

MISSION CREEK SUBBASIN ANNUAL REPORT FOR WATER YEAR 2016-2017

March 2018



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For submission to:

**California Department of
Water Resources
In Accordance with
The Sustainable Groundwater Management Act**



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Acronyms, Abbreviations, and Glossary

Acronym	Definition
AB	Assembly Bill
AF	Acre-Feet
AFY	Acre-Feet per Year
AOB	Area of Benefit
CASGEM	California Statewide Groundwater Elevation Monitoring Program
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CVCC	Coachella Valley Conservation Commission
CVMC	Coachella Valley Mountains Conservancy
CVWD	Coachella Valley Water District
CVWMP	Coachella Valley Water Management Plan
CVRWMG	Coachella Valley Regional Water Management Group
CWA	Coachella Water Authority
DEH	Department of Environmental Health
DHS	Desert Hot Springs Subbasin
DHS	Desert Hot Springs
DWA	Desert Water Agency
DWR	California Department of Water Resources
ET	Evapotranspiration
ft	Feet
GRF	Groundwater Replenishment Facility
GRP	Groundwater Replenishment Program
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GQPP	Groundwater Quality Protection Program

Acronym	Definition
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
MC-GH WMP	Mission Creek-Garnet Hill Water Management Plan
MCL	Maximum Contaminant Level
MCSB	Mission Creek Subbasin
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
MSWD	Mission Springs Water District
MWD	Metropolitan Water District of Southern California
MWH	MWH Americas, Inc. now Stantec
RCFCWCD	Riverside County Flood Control and Water Conservation District
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
SWP	State Water Project
SWRCB	State Water Resources Control Board
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WMP	Water Management Plan
WY	Water Year

Executive Summary

The California Legislature enacted the Sustainable Groundwater Management Act (SGMA) which was intended to provide a framework for the sustainable management of groundwater resources throughout California, primarily by local authorities. The SGMA required local authorities to form local Groundwater Sustainability Agencies (GSAs) by June 30, 2017 to evaluate conditions in their local groundwater basins and adopt locally-based Groundwater Sustainability Plans (GSPs) tailored to their regional economic and environmental needs.

The California Department of Water Resources (DWR) developed emergency regulations that defined the content of GSPs, as well as the annual reporting requirements by each GSA. This Executive Summary is prepared in response to Section 356.2 of GSP Emergency Regulations, which requires the submission of an annual report to the DWR. This report is the first SGMA annual report for the Mission Creek Subbasin, designated the Basin No. 7-21.02 in DWR Bulletin No. 118 (2003),

ES.1 BACKGROUND

Three water agencies filed Notices of Election with DWR to become GSAs to manage the Mission Creek Subbasin of the Coachella Valley Groundwater Basin within their respective service areas with the following status:

- **Coachella Valley Water District (CVWD)** – approved as exclusive GSA within its service area.
- **Desert Water Agency (DWA)** – designated as exclusive GSA for all portions of the Mission Creek Subbasin located within DWA's boundaries, including those portions also located within MSWD boundaries.
- **Mission Springs Water District (MSWD)** – submitted an amended notice of election for a three-square mile area included by DWA. DWR designated the three-square mile area as “overlap” with DWA and MSWD and the overlap has not been resolved.

SGMA recognizes the efforts many areas have made in developing and implementing groundwater management by allowing existing groundwater management plans to be submitted as an alternative to preparing a GSP. CVWD, DWA, and MSWD jointly manage this Mission Creek Subbasin under the terms of the 2004 Mission Creek Settlement Agreement. The settlement agreement stated the three agencies would work jointly to manage the Mission Creek Subbasin and jointly prepare a water management plan. Following four years of effort, the three agencies adopted the Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP) in 2013.

In December 2016, CVWD, DWA, and MSWD collaboratively submitted the 2013 MC-GH WMP as a SGMA Alternative GSP for the Mission Creek Subbasin to DWR for review and evaluation.

In accordance with SGMA GSP Emergency Regulations, annual reports are required to be submitted to DWR on April 1 of each year, following adoption of a GSP. DWR requires GSAs that submitted Alternative GSPs submit their first annual reports by April 1, 2018. The annual reports are to be prepared in accordance with the SGMA GSP Emergency Regulations using information from Water Year (WY) 2017 (October 1, 2016 through September 30, 2017). The annual reports are required to present the following information:

- Groundwater elevation data
- Annual aggregated data identifying groundwater extraction for the preceding water year
- Surface water supply used for or available for use for groundwater recharge or in-lieu use
- Total water use
- Change in groundwater storage
- Progress toward implementing the GSP

The Mission Creek Subbasin Annual Report for WY 2016-2017 (Annual Report) is the first annual report prepared for the Mission Creek Subbasin in response to the SGMA requirements. This Annual Report contains a discussion of the Coachella Valley Groundwater Basin, more specifically the Mission Creek Subbasin, followed by sections describing each of the SGMA required annual report elements.

ES.2 COACHELLA VALLEY GROUNDWATER BASIN AND SUBBASINS

The Coachella Valley is a desert valley in Riverside County, California that extends approximately 45 miles southeast from the San Bernardino Mountains to the northern shore of the Salton Sea. Cities within the Coachella Valley include Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage, and the unincorporated communities of Thousand Palms, Thermal, Bermuda Dunes, Oasis, and Mecca. The Coachella Valley Groundwater Basin is bounded on the north and east by non-water-bearing crystalline rocks of the San Bernardino and Little San Bernardino Mountains and on the south and west by the crystalline rocks of the Santa Rosa and San Jacinto Mountains.

Although there is interflow of groundwater throughout the groundwater basin, fault barriers, constrictions in the groundwater 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 2003, and also by the United States Geological Survey (USGS) in 1971.

The subbasins of the Coachella Valley Groundwater Basin are the Indio, Mission Creek, Desert Hot Springs and San Geronio Pass Subbasins. The subbasins are defined without regard to water quantity or quality. They delineate areas underlain by formations which readily yield stored groundwater through water wells and offer natural reservoirs for the regulation of water supplies.

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

ES.3 GROUNDWATER ELEVATION AND MONITORING WELLS

In response to 2010 legislation, DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Monitoring wells are selected so they can provide a good representation of groundwater elevations within each agency's service areas. As shown in **Table 1**, the three GSAs maintain a total of four CASGEM monitoring wells in the Mission Creek Subbasin. Seventeen additional wells are also monitored.

Table ES-1
WY 2016-2017 Wells Measured for Water Levels
in the Mission Creek Subbasin

Monitoring Agency	CASGEM Wells Monitored	Additional Wells Monitored	Total Wells Monitored
Coachella Valley Water District	2	3	5
Desert Water Agency	0	3	3
Mission Springs Water District	2	11	13
Total Wells Monitored	4	17	21

Historical water level declines in the Mission Creek Subbasin, and conditions producing those declines, have been extensively described by the United States Geological Survey (USGS) and DWR, and are documented in the 2013 MC-GH WMP and the SGMA Bridge Document.

The groundwater elevations presented in this Annual Report represent groundwater conditions in the principal groundwater producing aquifer of the Mission Creek Subbasin. Average levels are presented because the Mission Creek Subbasin generally does not exhibit strong seasonal trends. Water levels near the replenishment facility respond directly to the timing of replenishment water deliveries and vary seasonally during periods of high replenishment. The remainder of the basin typically experiences seasonal level variations.

The Groundwater Replenishment Program (GRP), combined with other water management elements, including source substitution and water conservation, are helping to control groundwater overdraft, and restore water levels within the Mission Creek Subbasin.

ES.4 GROUNDWATER EXTRACTION

During WY 2016-2017, there was 13,782 acre-feet (AF) of groundwater extracted from 29 wells in the Mission Creek Subbasin. Because CVWD and DWA are authorized to collect replenishment assessment from groundwater producers, their respective legislations mandate the installation of water meters on the wells of well-owners that produce more than 25 acre-feet per year (AFY) in CVWD's service area, and 10 AFY in DWA's service area. Groundwater is the principal source of water for urban water use and represents about 90 percent of groundwater production from the Mission Creek Subbasin.

ES.5 SURFACE WATER USE

Average annual precipitation in the Coachella Valley varies from 4 inches on the Coachella Valley floor to more than 30 inches in the surrounding mountains (DWR 1964). A portion of the flow percolating into the mountain watersheds eventually becomes subsurface inflow to the subbasins. Precipitation on the local mountain watersheds generate runoff that is captured and used for direct uses or for groundwater replenishment.

In addition to natural replenishment from precipitation and stream flow, the Mission Creek Subbasin receives artificial replenishment from imported water. CVWD and DWA have contracts with DWR for State Water Project (SWP) water with a combined Table A Amount of 194,100 AFY. There are no physical facilities to deliver SWP water to the

Coachella Valley. CVWD's and DWA's Table A water is exchanged with Metropolitan Water District of Southern California (MWD) for a like amount of Colorado River water from MWD's Colorado River Aqueduct (CRA). MWD may also make advanced deliveries of SWP Exchange water to CVWD and DWA. SWP Exchange water has been used to recharge the Mission Creek Subbasin at the Mission Creek Groundwater Replenishment Facility (Mission Creek GRF) since 2002. For the WY 2016-17, 1,948 AF of SWP Exchange water was delivered to Mission Creek GRF in accordance with the Exchange Agreement.

There is no recycled water use in the Mission Creek Subbasin. However, the municipal wastewater generated in the Mission Creek Subbasin is treated and disposed through percolation/evaporation pond. In WY 2016-2017, a total of 2,004 AF of wastewater was treated, all of which was disposed through percolation.

ES.6 TOTAL WATER USE

A portion of the groundwater produced from the Mission Creek Subbasin totaling 5,657 AF is exported for urban use in the Desert Hot Springs, and 309 AF of groundwater is imported to the Mission Creek Subbasin from the Garnet Hill Subarea of the Indio Subbasin. A portion of the exported water is returned to the Mission Creek Subbasin as municipal wastewater that is treated and disposed.

In total, there was 8,434 AF of water delivered for direct use within the Mission Creek Subbasin and 1,948 AF was delivered for aquifer recharge that became part of the groundwater supply. Total water use was 10,382 AF.

ES.7 GROUNDWATER BALANCE AND CHANGE IN GROUNDWATER STORAGE

A groundwater balance is helpful in assessing the condition of the Mission Creek Subbasin. The groundwater balance compares the inflows and outflows to the Mission Creek Subbasin. The difference between inflows and outflows at a given time defines the change in storage for that time period. The groundwater balance for WY 2016-2017 is summarized in **Figure ES-1**.

Mission Creek Subbasin groundwater inflows consist of infiltration of natural recharge and inflows, infiltration of return flows from urban and agricultural uses, and artificial recharge. The long-term average historical natural recharge to the Mission Creek Subbasin is approximately 7,500 AFY. Inflows from outside the Mission Creek Subbasin consist of underflow from the adjacent Desert Hot Springs Subbasin across the Mission Creek fault and are estimated to average 1,840 AFY.

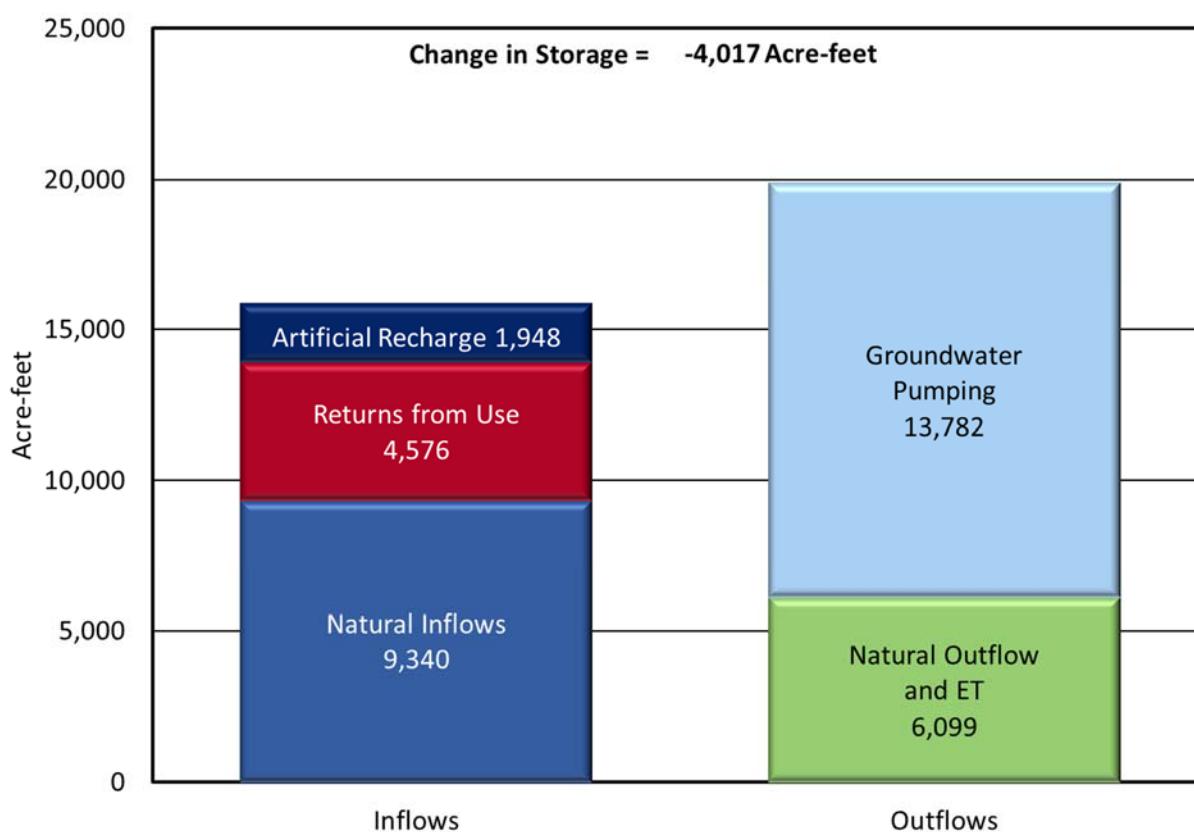
For WY 2016-2017, return flows to the Mission Creek Subbasin totaled 4,576 AF or approximately 29 percent of the total inflow budget. A portion of the Mission Creek Subbasin is served by municipal sewer systems that convey wastewater to municipal treatment plants operated by MSWD. All of the treated wastewater is disposed to percolation/evaporation ponds.

Artificial recharge is performed at the Mission Creek GRF using SWP Exchange water. Recharge at the Mission Creek GRF is variable based on availability of SWP Exchange water and deliveries by the Metropolitan Water District of Southern California (MWD). During WY 2016-2017, 1,948 AF of SWP Exchange water was recharged. Total inflows to the basin were 15,864 AF in WY 2016-2017.

Principal outflows from the basin are groundwater pumping, subsurface outflow to adjacent basins and evaporation/evapotranspiration. Subsurface outflow, evaporation, and evapotranspiration is estimated at 5,100, 99, and 900 AF for WY 2016-2017, respectively. Total outflows from the basin were 19,881 AF in WY 2016-2017.

The annual change in groundwater storage represents the annual difference between inflows and outflows in the Mission Creek Subbasin. During wet years or periods of high artificial recharge, the change in storage is positive (water in storage increases). In dry years, the change in storage is often negative (storage decreases). Because of the small amount of recharge in that period, the annual change in groundwater storage for the Mission Creek Subbasin is a negative 4,017 AF for WY 2016-2017.

Figure ES-1
WY 2016-2017 Water Balance - Mission Creek Subbasin



The average change in groundwater levels observed in the 21 wells monitored from 2016 to 2017 in the Mission Creek Subbasin was a decline of 3.4 ft. The average change in water levels observed in the 15 wells monitored from 2007 to 2017 in the Mission Creek Subbasin was an increase of 6.9 ft.

ES.8 SUMMARY OF PROGRESS AND PROJECTS

The sustainability goals described in the SGMA Alternative GSP for the Mission Creek Subbasin identified the following water management elements for implementation:

- Water conservation measures
- Acquisition of additional water supplies
- Conjunctive use programs to maximize supply reliability
- Source substitution programs
- Groundwater recharge programs
- Water quality protection measures
- Other management activities

The Mission Creek Subbasin GSAs continue to implement the goals and programs of the 2013 MC-GH WMP. Groundwater production remained about 20 percent less than the historical highs in the mid-2000s. The results of the on-going basin monitoring program demonstrate the significant progress being made toward the goal of eliminating groundwater overdraft. Since 2004, the Mission Creek Subbasin has gained over 40,000 acre-feet (AF) of groundwater in storage.

Groundwater level monitoring demonstrates that most of the Mission Creek Subbasin exhibited a water level decline in the past year. The recent water level decline is the residual effect of low imported replenishment water deliveries in previous five years due to the recent drought. However, for the past ten years, the Mission Creek Subbasin has experienced increased water levels due to substantial water conservation efforts and the imported water recharge program.

Continued implementation of 2013 MC-GH WMP programs is critical to meeting the goals of the plan. In the coming water year, the GSAs will continue to pursue their successful water conservation efforts. Increased imported water replenishment is anticipated as a result of increased deliveries from MWD.

The GSAs continue to evaluate the effectiveness of their groundwater monitoring program; additional wells are added to the program as the need arises.

Section 1

Introduction

1.1 BACKGROUND

1.1.1 Implementation of the Sustainable Groundwater Management Act

In 2014, faced with declining groundwater levels (most notably in California's Central Valley), the California Legislature enacted the Sustainable Groundwater Management Act (SGMA) which was intended to provide a framework for the sustainable management of groundwater resources throughout California, primarily by local authorities. SGMA consisted of three bills, Assembly Bill (AB) 1739 (Dickinson), Senate Bill (SB) 1168 (Pavley), and SB 1319 (Pavley), and was signed into law by Governor Brown on September 16, 2014.

The SGMA required local authorities to form local Groundwater Sustainability Agencies (GSAs) by June 30, 2017 to evaluate conditions in their local groundwater basins and adopt locally-based Groundwater Sustainability Plans (GSPs) tailored to their regional economic and environmental needs. The SGMA allows a 20-year time frame for GSAs to implement their GSPs and achieve long-term groundwater sustainability. It protects existing water rights and does not affect current drought response measures. SGMA provides local GSAs with tools and authority to:

- Monitor and manage groundwater levels and quality.
- Monitor and manage land subsidence and changes in surface water flow and quality affecting groundwater levels or quality or caused by groundwater extraction.
- Require registration of groundwater wells.
- Require reporting of annual extractions.
- Require reporting of surface water diversions to underground storage.
- Impose limits on extractions from individual wells.
- Assess fees to implement local GSPs.
- Request revisions of basin boundaries, including establishing new subbasins.

The California Department of Water Resources (DWR) developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Through its CASGEM program, DWR ranked the priority of all 515 groundwater basins and subbasins in California as either very low, low, medium, or high.

In addition, DWR, as required by SGMA, identified the basins and subbasins that are in conditions of critical overdraft. Twenty-one basins and subbasins in California were identified as critically-overdrafted basins. None of the subbasins in the Coachella Valley Groundwater Basin were listed as critically-overdrafted.

GSAs responsible for the 127 high-priority and medium-priority basins and subbasins must adopt GSPs by January 31, 2020 for critically overdrafted basins, and by January 31, 2022 for those not currently in critical overdraft. GSAs may adopt a single GSP covering an entire basin or combine a number of GSPs created by multiple GSAs. Sustainability must be achieved within 20 years after adoption of the GSP for all high-priority and medium-priority basins. GSAs who elect to submit an Alternative GSP, rather than prepare a GSP in accordance with Water Code §10727 et seq. must have done so by January 1, 2017, and every five years thereafter. The State Water Resources Control Board (SWRCB) is empowered to intervene if local agencies fail to form GSAs or fail to adopt their GSPs on schedule.

The Coachella Valley Groundwater Basin has been divided into four (4) subbasins by DWR in California Bulletin 108 (1964) and Bulletin 118 (2003): they are the Indio¹, Mission Creek, San Geronio Pass, and Desert Hot Springs Subbasins. The Indio, Mission Creek, and San Geronio Pass Subbasins have been designated medium-priority subbasins, and the Desert Hot Springs Subbasin has been designated a low-priority subbasin under SGMA.

1.1.2 Formation of GSAs by Local Agencies in the Mission Creek Subbasin

Presently, three separate entities filed Notices of Election with DWR to become GSAs to manage the Mission Creek Subbasin of the Coachella Valley Groundwater Basin within their respective service areas:

- **Coachella Valley Water District (CVWD)** – submitted its notice of election for the portion of the Mission Creek Subbasin within its service area and was approved by DWR as exclusive GSA to manage the Mission Creek Subbasin within that area of the Subbasin.

¹ The Indio Subbasin is also identified as the Whitewater River Subbasin by the USGS. However, the subbasin is identified as the Indio Subbasin in DWR Bulletin 108 (1964) and Bulletin 118 (2003). For continuity, this annual report will identify the subbasin as the Indio Subbasin.

- **Desert Water Agency (DWA)** – submitted its notice of election for a large portion of the Mission Creek Subbasin which includes a large area also located within the boundaries of Mission Springs Water District (MSWD). DWR designated DWA as exclusive GSA for all portions of the Mission Creek Subbasin located within DWA's boundaries, including those portions also located within MSWD boundaries.
- **Mission Springs Water District (MSWD)** – submitted a notice of election for the portion of the Mission Creek Subbasin located within its boundaries, which was rejected by DWR because it included areas also located within DWA's boundaries. MSWD later filed an amended notice of election for a three-square mile area included by DWA in its notice of election but which is not within DWA's boundaries. MSWD's amended notice of election was filed without prejudice to its initial notice of election. DWR designated the three-square mile area as "overlap" with DWA and MSWD. The overlap status of the three-square mile area has not been resolved. MSWD's initial notice of election, and DWA's claim of "exclusive" status over MSWD's service area are the subject of pending litigation, known as *Mission Springs Water District v. Desert Water Agency, et al.*, Riverside County Superior Court, Case No. PSC 1600676.

Several small portions of the Mission Creek Subbasin lie outside the boundaries of the GSAs. These fringe areas are located in San Bernardino County and are not included within the boundaries of a local water district. Portions of this fringe area are located within designated U. S. Forest Service and U. S. Bureau of Land Management wilderness areas with less than one square mile being privately owned. The entire fringe area falls within the recently designated Sand to Snow National Monument. Discussions with the County of San Bernardino indicate no interest in being a GSA within this area. Because development in this fringe area is restricted by land ownership and wilderness/national monument designation, it was excluded from GSA coverage. Additionally, these lands are owned by the federal government and thus may voluntarily participate in SGMA.

1.1.3 Submission of an Alternative Groundwater Sustainability Plan for the Mission Creek Subbasin to DWR

SGMA recognizes the efforts many areas such as the Coachella Valley have made in developing and implementing groundwater management by allowing existing groundwater management plans to be submitted as an alternative to preparing a GSP.

In October 2003, MSWD filed action in the Superior Court of the State of California against DWA and CVWD seeking a writ of mandate, declaratory relief for prescriptive and appropriative water rights, and declaratory and injunctive relief for a physical solution of a groundwater basin. MSWD sought adjudication of the Mission Creek Subbasin, challenged the validity of the replenishment assessments in the Indio and Mission Creek Subbasins and questioned the quality of the imported Colorado River Aqueduct (CRA) water. Both CVWD and DWA filed responses challenging the complaint. In December

2004, MSWD, DWA and CVWD reached an agreement to settle the litigation (2004 Mission Creek Settlement Agreement).

The settlement agreement stated the agencies would work jointly to manage the Mission Creek Subbasin and jointly prepare a water management plan. A Memorandum of Understanding (MOU) among CVWD, DWA, and MSWD was executed on July 27, 2009 to prepare this water management plan and develop a groundwater model for the Mission Creek Subbasin and Garnet Hill Subbarea. Following four years of effort, the three agencies adopted the Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP) in 2013.

On December 29, 2016, CVWD, DWA, and MSWD collaboratively submitted the MC-GH WMP and a bridge document that described how the existing WMP met the requirements of SGMA. This SGMA Alternative GSP for the Mission Creek Subbasin, (aka “SGMA Bridge Document”) was submitted to DWR for review and evaluation.

The SGMA Bridge Document requires the preparation of an MOU between the parties (including DWA, CVWD and MSWD) to jointly manage the Mission Creek Subbasin. A draft MOU has been prepared and is being reviewed by the agencies.

1.1.4 Annual Reporting

Annual reporting of groundwater conditions in the Mission Creek Subbasin has been performed by CVWD and DWA since 2003. CVWD and DWA both publish separate annual Engineer's Reports on Water Supply and Replenishment Assessment for the Mission Creek Subbasin Area of Benefit (AOB), in the Mission Creek Subbasin. The Engineer's Reports detail the groundwater levels, annual water balance, artificial and natural recharge, and groundwater pumping for the previous calendar year, as well as establish the replenishment assessment charged for production in the following fiscal year. In addition, CVWD, DWA, and MSWD prepare annual consumer confidence reports on the water quality of their urban water systems.

In accordance with SGMA (Water Code Section 10728), on April 1 following the adoption of a GSP and annually thereafter, a GSA shall submit a report to DWR containing the following information about the basin managed in the GSP:

- Groundwater elevation data
- Annual aggregated data identifying groundwater extraction for the preceding water year
- Surface water supply used for or available for use for groundwater recharge or in-lieu use

- Total water use
- Change in groundwater storage
- Progress toward implementing the GSP

The Mission Creek Subbasin Annual Report for Water Year (WY) 2016-2017 (Annual Report) is the first annual report prepared for the Mission Creek Subbasin in response to the SGMA requirements. The Annual Report contains a discussion of the Coachella Valley Groundwater Basin followed by sections describing each of the SGMA required annual report elements.

Section 2

Coachella Valley Groundwater Basin Setting

The Mission Creek Subbasin is shown on **Figure 2-1**, which is part of the greater Coachella Valley Groundwater Basin, as shown on **Figure 2-2**. The Coachella Valley Groundwater Basin extends approximately 45 miles southeast from the San Bernardino Mountains to the northern shore of the Salton Sea. Cities within the Coachella Valley include Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage, and the unincorporated communities of Thousand Palms, Thermal, Bermuda Dunes, Oasis, and Mecca. The Coachella Valley is bordered on the north by Mount San Gorgonio in the San Bernardino Mountains, on the west by the San Jacinto and Santa Rosa Mountains, on the east by the Little San Bernardino Mountains, and on the south by the Salton Sea. The Coachella Valley lies within the northwesterly portion of California's Colorado Desert, an extension of the Sonoran Desert. The San Bernardino, San Jacinto, and Santa Rosa Mountains provide an effective barrier against coastal storms, and greatly reduce the contribution of direct precipitation to replenish the Coachella Valley's groundwater, resulting in an arid climate.

The bulk of natural groundwater replenishment comes in the form of runoff from the adjacent mountains. Climate in the Coachella Valley is characterized by low humidity, high summer temperatures, and mild dry winters. Average annual precipitation in the Coachella Valley varies from 4 inches on the Coachella Valley floor to more than 30 inches in the surrounding mountains (DWR 1964). Most of the precipitation occurs during December through February (except for summer thundershowers). Prevailing winds in the area are usually gentle, but occasionally increase to velocities as high as 30 miles per hour or more. Mid-summer temperatures commonly exceed 100 degrees Fahrenheit (°F), frequently reach 110°F, and periodically reach 120°F. The average winter temperature is approximately 60°F.

2.1 COACHELLA VALLEY GROUNDWATER BASIN

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

The southern boundary is formed primarily by the watershed of the Mecca Hills and by the northwest shoreline of the Salton Sea running between the Santa Rosa Mountains and Mortmar. Between the Salton Sea and Travertine Rock, at the base of the Santa

Rosa Mountains, the southern boundary crosses the Riverside County Line into Imperial and San Diego Counties.

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

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

2.1.1 Subbasins and Subareas

The subbasins of the Coachella Valley Groundwater Basin are the Mission Creek, Desert Hot Springs, San Geronio Pass, and Indio Subbasins. The subbasins are defined without regard to water quantity or quality. They delineate areas underlain by formations which readily yield stored groundwater through water wells and offer natural reservoirs for the regulation of water supplies.

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

The following is a list of the subbasins and associated subareas in the Coachella Valley Groundwater Basin as designated by DWR in Bulletin 108 (1964) and Bulletin 118 (2003).

- Indio Subbasin (Subbasin 7-21.01)
 - o Palm Springs Subarea
 - o Thermal Subarea
 - o Thousand Palms Subarea
 - o Oasis Subarea

- o Garnet Hill Subarea²
- Mission Creek Subbasin (Subbasin 7-21.02)
- Desert Hot Springs Subbasin (Subbasin 7-21.03)
 - o Miracle Hill Subarea
 - o Sky Valley Subarea
 - o Fargo Canyon Subarea
- San Gorgonio Pass Subbasin (Subbasin 7-21.04)

The location of each subbasin is shown on **Figure 2-2**.

2.1.2 Geology

The Coachella Valley Groundwater Basin encompasses much of the floor area of Coachella Valley. The Coachella Valley itself trends northwest–southeast; its surface slopes generally to the southeast, and is bounded on its northern, northwestern, southwestern, and southern margins by uplifted mountains of bedrock. Coachella Valley sedimentary fill consists of thick sand and gravel sedimentary sequences eroded from the surrounding mountains. Sedimentary infill within the Coachella Valley thickens from north to south, and depending on location within the basin is at least several thousand and as much as 12,000 feet (ft) in thickness. The upper approximately 2,000 ft constitute the aquifer system that is the primary source of groundwater supply (DWR, 1979).

Figure 2-3 is a geologic map of the Mission Creek Subbasin.

² The Garnet Hill Subarea of the Indio Subbasin is also identified as a separate Garnet Hill Subbasin by the USGS. However, it is identified as the Garnet Hill Subarea of the Indio Subbasin in DWR Bulletin 108 (1964) and Bulletin 118 (2003). For continuity, this annual report will identify the subarea as the Garnet Hill Subarea of the Indio Subbasin.

Figure 2-1
Regional Map of the Mission Creek Subbasin

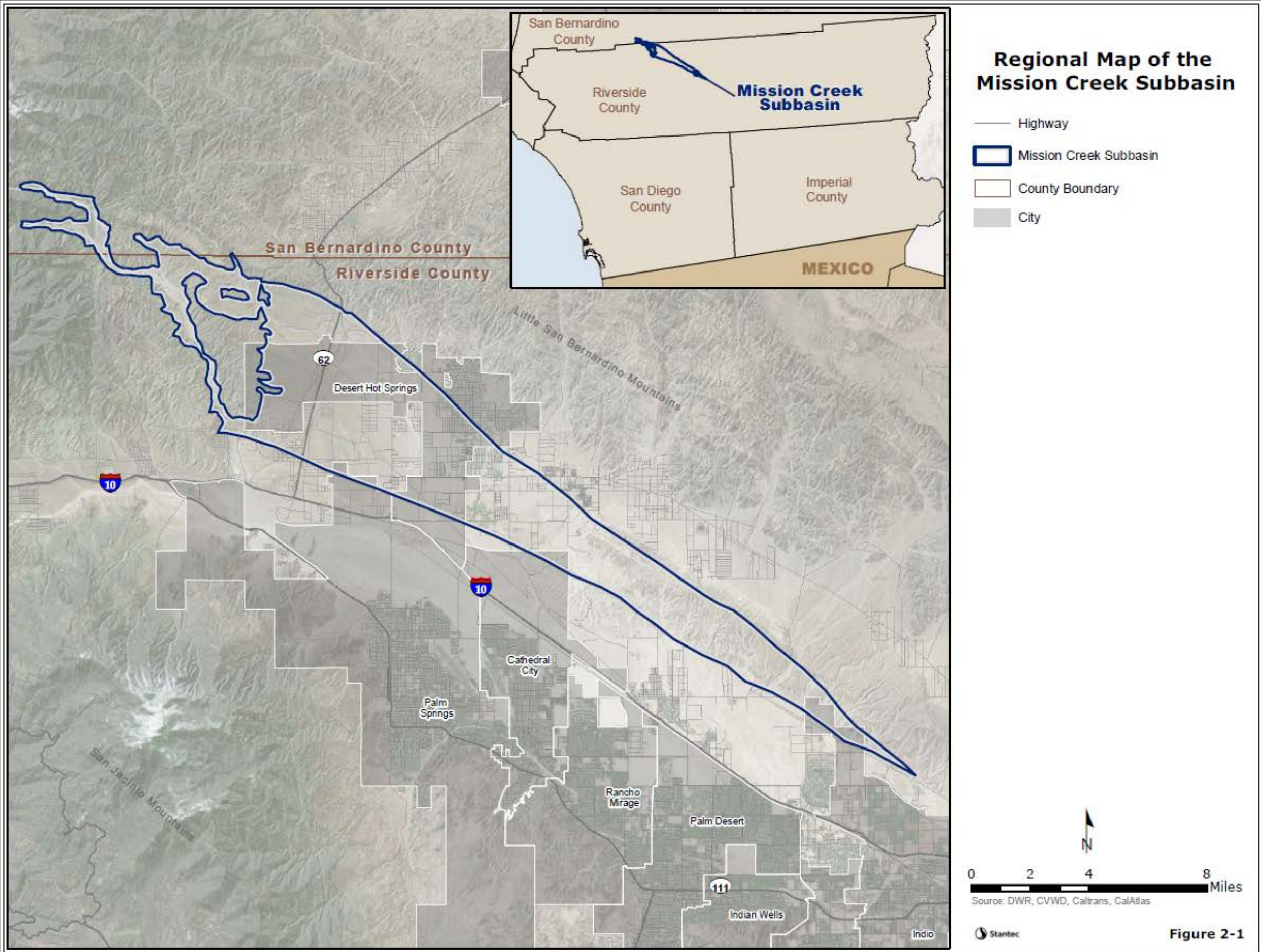


Figure 2-2
Coachella Valley Groundwater Basin and Subbasins

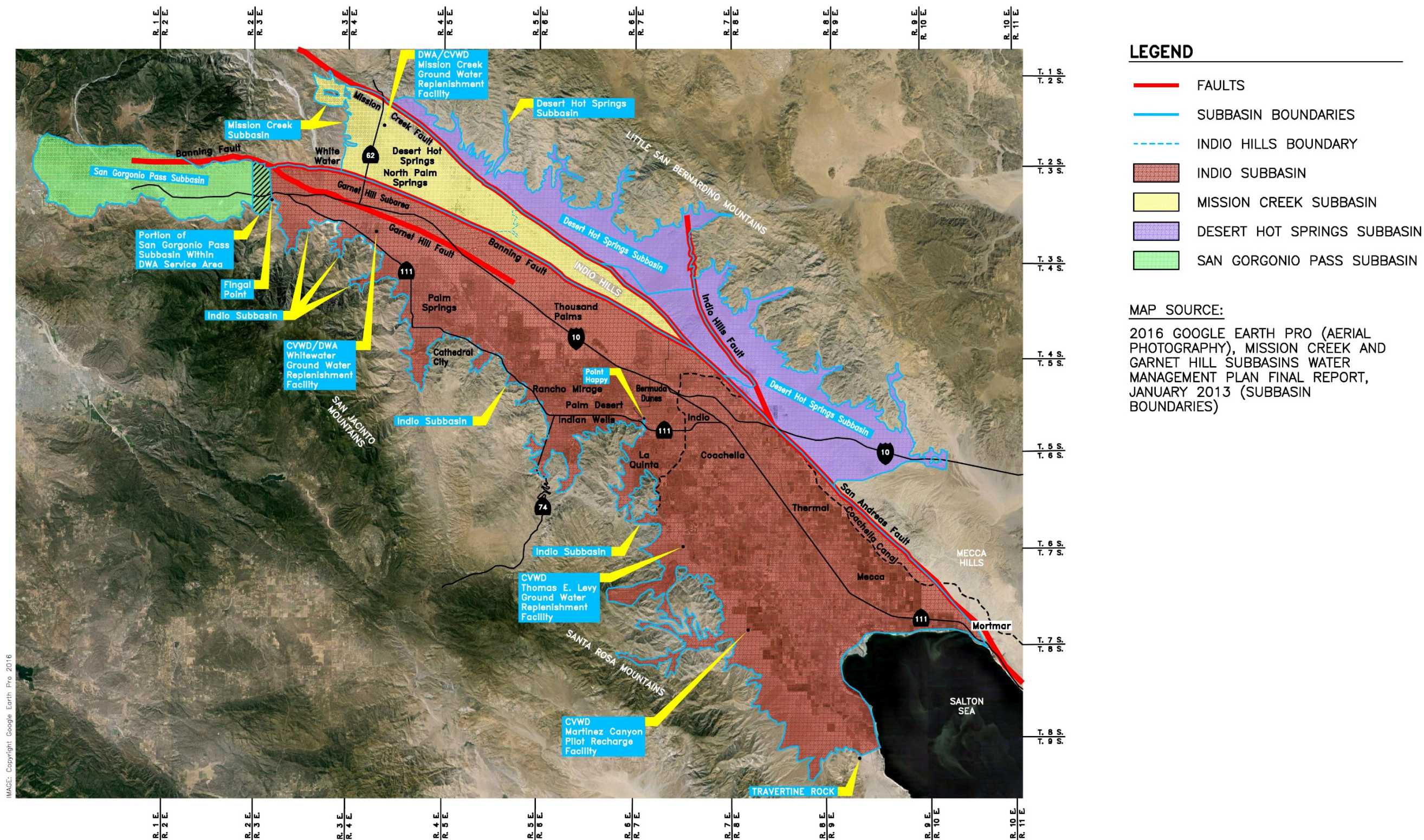
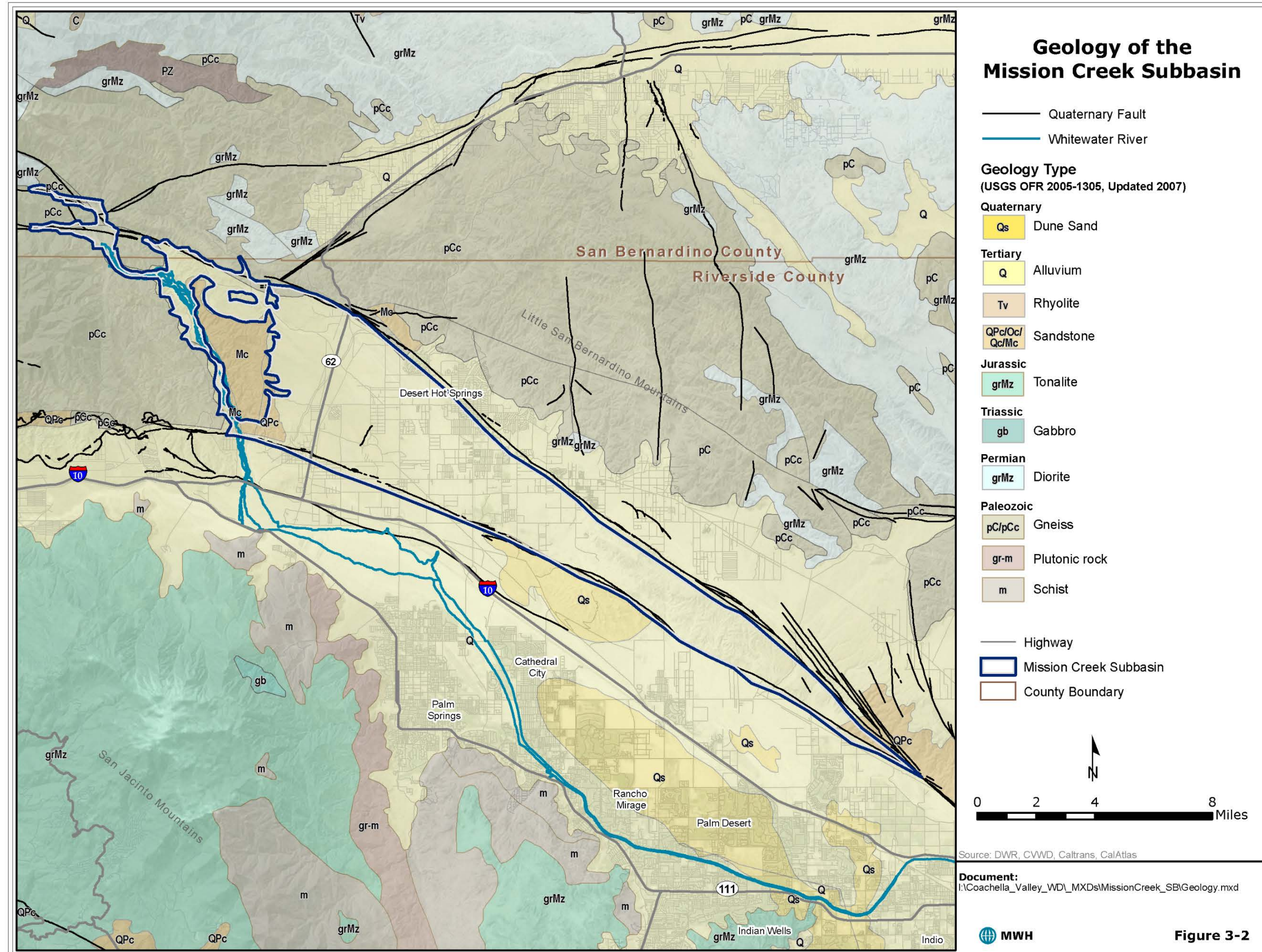


Figure 2-3
Coachella Valley Groundwater Basin Geological Map



2.1.3 Basin Storage Capacity

In 1964, DWR estimated that the subbasins in the Coachella Valley Groundwater Basin contained, in the first 1,000 ft below the ground surface, approximately 39,200,000 acre-feet (AF) of water. The capacities of the subbasins are shown in **Table 2-1**.

Table 2-1
Coachella Valley Groundwater Basin
Groundwater Storage Capacity

Subbasin/Subarea	Groundwater Storage (AF) ¹
Indio Subbasin	
Palm Springs Subarea	4,600,000
Thousand Palms Subarea	1,800,000
Oasis Subarea	3,000,000
Thermal Subarea	19,400,000
Garnet Hill Subarea	1,000,000
Subtotal Indio Subbasin	29,800,000
San Gorgonio Pass Subbasin	2,700,000
Mission Creek Subbasin	2,600,000
Desert Hot Springs Subbasin	4,100,000
Total All Subbasins	39,200,000

¹ First 1,000 feet below ground surface. DWR estimate (DWR, 1964).

2.2 MISSION CREEK SUBBASIN DESCRIPTION

Water-bearing materials underlying the Mission Creek upland comprise the Mission Creek Subbasin. The Mission Creek Subbasin is designated Number 7-21.02 in DWR's Bulletin 118 (2003). The Mission Creek Subbasin is bounded on the south by the Banning Fault and on the north and east by the Mission Creek Fault. The Mission Creek Subbasin is bordered on the west by relatively impermeable rocks of the San Bernardino Mountains. To the southeast of the Mission Creek Subbasin are the Indio Hills, which consist of the semi-water-bearing Palm Springs Formation. The area within this boundary reflects the estimated geographic limit of effective storage within the Subbasin (DWR 1964).

Both the Mission Creek Fault and the Banning Fault are partially effective barriers to lateral groundwater movement as evidenced by offset groundwater levels, fault springs,

and changes in vegetation. Water level differences across the Banning Fault, between the Mission Creek Subbasin and the Garnet Hill Subarea, are on the order of 200 ft to 250 ft. Similar water level differences exist across the Mission Creek Fault between the Mission Creek and Desert Hot Springs Subbasins (MWH 2013).

The Mission Creek Subbasin relies on imported water for replenishment. Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) have contracts with the DWR for State Water Project (SWP) water with a combined Table A amount of 194,100 acre-feet per year (AFY). There are no physical facilities to deliver SWP water to the Coachella Valley. CVWD's and DWA's SWP Table A water is exchanged with the Metropolitan Water District of Southern California (MWD) for a like amount of Colorado River water from MWD's Colorado River Aqueduct (CRA). SWP Exchange water has been used to recharge the Mission Creek Subbasin at the Mission Creek Groundwater Replenishment Facility (GRF) since 2002.

2.3 MANAGEMENT AREA AND AREAS OF BENEFIT

CVWD, DWA, and Mission Springs Water District (MSWD) jointly manage the Mission Creek Subbasin under the terms of the 2004 Mission Creek Settlement Agreement. The parties to the Settlement Agreement created a Management Committee made up of the General Managers from CVWD, DWA, and MSWD that meets quarterly to discuss on-going topics regarding management of the Mission Creek Subbasin and Garnet Hill Subarea. CVWD and DWA executed the Mission Creek Groundwater Management Agreement in 2014 to replace the previous 2003 Management Agreement. The 2014 Management Agreement provides for replenishing the Mission Creek Subbasin and sharing the costs of replenishment between CVWD and DWA.

The 2004 Settlement Agreement and the 2014 Management Agreement specify that the available SWP water will be allocated between the Mission Creek Subbasin and the western portion of the Indio Subbasin in proportion to the amount of water produced or diverted from each Subbasin; cumulative replenishment water deliveries between the Mission Creek and Indio Subbasins will be balanced as determined by the Management Committee but no later than 20 years from December 7, 2004.

Under the authority of their enabling legislation, CVWD and DWA have each designated an "Area of Benefit" (AOB) within their respective agency boundaries of the Mission Creek Subbasin for the purpose assessing groundwater replenishment charges on groundwater production from their respective portions of the Mission Creek Subbasin. The funds derived from these charges recover a portion of the cost of purchasing and recharging SWP water in the Subbasin.

Section 3

Groundwater Elevation Data

Section 356.2(b) of the Sustainable Groundwater Management Act (SGMA) Emergency Regulations requires:

A detailed description and graphical representation of the following conditions of the basin managed in the Plan:

(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

This section presents the groundwater level monitoring program results for the Mission Creek Subbasin for Water Year (WY) 2016-17.

3.1 MONITORING WELLS

In response to 2010 legislation, California Department of Water Resources (DWR) developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. The hydrologic system of the Coachella Valley has been extensively monitored by a number of agencies for many years. Monitoring data in the Mission Creek Subbasin is available for selected wells since the 1950s.

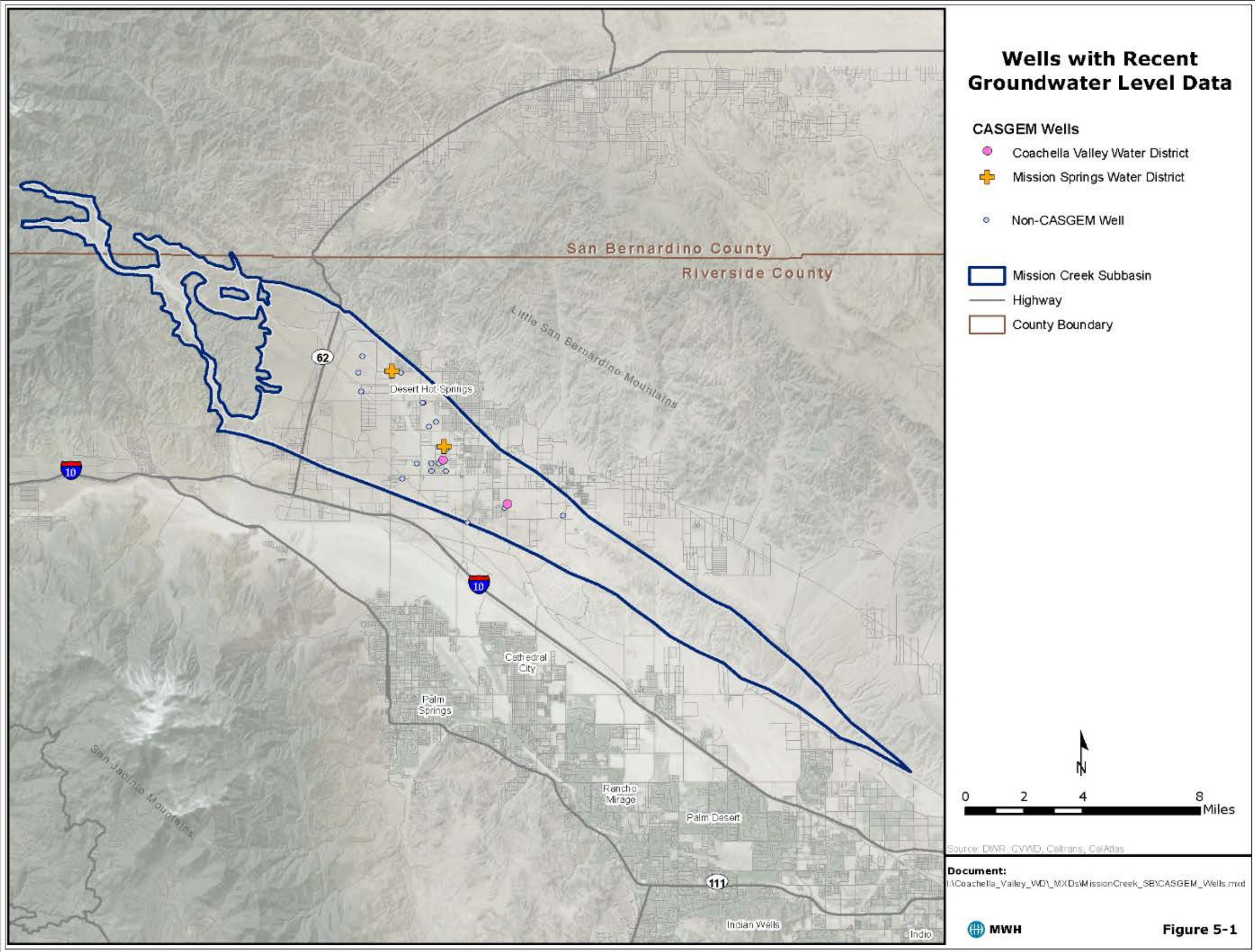
Coachella Valley Water District (CVWD) and Mission Springs Water District (MSWD) are currently in compliance with CASGEM reporting requirements. There are four CASGEM monitoring wells located in the Mission Creek Subbasin. The location of each CASGEM monitoring well within Mission Creek Subbasin is shown on **Table 3-1**.

In addition to monitoring for CASGEM compliance, CVWD, Desert Water Agency (DWA), and MSWD monitor 17 additional wells in the Mission Creek Subbasin also shown in **Table 3-1**. MSWD monitors its own wells with levels taken monthly, while CVWD monitors both its own wells with water levels taken three times per year. DWA monitors water levels monthly in its monitoring well located near the Mission Creek GRF and attempts to monitor two private production wells monthly beginning in late 2017.

Table 3-1
WY 2016-2017 Wells Measured for Water Levels in the Mission Creek Subbasin

Monitoring Agency	CASGEM Wells Monitored	Additional Wells Monitored	Total Wells Monitored
Coachella Valley Water District	2	3	5
Desert Water Agency	0	3	3
Mission Springs Water District	2	11	13
Total Wells Monitored	4	17	21

Figure 3-1
Monitoring Well Locations in the Mission Creek Subbasin



3.2 GROUNDWATER LEVELS

Historical groundwater level declines in the Mission Creek Subbasin, and conditions producing those declines, have been extensively described by the United States Geological Survey (USGS) and DWR, and are documented in the 2013 Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP) and the SGMA Alternative Groundwater Sustainment Plan (GSP).

Figure 3-2 presents the average water elevations in the Mission Creek Subbasin based on WY 2016-2017 monitoring data. The groundwater elevations represent groundwater conditions in the principal producing aquifer of the Mission Creek Subbasin. Average levels are presented because the Mission Creek Subbasin does not exhibit strong seasonal trends. Water levels near the replenishment facility respond directly to the timing of replenishment water deliveries and have varied seasonally by 3 ft to more than 100 ft during periods of high replenishment. The remainder of the basin typically experiences seasonal level variations of about 3.5 ft.

3.3 HYDROGRAPHS

Figure 3-3 includes hydrographs for a selection of four representative wells in the Mission Creek Subbasin, to provide some context regarding the long-term changes in the water levels of the aquifer. The hydrographs are shown larger in **Appendix A**. These four wells were selected on the basis of having been consistently monitored over a relatively long-time period and on their location in different regions within the Mission Creek Subbasin. Each hydrograph is marked with a vertical red line indicating the commencement of replenishment activities in the Mission Creek Subbasin at the Mission Creek Groundwater Replenishment Facility (GRF) in 2002. The hydrographs indicate that water levels throughout the Mission Creek Subbasin have either increased, stabilized, or remained relatively constant since commencement of conservation efforts and replenishment activities.

Figure 3-2
WY 2016-2017 Average Groundwater Elevation Contours in the Mission Creek Subbasin

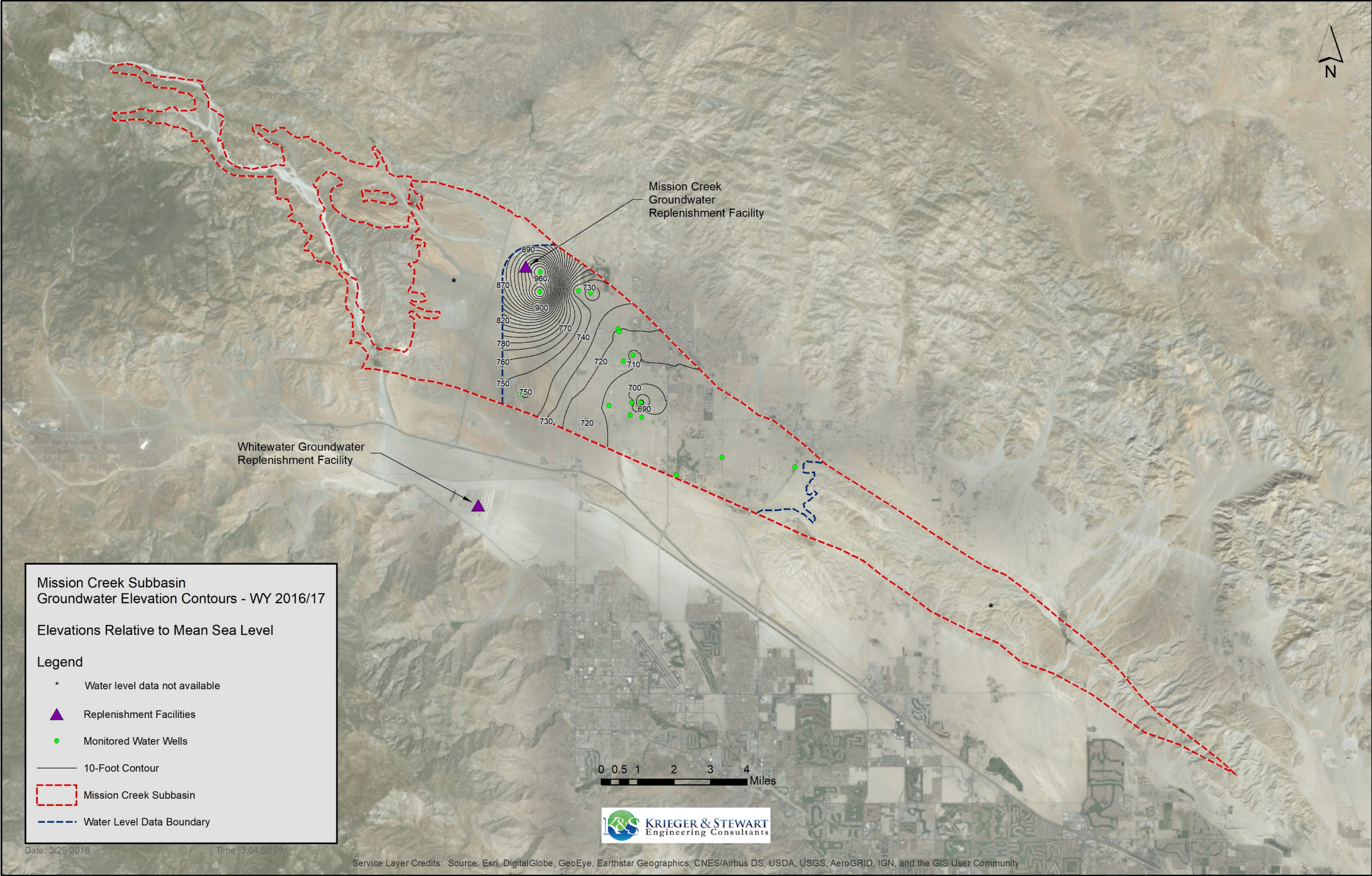
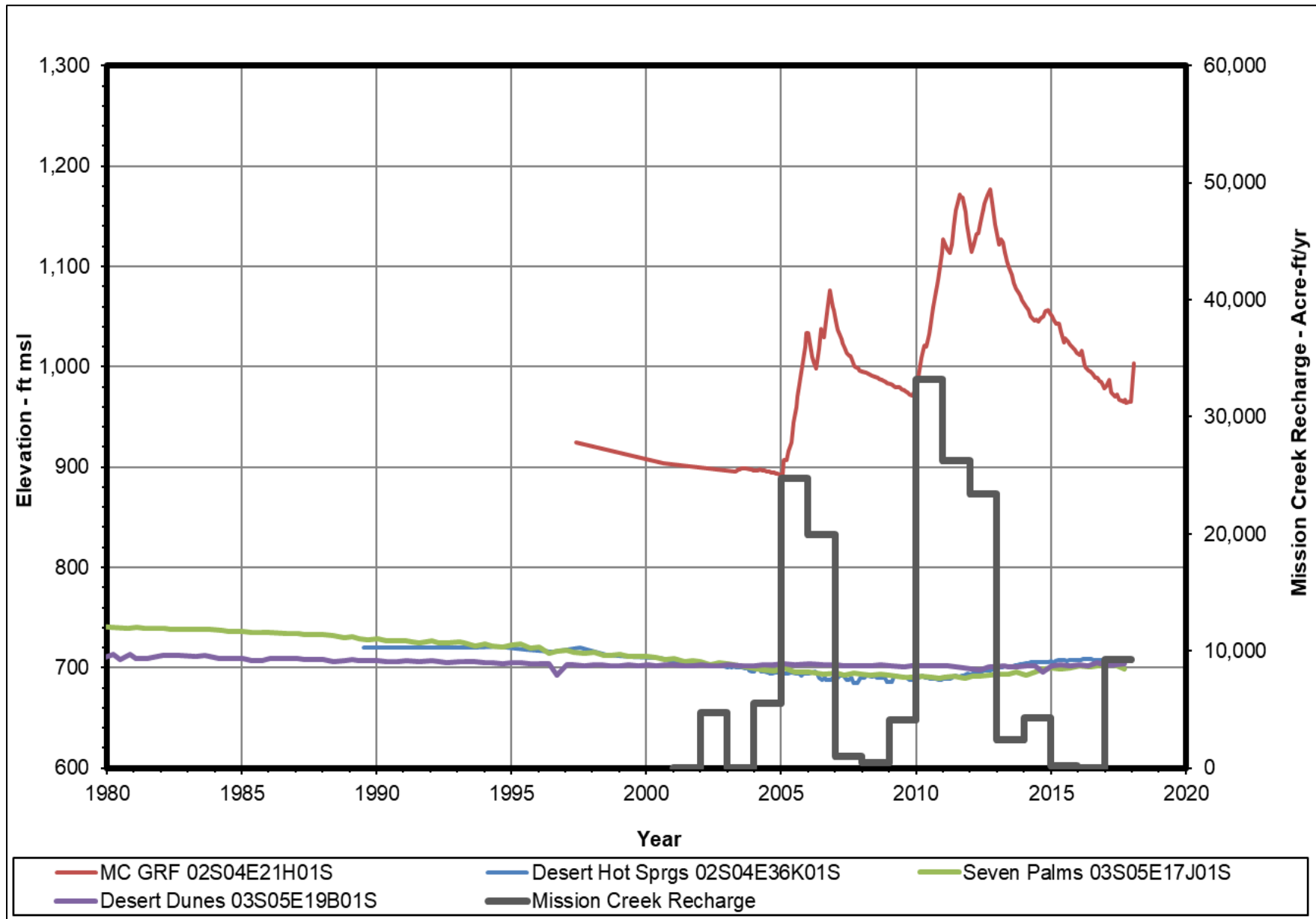


Figure 3-3
Representative Groundwater Elevation Hydrographs - Mission Creek Subbasin



Section 4

Groundwater Extraction

Section 356.2(b)(2) of the Sustainable Groundwater Management Act (SGMA) Emergency Regulations requires:

A detailed description and graphical representation of the following conditions of the basin managed in the Plan: ...

(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

This section presents the groundwater extraction monitoring program results for the Mission Creek Subbasin for Water Year (WY) 2016-2017.

4.1 GROUNDWATER EXTRACTION

During WY 2016-2017, there was 13,782 acre-feet (AF) of groundwater extracted from 29 wells in the Mission Creek Subbasin. Because Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) are authorized to collect replenishment assessment from groundwater producers, their respective legislations mandate the installation of water meters on all wells when the collective production for a producer's wells exceeds 25 acre-feet per year (AFY) in CVWD's service area, and 10 AFY in DWA's service area. Groundwater is the principal source of water for urban water use and represents about 90 percent of groundwater use in the Mission Creek Subbasin.

As indicated in **Table 4-1**, all production wells that participate in the replenishment assessment programs are metered. However, the Groundwater Sustainability Agencies (GSAs) estimate there could be about 500 AFY of unreported pumping whose use is unknown³. This estimated unreported production is from minimal producers (less than 25 AFY in CVWD and 10 AFY in DWA).

Figure 4-1 presents a map showing the general location of production in the Mission Creek Subbasin. This map summarizes production by public land survey section and classifies the production intensity by color.

³ Based on CVWD well records, there may be over 150 private wells whose operational status is not known but which may be capable of producing groundwater. Assuming one-third are operational and pump an average of 10 AFY results in 500 AFY of production.

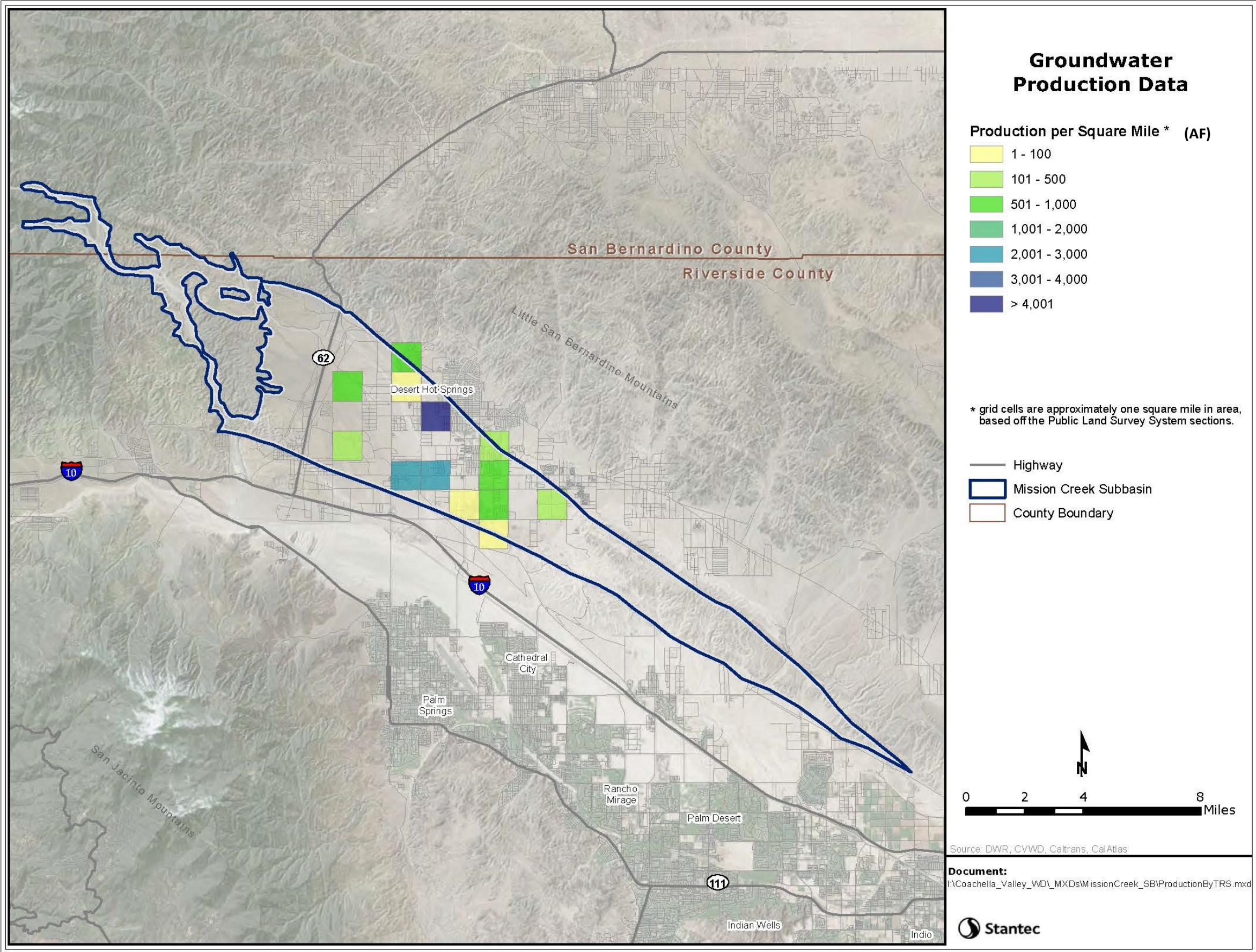
Table 4-1
WY 2016-2017 Groundwater Extractions by Water Use Sector in the Mission Creek Subbasin

Water Use Sector	Groundwater Extractions (AF)	Method of Measurement⁴	Accuracy of Measurement
Agriculture ¹	614	100% metered	±1%
Industrial	261	100% metered	±1%
Urban ²	12,407	100% metered	±1%
Environmental	0	Not applicable	--
Undetermined ³	500	100% estimated	±50%
Total Production	13,782		

Notes:

1. Includes fish farms.
2. Includes municipal and recreational use.
3. Estimated production by small pumpers who do not report production to CVWD (<25 AFY) or DWA (<10 AFY).
4. Method of measurement is estimated based on percent of total production. For Industrial 319 AF is metered and 1100 AF is estimated, percents are approximate.

Figure 4-1
WY 2016-2017 Groundwater Production Map for the Mission Creek Subbasin



Section 5

Surface Water

Section 356.2(b)(3) of the Sustainable Groundwater Management Act (SGMA) Emergency Regulations requires:

A detailed description and graphical representation of the following conditions of the basin managed in the Plan: ...

(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

This section presents the surface water availability and use for the Mission Creek Subbasin for Water Year (WY) 2016-2017. For purposes of this report, surface water supplies consist of local surface water, imported water from the State Water Project (SWP - exchanged for Colorado River water), and any treated wastewater produced by publicly owned wastewater treatment plants.

5.1 COACHELLA VALLEY GROUNDWATER BASIN PRECIPITATION AND STREAM FLOW

Average annual precipitation in the Coachella Valley varies from 4 inches on the Coachella Valley floor to more than 30 inches in the surrounding mountains (DWR 1964). Precipitation predominantly occurs December through March, with occasional intense precipitation events during the summer months resulting from subtropical thunderstorms. The precipitation that occurs within the tributary watersheds either evaporates, is consumed by native vegetation, percolates into underlying alluvium and fractured rock, or becomes runoff, which can be captured by mountain-front debris basins and percolated into the aquifer. A portion of the flow percolating into the mountain watersheds eventually becomes subsurface inflow to the subbasins. The majority of the stream flow available for aquifer replenishment originates in the San Bernardino and San Jacinto Mountains, with lesser amounts from the Santa Rosa Mountains.

5.1.1 Precipitation

During WY 2016-17, the average annual rainfall was 9.81 inches throughout the Coachella Valley, as recorded by 12 rain gage stations located throughout the Coachella Valley, monitored by Riverside County Flood Control and Water Conservation District. **Table 5-1** presents the monthly and annual precipitation data within the Coachella Valley watershed. Precipitation on the local mountain watersheds generates runoff that is percolated for groundwater replenishment.

Table 5-1
WY 2016-2017 Coachella Valley Precipitation Data
Monthly and Annual Recorded Precipitation (Inches)

STATION NAME	WHITEWATER NORTH	SNOW CREEK	DESERT HOT SPRINGS	TACHEVAH DAM	TRAM VALLEY	CATHEDRAL CITY	THOUSAND PALMS	PALM SPRINGS SUNRISE	EDOM HILL	OASIS	MECCA LANDFILL III	THERMAL AIRPORT
LOCATION	WEST INDIO	WEST INDIO	MC	WEST INDIO	WEST INDIO	WEST INDIO	WEST INDIO	WEST INDIO	MC	EAST INDIO	EAST INDIO	EAST INDIO
STATION NUMBER	233	207	57	216	224	34	222	442	436	431	432	443
OCTOBER	0.22	0.42	0.38	0.12	0.65	0.11	0.17	0.12	0.15	0.07	0.26	0.29
NOVEMBER	1.38	1.52	0.18	0.13	0.65	0.09	0.06	0.20	0.09	0.03	0.02	0.00
DECEMBER	4.08	4.44	1.48	1.75	3.25	1.38	1.34	1.53	1.08	1.18	1.23	1.24
JANUARY	10.40	11.30	3.51	4.73	8.81	2.57	2.12	4.27	2.49	1.41	0.94	1.39
FEBRUARY	2.89	3.41	2.09	1.49	2.68	2.05	1.62	1.74	1.48	0.69	0.50	0.68
MARCH	0.30	0.52	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
APRIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAY	0.03	0.01	0.00	0.00	0.08	0.02	0.02	0.00	0.00	0.02	0.00	0.00
JUNE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JULY	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.00	0.05	0.06	0.00
AUGUST	0.09	0.09	0.34	0.00	0.56	0.55	0.78	0.93	0.25	0.16	0.01	0.08
SEPTEMBER	0.00	0.02	0.20	1.29	0.81	0.32	0.04	1.71	0.07	0.16	0.39	1.09
TOTAL	19.39	21.73	8.19	9.54	17.49	7.09	6.15	10.53	5.61	3.77	3.42	4.78
AVERAGE: UPPER	11.75											
AVERAGE: LOWER										3.99		
AVERAGE: ALL	9.81											

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

5.1.2 Streamflow

The United States Geological Survey (USGS) measures streamflow at one gauging station in the Mission Creek Subbasin. **Table 5-2** presents the total gauged runoff for WY 2016-2017. All of this runoff naturally replenishes the Mission Creek Subbasin; there is no direct use of local surface water.

Table 5-2
WY 2016-2017 Local Streamflow Data

Gauge Number	Gauge Name	Stream Flow (AF)
10257600	Mission C Nr Desert Hot Springs CA	617

5.2 IMPORTED WATER DELIVERIES

In addition to natural replenishment from precipitation and stream flow, the Mission Creek Subbasin receives artificial replenishment from importation of SWP water exchanged for Colorado River water. Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) provide artificial replenishment of the Mission Creek Subbasin through their Groundwater Replenishment Program (GRP). Groundwater replenishment is accomplished through direct replenishment, in which imported surface water is percolated directly into the aquifer.

CVWD and DWA have contracts with DWR for SWP water with a combined Table A Amount⁴ of 194,100 acre-feet per year (AFY) as shown in **Table 5-3**. There are no physical facilities to deliver SWP water to the Coachella Valley. CVWD's and DWA's Table A water is exchanged with the Metropolitan Water District of Southern California (MWD) for a like amount of Colorado River water (SWP Exchange Water) from MWD's Colorado River Aqueduct (CRA), that extends from Lake Havasu, through the Coachella Valley to MWD's Lake Mathews. SWP Exchange water has been used to recharge the Mission Creek Subbasin at the Mission Creek GRF since 2002. MWD, DWA and CVWD executed an advanced delivery agreement in 1985 that allowed MWD to pre-deliver up to 600,000 acre-feet (AF) of SWP water into the Coachella Valley. MWD then has the option to deliver CVWD's and DWA's SWP allocation either from the CRA or from water

⁴ Each SWP contract contains a "Table A" exhibit which 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.

previously stored groundwater in the basin. This agreement was subsequently amended to increase the pre-delivery amount to a maximum of 800,000 AF.

**Table 5-3
State Water Project Table A Amounts**

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

Note: All values expressed in 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. During 2016, DWR allocated 60 percent of the Table A Amounts to contractors. In response to the high snowpack, DWR allocated 85 percent of Table A Amounts in 2017.

For the WY 2016-17, CVWD's and DWA's SWP allocation was approximately 153,000 AF, which is delivered to MWD in accordance with the Exchange Agreement. As shown in **Table 5-4**, MWD received on behalf of CVWD and DWA, 31,753 AF of SWP Table A water, 25,435 AF of SWP Article 56 carryover water from calendar year 2016, 1,131 AF of SWP Turnback Pool water, 16,776 AF of Flexible Storage Payback water, and 12,500 AFY of Rosedale-Rio Bravo water transfers on behalf of CVWD. In addition, MWD received 35,000 AF of SWP water transferred to CVWD under QSA. The total deliveries to MWD were 122,595 AF. A portion of the Table A Allocation for 2017 (110,768 AF) was carried over for delivery in calendar year 2018.

Due to the nature of the Advanced Delivery agreement with MWD, CVWD and DWA may either receive direct deliveries of SWP Exchange water or water delivered from the Advanced Delivery storage account. As shown in **Table 5-4**, CVWD and DWA took delivery of 267,793 AF of SWP Exchange water at the Whitewater River Groundwater Replenishment Facility (GRF) and 1,948 AF was delivered to the Mission Creek GRF.

Table 5-4
Deliveries of CVWD and DWA State Water Project Water to Metropolitan Water District in WY 2016-2017

Description	CVWD (AF)	DWA (AF)	Total (AF)
Table A	22,632	9,121	31,753
Article 21 "Interruptible"	0	0	0
Turnback Pool A and B	806	325	1,131
Multi-Year Pool	0	0	0
Dry Year (Yuba)	0	0	0
Flex Storage Payback	11,959	4,817	16,776
Article 56 (c) "Carryover" from 2016 delivered in 2017	18,129	7,306	25,435
Rosedale-Rio Bravo	12,500	0	12,500
CVWD QSA Transfer	35,000	0	35,000
Total Delivered to MWD	101,026	21,569	122,595
Water Delivered to CVWD and DWA at Whitewater	--	--	267,793
Water Delivered to CVWD and DWA at Mission Creek	--	--	1,948
Total Water Delivered to Coachella Valley			269,741
Credit to/from Advanced Delivery Account			+147,146

Note: Credit to/from Advanced Delivery Account is the difference between Total Water Delivered to MWD and Total Water Delivered to Coachella Valley.

As of the end of WY 2016-2017, there was 259,221 AF stored in MWD's advanced delivery account in the Coachella Valley. This represents over two years of SWP Exchange deliveries at the current average reliability of 62 percent of CVWD's and DWA's combined Table A Amounts.

5.2.1 Total Imported Water Deliveries

Table 5-5 summarizes the imported water deliveries to the Mission Creek Subbasin by water use sector and source during Water Year 2016-2017. Total imported water deliveries were 1,948 AF, all for aquifer recharge.

Table 5-5
WY 2016-2017 Imported Water Use in the Mission Creek Subbasin

Water Use Sector	Water Source	Imported Water Use (AF)	Method of Measurement ¹	Accuracy of Measurement
Aquifer Recharge	SWP Exchange Water	1,948	100% metered	±1%
Total Production		1,948		

Note: Method of measurement is estimated based on percent of total production.

5.3 RECYCLED WATER

There is no recycled water use in the Mission Creek Subbasin. However, the municipal wastewater generated in the Mission Creek Subbasin is disposed through percolation/evaporation ponds as shown in **Table 5-6**. In WY 2016-2017 a total of 2,004 AF of wastewater was treated, all of which was disposed through percolation/evaporation.

Table 5-6
WY 2016-2017 Wastewater Treatment and Disposal in the Mission Creek Subbasin

Plant	Wastewater Treated (AF)	Disposal Percolation/ Evaporation (AF)
MSWD – Horton WWTP	1,955	1,955
MSWD – Desert Crest WWTP	49	49
Total	2,004	2,004

Reference: Mission Springs Water District (MSWD), Monthly Board Packets

Section 6

Total Water Use

Section 356.2(b)(4) of the Sustainable Groundwater Management Act (SGMA) Emergency Regulations requires:

A detailed description and graphical representation of the following conditions of the basin managed in the Plan: ...

Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

This section presents the total water use for the Mission Creek Subbasin for Water Year (WY) 2016-2017.

A summary of water use by source and sector is presented in **Table 6-1**. The information presented in this table is derived from the tables in Sections 4 and 5. **Table 6-1** lists the net water use, the method of measurement and the estimated accuracy of the measurements.

It should be noted that a portion of the water produced from, or delivered to, the Mission Creek Subbasin is exported for use outside the Mission Creek Subbasin. **Table 6-1** shows a total of 5,657 acre-feet per year (AFY) of exported water all of which is groundwater delivered to urban users in the adjacent Desert Hot Springs Subbasin. A portion of this exported water is returned to the Mission Creek Subbasin as municipal wastewater that is treated and disposed. For WY 2016-17, Mission Springs Water District (MSWD) exported 3,123 acre-feet (AF) to the Desert Hot Springs Subbasin; of which, an estimated 1,261 AF was returned to the Mission Creek Subbasin via wastewater treatment and percolation. In addition, for WY 2016-2017, Coachella Valley Water District (CVWD) exported 2,534 AF to serve its customers overlying the Desert Hot Springs Subbasin, none of which returned to the Mission Creek Subbasin. **Table 6-1** also shows 309 AF of groundwater imported from the Garnet Hill Subarea of the Indio Subbasin that is used to partially meet MSWD's water demands.

In total, there was 8,434 AFY of water delivered for direct use within the Mission Creek Subbasin and 1,948 AFY was delivered for percolation/evaporation and considered inflow to groundwater. Total water use was 10,382 AF as shown in **Table 6-1**.

Table 6-1
WY 2016-17 Total Water Use by Sector and Source in the Mission Creek Subbasin

Water Use Sector	Water Source (AF)							Accuracy of Measurement
	Ground-water Production	SWP Exchange Water	Recycled Water	Imported Ground-water from Adjacent Basins ²	Exported for Use Outside Subbasin ³	Total Water Use Within Subbasin	Method of Measurement ¹	
Agriculture⁴	614	0	0	0	0	614	100% metered	±1%
Industrial	261	0	0	0	0	261	100% metered	±1%
Urban⁵	12,407	0	0	309	-5,657	7,059	100% metered	±1%
Environmental	0	0	0	0	0	0	Not applicable	--
Undetermined⁶	500	0	0	0	0	500	100% estimated	±50%
Aquifer Recharge	0	1,948	0	0	0	1,948	100% metered	±1%
Total	13,782	1,948	0	309	-5,657	10,382		

Notes:

1. Method of measurement is estimated based on percent of total production.
2. Consists of groundwater imported from the Garnet Hill Subarea of the Indio Subbasin.
3. Exported water is delivered to customers overlying the adjacent Desert Hot Springs Subbasin and is estimated based on customer billing records and non-revenue water values from annual water distribution system audits. A breakdown of this amount is provided in the narrative above.
4. Includes fish farms.
5. Includes municipal and recreational uses.
6. Estimated production by small pumpers who do not report production to CVWD (<25 AFY) or DWA (<10 AFY).

Section 7

Groundwater Balance and Change in Groundwater Storage

Section 356.2(b)(4) of the Sustainable Groundwater Management Act (SGMA) Emergency Regulations requires:

A detailed description and graphical representation of the following conditions of the basin managed in the Plan: ...

(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

This section presents the groundwater balance and change in storage for the Mission Creek Subbasin for Water Year (WY) 2016-2017.

7.1 GROUNDWATER BALANCE

A groundwater budget is helpful in assessing the condition of the Mission Creek Subbasin. The groundwater budget compares the inflows and outflows to the groundwater Subbasin. The difference between inflows and outflows at a given time is defined as the change in storage for that time period.

7.1.1 Groundwater Inflows

Mission Creek Subbasin groundwater inflows consist of:

- Infiltration of natural recharge and inflows,
- Infiltration of return flows from urban and agricultural uses, and
- Artificial recharge.

7.1.1.1 Natural Recharge

Precipitation in the bordering San Bernardino Mountains produces surface runoff and subsurface inflow that are the chief natural sources of recharge to the Mission Creek

Subbasin. The volume of natural recharge varies dramatically annually due to wide variations in precipitation. Perennial flow is limited to one stream, Mission Creek. The long-term average historical natural recharge to the Mission Creek Subbasin (based on 1936-2009) is approximately 7,500 acre-feet per year (AFY) based on analyses performed for the Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP).

7.1.1.2 Inflows from Outside the Mission Creek Subbasin

Inflows from outside the Mission Creek Subbasin consist of underflow from the adjacent Desert Hot Springs Subbasin across the Mission Creek fault. These inflows are estimated to average 1,840 AFY. This is a relatively small component of the water balance (less than 3 percent) and does not change significantly with time.

Table 7-1
Mission Creek Subbasin Estimated Average Subsurface Inflows and Outflows

Mission Creek Subbasin Boundary Transfer	Estimated Average Annual Underflow (AF)
Desert Hot Springs Subbasin to Mission Creek Subbasin	1,840 ¹
Mission Creek Subbasin to Indio Subbasin	-5,100 ²

Notes:

1. MWH 2013, Psomas 2013.
2. MWH 2013, Psomas 2013. Values is based on modeled outflow as described in Section 7.1.2.3.

7.1.1.3 Return Flows from Use

Return flow is the difference between the amount of water applied for irrigation (agricultural, golf course, or urban) and the amount consumed by plants to satisfy their evapotranspiration (ET) requirement. Water is also returned to the Mission Creek Subbasin through percolation of treated wastewater and septic tank flow. For WY 2016-2017, return flows to the Mission Creek Subbasin are 4,576 acre-feet (AF) or approximately 29 percent of the total inflow budget. For this report, a relatively rigorous calculation of return flows was utilized that considers types of water use, irrigation efficiency, and water conservation impacts. Irrigation return flows are estimated to be 1,665 AF for WY 2016-2017 in the Mission Creek Subbasin.

Other components of return flows are wastewater disposal and septic returns. A portion of the Mission Creek Subbasin is served by municipal sewer systems that convey wastewater to municipal treatment plants operated by Mission Springs Water District (MSWD). All of the treated wastewater is disposed to percolation/evaporation ponds as

described in Section 5. Wastewater disposal to percolation/evaporation was 2,004 AF in WY 2016-2017. Portions of the Mission Creek Subbasin that do not currently have access to the sewer systems use septic tank/leachfield systems to treat and dispose wastewater. It is estimated that about 907 acre-feet per year (AFY) of septic effluent is disposed to the Mission Creek Subbasin based on the estimated number of water users with septic tanks. MSWD has an on-going program, the Groundwater Quality Protection Program (GQPP), to install sewers and convert septic system users to its municipal wastewater system. See **Section 8.1.4** for additional details. MSWD's continued implementation of its GQPP will further reduce water losses to the Desert Hot Springs Subbasin and increase return flows to the Mission Creek Subbasin.

Both return flows and wastewater disposal are affected by water use efficiency and overall demands. As conservation efforts increase, groundwater production along with the amount of return flow decreases, reducing both outflow and inflow to the Mission Creek Subbasin.

7.1.1.4 Artificial Recharge

Artificial recharge is performed at the Mission Creek Groundwater Replacement Facility (GRF) using State Water Project (SWP) Exchange Water exchanged for Colorado River Aqueduct (CRA) water.

Recharge at the Mission Creek GRF is variable based on availability of SWP Exchange Water and deliveries by the Metropolitan Water District of Southern California (MWD). During WY 2016-2017, a total of 1,948 AF of imported water was recharged at the Mission Creek GRF. The Mission Creek GRF has recharged as much as 33,200 AF in a given year.

7.1.2 Groundwater Outflows

Mission Creek Subbasin groundwater outflows consist of:

- groundwater pumping to meet Coachella Valley demands,
- evaporative losses from recharge and percolation facilities,
- evapotranspiration from the aquifer, and
- Subsurface flow out of the Mission Creek Subbasin, into the adjacent Subbasins.

7.1.2.1 Groundwater Pumping

Groundwater pumping refers to the amount of groundwater pumped for agricultural, industrial, urban, and other uses. Groundwater pumping is the largest component of outflow from the Mission Creek Subbasin. During WY 2016-2017, there was 13,782 AF of groundwater was pumped for beneficial uses within the Mission Creek Subbasin or exported for use in adjacent subbasins.

7.1.2.2 Evapotranspiration and Evaporation

Native vegetation on undeveloped lands receives its water supply from precipitation and shallow groundwater. The evapotranspiration (ET) component was estimated using the groundwater model to be about 900 AFY, a relatively small outflow (less than 5 percent) of the total outflow (Psomas, 2013). In addition, a portion of the imported water used for recharge (2 percent) and wastewater disposal (3 percent) is estimated to be lost to evaporation. This is estimated to be about 99 AF for WY 2016-2017.

7.1.2.3 Subsurface Outflow from the Mission Creek Subbasin

There is a 100-300 ft difference in groundwater elevations across the Banning Fault between the Mission Creek and Indio Subbasins that results in subsurface outflow. Groundwater model calibration for the MC-GH WMP estimated the current outflow across the Banning Fault to be about 4,000 AFY (Psomas, 2013).

Subsurface outflow from the Mission Creek Subbasin also occurs through the semi-water bearing rocks of the Indio Hills. Examination of groundwater contours, water balance calculations, and groundwater model calibration as part of the MC-GH WMP estimated this outflow to be about 1,100 AFY (Psomas, 2013). Total subsurface outflow from the Mission Creek Subbasin is estimated to 5,100 AFY

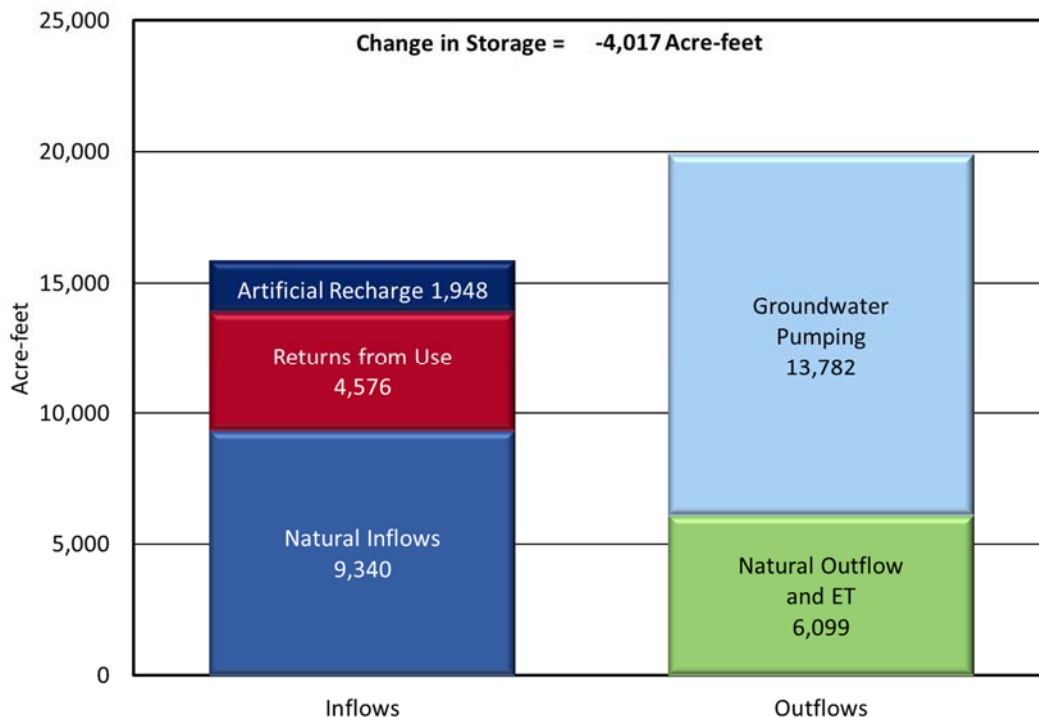
7.1.3 Annual Change in Groundwater Storage

The annual change in groundwater storage represents the difference between inflows and outflows in the Mission Creek Subbasin. During wet years or periods of high artificial recharge, the change in storage is positive (water in storage increases). In dry years, the change in storage is often negative (storage decreases). Because of the small amount of imported water recharge, the annual change in groundwater storage for the Mission Creek Subbasin is a negative 4,017 AF for WY 2016-2017. **Figure 7-1** is a graphical representation of the annual change in groundwater storage in the Mission Creek Subbasin.

Historical change in groundwater storage in the Mission Creek Subbasin is shown on **Figure 7-2** from 1978 to the present. It should be noted that 1978 was selected because good production records were available for the Mission Creek Subbasin from that point forward. In addition, the historical data used to prepare this figure is on a calendar year basis. Insufficient historical data is available to prepare this chart on a water year basis.

Also shown on **Figure 7-2** are annual inflows, outflows, groundwater production, and ten-year and twenty-year running average change in groundwater storage in the Mission Creek Subbasin. The Mission Creek Subbasin inflows are variable due to imported water replenishment deliveries. Replenishment activities have been variable in response to imported water availability since 2002 averaging about 9,500 AFY. Years of high inflows correspond to wet years, where increased SWP deliveries occurred. Outflows from the Mission Creek Subbasin were higher than groundwater production until the start of imported water replenishment in 2002. Groundwater pumping peaked in 2006 during the development boom and has decreased more than 20 percent since that time. After extended periods of decline, both the ten- and twenty-year running average change in groundwater storage have shown upward trends since 2004. The twenty-year running average shows that the Mission Creek Subbasin has been essentially in balance since 2012.

Figure 7-1
WY 2016-2017 Annual Groundwater Balance in the Mission Creek Subbasin



The cumulative change in storage is the running total of annual changes in storage from an established starting year. For this annual report, 1978 was selected as the starting year as described above. **Figure 7-3** shows the cumulative change in storage since 1978. The goal of the MC-GH WMP is to eliminate on-going groundwater overdraft and to manage the basin such that long-term average groundwater levels do not significantly decline from year 2009 conditions. Currently, about 80,000 AF have been removed from storage since 1978. The basin was at its minimum storage in 2004, which was two years after the start of operation at the Mission Creek replenishment facility and before significant water conservation efforts were implemented. The basin has recovered about 40,000 AF of storage, one-third of its maximum depletion in 2004. This demonstrates the progress made through implementation of the MC-GH WMP.

Table 7-2
WY 2016-2017 Groundwater Balance in the Mission Creek Subbasin

Component	2016-17 Flows (AF)
Inflows	
Infiltration of natural runoff	7,500
Subsurface inflows from adjacent basins	1,840
Infiltration of applied irrigation water	1,665
Wastewater percolation	2,004
Septic tank percolation	907
Artificial recharge	1,948
Total Inflow	+ 15,864
Outflows	
Groundwater Pumping	13,782
Evaporative Losses	99
Evapotranspiration from the shallow aquifer	900
Subsurface outflow to adjacent basins	5,100
Total Outflow	- 19,881
Change in Groundwater Storage	- 4,017

Figure 7-2
Historical Annual Change in Groundwater Storage
in the Mission Creek Subbasin

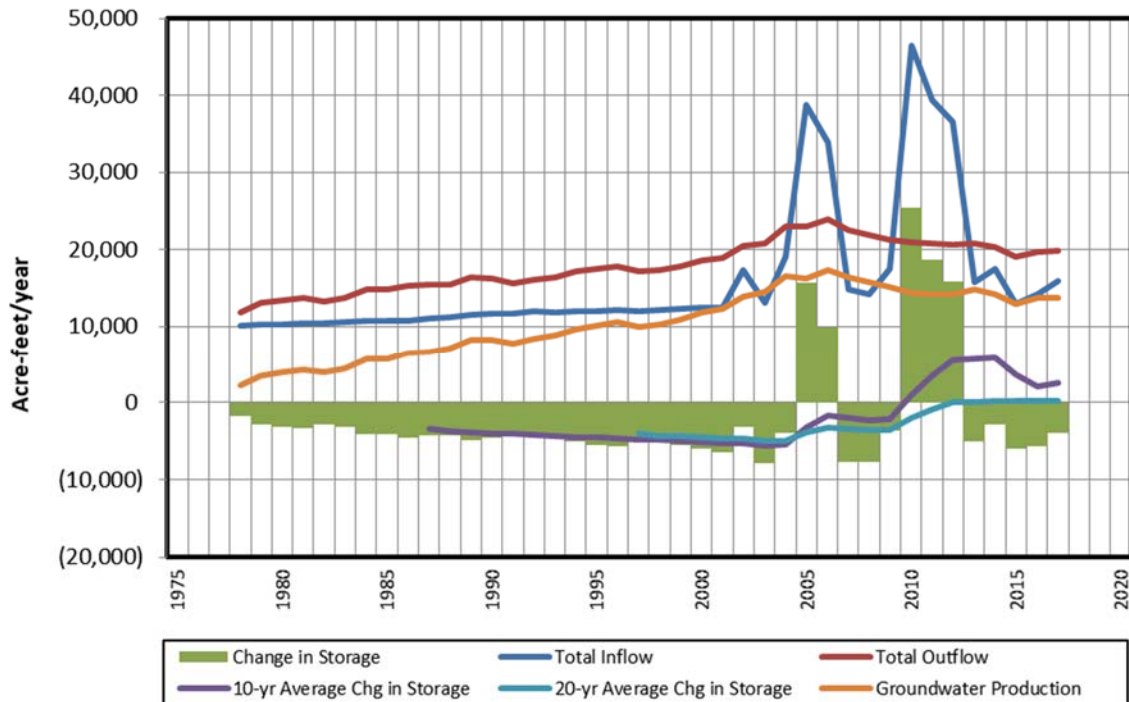
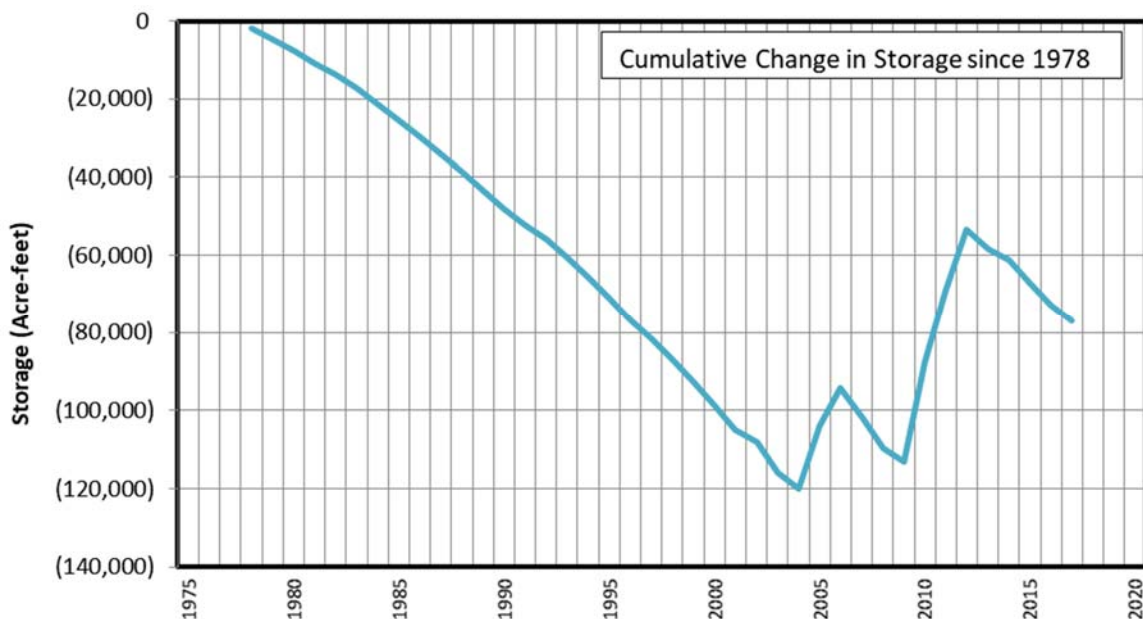


Figure 7-3
Cumulative Change in Groundwater Storage Since 1978
in the Mission Creek Subbasin



7.2 CHANGE IN GROUNDWATER STORAGE MAPS

Figure 7-4 and **Figure 7-5** show one-year and ten-year changes in groundwater storage throughout the Mission Creek Subbasin. The maps show the difference in average groundwater elevations for wells in the Mission Creek Subbasin monitored by all three agencies. Cooler colors (greens and blues) depict increases in groundwater storage while warmer colors (yellow through red) depict decreases in groundwater storage.

Figure 7-4 depicts the change in average groundwater storage from 2016 to 2017 in the Mission Creek Subbasin. The average change in groundwater levels observed in the 21 wells monitored from 2016 to 2017 in the Mission Creek Subbasin was a decline of 3.4 ft due to reduced replenishment water deliveries. One monitoring well and one production well (MSWD Well 34) are located near the Mission Creek GRF, and experience greater fluctuations in water levels throughout the year in response to recharge activities. In WY 2016-2017, water levels in these wells both declined approximately 24 ft due to such fluctuations.

Figure 7-5 depicts the change in average groundwater storage from 2007 to 2017 in the Mission Creek Subbasin. The average change in water levels observed in the 15 wells monitored from 2007 to 2017 in the Mission Creek Subbasin was an increase of 6.9 ft, in response to increased replenishment deliveries from 2010 through 2017.

Figure 7-4
One-Year (2016 to 2017) Change in Groundwater Storage in the Mission Creek Subbasin

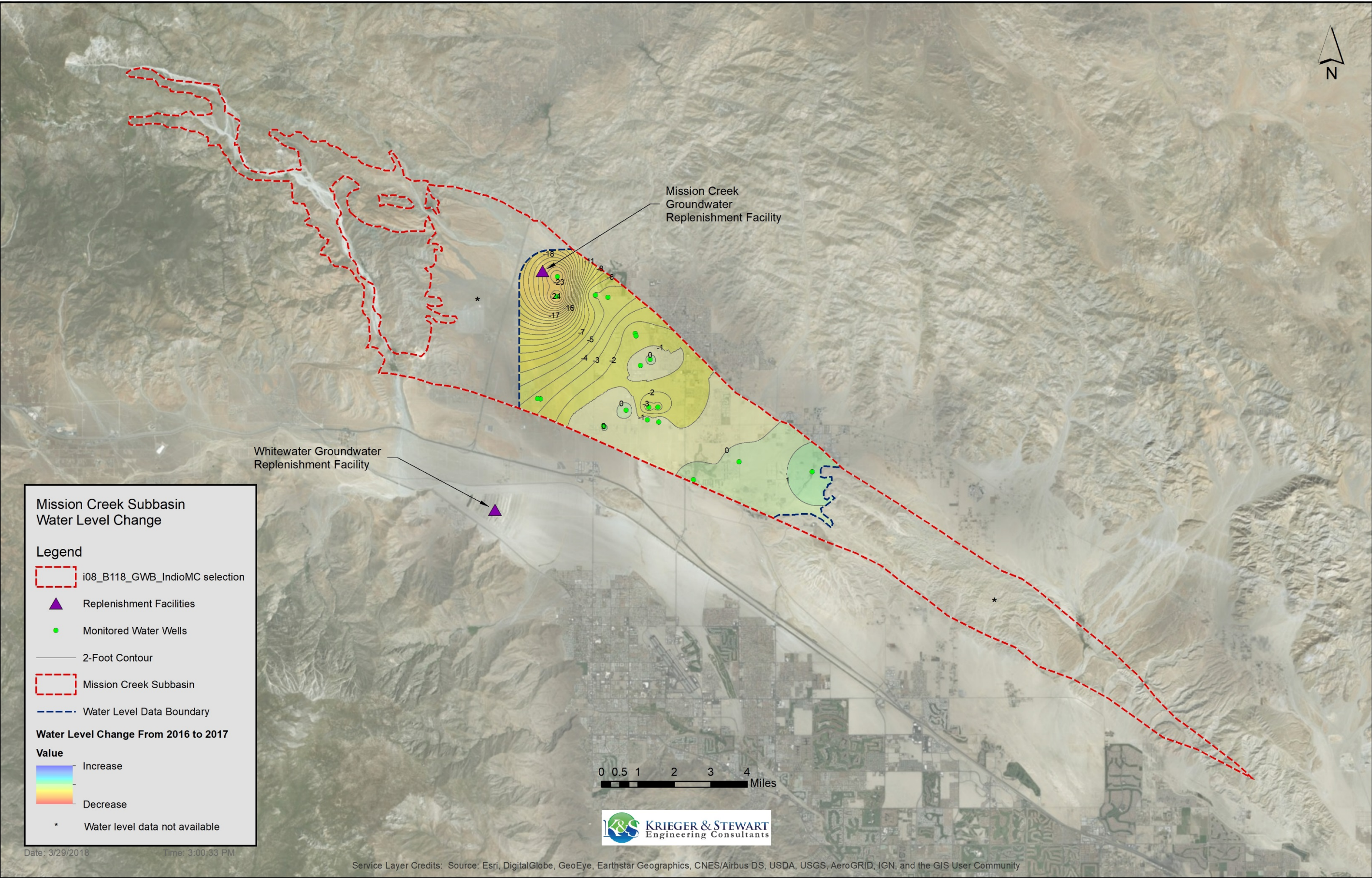
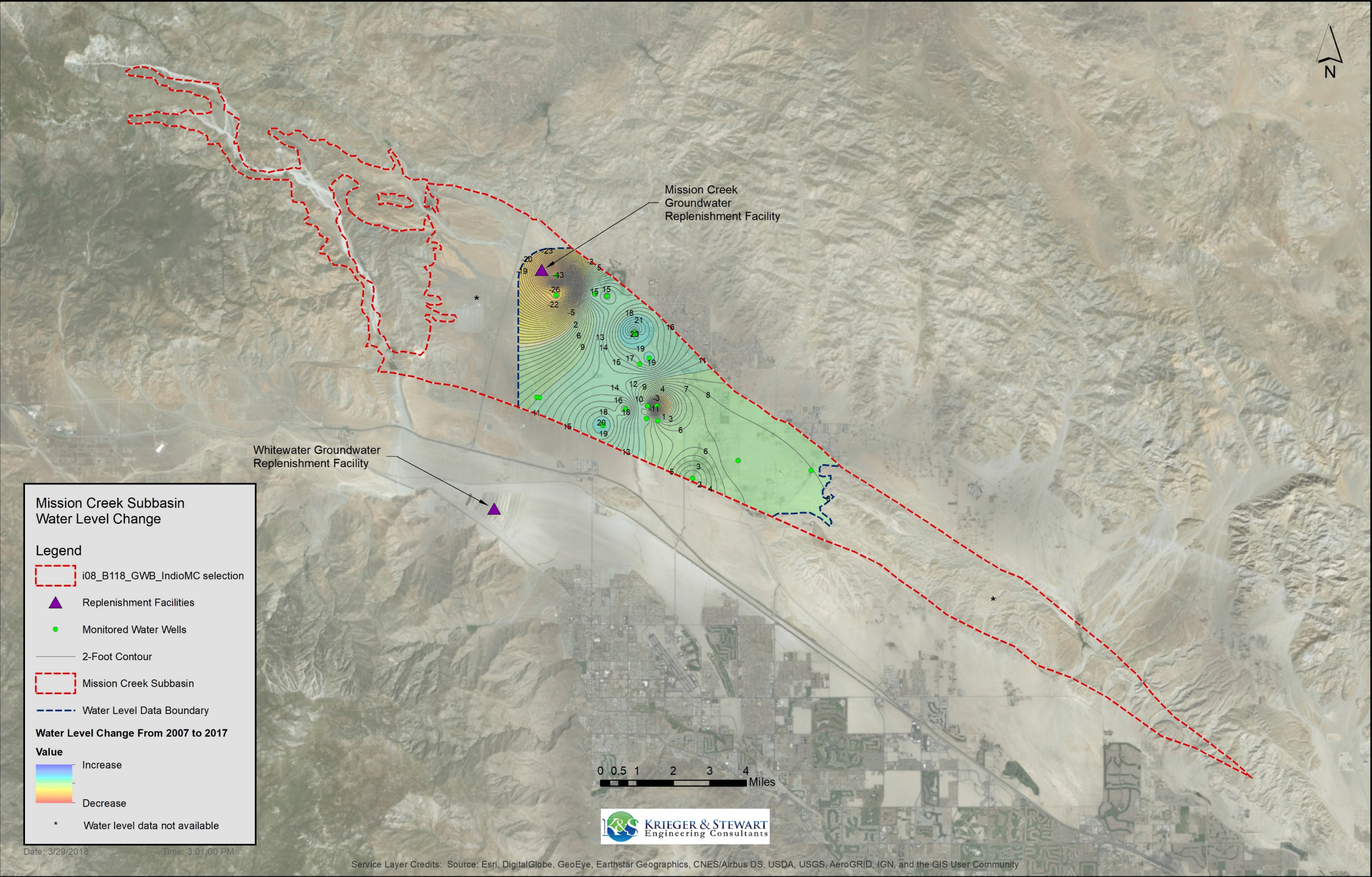


Figure 7-5
Ten-Year (2007 to 2017) Change in Groundwater Storage in the Mission Creek Subbasin



Section 8

Description of Progress

The Mission Creek-Garnet Hill Water Management Plan (MC-GH WMP) was prepared to provide a roadmap for water resources management in the Mission Creek Subbasin and the Garnet Hill Subarea of the Indio Subbasin. To guide the planning and development of the MC-GH WMP, the following mission statement was developed for the MC-GH WMP:

The purpose of the Mission Creek and Garnet Hill Water Management Plan is to manage the water resources to meet demands reliably and protect water quality in a sustainable and cost-effective manner.

In order to meet the overall goal of the MC-GH WMP as described in the Mission Statement, the participating agencies Coachella Valley Water District (CVWD), Mission Springs Water District (MSWD), and Desert Water Agency (DWA)) developed the following water management objectives for the Mission Creek Subbasin and Garnet Hill Subarea:

- Meet current and future water demands with a 10 percent supply buffer
- Eliminate long-term groundwater overdraft and manage the basin such that long-term average groundwater levels do not significantly decline from year 2009 conditions
- Manage and protect water quality
- Minimize adverse environmental impacts
- Comply with state and federal laws and regulations
- Manage future costs

In response to the adoption of Sustainable Groundwater Management Act (SGMA) in 2014, CVWD, DWA, and MSWD submitted the Alternative Groundwater Sustainability Plan (GSP). The Groundwater Sustainability Agencies (GSAs) prepared a SGMA Bridge Document that described how the existing MC-GH WMP meets the requirements of SGMA. These documents were submitted to California Department of Water Resources (DWR) on December 29, 2016.

This section provides an update of the status of the 2013 MC-GH WMP implementation activities during Water Year (WY) 2016-2017.

8.1 IMPLEMENTATION OF PROJECTS AND MANAGEMENT ACTIONS

The sustainability goals described in the SGMA Alternative GSP for the Mission Creek Subbasin identified the following water management elements for implementation:

- Demand Management
- Water Supply Development
- Imported Water Recharge
- Water Quality Protection
- Monitoring and Data Management
- Adaptive Management
- Planning Integration
- Stakeholder Involvement

8.1.1 Demand Management

As retail water purveyors, CVWD and MSWD have implemented significant water conservation programs within the Mission Creek Subbasin.

MSWD has utilized a drought surcharge, commercial audits and outreach, general community outreach, turf rebates, plumbing retrofit program, evaporative cooler audits, tent cards for hotels and restaurants, enhanced leak detection and high-bill follow up, hired conservation-focused staff member, and an audit of its 20 top water users to enhance conservation. Additionally, MSWD has included tiers in its rate structure since the mid-1980s to encourage efficient water use as well as established water waste penalties.

Existing per capita water demand is below the urban water target required by Senate Bill (SB) X7-7. CVWD, DWA, and MSWD have coordinated with private producers to offer assistance in efficiently using any extracted groundwater. Additionally, the Coachella Valley Regional Water Management Group (CVRWMG) has developed a Regional Water Conservation Program to achieve water conservation through outreach and water audits.

8.1.2 Water Supply

CVWD, DWA, and MSWD periodically review their local and imported water supply availability and needs, and acquire additional imported water supplies as needed. Furthermore, they have developed water supply and conservation contingency programs

to provide a supply buffer and explore the feasibility of developing recycled water system(s).

MSWD has reduced total water production by 36 percent since its peak production in 2006, even as population has increased by roughly 30 percent. MSWD has long focused its public outreach and education programs that encouraged wise water use and no waste policies. The effect of water conservation on future groundwater production is expected to result in deferral of the need for new wells to meet demands. CVWD's production from the Mission Creek Subbasin in WY 2016-2017 was 21 percent lower than the peak production in 2009.

MSWD is currently preparing a recycled water feasibility study to evaluate groundwater replenishment by surface spreading and delivery of recycled water to non-potable areas in the Mission Creek Subbasin. This study is funded through the CVRWMG, and is expected to be completed in mid-2018.

8.1.3 Imported Water Replenishment

CVWD and DWA jointly manage imported water replenishment operations in the Coachella Valley using State Water Project (SWP) Exchange water. The goal of the imported water replenishment operations is to deliver as much SWP Exchange water to the Coachella Valley as possible given SWP contract and delivery constraints and Metropolitan Water District of Southern California's (MWD) Colorado River Aqueduct (CRA) operations.

As part of the MC-GH WMP implementation plan, it is the intention of CVWD and DWA to continue annual recharge activities at the Mission Creek Groundwater Replenishment Facility (GRF) provided SWP Exchange water is available to the Coachella Valley, and to increase imported water replenishment to stabilize groundwater levels. Additionally, CVWD, DWA, and MSWD intend to work with planning entities and Riverside County Flood Control and Water Conservation District (RCFCWD) on local storm water capture and low impact development for further replenishment of the Mission Creek Subbasin.

CVWD and DWA are evaluating a water banking program with MWD that could result in increased replenishment at the Mission Creek GRF during periods of high imported water availability.

The CVRWMG is updating the region's Integrated Regional Water Management (IRWMP) Plan to include a Storm Water Resources (SWR) component. The Administrative Draft of the 2018 IRWM/SWR Plan update is anticipated for release in late April 2018. In addition, the City of Desert Hot Springs was pursuing a new master drainage plan for the Mission Creek Subbasin with the Riverside County Flood Control and Water Conservation District

(RCFCWCD). However, according to the RCFCWCD, the City of Desert Hot Springs lost interest in moving the project forward during the California Environmental Quality Act (CEQA) process in 2016 and the plan was shelved.

8.1.4 Water Quality Protection

MSWD's Groundwater Quality Protection Program (GQPP), a septic to sewer program, is ongoing and completion is subject to available funding. The initial Assessment District expired after 10 years; however, MSWD has successfully developed one replacement assessment district and is working on two more. To date, MSWD has converted approximately 7,800 parcels from septic to sewer, with approximately 3,200 parcels still to be converted.

MSWD's GQPP success has triggered the need for additional wastewater treatment capacity. As such, MSWD retained a consultant to design the West Valley Water Reclamation Facility (WVWRF, formerly Regional Wastewater Treatment Plant). The WVWRF will have an initial capacity of 1.5 million gallons per day (MGD) and is anticipated to be operational in 2019. The Regional Water Quality Control Board (RWQCB) has yet to comment on potentially requiring nitrogen removal at the WVWRF. Upon completion of the WVWRF first phase, MSWD will pursue construction of tertiary treatment, recycled water distribution systems, and recharge facilities within the 80-acre site owned by MSWD on 14th Avenue, approximately 1,500 feet (ft) west of Indian Canyon Drive.

Due to decreasing customer demands, MSWD does not use Wells 28 and 30, wells with higher than maximum contaminant level (MCL) concentrations of naturally occurring uranium. Therefore, uranium treatment has been discontinued.

CVWD is administering the 2017 Regional Well Retrofit and Abandonment Program, funded through the CVRWVG (Proposition 84, Round 4) for wells throughout the Coachella Valley Groundwater Basin. The program has \$250,000 in available funding, with up to \$35,000 available per well.

The City of Desert Hot Springs has approved cannabis cultivation (in areas zoned light industrial) within MSWD's service area. MSWD is in the process of evaluating impacts these land uses will have on water use and wastewater discharge quality. It is likely that prior to discharge of wastewater from these users, pretreatment will be required. MSWD continues to collaborate with the City of Desert Hot Springs, RWQCB, and the County of Riverside regarding CEQA compliance processing and land use planning documents.

8.1.5 Monitoring, Data Management and Reporting

In 1995 MSWD sponsored creation of the Groundwater Guardian Team. The Groundwater Guardian is a program of the Groundwater Foundation that provides support and encouragement for communities and teams of all types (cities, counties, watersheds, organizations, agencies, schools, etc.) to begin groundwater awareness activities, motivation to continue these efforts, and recognition for their achievements. Groundwater Guardian teams develop Result Oriented Activities (ROAs) to address the community's groundwater protection concerns and priorities. ROAs fall into many categories including education and awareness, pollution prevention, public policy, conservation, and best management practices.

MSWD is working with the Coachella Valley Conservation Commission (CVCC) and Coachella Valley Mountains Conservancy (CVMC) to construct two monitoring wells. The project is aimed at developing a more comprehensive understanding of water depths and its relation to mesquite hummocks health within the Willow Hole Conservation Area. The monitoring wells will be constructed in the Mission Creek Subbasin along its southerly boarder with the Garnet Hill Subarea. The wells are scheduled to be constructed in the Spring of 2018.

The 2013 MC-GH WMP outlines improved reporting of water resources data in Engineers' Reports, such as the inclusion of summaries of annual watershed precipitation, stream flow data, and additional hydrographs. Furthermore, CVWD, DWA, and MSWD intend to develop a regional water resources database to facilitate data sharing between participating agencies. CVWD and DWA have included additional monitoring data in their respective 2017 Engineer's Reports and plan to incorporate additional information in the future reports as appropriate.

8.2 ADAPTIVE MANAGEMENT

CVWD, DWA, and MSWD have laid out plans in the 2013 MC-GH WMP to continue the Basin Management Committee structure, consisting of the general managers from each agency. The agencies will also develop adaptive management procedures to monitor management progress and adjust as needed. The adaptive management process consists of the following steps: 1) Planning, 2) Implementation, 3) Monitoring, 4) Analysis and 5) Modification. The key to the adaptive management process is one of continual evaluation and program adjustment to meet the overall Mission Creek Subbasin management objectives.

As stated earlier, the SGMA Bridge Document requires the preparation of an MOU between the parties (including DWA, CVWD and MSWD) to jointly manage the Mission Creek Subbasin. A draft MOU has been prepared and is being reviewed by the agencies.

8.3 CURRENT IMPLEMENTATION STATUS

The recommended actions identified in the SGMA Alternative GSP were described in Table 6-2 of that document. A revised version of Table 6-2, with the current updated status, is presented as **Table 8-1**. Projects and initiatives listed as “Complete” in Table 6-2 of the SGMA Alternative GSP are not included in **Table 8-1**.

Table 8-1
Implementation of Projects and Management Actions
in the Mission Creek Subbasin

List	Project/Program	2013 Readiness to Implement	2016 Recommended Action	2017 Implementation Status
A - Water Conservation				
A-1	Continue to implement urban water conservation programs	Ongoing	Continue	Ongoing
A-2	Private pumper conservation program	Near-term	Pursue	Ongoing
A-3	Track water conservation effectiveness through UWMPs	Ongoing	Continue	Completed in 2015; re-evaluate in 2020.
B - Water Supply				
B-1	Construct additional wells as needed to meet future demands	Mid-term	Agency decision	Deferred until need exists
B-2	Locate new wells to minimize interference with adjacent wells	Mid-term	Agency decision	Deferred until need exists
B-3	Periodically review imported water supply availability and needs	Mid-term	Continue	Ongoing
B-4	Acquire additional imported water supplies as needed	Mid-term	Continue	Ongoing
B-5	Develop recycled water system(s) if feasible	Mid-term	Phase or Defer	MSWD conducting recycled water feasibility study

**Section 8 -
Description of Progress**

List	Project/Program	2013 Readiness to Implement	2016 Recommended Action	2017 Implementation Status
B-6	Develop water supply and conservation contingency programs to provide supply buffer	Mid-term	Pursue	Proposed
B-7	Construct SWP extension	Long-term	Defer	Deferred pending California WaterFix decision
C - Imported Water Replenishment				
C-1	Continue existing imported water replenishment program	Ongoing	Continue	Ongoing
C-2	Increase imported water replenishment to stabilize groundwater levels	Near-term	Pursue	Ongoing
C-3	Expand recharge basin capacity (if needed)	Long-term	Defer	Deferred until need is demonstrated
C-4	Work with planning entities and RCFCWCD on local stormwater capture and low impact development	Near-term	Pursue	New drainage plan on hold
D - Water Quality Protection				
D-1	Convert from septic to sewer in MSWD area	Ongoing	Continue	Ongoing based on available funding
D-2	Expand Horton WWTP and install nitrogen removal	Near-term	Continue	Deferred until need exists; Nitrogen Impact Study completed in 2017, pending RWQCB comments
D-3	Construct WWRF with nitrogen removal	Near-term	Phase	Under design; on-line by 2019; nitrogen removal pending RWQCB comments
D-4	Recharge Regional WWTP Effluent in MCSB	Mid-term	Pursue	Evaluated as part of MSWD recycled water feasibility study
D-5	Evaluate conversion of septic to sewer in CVWD area	Long-term	Pursue	Deferred until sufficient growth occurs to justify cost
D-6	Evaluate occurrence and risk of nitrate migration	Mid-term	Agency decision	Deferred until need exists
D-7	Participate in valley-wide salt/nutrient management plan (SNMP)	Near-term	Pursue	Completed; pending RWQCB acceptance

List	Project/Program	2013 Readiness to Implement	2016 Recommended Action	2017 Implementation Status
D-8	Develop and calibrate water quality model in conjunction with SNMP	Near-term	Part of SNMP	Mass balance model developed for SNMP; MSWD developing model to evaluate recycled water recharge
D-9	Manage groundwater levels in MCSB to minimize migration of warm brackish water from DHS Subbasin	Mid-term	Linked to C-2	Ongoing; increasing water levels noted in DHS Subbasin
D-10	Evaluate occurrence and risk of uranium migration	Near-term	Agency decision	Treatment discontinued due to decreased demands
D-11	Track potential regulatory actions of CDPH and USEPA that could affect drinking water regulation compliance	Near-term	Pursue	Ongoing
D-12	Coordinate with appropriate regulatory agencies responsible for preventing contaminating activities in well capture and recharge zones	Near-term	Pursue	Ongoing
D-13	Work cooperatively with Riverside County DEH to ensure well construction, abandonment, destruction policies are followed	Near-term	Work with Riverside County	CVWD is administering CVRWGM grant funding for the 2017 Regional Well Retrofit and Abandonment Program
D-14	Develop a cooperative program with Riverside County DEH to identify and cap/destroy unused wells	Near-term	Pursue	Ongoing
D-15	Review and comment on development proposals, environmental documents and land use plans to protect water quality		Continue	Ongoing – MSWD evaluating water quality impacts of cannabis cultivation proposals
D-16	Support Groundwater Guardian Program to educate public on water quality		Continue	Ongoing
D-17	Desalination of Colorado River recharge water	Long-term	Defer	Deferred pending need and economics
D-18	Desalination of East MC groundwater	Long-term	Defer	Deferred pending need and economics

List	Project/Program	2013 Readiness to Implement	2016 Recommended Action	2017 Implementation Status
E - Monitoring				
E-1	Summarize precipitation data annually to estimate natural inflows to basins	Near-term	Pursue	Completed
E-2	Install a CIMIS station in DHS area	Near-term	Pursue	CVWD conducted review of existing ET data in 2017; potential update to ET mapping being evaluated
E-3	Update well canvas and determine well operational status	Near-term	Update Existing	Ongoing
E-4	Continue to monitor public and private wells for water level and quality	Ongoing	Continue	Ongoing – DWA added monitoring of three power plant wells during 2017
E-5	Incorporate additional private wells in routine water level and quality monitoring	Near-term	Pursue	DWA added monitoring of three power plant wells during 2017 Additional wells are monitored as needed to fill data gaps
E-6	Install production meters on private wells not having meters	Near-term	Continue	All well required to report for assessment purposes are metered
E-7	Install water level data loggers in 5-10 monitoring wells	Near-term	Pursue	Deferred until need is demonstrated
E-8	Monitor local surface runoff quality	Near-term	Defer	Deferred
E-9	Investigate viability of conducting geophysical survey near recharge basin	Near-term	Investigate	Deferred until need is demonstrated
E-10	Construct 1-2 new monitoring wells to document recharge activities	Near-term	Investigate	Deferred until need is demonstrated
E-11	Construct 1-3 new monitoring wells to document water levels near mesquite hummocks	In Progress	By others	MSWD completed design and will construct two wells in Spring 2018.
E-12	Conduct flow loss study on Whitewater River	Near-term	Defer	Deferred

List	Project/Program	2013 Readiness to Implement	2016 Recommended Action	2017 Implementation Status
E-13	Periodic groundwater model update and recalibration; combine with Whitewater model	Near-term	Pursue	Deferred until next WMP update
E-14	Conduct ground surface elevation surveys	Near-term	Defer	Deferred
E-15	Construct 1-3 new monitoring wells to document basin inflows	Mid-term	Investigate	Deferred
E-16	Investigate additional stream gauging in MCSB	Mid-term	Defer	Deferred until need is demonstrated
F - Data Management				
F-1	Improved reporting of water resources data in Engineers' Reports	Ongoing	Pursue	Ongoing
F-2	Develop valley-wide water resources database	Near-term	Investigate, could be done by CVRWGMG	Deferred
G - Other				
G-1	Continue existing basin management committee structure	Near-term	Continue	Ongoing
G-2	Develop adaptive management procedures to monitor management progress and adjust as needed	Mid-term	Pursue	Ongoing

8.4 SUMMARY OF PROGRESS

The Mission Creek Subbasin GSAs continue to implement the goals and programs of the 2013 MC-GH WMP. Groundwater production remained about 20 percent less than the historical highs in the mid-2000s. The results of the on-going basin monitoring program demonstrate the significant progress being made toward the goal of eliminating groundwater overdraft. Since 2004, the Mission Creek Subbasin has gained over 40,000 AF of groundwater in storage.

Groundwater level monitoring demonstrates that most of the Subbasin exhibited a water level decline in the past year. The water level decline is the residual effect of low imported replenishment water deliveries in previous years due to the recent drought.

Continued implementation of 2013 MC-GH WMP programs is critical to meeting the goals

of the plan. In the coming water year, the GSAs will continue to pursue their successful water conservation efforts. Increased imported water replenishment is anticipated as a result of increased deliveries from MWD.

The GSAs continue to evaluate the effectiveness of their groundwater monitoring program; additional wells are added to the program as the need arises.

Section 9

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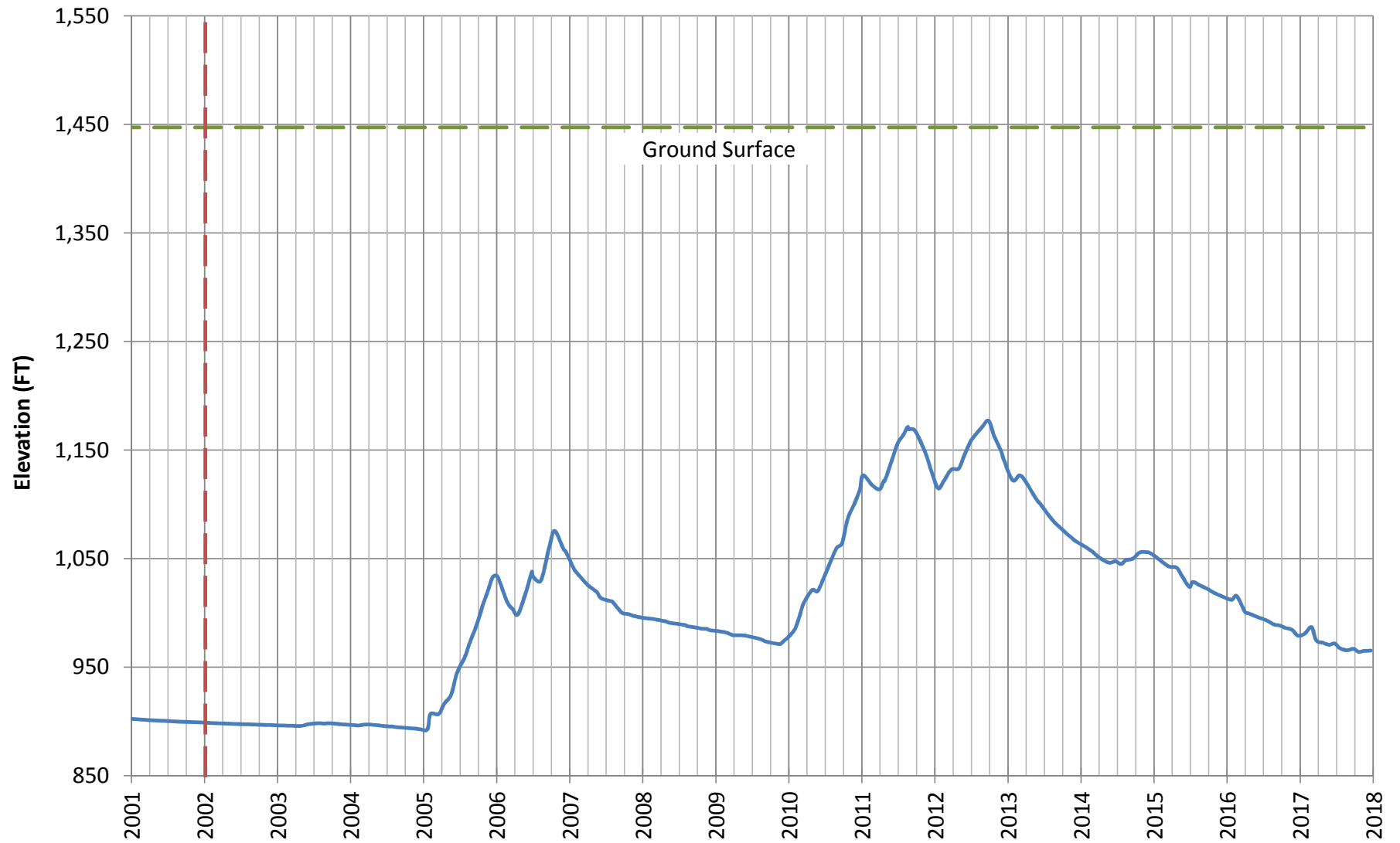
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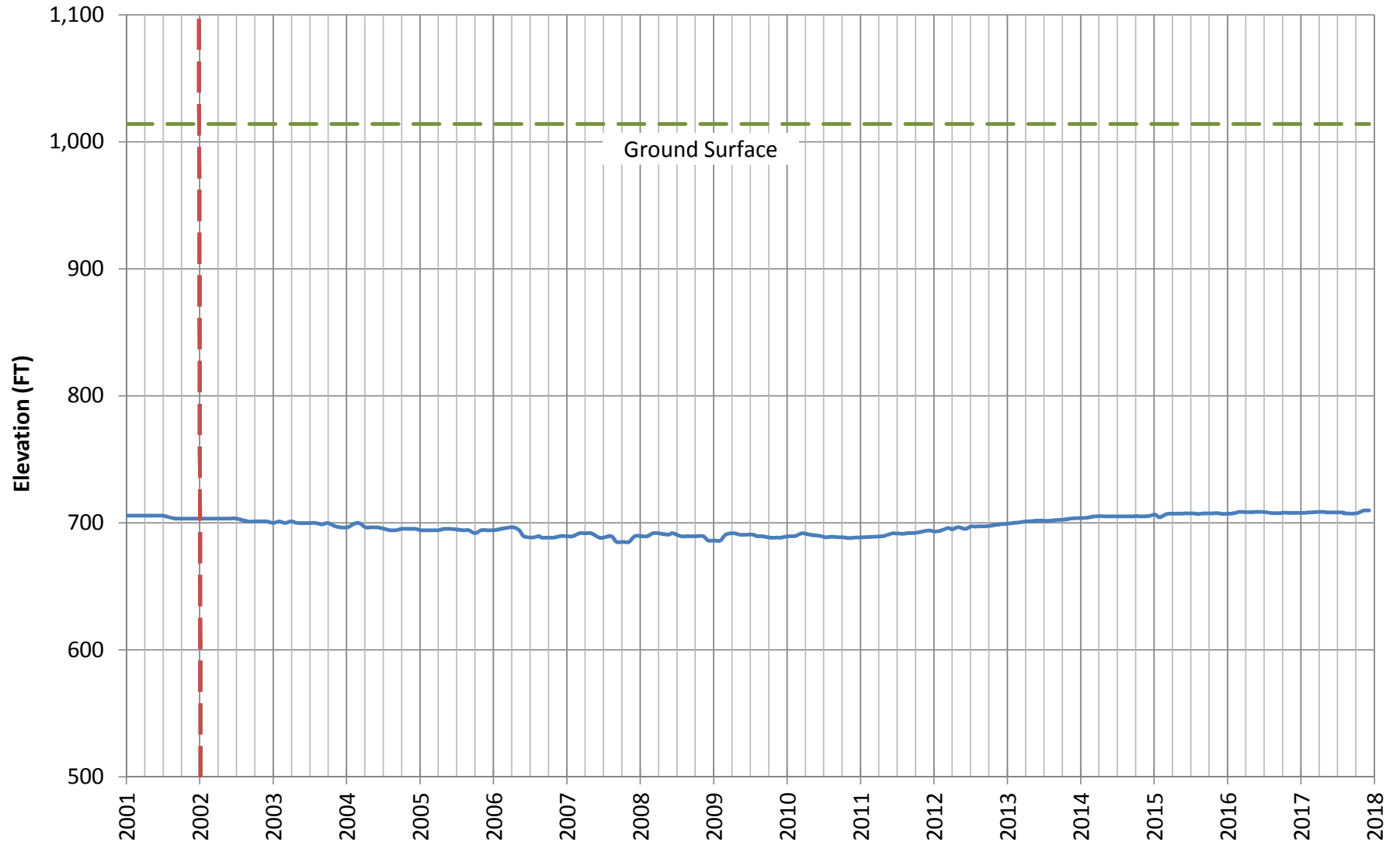
APPENDICES

Appendix A Representative Groundwater Elevation Hydrographs

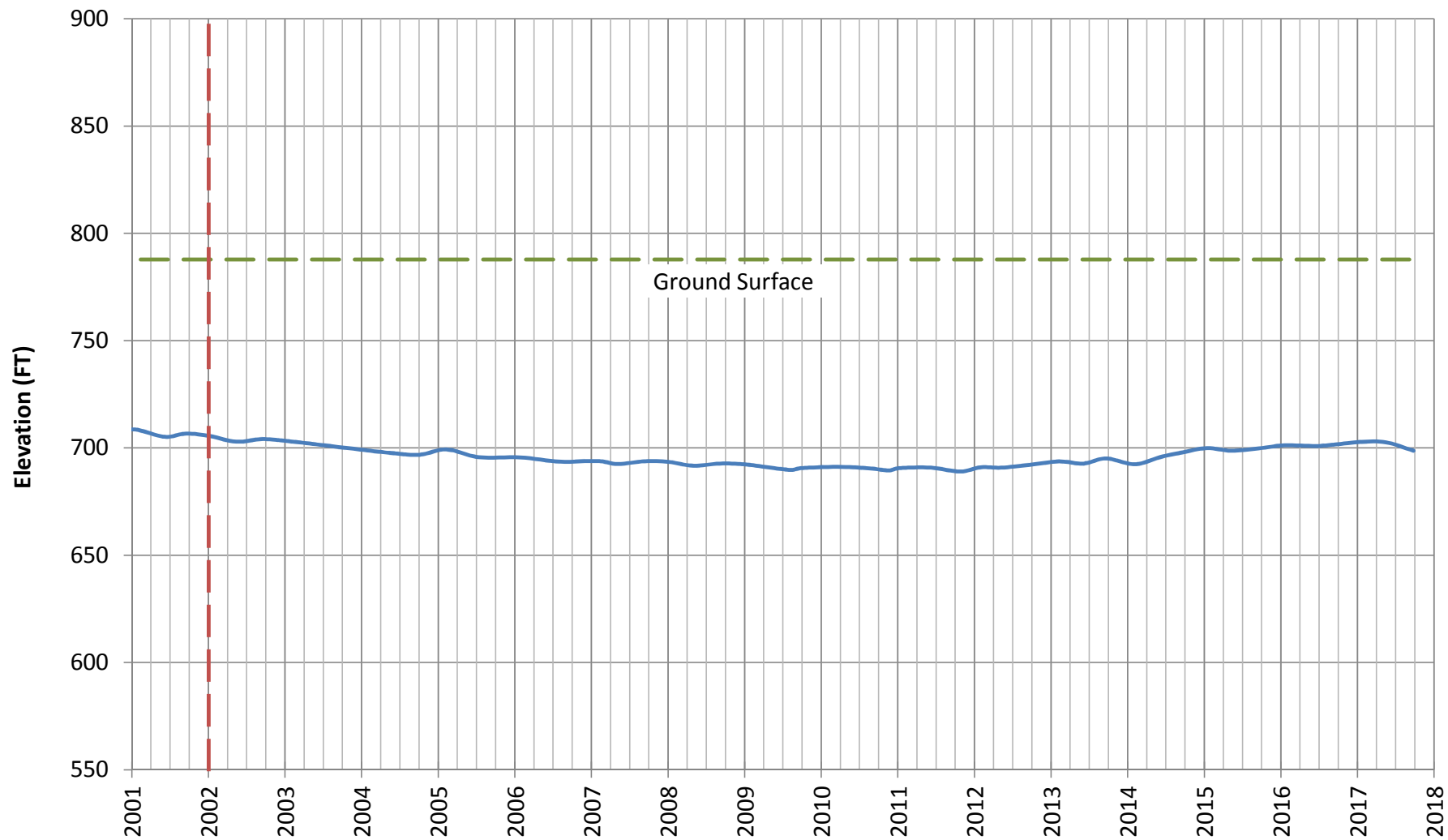
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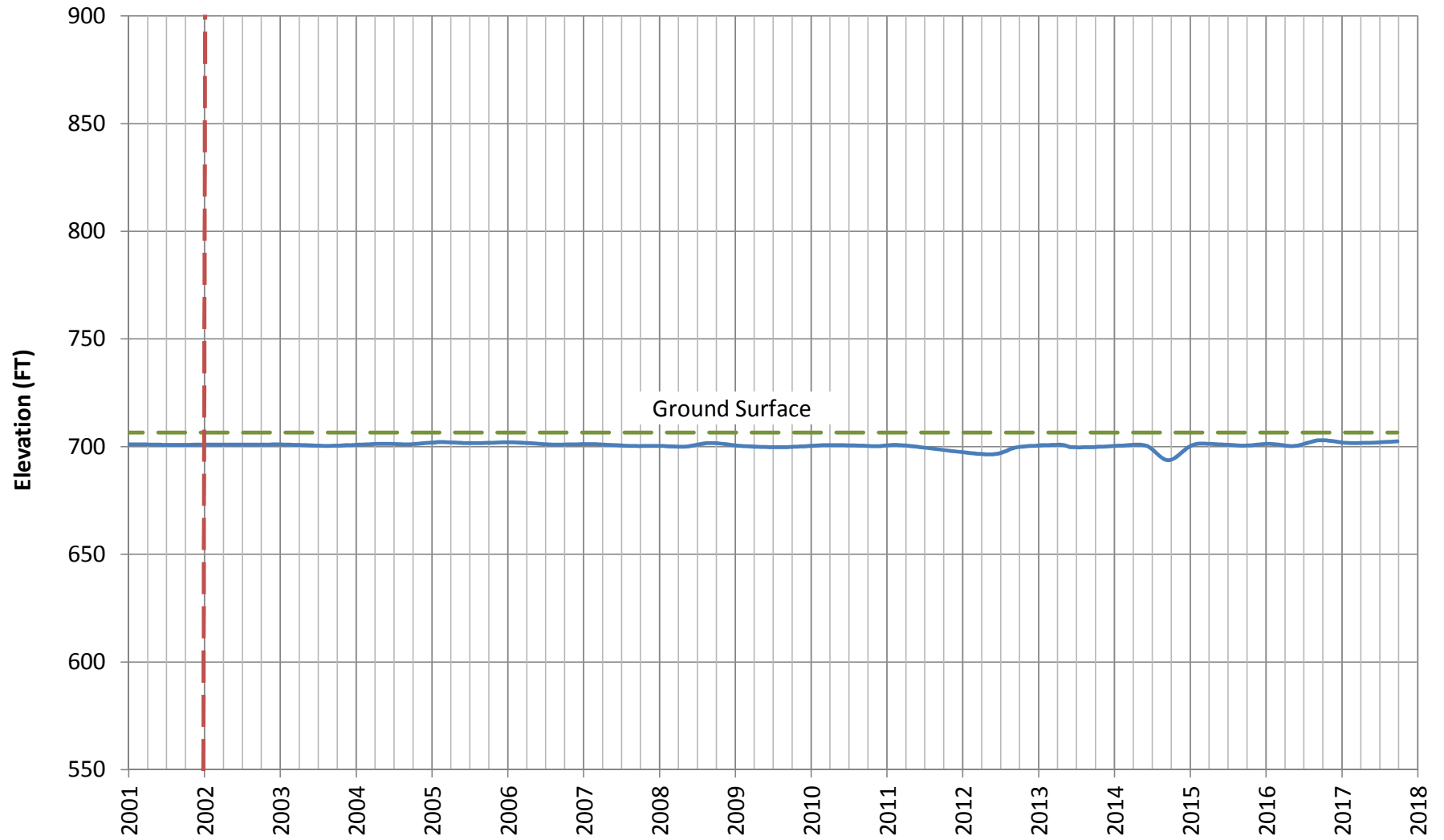
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