Elsinore Valley Municipal Water District

DROUGHT CONTINGENCY PLAN

APRIL 2018

Prepared for the

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

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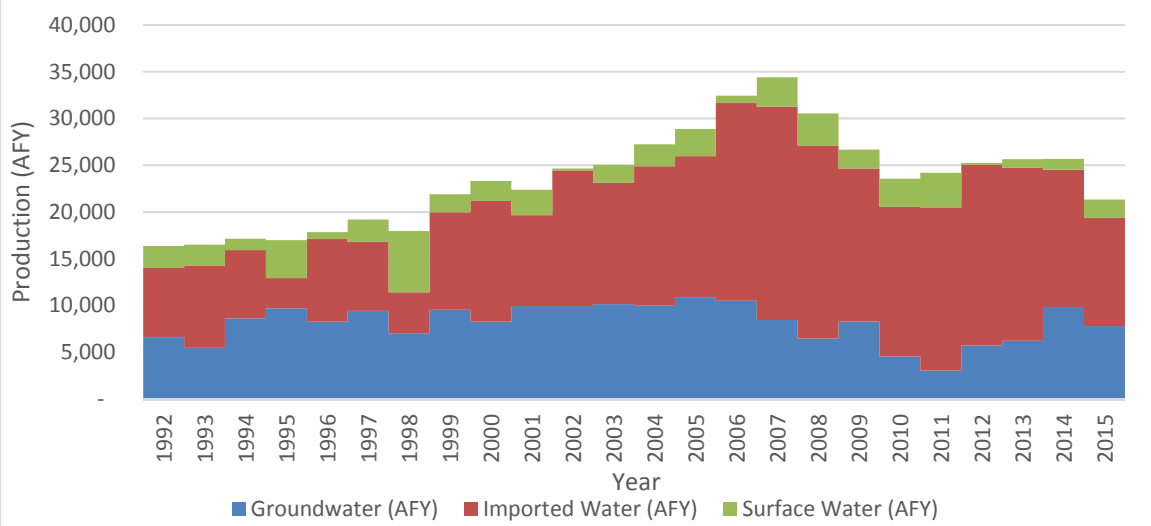
E.1 Introduction

California was in the fifth year of a significant drought resulting in severe impacts to California's water supply ability to meet water demands in the state. Early 2017, wet weather brought some relief to all water consumers. The implementation of the Governor's Executive Order imposing restrictions on water use, a first in California's history, underscore the gravity of the water crisis in California during drought conditions.

Elsinore Valley Municipal Water District (EVMWD) is located in Southern California in the western portion of Riverside County, one of the fastest growing areas in California. EVMWD provides water supply and wastewater collection services to approximately 148,587 residential customers, 3,767 institutional, commercial, and industrial users in the cities of Lake Elsinore, Canyon Lake, Wildomar, parts of Murrieta, Corona, unincorporated areas of Riverside County, and Temescal System. The current water demand is approximately 25,500 acre-feet per year (AFY). The demand is expected to nearly double by 2040 to approximately 50,000 AFY. The average yearly rainfall in the area is about 12-inches.[1] The average yearly evapotranspiration (ETo) for EVMWD service area Zone 6 is about 49.4 inches (California Irrigation Management Information System (CIMIS)).

Figure E.1 – EVMWD Historical Water Production



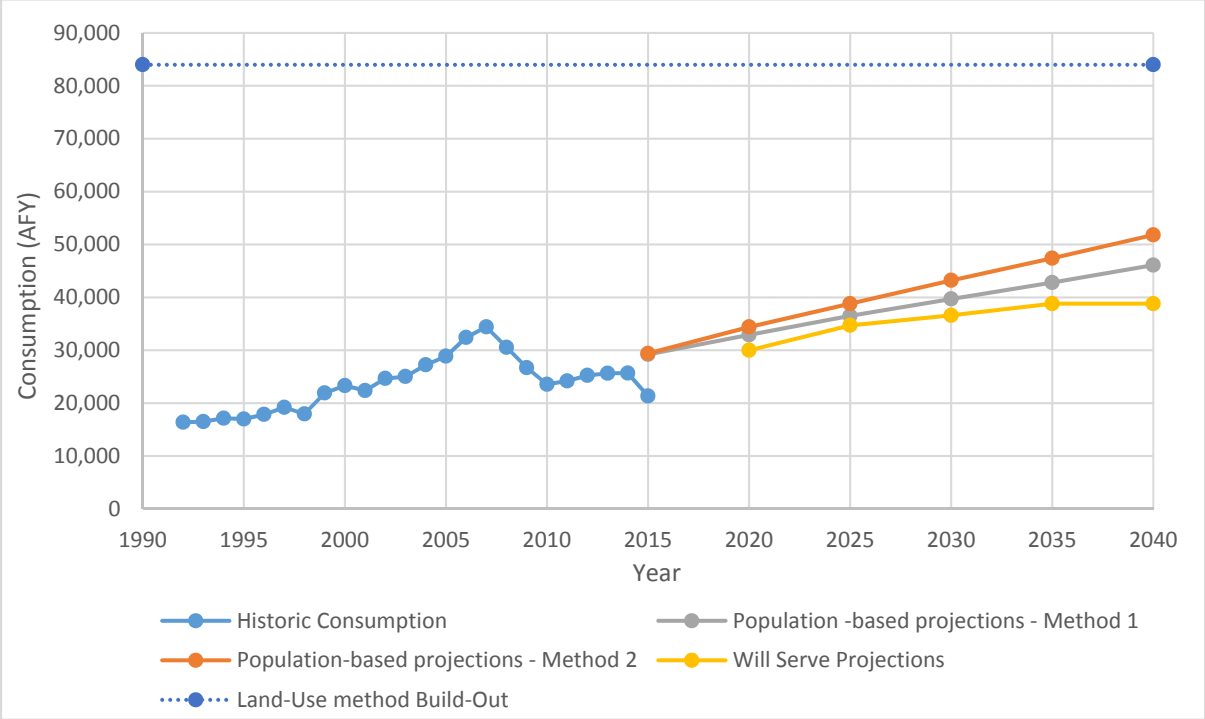
EVMWD has three primary sources of water supply: local groundwater, local surface water, and imported water obtained via the California State Water Project (SWP) and the Colorado River Aqueduct. Figure E.1 shows a graphical representation of the historical

[1] 2011 Elsinore Valley Municipal Water District Urban Water Management Plan

water production over the past twenty years. The average annual water production from 2005-2013 is approximately 27,700 AFY with the highest production occurring in 2007 (33,800 AFY) and the lowest production in 2011 (23,700 AFY). The decline in overall water production from 2007 can be attributed to the Great Economic Recession coupled with increased water conservation within EVMWD's service area.

EVMWD estimated future demands for the next 25 years utilizing three different methods, and estimated demand at build-out for EVMWD's service area. Figure E.2 indicates water demand projections developed using Method 2 are most conservative and are considered appropriate for the purposes of water supply planning. Water demand in year 2040 is projected to be approximately 51,600 AFY. The build-out water demand (represented via a dotted line on Figure E.2) for the EVMWD service area is approximately 84,000 AFY. The comparison of EVMWD's existing and projected water demands indicates a potential deficit of approximately 16,100 AFY by the year 2040.

Figure E.2 – Summary of Demand Projections



EVMWD faces a number of challenges stemming from its reliance on imported water. Uncertain long-term reliability issues associated with drought shortages, climate change, seismic events, environmental impacts, and flow restrictions in the Sacramento-San Joaquin Delta (Delta), which is the origin for the SWP, and salinity of the Colorado River supplies. EVMWD also faces an additional financial burden to fund infrastructure improvements as the cost of imported water is expected to increase significantly into the

foreseeable future. In addition, more funds may need to be allocated for future imported water purchases. Metropolitan Water District of Southern California (MWD); the imported water supplier to EVMWD, routinely increases imported water costs in order to improve water supply and deliver system reliability.

EVMWD's local groundwater resources are limited. Pumping is restricted due to declining groundwater levels in local groundwater basins. Trace amounts of arsenic in some of the local groundwater sources present restraints on production. Regulatory challenges to protect the groundwater basin water quality limit the use of existing groundwater supply sources. The presence of contaminated groundwater potentially requires the construction of expensive water treatment facilities or development of an alternate source of supply including development of local desalination facilities to supplement water supply. EVMWD has taken a number of steps to conserve water already, including implementing a water conservation program that achieved a 30% reduction in water use; instituting a Landscape Ordinance to eliminate irrigated turf areas in new developments; maximizing wastewater reuse with 100% of recycled wastewater being used for landscape irrigation and environmental enhancement; and by implementing a deep injection aquifer storage and recovery project reducing reliance on imported water by 16%. As a result, and with the goal of involving local stakeholder participation, EVMWD considers the need for the development of a Drought Contingency Plan (DCP). The DCP will allow EVMWD to proactively offset the direct impacts of past and current droughts conditions. The DCP will provide a plan to prepare for and effectively manage future drought impacts.

E.2 Approach and Organization of Drought Contingency Plan

The DCP is developed based on the existing water supply guidelines including: EVMWD's Water Shortage Ordinance 225, which was drafted and updated for consistency with MWD's Water Surplus and Drought Management Plan (WSDMP) and the Western Municipal Water District's (WMWD) Water Shortage Contingency Plan (WSCP). The DCP includes EVMWD's previous planning efforts and adopted various components from different planning projects. The DCP includes six required elements of the Bureau of Reclamation's (BOR) 2016 WaterSMART guidelines including:

- Drought Monitoring
- Vulnerability Assessment
- Mitigation Actions
- Response Actions
- Operational and Administrative Framework
- Plan Update Process

E.2.1 Drought Monitoring

EVMWD has established a process for monitoring near and long-term water availability, and a process for predicting the probability of future droughts or confirming an existing

drought is present utilizing various tools, data, sources, and monitoring procedures. The EVMWD Drought Task Force (DTF) reviewed and approved the data, which is included in the DCP. This DCP consists of preparing population projections, determining water supply availability, verifying water demand, monitoring reservoir and ground water levels, forecasting weather, projecting climate change and projecting any potential change on water usage due to new development, ranching, and golf course developments.

EVMWD Water Resources Department will monitor the weather indices such as the Palmer Drought Severity Index (PDSI) and the Standardized Precipitation Index (SPI). EVMWD will also update the current drought stages consistent with Ordinance 225 and MWD water shortage stages. Table E.1 outlines the triggers for determining the drought level of all five different drought stages.

Table E.1 – Drought Triggering Criteria

Drought Stage	Water Shortage Contingency Plan		Required Supply Reduction%
	MWD[1]	EVMWD Ordinance 225[2]	
1 - Normal	Baseline Water Use Efficiency	Stage 1 – Water Supply Watch	0 % to 5% (voluntary)
2 - Moderate	Water Supply Watch / Water Supply Alert	Stage 2 – Water Supply Alert	6 to 10%
3 - Severe	MWD's Water Shortage Allocation Plan Shortage Levels 1 through 4	Stage 3 – Mandatory Waste Reduction	11 to 25%
4 - Critical	MWD's Water Shortage Allocation Plan Shortage Levels 5 through 7	Stage 4 – Mandatory Outdoor Reductions	26 to 40%
5 - Extreme	MWD's Water Shortage Allocation Plan Shortage 8, 9,10 or greater	Stage 5 – Mandatory Targeted Indoor/Outdoor Reductions – Catastrophic Failure or "Immediate Emergency"	40 to >50%

The DTF, in coordination with EVMWD, will monitor water supply and demand conditions on a regular basis. This will be performed to determine and recommend when those specified "triggers" have been reached which warrant the initiation or termination of the respective stages of the drought.

Assessment of water availability (surface water levels, groundwater levels, precipitation) and Drought Indices conditions will be performed by the EVMWD Water Resources Department. Water availability data will be provided to the DTF. The following steps will be conducted monthly to assess the drought stages.

1. Check the status of executive orders from state which require reduction in water usage.
2. Monitor the PDSI and SPI index number from the National Oceanic and Atmospheric Administration (NOAA).
3. Check the status of regional water supply availability and determine the presence of a water shortage which will impact EVMWD, and would require water use reductions.
4. Collaborate with EVMWD's Engineering, Operations and Water Resources Departments to determine operability of infrastructure; such as storage reservoirs, main pipelines, pumps, water treatment plants, or groundwater wells. Confirm with these Departments if infrastructure conditions require a reduction in water use.
5. Verify if alternative water supply is limited or unavailable which would trigger any requirement to reduce water usage.
6. Verify if a decline of groundwater and surface water levels warrant a reduction in water usage.
7. Check MWD's surface water availability.

E.2.2 Vulnerability Assessment

The vulnerability assessment is the process of identifying, quantifying, and prioritizing the key factors that can negatively affect water supply reliability. The vulnerability assessment methodology involves the following activities:

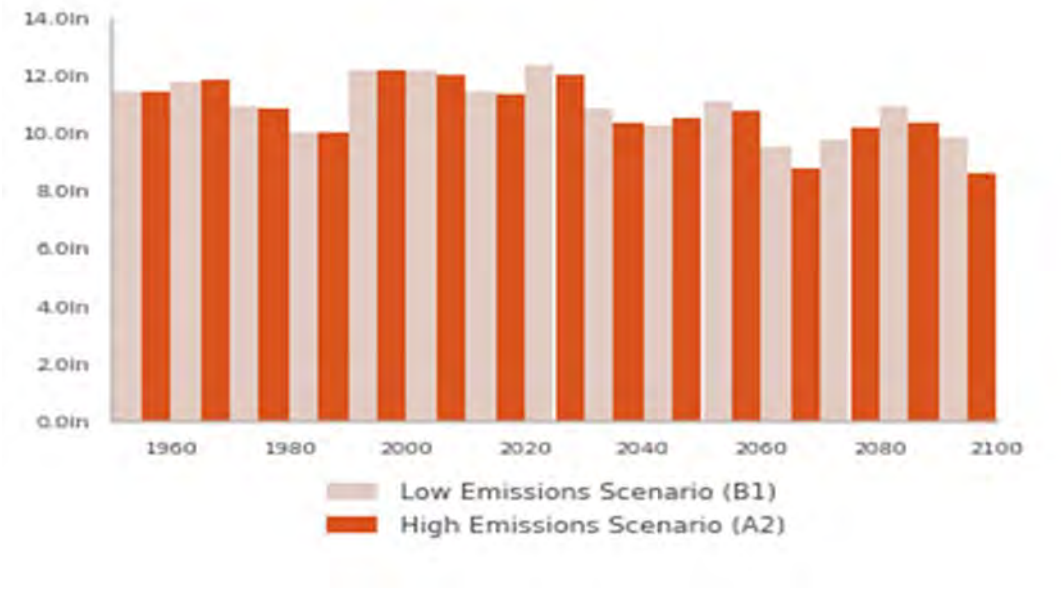
1. Develop and define possible impacts of drought including frequency and magnitude on an area by the effects of projected climate change and predicted trends.
2. Review the impact of drought on different customer sectors such as agriculture, fishery and wildlife, health, commercial, and industrial.
3. Evaluate impacts of climate change on EVMWD's water supplies and review the impacts to Lake Elsinore and Canyon Lake. These activities include reduced lake levels, deteriorated water quality, reduced oxygen levels resulting from toxic algae blooms, and increased fish kills.

The 2010 California DCP[2] identifies regions relying heavily upon surface water that could be particularly affected by drought as runoff becomes more variable and more demand is placed on groundwater. Climate change and a projected increase in California's population will affect regional water demand. The California Energy Commission developed the Cal Adapt software model that considers the influence of greenhouse gas emissions on the environment. This model indicates the average precipitation will decrease every decade in the foreseeable future. The model indicates the average precipitation will decrease in

[2] "California Drought Contingency Plan 2010." California Department of Water Resources.

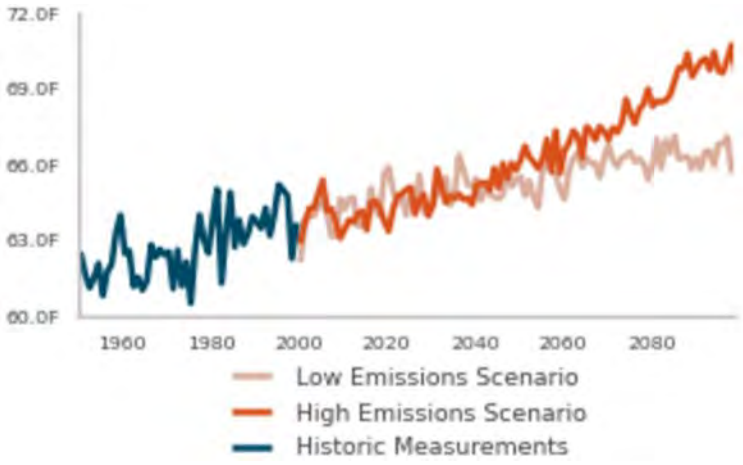
EVMWD's service area in both low emission and high emission scenarios as shown in Figure E.3.

Figure E.3 – Historical and Projected Precipitation for Lake Elsinore Area



The temperature prediction model, developed by the California Energy Commission utilizing Cal Adapt software, projected low and high emission temperatures begin to diverge at mid-century such that by the end of the century, temperatures for the high emissions scenario, are twice as high as the temperatures projected for the low emissions scenario, as shown in Figure E.4.

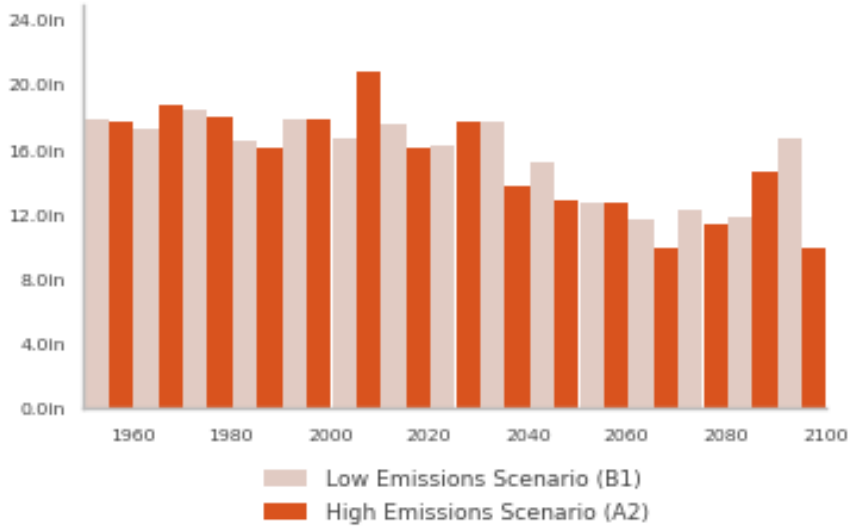
Figure E.4 – Historical and Projected Temperatures for Lake Elsinore Area



Snowpack plays a vital role in California's water supply. Snowpack replenishes the state's reservoirs in advance of the dry summer and fall months, providing one third of the water used by California's cities and farms. Projections of further reduction of snowpack, runoff and soil moisture pose higher risks to the water supply needed to maintain normal conditions in cities, ecosystems, and agriculture.

Figure E.5; developed using Cal Adapt[3] software, shows historical and the projected amount of water stored in the Sierra Nevada Lakeshore Area for low and high emissions scenarios.

Figure E.5 – Historical and Projected Snowpack in the Sierra Nevada Lakeshore Area



Sea level rise may affect water supply. Two major effects of global sea level rise; due to climate change and persistent drought, are the loss of land-based ice, such as glaciers, and ice sheets due to increased melting and thermal expansion caused by warming of the oceans. In addition, drought can increase wildfire potential, encourage invasive species, and increase forest mortality, resulting in water quality and long-term watershed related concerns.

EVMWD is subject to climate vulnerabilities; including more frequent and longer drought periods, reduced imported water supply availability and impacted water supply reliability. Droughts will impact local water availability and water quality as follows.

1. The reliability and availability of imported water will play a key role in EVMWD's water resource management strategies. Hydrologic conditions in tributaries that

[3] V1.cal-adapt.org, California Energy Commission

feed the SWP; originating from the California Northern Sierras and the Colorado River Aqueduct which originate from the Colorado River Basin, affect the quantity and quality of imported water available to meet water demands and to replenish regional storage. Reductions to the Sierra snowpack levels would reduce the availability of water that would normally fill the SWP reservoirs. This would require the State to further reduce SWP "Table A" entitlements, including water delivery allocations to EVMWD.

2. The current and future reliability at the Canyon Lake Water Treatment Plant (CLWTP) depends on hydrology in the Lake Elsinore Area and San Jacinto River Watershed. This water availability is reduced during dry year conditions. A review of historical data indicates a reduction of up to 50% in available natural recharge at Canyon Lake during dry years from average or normal year flows.

3. Local surface water quality would decrease. Warming temperatures will result in lower dissolved oxygen levels in water bodies. Warming water temperatures promote algal blooms and in turn enhance eutrophication. Eutrophication is defined as an excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen. Changes in stream flows with increased ETo may affect pollutant concentrations in water bodies resulting in poor water quality.

4. Low stream flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations.

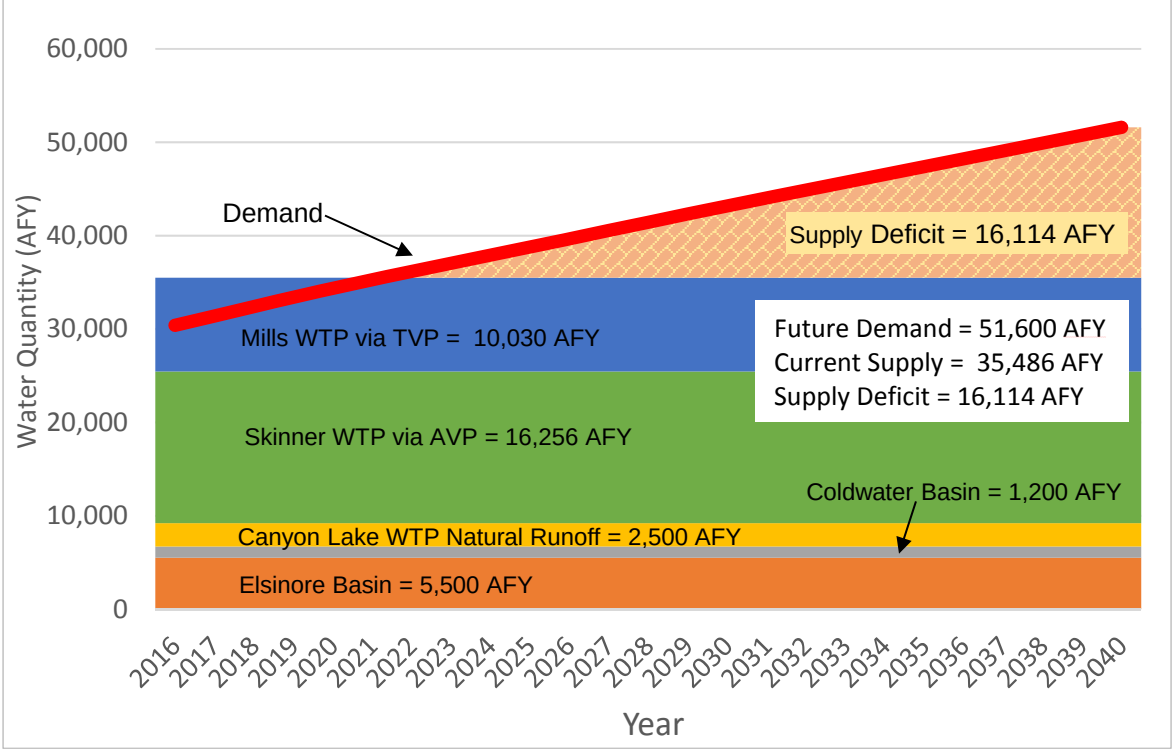
E.2.3 Mitigation Actions

"Mitigation" – is taking steps ahead of time to prevent known potential impacts from a natural disaster. Mitigation measures are actions, programs, and strategies implemented before drought occurs to address potential risks and impacts. These actions are intended to decrease water availability and water supply reliability vulnerabilities and reduce the need for response actions. To address the uncertainty associated with water supply reliability due to climate change, extended drought conditions, and the increasing cost of imported water, EVMWD embarked upon preparing a comprehensive Integrated Resources Plan (IRP). The IRP is a long-term strategy for providing reliable water supply to its growing customer base.

The IRP considers a 25-year planning horizon covering years 2016-2040. Figure E.6 depicts a comparison between current supplies and projected demand for EVMWD's service area for the next 25 years. At the end of the planning horizon water demand is estimated to be approximately 51,600 AFY. Overall supply available to EVMWD is estimated to be approximately 35,500 AFY. The IRP identified a deficit of approximately

16,114 AFY by 2040. The IRP considered 44 supply alternatives and evaluated water supply scenarios to address this deficit including additional supply options such as producing water from untapped groundwater basins, indirect potable reuse, local brackish and recycled water desalination, sea water desalination, water exchanges and transfers, and continued water conservation.

Figure E.6 – Demand Versus Current Supply



A hybrid water supply scenario was selected to satisfy EVMWD's future water supply deficit. This water supply scenario exhibits the following:

- Optimizes the use of EVMWD's local water supply sources.
- Has an effective unit cost relative to current and forecasted cost of imported water.
- Has one of the lowest Total Dissolve Solids (TDS) concentration values. A critical factor for EVMWD given the regulatory and financial implications of TDS management in the groundwater basins.
- Has the highest reliability relative to the other scenarios.
- Satisfies the highest priority set forth by the EVMWD Board of Directors.

Table E.2 lists the water supply projects that constitute the hybrid scenario. These projects comply with the overarching objectives of the IRP as established by EVMWD's Board of Directors.

Table E.2 – Scenario 7 (Hybrid) Water Supply Projects in Relation to IRP Objectives

Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)	Phase and Status
1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona	5.56	6,223	6,223	1.00	30.6	3,547,000	847	400	Phase 1 Consultant has been retained to further evaluate and refine alternative options. Report is expected in approximately 2-3 months.
2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Desalination Treatment	0.89	1,000	500	0.50	11.3	227,000	593	800	Phase 1 Ongoing negotiations with developer to define location of wells.
2A-2. Pump Bedford Groundwater via the TVP. No Treatment	1.37	1,300	1,045	0.80	6.6	345,000	542	800	Phase 1 EVMWD has selected a consultant to design the well equipping. Construction anticipated in 2018.
3D. Palomar Well Replacement	0.50	560	560	1.00	3.1	106,000	496	400	Phase 1 EVMWD has completed design of the well and construction completion anticipated in 2018.
4A. Extract Groundwater from Warm Springs Basin - No Desalination Treatment	0.89	1,000	1,000	1.00	6.9	428,000	794	1,000	Phase 1 EVMWD has selected the consultant to study the groundwater basin. Design is expected to begin in 2018 and construction in 2020.
5E. Modify Operation of Canyon Lake	7.00	1,500	1,125	0.75	5.9	502,000	589	800	Phase 2 EVMWD has selected a consultant to prepare CLWTP – Facilities Master Plan. This study will be the basis to define the

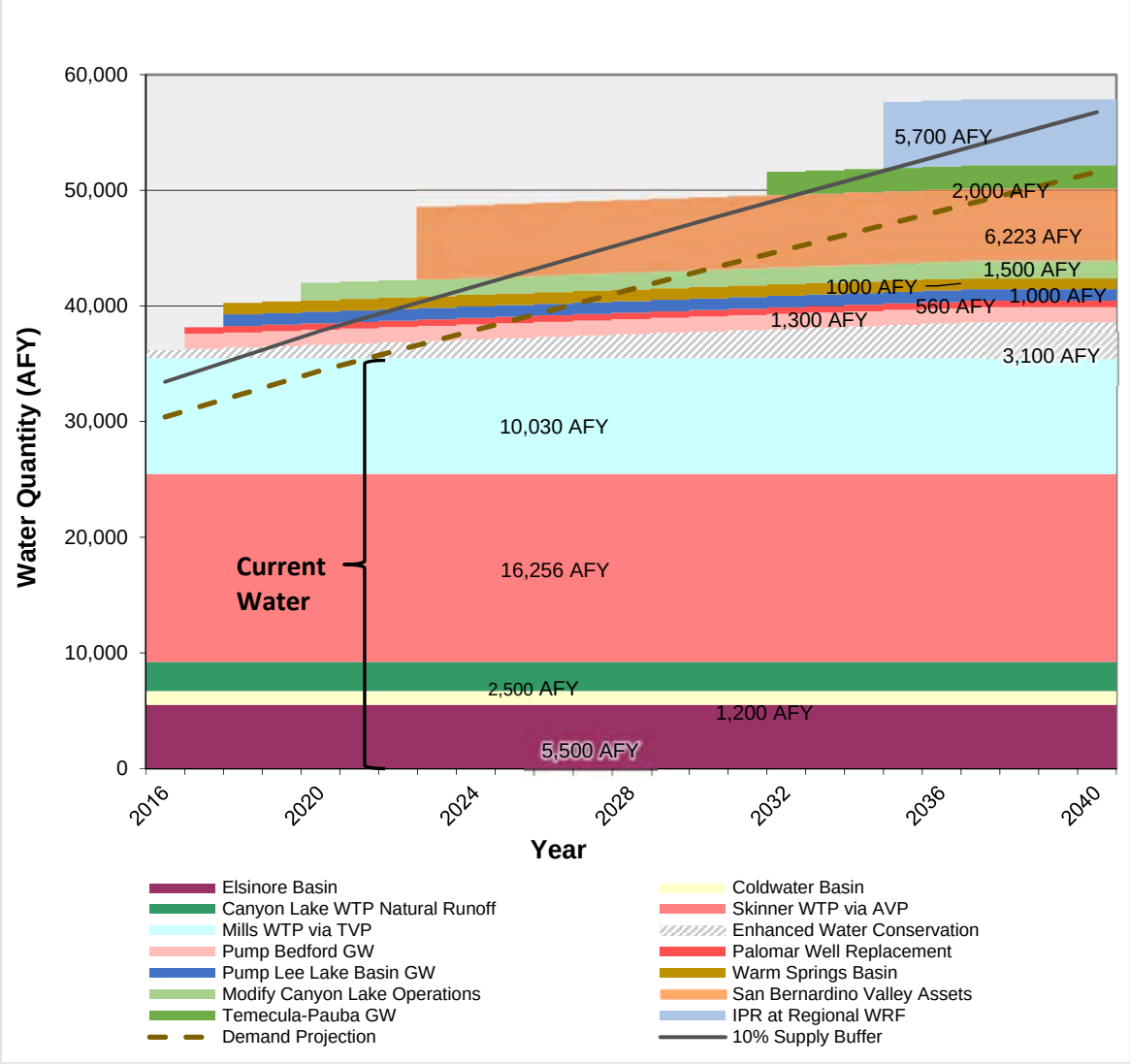
Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Relia bility	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)	Phase and Status
									potential modification operation of CLWTP. The plan is expected to be completed by early 2018.
10B. Indirect Potable Reuse at Regional WRF. Injection/Extraction with AWT	6.00	5,700	5,415	0.95	132.1	5,707,000	2,515	100	Phase 3 EVMWD has just prepared a IRP Feasibility Study (May 2017). If growth occurs as forecasted, IRP phase 1 construction is expected to be implemented between 2030-2031.
11. Temecula-Pauba Groundwater	1.79	2,000	2,000	1.00	7.8	328,000	375	725	Phase 3 EVMWD is in ongoing discussion with water utilities overlying the northern portion of Temecula/Pauba aquifer. A study will be implemented in the forthcoming month to update safe yield and return flows.
12B. Implement Increased Water Conservation Measures - Enhanced	0.00	3,100	3,100	1.00	-	1,240,000	400	450	Phase 1 to 3(EVMWD is in the process of updating the Water Business Conservation Plan, which will serve as the basis to instrument this project.
Total	**24**	**22,383**	**20,968**	**0.93**	**204.3**	**12,778,000**	**1,110**	**506**	

The IRP plan is proposed to be implemented in 3 phases:

- Phase 1 – (2017-2018) increasing supply by approximately 4,860 AFY.
- Phase 2 - (2020-2023) increasing supply by 7,700 AFY.
- Phase 3 - (2026-2040) increasing supply by 10,800 AFY.

The anticipated increased capacity through all phases includes enhanced water conservation will be close to 23,360 AFY. This IRP's water supply portfolio will reliably meet 100% of the future water demand and provides an additional 10% water supply buffer to hedge against uncertainties. Figure E.7 indicates the phasing for the implementation of the recommended water supply portfolio. EVMWD will track several triggers to delineate implementation of medium and long-term projects, including but not limited to: trends in water demand relative to forecasts, imported water supply reliability, trends in supply costs, and regulatory changes that may impact access to groundwater supplies, or affect the ability to meet water quality objectives or conservation targets.

Figure E.7 – Recommended Hybrid Scenario Implementation and Projected Demand



E.2.4 Response Actions

Response actions are planned actions that are implemented based on specific triggers, and are not intended to be emergency/crisis driven. Response actions are characterized based on the severity of drought and are implemented pursuant to specific triggers. EVMWD adopted a WSCP on February 5, 1992. This section provides a summary of the WSCP in order to meet the requirements of the Urban Water Master Plan (UWMP) Act. EVMWD had two Water Shortage Ordinances (Nos.78 and 81) that were recently combined, updated, and approved by its board on May 28, 2015 as Ordinance 225. The WSCP was developed utilizing Ordinance 225. The DTF used this WSCP (Ordinance 225) to delineate DCP's response actions. The ordinance is summarized in Table E.3, which includes phased water use restrictions and a drought rate structure.

Table E.3 – Stages of Water Shortage Contingency Plan

Stage	Percent Supply Reduction *Numerical value as a percent*	Water Supply Condition	Restriction
I	0% to 5%	Water Supply Watch - Stage 1 applies during periods when EVMWD is able to meet all of the water demands of its customers. Stage 1 shall be in effect at all times unless the Board of Directors otherwise declares that another stage is in effect.	Landscape - Requires automatic shut off hoses, no landscape irrigation between 6am and 6pm, sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff and waste. Watering on windy days is to be avoided. Installation of water saving devices, such as low flow shower heads and faucet aerators, is encouraged, etc.
II	6% to 10%	Water Supply Alert - Stage 2 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDMP stage of "Water Supply Watch" or "Water Supply Alert" Conditions.	Landscape - Use of movable or permanent sprinkler systems allowed no more than four days per week. Installation of new landscapes shall be prohibited unless irrigated with drip irrigation. Restaurants may only serve water upon request, require covers for pools and spas.
III	11% to 25%	Mandatory Waste Reduction. Stage 3 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's Shortage Allocation Plan Shortage Levels 1 through 4. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.	Landscape - Irrigation only three days per week. Pools - No filling uncovered swimming pools. Water Features - Operation of any exterior ornamental fountain or similar structure is prohibited unless equipped with a recirculating system. EVMWD shall eliminate all adjustments to existing residential customers' outdoor water budgets including increases for swimming pools, spas, pond maintenance adjustments, etc.

Stage	Percent Supply Reduction *Numerical value as a percent*	Water Supply Condition	Restriction
IV	26% to 40%	Stage 4 applies during periods when the EVMWD will not be able to meet all of the water demands of its customers. This may correlate to any of the MWD's WSCP Regional Shortage Levels 5 through 7. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.	Landscape - Irrigation only two times a week on odd/even calendar days. No EVMWD water shall be used for construction purposes. Commercial car-washing using recycled water only. Potable water shall not be used for earthwork, road construction, dust control, compaction, or trenching jetting.
V	40% to >50%	Stage 5 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This shortage level may correlate to MWD's WSCP Regional Shortage Levels 8, 9, 10, or greater. Stage 5 may be declared during an Immediate Emergency. A Stage 5 declaration may also be accompanied by a Board Resolution declaring a Water Shortage Emergency.	Water use beyond the water volume permitted will be charged a civil administrative penalty of $4.01 per hundred cubic feet. All landscape and non-essential outdoor water use for all customers in all areas of EVMWD's retail water service area shall be prohibited. No new water meter(s) shall be provided, except if the project is necessary to protect public health, safety, and welfare or when using recycled water. All dedicated irrigation meters will be locked off by EVMWD personnel.

E.2.5 Operational and Administrative Framework

The DCP developed an operational and administrative framework identifying responsibilities for undertaking the actions necessary to implement each element of the DCP along with related procedures and resources. Table E.4 identifies the key members of the DTF and responsibilities associated with each plan element. The DCP recognizes the following as members of its task force: Water Resources Manager, Director of Water Resources and Engineering, Senior Water Resources Planner/Engineer, Assistant General Manager, WMWD, County of Riverside, City of Lake Elsinore, City of Canyon Lake, City of Wildomar, City of Murrieta, Lake Elsinore Unified School District (LEUSD), Murrieta Unified School District (MUSD), Chamber of Commerce (Lake Elsinore, Canyon Lake, Murrieta, and Wildomar), Summerly Golf Course, Congressman Ken Calvert, 42nd District, Assemblywomen Melissa Melendez, 67th District, Northwest Mosquito and Vector Control District (Northwest MVCD), and Sierra Club, etc.

Table E.4 – Operational and Administrative Framework

TASK	TASK FORCE LEAD	RESPONSIBILITIES
Drought Monitoring	Water Resources Manager	Data collection, observation, drought forecast, monitor hydrologic conditions, and share information with stakeholders.
Vulnerability Assessment	Water Resources Manager	Climate change assessment, vulnerability assessment.
Mitigation Actions	Water Resources and Engineering Managers	Evaluate and initiate infrastructure opportunity for mitigation actions.
Response Actions	Water Resources Manager, Community Relations Manager/ Community Affairs Supervisor, Assistant General Manager	Create and identify response actions, stages and fines, relationship, education, communication, and initiate response actions.
Plan Update	Water Resources Manager	Create plan update process and assign personnel.

The stakeholders and the public will continue to collaborate in future planning by providing valuable feedback and comments. Collaboration from the stakeholders and the public is facilitated by the DTF through public meetings, webinars, public notices and other outreach forums. Communication with these stakeholders will continue through informal public

meetings, newsletter articles, email blasts, posting on EVMWD's website, and through EVMWD's social media channels.

E.2.6 Plan Update Process

EVMWD will update the DCP and prepare an evaluation of its effectiveness in the post-drought period. Drought Monitoring, Mitigation Actions and Response Actions are the main components of the DCP and are also an integral part of EVMWD's WSCP and IRP.

EVMWD will monitor and update its WSCP to ensure consistency with the regional supplier and will simulate/analyze water consumption to confirm the effectiveness of implementation.

In summary, with input from the stakeholder and public, the DTF will draft the DCP updates. After completion of the update, EVMWD will present the purpose, scope, operational characteristics, and needed modifications of the plan to its stakeholders at a public meeting. EVMWD will discuss the specific modifications for mitigation actions and response measure in the updated DCP. The Community Relations Manager from the DTF will facilitate planning for the meetings and prepare news releases to announce the meetings and provide an overview of the plan updates.

CHAPTER 1 – INTRODUCTION

1.1 General Description

A drought is defined by the Bureau of Reclamation (BOR) as "a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size and location of the affected area"[1].

The President's Climate Action Plan: Preparing the United States for the Impacts of Climate Change"[2], released in June 2013, highlights drought preparedness as a priority. EVMWD is committed to DCP to address the possibility of continuing dry conditions in 2016 and beyond.

Drought Planning is defined by the National Drought Mitigation Center (NDMC) as actions taken by individual citizens, industry, government, and others before drought occurs to reduce or mitigate impacts and conflicts arising from drought[3]. The NDMC categorizes drought plans as mitigation plans or response plans. Drought mitigation refers to actions taken in advance of a drought that reduce potential drought-related impacts when the event occurs. Drought response planning addresses actions that should be taken in response to emerging and ongoing drought. The following DCP contains strategies and actions EVMWD may take to prepare for, respond to, and recover from droughts.

1.2 Background

Drought played a role in shaping California's early history, as the so-called Great Drought in 1863-64 contributed to the demise of the cattle rancho system, especially in Southern California. Subsequently, a notable period of extended dry conditions was experienced during most of the 1920s and well into the 1930s, with the latter time including the Dustbowl Drought that gripped much of the United States. Three twentieth century droughts were of particular importance from a water supply standpoint – the droughts of 1929-35, 1976-77, and 1987-92. More recent multi-year droughts are 2007-09 and 2012-15.

The 1929-35 drought was notable not only for its duration but also for its occurrence within a longer period of very dry hydrology. This drought's hydrology was subsequently widely used in evaluating and designing storage capacity and yield of large Northern California reservoirs. The 1976-77 drought, when statewide runoff in 1977 hit an all-time low, served as a wake-up call for California water agencies that were unprepared for major cut-backs

[1] What is drought? U.S. Department of the Interior Bureau of Reclamation. http://www.usbr.gov/mp/drought/what.html
[2] The President's Climate Action Plan. Executive Office of the President. June 2013. https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf
[3] What is Drought Planning? National Drought Mitigation Center. http://drought.unl.edu/Planning/WhatisDroughtPlanning.aspx

in their supplies. Forty-seven of the State's 58 counties declared local drought-related emergencies at that time. Probably the most iconic symbol of the 1976-77 drought was the construction of an emergency pipeline across the San Rafael Bridge to bring water obtained through a complex system of exchanges to Marin Municipal Water District in southern Marin County. The 1987-92 drought stands out because of its six-year duration. Twenty-three counties declared local drought emergencies. Santa Barbara experienced the greatest water supply reductions among the larger urban areas. In addition to adoption of measures, such as a 14-month ban on all lawn watering, Santa Barbara installed a temporary emergency desalination plant and an emergency pipeline was constructed to make State Water Project supplies available to southern Santa Barbara County[4].

1.3 Approach

Most recently, the current drought that began in 2012 resulting in record low precipitation has stemmed major changes to water management practices and severe water use restrictions. On January 17, 2014, Governor Brown proclaimed a State of Emergency and on April 1, 2015, the governor issued Executive Order B-29-15, which ordered the State Water Resources Control Board (SWRCB) to impose restrictions to achieve a 25% reduction in potable urban water usage across the State through February 2016. Despite the significant savings EVMWD has already achieved, in May 2015, the SWRCB proposed a mandatory Regulatory Framework that apportions water reductions according to consumption. This required agencies such as EVMWD, with a residential water use above 170 gallons per capita per day, to reduce water use by 28%. EVMWD successfully complied with the water conservation mandate, which was rescinded on April 26, 2017.

As a result, and with local stakeholder participation, EVMWD developed a DCP. Partial funding for this project was provided by the US Bureau of Reclamation (USBR). The planning effort was built upon the District's Water Shortage Ordinance No. 225, which was drafted and updated for consistency with MWD's WSDMP.

EVMWD has been very proactive in its water resources planning and management efforts to enhance its water supply reliability and being better positioned to handle short- and long-term drought conditions and climate variability. For instance, EVMWD has worked on an IRP, a Water Master Plan, an Urban Water Management Plan (UWMP), among others. The DCP's most important elements will be developed taking into consideration EVMWD's current water resources planning efforts.

This DCP will position EVMWD to better manage future drought conditions. Drought stakeholders will provide feedback to enhance the District's drought planning efforts.

[4] "Drought in California." California Department of Water Resources. Fall 2015. http://www.water.ca.gov/waterconditions/docs/DWR_DroughtBroch_070815-web.pdf

The following scope has been developed according to the required elements of a DCP established in the Drought Response Program Framework by the BOR.

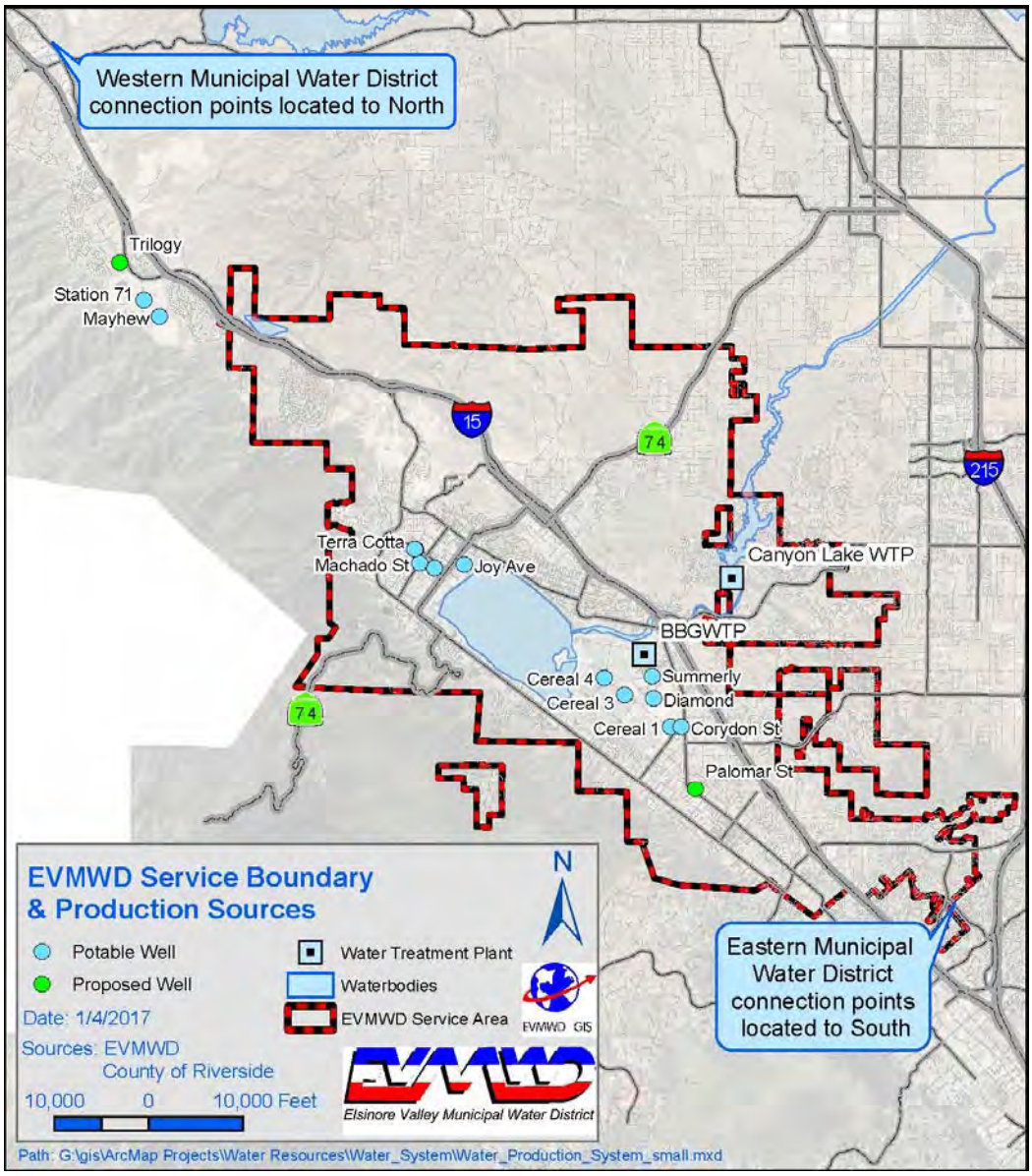
- Establish a process for monitoring near- and long-term water availability, and a framework for predicting the probability of future droughts or confirming an existing drought.
- Evaluate the risks and impacts of drought to critical resources within the planning area and the factors contributing to those risks based on a range of future condition.
- Identify, evaluate, and prioritize mitigation actions and activities that will build long-term resiliency to drought and that will mitigate the risks posed by drought. These measures will be implemented before a drought to address potential risks and impacts. The actions are outside of regular management activities and are intended to decrease sector vulnerabilities and reduce the need for response actions.
- Identify, evaluate, and prioritize response actions and activities that can be implemented during a drought to mitigate the impacts.
- Develop an operational and administrative framework to identify individuals or taskforce responsible for undertaking the actions necessary to implement each element of the DCP.
- Describe a process and schedule for monitoring, evaluating, and updating the DCP.

1.4 Study Area

EVMWD is located in Southern California in the western portion of Riverside County, one of the fastest growing areas in California. EVMWD provides water supply and wastewater collection services to approximately 148,587 residential customers, 3,767 institutional, commercial, and industrial users in the cities of Lake Elsinore, Canyon Lake, Wildomar, parts of Murrieta, Corona, and unincorporated areas of Riverside County.

EVMWD serves a 96-square mile area and is divided into two divisions: The Elsinore Division and the Temescal Division. The Elsinore Division makes up the majority of the service area with approximately 48,000 service connections. The Temescal Division is isolated from the Elsinore Division and is located to the northwest of the Elsinore Division. It has 707 connections and covers an area of approximately 2.5 square miles (mi^2). The current water demand is approximately 25,500 AFY. The demand is expected to be nearly double by 2040. The map of the service area is shown on Figure 1.1.

Figure 1.1 – EVMWD Service Boundary



1.5 History

EVMWD was incorporated on December 23, 1950 under the provisions of the California Municipal Water District Act of 1911. The purposes of EVMWD are to finance, construct, operate, and maintain water and wastewater systems serving properties within EVMWD boundaries. EVMWD was formed to protect local water supplies and importing supplemental water to alleviate water shortages. EVMWD has operated under these purposes from that time and has expanded its services throughout the years to accommodate growth, secure water supplies and meet the general water needs of the community.

EVMWD has the authority to collect revenues in the form of rates and charges for facilities and services provided. EVMWD is also legally empowered to construct, operate, and maintain sewage, waste, reclamation, and storm water disposal facilities, and to acquire, construct, operate, and maintain fire protection facilities.

1.6 Climate

Elsinore Valley region enjoys a mild Mediterranean climate with warm, dry days and cool evenings. Located near the Pacific Ocean, the warm summer temperatures are often cooled by afternoon ocean breezes blowing into the valley through gaps in the Santa Ana foothills. The yearly average rainfall is approximately 12 inches and the air quality is consistently better than the surrounding communities.[5]

1.7 Population Projection Assessment

Population and employment forecasts, developed by Riverside County Center for Demographic Research (RCCDR), form the basis of the projections developed by MWH for EVMWD's service area. The 2010 RCCDR population and employment forecasts for Lake Elsinore, Wildomar, Murrieta, Canyon Lake, and Unincorporated Riverside County are available in five-year increments through 2035 planning. The percent increase in a five-year increment for each city forecast is applied to the portion of population that falls within the EVMWD service area. Table 1.1 shows the population projections broken down into cities and unincorporated areas of the EVMWD service area.

Table 1.1 – Population Projections for Cities and Unincorporated Areas within EVMWD Service Area

Year	City of Lake Elsinore	City of Wildomar	City of Murrieta	City of Canyon Lake	Unincorporated Riverside County	Total within EVMWD Service Boundary (1)
2010	52,400	30,300	17,000	9,300	24,400	**133,400**
2015	61,400	34,600	17,600	9,500	26,500	**149,600**
2020	70,300	39,400	18,300	9,700	31,800	**169,500**
2025	78,500	42,800	18,900	9,900	37,700	**187,800**
2030	86,200	46,200	19,600	10,100	43,000	**205,100**
2035	93,100	50,100	20,200	10,300	47,400	**221,100**
2040	**100,500**	**54,200**	**20,900**	**10,500**	**52,200**	**238,300**

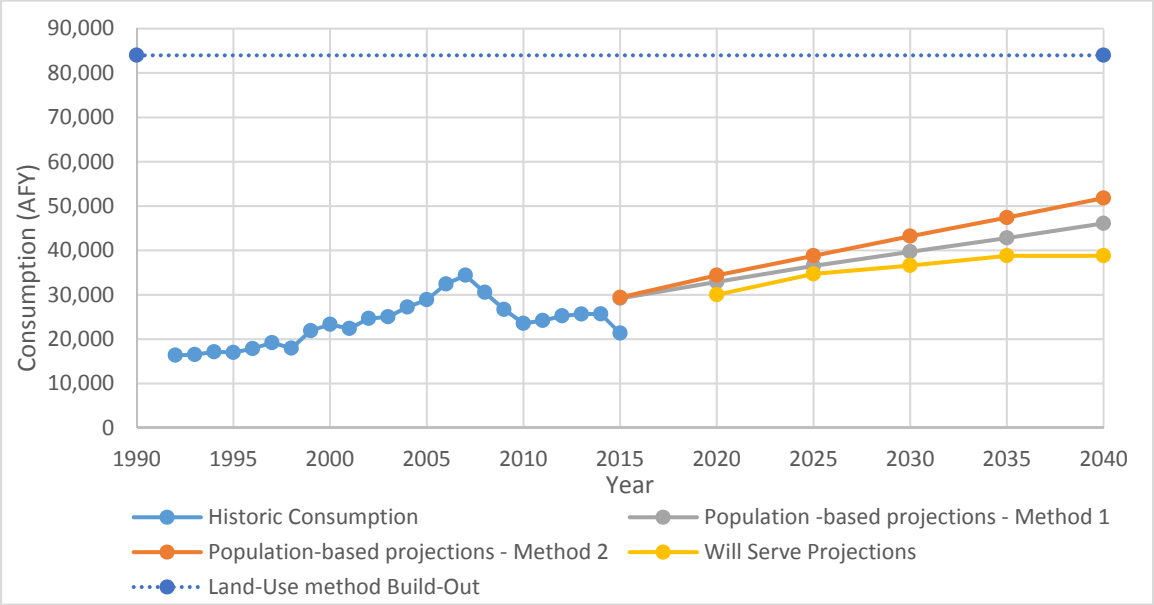
(1) Population does not include the Temescal Division service area. The population for Temescal Division, based on the 2010 census data, is approximately 2,700 and is not expected to change.

[5] 2005a EVMWD District-Wide Water Supply Assessment

1.8 Water Demand Assessment

The final build-out demand projections for EVMWD's service area is estimated to be 84,000 AFY, as shown in Figure 1.2.

Figure 1.2 – Summary of Demand Projections



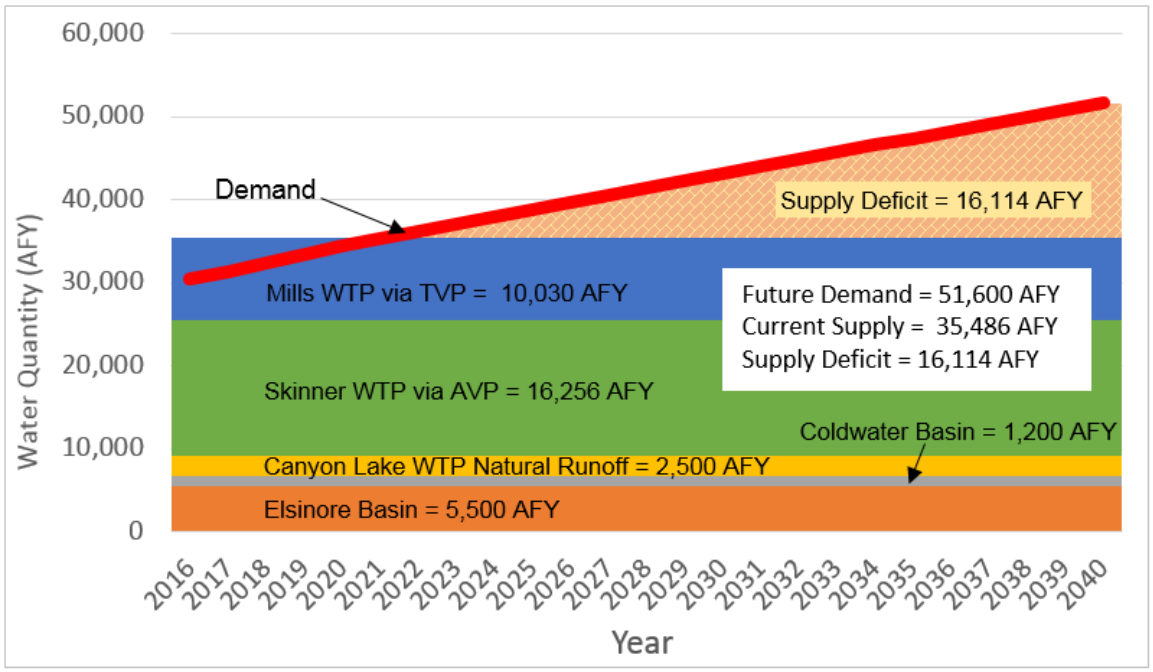
1.9 Water Supply Assessment

EVMWD has three primary sources of water supply: groundwater, surface water and imported water. Local groundwater, extracted from Elsinore Valley Groundwater Basin (EVGB) and Coldwater Basin, accounts for approximately 22% of EVMWD's water supply (historically from 2011-2015). Surface water from Canyon Lake Reservoir is treated at the CLWTP and accounts for approximately 8% of the current water supply portfolio.

Imported water purchased from MWD, through WMWD, accounts for approximately 70% of EVMWD's water supply. Water is imported from the Temescal Valley Pipeline connection and the Auld Valley Pipeline EM-17 connection.

Figure 1.3 shows a comparison between EVMWD's existing supplies and its projected water demands. The comparison reveals a deficit of approximately 16,114 AFY by 2040.

Figure 1.3 **– Demand Versus Current Supply**



1.10 Abbreviations

The following is a list of commonly used abbreviations that may be found in this DCP.

Act	California UWMP Act
AF	acre-feet
AFY	acre-feet per year
amsl	above mean sea level
AVP	Auld Valley Pipeline
BMP	Best Management Practices
BOR	Bureau of Reclamation
CCF	centum cubic feet
cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
CLWTP	Canyon Lake Water Treatment Plant
CUP	conjunctive use program
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DCP	Drought Contingency Plan
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
DSM	Decision Support Model

DSS	decision support system
DTF	Drought Task Force
DWR	California Department of Water Resources
ETo	evapotranspiration
EVGB	Elsinore Valley Groundwater Basin
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plans
IPR	Indirect Potable Reuse
IRP	Integrated Resources Plan
LAFCO	Riverside County Local Agency Formation Commission
LEUSD	Lake Elsinore Unified School District
MAF	million acre-foot
mgd	million gallons per day
MUSD	Murrieta Unified School District
MWD	Metropolitan Water District of Southern California
NCA	United States National Climate Assessment
NCDC	National Climatic Data Center
NDMC	National Drought Mitigation Center
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration
Northwest MVCD	Northwest Mosquito and Vector Control District
O&M	Operation and Maintenances
PDSI	Palmer Drought Severity Index
POA	Property Owner's Association
RCCDR	Riverside County Center for Demographic Research
RCWD	Rancho California Water District
RWQCB	Regional Water Quality Control Board
RWRF	Regional Water Reclamation Facility
SGMA	Sustainable Groundwater Management Act
SPI	Standardized Precipitation Index
SWE	snow water equivalent
SWP	California State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolve Solids
TVP	Temescal Valley Pipeline
TVWD	Temescal Valley Water District
UWMP	Urban Water Master Plan
WMWD	Western Municipal Water District
WRDSS	Water Resources Decision Support System
WRF	wastewater reclamation facilities
WSAP	Water Supply Allocation Plan

WSCP	Water Shortage Contingency Plan
WSDMP	Water Surplus and Drought Management Plan
WTP	Water Treatment Plant

CHAPTER TWO – DROUGHT MONITORING

2.1 General Description

The following chapter, in compliance with the BOR Drought Response Program Framework[1], establishes a process for monitoring near and long-term water availability and a process for predicting the probability of future droughts or confirming an existing drought. This includes a process for the collection, analysis, and dissemination of water availability and other drought-related data. It also explains how this data will be used to predict or confirm droughts; including identifying metrics and triggers that may be used to define stages of drought, to trigger mitigation or response actions and to define the different stages or levels of severity of drought.

2.2 Drought vs. Water Shortage

According to the Global Water Forum, drought is defined as a natural phenomenon exhibiting temporary, negative, and severe deviations along a significant time period and over a large region from average precipitation values. This condition might lead to meteorological, agricultural, hydrological, and socioeconomic drought, depending on its severity and duration. Similarly, water shortage occurs when supply is reduced to a level that cannot support existing demands. In a broader way, water shortage is a man-made phenomenon; a recurrent imbalance that arises from an overuse of water resources, caused by consumption being significantly higher than the natural renewable availability. It can be aggravated by water pollution during drought episodes.[2]

All droughts originate from a deficiency of precipitation, or meteorological drought, but other types of drought and impacts cascade from this deficiency. Figure 2.1 shows the sequence of drought occurrence and impacts for commonly accepted drought types.

2.3 Drought Impacts

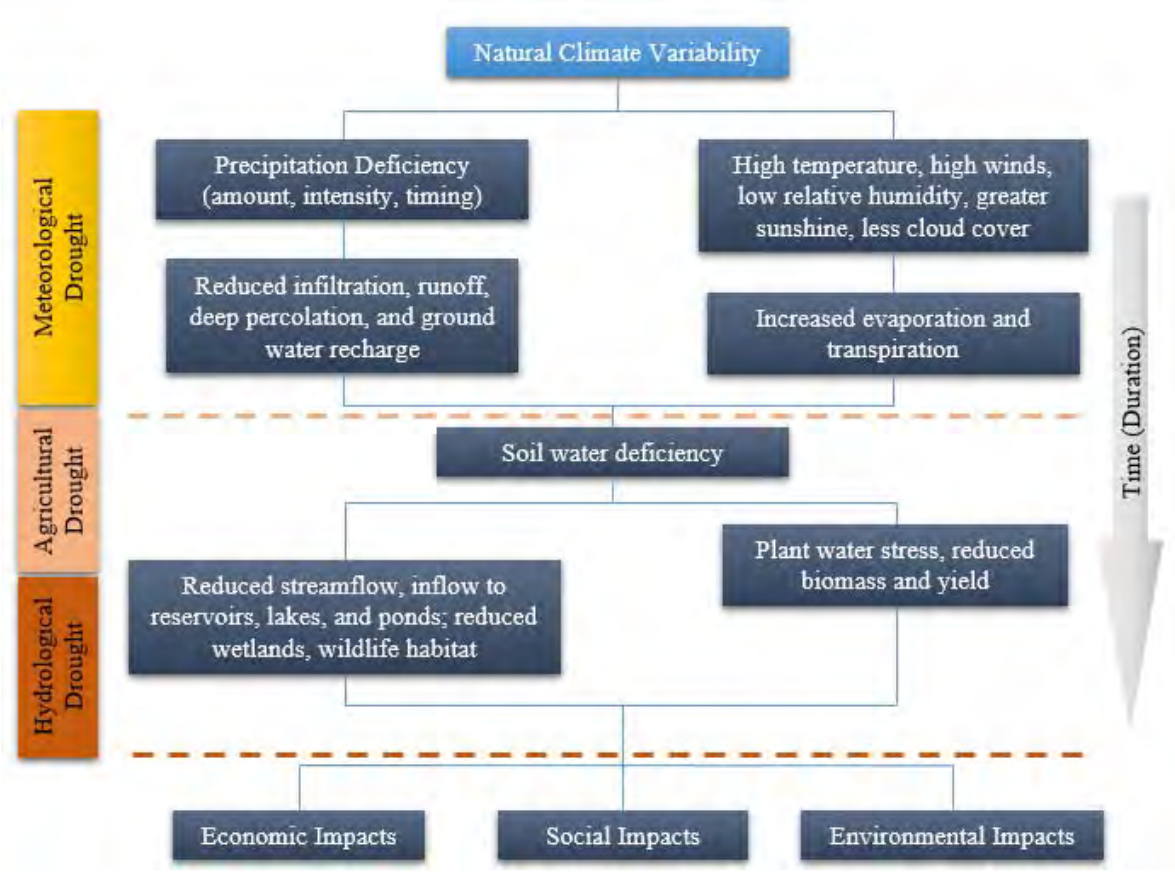
2.3.1 Short-Term Drought Impacts

A decrease in surface water levels during a drought can be adverse for navigation, recreation, agriculture, municipal supply, and habitat for aquatic species. Drought has the potential to affect the reliability of both local and imported water supplies and adds its own uncertainties to the challenges of planning.

[1] Drought Response Program Framework: WaterSMART Program. U.S. Department of the Interior Bureau of Reclamation Policy and Administration. April 2016.
[2] "How to distinguish water scarcity and drought in EU water policy?". Global Water Forum. August 2013 http://www.globalwaterforum.org/2013/08/26/how-to-distinguish-water-scarcity-and-drought-in-eu-water-policy/

In spite of reduced availability, dependency on groundwater increases through increased groundwater usage to meet water demands. Reduction in groundwater levels and water quality may be a result of water being pumped at a faster rate than an aquifer is recharged by precipitation[3].

Figure 2.1 – Sequence of Drought Occurrence and Impacts



Drought has a significant short-term impact on Mystic Lake which relies on the rainy season for its existence. There is usually water in the lake in the winter when it becomes a haven for birds of all species. It has the tendency to dry up in the summer or in years when there is not much rain. This lake lies within the outlet area of the San Jacinto River and is typically full only during high flow conditions in the San Jacinto River due to extreme precipitation events in the Upper San Jacinto Watershed. According to the 2015 Mystic Lake Impacts on TMDL Stakeholders report prepared for Western Riverside County Agricultural Coalition, Mystic Lake has a threshold capacity of 17,000 AF/Y. This

[3] "Drought Impacts. California Water Science Center. http://ca.water.usgs.gov/data/drought/drought-impact.html

threshold flow was exceeded 14 times in the 86 years of record resulting in overflow to the San Jacinto River. Mystic Lake can be totally dry for several years in dry weather conditions. A 2015 study performed by Riverside County Flood Control (RCFC) and Water Conservation District indicates that no significant changes have occurred to the Mystic Lake horizontal boundary limits between 2004 and 2014. However, the total storage volume increased by 2,054 acre-feet suggesting that the lake's storage capacity is increasing by roughly 200 acre-feet per year. Increasing capacity of Mystic Lake due to depth increase by significant subsidence is requiring larger precipitation events (wet weather events) to cause overflow to the San Jacinto River. Only an appreciable amount of flow from Mystic Lake to the San Jacinto River is realized in wet weather conditions. Mystic Lake is an example of an indicator of local drought conditions. Therefore, Mystic Lake serves as an indicator of dry conditions and is not considered a reliable supply of water to the San Jacinto River even in wet years.

More detailed information of short-term drought impacts is presented in Chapter 3.

2.3.2 Long-Term Drought Impacts

Long-term drought influences the occurrence of wildfires which are more likely to happen because of dry, hot and windy weather and dry vegetation. Drought conditions can increase the intensity and severity of these wildfires.

Groundwater over pumping can cause the aquifer to compact and cause land to sink. This will lead to a permanent loss of groundwater storage and infrastructure damage. Groundwater pumping can also cause a reversal of natural groundwater flows to the ocean and seawater to enter the aquifer system which can compromise groundwater quality and be a costly problem to manage.

During a severe drought, water allocations for river, wetland, wildlife, and fish restoration projects can be reduced or stopped altogether.

As an example, the long drought periods over the past years have caused the water storage in Mystic Lake to decrease from thousands of acres to under 200 acres. If dry conditions persist, experts speculate that Mystic Lake will dry up altogether, becoming an ephemeral lake. This is a part of a cycle of flooding and receding that the lake has gone through over hundreds and thousands of years.

More detailed information of long-term drought impacts is presented in Chapter 3.

2.4 Drought Triggering Mechanisms

Based on EVMWD's WSCP, the implementation of water supply stages may be triggered by, without limitation, any or all of the following circumstances or events:

1. A regional water supply shortage exists;

2. Delivery infrastructure; such as storage reservoirs, pipes, pumps, filtration devices or groundwater wells, is inoperable or unusable;

3. Alternative water supplies are limited or unavailable;

4. Groundwater levels or groundwater quality is approaching levels which may require augmentation of the groundwater basin or other actions necessary to protect the groundwater basin, as prescribed by the California Department of Water Resources, the Regional Water Quality Control Board, Riverside County, or some other regulatory body;

5. MWD's WSDMP Stages and the MWD Water Supply Allocation Plan (WSAP) stages and corresponding actions have been implemented; or

6. An executive order from the Governor.

In addition to the triggers mentioned above, EVMWD plans to consider the following parameters to declare a drought:

1. Based on the EVMWD sources of water, EVMWD will use monthly averages of surface water levels in Canyon Lake, Lake Elsinore, and groundwater levels in various basins; including but not limited to Elsinore Basin, Warm Springs Basin and Coldwater Basin;

2. Climate change and persistence of drought as indicated by Drought Indices; or

3. EVMWD will review state snow water equivalent (SWE) and average reservoir volumes that are associated with the State Water Project (SWP). Reports unusually below the average volumes can indicate a drought at the State level.

The EVMWD DTF will monitor a combination of weather based on the PDSI and the SPI from the NDMC and the National Climatic Data Center (NCDC), as well as its Ordinance 225 and MWD shortage stages in order to determine the drought stage. Table 2.3 provides a summary of the triggering mechanisms to be used to declare a drought stage.

EVMWD will monitor water supply and/or demand conditions on a regular basis and will determine when conditions warrant initiation or termination of each stage of the plan when the specified "triggers" are reached.

The trigger levels to move from one stage to the next depends on the local water supply conditions and actions taken by MWD. MWD's actions represent the principal trigger(s) for EVMWD's action, because cutbacks in the imported water supply to EVMWD will require action to mitigate those impacts.

The triggering criteria described below in Section 2.5 are based on:

1. Long or short-term changes in measured source water well levels that would indicate that groundwater aquifer(s) are being depleted at a rate that is unsustainable.
2. Sudden or gradual changes in source water quality that might indicate that a groundwater aquifer is under stress from lack of recharge.
3. Any sudden or catastrophic loss of water storage or production capacity.
4. Any other loss of water production or storage capacity that could result in a threat to public health or safety.

2.4.1 Drought Indices

In order to quantify and monitor drought, many drought indices have been developed and applied. The PDSI and SPI will be used for this study since they are the most prominent indices of meteorological drought used in the United States for drought monitoring and research.

Palmer Drought Severity Index

The PDSI[4] is a meteorological drought index developed in 1965 by Wayne Palmer. The PDSI is calculated based on precipitation and temperature data as well as the local available water content of the soil. The index is most effective in measuring impacts sensitive to soil moisture conditions, such as in agriculture production, but has also been useful as a drought monitoring tool and is used to trigger actions associated with drought contingency plans. Table 2.1 shows the PDSI classification criteria.

Table 2.1 – PDSI Classification Criteria

Palmer Classifications	
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

[4] Palmer Drought Severity Index. National Oceanic and Atmospheric Administration. https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/

Standardized Precipitation Index

The SPI[5] is another way of measuring drought that only takes into consideration precipitation data. Similar to the PDSI, this index when negative indicates a drought and when positive wet conditions are exhibited. It is based on the probability of recording a given amount of precipitation, and the probabilities are standardized so that an index of zero indicates the median precipitation amount. Table 2.2 shows SPI Classification Values.

Table 2.2 – SPI Values

SPI Values	
2.0+	Extremely wet
1.5 to 1.99	Very wet
1.0 to 1.49	Moderately wet
-0.99 to 0.99	Near normal
-1.0 to -1.49	Moderate drought
-1.5 to -1.99	Severe drought
-2 and less	Extreme drought

2.4.2 Groundwater

Due to long-term natural recharge of the Elsinore Basin, groundwater supply is considered reliable. During a normal year, the well pumps are not operated regularly during winter months when demands are low. However, during dry years, the well pumps can be used to extract groundwater throughout the year thus increasing total extraction. EVMWD's conjunctive use program recharges imported water in Elsinore Basin during wet years enhancing groundwater supply availability especially during dry years.

The only criteria EVMWD needs to maintain in the groundwater system is that pumped water from Elsinore Basin and Coldwater Basin remain at or below the safe yield of the basin, which is approximately 5,500 AFY and 1,200 AFY respectively. EVMWD will monitor those extraction rates on a monthly basis[6]. Figure 2.2[7] shows pumping, precipitation and groundwater levels in Coldwater Basin from years 1984 to 2016. In addition, Figure 2.3[8] shows groundwater levels in Elsinore Basin.

Additional detailed information about groundwater supply is presented in Chapter 3.

[5] Standardized Precipitation Index. National Oceanic and Atmospheric Administration. https://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/spi.html
[6] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.
[7] Coldwater Basin 2015 Annual Report
[8] EVMWD Water Resources at a Glance

Figure 2.2 – Pumping, Precipitation and Groundwater Levels in Coldwater Basin

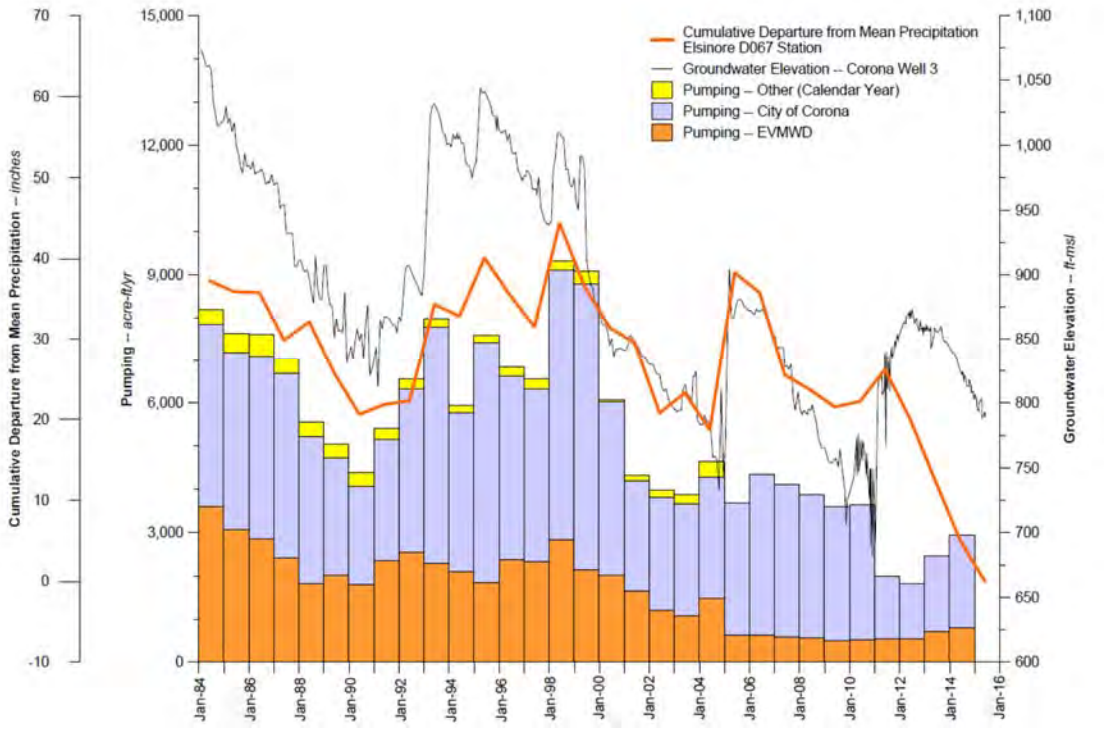
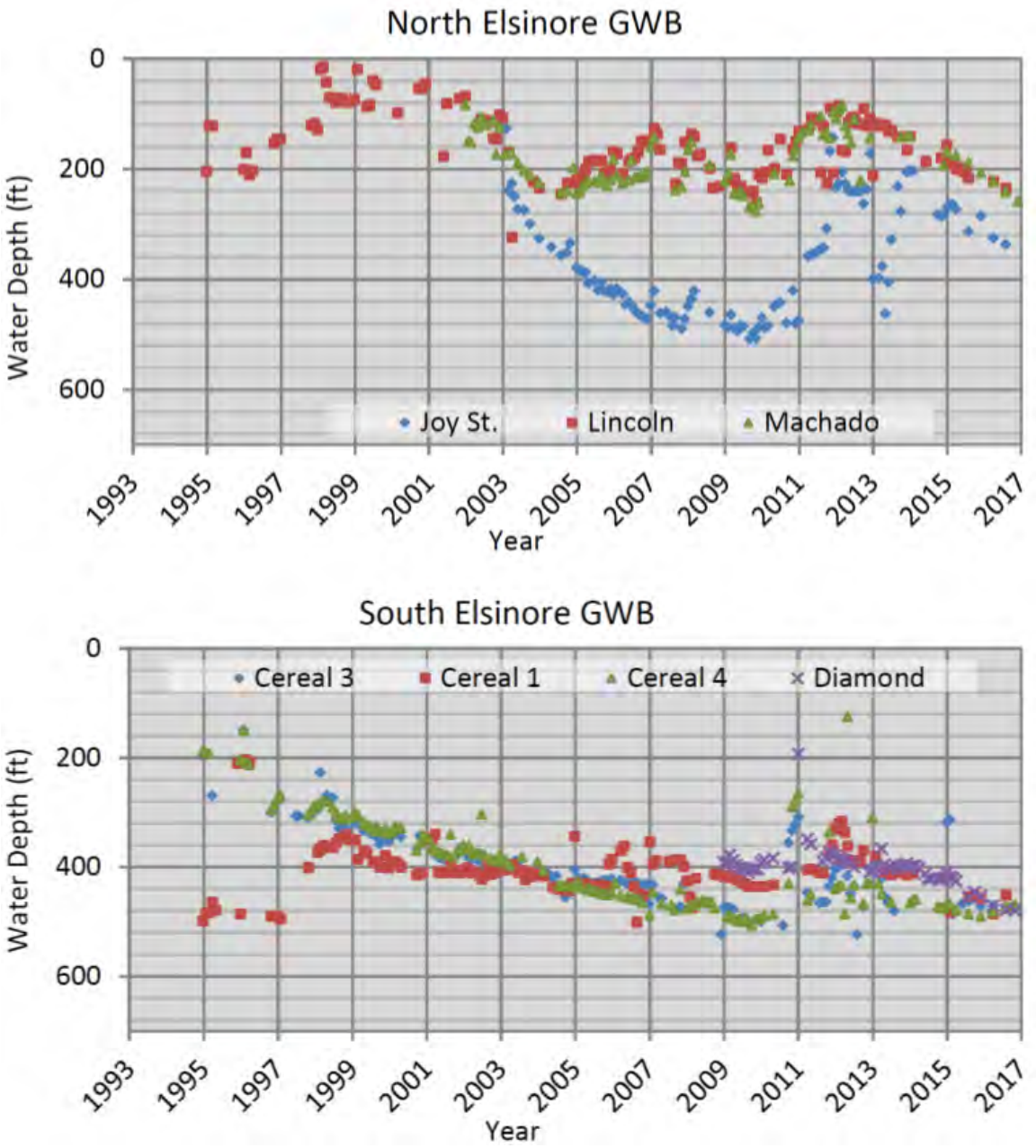


Figure 2.3 – Groundwater Levels in Elsinore Basin



2.4.3 Surface Water

EVMWD and Canyon Lake Property Owner's Association (POA) entered into an agreement dated February 12, 1968 for the lease of Canyon Lake Reservoir. The agreement requires that the minimum lake elevation be kept at 1,372 feet above mean sea level (amsl) at all times of the year. If the lake levels are expected to drop below 1,372 feet, EVMWD

typically discontinues operation of its Water Treatment Plant (WTP) and can purchase imported water to maintain the minimum lake elevation.

The availability of supplies at Canyon Lake depends on local hydrology and is reduced during dry year conditions. An analysis of historical data indicates a reduction of up to 50% in available natural recharge at Canyon Lake during dry years compared to average or normal year flows.[9] EVMWD will monitor Canyon Lake levels on a monthly basis and make sure they are maintained at the levels described above.

As mentioned previously in Section 2.3, the storage volume of Mystic Lake has been decreased from thousands of acres to under 200 acres. If dry conditions persist experts speculate that it will dry up altogether becoming an ephemeral lake. As a part of the San Jacinto River watershed that feeds Canyon Lake, Mystic Lake provides an indicator of drought conditions. However, provided that upstream uses of water in the San Jacinto River watershed are consistent with water rights entitlements, impacts to EVMWD supply through this source is considered negligible.

As part of the 2003 agreement between the City of Lake Elsinore and EVMWD, EVMWD currently delivers 5.5 million gallons per day (mgd) to Lake Elsinore to support Lake Elsinore levels, and to the extent feasible, maintain a minimum elevation of 1,240 feet. Figure 2.4 shows annual surface water production, historic annual average surface water elevation in Canyon Lake. Figure 2.5 shows historic annual average surface water elevation in Lake Elsinore.

[9] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.

Figure 2.4 – Precipitation and Historic Surface Water Level in Canyon Lake

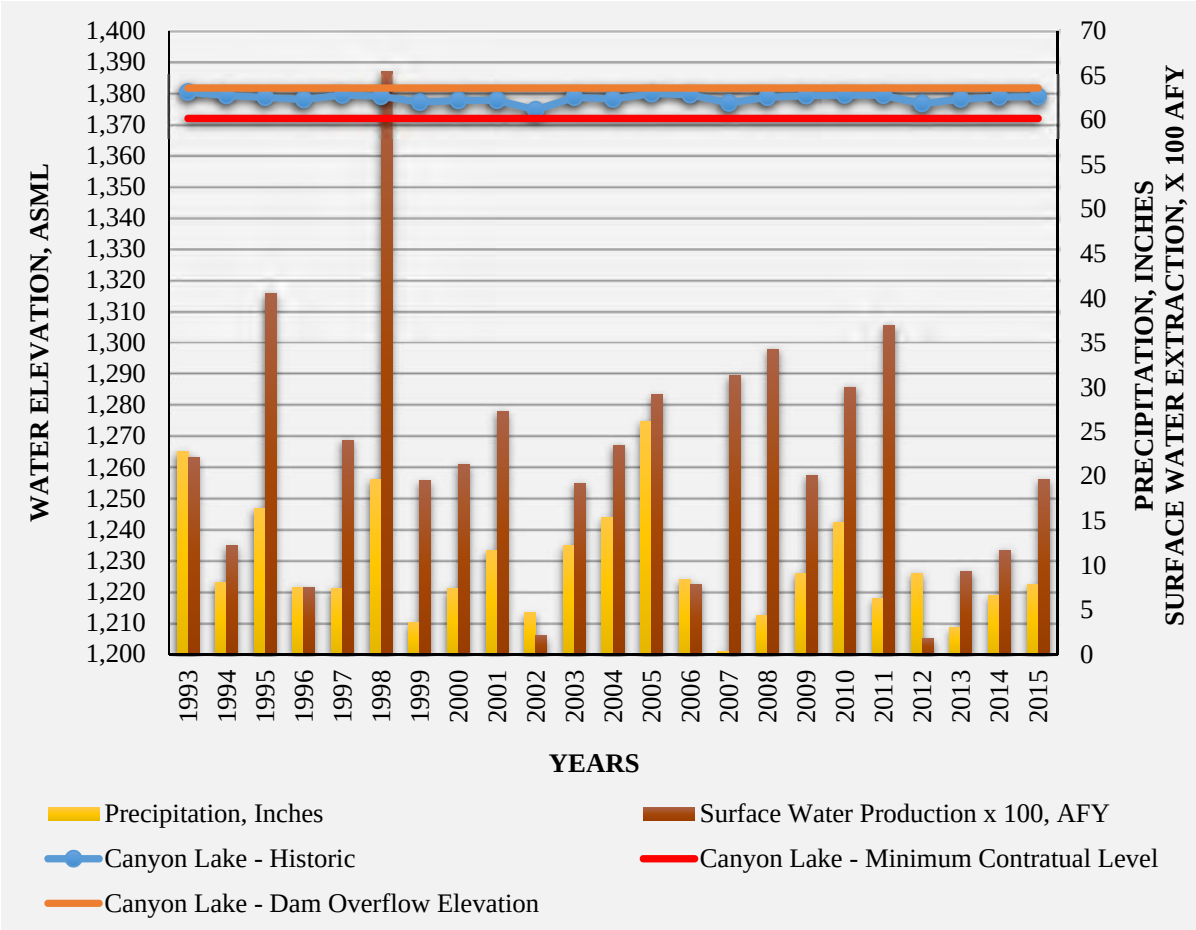
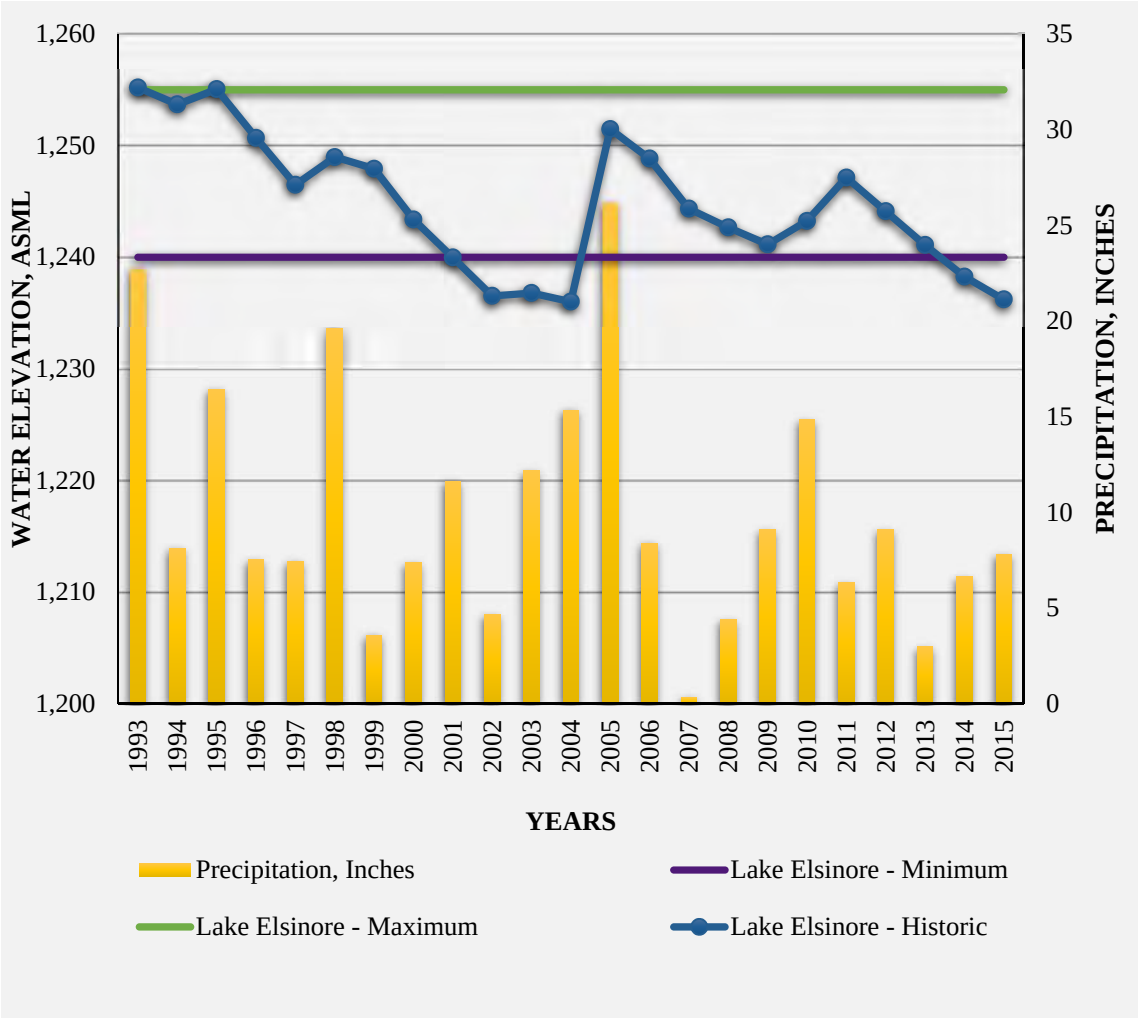


Figure 2.5 – Precipitation and Historic Surface Water Level in Lake Elsinore



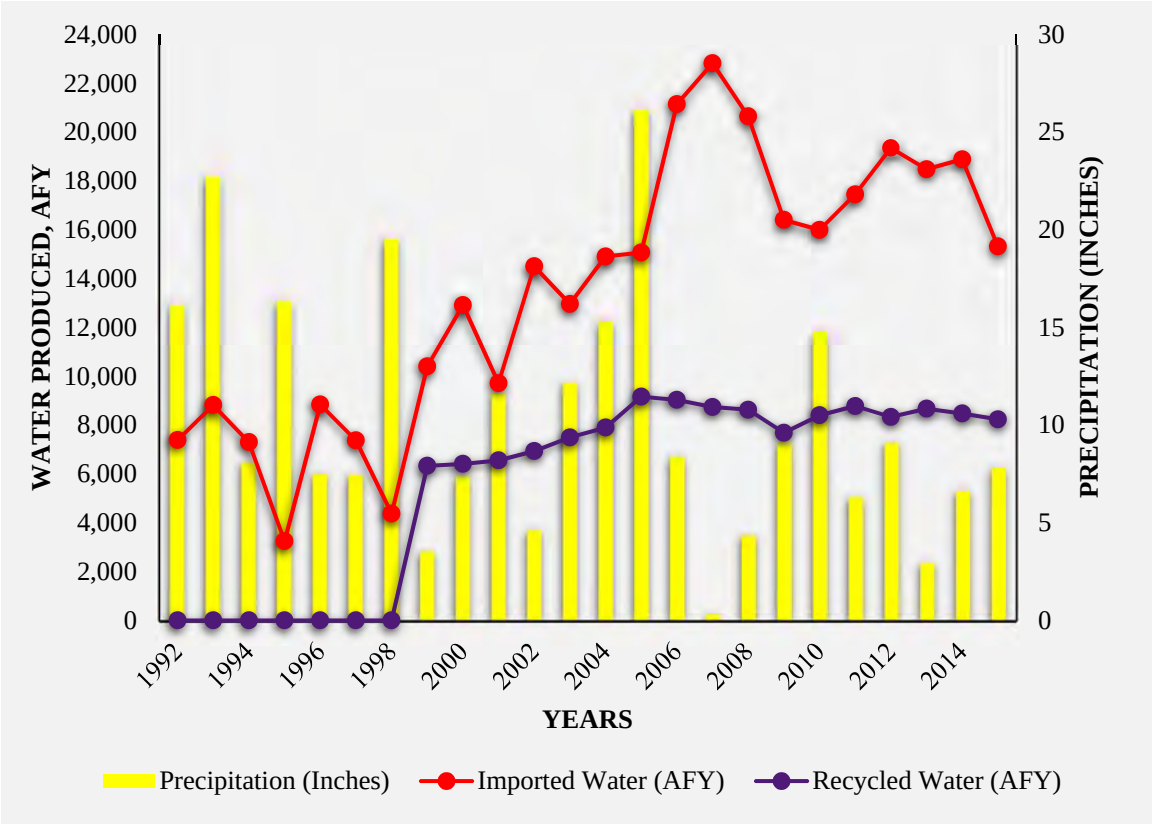
2.4.4 Imported Water

According to the MWD UWMP, MWD indicates that its existing supplies are adequate to meet the projected demands in all hydrologic conditions through 2040. It is assumed that imported water is fully reliable during average, dry and wet years.[10]

Figure 2.6 shows annual precipitation and impact on historic annual imported water demand. The graph indicates that imported water usage is inversely proportional to precipitation.

[10] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.

Figure 2.6 – Precipitation and Historic Imported Water



MWD developed a WSAP[11] in 2008 to fairly distribute a limited amount of water supply and applies it through a detailed methodology to reflect a range of local conditions and needs of the region's retail water consumers. MWD's Board authorized the implementation of the WSAP for the period of July 2009 through April 2011 in response to the drought and low water storage levels. The WSAP provides member agencies the flexibility to choose among various local supply and conservation strategies to help ensure that demands on MWD stay in balance with limited supplies. Therefore, EVMWD will comply with the MWD's WSAP in order to determine imported water availability and declare water shortages under drought conditions.

Additional detailed information about imported water is presented in Chapter 3.

2.5 Drought Triggers

The trigger levels to move from one stage to the next depend on the local water supply conditions and actions taken by MWD.

[11] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.

The General Manager shall monitor the projected supply and demand for water within the retail water service area of EVMWD during periods of a water shortage or supply shortage. The General Manager shall recommend to the Board of Directors the extent of the demand reduction required through the implementation and/or termination of a particular water supply shortage stage or sub-stage to prudently plan and supply water to its customers. Thereafter, the Board of Directors may order the implementation or termination of the appropriate stage or sub-stage. The declaration of any stage or sub-stage beyond Stage 1 shall be made by resolution of the Board of Directors. Within ten (10) calendar days of the adoption of the resolution declaring the applicable stage or substage, EVMWD shall make a public announcement and provide notice of the applicable water supply shortage stage. Such declaration and notice shall provide the extent, terms, and conditions as well as the associated water budget allocations and fines and/or penalties respecting the use and consumption of water in accordance with the applicable water supply shortage stage as provided in this Ordinance. Upon such declaration and publication of such notice, due and proper notice shall be deemed to have been given to each and every person supplied water within EVMWD's service area.

2.5.1 Stage 1 - Normal Conditions (Water Supply Watch)

Requirements for initiation
EVMWD Water Supply Watch - Stage 1 applies during periods when EVMWD is able to meet all of the water demands of its customers. Stage 1 shall be in effect at all times.

Requirements for termination
Stage 1 shall be in effect at all times unless the Board of Directors otherwise declares that another stage is in effect.

2.5.2 Stage 2 - Moderate Conditions (Water Supply Alert)

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses when:

Water Supply Alert - Stage 2 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDMP stage of "Water Supply Watch" or "Water Supply Alert" conditions.

Requirements for termination
Stage 2 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days. Upon termination of Stage 2, Stage 1 becomes operative.

2.5.3 Stage 3 – Severe Conditions (Mandatory Waste Reduction – Level 1 through 4)

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 3 of this plan when:

Mandatory Waste Reduction. Stage 3 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSAP Shortage Levels 2 through 4. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

Requirements for termination
Stage 3 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days. Upon termination of Stage 3, Stage 2 becomes operative.

2.5.4 Stage 4 – Critical Conditions (Mandatory Outdoor Reductions – Level 5 through 7)

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 of this plan when:

Stage 4 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This may correlate to any of the MWD's WSAP Regional Shortage Levels 5 through 7. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

Requirements for termination
Stage 4 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days. Upon termination of Stage 4, Stage 3 becomes operative.

2.5.5 Stage 5 – Extreme Conditions (Immediate Emergency – Level 8, 9, 10 or greater)

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 5 of this plan when:

Stage 5 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This shortage level may correlate to MWD's WSAP Regional Shortage Levels 8, 9, 10, or greater. Stage 5 may be declared during an Immediate

Emergency. A Stage 5 declaration may also be accompanied by a Board Resolution declaring a Water Shortage Emergency.

Requirements for termination

Stage 5 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days. Upon termination of Stage 5, Stage 4 becomes operative.

As mentioned in Section 2.4, the triggering criteria for the implementation of water supply stages will be based on the EVMWD WSCP. Table 2.3 shows the water supply stages that will be implemented according to the level of drought and water supply reduction. In addition, EVMWD will also consider climate change and persistence of drought as indicated by Drought Indices.

Table 2.3 – Drought Triggering Criteria

Drought Stage	Water Shortage Contingency Plan		Required Supply Reduction%
	MWD[12]	EVMWD Ordinance 225[13]	
1 - Normal	Baseline Water Use Efficiency	Stage 1 – Water Supply Watch	0 to 5 % (voluntary)
2 - Moderate	Water Supply Watch / Water Supply Alert	Stage 2 – Water Supply Alert	6 to 10%
3 - Severe	MWD's WSAP Shortage Levels 1 through 4	Stage 3 – Mandatory Waste Reduction	11 to 25%
4 - Critical	MWD's WSAP Shortage Levels 5 through 7	Stage 4 – Mandatory Outdoor Reductions	26 to 40%
5 - Extreme	MWD's WSAP Shortage 8, 9,10 or greater	Stage 5 – Mandatory Targeted Indoor/Outdoor Reductions – Catastrophic Failure or "Immediate Emergency"	40 to 50%

[12] Check MWD's WSDMP / MWD's WSAP
[13] Check EVMWD's Ordinance No. 225 - Included in Appendix A

2.6 Drought Assessment

EVMWD plans to use monthly surface and groundwater average levels as primary indicators of local drought conditions since these are important water sources that EVMWD depends on. EVMWD will also comply with MWD's WSAP in order to determine imported water availability and declare water shortages under drought conditions.

Drought indices, such as the PDSI and SPI, from the National Integrated Drought Information System (NIDIS), NCDC, and NDMC will be analyzed by the DTF on a monthly basis. In addition to Drought Indices, the DTF will review EVMWD's Ordinance No. 225, MWD's WSDMP and MWD's WSAP as additional indicators of assessing drought conditions.

The California UWMP Act (Act) requires every urban water supplier to assess water supply reliability that compares total projected water use with the expected water supply over the next twenty years in five-year increments. The Act also requires an assessment for a single dry water year and multiple dry water years. Per California Water Code (CWC) 10635 every urban water supplier shall include, as part of its UWMP, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years.

Assessment of water availability (surface water levels, groundwater levels, precipitation) and Drought Indices will be performed by EVMWD Water Resources Department and the data will be provided to the DTF. The following steps will be carried out monthly to assess the drought stages:

1. Check the status of executive orders from state which require reduction in water usage.
2. Monitor the PDSI and SPI index number from the NOAA.
3. Check the status of regional water supply availability and determine the presence of a water shortage which will impact EVMWD, and would require water use reductions.
4. Collaborate with EVMWD's Engineering, Operations and Water Resources Departments to determine operability of infrastructure, such as storage reservoirs, main pipelines, pumps, water treatment plants, or groundwater wells. Confirm with these Departments if infrastructure conditions require a reduction in water use.
5. Verify if alternative water supply is limited or unavailable which would trigger any requirement to reduce water usage.
6. Verify if a decline of groundwater and surface water levels warrant a reduction in water usage.
7. Check MWD's surface water availability.

2.7 Water Conservation Effectiveness

The success of EVMWD's water conservation program is demonstrated by the overall reduction in per capita water use since 2007, as shown in Figure 2.7. The significant change in water computation from 2007 to 2010 was also caused by the promulgation of Water Waste Prohibition-Conservation Ordinance 185 followed by implementation of a water budget by EVMWD. Similarly, significant drop in water consumption from 2014 to 2015 was a result of a drought proclamation and mandated cutbacks made by the state. Implementation by EVMWD through Ordinance 225 requiring minimum reduction of consumption by 25% ensured cutback thresholds were realized. EVMWD will continue to enhance its on-going conservation program by continuing its robust outreach, partnering with developers to promote water efficiency, and incentivizing water conservation as approved by EVMWD's Board of Directors. Table 2.4 below indicates the enhanced conservation supply for the planning horizons from 2020-2040.

Figure 2.7 – EVMWD Per Capita Water Use

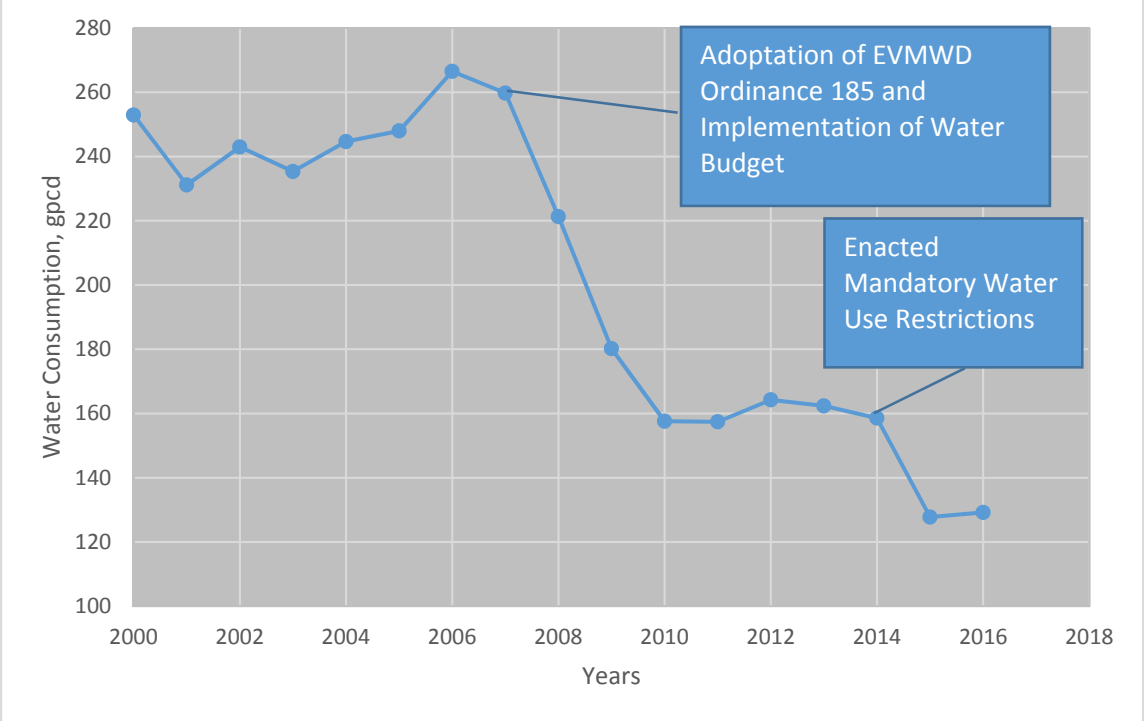


Table 2.4 – Enhance Conservation Supply Over Time

Source	2020	2025	2030	2035	2040
Enhance Conservation (AFY)	1,145	1,720	2,295	2,870	3,100

More detailed information about outreach plan is presented in Chapter 5.

CHAPTER 3 – VULNERABILITY ASSESSMENT

3.1 Purpose

This chapter will evaluate the risks and impacts of drought to critical resources within the planning area and the factors contributing to those risks based on a range of future conditions, including the effects of climate change. Potential mitigation and response actions will be based upon the results of the vulnerability assessment.

3.2 Description

Vulnerability assessment is the process of identifying, quantifying, and prioritizing the key factors that can negatively affect water supply reliability. The vulnerability assessment methodology involves the following activities:

- Develop and define possible impacts of drought including frequency and magnitude on area by effects of projected climate change and predicted trends.
- Review the impact of drought on different sectors such as agriculture, fishery and wildlife, health, commercial, and industrial.
- Evaluate impacts of climate change on EVMWD's water supplies and review the impacts to Lake Elsinore and Canyon Lake. These activities include reduced lake levels, deteriorated water quality, reduced oxygen levels resulting from toxic algae blooms, and increased fish kills.

3.3 Climate Change and Drought

3.3.1 Climate of Elsinore Valley Region

Elsinore Valley region enjoys a mild Mediterranean climate with warm, dry days and cool evenings. Located near the Pacific Ocean, the warm summer temperatures are often cooled by afternoon ocean breezes blowing into the valley through gaps in the Santa Ana foothills. The yearly average rainfall is approximately 12 inches and the air quality is consistently better than that of surrounding communities.

The climatic character of the area is semi-arid, with warm, dry summers and mild winters. Although there is one distinct climate, there are many micro-climates within EVMWD. Areas to the west experience cooler summers due to onshore breezes, where upland areas experience colder winters due to the surrounding low areas and higher elevations. Summer temperatures can exceed 100 degrees Fahrenheit (F), but nights are cool. Winters are also cool and wet. Winter night temperatures rarely drop below 25 degrees F. Annual precipitation averages 8-12 inches. The average growing season ranges from 250 to 300 days along the river bottom and valley areas, to less than 250 days in the upland areas.

3.3.2 Climate Change

Climate change has the potential to affect the reliability of both local and imported water supplies, and adds its own uncertainties to the challenges of water supply planning. Climate change could also increase water demand. For example, studies conducted by the National Center for Atmospheric Research for the Inland Empire Utilities Agency, suggest a 0.21 to 3.81 degrees F temperature increase and -19 to +8% change in winter precipitation in Southern California between 2000 and 2030[1]. Studies conducted by the Southern California Association of Governments suggest that current average temperatures will increase by 1 to 2 degrees F by 2050, and by 4 degrees F above current average levels by 2100[2]. Higher temperatures and reduced precipitation are expected to increase evapotranspiration and irrigation water demands. However, higher temperature may also result in increased humidity which could offset a portion of the demand increase. Reliability estimates, developed by the DWR, for the SWP supplies account for the impacts of climate change.

Traditional planning methods assume that future hydrologic conditions will be representative of past conditions (from early 1900s). However, as demonstrated by current weather patterns, future climate and hydrologic conditions may differ from past observations due to climate change and extremities of climate variation that have recently been manifested. In addition to climate change and natural variation, other uncertainties such as population projections and unforeseen regulatory changes may pose risks to resource management strategies that assume the status quo.

It is important to make a distinction between climate and weather. Climate is how the atmosphere behaves in an area over long periods of time, while weather is the state of the atmosphere over a short period of time. The following discussion is an assessment of the risks to critical resources within EVMWD area and the factors contributing to those risks with projections and previous studies provided by the United States National Climate Assessment (NCA) and the California Energy Commission, Cal Adapt. The assessment will be based on a range of future conditions, including the effects of climate change.

According to the 2014 NCA, climate change was once considered an issue for a distant future but now has moved into the present. It can be defined as a change in global or regional climate patterns, primarily due to human-induced emissions of heat-trapping gases.

“Climate change is already affecting the American people in far-reaching ways. Certain types of extreme weather events have become more frequent and/or intense, including prolonged periods of heat, heavy downpours, and, in some regions, floods and droughts.

[1] Groves, Knopman, Lempert, Berry, & Waifan presenting Uncertainty About Climate Change to Water-Resource Managers.
[2] Governments, S. C. A. o. (2009). Climate Change and the Future of Southern California.

In addition, warming is causing sea level to rise and glaciers and Arctic sea ice to melt, and oceans are becoming more acidic as they absorb carbon dioxide"[3].

Climate change is expected to affect California's water supply. One of the most significant impacts being reduction in mountain snowpack due to warmer temperatures that will likely increase evapotranspiration rates and extend growing seasons[4].

Per the 2010 California DCP[5], regions that rely heavily upon surface water could be particularly affected as runoff becomes more variable and more demand is placed on groundwater. Climate change and a projected increase in California's population will also affect regional water demand. Southern California entered a drought condition in 2012 continuing through 2016, according to the NOAA.

Precipitation

The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate model project slightly wetter winters, and another project slightly drier winters with a 10 to 20% decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized[6].

On average, the projections show little change in total annual precipitation. Based on several models, precipitation projections do not show a consistent trend during the next century.

The following two figures (Figure 3.1 and Figure 3.2) for both the Lake Elsinore Area and the Canyon Lake area, display the historical and projected annual precipitation totals at decadal averages. These graphs have been developed by using Cal Adapt software created by the California Energy Commission[7]. Both graphs show two scenarios: low emissions scenario, which assumes low carbon emissions in the future, and a high emissions scenario.

[3] Climate Change Impacts in the United States. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Edition 2014.
[4] "Highlights". Climate Change Impacts in the United States. U.S. National Climate Assessment.
[5] "California Drought Contingency Plan 2010." California Department of Water Resources.
[6] "Highlights". Climate Change Impacts in the United States. U.S. National Climate Assessment.
[7] Cal Adapt. California Energy Commission.

Figure 3.1 – Historical and Projected Precipitation for Lake Elsinore Area

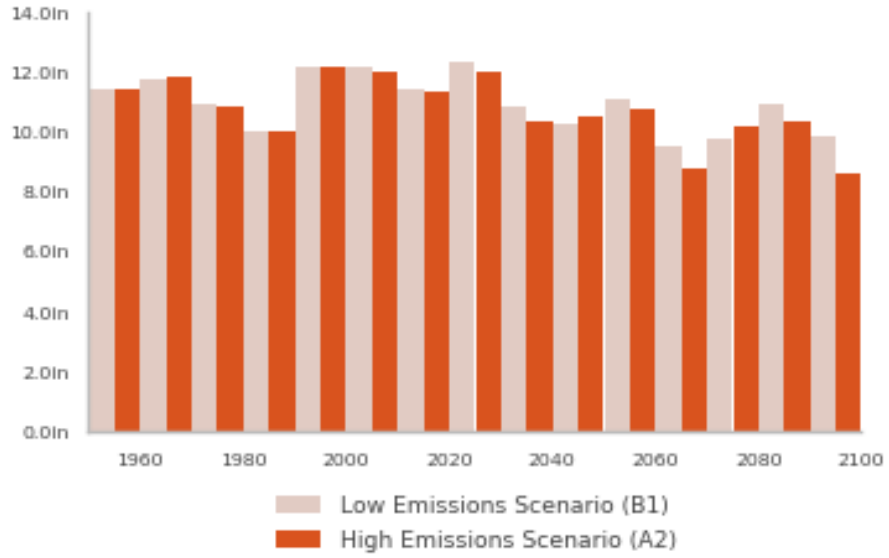
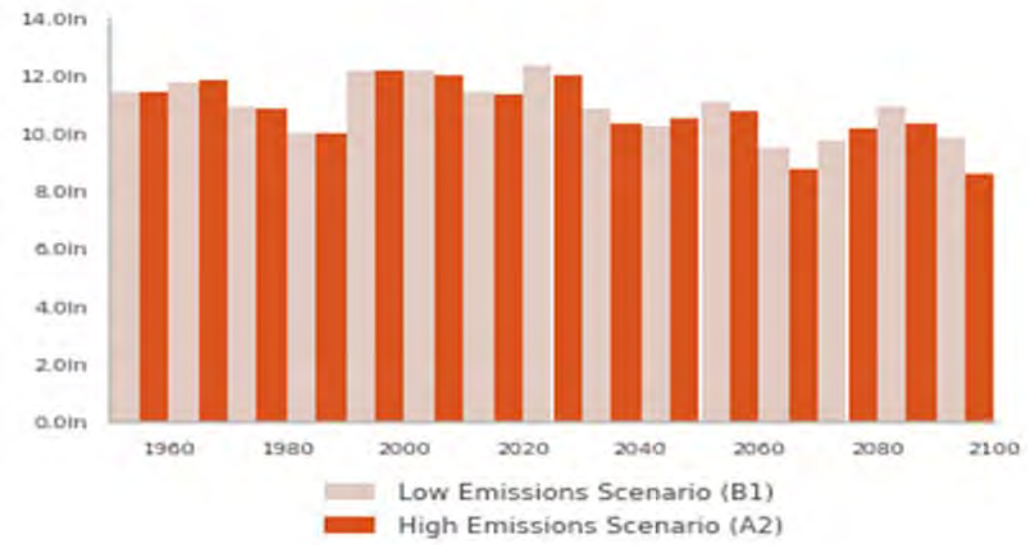


Figure 3.2 – Historical and Projected Precipitation for Canyon Lake Area



Temperature

Climate change is expected to affect areas in the world differently. Some areas are expected to see a rise in temperatures more than others. The southwest area of the U.S. is the hottest and driest region in the country and is expected to get hotter and significantly drier.

Temperatures are expected to rise substantially throughout the next century. According to Cal Adapt, scenarios project average temperature to rise between 1 and 2.3 degrees F during the next few decades. Summertime heat waves are projected to become longer and hotter, whereas the trend of decreasing wintertime cold air outbreaks is projected to continue[8].

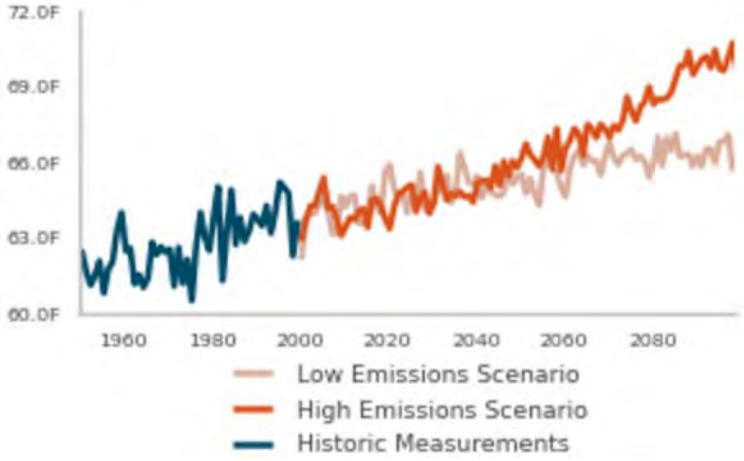
Table 3.1 shows historical average temperature for the Lake Elsinore Area, as well as the projected differences in temperature between a baseline period (1961-1990) and end of century (2070-2099) period.

Table 3.1 – Average Temperatures for Lake Elsinore Area

Historical Average	62.6 °F	
Low-Emissions Scenario:	66.4 °F	+3.8 °F
High-Emissions Scenario:	69.1 °F	+6.5 °F

Figure 3.3 has been developed using Cal Adapt[9] software and shows projected temperatures throughout the century for low and high emissions scenarios. Projected temperatures begin to diverge at mid-century so that by the end of the century, temperatures for the high emissions scenario, are twice as high as the ones projected for the low emissions scenario.

Figure 3.3 – Historical and Projected Temperatures for Lake Elsinore Area



Warmer waters may be responsible for reduced clarity of lake waters, making the conditions favorable for certain algae and introduced species. Also, warmer ocean waters

[8] Climate Change Impacts in the United States. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Edition 2014.
[9] Cal Adapt. California Energy Commission.

contribute to global sea level rise and extreme weather events, and can impact the marine ecosystem and its populations.

Snowpack

Snowpack plays a vital role in California's water supplies, since snowmelt replenishes the state's reservoirs in advance of the dry summer and fall months, providing one third of the water used by California's cities and farms. Projections of further reduction of snowpack and reductions in runoff and soil moisture pose higher risks to the water supplies needed to maintain the cities, ecosystems, and agriculture.

Snow accumulates at high elevations in the Sierra Nevada and Southern Cascades from October to March, melting and running off gradually from April to July as a consequence of warmer temperatures. [10]Snow in the Sierra Nevada provides 65% of California's water supply.

While no overall trend is discernible in statewide snow-water content (the amount of water stored in snowpack), a decreasing trend has been observed in the northern Sierra Nevada, and an increasing trend in the southern Sierra Nevada. Snowpacks store water that is later available to runoff or percolate into soils in spring and summer.

If greenhouse gases continue to increase with the same intensity, more precipitation will fall as rain instead of snow, causing a reduction in the Sierra Nevada spring snowpack by as much as 70 to 90%.

Figure 3.4 has been developed using the NCA. Figure 3.4 shows projected snow water equivalent (SWE) for the southwest region as a percentage from 1971-2000, assuming continued increases in global greenhouse gas emissions. For watersheds that depend on snowpack to provide annual runoff, such as in the Sierra Nevada and in the Upper Colorado and Upper Rio Grande River Basins, lower SWE translates to reduced reservoir water storage.

[10] "2015 EVMWD Urban Water Management Plan."

Figure 3.4 – NCA Projected SWE for the Southwest Region

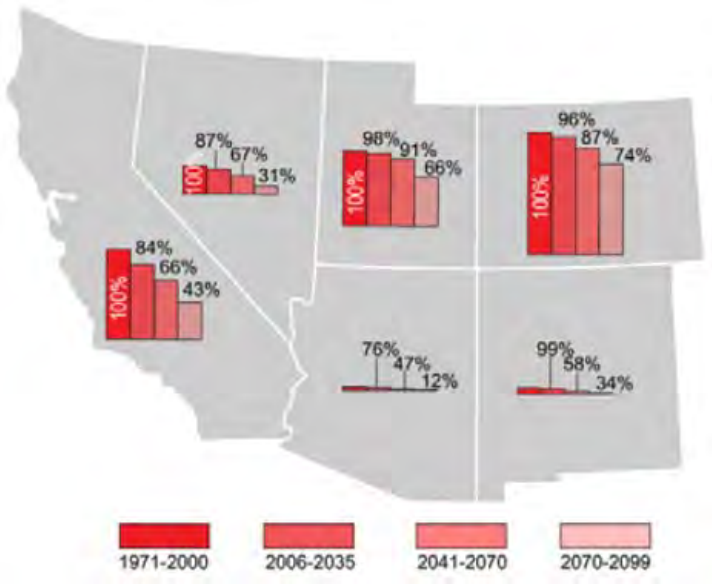
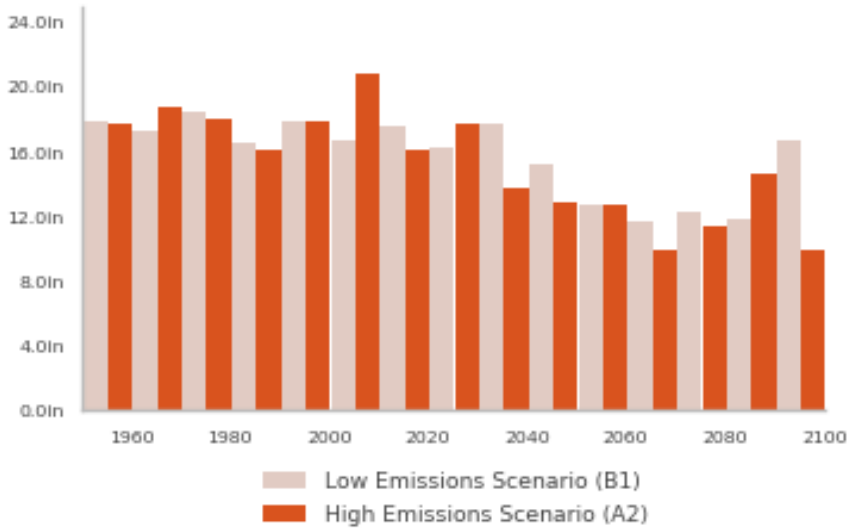


Figure 3.5 has been developed using Cal Adapt[11] software that shows historical and projected amount of water stored in the Lakeshore Area, located in the Sierra Nevada, for low and high emissions scenarios.

Figure 3.5 – Historical and Projected Snowpack in the Sierra Nevada Lakeshore Area



[11] Cal Adapt. California Energy Commission.

Sea Level Rise

The two major causes of global sea level rise are the loss of land-based ice, such as glaciers, and ice sheets due to increased melting and thermal expansion caused by warming of the oceans.

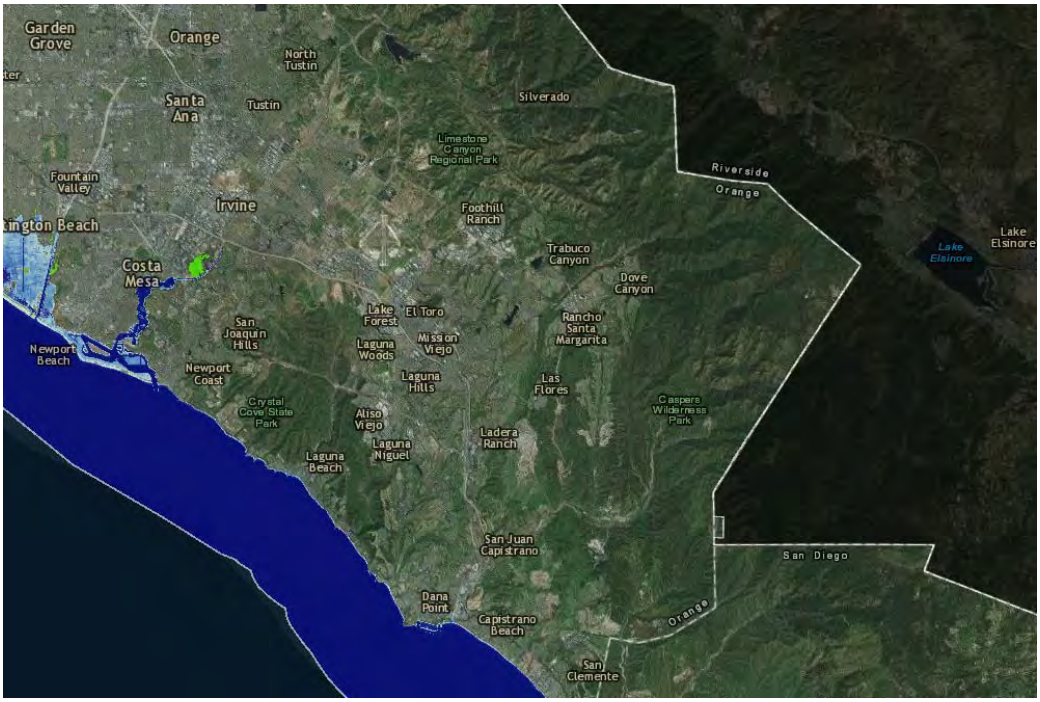
According to the NCA, sea level has risen along the California coast by 6.7 to 7.9 inches in the last 100 years. Both global and relative southwest sea levels are expected to increase at accelerated rates. Sea level rise poses a threat to groundwater supplies and estuaries, by potentially contaminating groundwater with seawater, or increasing the costs to protect coastal freshwater aquifers.

Coastal erosion is expected to occur over the next century as sea level rises. Additionally, sea level rise could lead to flooding of low–lying areas, loss of coastal wetlands, erosion of cliffs, levees, and beaches, saltwater contamination of drinking water, impacts on roads and bridges, and harmful ecological effects along the coastline[12].

Figure 3.6 shows inland extent of inundation at 6 feet above mean high water for the Lake Elsinore Area provided by the NOAA Digital Coast Sea Level Rise and Coastal Flooding Impacts Viewer. As seen in the figure, the Lake Elsinore Area will not be impacted from sea level rise.

[12] Sea Level Rise. Climate Change Impacts in the United States. U.S. National Climate Assessment

Figure 3.6 – NOAA Sea Level Rise Viewer



Wildfire

Wildfire is an important ecosystem disturbance. Wildfires promote vegetation and wildlife diversity, releases nutrients into the soil, and eliminate heavy accumulations of underbrush that can fuel catastrophic fires. A wildfire can be defined as a large, destructive and out of control fire over woodland or brush. Wildfires contribute to upslope shifting of vegetation, spread of invasive plants after extensive and intense fire, and conversion of forests to woodland or grassland.

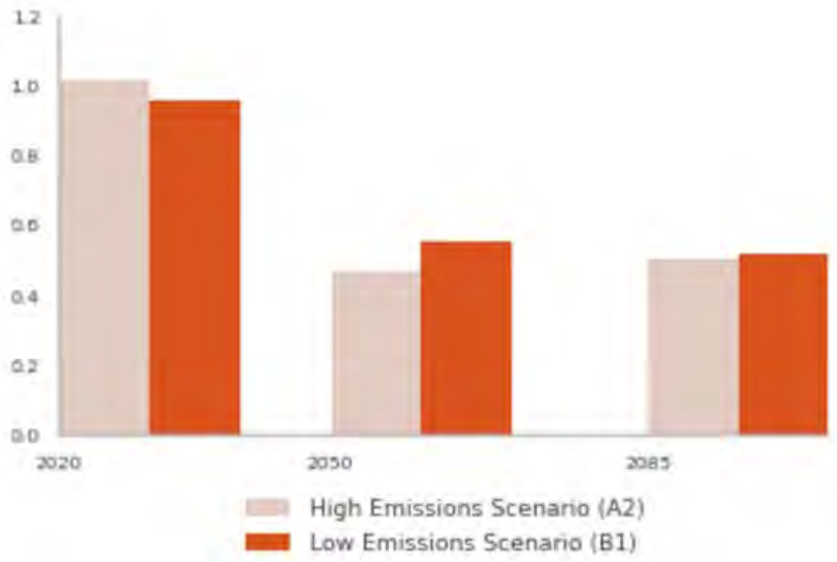
Drought can increase wildfire potential, encourage invasive species, or increase forest mortality, resulting in short term water quality problems, and long-term watershed complications. For example, as plants die due to drought, runoff can more efficiently dislodge and transport sediment because of the increased soil erodibility of damaged vegetative cover. More sedimentation in rivers can affect navigation and more sedimentation in water-supply reservoirs can reduce storage capacity and drought resiliency. The potential for high sediment yields resulting from drought demonstrates the need to consider landscape vulnerability in long-term planning and the importance of long-term monitoring for predicting water supply, navigation, and other impacts.

Models project a doubling of burned area in the southern Rockies, and up to a 74% increase in burned area in California. The area projected to be burned by wildfire will increase substantially in the Lake Elsinore Area towards the end of the century due to climate

change. Figure 3.7 shows the increase in area burned in the Lake Elsinore Area for high and low emissions scenarios. The indicated data are modeled solely on climate projections and do not take landscape and fuel sources into account. New fire risk projections are currently being produced that take more landscape information into account.

As shown in Figure 3.7, there are two different scenarios; a high emission (A2) and a low emission (B1). The first scenario projects continuous population growth and uneven economic and technological growth. Heat-trapping emissions increase through the 21st century; atmospheric CO2 concentration approximately triples, relative to pre-industrial level, by 2100. There is a decrease in precipitation and an increase in temperatures more than 4 degrees Celsius (C) caused by high emissions levels. A decrease in precipitation produces a dry ecosystem and less fuel coverage to be burned. On the other hand, the second scenario characterizes a world with high economic growth and a global population that peaks by mid-century and then declines, a rapid shift toward less fossil fuel-intensive industries and introduction of clean and resource-efficient technologies. This model characterizes an increase in precipitation and a temperature raise of less than 2 degrees C. Wet conditions promote fuel during the growing season. A relatively wet and densely forested ecosystem will have abundant fuel that will dry out during dry season and hence more area will be burned.

Figure 3.7 – Increase in Area Burned in the Lake Elsinore Area



3.4 Climate Impacts on Sectors

Economic and environmental challenges continue to mount on various sectors of the EVMWD's planning area as our State undergoes consecutive years of drought. EVMWD has gone through rigorous planning processes to optimize the use of available water within the planning area and reduce the dependence on imported water. These planning processes

accounted for a range of future conditions resulting from development of potential mitigation and response actions as described in Chapter 4 and 5. EVMWD has also adopted Ordinance 225 that has various water shortage and conservation stages. These water use restriction stages have varying impacts on various relevant sectors within the planning area. This section summarizes the climate impacts on various sectors in the planning area of EVMWD like Agriculture, Fishery and Wildlife, Health, Commercial, Industrial and Institutional sectors. The Agriculture, Commercial, Industrial and Institutional sectors listed herein are very limited in demand on the EVMWD system. Within the planning area these sectors will not be impacted materially by climate. They are only considered herein in the context of representing all possible sector impacts.

3.4.1 Agriculture

The southwest region of the country, which is where EVMWD is located, produces more than half of the nation's high-value specialty crops, which are irrigation-dependent and particularly vulnerable to extremes of moisture, cold, and heat. The pastures of the region are rain-fed and very susceptible to projected drought. More than 92% of the region's cropland is irrigated, and agricultural uses account for 79% of all water withdrawals in the region. A warmer, drier climate is projected to accelerate current trends of large transfers of irrigation water to urban areas, which would affect local agriculturally dependent economies.

Fruit and nut crops are climate-sensitive and may need additional water as the climate warms. California produces nearly 95% of the nation's apricots, almonds, artichokes, figs, kiwis, raisins, olives, cling peaches, dried plums, persimmons, pistachios, walnuts, among other high-value crops. Climate change and drought affect the market value of fruits and vegetables because of the high-water content and visual appearance. The combination of climate changes is projected to continue and intensify, possibly requiring a northward shift in crop production, displacing existing growers and affecting farming communities[13].

Farmers bear the most direct stress from drought due to climate change. In rural settings, wells may run dry, crops may fail, and forage for livestock may be scarce. Drought is one of the stressors on farm families that contribute the pattern of small farms being consolidated into large agribusinesses. Ultimately, costs are spread more widely to taxpayers and consumers, who are also part of the food system.

In developing countries where many people practice subsistence farming, rainfall is closely linked to gross national product, and drought can trigger population migration and famine.

There are no significant demands associated with this sector within EVMWD's sphere of influence. However, there are service connections supplying water solely for landscape

[13] "Threats to Agriculture". Climate Change Impacts in the United States. U.S. National Climate Assessment . nca2014.globalchange.gov

irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the service is solely for landscape irrigation.

3.4.2 Fishery and Wildlife

In general, protections of endangered species and other fish and wildlife resources that are suffering from impacts due to drought and drought-related operations will continue. A balanced approach must be identified to meet watercourse temperatures, instream flows, and protective actions. A primary consideration involves the need to conserve enough water in reservoirs early in the year to maintain cool water temperatures to support the various runs of spawning fish. Changes in snowmelt patterns in the future for the Sierra Nevada, which is a source of imported water, may make it difficult to balance water demands to support aquatic life and ultimately have an impact on import supplies to EVMWD if supplies were curtailed to maintain wildlife. EVMWD is proactive in maintaining water levels in Canyon Lake and contractually obligated to supply tertiary recycled water to Lake Elsinore to maintain habitat for fishery and wildlife. Additionally, The Endangered Species Act now requires that river system managers maintain certain amounts of water in the channels for fish and wildlife habitat.

3.4.3 Health

According to the NCA, the southwest region of the nation has the highest percentage of its population living in a City of any other U.S. region. Increasing metropolitan populations already pose challenges to providing adequate domestic water supplies and the combination of increased population growth and projected increased risks to surface water supplies will add to further challenges. Tradeoffs are inevitable between conserving water to help meet the demands of an increasing population and providing adequate water for urban greenery to reduce increasing urban temperatures.

The effects of heat stress are greatest during heat waves lasting several days or more, and heat waves are projected to increase in frequency, duration, and intensity, becoming more humid, and cause a greater number of deaths. Exposure to excessive heat can also aggravate existing human health conditions. Increased temperatures can reduce air quality and will also lead to shifts in the distribution of disease-transmitting mosquitoes[14].

3.4.4 Commercial, Industrial, and Institutional Sectors

Important issues of concern due to global climate change include changes in urban demand levels and patterns, declines in ecosystem health and function, alterations to power

[14] "Heat Threats to Health". Climate Change Impacts in the United States. U.S. National Climate Assessment. nca2014.globalchange.gov

generation, and pumping regimes. As average temperatures increase, cooling water needs may also increase.

Electrical energy needs are expected to increase in many locations as the climate warms. This increase in electricity demand may compound decreases in hydropower production, increasing its priority for a region.

Additional risks and uncertainties occur individually or connectively, such as water quality, regulatory and operational changes, projects construction and implementation issues, infrastructure reliability and maintenance, demographic and growth uncertainty.

Ninety three percent (93%) of the service connections within EVMWD are single-family residential connections. There are no large commercial, institutional, or industrial water consumers within EVMWD, and therefore the demand is almost entirely residential connections. However, EVMWD has developed restrictions during stage II drought in the WSCP. Restaurants, cafes, and other public food service establishments are prohibited from serving drinking water unless specifically requested by their customers[15].

3.5 Critical Water Resources Vulnerabilities

3.5.1 Imported Water

EVMWD relies heavily on imported water supply. Consequently, the uncertainty associated with imported water supply reliability due to climate change, and increasing cost of imported water are critical issues for EVMWD. EVMWD obtains the imported water via the SWP and the Colorado River Aqueduct as shown in Figure 3.8.

The imported raw water can be purchased from the WMWD connections WR-18A (Colorado River water) and WR-31 (SWP water), and discharged into the San Jacinto River near Nuevo to flow downstream and fill Canyon Lake. Treated imported water is available through two water source connection points at nearly opposite ends of EVMWD.

SOUTHERN CONNECTION

The southern water source connection point supplies treated water from MWD's Skinner Filtration Plant. The Skinner Filtration Plant blends primarily Colorado River water and a small amount of State Project Water. Imported water purchased from MWD through WMWD, accounts for approximately 70% of EVMWD's water supply.

EVMWD has not purchased water from the MWD connection WR-18A (Colorado River Water) since 1989 because the high TDS in the Colorado River supply adversely affects

[15] 2015 EVMWD Urban Water Management Plan

wastewater effluent quality. Construction of MWD connection WR-31 was completed in December 2003 and EVMWD purchased water from this turnout in 2007.

The SWP conveys water from the western slope of the Sierra Nevada to water users both north and south of the Bay-Delta. Specifically, SWP water is delivered to MWD's service area through a system of reservoirs, the San Francisco-San Joaquin Bay-Delta pumping plants, and the California Aqueduct. Owned and operated by the DWR, the SWP provides municipal and agricultural water to 29 State Water Contractors. Annual deliveries for the SWP average about 2.5 million acre-foot (MAF).

In dry, below-normal water availability conditions, MWD has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Over the last two years, under the pumping restrictions of the SWP, MWD has worked collaboratively with other water supply contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage and transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and meet regulatory restrictions[16].

Skinner Plant's treated water is delivered to EVMWD's service area through the Auld Valley Pipeline (AVP) (MWD's service connection EM-17), to the 1434 zone by the Auld Valley Booster Pumps and into the 1650 zone through the California Oaks Booster Pump Station. The pump stations are located at EVMWD's southeast border on Hancock Avenue, east of California Oaks Road. EVMWD can purchase or acquire a maximum flow rate of 37.5 cubic feet per second (cfs) (24.2 mgd or 27,100 AFY) through AVP, although this maximum flow rate cannot be achieved due to hydraulic restrictions within EVMWD delivery system.

NORTHERN CONNECTION

The northern connection point receives treated water from MWD's Mills Filtration Plant, which primarily treats SWP. The treated water is conveyed from the Mills Gravity Pipeline (owned and operated by WMWD) to EVMWD's Temescal Valley Pipeline (TVP). The connection point to the TVP is in Corona, at the intersection of Temescal Canyon Road and La Gloria Street. Through a series of transfers, EVMWD has the capacity for 21 cfs (15,200 AFY) in TVP. Figure 3.9 shows a schematic of interconnections with other agency and EVMWD's major water infrastructures.

TVP was designed to convey 41 cfs with the construction of a proposed pump station, although the current hydraulic capacity of TVP is 19.6 cfs (14,190 AFY) based on gravity flow from the Mills Gravity Pipeline. It is assumed that EVMWD can obtain 10,030 AFY

[16] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.

(8.9 mgd) from TVP on an annual basis. A feasibility study was performed in 2014 and was used for increasing hydraulic capacity in TVP. Some of the alternatives included partial and full replacement of the existing pipeline and/or installation of a pump station. The study recommends a partial upsizing of the 36-inch and 30-inch line to a 48-inch line, which will increase the capacity of the line to 37 cfs. This alternative does not require a pump station and consequently provides economic benefits.

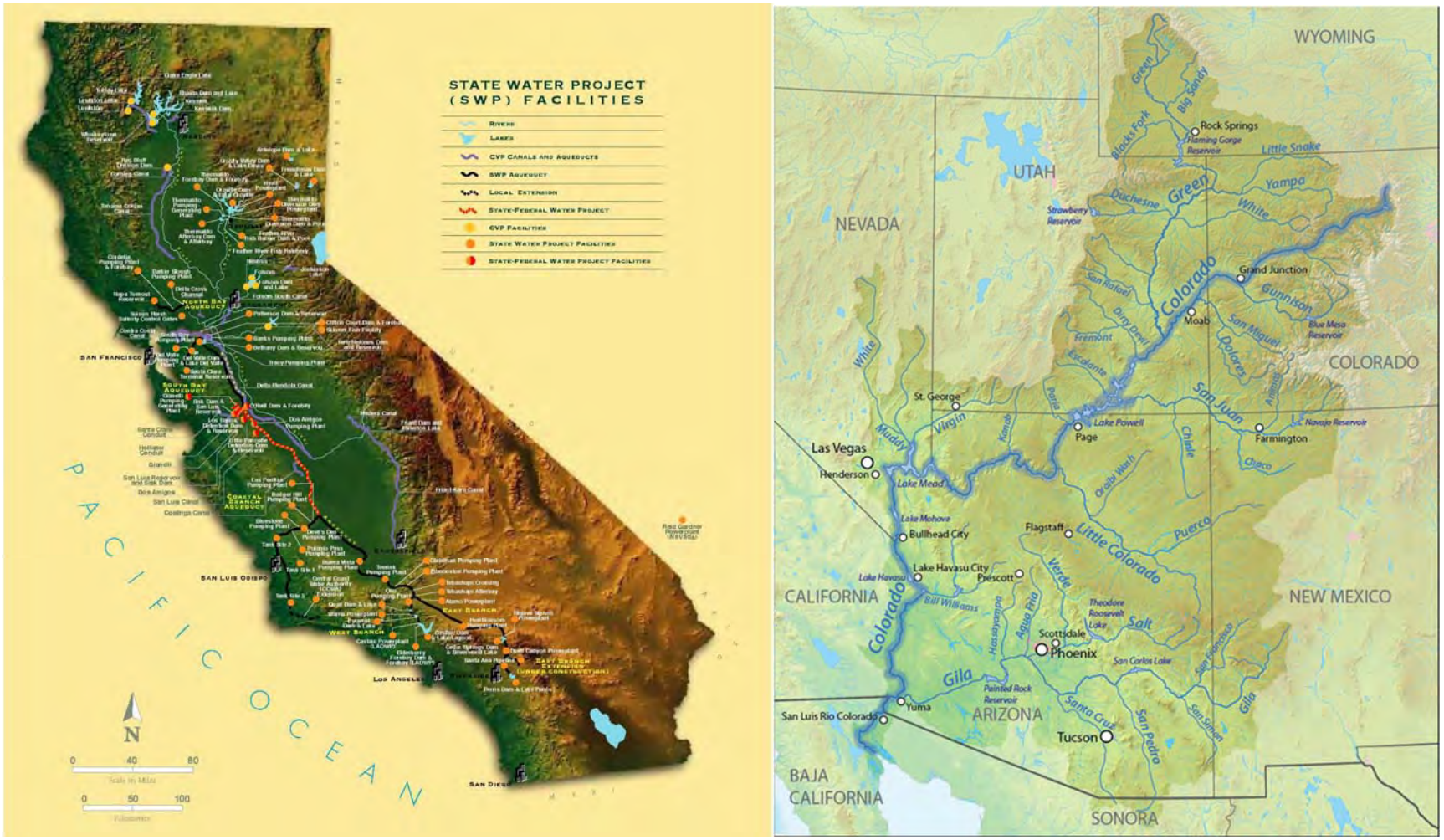
Per MWD's UWMP, MWD indicates that its existing supplies are adequate to meet the projected demands in all hydrologic conditions through 2040[17]. It is assumed that imported water is available during average, dry, and wet years. Therefore, it is assumed that MWD will have sufficient supplies to meet all demands during wet, dry, and average years.

MWD recognizes the importance of the quality of its water supplies and, to the extent possible, is concentrating on maintaining the quality of its source water and developing water management programs that protect and enhance water quality. These management programs recognize that any contaminants which cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. Currently, there are no restrictions on water supply due to imported water quality. Per MWD's 2015 UWMP, the Upper Colorado River Basin snowpack generally peaked in March at 76% of normal. Runoff for that basin measured 94% of normal due to above normal rainfall in May, June and July, which averted a Colorado River shortage condition for 2016. This allowed MWD to implement new water management programs and bolster supplies in 2015. The Colorado River, however, is experiencing a 16-year drought causing total storage levels in that system to steadily decline, increasing the likelihood of water supply shortage in future years beyond 2016. 2016 restrictions on water use generated a record demand for water-saving rebates and refocused efforts to increase development of local water resources.

Therefore, the biggest constraint in the imported water supply will be the availability of MWD's water supply, which is dependent on legal, environmental, and climatic changes.

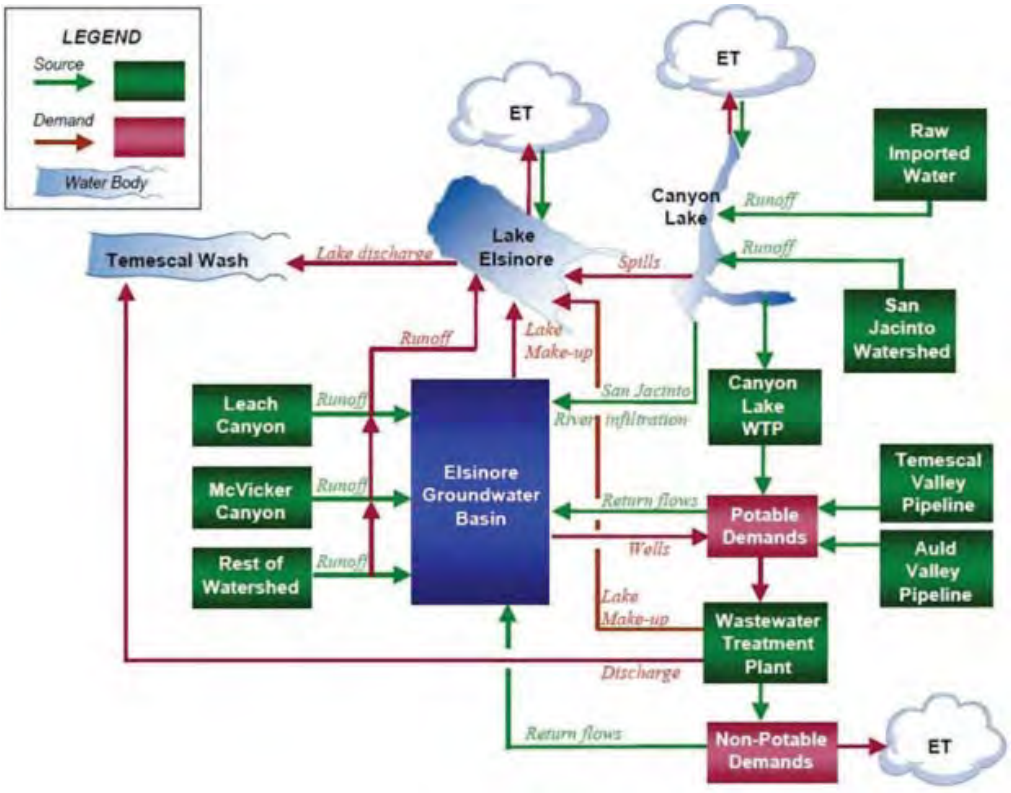
[17] 2015 Metropolitan Water District of Southern California UWMP. Water Supply Allocation Plan-Appendix 4. June 2016.

Figure 3.8 – Imported Water Sources (State Water Projects and Colorado River)[18]



[18] California Department of Water Resources and National Map Services

Figure 3.9 – Interconnections and EVMWD Major Water Infrastructures



3.5.2 Groundwater

Local groundwater, extracted from EVGB and Coldwater Basin, accounts for approximately18% of the water supply (historically from 2008-2013).

The Elsinore Valley Basin encompasses approximately a 25-square mile area including Lake Elsinore, which covers about 3,600 acres of the basin. The EVGB's natural recharge (safe yield) is composed of precipitation (2,464 AFY), runoff from the San Jacinto watershed (1,336 AFY), landscape infiltration (864 AFY), and septic tank discharges (850 AFY). The total EVGB's safe yield is estimated to be around 5,500 AFY. Consistent with the safe yield of the basin, annual groundwater production in EVGB is approximately 5,500 AFY. There are 10 groundwater wells in EVGB[19] [20].

Groundwater supply from the Elsinore Basin is considered a reliable source of supply due to the long-term natural recharge of the groundwater basin.

[19] EVMWD Draft Report: 2015 Water System Master Plan
[20] Sibbet, S., & Gastelum, J. 2014 Memorandum: Preliminary Safe Yield Estimation of the Elsinore Valley Groundwater Basin.

Pursuant to California Water Code, section 10723.8 of the Sustainable Groundwater Management Act (SGMA), EVMWD intends to be the Groundwater Sustainability Agency (GSA) for the entire Elsinore Valley Sub-basin (No. 8-004.01, (the "Sub-basin") of the overall Elsinore Basin (No. 8-004)), and there are no other entities proposing to manage groundwater in the Sub-basin. Becoming a GSA supports EVMWD's participation in the efforts to implement a sustainable management of the Sub-basin and to ensure water supply reliability within its service area.

The Elsinore Valley Sub-basin extends from northwest to southeast in Elsinore Valley. It abuts the Bedford-Coldwater Sub-basin (Basin No. 8-004.02) on the northwest and the Temecula Valley Basin (No. 9-005) on the southeast. Approximately 90 to 95% of the Elsinore Valley Sub-basin lies within the jurisdictional boundary of EVMWD while 100% of the sub-basin lies within the sphere of influence of EVMWD. EVMWD is the water agency uniquely assigned by the Riverside County Local Agency Formation Commission (LAFCO) to provide municipal water service to all parcels within its sphere of influence.

Accordingly, the proposed Elsinore Valley GSA is exactly coterminous with the Elsinore Valley Sub-basin, as described in the 2016 Interim Update of Bulletin 118 by the DWR.

The State of California recently passed the SGMA of 2014. The goal of the SGMA is to sustainably manage groundwater basins so they are a long-term reliable water supply for all current and future beneficial uses. DWR currently designates the Elsinore Basin (No. 8-004), including the Elsinore Valley Sub-basin and the Coldwater Basin, a high priority basin.

The SGMA requires that high-priority basins have a Groundwater Sustainability Plan (GSP), which must include a statement of objectives and various monitoring and reporting requirements to demonstrate sustainable management.

More recently, EVMWD joined efforts with the City of Corona and Temescal Valley Water District (TVWD) to create Joint Powers Authority (JPA), which has been designated by DWR as the exclusive GSA Agency for the Coldwater and Bedford Basins. As related to SGMA-GSP implementation, some of the following efforts will be considered to maximize sustainable use of the Coldwater groundwater basin:

1. Develop plans to enhance storm-water recharge in the Coldwater Basin.

2. Develop plans to optimize groundwater-production patterns to maximize the sustainable yield of the Coldwater Basin.

Implementation of these plans will enhance the long-term sustainable yield of the Coldwater Basin, improve groundwater quality, and mitigate any potential adverse impacts from high or low groundwater levels.

During a normal year, the well pumps are not operated regularly during winter months when demands are low. However, during dry years, the well pumps can be used to extract groundwater throughout the year, increasing total extraction. Therefore, the only quantity constraint on the groundwater system is that the pumped water from the Elsinore Basin and Coldwater Basin must remain at or below the safe yield of the basin, which is approximately 5,500 AFY and 1,200 AFY, respectively.

The presence of nitrates and arsenic in groundwater is a concern in the Elsinore Valley Basin. Although, based on studies conducted by EVMWD, there is no conclusive evidence that nitrate concentrations have been increasing in the groundwater basin over time. EVMWD is proactively investigating and has implemented solutions to mitigate high arsenic concentrations in groundwater. While the presence of arsenic in groundwater is likely to impact groundwater production, EVMWD has constructed arsenic treatment and removal facilities to address water quality issues so there is no anticipation of any groundwater quality to have adverse impacts on supply reliability. Groundwater is not expected to be impacted by any other factors such as legal, environmental, or climatic changes.

3.5.3 Private Wells

Various private domestic wells are located throughout the sub-basin. The exact number is not yet known because historical well records obtained to date are incomplete. The development of GSPs is expected to have a more precise estimate and location of private well owners. Private domestic wells extracting two-acre feet or less per year are defined as de minimis extractor and are mostly exempt from SGMA regulations. Given that the main purpose of SGMA is to instrument a sustainable use of the groundwater basins, this will provide a direct benefit to all the users, including private well users, by implementing projects and programs to have sustained groundwater levels and improved water quality. GSAs, as mandated by SGMA, will consider the interest of all beneficial users and users of groundwater, including private well owners, and will implement an outreach plan to invite them to stay involved in the implementation of SGMA.

3.5.4 Local Surface Water

The third water supply source for EVMWD is surface water obtained from Canyon Lake, also known as the Railroad Canyon Reservoir. Canyon Lake was constructed in 1928 by the Temescal Water Company with a spillway elevation of 1381.76 feet above mean sea level (amsl) and a capacity of 11,868 acre-feet (AF). However, it is assumed that siltation has decreased the capacity of the lake. The exact capacity reduction, based on siltation, is uncertain; however, based on preliminary studies[21], the full pool volume of the lake is estimated to be 8,758 AF. Canyon Lake impounds water from the San Jacinto River, Salt

[21] Anderson, M. 2015 Presentation: Bathymetric Survey and Sediment Hydrocaustic Study of Canyon Lake.

Creek, and local surface runoff. The water is then treated by the CLWTP for distribution. Supplemental raw water can be purchased from the WMWD connections WR-18A (Colorado River water) and WR-31 (SWP water), and discharged into the San Jacinto River near Nuevo Street to flow downstream and fill Canyon Lake.

Historical records show that approximately 11% of the volume of water discharged by WMWD into San Jacinto River is lost due to percolation before the water reaches Canyon Lake. Therefore, releases from WR-31 are typically performed during the wet season when the river has natural flow to minimize the loss of water through percolation.[22]

The CLWTP, located near the southwest dam abutment of Canyon Lake, provides conventional treatment of surface water impounded in the lake. The treatment plant has a design capacity of 9 mgd (13.9 cfs), although operating the plant at a capacity greater than 7 mgd (10.9 cfs) adversely affects the water quality. During periods of increased raw water, turbidity associated with high water inflows to the lake, the plant operators typically treat a maximum of 4.5 mgd (7.0 cfs).

According to EVMWD 2015 UWMP, the reliability of supplies at the CLWTP is dependent on local hydrology and is reduced during dry year conditions. However, during dry periods supplemental raw water is not purchased due to the high amount of water lost through percolation from the San Jacinto River. Therefore, the biggest constraint to the local surface water supply is the hydrology and the annual natural flow to Canyon Lake, and when this flow is low. EVMWD typically purchases a greater amount of imported water from MWD.

Canyon Lake has the highest TDS among all EVMWD's water sources. With the proposed implementation of UV disinfection facilities at the CLWTP, it is expected that Canyon Lake water quality will not affect supply reliability. Supply from Canyon Lake is not expected to be impacted by legal, water quality, or environmental factors.

EVMWD is preparing a Facilities Master Plan for the CLWTP optimization. This Facilities Master Plan will include analysis for the impacts of raw water quality fluctuations on the existing processes adversely affecting the CLWTP, and will provide recommendations to achieve the goal for long-term normal operation of the facility. The Facilities Master Plan also will contain a condition assessment task of all of the processes to determine if the specific facility, or equipment, requires upgrades, redesign, or decommissioning. The recommendations of the Facilities Master Plan shall be based on consideration of the potential upcoming regulations in the future and the ability to assure public health safety from traditional parameters (coliform, TTHMs), as well as, cyanotoxins, etc.

[22] 2011 Elsinore Valley Municipal Water District Urban Water Management Plan

3.5.5 Recycled Water

According to the 2016 EVMWD IRP also included in Appendix B, EVMWD currently operates three wastewater reclamation facilities (WRF): The Regional WRF, Horsethief Canyon WRF, and Railroad Canyon WRF. In addition, wastewater flow in the southern part of EVMWD's service area is treated at the Santa Rosa WRF, operated by the Rancho California Water District (RCWD). These wastewater facilities produce tertiary treated water, which is used for irrigation, lake replenishment, and environmental uses.

Regional WRF is the largest reclamation facility, producing around 74% of the total recycled water. Approximately 90% of the effluent generated at the Regional WRF is used for replenishment of Lake Elsinore, and the remaining 10% is discharged to Gunnerson Pond. The other WRFs produce 26% of the total recycled water which is used for irrigation in Horsethief Canyon, Canyon Hills and Wildomar areas within EVMWD's service area.

3.6 Climate Impacts on Critical Resources

Climate plays a central role in the operation, planning, and management of water resource systems for water supply, flood management, and environmental stewardship. Expectations of the timing, form of precipitation and the availability of water for beneficial use, are based on our understanding of the climate system and historical and projected data regarding meteorological and hydrological events as described in the previous section.

The potential impacts of climate change on critical water resources may be felt through changes in temperature, precipitation, and runoff. There is growing evidence that climate change will cause longer and more frequent droughts in some areas.

According to the DWR, drought due to climate change has caused severe impacts across the State, including community water sources running dry, the loss of agricultural production and jobs, depletion of groundwater basins, widespread tree death, and impacts to fish and wildlife. The effects of climate change are likely to intensify in the future as the population continues to grow and competition for water resources intensifies. It is recognized that permanent reductions per capita in water use, and increases in water use efficiency across all sectors, will be needed to ensure long-term water supply reliability[23].

Particularly, EVMWD is subject to the following climate vulnerabilities:

1. More frequent and longer droughts would reduce imported water supply availability and decrease local water quality and habitat.

2. The reliability and availability of imported water will play a key role in EVMWD's water resource management strategies. Hydrologic conditions in tributaries that

[23] Making Water Conservation a California Way of Life. Department of Water Resources.

feed the SWP, originating from the California Northern Sierras and the Colorado River Aqueduct which originate from the Colorado River Basin, affect the quantity and quality of imported water available to meet water demands and to replenish regional storage. Reductions to the Sierra snowpack levels would reduce the availability of water that would normally fill the SWP reservoirs. This would require the State to further reduce SWP "Table A" entitlements, including water delivery allocations to EVMWD.

3. The current and future reliability at the CLWTP depends on hydrology in the Lake Elsinore Area and San Jacinto River Watershed. This water availability is reduced during dry year conditions. A review of historical data indicates a reduction of up to 50% in available natural recharge at Canyon Lake during dry years from average or normal year flows.

4. Local surface water quality would decrease. Warming temperatures will result in lower dissolved oxygen levels in water bodies. Warming water temperatures promote algal blooms and in turn enhance eutrophication. Eutrophication is defined as an excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen. Changes in stream flows with increased ETO may affect pollutant concentrations in water bodies resulting in poor water quality.

5. Low flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

3.7 Develop Worst Case Planning Scenario

Before developing a strategy for addressing water shortages, possible shortage scenarios have to be considered, and how they might impact EVMWD. Developing possible water shortage scenarios will help to understand the possible risks a water shortage would pose to EVMWD and will allow the development of an effective plan for addressing possible shortages.

A hypothetical worst-case planning scenario is developed using consecutive, increasingly dry water years. Once the worst-case scenario has been created, alternative ways will be considered to address the resulting shortages. These alternatives will include supply augmentation, demand reduction, and a combination of supply augmentation and demand reduction.

In 2009, EVMWD developed a Decision Support Model (DSM) which is called the Water Resources Decision Support System (WRDSS). This tool is very useful for simulating a

complex water resource system that can be represented by key components such as water demand, conveyance, storage, and supply. The DSM can simulate specific "what-if" scenarios (e.g. how can EVMWD meet water demands during an imported water supply shortage?). The DSM can be used to find an optimal solution given a set of options (e.g. what combination of water supply projects meet future water demands at the least cost?). The DSM can also provide key input for developing resource management strategies and policies, and serve as the primary tool for adaptive management practices.

The WRDSS optimizes short-term potable water supply operations with different supply sources (groundwater, surface water, and imported water). The model also captures constraints within EVMWD's water distribution system such as capacity constraints, water quality constraints, etc.[24]

The WRDSS model was recently updated to include new programs such as MWD's conjunctive use program (CUP). The WRDSS model allows EVMWD to develop and evaluate comprehensive scenarios and examine EVMWD's vulnerability to risks such as water supply reliability, water quality and changing demand conditions.

[24] MWH, EVMWD 2009 Water Supply Optimization Plan.

CHAPTER 4 – MITIGATION ACTIONS

4.1 Purpose

This chapter will identify, evaluate, and prioritize mitigation actions and activities that will build long-term resiliency to drought and will mitigate the risks posed by drought. These preemptive drought actions and activities are intended to decrease vulnerabilities and reduce the need for response actions and are aimed mainly at infrastructure improvements, education, and communication.

4.2 Description

"Mitigation" – is taking steps ahead of time to prevent known impacts from a natural disaster. Planning is generally seen as more efficient and more effective than measures taken in crisis mode. This includes the following activities:

- Identify Mitigation Actions: Current mitigation measures will be identified, see Section 4.3.
- Plan, evaluate, and prioritize of mitigation goals, see Section 4.4.
- Prioritization of mitigation actions, see Section 4.5.

4.3 Current Mitigation Measures

Climate change introduces uncertainty in water supply planning for EVMWD that may require Drought Contingency Planning.

Drought planning can and should be conducted at all levels of decision-making – by federal and regional water management agencies; by state agencies with authority over water, agriculture, the environment, natural resources, and health; by tribal governments; by water suppliers; and by counties and municipalities. Farmers, ranchers, and others whose livelihoods depend on regular rain should also know their options and have plans in place in case the rain stops.

It is expected that providing support for Drought Contingency Planning and projects to build drought resiliency may also reduce the need for some emergency response actions.

Mitigation measures are actions, programs, and strategies implemented before a drought occurs to address potential risks and impacts. These actions are intended to limit water availability, reduce water supply reliability vulnerabilities and reduce the need for response actions. The principal mitigation goals should be focused on decreasing consumptive environmental use, developing supply augmentation, and preventing economic loss.

Many factors should be considered when developing an action plan and choosing water shortage mitigation measures. These factors include potential water savings mechanisms, the implementation of measures, direct and indirect costs, quality of supplies,

environmental impacts, legal or procedural requirements for implementation, community support, adequacy of treatment facilities to use supplemental sources, and staffing requirements.

When planning for a water shortage, it is essential to balance supply and demand. Challenges that will be faced when preparing for a water shortage include:

- Unpredictability. The duration and severity of water shortages vary and no two water shortage events will have the same impact on a water district.
- Water shortages can impact adjacent districts differently depending on the source of water supplies used by the districts, the amount of water held in reserve (water shortage buffer), the type of customers and the types of water use efficiency measures practiced in typical, non-drought years.
- Investing the time to plan for a water shortage when water supplies are plentiful. Management action is taken only when crisis strikes, thus freely funneling time and money into alleviating suffering and property damage. This condition is considered to be crisis management. Upon termination of the crisis, the investment of time and resources in planning is rarely implemented to anticipate future conditions so as to ease the effects of the next water shortage.
- The responsibility for responding to water shortages is divided among many government jurisdictions including the planning departments, water purveyors, public health departments, etc. These entities must coordinate efforts to effectively respond to a water shortage event.

4.3.1 Integrated Mitigation Approach

To address the uncertainty associated with water supply reliability due to climate change, extended drought conditions, and the increasing cost of imported water, EVMWD embarked upon preparing a comprehensive Integrated Resources Plan (IRP). The IRP is a long-term strategy for providing reliable water supply to its growing customer base. The IRP considers a 25-year planning horizon covering years 2016-2040. The IRP is composed of two main mitigation approaches:

1. **Core Resource Strategy:** A preferred water supply portfolio is implemented to meet future water demands. A 10% water supply buffer must be included as a contingency. EVMWD focusses on the implementation of the recommended portfolio which increases long-term water supply reliability by reducing reliance on imported water supplies. This core resource strategy considers planning for 10% buffer to meet future uncertainties.
2. **Adaptive Resource Plan:** Alternative water supply options are implemented based on changed conditions and triggers. EVMWD's resources management strategies will focus on the following areas: Long-term groundwater storage in the Elsinore Valley Groundwater Basin (Elsinore Basin), Drought management and

response, Continued water conservation, and Acquiring strategic water assets Mitigation Goals Planning, Evaluation, and Prioritization.

4.4 Mitigation Goals Planning, Evaluation, and Prioritization

While the effects of climate change cannot be precisely estimated, EVMWD's core resource strategy as well as its adaptive resource framework that focus on four key areas as detailed previously will assist EVMWD in reliably meeting the long-term water demands within its service area.

The IRP considers a comprehensive set of mitigation actions (IRP goals, see below) to maximize local water supplies and define the most optimal water supply portfolio to enhance water supply reliability under climate change and prolonged drought conditions.

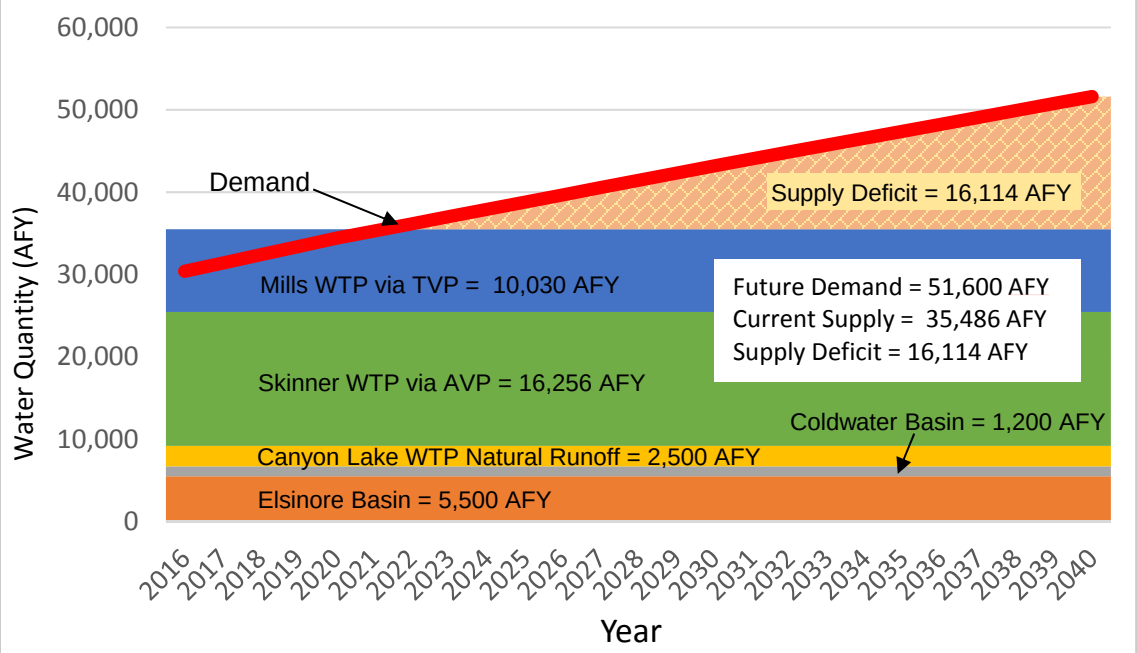
- CREATE NEW WATER: Identify local new water supply options beyond sources in EVMWD's existing supply portfolio.
- INCREASE SUPPLY RELIABILITY: Develop a water supply portfolio that offers the highest reliability under all hydrologic conditions.
- DECREASE DEPENDENCE ON IMPORTED WATER: Diversify the water supply portfolio to be less dependent on imported water.
- PROMOTE REUSE: Develop a plan that reuses 100% of the wastewater effluent generated by EVMWD.
- IMPROVE WATER QUALITY: Provide high quality water to customers within EVMWD's service area.
- IMPROVE GROUNDWATER MANAGEMENT: Protect and sustainably manage EVMWD's groundwater resources.
- PROMOTE CONSERVATION: Continue and promote water conservation programs to reduce EVMWD's water footprint.

4.4.1 Water Supply Project Evaluation and Analysis

Core Resources Strategy: Portfolio Evaluation

The IRP considers a 25-year planning horizon covering the period 2016-2040. Figure 4-1 depicts a comparison between current supplies and projected demand for EVMWD's service area for the next 25 years. At the end of the planning horizon in 2040, water demand is estimated to be approximately 51,600 AFY. Overall supplies available to EVMWD are estimated to be approximately 35,500 AFY. This is a conservative estimate which assumes that long-term imported water supply availability to EVMWD is representative of EVMWD's historical maximum imported water use. For the purposes of this IRP, it is assumed that over the planning horizon, approximately 26,300 AFY of imported water will be available to EVMWD. This represents a 15% increase over the historical maximum use of 22,800 AFY in 2007.

Figure 4.1 – Demand Versus Current Supply



In order to offset the deficit of approximately 16,114 AFY by 2040, the IRP considered 44 supply alternatives covering different supply options such as producing water from untapped groundwater basins, indirect potable reuse (IPR), seawater desalination, water exchanges and transfers, continued water conservation, etc. These supply alternatives are presented in Table 4-1. A total of 44 projects were identified as potential long-term water supply options. These projects represent approximately 58,000 AFY of additional supplies. Each project was further evaluated using key metrics such as average yield, dry year yield, reliability, capital and annual operations and maintenance costs, salinity, implementation ability, and environmental impacts. The IRP provides additional details on the metrics used to evaluate these projects.

Table 4.1 – List of 44 Projects as Potential Sources of Long-Term Water Supplies

Supply Source		Alternatives Investigated
1	Meeks and Daley Assets	1A. Transfer Bunker Hill Basin Groundwater (1) via TVP and Riverside-Corona Feeder 1C. Sell the Bunker Hill groundwater facilities and water rights 1D. Transfer Bunker Hill Basin groundwater (1) via Riverside and Gage Canal, Arlington Line, Lester WTP, and TVP 1E. Transfer Bunker Hill Basin groundwater via Riverside and Gage Canal, Arlington Line, New EVMWD WTP, and TVP 1F. One time transfer of water conservation assets (Potential clients: City of Riverside, Western, etc.) 1G. Continue with WMWD Exchange Agreement 1H. Transfer Bunker Hill Basin groundwater via SBVMWD CUP/Central Feeder/MWD 1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
2	Temescal Valley Groundwater Basins	2A-1. Pump Lee Lake Basin groundwater via TVP. No salt removal treatment. 2A-2. Pump Bedford groundwater via TVP. No salt removal treatment. 2B. Extract Coldwater Basin groundwater with existing wells and transfer the water via TVP 2E. One-time water exchange transfer with the City of Corona (3,200 AF), unused water in Coldwater Basin 2F. Coldwater groundwater exchange with Corona for Temescal Basin water 2G. Bedford groundwater exchange with Corona for Temescal Basin water
3	Elsinore Groundwater Basin	3D. Palomar Well replacement 3E-1. McVicker and Leach Canyon stormwater recharge 3E-2. McVicker and Leach Canyon stormwater/imported water recharge 3F. Elsinore Valley Groundwater Storage Project (Canyon Lake Water Storage) 3G. Elsinore Basin conjunctive use expansion
4	Warm Springs Groundwater Basin	4A. Extract groundwater from Warm Springs Basin – No salt removal treatment 4B. Extract groundwater from Warm Springs Basin – Salt removal treatment
5	Canyon Lake	5A. Supplement Canyon Lake with MWD imported water (WR-31) via San Jacinto River 5B. Supplement Canyon Lake with MWD imported water (WR-31) via a new pipeline 5C. Supplement Canyon Lake with MWD imported water (WR-31) via the San Jacinto River and a new water treatment plant 5D. Supplement Canyon Lake with MWD imported water (WR-31) via a new pipeline and a new water treatment plant 5E. Modify operation of Canyon Lake
6	Surface Water	6B. Lee Lake Reservoir storage (using surface water rights) for non-potable use 6C. Lee Lake Reservoir storage (using surface water rights) for IPR use
7	MWD Water Sources	7A. Obtain MWDSC Mills treated water through TVP expansion with additional capacity in MGL 7C. Obtain MWDSC Mills treated water through Perris Valley pipeline 7E. Obtain MWDSC Lakeview treated water through a new pipeline 7H. Obtain MWDSC Eagle Valley WTP treated water 7I. Obtain treated imported water from Corona Lester WTP
9	Desalter	9A. Arlington Desalter 9B. Construct an Ocean Desalination Plant at San Onofre (Nuclear Station)
10	Indirect Potable Reuse	10A. IPR at Regional WRF. Surface recharge to AWT
		10B. IPR at Regional WRF. Injection/extraction with AWT

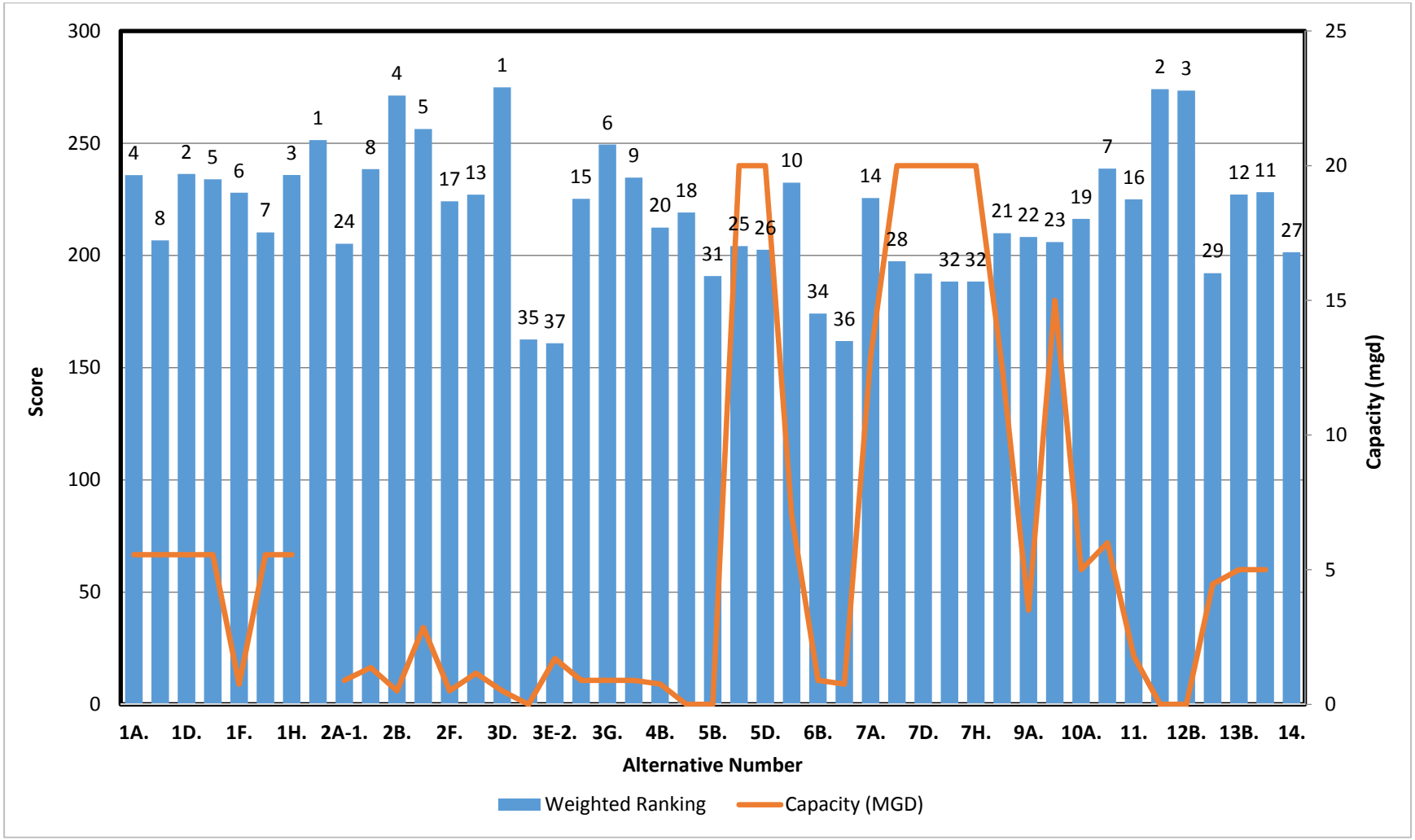
Supply Source		Alternatives Investigated
11	Temecula-Pauba Groundwater	11. Temecula-Pauba groundwater
12	Expand Water Conservation	12A. Implement increased water conservation measures 12B. Implement increased water conservation measures – Enhanced
13	Water Transfers	13A. Cadiz Project 13B. Bunker Hill Basin Conjunctive Use project (led by SBVMWD) 13C. Willow Springs Water Bank
14	Stormwater	14. Stormwater Harvesting

Each alternative was given a score for each metric (with applied weighting based upon its relative importance), and then ranked based upon the sum of all its scores. The supply alternative evaluation screens the highest ranked projects which are then utilized to develop scenario based portfolios to offset the supply deficit identified for the planning horizon (year 2040). Figure 4-2 shows the expected production capacity for each project and the assigned ranking. Table 4-2 shows the top ranked projects based on source, which have a total average yield of 17,883 AFY.

Table 4.2 – Summary of Top Ranked Projects Based on Source

Alternatives Investigated	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability (DYY/AYY Ratio)	Capital Cost	Annual O&M Cost	Unit Cost	TDS (mg/L)	Implement-ability	Environ-mental Impacts
1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona	5.56	6,223	6,223	1.0	$30,634,000	$3,547,000	$847	400	2.5	3.0
2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment	1.37	1,300	1,045	0.8	$6,599,000	$345,000	$542	800	4.0	4.0
3D. Palomar Well Replacement	0.50	560	560	1.0	$3,120,000	$106,000	$496	400	4.0	4.0
4A. Extract Groundwater from Warm Springs Basin – No Salt Removal Treatment	0.89	1,000	1,000	1.0	$6,859,000	$428,000	$794	1,000	3.0	3.0
10B. IPR at Regional WRF. Injection/Extraction with AWT	6.00	5,700	5,415	1.0	$132,082,000	$5,707,000	$2,515	100	2.0	2.0
12B. Implement Increased Water Conservation Measures - Enhanced	0.00	3,100	3,100	1.0	Not Identified	$1,240,000	$400	450	4.0	4.0

Figure 4.2 – IRP Projects Ranking based on Combined Weights



Scenario Evaluation

Seven scenarios, each targeting a specific goal, were developed for further analysis. Seven scenarios were developed to test the performance of different project combinations relative to the highest ranked projects listed in Table 4-2. The combination of the top ranked projects is referred to as Scenario 6 in this chapter. Scenario 7 represents a modified or a hybrid version of Scenario 5 and includes additional local supply projects (listed on Table 4-1). Each scenario generates sufficient yield to satisfy the long-term water supply deficit of 16,114 AFY. Table 4-3 shows the selected projects to form each of the scenarios. Each scenario is briefly described below:

Scenario 1 - Current Philosophy/Status Quo

This scenario represents no change to the current dependence on imported water supply to meet future water demands. Approximately 69% of the total water supply is imported water delivered via a proposed expansion of the TVP (Project 7A).

Scenario 2 - Other Imported Water

This scenario considers other water supplies in lieu of imported water such as water obtained by desalinating ocean water. A conceptual project was established to estimate potential capital and operating costs. The scenario objective was met by constructing a seawater desalination facility at the existing San Onofre Nuclear Generating Station (Project 9B). Approximately 75% of the total water supply will be delivered via seawater desalination.

Scenario 3 - Maximize Local Resources

This scenario considers local water supply projects intended to maximize EVMWD's groundwater and surface water assets. Approximately 49% of the total water supply in this scenario is made up of local supplies.

Scenario 4 - Minimize Salinity (TDS)

The intent of this scenario is to minimize the salinity levels (represented by TDS concentrations) in EVMWD's water supplies. This is accomplished by prioritizing two projects that are low in TDS concentrations: 10B (IPR) and 7A (Additional imported water from Henry J. Mills Water Treatment Plant). These projects represent 89% of the total water supply in this scenario.

Scenario 5 - Minimize Unit Costs

The intent of this scenario is to develop a water supply portfolio that has the lowest unit cost.

Scenario 6 - Top Ranked Projects Based on Source

This scenario represents the supply portfolio presented in Table 4-2. The supply projects in this scenario represent the highest ranked among the 44 projects considered to offset EVMWD's future water supply deficit.

Scenario 7 - Hybrid

The intent of this scenario is to develop a supply portfolio that offers the highest supply reliability at a reasonable cost. This is accomplished by modifying the supply portfolio identified as part of Scenario 6 to include additional local projects such as: 2A-1. Lee Lake Basin, 5E. Modify Operation of Canyon Lake, and 11. Temecula Pauba Well.

These scenarios were evaluated using the same methodology used to identify the highest yielding projects and rank accordingly. In addition, by using the Water Resources Decision Support System (WRDSS), the following tactical evaluation criteria were used to determine performance of each scenario:

- Salinity (total dissolved solids in mg/L)
- Unit cost of water
- Reliability under historical hydrologic conditions
- Projected cumulative supply deficit under historical hydrologic conditions

Table 4.3 – Selected Projects Scenarios

Scenarios	List of Projects
Scenario 1. Current Philosophy (or Baseline Scenario)	3D. Palomar Well Replacement
	5E. Modify Operation of Canyon Lake
	7A. Obtain MWDSC Mills Treated Water through the TVP Expansion with Additional Capacity in MGL
	12B. Implement Increased Water Conservation Measures - Enhanced
Scenario 2. Other Imported Water	3D. Palomar Well Replacement
	5E. Modify Operation of Canyon Lake
	9B. Construct an Ocean Desalination Plant at San Onofre (Nuclear Station)
	12B. Implement Increased Water Conservation Measures - Enhanced
Scenario 3. Maximize Local Resources	1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Salt Removal Treatment
	2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment
	3D. Palomar Well Replacement
	3E-2. McVicker and Leach Canyon Stormwater/Imported Water Recharge
	4A. Extract Groundwater from Warm Springs Basin - No Salt Removal Treatment
	5E. Modify Operation of Canyon Lake
	6B. Lee Lake Reservoir Storage (using Surface water rights) for non-potable use
	12A. Implement Increased Water Conservation Measures
	11. Temecula-Pauba Groundwater

Scenarios	List of Projects
Scenario 4. Minimize Salinity (TDS)	10B. IPR at Regional WRF. Injection/Extraction with AWT
	3D. Palomar Well Replacement
	7A. Obtain MWDSC Mills Treated Water through the TVP Expansion with Additional Capacity in MGL
	12A. Implement Increased Water Conservation Measures
Scenario 5. Minimize Unit costs	1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Salt Removal Treatment
	2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment
	3D. Palomar Well Replacement
	4A. Extract Groundwater from Warm Springs Basin - No Salt Removal Treatment
	5E. Modify Operation of Canyon Lake
	11. Temecula-Pauba Groundwater
	12B. Implement Increased Water Conservation Measures - Enhanced
Scenario 6. Top Ranked by Sources	1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona
	2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment
	3D. Palomar Well Replacement
	4A. Extract Groundwater from Warm Springs Basin - No Salt Removal Treatment
	10B. IPR at Regional WRF. Injection/Extraction with AWT
	12B. Implement Increased Water Conservation Measures - Enhanced
Scenario 7. Hybrid	1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Salt Removal Treatment
	2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment
	3D. Palomar Well Replacement
	4A. Extract Groundwater from Warm Springs Basin - No Salt Removal Treatment
	5E. Modify Operation of Canyon Lake
	10B. IPR at Regional WRF. Injection/Extraction with AWT
	11. Temecula-Pauba Groundwater
	12B. Implement Increased Water Conservation Measures - Enhanced

Figure 4-3 shows the scores for each scenario, along with their total water supply yield. Each scenario generates sufficient yield to satisfy the long-term water supply deficit of 16,114 AFY. Scenario 6, Scenario 7, and Scenario 5 have the highest scores. These scenarios also offer a higher level of reliability relative to the other scenarios.

Figure 4.3 – Scenario Comparison by Rank

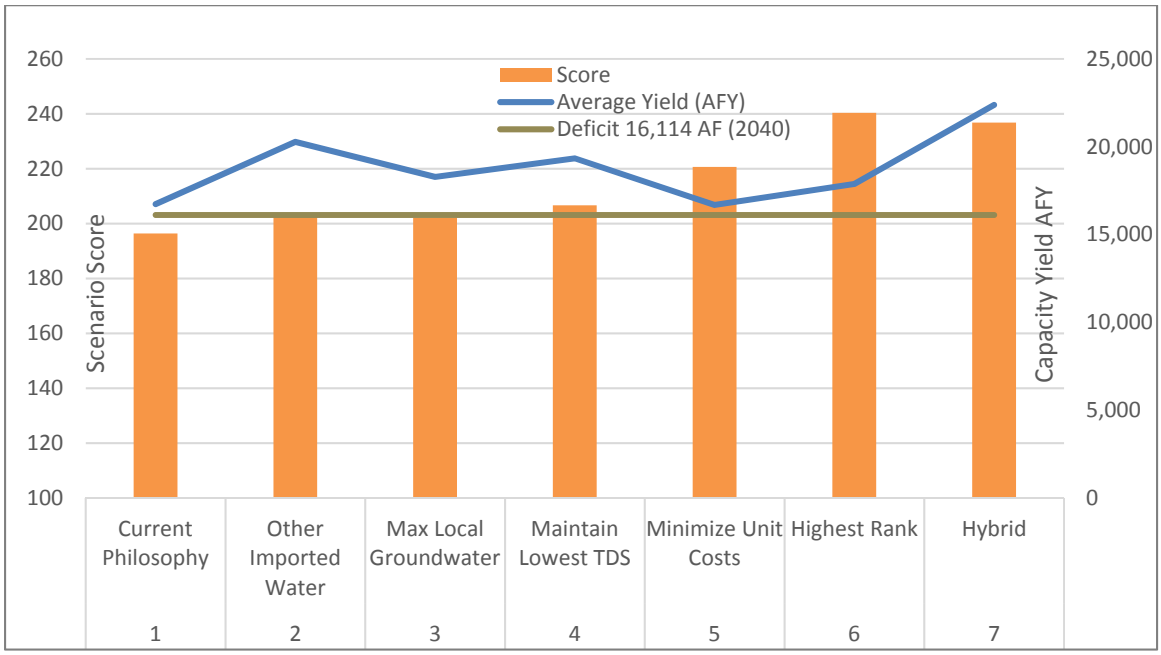


Figure 4-4 depicts the capital cost, unit cost, and potential impact on connection fees associated with implementing each scenario. An incremental connection fee was approximated for comparative purposes only. The following simplistic rule of thumb was applied: a $100 connection fee increase accounts for every $100,000 in capital investment. Actual connection fees will be determined in the future by completing a comprehensive financial study in conjunction.

Scenario 2 represents the costliest alternative for securing additional supplies to offset the long-term deficit of 16,114 AFY. Costs for this scenario are primarily driven by the San Onofre Ocean Desalination Plant and the associated pipeline to deliver desalinated water to EVMWD. This scenario has the highest unit cost ($3,616/AF), capital cost ($506 million), and has a significant impact on future connection fees (an increase of $14,682). Scenarios 6 and 7 have the second ($1,265/AF) and third ($1,110/AF) highest unit costs, respectively. However, these costs are very comparable to current imported water costs (around $1,000/AF). In addition, imported water costs are projected to increase 3% to 5% annually for the long-term. Therefore, the unit costs of water supply for the different water supply portfolios in the seven scenarios are considered to be in-line with the expected cost for imported water supply in the future.

Figure 4.4 – Scenario Comparison by Cost

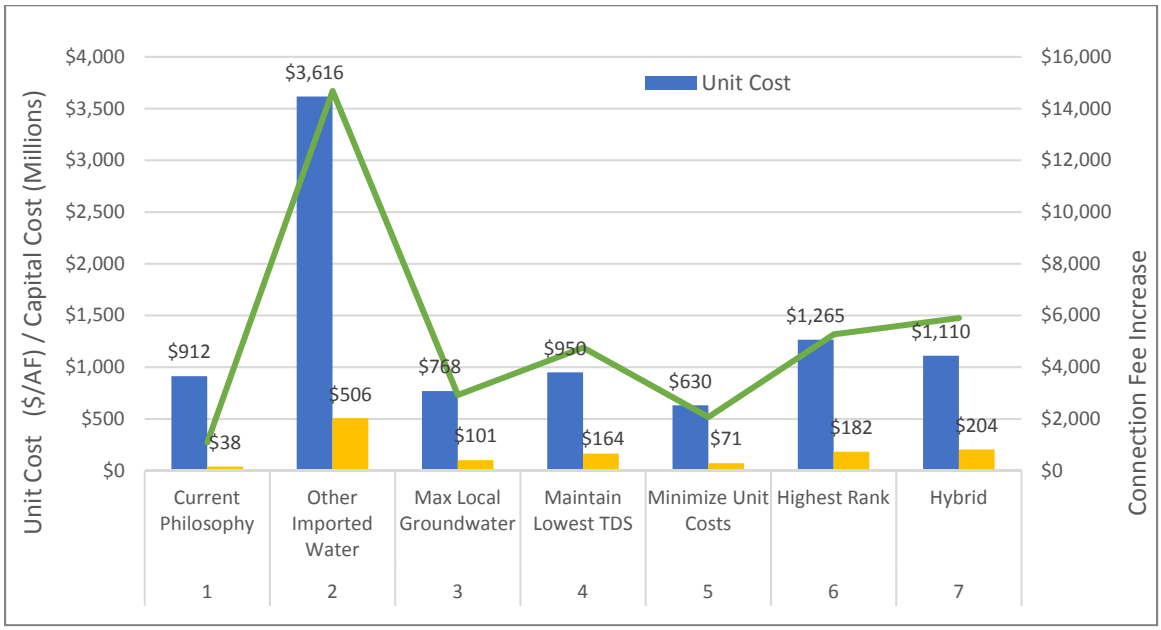
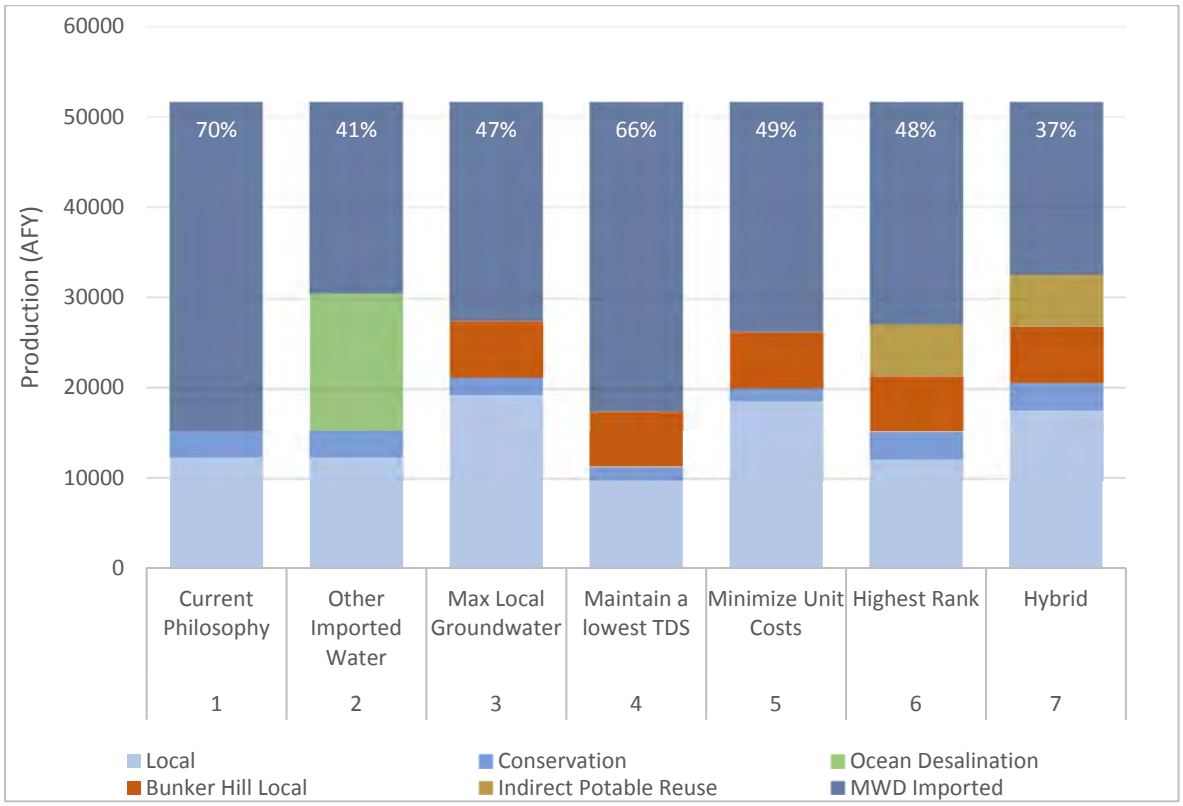


Figure 4-5 summarizes the water supply mix associated with each scenario. Scenarios 1 and 4 rely heavily on imported water supplies to offset the long-term deficit; with imported water comprising approximately 70% and 66%, respectively, of the total yield generated in these scenarios. While imported water constitutes only 41% of the total yield generated in Scenario 2, this scenario considers offsetting the long-term supply deficit by constructing a relatively costly ocean desalination facility. In Scenario 3, the imported water needs are reduced by maximizing local resources including EVMWD's surface water assets and stormwater capture. Scenarios 5, 6, and 7 significantly reduced imported water needs with imported water comprising 49%, 48%, and 37%, respectively, of the total yield generated in these scenarios.

Figure 4.5 – Water Supply Mix of Scenarios



DSS Simulation of Reliability and TDS Values

Table 4-4 shows the TDS, unit cost, reliability, and expected water supply deficit for each of the scenarios discussed in this section. The results presented in this table were obtained by simulating EVMWD's complex water resources system using the WRDSS model.

Salinity in the source waters is a very important consideration for EVMWD as the source water quality directly affects the TDS in EVMWD's wastewater discharges, which are regulated by the Santa Ana Regional Water Quality Control Board. The model simulation results indicate that the expected salinity levels of the different supply portfolios do not deviate significantly from the current salinity levels in EVMWD's water supply sources.

While cost efficiency is a very important consideration for EVMWD, supply reliability is a growing concern in light of climate change and potential population growth in the service area. The on-going drought has highlighted the need for a diverse and robust water supply portfolio. Given their significant dependence on imported water (susceptible to climatic, environmental, and conveyance issues), the portfolios in Scenarios 1 and 4 leads to significant supply deficits for the 25-year planning period. Scenario 1 has a cumulative supply deficit of approximately 45,000 AF over the planning period. Conversely, Scenario 7 exhibits the lowest cumulative supply deficit of approximately 700 AF over the planning

period. While Scenario 5 performs very well from a cost perspective, it still exhibits a cumulative supply deficit of over 12,000 AF over the planning period.

Table 4.4 – Summary of Performance Metrics

	Current Philosophy	Other Imported Water	Maximum Local Groundwater	Maintain the Lowest TDS	Minimize Unit Costs	Highest Rank	Hybrid
TDS (ppm)	518	524	508	478	546	500	506
Cost ($/AF)	$912	$3,616	$768	$950	$630	$1,265	$1,110
Reliability	0.95-0.99	0.97-1	0.98-1	0.98-1	0.99-1	0.99-1	1
Deficit (AFY)	44,798	22,788	16,982	21,123	12,424	5,389	710

Recommended Water Supply Portfolio and Project Implementation

Based on the WRDSS model results, Scenario 7 (Hybrid) represents the recommended water supply portfolio (Table 4-5) for implementation. The hybrid water supply scenario is utilized to analyze the combination of highest ranked projects and was selected as the representative model. This water supply scenario exhibits the following:

- Optimizes the use of EVMWD's local water supply sources.
- Has an effective unit cost relative to current and forecasted cost of imported water.
- Has one of the lowest TDS concentration values. A critical factor for EVMWD given the regulatory and financial implications of TDS management in the groundwater basins.
- Has the highest reliability relative to the other scenarios.
- Satisfies the highest priority set forth by the EVMWD Board of Directors.

As shown on Table 4-5, the water supply projects that constitute Scenario 7 comply with the overarching objectives of the IRP as established by EVMWD's Board of Directors. These projects, shown in Figure 4-6, represent an optimum mix of imported water and local supplies, including new supplies from previously untapped groundwater basins and innovative concepts such as IPR, which ensures resiliency during dry-years and promotes efficient reuse of EVMWD's water supplies. The recommended water supply portfolio also includes utilizing EVMWD's water supply assets in the San Bernardino Basin Area. These assets will provide reliable, high quality groundwater that will improve the overall water quality within EVMWD's service area. Lastly, enhanced water conservation, furthered by EVMWD's landscape ordinance, will ensure efficient utilization of EVMWD's precious water resources.

Groundwater from Coldwater, Bedford, Lee Lake and San Bernardino basins will be delivered to EVMWD's system via TVP. These projects will provide a total capacity of

10.5 mgd. The current operational capacity of TVP is approximately 21 cfs, constrained by bottlenecks in EVMWD's distribution system. Consequently, a TVP expansion will be required by 2020, as depicted in Figure 4-7. A concurrent feasibility study evaluating TVP expansion, initially shows an additional 20 cfs (13.8 mgd) requirement, for an ultimate capacity of 41 cfs.

Table 4.5 – Scenario 7 (Hybrid) Water Supply Projects in Relation to IRP Objectives

	IRP Objectives						
Projects for Hybrid	**Create "New Water"**	**Improve Supply Reliability**	**Decrease Dependence On Imported Supply**	**Promote Reuse Projects**	**Improve Water Quality**	**Improve Groundwater Management**	**Promote Conservation**
1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona	X	X	X		X		
2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Salt Removal Treatment			X				
2A-2. Pump Bedford Groundwater via the TVP. No Salt Removal Treatment			X				
3D. Palomar Well Replacement	X	X	X				
4A. Extract Groundwater from Warm Springs Basin - No Salt Removal Treatment	X	X	X				
5E. Modify Operation of Canyon Lake			X				
10B. IPR at Regional WRF. Injection/Extraction with AWT	X		X	X	X	X	
11. Temecula-Pauba Groundwater	X	X	X				
12B. Implement Increased Water Conservation Measures - Enhanced		X	X			X	X

Figure 4.6 – Recommended Hybrid Scenario Location Map

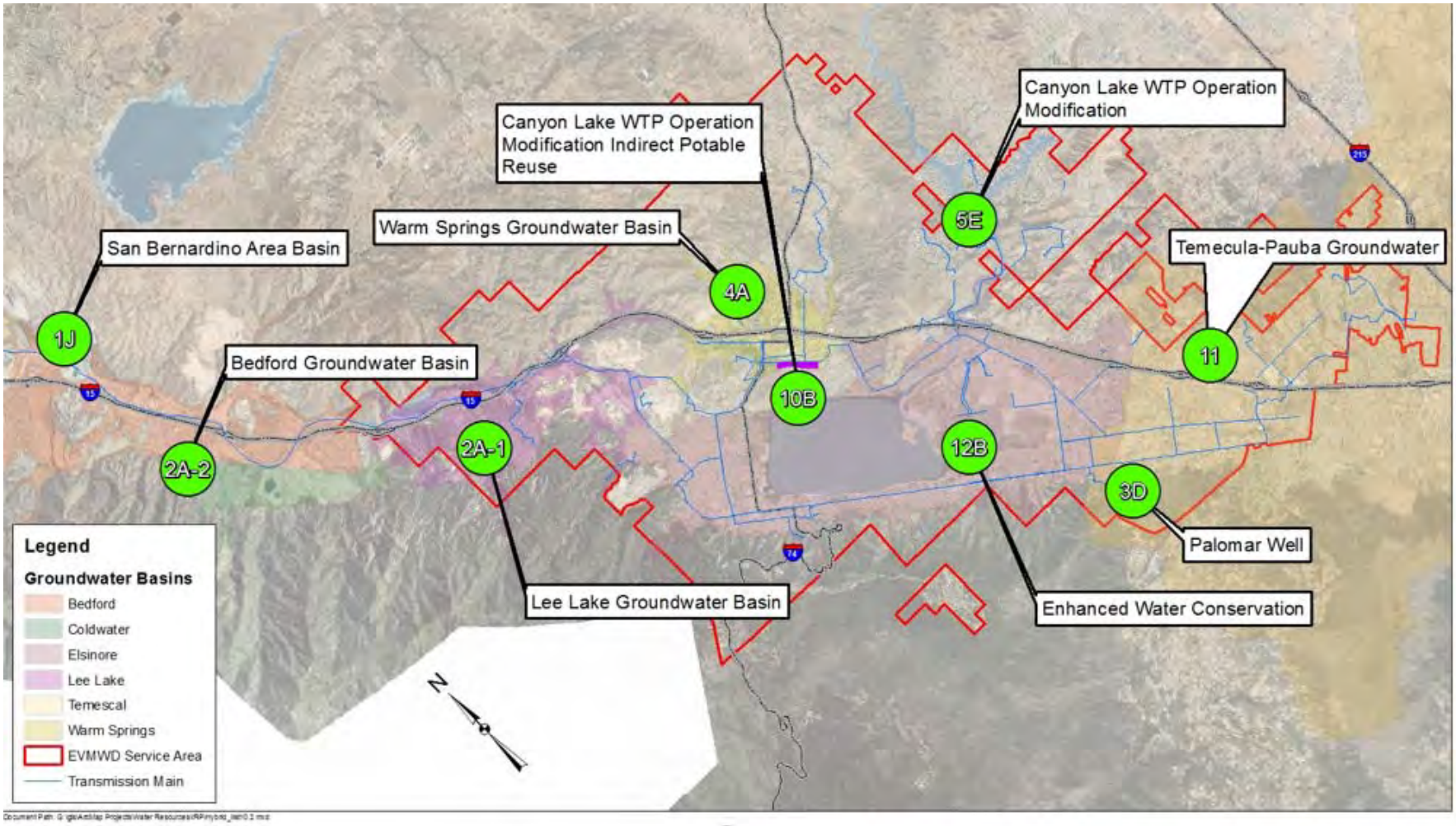
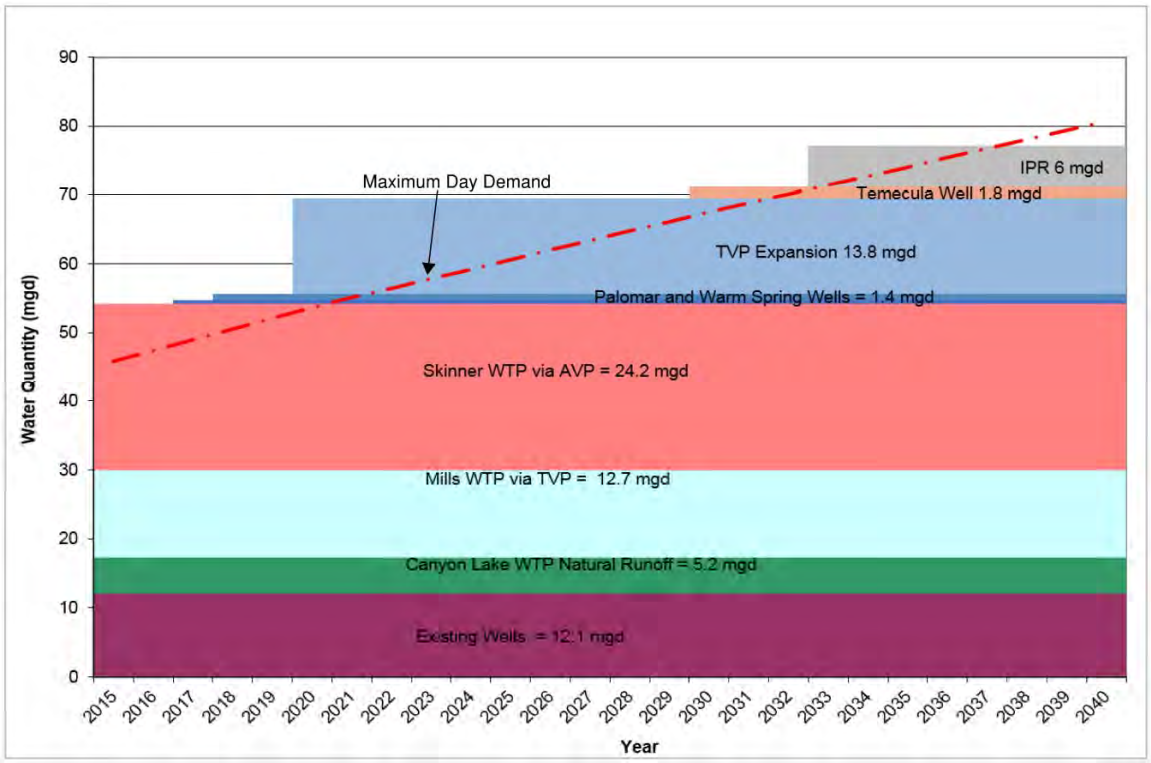


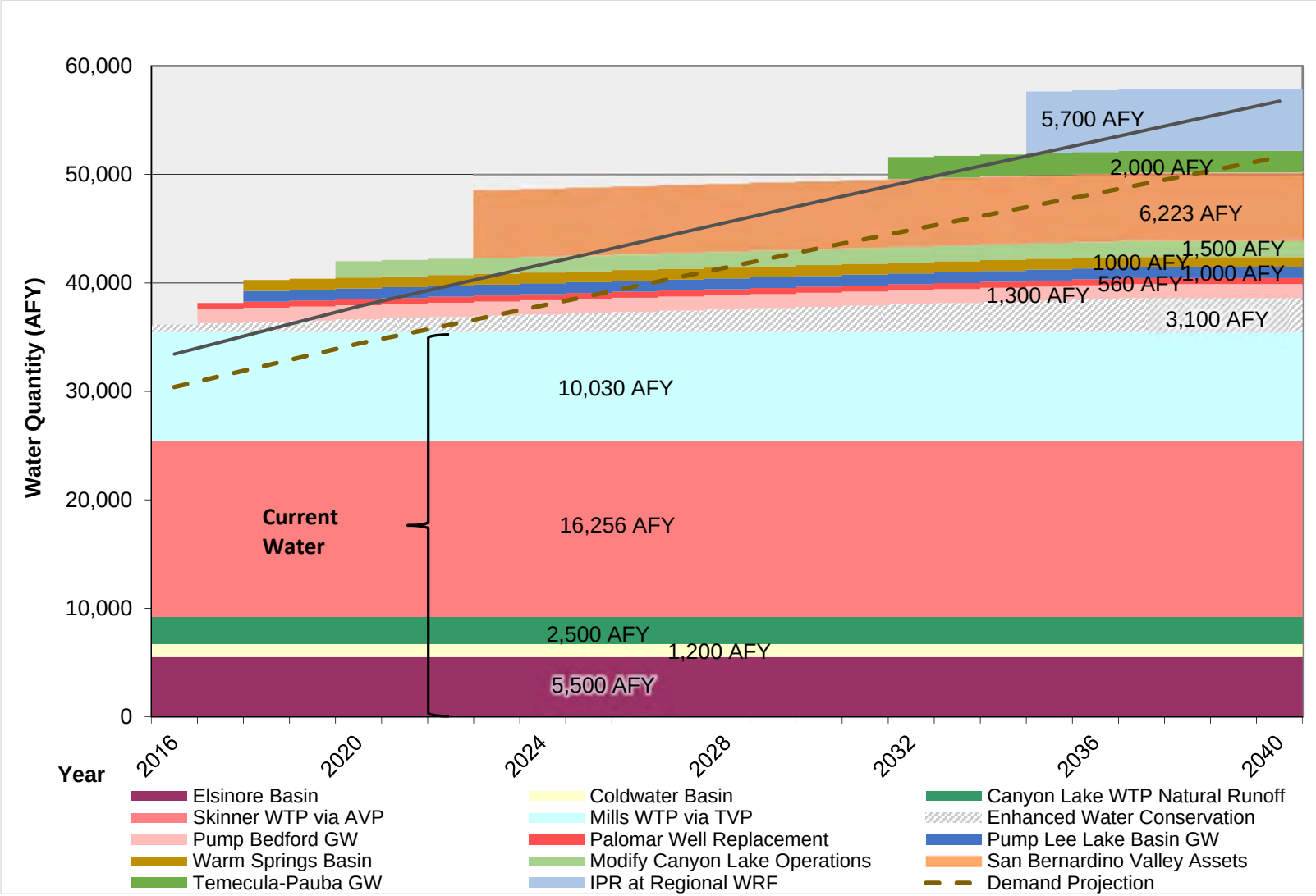
Figure 4.7 – EVMWD's Projected Demand and Supply Capacity



Core Resources Strategy: Phasing

By completing the extensive project evaluation process described herein, the IRP's Core Resource Strategy was developed. Figure 4-8 depicts the phasing for implementing the recommended supply portfolio. The phasing plan is designed to reliably meet 100% of the future water demand, but also provides an additional 10% water supply buffer to hedge against "known" uncertainties (e.g. variations in supply or demand relative to forecasts). In order to address "unknown" uncertainties (e.g. impact of climate change), EVMWD will implement a multi-faceted approach that includes supply development strategies that can adapt to changing conditions, in concert with long-range resource management policies that optimize water supply and storage assets in times of both drought and surplus. Phase 1 consist of implementing the near term local groundwater supply projects (low hanging fruit). Several triggers will be tracked to delineate implementation of medium and long-term projects, including but limited to: trends in water demand relative to forecasts, imported water supply reliability, trends in supply costs, and regulatory changes that may impact access to groundwater supplies, or affect the ability to meet water quality objectives or conservation targets. The adaptive management framework is further discussed in Section 7 of the IRP.

Figure 4.8 – Recommended Hybrid Scenario Implementation and Projected Demand



Phase 1 - The first phase, covering the period 2017-2018, consists of the implementation of the near term local supply projects, which will increase total supplies by 3,860 AFY. Besides having very minor implementation constraints (complying with state water quality treatment requirements and/or locating the wells in areas to achieve efficient yield), these projects also have some of the lowest unit cost values ranging from $496/AF - $794/AF, which are significantly lower than imported water unit costs ($1,000/AF). It is expected that most of the projects will be built within a two-year timeframe, with a preliminary expected total capital investment of $27.2 million and an annual Operation and Maintenances (O&M) cost of $1.5 million. Table 4-6 provides a summary of the costs and key characteristics for each of the recommended projects.

Phase 2 - The second phase, beginning in 2020, consists of maximizing local assets such as EVMWD's stored water within Canyon Lake and groundwater assets in the San Bernardino Basin Area. The projects will provide an additional 7,723 AFY. The unit cost of these projects (5E and 1J) is $589/AF and $847/AF, respectively. These costs are also below current imported water unit costs. These projects are complex relative to the projects considered for implementation in the first phase. A comprehensive facilities master plan will be performed to determine needed improvements to the Canyon Lake Water Treatment Plant to reliably operate under varying water quality conditions in Canyon Lake. The master plan will also consider the feasibility of expanding the production capacity of the treatment plant. The estimated capital cost and O&M annual expenses are $5.9 million and $502,000, respectively.

Transferring San Bernardino Basin Area supply assets to EVMWD's service area will require "Wheeling" of water through the City of Riverside and the City of Corona's water distribution systems. Due diligence, including hydraulic feasibility studies, meetings and negotiations with multiple stakeholders, and creation of agreements are underway. Implementing this option will require improvements to existing conveyance infrastructure. It is expected that the project will be completed in a period of five years. The estimated capital cost and O&M annual expense are $30.6 million, and $3.5 million, respectively.

Phase 3 - The final phase considers the implementation of two main projects beyond year 2030: Temecula-Pauba Well in 2032 and IPR in 2035. The total water supply generated by these projects will be approximately 7,700 AFY. This project involves capturing return flow credits of imported water used in the southern portion of EVMWD's service area, which overlies a portion of the Temecula-Pauba aquifer, via groundwater production facilities. Water use in this aquifer is overseen by the Santa Margarita River Watermaster, which reports to the United States District Court Southern District, Southern Division. The Court appointed the Watermaster in 1989 to administer and enforce the provisions of the 1966 Modified Final Judgment and Decree issued by the Court. A considerable amount of effort has been spent on litigation and water resource management in the Santa Margarita River Watershed over the last century. Furthermore, it is expected that the Court and Watermaster will formally adjudicate groundwater rights in the Murrieta-Temecula Groundwater Basin. Consequently, pursuing rights to cumulative return-flows in the basin

will require significant time, resources and collaboration among stakeholders; a process that could take many years.

Table 4.6 – Summary of The Recommended Portfolio

Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)
1J. Transfer Bunker Hill Basin Groundwater via Riverside and Corona	5.56	6,223	6,223	1.00	30.6	3,547,000	847	400
2A-1. Pump Lee Lake Basin Groundwater via the TVP. No Desalination Treatment	0.89	1,000	500	0.50	11.3	227,000	593	800
2A-2. Pump Bedford Groundwater via the TVP. No Treatment	1.37	1,300	1,045	0.80	6.6	345,000	542	800
3D. Palomar Well Replacement	0.50	560	560	1.00	3.1	106,000	496	400
4A. Extract Groundwater from Warm Springs Basin - No Desalination Treatment	0.89	1,000	1,000	1.00	6.9	428,000	794	1,000
5E. Modify Operation of Canyon Lake	7.00	1,500	1,125	0.75	5.9	502,000	589	800
10B. IPR at Regional WRF. Injection/Extraction with AWT	6.00	5,700	5,415	0.95	132.1	5,707,000	2,515	100
11. Temecula-Pauba Groundwater	1.79	2,000	2,000	1.00	7.8	328,000	375	725
12B. Implement Increased Water Conservation Measures - Enhanced	0.00	3,100	3,100	1.00	-	1,240,000	400	450
Total	**24**	**22,383**	**20,968**	**0.93**	**204.3**	**12,778,000**	**1,110**	**506**

IPR has been identified as a key component of EVMWD's long-term water supply strategy. By recharging the Elsinore Basin, IPR supports many of the objectives established, most specifically the objectives of increasing water supply reliability during dry years and improving salinity in the Elsinore Basin. EVMWD produces approximately 6,000 AFY of

recycled water at the Regional Water Reclamation Facility (RWRF) which is primarily used for environmental enhancement. Water levels in Lake Elsinore, a key natural and economic resource for the local community, are maintained by discharging tertiary treated recycled water into the lake. In addition, riparian habitat along the Temescal Wash is sustained by maintaining a steady discharge of tertiary treated recycled water along the wash. Effluent flows from the RWRF are expected to increase to approximately 30 mgd (or 33,000 AFY) at build-out. After reserving approximately 10,600 AFY to protect riparian habitat and environmental enhancement, nearly 20,000 AFY of recycled water will be available for the purpose of IPR (by build out). EVMWD applied for and received a Title XVI grant from the United States Bureau of Reclamation with a not-to-exceed amount of $150,000 to partially fund the IPR feasibility study. The study will evaluate options to treat Regional WRF tertiary effluent, convey treated water to spreading or groundwater injection sites, and identify facilities to implement IPR. The feasibility study will also determine the preferred IPR project alternative.

IPR project will require significant regulatory efforts with the California Department of Public Health (now SWRCB, Division of Drinking Water (DDW), and the Regional Water Quality Control Board (RWQCB) to meet the salt and nutrient basin plan objectives, and to comply with existing water rights filings[1]. It is expected that the project will be fully implemented by 2040 in two phases. The estimated capital cost and O&M annual expenses are $58.1 million and $12.4 million for phase 1, and $112 million and $86.6 million for phase 2 with aggregated unit water cost of 1,166 per AFY, respectively[2].

EVMWD's conservation program encompasses both "active" and "code-based" conservation efforts. Active conservation consists of EVMWD funded programs such as rebates, flow restriction device installations, and education outreach. Code-based conservation consists of demand reductions achieved through conservation-oriented legislation, building and plumbing codes, ordinances, and usage reductions resulting from changes in price structure (e.g. budget based rates). Active and code-based programs are closely linked to efforts of the California Urban Water Conservation Council (CUWCC), from which EVMWD has adopted and implemented Best Management Practices (BMPs). By pursuing conservation on multiple fronts, EVMWD has achieved well beyond its 20% demand reduction by 2020 as required by UWMP SBX7-7. Since 2009, EVMWD has significantly reduced its per capita water use. Moving forward, EVMWD plans to conserve approximately 3,100 AFY over the planning horizon.

Local stormwater capture projects (3E-2-McVicker and Leach Canyon Stormwater/ Imported Water Recharge and 6B-Lee Lake Reservoir Storage) had very poor scores due to their low reliability (only available during the wet years) and implementing (requires large property space) values. Consequently, these projects were not included in the list of

[1] EVMWD Draft Report: 2015 Water System Master Plan
[2] EVMWD, Final IPR Feasibility Study, 2017

recommended projects. Additional investigation is on-going to further evaluate these projects and reconsider their potential inclusion in the list of long-term projects.

Project 6B considers the use of surface water rights from Indian Creek/Temescal Creek, Indian Creek, Horse Thief Creek, and Mayhew Creek. Since the acquisition of the Temescal System, EVMWD has been serving domestic and agricultural users located in the Temescal area. Last year, EVMWD and TVWD signed an Asset Transfer Agreement. Under the agreement, EVMWD transferred all of the Temescal agricultural users and portions of the Temescal Agricultural Water System to TVWD. In exchange, EVMWD will use TVWD's unutilized conveyance capacity in the Mills Gravity Pipeline up to 7,300 cfs-days. Additional investigation is on-going to further evaluate these projects and reconsider their potential inclusion in the list of long-term projects.

4.5 Adaptive Resources Plan

EVMWD will implement alternative water supply options based on changed conditions and triggers. EVMWD's resource management strategies will focus on the following areas:

- Long-term groundwater storage in the Elsinore Basin
- Drought management and response
- Continued water conservation
- Acquiring strategic water assets

Long-Term Groundwater Storage in The Elsinore Basin:

EVMWD adopted a Groundwater Management Plan[3] in 2005 that identified CUP as an important element of basin management. Direct recharge projects that utilize the groundwater basin as a storage facility and allow for the extraction of stored water for use during drought and high-demand periods were identified, designed, and constructed. These direct recharge projects were funded by MWD as part of their groundwater storage program. During any fiscal year (beginning on July 1st and ending on June 30th), MWD may deliver up to 3,000 AF of water for storage in the Elsinore Basin. EVMWD's dual-purpose wells are used to inject these deliveries into the Elsinore Basin. MWD may also extract up to 4,000 AF of water stored in the Elsinore Basin to offset imported water deliveries.

Since 2010, EVMWD has stored approximately 8,000 AF of imported water during wet periods and extracted the same amount during the periods of drought. Given the success of this program and the large storage potential in the Elsinore Basin, long-term groundwater storage will be a key component of EVMWD's adaptive management strategy. EVMWD may utilize a combination of imported water supplies and local Canyon Lake surface water for the purposes of groundwater storage. EVMWD may also choose to expand the existing

[3] MWH, EVMWD 2005 Elsinore Basin Groundwater Management Plan.

conjunctive use program with MWD or participate in regional dry year yield programs with the intent of storing water in the Elsinore Basin.

For planning purposes, water management experts assume that a 10-year hydrologic cycle in California is comprised of three wet years, four normal years, and three dry years. A 10-year storage program would consider recharging a total of 10,000 AF (2,000 AF each wet year, and 1,000 AF each normal year). This volume was defined considering that during the dry years, EVMWD will experience a water shortage condition of around 10% of current water consumption. Consequently, extraction of stored water will be implemented during each of the three dry years at the rate of 3,000 AFY.

Drought Management and Response

In 2015, EVMWD updated its water existing WSCP in order to make it consistent with that of regional water suppliers. The WSCP establishes triggers for the implementation of demand reduction measures based on regional water shortages. The WSCP also empowers EVMWD to implement surcharges and penalties to promote conservation and penalize waste during regional shortages.

Continued Water Conservation:

The success of EVMWD's water conservation program is demonstrated by the overall reduction in per capita water use since 2007. EVMWD continues to enhance its on-going conservation program by continuing its robust outreach program, partnering with developers to promote water efficiency, and incentivizing water conservation as approved by EVMWD's Board of Directors.

Acquiring Strategic Water Assets:

On proactive basis, EVMWD will review on-going and proposed regional and statewide water programs. As part of this effort, EVMWD will work closely with WMWD and may participate in groundwater banking programs outside its service area, purchasing permanent water rights on the open market, and participate in regional desalination programs, etc.

While the effects of climate change cannot be precisely estimated, EVMWD's core resource strategy, as well as its adaptive resource framework that focuses on four key areas, will assist EVMWD to reliably meet the long-term water demands within its service area.

CHAPTER 5 – RESPONSE ACTIONS

5.1 Purpose

This chapter will identify, evaluate, and prioritize response actions and activities that can be implemented during a drought to mitigate the impacts. These actions are triggered during specific stages of drought to manage the limited supply and decrease the severity of immediate impacts. Response actions can be quickly implemented and provide expeditious benefits.

5.2 Description

This includes the following activities:

- Develop Goals and Responses for Each Stage of Drought: Specific actions shall be created in response to the stages of drought.
- Develop EVMWD's specific drought stage response outreach plan including audience type, key messages, strategies and tactics, measurements, and evaluation criteria.
- Employ well-established communication avenues through outreach campaign.

5.3 Development of Response Actions

Response actions are different than mitigation measures in that they are triggered by specific stages of drought to manage the limited supply and decrease the severity of immediate impacts. Response actions are planned actions that are implemented based on specific triggers, and are not intended to be emergency/crisis driven. Response actions are characterized based on the severity of drought and actions taken pursuant to specific triggers. In contrast, emergency response actions are crisis driven actions in response to unanticipated circumstances. There are no defined triggers associated with emergency response actions.

These actions can be quickly implemented and provide expeditious benefits. The steps that may be taken in developing response actions are as follows:

- Develop goals for each stage of drought.
- Identify corresponding actions appropriate for each drought stage. Each stage shall have recommended and/or mandatory actions that will assist in achieving the stage goal for multiple sectors, including, but not limited to, public water suppliers, residents, industry, and government entities. Response actions include things such as public drought campaigns and outreach plans, demand reduction, water use restrictions, curtailment, or drought surcharges, water waste ordinances, system operation to reallocate supplies amongst users, etc.

5.4 Emergency Response Actions

Typically, emergency response actions are crisis driven actions in response to unanticipated circumstances such as an earthquake that damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. These are distinguishable from "response" actions, which are identified through the contingency planning process and associated with different stages of drought or "triggers." Potential emergency response actions are limited to temporary construction activities and other actions that do not involve construction of permanent facilities.

5.5 Drought Triggers, Targets, and Responses

Stages of actions are to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50% reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

EVMWD adopted a WSCP on February 5, 1992. EVMWD's WSCP[1] was prepared to comply with Assembly Bill 11x (1991). The bill modified Section 10632 of the California Water Code and required every urban water supplier to file a plan, because of the worsening 1986–1992 drought.

The key elements of EVMWD's WSCP are ordinances with phased water use restrictions and a drought rate structure. EVMWD had two Water Shortage Ordinances (Nos.78 and 81) that were recently combined, updated, and approved by the Board on May 28, 2015, and labeled as Ordinance 225. The drought plan stages and reduction goals (applied to the base years specified in the ordinances) are presented in Table 5-1. Stage I is the default stage when EVMWD is able to meet all the water demands of its customers, and is intended to encourage customers to use water efficiently and to take advantage of EVMWD's water use efficiency programs. Determination of a Stage II, III, IV or V condition is at the discretion of EVMWD's General Manager in consultation with the Board of Directors. EVMWD has a 50% reduction goal for Stage V. The WSCP establishes five water shortage stages and supply shortage response measures to be implemented by EVMWD, with increasing restrictions on water use and administrative fines and/or penalties for water waste in response to decreasing water supplies and/or worsening drought conditions.

The trigger levels to move from one stage to the next depend on the local water supply conditions and actions taken by MWD. MWD's actions represent the principal trigger(s) for EVMWD's action, because cutbacks in the imported water supply to EVMWD will require action to mitigate those impacts. The reduction in supply to the different customers is depended on the customer class, as shown in Table 5-1, that was based on information of the WSCP. EVMWD does not have customers with interruptible deliveries at this time.

[1] James M. Montgomery Consulting Engineers, 1992 EVMWD Water Shortage Contingency Plan

Table 5-1 – Stages of Water Shortage Contingency Plan

Stage	Percent Supply Reduction *Numerical value as a percent*	Water Supply Condition
I	0% to 5%	Water Supply Watch - Stage 1 applies during periods when EVMWD is able to meet all of the water demands of its customers. Stage 1 shall be in effect at all times unless the Board of Directors otherwise declares that another stage is in effect.
II	6% to 10%	Water Supply Alert - Stage 2 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDMP stage of "Water Supply Watch" or "Water Supply Alert" conditions.
III	11% to 25%	Mandatory Waste Reduction. Stage 3 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSAP Regional Shortage Levels 1 through 4. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.
IV	26% to 40%	Stage 4 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This may correlate to any of the MWD's WSAP Regional Shortage Levels 5 through 7. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.
V	40% to >50%	Stage 5 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This shortage level may correlate to MWD's WSAP Regional Shortage Levels 8, 9, 10, or greater. Stage 5 may be declared during an Immediate Emergency. A stage 5 declaration may also be accompanied by a Board Resolution declaring a Water Shortage Emergency.

Notification of the Public:

The customers of EVMWD shall be notified by means of any or all of the following: telephone, email, inserts with utility bills, mailings, postings at EVMWD offices and facilities, flyers, "door hanger" and other means. All customers shall ensure that EVMWD has current telephone and email contact information. At its discretion, the Board or its authorized designee shall also notify, or cause to be notified, agencies or organizations it believes may be affected.

5.5.1 Stage 1- Water Supply "WATCH" Conditions

In general, customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses when:

(A) The state governor or local authority issues a drought declaration at Level/ Stage 1.

Per WSCP, and Table 5-1, Water Supply Watch - Stage 1 applies during periods when EVMWD is able to meet all of the water demands of its customers. Stage 1 shall be in effect at all times unless the Board of Directors otherwise declares that another stage is in effect.

Target:

This stage mandates the implementation of several permanent water waste prohibitions, even when there is no foreseeable threat of a water shortage. Water waste is in violation of California Law at any stage. California's water law and policy, Article X, Section 2 of the California Constitution, requires that all uses of the State's water be both reasonable and beneficial and places a significant limitation on water rights by prohibiting the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. The permanent prohibitions shall be continually in effect at all levels of water shortage declarations in addition to the requirements specific to each level. All normal water efficiency programs and water conservation regulations of EVMWD will be in full force and effective during Stage 1.

Response:

(a) Water customers shall ensure automatic irrigation timers are adjusted according to changing weather patterns and landscape requirements.

(b) All open hoses shall be equipped with automatic positive shut-off nozzles.

(c) Watering of lawns and/or groundcovers and irrigating landscaping is permitted only between the hours of 6:00 p.m. and 6:00 a.m.

(d) Sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff and waste. Watering on windy days is to be avoided.

(e) Installation of water saving devices, such as low flow shower heads and faucet aerators, is encouraged.

(f) Selection of low-water-demand shrubs, groundcovers and trees for all new landscaping is strongly encouraged.

(g) All swimming pools, spas, ponds, and fountains shall be equipped with re-circulating pumps.

(h) All plumbing leaks, improperly adjusted sprinklers, or other water conduits/fixtures that require repair or adjustment shall be corrected to the satisfaction of EVMWD within ninety-six (96) hours of notification by EVMWD.

(i) No person shall use water to wash down sidewalks, driveways, parking areas, tennis courts, patios, or other paved or hard surface areas, except to alleviate sanitation hazards, and then only by use of: a hand-held bucket or similar container; a hand-held hose equipped with an automatic, positive self-closing shut-off device; or a low volume, high-pressure cleaning machine.

(j) No person shall allow water to leave his or her property by drainage onto adjacent properties or public or private roadways or streets due to excessive irrigation and/or uncorrected leaks.

(k) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment, is permitted at any time with a hand-held bucket or a hand-held hose equipped with an automatic, positive shutoff nozzle. Provided, however, such washing may be done at any time on the immediate premises of a commercial car wash, a commercial service station or car dealership with commercial car washing equipment, or by a licensed mobile detailing/car wash professional using low volume, high pressure washing equipment. Furthermore, such washings are exempted from these regulations where the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables.

(l) Construction operations receiving water from a construction meter, hydrant meter, or water truck shall not use water for any purpose other than those required by regulatory agencies.

5.5.2 Stage 2- Water Supply "ALERT" Conditions

In general, customers shall be required to comply with the requirements and restrictions on certain non-essential water uses when:

(A) The state governor or local authority issues a drought declaration at Level/ Stage 2, or;
(B) Any combination of circumstances reduces the water system's overall water supply or production capabilities by 6 to 11% or less.

Per WSCP and Table 5-1, Water Supply Alert - Stage 2 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDM Plan stage of "Water Supply Watch" or "Water Supply Alert" conditions.

Target:

Per WSCP and Table 5-1, it is required to achieve a 6 to 11% reduction in total water use.

This moderate reduction in water use shall be achieved through mandatory actions and may be adjusted depending on supply conditions via a Board Approved Resolution.

Response:

The restrictions listed in Stage I shall remain in effect with the following additions:

(a) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs, or other landscaped areas shall be permitted no more than three days per week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs, or other plants is permitted at any time if:
- A hand-held hose is used, or
- A hand-held bucket is used, or
- A drip irrigation system is used, or
- Recycled water is used.

(b) Irrigation occurring during or 48 hours after a rain event is prohibited.

(c) Construction meters utilizing potable water shall be issued only to those persons who have been issued valid grading and/or building permits.

(d) All restaurants, cafes, and other public food service establishments are prohibited from serving drinking water unless specifically requested by their customers.

(e) Hotels, motels and other commercial lodging establishments should provide customers the option of not having towels and linens laundered daily. Commercial lodging establishments should prominently display notice of this option in each bathroom using clear and easily understood language.

(f) Customers shall install pool and spa covers to minimize water loss due to evaporation.

(g) Installation of new landscapes shall be prohibited unless irrigated with drip irrigation. Exceptions may be provided for projects with prior approval by the appropriate jurisdiction.

(h) EVMWD shall develop a public information campaign to provide customers with options for achieving the Stage 2 demand reduction goal. EVMWD shall explore increased customer incentives for conservation measures.

5.5.3 Stage 3- Mandatory Waste Reduction- "WARNING" Conditions

In general, customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 3 of this DCP when:

(A) The state governor or local authority issues a drought declaration at Level/ Stage 3, or;
(B) Any combination of circumstances that reduces the water system's overall water supply or production capabilities by 11 to 25% or less.

Per WSCP and Table 5-1, mandatory Waste Reduction Stage 3 applies during periods when a reasonable probability exists that EVMWD will not be able to meet all of the water demands of its customers. This may correlate to MWD's Shortage Allocation Plan Shortage Levels 2 through 4. EVMWD's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

Target:

Per WSCP and Table 5-1, it is required to achieve 11 to 25% reduction in total water use through Stage 3a, 3b, and 3c.

Response:

This stage does not apply to the use of non-potable or recycled water. The use of recycled water for daytime irrigation is permitted. EVMWD shall develop a public information campaign to provide customers with options for achieving Stage 3 demand reduction goal and complying with their applicable water allocation. EVMWD shall explore increased customer incentives for conservation measures.

Using the potable water by customers shall be limited as follows:

- For residential customers, water use shall be limited to using a volume equal to Blocks 1 and 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property.
- For irrigation customers, water use shall be limited to using a volume equal to Blocks 1 and 2 of their irrigation water budget per billing cycle for outdoor water use for his or her property.
- For wholesale customers, water use shall be limited to using a volume equal to Blocks 1 and 2.
- Water use beyond the water volume, as previously stated above, will be charged a civil administrative penalty of $1.59 per centum cubic feet (CCF).

All requirements of Stage 2 shall remain in effect during Stage 3 after it has been declared with the following additions:

1) Stage 3 (a)

(a) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs, or other landscaped areas shall be permitted no more than two days per week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs, or other plants is permitted at any time if:

- A hand-held hose is used, or
- A hand-held bucket is used, or
- A drip irrigation system is used, or
- Recycled water is used.

(b) The filling, refilling or addition of water to uncovered outdoor swimming pools, wading pools or spas is prohibited.

(c) The operation of any exterior ornamental fountain or similar structure is prohibited.

2) Stage 3 (b)

(a) The washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment, is permitted only on the immediate premises of a commercial car wash, a commercial service station or a car dealership with commercial car washing equipment, or by a licensed mobile detailing/car wash professional using low volume, high pressure washing equipment. Furthermore, such washings are exempted from these regulations where the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables.

3) Stage 3 (c)

(a) EVMWD shall eliminate all adjustments to existing residential customers' outdoor water budgets including, but not limited to, increases for swimming pools, spas, or pond maintenance adjustments. New water using features or expanded landscapes shall not qualify for a water budget variance.

(b) EVMWD shall develop a public information campaign to provide customers with options for achieving the Stage 3 demand reduction goals and complying with their applicable water allocation. EVMWD shall explore increased customer incentives for conservation measures.

5.5.4 Stage 4- Mandatory Outdoor Reductions- “CRITICAL” Conditions

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 of this plan when:

(A) The state governor or local authority issues a drought declaration at Level/ Stage 4, or;
(B) Any combination of circumstances reduces the water system’s overall water supply or production capabilities by 26 to 40%.

Per WSCP and table 5-1, Stage 4 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This may correlate to any of MWD’s WSAP Regional Shortage Levels 5 through 7. EVMWD's Board of Directors may choose

to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

Target:

Per WSCP and Table 5-1, it is required to achieve a 26 to 40% reduction in total water use through Stage 4a, 4b, and 4c.

Response:

This stage does not apply to the use of non-potable or recycled water. The use of recycled water for daytime irrigation is permitted. EVMWD shall develop a public information campaign to provide customers with options for achieving Stage 4 demand reduction goals and complying with their applicable water allocation. EVMWD shall explore increased customer incentives for conservation measures.

Using the potable water by customers shall be limited as follows:

- For residential customers, water use shall be limited to using a volume equal to Block 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property.
- For irrigation customers, water use shall be limited to using a volume equal to Block 1 of their irrigation water budget per billing cycle for outdoor water use for his or her property.
- For wholesale customers, water use shall be limited to using a volume equal to Blocks 1 and 2.
- Water use beyond the water volume, as previously stated above, will be charged a civil administrative penalty of $2.09 per CCF.

All supply shortage response measures of Stages 1 through 3 shall be in full force and effective during Stage 4 after it has been declared with the following additions:

1) Stage 4 (a)

(a) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs, or other landscaped areas shall be permitted no more than two days per week on odd/even calendar days corresponding to the last digit of a service address. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs, or other plants is permitted at any time if:

  - A hand-held hose is used, or
  - A hand-held bucket is used, or
  - A drip irrigation system is used, or
  - Recycled water is used.

2) Stage 4 (b)

(a) Use of water from fire hydrants shall be limited to health, safety and welfare of the citizens and shall not be used for construction purposes.

(b) No EVMWD water shall be used for construction purposes except for system pressurization and/or testing.

3) Stage 4 (c)

(a) No new construction or hydrant meters will be issued. Potable water shall not be used for earth work, road construction purposes, dust control, compaction, or trenching jetting. Construction projects necessary to maintain the health, safety, and welfare of the public are exempt from these regulations.

(b) If EVMWD Board of Directors declares a Water Shortage Emergency during a Stage 4, no new potable water service connections shall be provided, and no statements of immediate ability to serve or provide potable water service (such as will serve letters, certificates, or letters of availability) shall be issued, except under the following circumstances:

- A valid, unexpired building permit has been issued for the project.
- The project is necessary to protect the public's health, safety, and welfare.
- Where an existing service connection exists and an existing water meter is inoperable and cannot be repaired. In such an instance, the size of the new water meter shall be the same or smaller than the water meter being replaced.

(c) EVMWD shall develop a public information campaign to provide customers with options for achieving the Stage 4 demand reduction goals and complying with their applicable allocation. EVMWD may explore increased customer incentives for conservation measures.

5.5.5 Stage 5- Mandatory Targeted Indoor/Outdoor Reductions-Catastrophic Failure or Immediate "EMERGENCY" Conditions

In general, customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 5 of this DCP when:

(A) The state governor or local authority issues a drought declaration at Level/ Stage 5, or;
(B) Any combination of circumstances reduces the water system's overall water supply or production capabilities by 40 to 50%.

Per WSCP and Table 5-1, Stage 5 applies during periods when EVMWD will not be able to meet all of the water demands of its customers. This shortage level may correlate to MWD's WSAP Regional Shortage Levels 8, 9, 10, or greater. Stage 5 may be declared

during an Immediate Emergency. A Stage 5 declaration may also be accompanied by a Board Resolution declaring a Water Shortage Emergency.

Target:

The objective of the measures undertaken in Stage 5 is to significantly reduce water consumption within EVMWD to protect public health, safety, and fire flow.

Per WSCP and Table 5-1, it is required to achieve a 40 to 50% reduction in total water use through Stage 5a, 5b, and 5c.

Response:

Stage 5 does not apply to the use of non-potable or recycled water. The use of recycled water for daytime irrigation is permitted. EVMWD shall develop a public information campaign to provide customers with options for achieving Stage 5 demand reduction goals and complying with their applicable water allocation. EVMWD shall explore increased customer incentives for conservation measures.

Using potable water by customers shall be limited as follows:

- For residential customers, water use shall be limited to using a volume equal to Block 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property.
- For irrigation customers, water use shall be limited to using a volume equal to Block 1 of their irrigation water budget per billing cycle for outdoor water use for his or her property.
- For wholesale customers, water use shall be limited to using a volume equal to Blocks 1 and 2.
- Water use beyond the water volume, as previously stated above, will be charged a civil administrative penalty of $4.01 per CCF.

All supply shortage response measures of Stages 1 through 4 shall be in full force and effective during Stage 5 after it has been declared with the following additions:

1) Stage 5 (a)

(a) All landscape and non-essential outdoor water use for all customers in all areas of EVMWD's retail water service area shall be prohibited.

2) Stage 5 (b)

(a) Except as to property for which a building permit has been heretofore issued, no new water meter (s) shall be provided, except in the following circumstances:

  - For projects necessary to protect the public's health, safety, and welfare.
  - When using recycled water.

(b) The use of water for commercial, manufacturing, or processing purposes may be further reduced in volume if it is determined to be in the best interest of the health, sanitation, and fire flow protection in the communities served by EVMWD. This determination may be made by the Board of Directors and the General Manager of his or her authorized designee.

3) Stage 5 (c)

(a) All dedicated irrigation meters will be locked off by EVMWD personnel.

(b) Customers with EVMWD authorized Medical Adjustment to their Tier 1 allocation will be permitted 100% of their Tier 1 water budget.

EVMWD shall develop a public information campaign to provide customers with options for achieving Stage 5 demand reduction goals and complying with their applicable water allocation. EVMWD shall explore increased customer incentives for conservation measures.

5.6 EVMWD Specific Drought Stage Response Plan

5.6.1 Overview and Goals

Per the "State of California Water Control Resources Board" adopted mandatory water restrictions, EVMWD was required to reduce water consumption by 28% within its service area or receive significant penalties, potentially up to $10,000 per day. EVMWD successfully complied with the water conservation mandate, which was rescinded on April 26, 2017.

EVMWD customers saved 20.5% between June 2015 and March 2016, compared with 2013 levels. Fortunately, California's water picture improved over the winter, but there was not enough precipitation to end the drought. EVMWD, through its outreach plan, will continue to encourage customers to do their part to use water wisely, as it will become the norm across the state.

Goals for a Specific Stage Outreach

- Adhere to Governor and SWRCB's new focus on locally-appropriate, drought-related actions and common-sense mandates.
- Assisting customers through communication to stay within individualized water budgets and use water efficiently and offer efficiency programs and rebates as incentive.
- Communicate the investment in securing a resilient water supply; diversifying and expanding local sources of water.
- Have consistent messaging with neighboring water districts.

5.6.2 Audiences of Outreach Plan

EVMWD's outreach efforts are aimed primarily at the audiences listed below. It is imperative that this message is shared with all EVMWD customers, to convey the need to continue water savings.

Retail customers

- Long-time residents
- New residents
- Families
- Seniors
- Students
- Involved residents
- Businesses
- Developers

Government entities

- Board of Supervisors
- City Councils
- Related agencies

Community groups

- Homeowners' Association (HOA)/Property Owner's Association (POA)

5.6.3 Key Messages of Outreach Plan

- Thank customers for reducing water use when called upon by the Governor.
- EVMWD and neighboring districts support the Governor and State Water Resources Control Board's new focus on locally-appropriate, drought-related actions and common-sense mandates.
- Urge customers to stay within individualized water budgets and use water efficiently, while offering efficiency programs and rebates.
- EVMWD continues to invest in securing a resilient water supply; diversifying and expanding local sources of water.

5.6.4 Strategies and Tactics of Outreach Plan

This plan will be carried out through a combination of tactics described below.

Strategy

This plan will be completed as a collaboration with the neighboring districts and will have an individual component as well. EVMWD will work with neighboring districts to convey similar messages to avoid confusion for the community. EVMWD will utilize several

tactics to reach out to customers and will continue to use this messaging while EVMWD remains in a specific Stage.

Tactics/Outreach

- **Direct Mail Piece/Waterlog Flyer:** Special Edition of the Waterlog in English and Spanish to announce the adoption of the appropriate Drought Stage, along with regulations, fines, and penalties.
- **FAQs:** To be available in the lobby and online to answer more in-depth questions about the technology.
- **E-Blast:** Sent to all paperless customers, similar to the Waterlog flyer.
- **Drought Microsite:** Update the drought microsite to reflect the new guidelines and information, housing FAQs, rebate information, current news articles, and other information for customer awareness.
- **Press Release:** To be sent after the Board announces the adoption of a specific Stage.
- **Social Media Outreach:** Use Facebook and Twitter to keep customers current of any developments related to a specific Stage, announcements, rebates, etc.
- **Door Hangers:** For field staff to note violations while in the field-friendly reminders to watch water use.
- **Internal Messaging**
- **Billboard Messaging:** At two freeway locations with a specific Stage messaging.
- **Partnership with neighboring agencies** on campaigns with conservation messaging: WMWD, EMWD, and RCWD.

5.6.5 Measurement and Evaluation

Outcome Measure

Monitoring the components of the tactics used for this DCP will determine the outcomes and will be adjusted as responses are measured.

Output Measure

In addition to monitoring outcomes, a number of measures can be used to track community engagement output:

- Microsite visits and downloads
- Facebook/Twitter analytics
- Google analytics
- Collateral shared through lobby and direct mail
- E-blast data

5.7 Water Conservation Outreach Campaign

Per EVMWD's Water Shortage Ordinance No. 225 requirements, a water conservation outreach campaign shall be developed to provide customers with options for achieving the Stage demand reduction goals and complying with their applicable allocation. This campaign will be needed to engage and educate EVMWD's customers about the severity of the California drought, while encouraging them to become part of the solution and rewarding them for conserving water during this critical time. It suggests a "we're all in this together" approach that encourages customers to help get through California's water crisis.

5.7.1 Campaign Delivery Methods

EVMWD's existing delivery channels can be implemented per the following methods:

- **Waterlog Newsletter Tear Off**: Create a campaign newsletter column with a business reply mail tear-off card. The card would consist of a "check-list" for residents to fill out to document their pledge to conserve water. (i.e. installing low-flush toilets, checking for sprinkler leaks, installing a Temescal garden, etc.). The checklist can also include their commitment to getting involved by signing up for EVMWD email blasts, social media updates, etc.
- **Direct Mail Postcard(s):** Similar to the Waterlog tear off, residents could mail the reply card or go online to "take the pledge."
- **Bill Inserts:** Insert campaign and pledge information in water bills.
- **Website:** Utilize the www.EVMWD.com and www.evmwddrought.com websites to communicate conservation tips and provide a link to the pledge form.
- **EVMWD App:** Enhance and utilize new EVMWD app for updates and provide water conservation information.
- **Media Relations/Feature Stories:** Develop news releases and feature stories and pitch articles to local media.
- **Social Media:** Regular updates and campaign reinforcements via EVMWD social media channels (Facebook, Instagram, Twitter, etc.).

The following additional campaign elements are recommended:

- **Door Hangers:** Campaign and pledge information could be distributed in specific areas of concern or to our higher water users. Water enforcers could also use them to notify residents about water wasting observations.
- **External Publications:** Research, write and coordinate placement of printed and on-line articles in publications such as HOA newsletters, City publications, elected official constituent updates, chamber newsletters, etc.
- **Robo Calls:** Write and coordinate recorded, bi-lingual conservation and/or campaign call-home messages.

- **Email Blasts:** Send email blast messages to remind customers about the importance of conserving water, which could be distributed on particularly hot summer days with tips and critical water saving information.
- **Speakers Bureau:** Develop process, list of approved speakers, research venues, create PowerPoint presentation, and coordinate logistics for water conservation presentations to key community groups (Chambers, Rotary Club, HOAs, City Council meetings, etc.).
- **Water Ambassadors:** Residents passionate about water conservation could sign up to become volunteer EVMWD Water Ambassadors and be assigned projects like passing out door hangers, staffing events, handing out water saving devices, spreading the word in their neighborhoods, etc. They could be provided Water Ambassador T-shirts to wear, and given Board and newsletter recognition to thank them for volunteering.
- **Water Conservation Specialist Visits:** EVMWD staff (or hired consultants) could be available to make personal visits to customers to evaluate their water usage and make recommendations for conservation and bill reduction. This is a staff intensive effort and could initially be available only to our identified high-water users.
- **Water Conservation Hotline:** Set up a 24/7 bi-lingual telephone hotline for people to call to report water wasters, obtain water conservation information or make an appointment for a visit with a water conservation specialist.
- **Newspaper/Radio Advertisements:** Develop and coordinate newspaper and radio advertisements.
- **Regional Message Coordination:** Coordination with regional agencies to ensure consistent messages.

CHAPTER 6 – OPERATIONAL AND ADMINISTRATIVE FRAMEWORK

6.1 Purpose

This chapter will develop an operational and administrative framework to identify who is responsible for undertaking the actions necessary to implement each element of the DCP and the related procedures and resources.

6.2 Description

- The framework identifies roles, responsibilities and procedures necessary to conduct drought monitoring.
- Initiate response actions, including emergency response actions.
- Initiate mitigation actions.
- Update the DCP.

6.3 Development of an Operational and Administrative Framework

An operational and administrative framework has been developed to identify the responsible parties for undertaking the actions necessary to implement each element of the DCP and the related procedures and resources. The operational and administrative framework is also imperative to responding to drought crises. Without a proper framework in place, emergency responses can be slow and inefficient.

This DCP has documented the operational and administrative framework, including tables which identify the roles and responsibilities of entities with drought related responsibilities, flow charts identifying how information will flow between the responsible entities, and who is responsible for decision making.

6.3.1 Content of the Administrative and Operational Framework

The following information is included in the operational and administrative framework of this DCP:

Responsibilities. -- Types of "responsibilities" identified in the operation and administrative framework include:

- Drought monitoring, warning, and information sharing.
- Declaration of drought.
- Identification of stages of drought.
- Activation of Task Forces activities.
- Initiation of drought response actions, including emergency response actions.
- Initiation of mitigation actions.
- Procurement and resource tracking.

- Development of public information messages and otherwise communicating with the public and water users regarding drought.
- Requests for assistance under State and Federal assistance programs.
- Request for a Presidential Disaster Declaration (if applicable).
- Update of DCP.

Roles. -- Identification of "roles" (e.g., assigning the above-listed responsibilities to appropriate Task Force members), including:

- Flow chart identifying the flow of information between appropriate entities and identifying any Task Forces, or working groups with ongoing drought-related responsibilities.
- Table of State/local agency responsibilities.
- Identification of the role of each Task Force and work group and the duties assigned to specific members.

Procedure. -- Document processes and procedures, including:

- Drought declaration process.
- Process for initiating a Task Force or working group.
- Process for requesting State or Federal assistance.

Resources. -- Available resources, including:

- A description of Federal, State, and local drought relief and mitigation programs and drought resources.
- Tools for communities/citizens/businesses to aid and support drought actions and decisions. This includes user friendly references for: water rights/allocations, water use facts, flow charts for drought responsibilities and jurisdictions, and any other resources available.

6.3.2 Matrix for Operational and Administrative Framework

Table 6-1 indicates the operational and administrative framework to identify individuals or Task Force responsible for undertaking the actions necessary to implement each element of the plan.

Table 6-1 – Operational and Administrative Framework

Task	Task Force Lead	Task Force Member	Responsibilities	Reports To	Coordinates With	Procedures/ Resources	Documentation
Drought Monitoring	Water Resources Manager	Water Resources Planner/Engineer	Data Collection - Record State Snow and Precipitation	Water Resources Manager	Drought Task Force	Monthly monitor statewide snow pack water equivalent, north sierra region precipitation, precipitation in south coast region, and in Lake Elsinore.	EVMWD Water Resources at a glance report. See Chapter 2 of DCP.
		Water Resources Planner/Engineer	Data Observation - State Allocation to MWD	Water Resources Manager	Drought Task Force	Yearly update state water allocation as reported by MWD.	EVMWD Water Resources at a glance report. See Chapter 2 of DCP
		Water Resources Planner/Engineer	Monitor drought forecasts and climate conditions	Water Resources Manager	Drought Task Force	Monitor monthly Climate Reports PDSI and SPI (www.ncdc.noaa.gov)	Report of Drought Indices, update www.evmwddrought.com portal to NOAA website. See Chapter 2 of DCP.
		Water Resources Planner/Engineer	Lake Elsinore and Canyon Lake Elevation Projections	Water Resources Manager	Drought Task Force	Monitor weekly precipitation in San Jacinto Water Shed, runoff in San Jacinto River, evaporation in Lake Elsinore/ Canyon Lake and Canyon Lake production data.	Weekly publish Canyon Lake and Lake Elsinore projected water levels through the upcoming calendar year on EVMWD website. See Chapter 2 of DCP.
		Water Resources Planner/Engineer	Monitor state hydrologic conditions	Water Resources Manager	Drought Task Force	Drought monitoring chapter/NRCS (SNOWTEL) sites; stream flow data.	Report of Drought Indices, update www.evmwddrought.com portal to NRCS website. See Chapter 2 of DCP.

Task	Task Force Lead	Task Force Member	Responsibilities	Reports To	Coordinates With	Procedures/ Resources	Documentation
Drought Monitoring	Water Resources Manager	Water Resources Planner/Engineer	Monitor hydrologic conditions in the Colorado River Basin	Assistant General Manager	Drought Task Force	Drought monitoring chapter/NRCS (SNOWTEL) sites; stream flow data.	Report of Drought Indices, update www.evmwddrought.com portal to NRCS website. See Chapter 2 of DCP.
	Director of Legislative & Community Affairs	Public Relations Administrator	Share information with other entities; Task Force meetings and feedback	Customer Relations Manager	Drought Task Force	Schedule meetings; update EVMWD websites; list servers; media contacts; communication tools.	See Chapter 6 of DCP.
	Assistant General Manager	Water Resources Manager	Identification of Stages of Drought and Determination of Response Actions	Director of Engineering/Water Resources	Drought Task Force	Drought monitoring conclusions/drought triggers/MWD WSAP/Executive Order.	Publish bill inserts, community outreach and updates to EVMWD website. See Chapter 5 of DCP.
Vulnerability Assessment	Water Resources Manager	Water Resources Planner/Engineer	Climate change assessment; evaluate precipitation, temperature and snowpack conditions, and projections on local, state and regional levels	Water Resources Manager	Drought Task Force	Yearly review updates to Cal Adapt and National Climate Assessment.	Summary of climate change conditions, update www.evmwddrought.com portal with Cal Adapt information. See Chapter of 3 DCP.
		Water Resources Planner/Engineer	Climate change assessment; evaluate sea level rise	Water Resources Manager	Drought Task Force	Every 5 years review NCA documentation for changes in impacts. Impacts are not expected.	Summary of sea level conditions, update www.evmwddrought.com portal to Cal Adapt. See Chapter of 3 DCP.

Task	Task Force Lead	Task Force Member	Responsibilities	Reports To	Coordinates With	Procedures/ Resources	Documentation
Vulnerability Assessment	Water Resources Manager	Water Resources Planner/Engineer	Climate change assessment; evaluate wild fire risk	Water Resources Manager	Drought Task Force	Yearly review NCA documentation for changes in impacts.	Summary of wild fire risks, update www.evmwddrought.com portal to Cal Adapt. See Chapter of 3 DCP.
		Water Resources Planner/Engineer	Import Water Vulnerability	Water Resources Manager	Drought Task Force	MWD Water Supply Outlook found in UWMP and IRP published every 5 years.	Review and consider MWD UWMP and IRP. See Chapter 3 of DCP.
		Water Resources Planner/Engineer	Ground Water Vulnerability	Water Resources Manager	Drought Task Force	Review SGMA requirements and production ground water production related to safe yield of basins.	Track ground water production. See Chapter 3 of DCP.
		Water Resources Planner/Engineer	Surface Water Vulnerability	Water Resources Manager	Drought Task Force	Characterize capacity and risks to Canyon Lake WTP treatment capacity.	See Chapter 3 of DCP.
		Water Resources Planner/Engineer	Worst Case Planning Scenarios	Water Resources Manager	Drought Task Force	Operate WRDSS on a yearly basis to confirm analysis and projections.	Report supply conditions and update as needed. See Chapter 3 of DCP.
Mitigation Actions	Water Resources and Engineering Managers	Water Resources Planner/Engineer	Evaluate Infrastructure Opportunities	Water Resources Manager	Drought Task Force	Formalize results of WRDSS and make recommendations for improvements, timing and phasing.	Update IRP. See Chapter 4 of DCP.
	Engineering Manager	Engineering Staff	Initiate Infrastructure Opportunities	Director of Engineering/Water Resources	Drought Task Force	Implement projects in accordance with phasing and priority. Formalize preliminary design efforts and feasibility studies.	Update IRP. See Chapter 4 of DCP.

Task	Task Force Lead	Task Force Member	Responsibilities	Reports To	Coordinates With	Procedures/ Resources	Documentation
Mitigation Actions	Community Relations Manager	Water Use Efficiency Specialist	Educational Development and Communication	Community Affairs Supervisor	Drought Task Force	Communications Tools	See Chapter 5 of DCP.
	Assistant General Manager	Engineering Manager/Water Resources Manager	Initiate Mitigation Actions	Water Resources Manager	Drought Task Force		See Chapter 4 of DCP.
Response Actions	Water Resources Manager	Water Resources Manager	Create and Identify Actions, Stages, and Fines	Director of Engineering/Water Resources	Drought Task Force	WSCP	See Chapter 5 of DCP.
	Community Relations Manager	Water Use Efficiency Specialist	Relationship, Education, and Communication with stakeholders and public	Community Affairs Supervisor	Drought Task Force	Communications Tools	See Chapter 5 of DCP.
	Assistant General Manager	Water Resources Manager	Initiate Response Actions	Board of Directors	Drought Task Force		See Chapter 5 of DCP.
Plan Update	Water Resources Manager	Consultant	Create Plan Update Process	Water Resources Manager	Drought Task Force	Plan update process chapter; 10 Step Drought Planning Process.	See Chapter 6 of DCP.

6.4 Roles and Responsibilities

There are several diverse entities with mutual water conservation concerns and the need for a DCP in the designated area. These entities include the City of Lake Elsinore, City of Canyon Lake, WMWD, City of Wildomar, City of Murrieta, Chambers of Commerce for each city, LEUSD, MUSD, County of Riverside, the Summerly Golf Course, Congressman Ken Calvert, 42nd District, Assemblywomen Melissa Melendez, 67th District, Northwest Mosquito and Vector Control District (Northwest MVCD), and Sierra Club. These diverse stakeholders represent over 136,000 residential water users, over 10,000 businesses including tourism and recreation, 23 school campuses, and the larger County of Riverside. An open and reciprocal relationship has been encouraged with EVMWD's stakeholders through all aspects of the creation and implementation of the DCP. Several stakeholder meetings were held during the development of the DCP development process to inform and receive feedback on all aspects of the DCP. EVMWD's stakeholders have shown a commitment to supporting the plan, complying with regulations, contributing feedback if necessary and helping to educate all our residents, businesses, and visitors. These efforts have focused on water conservation and education of local ecological impacts so as to preempt water shortages before they have a drastic effect on the community. Other stakeholders will be identified during future stages of DCP implementation and the feedback they may contribute will be considered in future updates.

6.4.1 Drought Task Force

EVMWD has an experienced and enthusiastic team of individuals who will lead the efforts of the Task Force as well as the consultant in performance of data collection, planning, design and updating the comprehensive DCP. They will also be responsible for communicating with stakeholders and implementing the DCP. The following position descriptions are intended to present a descriptive list of the range of duties performed and do not reflect all duties performed with the stakeholder's employment:

Water Resources Manager: Directs, manages, supervises, and coordinates the activities and operation of the Water Resources Division through three functional sections: water resources planning, water systems engineering and wastewater systems engineering.

Water resources planning is responsible for forward planning to ensure adequate supplies and facilities are provided to ensure water and wastewater services remain reliable, cost effective, and provide a high-quality product.

Water systems engineering is responsible for all regulatory reporting and providing technical support to the Operations Department related to the water system. The cross-connection control and onsite recycled water regulatory functions are within the water systems engineering section. The Water Resources Manager is responsible for all regulatory reporting and providing technical support related to the wastewater system, industrial waste monitoring and pretreatment functions. Water Resources Manager maintains knowledge of all relevant water quality regulations and ensures current and future EVMWD compliance with all local, state, and federal regulations.

Director of Water Resources and Engineering: Under general administrative direction, plans, organizes, directs, manages, and oversees the functions, programs, and operations of the Engineering and Water Resources Departments; coordinates assigned activities with other departments and outside agencies; and provides highly responsible and complex administrative support to the Assistant General Manager.

The Director also plans, organizes, directs, and supervises the efficient operation of the Engineering and Water Resources Departments. Oversees and participates in the development and administration of the department budget; approves the forecast of funds needed for staffing, equipment, materials, and supplies; approves expenditures; and implements budgetary adjustments as appropriate and necessary. Assumes overall management responsibility of all planning, design, construction and inspection activities of EVMWD projects and developer projects. Assumes overall management of the Water Resources Department including those activities identified in Drought Monitoring and Mitigation Actions in the DCP.

Senior Water Resources Planner/Engineer: Manages the Water Resources Planning program. Performs professional planning research and technical analyses related to water demand, supply availability, optimization, and use of local supplies; new supply development; short-term and long-term operational optimization of water supplies; water management; and water policy issues. Administers and oversees the work of planning staff and consultants related to water resources planning, environmental studies and project management.

Assistant General Manager: Plans, directs, manages and oversees the functions, programs, and operations of the Water Resources, Engineering and Operations Divisions. Provides administrative support to the General Manager. Acts as General Manager in the absence of the General Manager.

6.4.2 Stakeholders

WMWD

WMWD is a wholesaler of imported water to EVMWD and other districts, in addition to its retail business stretching 527-square miles in western Riverside County with a population of more than 880,000 people. This regional area includes the cities of Corona, Norco and Riverside and the water agencies serving Box Springs, Eagle Valley, Lake Elsinore, Lee Lake, and Temecula. WMWD will participate in planning meetings as needed.

County of Riverside

EVMWD serves a 96-square-mile area in Riverside County along the eastern foothills of the Santa Ana Mountains. County Board of Supervisors, Kevin Jeffries, is an avid supporter of EVMWD. The Riverside County will participate in planning meetings as needed.

City of Lake Elsinore

EVMWD services the entire City of Lake Elsinore (population 53,024) and works cooperatively with the City to manage the Lake Elsinore water levels. The City has participated as a major stakeholder in planning meetings and will participate in planning meetings as needed.

City of Canyon Lake

Canyon Lake is a major surface water source for EVMWD. The lake also provides recreational opportunities for the 10,647 residents in that City. They are committed and have been an active participant in planning meetings. The City will continue to participate in planning meetings as needed.

City of Wildomar

EVMWD services a large portion of the City of Wildomar, providing water for their parks and green spaces. With 51,821 residents, the City is a mix of mature homes with acreage for horses along with smaller housing tracts. The City continues to participate in stakeholder planning meetings and will participate in future planning meetings as needed.

City of Murrieta

While EVMWD services only a small portion of the City of Murrieta's 107,479 residents, the City stands ready and has participated in planning meetings and will continue to participate in planning meetings as needed.

LEUSD

EVMWD services the entire LEUSD which consists of 23 school campuses with potable water to maintain green spaces including landscaping, and athletic and sports fields. Resource conservation and ecology are already part of LEUSD's cumulative curriculum, and they will incorporate the educational elements of a DCP to inform students and their families of the importance of water conservation for the future. They will continue to participate in planning meetings as needed.

MUSD

EVMWD services portions of the Murrieta Unified School District (MUSD) that educates 22,700 students from transformation kindergarten through high school. The MUSD has participated in planning meetings and will continue to participate in planning meetings as needed.

Chamber of Commerce (Lake Elsinore, Canyon Lake, Murrieta, and Wildomar)

The Chamber of Commerce membership rosters include representatives from all sectors of the business community who play an active role in community events, preservation and conservation programs. As of 2015, Governor Jerry Brown has imposed mandatory restrictions on California businesses including a reduction of water usage by 25%, serving

water only by request in restaurants, and providing laundry only by request in hotels. The Chamber of Commerce is a leading source of information for local businesses and encourages the educational aspects of a DCP in informing businesses in water conservation efforts and will continue to participate in planning meetings as needed.

Summerly Golf Course

Located in the City of Lake Elsinore, Summerly's par-72, 7,000-yard golf course is serviced entirely by potable water from EVMWD. The golf course is committed to working with EVMWD to ensure the availability of water given the consequences of the ongoing drought and will participate in planning meetings as needed.

Congressman Ken Calvert, 42nd District

Congressman Calvert is fully supportive of EVMWD's planning efforts and will assist EVMWD as he is able to.

Assemblywoman Melissa Melendez, 67th District

Assemblywoman Melendez is fully supportive of EVMWD's planning efforts and her staff has attended DTF meetings.

Northwest MVCD

The Northwest MVCD was formed on December 28, 1959 to control mosquitoes in the northwest portion of Riverside County encompassing 150 square miles. The MVCD has subsequently been charged with the responsibility to control all important vectors. The MVCD will participate in planning meetings as needed.

Sierra Club

The mission of the Sierra Club is to practice and promote the responsible use of the earth's ecosystems and resources and are participants of the DCP effort and will participate in planning meetings as needed.

6.5 Coordination between Recipient, The Task Force, and Interested Stakeholders

EVMWD created the DTF as a partnership between EVMWD and stakeholders of the community as described above. The DTF will provide a mechanism for agencies to exchange drought information, discuss issues and solutions, and coordinate response activities related to the drought. Along with the drought consultant, the DTF will coordinate with other relevant regional and statewide agencies efforts including the MWD, SWRCB, and the Inland Empire Coalition of Water Agencies. Meetings will continue to discuss water use efficiency and what actions the cities and school districts can employ to help mitigate drought effects and streamline communications between stakeholders.

6.6 Communication Plan

1. Stakeholders and the public have been and will continue to be involved in the planning process, and have provided input on drafting this DCP. Feedback of the stakeholders and public has been facilitated by the DTF by way of public meetings, webinars, public notices and other forums.
    a. The most important element in these stakeholder communications have included identifying the target audience. Communication with these stakeholders has taken on many forms as follows:
        i. Informal Meetings
        ii. Newsletters
        iii. Email
        iv. Website
        v. Social Media

6.7 Monitoring/Early Warning and Prediction Committee

The assessment of water availability and its outlook for the near and long-term is valuable information and will be performed in both dry and wet periods. During a drought, the value of this information increases. The monitoring committee includes representatives from agencies with responsibilities for water use and demand. Data and information on each of the relevant indicators are considered in the committee's evaluation of the water situation and outlook. The DTF and EVMWD are responsible for collecting, analyzing, and disseminating data and information to the monitoring committee. EVMWD would lead this effort with support/feedback from the DTF and stakeholders. The monitoring committee will meet semi-annually, especially in advance of the peak demand season. In general, the primary objectives of the monitoring committee are as follows:

1. Collaborate on the development of drought conditions that will be used to phase in and phase out levels of state and federal actions in response to drought. The monitoring committee is well versed in the established terminology used in the WSCP and will continue to be vigilant in promulgating drought related information in their respective areas of responsibility. The alert levels are defined in EVMWD's WSCP.

2. EVMWD has established its drought management areas based on its sphere of influence and service boundaries. Members of the monitoring committee are incorporated into the DCP process as entities serving within these service boundaries.

3. EVMWD maintains a data collection system for monitoring climate and water supplies and identifying potential shortfalls in the system. Responsibility for collecting, analyzing, and disseminating the data is maintained by the DTF. The monitoring committee's is to coordinate the analysis prepared by the DTF so decision makers at the respective entities and the public receive early warning of emerging drought conditions.

4. As drought conditions develop and change occurs, the DTF will develop and/or modify relevant data and information delivery systems to effectively address drought concerns.

CHAPTER 7 – PLAN UPDATE PROCESS

7.1 Purpose

This chapter creates a Plan Update Process and schedule to monitor, evaluate, and update the DCP in an effort to keep the DCP flexible and amended when unforeseen situations arise, new legislation is created, or new technology becomes available. Drought simulations and plan evaluations will be used after a drought.

7.2 Description

This includes the following activities:

- Plan evaluation process.
- General steps for drought planning and plan update process.

7.3 Plan Evaluation Process

EVMWD will revise the DCP to keep it current and make an evaluation of the DCP's effectiveness in the post-drought period. Drought Monitoring, Mitigation Actions and Response Actions are main components of the DCP and are also an integral part of EVMWD's WSCP and IRP. EVMWD monitors and updates WSCP to make it consistent with that of the regional supplier and will simulate/analyze water consumption to confirm the effectiveness of implementation.

A detailed set of procedures have been set forth to ensure adequate DCP evaluation. Periodic testing, evaluation, and updating of the DCP are essential to keep the DCP responsive to local, state, or national needs. To maximize the effectiveness of the system, EVMWD has included two modes of evaluation: ongoing and post-drought.

7.3.1 Ongoing Evaluation

The ongoing evaluation involves testing the effectiveness of the DCP under simulated drought conditions (i.e., using a "drought exercise") prior to implementation and periodically thereafter. This will also test the effectiveness of the DCP given changes in technology, new laws, changes to water infrastructure, changes to political leadership, and other changes.

EVMWD will collect and file monthly urban water conservation reports and track per capita per day water usage. The DTF will monitor any changes to the water infrastructure, changes to the political leadership, new laws, and changes in technology and review if the changes will impact the current DCP. As drought planning is a process, EVMWD will continue monitoring drought risk and plan continuously.

7.3.2 Post-Drought Evaluation

The post-drought evaluation is intended to assess the effectiveness of the DCP once it has been implemented. The post-drought evaluation analyzes the assessment and response actions of stakeholders including cities, water agencies, school boards, industrial users and EVMWD. It also provides a mechanism to implement recommendations for improving the system. Post-drought evaluations will help EVMWD and stakeholders to learn from successes and mistakes and keep records of recommendations because institutional memory fades with time.

These post-drought evaluations include the analysis of the climatic and environmental aspects of the drought; its economic and social consequences; the extent to which predrought planning has been useful in mitigating these impacts, in facilitating relief or assistance to stricken areas in post-recovery; and any other weaknesses or problems caused by or not covered by this DCP. Attention will also be directed to situations in which drought-coping mechanisms worked and where the local community and larger sphere of influence exhibited resilience. Evaluations will not focus only on those situations in which coping mechanisms failed. Evaluations of previous responses to severe drought will also be utilized as a planning aid to further improve this DCP.

To ensure an unbiased appraisal, EVMWD has established a group of DTF members and community stakeholders to ensure all voices in the process are heard. EVMWD intends to implement post drought evaluation along with DCP updates every five years.

7.4 Measuring Effectiveness of the Plan

The evaluation process included in this DCP is an objective approach to measuring the effectiveness of the DCP. This includes the documented set of criteria for evaluating this DCP, and includes the use of an external entity inclusive of the established stakeholders to critique and provide input to this DCP. The WRDSS is utilized to establish a ranking of supply opportunities and improvements. As the various phases of mitigation actions are implemented, the results of the implementation will be characterized and compared to ensure that the goals of the mitigation actions are realized. Goals of mitigation are detailed as EVMWD's objective is to create new water, increase supply reliability, decrease reliance on imported water, promote reuse, improve water quality, improve groundwater management, and promote conservation.

7.5 Timing of Plan Updates

This DCP identifies the interval for plan evaluations and updates. Certain aspects of this DCP, such as drought monitoring and mitigation action, will be updated periodically. EVMWD will benefit from frequent updates at no more than every 2-year intervals and will simulate the WRDSS to confirm the effectiveness of implementation. For example, as progress is made in implementing mitigation actions as described in Chapter 4, this section

of the DCP will require an update sooner than the rest of the DCP. Updates to the entire DCP will be implemented every five years in concert with preparation of the EVMWD UWMP.

It is EVMWD's intention to update the DCP, at a minimum, every five (5) years; however, should drought conditions change and/or when new legislation or new technology becomes available, an update will occur as needed.

7.6 Data/Models Used for Plan Update

As part of the planning update process, the data/models that will be used to help update this DCP includes, but are not limited to, the following documentation, agencies and climate change models:

EVMWD Urban Water Management Plan*:* A planning tool updated every 5 years that generally guides the actions of water management agencies to support long-term resources planning and ensure adequate water supplies are available to meet existing and future water demands.

EVMWD Integrated Resource Plan*:* The IRP is intended to serve as a living document that can adapt to changing local, regional, and statewide water supply conditions.

EVMWD Water, Recycled Water and Wastewater Master Plans*:* A hydraulic planning document, routinely updated at 5-year intervals, to quantify growth and establish infrastructure needs.

National Integrated Drought Information System's (NIDIS) U.S. Drought Portal: Models include U.S. Drought Monitor, Crop Moisture Index, HPRCC ACIS Map, Palmer Drought Severity Index, Soil Moisture Percentiles, Standardized Precipitation Index, Hydrological Monitoring, Paleoclimate Data, and Water Quality.

National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service's Climate Prediction Center: U.S. Seasonal Drought Outlook based on information collected and analyzed from GIS data, U.S. Weekly Drought Monitor, and Soil Moisture.

California Energy Commission and UC Berkeley's Cal-Adapt: Collects and collates data from the Pacific Institute, Santa Clara University, Scripps Institution of Oceanography, UC Berkeley, UC Merced, and the U.S. Geological Survey to create the following interactive and predictive climate change models: Local Climate Snapshots (for any given location in California), Temperature Maps and Charts (Decade Averages, Degrees of Change, Monthly Averages, and Extreme Heat), Snow Pack Decadal Averages Map, Precipitation Decadal Averages Map, Sea Level Rise Threatened Areas Map, and Wildfire Risk Map.

7.7 Steps for Drought Planning and Plan Update Process

This plan utilizes a 9-step drought planning process as the basis for its development.

EVMWD has implemented steps 1–4 of the process to focus on making sure the right people are brought together, have a clear understanding of the planning and update process, know what the drought plan must accomplish, and are supplied with adequate data to make fair and equitable decisions when formulating and writing the actual drought plan. Step 5 describes the process EVMWD has taken to establish an organizational structure for completion of the tasks necessary to prepare this plan. This plan has been viewed as a process, rather than a discrete event that produces a static document.

A risk assessment has been undertaken in conjunction with Step 4, in order to construct a vulnerability profile for key economic sectors, population groups, regions, and communities. Step 5 establish a framework for DCP and start writing it in coordination with EVMWD. Step 6 details the process to engage stakeholders during plan preparation and coordination between EVMWD, stakeholders and plan preparer. Steps 7 and 8 stress the importance of promoting and testing the plan before drought occurs. Finally, Step 9 emphasizes revising the plan to keep it current and evaluating its effectiveness in the post drought period. Although the steps are sequential, many of these tasks are addressed simultaneously under the leadership of the drought task force and its complement of committees and working groups. These steps as shown in Figure 7-1 and the tasks included in each, provide a "checklist" that should be considered and may be completed as part of the drought planning and plan update process.

7.7.1 Step 1: Appoint a Drought Task Force

EVMWD has initiated the drought planning process and the plan update process through appointment of a drought task force and development of this plan. For more description of this step, refer to chapter six (6) of Operational and Administrative Framework, Section 6.8.

7.7.2 Step 2: State the Purpose and Objectives of the Drought Plan

EVMWD has considered many questions as they defined the purpose of this plan and have included the following:

- Purpose and role of EVMWD in drought mitigation and response efforts
- Scope of this plan
- Identifying the most drought-prone areas
- Historical impacts of drought
- Historical response to drought
- Most vulnerable economic and social sectors
- Role of the plan in resolving conflict between water users and other vulnerable groups during periods of shortage.

- Current trends (e.g., land and water use, population growth) that may increase or decrease vulnerability and conflicts in the future.
- Resources (human and economic) the government is willing to commit to the planning process
- Legal and social implications of the plan
- Principal environmental concerns caused by drought

This plan has been prepared to reduce the impacts of drought by identifying principal activities, groups, or regions most at risk and developing mitigation actions and programs that alter these vulnerabilities. This plan is directed at providing EVMWD with an effective and systematic means of assessing drought conditions, developing and implementing mitigation actions and programs to reduce risk in advance of drought, and developing response options that minimize economic stress, environmental losses, and social hardships during drought.

EVMWD has identified the specific objectives that support the purpose of this plan that include the following:

- Collect and analyze drought-related information in a timely and systematic manner.
- Establish criteria for declaring drought emergencies and triggering various mitigation and response activities.
- Provided an organizational structure and delivery system that ensures information flow between and within levels of government and the community.
- Define the duties and responsibilities of all task force members with respect to drought.
- Maintain a strategy used in assessing and responding to drought emergencies.
- Identify drought-prone areas of the region and vulnerable economic sectors, individuals and environments.
- Keep the public informed of current conditions and response actions by providing accurate, timely information to media in print and electronic form (e.g., via TV, radio, and the World Wide Web).
- Establish and pursue a strategy to remove obstacles to the equitable allocation of water during shortages and establish requirements or provide incentives to encourage water conservation.
- Establish a set of procedures to continually evaluate and exercise the plan and periodically revise the plan so it will stay responsive to the needs of the area.

7.7.3 Step 3: Seek Stakeholder Participation and Resolve Conflict

Social, economic, and environmental values often clash as competition for scarce water resources intensifies. As a result, EVMWD task force members have identified all citizen groups, municipalities, governmental entities and politicians (stakeholders) that have a stake in drought planning and understand their interests. These groups have been involved

early and continuously for fair representation in the process of effective drought management and planning. Discussing the concerns early in the process have given participants a chance to develop an understanding of one another's various viewpoints and generate collaborative solutions. The level of involvement of these groups has varied notably from entity to entity, yet the power of stakeholders in developing this plan has been considerable. The task force will also protect the interests of stakeholders who may lack the financial resources to serve as their own advocates.

EVMWD has facilitated public participation through inclusion of all stakeholders in routine drought related meetings, outreach, advisory communication and this has become a permanent feature of this drought plan.

7.7.4 Step 4: Inventory Resources and Identify Groups at Risk

An inventory of natural, biological, and human resources, including the identification of constraints that could impede the planning process, have been identified by the task force. EVMWD already possesses considerable information about natural, biological, human resources in its sphere of influence and utilizes numerous planning processes to mitigate drought impacts. The vulnerability of these resources to periods of water shortage that result from drought have been considered in this plan. Constraints to the planning process have been identified and the activation of the various elements of this plan as drought conditions develop. The purpose of this drought plan has been to reduce risk and, therefore, economic, social, and environmental impacts.

7.7.5 Step 5: Establish and Write Drought Plan

This drought plan has three primary components: (1) monitoring, early warning, and prediction; (2) risk and impact assessment; and (3) mitigation and response. The Task Force has been established to focus on all of these components with correspondence with the established committees.

The committees have their own tasks and goals and well-established communication and information flow between committees and the task force has been implemented to ensure effective planning. For more information about the committees' responsibilities, refer to chapter six (6) of Operational and Administrative Framework, Sections of 6.9, 6.10, and 6.11.

A methodology has been developed by EVMWD that focuses on identifying and ranking the priority of relevant drought impacts; examining the underlying environmental, economic, and social causes of these impacts; and then choosing actions that will address these underlying causes.

7.7.6 Step 6: Engage and Receive Input from Stakeholders

The DCP heavily relies on engaging stakeholders and receiving feedback throughout the plan preparation process. Good communication was established between the Task Force, stakeholders, plan preparer and the EVMWD's planning personnel having good understanding of planning works for responding to the drought, development of mitigation measure and action items. As soon as the Consultant was selected for plan preparation, a meeting was called by the EMVWD for all stakeholders. The meeting was used to introduce all participant and assigned roles and established contact persons for future communication. The selected Consultant presented the scope of work and outlined the DCP framework and elements. All the participants were happy to know that the EVMWD is planning for worst condition and getting ready for prolong Drought and BOR is helping for the study.

Every month, after completion of each DCP chapter following BOR guidelines, all the stakeholders, EVMWD and Consultant convened in EVMWD. The Consultant presented the Chapter(s) to the stakeholders and EVMWD and stake holder provided suggestion and comments on the DCP chapter. The consultant noted the suggestion, comments and clarify the questions stakeholders had. At least 6 meetings and presentations were held during plan preparation involving stakeholders and received input. The consultant prepared final draft DCP assembling all Chapters, presented to all stakeholders and publish the plan for 30 days for public review. Incorporating the feedback and comments received from the stakeholders, final draft DCP was prepared and presented to EVMWD's board to adopt as a planning document before submitting to BOR for final approval.

7.7.7 Step 7: Publicize the Drought Plan- Build Public Awareness and Consensus

EVMWD has communicated well with the public throughout the process of establishing this drought plan and there is great awareness of drought and drought planning which has been considered in this plan. Themes to emphasize in writing news stories during and after the drought planning process have included:

- How the drought plan is expected to relieve drought impacts in both the short and long term. Stories have been articulated related to the human dimensions of drought.
- What changes people might be asked to make in response to different degrees of drought, such as restricted lawn watering and car washing or not irrigating certain uses at certain times.

In subsequent years, EVMWD plans to publish "drought plan refresher" news releases at the beginning of the most drought sensitive season, letting people know whether there is pressure on water supplies or reason to believe shortfalls will occur later in the season, and reminding them of the plan's existence, history, and any associated success stories. It has

been found to be useful to refresh people's memories about circumstances that would lead to water use restrictions.

During drought, the task force will work with public information professionals to keep the public well informed of the status of water supplies, whether conditions are approaching "trigger points" that will lead to requests for voluntary or mandatory use restrictions, and how victims of drought can access assistance. EVMWD will post all pertinent information on the drought EVMWD website so that the public can get information directly from the task force without having to rely on mass media.

7.7.8 Step 8: Develop Education Programs

A broad-based education program to raise awareness of short and long-term water supply issues has been implement by EVMWD to help ensure that people know how to respond to drought when it occurs, and that drought planning does not lose ground during non-drought years. Information has been tailored to the needs of specific groups (e.g., elementary and secondary education, small business, industry, homeowners, utilities). The drought task force has prepared presentations and educational materials for events such as a water awareness week, community observations of Earth Day, relevant trade shows, specialized workshops, and other gatherings that focus on natural resource stewardship or management.

7.7.9 Step 9: Evaluate and Revise Drought Plan

Periodic testing, evaluation, and updating of the drought plan and other necessary documentation have been established to keep the plan responsive to local and state needs. To maximize the effectiveness of the system EVMWD has included two modes of evaluation: ongoing and post-drought. Refer to Section 7.3 of this chapter for ongoing evaluation and post-drought evaluation

7.8 Updating the Drought Contingency Plan

With input from the working groups, the DTF and the assistance from a drought consultant, EVMWD will draft the DCP updates. After completion of an updated draft, EVMWD will hold stakeholder meetings at their headquarters to explain the purpose, scope, operational characteristics, and needed updates of the DCP. In addition, EVMWD will discuss the specific mitigation actions and response measures updates in the DCP. A public information specialist for the DTF will facilitate the meetings and prepare news releases to announce the meeting and provide an overview of the DCP updates.

Figure 7-1 DCP Update Steps and Schedule

S. No.	Steps	Schedule to Implement Each Step
1	Appoint a Drought Task Force	3 Months
2	State the Purpose and Objectives of the Drought Plan	2 Months
3	Seek Stakeholder Participation and Resolve Conflict	3 Months
4	Inventory Resources and Identify Groups at Risk	4 Months
5	Establish and Write Drought Plan	8 Months
6	Engage and Receive Input from Stakeholders	10 Months
7	Publicize the Drought Plan- Build Public Awareness and Consensus	2 Months
8	Develop Education Programs	On Going
9	Evaluate and Revise Drought Plan	Every 2 & 5 Years

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Sea Level Rise - Climate Change Climate Change Impacts in the United States

U.S. National Climate Assessment
Threats to Agriculture - Climate Change Impacts in the United States

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Heat Threats to Health - Climate Change Impacts in the United States

Department of Water Resources
Making Water Conservation a California Way of Life

APPENDIX – A

EVMWD's Water Shortage Ordinance 225

ORDINANCE NO. 225

AN ORDINANCE OF THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY UPDATING AND RESTATING THE DISTRICT'S WATER SHORTAGE CONTINGENCY PLAN / WATER CONSERVATION PROGRAM

WHEREAS, California Constitution article X, section 2, and California Water Code section 100 provide that, because of conditions prevailing in the State of California ("State"), it is the declared policy of the State that the general welfare requires that the water resources of the State shall be put to beneficial use to the fullest extent of which they are capable; the waste or unreasonable use of water shall be prevented; and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare; and

WHEREAS, pursuant to California Water Code section 106, it is the declared policy of the State that the use of water for domestic use is the highest use of water and that the next highest use is for irrigation; and

WHEREAS, pursuant to California Water Code section 375 et seq., the Elsinore Valley Municipal Water District ("District"), by ordinance or resolution, is authorized to adopt and enforce a Water Conservation Program to reduce the quantity of water used by persons within its jurisdiction for the purpose of conserving the water supplies of the District; and

WHEREAS, pursuant to California Water Code section 10610 et seq., the District is required to include a water shortage contingency analysis establishing various stages of action to be implemented in cases of water supply shortage, known as a Water Shortage Contingency Plan, as part of the District's Urban Water Management Plan; and

WHEREAS, pursuant to California Water Code section 71610.5, the District may undertake a water conservation program to reduce water use and may require, as a condition of new service, that reasonable water-saving devices and water reclamation devices be installed to reduce water use; and

WHEREAS, pursuant to California Water Code section 71640 et seq., the District may restrict the use of District water during any emergency caused by drought, or other threatened or existing water shortage, and may prohibit the waste of District water or the use of District water during such periods for any purpose other than those that the District determines to be necessary. The District may also prohibit use of District water during such periods for specific uses which it finds to be nonessential.

WHEREAS the District's Board of Directors recognizes continued long term challenges to the region and the State. Climate change impacts are predicted to increase the uncertainty of water supplies. Additionally, regulatory restrictions on pumping from the Bay-Delta region affecting State Water Project ("SWP") deliveries will continue to impact the District's supply reliability. Further, the District is dependent on the Metropolitan Water District of Southern California ("Metropolitan") for its imported water supplies and is subject to the policy actions pertaining to water supply set by Metropolitan's governing body. The District relies heavily on SWP supplies, obtaining approximately up to 70 percent of its total supply through imported water sources from Metropolitan; and

WHEREAS, Metropolitan has adopted a Water Shortage Allocation Plan and has declared a regional supply shortage reduction of fifteen percent (15%) which will be in effect on July 1, 2015; and

WHEREAS, because of the prevailing conditions in the State and the declared policy of the State that the District manage its water resources for the general welfare to ensure their beneficial use to the fullest extent of which they are capable, the District hereby finds and determines that it is necessary and appropriate for the District to adopt, implement, and enforce an updated Water Shortage Contingency Plan / Water Conservation Program (together, the "WSCP") to reduce the quantity of water used by consumers within the District to ensure that there is sufficient water for human consumption, sanitation, and fire protection; and

WHEREAS, the Governor, on April 1, 2015 issued Executive Order B-29-15 that, in part, directed the State Water Resources Control Board ("SWRCB") to

impose restrictions on water suppliers to achieve a statewide 25 percent (25%) reduction in potable urban usage through February 2016. The Executive Order includes, but is not limited to, the following: (1) commercial, industrial, and institutional water users shall implement water efficiency measures; (2) prohibits irrigation with potable water of ornamental turf in public street medians; and (3) prohibits irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development; and

WHEREAS, the SWRCB, on May 5, 2015 mandated that urban water suppliers whose average July-September 2014 Residential Gallons Per Capita Per Day ("R-GPCD") was 130 or more but less than 170 shall reduce its total potable water production by twenty-eight percent (28%) for each month as compared to the amount of use in the same month in 2013; and

WHEREAS, the District's average R-GPCD was 146.3 for July-September 2014; and

WHEREAS, the Board of Directors hereby finds and determines that in the event the District determines that it is necessary to declare that a Water Shortage Emergency exists, the District will be authorized pursuant to this Ordinance to implement supply shortage response measures to regulate water consumption activities within the District and ensure that the water delivered in the District is put to beneficial use for the greatest public benefit, with particular regard to domestic use, including human consumption, sanitation, and fire protection, and that the waste or unreasonable use of water is prevented; and

WHEREAS, the Board of Directors is authorized and hereby finds and determines that it is necessary to prescribe and define by ordinance restrictions, prohibitions, and exclusions for the use of water during a threatened or existing water shortage and adopt and enforce a WSCP to: (i) prohibit the waste of District water or the use of District water during such period; (ii) prohibit use of water during such periods for specific uses which the District may from time to

time find nonessential; and (iii) reduce and restrict the quantity of water used by persons within the District; and

WHEREAS, the Board of Directors hereby finds and determines that the District shall: (i) implement water supply shortage response measures; (ii) regulate the water consumption activities of persons within the District for the purposes of conserving and protecting the District's water supplies, reducing the quantity of water consumed, and deterring and preventing the waste or unreasonable use or unreasonable method of use of valuable water resources; and (iii) establish and collect regulatory fees and impose fines and/or penalties as set forth herein to accomplish these purposes and recover the costs of the District's water conservation and regulatory program; and

WHEREAS, the Board of Directors hereby finds and determines that it is desirable to adopt this WSCP in order to codify the rules and regulations governing its actions, and the actions of persons using and consuming water within the District, particularly during declared water shortages and water shortage emergencies, to protect the general welfare and the District's water supplies, and to reduce water consumption, all in accordance with the declared policies and laws of the State; and

WHEREAS, the Board of Directors hereby further finds and determines that this Ordinance and the WSCP set forth herein are in the public interest and serve the public purpose of the District; and

WHEREAS, at a public hearing held on May 28, 2015, the Board heard and considered all oral testimony, written materials, and written protests concerning the establishment of and imposition of the proposed WSCP; and

WHEREAS, due to the fiscal impacts referenced above, the Board has determined that it is in the best interests of the District to adopt the proposed WSCP identified herein and as more particularly described and set forth herein; and

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of the Elsinore Valley Municipal Water District of Riverside County as follows:

Section 1. Recitals

The Board of Directors hereby finds and determines that the above recitals are true and correct and incorporated herein.

Section 2. Findings a nd Intent

(A) The Board of Directors finds and determines that because of the prevailing conditions in the State, and the declared policy of the State, it is necessary and appropriate for the District to adopt, implement, and enforce this WSCP to reduce the quantity of water used by persons within the District to ensure that there is sufficient water for human consumption, sanitation, and fire protection. The District further finds and determines that, during periods of drought, water shortages, and water shortage emergencies the general welfare requires that the District maximize the beneficial use of its available water resources to the extent that it is capable, and that the waste or unreasonable use, or unreasonable method of use of water shall be prevented and the conservation of water is to be extended with the view to the reasonable and beneficial use thereof in the interests of the people of the District and for the public health, safety, and welfare.

(B) This Ordinance adopts the WSCP, which establishes water waste restrictions, supply shortage response measures, regulations, and administrative fines and/or penalties to be implemented during declared water supply shortage stages.

(C) This Ordinance adopts the WSCP which establishes five (5) water supply shortage stages and supply shortage response measures to be implemented by the District, with increasing restrictions on water use and administrative fines and/or penalties for water waste in response to decreasing water supplies and/or worsening drought conditions.

(D) The implementation of water supply shortage stages may be triggered by, without limitation, any or all of the following circumstances or events:

(1) A regional water supply shortage exists;

(2) Delivery infrastructure such as storage reservoirs, pipes, pumps, filtration devices or groundwater wells, is inoperable or unusable (such as by power outages, mechanical failure, or contamination);

(3) Alternative water supplies are limited or unavailable;

(4) Groundwater levels or groundwater quality is approaching levels which may require augmentation of the groundwater basin or other actions necessary to protect the groundwater basin, as prescribed by the California Department of Water Resources, the Regional Water Quality Control Board, Riverside County, or some other regulatory body;

(5) Metropolitan's Water Surplus and Drought Management Plan stages and the Metropolitan Water Supply Allocation Plan stages and corresponding actions have been implemented; or

(6) An executive order from the Governor.

Section 3. Purpose and S cope

(A) The purposes of the provisions of this Ordinance and WSCP are to assure the highest beneficial use of District water supplies and to provide sufficient water supplies to meet the basic needs of human consumption, sanitation, and fire protection within the District's direct retail service area.

(B) This Ordinance is not intended to repeal, abrogate, annul, impair or in any way interfere with the free use of property by covenant, deed, or other private agreement or with restrictive covenants running with the land to which the District provides water services.

(C) The provisions of this Ordinance shall apply to all persons within the District's direct retail service area and all property served in a retail capacity by the District wherever situated.

(D) Nothing in this Ordinance is intended to affect or limit the ability of the District to respond to an emergency, including an emergency that affects the ability of the District to supply water.

Section 4. Definitions

For the purposes of this Ordinance, the following words, terms, and phrases shall have the following meanings:

"Appellant" means the Person appealing a decision of the Approving Authority, General Manager or other District official.

"Approving Authority" means the General Manager of the District, or his or her designee, charged with approving or denying written applications for Relief.

"Board of Directors" means the Board of Directors of the District.

"District" means the Elsinore Valley Municipal Water District.

"Enforcement Officer" means any individual employed or otherwise charged by the District to inspect or enforce codes, ordinances, mandates, regulations, resolutions, rules or other laws adopted by the Board of Directors or other regulatory bodies.

"General Manager" means the General Manager of the District or his or her authorized designee.

"Immediate Emergency" means a breakage or failure of a dam, pump, pipeline or conduit, a disaster or other disruption of the District's water supply.

"Medical Adjustment" means an adjustment to the residential indoor water allocation based on medical needs. Medical adjustments must be approved by the District and are not subject to mandatory residential indoor water allocation reductions in any stage. The District will consider a request for medical adjustment at any time and at any stage. The adjustment shall be removed with any changes to the account holder.

"Metropolitan" means the Metropolitan Water District of Southern California.

"Non-Potable Water" means water that is not of drinking water quality, but which may still be used for purposes other than for human consumption.

"Person" means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the District, or the manager, lessee, agent, servant, officer or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

"Property Owner" means the owner of a parcel whose name and address appears on the last Riverside County equalized secured property tax assessment roll, or in the case of any public entity, the State of California, or the United States, means the representative of that public entity at the address of that entity known to the District.

"Recycled Water" means municipal wastewater that has been treated to meet all applicable Federal, State and local standards for use in approved applications, including, but not limited to, agricultural and landscape irrigation.

"Relief" means excuse from compliance with the regulations and restrictions on water use contained in this Ordinance.

"State" means the State of California.

"Water Budget" means a Customer's total water billing allocation for indoor and outdoor water use. The specific indoor and outdoor allocation of water depends on the type of Customer (Customer sector) and the specific characteristics of the Customer's site. Use in excess of the allocation is charged at incrementally higher rates.

"Water Customer" or "Customer" means any Person, firm, partnership, association, corporation, or local political entity using water obtained from the District.

"Water Shortage Emergency" means a condition existing within the District where the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation,

and fire protection. A Water Shortage Emergency includes both an Immediate Emergency, in which the District is unable to meet current water needs of persons within the District, as well as a threatened water shortage, in which the District determines that its supply cannot meet an increased future demand.

“WSCP” means the Water Shortage Contingency Plan adopted pursuant to this Ordinance.

“Water Supply Allocation Plan" or “WSAP” means the Plan developed by Metropolitan to calculate member agencies' supply allocations should a shortage be declared.

“Water Surplus and Drought Management Plan” or “WSDM Plan” means the 1999 plan that Metropolitan uses to direct its resource operations to ensure that shortage allocations of imported water supplies are not required.

Section 5. Stage Implementation

(A) The General Manager shall monitor the projected supply of and demand for water within the retail water service area of the District during periods of a water shortage or supply shortage and shall recommend to the Board of Directors the extent of the demand reduction required through the implementation and/or termination of particular water supply shortage stages or sub-stages to prudently plan and supply water to water Customers. Thereafter, the Board of Directors may order the implementation or termination of the appropriate stage or sub-stage.

(B) The declaration of any stage or sub-stage beyond Stage 1 shall be made by resolution of the Board of Directors. Within ten (10) calendar days of the adoption of the resolution declaring the applicable stage or sub-stage, the District shall make a public announcement and provide notice of the applicable water supply shortage stage. Such declaration and notice shall provide the extent, terms, and conditions as well as the associated water budget allocations and fines and/or penalties respecting the use and consumption of water in accordance with the applicable water supply shortage stage as provided in this Ordinance. Upon such declaration and publication of such notice, due and

proper notice shall be deemed to have been given to each and every Person supplied water within the District.

(C) The water supply shortage stage designated shall become effective immediately upon announcement.

(D) Except in the event of an Immediate Emergency, the declaration of a Water Shortage Emergency during any water supply shortage stage shall be made in accordance with California Water Code sections 350 et seq.

(E) Notwithstanding any other provision of this Ordinance, if an Immediate Emergency occurs and the Board of Directors cannot meet in time to act to protect the public interest, the General Manager is hereby authorized and directed to implement any necessary rules and regulations upon his or her written determination that the District cannot adequately supply water to meet the ordinary demands of water consumers, and that such implementation is necessary to protect the public health and safety.

(1) The General Manager's written determination of an Immediate Emergency shall be:

(a) filed with the District Secretary;

(b) posted on the District's website;

(c) delivered to the Board of Directors; and

(d) subsequently considered by the Board of Directors at a general or special meeting for review, revocation, or ratification.

(2) The implementation of any rules and regulations during an Immediate Emergency shall take effect immediately upon making a posting of the determination of the Immediate Emergency on the District's website.

(3) The Board of Directors' meeting shall be held on the earliest date that a quorum of the Board of Directors is available. At the Board of Directors meeting, the General Manager shall update the Board of Directors on the severity and length of the Immediate Emergency.

Section 6. Stage 1 – Water Supply Watch

(A) Stage 1 applies during periods when the District is able to meet all of the water demands of its Customers. Stage 1 and the permanent prohibitions set forth herein shall be in effect at all times unless the Board of Directors otherwise declares that another stage is in effect pursuant to this Ordinance and such stage establishes more stringent prohibitions on the use of water during the particular stage.

Under Stage 1, Customers are encouraged to use water efficiently and take advantage of the District's water use efficiency programs. Stage 1 also mandates the implementation of several permanent water waste prohibitions, even when there is no foreseeable threat of a water shortage. Water waste is in violation of California Law at any stage. California's water law and policy, Article X, Section 2 of the California Constitution, requires that all uses of the State's water be both reasonable and beneficial and places a significant limitation on water rights by prohibiting the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. The permanent prohibitions shall be continually in effect at all levels of water shortage declarations in addition to the requirements specific to each level. All normal water efficiency programs and water conservation regulations of the District will be in full force and effect during Stage 1. The permanent shortage response measures include:

(1) All irrigators shall ensure automatic irrigation timers are adjusted according to changing weather patterns and landscape requirements.

(2) All open hoses shall be equipped with automatic, positive shut-off nozzles.

(3) Watering of lawns and/or groundcovers and irrigating landscaping is permitted only between the hours of 6:00 p.m. and 6:00 a.m.

(4) Sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff and waste. Watering on windy days is to be avoided.

(5) Installation of water saving devices, such as low flow shower heads and faucet aerators, is encouraged.

(6) Selection of low-water-demand shrubs, groundcovers and trees for all new landscaping is strongly encouraged.

(7) All swimming pools, spas, ponds, and fountains shall be equipped with re-circulating pumps.

(8) All plumbing leaks, improperly adjusted sprinklers, or other water conduits/fixtures that require repair or adjustment shall be corrected to the satisfaction of the District within ninety-six (96) hours of notification by the District.

(9) No Person shall use water to wash down sidewalks, driveways, parking areas, tennis courts, patios, or other paved or hard surface areas, except to alleviate immediate fire or sanitation hazards, and then only by use of: a hand-held bucket or similar container; a hand-held hose equipped with an automatic, positive self-closing shut-off device, or a low volume, high-pressure cleaning machine.

(10) No Person shall allow water to leave his or her property by drainage onto adjacent properties or public or private roadways or streets due to excessive irrigation and/or uncorrected leaks.

(11) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment, is permitted at any time with a hand-held bucket or a hand-held hose equipped with an automatic, positive shut-off nozzle. Provided, however, such washing may be done at any time on the immediate premises of a commercial car wash, a commercial service station or car dealership with commercial car washing equipment, or by a licensed mobile detailing/car wash professional using low volume, high pressure washing equipment. Further, such washings are exempted from these regulations where the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables.

(12) Construction operations receiving water from a construction meter, hydrant meter, or water truck shall not use water for any purpose other than those required by regulatory agencies. Construction projects requiring watering for new landscaping materials shall adhere to the designated irrigation requirements set forth in Section 4 hereof.

(B) The District will attempt to contact Customers by telephone, mail, email and/or printed "door-hanger" to alert of a required repair, adjustment, or violation. All Customers shall ensure that the District has current telephone and email contact information. The District is not responsible for incorrect phone numbers or email addresses.

Section 7. Stage 2 – Water Supply Alert

(A) Stage 2 applies during periods when a reasonable probability exists that the District will not be able to meet all of the water demands of its Customers. This may correlate to Metropolitan's WSDM Plan stage of "Water Supply Watch" or "Water Supply Alert" Conditions.

(B) The objective of Stage 2 is to affect a moderate reduction in water use up to 4% through mandatory actions and may be adjusted depending on supply conditions via a Board approved Resolution.

(C) Mandatory conservation measures will be called upon during this stage. The restrictions listed in Stage I shall remain in effect with the following additions:

(1) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs or other landscaped areas shall be permitted no more than three days per week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted at any time if:

a. A hand-held hose is used, or

b. A hand-held bucket is used, or

c. A drip irrigation system is used, or

d. Recycled water is used.

(i)Irrigation occurring during or 48 hours after a rain event is prohibited;

(2) Construction meters utilizing potable water shall be issued only to those persons who have been issued valid grading and/or building permits.

(3) All restaurants, cafes, and other public food service establishments are prohibited from serving drinking water unless specifically requested by their customers.

(4) Hotels, motels and other commercial lodging establishments should provide customers the option of not having towels and linens laundered daily. Commercial lodging establishments should prominently display notice of this option in each bathroom using clear and easily understood language.

(5) Customers shall install pool and spa covers to minimize water loss due to evaporation.

(6) Installation of new landscapes shall be prohibited unless irrigated with drip irrigation. Exceptions may be provided for projects with prior approval by the appropriate jurisdiction.

(7) The District shall develop a public information campaign to provide Customers with options for achieving the Stage 2 demand reduction goal. The District shall explore increased Customer incentives for conservation measures.

Section 8. Stage 3 – Mandatory Waste Reduc tion

(A) The intent of Stage 3 is to target and eliminate excessive water use and water waste. Stage 3 applies during periods when a reasonable probability exists that the District will not be able to meet all of the water demands of its Customers. This may correlate to Metropolitan's Shortage Allocation Plan Shortage Levels 1 through 4. The District's Board of Directors

may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

(B) After a Stage 3 has been declared and the District has completed the notice requirements set forth herein, each customer who has had a potable water account with the District shall be limited to using potable water as follows:

(i) For residential customers, water use shall be limited to using a volume equal to Blocks 1 and 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property;

(ii) For irrigation customers, water use shall be limited to using a volume equal to Block 1 of their irrigation water budget per billing cycle for outdoor water use for his or her property;

(iii) For wholesale customers, water use shall be limited to using a volume equal to Block 1 and Block 2;

(iv)Water use beyond the water volume permitted in (i), (ii) and (iii) above will be charged a civil administrative penalty of $1.59 per CCF.

(C) The objective of the measures undertaken in Stage 3 is to reduce water system consumption within the District by five to fifteen percent (5 to 20%).

(D) Stage 3 does not apply to the use of non-potable or recycled water. The use of recycled water for daytime irrigation is permitted.

(E) Mandatory conservation measures will be called upon during this stage. The restrictions listed in Stages 1 and 2 shall remain in effect with the following additions:

(1) Stage 3 (a)

(i) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs or other landscaped areas shall be permitted no more than two days per week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted at any time if:

a. A hand-held hose is used, or

b. A hand-held bucket is used, or

c. A drip irrigation system is used, or

d. Recycled water is used.

(ii) The filling, refilling or addition of water to uncovered outdoor swimming pools, wading pools or spas is prohibited;

(iii) The operation of any exterior ornamental fountain or similar structure is prohibited;

(2) Stage 3 (b)

(i) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment, is permitted only on the immediate premises of a commercial car wash, a commercial service station or car dealership with commercial car washing equipment, or by a licensed mobile detailing/car wash professional using low volume, high pressure washing equipment. Further, such washings are exempted from these regulations where the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables;

(3) Stage 3 (c)

(i) The District shall eliminate all adjustments to existing residential Customers' outdoor Water Budgets including, but not limited to, increases for swimming pools, spas, or pond maintenance adjustments. New water using features or expanded landscapes shall not qualify for a Water Budget Variance.

(F) The District shall develop a public information campaign to provide Customers with options for achieving the Stage 3 demand reduction goal and complying with their applicable water allocation. The District shall explore increased Customer incentives for conservation measures.

Section 9. Stage 4 - Mandatory Outdoor Reductions

(A) The intent of this stage and the related sub-stages is to strategically reduce the demand for water though targeted outdoor reduction actions. Stage 4 applies during periods when the District will not be able to meet all of the water demands of its Customers. This may correlate to any of Metropolitan's WSAP Regional Shortage Levels 5 through 7. The District's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

(B) After a Stage 4 has been declared and the District has completed the notice requirements set forth herein, each customer who has had a potable water account with the District shall be limited to using potable water as follows:

(i) For residential customers, water use shall be limited to using a volume equal to Block 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property;

(ii) For irrigation customers, water use shall be limited to using a volume equal to Block 1 of their irrigation water budget per billing cycle for outdoor water use for his or her property;

(iii) For wholesale customers, water use shall be limited to using a volume equal to Block 1 and Block 2;

(iv) Water use beyond the water volume permitted in (i), (ii) and (iii) above will be charged a civil administrative penalty of $2.09 per CCF.

(C) The objective of the measures undertaken in Stage 4 is to reduce water system consumption within the District by twenty-five to forty percent (25 to 40%).

(D) Stage 4 does not apply to non-potable or recycled water. The use of recycled water for daytime irrigation is permitted.

(E) Except as otherwise provided in this Section 9, all supply shortage response measures of Stages 1 through 3 shall be in full force and effect during Stage 4.

(1) Stage 4 (a)

(i) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs or other landscaped areas shall be permitted no more than two days per week on odd/even calendar days corresponding to the last digit of a service address. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted at any time if:

a. A hand-held hose is used, or

b. A hand-held bucket is used, or

c. A drip irrigation system is used, or

d. Recycled water is used.

(2) Stage 4 (b)

(i) Use of water from fire hydrants shall be limited to firefighting, related activities and/or other activities necessary to maintain the health, safety and welfare of the citizenry and shall not be used for construction uses;

(ii) No District water shall be used for construction purposes except for system pressurization and/or testing.

(3) Stage 4 (c)

(i) No new construction or hydrant meters will be issued. Potable water shall not be used for earth work, road construction purposes, dust control, compaction, or trenching jetting. Construction projects necessary to maintain the health, safety, and welfare of the public are exempt from these regulations.

(ii) If the District Board of Directors declares a Water Shortage Emergency during a Stage 4, no new potable water service

connections shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as will serve letters, certificates, or letters of availability) shall be issued, except under the following circumstances:

(1) a valid, unexpired building permit has been issued for the project; or

(2) the project is necessary to protect the public's health, safety, and welfare; or

(3) where an existing service connection exists and an existing water meter is inoperable and cannot be repaired. In such an instance, the size of the new water meter shall be the same or smaller than the water meter being replaced.

(F) The District shall develop a public information campaign to provide Customers with options for achieving the Stage 4 demand reduction goals and complying with their applicable allocation. The District may explore increased Customer incentives for conservation measures.

Section 10. Stage 5 – Mandatory Targeted Indoor/Outdoor Reductions – Catastrophic Failure or "Immediate Emergency"

(A) The intent of this stage and the related sub-stages is to substantially reduce the demand for water through indoor actions in addition to the elimination of landscape and non-essential outdoor water use. Stage 5 applies during periods when the District will not be able to meet all of the water demands of its Customers. This shortage level may correlate to Metropolitan's WSAP Regional Shortage Levels 8, 9, 10, or greater. Stage 5 may be declared during an Immediate Emergency. A Stage 5 declaration may also be accompanied by a Board Resolution declaring a Water Shortage Emergency under California Water Code sections 350 et seq. The District's Board of Directors may choose to implement a temporary drought rate and a temporary drought penalty to achieve water conservation.

(B) After a Stage 5 has been declared and the District has completed the notice requirements set forth herein, each customer who has had a potable water account with the District shall be limited to using potable water as follows:

(i) For residential customers, water use shall be limited to using a volume equal to Block 2 of their potable water budget per billing cycle for indoor and outdoor water use for his or her property;

(ii) For irrigation customers, water use shall be limited to using a volume equal to Block 1 of their irrigation water budget per billing cycle for outdoor water use for his or her property;

(iii) For wholesale customers, water use shall be limited to using a volume equal to Block 1 and Block 2;

(iv) Water use beyond the water volume permitted in (i), (ii) and (iii) above will be charged a civil administrative penalty of $4.01 per CCF.

(C) The objective of the measures undertaken in Stage 5 is to significantly reduce water consumption within the District to protect public health, safety, and fire flow.

(D) Except as otherwise provided in this Section 10, all water supply shortage response measures of Stages 1 through 4 shall be in full force and effect during Stage 5.

(E) Stage 5 does not apply to non-potable or recycled water, although there is no guarantee of availability. The use of recycled water for daytime irrigation is permitted.

(1) Stage 5 (a)

(i) All landscape and non-essential outdoor water use for all Customers in all areas of the District's retail water service area shall be prohibited.

(2) Stage 5 (b)

(i) Except as to property for which a building permit has been heretofore issued, no new water meter(s) shall be provided, except in the following circumstances:

(1) for projects necessary to protect the public's health, safety, and welfare; or

(2) when using recycled water.

(ii) The use of water for commercial, manufacturing, or processing purposes may be further reduced in volume if it is determined to be in the best interest of the health, sanitation, and fire flow protection in the communities served by the District. This determination may be made by the Board of Directors, the General Manager or his or her authorized designee as provided for in Section 5(E).

(3) Stage 5 (c)

(i)All dedicated irrigation meters will be locked off by District personnel.

(ii) Customers with a District authorized Medical Adjustment to their Tier 1 allocation will be permitted 100 percent (100%) of their Tier 1 Water Budget.

(F) The District shall develop a public information campaign to provide Customers with options for achieving the Stage 5 demand reduction goals and complying with their allocation. The District may explore increased Customer incentives for conservation measures.

Section 11. Violation s and Remedies

(A) Criminal Violation. It shall be unlawful for any Person to willfully violate the provisions of this Ordinance. Any violation of the provisions of this Ordinance shall be a misdemeanor, unless made an infraction by the prosecutor, subject to imprisonment in the county jail for not more than thirty (30) days or by fine not to exceed $1,000, or by both as provided in California Water Code section 377.

(B) Cease and Desist Order. The General Manager may issue a cease and desist order directing the Property Owner, or occupant, or other Person in charge of day-to-day operations of any property, and/or any other Person responsible for a violation of this Ordinance to:

(1) immediately discontinue any prohibited use of water pursuant to this Ordinance; and

(2) immediately cease any activity not in compliance with the terms, conditions, and requirements of this Ordinance.

(C) Civil Action. In addition to any other remedies provided in this Ordinance, any violation of this Ordinance may be enforced by civil action brought by the District and the imposition of administrative fines and/or penalties. In any such action, the District may seek, and the court may grant, as appropriate, any or all of the following remedies:

(1) a temporary and/or permanent injunction;

(2) assessment of the violator for the costs of enforcement of the violation and for the reasonable costs of preparing and bringing legal action under this Ordinance; and

(3) assessments under this subsection shall be paid to the District to be used exclusively for costs associated with implementing or enforcing the water supply shortage and regulatory provisions of this Ordinance.

(D) Cumulative. All remedies provided herein shall be cumulative and not exclusive.

(E) On-going. A Person shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any provision of this Ordinance is committed, continued, or permitted.

Section 1 2. Notices

(A) Any notice, notice of violation, cease and desist order, and administrative compliance order shall be served pursuant to the requirements of this Ordinance and shall:

(1) identify the provision(s) of this Ordinance and any State law, if applicable, alleged to have been violated; and

(2) state that continued noncompliance may result in civil, criminal, or administrative enforcement actions against the Person who committed the violation, or the Property Owner and/or occupant of the property where the violation occurred; and

(3) state a compliance date that must be met by the Person who committed the violation, or the Property Owner and/or occupant of the property where the violation occurred; and

(4) order remediation work, where applicable, that must be taken by the Property Owner and/or occupant of the property; and

(5) state that the recipient has a right to appeal the matter as set forth in this Ordinance; and

(6) include the address of the affected property and be addressed to the Property Owner as shown on the most recently issued equalized assessment roll, or as may otherwise appear in the current records of the District. If the order applies to a responsible party who is not the Property Owner, or if the event is not related to a specific property, the notice may be sent to the last known address of the responsible party; and

(7) be deemed served ten (10) business days after posting on the property, if the Property Owner or occupant of the affected property cannot be located after the reasonable efforts of the General Manager or his or her authorized designee.

(B) Any notice, notice of violation, cease and desist order, and administrative compliance order may be sent by regular mail. Service by regular mail is effective on the date of mailing.

(C) The notice of violation may include, where deemed applicable by the General Manager or his or her authorized designee, the following terms and conditions:

(1) specific steps or actions and time schedules for compliance as reasonably necessary to prevent future violations of this Ordinance; and

(2) any other terms, conditions, or requirements reasonably calculated to prevent continued or threatened future violations of this Ordinance, including, but not limited to, discontinuing or limiting water service.

(D) In addition to or in conjunction with the notice of violation, for a first violation of any provision of this Ordinance, within two (2) weeks of the violation:

(1) the District may provide notice to the Property Owner or occupant of the property where the violation occurred to advise such Person of:

(a) the water supply shortage stage then in effect and the provisions of this Ordinance relating thereto;

(b) water supply shortage response measures that are required and may be implemented pursuant to this Ordinance;

(c) possible consequences and actions which may be taken by the District for future violations of this Ordinance, including discontinuance of water service; and

(d) fines and/or penalties that may be imposed for the specific violation and any future violations of this Ordinance;

(E) In addition to or in conjunction with the notice of violation, for a second or any subsequent violation of this Ordinance, within two (2) weeks of the violation:

(1) the District may provide notice to the property where the violation occurred to notify the Property Owner or occupant of the property where the violation occurred to advise such Person of:

(a) the water supply shortage stage then in effect and the provisions of this Ordinance relating thereto;

(b) the water supply shortage response measures that are required and may be implemented by such Person; and

(c) possible consequences which may occur in the event of any future violations of this Ordinance;

(2) if the General Manager or his or her authorized designee deem it to be appropriate, the District may order the installation of a flow-restricting device on the service line for any Person who violates any term or provision of this Ordinance;

(3) if the General Manager or his or her authorized designee deem it to be appropriate, the District may discontinue water service at the location where the violation occurred.

(F) The District may, after one (1) written notice of violation, order that a special meter reading or readings be made in order to ascertain whether wasteful or unreasonable use of water is occurring. The District may impose a meter reading fee for each meter reading it conducts pursuant to this Ordinance.

Section 13. Administrative Compliance Order and Fines and/or Penalties

(A) Separate from, in addition to, or in combination with a notice of violation or cease and desist order, the General Manager or his or her authorized designee may issue an administrative compliance order against the Property Owner and/or occupant of the property where a violation of this Ordinance occurred and/or any other Person responsible for a violation of this Ordinance who violates any provision of this Ordinance. Issuance of a notice of violation or a cease and desist order is not a prerequisite to the issuance of an administrative compliance order. The administrative compliance order shall allege the act(s) or failure(s) to act that constitute violations of this Ordinance and shall set forth the penalty for the violation(s).

(B) The General Manager may impose the following administrative monetary fines and/or penalties, in addition to other appropriate action requirements and measures:

(i) For the first violation during any water supply shortage stage by any Person of any provision of this Ordinance, the District shall issue a written warning notice of non-compliance for any Person who violates any provisions of this Ordinance.

(ii) For a second violation during any water supply shortage stage by any Person of any provision of this Ordinance within the preceding twelve (12) calendar months, the District shall issue a final written notice to the Person which sets forth a complete copy of this Ordinance or summary document of the WSCP as well as additional information such as the required compliance and potential fines and/or penalties for noncompliance.

(iii) For a third violation during Stages 1 and 2 by any Person of any of the provisions of this Ordinance within the preceding twelve (12) calendar months, the District may impose a monetary penalty in the amount of one hundred dollars ($100.00) per day for each day a Person violates any provision of this Ordinance. During Stages 3, 4, and 5 the District may impose a monetary penalty in the amount of two hundred dollars ($200.00) per day for each day a Person violates any provision of this Ordinance.

(iv) For a fourth and any subsequent violation during Stages 1 and 2 by any Person of any of the provisions of this Ordinance, the District may impose a monetary penalty in the amount of one hundred dollars ($100.00) per day for each day a Person violates any provision of this Ordinance. During Stages 3, 4, and 5 the District may impose a monetary penalty in the amount of four hundred dollars ($400.00) per day for each day a Person violates any provision of this Ordinance.

(v) For a fifth violation during Stages 1 and 2 by any Person of any of the provisions of this Ordinance within the preceding twelve (12) calendar months, the District may impose a monetary penalty in the amount of one hundred dollars ($100.00) per day for each day a Person violates any

provision of this Ordinance. During Stages 3, 4, and 5 the District may impose a monetary penalty in the amount of five hundred dollars ($500.00) per day for each day a Person violates any provision of this Ordinance.

(vi) For a sixth and any subsequent violation, the District may install a flow-restricting device or terminate a Person's service in accordance with the District's applicable rules and regulations. These measures are in addition to any monetary fines and/or penalties provided for herein.

(vii) Any such restricted or terminated service may be restored in accordance with the District's applicable rules and regulations and only upon a showing that the Person is in compliance with this Ordinance. Prior to any restoration of service, the Customer shall pay all District charges for any restriction or termination of service and its restoration as provided for in the District rules governing water service, including, but not limited to payment of all past due bills and fines and/or penalties and any other amounts which may be due and owing under this Ordinance.

(viii) An amount that shall not exceed five hundred dollars ($500.00) per day for each day on which a Person violates any provision of this Ordinance. Unless timely appealed, an administrative compliance order shall be effective and final as of the date it is issued by the General Manager.

(ix) To the extent the amounts of penalties and fines referenced in this Section are not otherwise authorized under State law, the penalties and fines assessed shall be in the amounts authorized under the Municipal Water District Law of 1911.

(C) The amount of any fines and/or penalties imposed pursuant to this Section 13 may be collected by including said amount on the Customer's water bill. The amount of any fines and/or penalties imposed pursuant to this Section 13 which have remained delinquent for a period of sixty (60) calendar days shall constitute a lien against the real property of the Person violating this Ordinance. The lien provided herein shall have no force and effect until recorded with the Riverside County Recorder and when recorded shall have the force and effect and priority of a judgment lien and continue for ten (10) years from the time

of recording unless sooner released, and shall be renewable in accordance with the provisions of sections 683.110 to 683.220, inclusive, of the California Code of Civil Procedure.

(D) All moneys collected under this Section 13 shall be deposited in a special account of the District and shall be made available for enforcement of this Ordinance and enhanced water conservation incentive programs.

(E) The District may, at its option, elect to petition the Superior Court to confirm any order establishing administrative fines and/or penalties and enter judgment in conformity therewith in accordance with the provisions of sections 1285 to 1287.6, inclusive, of the California Code of Civil Procedure.

Section 14. Over-Budget Water Use Penalties

(A) All penalty moneys collected from over-budget water use during a declared water shortage stage in excess of the applicable Tier 2 rate, shall be deposited in the existing special funding accounts designated for conservation penalty and/or supply penalty as appropriate and may be allocated to or used for any of the following as determined by the District:

1. Conservation Penalty Account:

(a) Enhanced conservation programs designed to reduce water demands;

(b) Outreach and Education Programs designed to reduce water demands, decrease water waste, or generally raise water awareness;

(c) Enforcement of any provision of this Ordinance;

2. Supply Penalty Account:

(a) Purchase, acquisition, delivery, or wheeling of additional water supplies;

(b) General operations and maintenance expenses, including those incurred as a result of reduced water sales;

(c) The difference between budgeted revenue expected from the operations and maintenance component in the water rates of Tier 1 and 2 and actual revenue received from this component;

(d) Payment of penalty expenses incurred as a result of exceeding a Metropolitan water supply allocation;

(e) Payment of any other incremental cost of service associated with providing water deliveries and/or water service during any water curtailment, water shortage emergency, or "Immediate Emergency" pursuant to Water Code sections 350 et seq.

Section 15. Recovery of Costs

(A) The General Manager shall serve an invoice for costs upon the Property Owner and/or occupant of any property, or any other responsible Person who is subject to a notice of violation, a cease and desist order, or an administrative compliance order. An invoice for costs shall be immediately due and payable to the District. If any Property Owner or Person in charge of day-to-day operations, Customer, or responsible party, or any other Person fails to either pay the invoice for costs or appeal successfully the invoice for costs in accordance with this Ordinance, then the District may institute collection proceedings. The invoice for costs may include reasonable attorneys' fees.

(B) The District shall impose any other fines and/or penalties or regulatory fees, as fixed from time to time by the Board of Directors, for a violation or enforcement of this Ordinance.

(C) In order to recover the costs of the WSCP set forth in this Ordinance, the Board of Directors may, from time to time, fix and impose regulatory fees. These regulatory fees shall not exceed the cost of the regulatory activities for which they are imposed and shall not be used for unrelated revenue purposes. The District fees and charges may include, but are not limited to fees and charges for:

(1) any visits of an Enforcement Officer or other District staff for time incurred for meter reading, follow-up visits, or the installation or removal of a flow-restricting device;

(2) monitoring, inspection, and surveillance procedures pertaining to enforcement of this Ordinance;

(3) enforcing compliance with any term or provision of this Ordinance;

(4) re-initiating service at a property where service has been discontinued pursuant to this Ordinance;

(5) processing any fees necessary to carry out the provisions of this Ordinance.

Section 1 6. Appeals

Any Person subject to a notice of violation, cease and desist order, or administrative compliance order may file a written appeal of such order or notice to the General Manager within thirty (30) calendar days of the date of service of the order or notice. An appeal shall be made in accordance with the following procedures:

(A) The Appellant shall complete and submit in writing a form provided by the District for such purpose and shall state in such form the grounds for his or her appeal. All appeals shall be submitted to the District Secretary within thirty (30) calendar days of the date of the notice of violation, cease and desist order, or administrative compliance order.

(B) The General Manager or his or her authorized designee shall review the appeal and any related information provided, and, if necessary, cause an investigation and report to be made concerning the request for Relief. The General Manager or his or her authorized designee shall have fifteen (15) calendar days from the submission of the appeal to render a decision on whether to grant the appeal and mail notice thereof to the Appellant. If the General Manager or his or her authorized designee grants the appeal, then within fifteen (15) calendar days of such determination the General Manager or his or her authorized designee shall give written notice thereof to the Appellant.

(C) The decision of the General Manager or his or her authorized designee may be appealed by the Appellant to the Board of Directors.

Such appeal must be submitted in writing and filed with the District Secretary within fifteen (15) calendar days of the date of decision of the General Manager or his or her authorized designee. The Board of Directors shall conduct a hearing on such appeal at its next regularly scheduled Board of Directors meeting; provided, however, the Board of Directors shall have received the notice of appeal at least fifteen (15) calendar days prior to such meeting. If the appeal is not submitted within at least fifteen (15) calendar days prior to a regularly scheduled Board of Directors meeting, then the Hearing shall be held at the following regularly scheduled meeting of the Board of Directors. A notice of the Hearing shall be mailed to the Appellant at least ten (10) calendar days before the date fixed for the Hearing. The Board of Directors shall review the appeal de novo. The determination of the Board of Directors shall be conclusive and shall constitute a final order. Notice of the determination by the Board of Directors shall be mailed to the Appellant within ten (10) calendar days of such determination and shall indicate whether the appeal has been granted in whole or in part and set forth the terms and conditions of the appeal, if any, granted to the Appellant. If the appeal is denied, the Appellant shall comply with all terms and conditions of this Ordinance and the applicable stage then in effect.

(D) After an Appeal Request form has been received, a site survey may be required by the District. The site survey will be at no charge to the person and will require the person who submitted the Appeal request form to be present.

(E) Until the conclusion of the appeal process, all provisions and decisions under appeal shall remain in full force and effect until the conclusion of the appeal process.

Section 17. Variances

The District may, in writing, grant a temporary variance from any fines, Allocation Surcharges and monetary assessments, or restrictions imposed by the WSCP if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire

protection for the public or the person requesting such variance, and under the following conditions:

(A) Compliance with the WSCP cannot be technically accomplished during the duration of a water supply shortage or other condition for which the WSCP Shortage Stage is in effect

(B) Alternative methods or technology used as part of a District-sanctioned trial or test study can be implemented which will achieve the same level or reduction in water use.

(C) Doctor-approved health circumstances, illness or injury will be considered on a case-by-case basis.

(D) No variances will be issued, beginning in Shortage Stage 3c of the WSCP, for filling swimming pools, leaks not repaired within 14 days or having large livestock animals.

(E) Additional 55 gallons per day (gpd) for each additional person. Documentation of additional residents must be submitted with application if the property will have more than 6 full-time residents. This may be children's birth certificates, school records, copies of income tax returns, lease agreements, etc. Type of documentation provided for this variance will be verified and notated on the variance form. After verification is complete, documentation provided will be destroyed.

(F) Variances will be considered for landscape adjustments within a 60 day grace period after the WSCP adoption.

(G) Variances will be considered for health and safety issue only in Shortage Stages 4 and 5.

(H) A written variance shall be accepted by the District, and may be denied at the sole discretion of the District.

(I) All variances must be requested in writing any time after the WSCP stage implementation. The following must be provided:

1. Name, contact phone number, service address and customer account number of petitioner;

2. Purpose of water use (e.g., domestic, commercial, agriculture);
3. Specific provision(s) of the WSCP from which the petitioner is requesting relief;
4. Detailed statement as to how the provision of the WSCP adversely affects the petitioner or what damage or harm will occur;
5. Description of the relief requested;
6. Period of time for which the variance is sought; and
7. Any alternative water use restrictions (e.g. indoor use) that the petitioner is taking or proposes to take to meet the intent of the WSCP.

Section 1 8. Relief From Complianc e

Consideration of written applications for Relief from compliance regarding the regulations and restrictions on water use set forth in this Ordinance may be made by the District.

(A) Written applications for Relief shall be accepted, and may be granted or denied, by the Approving Authority, at his or her sole discretion, or by his or her designee at his or her sole discretion. The application shall be in a form prescribed by the District and shall be accompanied by a non-refundable processing fee in an amount as determined by the Board of Directors for the purpose of defraying the costs incidental to the proceedings.

(B) The grounds for granting or conditionally granting Relief are:

(1) due to unique circumstances, a specific requirement of this Ordinance would result in undue hardship to a Person using District water or to property upon which District water is used, that is disproportionate to the impacts to other District water users generally or to similar property or classes of water users; or

(2) failure to grant Relief would adversely affect the health, sanitation, fire protection, or safety of the applicant or the public.

(C) The application for Relief shall be accompanied, as appropriate, with photographs, maps, drawings, and other information substantiating the applicant's request, including a statement of the applicant.

(D) An application for Relief shall be denied unless the Approving Authority finds, based on the information provided in the application, supporting documentation, or such other additional information as may be requested, and on water use information for the property as shown by the records of the District, all of the following:

(1) That the Relief does not constitute a grant of special privilege inconsistent with the limitations upon other District Customers;

(2) That because of special circumstances applicable to the property or its use, the strict application of this Ordinance would have a disproportionate impact on: (a) the property or use that exceeds Customers generally; or (b) the applicant's health that exceeds Customers generally;

(3) That the authorization of such Relief will not be of substantial detriment to adjacent properties, will not materially affect the ability of the District to effectuate the purposes of this Ordinance, and will not be detrimental to the public interest; and

(4) That the condition or situation of: (a) the subject property or the intended use of the property for which the Relief is sought is not common, recurrent, or general in nature; or (b) the applicant's health or safety is not common, recurrent, or general in nature.

(E) The denial or grant of a Relief shall be acted upon within fifteen (15) business days of the submittal of the complete application, including any photographs, maps, drawings, and other information substantiating the applicant's request and the statement of the applicant. The application may be approved, conditionally approved, or denied. The decision of the Approving Authority shall be prepared in writing, include terms and conditions, if any, and promptly sent to the applicant.

(F) The denial of a request for Relief may be appealed in writing to the General Manager. An appeal shall be made in accordance with the following procedures:

(1) The Appellant shall complete and submit in writing a form provided by the District for such purpose and shall state in such form the grounds for his or her appeal. All appeals shall be submitted to the District Secretary within thirty (30) calendar days of the date of the notice of the denial of the request for Relief.

(2) The General Manager or his or her authorized designee shall review the appeal and any related information provided, and, if necessary, cause an investigation and report to be made concerning the request for Relief. The General Manager or his or her authorized designee shall have fifteen (15) calendar days from the submission of the appeal to render a decision on whether to grant the appeal and mail notice thereof to the Appellant. If the General Manager or his or her authorized designee grants the appeal and determines that the request for Relief shall be granted, then within fifteen (15) calendar days of such determination the General Manager or his or her authorized designee shall give written notice thereof to the Appellant.

(3) The decision of the General Manager or his or her authorized designee may be appealed by the Appellant to the Board of Directors. Such appeal must be submitted in writing and filed with the District Secretary within fifteen (15) calendar days of the date of decision of the General Manager or his or her authorized designee. The Board of Directors shall conduct a hearing on such appeal at its next regularly scheduled Board of Directors meeting; provided, however, the Board of Directors shall have received the notice of appeal at least fifteen (15) calendar days prior to such meeting. If the appeal is not submitted within at least fifteen (15) calendar days prior to a regularly scheduled Board of Directors meeting, then the Hearing shall be held at the following regularly scheduled meeting of the Board of Directors. A notice of the Hearing shall be mailed to the Appellant at least ten (10) calendar days before the date fixed for the Hearing. The Board of Directors shall review the appeal de

novo. The determination of the Board of Directors shall be conclusive and shall constitute a final order. Notice of the determination by the Board of Directors shall be mailed to the Appellant within ten (10) calendar days of such determination and shall indicate whether the appeal has been granted in whole or in part and set forth the terms and conditions of the Relief, if any, granted to the Appellant. If the appeal is denied, the Appellant shall comply with all terms and conditions of this Ordinance and the applicable stage then in effect.

(4) Until the conclusion of the appeal process, all provisions and decisions under appeal shall remain in full force and effect until the conclusion of the appeal process.

Section 1 8. Conflictin g Prov isions

If provisions of this Ordinance are in conflict with each other, other rules and regulations of the District, or any other resolution or ordinance of the District, including but not limited to Ordinance Numbers 78, 79, 81, 87, 88, 185, and 219 as any or all of same have been amended from time to time the provisions of this Ordinance No. 255 shall apply. If the provisions of this Ordinance are in conflict with any State law or regulation, the more restrictive provisions shall apply.

Section 19. Severabi lit y

If any provision, section, subsection, sentence, clause or phrase or sections of this Ordinance, or the application of same to any Person or set of circumstances, is for any reason held to be unconstitutional, void or invalid, the invalidity of the remaining portions of sections of this Ordinance shall not be affected, it being the intent of the Board of Directors in adopting this Ordinance that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof and all provisions of this Ordinance are declared to be severable for that purpose.

Section 20. Effectiv e Date and Publication

This Ordinance shall be effective immediately upon adoption. Within ten (10) days after its adoption, the District Secretary shall cause this

Ordinance to be published once pursuant to California Government Code section 6061 in full in a newspaper of general circulation which is printed, published, and circulated in the District. If there is no such newspaper, the Ordinance shall be posted within the District after its adoption in three public places.

ADOPTED AND APPROVED this 28th day of May 2015 by the Board of Directors of the Elsinore Valley Municipal Water District.

Phil Williams, President
Board of Directors
Elsinore Valley Municipal Water District

ATTEST:

Terese Quintanar, Secretary of the
Board of Directors of the
Elsinore Valley Municipal Water District

STATE OF CALIFORNIA)
) ss:
COUNTY OF RIVERSIDE)

I, Terese Quintanar, Secretary of the Board of Directors of the Elsinore Valley Municipal Water District, do hereby certify that the foregoing Ordinance No. 225 was duly adopted by said Board at its Regular Meeting held on May 28, 2015, and that it was so adopted by the following roll call vote:

AYES: Cambero, Horton, Morris, Ryan, Williams

NOES: None

ABSENT: None

ABSTAIN: None

_____
Terese Quintanar, Secretary of the Board of Directors of the Elsinore Valley Municipal Water District

APPENDIX – B

EVMWD's Integrated Resources Plan

INTEGRATED RESOURCES PLAN 2016

Reliable, cost-effective, high quality water and wastewater services that are dedicated to the people we serve.

Elsinore Valley Municipal Water District

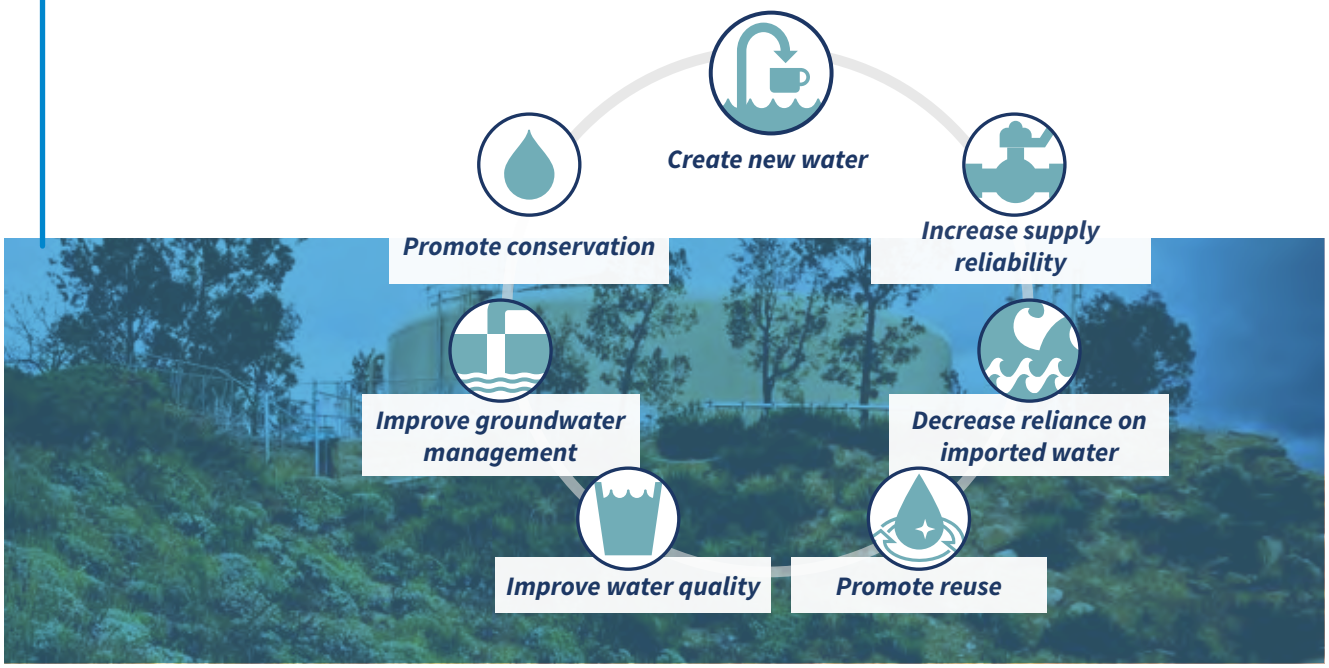
Elsinore Valley Municipal Water District | 31315 Chaney St. Lake Elsinore, CA 92531 | (951) 674-3146 | www.EVMWD.com

E.1 | Introduction

California is in the fifth year of a significant drought resulting in severe impacts to California's water supplies and its ability to meet water demands in the state. On April 1, 2015, Governor Brown signed Executive Order B-29-15, to impose restrictions in water use in order to achieve a 25% reduction in potable urban water use statewide. The implementation of this Executive Order, a first in California's history, underscores the gravity of the current water crisis in California.

The current population within Elsinore Valley Municipal Water District's (EVMWD) service area is approximately 37% of build-out conditions and significant growth is expected to occur during the next 25 years. This growth is expected to place significant strain on EVMWD's water resources. EVMWD, like many other water agencies in the region, relies heavily on imported water supply. Consequently, the uncertainty associated with imported water supply reliability due to climate change, and the increasing cost of imported water are critical issues for EVMWD. In light of these concerns, EVMWD, which serves one of the fastest-growing regions in Riverside County, embarked upon its first Integrated Resources Plan (IRP) – a long-term strategy for providing reliable water supplies to its growing customer base. The IRP considers a 25-year planning horizon through year 2040. EVMWD's IRP has the following foundational goals as depicted in the graphic below (Figure ES-1).

Figure ES-1 | IRP Foundational Goals



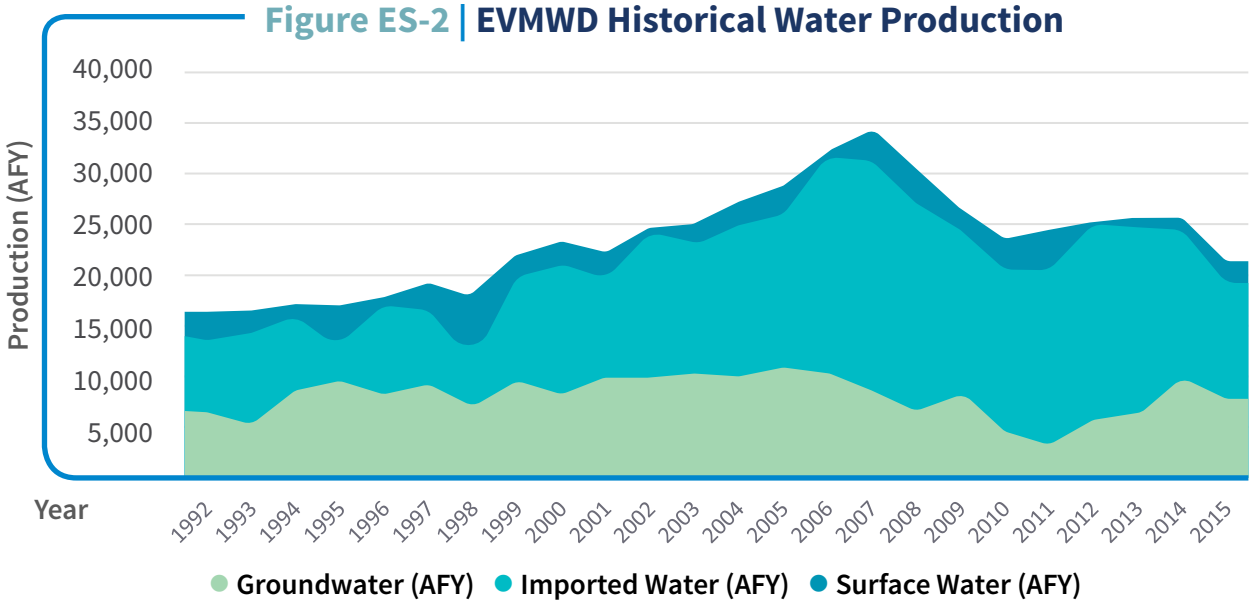
The IRP is intended to serve as a living document that can adapt to changing local, regional, and statewide water supply conditions. The remainder of this section summarizes the key background information, methodology, and findings from the IRP.

E.2 | Service Area & Water Demands

EVMWD's service area is located in Southern California, in the western portion of Riverside County, which is considered one of the fastest-growing areas in the State. EVMWD provides water and wastewater services to more than 148,000 residential customers, and to more than 3,500 institutional, commercial, and industrial users in the cities of Lake Elsinore, Canyon Lake, Wildomar, parts of Murrieta, Corona, and unincorporated areas of Riverside County. The current water demand is approximately 25,500 acre-feet per year (AFY). The demand is expected to nearly double by 2040 to approximately 50,000 AFY. The average yearly rainfall in the area is about 12 inches (MWH, 2011).

EVMWD has three primary sources of water supply: local groundwater, local surface water, and imported water obtained via the State Water Project and the Colorado River Aqueduct. Figure ES-2 shows a graphical representation of the historical water production over the past 20 years. The highest production occurred in 2007 (33,800 AFY). The decline in overall water production since 2007 can be attributed to the great economic recession, coupled with increased water conservation within EVMWD's service area.

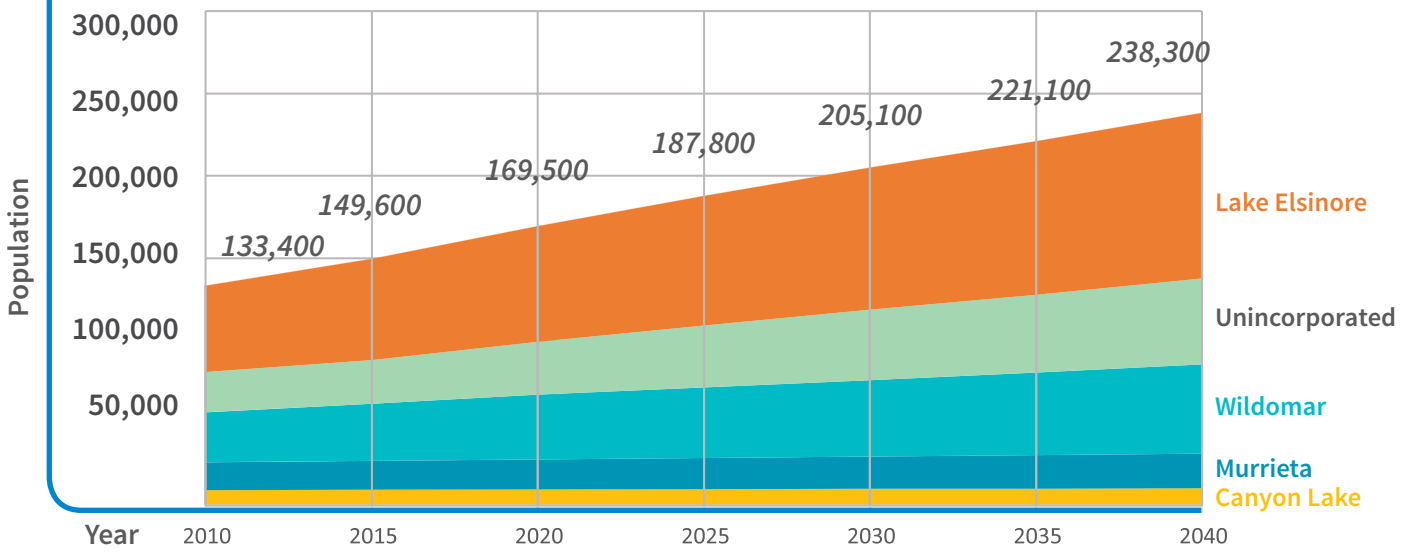
Figure ES-2 | EVMWD Historical Water Production



Population and employment forecasts developed by the Riverside County Center for Demographic Research (RCCDR) form the basis of the projections developed for EVMWD's service area. The 2010 RCCDR population and employment forecasts for Lake Elsinore, Wildomar, Murrieta, Canyon Lake, and unincorporated Riverside County are presented in five-year increments through the 2040 planning horizon. Based on these projections, the population within EVMWD's service area is expected to increase by approximately 60% (an increase of 90,000 people) by 2040 (See figure ES-3).

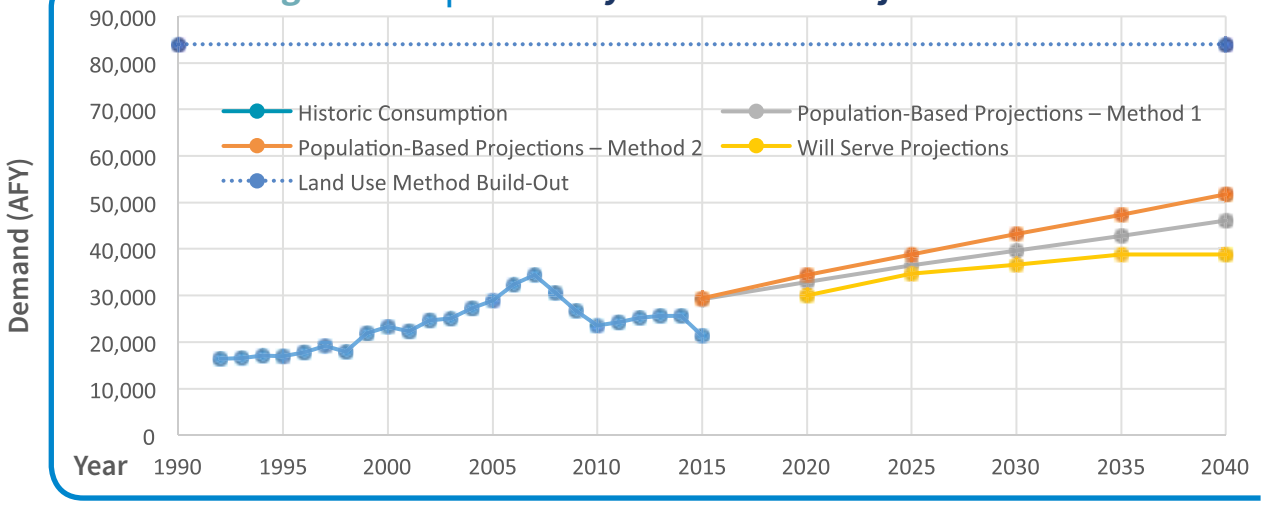
E.2 | Service Area & Water Demands *(Continued)*

Figure ES-3 | Population Projections For Cities & Unincorporated Areas Within EVMWD Service Area



Three different methods were used to MWH (2015) estimate future demands for the next 25 years and at build-out for EVMWD's service area. Method 1 and Method 2 are population-based projection approaches while Method 3 considers will-serve projections in order to correlate equivalent dwelling units (EDUs) with the anticipated demand per EDU. As depicted on Figure ES-4, projections developed using Method 2 are most conservative and are considered for the purposes of this IRP. Water demand in year 2040 is expected to be approximately 51,600 AFY. The build-out demand (represented via a dotted line on Figure ES-4) for the EVMWD service area is 84,000 AFY.

Figure ES-4 | Summary Of Demand Projections



E.3 | Water Supply

Local groundwater, extracted from Elsinore Valley Groundwater Basin (EVGB) and Coldwater Basin, accounts for approximately 22% of EVMWD's water supply (historically from 2011-2015). Surface water from Canyon Lake Reservoir is treated at the Canyon Lake Water Treatment Plant (CLWTP) and accounts for approximately 8% of the current water supply portfolio.

Imported water purchased from Metropolitan Water District of Southern California (MWD) through Western Municipal Water District (WMWD), accounts for approximately 70% of EVMWD's water supply. Water is imported from the Temescal Valley Pipeline connection, the Auld Valley Pipeline EM-17 connection, the conjunctive use program (CUP), and the Coldwater Basin (since August 2013).

Figure ES-5 | EVMWD's Projected Annual Water Supply & Demand - IRP Implementation

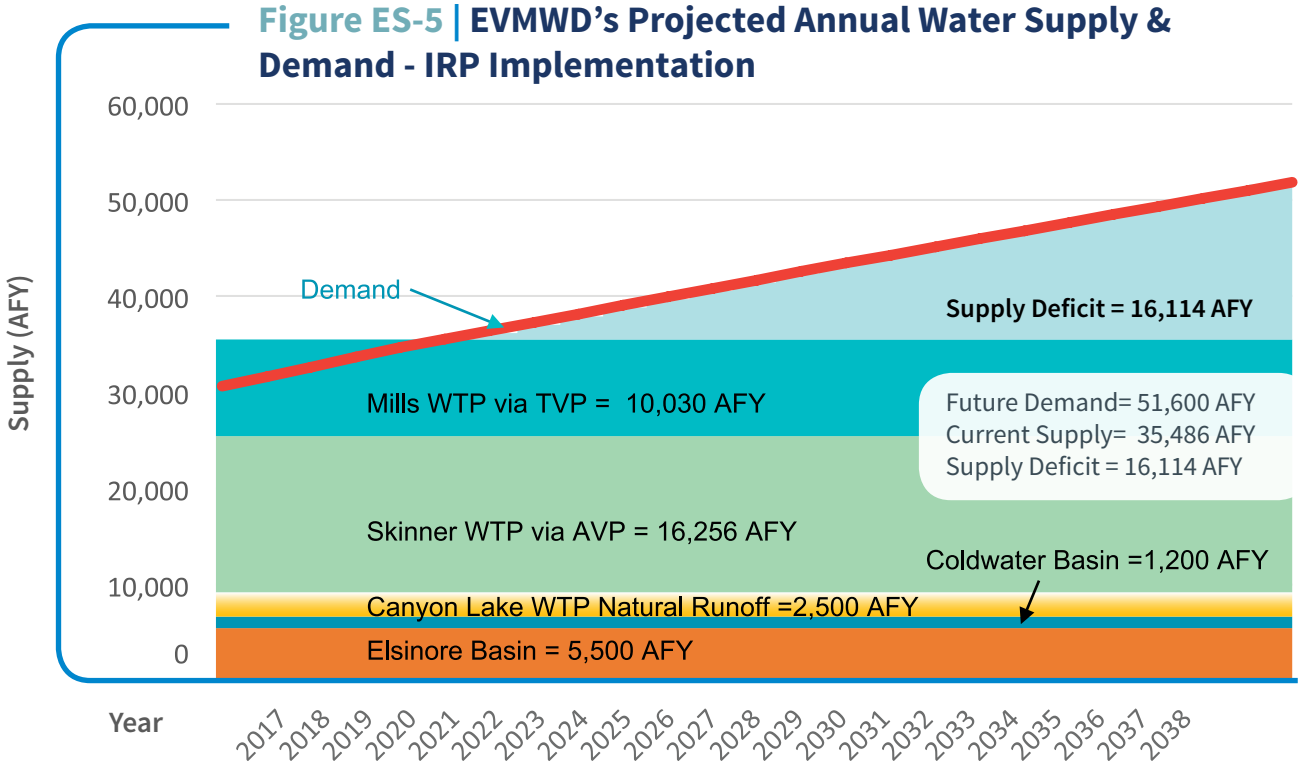


Figure ES-5 presents a comparison between EVMWD's existing supplies and its projected water demands as established using Method 2 (discussed above). The comparison reveals a deficit of approximately 16,114 AFY by 2040. The IRP considers several supply alternatives to overcome the projected water supply deficit and recommends a preferred water supply portfolio. Details of the water supply alternatives and the preferred portfolio are presented in the following pages.

E.4 | Project Evaluation

In order to offset the deficit of 16,114 AFY by 2040, the IRP evaluated 45 supply alternatives covering a vast array of viable options, including production from untapped groundwater basins, indirect potable reuse, seawater desalination, water exchanges and transfers, and expanding water conservation. These supply alternatives are presented in Table ES-1. Each project concept was further defined by developing metrics such as average yield, dry year yield, reliability, capital and annual operations and maintenance costs, salinity, implementability, and environmental impacts. Each alternative was given a score for each metric (with applied weighting based on its relative importance), and then ranked based upon the sum of all its scores. The supply alternative evaluation is aimed at selecting the highest-ranked projects, which are then used to develop scenario-based portfolios to offset the supply deficit identified for the planning horizon (year 2040). Table ES-2 shows the highest-ranked projects, which have a total yield of 17,883 AFY.

'Supply alternatives' are presented in Table ES-1 *(next page)*

E.4 | Project Evaluation *(Continued)*

Table ES-1 | List of 45 Supply Alternatives

SUPPLY SOURCE		SUPPLY ALTERNATIVE
1	Meeks and Daley Assets	1A. Transfer Bunker Hill Basin groundwater (1) via the TVP and the Riverside-Corona Feeder. 1C. Sell the Bunker Hill groundwater facilities and water rights. 1D. Transfer Bunker Hill Basin groundwater(1) via the Riverside and Gage Canal, Arlington Line, Lester WTP, and TVP 1E. Transfer Bunker Hill Basin groundwater via the Riverside and Gage Canal, Arlington Line, New EVMWD WTP, and TVP 1F. One-time transfers of water conservation assets (potential clients: City of Riverside, Western, etc.) 1G. Continue with WMWD exchange agreement 1H. Transfer Bunker Hill Basin groundwater via the SBVMWD CUP/Central Feeder/MWD 1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
2	Temescal Valley Groundwater Basins	2A-1. Pump Lee Lake Basin groundwater via the TVP; no Tteatment 2A-2. Pump Bedford Groundwater via the TVP; no treatment 2B. Extract Coldwater Basin groundwater with existing wells and transfer the water via TVP. 2E. One-time water exchange transfers with the City of Corona (3,200 AF) unused water in Coldwater Basin 2F. Coldwater groundwater exchange with Corona for Temescal Basin water 2G. Bedford groundwater Exchange with Corona for Temescal Basin water
3	Elsinore Groundwater Basin	3D. Palomar Well replacement 3E-1. McVicker and Leach Canyon stormwater recharge 3E-2. McVicker and Leach Canyon stormwater/Imported Water Recharge 3F. Elsinore Valley groundwater storage project (Canyon Lake water storage) 3G. Elsinore Basin conjunctive use expansion
4	Warm Springs Groundwater Basin	4A. Extract groundwater from Warm Springs Basin; no treatment 4B. Extract groundwater from Warm Springs Basin; treatment
5	Canyon Lake Surface Water	5A. Supplement Canyon Lake with MWD imported water (WR-31) via the San Jacinto River. 5B. Supplement Canyon Lake with MWD imported water (WR-31) via a new Pipeline. 5C. Supplement Canyon Lake with MWD imported water (WR-31) via the San Jacinto River and a new water treatment plant. 5D. Supplement Canyon Lake with MWD imported water (WR-31) via a new pipeline and a new water treatment plant. 5E. Modify operation of Canyon Lake

E.4 | Project Evaluation *(Continued)*

SUPPLY SOURCE		SUPPLY ALTERNATIVE
6	Other Surface Water	6B. Lee Lake Reservoir storage (using surface water rights) for non-potable use 6C. Lee Lake Reservoir storage (using surface water rights) for IPR use
7	MWD Imported Water	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL 7C. Obtain MWD Mills treated water through the Perris Valley Pipeline 7E. Obtain MWD Lakeview treated water through a new pipeline. 7H. Obtain MWD Eagle Valley WTP treated water 7I. Obtain treated imported water from Corona Lester WTP
9	Desalter	9A. Arlington Desalter 9B. Construct an Ocean Desalination Plant at San Onofre (nuclear station)
10	Indirect Potable Reuse	10A. Indirect potable reuse at Regional WRF; surface recharge no AWT 10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
11	Temecula-Pauba Groundwater Basin	11. Temecula-Pauba groundwater
12	Expand Water Conservation	12A. Implement increased water conservation measures 12B. Implement increased water conservation measures; enhanced
13	Water Transfers	13A. Cadiz Project 13B. Bunker Hill Basin conjunctive use project (led by SBVMWD) 13C. Willow Springs water bank
14	Stormwater	14. Stormwater harvesting

'Each project concept was further defined by developing metrics such as average yield, dry year yield, reliability, capital and annual operations and maintenance costs, salinity, implementability, and environmental impacts.'

E.4 | Project Evaluation

Table ES-2 | List of Highest Ranked Supply Projects

ALTERNATIVES INVESTIGATED	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability (DYY/AYY Ratio)	Capital Cost
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	5.56	6,223	6,223	1.0	$30,634,000
2A-2. Pump Bedford groundwater via the TVP; no treatment	1.37	1,300	1,045	0.8	$6,599,000
3D. Palomar Well replacement	0.50	560	560	1.0	$3,120,000
4A. Extract groundwater from Warm Springs Basin; no treatment	0.89	1,000	1,000	1.0	$6,859,000
10B. Indirect potable reuse at Regional WRF; injection/ extraction with AWT	6.00	5,700	5,415	1.0	$132,082,000
12B. Implement increased water conservation measures; enhanced	0.00	3,100	3,100	1.0	Not Identified

E.4 | Project Evaluation *(Continued)*

Table ES-2 | List of Highest Ranked Supply Projects *(Continued)*

ALTERNATIVES INVESTIGATED	Annual O&M Cost	Unit Cost	TDS (mg/L)	Implementability	Environmental Impacts
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	$3,547,000	$847	400	2.5	3.0
2A-2. Pump Bedford groundwater via the TVP; no treatment	$345,000	$542	800	4.0	4.0
3D. Palomar Well replacement	$106,000	$496	400	4.0	4.0
4A. Extract groundwater from Warm Springs Basin; no treatment	$428,000	$794	1,000	3.0	3.0
10B. Indirect potable reuse at Regional WRF; injection/ extraction with AWT	$5,707,000	$2,515	100	2.0	2.0
12B. Implement increased water conservation measures; enhanced	$1,240,000	$400	450	4.0	4.0

E.5 | Scenario Evaluation

Seven scenarios were used to evaluate various water supply portfolios. The intent of this exercise was to test the performance of different project combinations relative to the highest ranked projects listed in Table ES-2. The combination of the highest ranked projects is referred to as Scenario 6 in this report. Scenario 7 represents a modified or a hybrid version of Scenario 6 and includes additional local supply projects (listed on Table ES-1). Each scenario generates sufficient yield to satisfy the long term water supply deficit of 16,114 AFY. The performance of each scenario is assessed based on the following metrics:

- *Salinity expressed in terms of total dissolved solids in mg/L*

- *Unit cost of water*

- *Reliability under historical hydrologic conditions*

- *Projected cumulative supply deficit historical hydrologic conditions*

The performance metrics associated with each scenario are presented in Table ES-4. The values presented in Table ES-4 were obtained by running EVMWD's Water Resources Decision Support System model. Figure ES-6 summarizes the water supply mix associated with each scenario. It can be observed that Scenario 7 (Hybrid) has the lowest percentage (37%) of imported water in its supply mix, while Scenario 1 has the highest (70%) imported water supply percentage.

E.6 | Recommended Water Supply Portfolio and Project Implementation

Given the results of the scenario evaluation, Scenario 7 (Hybrid) represents the water supply portfolio (Table ES-5) recommended for implementation. Scenario 7 has the highest reliability relative to other scenarios, satisfying the highest priority set forth by EVMWD's Board of Directors. This scenario also optimizes the use of EVMWD's local water supply assets, has a reasonable unit cost relative to the current and forecasted costs for imported water, and has one of the lowest TDS values, which is a very important factor for EVMWD given the regulatory and financial implications of TDS management in the groundwater basins.

Figure ES-7 provides the phasing for the implementation of the recommended supply portfolio. The recommended phasing for the implementation of the supply projects is flexible to adapt to water supply uncertainties inherent to California.

Table ES-3 | Summary Of Supply Scenarios

Scenario 1. Status Quo (or Baseline Scenario)	3D. Palomar Well replacement
	5E. Modify operation of Canyon Lake
	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL
	12B. Implement increased water conservation measures; enhanced
Scenario 2. Other Imported Water	3D. Palomar Well Replacement
	5E. Modify operation of Canyon Lake
	9B. Construct an Ocean Desalination Plant at San Onofre (nuclear station)
	12B. Implement increased water conservation measures; enhanced
Scenario 3. Maximize Local Resources	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	3E-2. McVicker and Leach Canyon stormwater/Imported water recharge
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	6B. Lee Lake Reservoir storage (using surface water rights) for non-potable use
	12A. Implement increased water conservation measures
	11. Temecula-Pauba Groundwater
Scenario 4. Minimize Salinity (TDS)	10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
	3D. Palomar Well Replacement
	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL
	12A. Implement increased water conservation measures

Continued on next page

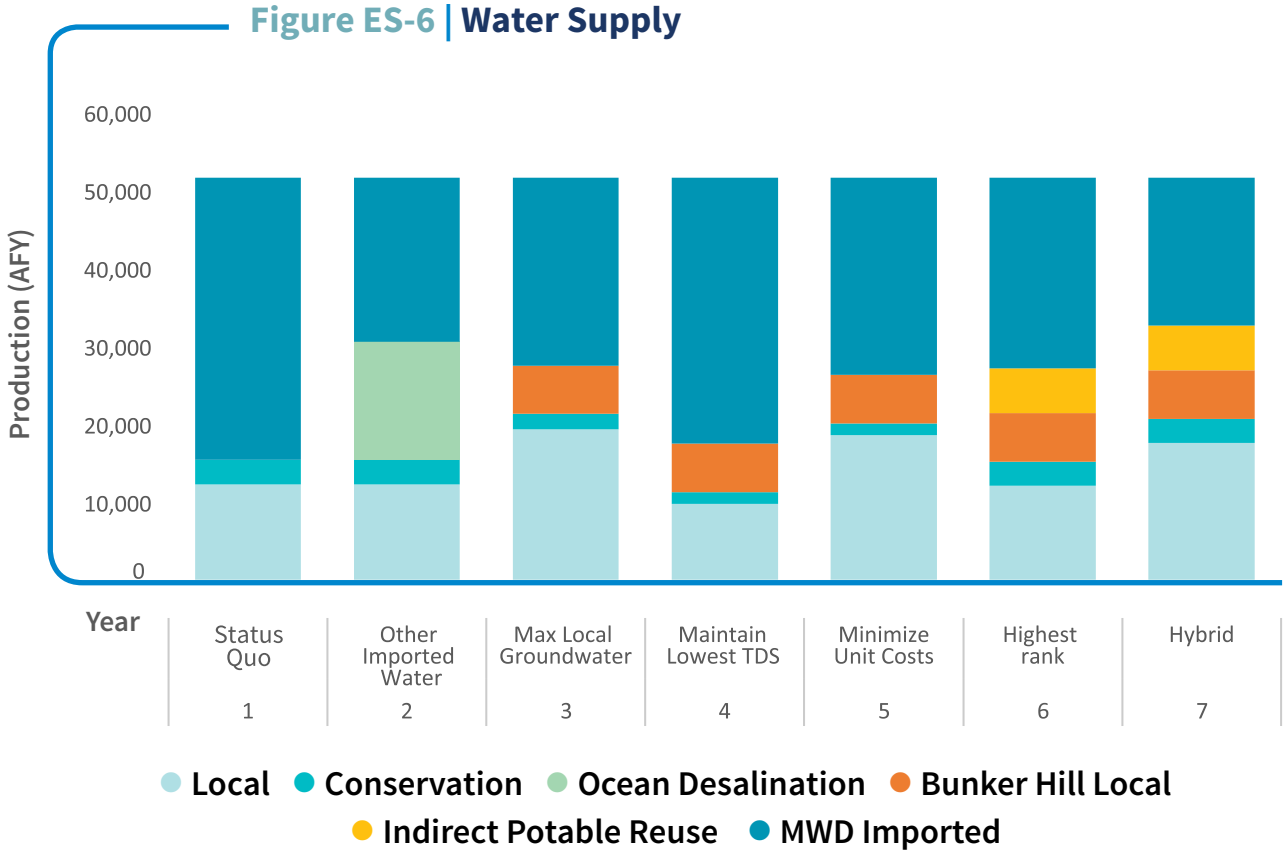
E.6 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

Tables ES-3 | List Of Highest Ranked Supply Projects *(Continued)*

Scenario 5. Minimize Unit costs	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well Replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	11. Temecula-Pauba groundwater
	12B. Implement increased water conservation measures; enhanced
Scenario 6. Highest Rank	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well Replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
	12B. Implement increased water conservation measures; enhanced
Scenario 7. Hybrid	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
	11. Temecula-Pauba groundwater
	12B. Implement increased water conservation measures; enhanced

E.6 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

Figure ES-6 | Water Supply



Tables ES-4 | Summary Of Performance Metrics

	1. Status Quo	2. Other Imported Water	3. Maximum Local Groundwater	4. Maintain Lowest TDS	5. Minimize Unit Costs	6. Highest Rank	7.Hybrid
TDS (ppm)	518	524	508	478	546	500	506
Cost ($/AF)	$912	$3,616	$768	$950	$630	$1,265	$1,110
Reliability	0.95-0.99	0.97-1	0.98-1	0.98-1	0.99-1	0.99-1	1
Deficit (AFY)	44,798	22,788	16,982	21,123	12,424	5,389	710

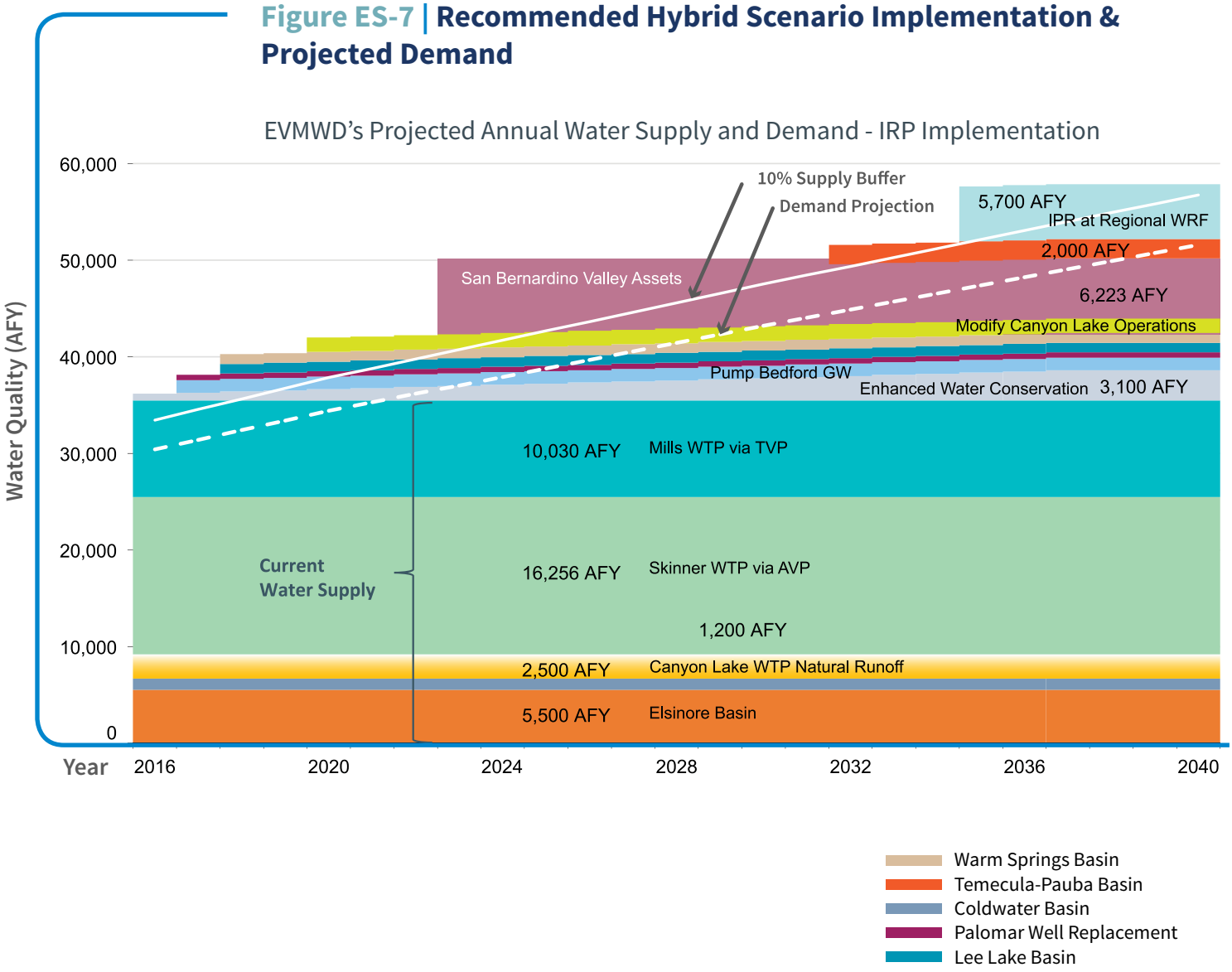
E.6 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

Table ES-5 | Summary Of The Recommended Portfolio

Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	5.56	6,223	6,223	1.00	30.6	3,547,000	847	400
2A-1. Pump Lee Lake Basin groundwater via the TVP; no salt removal treatment	0.89	1,000	500	0.50	11.3	227,000	593	800
2A-2. Pump Bedford Groundwater via the TVP; no salt removal treatment	1.37	1,300	1,045	0.80	6.6	345,000	542	800
3D. Palomar Well replacement	0.50	560	560	1.00	3.1	106,000	496	400
4A. Extract groundwater from Warm Springs Basin; no salt removal treatment	0.89	1,000	1,000	1.00	6.9	428,000	794	1,000
5E. Modify operation of Canyon Lake	2.5	1,500	1,125	0.75	5.9	502,000	589	800
10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT	6.00	5,700	5,415	0.95	132.1	5,707,000	2,515	100
11. Temecula-Pauba groundwater	1.79	2,000	2,000	1.00	7.8	328,000	375	725
12B. Implement increased water conservation measures; enhanced	0.00	3,100	3,100	1.00	-	1,240,000	400	450
Total	**24**	**22,383**	**20,968**	**0.93**	**203.5**	**12,778,000**	**1,110**	**506**

E.6 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

Figure ES-7 | Recommended Hybrid Scenario Implementation & Projected Demand



E.7 | Adaptive Management

In order to address uncertainty, EVMWD will implement a multi-faceted approach to ensure that its water resources strategy can adapt to changing conditions and that long-range resource management policies are in place to optimize water supply and storage assets in times of both shortage and surplus.

1. **Core Resource Strategy:** *Implement a preferred water supply portfolio to meet future water demands. Includes a 10 percent water supply buffer as a contingency.*
2. **Adaptive Resource Plan:** *Implement alternative water supply options based on changed conditions and triggers. Utilize EVMWD's DSS water resources model to update changed conditions and reevaluate resource strategies.*

A. CORE RESOURCE STRATEGY

EVMWD will focus on implementing the recommended portfolio to increase long-term water supply reliability by reducing reliance on imported water supplies. This core resource strategy includes a 10 percent supply buffer to meet future uncertainties.

B. ADAPTIVE RESOURCE PLAN

EVMWD's adaptive management strategy will focus on the following areas:

- ***Long-term groundwater storage in the Elsinore Basin***
- ***Drought management and response***
- ***Continued water conservation***
- ***Acquiring strategic water assets***

i. ***Long-term groundwater storage in the Elsinore Basin:***

Since 2010, EVMWD has stored approximately 8,000 acre-feet of imported water during wet periods and extracted the same amount during dry periods. Given the success of this program and the large storage potential in the Elsinore Basin, long-term groundwater storage will be a key component of EVMWD's adaptive management strategy. EVMWD may utilize a combination of imported water supplies and local Canyon Lake surface water for the purposes of groundwater storage. EVMWD may also choose to expand the existing conjunctive use program with MWD or explore participation in regional dry-year yield programs with the intent of storing water in the Elsinore Basin.

For planning purposes, a 10-year hydrologic cycle in California is comprised of three wet years, four normal years, and three dry years. A 10-year storage program would consider recharging a total of 10,000 AF (2,000 AF each wet year, and 1,000 AF each dry year).

E.7 | Adaptive Management *(Continued)*

This volume is based on the fact that during the dry years EVMWD will experience a water shortage condition of about 10% of current water consumption. Consequently, extraction of stored water will be implemented during each of the three dry years at a rate of 3,000 AFY.

ii. ***Drought management and response:***

In 2015, EVMWD updated its existing Water Shortage Contingency Plan (WSCP) to make it consistent with that of regional water suppliers. The WSCP establishes triggers for the implementation of demand reduction measures based on regional water shortages. The WSCP also empowers EVMWD to implement surcharges and penalties to promote conservation and penalize water waste during regional shortages.

iii. ***Continued water conservation:***

The success of EVMWD's water conservation program is demonstrated by the overall reduction in per capita water use since 2007. EVMWD will continue to enhance its on-going conservation program by continuing its robust outreach, partnering with developers to promote water efficiency, and incentivizing water conservation as approved by EVMWD's Board of Directors.

iv. ***Acquiring strategic water assets:***

On a pro-active basis, EVMWD will review on-going and proposed regional and statewide water programs. As part of this effort, EVMWD will work closely with WMWD and may participate in groundwater banking programs outside its service area, purchase permanent water rights on the open market, participate in regional desalination programs etc.

While the effects of climate change cannot be precisely determined, EVMWD's core resource strategy, with an adaptive framework, will assist EVMWD in meeting the long-term water demands within its service area.

E.8 | Conclusions

The recommended portfolio shown on Table ES-5 represents the most cost-effective option. It meets the forecasted long-term supply deficit and provides the highest reliability and exceptional water quality to EVMWD's customers. EVMWD's goal of maximizing its local water supply assets to offset the gap between supply and demand is a fiscally and environmentally responsible approach. Investments in innovative projects such as Indirect Potable Reuse and conjunctive use will enable EVMWD to mitigate the affects of climate change.

While the factors that influence water resource management in Southern California will continue to change the water supply strategy set-forth in this IRP will ensure that EVMWD is able to successfully meet its mission of providing reliable, cost-effective, high quality water and wastewater services within its service area.

Bibliographical References

MWH. (2011). Elsinore Valley Municipal Water District - Urban Water Management Plan.

MWH. (2015). Draft Report: Elsinore Valley Municipal Water District - 2015 Water System Master Plan.

1. INTRODUCTION

1.1 | Introduction

The Elsinore Valley Municipal Water District (EVMWD) has been at the forefront of water resources planning for several decades. In the early 1980s, EVMWD began receiving imported water deliveries from the Colorado River Aqueduct via the Auld Valley Pipeline. In 1997, EVMWD developed a Water Resources Development Plan (WRDP) that identified opportunities to increase water supplies to meet the growing needs in the Elsinore Valley. Findings from the WRDP and other studies resulted in projects that increased imported water deliveries from the State Water Project via the Temescal Valley Pipeline in the early 2000s. Faced with increasing development activity in the Elsinore Valley in 2007, EVMWD prepared a Water Resources Management Plan to evaluate alternatives to reduce EVMWD's reliance on imported water supplies. While these planning efforts laid the foundation for economic growth within EVMWD's service area, several external factors continue to affect the water supplies in the Elsinore Valley.

The current drought in California and environmental factors in the San Joaquin Delta have significantly impacted water supplies in California. Statewide conservation efforts continue to affect GPCD and XXXX demand projections. These changing conditions reinforce the need for a long-term plan. To address the complexity of developing, maintaining, and delivering reliable water supplies to its customers, EVMWD embarked on the 2015 Integrated Resources.

1.2 | Need for an Integrated Resources Plan

California is in the fifth year of a significant drought resulting in severe impacts to California's water supplies. On April 1, 2015, Governor Brown signed Executive Order B-29-15, to impose restrictions on water use in order to achieve a 25% reduction statewide in potable urban water use. The implementation of this Executive Order, a first in California's history, underscores the gravity of the current water crisis in California.

The current population within EVMWD's service area is approximately 37% of build out conditions and significant growth is expected to occur during the next 25 years. This growth is expected to place significant strain on EVMWD's water resources. EVMWD, like many other water agencies in the region, relies heavily on imported water. Consequently, the uncertainty associated with reliable imported water supplies due to climate change and the increasing cost of imported water are areas of concern for EVMWD. In light of these issues, EVMWD, which serves one of the fastest-growing regions in Riverside County, embarked upon the development of its first Integrated Resources Plan (IRP) – a long-term strategy for providing reliable water supplies to its growing customer base.

1.2 | Need for an Integrated Resources Plan *(Continued)*

Integrated resource planning is used by many water agencies in the United States to evaluate their current and future water supply conditions in a holistic manner in order to make optimal prudent policy decisions and optimize operations. An IRP can be summarized as a collaborative and comprehensive planning approach that incorporates least-cost analysis under a participatory decision making process (American Water Resources Association, 2001; Boonin, 2011; Palmer & Lundberg, 2003). An IRP identifies and considers supply and demand management alternatives and includes analyses of economic, societal, scientific, and environmental concerns that balance the needs and objectives of competing resource users. Integrated resource planning also attempts to identify and manage risk and uncertainty (Gastélum, Cullom, Rossi, & Mahmoud, 2013).

The IRP process analyzes different water supply alternatives aimed at meeting the overarching objectives. Stakeholder participation and feedback ensures that multiple perspectives are considered in the development of this IRP. The IRP will identify and define water resources strategies that will assist in actualizing the core mission of EVMWD: "To provide reliable, cost effective, high quality water and wastewater services that are dedicated to the people we serve."

1.3 | Objectives of the IRP

The programs and projects identified in the IRP are based on the following objectives:

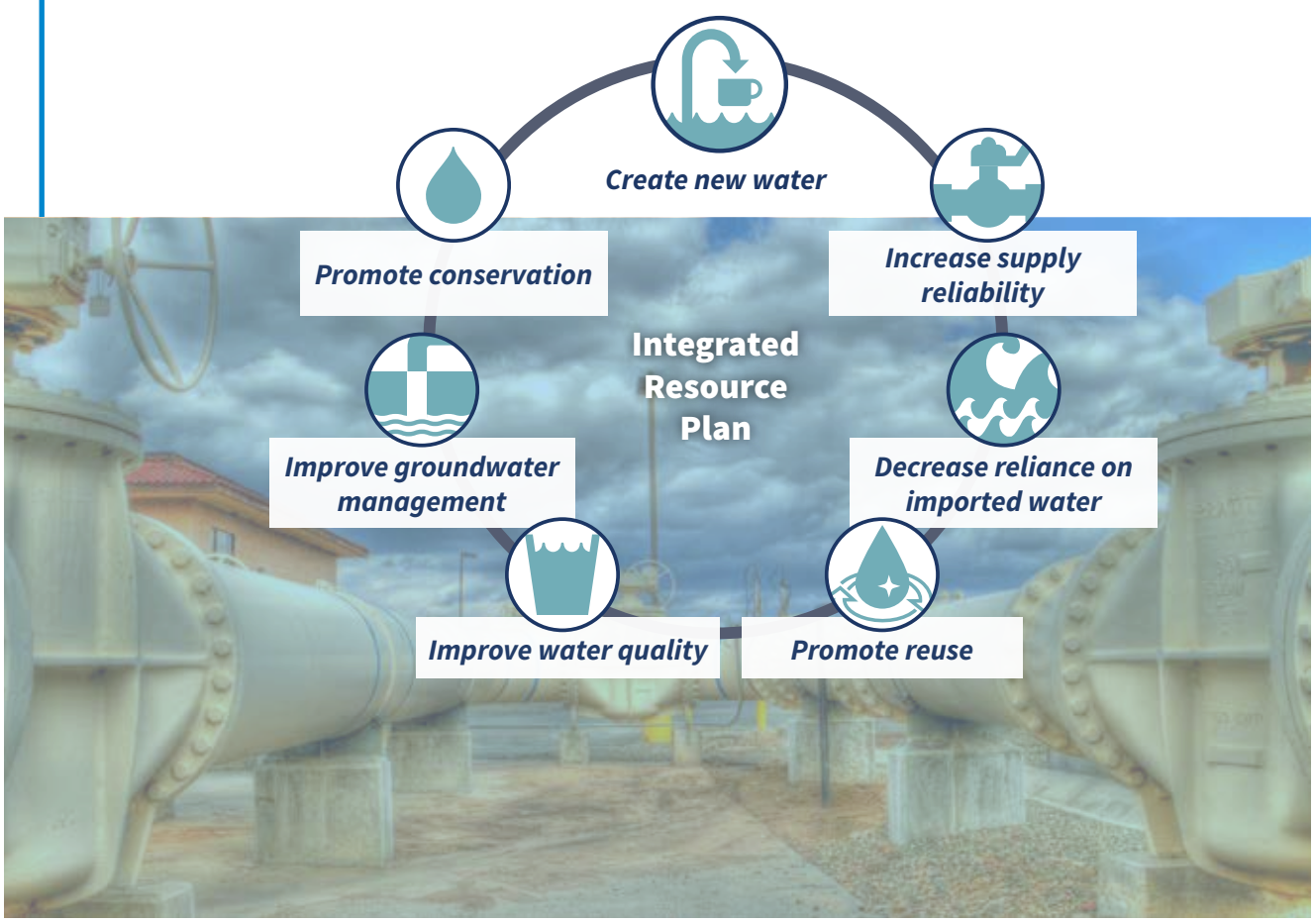
- ***Create new water***
- ***Increase supply reliability***
- ***Decrease reliance on imported water***
- ***Promote reuse***
- ***Improve water quality***
- ***Improve groundwater management***
- ***Promote water conservation***

Each objective contributes to improved water supply reliability for the Elsinore Valley by ensuring that adequate supplies are available to meet current and future demands. These objectives are shown on Figure 1-1. The ultimate outcome of the IRP process will be to identify the most optimal and cost-effective supply portfolio that guarantees a reliable water supply to satisfy future water demand.

1.4 | Organization of the IRP

Section 2 of the IRP describes the population and land use projections, and the corresponding water demand forecast. Section 3 describes available water supplies: including details on the source type and quantities. Section 4 describes the underlying processes and criteria used in the development of the IRP. Section 5 describes the evaluation of the different alternatives and the selection of projects. Section 2 describes the population and land use projections, and the estimation of future water demand. The estimation of this water demand is the key component, which serves as basis to identify the needs of future water supply. Section 3 describes the past and current water supplies. Section 4 describes the process and methodology used in the implementation of IRP. Section 5 describes the evaluation of the different alternatives and the evaluation process uses to estimate the IPR's preferred water supply portfolio for the next 25 years, including a programmatic cost estimate and a implementation plan. Section 6 describes the adaptive framework of the IRP to respond to uncertainty and changing conditions. Section 6 describes the adaptive framework of the IRP to respond to uncertainty and changing conditions.

Figure 1-1 | IRP Objectives



1.5 | Other planning efforts and challenging conditions

EVMWD has been very proactive in water resources planning and management. These planning efforts, as depicted in Table 1-1, have different goals and were developed in response to different catalysts such as regulatory changes, infrastructure needs, operational changes, etc. A number of related, compatible planning efforts are briefly described below.

1.5.1 GROUNDWATER MANAGEMENT PLANS

In 2005, EVMWD adopted a Groundwater Management Plan (GWMP) for the Elsinore Basin. The GWMP identified conjunctive use as an important element of basin management. Consistent with the GWMP, Western Municipal Water District (EVMWD's water wholesaler), EVMWD, and the Metropolitan Water District of Southern California (Metropolitan) entered into construction and funding agreements to store up to 12,000 AF in the Elsinore Groundwater Basin. The conjunctive use project has been successfully implemented and operational since pilot testing was completed in 2007.

1.5.2 WATER RESOURCES MANAGEMENT PLANS

In 1997, EVMWD developed a Water Resources Development Plan (WRDP) that identified opportunities to increase water supplies to meet the growing needs in the Elsinore Valley. Findings from the WRDP and other studies resulted in projects that enabled imported water deliveries from the State Water Project via the Temescal Valley Pipeline in the early 2000s. Faced with increasing development activity in the Elsinore Valley, in 2007 EVMWD developed the Water Resources Management Plan to investigate alternatives for reducing EVMWD's reliance on imported water supplies.

'Planning Studies' are presented in Table 1-1 *(next page)*

1.5 | Other planning efforts and challenging condition

Tables 1-1 | Long-Range Planning Studies

Plan	Author	Year	Outline	Purpose
Groundwater Management Plan	MWH	2005	• Hydrologic setting • Groundwater model • Baseline conditions • Management issues & strategies • Description of alternatives	Evaluation of groundwater basin and developing a reliable groundwater supply to meet drought and dry season demands through 2020
Water Resources Management Plan	MWH	1997/2007	• Service area and water demands • Water supply sources • Water supply scenarios	To develop reliable and cost-effective water supply options and a priority schedule for recommended improvements required to implement the preferred water supply strategy through 2030
Water Distribution System Master Plan	MWH	2008/2015	• Study area and land use • Water production and demand • Existing water system • Model development and calibration • Planning and evaluation criteria • Existing system evaluation • Future system evaluation • Capital improvement program	Evaluation of the District's water system under existing and future demand conditions through 2030
Wastewater Master Plan	Carollo MWH	2008/2015	• Study area characteristics • Wastewater flow projections • Existing wastewater • Collection systems • Model creation and calibration • Planning and evaluation criteria • Existing system evaluation • Future system evaluation • Capital improvement program	Propose improvements to mitigate existing system deficiencies and propose expansion projects
Urban Water Management Plan	MWH	2011/2015	• Plan preparation • System description • System demands • System supplies • Water supply reliability and water shortage contingency planning • Demand management measures	To prepare and adopt a UWMP, in accordance with the UWMP Act (Assembly Bill 797), every five years, which defines current and future water use, sources of supply, source reliability, and existing conservation measures

1.5 | Other planning efforts and challenging conditions *(Continued)*

1.5.3 URBAN WATER MANAGEMENT PLAN (UWMP)

EVMWD prepares and adopts an UWMP every five years in accordance with the UWMP Act (Assembly Bill 797). The UWMP demonstrates reliability of service that is sufficient to meet the needs of all classes of customers during normal, dry, and multiple dry years. EVMWD's most recent UWMP was completed and adopted by its Board of Directors in June 2016.

1.5.4 WATER DISTRIBUTION SYSTEM AND WASTEWATER MASTER PLANS

Infrastructure Master Plans are a core component of utility planning by identifying improvements to mitigate existing system deficiencies as well as new infrastructure to serve future customers. EVMWD developed these plans in 2002, 2007, and 2008, which formed the basis for the Capital Improvement Plan implemented in the past decade. An Integrated Facilities Master Plan is being developed to evaluate water, sewer and the recycled system through 2040. The final report is expected to be completed by September 2016.

1.5.5 SALT AND NUTRIENT MANAGEMENT PLANS (SNMP)

The Santa Ana Regional Water Quality Control Board (RWQCB) manages salt and nutrients in the Santa Ana River Basin, in part by regulating the discharge and reuse of recycled water. Total dissolved solids (TDS) and nitrate (as nitrogen [nitrate-N]) concentration limitations for recycled water discharge and reuse are based on the water quality objectives and ambient concentrations of the receiving groundwater management zone(s) (Wildermuth Environmental Inc., 2013). EVMWD is in the process of developing a Salt and Nutrient Management Plan (SNMP) for areas in the Temescal Valley and is conducting salinity planning efforts in the Elsinore Basin to comply with the discharge and reuse of recycled water. These plans will ensure that groundwater quality in EVMWD's service area is protected from degradation.

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2. SERVICE AREA & WATER DEMANDS

2.1 | Overview of Elsinore Valley Municipal Water District

EVMWD is located in Southern California's western portion of Riverside County, which is considered one of the fastest-growing areas in the state. EVMWD provides water and wastewater services to residential, institutional, commercial, and industrial customers in the cities of Lake Elsinore, Canyon Lake, Wildomar, parts of Murrieta and Corona, and unincorporated areas of Riverside County, and Temescal Valley.

EVMWD's service area is divided into two divisions: the Elsinore Division and the Temescal Division. A map of the service area is shown on Figure 2-1. The Elsinore Division makes up the majority of the service area with approximately 48,000 service connections, encompassing an area of 96 square miles. The Temescal Division is located to the northwest of the Elsinore Division. It has 707 connections and covers an area of approximately 2.5 square miles. EVMWD's current water demand is approximately 25,500 AFY, and is expected to nearly double by 2040.

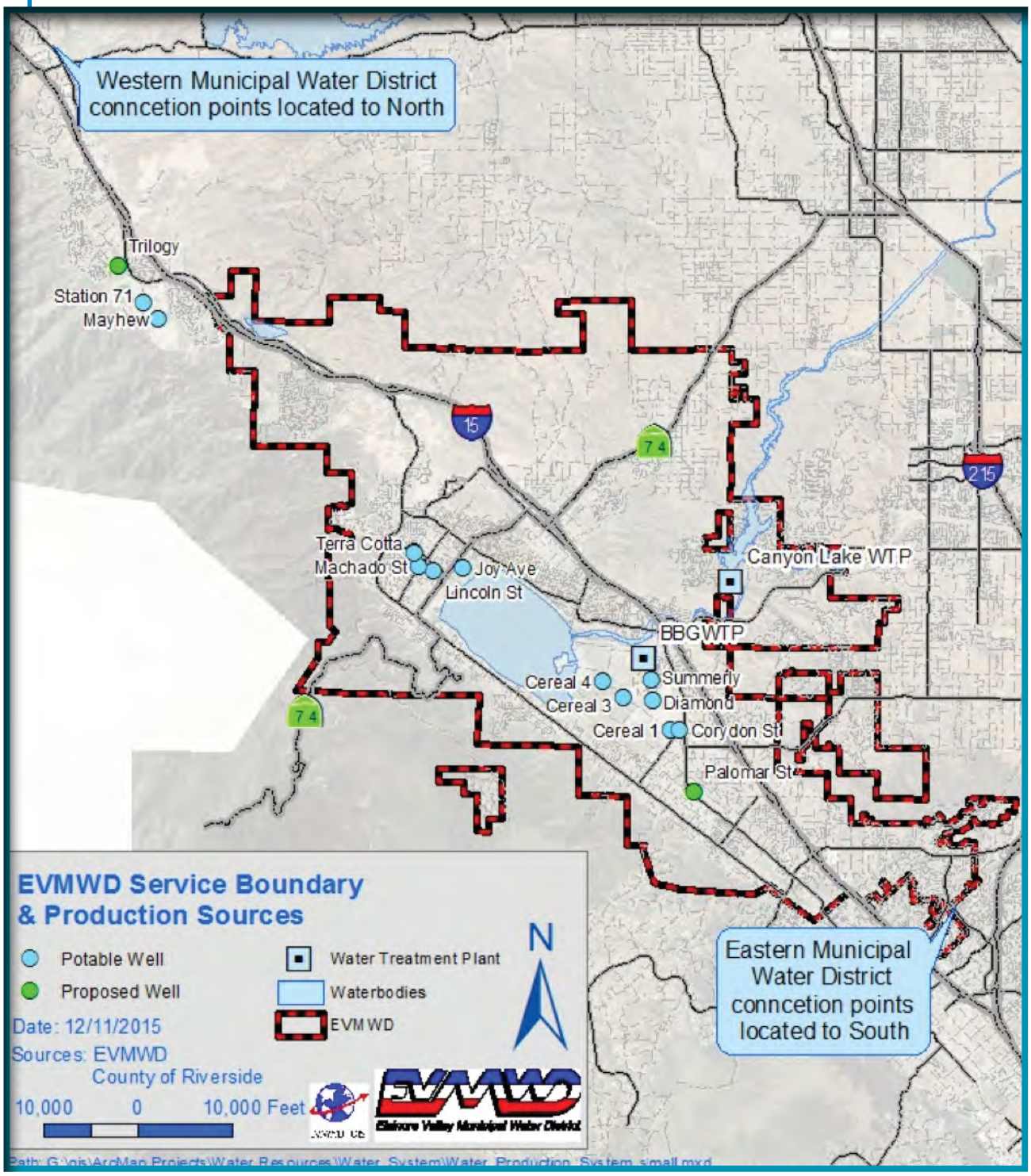
2.2 | Historical Conditions

EVMWD was incorporated on December 23, 1950, under the provisions of the California Municipal Water District Act of 1911. The purposes of the District are to finance, construct, operate, and maintain water and wastewater systems serving properties within the District boundaries. EVMWD was formed to protect local water supplies and importing supplemental water to alleviate shortages. At its inception, the District was found to have too low of an assessed valuation to become a member of the Metropolitan Water District of Southern California (Metropolitan). Consequently, in 1954, EVMWD was annexed to the then newly-formed Western Municipal Water District (Western MWD), a member agency of Metropolitan (MWH, 2005a, 2005b, 2011).

A bond election in 1955 provided $1.6 million in capital funding for transmission, storage, treatment, and limited distribution facilities for the importation and distribution of Metropolitan's imported water within EVMWD. Subsequent negotiations with the Temescal Water Company (TWC) resulted in the Railroad Canyon Storage Agreement in 1955, which provided EVMWD with 3,000 acre-feet of storage in the Railroad Canyon Reservoir. During 1956 and 1957, construction proceeded on the loop feeder system and Improvement District No. 1. Also during this period, several small mutual water companies petitioned EVMWD to acquire and operate their water systems including: Elsinore Valley Mutual, Kilmeny Lot Owner's Mutual, Landowner's Mutual, Grand Avenue Mutual, Lakeview Mutual, and Clayton Mutual water companies. The first delivery of imported water started on April 8, 1957 (MWH, 2005a).

2.2 | Historical Conditions *(Continued)*

Figure 2-1 | EVMWD Service Boundary



2.2 | Historical Conditions *(Continued)*

In July 1962, Improvement District No. 2 encompassing the Meadowbrook area was formed, which increased the EVMWD service area by one-third. Services were extended to the El Cariso area by the formation of Improvement Districts 3A and 4, and to the Eucalyptus Grove area by the formation of Assessment District 65-1 under the Improvement Act of 1911. During 1967-1968, Improvement District U-1 serving the Rancho Capistrano area was formed. The formation of Improvement District U-2 during 1967-1968, serving the Canyon Lake Development, was the first step to provide sewer service within the EVMWD serice area. In 1969, the assets of South Elsinore Mutual Water Company were purchased for cash and the services in that area were consolidated within EVMWD's operations. The acquisition of the TWC in 1989 increased the service area of EVMWD to include the Temescal Valley. This portion of the District's service area is designated as the Temescal Division, while the remainder of the service area is the Elsinore Division.

As a special district, EVMWD has the authority to act in its own name in order to make and enter into contracts; to incur debts, liabilities, or obligations; to issue bonds, notes, warrants, and other evidences of indebtedness. EVMWD has the authority to collect revenues in the form of rates and charges for facilities and services provided. EVMWD also has the power to levy ad valorem taxes, and acquire property and rights-of-way by eminent domain procedures.

2.3 | Climate

The Elsinore Valley region enjoys a mild Mediterranean climate with warm, dry days and cool evenings. Located near the Pacific Ocean, the warm summer temperatures are often cooled by afternoon ocean breezes blowing into the valley through gaps in the Santa Ana Mountains. The yearly average rainfall is approximately 12 inches, (MWH, 2005a).

The climate in Elsinore Valley is semi-arid, with warm, dry summers and mild winters. Although there is one distinct climate, there are many micro-climates within the District. Areas to the west receive cooler summers due to onshore breezes, where upland areas have colder winters due to the surrounding low areas and higher elevations. Summer temperatures can exceed 100 degrees Fahrenheit. Winters temperatures average around 66 degrees Fahrenheit, but rarely drop below 25 degrees Fahrenheit. Annual precipitation averages 8-12 inches. The average growing season ranges from 250 to 300 days along the river bottom and valley areas, to less than 250 days in the upland areas. Table 2-1 presents a summary of monthly temperature and precipitation variations based on 114 years of record for Lake Elsinore.

2.3 | Climate *(Continued)*

Table 2-1 | Historical Climate – Lake Elsinore (1900-2014)

Month	Temperature - °F				Precipitation - in		
	Min*	Everyday Avg Min	Max*	Everyday Avg Max	Min	Max	Average
January	26	36.5	79.5	65.5	0	14.83	2.501
February	29	39.0	81.7	67.5	0	11.93	2.509
March	32	41.5	86.1	70.9	0	9.83	1.981
April	35	44.9	92.4	76.0	0	6.30	0.717
May	40	50.0	97.8	81.8	0	2.33	0.221
June	46	54.4	104.5	90.5	0	0.40	0.020
July	51	59.8	107.9	98.1	0	2.50	0.086
August	51	60.0	108.1	98.1	0	3.13	0.122
September	47	56.1	105.5	93.4	0	4.26	0.245
October	40	49.1	98.3	83.8	0	7.66	0.490
November	31	41.4	88.4	74.2	0	7.33	0.948
December	27	36.8	80.2	66.9	0	13.21	2.087
Annual	-	-	-	-	**1.74**	**37.97**	**11.93**

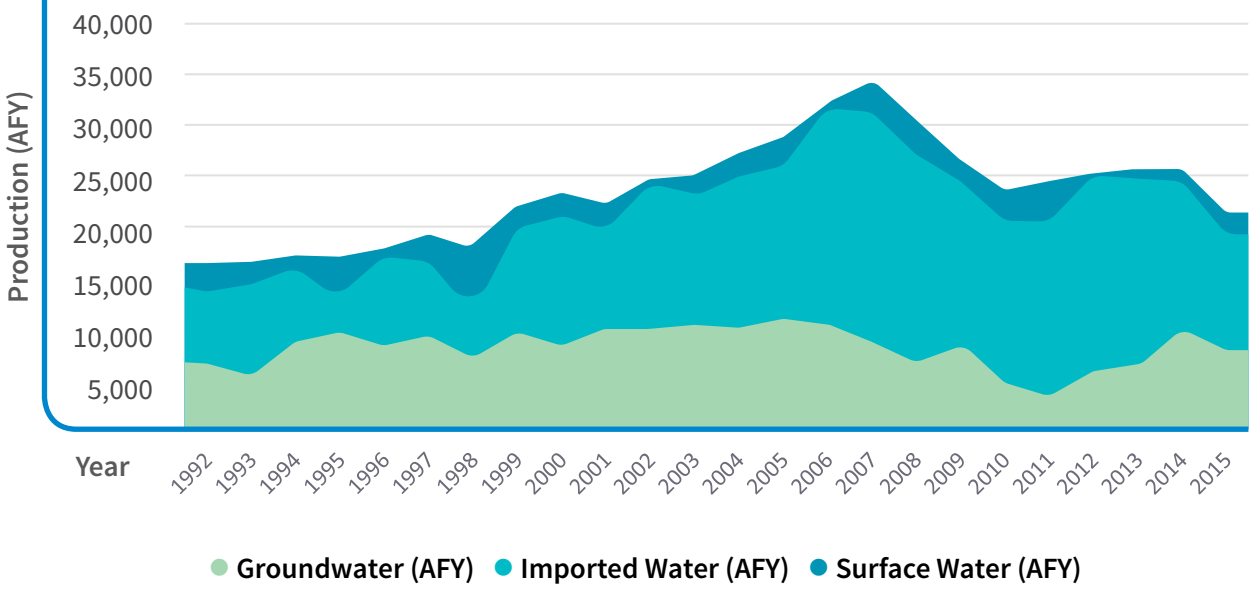
* The absolute Min or Max temperature that occurred that month averaged together for different years.

Reference: NOAA National Climatic Data Center: Station 42805 - Elsinore, 1900 - 2014

2.4 | Historical water use

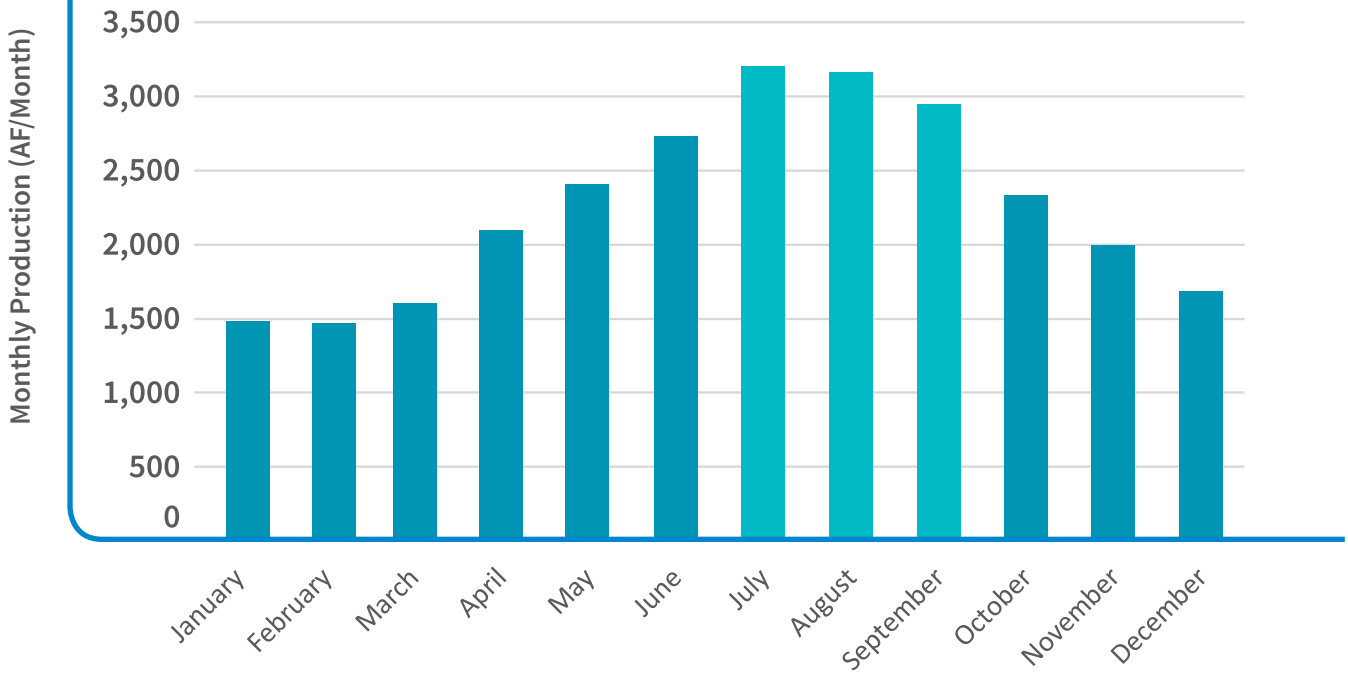
EVMWD has three primary sources of water supply: local groundwater, surface water, and imported water. Figure 2-2 shows a graphical representation of the historical water production over the past 20 years. The average annual water production from 2005-2015 was approximately 27,700 acre-feet per year (AFY) with the highest production occurring in 2007 (33,800 AFY) and the lowest production in 2011 (23,700 AFY). The maximum month production (MMP) peaking factors range from 1.38 to 1.57, which are typical values for water systems of this size in desert regions of Southern California. The 2009-2015 average annual water production value (25,454 AFY) will be used as the current baseline water production value. Figure 2-3 presents the monthly average of water production from 2005 to 2015 (MWH, 2015).

Figure 2-2 | EVMWD Historical Water Production



2.4 | Historical water use *(Continued)*

Figure 2-3 | Historical Average Monthly Production (2005-2015)



'The 2009-2015 average annual water production value (25,454 AFY) will be used as the current baseline water production value. '

2.5 | Population and Employment Projections for EVMWD's Service Area

Population and employment forecasts developed by Riverside County Center for Demographic Research (RCCDR) form the basis of the projections developed for EVMWD's service area. The 2010 RCCDR population and employment forecasts for Lake Elsinore, Wildomar, Murrieta, Canyon Lake, and unincorporated Riverside County are available in five-year increments through the 2040 planning horizon. The percent increase in each five-year increment for each city forecast is applied to the portion of population that falls within the EVMWD service. Table 2-2 and Figure 2-4 show the population projections broken down into cities and unincorporated areas of the EVMWD service area. The employment projections (Table 2-2)only include the percentage of the employment within EVMWD's service area. These percentages were assumed to be the same as the percent of population in each city within EVMWD's service area.

Table 2-2 | Population Projections For Cities & Unincorporated Areas Within EVMWD Service Area

Year	City of Lake Elsinore	City of Wildomar	City of Murrieta	City of Canyon Lake	Unincorporated Riverside County	Total within EVMWD Service Boundary (1)
2010	52,400	30,300	17,000	9,300	24,400	**133,400**
2015	61,400	34,600	17,600	9,500	26,500	**149,600**
2020	70,300	39,400	18,300	9,700	31,800	**169,500**
2025	78,500	42,800	18,900	9,900	37,700	**187,800**
2030	86,200	46,200	19,600	10,100	43,000	**205,100**
2035	93,100	50,100	20,200	10,300	47,400	**221,100**

(1) Population does not include the Temescal Division service area. The population for Temescal Division, based on 2010 Census data, is approximately 2,700, and is not expected to change.

2.5 | Population and Employment Projections for EVMWD's Service Area *(Continued)*

Figure 2-4 | Population Projections For Cities & Unincorporated Areas Within EVMWD Service Area

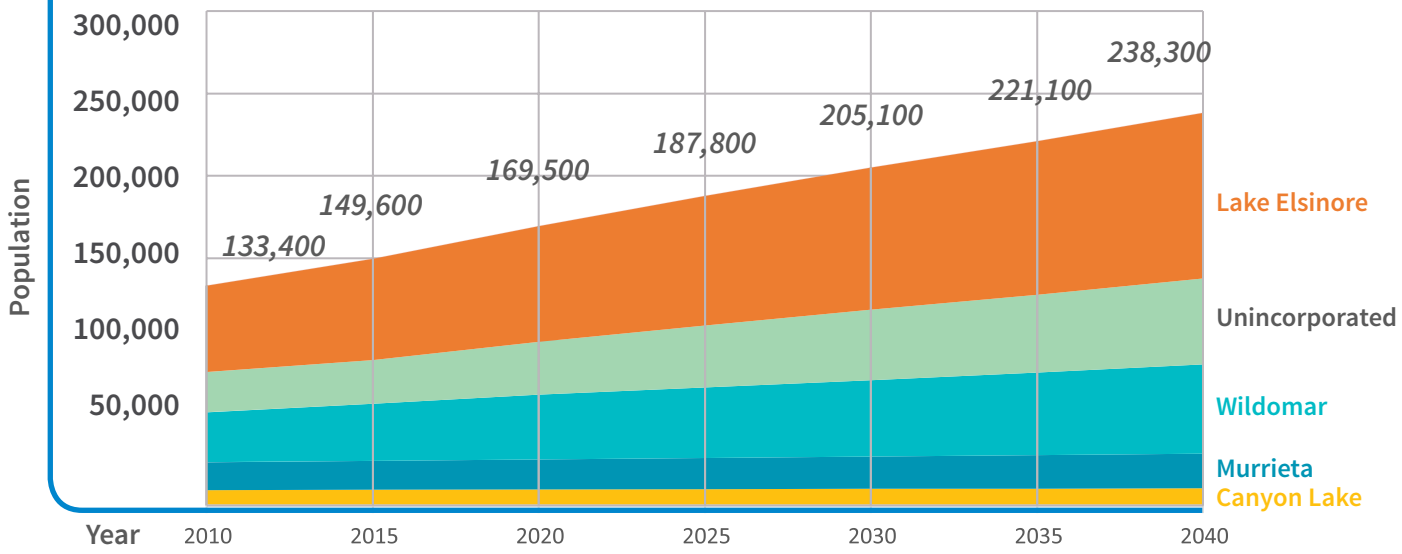


Table 2-3 | Employment Projections For Cities Within The EVMWD Service Area

Year	City of Lake Elsinore	City of Wildomar	City of Murrieta	City of Canyon Lake	Total within EVMWD Service Boundary (1)
2010	10,700	3,300	3,500	800	**18,300**
2015	12,500	4,200	5,600	900	**23,200**
2020	14,800	5,400	8,400	1,100	**29,700**
2025	16,800	6,600	10,700	1,100	**29,700**
2030	18,700	7,800	13,100	1,200	**40,800**
2035	20,700	9,000	15,500	1,200	**46,400**

(1) Employment forecasts for the Temescal Division and unincorporated areas.

2.6 | Future water demands

Three different methodologies were evaluated to estimate demands for the next 25 years and at build-out for EVMWD's service area. Method 1 and Method 2 forecast water demands based on population projections. Method 3 forecasts water demands based on the number of equivalent dwelling units (EDUs).

Method 1 estimates that the existing per capita water use is approximately 167 gallons per person per day (gpcd). This per capita water use estimate is multiplied by the population projections to estimate water demand. This method assumes that the per capita water use remains the same throughout the planning horizon (year 2040). Method 2 establishes per capita water use for both residential customers and commercial, industrial, and institutional customers (CII). The per capita water use is multiplied by the population and employment forecasts developed by the RCCDR to generate future water demands. The total water demand is calculated as the sum of the residential and CII demands. This method also assumes that the per capita water use remains the same throughout the planning horizon (year 2040).

Method 3 (will-serve projections) is an alternative way to project demand, which is to create a relationship between equivalent dwelling units (EDUs) and the anticipated demand per EDU. EDUs are representative of the number of people per housing unit. However, EDUs also apply to commercial developments to anticipate demand. For example, a new commercial business could represent multiple EDUs depending on the projected demand for that business. It is anticipated that each EDU has a demand of approximately 500 gallons per day (gpd) per EDU. By estimating the number of EDUs for the planning horizon based on specific plan and general plan land use data, a total water demand can be calculated. Additional information regarding each of these methods can be found in EVMWD's Facilities Master Plans (MWH 2015).

2.6.1 METHOD 1

As shown in Table 2-4, Method 1 estimates that the existing per capita water use is approximately 167 gallons per capita per day (gpcd). The population for each year is calculated using the DWR methodology 2, which calculates a factor between the most recent census population and the number of connections. This factor is then multiplied by the known number of connections for each year to estimate the population for each year. In 2010, the census population was 133,400 and the number of connections was 38,243. Therefore, there were 3.49 people per connection. This factor is multiplied by the number of connections for each year to estimate the population. The calculated per capita demand for the five-year average from 2003- 2007 reported in the 2010 UWMP was 253 gpcd. The current five-year average is 167 gpcd, which is 34% lower than the five-year average from the 2010 UWMP. These reductions are likely due to the District's conservation efforts and lower than expected population growth. Since the population for the 2015 WSMP is larger than the 2010 estimated population, the gpcd is smaller than the 2010 UWMP values.

2.6 | Future water demands *(Continued)*

Table 2-4 | Method 1: Existing Per Capita Water Use For This Service Area

Year	Population (1)	Annual Production (AFY)	Production (MGD)	Per Capita Demand (gallons per capita per day)
2009	132,300	27,815	25	**188**
2010	133,400	25,837	23	**173**
2011	134,100	23,733	21	**158**
2012	141,100	24,742	22	**156**
2013	143,600	25,142	22	**156**
Average Production *(gallons per day)*		**25,454**	**22.7**	**167**

(1) Population is determined using the DWR methodology and 2010 Census data.
Source: Production data provided by EVMWD staff.

2.6.2 METHOD 2

An alternative method to determine the average existing per capita water use is to separate the water use from residential use and CII use. The consumption (billing) data obtained from EVMWD includes the customer classes specifying whether the meter is for residential, commercial, institutional, or hydrant. The data is sorted into a residential class using the residential category and a CII class which includes the categories: commercial, hydrant, and institutional. The percentages of water consumption for 2009-2013 for the residential and the CII classes were calculated to be 75% and 25%, respectively. Table 2-5 presents billing data over the past five years.

2.6 | Future water demands *(Continued)*

Table 2-5 | BIlling Data (AFY: 2009-2013)

Year	CII			Residential	Total	Percent CII	Percent Residential
	Commercial	Hydrant	Institutional				
2009	4,800	66	2,157	19,112	26,138	27%	73%
2010	3,770	73	1,772	16,769	22,386	25%	75%
2011	3,711	94	1,553	17,103	22,464	24%	76%
2012	4,081	214	1,747	18,005	24,050	25%	75%
2013	4,140	289	1,651	18,178	24,261	25%	75%
Total	**20,502**	**736**	**8,880**	**89,166**	**119,299**	**25%**	**75%**

Using these percentages, the residential water demand for 2009-2013 is estimated to be 19,090 AFY. Based on an average population from 2009-2013 of 136,900 people, the residential water demand is 125 gpcd. The CII (employment-based) water demand for 2009-2013 is estimated to be 6,364 AFY. Using the RCCDR employment of 18,300 in 2010, the water demand per employee is 310 gallons per employee per day (GPED).

The residential and employment-based demand projections range between 42,800 and 47,400 AFY by year 2035 as depicted in Table 2-6. Method 2 forecasts a higher water demand than Method 1 because the employment growth rate is greater than the population growth rate. Since the GPED is greater than the GPCD, the projected demand will increase at a quicker rate for Method 2 than Method 1.

Table 2-6 | Residential & Employment Based Demand Projection

Year	Projections		Method 1	Method 2		
	Population (3)	Employee	Total Demand (AFY)	Residential Based Demand (AFY) (1)	CII Employment-Based) Demand (AFY) (2)	Total Demand (AFY)
2010	136,100	18,300	25,500	19,100	6,400	**25,500**
2015	152,800	23,200	29,200	21,300	8,100	**29,400**
2020	172,600	29,700	32,900	24,100	10,300	**34,400**
2025	191,100	35,200	36,500	26,700	12,200	**38,900**
2030	208,300	40,800	39,700	29,100	14,200	**43,300**
2035	224,300	46,400	42,800	31,300	16,100	**47,400**

(1) Residential-based demand is comprised of the residential demands. The residential factor is 125 gpcd.
(2) Employment-based demand is comprised of the commercial, institutional, and hydrant demands. The CII factor is 310 gpcd.
(3) Population includes Temescal Division population of 2,700.

2.6 | Future water demands *(Continued)*

2.6.3 METHOD 3

Method 3 estimates water demand based on the total known planned development during the period 2015-2040. Any planned development that requests a "Will Serve" letter provides EVMWD information such as number of Equivalent Dwelling Unit (EDUs) and the anticipated water use for the development. A total of 128 developments are planned for construction during the cited planning period.

It is anticipated that each EDU has a demand of approximately 500 gallons per day (gpd) per EDU. This demand per EDU value was determined from the previous water duty factors and has been used by EVMWD in anticipating the demand for future developments. A 500 gpd per EDU can be compared with the data from the past five years by evaluating the typical number of people per household and the residential GPCD. In 2013, the persons per household or EDU for Lake Elsinore was 3.54, according to the 2013 Department of Finance report, and the residential consumption from 2009 to 2013 averaged 125 GPCD as discussed previously in this section. Multiplying the persons per household per EDU by the average GPCD equals 440 gpd per EDU. Therefore, 500 gpd per EDU is a slightly conservative value, but is consistent with the past five years of data.

2.6.4 RESULTS

Based on Table 2-7, Method 2 has more conservative demand projections than the other two methods. By 2035, total annual water demand will be 42,800 AF, 47,400 AF, and 38,800 AF, respectively, for Method 1, 2, and 3. The final build-out demand for EVMWD's service area is estimated to be 84,000 AFY. The results of Table 2-7 are shown in Figure 2-5.

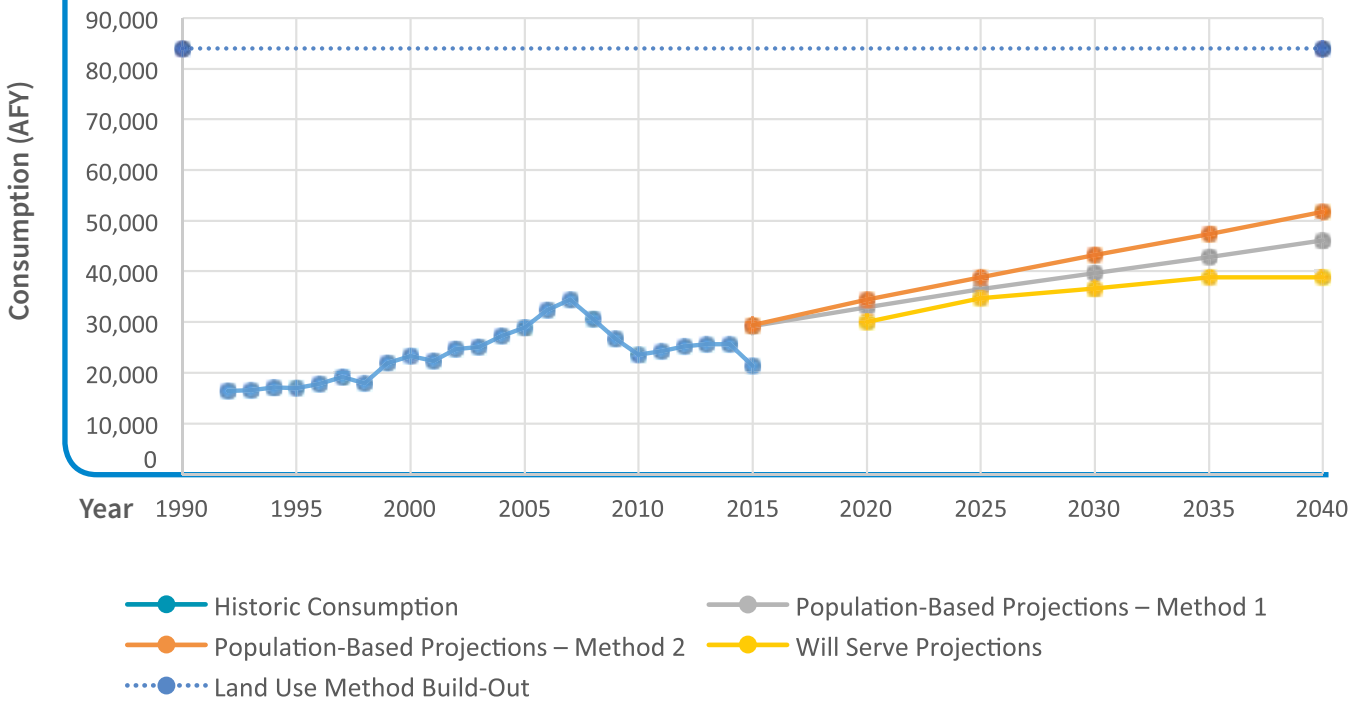
Table 2-7 | Summary Of Demand Projections

Year	Population Based Method		Will Serve (AFY) (1)
	Method 1 (AFY)	Method 2 (AFY)	
2015	29,200	29,400	–
2020	32,900	34,400	30,000
2025	36,500	38,800	34,700
2030	39,700	43,200	36,600
2035	42,800	47,400	38,800
Build-Out (land use)	**84,000**		

(1) The Will Serve column is calculated by adding the will serve demand for each phasing year as shown in Table 3-12 by the existing demand from 2009-2013.

2.6 | Future water demands *(Continued)*

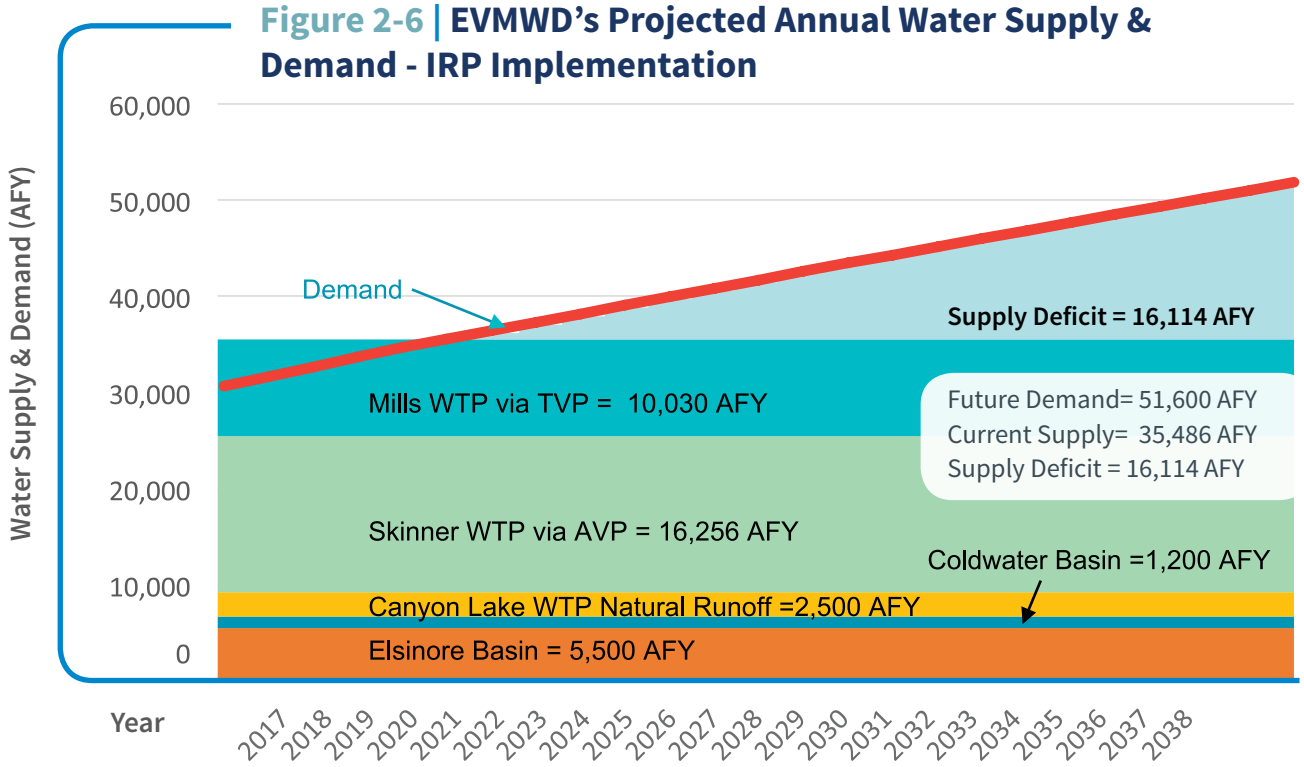
Figure 2-5 | Summary Of Demand Projections



The planning horizon for the IRP covers the 25-year period from 2016 to 2040. Figure 2-6 depicts the projected water demand for the next 25 years. At the end of the planning horizon (2040), the water demand is estimated to be approximately 51,600 AFY. EVMWD's current total water supply is approximately 35,500 AFY. If EVMWD's existing water supply portfolio does not change over time, it is estimated that the total water supply deficit in year 2040 would be approximately 16,100 AFY. This gap between the projected water demand and availability of existing water supplies indicates that the potential water supply deficit would have to be made up by either: (1) imposing mandatory rationing; (2) developing new sources of water supply; and/or (3) implementing new water conservation programs. In subsequent sections, this IRP investigates various alternatives to bridge the gap between EVMWD's future needs and existing supplies.

2.6 | Future water demands *(Continued)*

Figure 2-6 | EVMWD's Projected Annual Water Supply & Demand - IRP Implementation



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3. EXISTING WATER SUPPLY

This section summarizes EVMWD's existing water resources, including groundwater, local surface water, imported water, and recycled water.

EVMWD has three primary sources of water supply: groundwater, surface water, and imported water. Local groundwater is extracted from Elsinore Valley Groundwater Basin (EVGB) and the Coldwater Basin, which accounted for approximately 18% of the water supply from 2011-2015. Local surface water impounded at the Canyon Lake Reservoir is treated at the Canyon Lake Water Treatment Plant (CLWTP) and accounted for approximately 9% of the District's water supply from 2011-2015.

Imported water is purchased from Metropolitan Water District (MWD) through Western Municipal Water District (WMWD), which accounted for approximately 73% of the District's water supply from 2011-2015. Water is imported through the Temescal Valley Pipeline and the Auld Valley Pipeline. EVMWD's historical water production is summarized in Table 3-1.

GROUNDWATER

Groundwater basins in the Elsinore Valley and the Temescal Valley represent major sources of potable groundwater supply for EVMWD.

The Elsinore Basin is located in a graben (a down-dropped geologic block) created by two major fault zones: the Glen Ivy Fault Zone to the northeast and the Wildomar Fault Zone to the southeast. The groundwater basin encompasses approximately 25 mi^2 of valley fill including Lake Elsinore, which covers about 3,600 AF of the basin. The EVGB's natural recharge (safe yield) is composed of precipitation (2,464 AFY), runoff from the San Jacinto watershed (1,336 AFY), landscape infiltration (864 AFY), and septic tank discharges (850 AFY). The total EVGB safe yield is estimated to be around 5,500 AFY. Consistent with the safe yield of the basin, annual groundwater production in the EVGB is approximately 5,500 AFY. There are 10 groundwater wells in the EVGB. (MWH, 2005; Sibbet & Gastelum, 2014)

In 2005, Elsinore Valley Municipal Water District adopted a Groundwater Management Plan (GWMP) for the EVGB. The GWMP identified conjunctive use as an important objective of basin management. Consistent with the GWMP, WMWD (the wholesale agency in the Elsinore area), EVMWD, and MWD entered into construction and funding agreements to store up to 12,000 AF in the Elsinore Groundwater Basin. During any fiscal year (beginning on July 1st and ending on June 30th), Metropolitan may deliver up to 3,000 AF of water for storage in the Elsinore Basin. Eight dual-purpose wells are used to inject these deliveries into the Elsinore Basin. In dry years, when imported water is limited, Metropolitan may extract up to 4,000 AF of water stored in the Elsinore Basin for use in the WMWD service area.

Groundwater *(Continued)*

Since the implementation of the CUP program, a total of 8,109 AF, of imported water has been stored in the EVGB. Given current drought conditions, MWD successfully implemented a call program during the period of March 2014 to January 2016 to extract the previously stored amount.

The Coldwater Basin lies within a graben between the North Glen Ivy and South Glen Ivy faults, which are associated with the right lateral strike-slip-dominated Elsinore Fault Zone (EFZ). The EFZ extends approximately 200 km from Baja California north to the Corona area. The basin covers about 2.6 mi^2 (1,680 AF). Major surface water drainages include Coldwater, Anderson, Bixby, Mayhew, and Brown Canyons, which surround the western and southern boundaries of the groundwater basin. EVMWD produces approximately 700 AFY via two groundwater wells located in the Coldwater Groundwater Basin.

Prior to the transfer of EVMWD's non-potable system to Temescal Valley Water District in 2014, groundwater production in the Bedford and Lee Lake Groundwater Basins was approximately 1,900 AFY. Minor groundwater production occurs in the Warm Springs Groundwater Basin for the purposes of non-potable irrigation. Table 3-2 shows a summary of the Elsinore and Temescal Basins.

'2011-2015 Water Production' is presented in Table 3-1 *(next page)*

Groundwater *(Continued)*

Table 3-1 | EVMWD Water Production (1992-2015)

Year	Groundwater (AFY)	Imported Water (AFY)	Surface Water (AFY)	Total (AFY)
2011	3,045	17,448	3,697	**24,190**
2012	5,709	19,353	178	**25,240**
2013	6,232	18,479	932	**25,642**
2014	5,627	18,883	1,167	**25,677**
2015	4,051	15,318	1,964	**21,334**
Average	***4,933***	***17,896***	***1,588***	***24,417***
Percent of Total Water Production	**33%**	**57%**	**10%**	

Source: EVMWD Production Data "25 - Monthly Production.xlsx." and 2015 UWMP

Groundwater *(Continued)*

Table 3-2 | Elsinore & Coldwater Groundwater Basin

Wells		Flow in gpm	Max monthly capacity AF	TDS	Arsenic Treatment
Elsinore Basin	Corydon Street	900	121	340	*Blend / Summerly or Diamond*
	Cereal St. #1	1,200	161	355	*Blend / Summerly or Diamond*
	Lincoln Street	380	51	602	*NA*
	Terra Cotta Well	845	114	448	*NA*
	Summerly Well	1500	202	540	*NA*
	Diamond Well	1500	202	488	*NA*
	Machado Well	1600	215	572	*NA*
	Joy Street Well	900	121	401	*Blend / Lincoln or Machado*
	Cereal St. #3	1500	202	363	*Treated at BBGWTP*
	Cereal St. #4	1500	202	457	*Treated at BBGWTP*
Coldwater Basin	Mayhew Well	500	67	446	*NA*
	Station 71	250	34	446	*NA*

Note: NA = It does not require Arsenic Treatment

SURFACE WATER

Another imported water supply source for EVMWD is surface water stored in Canyon Lake, also known as the Railroad Canyon Reservoir. Canyon Lake was constructed in 1928 by the Temescal Water Company with a spillway elevation of 1381.76 feet masl and a capacity of 11,868 AF. However, it is assumed that siltation has decreased the capacity of the lake. The exact capacity reduction based on siltation is uncertain. Based on preliminary studies (Anderson, 2015), the full pool volume of the lake is estimated to be 8,758 AF. Further research is needed to define the impacts of siltation on the overall storage volume. Canyon Lake impounds water from the San Jacinto River, Salt Creek, and local surface runoff. The water is then treated at the CLWTP for potable use. Raw water can be delivered from WMWD connections WR-18A (Colorado River water) and WR-31 (SWP water) and discharged into the San Jacinto River near Nuevo to supplement natural recharge of Canyon Lake.

EVMWD has not purchased water from the MWD connection WR-18A since 1989 because the high TDS in Colorado River supply adversely affects wastewater effluent quality. Construction of MWD connection WR-31 was completed in December 2003 and EVMWD purchased water from this turnout in 2007.

Historical records show that approximately 11% of the volume of water discharged by WMWD into the San Jacinto River is lost due to percolation and evapotranspiration before the water reaches Canyon Lake. Therefore, releases from WR-31 are typically performed during the wet season when the river has natural flow to minimize water loss (MWH, 2011).

The Canyon Lake Water Treatment Plant (CLWTP), located near the southwest dam abutment of Canyon Lake, provides conventional treatment of surface water impounded in the lake. The treatment plant has a design capacity of 9 million gallons per day (mgd), 13.9 cubic feet per second (cfs); although operating the plant at a capacity greater than 7 mgd (10.9 cfs) adversely affects the water quality. During periods of increased raw water turbidity associated with high winter inflows to the lake, the plant operators typically treat a maximum of 4.5 mgd (7.0 cfs). The treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. The raw water pumping station, which pumps from Canyon Lake to the plant, operates manually. A steel reservoir tank at the plant temporarily stores the treated water, which also provides the required detention time for chlorination prior to conveyance of the water to the distribution system. Finished water flows to a 2.0 MG steel ground storage reservoir via pumping. The reservoir has an overflow elevation of 1,434 feet (ft) and a side water depth of 32 ft. Water flows by gravity from the reservoirs to the 1434 Zone.

From 1992 to 2015, the average annual production from the CLWTP was 2,322 AFY. From 2011 to 2015, CLWTP produced approximately 1,600 AFY (1.4 mgd) of water. Water treatment during 2002 and 2012-2015 was lower than normal due to scheduled improvements required at the CLWTP.

IMPORTED WATER

EVMWD can receive both treated and untreated imported water from MWD through WMWD. As discussed in the previous section, untreated imported water can be delivered via the San Jacinto River into Canyon Lake. Treated imported water is available through two district connection points at nearly opposite ends of the District. The southern connection point receives treated water from at MWD's Skinner Filtration Plant, which blends primarily Colorado River water and a small amount of State Project Water. The treated water is pumped through the Auld Valley Pipeline (AVP) to MWD's service connection EM-17, to the 1434 zone by the Auld Valley Booster Pumps and into the 1650 zone through the California Oaks Booster Pump Station. The pump stations are located at the District's southeast border on Hancock Avenue east of California Oaks Road. EVMWD can purchase or acquire a maximum flow rate of 37.5 cfs (24.2 mgd or 27,100 AFY) through AVP, although this flow rate cannot be achieved due to hydraulic restrictions within the delivery system.

The northern connection point receives treated water from MWD's Mills Filtration Plant, which primarily treats State Project water. The treated water is conveyed from the Mills Gravity Pipeline (owned and operated by WMWD) to EVMWD's Temescal Valley Pipeline (TVP). The connection point to the TVP is treated in Corona, at the intersection of Temescal Canyon Road and La Gloria Street. Through a series of transfers, EVMWD has the capacity for 21 cfs (15,200 AFY) in the TVP.

The TVP was designed to convey 41 cfs with the construction of a proposed pump station, although the current hydraulic capacity of the TVP is 19.6 cfs (14,190 AFY) based on gravity flow from the Mills Gravity Pipeline. It is assumed that EVMWD can obtain 10,030 AFY (8.9 mgd) from the TVP on an annual basis. A feasibility study was performed in 2014 to use for increasing hydraulic capacity in the TVP. Some of the alternatives included partial and full replacement of the existing pipeline and/or installation of a pump station. The study recommends a partial upsizing of the 36-inch and 30-inch line to a 48-inch line, which will increase the capacity of the line to 37 cfs of water. This alternative does not require a pump station and consequently provides economic benefit.

RECYCLED WATER

EVMWD operates three wastewater reclamation facilities (WRF): the Regional WRF, Horsethief Canyon WRF, and Railroad Canyon WRF. In addition, wastewater flow in the southern part of EVMWD's service area is treated at the Santa Rosa WRF operated by the Rancho California Water District (RCWD). These wastewater facilities produce tertiary treated water, which is used for irrigation, lake replenishment, and environmental enhancement.

Table 3-3 provides the annual production of recycled water during the last three years. Regional WRF is the largest reclamation facility, producing about 74% of the total recycled water. Approximately 90% of the effluent generated at the Regional WRF is used for replenishment of Lake Elsinore, and the remaining 10% is discharged to Gunnerson Pond for habitat restoration. The other wastewater treatment facilities produce 26% of the total recycled water, which is used for irrigation in Horsethief Canyon, Canyon Hills, South Lake Elsinore, and Wildomar.

Table 3-3 | Recycled Water Generated

Year	Unit	Horsethief	Railroad Canyon	Regional	Southern
2012	AFY	414	715	5803	927
2013	AFY	408	819	6119	942
2014	AFY	396	835	6159	853
2015	AFY	387	605	6371	872

WATER QUALITY

EVMWD's drinking water meets or exceeds all health and safety regulations. Per the Federal Safe Drinking Water Act and California Department of Public Health, EVMWD tests the water for a variety of water quality parameters as depicted in Figure 3-1. In 2014, EVMWD conducted more than 14,000 water quality tests for more than 150 contaminants. Appendix B provides additional details regarding the key water quality parameters that affect EVMWD's water resources and infrastructure planning activities and decision making.

Figure 3-1 | Water Quality Parameters

Federal Safe Drinking Water Act (EPA)

- *Unregulated Contaminant Monitoring Program*
- *Informational Collection Rule*
- *Undetermined Contaminate Limits (such as Cyanobacteria)*

Distribution System

- *Nitrification Surface Water Treatment Rule*
- *Disinfection By-Product Rule*
- *Total Chloroform Rule*
- *Lead and Copper Rule*
- *Arsenic MCL Compliance*
- *Groundwater Under Direct Influence Compliance*

California Department of Public Health

- *General Minerals*
- *General Physicals*
- *Inorganic Compounds*
- *Volatile Organic Compounds*
- *Synthetic Organic Compounds*
- *Radionuclides*

WATER RIGHTS AND SUPPLY

Surface Water Rights

Through the acquisition of the Temescal Water Company, EVMWD has the right to divert up to 12,000 AFY of natural inflow from the San Jacinto River annually and store that water in the Railroad Canyon Reservoir pursuant to Water Rights License 1533. A subsequent license allows the diversion of 2.4 cfs of San Jacinto River water from April 1 to May 31 each season pursuant to Water Rights License 6327 (SWRB, 1961). In settlement of litigation regarding the release of water into Lake Elsinore, EVMWD and the City of Lake Elsinore agreed that EVMWD would not treat more than 8,000 AFY (about 7.1 mgd continuous flow) of San Jacinto River flows in any water year at EVMWD's Canyon Lake Water Treatment Plant. This 8,000 AFY limit applies only to San Jacinto River runoff and excludes any imported water conveyed in the river channel.

The acquisition of the Temescal Water Company also provided EVMWD with surface water rights in the Temescal Valley in Indian Creek, Mayhew Creek, Horsethief Creek, and Temescal Creek. In addition, EVMWD filed for water rights associated with the discharge of the effluent from the Regional WRF. EVMWD reports the exercise of its water rights in annual filings to the State. Table 3-4 summarizes EVMWD's surface water rights.

Table 3-4 | Summary of EVMWD's Surface & Recycled Water Rights

Water Right	Quantity (AFY)	Licensed or Permitted Right
San Jacinto River Diversion	295	Water use filed with the SWRCB; licensed use
San Jacinto River Storage	12,000	Water use filed with the SWRCB; licensed use
Regional WWTP Discharge Use	11,200	Water use filed with the SWRCB; permitted use
Horsethief Creek Storage and Diversion	448	Water use filed with the SWRCB; licensed use
Indian Creek Storage and Diversion	2,215	Water use filed with the SWRCB; licensed use
Mayhew Creek Storage	1,000	Water use filed with the SWRCB; licensed use
Indian Creek/Temescal Creek Storage	400	Diversion from Lee Lake
Subtotal	**27,558**	

Water Rights and Supply *(Continued)*

Groundwater rights

EVWMD has been using groundwater from local groundwater basins, which are non-adjudicated. Based on Table 3-5, the total amount of groundwater used has been close to 7,831 AFY.

The acquisition of the Temescal Water Company by EVMWD resulted in the ownership of the Temescal System and majority holdings in the three mutual water companies of Alta Mesa Mutual Water Company, Aqua Mansa Water Company, and the Meeks and Daley Water Company (MWH, 2002).

The acquisition also made EVMWD a majority shareholder (57.85%) in the Meeks and Daley water rights. Ownership of these shares provides EVMWD with water rights, production/conveyance capacity (such as "canal carrying rights" in the Gage Canal and the Riverside Canal), and the Palm Avenue Well located in Grand Terrace, Riverside County. The construction of Seven Oaks Dam in 1998 allowed for capture of "new conservation" water as defined in the Judgment in the case of Western Municipal Water District of Riverside County v. East San Bernardino County Water District (judgment). (Western Municipal Water District, City of Riverside et al. 2013). In addition, Meeks and Daley would have the right to a one-time allocation of approximately 1,448 AF of water that was stored in the San Bernardino Basin Area (SBBA) during the 1998 to 2012 period. Starting in 2013, based on the proportional share (3.38%) of the total new conservation water, Meeks and Daley's water rights increased to 8,091 AFY in the Bunker Hill Basin. Since EVMWD receives 57.85% of the Meeks and Daley water rights, this new water conservation increases EVMWD's water right entitlement to 4,681 AFY from the Bunker Hill Basin. As part of the 1969 Judgment, Meeks and Daley has an annual base right of 836 AFY to extract water from the Colton Basin; 801 AF and 35 AF of the base right water volumes can be delivered for use in Riverside County and San Bernardino County, respectively. For the period 1989-2013, the total average yearly extraction was 551.5 acre-ft from the Colton Basin, representing 66% of the base water right amount.

Since EVMWD receives 57.86% of the Meeks and Daley water rights, EVMWD receives 485 AFY from the Colton Basin. EVMWD can extract water from the Riverside Basin area at an annual base right of 1,263 AFY. The total water right amount can be delivered for use in Riverside County. For the period 1989-2013, total average yearly extraction was 849.6 AFY, representing 67% of the base right amount. In summary, EVMWD has a total of 6,428.2 AFY of water rights in San Bernardino/Riverside groundwater basins as part of the acquisition of Temescal Water Company.

Water Rights and Supply *(Continued)*

Table 3-5 | Summary of EVMWD's Groundwater Supplies & Rights

Water Supply and/or Right	Quantity (AFY)	Comments
NON-ADJUDICATED USE		
Elsinore Basin	5,500	Estimated safe-yield
Warm Springs Basin	50	No estimated safe-yield; quantity based on historical
Lee Lake Basin	690	No estimated safe-yield; quantity based on historical
Coldwater Basin	1,056	Based on 1/3 of the estimated safe-yield of 3,300; recalculated every 5 years, safe-yield shared with the City of Corona
Bedford Basin	485	No estimated safe-yield; quantity based on historical
Temescal Basin	50	No estimated safe-yield; quantity based on historical pumping from Williams Well (abandoned). No active wells
ADJUDICATED WATER RIGHT		
Bunker Hill Basin	4,497	Based on the 1969 Judgment; includes both exportable and non-exportable water rights and includes "new conservation"
Rialto-Colton Basin	463.4	Based on the 1969 Judgment
Riverside Basin	1263	Based on the 1969 Judgment
Subtotal	**14,054**	

EVMWD Water Agreements

In addition to the water resources assets described above, EVMWD also has several strategic water supply agreements with agencies in Riverside County. These agreements provide EVMWD access to recycled water supply and capacity in major regional conveyance facilities. The summary and document agreements are presented in Appendix C.

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4. THE IRP PROCESS

4.1 | A Collaborative Process

The initial phase of the IRP process involved collaboration with both internal and external stakeholders, including the EVMWD Board of Directors (Board). A workshop was held with the Board to describe the IRP's purpose and process; and engage the Board in meaningful dialogue regarding current water resource management issues, such as drought and climate change. Through a series of questions and directed discussion, the Board set the following objectives to be met by the IRP.:

CREATE NEW WATER

Identify, local, new water supply options beyond sources in EVMWD's existing supply portfolio.

INCREASE SUPPLY RELIABILITY

Develop a water supply portfolio that offers the highest reliability under all hydrologic conditions.

DECREASE DEPENDENCE ON IMPORTED WATER

Diversify the water supply portfolio to be less dependent on imported water.

PROMOTE REUSE

Develop a plan that reuses 100% of the wastewater effluent generated by EVMWD.

IMPROVE WATER QUALITY

Provide high quality water to customers within EVMWD's service area.

IMPROVE GROUNDWATER MANAGEMENT

Protect and sustainably manage EVMWD's groundwater resources.

PROMOTE CONSERVATION

Continue and promote water conservation programs to reduce EVMWD's water footprint.

4.2 | Evaluation Process

Once these overarching objectives were established, an internal IRP Working Committee was formed comprised of key staff members with expertise in water resources planning, systems modeling, finance, and strategic planning. The committee met weekly over a 12-month period to accomplish several tasks, including:

- *Defining the anticipated supply gap over the planning period*
- *Developing water supply and water conservation options*
- *Reviewing preliminary supply projects and associated metrics such as yield, costs, quality, and reliability*
- *Facilitating sessions with EVMWD's Board of Directors and Executive Management to define the relative importance of planning and evaluation criteria*
- *Developing water supply scenarios and portfolios*
- *Evaluating portfolio results*
- *Developing the IRP report*

Additionally, throughout the development of the IRP, input from a variety of stakeholders was solicited. Meetings were held with key stakeholders such as Metropolitan Water District of Southern California, Western Municipal Water District, and Eastern Municipal Water District to better understand regional water supply issues and establish a framework for a collaborative planning effort. EVMWD communicated key components of the IRP to its customers through a monthly newsletter, called The Water Log. In addition, throughout the process, feedback was solicited from EVMWD's Board of Directors and Executive Management on key policy issues and assumptions.

4.2 | Evaluation Process *(Continued)*

Projected water demand was compared to current available water supplies to determine the supply deficit for the planning horizon of year 2040. Individual water supply alternatives were identified to offset the deficit. The merits of each alternative were considered relative to criteria such as supply capacity available to EVMWD during both average years and dry years, the expected timing of the alternative implementation, the expected water quality, associated costs (including, but not limited to, facility construction and annual operation and maintenance (O&M) costs), system implementability, and environmental impacts (MWH, 2007). These criteria are briefly discussed in Section 4.3. The evaluation of water quality is primarily focused on TDS levels. Other contaminants are evaluated where reliable data was available. Environmental impacts are estimated based on past experience in the region and elsewhere on similar projects. Several assumptions were made and estimates were prepared where background information was unavailable or incomplete.

The evaluation process can be distilled into three steps and is presented in Figure 4-1.

Step 1: This step involves identifying all potential water supply alternatives that can offset the water supply deficit identified for the planning horizon. Of 45 new water supply source alternatives, a total yield of 57,713 AFY, was identified. These projects were based on current and prior planning studies, feedback from EVMWD's Executive Management and Board of Directors, and engineering consultants.

Step 2: The second step involves defining metrics for the projects and eliminating mutually exclusive projects. The projects are evaluated on advantages, disadvantages, supply capacity, supply reliability, water quality, unit cost, implementability, and environmental impacts. The evaluation criteria and ranking associated with each criteria are presented in Table 4-1. The rankings for capacity, water quality, and cost are linearly interpolated between the maximum and minimum values for that particular criteria. Individual project scores are then developed, taking into consideration the rankings as well as the relative importance of each evaluation criteria. This approach allowed EVMWD to identify the highest ranked projects.

Step 3: The third step focused on evaluating a series of water supply portfolios or scenarios to evaluate the sensitivity of water supply projects to different factors such as reliability, cost, salinity, etc. These portfolios were based on the highest ranked projects identified in Step 2. This approach allowed EVMWD to identify the optimum portfolio that would meet the overarching objectives of this IRP.

4.2 | Evaluation Process *(Continued)*

Figure 4-1 | IRP Evaluation Methodology

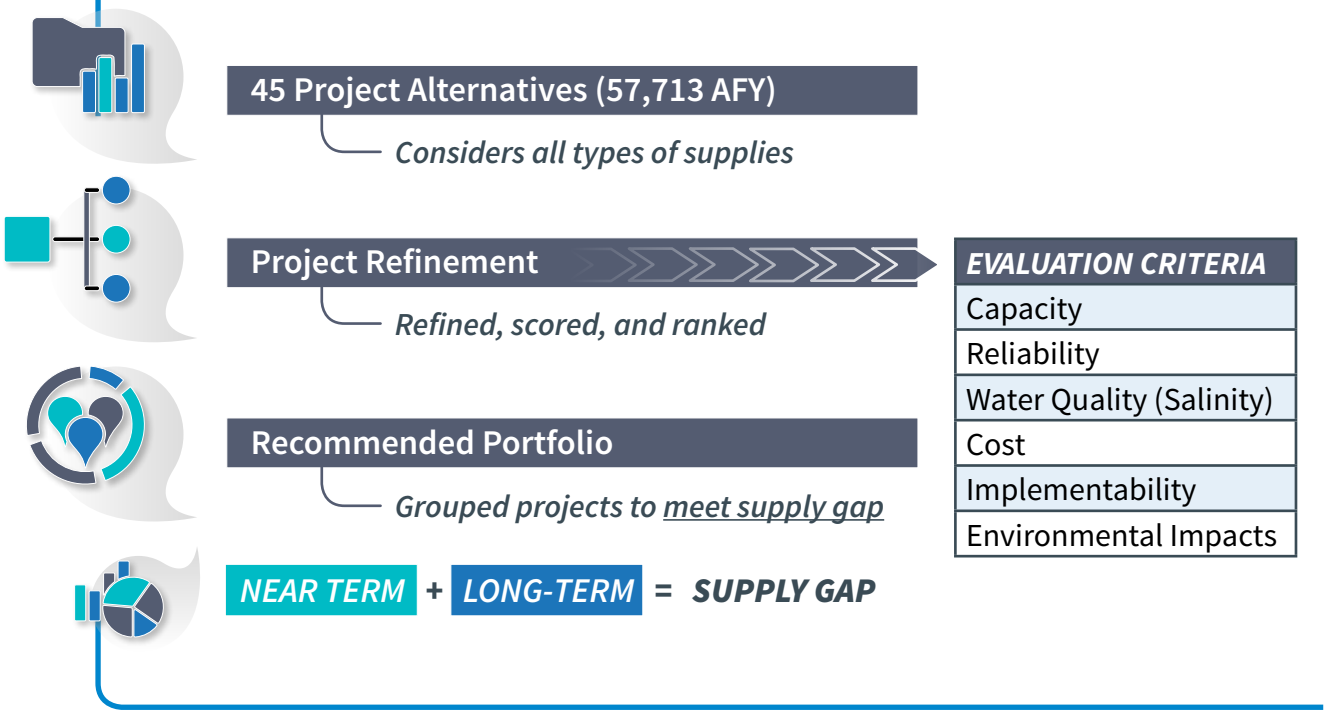


Table 4-1 | Supply Alternative Evaluation Criteria & Ranking Scale

Evaluation Criteria	Ranking			
	1	2	3	4
Average Year Supply Capacity MGD [1]	Minimum			Maximum
Water Supply Reliability	Low			Higher
Water Quality: TDS (mg/L) [1]	Maximum			Minimum
Cost ($/acre-ft) [1]	Maximum			Minimum
Implementability (Regulatory/Technical/ Financial/Public Process Constraints) [1]	Severe	Multiple	Some	None
Environmental Impacts	Major	Moderate	Minor	None

(1) Ranking is linearly interpolated between the minimum value and the maximum value

4.3 | Ranking and Weighting Factors for Evaluation Criteria

AVERAGE YEAR SUPPLY CAPACITY

This criteria evaluates the water supply capacity available to EVMWD during a normal year by implementing the specific alternative. This capacity is expressed in acre-feet per year for comparative purposes. A higher ranking in this category coincides with a higher normal year supply capacity.

WATER SUPPLY RELIABILITY

This criteria evaluates the available water supply yield under varying hydrologic conditions. Local water supplies are given a higher preference relative to imported water supplies. Water supply projects that provide consistent yield under different hydrologic conditions rank the highest in this category. Under this criteria, water supplies were evaluated to satisfy Maximum Daily Demand (MDD) for EVMWD's service area.

WATER QUALITY

This criteria evaluates the levels of TDS in the source water. Other contaminants that exceed the state and federal limits are evaluated where reliable data are available. The lower the concentration of TDS in the water supply source, the higher ranking the alternative receives.

COST

This criteria evaluates the project life cycle cost expressed in dollars per acre foot of water produced. Costs include, but are not limited to, construction of new pipelines, pump stations, and treatment plants; and annual operations and maintenance costs. The lower the cost of the water supply source per acre-foot, the higher ranking the alternative receives.

IMPLEMENTABILITY

This criteria evaluates the implementability associated with each alternative. Constraints to implementation may include, but are not limited to, regulatory, major construction complexity, funding, multiple stakeholder, and land acquisition. A project that has the fewest constraints receives the highest ranking.

4.3 | Ranking and Weighting Factors for Evaluation Criteria *(Continued)*

ENVIRONMENTAL IMPACTS

This criteria evaluates the environmental impact imposed by a given project. Projects that have the least environmental impact score the highest in this category.

CRITERIA RANKING

Weighting factors were developed for these evaluation criteria incorporating feedback from EVMWD's Executive Management and Board of Directors. Evaluation criteria were ranked by considering a scale from 1 through 6, with 1 being the highest and six being the lowest. Multiple workshops conducted with Executive Management and the Board of Directors produced the ranking result shown in Table 4-2.

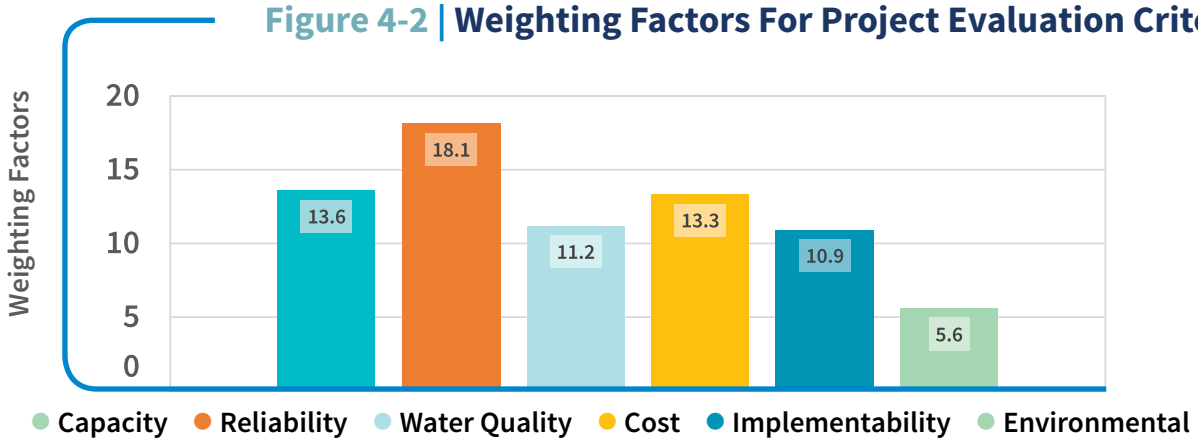
Table 4-2 | Ranking Preferences For Project Evaluation Criteria

Criteria Ranking	Ranking Average	Ranking Preference											
		M1	M2	M3	M4	M5	M6	M7	B1	B2	B3	B4	B5
Reliability	1.58	2	1	1	1	1	2	1	1	5	1	1	2
Capacity	3.00	3	2	4	5	5	3	3	2	3	2	3	1
Cost	3.08	1	5	2	2	4	4	4	4	2	4	2	3
Implementability	3.75	5	3	3	4	2	1	5	2	6	5	4	5
Water Quality (Salinity)	3.75	4	4	5	3	6	5	2	3	1	3	5	4
Environmental Impacts	5.58	6	6	6	6	3	6	6	6	4	6	6	6

Note: M = Executive Management Participant
B = Board of Directors Participant

4.3 | Ranking and Weighting Factors for Evaluation Criteria *(Continued)*

Figure 4-2 | Weighting Factors For Project Evaluation Criteria



4.4 | Decision Support System Model

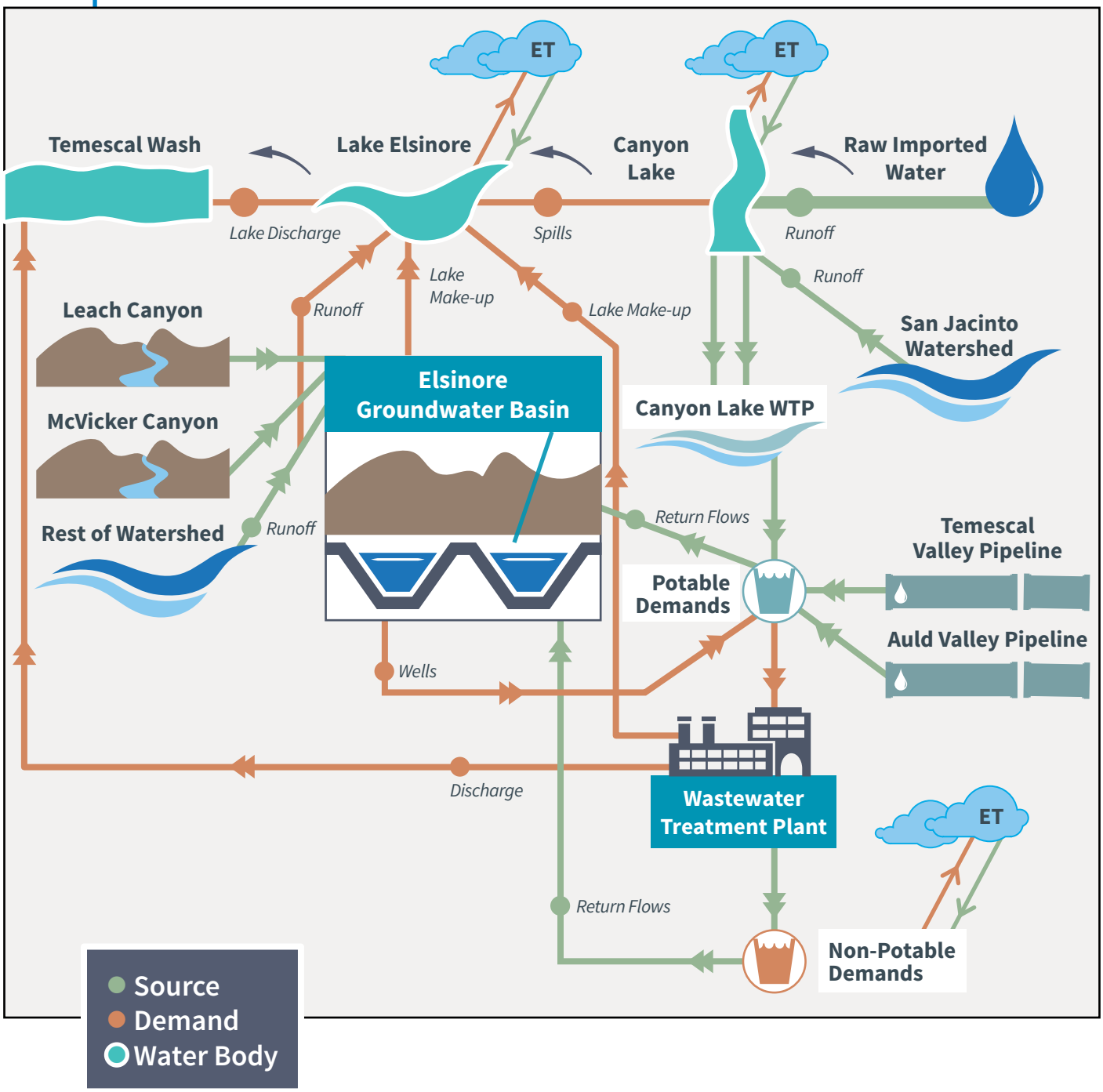
A Decision Support Model (DSM) is a useful tool for simulating a complex water resource system that can be represented by key components such as; water demand, conveyance, storage, and supply. The DSM can simulate specific "what-if" scenarios (e.g. how can EVMWD meet water demands during an imported water supply shortage?) The DSM can be used to find an optimal solution given a set of options (e.g. what combination of water supply projects meet future water demands at the least cost?). The DSM can also provide key input for developing resource management strategies and policies, and serve as the primary tool for adaptive management practices.

In 2009, EVMWD developed a DSM called Water Resources Decision Support System (WRDSS) to optimize short-term potable water supply operations with different supply sources (groundwater, surface water, and imported water). Figure 4-3 provides a schematic of EVMWD's water resources system. The model also captures constraints within EVMWD's water distribution system such as capacity constraints, water quality constraints, etc. (MWH, 2009).

The WRDSS model was recently updated to include new programs such as MWD's Conjunctive Use Program (CUP). The WRDSS model allows EVMWD to evaluate different scenarios and examine EVMWD's vulnerability to risks such as water supply reliability, water quality, changing demand conditions. Figure 4-4 depicts a screenshot of the user interface.

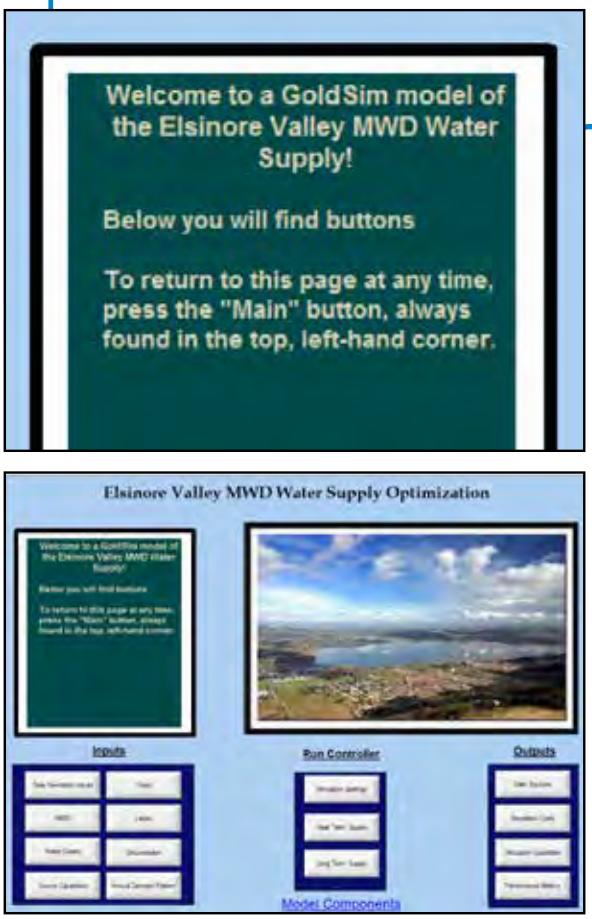
4.4 | Decision Support System Model *(Continued)*

Figure 4-3 | EVMWD's Water Resources System Schematic



4.4 | Decision Support System Model *(Continued)*

Figure 4-4 | EVMWD Decision Support System Model's User Interface



Elsinore Valley MWD Water Supply Optimization : *Menu Options*

INPUTS:

- *Daily Simulation Inputs*
- *MWD*
- *Water Quality*
- *Source Capacities*
- *Costs*
- *Lakes*
- *Groundwater*
- *Annual Demand Pattern*

RUN CONTROLLER:

- *Simulation Settings*
- *Near-Term Supply*
- *Long-Term Supply*

OUTPUTS:

- *Daily Sources*
- *Simulation Costs*
- *Simulation Quantities*
- *Performance Metrics*

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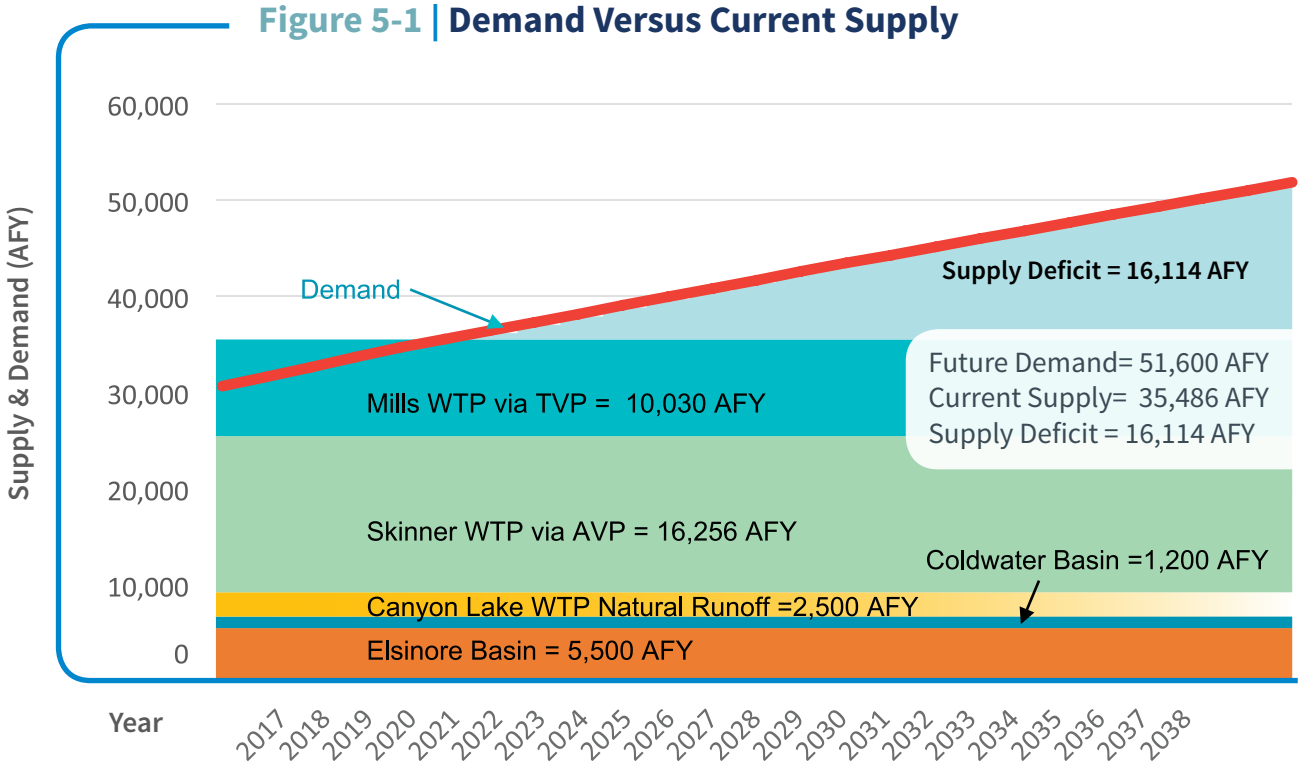
5. PROJECT EVALUATION & RELIABILITY ANALYSIS

5.1 | Portfolio Evaluation

The IRP considers a 25-year planning horizon covering the period 2016-2040. Figure 5-1 depicts a comparison between current supplies and projected demand for EVMWD's service area for the next 25 years. At the end of the planning horizon in 2040, the water demand is estimated to be approximately 51,600 AFY. Overall supplies available to EVMWD are estimated to be approximately 35,500 AFY. For the purposes of this IRP, it is assumed that over the planning horizon, approximately 26,300 AFY of imported water will be available to EVMWD. This represents a 15% increase over the historical maximum use of 22,800 AFY in 2007.

Figure 5-1 | Demand Versus Current Supply



In order to offset the deficit of approximately 16,114 AFY by 2040, the IRP considered 45 supply alternatives covering different supply options such as producing water from untapped groundwater basins, indirect potable reuse, seawater desalination, water exchanges and transfers, and additional water conservation. These supply alternatives are presented in Table 5-1. A total of 45 projects were identified as potential long-term water supply options. These projects represent approximately 58,000 AFY of additional supplies. Each project was further evaluated using key metrics such as average yield, dry year yield, reliability, capital and annual operations and maintenance costs, salinity, implementability, and environmental impacts. Table D1 in Appendix D provides additional details on the metrics used to evaluate these projects.

5.1 | Portfolio Evaluation *(Continued)*

Each alternative was given a score for each metric (with applied weighting based upon its relative importance), and then ranked on the sum of all its scores. The supply alternative evaluation screens the highest ranked projects which are then utilized to develop scenario based portfolios to offset the supply deficit identified for the planning horizon (year 2040). Figure 5-2 shows the expected production capacity for each project and the assigned ranking. Table 5-2 shows the highest ranked projects, which have a total average yield of 17,883 AFY.

Table 5-1 | List Of 45 Projects As Potential Sources of Long-Term Water Supplies

SOURCE		ALTERNATIVES
1	**Meeks and Daley Assets**	1A. Transfer Bunker Hill Basin groundwater (1) via the TVP and the Riverside-Corona Feeder. 1C. Sell the Bunker Hill groundwater facilities and water rights. 1D. Transfer Bunker Hill Basin groundwater (1) via the Riverside and Gage Canal, Arlington Line, Lester WTP, and TVP 1E. Transfer Bunker Hill Basin groundwater via the Riverside and Gage Canal, Arlington Line, new EVMWD WTP, and TVP 1F. One-time transfers of water conservation assets (potential clients: City of Riverside, Western, etc. 1G. Continue with WMWD exchange agreement 1H. Transfer Bunker Hill Basin groundwater via the SBVMWD CUP/Central Feeder/MWD 1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
2	**Temescal Valley Groundwater Basins**	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment 2A-2. Pump Bedford groundwater via the TVP; no treatment 2B. Extract Coldwater Basin groundwater with existing wells and transfer the water via TVP. 2E. One-time water exchange transfers with the City of Corona (3,200 AF) unused water in Coldwater Basin 2F. Coldwater Groundwater Exchange with Corona for Temescal Basin water 2G. Bedford Groundwater Exchange with Corona for Temescal Basin water
3	**Elsinore Groundwater Basin**	3D. Palomar Well replacement 3E-1. McVicker and Leach Canyon stormwater recharge 3E-2. McVicker and Leach Canyon stormwater/imported water recharge 3F. Elsinore Valley groundwater Storage Project (Canyon Lake Water Storage) 3G. Elsinore Basin conjunctive use expansion
4	**Warm Springs Groundwater Basin**	4A. Extract Groundwater from Warm Springs Basin; no treatment 4B. Extract Groundwater from Warm Springs Basin; treatment

Continued on next page

Table 5-1 | List Of 45 Projects As Potential Sources of Long-Term Water Supplies *(Continued)*

SOURCE		ALTERNATIVES
5	Canyon Lake	5A. Supplement Canyon Lake with MWD imported water (WR-31) via the San Jacinto River. 5B. Supplement Canyon Lake with MWD imported water (WR-31) via a new pipeline. 5C. Supplement Canyon Lake with MWD imported water (WR-31) via the San Jacinto River and a new water treatment plant. 5D. Supplement Canyon Lake with MWD imported water (WR-31) via a new pipeline and a new water treatment plant. 5E. Modify operation of Canyon Lake
6	Surface Water	6B. Lee Lake Reservoir Storage (using Surface water rights); non-potable use 6C. Lee Lake Reservoir Storage (using Surface water rights); IPR use
7	Imported Water Sources (MWD)	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL 7C. Obtain MWD Mills treated water through the Perris Valley Pipeline 7E. Obtain MWD Lakeview treated water through a new pipeline. 7H. Obtain MWD Eagle Valley WTP treated water 7I. Obtain treated imported water from Corona Lester WTP
9	Desalter	9A. Arlington Desalter 9B. Construct an ocean desalination plant at San Onofre (Nuclear Station)
10	Indirect Potable Reuse	10A. Indirect potable reuse at Regional WRF; surface recharge no AWT 10B. Indirect potable reuse at Regional WRF; Injection/extraction with AWT
11	Temecula-Pauba Groundwater Basin	11. Temecula-Pauba Groundwater
12	Expand Water Conservation	12A. Implement increased water conservation measures 12B. Implement increased water conservation measures; enhanced
13	Water Transfers	13A. Cadiz Project 13B. Bunker Hill Basin conjunctive use project (led by SBVMWD) 13C. Willow Springs water bank
14	Stormwater	14. Stormwater harvesting

5.1 | Portfolio Evaluation *(Continued)*

5.1 | Portfolio Evaluation *(Continued)*

Table 5-2 | List of Highest Ranked Supply Projects

ALTERNATIVES INVESTIGATED	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability (DYY/AYY Ratio)	Capital Cost
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	5.56	6,223	6,223	1.0	$30,634,000
2A-2. Pump Bedford groundwater via the TVP; no treatment	1.37	1,300	1,045	0.8	$6,599,000
3D. Palomar Well replacement	0.50	560	560	1.0	$3,120,000
4A. Extract groundwater from Warm Springs Basin; no treatment	0.89	1,000	1,000	1.0	$6,859,000
10B. Indirect potable reuse at Regional WRF; injection/ extraction with AWT	6.00	5,700	5,415	1.0	$132,082,000
12B. Implement increased water conservation measures; enhanced	0.00	3,100	3,100	1.0	Not Identified

5.1 | Portfolio Evaluation *(Continued)*

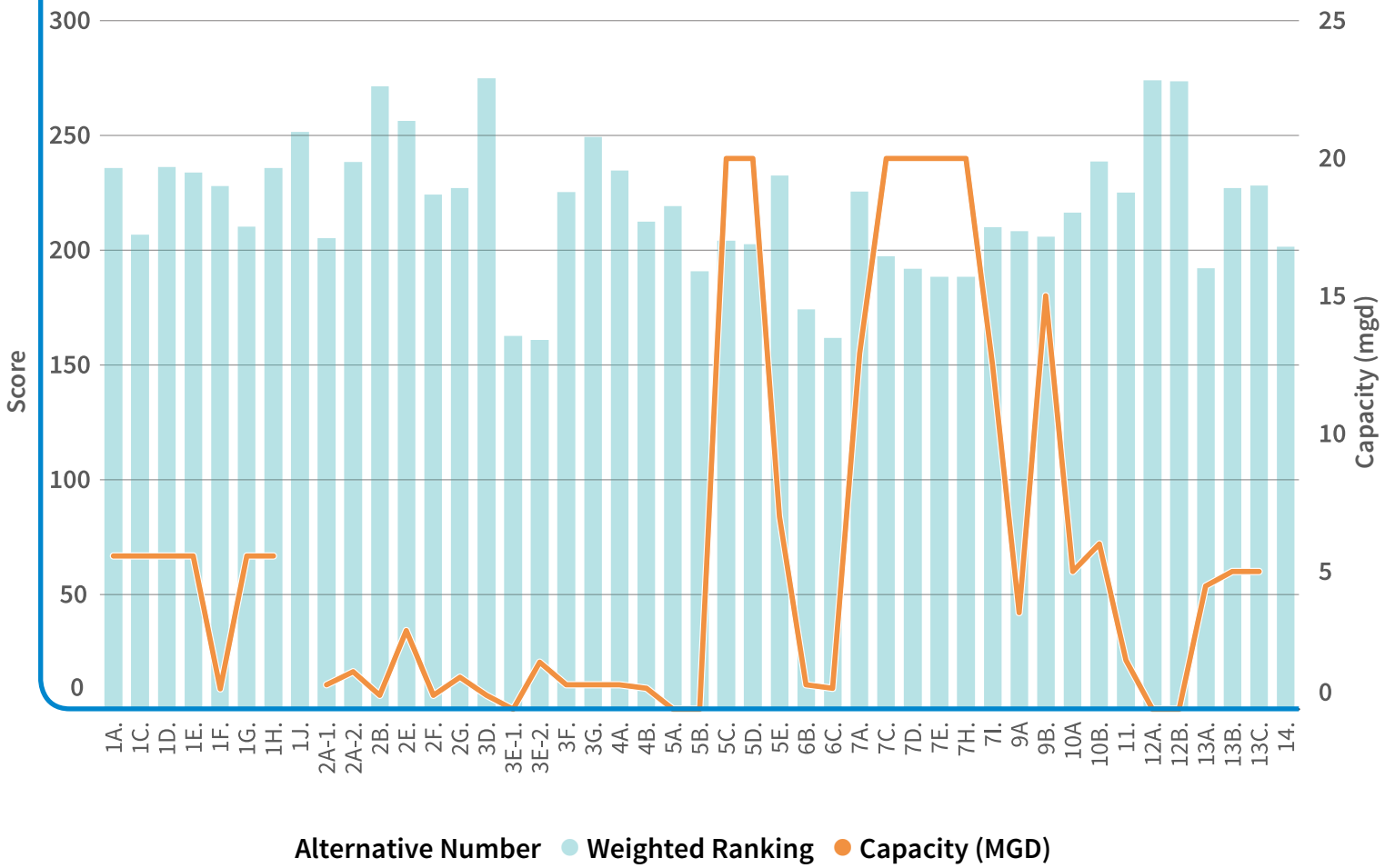
Table 5-2 | List of Highest Ranked Supply Projects *(Continued)*

ALTERNATIVES INVESTIGATED	Annual O&M Cost	Unit Cost	TDS (mg/L)	Implementability	Environmental Impacts
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	$3,547,000	$847	400	2.5	3.0
2A-2. Pump Bedford groundwater via the TVP; no treatment	$345,000	$542	800	4.0	4.0
3D. Palomar Well replacement	$106,000	$496	400	4.0	4.0
4A. Extract groundwater from Warm Springs Basin; no treatment	$428,000	$794	1,000	3.0	3.0
10B. Indirect potable reuse at Regional WRF; injection/ extraction with AWT	$5,707,000	$2,515	100	2.0	2.0
12B. Implement increased water conservation measures; enhanced	$1,240,000	$400	450	4.0	4.0

5.1 | Portfolio Evaluation *(Continued)*

(Need NEW content)* Each alternative was given a score for each metric (with applied weighting based upon its relative importance), and then ranked based upon the sum of all its scores. The supply alternative evaluation screens the highest ranked projects which are then utilized to develop scenario based portfolios to offset the supply deficit identified for the planning horizon (year 2040). Figure 5-2 shows the expected production capacity for each project and the assigned ranking. Table 5-2 shows the highest ranked projects, which have a total average yield of 17,883 AFY.

Figure 5-2 | IRP Projects Ranking Based On Combined Weights



5.2 | Scenario Evaluation

Seven scenarios, each targeting a specific goal as outlined in the objectives of the IRP, were developed for further analysis. The intent of this exercise was to test the performance of different project combinations relative to the highest ranked projects listed in Table 5-2. The combination of the highest ranked projects is referred to as Scenario 6 in this report. Scenario 7 represents a modified or a hybrid version of Scenario 5 and includes additional local supply projects (listed on Table 5-1). Each scenario generates sufficient yield to satisfy the long-term water supply deficit of 16,114 AFY. Table 5-3 shows the selected projects to form each of the scenarios. Each scenario is briefly described below:

5.2.1 SCENARIO 1 – *CURRENT PHILOSOPHY/STATUS QUO*:

This scenario represents no change to the current dependence on imported water supply to meet future water demands. Approximately 69% of the total water supply is imported water delivered via a proposed expansion of the Temescal Valley Pipeline (Project 7A).

5.2.2 SCENARIO 2 – *OTHER IMPORTED WATER*:

This scenario considers other water supplies in lieu of imported water such as that obtained by desalinating ocean water. A conceptual project was established to estimate potential capital and operating costs. The scenario objective was met by constructing a seawater desalination facility at the existing San Onofre Nuclear Generating Station (Project 9B). Approximately 75% of the total water supply would be delivered via seawater desalination.

5.2.3 SCENARIO 3 – *MAXIMIZE LOCAL RESOURCES*:

This scenario considers local water supply projects intended to maximize EVMWD's groundwater and surface water assets. Approximately 49% of the water in this scenario is made up of local supplies.

5.2.4 SCENARIO 4 – *MINIMIZE SALINITY (TDS)*

The intent of this scenario is to minimize the salinity levels (represented by TDS concentrations) in EVMWD's water supplies. This is accomplished by prioritizing two projects that are low in TDS concentrations: 10B (Indirect Potable Reuse) and 7A (Additional Imported Water from the Henry J. Mills Water Treatment Plant). These projects represent 89% of the total water supply in this scenario.

5.2.5 SCENARIO 5 – *MINIMIZE UNIT COSTS*

The intent of this scenario is to develop a water supply portfolio that has the lowest unit cost.

5.2 | Scenario Evaluation *(Continued)*

5.2.6 SCENARIO 6 – *HIGHEST RANKED PROJECTS*

This scenario represents the supply portfolio presented in Table 5-2. The supply projects in this scenario represent the highest ranked among the 45 projects considered to offset EVMWD's future water supply deficit.

5.2.7 SCENARIO 7 – *HYBRID*

The intent of this scenario is to develop a supply portfolio that offers the greatest reliability at a reasonable cost. This is accomplished by modifying the supply portfolio identified as part of Scenario 6 to include additional local projects such as: 2A-1. Lee Lake Basin, 5E. Modify Operation of Canyon Lake, and 11. Temecula-Pauba Well.

The performance of each scenario is assessed based on the following metrics:

- *Salinity (total dissolved solids in mg/L)*
- *Unit cost of water*
- *Reliability under historical hydrologic conditions*
- *Projected cumulative supply deficit under historical hydrologic conditions*

Table 5-3 | Selected Projects Scenarios

Scenario 1. Current Philosophy (or Baseline Scenario)	3D. Palomar Well replacement
	5E. Modify operation of Canyon Lake
	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL
	12B. Implement increased water conservation measures; enhanced
Scenario 2. Other Imported Water	3D. Palomar Well replacement
	5E. Modify operation of Canyon Lake
	9B. Construct an ocean desalination plant at San Onofre (nuclear station)
	12B. Implement increased water conservation measures; enhanced
Scenario 3. Maximize Local Resources	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin Groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	3E-2. McVicker and Leach Canyon stormwater/imported water recharge
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	6B. Lee Lake reservoir storage (using surface water rights) for non-potable use
	12A. Implement increased water conservation measures
	11. Temecula-Pauba groundwater

5.2 | Scenario Evaluation *(Continued)*

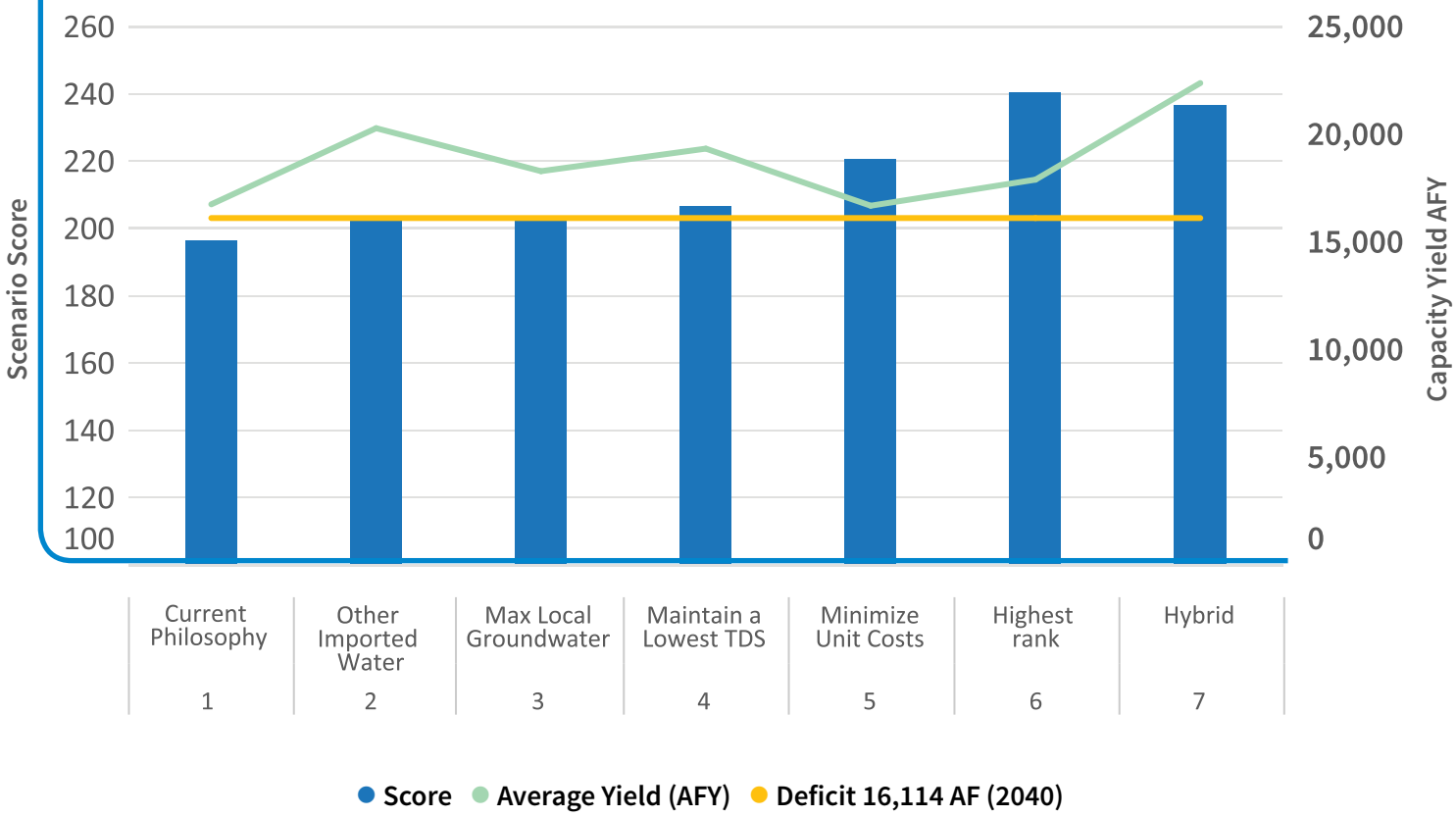
Table 5-3 | Selected Projects Scenarios *(Continued)*

Scenario 4. Minimize Salinity (TDS)	10B. Indirect potable reuse at Regional WRF. injection/extraction with AWT
	3D. Palomar Well replacement
	7A. Obtain MWD Mills treated water through the TVP expansion with additional capacity in MGL
	12A. Implement increased water conservation measures
Scenario 5. Minimize Unit costs	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	11. Temecula-Pauba groundwater
	12B. Implement increased water conservation measures; enhanced
Scenario 6. Highest Rank	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
	12B. Implement increased water conservation measures; enhanced
Scenario 7. Hybrid	1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona
	2A-1. Pump Lee Lake Basin groundwater via the TVP; no treatment
	2A-2. Pump Bedford groundwater via the TVP; no treatment
	3D. Palomar Well replacement
	4A. Extract groundwater from Warm Springs Basin; no treatment
	5E. Modify operation of Canyon Lake
	10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT
	11. Temecula-Pauba groundwater
	12B. Implement increased water conservation measures; enhanced

5.2 | Scenario Evaluation *(Continued)*

Figure 5-3 shows the scores for each scenario, along with their total water supply yield. Each scenario generates sufficient yield to satisfy the long term water supply deficit of 16,114 AFY. Scenario 6, Scenario 7, and Scenario 5 have the highest scores. These scenarios also offer a higher level of reliability relative to the other scenarios. Water supply reliability associated with each scenario is discussed in Section 5.3 of this report.

Figure 5-3 | Scenario Comparison by Rank

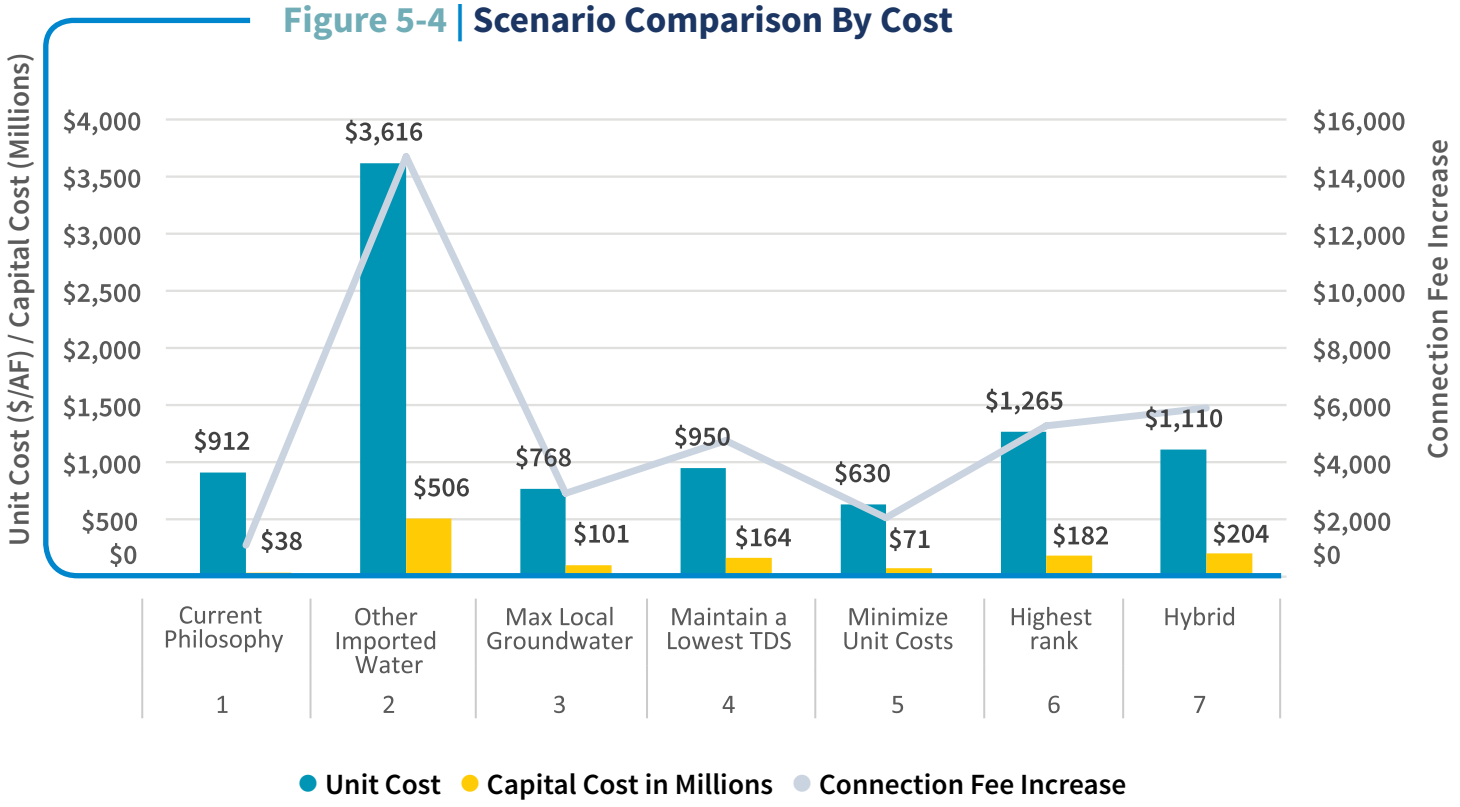


5.2 | Scenario Evaluation *(Continued)*

Figure 5-4 depicts the capital cost, the unit cost, and the potential impact on connection fees associated with implementing each scenario. An incremental connection fee was approximated for comparative purposes only; the following simplistic rule of thumb was applied: a $100 connection fee increase accounts for every $100,000 in capital investment. Actual connection fees will be determined in the future by completing a comprehensive financial study.

Scenario 2 represents the most costly alternative for securing additional supplies to offset the long-term deficit of 16,114 AFY. Costs for this scenario are primarily driven by the San Onofre Ocean Desalination Plant and the associated pipeline to deliver the desalinated water to EVMWD. This scenario has the highest unit cost ($3,616/AF), capital cost ($506 million), and has a significant impact on future connection fees (an increase of $14,682). Scenarios 6 and 7 have the second ($1,265/AF) and third ($1,110/AF) highest unit costs, respectively. However, these costs are comparable to current imported water costs (around $1,000/AF). In addition, imported water costs are projected to increase 3% to 5% annually for the long-term. Therefore, the unit costs of water supply for the different supply portfolios in the seven scenarios, with the exception of Scenario 2, are considered to be in-line with the expected cost for imported water supply in the future.

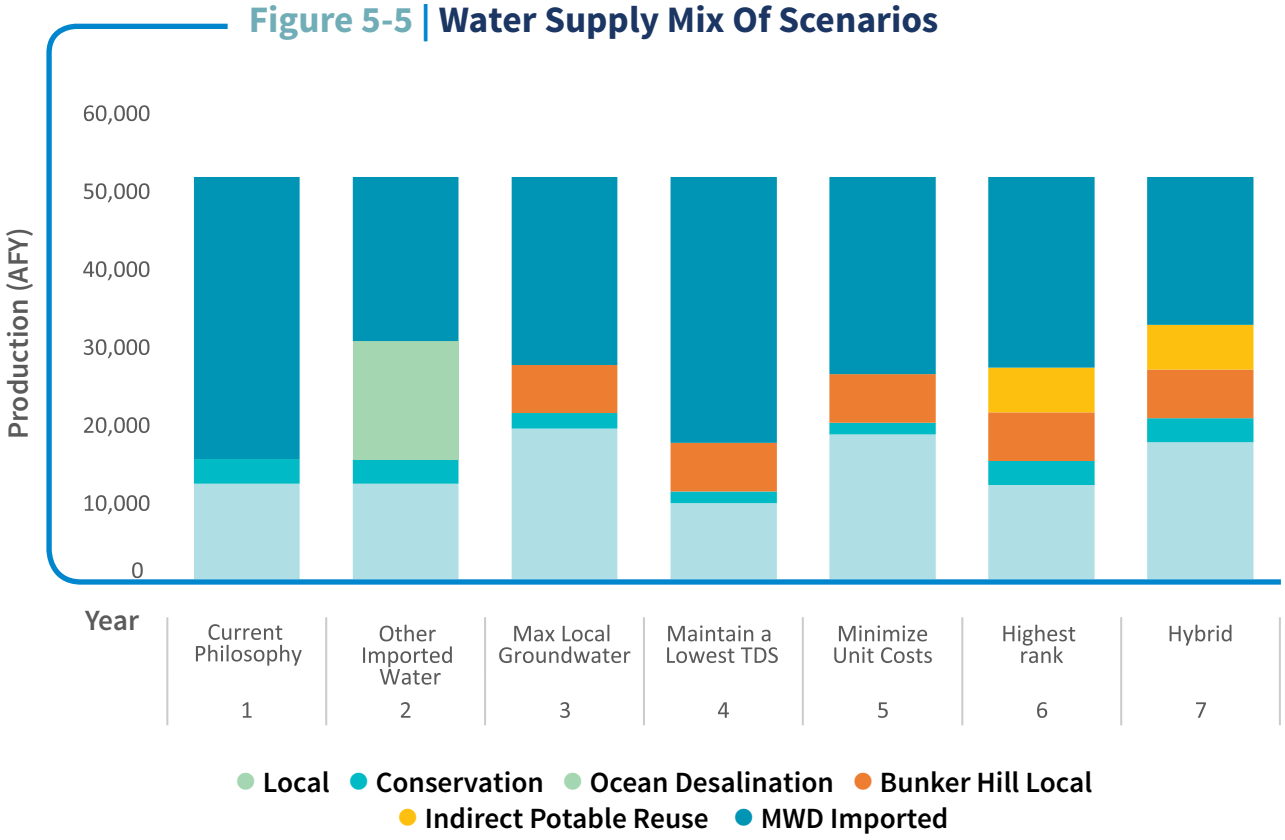
Figure 5-4 | Scenario Comparison By Cost



5.2 | Scenario Evaluation *(Continued)*

Figure 5-5 summarizes the water supply mix associated with each scenario. Scenarios 1 and 4 rely heavily on imported water supplies to offset the long-term deficit, with imported water comprising approximately 70% and 66%, respectively, of the total yield generated in these scenarios. While imported water constitutes only 41% of the total yield generated in Scenario 2, this scenario considers offsetting the long-term supply deficit by constructing a relatively costly ocean desalination facility. In Scenario 3, the imported water needs are reduced by maximizing local resources including EVMWD's surface water assets and stormwater capture. Scenarios 5, 6, and 7 have significantly reduced imported water needs with imported water comprising 49%, 48%, and 37%, respectively, of the total yield generated in these scenarios.

Figure 5-5 | Water Supply Mix Of Scenarios



5.3 | DSS simulation of Reliability and TDS values

Table 5-4 shows the TDS, unit cost, reliability, and expected water supply deficit for each of the scenarios discussed in this section. The results presented in this table were obtained by simulating EVMWD's complex water resources system using the WRDSS model.

Salinity in the source waters is a very important consideration for EVMWD as the source water quality directly affects the TDS in EVMWD's wastewater discharges which are regulated by the Santa Ana Regional Water Quality Control Board. The model simulation results indicate that the expected salinity levels of the different supply portfolios does not deviate significantly from the current salinity levels in EVMWD's water supply sources.

While cost efficiency is a very important consideration for EVMWD, supply reliability is a growing concern in light of climate change and potential population growth in the service area. The on-going drought has highlighted the need for a diverse and robust water supply portfolio. Given their significant dependence on imported water (susceptible to climatic, environmental, and conveyance issues), the portfolios in Scenarios 1 and 4 lead to significant supply deficits for the 25-year planning period. Scenario 1 has a cumulative supply deficit of approximately 45,000 AF over the planning period. Conversely, Scenario 7 exhibits the lowest cumulative supply deficit of approximately 700 AF over the planning period. While Scenario 5 performs well from a cost perspective, it exhibits a cumulative supply deficit of more than 12,000 AF over the planning period.

Table 5-4 | Summary Of Performance Metrics

	1.Current Philosophy	2. Other Imported Water	3. Maximum Local Groundwater	4.Maintain The Lowest TDS	5.Minimize Unit Costs	6.Highest Rank	7.Hybrid
TDS (ppm)	518	524	508	478	546	500	506
Cost ($/AF)	$912	$3,616	$768	$950	$630	$1,265	$1,110
Reliability	0.95-0.99	0.97-1	0.98-1	0.98-1	0.99-1	0.99-1	1
Deficit (AFY)	44,798	22,788	16,982	21,123	12,424	5,389	710

5.4 | Recommended Water Supply Portfolio and Project Implementation

Based on the WRDDS model results, Scenario 7 (Hybrid) represents the recommended water supply portfolio (Table 5-5) for implementation. Scenario 7 has the highest reliability relative to the other scenarios, satisfying the highest priority set forth by EVMWD's Board of Directors. This scenario also optimizes the use of EVMWD's local water supply assets, has a competitive unit cost relative to current and forecasted imported water costs, and has one of the lowest TDS values – a critical factor for EVMWD given the regulatory and financial implications of TDS management in the groundwater basins.

As shown on Table 5-5, the water supply projects that constitute Scenario 7 comply with the overarching objectives of the IRP as established by EVMWD's Board of Directors. These projects, shown in Figure 5-6, represent an optimum mix of imported water and local supplies, including new supplies from previously untapped groundwater basins and innovative concepts such as IPR, which ensures resiliency during dry-years and promotes efficient reuse of EVMWD's water supplies. The recommended water supply portfolio also includes utilizing EVMWD's water supply assets in the San Bernardino Basin Area. These assets will provide reliable, high-quality groundwater that will improve the overall water quality within EVMWD's service area. Lastly, enhanced water conservation, furthered by EVMWD's landscape ordinance, will ensure efficient utilization of EVMWD's precious water resources.

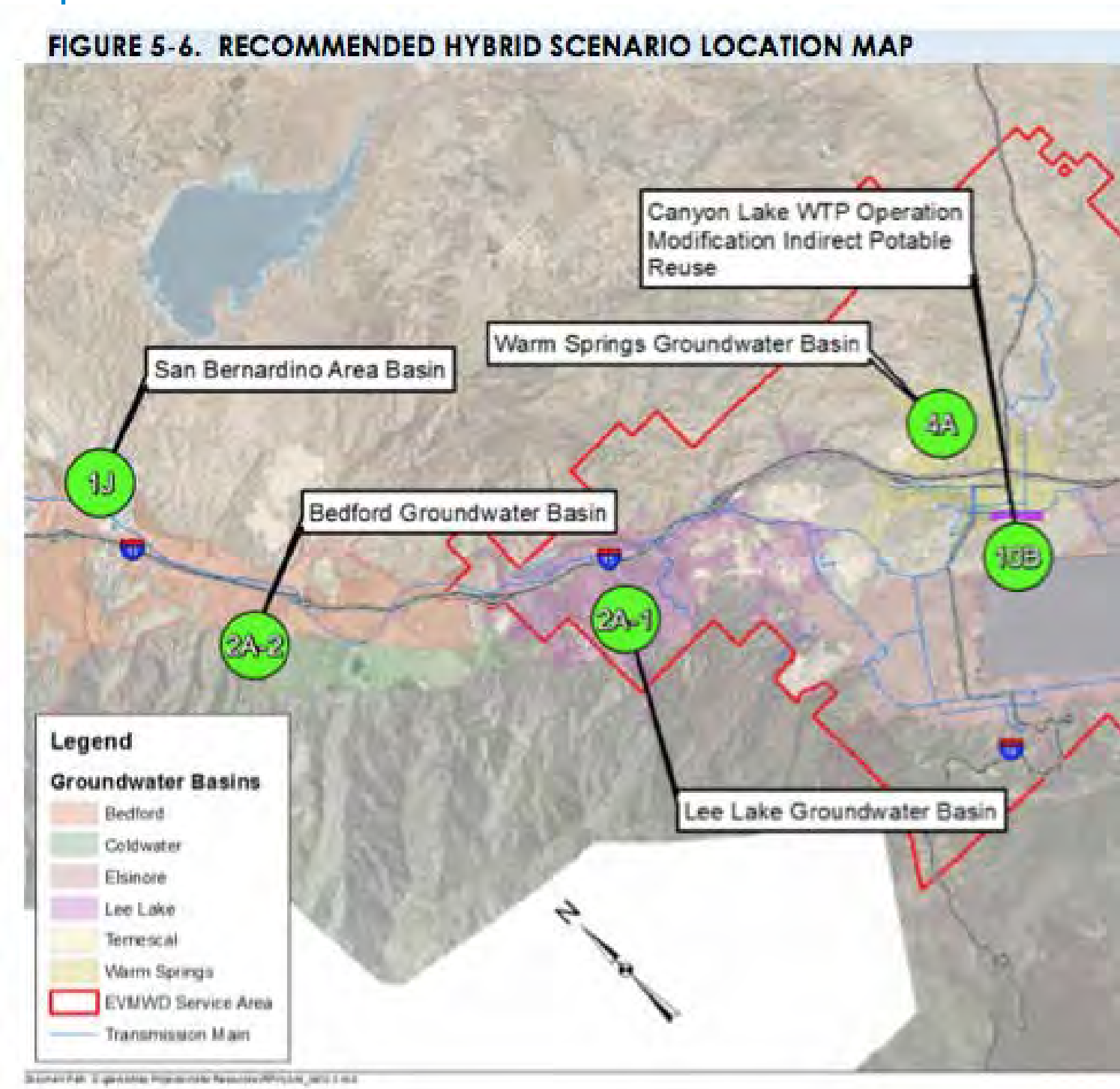
Groundwater from Coldwater, Bedford, Lee Lake and San Bernardino basins will be delivered to EVMWD's system via the TVP. These projects will require a total capacity of 10.5 mgd. The current operational capacity of the TVP is approximately 21 cfs, constrained by bottlenecks in EVMWD's distribution system. Consequently, a TVP expansion will be required by 2020 as depicted in Figure 5-7. A concurrent feasibility study evaluating the TVP expansion initially shows an additional 20 cfs (13.8 mgd) requirement, for an ultimate capacity of 41 cfs.

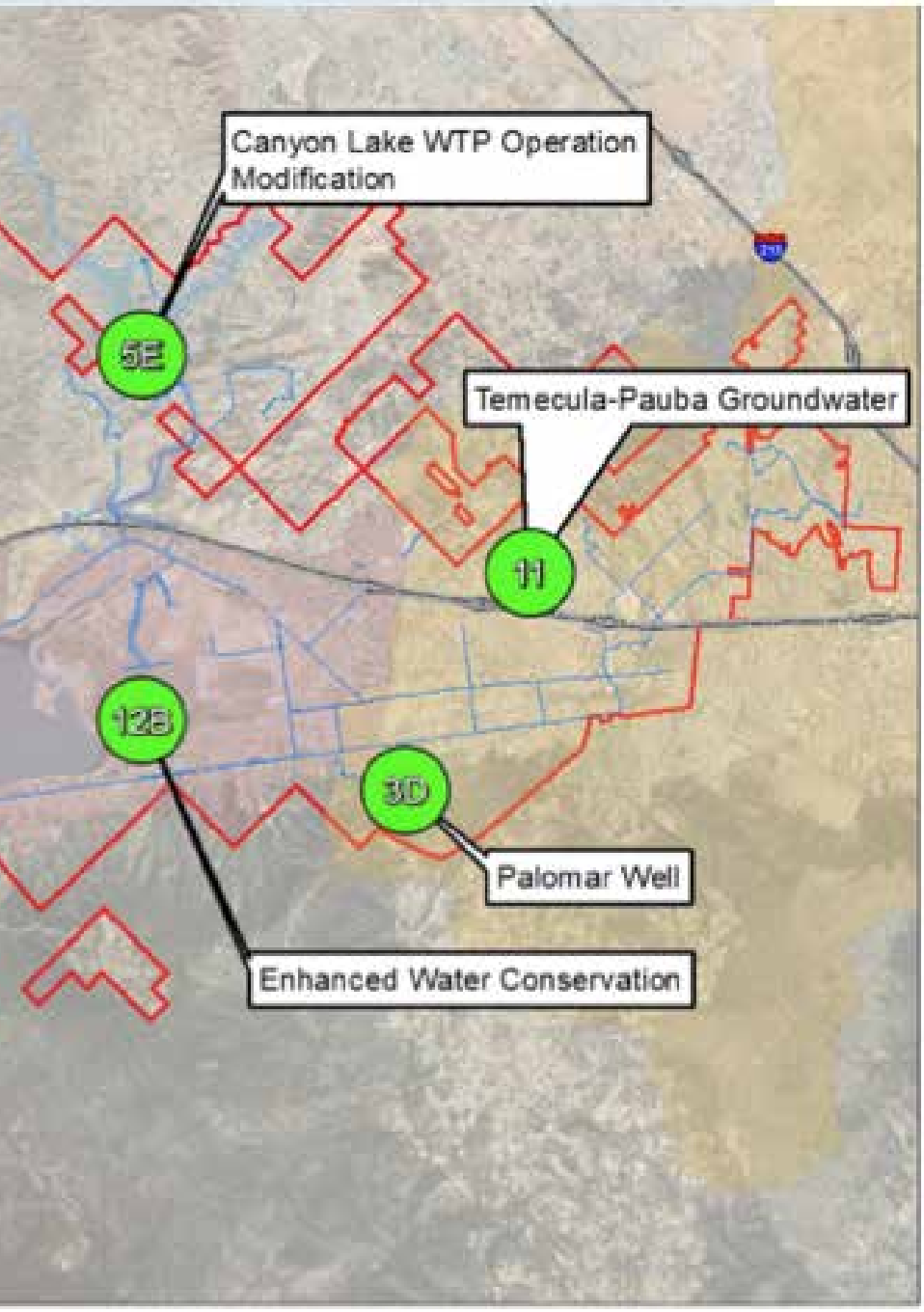
Table 5-5 | Scenario 7 (Hybrid) Water Supply Projects In Relation To IRP Objectives

	IRP objectives						
Projects for Hybrid	Create "New Water"	Increase Supply Reliability	Decrease Dependence On Imported Supply	Promote Reuse	Improve Water Quality	Improve Groundwater Management	Promote Conservation
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	X	X	X		X		
2A-1. Pump Lee Lake Basin groundwater via the TVP; no salt removal treatment			X				
2A-2. Pump Bedford groundwater via the TVP; no salt removal treatment			X				
3D. Palomar Well replacement	X	X	X				
4A. Extract groundwater from Warm Springs Basin; no salt removal treatment	X	X	X				
5E. Modify operation of Canyon Lake			X				
10B. Indirect potable reuse at Regional WRF; injection/extraction with AWT	X		X	X	X	X	
11. Temecula-Pauba groundwater	X	X	X				
12B. Implement increased water conservation measures; enhanced		X	X			X	X

5.4 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

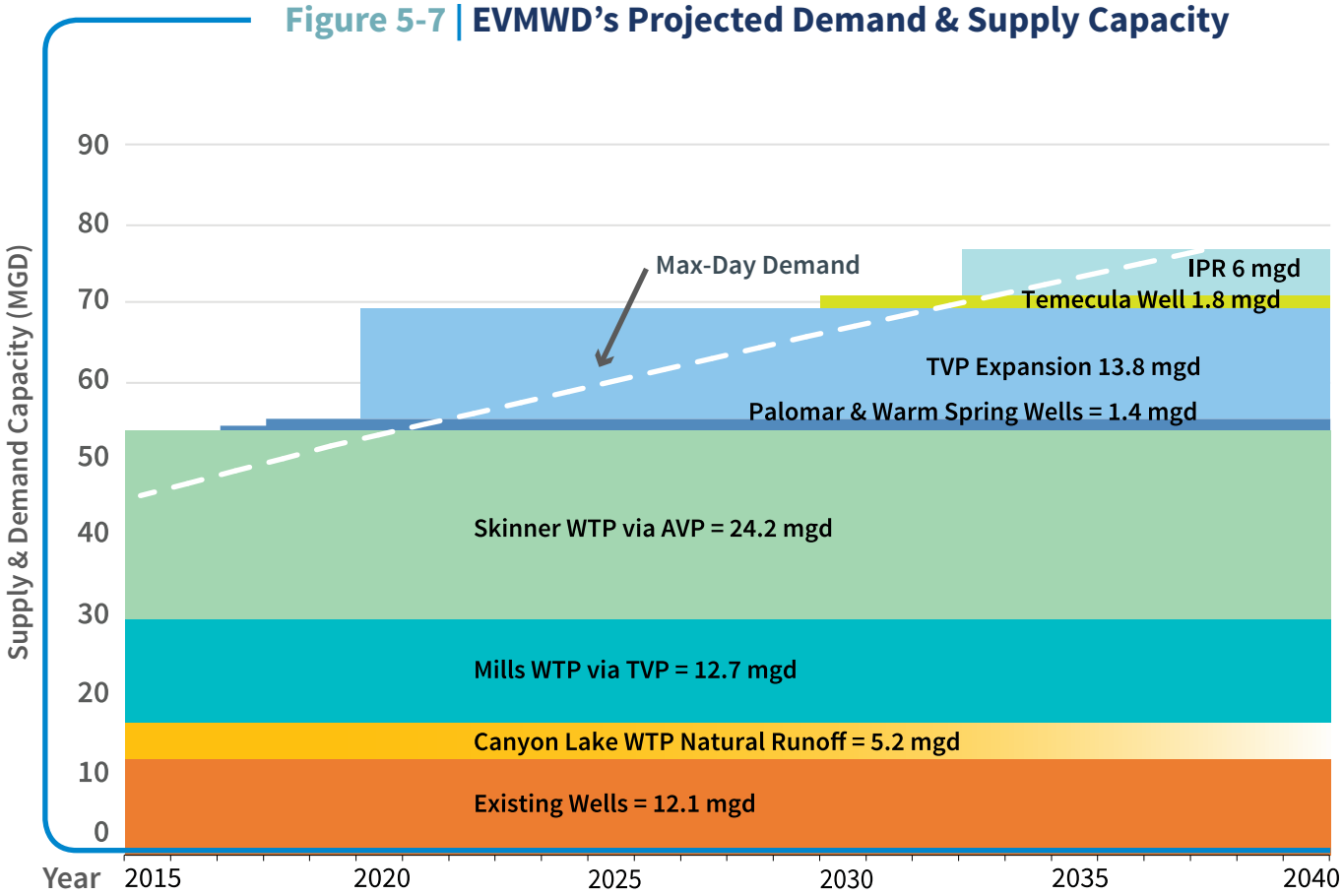
Figure 5-6 | Recommended Hybrid Scenario Location Map




Canyon Lake WTP Operation Modification
5E
Temecula-Pauba Groundwater
11
12B
3D
Palomar Well
Enhanced Water Conservation

5.4 | Recommended Water Supply Portfolio and Project Implementation *(Continued)*

Figure 5-7 | EVMWD's Projected Demand & Supply Capacity



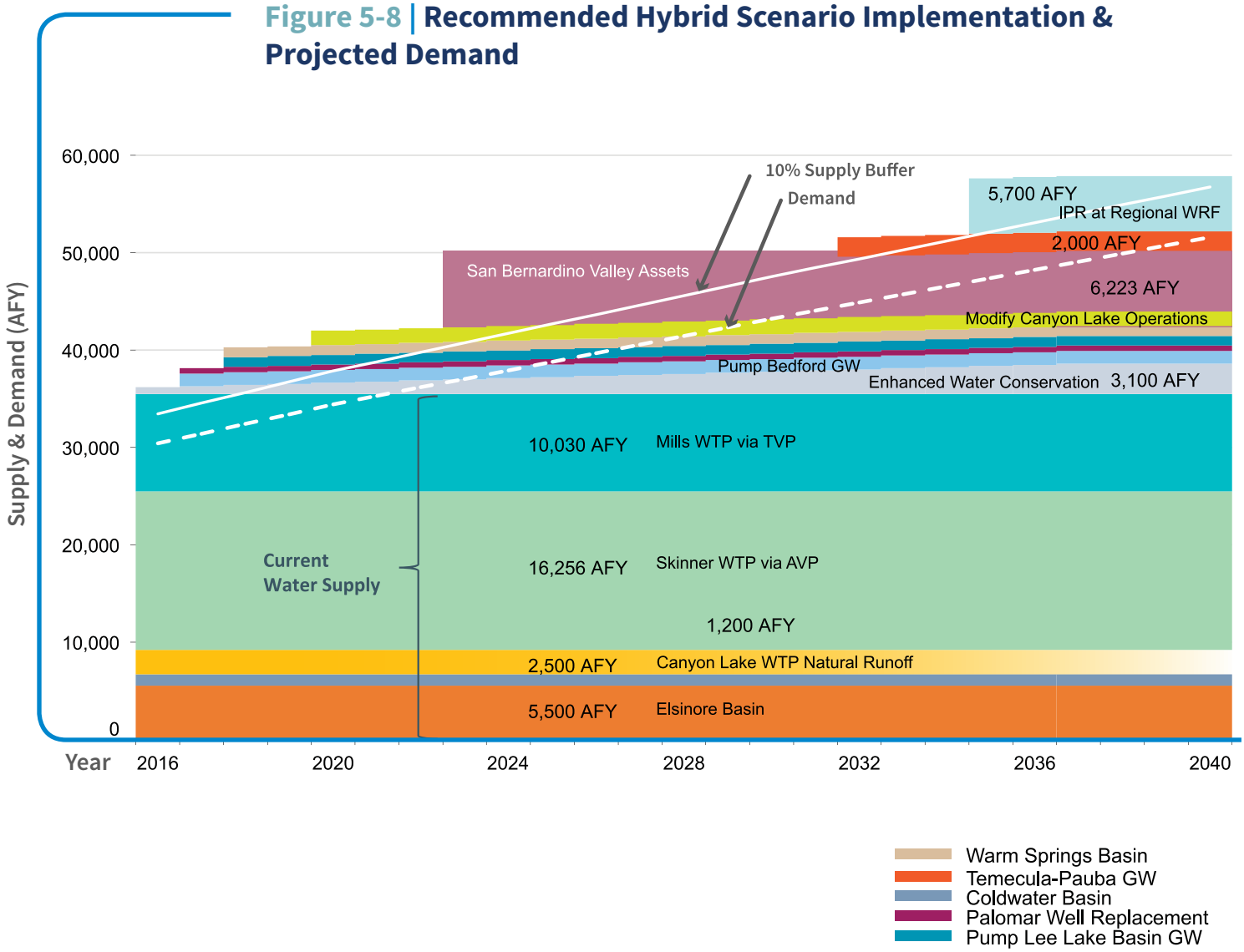
CORE RESOURCES STRATEGY

By completing the extensive project evaluation process described herein, the IRP's Core Resource Strategy was developed. Figure 5-8 depicts the phasing for implementing the Core Resources Strategy recommended supply comprised of projects that will reliably meet 100% of the future water demand, but also provide an additional 10% water supply buffer to hedge against "known" uncertainties (e.g. variations in supply or demand relative to forecasts). In order to address "unknown" uncertainties (e.g. impact of climate change), EVMWD will implement a multi-faceted approach that includes supply development strategies that can

CORE RESOURCES STRATEGY *(Continued)*

adapt to changing conditions, in concert with long-range resource management policies that optimize water supply and storage assets in times of both drought and surplus. Phase 1 consist of implementing the near term-local groundwater supply projects (low hanging fruit). Several triggers will be tracked to delineate implementation of medium (phase 2) and long-term projects (phase 3), including trends in water demand relative to forecasts, imported water supply reliability, trends in supply costs, and regulatory changes that may impact access to groundwater supplies, or affect the ability to meet water quality objectives or conservation targets. The adaptive management framework is further discussed in Section 6 of the IRP.

Figure 5-8 | Recommended Hybrid Scenario Implementation & Projected Demand



CORE RESOURCES STRATEGY PHASING

PHASE 1

The first phase, covering the period 2017-2018, consists of implementing near-term local supply projects, which will increase total supplies by 4,860 AFY. Besides having very minor implementation constraints, these projects also have some of the lowest unit costs ranging from $496/AF – $794/AF, which are significantly lower than imported water unit costs ($1,000/AF). It is expected that most of the projects will be built within a 2-year timeframe, with a preliminary capital investment of $27.2 million and an annual O&M cost of $1.5 million. Table 5-6 provides a summary of the costs and key characteristics for each of the recommended projects.

PHASE 2

The second phase, beginning in 2020, consists of maximizing local assets such as EVMWD's stored water within Canyon Lake and groundwater assets in the San Bernardino Basin Area. The projects will provide an additional 7,700 AFY. The unit cost of these projects (5E and 1J) is $589/AF and $847/AF, respectively. These costs are also below current imported water unit costs. These projects are complex relative to the projects considered for implementation in the first phase. A comprehensive facilities master plan will be performed to determine needed improvements to the Canyon Lake Water Treatment Plant to reliably operate under varying water quality conditions in Canyon Lake. The master plan will also consider the feasibility of expanding the production capacity of the treatment plant. The estimated capital cost and O&M annual expenses are $5.9 million and $502,000, respectively.

Transferring San Bernardino Basin Area supply assets to EVMWD's service area will require movement of water through the City of Riverside's and the City of Corona's water distribution systems. Due diligence, including hydraulic feasibility studies, meetings and negotiations with multiple stakeholders, and creation of agreements are underway. Implementing this option will require improvements to existing conveyance infrastructure. It is expected that the project will be completed in five years. The estimated capital cost and O&M annual expense are, $30.6 million, and $3.5 million, respectively.

PHASE 3

The final phase considers the implementation of two main projects beyond 2030: Temecula-Pauba Well in 2032 and IPR in 2035. The total water supply generated by these projects will be approximately 7,700 AFY. This project involves capturing return flow credits of imported water used in the southern portion of EVMWD's service area, which overlies a portion of the Temecula-Pauba aquifer, via groundwater production facilities. Water use in this aquifer is overseen by the Santa Margarita River Watermaster, which reports to the United States District Court Southern District, Southern Division. The Court appointed the Watermaster in 1989 to administer and enforce the provisions of the 1966 Modified Final Judgment and Decree issued by the Court. A considerable amount of effort has been spent on litigation and water

CORE RESOURCES STRATEGY PHASING *(Continued)*

resource management in the Santa Margarita River Watershed over the last century. Further, it is expected that the Court and Watermaster will formally adjudicate groundwater rights in the Murrieta-Temecula Groundwater Basin. Consequently, pursuing rights to cumulative return-flows in the basin will require significant time, resources and collaboration among stakeholders, a process that could take many years.

Table 5-6 | Summary Of The Recommended Portfolio

Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)
1J. Transfer Bunker Hill Basin groundwater via Riverside and Corona	5.56	6,223	6,223	1.00	30.6	3,547,000	847	400
2A-1. Pump Lee Lake Basin Groundwater via the TVP; no salt removal treatment	0.89	1,000	500	0.50	11.3	227,000	593	800
2A-2. Pump Bedford groundwater via the TVP; no salt removal treatment	1.37	1,300	1,045	0.80	6.6	345,000	542	800
3D. Palomar Well replacement	0.50	560	560	1.00	3.1	106,000	496	400
4A. Extract groundwater from Warm Springs Basin; no salt removal treatment	0.89	1,000	1,000	1.00	6.9	428,000	794	1,000
5E. Modify operation of Canyon Lake	2.5	1,500	1,125	0.75	5.9	502,000	589	800
10B. Indirect potable reuse at Regional WRF; injection/ extraction with AWT	6.00	5,700	5,415	0.95	132.1	5,707,000	2,515	100

Continued on next page

CORE RESOURCES STRATEGY PHASING *(Continued)*

Table 5-7 | Summary Of The Recommended Portfolio

Projects	Capacity (mgd)	Average Yield (AFY)	Dry Year Yield (AFY)	Reliability	Capital Cost (Million dollars)	Annual O&M Cost ($)	Unit Cost ($/AF)	TDS (mg/L)
11. Temecula-Pauba groundwater	1.79	2,000	2,000	1.00	7.8	328,000	375	725
12B. Implement increased water conservation measures; enhanced	0.00	3,100	3,100	1.00	-	1,240,000	400	450
Total	**24**	**22,383**	**20,968**	**204.3**	**0.9**	**12,778,000**	**1,110**	**506**

Indirect Potable Reuse (IPR) has been identified as a key component of EVMWD's long-term water supply strategy. By recharging the Elsinore Basin, IPR supports many of the objectives established within the IRP, most specifically the objectives of increasing water supply reliability during dry years and improving salinity in the Elsinore Basin. EVMWD produces approximately 6,000 AFY of recycled water at the Regional WRF which is primarily used for environmental enhancement. Water levels in Lake Elsinore, a key natural and economic resource for the local community, are maintained by discharging tertiary treated recycled water into the lake. In addition, riparian habitat along the Temescal Wash is sustained by maintaining a steady discharge of tertiary treated recycled water along the wash. Effluent flows from the RWRF are expected to increase to approximately 30 mgd (or 33,000 AFY) at build-out. After reserving approximately 10,600 AFY to protect riparian habitat and environmental enhancement, nearly 20,000 AFY of recycled water will be available for the purpose of IPR (by build-out). EVMWD applied for and received a Title XVI grant from the United States Bureau of Reclamation with a not-to-exceed amount of $150,000 to partially fund an IPR feasibility study. The study will evaluate options to treat Regional WRF tertiary effluent, convey treated water to spreading or groundwater injection sites, and identify facilities to implement IPR. The feasibility study will also determine the preferred IPR project alternative.

The IPR project will require significant regulatory efforts with the California Department of Public Health (now State Water Resources Control Board, Division of Drinking Water, DDW) and the RWQCB to meet the salt and nutrient basin plan objectives, and to comply with existing water rights filings (MWH, 2015). It is expected that the project will be fully implemented by 2032. The estimated capital cost and O&M annual expenses are $132.1 million and $5.7 million, respectively.

CORE RESOURCES STRATEGY PHASING *(Continued)*

EVMWD's conservation program encompasses both "active" and "code-based" conservation efforts. Active conservation consists of EVMWD funded programs such as rebates, installations, and education outreach. Code-based conservation consists of demand reductions achieved through conservation-oriented legislation, building and plumbing codes, ordinances, and usage reductions resulting from changes in price structure (e.g. budget based rates). Active and code-based programs are closely linked to efforts of the California Urban Water Conservation Council (CUWCC), from which EVMWD has adopted and implemented best management practices (BMPs). By pursuing conservation on multiple fronts, EVMWD has achieved well beyond its 20% demand reduction by 2020 as required by SBX7-7. Since 2009, EVMWD's has significantly reduced its per capita water use. Moving forward, EVMWD plans to conserve approximately 3,100 AFY over the planning horizon.

Local stormwater capture projects (3E-2-McVicker and Leach Canyon Stormwater/Imported Water Recharge and 6B-Lee Lake Reservoir Storage) had very poor scores due to their low reliability (only available during the wet years) and implementability (requires large property space) values. Consequently, these projects were not included in the list of recommended projects. Additional investigation is on going to further evaluate these projects and reconsider their potential inclusion in the list of long-term projects.

Project 6B considers the use of surface water rights from Indian Creek/Temescal Creek, Indian Creek, Horsethief Creek, and Mayhew Creek. Since the acquisition of the Temescal System, EVMWD has been serving domestic and agricultural users located in the Temescal area. Last year, EVMWD and Temescal Valley Water District (TVWD) signed an Asset Transfer Agreement. Under the agreement, EVMWD transferred all of the Temescal Agricultural users and portions of the Temescal Agricultural Water System (TWCAWS) to LLWD. In exchange, EVMWD will use LLWD's unutilized conveyance capacity in the Mills Gravity Pipeline up to 7,300 cfs-day. Additional investigation is on going to further evaluate these projects and reconsider their potential inclusion in the list of long-term projects.

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6. PLANNING FOR UNCERTAINTY: CLIMATE CHANGE

The future reliability of imported water will play a key role in EVWMD's water resource management strategies. Hydrologic conditions in tributaries that feed the State Water Project (California Northern Sierras) and the Colorado River Aqueduct (Colorado River Basin) affect the amount of imported water supply that is available in any given year to meet water demands or to replenish regional storage.

Climate change has the potential to affect the reliability of both local and imported water supplies. No formal studies have been conducted to evaluate the impacts of climate change on the Elsinore Valley. However, the results of several studies which have been conducted on a larger scale can be used to indicate trends for Elsinore Valley. For example, studies by the National Center for Atmospheric Research for Inland Empire Utilities Agency suggest a 0.21 to 3.81 degrees F temperature increase and -19 to +8 percent change in winter precipitation in Southern California between 2000 and 2030 (Groves, Knopman, Lempert, Berry, & Waifan, 2008). Studies conducted by the Southern California Association of Governments (SCAG) suggest that current temperatures will increase by 1 to 2 degrees F by 2050, and by 4 degrees F above current levels by 2100 (Governments, 2009). Higher temperatures and reduced precipitation are expected to increase evapotranspiration and irrigation water demands; however, higher temperatures may also result in increased humidity, which could offset a portion of the demand increase. Reliability estimates developed by the California Department of Water Resources (DWR) for the State Water Project (SWP) supplies account for the impacts of climate change.

Traditional planning methods assume that future hydrologic conditions will be representative of past conditions (from early 1900s). However, as demonstrated by current weather patterns, future climate and hydrologic conditions may differ from past observations due to climate change and extremities of climate variation. In addition to climate change and natural variation, other uncertainties such as population projections and unforeseen regulatory changes may pose risks to resource management strategies that assume the status quo.

The consequences of climate change introduce uncertainty in water supply planning for the Elsinore Valley that may require contingency planning. This section discusses EVMWD's strategies to mitigate the impacts associated with climate change.

6. PLANNING FOR UNCERTAINTY ❖ Integrated Resources Plan

6.1 | An Integrated Approach

In order to address uncertainty, EVMWD will implement a multi-faceted approach to ensure that water resources strategy can adapt to changing conditions and that long-range resource management policies are in place to optimize water supply and storage assets in times of both drought and surplus.

1. **Core Resource Strategy:** *Implement a preferred water supply portfolio to meet future water demands. Includes a 10% water supply buffer as a contingency.*
2. **Adaptive Resource Plan:** *Implement alternative water supply options based on changed conditions and triggers. Utilizes EVMWD's WRDSS model to update changed conditions and reevaluate resource strategies.*

6.2 | Core Resource Strategy

As discussed in the previous section, EVMWD will focus on the implementation of the recommended portfolio, which increases long-term water supply reliability by reducing reliance on imported water supplies. This core resource strategy considers planning for a 10% supply buffer to meet future uncertainties.

6.3 | Adaptive Resource Plan

EVMWD's resources management strategies will focus on the following areas:

- ***Long-term groundwater storage in the Elsinore Basin***
- ***Drought management and response***
- ***Continued water conservation***
- ***Acquiring strategic water assets***

EVMWD's WRDSS will be used to simulate the different changed conditions and triggers for these areas and understand their quantitative impacts on water demand, supply and quality. These simulations updates will assist EVMWD to implement a more comprehensive adaptive management approach to identify the best water resources management strategies to enhance its water supply reliability.

6.3 | Adaptive Resource Plan *(Continued)*

6.3.1 LONG-TERM GROUNDWATER STORAGE IN THE ELSINORE BASIN:

EVMWD adopted a Groundwater Management Plan (MWH, 2005) in 2005 that identified conjunctive use projects (CUP) as an important element of basin management. Direct recharge projects that utilize the groundwater basin as a storage facility and allow for the extraction of stored water for use during drought and high-demand periods were identified, designed, and constructed. These direct recharge projects were funded by the MWD as part of their groundwater storage program. During any fiscal year (beginning on July 1st and ending on June 30th), MWD may deliver up to 3,000 AF of water for storage in the Elsinore Basin. EVMWD's dual-purpose wells are used to inject these deliveries into the Elsinore Basin. MWD may also extract up to 4,000 AF of water stored in the Elsinore Basin to offset imported water deliveries.

Since 2010, EVMWD has stored approximately 8,000 AF of imported water during wet periods and extracted the same amount during periods of drought. Given the success of this program and the large storage potential in the Elsinore Basin, long-term groundwater storage will be a key component of EVMWD's adaptive management strategy. EVMWD may utilize a combination of imported water supplies and local Canyon Lake surface water for the purposes of groundwater storage. EVMWD may also choose to expand the existing conjunctive use program with MWD or explore participation in regional dry year yield programs with the intent of storing water in the Elsinore Basin.

For planning purposes, water management experts assume that a 10-year hydrologic cycle in California is comprised of three wet years, four normal years, and three dry years. A 10-year storage program would consider recharging a total of 10,000 AF (2,000 AF each wet year and 1,000 AF each dry year). This volume is based on the fact that during the dry years EVMWD will experience a water shortage condition of around 10% of current water consumption. Consequently, extraction of stored water will be implemented during each of the three dry years at rate of 3,000 AFY.

6.3.2 DROUGHT MANAGEMENT AND RESPONSE:

In 2015, EVMWD updated its existing Water Shortage Contingency Plan (WSCP) to make it consistent with that of regional water suppliers. The WSCP establishes triggers for the implementation of demand reduction measures based on regional water shortages. The WSCP also empowers EVMWD to implement surcharges and penalties to promote conservation and penalize water waste during regional shortages.

6.3 | Adaptive Resource Plan *(Continued)*

6.3.3 CONTINUED WATER CONSERVATION:

The success of EVMWD's water conservation program is demonstrated by the overall reduction in per capita water use since 2007. EVMWD will continue to enhance its on going conservation program by continuing its robust outreach, partnering with developers to promote water efficiency, and incentivizing water conservation as approved by EVMWD's Board of Directors.

6.3.4 ACQUIRING STRATEGIC WATER ASSETS:

On a pro active basis, EVMWD will review on-going and proposed regional and statewide water programs. As part of this effort, EVMWD will work closely with WMWD and may participate in groundwater banking programs outside its service area, purchase permanent water rights on the open market, and participate in regional desalination programs, etc.

While the effects of climate change cannot be precisely estimated, EVMWD's core resource strategy as well as its adaptive resource framework that focuses on four key areas, will assist EVMWD in reliably meeting the long-term water demands within its service area.

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