

# **Coachella Valley Water Management Plan 2016 Status Report**

**February 2017**

Prepared by



In association with

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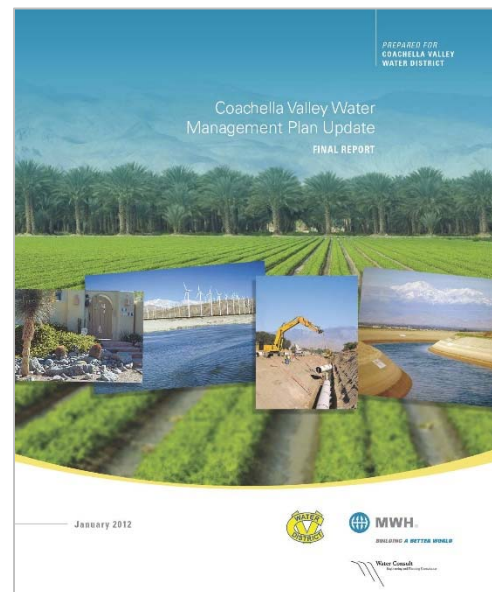
# Section 1 Overview

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The purpose of this 2016 Coachella Valley Water Management Plan Status Report (2016 CVWMP Status Report) is to accomplish the following:

1. Evaluate changes in the planning environment that impact water demand projections and warrant adjustments to the 2010 Coachella Valley Water Management Plan Update (2010 CVWMP Update).
2. Review the effectiveness of the 2010 CVWMP Update including overdraft reduction progress.
3. Evaluate implementation progress of the 2010 CVWMP Update programs and recommend new implementation targets.

The 2016 CVWMP Status Report demonstrates that the 2010 CVWMP Update is working. Continued implementation ensures that long-term overdraft will be eliminated by 2022 with increased groundwater levels in the Palm Springs area and the eastern Coachella Valley. Groundwater levels in the mid-Coachella Valley area will continue to decline until programs are implemented in this area to reduce groundwater pumping. These mid-Coachella Valley programs include urban conservation programs to reduce municipal pumping 20% by 2020; source substitution programs including non-potable water system expansion to golf courses, and Colorado River treatment for domestic water use; and direct groundwater recharge. In addition, CVWD is pursuing a groundwater replenishment facility in Palm Desert.



## 1.1 PLANNING AREAS

The planning areas for the CVWMP and the Mission Creek/Garnet Hill Water Management Plan are shown in **Figure 1-1**. There is a small area of overlap between the two plans in the Garnet Hill Subbasin; however, the planning assumptions for the two plans are consistent.

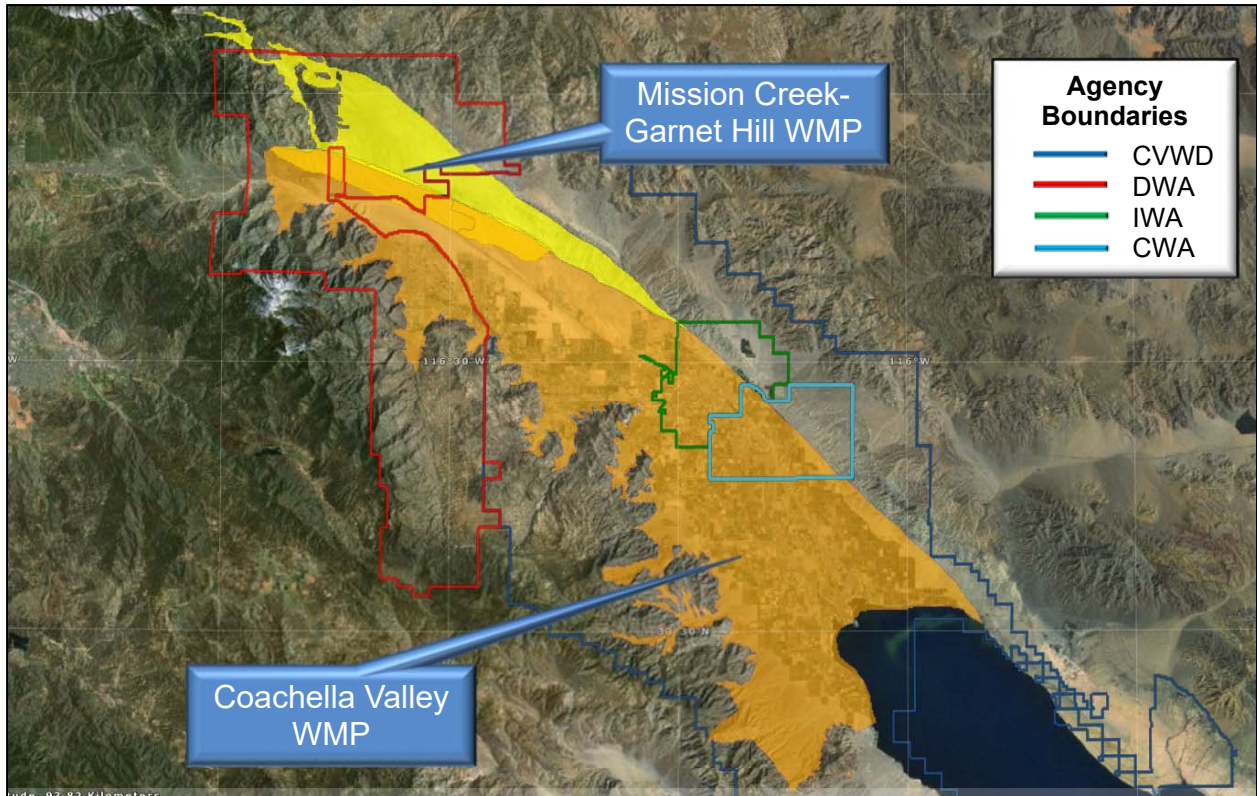
## 1.2 PURPOSE OF 2010 CVWMP UPDATE

The Coachella Valley Water District (CVWD) adopted the Coachella Valley Water Management Plan in 2002 (2002 CVWMP) to eliminate groundwater overdraft. The 2002 CVWMP was updated in 2010 in response to changes in the water planning environment such as increased growth projections and reduced State Water Project (SWP) reliability. The 2010 Coachella Valley Water

Management Plan Update (2010 CVWMP Update) was adopted by the CVWD Board of Directors in January 2012, following completion of a supplemental program environmental impact report. The 2010 CVWMP Update has a 35-year planning horizon and serves as a roadmap for water resources planning and development for the Coachella Valley.

The 2010 CVWMP Update focuses on a flexible management approach that allows CVWD to increase or decrease the magnitude and implementation rate of CVWMP elements in response to changes in supply availability, population projections, and water demands. The 2010 CVWMP Update uses a “building block approach” so that new supply increments and projects are developed as needed, rather than in response to a pre-defined schedule. Consequently, periodic review of water demands, supplies and implementation progress is an important element of the planning process. This 2016 CVWMP Status Report is the second periodic review of the 2010 CVWMP Update.

**Figure 1-1**  
**Water Management Planning Areas**



The goal of the CVWMP is to reliably meet current and future water demands with a 10 percent supply buffer in a cost-effective and sustainable manner. The key water management plan elements identified to meet this goal are:

- ▶ Water conservation
- ▶ Acquisition of additional imported water supplies

- ▶ Development of local water supplies such as recycled water and desalinated shallow groundwater
- ▶ Source substitution
- ▶ Groundwater recharge

The 10 percent supply buffer is necessary to protect against unanticipated growth and loss of supplies due to unforeseen conditions.

### 1.3 OBJECTIVES

The objectives of the 2002 CVWMP and the 2010 CVWMP Update are:

- ▶ Eliminate Groundwater Overdraft and its Associated Adverse Impacts
  - Storage Loss
  - Declining Groundwater Levels
  - Land Subsidence
  - Water Quality Degradation
- ▶ Maximize Conjunctive Use
  - Storing surface water in a groundwater basin in wet years and withdrawing it from the basin in dry years.
- ▶ Minimize Adverse Economic Impacts
- ▶ Minimize Environmental Impacts

### 1.4 TOOLS FOR REDUCING OVERDRAFT

The CVWMP uses a number of tools to reduce groundwater overdraft and ensure the sustainability of the groundwater supply:

- ▶ Water conservation – reduced use of water through demand management and efficient water use practices
- ▶ Additional water supplies – acquisition and development of new water supplies to meet future needs
- ▶ Groundwater recharge – percolation of imported and recycled water to replenish the groundwater basin
- ▶ Source substitution – conversion of groundwater users to imported or recycled water sources to reduce groundwater pumping
- ▶ Monitoring – on-going measurement and evaluation of groundwater conditions to determine the effectiveness of the CVWMP.

Goals were established for each tool based on groundwater modeling and program economics.

# Section 2

## Implementation Status

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Section 2 presents the implementation status of Coachella Valley Water Management Plan (CVWMP) program as of December 2016.

### 2.1 WATER CONSERVATION

#### 2.1.1 Goals and Programs

The water conservation goals of the 2010 CVWMP Update and principal programs to achieve those goals are as follows:

- ▶ Urban 20% by 2020
  - Budget Based Tiered Rates
  - Drought Emergency
  - Turf Rebates
  - Penalty Rates
  - Landscape Ordinance
- ▶ Agricultural 14% by 2020
  - Flood to Drip Program
- ▶ Golf Course 10% for existing; turf limits for new courses.
  - Turf Rebate Program
  - Landscape Ordinance (turf limits on new courses)

#### 2.1.2 Accomplishments

Coachella Valley Water District (CVWD) has implemented a successful urban water conservation program. To meet the State-mandated goal of 20% reduction in urban per capita water use, CVWD established the following urban water use baselines using highest 10-year average gallons per capita per day (gpcd): 1995 – 2010.

2010 Urban Water Management Plan (UWMP) = 591 gpcd (population based on 2000 Census data)

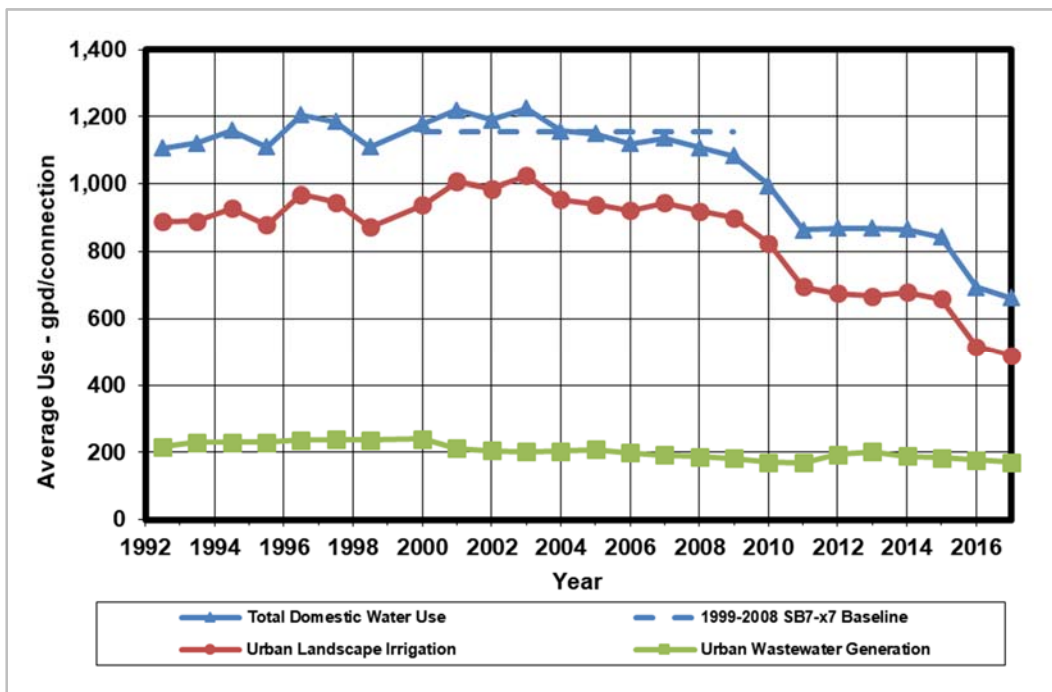
2015 UWMP = 606 gpcd (population based on 2010 Census data)

CVWD's 2015 UWMP established the 20% by 2020 Target of 473 gpcd. CVWD's urban water use in 2015 was determined to be 383 gpcd and the use for 2016 was 376 gpcd. This represents a 38% reduction in water use compared to the baseline. Water conservation efforts are expected to continue to reduce per capita water use as new development is significantly more water efficient.

Figure 2-1 shows the historical changes in CVWD’s urban water use on a connection basis between 1992 and 2016. The decline between 2008 and 2010 was caused by Tiered Water Rate implementation. The 2015 decline was caused by Mandatory Drought Restrictions. Most of the conservation was due to reduced landscape irrigation use as shown by the red line. In comparison, indoor water use (wastewater) as shown by the green line showed a 15% reduction from the baseline.

Additional evaluation is needed to determine the effectiveness of agricultural and golf water conservation.

Figure 2-1  
CVWD Urban Water Use Per Connection 1992-2016



2.2 WATER SUPPLY

The 2010 CVWMP Update established a goal of fully utilizing CVWD’s State Water Project (SWP) and Colorado River water supplies. CVWD and Desert Water Agency (DWA) have a combined Table A allocation of 194,100 acre-feet per year (AFY) of SWP water. CVWD and DWA continue to evaluate opportunities to acquire additional imported water supplies including participation in the California WaterFix and the Sites Reservoir project. CVWD and DWA expect to fully use the available SWP supply based on California Department of Water Resources (DWR) allocations and hydrologic conditions.

CVWD has access to up to 459,000 AFY of Colorado River water from the Coachella Branch of the All-American Canal as defined in the 2003 Quantification Settlement Agreement (QSA). CVWD’s QSA allocation increases annually and will reach the maximum amount in 2026. After 2048, the

allocation decreases to 456,000 AFY. As of 2017, CVWD's allocation is 401,000 AFY and will increase to 418,000 AFY in 2018. Projected conveyance losses are about 16,000 AFY. A high priority is fully using this supply to meet current and future demands and eliminate groundwater overdraft.

CVWD and DWA continue to increase the use of recycled water for non-potable uses. In addition, the Indio Water Authority (IWA) and Valley Sanitary District (VSD) are evaluating opportunities to use wastewater treated at the VSD facility. Recycled water use has been stable since 2014.

### **2.3 GROUNDWATER RECHARGE**

CVWD's groundwater recharge program currently focuses on the Whitewater River Groundwater Replenishment Facility (GRF) and Thomas E. Levy Groundwater Replenishment Facility (TEL GRF). A third GRF located in the Mission Creek Subbasin is operated by DWA. The 2010 CVWMP Update established a target for the Whitewater River GRF of 103,000 AFY on average. Since 2002, the Whitewater River GRF has recharged an average of 78,508 AFY. The recharge volume has been affected by reduced SWP Exchange water deliveries due to the on-going drought.

The 2010 CVWMP Update established a target for the TEL GRF of 40,000 AFY on average. Since 2002, the Whitewater River GRF has recharged an average of 33,844 AFY since the facility commenced full-scale operation in 2009. The 2010 CVWMP Update also recommended a GRF at Martinez Canyon with a 20,000 to 40,000 AFY target. Operation of the Martinez Canyon demonstration facility has been put on hold; CVWD water quality staff is monitoring wells in the area to determine if this facility will have an effect on the quality of down-gradient wells. A 10,000 AFY joint recharge project with the City of Indio was also proposed in the 2010 CVWMP Update; the City of Indio is evaluating this project. In addition, CVWD recently completed a study evaluating the feasibility of constructing a 25,000 AFY GRF in the Palm Desert area. This proposed facility would repurpose unused percolation ponds at Water Reclamation Plant No. 10 (WRP-10) and construct basins in the Coachella Valley Stormwater Channel.

### **2.4 SOURCE SUBSTITUTION**

Source substitution is the conversion of groundwater users to an alternate water source such as imported Coachella Canal water or recycled water to reduce groundwater pumping. CVWD source substitution programs focus on three primary areas: urban, agriculture, and golf.

#### **2.4.1 Urban**

Urban source substitution programs focus on two main areas: delivery of non-potable water for landscape irrigation and treatment of Canal water for domestic purposes. The 2010 CVWMP Update anticipated construction of separate potable and non-potable water systems as development occurs in the eastern Coachella Valley to reduce future dependence on groundwater supplies. In addition, the 2010 CVWMP Update envisioned treatment of Canal water for potable water supply. CVWD conducted a pilot water treatment study in 2008 that

compared three treatment processes and concluded that Canal water treatment for municipal use is feasible. Subsequently, CVWD completed the Domestic System Source of Supply/Treatment Study in December 2014. This study focused on groundwater treatment for Chromium 6 compliance. Subsequent investigations have found a more cost-effective method to meet the Chromium 6 standards.

### **2.4.2 Agriculture**

The principal agricultural source substitution project proposed in the 2010 CVWMP is the Oasis Area Irrigation System Expansion Project. This project is envisioned to provide Canal water to agricultural land on the Oasis slope with the goal of reducing groundwater pumping by 18,000 AFY to as much as 32,000 AFY at buildout. The CVWD Board of Directors has not authorized assessment district proceedings to finance the project. Consequently, the project is on hold indefinitely.

### **2.4.3 Golf**

The 2010 CVWMP Update included two golf course source substitution programs in the eastern Coachella Valley, CVWD has an on-going program to convert eastern Coachella Valley golf courses to Colorado River water. The goal of this program is the delivery of 28,700 AFY of Canal water to offset groundwater pumping. During 2016, about 21,000 AFY of Canal water was delivered for golf irrigation, 73 percent of the goal. CVWD staff continues to work with the remaining golf courses to meet the 2010 CVWMP Update goal.

CVWD completed construction of the first phase of the Mid-Valley Pipeline in 2008 to deliver Colorado River water to golf courses in the area of the cities of Indian Wells, Palm Desert, and Rancho Mirage in the western Coachella Valley. The program goal is to deliver 52,000 AFY of Colorado River water and recycled water for golf irrigation. In 2016, 16,100 AFY of Colorado River water and recycled water was delivered, 31% of the goal. Master planning of the Mid-Valley Pipeline Phase II is underway.



**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
<b>Water Conservation Program</b>				
Adopt and implement 2009 CVWD/CVAG Landscape Ordinance or equivalent	CVWD, water purveyors, cities, Riverside County	Ongoing	Completed	Ordinance revised in 2015 to comply with new State requirements and reduce ET Adjustment Factor
Establish urban water conservation baseline	CVWD, DWA, IWA, CWA, MDMWC	Completed	Completed	Re-evaluated in 2016 UWMPs based on 2010 census population
Achieve minimum 10 percent reduction in existing golf course use	CVWD, DWA	2015	Underway	Work via Golf Task Force to implement and monitor custom water budgets Budget program Funds in CIB
Achieve 14 percent reduction in agricultural water use	CVWD	2020	Deferred	2020
Achieve 20 percent reduction in urban per capita use	CVWD, DWA, IWA, CWA, MDMWC	2020	Underway	2015 UWMPs documented 37% reduction in 2015 from 1999 to 2008 baseline average.
<b>Water Supply Development Program</b>				
Complete siting studies, environmental impact evaluation and design for shallow groundwater capture and treatment facilities	CVWD	2013	Deferred due to changes in needs	Imported water status report (2015) indicated potential deferral until 2025
File for water rights application for change of point of use for wastewater effluent discharges to allow water recycling	CVWD, VSD, Coachella	2015	Deferred	Work with CVWD District Counsel to complete filing
Complete construction of initial CVSC drain water capture and treatment facilities	CVWD	2015	Deferred due to changes in needs	Imported water status report (2015) indicated potential deferral until 2025
Conduct a feasibility study to investigate the potential for additional stormwater capture in the East Valley	CVWD	2015	Ongoing with stormwater studies	Maximize stormwater capture in facilities design

**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
Conduct a study to determine the amount of water lost to leakage or otherwise unaccounted in the first 49 miles of the Coachella Canal and evaluate the feasibility of corrective actions to capture the lost water	CVWD	2015	No longer a priority due to measured losses below 5% since canal lining	Continue to monitor annual system losses
Conduct a joint investigation with Indio and Coachella of groundwater development potential in Fargo Canyon Subarea of the Desert Hot Springs Subbasin to determine the available supply and suitability for use in meeting non-potable demands of development east of the San Andreas fault	CVWD, IWA, Coachella	2020	Deferred due to changes in needs	Re-evaluate need in next WMP Update
<b>Source Substitution Program</b>				
Prepare a master plan for completion of Mid-Valley Pipeline Phase 2	CVWD	2011	Underway	To be completed in 2017
Connect four golf course users along the MVP alignment to MVP	CVWD	2011	Completed	Monthly Progress Report to Board
Work with existing East Valley golf courses having Colorado River water access to increase their use to 90 percent of demand	CVWD	2012	Underway – revised to 80% via non-potable agreements	Report Progress in annual Non-Potable Water Report
Investigate regional opportunities for Colorado River water treatment facilities	CVWD, IWA, CWA	2012	Completed via Source of Supply/Treatment Study (SS/TS)	Budget funds in future CIB based on growth
Develop policy requiring the installation of non-potable water systems for new development	CVWD	2012	Completed	Required via WSAs/WSVs and Development Design Manual
Work with large agricultural groundwater pumpers to determine what obstacles exist that prevent them from using additional Colorado River water and encourage them to reduce their groundwater pumping	CVWD	2012	Deferred	Re-evaluate need in next WMP Update
Construct north and east extensions to the MVP system	CVWD	2013	Deferred pending master plan	To be addressed in Phase 2 MVP master plan. Monthly Progress Report to Board

**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
Complete siting studies, environmental impact evaluation and design for Colorado River water treatment facilities	CVWD	2013	Deferred until need arises	Re-evaluate schedule based on SS/TS and growth
Complete construction of initial Colorado River water treatment facilities and connect to distribution system	CVWD	2015	Deferred until need arises	Re-evaluate schedule based on SS/TS and growth
Complete Oasis study update	CVWD	2015	Complete Design by 2015 Project on Hold	Quarterly Progress Report to Board Budget funds in CIP
Prepare a non-potable water distribution master plan Phase 3	CVWD	2015	Deferred	Budget for FY 2017-18
Complete construction of MVP backbone system	CVWD	2020	Deferred	Re-evaluate schedule based on Phase 3 MVP master planning
<b>Groundwater Recharge Program</b>				
Operate and monitor the Levy replenishment facility with a 40,000 AFY goal	CVWD	2010	Underway with lower goal of 32,000 AFY	Re-evaluate need in next WMP Update
Investigate groundwater storage opportunities with IID	CVWD	2010	Completed	
Transfer the unused portion of the 35,000 AFY of SWP water available under the QSA to the Whitewater Recharge Facility	CVWD	2011	Complete	Budget transportation funds annually. Maximize advanced delivery opportunities.
Work with the City of Indio to evaluate the feasibility of developing a groundwater recharge project that reduce groundwater overdraft. If feasible, work with Indio to construct the facility.	CVWD, IWA	2011	Deferred pending evaluation of need	Continue evaluation
Design and construct an additional pumping station and pipeline from Lake Cahuilla to the Levy facility if the existing pumping station and pipeline cannot provide sufficient water to meet the annual goal	CVWD	2015	Deferred	Re-evaluate need in next WMP Update
Conduct siting studies, environmental impact evaluation and design for Martinez Canyon Replenishment Facility	CVWD	2018	Deferred due to monitoring results	Budget Oasis Expansion funds in CIB

**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
<b>Monitoring and Data Management</b>				
Continue to monitor the extent of land subsidence	CVWD, USGS	2010	Monitoring ongoing – next report in 2018	Continue monitoring and evaluate results
Provide additional information in the annual engineers’ reports: <ul style="list-style-type: none"> <li>• Annual precipitation and stream flows</li> <li>• Additional groundwater level data and hydrographs</li> <li>• In-lieu recharge water deliveries from imported and recycled water that offset pumping</li> <li>• Imported water deliveries for direct use</li> </ul>	CVWD, DWA	2011	More consistency with DWA’s reports achieved. <ul style="list-style-type: none"> <li>• Complete</li> <li>• Hydrographs added</li> <li>• To be added to 2017-18 report</li> <li>• To be added to 2017-18 report</li> </ul>	Evaluate report content for compliance with SGMA reporting requirements
Obtain CDWR designation as groundwater level monitoring and reporting entity for the Coachella Valley within their respective service areas	CVWD, DWA, water purveyors	2011	Complete via the CASGEM Program	Budget funds as needed to continue program participation
Prepare a comprehensive groundwater monitoring plan	CVWD, DWA, water purveyors, wastewater agencies, tribes	2012	Deferred	Pursue IRWM Grant Funding; periodic review by GSAs
Enhance the CVSC gauging station at Lincoln Street to provide continuous flow recording	CVWD, USGS	2012	Complete	Budget CIB funds as necessary to continue to drain flow monitoring.
Develop centralized groundwater database	CVWD, DWA, water agencies, tribes	2012	Deferred	Budget funds in CIB as necessary to maintain program participation
<b>Other Programs</b>				
Continue to operate a groundwater advisory committee regarding groundwater management issues in the East Valley	CVWD, water agencies, pumpers, tribes	2010	Complete	Budget CIB funds as necessary to continue annual meetings

**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
Develop a program to educate and work with well owners to properly control artesian wells	CVWD	2011	Complete	Budget funds in CIB/CIP and pursue grant funding
Update and recalibrate the CVWD groundwater model based on the most current information	CVWD	2012	Deferred	Complete in parallel with future WMP Update
Develop a water planning interface to the groundwater model	CVWD	2012	Deferred	Add to scope of work for next groundwater model update
Prepare a plan to maintain and enhance the existing drainage system to allow its future use for urban purposes	CVWD	2012	Complete Legal Authority Established	
Develop well construction, destruction and abandonment policies	CVWD, DWA, water agencies, tribes, Riverside County	2012	Complete	Support County's efforts to enforce. Pursue IRWM Grant Funding
Add groundwater quality simulation capabilities to the model that will allow simulation of salinity (TDS) and nitrogen in the groundwater	CVWD	2013	Deferred	Add to scope of work for next groundwater model update.
Prepare a salt/nutrient management plan for the Valley to meet SWRCB Recycled Water Policy requirements	CVWD, DWA, water purveyors, wastewater agencies, tribes, agricultural and golf communities, and Regional Board	2014	Submitted to RWQCB in June 2015 RWQCB acceptance pending	Continue coordination with RWQCB to obtain acceptance

**Table 2-1  
CVWMP Implementation Plan Status**

Plan Element	Responsible Entity(ies)	2010 Update Goal	2016 Status	Recommendation
Extend urban water and sewer service to trailer/RV park communities with deficient infrastructure and poor water quality	CVWD	2015	Ongoing Formed Disadvantaged Community Task Force. Developing an implementation strategy that prioritizes connection needs. Secured IWRM and USDA Rural assistance funding for Saint Anthony’s, Huerda, Mountain View Estates mobile home parks. Short Term Arsenic Treatment,	Continue to sponsor applications for USDA, IRWM, CDPH, SWRCB funding
Investigate the feasibility of installing nitrate treatment on selected high nitrate wells to avoid redistribution of nitrates.	CVWD	2015	Underway via CVWD’s Source of Supply/Treatment Study. Treatment process being re-evaluated.	Complete by 12/2014 Budget funds in 2015/16 CIP
Undertake a cooperative program to identify and cap wells that are no longer being used for groundwater production	CVWD, DWA	2015	Underway	Support County’s efforts to enforce. Pursue IRWM Grant Funding
<b>Environmental Enhancement and Mitigation Projects</b>				
Develop plans for the creation of: <ul style="list-style-type: none"> <li>• 25 acres of managed pupfish replacement habitat</li> <li>• 66 acres of managed rail replacement habitat</li> <li>• 44 acres of Sonoran cottonwood-willow riparian forest habitat</li> </ul>	CVWD	2010	Underway: Received Wildlife Agency approval of site; Under Review by Corps.	Work with US Army Corps of Engineers to complete review. Update project implementation Schedule. Budget funds in CIB/CIP
Remove tamarisk, restore and enhance mesquite and Coachella Valley round-tailed ground squirrel habitat on land CVWD owns in the East Indio Hills Conservation Area	CVWD	Not Specified	Study underway by CVCC	Support CVCC efforts to complete feasibility study

**Table 2-1  
CVWMP Implementation Plan Status**

<b>Plan Element</b>	<b>Responsible Entity(ies)</b>	<b>2010 Update Goal</b>	<b>2016 Status</b>	<b>Recommendation</b>
Conserve approximately 1,200 acres of land owned in the CVFTL HCP Whitewater Floodplain Preserve in perpetuity as part of the CVMShCP Reserve System	CVWD	2010	Underway: Resource Agencies reviewing Draft Conservation Easement prepared by CVCC & CVWD	Work with Resource agencies to achieve conservation easement approvals

# Section 3

## Water Demands and Supplies

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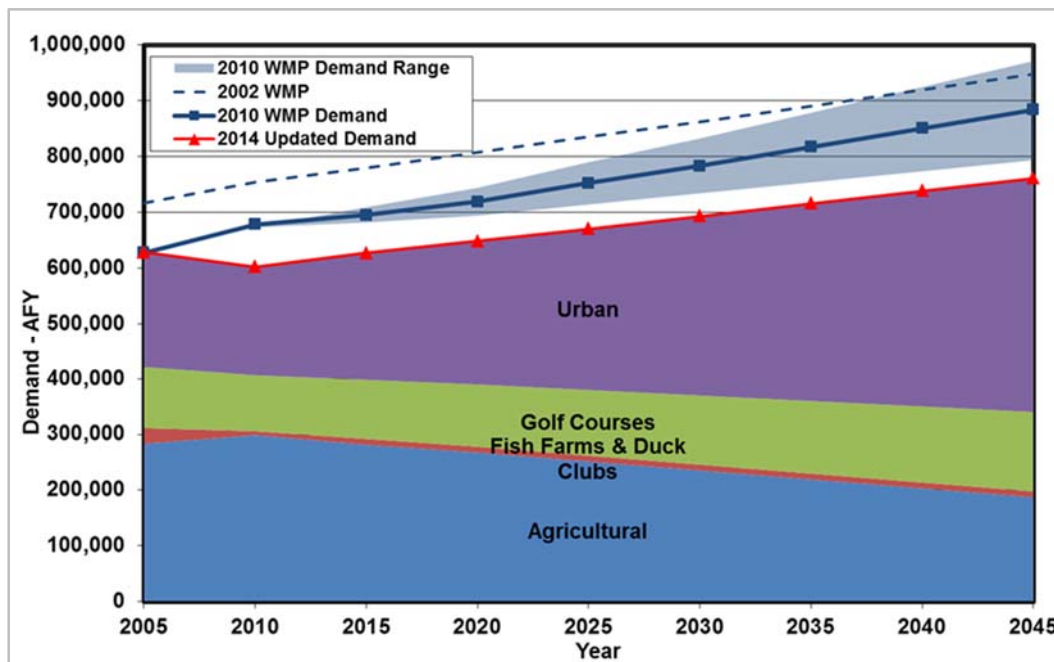
### 3.1 POPULATION FORECASTS

The 2014 Coachella Valley Water Management Plan (CVWMP) Status Report recommended the population projections be reduced from 1,137,000 in 2045 as published in the 2010 CVWMP Update, to approximately 920,000, based on Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) 2012 projections. This 2016 CVWMP Status Report uses the same population projections as the 2014 CVWMP Status Report.

### 3.2 WATER DEMANDS

Water demand projections for the 2016 CVWMP Status Report also remain the same as those prepared for the 2014 CVWMP Status Report as shown in **Figure 3-1**.

**Figure 3-1**  
**Projected Water Demands**



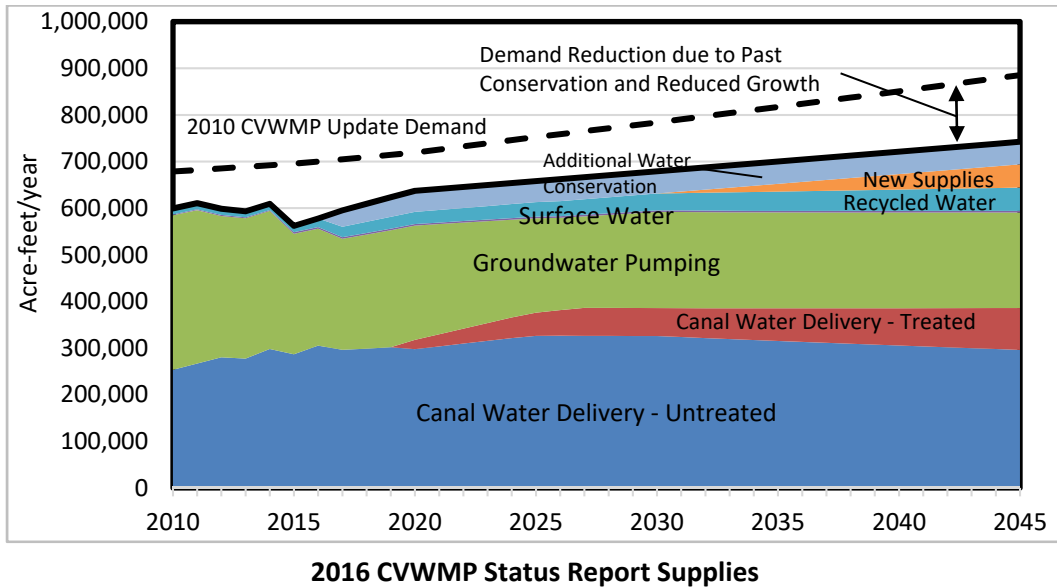
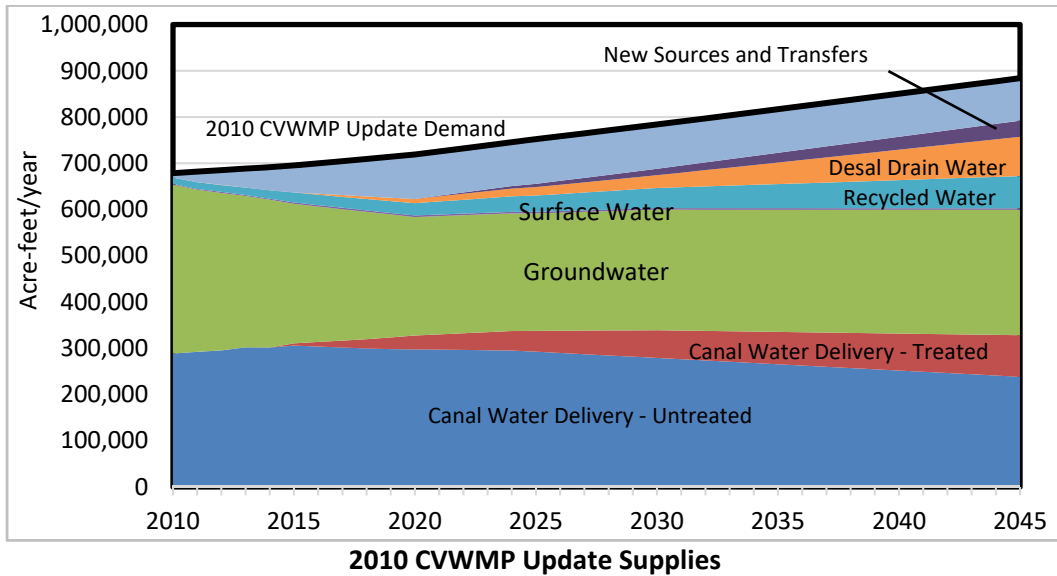
In the last two years, water demand in the Coachella Valley has declined by about 5% with most of the reduction in urban water use, primarily due to the mandatory conservation in response to the drought. The long-term impact of the drought on future water conservation is unknown. New development is expected to use much less water than existing development due to Coachella Valley Water District's (CVWD's) Landscape Ordinance and efficient plumbing fixtures. Consequently, future water management planning should consider reduced per capita water demands for both existing and future urban water use.



3.3 SUPPLIES

Figure 3-2 shows a comparison of the projected supplies to meet direct demands from the 2010 CVWMP Update with the supplies needed to meet demands for the 2016 CVWMP Status Report.

Figure 3-2  
Comparison of Supplies



3.4 NEED FOR ADDITIONAL SUPPLIES

As shown in Figure 3-2, the 2016 CVWMP Status Report anticipates a reduced need for new supplies (orange wedge). However, CVWD and Desert Water Agency (DWA) must continue to

### **Section 3 –Water Demands and Supplies**

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assess and participate in new supply projects to fill the future needs of the Coachella Valley. Projects like the California WaterFix, Sites Reservoir, and desalinated shallow groundwater provide opportunities to augment supplies to meet future demands.

# Section 4 Overdraft Status

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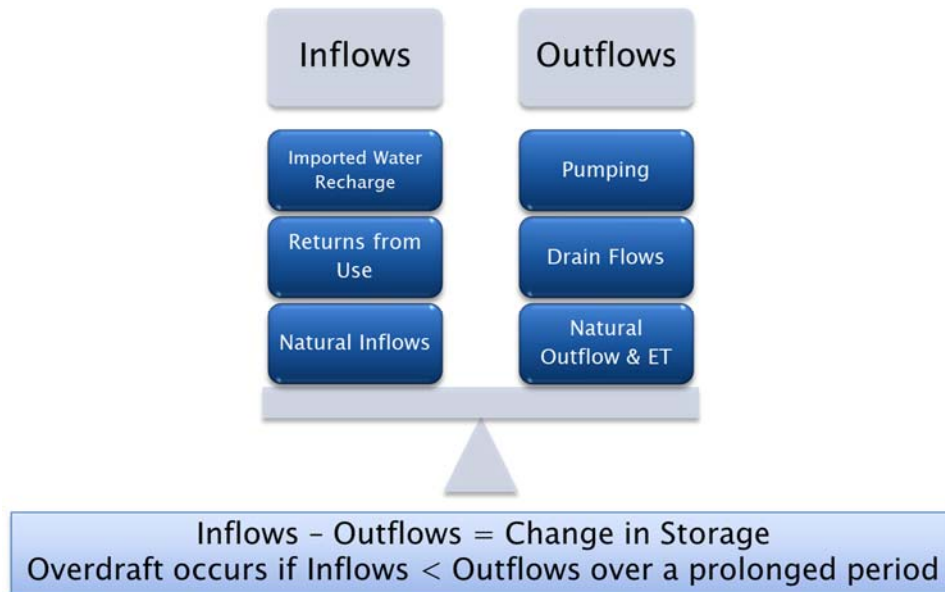
## 4.1 OVERDRAFT DEFINITION

The California Department of Water Resources (DWR) defines overdraft as the condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that replenishes the basin over a period of years during which water supply conditions approximate average conditions.

The adverse effects of overdraft are observed through reductions in groundwater storage, declining groundwater levels, land subsidence, and water quality degradation.

## 4.2 GROUNDWATER BALANCE COMPONENTS

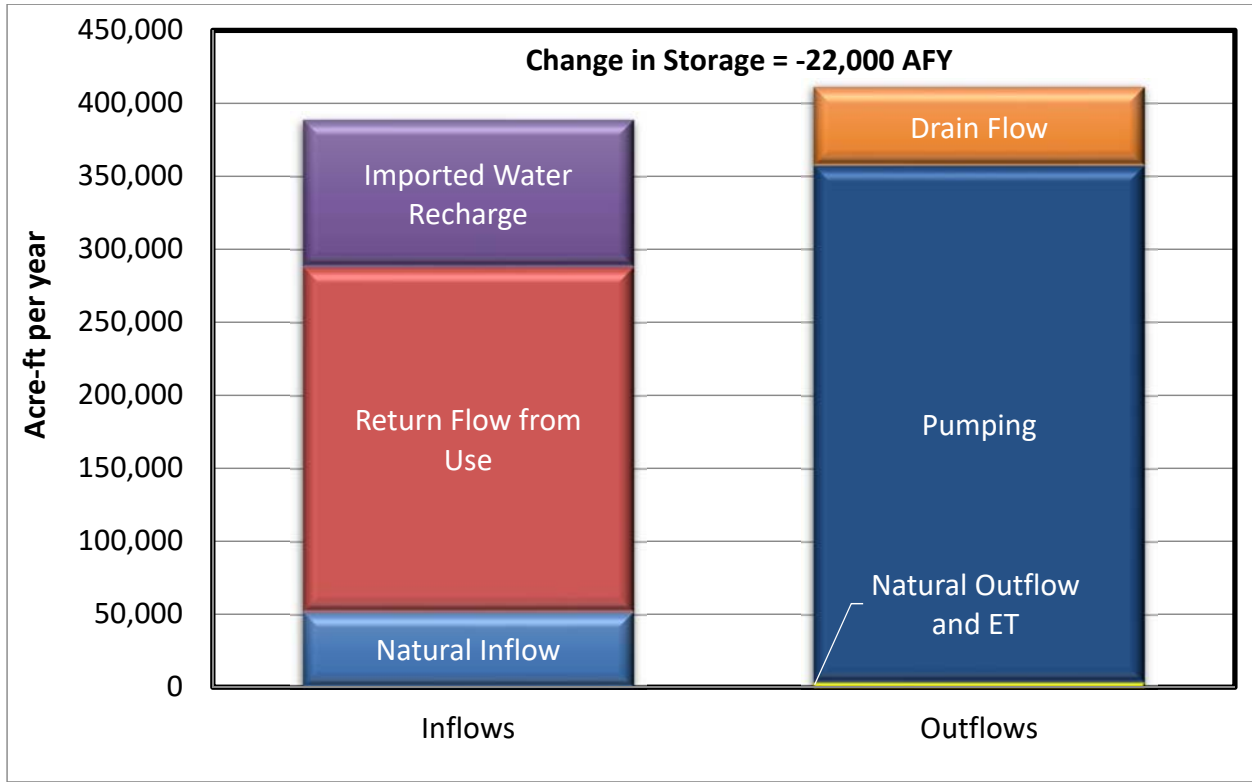
Groundwater balance is the sum of inflows to the basin minus the sum of all outflows. The difference between inflows and outflows is the change in storage. Groundwater overdraft can occur if outflows exceeds inflows for a prolonged period of time.



## 4.3 AVERAGE CHANGE IN STORAGE

Since the Coachella Valley Water Management Plan (CVWMP) was adopted in 2002, overdraft has averaged about 22,000 acre-feet per year (AFY) as shown on **Figure 4-1**. Increased imported water recharge combined with reduced pumping due to water conservation and source substitution are expected to bring the basin into a long-term balance.

Figure 4-1  
Average Groundwater Balance 2003-2016



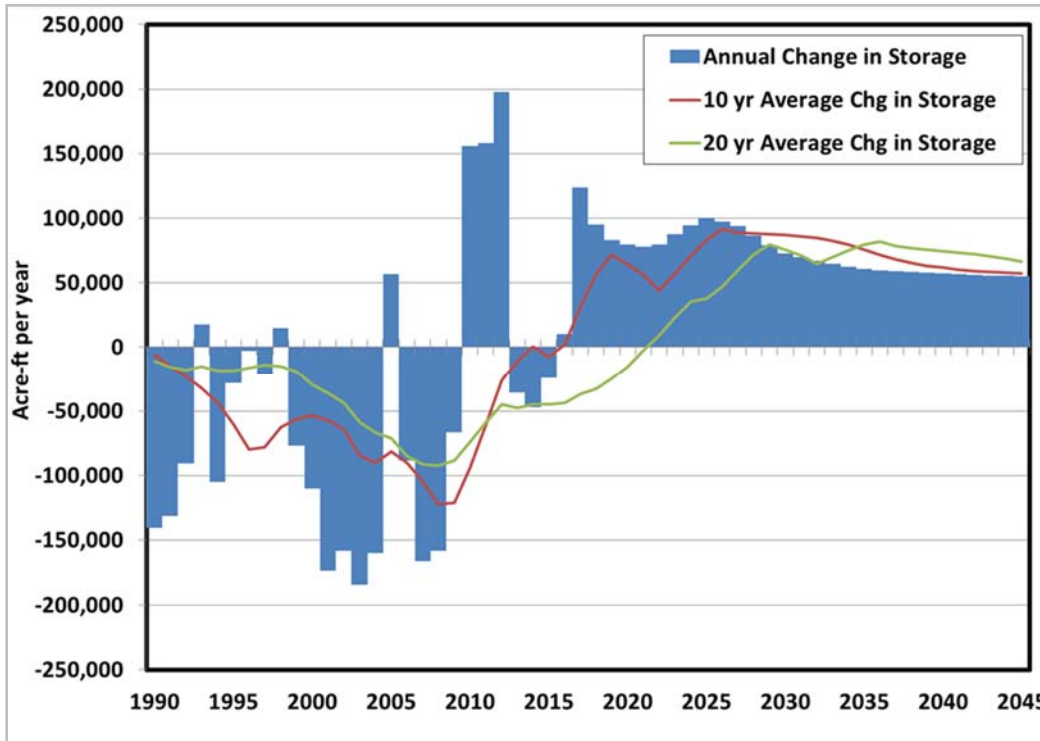
Coachella Valley Water District (CVWD) evaluates groundwater balance using ten-year (red line) and twenty-year (green line) historical periods as shown on **Figure 4-2**. Over the past ten years, the basin has been balanced; however, over the past twenty years, about 45,000 AFY of storage has been lost to overdraft. Implementation of the programs recommended in the 2010 CVWMP Update is expected to result in elimination of storage losses by about 2022, assuming average hydrologic conditions. Conjunctive use of the Coachella Valley’s local groundwater and imported supplies provides significant benefits by capturing imported water when it is available in wet years to provide stored water for pumping in dry years.

**4.4 WATER LEVEL CHANGES**

CVWD has monitored groundwater levels since the early 1900s. The monitoring program expanded as more wells were drilled in the Coachella Valley. The 2014 CVWMP Status Report showed a chart of groundwater level changes in ten-year increments starting in 1983 an updated version of which is shown on **Figure 4-3**, where gray shades indicate increasing water levels and red shades indicate decreasing water levels. For the period 1983-1993, the western portion of the Coachella Valley experienced increasing water levels in response to large advanced deliveries of Colorado River water from 1984-1986, while the rest of the Coachella Valley experienced declining levels. Declining levels continued for the 1993-2003 period before the CVWMP was adopted. Since adoption of the CVWMP, water levels in the eastern portion of the Coachella Valley have either stabilized or increased due to imported water replenishment at the Thomas E.

Levy Groundwater Replenishment Facility (TEL GRF) and source substitution as shown on **Figure 4-3**. Levels in the western portion of the Coachella Valley have continued to decline due to reduced replenishment due to the recent drought and delays in implementing the Mid-Valley Pipeline source substitution program. Water conservation programs have reduced pumping amounts Coachella Valley-wide; this trend is expected to continue in the near future.

**Figure 4-2**  
**Historical and Projected Groundwater Balance**



**Figure 4-4** presents an example hydrograph of groundwater levels located near Avenue 62 and Pierce Street. This figure compares the historical water levels with groundwater model predictions for the No CVWMP, the 2002 CVWMP, and the 2010 CVWMP Update. Measured water levels (blue dots) are tracking about 20 feet above the predictions for the 2010 CVWMP Update.

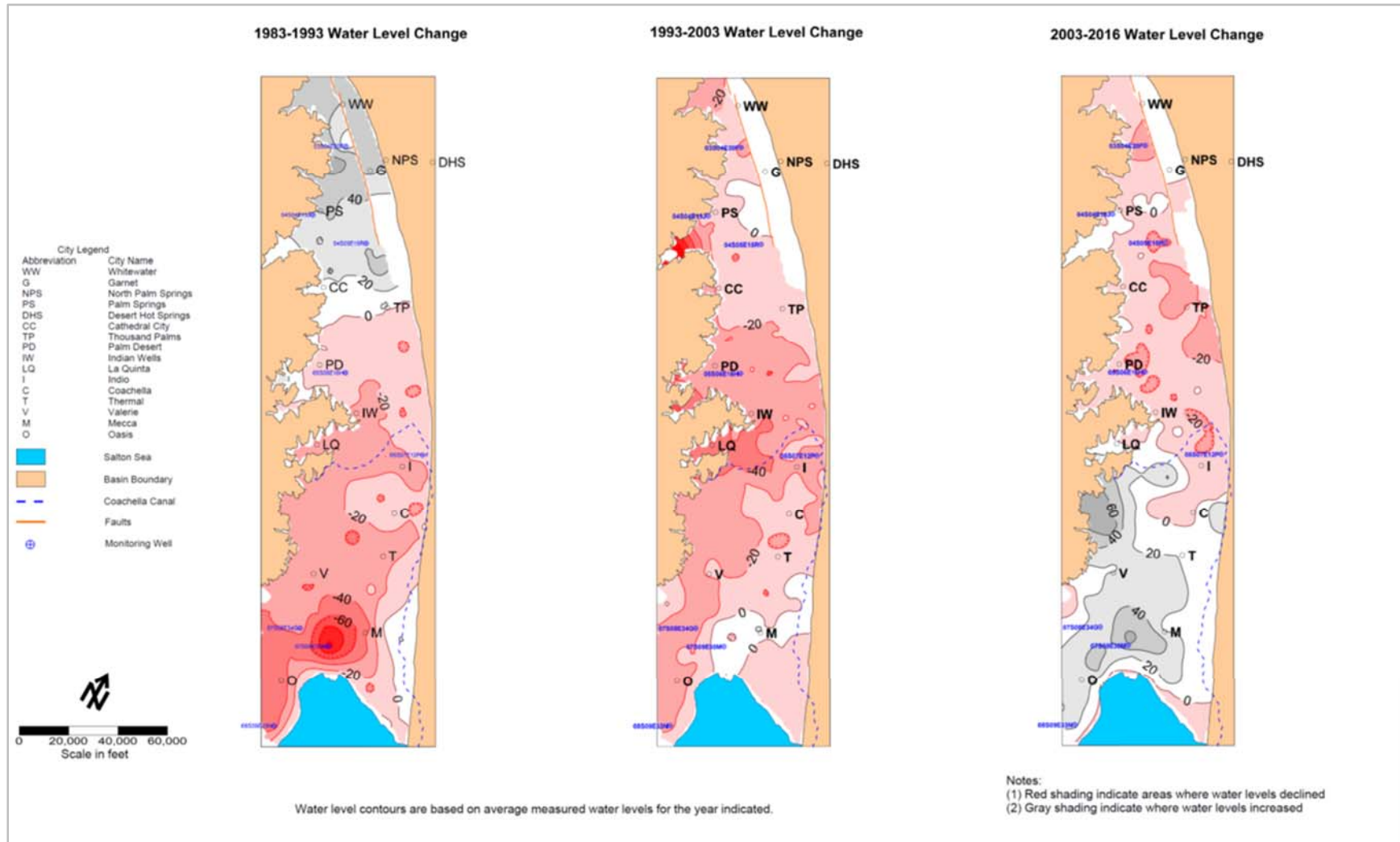
**4.5 LAND SUBSIDENCE**

CVWD has been working with the United States Geological Survey (USGS) since the late 1990s to monitor land subsidence in the Coachella Valley. The USGS published its fifth period report on subsidence in 2014. **Figure 4-5** shows the results of monitoring since the program began with the yellow and red areas showing the most subsidence, up to 410 millimeters (mm) (1.35 ft). The maximum areas of subsidence are in the cities of Palm Desert and La Quinta of the Coachella Valley.

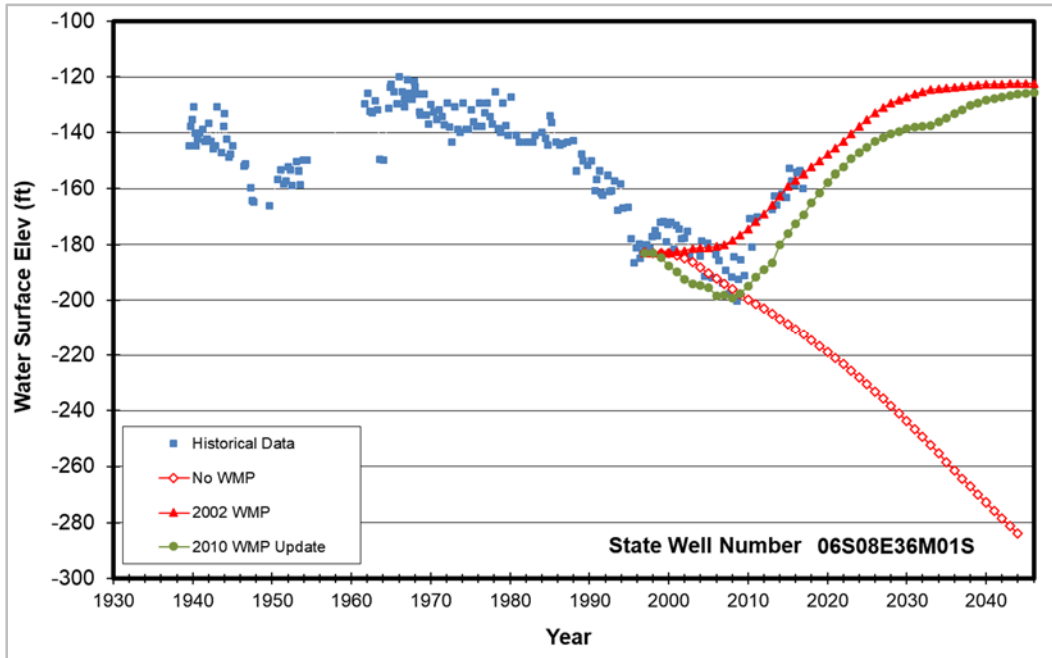
**Figure 4-6** shows the results of recent USGS Global Positioning System (GPS) monitoring in the Palm Springs and Thermal areas. The figure shows stable to slightly increasing land elevations in the Palm Springs area. Monitoring in the Thermal area showed declining land elevations until about 2010, followed by increasing elevations. This increase is believed to be caused by groundwater replenishment at the TEL GRF combined with reduced pumping due to conservation and source substitution using Canal water.

CVWD approved funding for Phase 6 of the USGS study for the next five years.

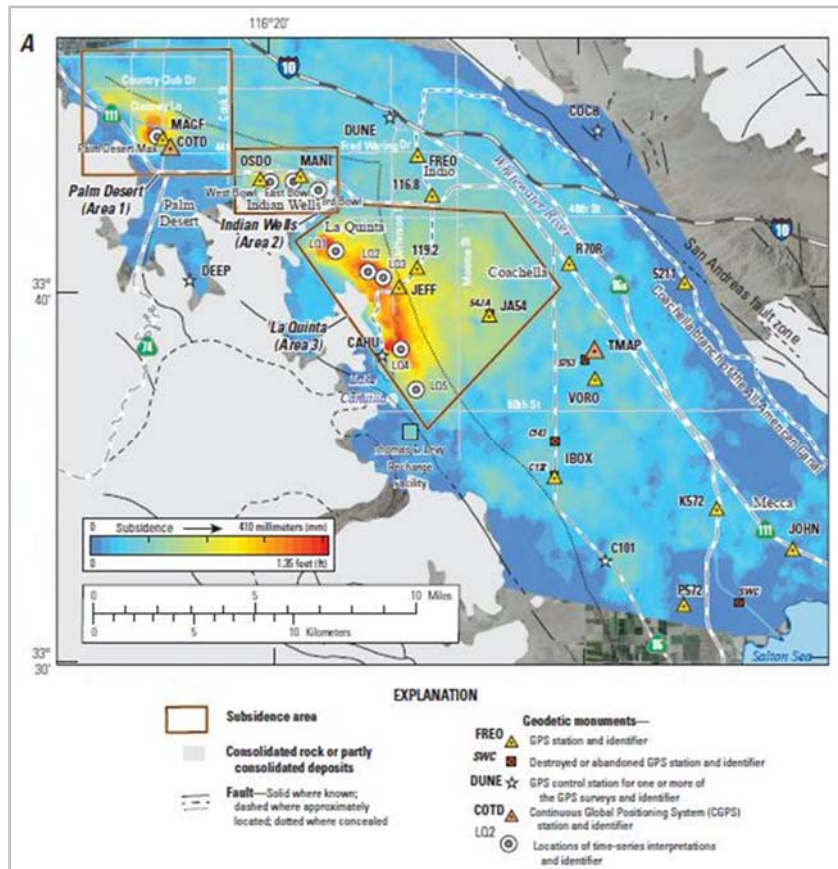
Figure 4-3  
Historical Groundwater Level Changes – Indio Subbasin



**Figure 4-4**  
**Sample Hydrograph Showing Monitoring Results and Projections**



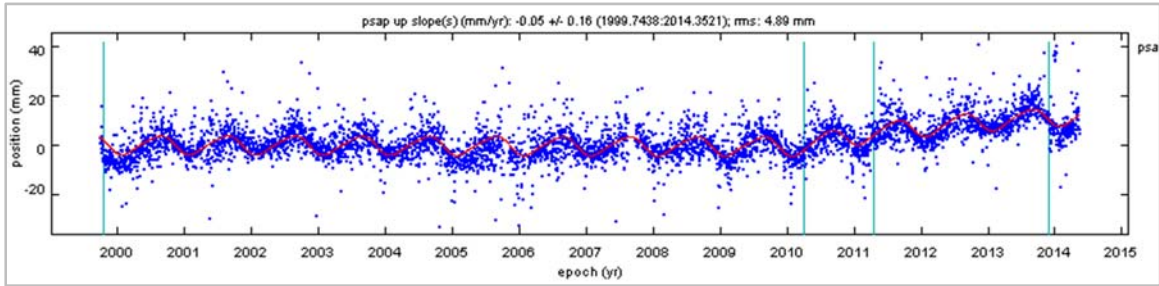
**Figure 4-5**  
**USGS Coachella Valley Land Subsidence Monitoring Study**



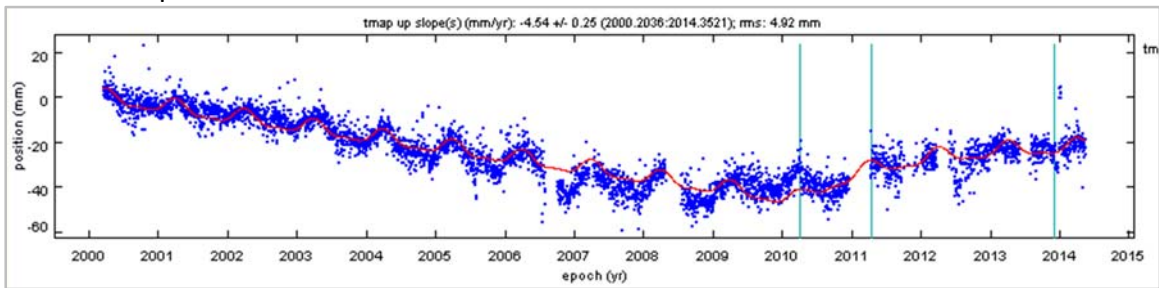


**Figure 4-6**  
**GPS Subsidence Monitoring Results**

Palm Springs Airport



Thermal Airport



#### 4.6 WATER QUALITY DEGRADATION

Groundwater overdraft can result in water quality degradation due to infiltration of salty return flows from irrigation and intrusion of salt water from beneath the Salton Sea. The quality of water in the Coachella Valley varies widely by source as shown in **Table 4-1**:

**Table 4-1**  
**Salinity of Coachella Valley Water Sources**

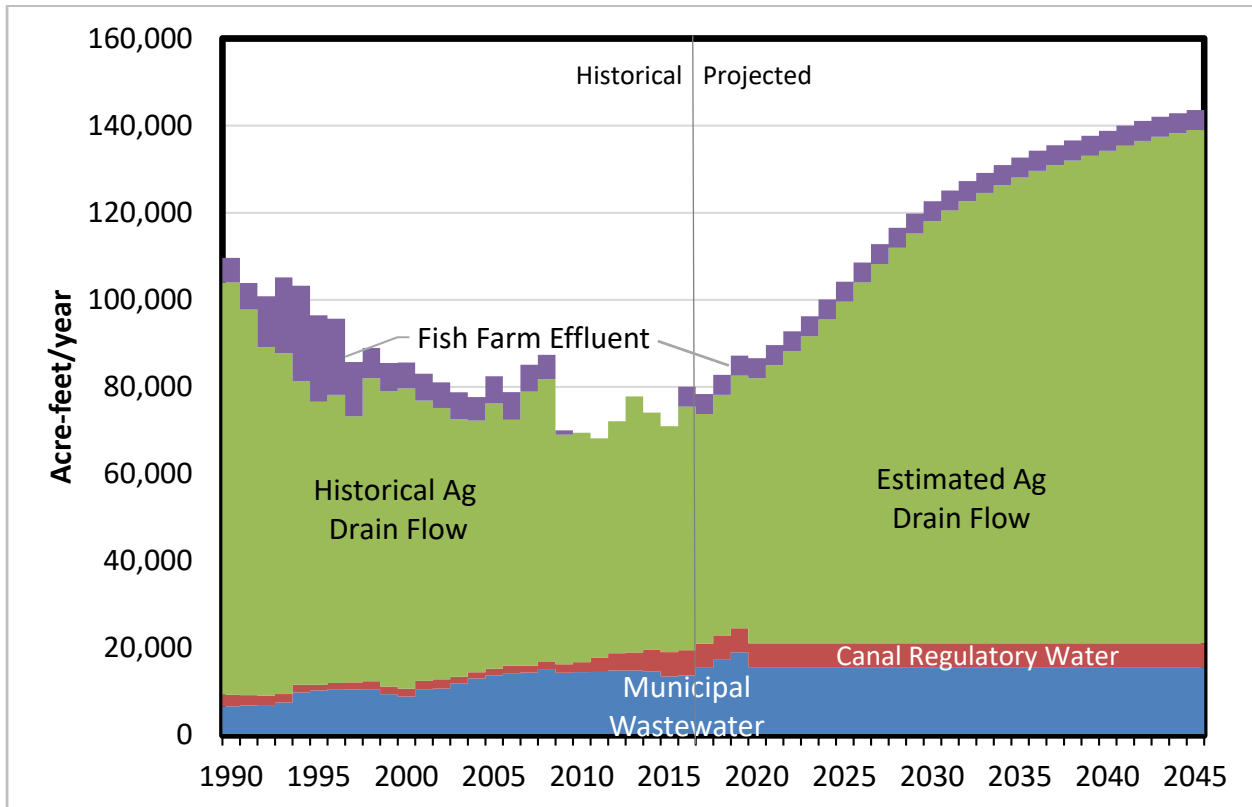
Source	Salinity (mg/L)
Groundwater	200-900
SWP Water (future)	300
Recycled Water	450
Colorado River Water	600-800
Storm Water Channel	1,000
Ag Drains	2,500
Perched Groundwater	2,500
Salton Sea	>50,000

The agricultural drain system exports salt from the Coachella Valley. The drain system flows respond to groundwater levels. When groundwater levels are low, so are drain flows allowing

salty water to return to the groundwater. Increased groundwater levels force the salty return flows into the drain system, protecting the groundwater quality.

Implementation of the CVWMP is expected to result in increased drain flows to the Salton Sea as shown in following chart. These future higher flows are representative of historical conditions before overdraft commenced in the 1980s. Drains flows reached a low point in 2010 and are showing an increasing trend.

**Figure 4-7**  
**Historical and Projected Change in Drain Flows**



# Section 5

## Is the CVWMP Working?

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Although the average overdraft for the period 2003 through 2016 was 22,000 acre-feet per year (AFY), it is significantly less than the 2010 Overdraft Status of 70,000 AFY for the period from 2000-2009 (2010 Coachella Valley Water Management Plan (CVWMP) Update pg 4-9). This loss in storage is largely attributed to low replenishment at the Whitewater River Groundwater Replenishment Facility (GRF) for the period 2014 through 2016 due to the recent drought. Overdraft is expected to be resolved by 2022 based on the 1990 baseline.

Continued implementation of CVWMP activities is needed to avoid the adverse effects of long-term overdraft including loss of storage, groundwater level decline, land subsidence and water quality degradation.

Success is measured by monitoring:

- ▶ Groundwater Balance – evaluation of change in storage over ten-year and twenty-year periods.
- ▶ Groundwater Levels – Depth to groundwater and the change in groundwater levels
- ▶ Groundwater Quality – Analysis of groundwater samples for mineral quality and metals.
- ▶ Subsidence - Change in land surface elevation using satellite and Global Positioning System (GPS) data.
- ▶ Drain Flows – Flow and salinity of water leaving the groundwater basin through the drains.

The western Coachella Valley area is showing positive response to the increased imported water made available through water transfers (Metropolitan Water District of Southern California, Berrenda Mesa, and Tulare Lake). However, the five-year drought has reduced imported water deliveries. Maximizing the use of imported water for recharge remains a key component of the CVWMP.

The Mid-Coachella Valley area will continue to have declining water levels until CVWMP programs reduce pumping through water conservation (on-going), source substitution (conversion of golf courses from groundwater to Canal and recycled water), and groundwater replenishment (proposed program to percolate Canal water near Water Reclamation Plant No. 10 (WRP-10)).

The eastern Coachella Valley area is showing positive results from water conservation, source substitution (conversion of golf courses from groundwater to Canal water), and groundwater recharge (Thomas E. Levy GRF). Continued program implementation may include treatment of Canal water for domestic use when growth resumes.

# Section 6

## What's New Since 2014

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The following are significant changes that have occurred since the 2014 Coachella Valley Water Management Plan (CVWMP) Status Report:

- ▶ The Oasis Project, a recommended agricultural source substitution project, is currently on hold. Pre-design and design and public outreach to landowners and operators has been completed; however, implementation was deferred indefinitely in 2016. This program remains an important element of overdraft management in the eastern Coachella Valley.
- ▶ Sustainable Groundwater Management Act (SGMA): Law was passed in 2014; requires formation of groundwater sustainability agencies (GSAs) and preparation of groundwater sustainability plans (GSPs) by 2022. Coachella Valley Water District (CVWD), along with Desert Water Agency (DWA), Indio Water Authority (IWA) and Coachella Water Authority (CWA) are GSAs for the Indio Subbasin and must have a GSP that eliminates overdraft within 20 years. The 2010 CVWMP Update and 2013 Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP) were submitted to the California Department of Water Resources (DWR) as alternative GSPs in December 2016. The GSAs are awaiting DWR review.
- ▶ CVWD's 2015 Urban Water Management Plan (UWMP) was submitted to DWR in June 2016 per State law.
  - Significant reduction in urban per capita water use; 20% by 2020 goal has been achieved.
  - Vacation population evaluated: 2015 UWMP estimates that CVWD's full time population is increased by the equivalent of 70,000 to account for vacation population
- ▶ **Strategic Plan Initiative 16** - Develop Mechanisms for Fully Utilizing Imported Water Supplies. CVWD staff developed a program to track Canal water use during the year to ensure all available water is being used.
  - Part of CVWD's Strategic Planning
  - NEED: Colorado River supplies are not fully used.
  - IMPACT: Overdraft has increased
  - SOLUTION: Transparent monthly reporting of progress so that need for adjustment can be recognized and corrective action can be taken
  - Example shown in Figure 6-1

Figure 6-1  
Canal Water Utilization Tracking

2016 Estimated Consumptive Use Goal				2016 YEAR-END Consumptive Use Goal <sup>2</sup>			
2016 QSA Allotment	362,000 afy			2016 QSA Allotment	362,000 afy		
2016 Estimated System Losses <sup>1</sup>	-7,348 afy			2016 Mesured System Losses <sup>1</sup>	-3,759 afy		
2016 Consumptive Use Goal	354,652 afy			2016 Transfer to MWD	-4,734 afy		
				2016 Final Consumptive Use Goal	353,507 afy		

Summary of Canal Water Sales by Account Type										Utilization Goal			
(acre feet)										(acre feet)			
Month	Agriculture	Construction	East Valley Golf	Mid Valley Pipeline	Recreation	Recharge	Regulatory	Monthly Total	Year-to-date Total	Monthly Goal <sup>2</sup>	Actual % of CU Goal	5-yr avg % of Total	Over or (Under)
Jan.	8,932	13	651	202	20	2,898	454	13,169	13,169	17,733	4	5	(4,563)
Feb.	16,395	43	1,078	459	67	3,067	392	21,500	34,669	39,012	10	11	(4,343)
March	21,525	46	1,804	660	107	3,233	366	27,742	62,411	67,384	18	19	(4,973)
April	24,298	77	2,024	793	115	2,857	385	30,549	92,961	99,303	26	28	(6,342)
May	25,696	73	2,819	1,200	144	3,177	435	33,543	126,504	134,768	36	38	(8,264)
June	30,443	86	2,966	1,423	177	3,058	441	38,593	165,097	170,233	47	48	(5,136)
July	29,135	82	3,131	1,499	591	3,229	566	38,233	203,330	205,698	57	58	(2,368)
Aug.	31,157	116	2,678	1,313	590	3,195	488	39,536	242,866	244,710	68	69	(1,844)
Sept.	24,661	101	1,837	801	417	3,041	504	31,361	274,227	276,629	77	78	(2,401)
Oct.	20,136	87	1,812	621	670	3,194	563	27,083	301,310	305,001	85	86	(3,691)
Nov.	20,284	88	1,312	373	533	3,215	584	26,389	327,699	333,373	92	94	(5,674)
Dec.	15,469	57	656	234	238	3,331	643	20,628	348,326	354,652	98	100	(6,326)
2016 Total	268,130	868	22,768	9,577	3,670	37,495	5,819	348,326					

