWR Table 4-1 R)*

| Use Type | 2015 Actual | | |
|---|---|---|---|
| | Additional Description | Level of Treatment When Delivered | Volume (AF) |
| Single Family | Potable | Drinking Water | 48,543 |
| Multi-Family | Potable | Drinking Water | 6,490 |
| Commercial | Potable | Drinking Water | 5,195 |
| Industrial | Potable | Drinking Water | 0 |
| Institutional/Governmental | Potable | Drinking Water | 868 |
| Landscape | Potable | Drinking Water | 21,513 |
| Other | Potable: construction | Drinking Water | 799 |
| Losses | Potable: non-revenue water | Drinking Water | 9,566 |
| | | **TOTAL** | **92,974** |
| NOTES: Distribution losses (non-revenue water) are the difference between production and customer billing. | | | |

Projected potable water demands are estimated using historical per capita consumption and projections based on recent conservation trends and implementation of the plumbing codes and landscape ordinance for future development (see **Appendix D** and **Appendix E**).

Baseline water use as calculated in the 2010 UWMP was 591 gallons per capita per day (GPCD) based on the period from 1999 to 2008 and the 20x2020 per capita use target was 473 GPCD.[1] For the period of 2010 through 2014, average per capita urban water use was 471 GPCD and was consistently more than 18 percent below the baseline. In 2014, per capita use dropped 3 percent below the previous year as a result of Governor Brown's 2014 drought declaration and CVWD's call for voluntary reductions in water use. In 2015, as a result of the SWRCB's mandatory drought regulations, per capita use dropped significantly to 383 GPCD, 19 percent below the 2020 target and 35 percent below the baseline water use.

To estimate future urban water use, CVWD assumes that per capita use associated with the existing 2015 population will remain at the current low level due to on-going plumbing upgrades, changes in landscaping (including turf removal) and improved irrigation practices. Further, future growth is expected to have an even lower per capita use driven by the CalGreen building standards mandates for

[1] Note: The baseline water use for 1999-2008 has been revised to 606 GPCD as a result of updated service area population data from the 2010 federal census as discussed in Section 5. Although the 20 percent reduction target using the updated population is 485 GPCD, CVWD has elected to retain the 473 GPCD target presented in its 2010 UWMP.

plumbing fixture efficiency and CVWD's landscape and conservation programs. The projected potable water demand assumes the population existing in 2015 will continue to use 383 GPCD in the future and any population added beyond 2015 will use 291 GPCD. This reduced per capita use for new customers incorporates the increased water efficiency measures mentioned above.

Potable water demand projections for the CVWD service area are summarized in **Table 4-2**. CVWD anticipates selling raw Colorado River water to other water agencies in future years as summarized in **Table 4-3**. Total retail and wholesale demands are summarized in **Table 4-4.** In addition, projected recycled water demands are included in **Table 4-4** as required by the 2015 UWMP Guidebook and standardized tables. Note that recycled water is reported in the tables with urban water demands to be consistent with the DWR standard tables, but recycled water is not a part of the urban water system.

*Table 4-2*
*Retail: Demands for Potable and Raw Water – Projected (DWR Table 4-2 R)*

| Use Type | Additional Description | Projected Water Use (AF) | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040-opt |
| Single Family | Potable | 59,800 | 71,000 | 82,300 | 93,400 | 101,400 |
| Multi-Family | Potable | 8,000 | 9,500 | 11,000 | 12,500 | 13,600 |
| Commercial | Potable | 6,400 | 7,600 | 8,800 | 10,000 | 10,900 |
| Industrial | Potable | 0 | 0 | 0 | 0 | 0 |
| Institutional/Governmental | Potable | 1,100 | 1,300 | 1,500 | 1,700 | 1,800 |
| Landscape | Potable | 26,500 | 31,500 | 36,500 | 41,400 | 44,900 |
| Other | Potable: construction | 1,000 | 1,200 | 1,400 | 1,500 | 1,700 |
| Losses | Potable: non-revenue water | 11,800 | 14,000 | 16,200 | 18,400 | 20,000 |
| **TOTAL** | | **114,600** | **136,100** | **157,700** | **178,900** | **194,300** |

NOTE: Potable system losses are conservatively assumed to scale linearly with demand as a result of system expansion.

*Table 4-3*
*Wholesale: Demands for Potable and Raw Water – Projected (DWR Table 4-2 W)*

| Use Type | Additional Description | Projected Water Use (AF) | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
| Sales to other agencies | Canal water for Indio Water Authority [1] | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| Sales to other agencies | Canal water for Coachella Water Authority [2] | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

NOTES:
[1] Indio Water Authority has identified Canal water as a future water source in its UWMP.
[2] Coachella Water Authority has identified Canal water as a potential future source but has not determined amounts and timing.

*Table 4-4*
*Total Water Demands (DWR Table 4-3 R and DWR Table 4-3 W)*

| | | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
|---|---|---|---|---|---|---|---|
| Retail | Potable and Raw Water (AF) | 92,974 | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Recycled Water Demand (AF) | 8,749 | 14,300 | 27,700 | 30,800 | 33,900 | 36,300 |
| | **Total Water Demand (AF)** | **101,723** | **128,900** | **163,800** | **188,500** | **212,800** | **230,600** |
| Wholesale | Potable and Raw Water (AF) | 0 | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Recycled Water Demand (AF) | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Total Water Demand (AF)** | **0** | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

Note:
Retail potable and raw water demand is from Table 4-3; wholesale potable and raw water demand is from Table 4-4. Recycled water demand is from Table 6-13. Recycled water does not currently and is not projected to offset urban water demands, but is used to offset private groundwater pumping. Recycled water is reported in the tables with urban water demands to be consistent with the DWR standard tables, but recycled water is not a part of the urban water system.

## 4.2.1 Urban Water Demand Sectors

The following urban demand sectors listed in CWC §10631 that apply to CVWD.

### 4.2.1.1 Single-Family Residential

A single-family dwelling unit is defined as a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. A relatively high percentage of these meters serve properties that are used seasonally. About 88 percent of CVWD's meters and about 58 percent of total water use are classified as single-family residential. The estimated permanent population currently served by single family residential connections is 162,500. The associated per capita use was 330 GPCD for 2010-2014 and 267 GPCD in 2015. The per capita use of these properties is relatively high due to the lower permanent occupancy and uncounted seasonal occupancy.

Future single family residences are expected to use less water than existing properties due to the mandated use of high efficiency plumbing fixtures under the CalGreen building standards and reduced landscape water use mandated by CVWD's Landscape Ordinance, which now applies to areas greater than 2,500 square feet.

### 4.2.1.2 Multi-Family

Multiple dwelling units contained within one building or several buildings within one complex. Within the CVWD service area, multi-family demand includes customers with more than one dwelling unit such duplexes, triplexes, apartments, other multiple dwelling properties, and mobile home and recreational vehicle parks served by a master meter. Many of these connections serve properties that are used seasonally. About 3 percent of CVWD's meters and about 7 percent of total water use are classified as multi-family residential. The estimated permanent population currently served by multi-family residential connections is 54,300 and the per capita use associated with that population was 123 GPCD for 2010-2014 and 107 GPCD in 2015. Given the seasonal use of many multi-family properties, this per capita

use is relatively low because many multi-family connections have separate landscape irrigation services.

Future multi-family residences are expected to use less water than existing properties due to the mandated use of high efficiency plumbing fixtures under the CalGreen building standards and reduced landscape water use mandated by CVWD's Landscape Ordinance.

#### 4.2.1.3 Commercial

A water user that provides or distributes a product or service. For the CVWD service area, commercial use includes businesses, commercial properties, restaurants, hotels and motels. Most existing and all new commercial customers are required to have separate landscape irrigation services. Commercial water use makes up about 6 percent of water use and 1 percent of connections. Future commercial use is expected to be lower in response to CalGreen requirements.

#### 4.2.1.4 Industrial

An industrial water user is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development. CVWD does not currently classify any of its users as industrial.

#### 4.2.1.5 Institutional (and Governmental)

Institutional and governmental water users are dedicated to public service. This user class typically includes, among other users schools, higher education institutions, courts, churches, hospitals, government facilities, and non-profit research institutions. CVWD classifies these users as "Public Agency" uses. Most existing and all new institutional customers are required to have separate landscape irrigation services. Public agency use represents about 1.2 percent of water use and less than 0.3 percent of connections. Future public agency use is expected to be lower in response to CalGreen requirements.

#### 4.2.1.6 Landscape

Landscape water connections supply water solely for landscape irrigation. Such connections may be associated with large single family properties, and multi-family, commercial, or institutional/governmental sites, but are considered a separate water use sector because the connection is solely for landscape irrigation. Many of these connections serve the common area landscaping of homeowner's associations and parks. CVWD's landscape ordinance requires the installation of dedicated landscape irrigation meters for all projects except single family homes with a landscape area less than 5,000 square feet (Coachella Valley Water District, 2015). Dedicated landscape connections account for about 28 percent of water use and about 5 percent of connections. Future landscape usage is expected to decrease due to implementation of CVWD's landscape ordinance that requires improved irrigation efficiency and reduced allowable water use.

#### 4.2.1.7 Other (Construction)

Water use for temporary construction activities is served from the potable domestic water system. CVWD provides construction water from the urban water system in the West Valley portion of its service area. CVWD also provides non-potable construction water from the Coachella Canal distribution system in the East Valley area. Construction use represents less than 1 percent of total water use and varies based on construction activity.

#### 4.2.1.8 Sales to Other Agencies

CVWD does not currently sell water to another water agency. Future sales to the Indio Water Authority (IWA) are based on projected demand information provided by IWA. There is inherent uncertainty in future projections, therefore, any projected sales reported in the UWMP are for planning purposes only and are not considered a commitment on the part of the seller. This use is listed as a wholesale demand.

#### 4.2.1.9 Distribution System Losses

This category consists of all unaccounted-for water that includes system losses to reconcile the difference between supply and customer demand; this category is included to ensure consistency with the tables in **Section 5** concerned with SB X7-7. Non-revenue water includes distribution system losses, which are discussed in **Section 4.3**.

### 4.2.2 Demands Not Served by the Urban Water System

CVWD operates several separate non-potable water systems that do not serve urban water customers. These uses are not served from CVWD's urban water system, but they are described below to provide a complete picture of CVWD's water supply operations. Consequently, with the exception of recycled water, these non-potable uses are not included in DWR's standardized tables.

The Coachella Canal water distribution system was constructed to deliver Colorado River water for agricultural uses in the East Valley. Currently, Canal water supplies agricultural, golf course irrigation, fish farming operations, duck clubs, and recreational lake uses. A more detailed discussion of the Coachella Canal water distribution system is presented in Section 6.

CVWD operates two recycled water systems supplied by two water reclamation plants (WRPs): WRP-7 in north Indio and WRP-10 in Palm Desert. The recycled water supply is described in Section 6.

CVWD also operates one groundwater recharge facility in the East Valley and jointly operates two other recharge facilities with DWA, one located north of Palm Springs and the other in the Mission Creek Subbasin. These recharge facilities are supplied with imported water as described in Section 6.

#### 4.2.2.1 Agricultural (Non-urban Non-potable Use)

CVWD delivers untreated Colorado River water from the Coachella Canal to customers for commercial agricultural irrigation. Agricultural use represents the largest use of Colorado River water (Canal water) in the Coachella Valley. Agricultural uses in areas that do not have access to Canal water are served by private groundwater wells; no agricultural irrigation is served by CVWD's urban water system. Current

and projected agricultural demand for Colorado River water is summarized in **Table 4-5**. These are non-urban uses that are met by non-potable water supply. As urban development occurs in the East Valley, a portion of the agricultural land will convert to urban land uses reducing demand for Colorado River water. CVWD anticipates treating Colorado River water for urban use in the future.

#### 4.2.2.2 Golf Course Irrigation (Non-urban Non-potable Use)

There are more than 105 golf courses within the CVWD service area. These golf courses are served by private wells and are responsible for about 30 percent of groundwater pumping in the Valley. To eliminate groundwater overdraft, CVWD has an aggressive program to deliver Coachella Canal water and recycled water for golf course irrigation, where feasible, to replace most of the private pumping. Under this program, golf courses sign a non-potable water agreement requiring them to meet at least 80 percent their demand with Coachella Canal water and recycled water. Consequently, no golf course irrigation is served by CVWD's urban water system.

Current and projected demand for golf course irrigation using Canal water and recycled water is shown in **Table 4-5**.

*Table 4-5*
*Current and Projected Non-Potable Water Use*

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Agricultural Irrigation (AF) | 259,733 | 300,000 | 296,400 | 290,000 | 274,600 | 263,100 |
| Golf Irrigation (AF) | 27,927 | 47,900 | 67,100 | 70,300 | 70,900 | 71,400 |
| Other Non-urban Non-potable Uses (AF) | 3,674 | 4,700 | 4,700 | 4,700 | 4,700 | 4,700 |
| **Total Non-urban Non-potable Use (AF)** | **293,349** | **354,620** | **370,225** | **367,030** | **352,235** | **341,240** |
| Note: The uses and amounts shown represent non-potable water delivered by CVWD and do not include water served by private wells or recycled water. None of this demand is served by the urban water system. | | | | | | |

#### 4.2.2.3 Other Non-Urban Non-Potable Uses

Other non-urban non-potable uses supplied from the Coachella Canal include duck clubs, fish farms, recreational lakes, and construction water, in addition to the already discussed agricultural, and golf irrigation uses. These uses amounted to 3,674 AF in 2015 and are expected to stay relatively constant at approximately 4,700 AF from 2020 to 2040 as shown in **Table 4-5**. None of these uses are supplied by CVWD's urban water system.

#### 4.2.2.4 Groundwater Recharge (Non-urban Non-potable Use)

CVWD and DWA operate groundwater recharge programs in the Whitewater River and Mission Creek subbasins. Currently, groundwater recharge in Mission Creek and West Whitewater uses SWP Exchange water (see **Section 6**), while groundwater recharge in East Whitewater is supplied by Colorado River water. **Table 4-6** presents the current and projected groundwater recharge demand. These uses are not supplied from the urban water system and the amounts are not included in **Table 4-2** and **Table 4-4.**

*Table 4-6*
*Current and Projected Groundwater Recharge*

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Mission Creek (AF0) | 171 | 10,700 | 12,500 | 14,400 | 16,300 | 18,100 |
| West Whitewater (AF) | 865 | 80,000 | 80,000 | 80,000 | 80,000 | 80,000 |
| East Whitewater (AF) | 37,322 | 35,000 | 35,000 | 60,000 | 60,000 | 60,000 |
| **Total (AF)** | **38,358** | **125,700** | **127,500** | **154,400** | **156,300** | **158,100** |

Note: Values shown for 2015 are actual values. Future values are anticipated average values that may vary annually based on imported water supply availability.

## 4.3 Distribution System Water Losses

***CWC 10631***

***(e)(1)*** *Quantify, to the extent records are available, past and current water use over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses …*

***(J)*** *Distribution system water loss*

***(3)(A)*** *For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.*

***(B)*** *The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

Several methods are commonly used for estimating distribution system losses. The simplest method is to compute "non-revenue" water, which is the difference between water production (water delivered to the system) and customer sales (metered consumption), but excluding authorized unbilled unmetered uses such as fire-fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. Non-revenue water for calendar year 2015 was 9,566 AF as listed in **Table 4-1**. Non-revenue water has varied from 9,566 AF to 11,699 AF over the past five years.

Distribution system water losses are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption. They are computed by subtracting estimated authorized unbilled unmetered from non-revenue water. Water losses consist of apparent losses and physical (or real) losses. Apparent losses result from unauthorized consumption (including unauthorized hydrant use and theft), metering inaccuracies, and data handling errors. Physical loss of water from the system includes leaks, breaks, or spillage that occurs prior to the point of customer consumption. Customer-side leaks are not considered system losses.

CVWD has begun completing annual water audits using the American Water Works Association (AWWA) Water Audit Method. The most recent water audit available at the time of this UWMP is the

water audit for the 2014-15 fiscal year. The water losses in CVWD's distribution system for this reporting period totaled 11,356 acre-feet and is summarized in **Table 4-7**.

*Table 4-7*
*12 Month Water Loss Audit Reporting (DWR Table 4-4 R)*

| Reporting Period Start Date | Volume of Water Loss (AF) |
|---|---|
| 07/2014 | 11,356 |
| Note: Losses shown include 1,973 AF of apparent losses and 9,382 AF of real losses. | |

CVWD's non-revenue water expressed as a percent of water production ranged from 9.0 percent to 10.3 percent in the last five years. Water losses as a percentage has increased due to two factors: 1) reduced production in 2015 due to water conservation efforts, and 2) aging infrastructure. CVWD serves several remotely located areas of where the ratio of pipelines to connections is high. These areas of Salton City, Bombay Beach, and Sky Valley/Indio Hills also tend to have aging facilities subject to corrosive soils. The replacement cost is high. CVWD is in the process of developing an asset management program that will help prioritize repairs and reduce system losses.

## 4.4 Estimating Future Water Savings

***CWC §10631***

***(e)(4)(A)*** *If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

***(B)*** *To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following: (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections. (ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

Future water savings resulting from the implementation of the CALGreen Building Standards Code and CVWD water conservation ordinances listed in **Table 4-8** are accounted for in the projections for future per capita urban water demand.

*Table 4-8*
*Inclusion in Water Use Projections (DWR Table 4-5R)*

| | |
|---|---|
| Are Future Water Savings Included in Projections? | Yes |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc. utilized in demand projections are found. | California Building Code, Title 24, Chapter 4, Division 4.3<br>California Building Code, Title 24, Chapter 5, Division 5.3<br>California Water Code §10608.16-10608.44<br>CVWD Ordinance No. 1302.2 (November 24, 2015)<br>CVWD Ordinance No. 1422.3 (May 24, 2016) |
| Are Lower Income Residential Demands Included In Projections?<br>Drop down list (y/n) | Yes |
| Note: Losses shown include 1,973 AF of apparent losses and 9,382 AF of real losses. | |

## 4.5 Water Use for Lower Income Households

***CWC §10631.1***

***(a)*** *The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

***California Health and Safety Code 50079.5***

***(a)*** *"Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families… In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

California Water Code 10631.1 requires retail urban water suppliers to provide water use projections for future single-family and multifamily residential housing needed for lower income households. These water use projections are to assist a supplier in complying with state code which grants priority of the provision of service to housing units that is affordable to lower income households.

The SCAG Regional Housing Needs Assessment (RHNA) Housing Need by Income Category adopted in 2012 is used to develop projections of lower income housing units in future years. The 2012 housing needs are assumed to be the same as 2015 housing needs, and future planning year needs are determined by scaling current needs by projected population growth. Persons per household are from SCAG Local Profiles Report for each city in 2014; this is assumed to stay constant through future planning years. Since unincorporated Riverside County needs are for the entire county, they are scaled proportionally to the CVWD-served unincorporated area.

**Table 4-9** summarizes the projected water use for additional lower income households assuming the following: (1) the average persons per household remains constant at the 2014 level, (2) lower income housing needs is proportional to the projected population growth, and (3) daily water use per capita is

equal to the projected per capita water use described in **Section 4.2**. Note that lower income household water use projections are included in the total water use projections above.

*Table 4-9*
*Projected Water Use for Lower Income Households*

| Location | | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Cathedral City | Lower income housing units (3.1 persons per household) | 254 | 265 | 276 | 288 | 301 |
| | Water use (AF) | 319 | 321 | 325 | 333 | 344 |
| Indian Wells | Lower income housing units (1.9 persons per household) | 71 | 72 | 73 | 74 | 77 |
| | Water use (AF) | 55 | 53 | 53 | 53 | 54 |
| La Quinta | Lower income housing units (2.6 persons per household) | 159 | 165 | 171 | 177 | 185 |
| | Water use (AF) | 167 | 167 | 169 | 171 | 177 |
| Palm Desert | Lower income housing units (2.1 persons per household) | 168 | 173 | 178 | 183 | 188 |
| | Water use (AF) | 143 | 142 | 142 | 143 | 146 |
| Rancho Mirage | Lower income housing units (2.0 persons per household) | 40 | 43 | 46 | 49 | 51 |
| | Water use (AF) | 32 | 34 | 35 | 37 | 38 |
| Unincorporated (within CVWD service area) | Lower income housing units (3.2 persons per household) | 3,988 | 5,816 | 7,644 | 9,472 | 10,684 |
| | Water use (AF) | 5,168 | 7,259 | 9,291 | 11,291 | 12,594 |
| **Total** | **Lower income housing units** | **4,680** | **6,534** | **8,388** | **10,243** | **11,486** |
| | **Water use (AF)** | **5,884** | **7,975** | **10,015** | **12,027** | **13,352** |

NOTES: Projected per capita water use is: 362 GPCD in 2020, 348 GPCD in 2025, 339 GPCD in 2030, 333 GPCD in 2035, and 329 GPCD in 2040.

## 4.6 Climate Change Effects

Projected potential changes in temperature or evapotranspiration for the Coachella Valley due to climate change are not currently available. However, based on larger scale studies, it can be inferred that increased temperatures in the Coachella Valley would increase water demands for crop and landscape irrigation, municipal water use, and evaporative losses from canals and open reservoirs. It has been suggested that increased summer temperatures could draw increased monsoonal flow resulting in more frequent summer thunderstorms. However, no formal studies have been conducted. A combination of state- and local-led demand management measures may reduce demand for irrigation via landscape ordinances while public outreach and education can lead to reductions in water demands through conservation measures.

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# SECTION 5 WATER USE BASELINES AND TARGETS

With the adoption of the Water Conservation Act of 2009 (SB X7-7), the State set a goal of reducing urban water use by 20 percent by the year 2020. Each retail urban water supplier must determine its baseline water use during their baseline period and establish water use targets for the years 2015 and 2020 in order to help the State achieve the 20 percent reduction. In the 2015 UWMP, water agencies must demonstrate compliance with their established water use target for the year 2015. This will also demonstrate whether or not the agency is currently on track to achieve its 2020 target. Compliance is verified by DWR's review of the SB X7-7 Verification Form submitted with an agency's 2015 UWMP. The SB X7-7 standardized tables are found in **Appendix B** and summarized below.

## 5.1 Guidance for Wholesale Agencies

CVWD is not a wholesale agency; this section does not apply. In the future, CVWD may become a wholesale agency if it sells treated or raw water to other water agencies.

## 5.2 Updated Calculations from 2010 UWMP

***CWC §10608.20***

***(g)*** *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

***Methodologies DWR 2011, Methodology 2 Service Area Population***

*Page 27 - Water suppliers may revise population estimates for baseline years between 2000 and 2010 when 2010 census information becomes available. DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates.*

The following subsections detail the changes from the 2010 UWMP based on direction from DWR.

### 5.2.1 Update of Target Method

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of four methods:

- Method 1: Eighty percent of the water supplier's baseline per capita water use
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and Commercial, Industrial and Institutional (CII) uses
- Method 3: Ninety-five percent of the applicable state hydrologic region target.
- Method 4: Baseline per capita water use minus savings from achieving water conservation measures in three water sectors (CII, Residential Indoor, and Landscape water use along with losses).

In the 2010 UWMP, CVWD calculated a 2020 Urban Water Use Target equal to 20 percent of their baseline water use. The same target method used in the 2010 UWMP, Method 1, is calculated in the 2015 UWMP.

### 5.2.2 2010 U.S. Census Data

After examining a sample of population data from the California Department of Finance (DOF), DWR determined that significant discrepancies exist between DOF's projected populations for 2010 (based on 2000 U.S. Census data) and the actual population for 2010, based on 2010 U.S. Census data. The average difference between projected and actual was approximately 3 percent, but the difference for some cities was as high as 9 percent. CVWD used 2000 Census data to estimate the 2010 service area population in the 2010 UWMP. Population estimates are updated based on CVWD's service area boundary using 2010 U. S. Census data for this 2015 UWMP. **Section 3** describes the methods used to incorporate 2010 U.S. Census data and update the historical and current population. Based on the information in **Section 3,** the 2010 service area population is estimated to be 212,029 and the 2015 service area population is estimated to 216,861.

### 5.2.3 SB X7-7 Verification Form

**Section 5** includes many of the standardized tables of the SB X7-7 Verification Form. The complete set of tables can be found in **Appendix B**.

## 5.3 Baseline Periods

***CWC §10608.20***

***(e)*** *An urban retail water supplier shall include in its urban water management plan due in 2010. . . the baseline daily per capita water use…along with the bases for determining those estimates, including references to supporting data.*

***(g)*** *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

To calculate the baseline per capita water use, the supplier must first define the base period. This is either a 10-year period if recycled water use in 2008 was less than 10 percent of the total water delivered or a 15-year period if recycled water use in 2008 was greater than 10 percent.

Although recycled water is a part of CVWD's overall water portfolio, it is not considered to be a component of the urban water system. The customers that receive recycled water are not CVWD potable water customers, but rather private groundwater producers (golf courses and other large irrigators) that offset a portion of their groundwater production with recycled water. Hence, the base period is 10 years.

In addition to the 10-year base period, DWR also requires that an evaluation be performed over a 5-year continuous period, ending no earlier than December 31, 2007 and no later than December 31, 2010. **Table 5-1** presents the baseline period ranges which have remained unchanged since the 2010 UWMP.

*Table 5-1*
*Baseline Period Ranges (SB X7-7 Table 1)*

| Baseline | Parameter | Value | Units |
|---|---|---|---|
| 10- to 15-year baseline period | 2008 total water deliveries | 129,273 | Acre Feet |
| | 2008 total volume of delivered recycled water | 0 | Acre Feet |
| | 2008 recycled water as a percent of total deliveries | 0.00% | Percent |
| | Number of years in baseline period[1] | 10 | Years |
| | Year beginning baseline period range | 1999 | |
| | Year ending baseline period range[2] | 2008 | |
| 5-year baseline period | Number of years in baseline period | 5 | Years |
| | Year beginning baseline period range | 2003 | |
| | Year ending baseline period range[3] | 2007 | |

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[2] The ending year must be between December 31, 2004 and December 31, 2010.

[3] The ending year must be between December 31, 2007 and December 31, 2010.

### 5.3.1 10-15 Year Baseline Period (Baseline GPCD)

***CWC §10608.12***

***(b)*** *"Base daily per capita water use" means any of the following:*

***(1)*** *The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

***(2)*** *For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

The same 10-year period used in the 2010 UWMP, from 1999 to 2008, is used in the 2015 UWMP.

### 5.3.2 5-Year Baseline Period (Target Confirmation)

***CWC §10608.12 (b)***

***(3)*** *For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.*

The same 5-year period used in the 2010 UWMP, from 2003 to 2007, is used in the 2015 UWMP.

## 5.4 Service Area Population

***CWC §10608.20***

***(e)*** *An urban retail water supplier shall include in its urban water management plan due in 2010…the baseline per capita water use, … along with the bases for determining those estimates, including references to supporting data.*

***(f)*** *When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

***CWC §10644***

***(a)(2)*** *The plan…shall include any standardized forms, tables or displays specified by the department.*

CVWD service area populations for the baseline period ranges shown in **Table 5-1** have been updated based on the methodology used by the DWR Population Tool (see **Section 3.4.1**). The method uses the number of single-family and multi-family residential connections to estimate population. **Table 5-2** summarizes CVWD's service area population for the baseline periods.

## 5.5 Gross Water Use

***CWC §10608.12***

***(g)*** *"Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

***(1)*** *Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*

***(2)*** *The net volume of water that the urban retail water supplier places into long term storage*

***(3)*** *The volume of water the urban retail water supplier conveys for use by another urban water supplier*

***(4)*** *The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

***California Code of Regulations Title 23 Division 2 Chapter 5.1 Article***

*Section 596 (a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

The Gross Water Use for each of the years in the baseline period is rather straightforward for CVWD as their sole urban water source during the period has been groundwater. CVWD does not have substantial industrial water use in its area so it does not include process water use deductions in its gross water use calculation. Gross water use for the baseline periods is summarized in **Table 5-2**.

## 5.6 Baseline Daily Per Capita Water Use

The daily per capita water use is calculated as the ratio of the gross water use to the population. The 10-year baseline daily per capita water use is 606 GPCD, the 5-year baseline daily per capita water use is 583 GPCD, and the 2015 daily per capita water use is 383 GPCD. Annual and baseline period average gallons per capita per day is presented in **Table 5-2**.

*Table 5-2*
*Gallons Per Capita Per Day (GPCD) (SB X7-7 Table 5)*

| Baseline Year *From SB X7-7 Table 3* | | Service Area Population *From SB X7-7 Table 3* | Annual Gross Water Use (AF) *From SB X7-7 Table 4* | Daily Per Capita Water Use (GPCD) |
|---|---|---|---|---|
| 10 to 15 Year Baseline GPCD | | | | |
| Year 1 | 1999 | 149,328 | 106,805 | 639 |
| Year 2 | 2000 | 155,972 | 117,547 | 673 |
| Year 3 | 2001 | 163,557 | 116,916 | 638 |
| Year 4 | 2002 | 169,889 | 123,219 | 648 |
| Year 5 | 2003 | 177,144 | 121,231 | 611 |
| Year 6 | 2004 | 186,583 | 124,139 | 594 |
| Year 7 | 2005 | 194,960 | 121,737 | 557 |
| Year 8 | 2006 | 202,094 | 134,988 | 596 |
| Year 9 | 2007 | 208,166 | 129,871 | 557 |
| Year 10 | 2008 | 209,218 | 129,273 | 552 |
| **10-15 Year Average Baseline GPCD** | | | | **606** |
| 5 Year Baseline GPCD | | | | |
| Year 1 | 2003 | 177,144 | 121,231 | 611 |
| Year 2 | 2004 | 186,583 | 124,139 | 594 |
| Year 3 | 2005 | 194,960 | 121,737 | 557 |
| Year 4 | 2006 | 202,094 | 134,988 | 596 |
| Year 5 | 2007 | 208,166 | 129,871 | 557 |
| **5 Year Average Baseline GPCD** | | | | **583** |
| 2015 Compliance Year GPCD | | | | |
| **2015** | | 216,861 | 92,974 | **383** |

## 5.7 2015 and 2020 Baselines and Target Summary

***CWC §10608.20***

***(e)*** *An urban retail water supplier shall include in its urban water management plan due in 2010 … urban water use target, interim urban water use target, … along with the bases for determining those estimates, including references to supporting data (10608.20(e)).*

***CWC §10608.20***

***(g)*** *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan …*

**Section 5.2.1** above described the acceptable methods for determining 2020 water use targets and 2015 interim targets. In accordance with CWC §10608.22, the 2020 urban water use target also must be less than the Minimum Water Use Reduction Requirement, which is calculated as 95% of the 5-year base daily per capita water use. For CVWD, this value is 554 GPCD. **Table 5-3** presents potential 2020

Water Use Targets for CVWD. The 20 percent water use reduction target for CVWD is 485 GPCD based on the updated 10-year baseline water use, which is 12 GPCD higher than the target determined in the 2010 UWMP. The revised 2015 interim water use target is 545 GPCD, which is 13 GPCD higher than the target determined in the 2010 UWMP. However, CVWD has elected to retain the lower water use targets determined in the 2010 UWMP for future compliance.

*Table 5-3*
*Potential Water Use Targets for 2020*

| Approach/Method | Description | Target (GPCD) |
|---|---|---|
| | 10-year baseline per capita daily use | 606 |
| | 5-year baseline per capita daily use | 583 |
| 1 | 80% of water supplier's baseline per capita use for the 10- or 15-year baseline period | 485 |
| 2 | Per capita daily water use estimated using the sum of performance standards applied to indoor residential, landscaped area water use; and CII uses | Not calculated |
| 3 | 95% of the applicable state hydrologic region target | 200 |
| 4 | Baseline per capita water use less savings from achieving water conservation measures in three water sectors (CII, Residential Indoor, and Landscape water use along with losses) | Not calculated |
| Minimum Reduction Requirement | 95% of Baseline per capita daily use for the 5-year period | 554 |
| 2010 UWMP Water Use Target for 2020 | 80% of water supplier's baseline per capita use for the 10- or 15-year baseline period calculated in the 2010 UWMP | 473 |
| Note: CVWD has elected to continue using the 2015 and 2020 water use targets determined in its 2010 UWMP rather than updating it based on the revised baseline water use. | | |

## 5.8 2015 Compliance Daily per Capita Water Use (GPCD)

***CWC §10608.12***

***(e)*** *"Compliance daily per-capita water use" means the gross water use during the final year of the reporting period…*

***CWC §10608.24***

***(a)*** *Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.*

***CWC §10608.20***

***(e)*** *An urban retail water supplier shall include in its urban water management plan due in 2010 … compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

CVWD uses the Method 1 water use target calculated in the 2010 UWMP of 473 GPCD as their 2020 water use target because this target is lower than the Method 1 water use target based on updated baselines in the 2015 UWMP. The interim 2015 water use target of 540 GPCD is calculated as the average of the 10-year baseline period per capita daily water use (606 GPCD) and the confirmed 2020 water use target (473 GPCD). CVWD's 2015 per capita daily water use of 383 GPCD is currently 19 percent below the 2020 target of 473 GPCD. **Table 5-4** summarizes the calculated water use targets.

*Table 5-4*
*Urban Water Use Targets*

| Water Use | GPCD | Percent Change from Baseline |
|---|---|---|
| 10-year baseline per capita daily use | 606 | -- |
| 2015 interim water use target | 540 | 11% |
| 2015 actual water use | 383 | 37% |
| 2020 water use target | 473 | 22% |
| Note: CVWD has elected to continue using the 2015 and 2020 water use targets determined in its 2010 UWMP rather than updating it based on the revised baseline water use. | | |

### 5.8.1 Adjustments to 2015 Gross Water Use

***CWC §10608.24***

***(d)(1)*** *When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:*

***(A)*** *Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.*

***(B)*** *Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.*

***(C)*** *Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.*

***(2)*** *If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.*

***Methodology Document, Methodology 4*** *This section discusses adjustments to compliance-year GPCD because of changes in distribution area caused by mergers, annexation, and other scenarios that occur between the baseline and compliance years.*

Allowable adjustments to the 2015 gross water include extraordinary events, weather normalization, and economic adjustments. No adjustments are made to CVWD's 2015 water use.

## 5.9 Regional Alliance

An urban water supplier may satisfy the requirements of CWC §10620 by participation in areawide, regional, watershed, or basin wide urban water management planning (Regional Alliance) where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use. CVWD did not choose to comply with the SB X7-7 requirements through a Regional Alliance.

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# SECTION 6 SYSTEM SUPPLIES

This section describes the existing and future water supplies available to CVWD to meet its domestic and non-potable water demands. Water supply reliability for normal, single dry and multiple dry years is presented in **Section 7**.

CVWD's urban water service area is defined as the area served by its potable water distribution system. Currently, all urban water uses are supplied from local groundwater. In addition to groundwater, CVWD has imported water supplies from the State Water Project and the Colorado River, and recycled water from several water reclamation plants. These imported and recycled water supplies are used to meet CVWD's non-urban water demands and to replenish the groundwater basin. Although the potable water distribution system does not currently receive water directly from either imported water source, CVWD has plans to install infrastructure to allow its urban water customers to obtain Colorado River water in the future as development occurs. This may include both treated Colorado River water for potable use and non-potable Colorado River water for landscape irrigation purposes. CVWD also has plans to increase its use of recycled water and to develop desalinated agricultural drain water to supplement the existing supplies in the future if needed.

## 6.1 Groundwater

Groundwater is the principal source of municipal water supply in the Coachella Valley. CVWD obtains groundwater from both Whitewater River and the Mission Creek subbasins. The Whitewater River subbasin is a common groundwater source, which is shared by CVWD, Desert Water Agency (DWA), Myoma Dunes Mutual Water Company, the cities of Indio and Coachella, and numerous private groundwater producers. For purposes of administering a replenishment assessment, CVWD divides the Whitewater River subbasin into the West and East Whitewater River Areas of Benefit (AOB). Myoma Dunes and the cities of Indio and Coachella obtain water from the East Whitewater River AOB. The Mission Creek subbasin is also a common water supply that is utilized by CVWD, Mission Springs Water District, and private groundwater producers.

The following presents a description of the groundwater basins, historical production, estimates of overdraft, and groundwater levels.

### 6.1.1 Basin Description

***CWC §10631***

***(b)*** *If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

***(2)*** *A description of any groundwater basin or basins from which the urban water supplier pumps groundwater*

The Coachella Valley groundwater basin, as described by the California Department of Water Resources (DWR) Bulletin 118, is bounded on the easterly side by the non-waterbearing crystalline rocks of the San Bernardino and Little San Bernardino Mountains and on the westerly side by the

crystalline rocks of the Santa Rosa and San Jacinto Mountains. The trace of the Banning fault on the north side of San Gorgonio Pass forms the upper boundary (DWR, 2003).

The lower 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 roughly coincides with the Riverside/Imperial County Line.

Southerly of the lower boundary (Mortmar and Travertine Rock), the subsurface materials are predominantly fine-grained and low in permeability. Although groundwater is present, it is not readily extractable and is of poor quality. 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 DWR in 1964 and the United States Geological Survey (USGS) in 1971.

The boundaries between subbasins within the groundwater basin are generally based upon faults that are 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 flow divides, and surface drainage divides.

The following is a list of the subbasins and associated subareas for the Coachella Valley groundwater basin, based on the DWR and USGS designations:

- Mission Creek Subbasin
- Desert Hot Springs Subbasin
- Garnet Hill Subbasin
- Whitewater River Subbasin (also known as the Indio Subbasin)
    - Palm Springs Subarea
    - Thousand Palms Subarea
    - Oasis Subarea
    - Thermal Subarea

**Figure 6-1** shows the locations of the above described subbasins. In 1964, DWR estimated that the subbasins in the Coachella Valley groundwater basin contained approximately 39,200,000 AF of water (in the first 1,000 feet below the ground surface).

The following areas are within the CVWD boundaries where a supply of potable groundwater is not readily available:

- Indio Hills area
- Mecca Hills area
- Barton Canyon area
- Bombay Beach area which is adjacent to the Salton Sea

- Salton City area which is adjacent to the Salton Sea

Groundwater is pumped from the Mission Creek or Whitewater River Subbasin and conveyed to meet water demands in these areas.

#### 6.1.1.1 Mission Creek Subbasin

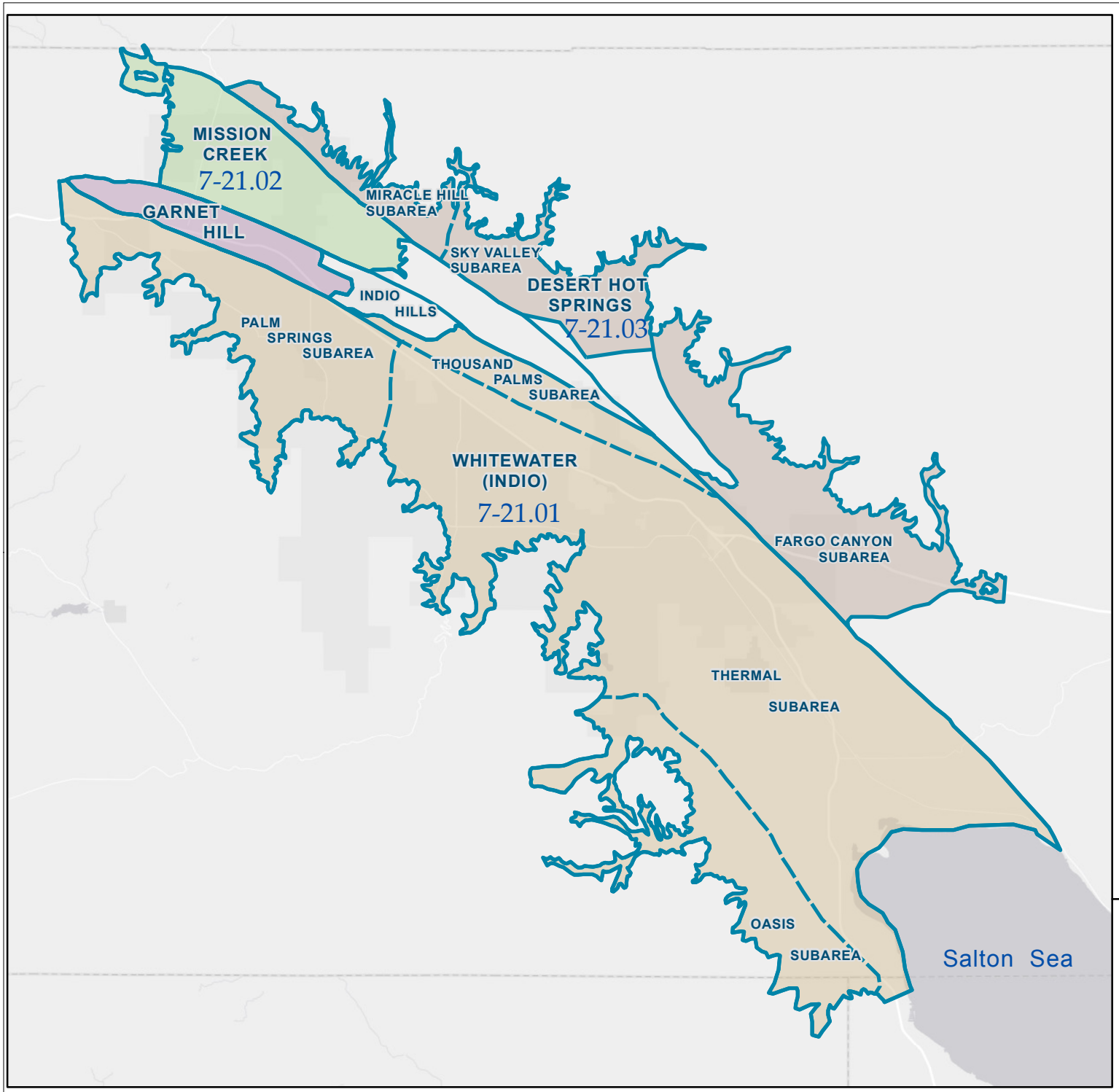
Water-bearing materials underlying the Mission Creek upland comprise the Mission Creek Subbasin (number 7-21.02 in DWR Bulletin 118) (DWR, 2003). The subbasin is bounded on the south by the Banning fault and on the north and east by the Mission Creek fault. The subbasin is bordered on the west by non-waterbearing rocks of the San Bernardino Mountains. To the southeast of the subbasin are the Indio Hills, which consist of the semiwater-bearing Palm Springs Formation. The area within this boundary reflects the estimated geographic limit of effective storage within the subbasin.

Both the Mission Creek fault and the Banning fault are effective barriers to groundwater movement, as evidenced by offset water levels, fault springs and changes in vegetation. The wells drilled in this Subbasin pass thorough unconsolidated recent alluvium (sands and gravels forming the uppermost geologic formation in the Subbasin) and semi-consolidated and interbedded sands, gravels and silts. Although these Pleistocene deposits are the main source of water, water also occurs in recent alluvium where the water table is sufficiently shallow.

CVWD, DWA and Mission Springs Water District (MSWD) jointly manage this subbasin under the terms of the Mission Creek Settlement Agreement (December, 2004). This agreement and the 2003 Mission Creek Groundwater Replenishment Agreement between CVWD and DWA specify that the available SWP water will be allocated between the Mission Creek and Whitewater River Subbasins in proportion to the amount of water produced or diverted from each subbasin during the preceding year. Groundwater recharge in the Mission Creek basin has taken place since 2002. In 2015, production from the Mission Creek Subbasin was about 7 percent of the combined production from these two subbasins (CVWD, 2012). CVWD, MSWD, and DWA jointly developed a water management plan for this subbasin and the Garnet Hill Subbasin in 2013.

#### 6.1.1.2 Desert Hot Springs Subbasin

The Desert Hot Springs subbasin is bounded on the north by the Little San Bernardino Mountains and to the southeast by the Mission Creek and San Andreas faults. The San Andreas fault separates the Desert Hot Springs subbasin from the Whitewater River subbasin and serves as an effective barrier to groundwater flow. The subbasin, designated number 7-21.03 in DWR Bulletin 118 (2003), has been divided into three subareas: Miracle Hill, Sky Valley and Fargo Canyon. Due to poor quality and low groundwater yields, all potable water demand overlying the subbasin is supplied by wells in the Mission Creek Subbasin. However, wells in the Miracle Hill area produce geothermally heated groundwater that supplies spa resorts in Desert Hot Springs. Private wells in the Fargo Canyon Subarea have historically been used for agricultural irrigation and currently supply aggregate mining operations. CVWD does not operate any wells in the Desert Hot Springs subbasin




# Coachella Valley Water District Subbasins

## Key to Features

- Subarea
- Subbasin

## Subbasins

- Desert Hot Springs
- Garnet Hill
- Mission Creek
- Palm Springs

Source: California Department of Water Resources

Basemap Source: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

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**Figure 6-1**

#### 6.1.1.3 Garnet Hill Subbasin

The area between the Garnet Hill fault and the Banning fault, named the Garnet Hill Subarea by DWR (DWR, 1964), was considered a distinct subbasin by the U. S. Geological Survey (USGS) (Tyley, 1974) because of the effectiveness of the Banning and Garnet Hill faults as barriers to groundwater movement. This is illustrated by a difference of 170 feet in groundwater level elevation in a horizontal distance of 3,200 feet across the Garnet Hill fault, measured in 1961. Although some recharge to this subbasin may come from Mission Creek and other streams that pass through during periods of high flood flows, the chemical character of the groundwater plus its direction of movement indicate that the main source of recharge to the subbasin comes from the Whitewater River. Based on groundwater level measurements, this area is partially influenced by artificial recharge activities at the Whitewater Recharge Facilities at Windy Point, especially during periods of high recharge. This subbasin is considered part of the Whitewater River (Indio) in DWR Bulletin 118.

The basin benefits from recharge in the adjacent Mission Creek Subbasin through subsurface inflow, and from the Whitewater River Subbasin during periods of high recharge. CVWD, MSWD, and DWA jointly developed a water management plan for this subbasin along with the Mission Creek Subbasin in 2013. Currently, CVWD includes a portion of the Garnet Hill Subbasin in its West Whitewater Area of Benefit replenishment assessment program. DWA has a separate replenishment assessment program in its portion of the Garnet Hill Subbasin.

#### 6.1.1.4 Whitewater River Subbasin

The Whitewater River Subbasin, designated the Indio Subbasin (Basin No. 7-21.01) in DWR Bulletin No. 108 (DWR, 1964) and Bulletin 118 (DWR, 2003), underlies the major portion of the Valley floor and encompasses approximately 400 square miles. Beginning approximately one mile west of the junction of State Highway 111 and Interstate Highway 10, the Whitewater River Subbasin extends southeast approximately 70 miles to the Salton Sea. The Subbasin is bordered on the southwest by the Santa Rosa and San Jacinto Mountains and is separated from Garnet Hill, Mission Creek and Desert Hot Springs Subbasins to the north and east by the Garnet Hill and San Andreas faults (CVWD, 2010a; DWR, 1964). The Garnet Hill fault, which extends southeastward from the north side of San Gorgonio Pass to the Indio Hills, is a relatively effective barrier to groundwater movement from the Garnet Hill Subbasin into the Whitewater River Subbasin, with some portions in the shallower zones more permeable. The San Andreas fault, extending southeastward from the junction of the Mission Creek and Banning faults in the Indio Hills and continuing out of the basin on the east flank of the Salton Sea, is also an effective barrier to groundwater movement from the northeast.

The subbasin underlies the cities of Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio, and Coachella, and the unincorporated communities of Thousand Palms, Thermal, Bermuda Dunes, Oasis, and Mecca. From about Indio southeasterly to the Salton Sea, the subbasin contains increasingly thick layers of silt and clay, especially in the shallower portions of the subbasin. These silt and clay layers, remnants of ancient lake beds, impede the percolation of water applied for irrigation and restrict groundwater recharge opportunities to the westerly and easterly fringes of the subbasin.

In 1964, the DWR estimated that the Coachella Valley groundwater basin contained a total of approximately 39.2 million AF of water in the first 1,000 feet below the ground surface; much of this water originated as runoff from the adjacent mountains. Of this amount, approximately 28.8 million AF of water was stored in the Whitewater River subbasin. However, the amount of water in the subbasin has decreased over the years due to pumping to serve urban, rural and agricultural development in the Coachella Valley has withdrawn water at a rate faster than its rate of recharge.

The Whitewater River Subbasin is divided into four subareas: Palm Springs, Thermal, Thousand Palms and Oasis. The Palm Springs Subarea is the forebay or main area of recharge to the Subbasin and the Thermal Subarea comprises the pressure or confined area within the basin. The other two subareas are peripheral areas having unconfined groundwater conditions (CVWD, 2010a).

The historical fluctuations of groundwater levels within the Whitewater River Subbasin indicate a steady decline in the levels throughout the Subbasin prior to 1949. With the importation of Colorado River water from the Coachella Canal after 1949, the demand on the groundwater basin declined in the East Valley (generally east and south of Washington Street) below Point Happy and the groundwater levels rose sharply. Water levels in the deeper aquifers of the East Valley rose from 1950 to about 1980. However, in the early 1980s, water levels in the East Valley began declining again, at least partly due to increasing urbanization and groundwater usage. In 2009, CVWD implemented large-scale recharge activities in the East Valley that have resulted in increasing water levels.

Recharge activities with SWP Exchange water commenced in 1973 at the Whitewater River Recharge Facility, north of Palm Springs. Recharge activities at this location have varied with the availability of SWP Exchange water. Groundwater levels in the vicinity of the recharge basins have stabilized since recharge commenced. Although the Palm Desert area is still experiencing a decline in groundwater levels, the rates of decline have been generally decreasing and CVWD is implementing the Mid-Valley Pipeline (MVP) to eliminate golf course groundwater pumping; see **Section 6.3.1.3** for discussion on the MVP.

### 6.1.2 Groundwater Management

***CWC §10631***

***(b)*** *...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

***(1)*** *A copy of any groundwater management plan adopted by the urban water supplier…or any other specific authorization for groundwater management.*

***(2)*** *…For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.*

The Coachella Valley groundwater basin was historically in a state of overdraft. In response to this, the Coachella Valley Water Management Plan, which was adopted by the CVWD Board in October 2002, serves as the groundwater management plan for the Whitewater River subbasin. This plan defines CVWD's long-term approach for eliminating groundwater overdraft and providing sustainable water

supply for the Coachella Valley. The Coachella Valley Water Management Plan was updated for 2010 and a Water Management Plan for the Mission Creek/Garnet Hill subbasins was developed for 2013. The legal authority for groundwater management and details of the ongoing Groundwater Replenishment Program (GRP) are briefly discussed in the following subsections.

#### 6.1.2.1 Legal Authority for Groundwater Management

The Coachella Valley Groundwater Basin is not adjudicated; rather it is jointly managed by CVWD and DWA under the terms of the 1976 Water Management Agreement. DWA and CVWD jointly operate a groundwater replenishment program whereby groundwater pumpers (other than minimal pumpers[1]) pay a per AF charge that is used to pay the cost of importing water and recharging the aquifer.

CVWD has the legal authority to manage the groundwater basins within its service area under special provisions of the County Water District Law (California Water Code, Division 12, Sections 31630-31639). CVWD has specific authority under Part 6, Chapter 7 to levy and collect water replenishment assessments within defined areas of benefit (AOBs) for the purpose of replenishing groundwater supplies within CVWD. CVWD and DWA first executed the Water Management Agreement in 1976, which was amended in 1992 to jointly manage the upper Whitewater River subbasin. This agreement formalized the water replenishment program and provided a mechanism for distributing the costs of SWP water between the CVWD and DWA benefit areas based on total production within each agency's service area. A similar agreement was implemented in 2002 for the Mission Creek subbasin. Both agreements were updated in 2014.

#### 6.1.2.2 Groundwater Replenishment Program

In 1973, CVWD and DWA began replenishing groundwater within the West Whitewater River Subbasin of the Coachella Valley Groundwater Basin by importing Colorado River water exchanged for SWP water allocations.

Since 1997, CVWD has been replenishing groundwater with Colorado River water in the East Whitewater River Subbasin, commencing with a pilot program at the Thomas E. Levy Groundwater Replenishment Facility. CVWD also operated the Martinez Canyon pilot project in the East Whitewater River Subbasin from 2005 to 2013. In 2002, CVWD and DWA expanded the GRP into the Mission Creek Subbasin.

Groundwater replenishment is essential in the Coachella Valley Groundwater Basin. If groundwater replenishment with imported water is eliminated, groundwater overdraft will result. Increased overdraft results in declining water levels, increased pump lifts, and increased energy consumption to pump groundwater for irrigation and domestic use. Extreme overdraft has the potential to cause ground surface subsidence and to impact water quality and groundwater storage volume (Krieger & Stewart [K&S] and MWH, 2016).

1 The Water Code (Section 31630.5(f)) defines a minimal pumper as any producer who produces 25 AFY or less in any year.

To recover the cost of CVWD's GRP, a Replenishment Assessment Charge (RAC) is applied to all non-exempted groundwater production within the West and East Whitewater River and Mission Creek AOBs.

#### 6.1.2.3 Sustainable Groundwater Management Act

In 2014, the California Legislature enacted the Sustainable Groundwater Management Act, a package of three bills (AB 1739, SB 1168, and SB 1319), that empowers local agencies to sustainability manage groundwater resources. The Sustainable Groundwater Management Act (SGMA) defines sustainable groundwater management as the management of groundwater supplies in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.

A local agency, combination of local agencies, or county may establish a Groundwater Sustainability Agency (GSA). It is the GSA's responsibility to develop and implement a groundwater sustainability plan (GSP) that considers all beneficial uses and users of groundwater in the basin. GSAs must be formed by June 30, 2017. GSAs must develop GSPs with measureable objectives and interim milestones that ensure basin sustainability. A basin may be managed by a single GSP or multiple coordinated GSPs. DWR will develop regulations for evaluating GSPs and alternatives to GSPs by June 1, 2016. The SGMA requires high and medium priority basins to develop GSPs. Low and very low priority basins are encouraged, but not required, to develop GSPs. A basin can be managed by an alternative to a GSP if approved by DWR. Alternatives to GSPs are due to DWR for evaluation and assessment by January 1, 2017. CVWD, in conjunction with the other Valley water agencies, anticipates submitting the 2010 Coachella Valley Water Management Plan Update and the 2012 Mission Creek and Garnet Hill Water Management Plan as alternatives to preparing a separate GSP for the Valley.

Under SGMA, DWA is designated to be an exclusive local groundwater management agency within its service area. CVWD, IWA, and CWA all filed to become GSAs and will jointly manage the Whitewater River Subbasin with DWA. CVWD filed for GSA status in the Mission Creek Subbasin along with DWA. CVWD, DWA, and MSWD will continue to jointly manage this subbasin in accordance with the 2003 Mission Creek Settlement Agreement.

### 6.1.3 Overdraft Conditions

***CWC §10631***

***(b)(2)*** *For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.*

Since the early part of the twentieth century, the Coachella Valley has been dependent on groundwater as a source of supply. The demand for groundwater has annually exceeded the limited natural recharge of the groundwater basin. The condition of a groundwater basin in which the outflows (demands) exceed the inflows (supplies) to the groundwater basin is called "overdraft".

The State of California Department of Water Resources Bulletin 160-93 describes overdraft as follows:

> "Where the groundwater extraction is in excess of inflow to the groundwater basin over a period of time, the difference provides an estimate of overdraft. Such a period of time must be long enough to produce a record that, when averaged, approximates the long-term average hydrologic conditions for the basin" (DWR, 1994).

DWR Bulletin 118-80 defines "overdraft as the condition of a groundwater basin where the amount of water extracted exceeds the amount of groundwater recharging the basin over a period of time." It also defines "critical condition of overdraft" as water management practices that "would probably result in significant adverse overdraft-related environmental, social, or economic effect" (DWR, 1980). Water quality degradation and land subsidence are given examples of two such adverse effects.

Bulletin 108 (1964) and Bulletin 118 (2003) are the most recent DWR bulletins that characterize the condition of the Coachella Valley aquifer as a whole. In Bulletin 108, DWR noted that the amount of usable supply in the aquifer was decreasing, while Bulletin 118 stated that overdraft remains a "primary challenge" in the aquifer. CVWD estimates the annual change in storage annually in its Engineer's Reports on Water Supply and Replenishment Assessment.

The historical overdraft in the Coachella Valley had caused groundwater levels to decline in many portions of the East Valley from La Quinta to the Salton Sea, and raised concerns about water quality degradation and land subsidence. Groundwater levels in the West Valley from Palm Springs to La Quinta had also decreased substantially, except in areas adjacent to and down-gradient of the Whitewater River Recharge Facility, where artificial recharge has successfully raised water levels. The Coachella Valley Groundwater Basin is presently not in overdraft due to active management of the Basin through Coachella Valley Water Management Plan programs like the GRP and non-potable supply to golf courses on private groundwater wells.

### 6.1.4 Historical Groundwater Pumping

***CWC §10631***

***(b)*** *...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

***(3)*** *A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

CVWD's total groundwater production from each of the two groundwater basins is presented in **Table 6-1**. In response to growth, CVWD will gradually increase groundwater production to meet demands. CVWD intends to continue meeting its urban water demands from groundwater but plans to treat Colorado River water for urban use in the future. In addition, CVWD has enacted water-saving policies such as tiered water rates, landscape irrigation conservation, and a new landscape ordinance that restricts the water use of new developments.

*Table 6-1*
*Retail Groundwater Volume Pumped (adapted from DWR Table 6-1 R)*

| Groundwater Type | Location or Basin Name | Volume Pumped (AF) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Alluvial Basin | Whitewater River Subbasin (Cove) | 104,164 | 109,400 | 111,787 | 111,920 | 108,959 | 90,407 |
| Alluvial Basin | Mission Creek Subbasin (ID08) | 3,109 | 2,907 | 3,055 | 2,939 | 2,950 | 2,567 |
| | **TOTAL** | **107,273** | **112,306** | **114,842** | **114,859** | **111,909** | **92,974** |

In additional to other urban water retail producers, there are individual private users who pump directly from the groundwater basin. To manage groundwater overdraft, CVWD will continue to convert the larger users to non-potable Canal water and recycled water, where feasible.

## 6.2 Surface Water

CVWD does not currently use or intend to use any local surface water (non-imported surface water) as part of its urban water supply. Local runoff is captured and used for groundwater recharge. See **Section 6.3** for a discussion on imported surface water.

## 6.3 Purchased or Imported Water

This section describes the two sources of imported water available to CVWD: Colorado River water and SWP Exchange water.

### 6.3.1 Colorado River Water

Colorado River water has been a major source of supply for the Coachella Valley since 1949 with the completion of the Coachella Canal. This water is used for agricultural and non-urban purposes, as well as groundwater recharge. The Colorado River is managed and operated in accordance with the *Law of the River*, the collection of interstate compacts, federal and state legislation, various agreements and contracts, an international treaty, a U.S. Supreme Court decree, and federal administrative actions that govern the rights to use of Col0orado River water within the seven Colorado River Basin states.

California's apportionment of Colorado River water is allocated by the 1931 *Seven Party Agreement* among Palo Verde Irrigation District (PVID), Imperial Irrigation District (IID), CVWD, and MWD. The allocations of the three remaining parties – the City and the County of San Diego and the City of Los Angeles – are now incorporated in MWD's allocations. The allocations defined in the *Seven Party Agreement* are shown in **Table 6-2**.

*Table 6-2*
*Priorities and Water Delivery Contracts, California Seven-Party Agreement of 1931*

| Priority | Description | AFY |
|---|---|---|
| 1 | Palo Verde Irrigation District gross area of 104,500 acres of valley lands | 3,850,000 |
| 2 | Yuma Project (Reservation Division) not exceeding a gross area of 25,000 acres within California | |
| 3(a) | Imperial Irrigation District, Coachella Valley Water District, and lands in Imperial and Coachella Valleys to be served by the All American Canal | |
| 3(b) | Palo Verde Irrigation District - 16,000 acres of mesa lands | |
| 4 | Metropolitan Water District of Southern California for use on coastal plain | 550,000 |
| | **Subtotal – California's Basic Apportionment** | **4,400,000** |
| 5(a) | Metropolitan Water District of Southern California for use on coastal plain | 550,000 |
| 5(b) | Metropolitan Water District of Southern California for use on coastal plain | 112,000 |
| 6(a) | Imperial Irrigation District and lands in the Imperial and Coachella Valleys to be served by the All American Canal | 300,000 |
| 6(b) | Palo Verde Irrigation District - 16,000 acres of mesa lands | |
| | **Total** | **5,362,000[1]** |

[1] Priorities 5-6 would only receive water if there is water available in excess of the 7.5 MAFY available to the Lower Basin States or unused water within the Lower Basin.

California's Colorado River supply is protected by the 1968 Colorado River Basin Project Act (PL 90-537, 1968), which authorized construction of the Central Arizona Project (CAP). This act provides that, in years of insufficient supply on the main stream of the Colorado River, supplies to the CAP shall be reduced to zero before California will be reduced below 4.4 million AF in any year. This provision assures full supplies to the Coachella Valley except in periods of extreme drought.

CVWD's use of Colorado River water is authorized under the terms of a contract between the United States and CVWD, signed October 15, 1934, under which the United States built the Imperial Dam, the All-American Canal and the Coachella Canal, and agreed to deliver water to CVWD in accordance with the priorities of the Seven Party Agreement and the 1934 Compromise Agreement between CVWD and Imperial Irrigation District (IID), that subordinated CVWD's right to use water to that of IID. CVWD's rights would later be quantified under the Quantification Settlement Agreement (QSA) in 2003.

The Coachella Canal (Canal) is a branch of the All-American Canal that brings Colorado River water into the Imperial and Coachella Valleys. Historically, CVWD received approximately 330,000 AFY of Priority 3A Colorado River water delivered via the Coachella Canal. The Canal originates at Drop 1 on the All-American Canal and extends approximately 122 miles, terminating in CVWD's Lake Cahuilla. The service area for Colorado River water delivery under CVWD's contract with Reclamation is defined as Improvement District No. 1 (ID-1) which encompasses most of the East Valley and a portion of the West Valley north of Interstate 10. Under the 1931 California Seven Party Agreement, CVWD has water rights to Colorado River water as part of the first 3.85 million AFY allocated to California. CVWD is in the third priority position along with IID.

#### 6.3.1.1 Quantification Settlement Agreement

In October 2003, CVWD, IID, MWD, and San Diego along with the state and federal governments executed the Quantification Settlement Agreement (QSA). The QSA quantifies the Colorado River water allocations of California's agricultural water contractors for the next 75 years and provides for the transfer of water between agencies. Under the QSA, CVWD has a base allotment of 330,000 AFY. In accordance with the QSA, CVWD has entered into water transfer agreements with MWD and IID that increase CVWD supplies as shown in **Table 6-3**.

As of 2015, CVWD receives 378,000 AFY of Colorado River water deliveries under the QSA. This includes the base entitlement of 330,000 AFY, MWD/IID Approval of 20,000 AFY, 36,000 AFY of IID/CVWD First transfer, and 35,000 AFY of MWD/SWP transfer. It also includes the 26,000 AFY transferred to San Diego County Water Authority (SDCWA) as part of the Coachella Canal lining project and the 3,000 AFY transfer to Indian Present Perfected Rights (PPRs). CVWD's allocation of Colorado River water will increase to 419,000 AFY in 2018, and 459,000 AFY in 2026, then reduce to 456,000 AFY in 2048 and remain at that level for the remaining 75-year term of the QSA.

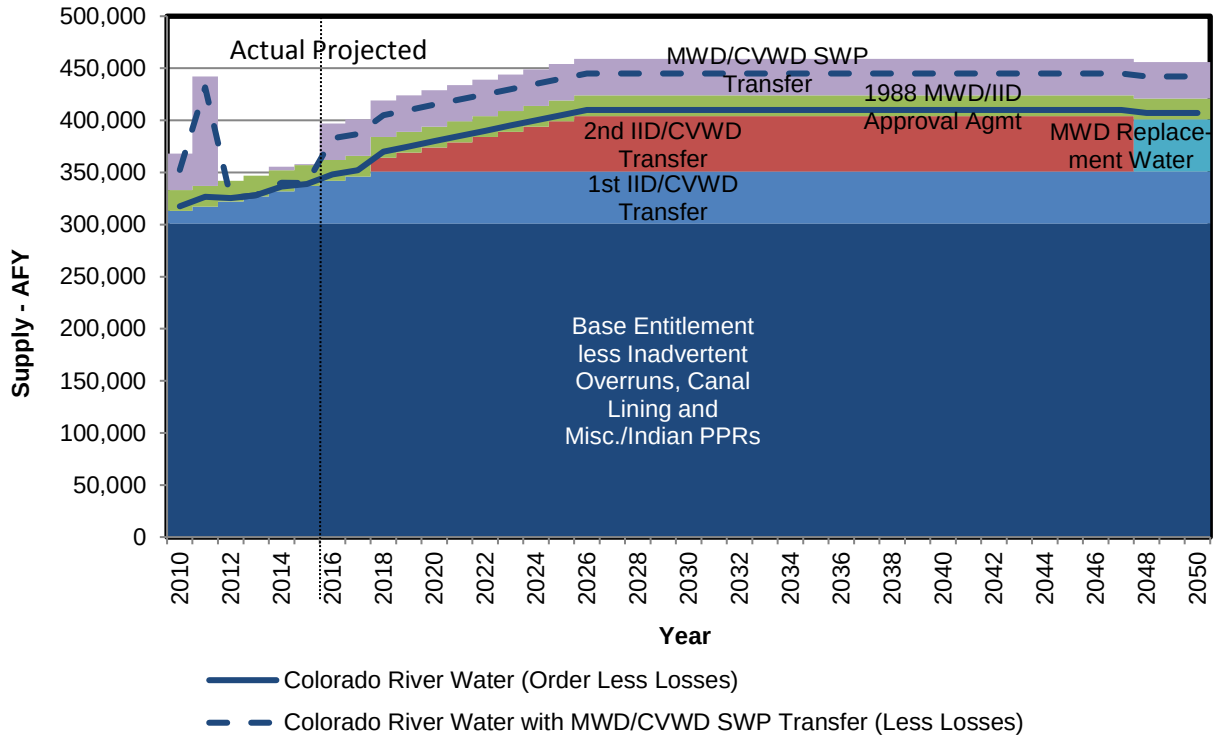
The QSA requires all Colorado River to be delivered at Imperial Dam, i.e., via the All- American Canal to the Coachella Canal. The only exception is the 35,000 AFY MWD/CVWD SWP Transfer, which can also be delivered to the Whitewater Turnout on the CRA. Deliveries at Whitewater are subject to a supplemental energy charge for CRA pumping. The 35,000 AFY supply is not subject to SWP delivery reliability, rather it is a fixed annual delivery. Either MWD or CVWD may request a reduction or elimination of delivery in a given year subject to mutual consent. However, no QSA water may be used in the Mission Creek Subbasin. Delivery of this water to Whitewater commenced in 2010. Since that year, 121,922 AF of water has been delivered, most of which was delivered in 2011 when CVWD took delivery of three years of the 35,000 AFY SWP supply. MWD made minimal deliveries in 2013 through 2015 due to the drought.

*Table 6-3*
*CVWD Colorado River Water Budget under the Quantification Settlement Agreement (MWH, 2015)*

| Component | 2015 Amount (AFY) | 2026-2047 Amount (AFY) | 2048-2077 Amount (AFY) |
|---|---|---|---|
| Base Entitlement | 330,000 | 330,000 | 330,000 |
| Less Coachella Canal Lining (to SDCWA) | -26,000 | -26,000 | -26,000 |
| Less Miscellaneous/Indian PPRs | -3,000 | -3,000 | -3,000 |
| 1988 MWD/IID Approval Agreement | 20,000 | 20,000 | 20,000 |
| First IID/CVWD Transfer | 36,000 | 50,000 | 50,000 |
| Second IID/CVWD Transfer | 0 | 53,000 | 0 |
| MWD/CVWD Replacement Water[1] | 0 | 0 | 50,000 |
| MWD/CVWD SWP Transfer[2] | 35,000 | 35,000 | 35,000 |
| **Total Allocation** | **392,000** | **459,000** | **456,000** |
| Less Conveyance Losses and Regulatory Water[3] | -14,000 | -14,000 | -14,000 |
| **Total Deliveries to CVWD** | **378,000** | **445,000** | **442,000** |

NOTES:
1 MWD assumes the obligation to provide 50,000 AFY of replacement water after 2048.
2 The 35,000 AFY may be delivered at either Imperial Dam or Whitewater River and is not subject to SWP or Colorado River reliability.
3 Conveyance losses and regulatory water based on 2009-2014 averages.

*Figure 6-2*
*CVWD Colorado River Water Deliveries under the QSA (MWH, 2015)*



#### 6.3.1.2 Canal Water Distribution System

The 123-mile Coachella Canal and its underground water delivery system is managed by CVWD and used to irrigate nearly 60,000 acres of farmland in the ID-1 Service Area. The Coachella Canal was built during the period from August 1938, to June 1948, with construction halted during World War II. Construction of the 500-mile underground distribution system was initiated in 1948 and completed in 1954. The canal distribution system was constructed and engineered to follow the natural slope of the land to allow the free flow of water in the direction of the force of gravity. Irrigation pumps are used to deliver water to elevated areas within the availability zones. This lateral distribution system delivers water to farmers at the highest point of every 40 acres of eligible land within the district's service area. In addition to agricultural irrigation, Canal water is currently delivered to a total of 29 golf courses in the East Valley in-lieu of groundwater pumping helping to reduce groundwater overdraft. Four additional golf courses in the north Indio area are supplied with Canal and recycled water. Golf courses served with Canal water are required to meet at least 80 percent of their water needs with Colorado River water. CVWD is working with nine additional golf courses to connect them to the Canal water system.

The QSA permits CVWD to use Colorado River water delivered under those agreements outside of ID-1 for direct and in lieu recharge programs that benefit the groundwater basins that ID-1 overlies. CVWD has agreed to use its best efforts to address the groundwater overdraft problem in ID-1 by 2033. Direct and in-lieu recharge programs in the Whitewater River Subbasin (both Eastern and Western portions) benefit the groundwater basin that ID-1 overlies and assist in addressing the overdraft.

#### 6.3.1.3 Mid-Valley Pipeline

The MVP is a pipeline distribution system to deliver Colorado River water to the Rancho Mirage-Palm Desert-Indian Wells area of the Valley for use with CVWD's recycled water for golf courses and open space irrigation. This source substitution project will reduce groundwater pumping for these uses. Construction of the first phase of the MVP from the Coachella Canal in Indio to WRP-10 (6.6 miles in length) was completed in 2009. Currently, five golf courses are connected directly to the MVP, and 13 courses are connected to the MVP recycled water system. Implementation of later phases will expand the MVP to be able to serve approximately 50 golf courses in the Rancho Mirage-Palm Desert-Indian Wells area that currently use groundwater as their primary source of supply with a mixture of Colorado River water and recycled water. Golf courses connected to the MVP system are required to meet at least 80 percent of their water needs with non-potable water. Due to their distant location relative to the MVP system, 13 golf courses will continue to rely on groundwater.

The MVP is expected serve about 37,000 AFY of imported water and 15,000 AFY of WRP-10 recycled water on average. The MVP will meet approximately 72 percent of the West Valley golf course demand by full buildout.

#### 6.3.1.4 Oasis Area Irrigation System Expansion

CVWD is proposing to expand its irrigation system in the Oasis Project Area near the northwest margin of the Salton Sea, south of Avenue 66, west of Harrison Street, and north of Avenue 86 to supply up to approximately 31,955 AFY. System improvements required to convey water to these lands include construction of gravity and pressurized pipelines, surface reservoirs, pump stations, and related

modifications and connections to the existing irrigation system. The project will be constructed, owned, and operated by CVWD. It will be connected to the existing water delivery system (Lateral 97.1) that serves the Oasis Area. This lateral serves one of the six distinct service zones within Improvement District No. 1 (ID-1). Its headworks is a turnout from the Coachella Canal (on the east side of the valley) and heads on a southwesterly alignment across the valley to the Oasis Tower (a distribution stand that controls water pressure to farms) located at the intersection of Avenue 70 and Polk Street.

### 6.3.2 State Water Project

To recharge groundwater supplies in the Upper Whitewater River and Mission Creek subbasins, CVWD and DWA obtain imported water supplies from the State Water Project (SWP). The SWP is managed by DWR and includes 660 miles of aqueduct and conveyance facilities extending from Lake Oroville in northern California to Lake Perris in the south. The SWP has contracts to deliver 4.172 million AFY to 29 contracting agencies. DWA and CVWD initially contracted with the State of California for water from the SWP in 1962 and 1963, respectively. CVWD's original SWP water allocation (Table A Amount[2]) was 23,100 AFY, while DWA's original SWP water allocation was 38,100 AFY. As a result of several water transfers, CVWD's Table A allocation is 138,350 AFY and DWA's Table A allocation is 55,570 AFY.

Each year, DWR determines the amount of water available for delivery to SWP contractors based on hydrology, reservoir storage, the requirements of water rights licenses and permits, water quality and environmental requirements for protected species in the Sacramento-San Joaquin Delta. The available supply is then allocated according to each SWP contractor's Table A Amount. Since the original allocation, both CVWD and DWA have obtained additional water transfers, which are discussed below. CVWD and DWA jointly manage their combined SWP Table A Amounts, allocating costs in proportion to total groundwater production within the Upper Whitewater and Mission Creek portions of their respective service areas.

#### 6.3.2.1 SWP Exchange and Advanced Delivery Agreements

There are no physical facilities to deliver SWP water to the Valley. CVWD's and DWA's Table A water is exchanged with MWD for a like amount of Colorado River water from MWD's Colorado River Aqueduct (CRA) that extends from Lake Havasu, through the Coachella Valley to MWD's Lake Mathews. CVWD and DWA first executed separate water exchange agreements with MWD in 1967. These agreements were modified and extended in 1983 for the term of the SWP contracts (until year 2035). A joint exchange agreement between CVWD, DWA, and MWD was signed in 2003 to transfer 100,000 AFY of SWP Table A Amount from to CVWD and DWA as discussed below. SWP Exchange water has been used to recharge the Upper Whitewater River Subbasin at the Whitewater Recharge Facility since 1973.

[2] Each SWP contract contains a "Table A" exhibit that defines the maximum annual amount of water each contractor can receive excluding certain interruptible deliveries. Table A Amounts are used by DWR to allocate available SWP supplies and some of the SWP project costs among the contractors.

MWD, DWA, and CVWD executed an advanced delivery agreement in 1984 that allowed MWD to pre-deliver up to 600,000 AF of SWP water into the Coachella Valley. MWD then has the option to deliver the Valley's SWP allocation either from the CRA or from water previously delivered to the basin and deducted from the advance delivery account. If the advance delivery amount drops to zero, MWD is obligated to directly deliver the required amount of exchange water. The Advance Delivery Agreement was amended in 2007 to increase the pre-delivery amount to a maximum of 800,000 AF based on the increased Table A Amounts of CVWD and DWA. The amount of water that has been pre-delivered is accounted for and reported annually in the Engineer's Reports on Water Supply and Replenishment prepared by CVWD and DWA. As of December 31, 2015, there was about 200,000 AF in the Advanced Delivery storage account.

#### 6.3.2.2 MWD 100,000 AFY Transfer

MWD historically has not made full use of its SWP Table A Amounts in normal and wet years. Under the 2003 Exchange Agreement, CVWD and DWA acquired 100,000 AFY of MWD's SWP Table A water as a permanent transfer (CVWD-DWA-MWD, 2003). The water is exchanged for Colorado River water and recharged at the existing Whitewater and Mission Creek Recharge Facilities. The transferred water may also be delivered from MWD's Advance Delivery account. CVWD and DWA would assume all SWP costs associated with this water except as described below.

The terms of the 2003 agreement provide that CVWD receives 88,100 AFY and DWA receives 11,900 AFY of MWD's SWP Table A water effective January 1, 2005. CVWD and DWA assume all capital costs associated with capacity in the California Aqueduct to transport this water and variable costs to deliver the water to Lake Perris. MWD retains other rights associated with the transferred water including interruptible water service, carryover storage in San Luis Reservoir and flexible storage at Castaic and Perris Reservoirs. Amendments to CVWD's SWP contract were executed in 2003 (DWR, 2003).

MWD has the option to call back the water in years when needed. This option must be exercised no later than April 30 of each year. MWD's callback options are to be exercised in two 50,000 AF blocks. The actual frequency of callback would depend on the availability of MWD's water supplies to meet its demands. Since 2003, MWD has called back the water only in 2005. MWD staff (2015) estimates the probability of a MWD call-back on SWP deliveries to be zero through 2024 and 1 percent of the time through 2050. MWD could potentially issue a call-back to restore the Advanced Delivery account after a drought. Because severe long-term droughts have occurred roughly three times in the 1922-2003 hydrologic sequence, it is assumed that a call-back could occur in three out of 82 years with an average supply loss of 3,500 AFY.

#### 6.3.2.3 Other SWP Transfers

In 2004, CVWD purchased an additional 9,900 AFY of SWP Table A water from the Tulare Lake Basin Water Storage District (Tulare Lake Basin) in Kings County (DWR, 2004). In 2007, CVWD made a second purchase of Table A SWP water from Tulare Lake Basin for 5,250 AFY (DWR, 2007). Also in 2007, a transfer was completed for 12,000 AFY of Table A Amounts from the Berrenda Mesa Water District in Kern County (DWR, 2007a). DWA participated in these latter two transfers in amounts of 1,750 AFY and 4,000 AFY, respectively. With these additional transfers, CVWD's total SWP Table A

Amount is 138,350 AFY. **Table 6-4** summarizes CVWD's and DWA's total allocations of Table A SWP water. Although CVWD and DWA have contracts for water amounts as shown on **Table 6-4**, the amount of water they are actually allocated in any given year is based on the amount of SWP water available. For 2014 and 2015, the allocations were 5 percent and 20 percent of the total contracted amount, respectively. A more detailed discussion of SWP reliability is provided in **Section 7**.

*Table 6-4*
*State Water Project Sources*

| Agency | Original SWP Table A | Tulare Lake Basin Transfer #1 | Tulare Lake Basin Transfer #2 | MWD Transfer | Berrenda Mesa Transfer | Total |
|---|---|---|---|---|---|---|
| | AFY | | | | | |
| CVWD | 23,100 | 9,900 | 5,250 | 88,100 | 12,000 | 138,350 |
| DWA | 38,100 | 0 | 1,750 | 11,900 | 4,000 | 55,750 |
| **Total** | **61,200** | **9,900** | **7,000** | **100,000** | **16,000** | **194,100** |

#### 6.3.2.4 SWP Turnback Pool and Interruptible Water

The SWP Contracts include provisions for contractors to offer unused Table A allocations for purchase by other contractors (Turnback Pool) and for DWR to offer available water in excess of deliveries (Interruptible or Article 21 water). During wet years, CVWD and DWA purchase Turnback Pool and Interruptible water, as available from other SWP contractors. Although the availability of this water is expected to decline in the future, CVWD and DWA continue to acquire these additional water supplies, as they become available. Over the past ten years, CVWD and DWA have purchased a total of 4,811 AF of SWP Turnback Pool water and 5,800 AF of Interruptible water.

### 6.3.3 Other Imported Water Supplies

CVWD and DWA along with other Valley agencies have investigated other water transfer opportunities described below. Since these water transfers are highly uncertain, they are not accounted for as firm existing supply capacity available to CVWD. CVWD and DWA have obtained water from the Yuba River Accord Dry Year Water Purchase Program, Rosedale-Rio Bravo Transfer; these transfers are discussed in **Section 6.7.2**.

## 6.4 Stormwater

The Coachella Valley drainage area is approximately 65 percent mountainous and 35 percent typical desert valley with alluvial fan topography buffering the valley floor from the steep mountain slopes. The mean annual precipitation ranges from 44 inches in the San Bernardino Mountains to less than 3 inches at the Salton Sea. Three types of storms produce precipitation in the drainage area: general winter storms, general summer storms and local thunderstorms. Longer duration, lower intensity rainfall events tend to have higher recharge rates, but runoff and flash flooding can result from all three types of storms. Otherwise, there is little or no flow in most of the streams in the drainage area.

The 70-mile-long Whitewater River/Coachella Valley Stormwater Channel and its tributaries have been channelized and improved to safely convey flood flows. Improvements typically consist of debris basins

and concrete channels to capture debris and convey flash flood flows to the main channel. Debris basins also have the added benefit of capturing and infiltrating small storm flows, thus enhancing recharge of stormwater. The East Valley and especially the Oasis area on the west side of the Salton Sea lack flood control improvements. As future development occurs in the East Valley and flood control funding becomes available, debris basins and channels will be constructed. Debris basins detain flood flows and enhance stormwater capture (CVWD, 2009). Significant amounts of local runoff are currently captured at the Whitewater River Recharge Facility and in the debris basins and unlined channels of the West Valley. Additional stormwater will be captured when the 1000 Palms Flood Control Project is completed and when flood control is constructed in the Oasis area. However, limited data exist to estimate the amount of additional stormwater that could be captured by new facilities in the Coachella Valley.

CVWD maintains rain and flow gauges and also participates in flow measurement with the USGS, which maintains 16 stream gauging stations in the Valley. Analysis of historical flow data at the Whitewater River station near Indio indicates that average flows are about 3.5 cfs; however, measurable flow only occurs about 2.3 percent of the time or about 8 days per year. When flow is occurring, the average flow rate is 142 cfs with peak flow exceeding 5,000 cfs. The amount of storm water that could be recovered is a function of diversion and storage capacity. For example, if a 10 AF storage facility were constructed, an average of about 50 AFY of additional flow could be captured. A 100 AF facility would capture about 250 AFY on average. A 10,000 AF facility might be required to capture all flow and would yield about 2,600 AFY. Consequently, large-scale stormwater capture is not expected to yield sufficient water to be worth the investment as a single purpose project. However, small-scale stormwater retention systems located in areas of suitable geology to allow percolation could capture small intensity storms as well as street runoff. The potential yield of these smaller systems is not known at this time. Consequently, stormwater capture should be considered in conjunction with projects that construct stormwater and flood control facilities (CVWD, 2012).

## 6.5 Wastewater and Recycled Water

Recycled water is a significant potential local resource that can be used to help reduce overdraft. Wastewater that has been highly treated and disinfected can be reused for landscape irrigation and other purposes; however, treated wastewater is not suitable for direct potable use. Valley golf courses are not connected to CVWD's urban water but instead rely on private groundwater wells to meet their irrigation needs. To manage groundwater overdraft, CVWD started recycling wastewater for irrigation of golf courses and landscaping in the Coachella Valley in the late 1960s. As growth occurs in the East Valley, the supply of recycled water is expected to increase creating an additional opportunity to maximize local water supply.

CVWD operates five water reclamation plants (WRPs), three of which (WRP-7 and WRP-10) generate recycled water for irrigation of golf courses and large landscaped areas. WRP-4 became operational in 1986 and serves communities from La Quinta to Mecca. WRP-4 effluent is not currently recycled; however, it will be recycled in the future when the demand for recycled water develops and tertiary treatment is constructed. The other two WRPs serve isolated communities near the Salton Sea. A sixth WRP (WRP-9) was decommissioned in July 2015.

### 6.5.1 Recycled Water Coordination

***CWC §10633***

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.*

CVWD provides both water and wastewater services in its service area. CVWD does not serve recycled water treated by another agency. Currently, the only interagency coordination occurring with relation to recycled water is that between the City of Palm Springs and DWA. The City of Palm Springs operates the Palm Springs Wastewater Treatment Plant. DWA provides tertiary treatment to effluent from this plant and delivers recycled water to golf courses and parks in the Palm Springs area. IWA is planning for the future use of VSD wastewater to serve recycled water to nearby golf courses.

### 6.5.2 Wastewater Collection, Treatment, and Disposal

***CWC §10633***

***(a)*** *(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

***CWC §10633***

***(b)*** *(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

CVWD provides wastewater collection and treatment services for all or a part of the cities of Cathedral City, Indian Wells, La Quinta, Palm Desert, and Rancho Mirage. By agreement, a small portion of flow from DWA's service area is sent to CVWD's system.

#### 6.5.2.1 Wastewater Collected Within Service Area

CVWD's wastewater collection system consists of approximately 1,100 miles of 6-inch through 36-inch diameter sewers, and includes 35 sewage lift stations and associated force mains. The system contains trunk sewers, generally 10-inches in diameter and larger, that convey the collected wastewater flows to the District's treatment facilities (Carollo, 2009). **Table 6-5** summarizes the wastewater collected in 2015 within CVWD's service area.

*Table 6-5*
*Wastewater Collected Within Service Area in 2015 (DWR Table 6-2 R)*

| Wastewater Collection | | | Recipient of Collected Wastewater | | | |
|---|---|---|---|---|---|---|
| **Name of Wastewater Collection Agency** | **Wastewater Volume Metered or Estimated?** | **Volume of Wastewater Collected in 2015 (AF)** | **Name of Wastewater Treatment Agency Receiving Collected Wastewater** | **Treatment Plant Name** | **Is WWTP Located Within UWMP Area?** | **Is WWTP Operation Contracted to a Third Party?** |
| CVWD | Metered | 18 | CVWD | WRP-1 | Yes | No |
| CVWD | Metered | 14 | CVWD | WRP-2 | Yes | No |
| CVWD | Metered | 5,145 | CVWD | WRP-4 | Yes | No |
| CVWD | Metered | 3,018 | CVWD | WRP-7 | Yes | No |
| CVWD | Metered | 141 | CVWD | WRP-9 | Yes | No |
| CVWD | Metered | 10,627 | CVWD | WRP-10 | Yes | No |
| **Total Wastewater Collected from Service Area in 2015:** | | **18,962** | | | | |
| NOTES: WRP-9 was taken offline on July 15, 2015 and has been decommissioned. | | | | | | |

#### 6.5.2.2 Wastewater Treatment and Discharge within Service Area

The amount of wastewater treated and discharged or recycled by water reclamation plant is summarized in **Table 6-6**. Brief descriptions of CVWD's wastewater facilities are presented in the following subsections. One facility (WRP-9) was decommissioned in 2015.

##### 6.5.2.2.1 WRP-1

WRP-1 serves the Bombay Beach community near the Salton Sea. WRP-1 has a design capacity of 150,000 gallons per day (gpd) and consists of two mechanically-aerated concrete-lined oxidation basins, two unlined stabilization basins, and six evaporation-infiltration basins. Currently all of the effluent from this facility is disposed by evaporation-infiltration. CVWD has no plans to recycle effluent from this facility because of the low flow and lack of potential uses near the plant.

##### 6.5.2.2.2 WRP-2

WRP-2 serves the nearby North Shore community housing. WRP-2 has two types of treatment facilities: an activated sludge treatment plant capable of providing secondary treatment to a maximum of 180,000 gpd, and an oxidation treatment basin having a design treatment capacity of 33,000 gpd. The oxidation treatment basin is mechanically aerated and is lined with a single synthetic liner. The activated sludge treatment plant is used only when the maximum daily flow exceeds 33,000 gpd, otherwise the oxidation basin is used for treatment. WRP-2 discharges treated secondary effluent into four evaporation-infiltration basins for final disposal. CVWD has no plans to recycle effluent from this facility because of the low flow and lack of potential uses near the plant.

*Table 6-6*
*Wastewater Treatment and Discharge within Service Area in 2015 (adapted from DWR Table 6-3 R)*

| WWTP Name | Discharge Location Name or Identifier | Discharge Location Description | Method of Disposal | Treatment Level | 2015 Volumes (AF) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Treated | Discharged | Recycled |
| WRP-1 | Bombay Beach | Percolation Ponds | Percolation ponds | Secondary, Undisinfected | 18 | 18 | 0 |
| WRP-2 | North Shore | Percolation Ponds | Percolation ponds | Secondary, Undisinfected | 14 | 14 | 0 |
| WRP-4 | Thermal | CVSC | River or creek outfall | Secondary, Disinfected - 23 | 5,145 | 5,145 | 0 |
| WRP-7 [1,2] | North Indio | Non-potable customers and percolation ponds | Percolation ponds | Tertiary | 3,018 | 1,016 | 1,773 |
| WRP-9 [3] | East Palm Desert | Out of Service | Percolation ponds | Secondary, Disinfected - 23 | 141 | 61 | 80 |
| WRP-10 [1,2] | Palm Desert | Non-potable customers and percolation ponds | Percolation ponds | Tertiary | 10,627 | 3,204 | 6,896 |
| | | | | **Total** | **18,962** | **9,457** | **8,749** |

NOTES:
[1] Tertiary capacity of WRP-7 is 2.5 MGD, WRP-10 is 15 MGD.
[2] Included in the recycled water is water used within the plant, WRP-7 recycled 228.5 AF for plant use and WRP-10 recycled 527.5 AF for plant use.
[3] WRP-9 was taken offline on July 15, 2015 and has been decommissioned.

#### 6.5.2.2.3 WRP-4

CVWD's WRP-4 is a 9.9 million gallons per day (MGD) capacity treatment facility located in Thermal. WRP-4 provides secondary treatment consisting of pre-aeration ponds, aeration lagoons, polishing ponds, and disinfection. The treated effluent is discharged to the CVSC pursuant to a National Pollution Discharge Elimination System (NPDES) permit. Effluent from WRP-4 is not currently suitable for water recycling due to the lack of tertiary treatment. However, CVWD plans to add tertiary treatment and reuse effluent from this plant in the future as development occurs.

#### 6.5.2.2.4 WRP-7

WRP-7 is located in North Indio and has a capacity of 5.0 mgd. The design capacity of the tertiary treatment system at WRP-7 is 2.5 MGD. The off-site pumping capacity of the WRP-7 recycled water pump is approximately 4,500 gpm. In the summer, peak demands exceed the pumping capacity of 4,000 gpm, which typically serves Sun City, and 500 gpm which serves Shadow Hills.

Since 1997, WRP-7 has served a blend of canal water and disinfected tertiary recycled water to two 18-hole golf courses and an additional 9-holes on another course. At WRP-7, the tertiary treated recycled

water from the tertiary storage pond is blended in a wet-well with canal water and then pumped to open reservoirs located at the golf courses.

#### 6.5.2.2.5 WRP-9 (Out of Service July 2015)

WRP-9 was located in East Palm Desert with a design capacity of 0.4 MGD. It served disinfected secondary treated recycled water to portions of the Palm Desert Country Club golf course since 1968. Due to the lack of supply and regulatory restrictions on the type of recycled water (disinfected secondary recycled water), recycled water was not capable of providing the total irrigation demand and was supplemented with groundwater. CVWD began decommissioning of WRP-9 in July 2015 and the plant is now closed. WRP-10 is now the sole provider of non-potable water to Palm Desert County Club.

#### 6.5.2.2.6 WRP-10

WRP-10 is also located in Palm Desert. WRP-10 began delivering recycled water in 1987. The design capacity of the tertiary treatment system at WRP-10 is 15 MGD. Since 2009, WRP-10 is also capable of serving canal water from the MVP blended with the tertiary water to the non-potable water customers.

WRP-10 has two distribution systems. One is a low-pressure system, which recycled water and/or canal water delivered by the MVP leaves the plant in this system at 85 psi. The other system is a high pressure system which pumps recycled water and/or canal water delivered by the MVP out at 135 psi. Because the winter demand for recycled water is less than the available supply, a portion of the plant flow is disposed through on-site percolation-evaporation ponds. As more golf courses are connected to the MVP system, CVWD plans to eliminate percolation of recycled water.

### 6.5.3 Recycled Water System

***CWC §10633***

***(c)*** *(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

The approach to reuse implementation depends on the location of the wastewater discharges in the Valley. In 2010, CVWD developed a new non-potable water use agreement that requires golf courses with access to Canal or recycled water to meet at least 80 percent of their irrigation demand from that source (CVWD, 2010b). CVWD is also preparing a non-potable master plan that is expected to be completed in 2016. Recycled water use directly offsets groundwater pumping by private well owners and does not augment the urban water supply. However, it does directly reduce groundwater overdraft.

#### 6.5.3.1 West Valley

In the West Valley, all treated municipal wastewater is either reused for irrigation uses or percolated for disposal. No treated wastewater is discharged to surface waters. When reused, the recycled water offsets groundwater pumping by golf courses and other large landscape irrigators. Wastewater that is not recycled is disposed to percolation-evaporation ponds where most of the percolated water enters the groundwater basin. This typically occurs during the winter months when irrigation demands and evaporation losses are low. Consequently, from a groundwater balance point of view, there is little

difference between recycling the water for irrigation and disposal by percolation in the West Valley. However, from a water quality point of view, treated wastewater contains nutrients like nitrogen that can adversely affect groundwater quality. When the water is recycled for irrigation uses, much of the nutrients are taken up by the plants and turf reducing the need for fertilizer. Thus, reuse provides a water quality benefit. To maximize this benefit, CVWD plans to increase the number of golf courses supply with recycled water to minimize the amount of wastewater percolation.

One issue in the West Valley is that the demand for non-potable water typically exceeds the available supply, especially in the summer months. Irrigators using recycled water currently must supplement that supply with local groundwater to meet their peak summer demands. This limits the amount of overdraft reduction that is possible to the available recycled water supply.

In 2008, CVWD completed the initial phase of the MVP project to convey Canal water to WRP-10 where it is blended with recycled water for delivery to golf courses and other large urban irrigators. Eventually, the delivery system will be expanded to serve additional golf courses and significantly reduce their groundwater use.

CVWD also supplements the recycled supply from WRP-7 with Coachella Canal water. For the West Valley, a planning target of recycling 90 percent of the available treated wastewater has been established. Where feasible, recycled water would be supplemented with available imported water sources to reduce pumping by large landscape irrigators.

#### 6.5.3.2 East Valley

Currently, in the East Valley, there is no recycled water use from CVWD wastewater plants. Wastewater produced from CVWD's WRP-4 is discharged into the CVSC, pursuant to a NPDES permit issued by the Colorado River Regional Water Quality Control Board (Regional Board). Effluent at CVWD WRP-1 and CVWD WRP-2 is disposed to evaporation-infiltration ponds under Regional Board-issued waste discharge permits. As growth occurs in the East Valley, significantly more wastewater will be generated and will require treatment. This represents a significant resource that could be used to offset current and future groundwater pumping.

CVWD will be developing a non-potable water master plan in the next five years, which will further evaluate recycling options in the East Valley and recommend projects for optimizing the use of recycled water in the East Valley.

### 6.5.4 Recycled Water Beneficial Uses

***CWC §10633***

***(d)*** *(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

***CWC §10633***

***(e)*** *(Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

This section describes current and planned uses of recycled water within CVWD and provides an update of 2010 projections for 2015 versus actual recycled water use.

### 6.5.4.1 Current and Planned Uses of Recycled Water

The existing recycled water customers, which are golf courses, are not part of CVWD's urban water potable system, but rather private groundwater producers that purchase recycled water. It is expected that golf course irrigation will remain the largest use of recycled water in the future. Although CVWD's urban water demand is not offset by recycled water use, the Coachella Valley's water supply is indirectly increased by taking private producers off groundwater and using recycled water. **Table 6-7** summarizes the current and projected uses of recycled water within CVWD's service area.

*Table 6-7*
*Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4 R)*

| Beneficial Use Type | General Description of Uses | Level of Treatment | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
|---|---|---|---|---|---|---|---|---|
| Agricultural irrigation | Served by WRP-4 | Tertiary | 0 | 0 | 12,700 | 15,100 | 17,500 | 19,200 |
| Landscape irrigation (excludes golf courses) | HOAs and one high school served by WRP-10 | Tertiary | 387 | 400 | 400 | 400 | 400 | 400 |
| Golf course irrigation | Served by WRP-7 and WRP-10 | Tertiary | 8,282 | 13,900 | 14,600 | 15,300 | 16,000 | 16,700 |
| Golf course irrigation | Served by WRP-9 | Secondary, Disinfected - 23 | 80 | 0 | 0 | 0 | 0 | 0 |
| | | **Total** | **8,749** | **14,300** | **27,700** | **30,800** | **33,900** | **36,300** |
| NOTES: WRP-9 was taken offline on July 15, 2015 and has been decommissioned. | | | | | | | | |

### 6.5.4.2 Planned versus Actual Use of Recycled Water

***CWC §10633***

***(e)*** *(Provide) a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

The 2010 UWMP projected recycled water uses for 2015 are presented in **Table 6-8** compared with actual recycled water use.

*Table 6-8*
*2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (DWR Table 6-5 R)*

| Use Type | 2010 Projection for 2015 (AF) | 2015 Actual Use (AF) |
|---|---|---|
| Agricultural irrigation | 0 | 0 |
| Landscape irrigation (excludes golf courses) | 530 | 387 |
| Golf course irrigation | 12,330 | 8,362 |
| **Total** | **12,860** | **8,749** |
| NOTES: Plant use of recycled water not projected in 2010 UWMP. | | |

### 6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

***CWC §10633***

***(f)*** *(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

***CWC §10633***

***(g)*** *(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

CVWD has long encouraged the use of recycled water for irrigation purposes. In 2006, CVWD sponsored SB 1557 that was adopted by the California Legislature as Part 8.2 (CWC §32600-32603) of the County Water District Law. This law applies only to CVWD and specifies that the use of potable domestic water for "non-potable uses for cemeteries, parks, highway landscaped areas, new industrial facilities, and golf course irrigation is a waste and an unreasonable use." The law mandates the use of non-potable water (including recycled water) for cemeteries, parks, highway landscaped areas, new industrial facilities, and golf course irrigation provided:

1. The CVWD Board determines that the source of non-potable water is of adequate quality for the proposed use and is available for that use.
2. The CVWD Board determines that the non-potable water may be furnished for the proposed use at a reasonable cost to the user.
3. The State Department of Public Health determines that the use of non-potable water from the proposed source will not be detrimental to public health.
4. The California Regional Water Quality Control Board determines that the use of non-potable water from the proposed source will comply with any applicable water quality control plan.
5. The CVWD Board determines that the use of non-potable water for the proposed use will not adversely affect groundwater rights, will not degrade water quality, and is determined not to be injurious to plant life, fish, and wildlife.

CVWD intends to use this law to encourage the use of both recycled water and Coachella Canal water for non-potable uses. In 2009, CVWD developed a standardized non-potable water use contract that mandates at least 80 percent of the demand be met with non-potable water. As part of the non-potable water use contract, CVWD establishes the price of non-potable water at 85 percent of the cost of groundwater pumping and the applicable replenishment assessment. The agreement also specifies a 50 percent "conservation charge" for any non-potable water use below 80 percent of demand, providing a financial incentive to use non-potable water.

Where practical, CVWD requires new developments to use recycled or non-potable water as a condition of receiving domestic and sanitation services from CVWD. The developments will then use the recycled or non-potable water as it becomes available. CVWD also has a policy of requiring that new golf courses either use recycled water or canal water where it is available. CVWD is committed to maximizing the use of non-potable water for non-potable uses by investing in infrastructure improvements as discussed previously. **Table 6-9** summarizes methods planned by CVWD to expand future recycled water use as a result of financial incentives, improvements to treatment plants and conveyance facilities, and other activities.

*Table 6-9*
*Methods to Expand Future Recycled Water Use (adapted from DWR Table 6-6 R)*

| Name of Action | Description | Planned Implementation Year | Expected Increase in Recycled Water Use |
|---|---|---|---|
| Recycled Water Market Assessment | CVWD will conduct a market assessment for recycled water in the next year. | By 2020 | 19,200 |
| Financial incentives | CVWD makes the use of recycled water more affordable than the cost to pump groundwater. | 2015-2040 | |
| WRP-4 Recycled Water Program | Initial phases of WRP-4 recycled water program with eventual construction of tertiary treatment, plant expansion, and conveyance facilities. | 2020-2040 | |
| Addition of golf courses to MVP | Utilization of recycled water during winter months. | 2020-2040 | 5,600 |
| IWA Recycled Water Program | CVWD will work with IWA to develop their Recycled Water Program. | 2020-2040 | 9,250 |
| | | **Total** | **34,050** |

## 6.6 Desalinated Water Opportunities

***CWC §10631***

***(h)*** *Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

CVWD anticipates the future use of desalinated water as part of its water supply portfolio. Opportunities include desalinating local agricultural drain water and acquisition of desalinated ocean water through a water exchange.

### 6.6.1 Desalinated Drain Water

CVWD plans to use treated agricultural drainage water for irrigation purposes. The 2002 WMP recommended that a drain water desalination facility commence operation between 2010 and 2015 with a 4,000 AFY facility. The facility would be expanded to 11,000 AFY by 2025. Product water would be delivered to the Canal distribution system for non-potable use. This supply would offset groundwater pumping in the basin. The 2010 Coachella Valley Water Management Plan Update reassessed the need for desalinated drain water in light of reduced SWP reliability as a result of environmental and regulatory issues in the Delta. To preserve future supply flexibility, CVWD is evaluating development of up to 85,000 AFY of desalinated drain water by 2045. Based on non-potable demand projections, drain water will be needed to supplement Canal water supply by 2025.

A brackish groundwater treatment pilot study and feasibility study was completed in 2008 (Malcolm-Pirnie, 2008a and 2008b). A variety of treatment technologies, brine management approaches and source water supply combinations were compared and assessed over a range of treatment capacities. The treatment alternatives compared reverse osmosis (RO) with dew evaporation, and RO was the chosen technology. Source water supply options consist of the collection of agricultural drainage water at select outfall locations and the installation of a well field to extract shallow groundwater in the upper part of the aquifer, which consists mostly of agricultural runoff water.

The 2008 study recommended a combined source water strategy involving wells and direct connection to the open drain outfalls. Such a combined approach will provide additional flexibility and reliability to this new water supply. The study also developed a detailed evaluation of performance and cost of the two technologies, and RO was the recommended treatment technology to meet the current water quality goals and provide additional flexibility in the level of water quality produced should the facility's objectives change in the future. After a similar evaluation of brine management strategies, the recommended approach was to convey the RO concentrate via pipeline to constructed wetlands located at the north shore of the Salton Sea. This approach takes advantage of the water quality characteristics of the RO concentrate to generate and sustain a new saline wetlands habitat. This study concluded that agricultural drainage water can effectively be treated for reuse as non-potable water and potentially as new potable water (CVWD, 2011).

The amount of drain water that would be treated and used depends on supply availability (the amount of drain flow occurring), the overall supply mix (the amount of additional water needed), and the cost of treatment and brine disposal.

Treated drain water could be delivered to the Canal water distribution system and used as a non-potable supply for agricultural, golf course and landscape irrigation and potentially for potable water supply. Since the desalinated drain water is local water, it could be used anywhere within the CVWD service area. This could provide opportunities to deliver the water to users outside the Colorado River service area (ID-1) including the West Valley through a Colorado River water exchange. Such an exchange would involve delivering the treated water to existing Colorado River users in exchange for

using an equal amount of Colorado River water elsewhere in the District. This exchange could allow desalinated drain water to be used for recharge at Whitewater or other locations via exchange for Colorado River water. The quality of desalinated drain water exchanged for Colorado River water would be the same as the existing SWP Exchange water.

The 2010 WMP Update recommended development of additional desalinated drain water to meet projected demands with annual supplies in the range of 55,000 AFY to 85,000 AFY by 2045 (CVWD, 2012). The 2014 WMP Report recommended the initial phases of this supply be available by 2025 (CVWD, 2014). Changes in water demands as a result of on-going water conservation efforts and availability of other supplies could further affect this timing.

### 6.6.2 Desalinated Ocean Water

Along the California coastline, from the San Francisco Bay to San Diego, numerous studies are currently underway investigating the feasibility of desalting seawater. Recent technological advances in various desalination processes have significantly reduced the cost of desalinated water to levels that are comparable and, in some instances, competitive with other alternatives for acquiring new water supplies. Desalination technologies are becoming more efficient, less energy demanding, and less expensive; however, they are still considered energy intensive relative to other treatment technologies. In December 2015, the Claude "Bud" Lewis Carlsbad Desalination Plant, a 50 million gallon per day (56,000 AFY) seawater desalination plant located adjacent to the Encina Power Station in Carlsbad, California, commenced operation. This facility provides water to the San Diego County Water Authority under a 30-year purchase agreement.

One potential water management alternative is the possibility of CVWD investing in a new desalination plant, planned by other water agencies such as MWD and San Diego County, in exchange for receiving a portion of their Colorado River water deliveries. However, at this time seawater desalination is not part of CVWD's water supply portfolio.

## 6.7 Exchanges or Transfers

***CWC §10631***

***(d)*** *Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

This section describes opportunities for water exchanges and transfers, including existing emergency interconnections between CVWD and adjacent water agencies.

### 6.7.1 Exchanges

SWP Exchange water is a significant supply for groundwater recharge in the Coachella Valley. Refer to **Section 6.1** and **Section 6.2** for detailed discussions on SWP Exchange water and groundwater recharge.

### 6.7.2 Transfers

Water transfers involve the temporary or permanent sale or lease of a water right or contractual water supply between willing parties. Water can be made available for transfer from other parties through a variety of mechanisms:

- Transferring imported water from storage that would have otherwise carried over to the following years
- Pumping groundwater instead of imported water delivery and transferring the imported water
- Transferring previously stored groundwater either by direct pumping or exchange for imported water
- Reducing consumptive use through crop idling/shifting or implementing water use efficiency measures
- Reducing return flows or conveyance losses

The water made available from these mechanisms would then be delivered through existing facilities such as the SWP.

The ability to successfully execute a water transfer depends upon a number of factors including:

- Water rights (pre- vs. post-1914 rights) and place of use requirements
- Regulatory approval (SWRCB, DWR, Reclamation)
- Ability to convey the transferred water
- Delta carriage water and conveyance losses
- Environmental impacts (CEQA/NEPA compliance)
- Third-party impacts
- Supply reliability
- Cost

Potential sources of water transfers include the Sacramento Valley and the San Joaquin Valley. DWR and Reclamation typically limit water transfers involving crop idling to no more than 20 percent of the total agricultural land in a county to minimize economic impacts. Potential transfer opportunities are described below.

#### 6.7.2.1 Yuba River Accord Dry Year Water Purchase Program

In March 2008, CVWD and DWA entered into separate agreements with the DWR for the purchase and conveyance of supplemental SWP water under the Yuba River Accord Dry Year Water Purchase Program. This program provides dry year supplies through a water purchase agreement between DWR and Yuba County Water Agency (YCWA) as part of the Lower Yuba River Accord (Yuba Accord) which settled long-standing operational and environmental issues over instream flow requirements for the lower Yuba River. Yuba Accord water transfers will include both surface water and groundwater substitution transfers for an estimated total of up to 140,000 AFY. The available water is allocated among participating SWP contractors based on their Table A Amounts. It is estimated that CVWD and DWA may be able to purchase up to 4 percent or 5,600 AFY, and 1.3 percent or 1,820 AFY, respectively

for a total of 7,420 AFY. The amount of water available for purchase in a given year varies and will be based on DWR's determination of the Water Year Classification. These agreements provide for the exchange of these supplies with MWD for Colorado River water in accordance with existing exchange agreements. Since the Yuba Accord was signed, CVWD and DWA have obtained almost 11,000 AF from this program.

#### 6.7.2.2 Rosedale-Rio Bravo Transfers

In 2008, CVWD executed an agreement with Rosedale-Rio Bravo Water Storage District (Rosedale) in Kern County for a one-time transfer of 10,000 AF of banked Kern River flood water that is exportable to CVWD. Per the Rosedale agreement, deliveries to CVWD began in 2008 and were to be completed by 2012 (CVWD, 2011). Similar transfers could be executed in future years based on water availability.

CVWD entered into an Assignment Agreement with the Glorious Lands Company (GLC) effective July 10, 2012, which transferred the existing Amended Water Supply Agreement between GLC and Rosedale to CVWD. CVWD will receive up to 9,500 AF per year of Rosedale water through 2035. In 2013, 16,500 AF was delivered to CVWD at the Whitewater Groundwater Replenishment Facility. In 2014 and 2015, a total of 14,500 AF of Rosedale water was delivered to CVWD from the Advance Delivery Account.

#### 6.7.2.3 Paradise Valley Water Transfer

A 6,400 acre master planned community known as Paradise Valley is in the planning process. The development would be located in Shavers Valley, an unincorporated area in Riverside County, approximately 15 miles east of the City of Indio. The project site is located outside of CVWD's boundary. If approved, the development would annex to CVWD and be subject to all CVWD water management requirements including this UWMP and the requirements of SGMA. The proposed water supply would be obtained from a purchase of firm supply from Rosedale-Rio Bravo Water Storage District. The water would be exchanged with MWD for Colorado River water and would be delivered to the project site from MWD's Colorado River Aqueduct. The water supply for this project would be self-sustaining and would have no impact on CVWD's existing and future supplies.

#### 6.7.2.4 Imported Water Acquisitions

CVWD, DWA and the City of Indio (IWA) are considering the acquisition of additional imported water supply to augment existing supplies. However, specific plans and amounts for these acquisitions have not yet been identified. Potential sources might include Sacramento Valley irrigation water transfers or purchase of additional Table A water from other SWP contractors.

#### 6.7.2.5 Other Water Exchange and Transfer Opportunities

Other potential water transfers and exchanges could include development of a new source of water elsewhere in the region or State that could be used in lieu of an existing supply. The existing supply would then be transferred to the Coachella Valley and delivered via the SWP, MWD's Colorado River Aqueduct or the Coachella Canal. As an example, CVWD could pay the capital and operations cost to develop and install a drain water treatment facility in Central California that allowed a local water district that currently uses SWP or Central Valley Project (CVP) water to reuse the drain water instead for

irrigation. The local district's SWP or CVP water would be delivered to CVWD via the SWP aqueduct. Contractually, the local district's water would continue to be used locally while the reclaimed drain water would be transferred to CVWD. Conveyance would likely be on an "as-available" capacity basis, meaning that the water could be transferred only when sufficient SWP aqueduct capacity is available. This operational limitation might require some type of storage agreement in addition to development and exchange agreements.

Another option would be to pay for the installation of water conservation devices (such as drip irrigation, tailwater pumpback systems or urban conservation) or recycled water delivery systems at a local water district in central or northern California in exchange for their transferring the saved water to CVWD.

At this point, no specific transfer projects have been identified that follow this model.

### 6.7.3 Emergency Interties

CVWD currently has emergency interties with IWA, Mission Springs Water District, and Desert Water Agency. The combined capacities of these connections is in excess of 20 million gallons per day.

## 6.8 Future Water Projects

***CWC §10631***

***(g)*** *… The urban water supplier shall include a detailed description of expected future projects and programs … that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

CVWD recognizes the need to obtain additional water supplies to meet projected water demands and help eliminate groundwater overdraft. As described previously, the agency plans to provide both treated and untreated Colorado River water, and desalinated agricultural drain water directly to its urban water distribution system. CVWD will need to construct both conveyance and treatment facilities in order to make this happen. The capacity of the Colorado River treatment system will gradually increase over time as demand increases and more infrastructure is developed. As mentioned previously Colorado River water is a relatively reliable source of water for CVWD due to the agency's high allocation priority under the *Seven Party Agreement*.

**Table 6-10** provides a summary of expected future water supply projects. Historically, CVWD has never had its Colorado River allocation reduced due to drought conditions because of the agency's high allocation priority. Hence, it is assumed that the agency's Colorado River supply will not be reduced in single-dry or multiple-dry years in the future. Desalinated agricultural drain water is also assumed to not be reduced in single-dry or multiple-dry years since agricultural water is also sourced from groundwater and Colorado River water.

In addition to this treatment and conveyance project, CVWD is also investigating several other programs to obtain additional supply from the Colorado River and the SWP. CVWD is also investigating feasibility of some local projects. These programs are described below.

*Table 6-10*
*Expected Future Water Supply Projects or Programs (DWR Table 6-7 R)*

| Name of Future Projects or Programs | Joint Project with other agencies? | | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|---|---|---|---|---|---|---|
| Desalinated agricultural drain water | No | | Supplementary non-potable source for non-urban use | 2025 to 2040 | Average Year | 5,000 to 20,000 AFY |
| Recycled Water | No | | Additional recycled water supplies | 2020 to 2040 | Average Year | 10,000 to 20,000 AFY |
| California WaterFix | Yes | SWP Contractors, DWR | Construction of water facilities to improve SWP delivery reliability in the Delta | 2025 to 2040 | Average Year | 35,000 to 40,000 AFY |
| NOTES: California WaterFix expected increase estimated assuming SWP reliability increase from 50% to about 70%. | | | | | | |

### 6.8.1 Potential Future SWP Supplies

An ongoing planning effort to increase long-term supply reliability for both the SWP and CVP is taking place through the Bay Delta Conservation Plan (BDCP) process. The co-equal goals of the BDCP are to improve water supply reliability and restore the Delta ecosystem. The BDCP is being prepared through a collaboration of state, federal, and local water agencies, state and federal fish agencies environmental organizations, and other interested parties. Several “isolated conveyance system” alternatives are being considered in the plan that would divert water from the north Delta to the south Delta where water is pumped into the south-of-Delta stretches of the SWP and CVP. The new conveyance facilities would allow for greater flexibility in balancing the needs of the estuary with the reliability of water supplies. The plan would also provide other benefits, such as reducing the risk of long outages from Delta levee failures.

The BDCP has been in development since 2006 and is currently undergoing extensive environmental review. The Draft BDCP and its associated Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) were released for public review in December 2013. In response to public comments, the BDCP was reevaluated, and in April 2015 the lead agencies announced a modified alternative which effectively split the project into two parts: the conveyance portion (known as Cal WaterFix), and the restoration portion (known as EcoRestore). The Cal WaterFix alternative is evaluated in a partially recirculated draft environmental document (Recirculated Draft EIR/Supplemental Draft EIR) that was released for public review in July 2015. That environmental document is not anticipated to be final until at least 2016.

While there is widespread support for the BDCP/Cal WaterFix project, plans are currently in flux and environmental review is ongoing. Additionally, several regulatory and legal requirements must be met

prior to any construction. Because of this uncertainty, any improvements in SWP supply reliability or other benefits that could result from this proposed project are not included in this Plan.

### 6.8.2 Desalinated Drain Water

As described in **Section 6.6.1,** CVWD is considering construction of agricultural drain water desalination to supplement the existing Coachella Canal water supply. The amount of water that could be developed will depend on the outcome of several other on-going programs including the District's water conservation efforts, implementation of recycled water, the results of the California Water Fix, and population growth in the Valley.

## 6.9 Summary of Existing and Planned Sources of Water

***CWC §10631***

***(b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision 10631(a).*

***(4)*** *(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Summaries of the existing and planned urban water supply volumes by source are presented on **Table 6-11** and **Table 6-12**, respectively.

*Table 6-11*
*Water Supplies – Actual (DWR Table 6-8 R)*

| Water Supply | Additional Detail on Water Supply | 2015 | | |
|---|---|---|---|---|
| | | Actual Volume (AF) | Water Quality | Total Right or Safe Yield (AF) |
| Groundwater | Potable urban use | 92,974 | Drinking Water | Undefined |
| Recycled Water | WRP-9 [1,2] | 80 | Recycled Water | 141 |
| Recycled Water | WRP-7 [1] | 1,773 | Recycled Water | 3,018 |
| Recycled Water | WRP-10 [1] | 6,896 | Recycled Water | 10,627 |
| | **Total** | **101,723** | | **13,786** |

NOTES:
[1] Recycled water safe yield is based on total projected flows at each WWTP; surface discharge and percolated wastewater effluent is not included in the reasonably available supply estimates.
[2] WRP-9 was taken offline on July 15, 2015 and has been decommissioned.

*Table 6-12*
*Water Supplies – Projected (adapted from DWR Table 6-9 R and DWR Table 6-9 W)*

| Water Supply | Additional Detail on Water Supply | Projected Water Supply (AF) | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
| Groundwater | Potable urban use | 113,400 | 102,100 | 112,700 | 106,600 | 101,000 |
| Purchased or Imported Water | Treated Canal water for potable urban use in East Valley [1] | 0 | 18,000 | 18,000 | 31,000 | 40,000 |
| **Urban Potable Subtotal** | | **113,400** | **120,100** | **130,700** | **137,600** | **141,000** |
| Purchased or Imported Water | Untreated Canal water for non-potable urban use in East Valley [1] | 1,200 | 11,000 | 17,000 | 26,300 | 33,300 |
| Desalinated Water | Desalinated drain water for non-potable urban use | 0 | 5,000 | 10,000 | 15,000 | 20,000 |
| **Urban Non-potable Subtotal** | | **1,200** | **16,000** | **27,000** | **41,300** | **53,300** |
| Recycled Water | WRP-7 [2] | 3,400 | 3,700 | 4,000 | 4,300 | 4,600 |
| Recycled Water | WRP-10 [2] | 10,900 | 11,300 | 11,700 | 12,100 | 12,500 |
| Recycled Water | WRP-4 [2,3] | 0 | 12,700 | 15,100 | 17,500 | 19,200 |
| **Recycled Water Subtotal** | | **14,300** | **27,700** | **30,800** | **33,900** | **36,300** |
| **Total Retail Supply** | | **128,900** | **163,800** | **188,500** | **212,800** | **230,600** |
| Purchased or Imported Water | Sale of Canal water to IWA for potable use | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| **Total Wholesale Supply** | | **5,000** | **10,000** | **20,000** | **20,000** | **20,000** |

NOTES:
[1] Total Colorado River allotment will increase from 397,000 AF in 2016 to 459,000 AF in 2026. Colorado River water supply does not sum to total right because of nonurban supply not shown on this table and projected wholesale to other agencies.
[2] Recycled water safe yield is based on total projected flows at each WWTP; surface discharge and percolated wastewater effluent is not included in the reasonably available supply estimates.
[3] Assumes tertiary treatment is not available until after 2020 at WRP-4.

## 6.10 Climate Change Impacts to Supply

Climate change has the potential to affect Coachella Valley's two major sources of imported water: the Colorado River and the SWP. Potential effects of global warming could also increase water demand within the Coachella Valley. Water supply reliability is discussed in greater detail in **Section 7**.

### 6.10.1 Colorado River

Precise estimates of future impacts of climate change on runoff throughout the Colorado River basin are not currently available (USBR, 2007a). These impacts may include decrease in annual flow and increased variability, including more frequent and more severe droughts. Furthermore, even without precise knowledge of the effects, increasing temperatures alone would likely increase losses due to evaporation and sublimation, resulting in reduced runoff (CVWD, 2012).

Increased air temperature will result in earlier snow melt runoff and a greater proportion of runoff due to rainfall. Because reservoir storage in the Colorado River basin is so large in comparison to annual basin runoff (roughly four times average runoff), a change in the timing of annual runoff would not be expected to significantly affect basin yield (DWR, 2006).

Potential changes in the amount of precipitation received by the Colorado River basin could affect basin yield. Warmer temperatures could also be expected to increase water demands and increase evaporation from reservoirs and canals. While changes in any particular location will likely be small, the aggregate change for the basin could be significant because so much land is involved. With regard to climate change, the study indicated the median of the mean natural flow at Lees Ferry over the next 50 years is projected to decrease by approximately nine percent, along with a projected increase in both drought frequency and duration (Reclamation, 2012). The potential effect of climate change on deliveries is uncertain based on the current Law of the River.

Climate changes impacts were evaluated in the Environmental Impact Study (EIS) on the “Colorado River Interim Guidelines for East Basin Shortages and Coordinated Operations for Lakes Powell and Mead,” (USBR, 2007a). The guidelines extend only through 2026, providing the opportunity to gain valuable operating experience through the management of Lake Powell and Lake Mead, particularly for low flow reservoir conditions, and to improve the bases for making additional future operational decisions during the interim period and thereafter.

The shortage sharing guidelines are crafted to include operational elements that would respond if potential impacts of climate change and increased hydrologic variability occur. The guidelines include coordinated operational elements that allow for adjustment of Lake Powell releases to respond to low average storage conditions in Lake Powell or Lake Mead. In addition, the guidelines enhance conservation opportunities in lower basin and retention of water in Lake Mead.

While impacts from climate change cannot be quantified at this time, the interim guidelines should provide additional protection against impacts of shortage sharing at least through 2026. Coachella Valley water supplies are protected from impacts of climate change and corresponding shortages by 1) California’s first priority for Colorado River water supplies in the lower Colorado River basin, and 2) Coachella’s high priority for Colorado River supplies among California users of Colorado River water (CVWD, 2012).

Although groundwater is a relatively resilient water supply with respect to climate change, long periods of drought/dry weather may reduce the availability of imported water for groundwater recharge. Climate change may more directly impact the planned use of imported water to IWA directly in future years. A more detailed discussion of potential climate change impacts is presented in Section 3.

The U. S. Bureau of Reclamation's Upper Colorado and Lower Colorado Regions, in collaboration with representatives of the seven Colorado River Basin States (non-federal Cost Share Partners), funded the "Colorado River Basin Water Supply and Demand Study" under Reclamation's Basin Study Program. The Study was completed in December 2012. It defined current and future imbalances in water supply and demand in the Colorado River Basin and the adjacent areas of the Basin States that receive Colorado River water for approximately the next 50 years, and developed and analyzed adaptation and mitigation strategies to resolve those imbalances.

The Study characterized current and future water supply and demand imbalances in the Basin and assessed the risks to Basin resources. Resources include water allocations and deliveries consistent with the apportionments under the Law of the River; hydroelectric power generation; recreation; fish, wildlife, and their habitats (including candidate, threatened, and endangered species); water quality including salinity; flow- and water-dependent ecological systems; and flood control. The Study confirmed what most experts know: there are likely to be significant shortfalls between projected water supplies and demands in the Colorado River Basin in the coming decades. The Study indicates that targeted investments in water conservation, reuse, and augmentation projects can improve the reliability and sustainability of the Colorado River system to meet current and future water needs. (U.S. Bureau of Reclamation [USBR], 2012).

With regard to climate change, the study indicated the median of the mean natural flow at Lees Ferry over the next 50 years is projected to decrease by approximately nine percent, along with a projected increase in both drought frequency and duration (Reclamation, 2012). The potential effect of climate change on deliveries is uncertain based on the current Law of the River.

Under the 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead and the Law of the River, CVWD's Colorado River water supplies are fully reliable based on California's water priority compared to Arizona's and Nevada's priorities. Total Lower Basin shortages would need to exceed about 1.7 million AFY before California experiences any reductions. CVWD has a higher priority under the QSA compared to Metropolitan's MWD's priority. Should water deliveries to California drop below 4.4 million AFY, Metropolitan's MWD's deliveries under Priority 4 would be reduced before CVWD's and IID's deliveries are reduced. CVWD and IID have agreed to share in any reductions if California's allocation is reduced (CVWD & MWH, 2015).

### 6.10.2 State Water Project

To assess impacts of climate change on the SWP, DWR evaluated four scenarios generated from two different Global Climate Models (GCMs), a Geophysical Fluid Dynamic Lab (GFDL) model and a Parallel Climate Model (PCM). All four scenarios predict a warming trend for California. The likelihood of any one of these scenarios occurring over another has not been assessed (DWR, 2006). DWR conducted an updated analysis using six different global climate models in 2009. The analysis shows a 7 percent to 10 percent reduction in Delta exports by mid-century and up to 25 percent reduction by the end of the century. Reservoir carryover storage is projected to decrease by 15 percent to 19 percent by mid-century and up to 38 percent by the end of the century.

The models also projected a change in the timing of runoff from the Sierra Nevada and the southern end of the Cascades. More runoff will occur in the winter and less in the spring and summer, making it more difficult for the SWP to capture water and deliver it to contractors.

The 2006 study performed by DWR predicted significant declines in SWP deliveries. **Table 6-13** presents potential impacts on SWP water deliveries.

*Table 6-13*
*Impacts of Five Climate Change Scenarios on State Water Project Table A and Article 21 Average Deliveries (for 2020)*

| Scenario | Table A | | | Article 21 | | |
|---|---|---|---|---|---|---|
| | Average | Difference | | Average | Difference | |
| | TAFY* | TAFY | % | TAFY | TAFY | % |
| BASE | 3,186 | 0 | 0 | 99 | 0 | 0 |
| GFDL A2 | 2,879 | -307 | -9.6 | 106 | 7 | 7.1 |
| PCM A2 | 2,964 | -222 | -7.0 | 103 | 4 | 4.0 |
| GFDL B1 | 2,861 | -325 | -10.2 | 101 | 2 | 2.0 |
| PCM B1 | 3,224 | +38 | +1.2 | 88 | -11 | 11.1 |

TAFY = Thousand acre-feet per year
GFDL = National Oceanic and Atmospheric Administration Geophysical Fluid Dynamics Laboratory CM2.1 model
PCM = Parallel Climate Model
Source: Progress on Incorporating Climate Change into Management of California's Water Resources (DWR, 2006)

DWR assessed the impacts of climate change on SWP Table A and Article 21 deliveries in 2007 and 2009. The assessment included the impact of court rulings to protect the endangered Delta smelt. A review of the effects of climate change, as presented in DWR's 2009 SWP Reliability Report, indicates that climate change could decrease average SWP deliveries by as much as 5 percent by 2029 based on interpolation of the 2006 climate change report. To capture uncertainty in future SWP supply in the absence of the WaterFix, CVWD is using a 50% average supply reliability after 2035.

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# SECTION 7 WATER SUPPLY RELIABILITY ASSESSMENT

The California Urban Water Management Planning Act (Act) requires urban water suppliers to assess water supply reliability by comparing total projected water use with the expected water supply over the next 20 to 25 years in five-year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for CVWD's service area.

## 7.1 Constraints on Water Sources

***CWC §10631***

***(c)(2)*** *For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.*

***CWC §10634***

*The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

As described in **Section 6**, CVWD's only direct source of urban potable water supply is local groundwater. However, the groundwater supply is replenished with CVWD's supplies of Colorado River and SWP water. This section describes potential constraints that could affect water supply reliability.

### 7.1.1 Groundwater

As described in **Section 6**, CVWD pumps groundwater from the Whitewater River and Mission Creek Subbasins as its sole source of urban water supply. With regional management of the groundwater basin, long-term overdraft of the basin has been essentially eliminated and water supply reliability is expected to be good. However, the groundwater supply has several water quality concerns that CVWD is addressing. Consequently, the groundwater supply is expected to be fully reliable.

#### 7.1.1.1 Supply Constraints

Both subbasins have been in overdraft for a number of years. However, the large storage volume of these basins has not limited groundwater production. In 2002, CVWD adopted the Coachella Valley Water Management Plan (CVWMP) to address groundwater overdraft and is implementing that plan. An update to the CVWMP was adopted in 2012 and a status report was prepared in 2014. Projects constructed in the past ten years include the Thomas E. Levy Groundwater Replenishment Facility in La Quinta, the Martinez Canyon Pilot Recharge Facility in Oasis and Phase 1 of the Mid-Valley Pipeline project, which provides recycled and Colorado River water to golf courses in the Indian Wells-Palm Desert-Rancho Mirage area of the Valley.

In addition, CVWD and DWA have acquired additional SWP supplies and CVWD is signatory to the 2003 Quantification Settlement Agreement (QSA), which provides additional Colorado River water for

groundwater recharge and source substitution. These activities assure the reliability of the groundwater supply in the future. As reported in CVWD's 2016-17 engineer's reports on water supply and replenishment assessment, the Whitewater and Mission Creek subbasins have exhibited increased storage over the past ten years in spite of the drought.

#### 7.1.1.2 Tribal Litigation

On May 14, 2013, the Agua Caliente Band of Cahuilla Indians, a federally recognized tribe, sued CVWD and DWA in United States District Court, claiming senior water rights under an aboriginal rights theory and seeking an injunction prohibiting CVWD and DWA from:

1. Withdrawing groundwater from the aquifer in the western Coachella Valley.
2. Replenishing the aquifer with untreated water.

On June 25, 2014, the United States filed a complaint in intervention supporting the Tribe's claim of reserved water rights.

On March 24, 2015, the United States District Court ruled that the Tribe's federal reserved water rights may extend to include groundwater, but "whether groundwater resources are necessary to fulfill the reservation's purposes, however, is a question that must be addressed in a later phase of this litigation." The district court also ruled that the Tribe's claim of aboriginal occupancy was extinguished by the provisions of an 1851 Act of Congress, so the Tribe has no derivative right to groundwater on that basis. The district court certified its ruling on reserved water rights for interlocutory appeal. On June 10, 2015, the United States Court of Appeals for the Ninth Circuit agreed to hear CVWD and DWA's appeal of that ruling. Further proceedings in the district court have been stayed pending determination of the appeal. If the ruling is affirmed, further trial proceedings will be necessary in the district court to address unresolved issues.

The Tribe's Lawsuit does not have an effect on groundwater supply reliability at this time. CVWD and DWA will continue to fulfill all of their responsibilities as stewards of the Coachella Valley's groundwater.

#### 7.1.1.3 Water Quality

Groundwater quality in the Coachella Valley varies with depth, proximity to faults and recharge basins, presence of surface contaminants, and other hydrogeologic or human factors. CVWD conducts water quality monitoring in accordance with federal and state drinking water requirements, and analyzes water samples for more than 100 regulated and unregulated substances. Based on the most current water quality report (CVWD 2015a), CVWD's drinking water supplied from groundwater wells complies with all state and federal drinking water quality standards, with the exception of arsenic and chromium-6.

Arsenic and chromium-6 are naturally-occurring substances in the Coachella Valley's groundwater supply. Both of these substances have been identified by the California Department of Public Health as having the potential to cause adverse health effects if ingested at levels above Maximum Contaminant Levels (MCLs) over a long period of time. The arsenic MCL was revised to 10 micrograms per liter (µg/L) in 2001 and became enforceable in January 2006. In July 2014, California became the first state in the U.S. to implement a drinking water standard for chromium-6 with a MCL of 10 µg/L.

In response to elevated arsenic levels in some East Valley water supply wells, CVWD evaluated and designed facilities to meet the revised standard. Three groundwater treatment facilities, which use an ion exchange treatment process (IXTP), were constructed to remove the naturally occurring arsenic from drinking water before it is delivered to customers. These facilities have been operating since 2005-06 and have proved successful at removing both arsenic and chromium-6 from drinking water supplies in the East Valley water supply wells.

Based on historical and recent monitoring, CVWD has identified that about 30 percent of its drinking water wells have chromium-6 levels that are above California's new standard. Building on the success with IXTP technology for arsenic removal and treatment, CVWD evaluated the use of similar technology to reduce chromium-6 levels found in other drinking water wells. CVWD is currently developing the proposed Chromium-6 Water Treatment Facilities Project that would use IXTP to treat drinking water wells located within the cities of Desert Hot Springs, Rancho Mirage, Palm Desert, La Quinta, Indio, and within portions of unincorporated Riverside County including Thermal. CVWD also plans to construct a centralized facility to regenerate the ion exchange resin from each treatment facility. These facilities will be operational before January 1, 2020.

#### 7.1.1.4 Colorado River Water

As described in **Section 6**, the Colorado River is managed and operated in accordance with the Law of the River, which governs the rights to use of Colorado River water within the seven Colorado River Basin states.

Under the 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead and the Law of the River, CVWD's Colorado River water supplies are fully reliable based on California's water priority compared to Arizona's and Nevada's priorities. Total Lower Basin shortages would need to exceed about 1.7 million AFY before California experiences any reductions. CVWD has a higher priority under the QSA compared to Metropolitan's priority. Should water deliveries to California drop below 4.4 million AFY, Metropolitan's deliveries under Priority 4 would be reduced before CVWD's and IID's deliveries are reduced. CVWD and IID have agreed to share in any reductions if California's allocation is reduced (CVWD & MWH, 2015).

In 2012, the U. S. Bureau of Reclamation, in partnership with the seven Colorado River Basin States, published the most comprehensive study of future supplies and demands on the Colorado River ever undertaken. The Colorado River Basin Water Supply and Demand Study confirmed what most experts knew: there are likely to be significant shortfalls between projected water supplies and demands in the Colorado River Basin in coming decades.

In 2013, Reclamation and the Basin States, in collaboration with the Ten Tribes Partnership and conservation organizations, initiated the *Moving Forward* effort to build on future considerations and next steps identified in the Basin Study. Phase 1 of the effort, which was funded by Reclamation and the Basin States, began with the formation of a Coordination Team and three multi-stakeholder workgroups that focus on water conservation, reuse, and environmental and recreational flows. Based on insights from data collection, case studies, and exploring successes and challenges of existing programs, each workgroup identified future opportunities and potential actions to advance those opportunities within their particular areas of expertise. These opportunities look to increase or expand

M&I water conservation and reuse, facilitate future agricultural water saving or productivity enhancements, and provide environmental and recreational benefits within the Basin. It was recognized that the applicability of such programs are dependent upon physical location and state and federal water law and will need to be vetted in consideration of local economies and related factors. In Phase 2 of *Moving Forward*, which commenced in 2015, the Coordination Team, with input from the workgroups, will integrate and synthesize the Phase 1 opportunities and potential future actions identified by the workgroups and identify several proposed pilot projects (USBR, 2015).

### 7.1.2 State Water Project

DWR is responsible for managing water deliveries from the SWP. SWP water contractors submit annual requests to the DWR for water allocations and DWR makes an initial SWP Table A allocation for planning purposes, typically in December of each year. Throughout the year, as additional information regarding water availability becomes available to DWR, its allocation/delivery estimates are updated based on hydrologic conditions, storage levels in SWP reservoirs, SWP operational and environmental constraints and SWP contractor delivery requests. **Table 7-1** presents the historic reliability of SWP deliveries, including their initial and final allocations for the past 28 years (1988 through 2015). During this period, average deliveries were 70 percent of Table A Amounts. However, in the last ten years (2006-2015), average deliveries were only 49 percent of Table A Amounts.

#### 7.1.2.1 Projected SWP Reliability

DWR issues the SWP Delivery Capability Report[1] (DCR) every two years, with the 2015 final version currently available (DWR, 2015). This report accounts for impacts to water delivery reliability associated with climate change and recent federal litigation. Based on information from the final 2015 DRR, the average reliability of SWP Table A deliveries through 2035 is projected to be 62 percent of Table A Amounts after taking into consideration the effects of climate change. This allocation percentage is based on computer modeling of the state's watersheds, an expected range of Delta export controls to protect the Delta smelt, the current condition of the river and reservoir systems, and a climate change scenario.

There are additional uncertainties related with SWP reliability in the future, which further reduces the reliability factor. As described in the 2010 WMP Update, the factors that could affect SWP reliability considered in this report are:

- Uncertainty in modeling restrictions associated with biological opinions;
- Risk of levee failure in the Delta;
- Additional pumping restrictions resulting from biological opinions on new species or revisions to existing biological opinions;
- Impacts associated with litigations such as the California ESA lawsuit; and
- Climate change impacts

1 Prior to 2015, the SWP Delivery Capability Report was titled "State Water Project Delivery Reliability Report."

*Table 7-1*
*Historical Reliability of SWP Deliveries*

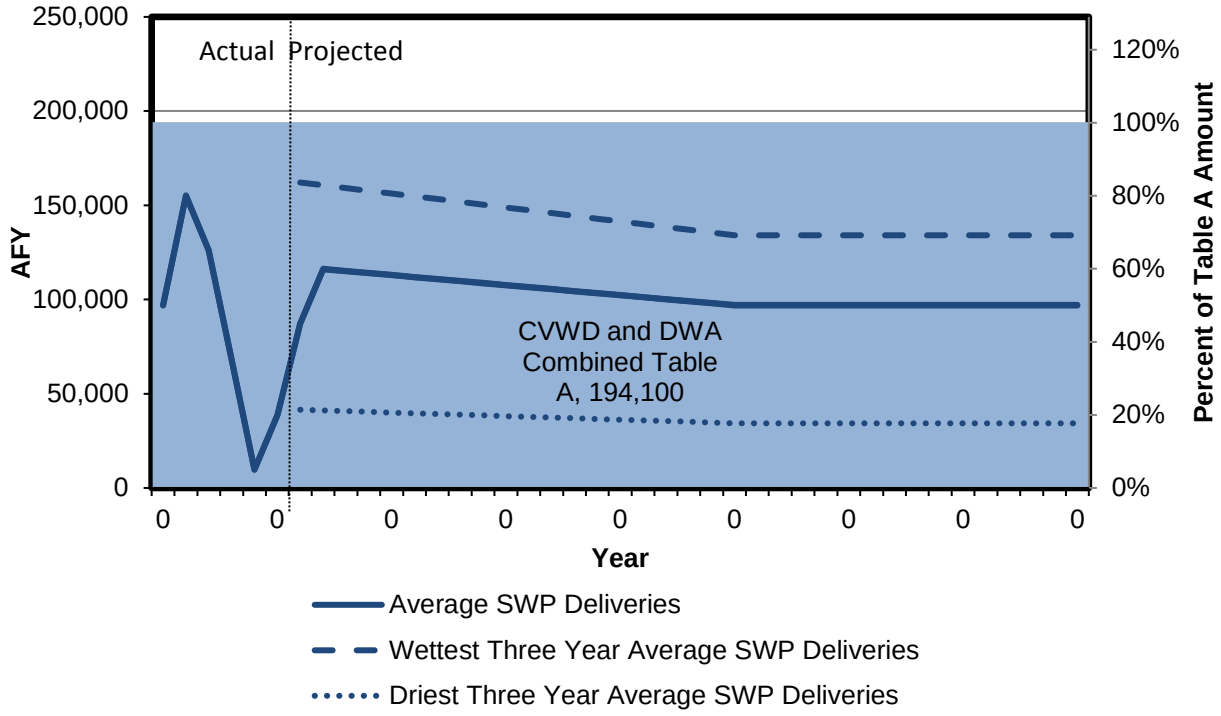
| Year | Water Year Type [1] | Initial Allocation | Final Allocation |
|---|---|---|---|
| **1988** | Critical | 100% | 100% |
| **1989** | Dry | 100% | 100% |
| **1990** | Critical | 100% | 100% |
| **1991** | Critical | 85% | 30% |
| **1992** | Critical | 20% | 45% |
| **1993** | Above Normal | 10% | 100% |
| **1994** | Critical | 50% | 50% |
| **1995** | Wet | 40% | 100% |
| **1996** | Wet | 40% | 100% |
| **1997** | Wet | 70% | 100% |
| **1998** | Wet | 40% | 100% |
| **1999** | Wet | 55% | 100% |
| **2000** | Above Normal | 50% | 90% |
| **2001** | Dry | 40% | 39% |
| **2002** | Dry | 20% | 70% |
| **2003** | Above Normal | 20% | 90% |
| **2004** | Below Normal | 35% | 65% |
| **2005** | Above Normal | 40% | 90% |
| **2006** | Wet | 55% | 100% |
| **2007** | Dry | 60% | 60% |
| **2008** | Critical | 25% | 35% |
| **2009** | Dry | 15% | 40% |
| **2010** | Below Normal | 5% | 50% |
| **2011** | Wet | 25% | 80% |
| **2012** | Below Normal | 60% | 65% |
| **2013** | Dry | 30% | 35% |
| **2014** | Critical | 5% | 5% |
| **2015** | Critical | 10% | 20% |
| | **Average** | 43% | 70% |

Source: DWR, Water Contract Branch within the State Water Project Analysis Office, Notices to State Water Contractors, 1988 – 2015.

[1] Water year designation based on Sacramento Valley Water Year Hydrologic Classification, which is based on the sum of the unimpaired runoff in the water year as published in the DWR Bulletin 120 for the Sacramento River at Bed Bridge, Feather River inflow to Oroville, Yuba River at Smartville and American River inflow to Folsom reservoir.

For conservative planning purposes, CVWD has reduced the estimated future reliability to 50 percent to account for these risks if the Bay Delta Conservation Plan (BDCP) and related facilities are not completed. **Figure 7-1** illustrates the actual and projected SWP deliveries to CVWD and DWA based on the 2015 SWP DCR.

*Figure 7-1*
*Actual and Projected State Water Project Deliveries*




The extremely dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in the historical record. Water year 2013 was a year with two hydrologic extremes. October through December 2012 was one of the wettest fall periods on record, but was followed by the driest consecutive 12 months on record. Accordingly, the 2013 SWP supply allocation was a low 35 percent of SWP Table A Amounts. The 2013 hydrology ended up being even drier than DWR's conservative hydrologic forecast, so the SWP began 2014 with reservoir storage lower than targeted levels and less stored water available for 2014 supplies. Compounding this low storage situation, 2014 also was an extremely dry year, with runoff for water year 2014 the fourth driest on record. Due to extraordinarily dry conditions in 2013 and 2014, the 2014 SWP water supply allocation was a historically low 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 DWR's 2015 Delivery Capability Report. It is anticipated that the hydrologic record used in the DWR 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. For the reasons stated above, this UWMP uses a conservative assumption that a 5 percent allocation of SWP Table A Amounts represents the "worst case" scenario.

It should be noted that the 1984 Advance Delivery Agreement allows Metropolitan to make SWP Exchange water deliveries in excess of its exchange delivery obligations, which are applied to offset Metropolitan's future exchange water delivery obligations. If Metropolitan determines that its available Colorado River supply is needed to meet the needs of its member agencies, Exchange water previously delivered to the Valley is used to meet Metropolitan's exchange obligation provided such credit is available. In such years, direct delivery of SWP Exchange water at Whitewater can be discontinued or drastically reduced. Such reductions happened in 1988, 1991, 2001, 2003, and 2013 through 2015. If there is no water credit available, Metropolitan is required to make all required deliveries. As of December 31, 2015, there was 200,161 AF in the Advance Delivery storage account.

#### 7.1.2.2 Potential Future SWP Supplies

An ongoing planning effort to increase long-term supply reliability for both the SWP and Central Valley Project (CVP) is taking place through the Bay Delta Conservation Plan (BDCP) process. The co-equal goals of the BDCP are to improve water supply reliability and restore the Delta ecosystem. The BDCP is being prepared through a collaboration of state, federal, and local water agencies, state and federal fish agencies environmental organizations, and other interested parties. Several "isolated conveyance system" alternatives are being considered in the plan that would divert water from the north Delta to the south Delta where water is pumped into the south-of-Delta stretches of the SWP and CVP. The new conveyance facilities would allow for greater flexibility in balancing the needs of the estuary with the reliability of water supplies. The plan would also provide other benefits, such as reducing the risk of long outages from Delta levee failures.

The BDCP has been in development since 2006 and is currently undergoing extensive environmental review. The Draft BDCP and its associated Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) were released for public review in December 2013. In response to public comments, the BDCP was reevaluated, and in April 2015 the lead agencies announced a modified alternative which effectively split the project into two parts: the conveyance portion (known as Cal WaterFix), and the restoration portion (known as EcoRestore). The Cal WaterFix alternative is evaluated in a partially recirculated draft environmental document (Recirculated Draft EIR/Supplemental Draft EIR) that was released for public review in July 2015. That environmental document is not anticipated to be final until at least 2016.

While there is widespread support for the BDCP/Cal WaterFix project, plans are currently in flux and environmental review is ongoing. Additionally, several regulatory and legal requirements must be met prior to any construction. Because of this uncertainty, any improvements in SWP supply reliability or other benefits that could result from this proposed project are not included in this UWMP.

### 7.1.3 Metropolitan 100,000 AFY Transfer

As described in Section 6, CVWD and DWA completed a 100,000 AFY water transfer with Metropolitan in 2003. Under the transfer agreement, Metropolitan has the option to call back the water in years when needed to meet Metropolitan's water management goals. This option must be exercised no later than April 30 of each year. Metropolitan's callback options are to be exercised in two 50,000 AF blocks. To estimate the average supply from this transfer conservatively, this report assumes that Metropolitan

would exercise its option to callback the 100,000 AFY in 4 wet years out of every 10 years, which is in accordance with the 2010 WMP Update. The actual frequency of callback would depend on the availability of Metropolitan's water supplies to meet its demands. Since 2003, Metropolitan has called back the water only in 2005. Metropolitan staff (2015) estimates the probability of a Metropolitan call-back on SWP deliveries to be zero through 2024 and 1 percent of the time through 2050. Metropolitan could potentially issue a call-back to restore the Advanced Delivery account after a drought. Because severe long-term droughts have occurred roughly three times in the 1922-2003 hydrologic sequence, it is assumed that a call-back could occur in three out of 82 years with an average supply loss of 3,500 AFY.

## 7.2 Reliability by Type of Year

***CWC §10631***

***(c)(1)*** *Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:*

***(A)*** *an average water year,*

***(B)*** *a single dry water year,*

***(C)*** *multiple dry water years.*

### 7.2.1 Types of Years

The average year, single dry year, and multiple dry year periods are described in the following subsections.

#### 7.2.1.1 Average Year

The average year is a year, or an averaged range of years, that most closely represents the median water supply available to CVWD. The UWMP Act uses the term "normal" conditions. This UWMP uses the long-term average supply metrics to represent average year conditions.

#### 7.2.1.2 Single Dry Year

The single dry year is the year that represents the lowest water supply available to CVWD. This UWMP uses 2014 for the single dry year as a worst case. The base (existing conditions) model runs conducted for the 2015 SWP DCR indicate the single driest year was 1977 with an estimated reliability of 11 percent of Table A Amounts.

#### 7.2.1.3 Multiple Dry Year Period

The multiple dry year period is the period that represents the lowest average water supply availability to CVWD for a consecutive multi year period (three years or more). This is generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903. DWR has interpreted "multiple dry years" to mean three dry years; however, water agencies may project their water supplies for a longer time period. This UWMP uses 2013 through 2015 as the multiple dry year period when the actual SWP delivery allocations averaged 20 percent of

Table A Amounts. The base (existing conditions) model runs conducted for the 2015 SWP DCR indicate the driest three-year period was 1990-1992 with an estimated reliability of 22 percent of Table A Amounts.

### 7.2.2 Agencies with Multiple Sources of Water

The available water supplies and demands for CVWD's service area are analyzed to understand the region's ability to satisfy demands during three scenarios: an average water year, single dry year, and multiple dry years. The historical supply availability during these years is used as an assumption for future reliability. Groundwater, Colorado River water from the Coachella Canal, recycled water, and future desalinated drain water supplies are assumed to be fully reliable. SWP Exchange water reliability, which is not used as an urban supply, is based on the final allocations for the representative dry years selected: 35% of total Table A allocation for 2013, 5% for 2014, and 20% for 2015. **Table 7-2** summarizes the water years used as the basis for urban water supply reliability assessment and the percent of average supply available for each base year.

*Table 7-2*
*Basis of Water Year Data (adapted from DWR Table 7-1 R)*

| Year Type | Base Year | Available Supplies if Year Type Repeats | |
|---|---|---|---|
| | | Volume Available | % of Average Supply |
| Average Year | N/A[1] | | 100% |
| Single-Dry Year | 2014 | | 100% |
| Multiple-Dry Years 1st Year | 2013 | | 100% |
| Multiple-Dry Years 2nd Year | 2014 | | 100% |
| Multiple-Dry Years 3rd Year | 2015 | | 100% |

NOTES: Groundwater, Colorado River water, recycled water, and desalinated drain water supplies assumed to remain at 100% of average year supply during dry years.
[1] Average year is not applicable as supply amounts vary based on the QSA.

## 7.3 Supply and Demand Assessment

***CWC §10635***

***(a)*** *Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional or local agency population projections within the service area of the urban water supplier.*

The following tables provide CVWD's projected water supplies and demands in a normal year, single dry year, and multiple dry years. These tables combine retail and wholesale numbers to simplify the

presentation. It should be noted that the retail supplies and demands presented in the tables below include recycled water delivered to CVWD's non-urban customers based on DWR's standardized tables and the 2015 UWMP Guidebook. However, as discussed in Sections 4 and 6, recycled water is not an urban water supply and is not delivered to CVWD's urban water customers. Instead, recycled water is used to offset the groundwater pumping of private wells owners (mainly golf courses) to eliminate overdraft. The wholesale demand and supply listed is the anticipated sale of raw Colorado River water to the Indio Water Authority.

### 7.3.1 Average Year

The average year supply and demand come from supply and demand projections in **Section 4** and **Section 6**, respectively. DWR requires the supply reliability tables to include both potable and recycled water; this is summarized below in **Table 7-3** for the average year. CVWD does not use recycled water in its urban water supply, therefore a version of this table without recycled water is presented in **Table 7-4**,which more accurately represents CVWD's urban water supply reliability.

*Table 7-3*
*Normal Year Supply and Demand Comparison (adapted from DWR Table 7-2 R and DWR Table 7-2 W)*

| | | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
|---|---|---|---|---|---|---|
| **Retail** | Supply totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | Demand totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

*Table 7-4*
*Normal Year Supply and Demand Comparison – Urban Supply Only*

| | | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
|---|---|---|---|---|---|---|
| **Retail** | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

### 7.3.2 Single Dry Year

Urban water supplies during the single dry year is fully percent reliable. Thus, the supply and demand comparison for the single dry year, shown in **Table 7-5**, is the same as the average year. **Table 7-6** presents the urban supply and demand comparison without recycled water.

*Table 7-5*
*Single Dry Year Supply and Demand Comparison (adapted from DWR Table 7-3 R and DWR Table 7-3 W)*

| | | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
|---|---|---|---|---|---|---|
| **Retail** | Supply totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | Demand totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

*Table 7-6*
*Single Dry Year Supply and Demand Comparison – Urban Only*

| | | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
|---|---|---|---|---|---|---|
| **Retail** | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

### 7.3.3 Multiple Dry Year Period

Similar to the single dry year, the multiple dry year urban water supply reliability is 100 percent. **Table 7-7** summarizes the multiple dry year supply and demand comparison. **Table 7-8** presents the urban supply and demand comparison without recycled water.

*Table 7-7*
*Multiple Dry Years Supply and Demand Comparison (adapted from DWR Table 7-4 R and DWR Table 7-4 W)*

| | | | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
|---|---|---|---|---|---|---|---|
| **Retail** | First year | Supply totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Demand totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Second year | Supply totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Demand totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Third year | Supply totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Demand totals (AF) | 128,900 | 163,800 | 188,500 | 212,800 | 230,600 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | First year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Second year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Third year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

*Table 7-8*
*Multiple Dry Years Supply and Demand Comparison – Urban Only*

| | | | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
|---|---|---|---|---|---|---|---|
| **Retail** | First year | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Second year | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Third year | Supply totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Demand totals (AF) | 114,600 | 136,100 | 157,700 | 178,900 | 194,300 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| **Wholesale** | First year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Second year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |
| | Third year | Supply totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Demand totals (AF) | 5,000 | 10,000 | 20,000 | 20,000 | 20,000 |
| | | Difference (AF) | 0 | 0 | 0 | 0 | 0 |

## 7.4 Regional Supply Reliability

***CWC §10620***

***(f)*** *An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

CVWD was formed in 1918 for the purpose of protecting the water supplies of the Coachella Valley. At that time, the primary source of water was groundwater. In the early 1930s, CVWD recognized the onset of declining groundwater levels as a result of farming activities. This prompted CVWD to acquire imported water supplies. The delivery of Colorado River through Coachella Canal commenced in 1949. In the early 1960s, CVWD and DWA contracted with the State of California for SWP water. This water has been exchanged with Metropolitan for a like amount of Colorado River Aqueduct water since 1973. Continued groundwater overdraft prompted CVWD to begin development of the Coachella Valley Water Management Plan (CVWMP) in 1995. CVWD adopted the CVWMP for the Whitewater River Subbasin portion of the Valley in 2002 to address groundwater overdraft. An updated plan was adopted by the CVWD Board in early 2012 and an implementation status report was prepared in 2014. CVWD, DWA, and MSWD cooperatively developed the Mission Creek-Garnet Hill Water Management Plan in 2013.

Since these plans were developed, significant investments have been made to implement water conservation programs, acquire additional SWP Table A allocations, construct pipelines and groundwater replenishment facilities to convey and recharge the groundwater basins, and convert groundwater users to imported water. These programs have had a significant effect on stabilizing groundwater levels and eliminating overdraft.

CVWD has implemented a number of programs to maximize the use of local water supplies and reduce demands including significant recycled water and water conservation programs; see **Section 9** for demand management measures currently in place by CVWD. CVWD plans to implement stormwater capture programs where feasible. Due to the nature of local storms, runoff generated often occurs in high volumes over short durations making capture difficult and costly. CVWD also plans to capture, treat, and reuse a portion of the agricultural drain water that is currently discharged to the Salton Sea. This program is also described in more detail in Section 6.7 of this report.

In 2008, the five public water agencies in the Coachella Valley formed the Coachella Valley Regional Water Management Group (CVRWMG). They adopted the Coachella Valley Integrated Regional Water Management Plan (IRWMP.) in 2010 to ensure sustainable water supplies for the Coachella Valley. The CVRWMG agencies work together, share information, discuss concerns and viewpoints, meet with stakeholders on a quarterly basis, and build consensus in supporting future projects that benefit the entire region. Since its formation, the CVRWMG has added the Valley Sanitary District as a member and is working toward adding the Agua Caliente Tribe as a member. The CVIRWMP accomplishes the following:

- Defines the Coachella Valley IWRM Regions and water systems,
- Identifies regional water management goals and objectives,
- Establishes objectives and measureable targets for the Region,

- Identifies water management issues and needs,
- Identifies stakeholder involvement and agency coordination processes,
- Identifies and evaluates regional water management strategies,
- Assesses the integration of projects based on objectives,
- Establishes a project evaluation and prioritization process based on regional priorities, and
- Establishes a framework for project implementation.

The initial CVIRWMP was revised plan in 2014 (CVRWMG, 2014). Since plan adoption, the CVRWMG has obtained grant funding for a variety of projects including:

- Regional water conservation program
- Regional turf reduction program
- Onsite plumbing retrofit program
- Short term arsenic treatment project
- Groundwater quality protection programs – septic tank to sewer conversion
- Water supply connection projects
- Non-potable water use expansion program
- Recycled water project
- Regional well retrofit and abandonment program

# SECTION 8 WATER SHORTAGE CONTINGENCY PLANNING

**Section 6** describes the water supplies available to meet the demands of CVWD's urban customers. Due to the size of the groundwater basin from which CVWD draws its urban water supply, drought conditions do not adversely affect supply availability. During droughts, groundwater replenishment with imported water may be reduced based on available supply. Drought conditions would not affect CVWD's Colorado River water supply due to the agency's high priority allocation. However, if a reduction in Colorado River water supply occurred, CVWD would initially reduce deliveries to groundwater replenishment projects, followed by reductions to golf course and urban irrigation that could be supplied by private wells, and finally by reductions to agricultural and urban customers that do not have access to private wells. Drought conditions would have an effect on CVWD's supply of SWP Exchange water. This water is used for replenishment of the groundwater basin and is not a direct source of urban water supply. Consequently, water use restrictions due to drought involving the SWP Exchange supply would likely be implemented only as a result of a prolonged drought combined with MWD exercising its call back of SWP water and depletion of the Advanced Delivery storage account.

Although **Section 7** demonstrates that CVWD's urban water supply is reliable, there are risks that are unlikely but impossible to predict and should be considered in planning. They include the following:

- Extreme drought beyond that which has ever occurred
- Climate change
- Endangered species, habitat protection, or water quality challenges
- Catastrophic events such as earthquakes
- Lawsuits
- Delta levee failure

Water shortage contingency planning provides a way to plan for these risks and anticipate actions that should be implemented to manage risks. This section of the Plan describes how CVWD intends to respond to such emergencies so that emergency needs are met promptly and equitably.

Long-term water shortage contingency planning will be necessary if climate change increases the frequency of drought in an already water-stressed region. CVWD has taken significant actions to update and strengthen its water shortage ordinances.

# Section 8
# Water Shortage Contingency Planning

## 8.1 Stages of Action

***CWC §10632***

***(a)*** *The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier.*

***(a)(1)*** *Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

The current drought that began in 2013 resulted in record low precipitation both Statewide and in the Valley has brought about major changes to water management practices and severe water use restrictions. On January 17, 2014, the governor proclaimed a State of Emergency and on April 1, 2015, the governor issued Executive Order B-29-15, which ordered the State Water Resources Control Board (SWRCB) to adopt emergency regulations imposing restrictions to achieve a 25 percent reduction in potable urban water usage across the State. Agencies assigned to Tier 9, including CVWD, having residential water use above 215 GPCD, were required to reduce water use by 36 percent compared to its 2013 water use. This reduction was reduced to 32 percent in February 2016. As a result, agencies across the State have made significant cuts to water uses. This is apparent in **Section 5** in which SB X7-7 20x2020 per capita water use targets were already met in 2015 by a large margin.

Following an above normal snowpack in northern California, on May 9, 2016, Governor Brown issued Executive Order B-37-16 that is focused on long-term water use efficiency. In response to that order, the SWRCB adopted revised emergency regulations on May 18, 2016 that transition the mandates away from demand-based regulations. Under the new regulations, individual districts will self-certify the level of available water supplies assuming three additional dry years and the level of conservation necessary to assure adequate supply over that time. It is anticipated that the new self-certification process will result in a reduction in the emergency mandatory reduction target imposed on CVWD by the SWRCB.

Following the governor's drought emergency declaration, CVWD implemented its water shortage contingency plan through a series of ordinances with phased water use restrictions and a drought penalty rate structure:

- Ordinance 1414 – Stage 2 – 10% Mandatory Reduction;
- Ordinance 1419 – Stage 3 – 36% Mandatory Reduction;
- Ordinance 1422 – Stage 3 – Adopt Additional Watering Restrictions; 36% Mandatory Reduction
- Ordinance 1426 – Stage 3 – Replace Previous Ordinances, 32% Mandatory Reduction

After the SWRCB's adoption of revised regulations in May 2016, CVWD repealed these ordinances and adopted Ordinance 1422.3 which establishes Stage 2 restrictions that remains in effect until the SWRCB rescinds its emergency regulations. Copies of these ordinances are contained in Appendix E.

Based on the experiences from the current drought, the domestic water shortage contingency plan provides the stages and action levels summarized in **Table 8-1**.

*Table 8-1*
*Stages of Urban Water Shortage Contingency Plan (DWR Table 8-1 R)*

| Stage | Percent Supply Reduction | Water Supply Condition |
|---|---|---|
| 1 | 10% | Normal water supplies |
| 2 | 10% | 10% reduction in total groundwater and imported supplies relative to long-term average conditions |
| 3 | 25% | 25% reduction in total groundwater and imported supplies relative to long-term average conditions |
| 4 | 50% | 50% reduction in total groundwater and imported supplies relative to long-term average conditions |
| NOTES:<br>Stage 1 is voluntary reduction, stages 2 through 4 are mandatory reductions.<br>The Stage 2 and 3 reduction targets are flexible and may be adjusted by CVWD Board action based on actual supply conditions. | | |

The trigger levels used to determine the water shortage stage depend on the local water situation. CVWD has a diverse mix of water supplies and a large groundwater basin providing storage. Consequently, a shortage in one imported water supply would have a relatively small impact on the total supply. During periods of low SWP Exchange deliveries, groundwater replenishment is reduced by a like amount. However, the impact of such a reduction is buffered by CVWD's other supplies. For example, a 50 percent SWP allocation would have an impact of less than 5 percent on total Valley supplies. This is largely the result of the high priority of CVWD's Colorado River supply. Even a complete elimination of SWP Exchange water would only have a 15-20 percent effect on Valley supplies.

CVWD has prepared a separate Colorado River water drought contingency plan, a copy of which is included in **Appendix E**. This plan considers the unlikely event of a Colorado River shortage affecting the Valley. The Colorado River shortage plan establishes three stages of reduction based on the level of supply reduction. Because CVWD's Colorado River allocation increases annually under the QSA, the impact of a percentage cutback also changes. For 2016, the total allocation under the QSA is 397,000 AFY of which 35,000 AFY is from the MWD-CVWD transfer agreement. A 10 percent supply reduction would reduce the total supply by about 40,000 AFY. CVWD has determined that its initial response to such a reduction will be to reduce groundwater replenishment deliveries of Colorado River water by the amount of the reduction. Once replenishment deliveries are eliminated, further reductions are allocated to users outside Improvement District No. 1 (ID-1), the contractual service area for Colorado River water. These users are currently golf courses and agriculture. Any remaining reductions would be applied to users within the ID-1 service area, including agricultural, golf course, and future domestic users.

It is extremely unlikely that a 50 percent Colorado River supply reduction would occur for CVWD. Under the Law of the River, Colorado River supplies to the Lower Basin states and Mexico would need to be reduced to less than 7.27 million AFY before California would experience any reduction in deliveries below 4.4 million AF. Due to its allocation priority, CVWD would not experience any reduction in deliveries unless total supplies to the Lower Basin States and Mexico are less than about 6.54 million

AF (USBR, 2007b). At this level of shortage, MWD would experience complete elimination of its Priority 4 deliveries. Shortages to Priority 3 entitlement holders would likely be allocated between CVWD, IID, and Palo Verde Irrigation District based on their entitlements, excluding present perfected rights. CVWD might experience a 50 percent delivery reduction only if total deliveries to the Lower Basin States and Mexico were less than about 6.0 million AF.

Reclamation's Interim Surplus/Shortage Guidelines establish shortage sharing guidance if the Lake Mead water level drops below elevation 1,075 ft msl. Under these guidelines, no shortages would be experienced by California entitlement holders. If Lake Mead levels drop below 1,025 ft msl, the guidelines require consultation between Reclamation and the Lower Basin States (USBR, 2007a).

Based on voluntary response during Stage 1, CVWD's General Manager can determine that it is necessary to implement Stage 2 to protect the public welfare and safety. Prior to the implementation of each mandatory phase, CVWD shall hold a public hearing for the purpose of determining whether a shortage exists and which measures should be implemented. The public shall be informed of the public hearing at least 10 days prior to the hearing, and CVWD shall notify the public of its determination by public proclamations.

## 8.2 Prohibition on End Uses

***CWC §10632***

***(a)(4)*** *Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.*

***(5)*** *Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*

As CVWD experiences increasing stages of action, customers must adjust their water use behaviors accordingly to reduce strain on limited supplies. **Table 8-2** lists restrictions and prohibitions on end uses associated with each of the stages of action and the applicable CVWD ordinance citations. Penalties or fines for unauthorized water usage are effective once the respective stage has been declared by ordinance.

*Table 8-2*
*Restrictions and Prohibitions on End Uses (adapted from DWR Table 8-2 R)*

| Stage | Restrictions and Prohibitions on End Users | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? |
|---|---|---|---|
| **Mandatory Restrictions and Prohibitions** | | | |
| 1 | Landscape - Other landscape restriction or prohibition | Application of any water supply to outdoor landscapes during and within 48 hours after measurable rainfall is prohibited. CVWD Ordinance 1422.3 (5a). | Yes |
| 1 | Landscape - Prohibit certain types of landscape irrigation | Irrigation with any water of ornamental turf on public street medians is prohibited. CVWD Ordinance 1422.3 (5b). | Yes |
| 1 | Landscape - Prohibit certain types of landscape irrigation | Irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established in the California Building Standards Commission and the Department of Housing and Community Development is prohibited. CVWD Ordinance 1422.3 (5c). | Yes |
| 1 | Landscape - Other landscape restriction or prohibition | Variances for increased water budgets for over-seeding shall not be granted. CVWD Ordinance 1422.3 (5d). | Yes |
| 1 | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner | Broken sprinklers shall be repaired within 24 hours of notification by CVWD, and leaks shall be repaired as soon as practicable. CVWD Ordinance 1422.3 (5e). | Yes |
| 1 | CII - Restaurants may only serve water upon request | The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased is prohibited. CVWD Ordinance 1422.3 (5f). | Yes |
| 1 | CII - Lodging establishment must offer opt out of linen service | Hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. Hotels and motels shall prominently display notice of this option in each guestroom using clear and easily understood language. CVWD Ordinance 1422.3 (5g). | Yes |
| 1 | Landscape - Restrict or prohibit runoff from landscape irrigation | Applying any water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures is prohibited. CVWD Ordinance 1422.3 (5h). | Yes |
| 1 | Other - Require automatic shut of hoses | Using a hose to wash an automobile, windows, solar panels, and tennis courts, except where the hose is equipped with a shut-off nozzle, is prohibited. CVWD Ordinance 1422.3 (5i). | Yes |
| 1 | Other - Prohibit use of potable water for washing hard surfaces | Applying any water to any hard surface including, but not limited to, driveways, sidewalks, and asphalt is prohibited. CVWD Ordinance 1422.3 (5j). | Yes |

| Stage | Restrictions and Prohibitions on End Users | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? |
|---|---|---|---|
| 1 | Landscape - Other landscape restriction or prohibition | Homeowner's Associations, community service organizations, or similar entities are prohibited from enforcing provisions of their Rules and Regulations that prohibit reducing or eliminating the watering of vegetation or lawns during a declared drought emergency. CVWD Ordinance 1422.3 (5l). | Yes |
| 1 | Water Features - Restrict water use for decorative water features, such as fountains | Using any water in a fountain or other decorative water feature is prohibited, except where the water is part of a recirculating system. CVWD Ordinance 1419(4c) and SWRCB Regulation 864(a4). | Yes |
| 2 | Other | Reduced outdoor water budget by 10%. Enforced through penalty water rates. Enacted as needed by ordinance. | Yes |
| 3 | Other | Reduced outdoor water budget by 25%. Enforced through penalty water rates. Enacted as needed by ordinance. | Yes |
| 4 | Other | Reduced outdoor water budget by 50%. Enforced through penalty water rates. Enacted as needed by ordinance. | Yes |
| **Recommended Activities** | | | |
| 1 | Other | The irrigation and preservation of trees and shrubs is strongly encouraged. CVWD Ordinance 1422.3 (6a). | No |
| 1 | Other | CVWD strongly encourages counties, cities, Homeowners' Associations ("HOA's") and other enforcement agencies to suspend code enforcement and fines for brown turf areas and to otherwise comply with new State laws regarding limitations on such enforcement. CVWD Ordinance 1422.3 (6b). | No |
| 1 | Other | CVWD will work with private pumpers, canal water and non-potable water users to reduce water use. CVWD Ordinance 1422.3 (6c). | No |
| 1 | Pools and Spas - Require covers for pools and spas | Use of pool covers when not in use, especially during summer months, is strongly encouraged. CVWD Ordinance 1422.3 (6d). | No |
| 1 | Other water feature or swimming pool restriction | Draining and refilling of private swimming pools is discouraged, unless necessary for health and safety or leak repair. CVWD Ordinance 1422.3 (6e). | No |
| 1 | Other | HOA's are strongly encouraged to adopt and enforce water use restrictions in their rules and regulations. CVWD Ordinance 1422.3 (6f). | No |
| 1 | Other | Over-seeding is strongly discouraged. CVWD Ordinance 1422.3 (6g). | No |
| 1 | Other | Planting of spray irrigated annual flower beds is strongly discouraged. CVWD Ordinance 1422.3 (6h). | No |
| 1 | Other | Installation of irrigation smart controllers is strongly encouraged. CVWD Ordinance 1422.3 (6i). | No |

### 8.2.1 Landscape Irrigation

Key water savings are to be found in restrictions involving landscaping and irrigation. CVWD adopted the following restrictions relative to landscape irrigation:

- Irrigation within 48 hours of measurable rainfall is prohibited
- Runoff from landscape irrigation is prohibited
- Certain types of landscape irrigation are prohibited
- Variances for increased water budgets for over-seeding shall not be granted
- Irrigation with any water of ornamental turf on public street medians is prohibited
- Irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established in the California Building Standards Commission and the Department of Housing and Community Development is prohibited.
- HOAs are prohibited from enforcing rules and regulations that prohibit reducing or eliminating the watering of vegetation or lawns during a declared drought emergency

CVWD adopted a tiered water-budget based rate schedule in 2009 that establishes customized indoor budgets based on the number of residents (Tier 1) and outdoor water budgets based on the amount of landscaping (Tier 2). Customers with dedicated landscape meters do not have Tier 1 budget allowance. CVWD enforces mandatory reductions in landscape water use through its water rate schedule whereby the penalty rates are assessed for water usage exceeding required usage reduction limits as established by ordinance. CVWD strongly encourages the irrigation and preservation of trees and shrubs during drought emergencies.

### 8.2.2 Commercial, Industrial, and Institutional (CII)

The CVWD service area is not a heavily industrialized area and most water use (70-75 percent) is for irrigation. In 2015, commercial, industrial, and institutional (CII) use made up 7 percent of CVWD's urban water demand. The indoor water budgets for CII customers are based on the number of equivalent dwelling units (EDUs) as assigned by CVWD's Development Services Department based on business type when the business was established or repurposed and assigned to Tier 2. Most CII customers have a dedicated landscape meter and have a separate landscape water budget that encourages the use of desert landscaping. In addition, new CII customers are subject to the landscape ordinance described in **Appendix D**, and the tiered water rate structure.

Depending on the stage identified, CII restrictions include:

- Restaurants may only serve water upon request
- Lodging establishments must offer the option of choosing not to have linens and towels laundered daily

CII water use is subject to mandatory water use reductions established by ordinance; these reductions are enforced through the tiered water rates and penalty rates are enforced for use in excess of required reductions.

### 8.2.3 Water Features and Swimming Pools

***CWC §10632***

***(b)*** *Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

***Health and Safety Code Section 115921***

*As used in this article the following terms have the following meanings:*

***(a)*** *"Swimming pool" or "pool" means any structure intended for swimming or recreational bathing that contains water over 18 inches deep. "Swimming pool" includes in-ground and aboveground structures and includes, but is not limited to, hot tubs, spas, portable spas, and non-portable wading pools*

CVWD does not have mandatory prohibitions relative to swimming pools. The use of potable water in non-recirculating water features is prohibited. The use of pool covers when not in use, especially in the summer, is strongly encouraged to reduce evaporative losses. The draining and refilling of private swimming pools is discouraged, unless necessary for health and safety or leak repair. Customers filling swimming pools or water features receive no water budget adjustments. Therefore, they would exceed their budgets and incur higher water rates and significant penalties, if penalty rates are in effect.

### 8.2.4 Other

Other prohibitions identified include:

- Broken sprinklers shall be repaired within 24 hours of notification by CVWD, and leaks shall be repaired as soon as practicable
- Using a hose to wash an automobile, windows, solar panels, and tennis courts, except where the hose is equipped with a shut-off nozzle, is prohibited
- Applying any water to any hard surface including, but not limited to, driveways, sidewalks, and asphalt is prohibited

Mandatory reductions in water use by all customers are adopted by CVWD ordinance and enforced through the tiered water rates structure and drought penalty charges.

## 8.3 Penalties, Charges, Other Enforcement of Prohibitions

***CWC §10632***

***(a)(6)*** *Penalties or charges for excessive use, where applicable.*

Mandatory water use restrictions include penalties for customers for non-compliance as specified in CVWD Ordinance No. 1422.3. These penalties will take effect during stages 2 through 4. The first violation will result in a notice of non-compliance. Subsequent violations are within a twelve month period will result in fines added to the customer's water bill. The fines begin at $50 and double for each successive violation up to the fourth violation. The General Manager may initiate procedures to terminate water service, seek injunctive relief in the Superior Court, or take enforcement action, including discontinuing or appropriately limiting water service by the installation of a flow restricting device to any customer, for more than four violations of the Ordinance in a twelve month period.

## 8.4 Consumption Reduction Methods

***CWC §10632***

***(a)(5)*** *Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*

### 8.4.1 Categories of Consumption Reduction Methods

CVWD currently implements the following consumption reduction methods in each respective water shortage contingency stage summarized in **Table 8-3**. The primary method for implementing water use reduction is through the water budget-based tiered rates structures and drought penalty charges for use in excess of the required reductions as described in **Section 8.6**.

*Table 8-3*
*Stages of Water Shortage Contingency Plans – Consumption Reduction Methods (DWR Table 8-3 R)*

| Stage | Consumption Reduction Methods by Water Supplier | Additional Explanation or Reference *(optional)* |
|---|---|---|
| Varies | Other | Voluntary Rationing - 10% projected reduction |
| Varies | Implement or Modify Drought Rate Structure or Surcharge | Demand Reduction Program - % reduction varies with stage; penalty rates for exceedance |
| Varies | Expand Public Information Campaign | 10% projected reduction |
| Varies | Provide Rebates on Plumbing Fixtures and Devices | 10% projected reduction |
| Varies | Other | Mandatory Rationing - up to 50% projected reduction |
| Varies | Other | Flow Restrictions - up to 50% projected reduction |
| 1 | Other | Use Prohibitions |
| All | Provide Rebates for Turf Replacement | |

## 8.5 Determining Water Shortage Reductions

***CWC §10632***

***(a)(9)*** *A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

In the event of a water shortage, CVWD will use monitoring mechanisms to determine water use reductions. Each customer is metered and has a customized water budget that defines the amount of water that may be used without triggering penalty tiers in the rate structure. The mechanisms and their benefits are listed below:

- Water Meter Readings – Monthly meter records determine customer compliance with required reduction levels
- Remote Metering Program – Increased efficiency in meter readings and real-time detection of customer-side leaks
- Residential Meter Replacement Program for Automated Meter Reading (AMR) (every 10 years) **–** Accurate readings and revenue collection
- Daily Production Recording (Groundwater wells, Coachella Canal, SWP, recycled water, and interagency connections) **–** Determine monthly or annual system losses when compared with billing records
- Comparison of Actual Use to Water Budget – Budget-based tiered water rates provides customers with clear picture of conservation success; monthly bill provides customers a comparison between actual use and water budget; helps CVWD identify high water users for possible outreach
- Annual Update of Per Capita Water Use – Provides clear indication of progress toward meeting CVWD water conservation targets

## 8.6 Revenue and Expenditure Impacts

***CWC §10632***

***(a)(7)*** *An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.*

A reduction in the amount of water consumed will lead to a reduction in revenue and expenses for CVWD. These reductions will have an impact on CVWD's ability to finance its operations during periods of water shortages.

Revenue from water sales would decrease as a result of reduced water sales to customers of CVWD. The revenue reduction percentage is expected to be 9 percent at Stage 2, 19 percent at Stage 3, and 47 percent at Stage 4 (CVWD, 2011). However, this decrease is expected to be offset by drought penalty rates imposed on customers that exceed their water use targets as described below.

Expenditures by CVWD are also expected to decrease in the event of a water shortage. Reductions are expected in source supply and pumping expenses.

Several measures can be taken to generate additional funds to absorb the negative financial impact of a severe water shortage. Examples of such measures are listed in **Table 8-4**.

*Table 8-4*
*Proposed Measures to Overcome Revenue and Expenditure Impacts*

| Proposed Measure | Potential Impacts of Measure |
|---|---|
| Rate Adjustment | • Increased savings to Domestic Water Enterprise Fund<br>• In normal years, CVWD would receive more money than required for normal operations<br>• Water customer resistance |
| Use of Accumulated Reserves | • Increased savings to Domestic Water Enterprise Fund<br>• Decreased availability for O&M or Capital Fund |
| Decrease Capital Expenditure | • Increased savings to Domestic Water Enterprise Fund<br>• Delay of system rehabilitation<br>• Decrease in quality of future system facilities |
| Decrease O&M Expenditure | • Increased savings to Domestic Water Enterprise Fund<br>• Less staff available to respond to emergencies<br>• Reduced maintenance frequency of system facilities<br>• Decrease quality of service provided to customers |

### 8.6.1 Drought Rate Structures and Surcharges

During each subsequent drought stage, any customer who uses water in excess of his or her calculated consumption threshold shall be in violation of the rules and regulations established by CVWD's Water Shortage Contingency Plan and shall pay a penalty for the excessive water use in addition to the normal water rates. Penalty charges are defined as fines and are authorized by Proposition 26 (2010) and are not subject to the requirements of Proposition 218. The penalties begin by being applied to water usage that is in excess of established consumption levels relative to individual customer water budgets, and the penalties incrementally increase with subsequent tiers. This policy targets those customers whose excessive water use is creating the need for the drought stage (MWH, 2016). CVWD first adopted drought penalty charges with Ordinance No. 1419 in May 2015. The penalty charges for Tier 3 were increased by 50 percent and those for Tiers 4 and 5 were doubled with the adoption of Ordinance No. 1422.

In May 2016, the drought penalty structure was revised in Ordinance 1422.3. The penalty charges remain the same as adopted in Ordinance No. 1422. However, the penalties will now be applied if CVWD is required by the SWRCB to reduce water usage by an amount greater than 25 percent. In such a case, CVWD will require customers to reduce their usage by difference between the SWRCB target percentage and 25 percent. For example, if CVWD is required in the future to reduce usage by 30 percent, CVWD will implement volumetric drought penalties to discourage that additional 5 percent use. The reduction is applied to the customer's Tier 2 water budget. If the customer's monthly Tier 2 water budget is 2,000 cubic feet (20 ccf) and the required reduction is 5 percent, customer will pay a Tier 2 penalty charge based on water use exceeding 19 ccf in addition the water rate for that tier. Any

customer use in the higher tiers will pay a penalty based on the amount of excess water use in each tier in addition to the cost of the water. This revision to the ordinance provides increased implementation flexibility.

The drought penalties by tier for drought Stage 3 adopted by CVWD are summarized in **Table 8-5**. The drought penalties are independent from, and in addition to, normal water rates.

*Table 8-5*
*Drought Penalty Rates for Stage 3*

| Tier | Budget Allowance | Penalty |
|---|---|---|
| 1: Excellent | Indoor Budget | No Penalty |
| 2: Efficient | Water use within assigned percentage of Budget<br>Water use exceeding assigned percentage of Budget | No Penalty<br>$ 2.51 per ccf above reduction goal |
| 3: Inefficient | 105 – 150% of budget | $ 5.00 per ccf or portion thereof |
| 4: Excessive | 150 – 250% of budget | $10.00 per ccf or portion thereof |
| 5: Wasteful | Over 250% of budget | $20.00 per ccf or portion thereof |
| Reference: CVWD Ordinance No. 1422.3 Section 8. | | |

### 8.6.2 Use of Financial Reserves

CVWD has adopted target reserve policies in order to maintain sufficient working capital in CVWD's enterprise funds so as to mitigate current and future risks and promote stable services and fees. The FY 2016 domestic water fund reserve target is about $60 million, or about 78 percent of forecasted revenue. These reserves include $5.3 million for rate stabilization (MWH, 2016).

### 8.6.3 Other Measures

Other measures to overcome revenue and expenditure impacts include decreased capital expenditure. The impact of this measure would be increased savings to the Domestic Water Enterprise Fund, but could also cause a delay of system rehabilitation and a decrease in quality of future system facilities.

Another proposed measure is a decrease of O&M expenditure. This could also provide increased savings to the Domestic Water Enterprise Fund, but may also result in less staff available to respond to emergencies and reduced maintenance frequency of system facilities. The quality of customer service is also expected to decrease if O&M expenditures were reduced.

## 8.7 Resolution or Ordinance

***CWC §10632***

***(a)(8)*** *A draft water shortage contingency resolution or ordinance.*

CVWD adopted Ordinance No. 1422.3 on May 24, 2016 titled "Ordinance of the Coachella Valley Water District Imposing Revised and Additional Restrictions on Water Use to Comply with Statewide Drought Regulations." A copies of this ordinance and all previous ordinances are available in **Appendix D**.

Ordinance No. 1302.2 "An Ordinance of the Coachella Valley Water District Establishing Landscape and Irrigation System Design Criteria" went into effect on December 1, 2015 mandating strict requirements for landscaping and landscape watering. A copy of this ordinance is included as **Appendix E**.

## 8.8 Catastrophic Supply Interruption

***CWC §10632***

***(a)(3)*** *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

Because of the significant amount of groundwater in storage, both natural and imported, CVWD does not anticipate any significant short term, drought or emergency water supply deficiencies.

In the event of a major catastrophe (including but not limited to a regional power outage, an earthquake, or other disaster), the availability of groundwater will not be affected. CVWD has a number of generators that can be used to operate wells and booster stations in case of power failure.

Most of CVWD's pressure zones are served by steel reservoirs located at higher elevations. Several of the reservoirs are equipped with automatic valves that close during a seismic event, thereby preserving the stored water. Likewise, most of the pressure zones have interconnections to other zones, which permit CVWD to transfer water to any zone that may suffer deficiencies. CVWD has portable pumps and temporary above-ground pipe is available to allow water service to be provided should earthquakes damage portions of the system.

CVWD has an Emergency Response Program. Staff receives regular Incident Command System (ICS) training through the Federal Emergency Management Agency and drills are conducted routinely. CVWD remotely monitors the status of most key facilities at CVWD headquarters, which enables it to detect areas affected by disasters. Also most of CVWD's employees live within a short driving distance of CVWD facilities; therefore, CVWD is capable of addressing any emergency in a quick and efficient manner.

CVWD is reliant on imported water supplies to meet a significant portion of its water demand. The Coachella Canal parallels the San Andreas Fault. The SWP Exchange water supply is obtained through MWD's Colorado River Aqueduct which also parallels this fault and crosses other faults. These supplies could be severely damaged in the event of an earthquake CVWD's domestic water supply is protected

from such a catastrophe because it is derived from local groundwater storage. However, groundwater recharge programs and deliveries to agricultural and other non-potable users could be interrupted while repairs are made. Many non-potable customers are required to have groundwater wells to meet their demands in the event of an imported water supply interruption. CVWD has emergency plans in place to respond to a catastrophic supply interruption and make any necessary repairs as quickly as possible.

## 8.9 Minimum Supply Next Three Years

***CWC §10632***

***(a)(2)*** *An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*

CVWD has several water supply sources that enable it to withstand imported water reductions better than agencies that are solely dependent on imported water supply.

CVWD and DWA receive delivery of their SWP Table A water through exchange with MWD at the Whitewater River and the Mission Creek Turnouts on the Colorado River Aqueduct. Under the terms of the Advance Delivery Agreement, MWD has stored water in the upper Whitewater River subbasin in advance of CVWD's and DWA's Table A deliveries. MWD may discontinue direct delivery of SWP Exchange Water to these turnouts if the water is needed to meet MWD's demands. During such years, MWD would make its required deliveries from its storage account in the groundwater basin. As of December 2015, MWD had approximately 200,000 AF of water in storage. Assuming a repeat of the past three dry years, t is expected that CVWD and DWA would receive 20 percent of their total Table A allocation (194,100 AFY) or an average of about 38,800 AFY over three years or 116,500 AF, assuming MWD does not exercise its callback option. This amount is less than the balance in the advance delivery account.

For water shortage planning purposes, it is assumed that MWD could take the entire amount of CVWD and DWA Table A Water Deliveries for the succeeding three years and significantly deplete the Advance Delivery Storage account. Although CVWD and DWA might not have access to SWP Exchange water deliveries in these three years, the water is already stored in the basin. The vast storage capacity of the Whitewater River subbasin (about 28.8 million AF) would be more than adequate to meet the projected groundwater extraction needs of CVWD, DWA and the private pumpers. Without replenishment, the decline in storage would be less than 0.5 percent of the basin storage each year.

Under the QSA, CVWD is scheduled to receive 362,000 AF of Colorado River water in 2016, 366,000 in 2017, and 384,000 AFY in 2018 at Imperial Dam. The actual water deliveries to CVWD users are expected to be 348,000 AFY in 2016, 352,000 AFY in 2017 and 370,000 AFY in 2018 after deducting conveyance and operating losses. Because of CVWD's Priority 3(a) allocation, this supply would not be reduced during a dry period unless the drought was so severe that Colorado River supplies are inadequate to supply both Arizona's allocation of 2.8 million AF and MWD's Priority 4 allocation of 550,000 AFY. Under Reclamation's current operating rules, California would not experience a shortage until Arizona's post-1968 water contracts are reduced completely and only after Lake Mead dropped below elevation 1,025 feet above mean sea level. In addition, CVWD expects to receive 35,000 AFY of SWP water from MWD through the QSA over the next three years.

For urban water supplies, groundwater is limited by the total production capacity of CVWD's groundwater wells and the water demand. This supply is fully reliable and is used to meet all urban demands not met by future Canal water or recycled water. The highest pumping from the recent 2011 to 2015 period of 114,900 AF is used as the minimum available supply for the next three years. Canal water is assumed to be unavailable for urban use in the next three years. **Table 8-6** presents the estimated three-year minimum urban water supply. If demand remain similar that in 2015, CVWD would pump about 22,000 AFY less than the highest amounts over the past five years.

*Table 8-6*
*Minimum Supply Next Three Years (DWR Table 8-4 R)*

| Supply | 2016 | 2017 | 2018 |
|---|---|---|---|
| Available Water Supply | 114,900 | 114,900 | 114,900 |
| NOTES: Assumes available groundwater supply is the highest amount pumped from 2011 to 2015 of 114,900 AF. Colorado River water assumed to be unavailable for urban use until 2020. | | | |

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# SECTION 9 DEMAND MANAGEMENT MEASURES

This section describes CVWD water conservation goals, its existing and proposed conservation programs, and addresses all of the requirements of the UWMP relative to demand management.

## 9.1 Demand Management Measures for Wholesale Agencies

CVWD does not receive or currently provide wholesale water. This section is not applicable to CVWD's service area.

## 9.2 Demand Management Measures for Retail Agencies

***CWC §10631***

***(f)(A)*** *…The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

***(B)*** *The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

***(i)*** *Water waste prevention ordinances.*

***(ii)*** *Metering.*

***(iii)*** *Conservation pricing.*

***(iv)*** *Public education and outreach.*

***(v)*** *Programs to assess and manage distribution system real loss.*

***(vi)*** *Water conservation program coordination and staffing support.*

***(vii)*** *Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

CVWD implements the demand management measures (DMMs) identified in CWC §10631 in addition to other DMMs described in **Section 9.2.7**. The following subsections summarize the current DMMs in place and implementation over the past five years.

### 9.2.1 Water Waste Prevention Ordinances

CVWD has implemented water waste restrictions through its ordinance imposing mandatory restrictions on water use.

The following activities are prohibited according to the Ordinance 1422.3

- Application of any water supply to outdoor landscapes during and within 48 hours after measurable rainfall is prohibited.
- Irrigation with any water of ornamental turf on public street medians is prohibited.

- Irrigation with potable water of landscapes outside of newly constructed homes and buildings in manner inconsistent with regulations or other requirements established in the California Building Standards Commission and the Department of Housing and Community Development is prohibited.
- Variances for increased water budgets for over-seeding shall not be granted.
- Broken sprinklers shall be repaired within 24 hours of notification by CVWD, and leaks shall be repaired as soon as practicable.
- The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased is prohibited.
- Hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. Hotels and motels shall prominently display notice of this option in each guestroom using clear and easily understood language.
- Applying water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures is prohibited.
- Using a hose to wash an automobile, windows, solar panels, and tennis courts, except where the hose is equipped with a shut-off nozzle, is prohibited.
- Applying any water to any hard surface including, but not limited to, driveways, sidewalks, and asphalt is prohibited.
- Prohibit outdoor irrigation on Mondays and Thursdays from December 1, 2015 to March 31, 2016.
- Homeowner's Associations, community service organizations or similar entities are prohibited from enforcing provisions of their rules and regulations that prohibit reducing or eliminating the watering of vegetation or lawns during a declared drought emergency.

Levels of mandatory restrictions are implemented based on the stage of its water shortage contingency plan.

**Stage 2:**

**Mandatory Prohibitions:** Effective immediately upon adoption of this Ordinance, the following mandatory prohibitions shall be in effect for Stage 2:

(a) Outdoor irrigation of ornamental landscapes and turf are limited to the hours between sunset and 10:00 a.m., except as necessary for essential turf maintenance and overseeing;

(b) Customers shall follow the CVWD drought watering guide, a copy of which is attached hereto and can also be found at www.cvwd.org/conservation/wateringguide.php;

(c) Broken sprinklers shall be repaired within 24 hours of notification by CVWD, and leaks shall be repaired as soon as practicable;

(d) Water shall be served in restaurants only upon request; and

(e) A request will be made of hotels to place messaging in hotel rooms asking guests to conserve water.

**Conditional Prohibitions**: The following actions are prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

(a) Applying water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures is prohibited;

(b) Using a hose to wash an automobile, windows, solar panels, and tennis courts except where the hose is equipped with a shut-off nozzle is prohibited;

(c) Applying water to any hard surface including, but not limited to, driveways, sidewalks, and asphalt is prohibited; and

(d) Using potable water in a fountain or other decorative water feature is prohibited, except where the water is part of a recirculating system.

**Stage 3:**

The following mandatory restrictions are implemented in Stage 3 in addition to those in Stage 2:

**Mandatory Restrictions**. Effective immediately upon adoption of this Ordinance, the following mandatory prohibitions shall be in effect for Stage 3, except where necessary to address an immediate health, safety and sanitation need or to comply with a term or condition in a permit issued by a state or federal agency:

(a) Application of any water supply to outdoor landscapes during and within 48 hours after measurable rainfall is prohibited.

(b) Irrigation with any water of ornamental turf on public street medians is prohibited.

(c) Irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established in the California Building Standards Commission and the Department of Housing and Community Development is prohibited.

(d) Variances for increased water budgets for over-seeding shall not be granted.

(g) Hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. Hotels and motels shall prominently display notice of this option in each guestroom using clear and easily understood language.

(l) Prohibit outdoor irrigation on Mondays and Thursdays from December 1, 2015 to March 31, 2016.

**Recommended Activities.**

(a) The irrigation and preservation of trees and shrubs is strongly encouraged.

(b) CVWD strongly encourages counties, cities, Homeowners' Associations ("HOA's") and other enforcement agencies to suspend code enforcement and fines for brown turf areas and to otherwise comply with new State laws regarding limitations on such enforcement.

(c) CVWD will work with private pumpers, canal water and non-potable water users to reduce water use.

(d) Use of pool covers when not in use, especially during summer months, is strongly encouraged.

(e) Draining and refilling of private swimming pools is discouraged, unless necessary for health and safety or leak repair.

(f) HOAs are strongly encouraged to adopt and enforce water use restrictions in their rules and regulations.

(g) Over-seeding is strongly discouraged.

(h) Planting of spray irrigated annual flower beds is strongly discouraged.

(i) Installation of irrigation smart controllers is strongly encouraged.

In addition, provisions of the District's landscape ordinance (revised November 24, 2015), which can be found in the **Appendix D**, include specific prohibitions and penalties for water waste. These provisions are provided below:

Section 0.00.040, Part C

1. Water Waste Prevention. Water waste resulting from inefficient landscape irrigation including run-off, low-head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures is prohibited. All broken heads and pipes must be repaired within 72 hours of notification. Penalties for violation of these prohibitions are established in Section 0.00.070.

2. Water service to customers who cause water waste may have their service discontinued.

3. Customers who appear to be exceeding the Maximum Applied Water Allowance (MAWA) may be interviewed by the District Water Management Department to verify customer water usage to ensure compliance.

The measurement of success for this program is a reduction in water waste violations in the future. Since 2010, 2,208 water waste reports have been investigated by CVWD.

### 9.2.2 Metering

One hundred percent of CVWD's urban water customers are metered. The meters are billed based on volume of use. CVWD has mixed use meters serving both domestic use and landscape irrigation. The landscape ordinance Section 0.00.030, Part E specifies:

Separate landscape water meters shall be installed for all projects except single family homes with a landscape area less than 5,000 square feet. Landscape meters for single family homes with a landscape area over 5,000 square feet may be served by a permanent service

connection provided by the District or be a privately owned submeter installed at the irrigation point of connection on the customer service line.

### 9.2.3 Conservation Pricing

Conservation pricing provides incentives to customers to reduce average or peak use, or both. The agency uses water commodity rates for its domestic water, non-potable (including Canal and recycled) water, and groundwater replenishment services. For its urban water system, CVWD has used a water budget-based tiered rate structure that discourages wasteful water use since 2009.

Every residential customer is given a personalized water budget based on the number of people living in the home, the size of the home's landscaped area (budgeting more water to those with larger landscapes), and daily weather (budgeting more water during hotter months). Customers pay the tier rate for all water used within that tier.

CVWD recently completed water rate studies for its domestic water, Canal water, and replenishment assessment charges. The domestic water rates and customer budgets are proposed to be adjusted to encourage additional water conservation and generate the revenue required to meet District expenses, consistent with cost of service principles and legal requirements.

### 9.2.4 Public Education and Outreach

There are several public information programs being operated presently by CVWD. The purpose of these programs is to educate the public on conservation programs being planned and/or implemented by CVWD as well as educational tips that customers can use to lower their water usage.

#### 9.2.4.1 Publications – Lush and Efficient

CVWD publishes a comprehensive book on water-efficient landscaping in the Coachella Valley titled *Lush and Efficient*: *Landscape Gardening in the Coachella Valley*. The guide draws on the expertise of local irrigation and landscaping specialists to provide users with step-by-step instructions and techniques for creating and maintaining water-efficient landscapes, plus hundreds of low-water using plants that thrive in the desert. First published in 1988, the popular book is available for free from CVWD's website. Hard copies are also readily available for free at special events and for purchase for a nominal fee. In 2016, an updated version showcasing new plant materials and the latest irrigation tools and techniques, will be debuted. The measurement of interest and success of this program will be to show a steady and/or increase in the number of hard copies distributed and the number of page views the online version receives.

#### 9.2.4.2 Demonstration Gardens

The majority of urban potable water distributed by CVWD is used outside with about 70-80 percent being used to maintain landscapes. Since CVWD's boundaries fall within the California Department of Water Resources' highest ET zone (18), it takes more water to grow landscapes here than in any other portion of California. The Coachella Valley shares this highest water use designation with the Palo Verde Valley, Imperial Valley, and Death Valley.

One way to reduce landscape water requirements is to use native desert plants in landscaping. Desert native plants have evolved both anatomical and physiological mechanisms that allow them to survive on annual rainfall alone.

Within the Coachella Valley, which is one of the lowest annual rainfall areas in the state, desert plants from other, wetter deserts can be utilized with a minimum amount of irrigation. CVWD has identified and illustrated these plant choices in its publication *Lush and Efficient*: *Landscape Gardening in the Coachella Valley*. CVWD's two demonstration gardens, one at its headquarters in Coachella and the other at its office in Palm Desert, provide the landscape industry and the general public an opportunity to observe the plants in a landscape setting.

The objective measurements of interest and success of this program will be attendance at the gardens and subjective measurements achieved through the feedback from visitor surveys.

#### 9.2.4.3 Landscape and Leak Detection Workshops

CVWD started offering an annual horticultural workshop more than 20 years ago with about 30 people attending a half-day session at College of the Desert. This program steadily grew over the years to a culmination of 220 people participating in 2010. In order to make the workshop more manageable, the structure was changed and is now held six times a year, for two hours, with different topics continually being introduced.

Speakers include CVWD staff and community members who are experts in various fields related to landscaping. Participants are given a free copy of *Lush and Efficient*: *Landscape Gardening in the Coachella Valley* and other xeriscape information. Attendance at each event ranges from 50-75 people.

The measurement of interest and success of this program will be through steady and/or increase in the number of people attending the course offered under this program.

#### 9.2.4.4 Community Outreach in 2015

CVWD staff hosted a booth/table at 44 community events, hosted or participated in 51 tours, and gave 78 presentations to community groups on water conservation.

In 2015, CVWD launched a new quarterly newsletter distributed in domestic bills with news and information.

CVWD's marketing/advertising program includes print, radio and TV ads primarily focused on water conservation and promotion of workshops.

#### 9.2.4.5 Water Conservation Website, E-notifications, and Facebook

CVWD has a large section on its website (www.cvwd.org/conservation) devoted to water conservation and education. Started in 2005, the webpage provides information on all of the agency's conservation programs including conservation rebate programs, current water-use restrictions, upcoming workshops, conservation tips (in the form of videos, fact sheets and guides), a guide for proper irrigation, and a link to download CVWD's landscaping book, *Lush and Efficient*: *Landscape Gardening in the Coachella Valley.* In addition, regional daily and monthly weather and ETo information is provided to guide water users. The conservation section received 71,022 page views in 2015. The measurement of interest and

success of this program will be to show a steady and/or increase in the number of page views to the section.

In addition, CVWD partners with four other public water agencies in the region to maintain a cooperative educational website at www.cvwatercounts.com. This site also provides water conservation tips and links to the five agencies.

The e-notifications program began in 2014 to provide a voluntary email subscription service to customers. As of January 2016, 811 people have subscribed to receive monthly emails with a Water Wise Tip of the Month, 943 people receive notifications of upcoming landscape and leak detection workshops and 598 people receive an electronic copy of the quarterly conservation newsletter for commercial customers called *Water Wise*.

The Facebook page was launched in July 2014. As of January 2016, the page had 563 followers. Many of the posts are conservation related, including tips, reminders to turn off sprinklers when it rains and kudos to customers who are doing a good job conserving water. Other posts are news related, including traffic advisories for construction work and announcements of new policies or programs.

#### 9.2.4.6 School Education Program

Started in 1992, CVWD has an established school education program. The agency has two full-time teachers on staff implementing the program. Presently, there are four components to the program. The first is classroom presentations on a variety of water-related topics with emphasis on water conservation. The second component is field tours, the third is science fair promotion and sponsorship and the fourth is a newsletter targeted to teachers. CVWD's teachers make audience-specific water education presentations to students at every level from pre-school to college. All school lesson plans are developed using California State Board of Education Standards and Frameworks. In addition to classroom presentations, CVWD's teachers host several tours of water-related facilities and judge science fairs for the public and private schools within the agency's service area. A quarterly newsletter, *The Water Wheel*, is targeted specifically to teachers promotes the other three components of the program and provides valuable information to assist teachers in incorporating water-related topics into their lesson plans.

### 9.2.5 Programs to Assess and Manage Distribution System Real Loss

CVWD's distribution system water audit and leak detection activities are presently performed on an as-needed basis. CVWD has legal authority to implement this DMM. CVWD routinely evaluates historical data on water production and consumption. According to the California Urban Water Conservation Council (CUWCC), an existing system is considered to be in excellent condition when water losses are lower than 10 percent. CVWD recently prepared a water system audit for fiscal year 2014-15 using the American Water Works Association's (AWWA's) spreadsheet-based water audit tool; the water loss determined as a result of this audit showed a loss of about 12 percent. The higher water loss is attributable to two main factors: (1) Pumping during the 2014-15 fiscal year was down more than 25 percent as a result of the drought and system losses are largely a function of the system size, not the total water served; and (2) CVWD has several remotely located areas of its urban water system where the ratio of pipe to connections is high and these areas (Salton City, Bombay Beach, and Sky Valley)

also tend to have aging facilities subject to corrosive soils. The replacement cost for aging infrastructure in these areas is high. CVWD is in the process of developing an asset management program that will help prioritize repairs and reduce losses.

The domestic water system was directly built within CVWD's service area or as part of communities that were built on neighboring County land, which developed into cities and thereafter incorporated into CVWD's service area. The bulk of pipelines installed and acquired by CVWD were installed in the 1970s to present. Consequently, aging infrastructure is not currently a significant component of water leakage. CVWD, on an as needed basis, performs monitoring and repair of water leaks and breaks. CVWD's goal is to maintain the system to keep the water loss around its existing level and prevent it from exceeding the threshold level of 10 percent. This goal will be measured by reviewing monthly water consumption and production data currently being tracked by CVWD.

### 9.2.6 Water Conservation Program Coordination and Staffing Support

CVWD currently has a full-time water conservation coordinator as well as support staff for CVWD's conservation program. Supporting positions include a water management supervisor, water management specialists, water management technicians, and water management aides. Beginning in 2001 with a staff of two people, the staff now consists of 14 people to carry out the agency's various conservation programs.

### 9.2.7 Other Demand Management Measures

CVWD has several other demand management measures including landscape conservation and incentive programs, residential efficiency programs, and golf and agricultural conservation programs. These are described briefly in the following subsections

#### 9.2.7.1 Large Landscape Conservation Programs and Incentives Program

There are two principal groups of large landscape customers within the CVWD service area – those with separate irrigation meters on the urban water system and those with private wells for golf course or other landscape irrigation. Irrigation accounts for approximately 75-80 percent of total urban water usage. Consumption by users with separate irrigation meters represents about 28% of total CVWD domestic water consumption. There are also many golf course irrigation users, who are not CVWD urban water users, but produce groundwater from private wells. One of CVWD's goals is to reduce water use by these large landscape pumpers.

##### 9.2.7.1.1 Landscape Irrigation Retrofit Low-Interest Loan Program

CVWD historically offered an irrigation retrofit low-interest loan program to provide financial assistance to large domestic water meter users with older, inefficient irrigation. The program offered low interest (three percent) loans for up to $50,000 for the replacement of inefficient irrigation systems. The public has met the program with little interest since its inception in 1992. The program averaged only two loan approvals per year through 1996. From 2002-2004, only one loan application had been both submitted and approved. The loan program has since been discontinued.

#### 9.2.7.1.2 Water Management Seminar for Landscape Professionals (English and Spanish)

Commercial and recreational landscape irrigation systems are often improperly installed, poorly maintained, and inefficiently scheduled by transitory landscape maintenance personnel who are often unskilled and uneducated in the science and practice of landscape irrigation efficiency. Career landscape maintenance professionals have little or no in-valley, irrigation science educational opportunities.

Starting in September 2009, CVWD began offering a water landscape workshop specifically aimed at landscape professionals. The 6-hour workshop is designed to help local landscape professionals efficiently irrigate their clients' lawns and gardens without wasting water. Certified water conservation managers and turf and irrigation experts give presentations on Coachella Valley soils, drip irrigation, smart controllers, water pressure regulation, and irrigation scheduling. At the conclusions of each workshop, all participants receive a certificate of completion. Participants with professional landscape companies are listed on CVWD's website (www.cvwd.org).

The workshop, which is offered twice a year in both English and Spanish, has enjoyed much interest and participation since its inception. The workshops have an average attendance of approximately 50 people for each workshop. Class participants have included industry business owners, landscape managers, landscapers from cities and country clubs, and homeowners association (HOA) landscape committee members.

CVWD will continue to offer this workshop in the future. The measure of success of this program will be performed by surveying participants in the program as well as monitoring and measuring the annual attendance at the program.

#### 9.2.7.1.3 Landscaper Certification Program

CVWD will initiate a Landscaper Certification Program (LCP) for professional landscapers that will focus on water use efficiency. The class will be modeled after an existing course focused on air quality in relation to lawn scalping and re-seeding practices. The certification will be a requirement in order to obtain or renew a professional landscaping business license in any city or county areas in the Coachella Valley.

CVWD will partner with COD, a local community college with an established Landscape Management Program, Coachella Valley Association of Governments (CVAG), and the cities, county and neighboring water districts to implement the course and establish certification criteria for incorporation into each city's business license qualification requirements.

CVWD will develop the curriculum of the LCP using existing staff that hold licenses and certifications in irrigation efficiency, plant water use, horticultural practices, arboriculture, and landscape/golf course irrigation auditing. CVWD will ensure the curriculum is high quality by asking for review from industry educators such as COD instructors or industry professionals. CVWD and COD will work together to create a course and certification based on the developed curriculum. CVWD and CVAG will work with the cities on an amendment to existing ordinances to establish the business license requirement.

#### 9.2.7.1.4 Water Audits for Large Water Users

The purpose of the large landscape irrigation audit program is to assist users in maximizing the efficient operation of their irrigation system by measuring performance, generating irrigation schedules and recommending improvement actions.

The goals of this audit program are to determine the irrigation uniformity, efficiency and application rate of each approved site, suggest modifications in design, operation, maintenance and scheduling and estimate the water and energy savings associated with the suggested modifications. A report summarizing the audit's findings and recommendations is hand-delivered and explained to the irrigation manager.

Audit sites are chosen based on excessive water consumption or in response to a request for audit services. CVWD's Water Management Specialist evaluates and approves each site. All auditors must take the Irrigation Association's Landscape Irrigation Auditor course and pass the Certified Landscape Irrigation Auditor's Examination.

Once a site is approved for audit, the owner or operator of the facility is contacted and an appointment is made to conduct the audit. After measurements and calculations are completed, a summary report and recommendations is delivered and explained to the site operator by the auditor. The large landscape audit program operates continuously and completes approximately 20 landscape audits per year. The success of this program will be measured by the annual water reduction achieved by large water users participating as a result of the program. A study in 2005 found that the average HOA saved 3.1 acre feet per year as a result of implementing some of the audit recommendations.

#### 9.2.7.1.5 Adoption of Model Landscape Ordinance by Coachella Valley Cities to Establish Water Budget and Landscaping Criteria for New Development

The Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird) required cities and counties, to adopt water conservation ordinances by January 1, 2010. In accordance with the law, the DWR prepared an updated Model Efficient Landscape Ordinance (MWELO). For all cities and counties that do not adopt their own conservation ordinances, DWR's updated MWELO would apply within their jurisdiction by January 1, 2010.

In response to this law, CVWD worked with the Coachella Valley Association of Governments, Coachella Valley cities, Riverside County, other water agencies, and the Building Industry Association for the acceptance of CVWD's Landscape Water Conservation Ordinance No. 1302.2. The most recent revisions to this ordinance were adopted on November 24, 2015 to reduce the minimum threshold for applicability to single family landscaping from 5,000 to 2,500 square feet, reduce the ET adjustment factor from 0.5 to 0.45, prohibit the use of high water use plants on roadway medians, and other changes.

#### 9.2.7.1.6 Plan Checking for Compliance with Landscape Ordinance

New and rehabilitated landscape sites are required to submit water conserving landscape plans to CVWD's Water Management Department for a plan check prior to construction. The plan check is conducted to insure that the water conserving features of the new landscape meet the provisions of

CVWD's Landscape Water Conservation Ordinance No. 1302.2. Each proposed site is given an annual maximum water allowance based on landscaped area, plant water use zone, low-moderate landscape plant water use rates and high irrigation system application efficiency. The landscape designer must utilize a combination of plant choice and irrigation system choice such that the estimated annual water use of the finished landscape does not exceed the annual maximum water allowance assigned. In addition, certain irrigation system design practices are mandated, such as setting sprinkler irrigated areas at least 24 inches back from street curbs, or prohibited, such as overhead sprinkling of street median strips. Since 2010, CVWD has performed 504 landscape plan checks for new and rehabilitated landscape sites.

#### 9.2.7.1.7 Random Inspections of Landscape Projects for Compliance with Landscape Ordinance

As mentioned in the previous section, all new and rehabilitated landscape sites are required to submit water conserving landscape plans to CVWD's Water Management Department for a plan check prior to construction. The plan check is conducted to ensure that the water conserving features of the new landscape meet the provisions of CVWD's Landscape Water Conservation Ordinance. Recent investigations of excessive water use and nuisance water complaints have revealed that some of these new sites did not construct their landscape to include the approved water conservation features.

In order to ensure that contractors are installing plan-checked, water conserving landscapes as approved, CVWD has implemented a random inspection program. The inspections signal to the landscape construction industry that CVWD is spot checking completed landscape irrigation systems for plan-check compliance and will require errors and omissions to be corrected or face the possibility of discontinued water service.

#### 9.2.7.1.8 Smart Controller Rebate Program

Beginning in 2005, CVWD instituted a smart irrigation controller rebate program to financially assist large water users in reducing landscape irrigation water consumption by purchasing an advanced irrigation controller capable of synchronizing their landscape irrigation schedules with seasonal variations in Coachella Valley reference evapotranspiration (ETo) rates.

ETo is a scientific description of the rate at which plant water use varies with the weather. Since the weather changes from season-to-season, week-to-week and even day-to-day, programming irrigation controllers frequently and efficiently remains one of the landscape industry worker's most neglected tasks. CVWD's program is specifically aimed at encouraging the use of "smart" irrigation clocks that reprogram themselves according to periodic variations in ETo after the initial calibrating program has been professionally installed.

CVWD initially offered this program to residential customers in November 2005 and expanded the program to large landscape customers in March 2008. For residential customers, CVWD staff will install and program the "smart" controller at no cost to the customer. For large landscape customers, CVWD will rebate 50% of the cost of the controller. Since 2010, CVWD has installed 14,710 smart controllers for residential customers and has issued 1,211 rebates to large landscape customers that added smart controllers.

The measurement of success of this program will be documenting water reduction by each participating user as well as showing an annual increase in applications for the rebate as the region grows.

#### 9.2.7.1.9 Landscape Conversion Rebate Program

Since 2007, CVWD has offered a rebate to its customers for converting their outdoor grass landscaping to desert-friendly landscaping, which requires less irrigation. CVWD's landscaping guide, *Lush & Efficient: Landscape Gardening in the Coachella Valley*, provides guidelines on which plants work best in the hot, arid climate that CVWD's customers are situated in. The rebate consists of $1 per square foot of landscaping or turf, up to $2,000. Since 2010, 2,436 residential and 552 commercial/HOA rebates have been issued, amounting to a total of 8,958,400 acres of turf conversion.

The measurement of the success of this program will be the number of rebates issued per year and a marked reduction in a participating customer's water consumption. CVWD performed a study of smart controllers using actual customers after having converted their landscaping and found that, on average, water savings amounted to 36% as a result of landscape conversion.

### 9.2.7.2 Residential Ultra-Low-Flush Toilet Replacement Rebate Program

Ultra-low-flush (ULFT) toilets conserve water by utilizing far less water than older, less efficient toilets. CUWCC's BMP 14 defines ULFT as toilets using less than 1.6 gallons per flush. In addition to direct conservation benefits, the promotion and use of these toilets has social value as it brings conservation products, literally, in direct contact with area users, thereby raising awareness of water conservation efforts. Furthermore, the use of these products has the potential to reduce customer water and electric bills. The use of these products provides no direct health benefit or detriment.

CVWD has had a toilet rebate program since 2011. The agency provides a rebate of $100 for each toilet replacement, which will cover approximately half the cost of purchasing and installing a ULFT. Since 2010, a total of 1,183 rebates have been issued for ULFT replacements.

In addition to the rebate program, ULFTs are required for all new construction per plumbing code requirements. ULFTs were first introduced to the U.S. market in 1980 and the manufacturing of older, less efficient toilets designs was halted shortly thereafter. It is estimated by the CUWCC that natural replacement of residential toilets occurs every 20-30 years or at a rate of about 3-5 percent per year. Using this methodology, approximately 25 percent of the toilets from pre-1980 houses would still be installed in 2025.

### 9.2.7.3 High-Efficiency Washing Machine Rebate Program

CUWCC classifies washing machines with a water use factor of less than 8.5 as high efficiency clothes washing machines (HEWS). Presently, CVWD does not provide high-efficiency washing machine rebates. CVWD is the principal water and wastewater provider within its service area and has legal authority to implement this DMM. Nearly all of the wastewater generated in CVWD is reused or is returned to the groundwater.

The promotion and use of high-efficiency washing machines has social value as it brings conservation products, literally, in direct contact with area users, thereby raising awareness of water conservation

efforts. Furthermore, the use of these products has the potential to reduce customer water, wastewater, gas and electric bills. The use of these products provides no direct health benefit or detriment. The indirect benefits of this are that less energy and detergents are used to operate the machines. This would reduce the need for groundwater pumping and replenishment, collection, treatment and the subsequent reuse or disposal of wastewater as well as the numerous environmental benefits of reducing energy consumption.

In addition, nearly all discharge from washing machines are discharged to CVWD's sewer system where essentially all water is recycled. The implementation of this program would not significantly save discarded water in the CVWD service area.

#### 9.2.7.4 Golf Course Conservation

CVWD continues to work with new and existing golf courses to reduce water demands through programs such irrigation system audits, plan checking, inspecting new golf courses for plan check compliance, and monitoring maximum water allowance compliance.

Existing golf courses could achieve enhanced water savings by the following methods:

- Scientific irrigation scheduling
- Water audits - each course is audited every five years
- Monitoring of maximum water allowance compliance

Future reduction in demand of golf courses can be achieved by the following methods:

- Full implementation of turf limitations specified in the Landscape Ordinance
- Plan checking for all new golf courses
- Inspection of all new courses after construction
- Water audits every five years

CVWD also administers a golf course turf rebate program funded partly by Prop 84 funding ($1.3 million) to promote the reduction of water use at golf courses.

#### 9.2.7.5 Agricultural Conservation

Similar to golf courses, agricultural customers are served with canal water. For agricultural conservation, it has been demonstrated that CVWD-provided programs with voluntary grower participation are effective in increasing water use efficiency through both the 2025 and the Extraordinary Conservation Measures programs. The Extraordinary Conservation Measures programs are a series of voluntary agricultural conservation measures, which pay back USBR for past excess Colorado River diversions under the Inadvertent and Overrun and Payback Policy. The following programs are currently being developed for agricultural conservation by CVWD.

**Grower Education and Training:** This would consist of grower meetings and grower training programs funded by CVWD. In order to encourage grower participation, CVWD would implement confidential grower audits.

**CVWD-Provided Services**: This would include CVWD-funded conservation programs provided as a service to growers within the District. Programs would include scientific irrigation scheduling, scientific salinity management, soil moisture monitoring, and farm distribution uniformity evaluations.

**Irrigation Upgrade/Retrofit**: This would add full funding, partial funding or financial support to growers that wish to convert from flood and sprinkler to micro-sprinkler and drip systems. In a fully funded program, CVWD would provide reasonable reimbursement to a grower who upgrades his irrigation system or retrofits an aging drip system. A partially funded program would share the expenses and a program that offers financial support would provide low or no-interest loans for the upgrades or retrofits.

**Economic Incentives**: This would involve adoption of one or more pricing approaches to encourage conservation, if needed. This might be accomplished by establishing an irrigation water allocation based on evapotranspiration and a crop-specific coefficient. Water use in excess of the base allocation would be charged at a higher rate.

**Regulatory Programs**: These types of programs would be considered as a last resort, and would include regulations that support and provide for agricultural conservation. Programs could include the following:

- Grower-prepared on-farm water management plans defining the methods of applying water and the water conservation measures utilized, and
- All new permanent crops would use drip and/or micro-spray irrigation systems. All current crops must be converted within a 5 year period.

CVWD received $1 million in program funding from USBR for a flood-to-drip agricultural rebate program. The program is expected to save about 3 AFY per acre of agricultural land converted, or 2,000 AFY of irrigation water.

## 9.3 Implementation over the Past Five Years

***CWC §10631***

***(f)*** *Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

***(1)(A)*** *… a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

Discussions of the DMMs in **Section 9.2** include implementation over the past five years. DMM implementation is summarized in **Table 9-1** below.

*Table 9-1*
*Demand Management Measure Implementation Summary*

| Program | Completed Since Program Inception | Competed Since 2010 | Competed This Year |
|---|---|---|---|
| Landscape Plan Check | 704 | 504 | 67 |
| Residential Smart Controller Installations | 15,883 | 14,710 | 3,594 |
| Large Landscape Smart Controller Rebates | 1,321 | 1,211 | 416 |
| Residential Turf Conversions | 2,496 (3,537,632 sq. ft.) | 2,436 (3,457,851 sq. ft.) | 1,273 (1,674,695 sq. ft.) |
| Commercial/HOA Turf Conversions | 552 (5,500,549 sq. ft.) | 552 (5,500,549 sq. ft.) | 161 (1,448,967 sq. ft.) |
| Water Waste Investigations | 2,261 | 2,208 | 1,205 |
| Toilet Rebates | 1,183 | 1,183 | 603 |

## 9.4 Planned Implementation to Achieve Water Use Targets

***CWC §10631***

***(f)*** *Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

***(1)(A)*** *… The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

CVWD has currently achieved its 2020 water use target but continues to implement demand management measures to reduce per capita water use. CVWD anticipates the average per capita use by its existing customers will at least maintain the 383 GPCD average usage observed in 2015. In addition, CVWD anticipates that CVWD future users will achieve a 291 GPCD average usage across all customer classes due to implementation of plumbing code and updated landscape ordinance requirements. CVWD's service area has a significant seasonal and tourist population component that impacts the per capita water use calculations. CVWD anticipates continued growth in the seasonal population but at lower rates than have been observed historically.

## 9.5 Members of the California Urban Water Conservation Council

***CWC §10631***

***(i)*** *For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.*

Although not a member of CUWCC, CVWD is in compliance with the requirements of the CUWCC Memorandum of Understanding (MOU). CVWD has submitted the AB 1420 self-certification Tables 1 and 2 and the Certification for Compliance with Water Metering Requirements for Funding Applications. Based on DWR's review CVWD has and is currently implementing the BMPs consistent with AB 1420

and, therefore, is eligible to receive water management grants and funding. Copies of the tables and certification and DWR's response are included in **Appendix K**.

# SECTION 10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

This section addresses the CWC requirements for a public hearing, the UWMP adoption process, submitting the adopted UWMP, and plan implementation.

## 10.1 Inclusion of All 2015 Data

CVWD's 2015 UWMP includes the water use and planning data for the entire year of 2015. CVWD is reporting on a calendar year basis, therefore the 2015 UWMP is completed in 2016 in order to include all 2015 data.

## 10.2 Required Notifications

The CWC requires several notifications regarding the preparation and adoption of the 2015 UWMP as described below. **Table 10-1** below lists the cities, counties, and other parties included on all public notifications.

*Table 10-1*
*Notification to Cities and Counties (DWR Table 10-1 R)*

| City Name | 60 Day Notice | Notice of Public Hearing |
|---|---|---|
| La Quinta | x | x |
| Indio (Indio Water Authority) | x | x |
| Coachella (Coachella Water Authority) | x | x |
| Palm Desert | x | x |
| Cathedral City | x | x |
| Indian Wells | x | x |
| Rancho Mirage | x | x |
| Desert Water Agency | x | x |
| Mission Springs Water District | x | x |
| County of Riverside Transportation and Land Management Agency - Planning Department | x | x |
| Riverside County Flood Control and Water Conservation District | x | x |
| Riverside County Department of Public Health | x | x |
| Imperial County Planning and Development Services | x | x |
| Native American Tribes | x | x |
| **County Name** | **60 Day Notice** | **Notice of Public Hearing** |
| Riverside County | x | x |
| Imperial County | x | x |

## 10.2.1 Notice to Cities and Counties

***CWC §10621***

***(b)*** *Every urban water supplier required to prepare a plan shall… at least 60 days prior to the public hearing on the plan … notify any city or county within which the supplier provides waters supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

***CWC §10642***

*…The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area…*

The CWC states that cities and counties must be notified that the supplier will be reviewing the UWMP and considering amendments to the Plan. CVWD sent a notification to cities and counties within its service area on April 11, 2016, informing them of CVWD's intent to update the UWMP.

CVWD provided notice of the time and place of the public hearing to cities and counties within which it provides water on May 26, 2016. The notice to the cities and counties included the location where the 2015 UWMP can be viewed, the UWMP revision schedule, and contact information of the UWMP preparer.

## 10.2.2 Notice to the Public

The following entries in the CWC and government code describe the requirement to notify the public of the time and place of the hearing prior to adopting the Plan.

***CWC §10642***

*…Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection…Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code…*

***Government Code 6066***

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

CVWD published a notice of the public hearing in a local newspaper two weeks and one week before the hearing itself to inform the public on the meeting time and place, with the location of where the 2015 UWMP was made available for review.

## 10.3 Public Hearing and Adoption

***CWC §10642***

*…Prior to adopting a plan, the urban water supplier shall hold a public hearing thereon.*

***CWC §10608.26***

***(a)*** *In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*

***(1)*** *Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*

***(2)*** *Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*

***(3)*** *Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.*

CVWD held a public hearing meeting for its 2015 UWMP on June 14, 2016. The public hearing provided an opportunity for the public to give feedback on the plan before it was adopted.

### 10.3.1 Adoption

***CWC §10642***

*…After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

CVWD adopted the 2015 UWMP by resolution following the public hearing held on June 14, 2016.

## 10.4 Plan Submittal

***CWC §10621***

***(d)*** *An urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*

***CWC §10644***

***(a)(1)*** *An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*

***CWC §10635***

***(b)*** *The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

CVWD submitted standard tables electronically via DWR's UWMP submittal website along with a copy of the final report. The plan will also be submitted to the California State Library. The plan is made available to all cities and counties to which CVWD supplies water.

# Section 10
# Plan Adoption, Submittal, and Implementation

## 10.5 Public Availability

***CWC §10645***

*Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

The 2015 UWMP will be available on the CVWD website for public viewing within 30 days of filing a copy of the UWMP with DWR.

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