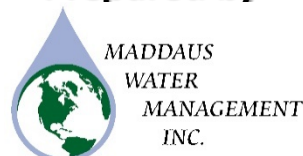




# **2018 Water Conservation Business Plan FINAL DRAFT**

**June 8, 2018**

**Prepared by**



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## Acronyms and Abbreviations

AB	Assembly Bill	MWELO	Model Water Efficient Landscape Ordinance
AF	acre-feet	MWM	Maddaus Water Management Inc.
AFY	acre-feet per year	N/A	not applicable
AMI	Advanced Metering Infrastructure	NRW	Non-Revenue Water
AWWA	American Water Works Association	psi	pounds per square inch
AWWARF	American Water Works Association Research Foundation	REUWS	Residential End Uses of Water Study
BMP	Best Management Practice	SB	Senate Bill
CalWEP	California Water Efficiency Partnership	SB X7-7	Water Conservation Bill of 2009
CEC	California Energy Commission	SF	Single Family
COM	commercial	SFPUC	San Francisco Public Utilities Commission
CII	Commercial, Industrial, and Institutional	ULFT	ultra-low flush toilet
CUWCC	California Urban Water Conservation Council	USBR	United States Bureau of Reclamation
DWR	California Department of Water Resources	UWMP	Urban Water Management Plan
EVMWD	Elsinore Valley Municipal Water District	WBIC	weather-based irrigation controller
FY	fiscal year	WMWD	Western Municipal Water District
GPCD	gallons per capita per day	WRF	Wastewater Reclamation Facilities
gpd	gallons per day	WUE	Water Use Efficiency
gpf	gallons per flush		
gpm	gallons per minute		
HET	high efficiency toilet		
HEU	high efficiency urinal		
ILI	Infrastructure Leakage Index		
INS	institutional		
MAWA	Maximum Applied Water Allowance		
MF	multifamily		
MWD	Metropolitan Water District of Southern California		

## EXECUTIVE SUMMARY

The purpose of the Executive Summary is to briefly describe the Elsinore Valley Municipal Water District (EVMWD) Water Conservation Business Plan (Business Plan). The evaluation process and assumptions used to develop this Business Plan as well as recommendations for future implementation are included herein.

### Project Overview

The purpose of the Business Plan analysis was three-fold: (1) to evaluate current conservation measures and identify new ones that will reduce future water demand; (2) to estimate the costs and water savings of these measures; and (3) to combine the measures into increasingly more aggressive programs then evaluate the costs and water savings of these programs.

EVMWD's Business Plan illustrates that expanding its existing water conservation program efforts in a cost-effective manner will help meet future water needs and the State of California's mandated per capita reduction targets according to the 2009 Water Conservation Act (SB X7-7). As the State continues to adapt to the recent changes due to the 2014-2016 drought, the Business Plan provides two alternative options for higher levels of water conservation programs which would yield higher water use savings. These two additional programs could be implemented if needed to meet state or local drought requirements.

On May 31, 2018, Governor Edmund G. Brown Jr. signed Senate Bill (SB) 606 and Assembly Bill (AB) 1668 centered around "Making Water Conservation a California Way of Life." to help the State better prepare for droughts and climate change by establishing statewide water efficiency standards. SB 606 and AB 1668 establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards, which must be in place by 2022. The two bills strengthen the State's water resiliency in the face of future droughts with provisions that include the following:

- Establishing an indoor, per person water use goal of 55 gallons per day until 2025, 52.5 gallons from 2025 to 2030, and 50 gallons beginning in 2030
- Creating incentives for water suppliers to recycle water
- Requiring both urban and agricultural water suppliers to set annual water budgets and prepare for drought<sup>1</sup>

The process used to develop the Business Plan included analyzing conservation measures and programs using the Least Cost Planning Water Demand Management Decision Support System Model (DSS Model). The evaluation included measures directed at existing customers and new development to help new and existing residential and business customers become increasingly more water efficient. A measure screening of over 126 measures was conducted following the American Water Works Association Conservation Planning Manual M52 methodology (AWWA, 2017).

Three programs were developed to evaluate the net effect of running multiple measures together over time. From this analysis, these three options were put forward for review and selection by EVMWD. Program A identifies measures currently being implemented by EVMWD. Program B is a combination of current measures and new measures that could be implemented to achieve greater water savings. Program C is a compilation of all current and proposed measures that could provide the most water savings, but will not be implemented unless more drastic measures are needed should California face another drought situation. EVMWD has chosen to move forward with implementing Program B to further its conservation efforts.

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<sup>1</sup> <https://www.gov.ca.gov/2018/05/31/governor-brown-signs-legislation-establishing-statewide-water-efficiency-goals/>





EVMWD selected conservation Program B comprised of innovative water conservation measures<sup>2</sup>, including, but not limited to, commercial, industrial, and institutional (CII) indoor water efficiency evaluations and a water neutrality ordinance. The elements of Program B are further presented in Tables ES-1 and ES-2.

The benefits of Program B are as follows:

- Aims to expand existing conservation efforts to help meet future water needs and meet state-mandated year 2020 per capita reduction targets
- Is cost-effective and less expensive than continuing to buy water from Metropolitan Water District of Southern California (MWD) through Western Municipal Water District (WMWD). Many of EVMWD's measures are partially funded by MWD, WMWD, developers, and customers such that the overall measure costs to EVMWD are low.
- Aids EVMWD in becoming more self-sufficient with its water supply
- Is environmentally beneficial and allows EVMWD to be more sustainable

## Program Analysis

The EVMWD Business Plan analysis consisted of two main parts: (1) create a demand and plumbing code (passive) conservation analysis for 2018 to 2040, and (2) evaluate conservation savings potential for the years 2018 to 2040 with a variety of different measures and conservation programs.

The first step in the analysis was to review and analyze historical water use production and billing data. Billing data was provided for the years 2010 to 2017. The data was graphically analyzed and discussed with EVMWD. The historical water use, selected population and employment projections, plumbing code information, and discussions with EVMWD were used to create a demand forecast for the years 2018 to 2040, as further described in Section 2.

Once the demand forecast was completed, 126 measures were presented and the final 25 conservation measures selected by EVMWD were analyzed, as listed in Table ES-1 and described in Section 5. Factors incorporated into the conservation measures analysis included the following:

- Recent California state-wide plumbing standards that were adopted in 2015
- Model Water Efficient Landscape Ordinance (MWELO) – effective December 31, 2015 (DWR, 2015)
- CALGreen building code – effective January 1, 2017, found in Section 3 of the Business Plan (CALGreen, 2016)

The Business Plan presents the water demands with passive savings and conservation program savings determined by this analysis. All the demand scenarios with conservation program savings include the active savings from conservation measures and the passive savings due to plumbing codes. Water savings are considered “passive” due to their inevitable occurrence from implementation of plumbing codes and standards. Water savings are considered “active” if a specific action unrelated to the implementation of codes and standards is taken by the water agency to accomplish conservation measure savings. The plumbing code includes the new California State Law (Assembly Bill 715), which requires high efficiency toilets (HETs) and high efficiency urinals (HEUs) as of 2014, as well as SB 407, which applies to all new construction and replacements as of 2017 for single family and 2019 for multifamily and commercial properties. The three conservation program scenarios are organized as follows:

- **Program A** – 14 measures. Program A represents EVMWD's currently active measures.
- **Program B** – 21 Measures. Program B includes all the measures in Program A plus additional measures that are generally cost-effective, save significant amounts of water, and are recommended for future implementation.

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<sup>2</sup> Though “demand management measure” is not a term used in this report, it may be relevant to readers who are more familiar with the term to understand that it's essentially the same as the term “water conservation measure.”

- **Program C** – Program C includes all 25 measures evaluated and represents the highest cost and most water savings. Program C would be implemented for more severe conservation-required situations.

Table ES-1 presents all 25 conservation measures modeled in this analysis sorted by category.

**Table ES-1. Conservation Measures Evaluated**

Utility Measures	CII Measures	Landscape Measures	Residential Measures
Public and School Education	CII Indoor Water Efficiency Evaluation	Large Landscape Outdoor Water Efficiency Evaluation	Hot Water Recirculating Pump Rebate
District System Optimization Review	CII Rebates to Replace Inefficient Equipment	Landscape Conversion or Turf Removal – Residential*	Landscape Conversion or Turf Removal – Residential*
Water Neutrality Ordinance	Public Agency Program	Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development	Residential High Efficiency Toilet Rebate
Partnership with Energy Utilities	Require Plan Review for New CII	Require Irrigation Designers/Installers be Certified	Clothes Washer Rebate
	CII Leak Alert	Water Conserving Landscape and Irrigation Codes	Pool Cover Rebate
	Cooling Tower Regulations	Financial Incentives for Residential Irrigation and Landscape Upgrades*	Financial Incentives for Residential Irrigation and Landscape Upgrades*
	Financial Incentives for CII Irrigation and Landscape Upgrades*	Financial Incentives for CII Irrigation and Landscape Upgrades*	Leak Repair and Plumbing Emergency Assistance for Low-Income Customers
	Landscape Conversion or Turf Removal – CII*	Landscape Conversion or Turf Removal – CII*	High Efficiency Device Giveaway*
	High Efficiency Device Giveaway*	Residential Outdoor and Indoor Water Efficiency Evaluation*	Residential Outdoor and Indoor Water Efficiency Evaluation*

\*Measures target multiple categories.

Table ES-2 presents EVMWD’s conservation measure program scenarios, indicating which measures have been selected for implementation within each program.

**Table ES-2. Conservation Program Measures**

Measures	Program A	Program B	Program C
Public and School Education	X	X	X
District System Optimization Review	X	X	X
Water Neutrality Ordinance		X	X
CII Indoor Water Efficiency Evaluation		X	X
CII Rebates to Replace Inefficient Equipment	X	X	X
Public Agency Program		X	X
Require Plan Review for New CII			X
CII Leak Alert	X	X	X
Cooling Tower Regulations			X
Financial Incentives for CII Irrigation and Landscape Upgrades	X	X	X
Large Landscape Outdoor Water Efficiency Evaluation	X	X	X
Landscape Conversion or Turf Removal – CII		X	X
Landscape Conversion or Turf Removal – Residential		X	X
Water Conserving Landscape and Irrigation Codes	X	X	X
Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development			X
Require Irrigation Designers/Installers Be Certified (possibly by Irrigation Association or CA Landscape Contractor's Association)			X
Hot Water Recirculating Pump Rebate		X	X
Residential Outdoor and Indoor Water Efficiency Evaluation	X	X	X
Financial Incentives for Residential Irrigation and Landscape Upgrades	X	X	X
High Efficiency Device Giveaway	X	X	X
Partnership with Energy Utilities	X	X	X
Residential High Efficiency Toilet Rebate	X	X	X
Clothes Washer Rebate	X	X	X
Pool Cover Rebate	X	X	X
Leak Repair and Plumbing Emergency Assistance for Low-Income Customers		X	X

Table ES-3 shows the estimated annual savings in acre-feet per year (AFY) in five-year increments for only plumbing codes and no active conservation activity, and for plumbing codes with Program A, Program B, and Program C active conservation program implementation. EVMWD and customer benefit-cost ratios are presented for each program as well as the present value of water savings and utility costs.

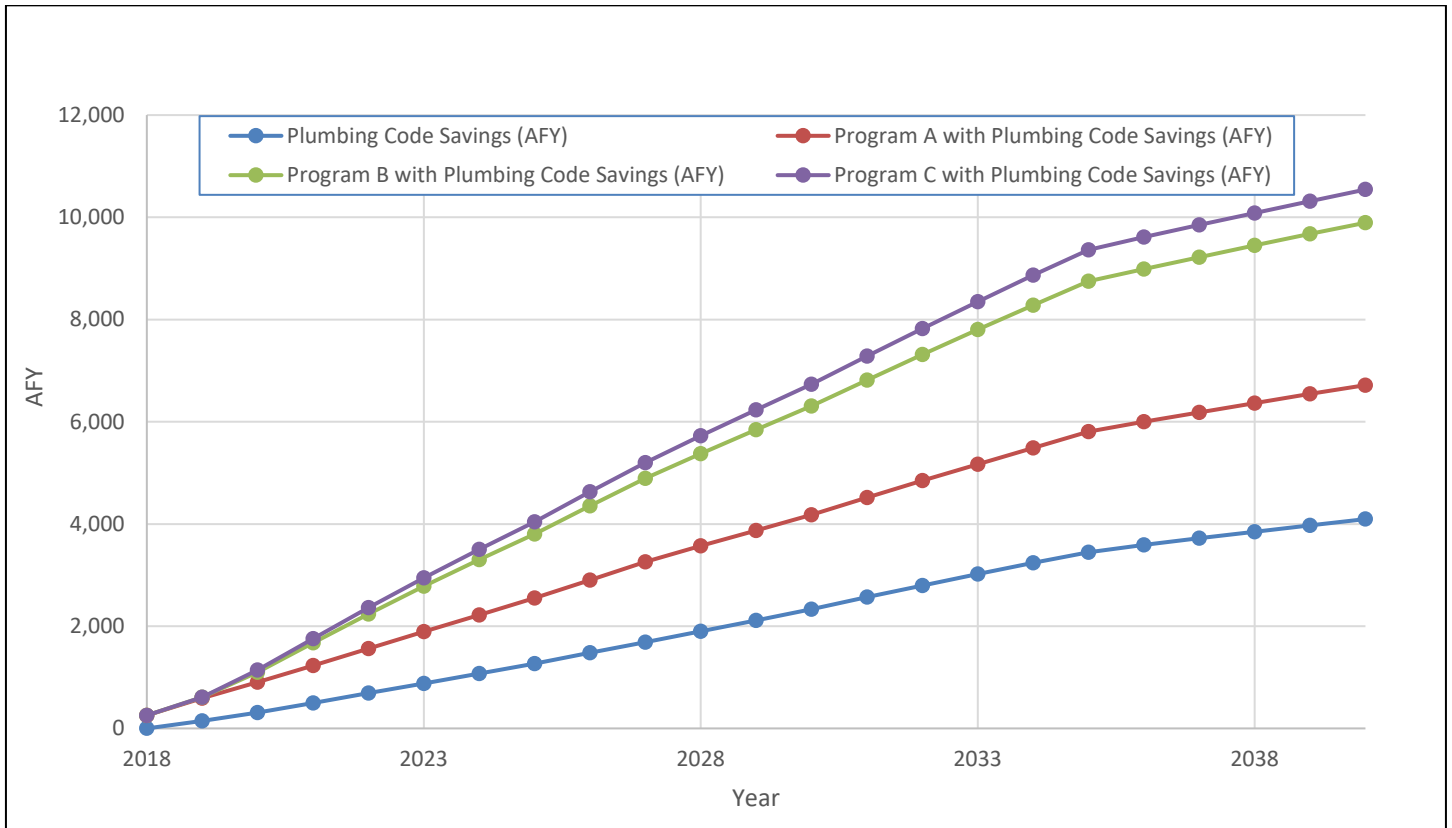
**Table ES-3. Comparison of Program Estimated Costs and Water Savings**

Conservation Program	Water Savings (AFY)					Water Utility Benefit-Cost Ratio	Present Value of Water Savings	Present Value of Utility Costs	Water Utility Cost of Water Saved (\$/AF)
	2020	2025	2030	2035	2040				
<b>Plumbing Code Only</b>	310	1,270	2,330	3,450	4,100	N/A	N/A	N/A	N/A
<b>Program A with Plumbing Code</b>	900	2,550	4,180	5,800	6,720	3.4	\$34,565,000	\$10,089,000	\$270
<b>Program B with Plumbing Code</b>	1,100	3,810	6,310	8,750	9,890	5.3	\$72,940,000	\$13,868,000	\$170
<b>Program C with Plumbing Code</b>	1,140	4,040	6,730	9,360	10,540	4.9	\$80,360,000	\$16,391,000	\$190

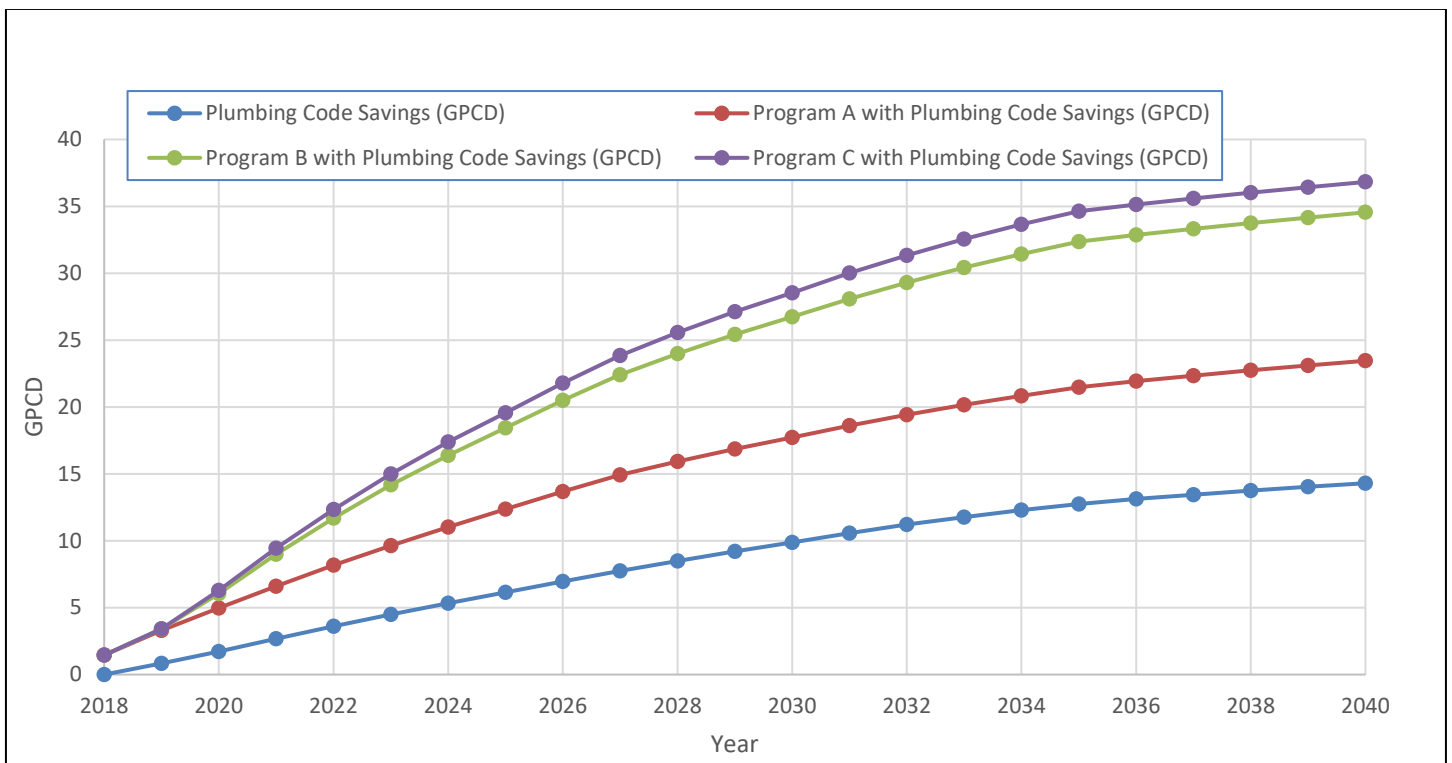
Note: Measure utility costs and staffing covered by SoCal Water\$mart, WMWD, and other partners are not included. The costs presented here are directly attributed to EVMWD only.

Figures ES-1 and ES-2 present estimated average AFY and average gallons per capita per day (GPCD) savings use without conservation and with the plumbing codes only, and with plumbing codes and each of the three alternative programs. Plumbing code includes current local, state, and federal standards for retrofits of items such as toilets, showerheads, faucets, and pre-rinse spray valves.

**Figure ES-1. Water Savings (AFY) with Different Program Options**



**Figure ES-2. Water Savings (GPCD) with Different Program Options**





The selected Program B has an average annual implementation cost of approximately \$582,000 for 2018-2020. Average annual implementation cost includes administrative costs and staff labor. However, the program is intended to be flexible and structured in a “menu/toolbox” format to allow individual measures to change as necessary. This flexible format will allow adaptation to new or best-available technology, changes in cost-sharing partnerships, or other unforeseen needs. It will also enable EVMWD to select or change measures for implementation as needed to reach its conservation goals.

Seven new conservation measures will be employed and will work together to achieve EVMWD’s goals. Successful implementation of Program B will require effort on the part of EVMWD. Recommendations to assist with implementation include the following:

- Track upcoming state regulations regarding CII, landscape, and water loss management
- Consider launching pilot studies for new measures
- Consider soliciting and tracking community input and feedback via an online or phone survey or at outreach and education events
- Prioritize measures that contribute the most to meeting the per capita use targets and that are relatively easy to operate with limited staff
- Consider working with the largest 100 water using customers to reduce water use
- Develop an annual work plan for each plan year as soon as budget is adopted (or in concert with the budget planning process)
- Form partnerships and apply for grants where appropriate
- Outsource to gain enough staff support to administer the expanded program, as needed
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors
- Use the analytical tools annually to help decide on priorities for the following plan year
- Set up a database to store and manage measure participation, cost, and other data to gauge successes and areas that need improvement or added attention
- Update the plan annually, including actual measure participation, projected water savings, and expected per capita water use reductions, to ensure EVMWD is on track to meet conservation goals

A five-year action plan is provided in Section 7 with implementation guidelines for the recommended conservation Program B.



## 1. INTRODUCTION

This section provides an overview of the main components of the Elsinore Valley Municipal Water District water system, describes the purpose and scope of the Business Plan, and provides a project history of the steps used to complete the Business Plan.

### 1.1 Overview of EVMWD System

Elsinore Valley Municipal Water District (EVMWD), a public non-profit agency, was incorporated on December 23, 1950 under the Municipal Water District Act of 1911. The purpose of EVMWD is to finance, construct, operate, and maintain water and wastewater systems serving properties within EVMWD's boundaries. EVMWD provides public water service, water supply development and planning, wastewater treatment and disposal, and recycling services for a 97-square-mile service area in Southwestern Riverside County, California. Currently, EVMWD has over 160 employees who serve approximately 42,700 domestic water service accounts; 1,030 irrigation water service accounts; approximately 34,700 sewer service accounts; and 144 recycled water service accounts. EVMWD provides water services for a service population of over 154,600 residents, with a projected 65 percent population increase by 2040 to over 255,000.<sup>3</sup> EVMWD's population remains consistent throughout the year and does not have a seasonal population.

Most of EVMWD's water supply is purchased from Metropolitan Water District of Southern California through Western Municipal Water District, EVMWD's wholesale agency. EVMWD is governed by a five-member Board of Directors, with each director elected to staggered four-year terms by registered voters within their division. The Board sets governing policy; is the final authority for related appeals; and is authorized to set rates, fees and charges for district services, operations, and debt financing of capital improvements.

In 1968, Canyon Lake area was annexed, adding an additional 1,800 acres to EVMWD. In 1985, the Horsethief Canyon annexation added 960 acres to EVMWD and the California Oaks annexation added another 785 acres. The following year, needing additional imported water, EVMWD entered into an agreement with Eastern Municipal Water District for capacity in the Auld Valley 36-inch pipeline from Lake Skinner. That project brought an additional 27,000 acre-feet annually to EVMWD. In 1990, the Cottonwood Hills annexation added 1,969 acres to EVMWD. Two years later, the Temescal Canyon area was annexed, expanding EVMWD boundaries by 3,001 acres.

Originally, EVMWD was a wholesaler to the Elsinore Water District (EWD), located northwest of Lake Elsinore and surrounded by the EVMWD service area. In 2011, EVMWD acquired EWD, its pipe network, and other facilities to the northwest of Lake Elsinore.

EVMWD's Automated Metering Infrastructure (AMI) implementation project was completed in 2017. Phase II and Phase III of the AMI project were funded with over five million dollars in state and federal grants and almost three million dollars in low-interest loans coming from the state. Approximately 44,000 EVMWD customers use the AMI system to detect leaks, view water usage, set alerts, and gather reports about their home water system in real time through a wireless sensor network. AMI is further explained in Section 2.4.2.

#### 1.1.1 EVMWD Service Area

EVMWD serves communities in the suburbs of Los Angeles and Orange County, within the communities of Lake Elsinore, Canyon Lake, Murrieta, Wildomar and unincorporated communities of The Farm, Lakeland Village, Cleveland Ridge, Rancho Capistrano-El Cariso Village, Horsethief Canyon, Sedco and Temescal Canyon (see Figure 1-1). EVMWD sells water wholesale to the Farm Mutual Water Company, which is located entirely within EVMWD boundaries. Most of the Farm Mutual Water Company's water comes from EVMWD. EVMWD also provides wastewater and recycled water service to customers but does not provide services for storm water disposal or fire protection facilities. Most of the

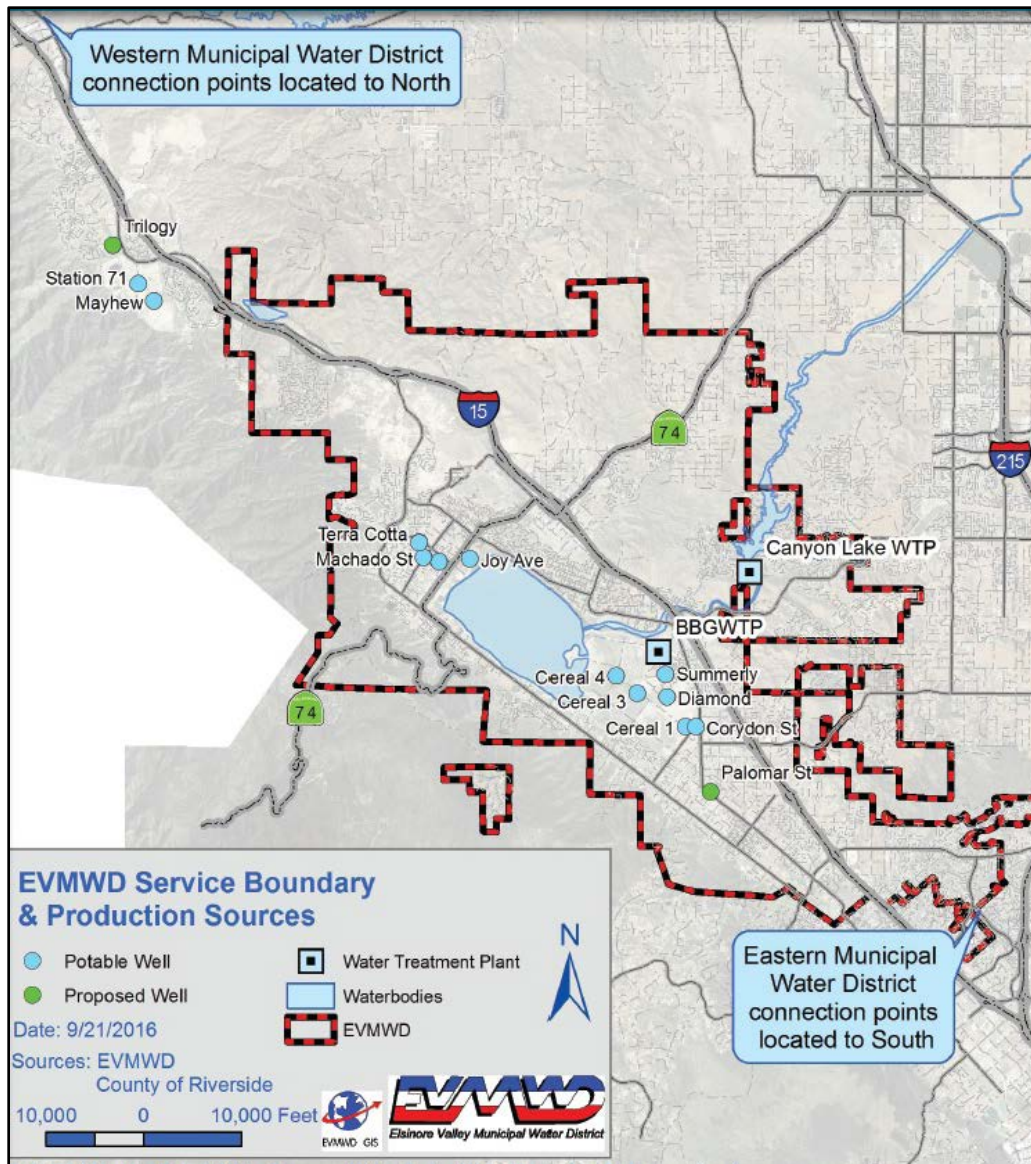
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<sup>3</sup> Infrastructure Engineering Corporation. *EVMWD Water Demand Projection Update 2018 Technical Memorandum – FINAL*, 2018.

service connections are single family residential connections with a small amount of commercial and institutional accounts. EVMWD has no industrial water consumers.

EVMWD’s service area generally experiences pleasant weather for a majority of the year. Typically, July and August are the warmest months of the year. The highest recorded temperature in EVMWD’s service area was 115°F in 1960. Generally, December is the coolest month of the year. The lowest recorded temperature in EVMWD’s service area was 10°F in 1974. The wettest months of the year are January and February. Lake Elsinore averages 12.45 inches of precipitation a year.

**Figure 1-1. EVMWD Service Area**



Source: EVMWD (2016). *Integrated Resources Plan*.

### 1.1.2 EVMWD Water Supply

The Elsinore Valley supports a 287-million-dollar local economy. EVMWD’s water supply is a blend of local groundwater, surface water from Railroad Canyon Reservoir (Canyon Lake), and imported water. On average, more than two-thirds of the supply is imported. Annual water production in the Elsinore Division is about 24,000 acre-feet.



## Groundwater

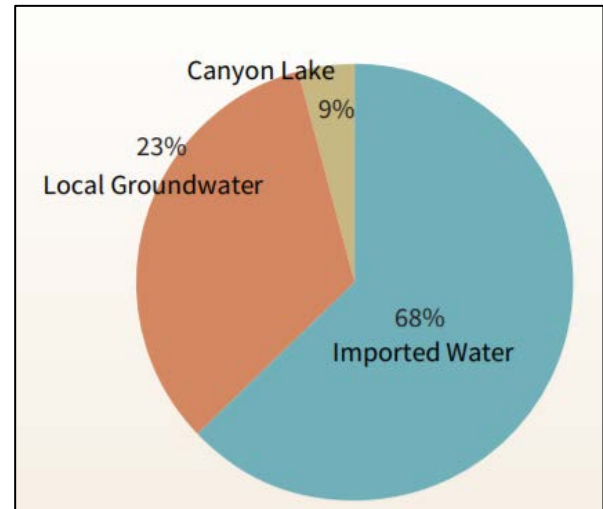
The Elsinore division has eight active municipal wells that provide quality drinking water from a deep aquifer. Several additional wells are planned. Groundwater is disinfected with chlorine and chloramines at the wellhead and represents approximately 20 percent of drinking water supplies in the Elsinore division. All water supplies to the Elsinore Division are disinfected by chloramines, which is a disinfectant commonly used in the United States.

### Railroad Canyon Reservoir

EVMWD owns Railroad Canyon Reservoir, also known as Canyon Lake. The reservoir impounds local runoff from the 750-square mile San Jacinto River watershed. Canyon Lake holds nearly 12,000 acre-feet of water behind Railroad Canyon Dam. Canyon Lake water is treated at the Canyon Lake Water Treatment Plant via conventional treatment methods that use coagulation, sedimentation and disinfection.

### Imported Water

The Colorado River Aqueduct and Northern California provide most of Southern California's water supply. Colorado River water is delivered through Lake Skinner through the Auld Valley pipeline in Murrieta. Water from Northern California is delivered through the Temescal Valley Turnout in Corona. On average, imported water accounts for nearly 70 percent of EVMWD's supply.



Source: EVMWD Agency Profile, updated November 2016.

## 1.2 Purpose and Scope of Business Plan

The Business Plan is intended to serve as a guide and set measurable targets for EVMWD regarding future conservation investments and activities. It includes a functional implementation plan for use by EVMWD to establish and administer cost-effective conservation programs to achieve conservation goals. EVMWD will use this Business Plan in preparation of the 2020 Urban Water Management Plan Water Use Efficiency Chapter; United States Bureau of Reclamation (USBR) required reporting of the former California Urban Water Conservation Council Best Management Practice (BMP) activities; and meeting the 20 percent reduction goals, in gallons per capita per day, by 2020 per the legislation SB X 7-7. The Business Plan will also start EVMWD on a path for compliance with SB 606 and AB 1668, which were recently signed on May 31, 2018.

The evaluation in the Business Plan includes measures directed at existing accounts, as well as new development measures that mandate that new residential and business customers be water efficient. Based on a preliminary analysis of the individual measures, three programs (Program A, B and C) were designed by EVMWD. Each of the three programs were evaluated to determine the net effect of running multiple measures together over the 23-year period of analysis from 2018 to 2040. Assumptions and results for each of the 25 individual measures and three programs are described in detail in this Business Plan.

### 1.2.1 Objectives of Business Plan

The Elsinore Valley Municipal Water District's 2018 Water Conservation Business Plan incorporates EVMWD's specific objectives as follows:

- Provide assessment, analysis, and measurement of completed and existing water conservation programs
- Identify new water conservation opportunities
- Determine prospects for leveraging EVMWD resources through partnership funding

### 1.2.2 Conservation Savings Goals

EVMWD is committed to implementing a water demand reduction through conservation savings and water recycling.

With Southern California's semi-arid climate, water sustainability will always be a priority. EVMWD's goal is to encourage water saving habits that will eventually become "ways of life" for its customers. Through implementation of the Business Plan, EVMWD will create opportunities to make its service area more water efficient. This will allow EVMWD to pursue grant opportunities to fund new programs, educate customers on easier ways to save, and explore innovative solutions to improve efficiencies. Currently, the goal is to implement Program B and stay in compliance with any state regulations.



### 1.2.3 Structure and Basis of Existing EVMWD Conservation Program

Water use efficiency is key in Southern California, and EVMWD customers have taken many steps to save water through its programs. To ensure standards set by the efficiency industry are met, EVMWD has been a member of the former California Urban Water Conservation Council (CUWCC) since December 2002. In 2017, the CUWCC was reorganized into the California Water Efficiency Partnership (CalWEP), of which EVMWD is also a member. As a member agency of Metropolitan Water District of Southern California and a sub agency of wholesaler Western Municipal Water District, EVMWD partners SoCal Water\$mart for most of its conservation programs. Historically, over 25 separate rebate programs have been offered to EVMWD's customers through WMWD and SoCal Water\$mart. These programs provide device and appliance rebates for indoor and outdoor water use efficiency. While these programs enhance EVMWD's water efficient programming, they do not stand alone. Extensive outreach and education to EVMWD customers is required to assist in using devices and changing behaviors. This includes instruction to customers through workshops and residential/commercial water use evaluations, collateral materials and use of video and other online tools. Program funding is limited through the SoCal Water\$mart and WMWD programs, so it is essential for EVMWD to consider alternative funding when programs sunset.

## 1.3 Project Background

Since the inception of EVMWD's original Water Conservation Business Plan (2009), a substantial shift in the challenges and drivers for water management has occurred and includes the recent drought, state water supply conditions, and compliance with water conservation regulations. In 2016, EVMWD received a grant from the US Bureau of Reclamation for \$92,000 to update its Water Conservation Business Plan. This updated plan would allow EVMWD to implement measures more in line with current state conditions regarding water sustainability and reliability. The revised plan would consider best management practices more in line with current state regulations and best practices in the industry. The requirements of the specific US Bureau of Reclamation grant are available in Appendix A.

The intent of this document is that it be not just a conservation plan but also a "business plan." It represents how EVMWD seeks to continue to develop a conservation program that is cost-effective, can be implemented efficiently, and directly addresses service area needs while targeting EVMWD and California state goals. The goal of the business plan is to optimize program cost and water savings. It also evaluates whether expanding existing efforts is a feasible and cost-effective way to meet future water needs in comparison to using and/or developing other water supply sources. Based on the analysis of current water use patterns, and considering characteristics of the service area, a list of 126 potential



conservation measures was compiled and reviewed with EVMWD. During the measure screening process 25 measures were selected for further detailed economic analysis.

A water savings and benefit-cost evaluation was performed on all the selected measures using the Least Cost Planning Water Demand Management Decision Support System Model developed by Maddaus Water Management, Inc. (MWM). This DSS Model is a planning tool that assists water planners with evaluating alternative water conservation programs. The model itself is an end-use model that calculates water savings, costs, and benefits from individual measures as well as programs comprised of several measures. Projections of future water demand with and without water conservation programs are made for EVMWD's water service area. Calculations are made for every year in the 23-year analysis period.

## 1.4 Project Timeline

### October – December 2017

- MWM selected to prepare Business Plan
- MWM presented overview of process for plan development to EVMWD's Board of Directors
- Data request submitted
- Data collection and analysis from EVMWD
- MWM conducted literature review
- Measure list was reviewed and finalized by EVMWD for conservation measures analysis

### January – March 2018

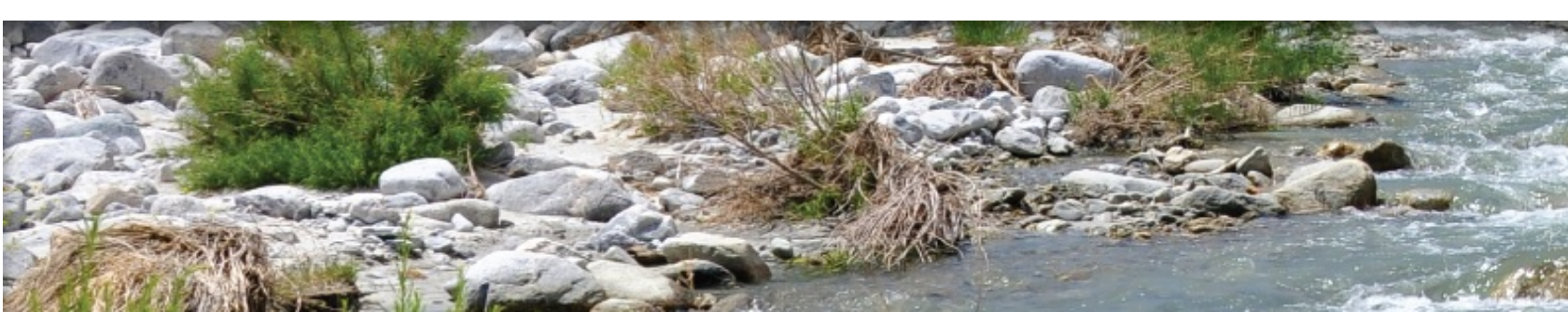
- MWM worked directly with EVMWD staff to design individual conservation measures (program start and end date, assumed participation rates, incentive and utility cost values, etc.)
- Set up and calibrated a DSS Model to evaluate water savings, costs and benefits from potential conservation measures
- Held meetings with EVMWD staff to review conservation modeling results and preliminary findings

### April – May 2018

- Finalized DSS Model
- MWM created Draft EVMWD Business Plan
- EVMWD staff reviewed Draft Business Plan

### June 2018

- Final Business Plan completed
- Final Business Plan submitted to US Bureau of Reclamation as part of the grant reporting requirements



## 2. HISTORICAL WATER USE

This section presents information about the Business Plan data collection process as well as historical production and customer category consumption data. A summary of EVMWD's historical and current conservation efforts are also provided.

EVMWD's water use patterns were analyzed based on water production and consumption data from staff; water loss was examined as well. Historical monthly water use data was analyzed and data from 2017 was selected by EVMWD to be used to derive typical average water use per account per day. It was determined that other data from recent years was affected by drought and recession. Data from each customer category was analyzed separately. Based on EVMWD's water billing system, residential water use was broken down into single family and multifamily categories. Historical data was segregated into indoor and outdoor water use by customer type using the monthly billing data. Non-residential categories of use were analyzed separately. Average daily commercial and institutional water use was expressed on a gallons-per-account or gallons-per-employee basis.

### 2.1 Information Review and Data Collection Methods

A thorough collection and review of information relevant to this effort was conducted and can be found in EVMWD's Data Collection Workbook. At the beginning of the project effort, a preliminary draft electronic Excel Data Collection Workbook was provided to EVMWD with a detailed checklist that included instructions regarding what data was needed to conduct this analysis. To help streamline the process, MWM initially entered data from readily available sources like the 2015 Urban Water Management Plan (UWMP) and EVMWD end-use master database, into the Excel data collection workbook prior to sending the file to EVMWD staff for updating and review. A screen shot of the Data Collection Workbook checklist is shown in Figure 2-1.

Using the provided end-use data from EVMWD, MWM verified the number and types of customers within the EVMWD service area. The EVMWD master database was used to generate account and consumption customer data in a geocoded format by name, address, city, zip code, and type of customer. The "type of customer" field will provide a description of the end user. For the purposes of this project, "end user" is defined as the type of customer; i.e., hospital, restaurant, car wash, commercial laundry, etc. Several tasks of data review were conducted between EVMWD staff and MWM as the EVMWD master database was mined for valuable historical information. Monthly production data from 1999 to 2017 was reviewed, while monthly consumption data from Jan 2010 through Dec 2017 was reviewed due to the labor-intensive process of extracting monthly use and account data by the eight customer categories analyzed. MWM used the master database to organize the data by the following sectors:

- Single Family Residential
- Multifamily Residential
- Residential Dedicated Irrigation
- Commercial & Institutional Dedicated Irrigation
- Commercial
- Institutional
- Dedicated Landscape Irrigation
- Miscellaneous

These sectors are defined by USBR and the former CUWCC BMPs. Multiple webinar conference calls were held with EVMWD staff and MWM to review end-use data and sector information. Many of these meetings garnered critical buy-in from key EVMWD staff in other departments for the Business Plan.



Figure 2-1. Data Collection Workbook



**MADDAUS**  
WATER  
MANAGEMENT INC.

## Data Collection Workbook

Elsinore Valley Municipal Water District Demand and Conservation Projections Update

[Detailed Instructions](#)  
[FAQ](#)  
[Contact Info](#)

**Instructions:** Please complete the following:

**Step 1: Data Entry** - Click on each "Data Item" link to go to the associated data sheet. When in that data sheet, enter the requested data in the red cells and verify, or correct if needed, the data in the yellow cells. Once all the data has been entered / verified return to this "Checklist" Page and change the status field drop-down menu from "Incomplete" to "Data Entered/Verified".

**Step 2: Data Verification** - Click on each "Data Item" link to go to the associated data sheet. When in that data sheet, verify, or correct if needed, the data in the yellow cells. Once the data has been verified, return to this "Checklist" page and change the status field drop-down menu from "Not Verified" to "Verified".

  
**Checklist**

Step 1: Data Entry		
Status	Data Item	Description / Comments
<b>Required Data</b>		
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Water Production by Supply Source</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Consumption and Accounts</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Avoided Operational Costs</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Maximum and Average Day Production</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Capital Improvement Plans</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Top 100 CII Water Users</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Single Family Water Rates</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Commercial Water Rates</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Single Family Sewer Rates</a>
<b>Requested Data</b>		
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Commercial Account Closures</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Single Family Lot Sizes</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Water System Audits</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Abnormal Years</a>
<input checked="" type="checkbox"/>	<a href="#">Data Entered/Verified</a>	<a href="#">Questions and Comments</a>

Step 2: Data Verification		
Status	Data Item	Description
<b>General Info</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Agency Info</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Contact Info</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Planning Documents</a>
<b>Historical Data</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Customer Classes</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Historical Service Area Population</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Historical Service Area Jobs</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Historical Weather Data</a>
<b>Projected Data</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Projected Population</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Projected Jobs</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Unemployment Rates</a>
<b>Census Data</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">DP-1 General Profile and Housing Characteristics</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">DP03 Selected Economic Characteristics</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">DP04 Selected Housing Characteristics</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">B25033 Population in Housing Units</a>
<b>Costs</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Supply Projections</a>
<b>Survey Answers</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Answers to Survey Questions</a>
<b>Conservation</b>		
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Conservation Targets</a>
<input checked="" type="checkbox"/>	<a href="#">Verified</a>	<a href="#">Historical Conservation</a>

## 2.2 Production versus Consumption

Historical water production data for EVMWD was analyzed monthly and is shown in Figure 2-2, which illustrates the total production versus total consumption. Water production data was measured at the respective sources. Water consumption data was measured at the customer meters. Monthly water production from groundwater, surface water, and imported water sources for EVMWD is displayed from 1999 through 2017. Consumption data was tracked for the years 2010 through 2017; data prior to 2010 was not readily available for the eight customer categories analyzed. During the most recent drought period, EVMWD went up to tier 5 water rate charges and went through multiple drought stages (2, 3a, and 4a) to further encourage water conservation for its customers. The production and consumption were significantly reduced in 2014–2016 due to the historic State of California multi-year drought. On January 17, 2014, Governor Edmund G. Brown, Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response. Statewide mandated drought restrictions began in 2014 and were in effect until 2017. Therefore, some of the decrease in water use was not a true long-term reduction in water use, but only a

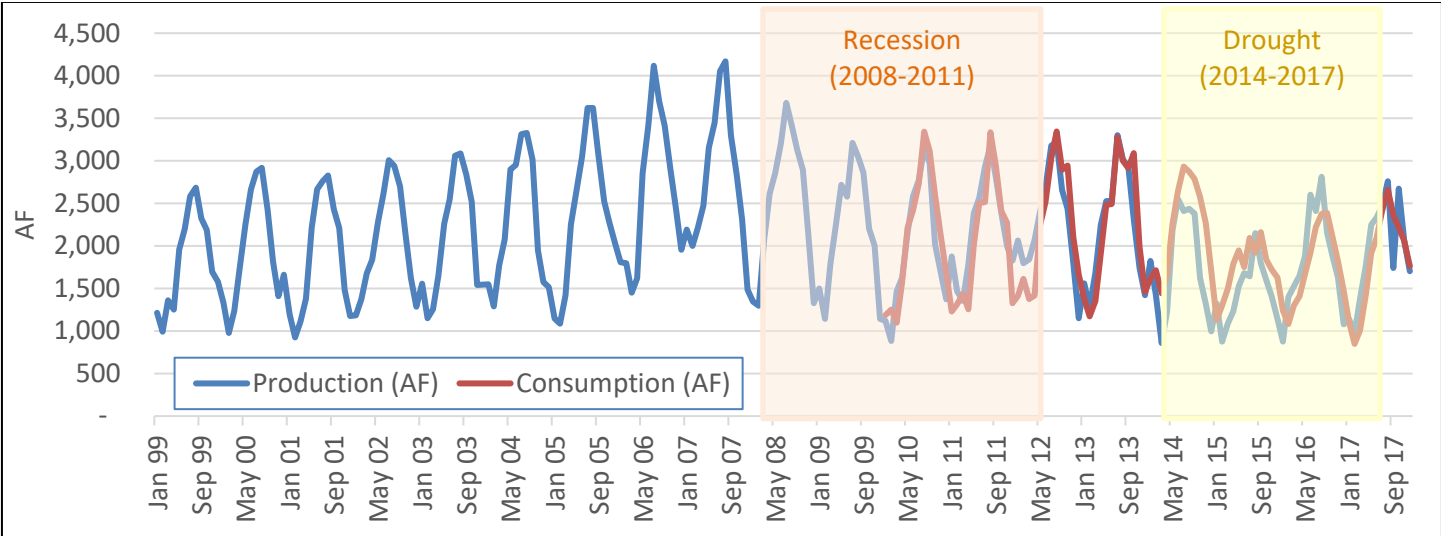
Elsinore Valley Municipal Water District's 2018 Water Conservation Business Plan

21



reflection of the drought restrictions. The production and consumption increased slightly in 2017 when drought restrictions were removed.

Figure 2-2. Water Production and Consumption\*

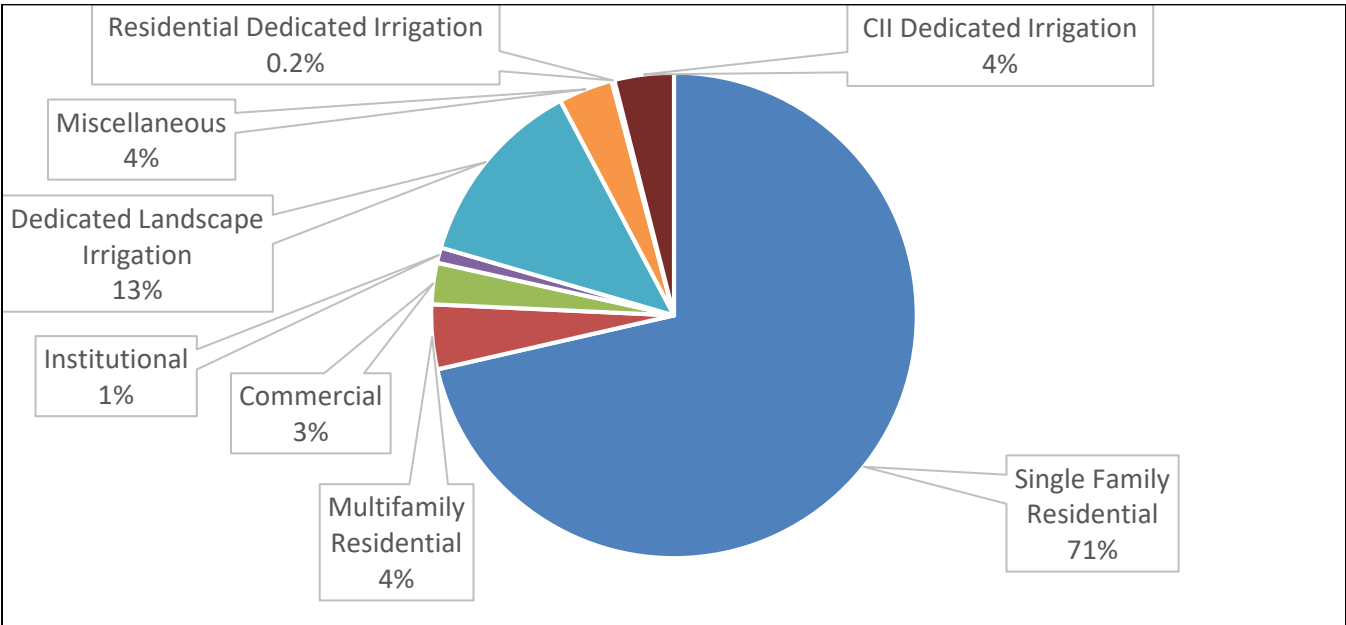


\*Consumption data prior to 2010 was not readily available for the eight customer categories analyzed.

2.3 Consumption by User Category

EVMWD has several different types of water users. The current and projected user categories in EVMWD may be generally classified as Single Family Residential, Multifamily Residential, Commercial, Institutional, Dedicated Landscape Irrigation, Miscellaneous, Residential Dedicated Irrigation, and CII Dedicated Irrigation. EVMWD is a mostly residential community, with light commercial activity. The largest category of water users in EVMWD is the single family residential users who consume more than 70 percent of the water sold. Shown in Figure 2-3 is the average annual consumption of the various user categories, based on average historical monthly water use and account data for 2017 for all customer categories. This is used to derive typical average per account per day water use. Residential use is approximately 75 percent of the total, typical of a community without significant commercial or industrial uses.

Figure 2-3. Consumption by User Category



## 2.4 Historical and Current Conservation Program

EVMWD has a committed partnership with its customers to provide knowledge, programs, and incentives to achieve water savings and make conservation a way of life. Through local events, educational trainings, conservation programs and awareness-building campaigns, EVMWD aims to collaborate with customers to secure its most precious resource. As a current member of CalWEP (and former member of CUWCC), EVMWD uses its resources to develop strategic plans that will help meet efficiency goals and needs for all.

### 2.4.1 Water Waste Prevention Ordinances

EVMWD and the cities it serves have ordinances in place to help alleviate water waste and increase water efficiency with its customers. These ordinances are explained below:

- EVMWD's Water Shortage Contingency Plan Ordinance 225
  - Updated to reflect Metropolitan Water District's Water Surplus and Drought Management Plan and Western Municipal Water District's Water Shortage Contingency Plan. This ordinance's purpose is to assure the highest beneficial use of EVMWD's water supplies and reduce water consumption for different stages of drought/water shortage conditions.
- Water Efficient Landscape Requirements
  - City of Lake Elsinore (Chapter 19.08) – to use water as efficiently as possible, Water Efficient Landscape Requirements were adopted. The intent of these requirements includes promoting the benefits of landscape, establishing structure for water efficient landscapes in new and rehabilitated projects, and establishing provisions for water management that eliminate water waste. Through these measures, the goal is to achieve water efficiency through public awareness, education, and motivation to embrace effective practices.
  - City of Murrieta (Chapter 16.28) – a code of Landscaping Standard and Water Efficient Landscaping is used to achieve water management practices and as well as prevent water waste. Requirements are implemented to help meet the State of California's Model Water Efficiency Landscape Ordinance of 2015 is governing code. Through water efficient structure establishment, this code will help promote water efficient landscaping and reduce water waste.
  - City of Wildomar (Resolution No. 2015-70) – directly relating to landscaping, this resolution is to promote the value and benefits of conserving water supplied by EVMWD. Water efficient landscape standards are to be followed for all new development and rehabilitated projects. These standards include providing a Maximum Applied Water Allowance (MAWA), prevention of overspray or runoff, and reducing the water demands for landscapes.



### 2.4.2 Metering

Most water service connections within EVMWD's service area are set up with Advanced Metering Infrastructure and the remaining connections are set to be converted in the near future. The AMI accounts are billed monthly based on each individual meter's water consumption. EVMWD's Advanced Meter System uses state-of-the-art metering technology for residential and commercial water customers. Through EVMWD's AquaHawk Portal, the AMI meter transmits hourly water usage information to EVMWD's Customer Service Center, four times per day, over a secure communication network. Water use is measured with near real-time accuracy and allows customers to set alerts if continuous or highwater use occurs. The Advanced Meter System also reduces water loss through the proactive identification of water leaks on customer service lines through AquaHawk's daily alert report that is sent to EVMWD staff for evaluation.



### 2.4.3 Conservation Rates

EVMWD uses a variable water rate established by the number of units of water delivered to a property that consists of four tiers that impose higher rates as the level of water use increases. A reasonable amount of water is allocated to each residential, irrigation and recycled water customer based on their needs. This is referred to as a “water budget.” The indoor water budget is calculated by the number of people in the household with an allocation of 55 gallons of water per person per day. The outdoor water budget is calculated by the amount of irrigated square footage per parcel, the average daily plant water loss (“evapotranspiration”), and a “plant factor” of 0.60 that reflects the water needs of local plants native to EVMWD’s service area. Above that water budget, inefficient and excessive water use will cost customers more, because it costs EVMWD more to secure the additional water supply. EVMWD’s water commodity rates, monthly fixed meter charges, wastewater rates, water capacity fees for 3/4-inch meters, and meter installation charges can be found in Appendix B.

### 2.4.4 Public Education, Outreach and Incentives

EVMWD provides a variety of programs and educational initiatives to assist customers in leading more water efficient lifestyles.

#### **Residential Efficiency Rebates**

In partnership with Western Municipal Water District and Metropolitan Water District, numerous rebates are offered for residential customers to upgrade their properties to be more water efficient. Rebates offered include free sprinkler nozzles, upgrades to indoor and outdoor water fixtures to reduce water use, pool covers to reduce evaporation, and turf removal to convert grass to water efficient landscaping.

Since 2010, 2,892 rebates have been provided to residential properties for upgrades to indoor fixtures such as high efficiency toilets and high efficiency clothes washers. For outdoor upgrades, a high of 7,081 rebates have been provided for items including weather-based irrigation controllers (WBICs), rain barrels, and rotating sprinkler nozzles. For turf removal, 218 acre-feet of turf have been removed and converted to water efficient landscaping.

#### **Commercial Efficiency Rebates**

In partnership with Metropolitan Water District, rebates are offered for commercial customers to upgrade to more water efficient standards, including upgrades to indoor and outdoor fixtures as well as operational equipment. In addition, turf removal has been offered to commercial properties.

Over the span of the last five years, more than 800 rebates have been provided to commercial properties for advancements in water efficient fixtures, including HETs and WBICs. Turf removal has also been a successful program. It has helped five schools in the Lake Elsinore Unified School District and multiple associations to convert existing turf to water efficient landscaping.

#### **Workshops**

EVMWD offers a variety of workshops on water-related topics designed to help educate residential customers. Topics offered include California Friendly Landscape Training, Composting, Drip Irrigation, and Using Your Controller. All workshops are free to EVMWD customers and are hosted at EVMWD’s headquarters.

Promoting the workshops includes sending out flyers in the mail, posting information on social media, sending e-mail blasts, and newspaper articles. These marketing materials are sent out to customers up to one month prior to the day of the workshop.

#### **Outreach Activities**

EVMWD offers continuous conservation-related messaging through its website [www.evmwd.com](http://www.evmwd.com), its microsites <http://evmwd drought.com/>, and Elsinore Eddie’s Gardens <http://elsinoreeddieefficientgardens.com/>. These websites contain a of variety of brochures, fact sheets, photo visuals, and other conservation program information. In addition to the websites, EVMWD is involved in a variety of public community events to further promote conservation. EVMWD

plans to host booths offering printed conservation materials for customers, including rebate program information, water-wise living tips, and free conservation devices. EVMWD currently hosts several of its own events and participates in events throughout its service area to share its conservation message. The outreach activities are an effective way to further educate customers on conservation practices and work directly with the community to promote conservation. EVMWD conducts significant and ongoing social media outreach initiatives as well.

## **Education**

Throughout the school year, EVMWD works with local K-12 schools to educate students on conservation and the importance of participating. Educational programs used by EVMWD include local poster contests to showcase the “Water is Life” concept; field trips to EVMWD water treatment facilities and water efficient gardens; and promotion of grant opportunities encouraging classes to create and implement water-related projects at their schools.

### **2.4.5 Programs to Assess and Manage Distribution System Loss**

Through EVMWD’s Meter Testing Program, meter accuracy can be monitored to ensure that water consumption is billed at an equitable rate and all usage is accounted for. The testing program adopted by EVMWD is guided by the accuracy parameters set forth by the American Water Works Association (AWWA). The data obtained through testing is also used for the Water Loss Audit required by the California Department of Water Resources (DWR). With approximately 45,000 meters in the EVMWD service area, 0.05 percent of meters are tested annually as determined by DWR. EVMWD continues to implement the Meter Testing Program on an annual basis to further increase efficiencies throughout the operating system.

### **2.4.6 Water Conservation Program Coordination and Staffing Support**

EVMWD’s water conservation staff consists of a Water Efficiency Specialist overseen by a Community Affairs Supervisor. Both positions are EVMWD’s points of contact for water conservation related discussions, support, distribution of conservation materials, and outreach opportunities. Historically, EVMWD’s customers have been offered over 25 separate rebate programs operated through WMWD and SoCal Water\$mart. These programs complement EVMWD’s water efficient programming. It is important to note that staffing and cost for measure implementation efforts conducted by SoCal Water\$mart and other partners are not included in this analysis as they are not funded directly by EVMWD.

### **2.4.7 Best Management Practice Compliance**

MWM reviewed and analyzed for completeness all BMP compliance completed by EVMWD that existed for Fiscal Year 2014-15. EVMWD was on track for all BMP compliances for FY 2014-15. No cost-effective BMP exemptions are required due to EVMWD meeting all requirements. With the sunset of the CUWCC, it is no longer required for BMP reports to be submitted directly for the CUWCC. Note that the USBR still requires BMP reporting. The yet to be completed FY 2016-17 reports were not reviewed by MWM and therefore are not part of this report.

### **2.4.8 Current Conservation Funding Strategy and Finance Efforts**

EVMWD actively pursues outside funding sources, including grants, partnerships, and supporting agencies.

## **Bureau Grants**

- In 2016, EVMWD was awarded a grant from the US Bureau of Reclamation for \$92,000 for the development of this Business Plan.
- In mid-2018, EVMWD found a grant opportunity through the US Bureau of Reclamation: the Water Conservation Field Services grant. EVMWD applied for the funding to explore current water loss levels, supporting a review of the EVMWD AWWA audit to identify any potential to reduce water loss. If accepted, it would support implementation of the District System Optimization Review measure. (More details can be found in Appendix C.)
- Water and Energy Efficiency grant – applications are cyclical and usually accepted annually in May.

- Small Scale Water Efficiency Projects – applications are cyclical and usually accepted annually in July.

Water\$mart regularly holds grant workshops, at which time applicants are advised of any upcoming opportunities.

#### **Partnerships and Supporting Agencies**

Additional existing and potential funding opportunities through partnerships are presented in Table 4-1 for each analyzed conservation measure. For example, EVMWD partners with SoCal Water\$mart to offer rebates to CII customers for upgrading inefficient equipment.

### 3. DSS MODEL OVERVIEW

This section presents information regarding the DSS Model, its methodology, the various plumbing codes applied in the DSS Model, current fixture proportions, and projected plumbing code savings.

#### 3.1 DSS Model Overview and Methodology

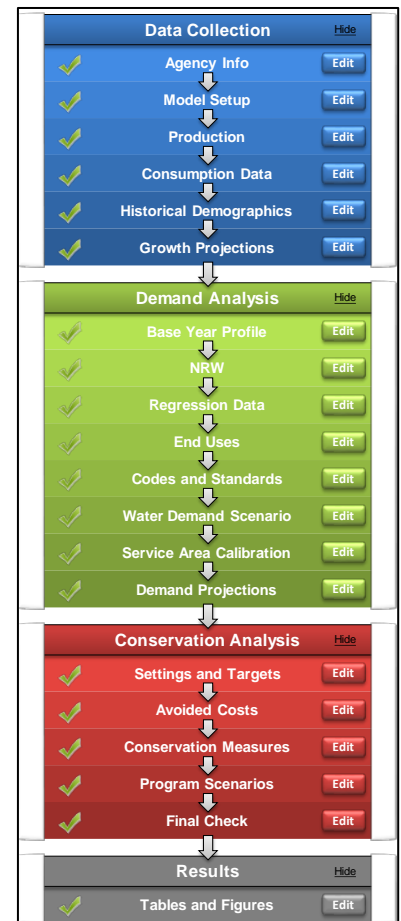
The DSS Model prepares long-range, detailed demand projections. The purpose of the extra detail is to enable a more accurate assessment of the impact of water efficiency programs on demand. A rigorous modeling approach is especially important when the project is subject to regulatory or environmental review. A screen shot of the DSS Model's main worksheet is presented on the right and demonstrates the numerous features of the model.

The DSS Model is an end-use model that breaks down total water production (water demand in the service area) to specific water end uses, such as toilets, faucets, irrigation, etc. This “bottom-up” approach allows for detailed criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The purpose of using end-use data is to enable a more accurate assessment of the impact of water efficiency programs on demand and to provide a rigorous and defensible modeling approach necessary for projects subject to regulatory or environmental review. It can also use a top-down approach with a utility prepared water demand forecast.

The DSS Model evaluates conservation measures using benefit-cost analysis with the present value of the cost of water saved (\$/gallon or \$/AF). Benefits are based on savings in water and wastewater facility operations and maintenance (O&M). The flow chart below illustrates the process for forecasting conservation water savings, including impacts of fixture replacement due to plumbing codes and standards already in place. The model's conservation component covers the entire forecast period, 2018-2040.

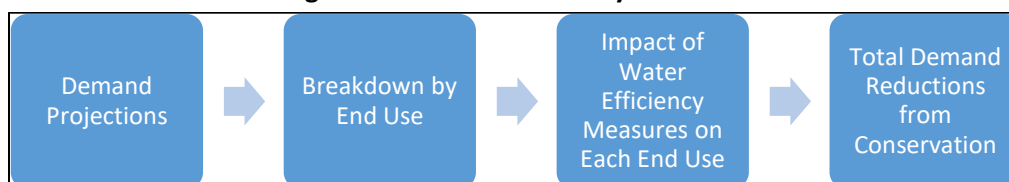
The model has been used for practical applications of conservation planning in over 230 service areas representing 20 million people, including extensive efforts nationally in Arizona, California, Colorado, Hawaii, Idaho, Utah, Georgia, Florida, North Carolina, Oregon, Texas, and Ohio, and internationally in Australia, New Zealand, and Canada.

To forecast water demands, the model relies on demographic and employment projections, combined with the effects of natural fixture replacement due to the implementation of plumbing codes, which is passive conservation savings. Passive conservation refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs from EVMWD. These savings result primarily from (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards, and (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards. The DSS Model evaluated water savings associated with these codes and standards to project passive conservation savings.



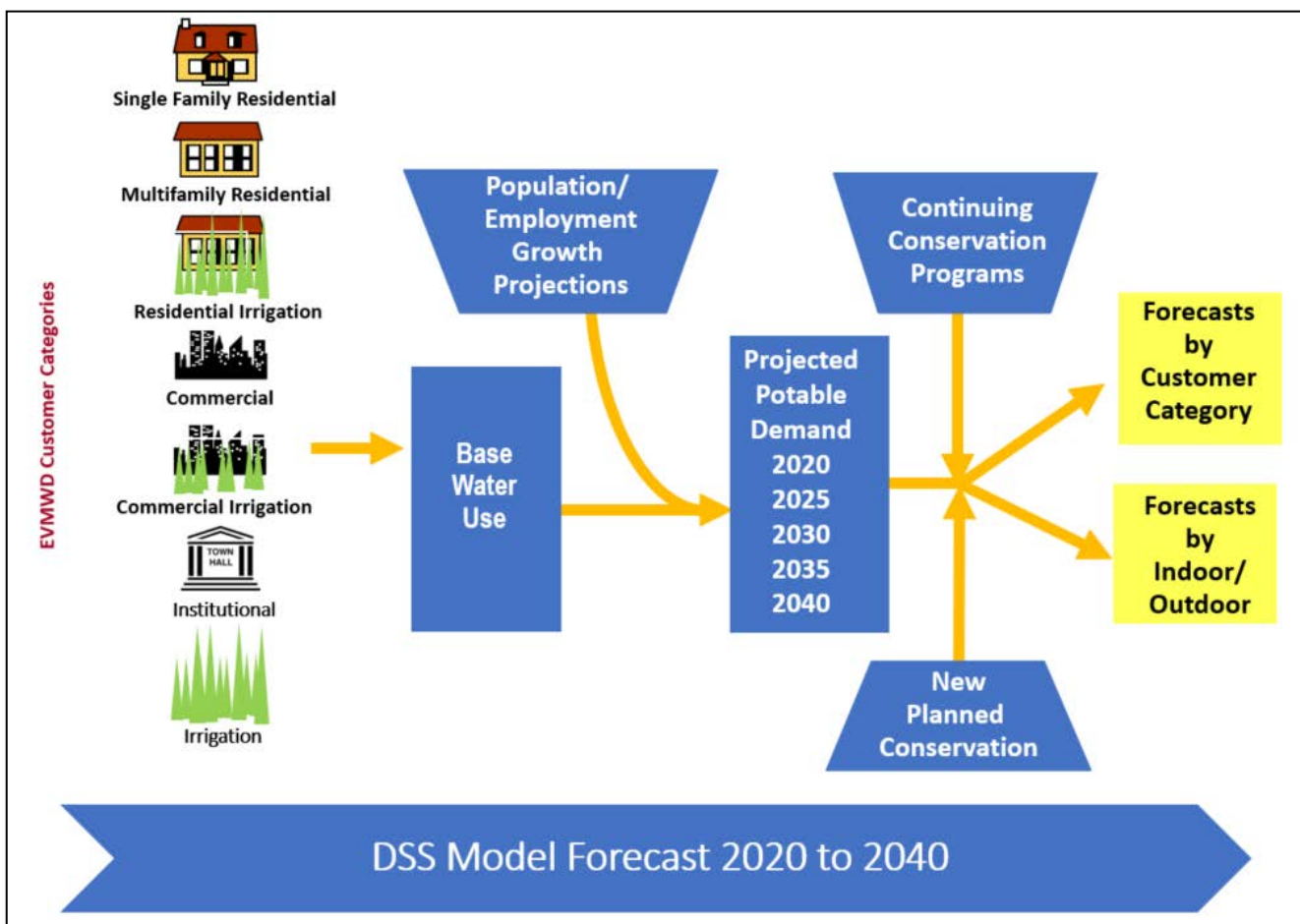
**Figure 3-1. DSS Model Main Worksheet Screenshot**

**Figure 3-2. DSS Model Analysis Process**



As shown in Figure 3-1, the first step MWM took in forecasting water demands using the DSS Model was to gather customer category billing data from EVMWD. The next step was to check the model by comparing water use data with available demographic data to characterize water usage for each customer category (single family, multifamily, commercial, institutional, agricultural, irrigation, and reclaimed water) in terms of number of users per account and per capita water use. During the model calibration process, data was further analyzed to approximate the indoor/outdoor split by customer category. The indoor/outdoor water usage was further divided into typical end uses for each customer category. Published data on average per capita indoor water use and average per capita end use was combined with the number of water users to verify that the volume of water allocated to specific end uses in each customer category was consistent with social norms from end-use studies on water use behavior (e.g., for flushes per person per day).

**Figure 3-3. DSS Model Flow Diagram**



### 3.2 Plumbing Codes and Standards

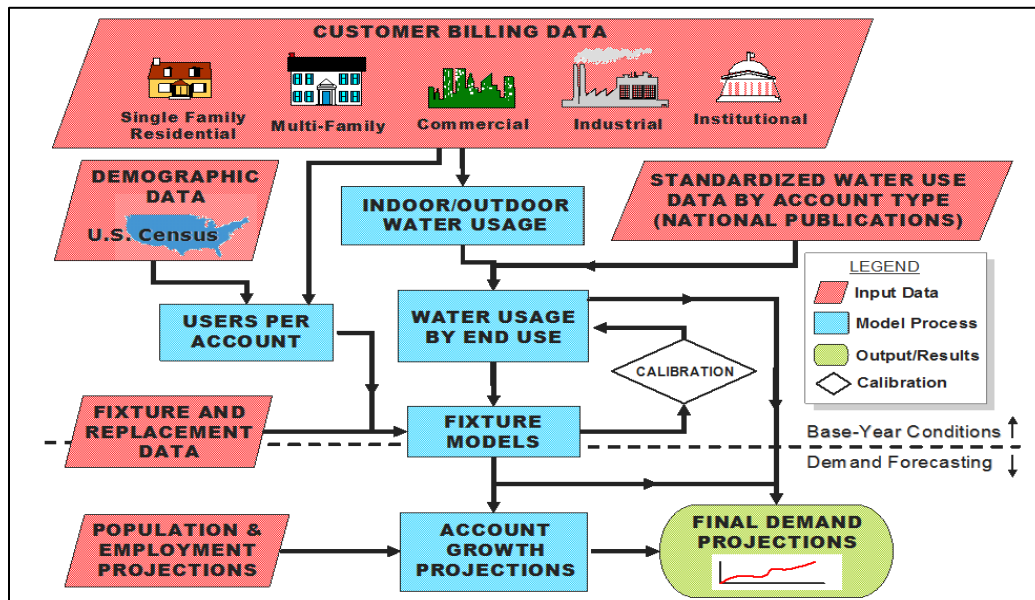
Plumbing code related water savings are considered reliable, long-term savings, and can be counted on over time to help reduce overall system water demand. The DSS Model incorporates the following items as a “code” meaning that the savings are assumed to occur and are therefore “passive” savings:

- The Federal Energy Policy Act of 1992 (amended in 2005)
- California Code of Regulations Title 20 California State Law (Assembly Bill 715)
- California State Law Senate Bill 407
- 2016 CALGreen Code (effective January 1, 2017)
- 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations



The following figure conceptually describes how plumbing codes are incorporated into the flow of information in the DSS Model. Further information about plumbing codes and standards can be found in Appendix D. The demand projections including plumbing code savings further assumes no active involvement by the water utility, and that the costs of purchasing and installing replacement equipment (and new equipment in new construction) are borne solely by the customers, occurring at no direct utility expense. The inverse of the fixture life is the natural replacement rate, expressed as a percent (i.e., 10 years is a rate of 10 percent per year). Plumbing code measures are independent of any conservation program; they are based on customers following applicable current local, state and federal laws, building codes, and ordinances.

**Figure 3-4. DSS Model Overview Used to Make Potable Water Demand Projections**



### 3.2.1 Fixture Replacement

The DSS Model is capable of modeling multiple types of fixtures, including fixtures with slightly different design standards. For example, currently toilets can be purchased that flush at a rate of 0.8 gallons per flush (gpf), 1.0 gpf or 1.28 gpf. The 1.6 gpf and higher toilets still exist but can no longer be purchased in California. Therefore, they cannot be used for replacement or new installation of a toilet. So, the DSS Model utilizes a fixture replacement table to decide what type of fixture should be installed when a fixture is replaced or a new one is installed. The replacement of the fixtures is listed as a percentage, as shown in Table 3-1. A value of 100 percent would indicate that all the toilets installed would be of one particular flush volume. A value of 75 percent means that three out of every four toilets installed would be of that particular flush volume type. The DSS Model contains a pair of replacement tables for each fixture type and customer category combination (i.e., single family toilets, multifamily toilets, commercial toilets, residential clothes washing machines, commercial washing machines, etc.).

In the following example, the DSS Model includes the effects of the Federal Policy Act and AB 715 on each toilet fixture type. This DSS Model feature determines the “saturation” of 1.6 gpf toilets as the Federal Policy Act was in effect from 1992-2014 for 1.6 gpf toilet replacements.

**Table 3-1. Example Toilet Replacement Percentages by Type of Toilet**

<b>Replacement Appliance Market Shares</b>					
Year	<1.0 gpf Toilet Residential	1.28 gpf HET Residential	1.6 gpf ULFT Residential	High Use Toilet Residential	Total
2018	10%	90%	0%	0%	100%
2025	25%	75%	0%	0%	100%
2030	35%	65%	0%	0%	100%
2040	50%	50%	0%	0%	100%
2050	65%	35%	0%	0%	100%
<b>New Appliance Market Shares</b>					
Year	<1.0 gpf Toilet Residential	1.28 gpf HET Residential	1.6 gpf ULFT Residential	High Use Toilet Residential	Total
2018	10%	90%	0%	0%	100%
2025	25%	75%	0%	0%	100%
2030	35%	65%	0%	0%	100%
2040	50%	50%	0%	0%	100%
2050	65%	35%	0%	0%	100%

### 3.3 Key Inputs to the DSS Model

The following table presents the key assumptions used in the DSS Model in determining projected demands with and without plumbing codes. The assumptions having the most dramatic effect on future demands are the natural replacement rate of fixtures, how residential or commercial future use is projected, and finally, the percent of estimated real water losses. Resources for the key assumptions used in the DSS Model in determining projected demands with and without plumbing codes can be found in Appendix D.

**Table 3-2. List of Key Assumptions**

Parameter	Model Input Value, Assumptions, and Key References		
Model Start Year	2018		
Water Demand Factor Year (Base Year)	2017*		
Non-Revenue Water in Start Year	8.2%		
	Source: 2016 system-wide water audit. (This value is consistent with the 8.4% used in the 2015 UWMP demand projections.)		
Population Source	Infrastructure Engineering Corporation (2018). <i>EVMWD Water Demand Projection Update 2018 Technical Memorandum – FINAL</i>		
Employment Source	Infrastructure Engineering Corporation (2018). <i>EVMWD Water Demand Projection Update 2018 Technical Memorandum – FINAL</i>		
Base Year Water Use Profile			
Customer Categories	Start Year Accounts	Total Water Use Distribution	Demand Factors (gpd/acct)
Single Family Residential	41,229	71.4%	330
Multifamily Residential	468	4.3%	1,752
Commercial	601	2.8%	873
Institutional	162	1.0%	1,204
Dedicated Irrigation	677	12.7%	3,586
Miscellaneous	298	3.6%	2,311
Residential Irrigation	8	0.2%	4,372
CII Irrigation	227	4.0%	3,321
Total	43,670	100%	N/A

\*2017 base year selected as a representative rebound year for EVMWD's service area's new normal account water use.

The DSS Model forecasts service area water fixture use. In the codes and standards part of the DSS Model, specific fixture end-use type (point of use fixture or appliance), average water use, and lifetime are compiled. Additionally, state and national plumbing codes and appliance standards for toilets, urinals, showers, and clothes washers are modeled by customer category. These fixtures and plumbing codes can be added to, edited, or deleted by the user. This yields two demand forecasts: 1) with plumbing codes, and 2) without plumbing codes.

### 3.4 Fixture Estimates

As described in the previous Sections 3.1 through 3.3 and Appendix D, MWM reconciled water efficient fixtures and devices installed within the EVMWD service area and identified the number of inefficient fixtures outstanding. Determining the current level of efficient fixtures in a service area is part of the standard process while evaluating the passive savings in the DSS Model which is called "initial fixture proportions."

MWM used the DSS Model to perform a saturation analysis for each of the following plumbing fixtures: toilets, urinals, showers, faucets, and clothes washers. The process included a review of age of buildings from census data, number of rebates per device, and assumed natural replacement rates. MWM presumed the fixtures that were nearing saturation and worth analysis would include residential toilets and residential clothes washers as they have been a recommended conservation practice for over two decades.

The Water Research Foundation recently updated the Residential End Uses of Water Study (REUWS) in toward the end of 2014. The original study was published in 1999. Water utilities, industry regulators, and government planning agencies have considered it the industry benchmark of single family home indoor water use. The Business Plan incorporates the recent study results which reflect the change to the profile of water use in residential homes including the adoption of more water efficient fixtures in the past 15 years (1999 to 2014). The REUWS results were combined

with EVMWD’s historical rebate and billing data to enhance and verify assumptions made for all customer accounts. This particularly included saturation levels on toilets, urinals, showerheads, clothes washers, and faucets as further described in Appendix D. Also included in the appendix are tables and figures that present the estimated current and projected proportions of these fixtures by efficiency level within EVMWD’s service area.

### 3.5 Plumbing Code Savings

The following table presents EVMWD’s estimated passive savings due to plumbing codes and standards. Since the plumbing code requires sales of more efficient water fixtures, typically EVMWD customers save 0.47 percent of their total demand each year when replacing older fixtures with new ones.

**Table 3-3. Plumbing Code Savings**

	2020	2025	2030	2035	2040
<b>Plumbing Code Savings (acre-feet)</b>	310	1,270	2,330	3,450	4,100



## 4. MEASURE REVIEW AND RECOMMENDATIONS

This section presents EVMWD's goal to develop a Business Plan that would result in the greatest ease and efficiency of program administration, the lowest cost of implementation, and the greatest water savings. The screening process undertaken with EVMWD staff to identify 25 measures for further evaluation is also presented.

### 4.1 Business Plan Conservation Programming Approach

Experience by many utilities has shown there is a reasonable limit to how many measures can be feasibly implemented at one time. Programs that consist of a large number of measures are historically difficult to implement successfully; therefore, prioritization of measures is important both as an outcome of this planning effort and as the program is implemented. The approach to program implementation is viewed as a "living" process where new opportunities may be adopted as new technologies become available over time. Program timelines can also be adjusted, but with the recognition that doing so will impact the savings objectives.

### 4.2 Potential New Conservation Measures

An important step in updating a water conservation program is the review and screening of water conservation measures. In this case, some of the measures reviewed have already been implemented by EVMWD, and some of the measures would be new. The new measures were designed with an implementation schedule reflecting future start dates.

This task included a review of EVMWD's current water conservation measures, identification of current and new measures that may be appropriate for the local entities, and the screening of these measures to a short-list for detailed evaluation (benefit-cost analysis). To complete this process, a list of potential water conservation measures for qualitative evaluation (screening) was compiled. Table 4-1 includes 25 conservation measures in the customer categories of:

- All Customers
- Residential
- Commercial
- Distribution System (System)

The list of potential measures was drawn from MWM and EVMWD's general experience and review of what other water agencies with conservation programs are currently implementing.

### 4.3 Screening of Conservation Measures – Selecting the Measures to Be Evaluated

A brief screening process was undertaken to develop a short-list of measures for evaluation in the DSS Model (water savings analysis and benefit-cost analysis). This evaluation was specific to the water use characteristics, economies of scale, demographics, and other factors that are unique to EVMWD's service area.

EVMWD considered the following parameters when evaluating whether a measure should be included in the DSS Model:

- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area's climate, building stock, or lifestyle. For example, promoting native and/or water efficient landscaping may not be appropriate where water use analysis indicates little outdoor irrigation.
- **Customer Acceptance/Equity** – Refers to whether retail customers within the service area would be willing to implement and accept the conservation measures. For example, will retail customers attend homeowner irrigation classes and implement lessons learned from these classes? If not, then the water savings associated with this measure will not be achieved and a measure with this characteristic would not be included. This

criterion also refers to retail customer equity (i.e., one category of retail customers receives benefit while another pays the costs without receiving benefits). Retail customer acceptance may be based on convenience, economics, perceived fairness, and/or aesthetics.

- **Additional Service Area Benefits** – Refers to benefits related to the saturation of devices and appliances based on past efforts as well as the response to and by customers from previous programs. This also includes the consideration of the following parameters:
  - **Technology/Market Maturity** – Refers to whether the technology needed to implement the conservation measure, such as an irrigation control device, is commercially available and supported by the local service industry. A device may be screened out if it is not yet commercially available in the region or if not yet supported by the local service industry.
  - **Savings Quantifiable** – Are the water savings quantifiable? For example, it is more difficult to determine the amount of water saved because of a Xeriscape demonstration garden versus replacing a grass playing field with an artificial turf sports field.

Each measure, project, and activity were evaluated and ranked by EVMWD staff and MWM according to the evaluation criteria. The evaluation criteria included but was not limited to the following:

- Cost-benefit analysis
- Quantifiable water savings potential
- Possible water savings potential
- Public interest
- Ease of implementation
- Schedule to complete
- Relationship to compliance with USBR and other regulations and programmatic conservation practices
- Relationship to UWMP requirements

Based on end-use data and evaluation of EVMWD's existing conservation measures, projects and activities, a list of 126 measures, projects and activities were provided to EVMWD to review and rank based on the evaluation criteria. Each measure to be reviewed included equipment/program type, the main focus of the program, incentive options, and measure description. For a full list of these measures, see Appendix E.

## 4.4 Conservation Measures Evaluated

Table 4-1 shows the results of the measure screening and the 25 measures that were selected for analysis. The list of measures includes devices or programs (e.g., new ultra-high efficiency toilets that would save water if installed by a water retailer, contractor, or customer) that can be used to achieve water conservation; methods through which the devices or programs can be implemented; and what distribution method, or mechanism, can be used to activate them. Funding sources and partnership opportunities as well as potential implementation obstacles for each measure are also listed.



**Table 4-1. Measure Descriptions, Funding Sources and Opportunities, and Implementation Obstacles**

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>Public and School Education</b>	Public and school education is used to raise awareness of water use efficiency measures available to customers. This measure includes: inserts/flyers, video production ads, landscape classes, signs for demonstration gardens, conservation advertising through giveaways including pens, books, etc., poster contests for schools, science fair program for schools, Solar Cup education program, educational materials and supplies for curriculums such as Admiral Splash and Potter the Otter educational books.	SoCal Water\$mart also partially conducts this measure.	It is imperative to continue messaging in a variety of ways with conservation outreach. Often the public is unaware of the water saving rebates available to them or how they can benefit from water use efficiency programs. Keeping the messages current and continuous may be key in this measure.
<b>District System Optimization Review</b>	This measure covers efforts to find and repair leaks in the distribution system to reduce real water loss. Actions could include installation of data loggers and proactive leak detection. Leak repairs would be handled by existing crews at no extra cost. A ten-year program to reduce Non-Revenue Water (NRW) to a lower target level such as 10 percent of production or less could be proposed for a combination of this measure and actions to reduce apparent water losses. In conjunction with system accounting, includes audits that identify and quantify known legitimate uses of NRW to determine remaining UAW losses. Measure also includes computing Infrastructure Leakage Index (ILI) on an annual basis. Goal would be to lower the ILI and NRW every year by a pre-determined amount based on cost effectiveness. In early 2018, EVMWD applied for the Water Conservation Field Services grant to fund the exploration of current water loss levels and support a review of EVMWD's recent AWWA water audit to identify any potential to reduce current water loss levels. Additional features of this measure's implementation can be found in Appendix C.	Operations budget for water loss	Involves multi-departmental coordination and support. Internal task force would need to be developed with this measure to ensure involved departments are aware of opportunities related to this measure. Identification of vulnerable areas is required to be maximally effective. Locating leaks throughout different materials used in our system. Ex: we have a large amount of PVC pipe used however leak detection equipment cannot trace leaks in plastic pipes.
<b>Water Neutrality Ordinance</b>	This measure would require developers of new homes to either contribute money to the water conservation program to help generate the water needed to supply their new development project or conduct water-efficiency fixture direct	Primarily conducted by City of Elsinore Planning Department.	Can be implemented at multiple water conserving levels. Requires significant community support and stakeholder involvement. Would need to find a

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	installations. Appendix F represents a resource index for information from the Alliance for Water Efficiency, the City and County of San Francisco and the City of Santa Monica. Alternatively, this measure could focus on outdoor only and be an aggressive local landscape ordinance that's a step-up from CA's MWELO. Targeting new development only, this measure would aim to achieve "net-zero" outdoor water use by any method including the use of native plants, weather-based irrigation controllers, gray water systems, cisterns and rain barrels, etc. Consider modeling after Cambria CSD program.		balance that would cover costs and not inhibit growth.
<b>CII Indoor Water Efficiency Evaluation</b>	Conduct a multi-step process for identifying customers, including: online pre-screening, phone call screening, on-site evaluation, incentives offering, and follow-up/site visit and water use tracking. This measure includes documenting inventory of current water using fixtures to support commercial program design and benchmarking. Top water user customers from each category would be offered a professional water evaluation that would evaluate ways to save water and money. The evaluation would be for large accounts (i.e., accounts that use more than 5,000 gallons of water per day) such as microbreweries, hotels, restaurants, stores and schools. Measure to encourage participation in inefficient equipment upgrade and rebate measure for water efficient equipment.	EVMWD proposed funding but watch for grant or regional programs if they become available.	Can be challenging getting businesses to participate. They are often very reluctant to voluntarily open their back doors. Also, survey recommendations often have a high initial investment which can be unappealing to businesses even with a reasonable payback period. Not necessarily cost-effective.
<b>CII Rebates to Replace Inefficient Equipment</b>	Measure to offer rebates for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, dry vacuum pump and conductivity controller on cooling towers. Eligible project costs include labor, hardware and may include annual water management fees. This measure is planned to evolve as technology changes.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Not necessarily cost-effective for the customer. There has been minimal participation in the last few years.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>Public Agency Program</b>	Measure will provide government facilities with enhanced financial incentives to replace indoor fixtures and upgrade landscape irrigation systems. To encourage agencies that have not already installed water-efficient landscape equipment to do so, SoCal Water\$mart has a Public Agency program, offering enhanced incentives paid up-front for public agencies to install water-efficient devices at their facilities and on their grounds. EVMWD staff will assist with rebate applications as needed.	SoCal Water\$mart also partially conducts this measure.	Coordinating with already busy public agency employees can be challenging; they oftentimes have priorities higher than water conservation as part of their job description. Not necessarily cost-effective for the public agency. Funding may not be readily available from city funds to use.
<b>Require Plan Review for New CII</b>	Require plan reviews for water use efficiency for all new business customers.	Primarily conducted by City of Elsinore Planning Department.	Multiple jurisdictions might have to be involved due to the service area's boundary. Involves multi-departmental coordination and support which can be time-consuming. Not necessarily cost-effective for the customer.
<b>CII Leak Alert</b>	This measure will use AMI data through the AquaHawk Alerting Portal to identify leaks in CII and dedicated Irrigation accounts. EVMWD requires all new CII developments to install dedicated irrigation meters.	EVMWD proposed funding but watch for grant or regional programs if they become available.	Customer communication can be time-consuming. This may require additional staff time, beyond current EVMWD staff to follow up with customers. Could be more difficult to get a hold of the correct person due to different people being at buildings/mgmt. not always available.
<b>Cooling Tower Regulations</b>	This measure will prohibit the discharge of cooling tower blow down unless the TDS of the water is at least a certain level (that would ensure a minimum of 5 cycles of concentration). Available cooling tower equipment rebates will be promoted. (See a list of BMPs for cooling towers in Appendix G.)	EVMWD proposed funding but watch for grant or regional programs if they become available.	Multiple jurisdictions might have to be involved due to service area boundary. Enforcement might require multiple agencies or departments and/or possibly be too sporadic to be effective. California Department of Public Health (CDPH) has guidelines due to Legionellosis concerns (CDPH, 2017). Not necessarily cost-effective for the customer.



Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>Financial Incentives for CII Irrigation and Landscape Upgrades</b>	After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be onsite or via a pre-screening online step. Staff may assist with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns. Rebates primarily offered through SoCal Water\$mart with Elsinore offering drip irrigation system rebates.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Depending on the upgrades, not necessarily cost-effective for the customer. There has been declining participation in the last few years.
<b>Large Landscape Outdoor Water Efficiency Evaluation</b>	All public and private irrigators of large landscapes, including residential and commercial, will be eligible for free landscape water efficiency evaluations. Customers with high water use will be targeted and provided a customized report. Evaluations include irrigation system assessment, irrigation schedule, and report. A consultant will be used to conduct the evaluation.	Western Municipal Water District also partially conducts this measure.	Can be challenging getting businesses to participate. They are often very reluctant to voluntarily open their back doors. Properties may not want/trust our help but prefer to use their own staff to do it.
<b>Landscape Conversion or Turf Removal - CII</b>	This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit per account. Measure includes a pre- and post-retrofit inspection of the landscape.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Many customers find the alternatives to turf aesthetically unappealing. Finding a landscaper who can manage a water efficient landscape after installed can be challenging.
<b>Landscape Conversion or Turf Removal - Residential</b>	This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence. Measure includes a pre- and post-retrofit inspection of the landscape.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to customers even with a reasonable payback period. Residential turf replacement is often not cost-effective

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
			for residential customers with smaller initial outdoor water use. Many customers find alternatives to turf aesthetically unappealing. Customers become overwhelmed or discouraged when faced with new landscape/plants and how to care for them. Customers often do not know how to start.
<b>Water Conserving Landscape and Irrigation Codes</b>	<p>Enforce CA Model Water Efficient Landscape Ordinance. Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers. In California, about half of the urban water is used for landscape irrigation. Substantial water savings can be gained by proper landscape design, installation and maintenance. To improve water savings in this sector, DWR updated the Model Water Efficient Landscape Ordinance. MWELo promotes efficient landscapes in new developments and retrofitted landscapes while increasing water efficiency standards for new and retrofitted landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. MWELo also requires reporting on the implementation and enforcement of local ordinances. To reduce the complexity and costs for the smaller landscapes now subject to ordinance, the 2015 revised MWELo has a prescriptive compliance approach for landscapes between 500 and 2,500 square feet. Landscapes within this size range can comply either through meeting the traditional MWELo approach or through the prescriptive approach. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 square feet. Only rehabilitated landscapes that are associated with a building or</p>	Primarily conducted by City Planning Department.	Multiple jurisdictions might have to be involved due to the service area's boundary. This measure would need to address the unincorporated areas of the district which can add more time for coordination. Involves multi-departmental coordination and support which can be time-consuming. Not necessarily cost-effective for the customer. There may be additional follow ups/inspections from EVMWD to confirm the jurisdictions are enforcing the rules.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	landscape permit, plan check, or design review are subject to the ordinance.		
<b>Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development</b>	Measure would require new development customers to install weather adjusting smart irrigation controllers and/or rain sensors. Might offer training class on how to install and program the device. The WBICs have onsite weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Implementing this measure may include the development of an ordinance and coordination with the City's planning department and new development plan review check process.	Primarily conducted by City Planning Department.	Multiple jurisdictions might have to be involved due to the service area's boundary. This measure would need to address the unincorporated areas of the district which can add more time for coordination. Involves multi-departmental coordination and support which can be time-consuming. Not necessarily cost-effective for the customer. There could be the need to verify enforcement which could add more time spent.
<b>Require Irrigation Designers/Installers be Certified (possibly by Irrigation Association or CA Landscape Contractor's Association)</b>	Require the design and installation of irrigation systems by trained certified contractors. Certification might be through the California Landscape Contractors Association, Irrigation Association (IA) and/or specialized training provided by utility.	Primarily conducted by City Planning Department.	Multiple jurisdictions might have to be involved due to the service area's boundary. This measure would need to address the unincorporated areas of the district which can add more time for coordination. Involves multi-departmental coordination and support which can be time-consuming. Enforcement might be challenging and/or possibly too sporadic to be effective.
<b>Hot Water Recirculating Pump Rebate</b>	Measure will provide a rebate to equip homes with efficient hot water recirculating pumps (hot water on demand systems). These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to reduce hot water waiting times by having an on-demand pump on a recirculation line. Can be installed on kitchen sink or master bath, wherever hot water waiting times are more than 1/2 minute.	Could partner with energy utilities.	Historically, customers were challenged by the application process, and only 30 percent of applications were awarded. Moving forward, EVMWD plans to simplify the application process. It can be challenging to retrofit older homes since an electrical outlet is required under the sink, which is not common in older home bathrooms.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>Residential Outdoor and Indoor Water Efficiency Evaluation</b>	Measure will provide indoor and outdoor water efficiency evaluations for single family and multifamily residential customers. Evaluations will be conducted by an outside contractor. Target those with high water use and provide a customized report to owner. This measure includes a multi-step process for identifying customers, including an online pre-screening and phone call screening before the field evaluation to identify high water using customers.	Could partner with energy utilities.	Can be challenging getting residences to participate. They are often very reluctant to voluntarily open their doors to a public agency representative. Also, survey recommendations may have a high initial financial or behavioral investment which can be unappealing. There has been minimal participation in the last few years
<b>Financial Incentives for Residential Irrigation and Landscape Upgrades</b>	After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be onsite or via a pre-screening online step. Customers are only eligible for rebates after this evaluation. Staff may assist with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather-based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing. Depending on the upgrades, not necessarily cost-effective. There has been minimal participation in the last few years. People don't always trust 'smart' systems and want to be able to control their watering themselves.
<b>High Efficiency Device Giveaway</b>	EVMWD buys high efficiency devices in bulk and gives them away at the administrative office. Devices include low-flow showerheads (1.5 gallons per minute or "gpm"), faucet aerators (kitchen and bath), 5-minute shower timers, toilet dye tabs, and automatic shut off nozzles for garden hoses. This measure is planned to evolve as technology changes. Kits are distributed as requested to approximately 100 accounts per year in addition to all new service accounts who register at the administrative office.	Could partner with energy utilities.	Little assurance the devices are installed.
<b>Partnership with Energy Utilities</b>	Partnerships with local energy utilities to offer incentives to customers to save both water and energy. SoCalGas provides kits with three faucet aerators and a low-flow showerhead at no cost. EVMWD to optimize efforts with partnering entities by tracking relevant data (interventions, water savings, energy savings, etc.) and ensuring consistent messaging. May consider	Could partner with local businesses interested in savings water and energy that are willing to work with	Can be complicated or time-consuming to coordinate. SoCal Gas may not be willing/able to provide their data on work done, so this could call for more involvement and potentially funding

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	streamlining residential site surveys by combining water and energy and cross-training staff with one agency financially subsidizing the other's efforts.	both water and energy utilities.	from EVMWD to ensure we are capturing everything be performed.
<b>Residential High Efficiency Toilet Rebate</b>	Rebates are available for \$40 (1.06 gpf or lower). Rebates are handled by SoCal Water\$mart.	SoCal Water\$mart also partially conducts this measure.	With the \$40 rebate amount, it's not necessarily cost-effective for a customer unless they are planning to get a new toilet anyway. There has been declining participation over the last few years. Residents' concern with having to pay extra to have it installed or do the install themselves.
<b>Clothes Washer Rebate</b>	Rebates will be provided for residential clothes washers. Rebates are available through and handled by SoCal Water\$mart and SoCalGas. SoCal Water\$mart Rebates start at \$85; SoCalGas rebates start at \$50.	Could partner with energy utilities. SoCal Water\$mart also partially conducts this measure.	Not necessarily cost-effective for the customer, unless they run full loads and/or were going to need a new machine anyway. Most effective water savings are achieved with full loads which can't be guaranteed. There has been declining participation over the last few years.
<b>Pool Cover Rebate</b>	Rebates will be provided for residential pool covers. Customers must submit a completed Rebate Request with a photo of their pool, a copy of the pool cover receipt and a copy of their current water bill.	Western Municipal Water District also partially funds this measure. Could also partner with pool equipment stores.	It is difficult to predict if the pool covers will be used. Not necessarily cost-effective.
<b>Leak Repair and Plumbing Emergency Assistance for Low-Income Customers</b>	Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. This program will require that customer leaks be repaired, but for low-income customers, be paid for with Rate Assistance for Residents of Elsinore Valley (RARE) funds that are paid back with customer monthly water bills over time.	Could partner with energy utilities.	Might require multiple departments to coordinate which can be time consuming. Customers may not pay back cost of repair on schedule. Could lead to further debt from the customer if not paying on-time. Customer's may not be as motivated to fix asap if they know the agency will fund it regardless. May need to have a time limit of when to fix it by.



## 5. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

This section presents the individual conservation measures analyzed, and describes the benefit-cost perspective, present value parameters, and measure assumptions.

### 5.1 Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided. MWM performed a benefit-cost analysis on all past, present and future conservation programs since 2013 that were included in the measure list presented in the previous section. Then the DSS Model was used to calculate the maximum active and passive activity and identify what potential water use reduction remained within the service area. The DSS Model received the endorsement of CUWCC in 2006 and calculates savings at the end-use level. Additional details on the DSS Model and its assumptions can be found in Section 3 and Appendix D.

### 5.2 Present Value Analysis and the Utility and Community Perspective

Present value analysis, using constant 2018 (base year) dollars and a real discount rate of 3 percent per year, is used to discount costs and benefits back to the base year. From this analysis, benefit-cost ratios of each measure are computed. When measures are combined into programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between the multiple measures.

The time value of money is explicitly considered. Typically, the costs to save water occur early in the planning period whereas the benefits usually extend to the end of the planning period. A planning period of more than 25 years is typically not used because costs and benefits that occur beyond that timeframe have very little influence on the total present value of the costs and benefits. The value of all future costs and benefits is discounted to the first year in the DSS Model (i.e., the base year of 2018), at the real interest rate of 3 percent. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1 percent) by the assumed rate of inflation (3 percent). Cash flows discounted in this manner are herein referred to as “Present Value” sums.

Economic analysis can be performed from several different perspectives based on which party is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses are the “utility” perspective and the “community” perspective. The “utility” benefit-cost analysis is based on the benefits and costs to the water provider. The “community” benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure beyond what the utility pays.

The utility perspective offers two advantages. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving versus supplying increased quantities of water. Second, revenue shifts are treated as transfer payments, which means program participants will have lower water bills and non-participants will have slightly higher water bills so that the utility’s revenue needs continue to be met. Therefore, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. It should be noted that there is a significant difference between the utility’s savings from the avoided cost of procurement and delivery of water and the reduction in retail revenue that results from reduced water sales due to conservation. This budget impact occurs slowly and can be accounted for in water rate planning. Because it



is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

Under the community perspective, costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Water bill savings are not a customer benefit in the aggregate for reasons described above.

Other factors external to the utility, such as environmental effects, are often difficult to quantify or are not necessarily under the control of the utility. They are therefore frequently excluded from economic analyses, including this one.

### 5.3 Assumptions About Measure Costs, Measure Savings, and Avoided Costs

Appendix H presents the measure assumptions and inputs used in the analysis to evaluate the water conservation measures selected by EVMWD. Information and assumptions regarding the following variables are made for each measure:

- Measure Device or Strategy – If a measure is not device-driven, the strategy being implemented and its benefits are described.
- Measure Sector/Targeted Water User Group End Use – This includes the water user group (e.g., single family residential) and end use (e.g., indoor or outdoor water use).
- Utility Unit Cost – This includes the cost of rebates, incentives, and contractors hired (by EVMWD) to implement measures. The assumed dollar values for the measure unit costs have been reviewed closely by EVMWD staff and found to be adequate for each individual measure. The values in most cases are in the range of what is currently offered by other water utilities in the region.
- Retail Customer Unit Cost – This is the cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a rebate or incentive).
- Utility Administration and Marketing Cost – This is the cost to the utility for administering the measure, including consultant contract administration, marketing, and/or participant tracking. The mark-up is sufficient (in total) to cover local agency conservation staff time, general expenses, and overhead.

The unit costs vary according to the type of customer account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account than a residential multifamily account, and for a rebate versus an ordinance requirement or a direct installation implementation method. Typically, water utilities have found there are increased costs associated with achieving higher market saturation, such as conducting more surveys per year. The DSS Model calculates the annual costs based on the number of participants each year. The general formula for calculating annual utility costs is:

*Annual Utility Cost = Annual market penetration rate x total accounts in category x unit cost per account x (1+administration and marketing markup percentage)*

*Annual Customer Cost = Annual number of participants x unit customer cost*

*Annual Community Cost = Annual utility cost + annual customer cost*

#### 5.3.1 Measure Costs

Costs were determined for each of the measures based on industry knowledge, previous experience, and data provided by EVMWD. Costs may have included incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. The model was run for 23 years (each year between 2018 and

2040). Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales was not included as a cost. This was because the conservation measures that were evaluated generally take effect over a long span of time sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations and savings on variable costs such as energy and chemicals.

### 5.3.2 Measure Savings

Data necessary to forecast water savings of measures includes specifics on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to seven years after the start of implementation, depending upon the implementation schedule. For every conservation activity or replacement with more efficient devices, there is what is considered a useful life or “measure life”. It is defined as how long a conservation measure stays in place and continues to save water. It is assumed that measures implemented because of codes, standards, or ordinances (e.g., toilets) will be permanent and not revert to an old inefficient level of water use if the device needed to be replaced. However, some measures that are primarily behavior-based (e.g., residential surveys) are assumed to need to be repeated on an ongoing basis to retain the water savings. For example, homeowners move away and the new homeowners may have less water efficient practices around the home. Using acquired demographic census data, potential water savings were quantified based on the number of end-users participating in a measure. Again, industry-established water savings estimates were assumed when the measure was device-driven, and in cases where no industry averages were available, historical water use data was consulted. Specific water savings estimates and assumptions are provided in each modeled measure’s screenshot in Appendix H.

### 5.3.3 Avoided Costs

EVMWD has multiple sources of water: groundwater, surface water, imported water, and recycled water. Groundwater basins in both Elsinore and Temescal valleys are the primary sources of drinking water supply for EVMWD. Surface water supplies are stored in Canyon Lake, also known as Railroad Canyon Reservoir. Imported water supplies are provided from Metropolitan Water District of Southern California through Western Municipal Water District. EVMWD operates three Wastewater Reclamation Facilities (WRF): the Regional WRF, Horsethief Canyon WRF, and Railroad Canyon WRF. Furthermore, 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). Tertiary treated water is produced at these wastewater facilities for irrigation, lake replenishment and environmental enhancement.

The estimated avoided cost of purchasing imported treated water has been identified by EVMWD staff to be a rate of \$1,344 per AF (\$4,125 per MG). Costs are based on projected year 2026 purchase water cost to represent a time midpoint of the modeling analysis timeframe 2018-2040.

## 5.4 Comparison of Individual Measures

Table 5-1 presents how much water the measures will save through 2040, how much they will cost, and what cost of saved water per unit volume *if the measures were implemented on a stand-alone basis (i.e. without interaction or overlap from other measures that might address the same end use(s))*. Savings from measures which address the same



end use(s) are not additive; the model uses impact factors to avoid double counting in estimating the water savings from programs of measures.<sup>4</sup>

Since interaction between measures has not been accounted for in Table 5-1, it is not appropriate to include totals at the bottom of the table. However, the table is useful to give a close approximation of the cost effectiveness of each measure.

Cost categories are defined below:

- Utility Costs - those costs that EVMWD as a water utility will incur to operate the Water Conservation Program, including administrative costs.
- Utility Benefits - the avoided cost of producing water at the identified rate \$1,344 per AF (\$4,125 per MG).
- Customer Costs - those costs customers will incur to implement a measure in EVMWD's Conservation Program and maintain its effectiveness over the life of the measure.
- Customer Benefits - the savings other than from reduced water/sewer utility bills, such as energy savings resulting from reduced use of hot water. Conservation program participants will see lower water and sewer bills but overall there will be no net customer benefit.
- Community Costs and Benefits - Community Costs and Benefits include Utility Costs plus Customer Costs, and Utility Benefits plus Customer Benefits, respectively.

The column headings in Table 5-1 are defined as follows:

- Present Value (PV) of Utility and Community Costs and Benefits (\$) = the present value of the 23-year time stream of annual costs or benefits, discounted to the base year (years 2018-2040).
- Utility Benefit-Cost ratio = PV of Utility Costs divided by PV of Utility Benefits over 23 years (2018-2040).
- Community Benefit-Cost ratio = (PV of Utility Benefits plus PV of customer energy savings) divided by (sum of PV of Utility Costs plus PV of Customer Costs), over 23 years (2018-2040).
- Five Years of Total Cost to Utility (\$) = the sum of the annual Utility Costs for the years from 2018 to 2023. The measures start in the years as specified for each measure shown in Appendix H. Utility costs include administrative costs and staff labor.
- Water Savings in 2040 (AFY) = water saved in acre-feet per year. The year 2040 is provided as requested by EVMWD staff.
- Cost of Savings per Unit Volume (\$/AF) = PV of Utility Costs over 23 years divided by the 23-Year Water Savings. The analysis period is 2018-2040. This value is compared to the utility's avoided cost of water as one indicator of the cost effectiveness of conservation efforts. It should be noted that the value somewhat undervalues the cost of savings because program costs are discounted to present value and the water benefit is not.

## 5.5 Measure Implementation Schedule

Table 5-2 presents the proposed implementation schedule for all 25 ongoing, planned, potential and analyzed measures.

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<sup>4</sup> For example, if two measures are planned to address the same end use and both save 10 percent of the prior water use, then the net effect is not the simple sum of 20 percent. Rather, it is the cumulative impact of the first measure reducing the use to 90 percent of what it was originally, without the first measure in place. Then, the revised use of 90 percent is reduced by another 10 percent ( $10\% \times 90\% = 9\%$ ) to result in the use being 81 percent ( $90\% - 9\% = 81\%$ ). In this example, the net savings is 19 percent, not 20 percent. Using impact factors, the model computes the reduction as follows,  $0.9 \times 0.9 = 0.81$  or 19 percent water savings.

**Table 5-1. Estimated Conservation Measure Costs and Savings**

Measure Name	Present Value of Water Utility Benefits <sup>a</sup>	Present Value of Community Benefits <sup>a</sup>	Present Value of Water Utility Costs <sup>a</sup>	Present Value of Community Costs <sup>a</sup>	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	Five Years of Water Utility Costs 2018–2023 <sup>b</sup>	Water Savings in 2040 (AFY)	Cost of Savings per Unit Volume (\$/AF)
<b>Public and School Education</b>	\$2,070,000	\$3,281,000	\$1,740,000	\$1,740,000	1.2	1.9	\$419,000	110	\$850
<b>District System Optimization Review</b>	\$2,550,000	\$2,550,000	\$1,366,000	\$1,366,000	1.9	1.9	\$404,000	140	\$510
<b>Water Neutrality Ordinance</b>	\$51,166,000	\$79,247,000	\$2,625,000	\$42,299,000	19.5	1.9	\$447,000	4,830	\$50
<b>CII Indoor Water Efficiency Evaluation</b>	\$192,000	\$348,000	\$525,000	\$767,000	0.4	0.5	\$85,000	10	\$2,640
<b>CII Rebates to Replace Inefficient Equipment</b>	\$389,000	\$708,000	\$84,000	\$1,323,000	4.7	0.5	\$20,000	40	\$200
<b>Public Agency Program</b>	\$110,000	\$158,000	\$3,000	\$200,000	31.9	0.8	\$3,000	10	\$30
<b>Require Plan Review for New CII</b>	\$46,000	\$84,000	\$23,000	\$217,000	2.0	0.4	\$5,000	-	\$470
<b>CII Leak Alert</b>	\$2,209,000	\$2,209,000	\$121,000	\$379,000	18.3	5.8	\$24,000	240	\$50
<b>Cooling Tower Regulations</b>	\$364,000	\$364,000	\$368,000	\$1,175,000	1.0	0.3	\$59,000	40	\$860
<b>Financial Incentives for CII Irrigation and Landscape Upgrades</b>	\$7,153,000	\$7,153,000	\$1,477,000	\$11,244,000	4.8	0.6	\$347,000	520	\$190
<b>Large Landscape Outdoor Water Efficiency Evaluation</b>	\$3,198,000	\$3,198,000	\$1,454,000	\$1,670,000	2.2	1.9	\$341,000	230	\$410
<b>Landscape Conversion or Turf Removal - CII</b>	\$939,000	\$940,000	\$15,000	\$1,323,000	61.4	0.7	\$13,000	50	\$20
<b>Landscape Conversion or Turf Removal - Residential</b>	\$158,000	\$158,000	\$30,000	\$403,000	5.2	0.4	\$26,000	10	\$180
<b>Water Conserving Landscape and Irrigation Codes</b>	\$16,032,000	\$16,032,000	\$2,249,000	\$42,715,000	7.1	0.4	\$512,000	1,430	\$120
<b>Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development</b>	\$6,470,000	\$6,470,000	\$1,586,000	\$10,341,000	4.1	0.6	\$273,000	650	\$210
<b>Require Irrigation Designers/Installers be</b>	\$2,646,000	\$2,646,000	\$547,000	\$2,459,000	4.8	1.1	\$92,000	200	\$180



Measure Name	Present Value of Water Utility Benefits <sup>a</sup>	Present Value of Community Benefits <sup>a</sup>	Present Value of Water Utility Costs <sup>a</sup>	Present Value of Community Costs <sup>a</sup>	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	Five Years of Water Utility Costs 2018–2023 <sup>b</sup>	Water Savings in 2040 (AFY)	Cost of Savings per Unit Volume (\$/AF)
<b>Certified (possibly by Irrigation Association or CA Landscape Contractor's Association)</b>									
<b>Hot Water Recirculating Pump Rebate</b>	\$556,000	\$1,270,000	\$433,000	\$982,000	1.3	1.3	\$378,000	20	\$810
<b>Residential Outdoor and Indoor Water Efficiency Evaluation</b>	\$343,000	\$489,000	\$299,000	\$356,000	1.1	1.4	\$72,000	20	\$850
<b>Financial Incentives for Residential Irrigation and Landscape Upgrades</b>	\$436,000	\$436,000	\$491,000	\$710,000	0.9	0.6	\$118,000	30	\$1,020
<b>High Efficiency Device Giveaway</b>	\$674,000	\$1,485,000	\$112,000	\$112,000	6.0	13.3	\$27,000	60	\$160
<b>Partnership with Energy Utilities</b>	\$1,657,000	\$3,730,000	\$90,000	\$90,000	18.4	41.5	\$39,000	90	\$50
<b>Residential High Efficiency Toilet Rebate</b>	\$81,000	\$81,000	\$39,000	\$250,000	2.1	0.3	\$21,000	-	\$490
<b>Clothes Washer Rebate</b>	\$2,094,000	\$5,570,000	\$558,000	\$6,073,000	3.8	0.9	\$134,000	170	\$260
<b>Pool Cover Rebate</b>	\$2,000	\$2,000	\$10,000	\$32,000	0.2	0.1	\$11,000	-	\$6,240
<b>Leak Repair and Plumbing Emergency Assistance for Low-Income Customers</b>	\$240,000	\$376,000	\$146,000	\$747,000	1.6	0.5	\$24,000	20	\$610

<sup>a</sup> Present value calculations use constant 2018 dollars and a real discount rate of 3 percent to discount costs and benefits through the analysis period of 2018-2040.

<sup>b</sup> Utility costs include administrative costs and staff labor.

**Table 5-2. Proposed Implementation Schedule**

Measure Name	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Public & School Education <sup>A,B,C</sup>																							
District System Optimization Review <sup>A,B,C</sup>																							
Water Neutrality Ordinance <sup>B,C</sup>																							
CII Indoor Water Efficiency Evaluation <sup>B,C</sup>																							
CII Rebates to Replace Inefficient Equipment <sup>A,B,C</sup>																							
Public Agency Program <sup>B,C</sup>																							
Require Plan Review for New CII <sup>C</sup>																							
CII Leak Alert <sup>A,B,C</sup>																							
Cooling Tower Regulations <sup>C</sup>																							
Financial Incentives for CII Irrigation & Landscape Upgrades <sup>A,B,C</sup>																							
Large Landscape Outdoor Water Efficiency Evaluation <sup>A,B,C</sup>																							
Landscape Conversion or Turf Removal - CII <sup>B,C</sup>																							
Landscape Conversion or Turf Removal - Residential <sup>B,C</sup>																							
Water Conserving Landscape & Irrigation Codes <sup>A,B,C</sup>																							
Require Smart Irrigation Controllers in New Development <sup>C</sup>																							
Require Irrigation Designers/Installers Be Certified <sup>C</sup>																							
Hot Water Recirculating Pump Rebate <sup>B,C</sup>																							
Residential Outdoor & Indoor Water Efficiency Evaluation <sup>A,B,C</sup>																							
Financial Incentives for Residential Landscape Upgrades <sup>A,B,C</sup>																							
High Efficiency Device Giveaway <sup>A,B,C</sup>																							
Partnership with Energy Utilities <sup>A,B,C</sup>																							
Residential High Efficiency Toilet Rebate <sup>A,B,C</sup>																							
Clothes Washer Rebate <sup>A,B,C</sup>																							
Pool Cover Rebate <sup>A,B,C</sup>																							
Leak Repair/Plumbing Assistance for Low-Income Customers <sup>B,C</sup>																							

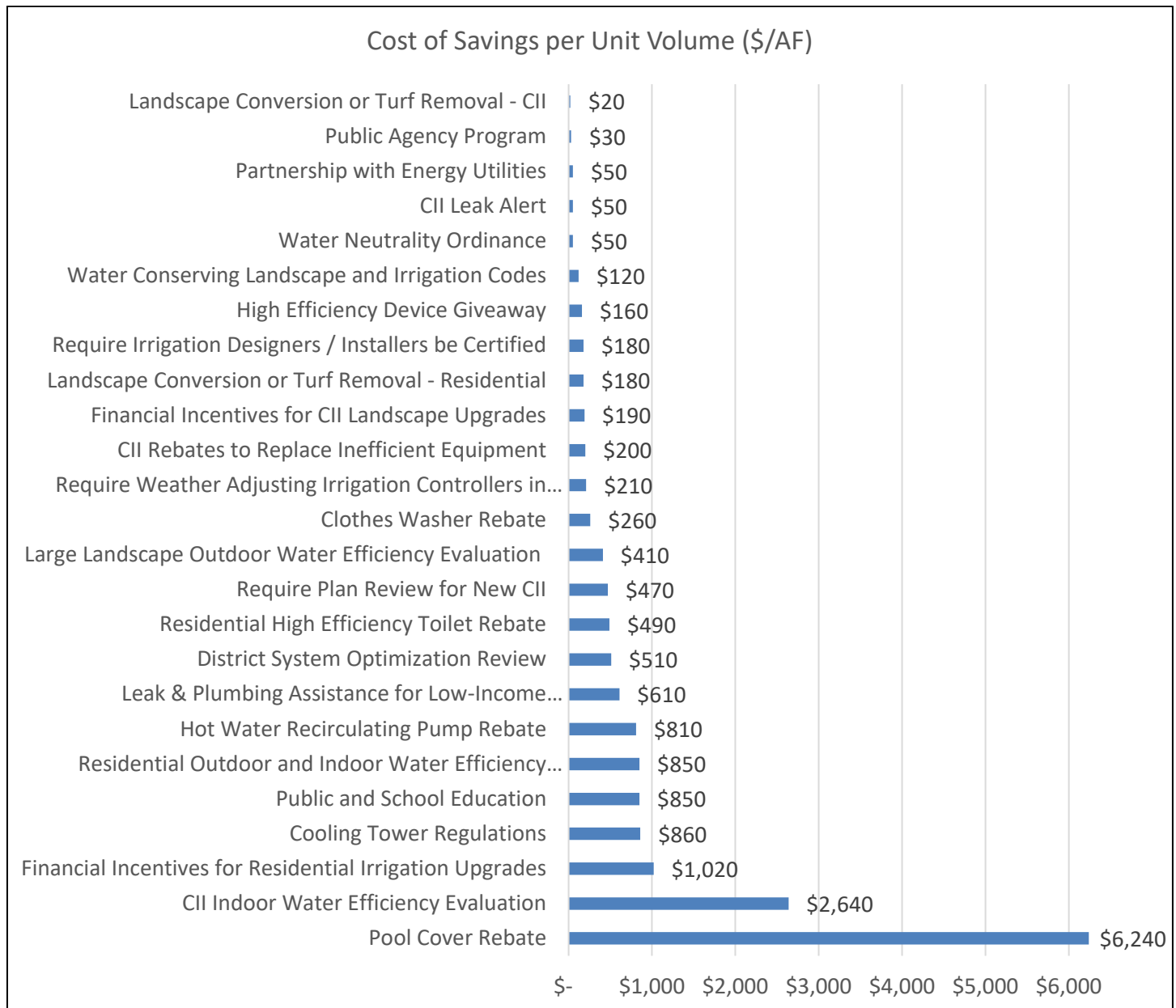
**Notes:**

1. Conservation programs are defined in the following section.
2. Some measure names have been shortened to better present schedule. Full measure names can be found in Table 5-1.
3. Superscript notes are defined as follows:
  - 1) A = measure is in Program A.
  - 2) B = measure is in Program B.
  - 3) C = measure is in Program C.

## 5.6 Economic Analysis of Potential Conservation Measures

MWM collected data to quantify the costs and water savings of these measures and conducted an economic evaluation of selected water conservation measures using the DSS Model developed for EVMWD. Water savings from each of the water conservation measures were estimated and expressed for each 5-year increment for 23 years. An economic analysis of these conservation measures/requirements was prepared for each individual measure. Dollar savings from reduced water demand was quantified annually and based on avoided costs provided by EVMWD. The following figure presents a comparison of each measure's cost of water saved.

**Figure 5-1. Comparison of Conservation Between Cost of Programs and Water Savings**



**Notes:**

1. Some measure names have been shortened to better present data. Full measure names are in Table 5-1.
2. The difference in costs, as previously discussed and shown in Table 4-2, is because some measures are funded by other agencies. For example, pool cover rebates are funded by EVMWD, but the landscape conversion or turf removal measure is funded by SoCal Water\$mart.

## 6. CONSERVATION PROGRAM EVALUATION

This section provides a summary of which measures are included in each of the three alternative programs, and which program EVMWD has selected to implement. The three alternatives are designed to illustrate a range of various measure combinations and resulting water savings. The following three key items were taken into consideration during measure selection for Programs A, B, and C:

- Existing conservation measures
- Conservation measures recommended by AWWA, CalWEP (formerly CUWCC), USBR and others
- New and innovative measures (such as the Water Neutrality Ordinance)

This section identifies and prioritizes the conservation programs and projects by cost effectiveness, quantifiable water savings, and compliance with USBR requirements.)

### 6.1 Selection of Measures for Programs – Menu of Water Use Efficiency Alternative Programs (Programs A, B, C)

MWM developed an economic analysis to show the true cost of conducting conservation. EVMWD's existing conservation program was evaluated, then three increasingly aggressive programs were developed for EVMWD to consider. The proposed programs included a combination of existing regional measures as well as the effects of adopted code changes and legislation between 2009 and 2018.

Using the data gathered, MWM created a list of all potential program concepts that were appropriate for EVMWD's service area to meet future regulatory and conservation compliance mandates. The list included program concepts and traditional conservation measures as well as concepts that had not currently been implemented or considered by EVMWD. The results of the program analysis were reviewed, at which point EVMWD adjusted the program contents to determine which measures would be in each of the programs. Factors for determining which measure should be in each program included budgeting, feasibility to implement the program, and the time at which each measure would need to be introduced to promote conservation efforts. MWM compiled descriptions and parameters of the programs for EVMWD.

These programs are not intended to be rigid but rather to demonstrate the range in savings that could be generated if selected measures were run at the same time. When programs are analyzed, any overlap in water savings (and benefits) from individual measures is taken into account to provide a total combined water savings (and benefits). Each program evaluated is described below.

**Program A** – 14 measures. Program A represents EVMWD's currently active measures.

**Program B** – 21 Measures. Program B includes all the measures in Program A plus additional measures for future implementation that are generally cost-effective and save significant amounts of water.

**Program C** – All 25 measures evaluated. Program C represents the highest cost and water savings conservation program that would be implemented for more severe conservation-required situations.

The following table shows which measures are included in each of the three programs.

**Table 6-1. Conservation Program Measures**

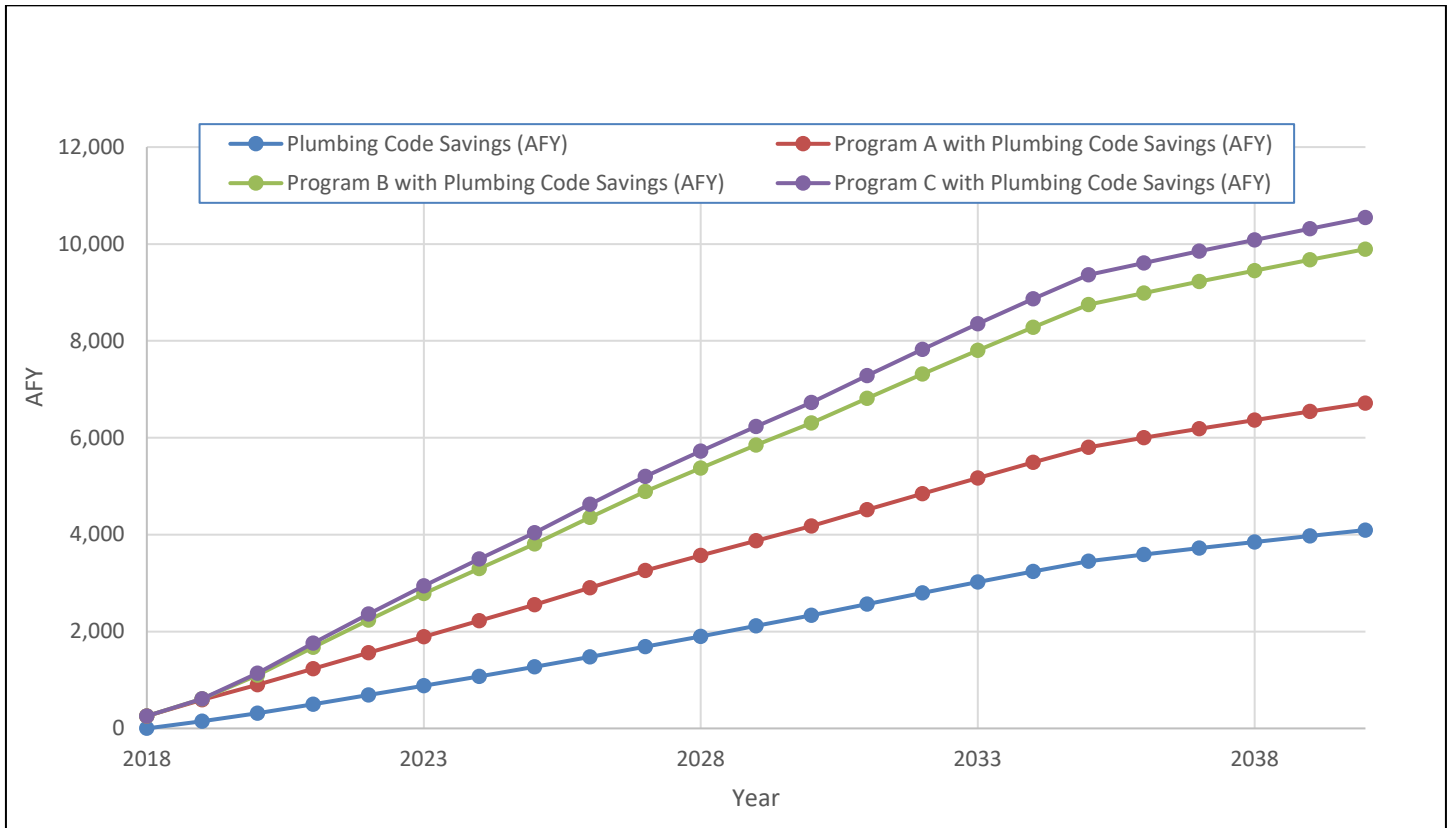
Measures	Program A	Program B	Program C
Public and School Education	X	X	X
District System Optimization Review	X	X	X
Water Neutrality Ordinance		X	X
CII Indoor Water Efficiency Evaluation		X	X
CII Rebates to Replace Inefficient Equipment	X	X	X
Public Agency Program		X	X
Require Plan Review for New CII			X
CII Leak Alert	X	X	X
Cooling Tower Regulations			X
Financial Incentives for CII Irrigation and Landscape Upgrades	X	X	X
Large Landscape Outdoor Water Efficiency Evaluation	X	X	X
Landscape Conversion or Turf Removal - CII		X	X
Landscape Conversion or Turf Removal - Residential		X	X
Water Conserving Landscape and Irrigation Codes	X	X	X
Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development			X
Require Irrigation Designers/Installers Be Certified (possibly by Irrigation Association or California Landscape Contractor's Association)			X
Hot Water Recirculating Pump Rebate		X	X
Residential Outdoor and Indoor Water Efficiency Evaluation	X	X	X
Financial Incentives for Residential Irrigation and Landscape Upgrades	X	X	X
High Efficiency Device Giveaway	X	X	X
Partnership with Energy Utilities	X	X	X
Residential High Efficiency Toilet Rebate	X	X	X
Clothes Washer Rebate	X	X	X
Pool Cover Rebate	X	X	X
Leak Repair and Plumbing Emergency Assistance for Low-Income Customers		X	X

## 6.2 Results of Program Evaluation

MWM compiled the best measures in the three program scenarios in EVMWD's DSS Model. Each program contains increasing levels of conservation effectiveness. The water savings, benefits, and costs of each program package have been computed. Figures 6-1 and 6-2 present estimated average AFY and GPCD savings use without conservation and with the plumbing codes only, as well as with plumbing codes and each of the three alternative programs. Plumbing code includes current local, state, and federal standards for retrofits of items such as toilets, showerheads, faucets, and pre-rinse spray valves.



**Figure 6-1. Water Savings (AFY) with Different Program Options**



**Figure 6-2. Water Savings (GPCD) with Different Program Options**

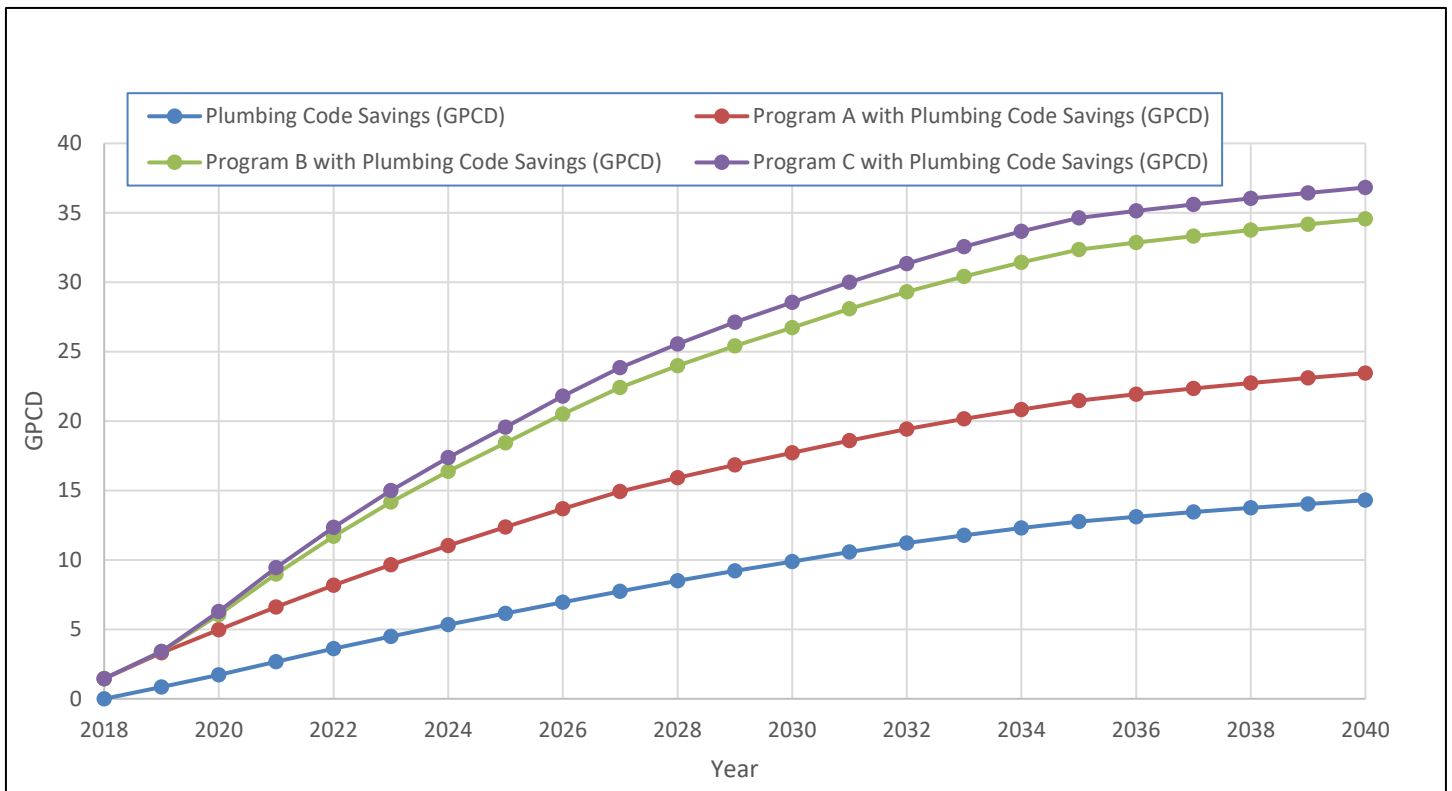


Table 6-2 shows the estimated annual savings in acre-feet per year in five-year increments for all three programs. EVMWD and customer benefit-cost ratios are also presented for each program, as well as the present value of water savings and utility costs.

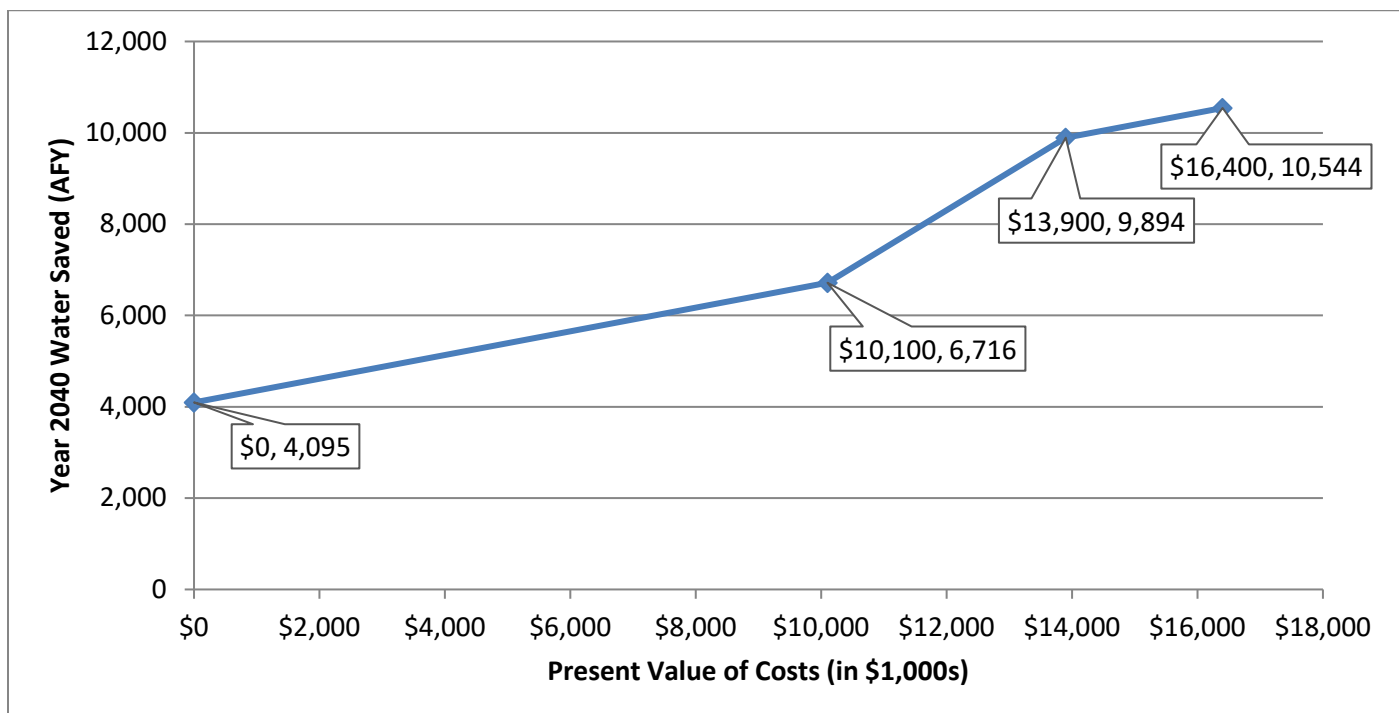
**Table 6-2. Comparison of Program Estimated Costs and Water Savings**

Conservation Program	Water Savings (AFY)					Water Utility Benefit-Cost Ratio	Present Value of Water Savings	Present Value of Utility Costs	Water Utility Cost of Water Saved (\$/AF)
	2020	2025	2030	2035	2040				
<b>Plumbing Code Only</b>	310	1,270	2,330	3,450	4,100	N/A	N/A	N/A	N/A
<b>Program A with Plumbing Code</b>	900	2,550	4,180	5,800	6,720	3.4	\$34,565,000	\$10,089,000	\$270
<b>Program B with Plumbing Code</b>	1,100	3,810	6,310	8,750	9,890	5.3	\$72,940,000	\$13,868,000	\$170
<b>Program C with Plumbing Code</b>	1,140	4,040	6,730	9,360	10,540	4.9	\$80,360,000	\$16,391,000	\$190

Note: Measure utility costs and staffing covered by SoCal WaterSmart, WMWD, and other partners are not included. The costs presented here are directly attributed to EVMWD only.

Figure 6-3 illustrates how marginal returns change as more money is spent to achieve water savings in acre-feet per year in 2040. A cost-effectiveness curve displays the results of the present value of each program's costs versus the cumulative water savings at the end of the planning period. This curve is helpful in determining how far to push the "conservation envelope" as the point of diminishing economic returns will be evident. As the figure shows, the costs increase as the water savings increase from Program A to C, which corresponds to increasing the budget, staffing, and participation in the conservation programs.

**Figure 6-3. Present Value of Utility Costs vs. Water Saved in 2040**



## 6.3 Estimated Budget

The estimated three-year 2018, 2019, and 2020 costs to EVMWD to implement Program A, B, and C as described in the Business Plan are approximately \$465,000, \$582,000, and \$619,000 per year, respectively. The budget includes staff time and expenses (materials, rebates, giveaways, etc.). This budget was developed while working closely with EVMWD staff on parts of the DSS Model evaluations for the level of activity by year. Many current and potential opportunities exist for cost sharing with other utilities (energy, sewer, or neighboring water utilities) to lower the cost of a conservation measure's budgetary needs for implementation. On an annual basis, EVMWD should continue to develop detailed annual work plans and use the DSS Model to monitor progress on demand reductions along with updates to the implementation cost estimates and associated budgets.

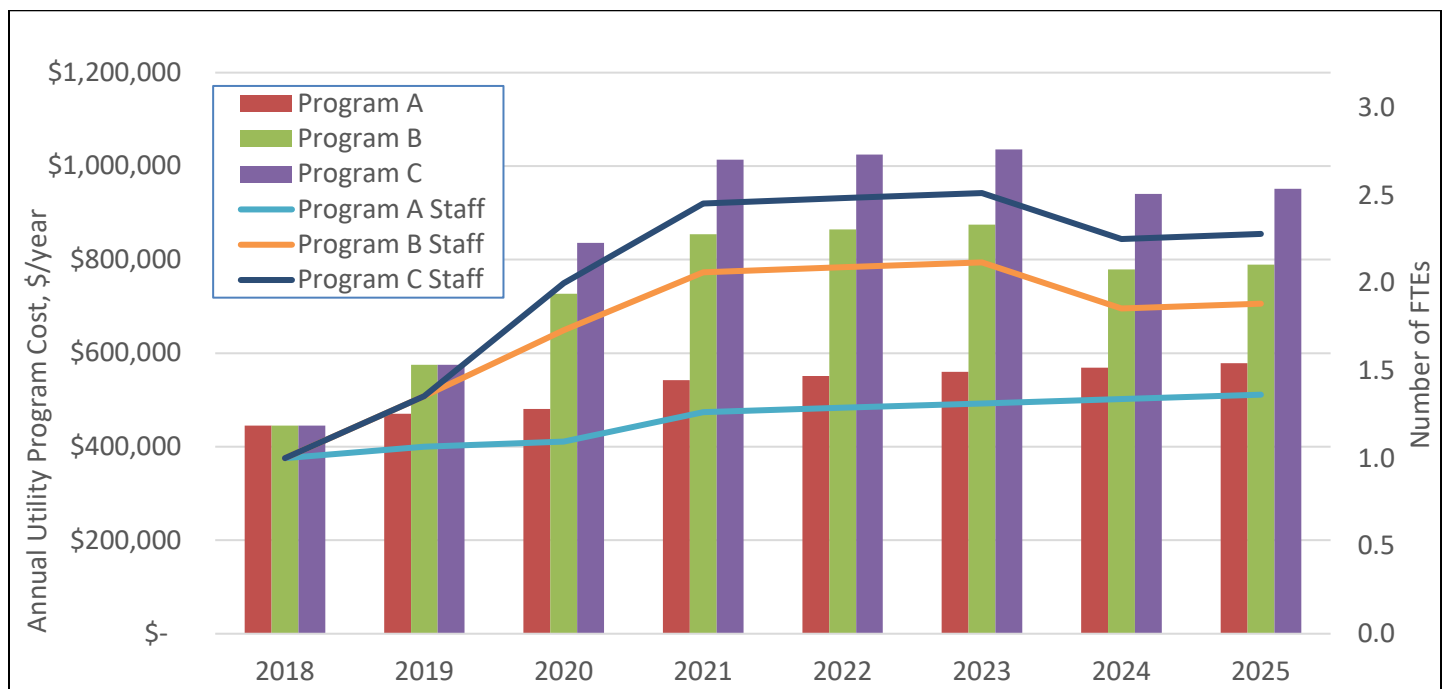
Figure 6-4 illustrates the proposed implementation budget for the planned and ongoing EVMWD Programs A-C measures. Measure elements and costs funded by SoCal WaterSmart and other partners are not included. Utility costs include unit costs (incentives and rebates) as well as administrative costs. Individual measure costs (including utility, administrative, and customer costs) can be found in the measure input sheets in Appendix H.

## 6.4 Staffing Needs

As part of this planning effort, consideration has been given to program staffing levels for EVMWD's effort in operating the service area measures. As mentioned previously, many of EVMWD's measures are partially funded, staffed, or outsourced by MWD, WMWD, developers, and customers such that the overall measure costs to EVMWD are low. However, addressing the initiatives needed to reduce water demand is applicable across many departments for EVMWD's staff and will require a coordinated effort. Current and proposed future needs for staff support of the conservation program is presented in this section.

Figure 6-4 presents the staffing EVMWD would need to implement any of the three modeled conservation programs. EVMWD staffing needs were calculated by dividing annual administrative costs by an average annual EVMWD salary of \$45 per hour or, estimating 2,087 work hours per year, approximately \$94,000 per staff person per year. Administrative costs were derived for each measure by taking a percentage of each measure's utility costs.

**Figure 6-4. Annual Estimated Conservation Program Utility Costs and Staffing**



## 6.5 Recommended Program

EVMWD has elected to implement Program B, which has the highest utility and customer benefit-cost ratios, offering significant savings at an appropriate cost. Program B was selected because many of the measures are currently being implemented and the other measures could be reasonably accomplished with existing staffing, consulting assistance, or in partnership with MWD and WMMD. Program C offers a little more savings for more cost to both EVMWD and customers but is much more severe than the other two programs. Therefore, EVMWD would only pursue Program C if a water shortage called for more drastic conservation measures.

## 7. PROGRAM B FIVE-YEAR IMPLEMENTATION PLAN

This section presents a potential conservation program implementation plan for EVMWD. The selected conservation Program B measure descriptions, potential obstacles, funding sources, existing and potential partnerships, schedule, utility costs and potential staffing requirements are provided.

### 7.1 Five-Year Schedule

Table 7-1 presents the implementation schedule for the planned EVMWD measures. Over the next five years, EMVWD plans to implement Program B. However, this may need to be reviewed based on any future mandates that are released based the newly adopted state regulations as noted earlier.

### 7.2 Measure Description, Obstacles, Funding, and Partnership Sources

Table 7-2 presents the 21 measures that were selected for inclusion in the recommended Program B. Funding sources and partnership opportunities as well as potential implementation obstacles for each measure are listed.

**Table 7-1. Proposed Five-Year Implementation Schedule for Program B**

Measure Name	2018	2019	2020	2021	2022
Public and School Education					
District System Optimization Review					
Water Neutrality Ordinance					
CII Indoor Water Efficiency Evaluation					
CII Rebates to Replace Inefficient Equipment					
Public Agency Program					
CII Leak Alert					
Financial Incentives for CII Irrigation and Landscape Upgrades					
Large Landscape Outdoor Water Efficiency Evaluation					
Landscape Conversion or Turf Removal - CII					
Landscape Conversion or Turf Removal - Residential					
Water Conserving Landscape and Irrigation Codes					
Hot Water Recirculating Pump Rebate					
Residential Outdoor and Indoor Water Efficiency Evaluation					
Financial Incentives for Residential Landscape Upgrades					
High Efficiency Device Giveaway					
Partnership with Energy Utilities					
Residential High Efficiency Toilet Rebate					
Clothes Washer Rebate					
Pool Cover Rebate					
Leak Repair/Plumbing Assistance for Low-Income Customers					

Notes:

1. Some measure names have been shortened to better present schedule. Full measure names can be found in Table 7-2.



**Table 7-2. Program B Measure Descriptions, Funding Sources and Opportunities, and Implementation Obstacles**

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>Public and School Education</b>	Public and school education is used to raise awareness of water use efficiency measures available to customers. This measure includes: inserts/flyers, video production ads, landscape classes, signs for demonstration gardens, conservation advertising through giveaways including pens, books, etc., poster contests for schools, science fair program for schools, Solar Cup education program, educational materials and supplies for curriculums such as Admiral Splash and Potter the Otter educational books.	SoCal Water\$mart also partially conducts this measure.	It is imperative to continue messaging in a variety of ways with conservation outreach. Often the public is unaware of the water saving rebates available to them or how they can benefit from water use efficiency programs. Keeping the messages current and continuous may be key in this measure.
<b>District System Optimization Review</b>	This measure covers efforts to find and repair leaks in the distribution system to reduce real water loss. Actions could include installation of data loggers and proactive leak detection. Leak repairs would be handled by existing crews at no extra cost. A ten-year program to reduce Non-Revenue Water to a lower target level such as 10 percent of production or less could be proposed for a combination of this measure and actions to reduce apparent water losses. In conjunction with system accounting, includes audits that identify and quantify known legitimate uses of NRW to determine remaining UAW losses. Measure also includes computing Infrastructure Leakage Index on an annual basis. Goal would be to lower the ILI and NRW every year by a pre-determined amount based on cost effectiveness. In early 2018, EVMWD applied for the Water Conservation Field Services grant to fund the exploration of current water loss levels and support a review of EVMWD's recent AWWA water audit to identify any potential to reduce current water loss levels. Additional features of this measure's implementation can be found in Appendix C.	Operations budget for water loss	Involves multi-departmental coordination and support. Internal task force would need to be developed with this measure to ensure involved departments are aware of opportunities related to this measure. Identification of vulnerable areas is required to be maximally effective. Locating leaks throughout different materials used in our system. Ex: we have a large amount of PVC pipe used however leak detection equipment cannot trace leaks in plastic pipes.
<b>Water Neutrality Ordinance</b>	This measure would require developers of new homes to either contribute money to the water conservation program to help generate the water needed to supply their new development project or conduct water-efficiency fixture direct installations. Appendix F represents a resource index	Primarily conducted by City of Elsinore Planning Department.	Can be implemented at multiple water conserving levels. Requires significant community support and stakeholder involvement. Would need to find a balance that would cover costs and not inhibit growth.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	for information from the Alliance for Water Efficiency, the City and County of San Francisco and the City of Santa Monica. Alternatively, this measure could focus on outdoor only and be an aggressive local landscape ordinance that's a step-up from CA's MWELO. Targeting new development only, this measure would aim to achieve "net-zero" outdoor water use by any method including the use of native plants, weather-based irrigation controllers, gray water systems, cisterns and rain barrels, etc. Consider modeling after Cambria CSD program.		
<b>CII Indoor Water Efficiency Evaluation</b>	Conduct a multi-step process for identifying customers, including: online pre-screening, phone call screening, on-site evaluation, incentives offering, and follow-up/site visit and water use tracking. This measure includes documenting inventory of current water using fixtures to support commercial program design and benchmarking. Top water user customers from each category would be offered a professional water evaluation that would evaluate ways to save water and money. The evaluation would be for large accounts (i.e., accounts that use more than 5,000 gallons of water per day) such as microbreweries, hotels, restaurants, stores and schools. Measure to encourage participation in inefficient equipment upgrade and rebate measure for water efficient equipment.	EVMWD proposed funding but watch for grant or regional programs if they become available.	Can be challenging getting businesses to participate. They are often very reluctant to voluntarily open their back doors. Also, survey recommendations often have a high initial investment which can be unappealing to businesses even with a reasonable payback period. Not necessarily cost-effective.
<b>CII Rebates to Replace Inefficient Equipment</b>	Measure to offer rebates for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, dry vacuum pump and conductivity controller on cooling towers. Eligible project costs include labor, hardware and may include annual water management fees. This measure is planned to evolve as technology changes.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Not necessarily cost-effective for the customer. There has been minimal participation in the last few years.
<b>Public Agency Program</b>	Measure will provide government facilities with enhanced financial incentives to replace indoor fixtures and upgrade landscape irrigation systems. To encourage agencies that have not already installed water-efficient landscape equipment to	SoCal Water\$mart also partially conducts this measure.	Coordinating with already busy public agency employees can be challenging; they oftentimes have priorities higher than water conservation as part of their

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	do so, SoCal Water\$mart has a Public Agency program, offering enhanced incentives paid up-front for public agencies to install water-efficient devices at their facilities and on their grounds. EVMWD staff will assist with rebate applications as needed.		job description. Not necessarily cost-effective for the public agency. Funding may not be readily available from city funds to use.
<b>CII Leak Alert</b>	This measure will use AMI data through the AquaHawk Alerting Portal to identify leaks in CII and dedicated Irrigation accounts. EVMWD requires all new CII developments to install dedicated irrigation meters.	EVMWD proposed funding but watch for grant or regional programs if they become available.	Customer communication can be time-consuming. This may require additional staff time, beyond current EVMWD staff to follow up with customers. Could be more difficult to get a hold of the correct person due to different people being at buildings/mgmt. not always available.
<b>Financial Incentives for CII Irrigation and Landscape Upgrades</b>	After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be onsite or via a pre-screening online step. Staff may assist with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns. Rebates primarily offered through SoCal Water\$mart with Elsinore offering drip irrigation system rebates.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Depending on the upgrades, not necessarily cost-effective for the customer. There has been declining participation in the last few years.
<b>Large Landscape Outdoor Water Efficiency Evaluation</b>	All public and private irrigators of large landscapes, including residential and commercial, will be eligible for free landscape water efficiency evaluations. Customers with high water use will be targeted and provided a customized report. Evaluations include irrigation system assessment, irrigation schedule, and report. A consultant will be used to conduct the evaluation.	Western Municipal Water District also partially conducts this measure.	Can be challenging getting businesses to participate. They are often very reluctant to voluntarily open their back doors. Properties may not want/trust our help but prefer to use their own staff to do it.
<b>Landscape Conversion or Turf Removal - CII</b>	This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit per account. Measure includes a pre- and post-retrofit inspection of the landscape.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Many customers find the alternatives to turf aesthetically unappealing. Finding a landscaper who

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
			can manage a water efficient landscape after installed can be challenging.
<b>Landscape Conversion or Turf Removal - Residential</b>	This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence. Measure includes a pre- and post-retrofit inspection of the landscape.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to customers even with a reasonable payback period. Residential turf replacement is often not cost-effective for residential customers with smaller initial outdoor water use. Many customers find the alternatives to turf aesthetically unappealing. Customers become overwhelmed or discouraged when faced with a new landscape/plants they are unsure of how to care for. Customers often don't know how to start.
<b>Water Conserving Landscape and Irrigation Codes</b>	Enforce CA Model Water Efficient Landscape Ordinance. Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers. In California, about half of the urban water is used for landscape irrigation. Substantial water savings can be gained by proper landscape design, installation and maintenance. To improve water savings in this sector, DWR updated the Model Water Efficient Landscape Ordinance. MWELo promotes efficient landscapes in new developments and retrofitted landscapes while increasing water efficiency standards for new and retrofitted landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. MWELo also requires reporting on the implementation and enforcement of local ordinances. To reduce the complexity and costs for the smaller landscapes now subject to ordinance, the 2015 revised MWELo has a	Primarily conducted by City Planning Department.	Multiple jurisdictions might have to be involved due to the service area's boundary. This measure would need to address the unincorporated areas of the district which can add more time for coordination. Involves multi-departmental coordination and support which can be time-consuming. Not necessarily cost-effective for the customer. There may be additional follow ups/inspections from EVMWD to confirm the jurisdictions are enforcing the rules.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
	prescriptive compliance approach for landscapes between 500 and 2,500 square feet. Landscapes within this size range can comply either through meeting the traditional MWELO approach or through the prescriptive approach. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 square feet. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the ordinance.		
<b>Hot Water Recirculating Pump Rebate</b>	Measure will provide a rebate to equip homes with efficient hot water recirculating pumps (hot water on demand systems). These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to reduce hot water waiting times by having an on-demand pump on a recirculation line. Can be installed on kitchen sink or master bath, wherever hot water waiting times are more than 1/2 minute.	Could partner with energy utilities.	Historically, customers were challenged by the application process, and only 30 percent of applications were awarded. Moving forward, EVMWD plans to simplify the application process. It can be challenging to retrofit older homes since an electrical outlet is required under the sink, which is not common in older home bathrooms.
<b>Residential Outdoor and Indoor Water Efficiency Evaluation</b>	Measure will provide indoor and outdoor water efficiency evaluations for single family and multifamily residential customers. Evaluations will be conducted by an outside contractor. Target those with high water use and provide a customized report to owner. This measure includes a multi-step process for identifying customers, including an online pre-screening and phone call screening before the field evaluation to identify high water using customers.	Could partner with energy utilities.	Can be challenging getting residences to participate. They are often very reluctant to voluntarily open their doors to a public agency representative. Also, survey recommendations may have a high initial financial or behavioral investment which can be unappealing. There has been minimal participation in the last few years
<b>Financial Incentives for CII Irrigation and Landscape Upgrades</b>	After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be onsite or via a pre-screening online step. Staff may assist with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns. Rebates primarily offered through SoCal Water\$mart with Elsinore offering drip irrigation system rebates.	SoCal Water\$mart also partially conducts this measure.	Can get complicated or time-consuming if done properly and water use before and after is tracked. The often-high initial investment can be unappealing to businesses even with a reasonable payback period. Depending on the upgrades, not necessarily cost-effective for the customer. There has been declining participation in the last few years.



Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
<b>High Efficiency Device Giveaway</b>	EVMWD buys high efficiency devices in bulk and gives them away at the administrative office. Devices include low-flow showerheads (1.5 gpm), faucet aerators (kitchen and bath), 5-minute shower timers, toilet dye tabs, and automatic shut off nozzles for garden hoses. This measure is planned to evolve as technology changes. Kits are distributed as requested to approximately 100 accounts per year in addition to all new service accounts who register at the administrative office.	Could partner with energy utilities.	Little assurance the devices are installed.
<b>Partnership with Energy Utilities</b>	Partnerships with local energy utilities to offer incentives to customers to save both water and energy. SoCalGas provides kits with three faucet aerators and a low-flow showerhead at no cost. EVMWD to optimize efforts with partnering entities by tracking relevant data (interventions, water savings, energy savings, etc.) and ensuring consistent messaging. May consider streamlining residential site surveys by combining water and energy and cross-training staff with one agency financially subsidizing the other's efforts.	Could partner with local businesses interested in savings water and energy that are willing to work with both water and energy utilities.	Can be complicated or time-consuming to coordinate. SoCal Gas may not be willing/able to provide their data on work done, so this could call for more involvement and potentially funding from EVMWD to ensure we are capturing everything be performed.
<b>Residential High Efficiency Toilet Rebate</b>	Rebates are available for \$40 (1.06 gpf or lower). Rebates are handled by SoCal Water\$mart.	SoCal Water\$mart also partially conducts this measure.	With the \$40 rebate amount, it's not necessarily cost-effective for a customer unless they are planning to get a new toilet anyway. There has been declining participation over the last few years. Residents are concerned with having to pay extra to have it installed or do the install themselves.
<b>Clothes Washer Rebate</b>	Rebates will be provided for residential clothes washers. Rebates are available through and handled by SoCal Water\$mart and SoCalGas. SoCal Water\$mart Rebates start at \$85; SoCalGas rebates start at \$50.	Could partner with energy utilities. SoCal Water\$mart also partially conducts this measure.	Not necessarily cost-effective for the customer, unless they run full loads and/or were going to need a new machine anyway. Most effective water savings are achieved with full loads which can't be guaranteed. There has been declining participation over the last few years.
<b>Pool Cover Rebate</b>	Rebates will be provided for residential pool covers. Customers must submit a completed Rebate Request with a photo of their pool, a copy of the pool cover receipt and a copy of their current water bill.	Western Municipal Water District also partially funds this measure. Could also	It is difficult to predict if the pool covers will be used. Not necessarily cost-effective.

Measure Name	Description	Funding Sources & Opportunities	Measure Implementation Issues/Obstacles
		partner with pool equipment stores.	
<b>Leak Repair and Plumbing Emergency Assistance for Low-Income Customers</b>	Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. This program will require that customer leaks be repaired, but for low-income customers, be paid for with Rate Assistance for Residents of Elsinore Valley (RARE) funds that are paid back with customer monthly water bills over time.	Could partner with energy utilities.	Might require multiple departments to coordinate which can be time consuming. Customers may not pay back cost of repair on schedule. Could lead to further debt from the customer if not paying on-time. Residents are concerned with having to pay extra to have it installed or do the install themselves.

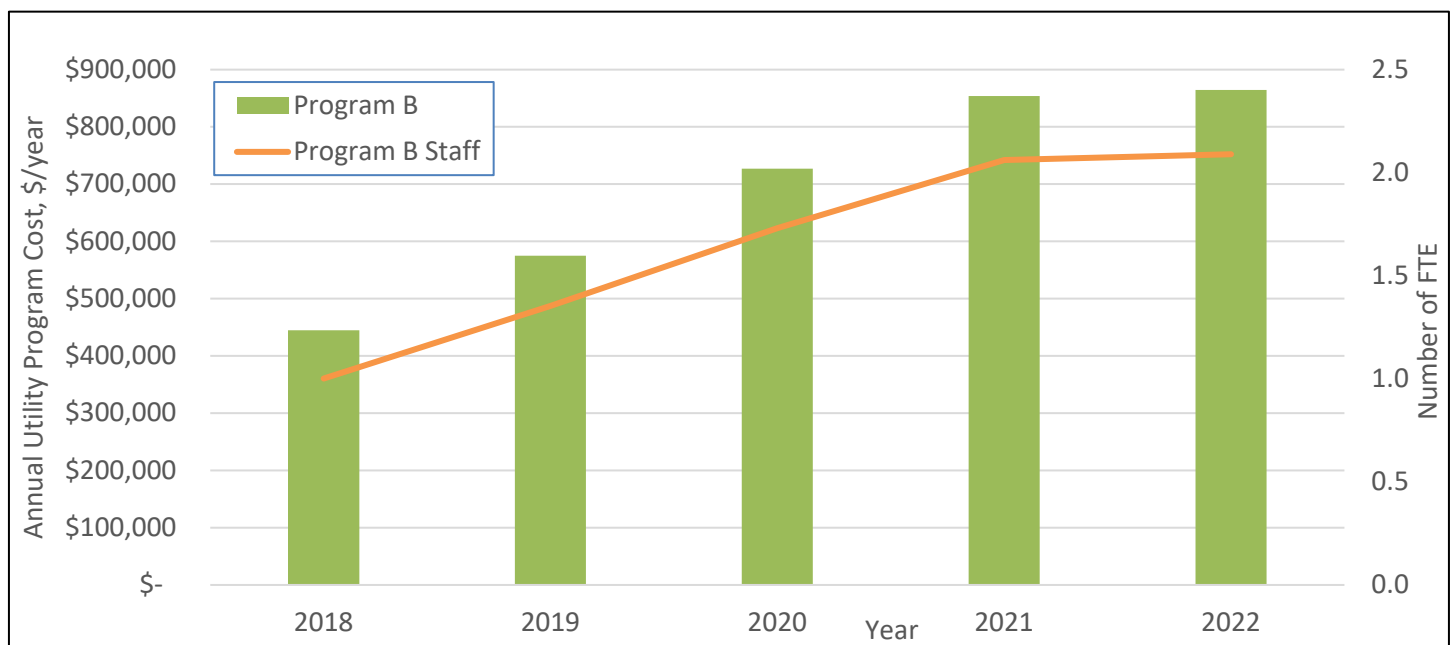
### 7.3 Five-Year Budget and Staffing

The estimated five-year 2018-2022 costs to EVMWD to implement Programs A, B, and C as described in the Business Plan are approximately \$2,489,000, \$3,465,000, and \$3,895,000, respectively (or \$498,000, \$693,000, and \$779,000 per year, respectively). The budget includes staff time and expenses (materials, rebates, giveaways, etc.).

The following figure presents the proposed implementation budget for the planned and ongoing EVMWD Program B measures. As noted earlier in this report, measure costs and staffing covered by SoCal Water\$mart and other partners are not included. Utility costs include unit costs (incentives and rebates) as well as administrative costs. Individual measure costs (including utility costs, administrative costs, and customer costs) can be found in the measure input sheets in Appendix H.

The following figure also presents the staffing EVMWD would need to implement Program B over the next five years. EVMWD staffing needs were calculated by dividing annual administrative costs by an average annual EVMWD salary of \$45 per hour or, estimating 2,087 work hours per year, approximately \$94,000 per staff person per year. Administrative costs were derived for each measure by taking a percentage of each measure's utility costs.

**Figure 7-1. Five-year Estimated Conservation Program B EVMWD Utility Costs and Staffing**



Note: Measure utility costs and staffing covered by SoCal Water\$mart, WMWD, and other partners are not included. The costs and staffing levels presented here are directly attributed to EVMWD only.

This following table presents EVMWD's Program B approximate utility costs including fixture/incentive costs as well as administrative costs for the next five years.

**Table 7-3. Conservation Program Utility Costs**

Year	Program B Utility Costs
2018	\$445,004
2019	\$574,899
2020	\$726,763
2021	\$854,086
2022	\$864,476

Note: The Conservation Program Utility Costs for Programs A, B, and C through 2040 can be found in Appendix I.

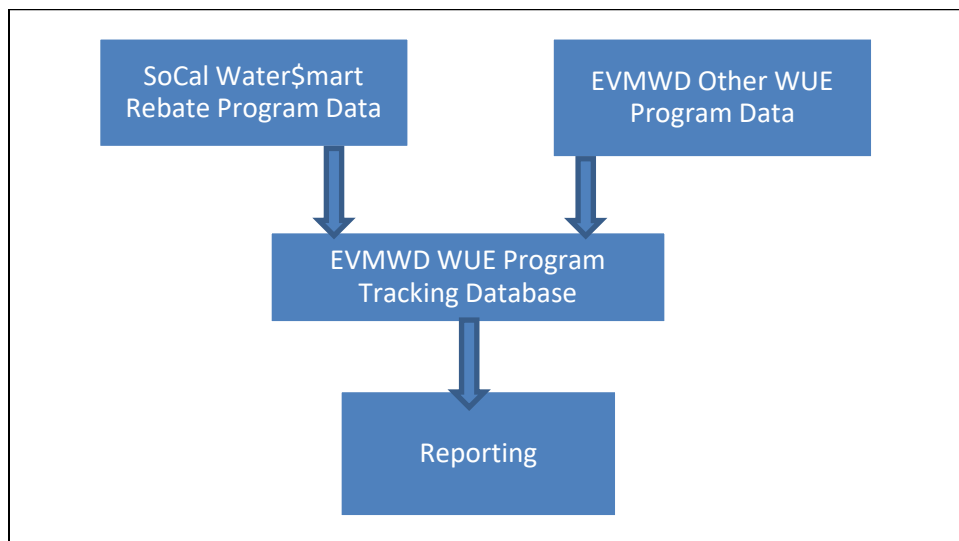
## 7.4 Monitoring Progress

It is recommended that EVMWD develop a tool that tracks the level of participation and program effectiveness of EVMWD's conservation programs. A tracking database in an Excel spreadsheet could store monthly data collected by EVMWD from each conservation measure as well as monthly rebate program data provided by SoCal Water\$mart. The tracking database could be designed to easily filter data for reporting purposes and updated monthly to reflect up-to-date program participation.

As shown in Figure 7-2 the tracking database could incorporate the following data:

- Customer information – Name, address, account number, type of business (e.g., CII customers)
- Water Use Efficiency (WUE) measure or device – Type (including make and model), quantity, unit water savings, life expectancy
- Cost information - Rebate amount
- Other documentation or data as appropriate (i.e., survey reports)

**Figure 7-2. Components of Tracking Tool Development**



Each year a progress update will be used to analyze the progress made meeting the Business Plan's targeted water savings. It is imperative to track activities, as well as water demand, to understand the level of progress being made in meeting overall goals.

Business Plan participation may be evaluated by tracking the following:

- Number of hits on the public information campaign website
- Cost of website development
- Number of water bills with campaign messaging
- Number of customers reached by water bills with campaign messaging
- Quantity and cost of electronic messaging via billboards
- Quantity and cost of radio and television advertising
- Number of impressions generated by radio and television advertising
- Number of teachers implementing lesson plans about water and water conservation
- Number and age range of students reached through teacher lesson plans
- Number of contests held to promote water efficiency and ages of participating students
- Number and cost of workshops as well as attendance

- Number of demonstration gardens installed and cost of installation/maintenance
- Number of citizen visits or tours of demonstration garden (administrative office)
- Customer satisfaction with the program or any complaints

Program participation by individual accounts may be evaluated by tracking the following:

- Number of occupants in the home/business
- Number and type of rebates or other incentives issued (including water saving details for rebates such as efficiency level of washing machines installed through incentive program)
- Water use before and after documented changes in replacement of fixtures or other implementation (including behavioral changes from survey)

## 7.5 Five-Year Implementation Recommendations

Recommendations to assist with implementation over the next five years include the following:

- Track upcoming state regulations regarding residential, CII, landscape, and water loss management
- Consider launching pilot studies for new measures
- Consider soliciting and tracking community input and feedback via an online or phone survey or at outreach and education events
- Prioritize measures that contribute the most to meeting the per capita use targets and are relatively easy to operate with limited staff
- Consider working with the largest 100 water using customers to reduce water use
- Develop annual work plan for each plan year as soon as budget is adopted (or in concert with budget planning process)
- Form partnerships and apply for grants where appropriate
- Outsource, if and as needed, to gain enough staff support to administer the expanded program
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors
- Set up a database to store and manage measure participation, cost, and other data to gauge successes and areas that need improvement or added attention
- Use the tools annually to help decide on priorities for the following plan year
- Annually update the plan, including actual measure participation, projected water savings, and expected per capita water use reductions, to ensure EVMWD is on track to meet conservation goals



## 8. CONCLUSIONS

This section presents a summary of the conservation program projected water savings as well as EVMWD's monitoring and implementation plan, including outreach, funding, and partnership opportunities.

Current conditions have encouraged EVMWD to implement Program B based on its effective methods. However, water use in a service area is very dynamic and responds to changes in service area population, economy, weather, efficiency of devices, and types of industry. In the future, as EVMWD's community evolves and water use patterns and weather change, there remains the possibility that EVMWD will elect to adjust measure implementation targets and schedules. This may include switching between implementing Program A, B, or C to be effective in achieving conservation goals. Additional measures (i.e., from Program C) may be necessary to further encourage EVMWD customers to conserve more water and to support EVMWD's conservation efforts. Whether these additional measures become necessary would be dependent on several factors, some of which include the following:

- Potential future drought conditions
- Compliance with the annual aggregate water use objectives as provided by the State in new regulations adopted in 2018
- EVMWD's ability to support new and more innovative programs

### 8.1 Projected Water Savings

Over 76 percent of EVMWD's service area water usage is associated with residential water use. Consequently, residential and irrigation conservation programs will produce the most savings. At 24 percent of overall water use, EVMWD's service area does not include intensive commercial activity, and therefore the conservation potential for the commercial sector is not particularly high. Some overall water savings conclusions are as follows:

- The total range of savings from Program A to Program C is 18 to 28 percent of projected demand with plumbing codes in 2040.
- The average cost of water saved from Programs A, B and C from the utility standpoint is \$270 per AF, \$170 per AF, and \$190 per AF, respectively; all of which are significantly less than the avoided cost of water at \$1,344 per AF.
- All programs have the possibility to reduce per capita water use in a cost-effective manner based on the implementation level of the plan.



It is important to note, costs are low and savings are high, yielding high conservation program benefit-cost ratios due to many of the measures being partially funded by MWD, WMWD, developers, and customers.

### 8.2 Conservation Program Evaluation

To track the success of EVMWD's conservation program, water use should be recorded before and after the conservation measure's initiation. In some instances, evaluation may be done on an individual site basis. If the water use at a residence or business does not decrease, then it is possible conditions have changed within the facility. For example, water use could change if a home has been sold or if additional tenants move into a commercial facility.

Maintaining a database of water use records will be needed to measure water savings. In addition, data may be normalized to account for unusual events that will affect water use such as:

- Abnormal weather

- Recessions and recovery
- Water price increases
- Changes in plumbing and appliance code regulations

Also, for tracking individual account water use changes, the following are some options to be considered:

- Changes in home ownership
- Changes in occupancy or uses of the facility
- Changes to landscape

To address the above factors, 5 to 10 years of monthly pre-program initiation water use data and 2 to 3 years of post-program initiation water use data should be gathered and statistically evaluated by qualified professionals.

### 8.3 Future Funding Opportunities, Partnerships, and Stakeholder Participation

EVMWD has expressed interest in creating partnerships with several public agencies, energy, and sewer utilities and local stakeholder groups who could provide cost-sharing or in-kind program support for the Business Plan. For example, EVMWD partners with SoCal Water\$mart to offer rebates for high efficiency toilets. EVMWD should create or continue, these partnerships to achieve program goals for minimum cost as well as maximize outreach and customer awareness/participation. A summary of EVMWD's current conservation program financing system is presented in Section 2.4.

The following is a list of suggested actions for EVMWD related to program financing:

- Budget for the selected Program B average 2018-2020 cost of approximately \$582,000 per year to cover the cost of implementing the program's measures.
- Staff conservation programs appropriately so that customer participation is successful. Both the Business Plan and meeting state mandates are largely driven by voluntary customer changes in equipment and behaviors that need to be permanent (including after the drought).
- Review program staff needs and hire staff to adequately support program needs.
- Seek testimonials of success to help with outreach materials and presentations to garner more customer participation.
- Look for new or expanded partnerships with local irrigation equipment contractors.
- Strengthen relationships with landscape professional associations, non-profits (e.g., University of California Cooperative Extension, Native Plant Society, etc.) to gain more word-of-mouth exposure to the community that is installing new or re-landscaping properties. This will help capture the maximum water savings from the point of initial installation of new landscapes and meeting local storm water permit needs.
- Seek additional new funding sources, such as Proposition 1E<sup>5</sup>, 84<sup>6</sup>, Cap & Trade<sup>7</sup> and/or US Bureau of Reclamation funds to support Business Plan budget needs. The existing budgets may be used as a cost-share to leverage into funding more activities, especially the less cost-effective measures.
- Seek additional financial support through the California Department of Water Resources Water-Energy Grant Program<sup>8</sup>. The DWR Water-Energy Grant Program provides funds to implement water efficiency programs or projects that reduce greenhouse gas emissions and water and energy use. The grant program is part of the California Climate Investments<sup>9</sup>, a statewide program that puts billions of cap-and-trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment, particularly in disadvantaged communities.

<sup>5</sup> <http://bondaccountability.resources.ca.gov/p1e.aspx>

<sup>6</sup> <http://bondaccountability.resources.ca.gov/p84.aspx>

<sup>7</sup> <https://www.edf.org/climate/how-cap-and-trade-works>

<sup>8</sup> <https://www.water.ca.gov/Work-With-Us/Grants-And-Loans/Water-Energy-Grant-Programs>

<sup>9</sup> <http://www.caclimateinvestments.ca.gov/>

- Market conservation opportunities through accredited program membership lists as a low-cost means to spread the word to other professionals in the water industry (e.g., Green Plumbers, WaterSense Partners, Irrigation Association Certified Professionals, etc.).
- Prioritize measures for implementation, with the highest priority for implementation given to those that contribute the most to meeting water saving targets and/or can be implemented with relative ease. To launch implementation of a conservation program, EVMWD may consider answering a series of key questions to determine measures, budget, and schedule for the Business Plan. These questions could include:
  - What level of support will be required from conservation staff to run the selected measures?
  - What other support is needed (e.g., outsourced support or other sources of funding) that is needed or wanted to run these programs?
- Prepare an annual work plan for each Business Plan year in concert with the budget planning process.
- Form additional partnerships and continue to apply for grants where appropriate.
- Set up a method to store and manage measure participation, cost, and other data to gauge successes and areas that need improvement.

Review Business Plan goals in the DSS Model annually and update measure participation or other elements that are refined. Track water use to ensure the Business Plan is on track to meet water use reduction goals. Use the input from EVMWD staff and the annual work planning process as the forum to amend the plan, budgets, staffing, contracting, schedule, and so forth to stay on track.

Periodically, EVMWD will be preparing comprehensive water conservation pricing and rate studies. EVMWD will also continue to actively pursue applications for state and federal grants as well as partnering opportunities.

## 8.4 Summary

The following is a summary of the water conservation analysis findings:

- Creating expanded water conservation efforts appears to be a feasible and cost-effective means of:
  - Meeting 20x2020 (SB X7-7) conservation reduction targets;
  - Being more sustainable within existing water supplies;
  - Remaining up-to-date with the USBR requirements to maintain programs in line with the former CUWCC's Best Management Practices;
  - Addressing reduction in water use as previously required by the statewide drought emergency declaration recently lifted; and
  - Implementing the mandated statewide prohibitions in the Governor's Executive Orders going forward (e.g., only serving water upon request, no watering for 48 hours after a rain event, etc.).
- EVMWD should track development of DWR framework into new state mandates for what is planned for 2021-2025 and beyond. The Governor recently signed SB 606 and SB 1668 into state law to create a more permanent conservation standard as part of implementing "Making Water Conservation a California Way of Life."
- The results provided in this Business Plan confirm that conservation is the least expensive means of meeting future water supply needs for the area. The implementation of these conservation measures should reduce per capita water use and have the potential to defer the need for further expansion infrastructure. While the conservation actions identified can have a significant cost, the cost of not doing conservation and having to address increased demands through engineering solutions are even higher. Furthermore, with climate change, long-term drought, and environmental restrictions on the delivery of imported water, additional water supplies may not be available to meet future increases in demands without conservation.
- Based on the analysis, EVMWD has selected to implement Program B, with 21 measures, which has the highest benefit-cost ratio (at 5.3) of all three modeled programs. The cost of water saved in Program B is \$170 per AF versus the cost of purchasing imported, treated water estimated at \$1,344 per AF.

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## APPENDIX A – GRANT REQUIREMENT ELEMENT REFERENCE KEY

The following table presents the location of various grant-required elements within the Business Plan. Per the MWM/EVMWD scope, the Business Plan will provide the following components listed in the first column and found in the section identified in the second.

**Table A-1. Grant Requirement Reference Key**

Business Plan Element Directly from Scope	Location in Business Plan
Executive summary	Executive Summary
Chapter on data collection methods and results <ul style="list-style-type: none"> <li>End-users by sector</li> </ul>	Section 2.1 Information Review and Data Collection Methods Section 2.3. Consumption by User Category Section 3.3 Key Inputs to the DSS Model Section 3.4 Fixture Estimates
EVMWD implemented programs and program analyses	Section 2.4 Historical and Current Conservation Program Section 5 Comparison of Individual Conservation Measures Section 6 Conservation Program Evaluation Section 7 Implementation Plan/Five-Year Action Plan Section 8 Conclusions
Chapter on available program options <ul style="list-style-type: none"> <li>Residential sector</li> <li>CII sectors</li> <li>Large landscape sector</li> <li>Other opportunities</li> </ul>	Executive Summary Table ES-1 Section 6 Conservation Program Evaluation
Chapter on new program recommendations	Section 6 Conservation Program Evaluation
Chapter on recommended program mixes	Section 6 Conservation Program Evaluation Section 6.5 Recommended Program
Chapter on five-year action plan	Section 7 Program B Five-Year Implementation Plan
Funding opportunities	Section 8.3 Future Funding Opportunities, Partnerships and Stakeholder Participation
Chapter on program life cycles (staff input) <ul style="list-style-type: none"> <li>Recommended program changes &amp; transitions</li> </ul>	Section 7 Implementation Plan/Five-Year Action Plan – presents the recommended program (Program B) Appendix H – presents individual measure life (life cycles) for each of the 25 analyzed measures
Chapter on periodic updates to the Water Conservation Business Plan and flexibility in the program mix (staff input)	Section 8 Conclusions – introduction paragraph discusses program flexibility Section 7.4 Monitoring Progress
Conclusion	Section 8 Conclusions Section 8.4 Summary



## APPENDIX B – EVMWD WATER, WASTEWATER, AND METER FEES

This appendix presents EVMWD's water commodity rates, monthly fixed meter charges, wastewater rates, water capacity fees for 3/4-inch meters, and meter installation charges.

**Figure B-1. Water Commodity Rates**

Commodity Rates	Block	Current Rate per CCF	Approved Rate 8/1/2017 per CCF	Approved Rate 7/1/2018 per CCF
<b>Elsinore Water Division</b>				
Domestic				
Indoor Use	1	\$2.27	\$2.29	\$2.34
Outdoor Use	2	2.77	2.78	2.84
Inefficient Use	3	4.38	5.05	5.05
Excessive Use	4	6.32	7.48	7.48
Irrigation				
Outdoor Use	1	2.86	2.87	2.93
Inefficient Use	2	4.56	5.25	5.25
Excessive Use	3	6.90	8.08	8.08
Commercial/Institutional		2.77	2.78	2.84
Hydrant Water		5.38	5.38	5.49
Recycled/Non-Potable				
Outdoor Use	1	2.36	2.28	2.29
Inefficient Use	2	4.01	4.12	4.14
Excessive Use	3	5.42	4.68	4.70
Inter-agency / Wholesale				
Tier 1		2.43	2.43	2.48
Tier 2		3.95	4.61	4.61
Tier 3		5.07	6.25	6.25
<b>Temescal Water Division</b>				
Domestic				
Indoor Use	1	1.16	0.74	0.76
Outdoor Use	2	1.60	1.23	1.26
Inefficient Use	3	3.20	1.53	1.56
Excessive Use	4	4.80	5.74	5.86
Irrigation				
Outdoor Use	1	1.60	1.32	1.35
Inefficient Use	2	3.20	1.73	1.77
Excessive Use	3	4.80	6.34	6.47
Commercial		\$2.08	\$0.94	\$0.96
1 AF = 435.6 CCF				
1 CCF = 748 gallons				

**Figure B-2. Monthly Fixed Meter Charges**

<b>Meter Sizes (inches)</b>	<b>Elsinore Current Rate</b>	<b>Temescal Current Rate</b>	<b>Approved Rate 7/1/2017</b>	<b>Approved Rate 7/1/2018</b>
3/4	\$21.27	\$16.58	\$23.77	\$26.27
1	33.36	28.18	37.16	41.29
1 1/2	63.58	54.70	70.63	78.85
2	99.84	87.85	110.79	123.91
3	214.67	165.76	237.96	266.59
4	383.90	276.82	425.37	476.87
6	970.16	551.98	1,074.63	1,205.35
8	1,695.43	883.49	1,877.83	2,106.55
10	2,541.58	-	2,814.89	3,157.94

*\*Both water divisions will have same fixed charges going forward*

**Figure B-3. Wastewater Rates**

<b>Classification</b>	<b>Current Rate per CCF</b>	<b>Approved Rate 8/1/2017 per CCF</b>	<b>Proposed Rate 7/1/2018* per CCF</b>
Domestic			
I-A Single Family Residential	\$43.50	\$45.87	N/A
I-B Multiple Family Residential	33.79	45.87	N/A
No Water Usage	13.52	18.96	N/A
Low Water Usage	33.79	30.92	N/A
I Fixed Charge*			20.29
I Variable Charge*			6.93
Commercial (applies to all service areas)			
II Commercial	3.99	3.87	4.15
III Commercial	4.40	4.67	5.00
IV Commercial	8.29	8.68	9.29
V Institutional	3.98	3.51	3.76
VII Septage (per gallon)	0.074	0.11	0.12
VIII Schools	3.81	3.51	3.76

NOTE: Canyon Lake sewer surcharges remain the same

\*Sewer rate will switch to a mixed (fixed/v variable) charge starting 7/1/2018.

\*The variable component of the rate will be based on persons per household

**Figure B-4. Water Capacity Fees (3/4-inch meter)**

<b>Component</b>	<b>Current Fee FY 2017 7/1/2016</b>	<b>Approved FY 2018 8/1/2017</b>
Administration	\$44	\$44
Pumping Plant	1,372	1,372
Storage	1,117	1,117
Temescal Valley Project	1,988	2,416
Source of Supply	1,656	1,656
Transmission Facilities	2,679	2,679
<b>TOTAL</b>	<b>\$8,856</b>	<b>\$9,284</b>

**Figure B-5. Meter Installation Charges**

<b>Meter Size (inches)</b>	<b>Current Charge</b>		<b>Approved Charge 8/1/2017</b>		<b>Approved Charge 7/1/2018</b>	
	<b>Hang Service</b>	<b>Full Service</b>	<b>Hang Service</b>	<b>Full Service</b>	<b>Hang Service</b>	<b>Full Service</b>
3/4	\$540	\$2,420	\$505	\$2,385	\$525	\$2,445
1	575	2,450	545	2,420	565	2,480
1 1/2 - Turbine	1,325	3,550	1,315	3,540	1,365	3,630
1 1/2 - Compound	1,815	4,040	1,760	3,985	1,825	4,085
2 - Turbine	1,550	3,735	1,545	3,730	1,605	3,825
2 - Compound	2,080	4,350	2,030	4,300	2,105	4,410

## APPENDIX C – IMPLEMENTATION OF DISTRICT SYSTEM OPTIMIZATION REVIEW

In mid-2018, EVMWD applied for the Water Conservation Field Services grant through the US Bureau of Reclamation. The grant is intended to fund the exploration of current water loss levels and support a review of EVMWD's recent AWWA water audit to identify any potential for reducing current water loss levels. If the grant effort is successful, the funding would support the planned items for implementation of EVMWD's selected District System Optimization Review conservation measure, as listed below:

- A collaboration between Water Conservation staff and Operations staff to discuss water loss opportunity, verify water loss magnitude, and ascertain if there is more potential to reduce system water loss
- A better understanding of EVMWD's water distribution system – materials, size, how many miles of service, age of area(s), weaknesses/strengths, etc.
- A discussion of current actions by EVMWD that reduce water loss with an investigation into whether any can be expanded upon should a new approach be taken
  - For example, currently, EVMWD conducts meter testing internally, with approximately 500 meters out of over 46,000 tested annually. There is potential to expand testing procedures using an outside consultant.
  - EVMWD seeks to improve its methods of tracking Non-Revenue Water. Leak detection is challenging for the large portion of the system made up of PVC pipe.
- Operations staff soliciting input from potential consultants to optimize what their approach for leak detection might be
- Staff reaching out to consultants for quotes and examples of services performed to gain knowledge of potential water loss management implementation practices
- The development of a scope of work based on Operations staff suggestions and consultant service examples

**Figure C-1. Standard AWWA Water Balance\***

Water from Own Sources	System Input Volume	Water Exported				Revenue Water
		Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption		
			Water Losses	Unbilled Authorized Consumption	Billed Unmetered Consumption	
					Unbilled Metered Consumption	
				Real Losses	Apparent Losses	Unbilled Unmetered Consumption
		Unauthorized Consumption				
		Customer Metering Inaccuracies				
		Systematic Data Handling Errors				
		Leakage on Mains				
			Leakage on Service Connections			
Leakage on Appurtenances						
Leakage and Overflow at Storage Tanks						
Water Imported	System Input Volume	Water Supplied	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water

\* Based on AWWA Manual M36, Water Audits and Loss Control Programs (AWWA, 2016).

## APPENDIX D – DEMAND AND PASSIVE SAVINGS METHODOLOGY

This appendix presents information regarding the various plumbing codes applied in the DSS Model, DSS Model key assumption resources related to determining plumbing code savings, and the EVMWD current fixture proportions for several fixture types by customer category.

### D.1 National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005, mandates that only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead – 2.5 gal/min at 80 pounds per square inch (psi)
- Residential faucets – 2.2 gal/min at 60 psi
- Public restroom faucets – 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act, which mandates that only devices with the specified level of efficiency (as shown above) can be sold as of 2006. The net result of the plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new, more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code, the U.S. Department of Energy regulates appliances, such as residential clothes washers, further reducing indoor water demands. Regulations to make these appliances more energy efficient have driven manufactures to dramatically reduce the amount of water these machines use. Generally, front loading washing machines use 30 to 50 percent less water than conventional models (which are still available).

In this analysis, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 12 gallons or less) so that by the year 2025 that will be the only type of machine available for purchase. In addition to the industry becoming more efficient, rebate programs for washers have been successful in encouraging customers to buy more water efficient models. Given that machines last about 10 years, eventually all machines on the market will be the more water efficient models. Energy Star washing machines have a water factor of 6.0 or less – the equivalent of using 3.1 cubic feet (or 23.2 gallons) of water per load. The maximum water factor for residential clothes washers under current federal standards is 9.5. The water factor equals the number of gallons used per cycle per cubic foot of capacity. Prior to year 2000, the water factor for a typical new residential clothes washer was about 12. In March 2015, the federal standard reduced the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines was further reduced to 6.5. For commercial washers, the maximum water factors were reduced in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Beginning in 2015, the maximum water factor for Energy Star certified washers was 3.7 for front-loading and 4.3 for top-loading machines. In 2011, the US Environmental Protection Agency estimated that Energy Star washers comprised more that 60 percent of the residential market and 30 percent of the commercial market (Energy Star, 2011). A new Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s.



## D.2 State Plumbing Code

This section describes California State Laws and Code of Regulations applicable to the State Plumbing Code.

### D.2.1 California State Law – AB 715

Plumbing codes for toilets, urinals, showerheads, and faucets were initially adopted by California in 1991, mandating the sale and use of ultra-low flush toilets (ULFTs) using 1.6 gpf, urinals using 1 gpf, and low-flow showerheads and faucets. California Code of Regulations Title 20 updated based on California State Law (Assembly Bill 715) requires high efficiency toilets and high efficiency urinals be exclusively sold in the State by 2014. Effective January 1, 2014, AB 715 (enacted in 2007) required that toilets and urinals sold and installed in California cannot have flush ratings exceeding 1.28 gpf (toilets) and 0.5 gpf (urinals).

### D.2.2 California State Laws – SB 407 and SB 837

SB 407 addresses plumbing fixture retrofits on resale or remodel. The DSS Model carefully considers the overlap with SB 407, the plumbing code (natural replacement), CALGreen, AB 715 and rebate programs (such as toilet rebates). SB 407 (enacted in 2009) requires that properties built prior to 1994 be fully retrofitted with water conserving fixtures by the year 2017 for single family residential houses and 2019 for multifamily and commercial properties. SB 407 program length is variable and continues until all the older high flush toilets have been replaced in the service area. The number of accounts with high flow fixtures is tracked to make sure that the situation of replacing more high flow fixtures than actually exist does not occur. Additionally, SB 407 conditions issuance of building permits for major improvements and renovations upon retrofit of non-compliant plumbing fixtures. SB 837 (enacted in 2011) requires that sellers of real property disclose on their Real Estate Transfer Disclosure Statement whether their property complies with these requirements. Both laws are intended to accelerate the replacement of older, low efficiency plumbing fixtures, and ensure that only high efficiency fixtures are installed in new residential and commercial buildings.

### D.2.3 2015 CALGreen and 2015 CA Code of Regulations Title 20 Appliance Efficiency Regulations

Fixture characteristics in the DSS Model are tracked in new accounts, which are subject to the requirements of the 2016 California Green Building Code and 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the California Energy Commission (CEC) on September 1, 2015. The CEC 2015 appliance efficiency standards apply to the following new appliances, if they are sold in California: showerheads, lavatory faucets, kitchen faucets, metering faucets, replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, commercial pre-rinse spray valves, urinals, and toilets. The DSS Model accounts for plumbing code savings due to the effects these standards have on showerheads, faucets, aerators, urinals, and toilets.

- Showerheads – July 2016: 2.0 gpm; July 2018: 1.8 gpm
- Wall Mounted Urinals – January 2016: 0.125 gpf (pint)
- Lavatory Faucets and Aerator – July 2016: 1.2 gpm at 60 psi
- Kitchen Faucets and Aerator – July 2016: 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
- Public Lavatory Faucets – July 2016: 0.5 gpm at 60 psi



In summary, the controlling law for **toilets** is Assembly Bill 715. This bill requires high efficiency toilets (1.28 gpf) to be exclusively sold in California beginning January 1, 2014. The controlling law for wall-mounted urinals is the 2015 CEC efficiency regulations requiring that ultra-high efficiency pint **urinals** (0.125 gpf) be exclusively sold in California





beginning January 1, 2016. This is an efficiency progression for urinals from AB 715's requirement of high efficiency (0.5 gpf) urinals starting in 2014.

Standards for **residential clothes washers** fall under the regulations of the U.S. Department of Energy. In 2018, the maximum water factor for standard top-loading machines was reduced to 6.5.

**Showerhead** flow rates are newly regulated under the 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the CEC, which requires the exclusive sale in California of 2.0 gpm showerheads at 80 psi as of July 1, 2016 and 1.8 gpm showerheads at 80 psi as of July 1, 2018. The WaterSense specification applies to showerheads that have a maximum flow rate of 2.0 gpm or less. This represents a 20 percent reduction in showerhead flow rate over the current federal standard of 2.5 gpm, as specified by the Energy Policy Act of 1992.

**Faucet** flow rates have likewise been recently regulated by the 2015 CEC Title 20 regulations. This standard requires that the residential faucets and aerators manufactured on or after July 1, 2016 be exclusively sold in California at 1.2 gpm at 60 psi; and public lavatory and kitchen faucets/aerators sold or offered for sale on or after July 1, 2016 be 0.5 gpm at 60 psi and 1.8 gpm at 60 psi (with optional temporary flow of 2.2 gpm), respectively. Previously, all faucets had been regulated by the 2010 California Green Building Code at 2.2 gpm at 60 psi.

### D.3 DSS Model Key Assumptions Resources

The following table presents the references for the key assumptions used in the DSS Model in determining projected demands with and without plumbing codes.

**Table D-1. Key Assumptions Resources**

Parameter	Resource
<b>Residential End Uses</b>	Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study," (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses) and AWWA Research Foundation (AWWARF) Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition. 2013. <a href="http://www.map-testing.com/content/info/menu/perc.html">http://www.map-testing.com/content/info/menu/perc.html</a> Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
<b>Non-Residential End Uses, percent</b>	Key Reference: AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008. Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
<b>Efficiency Residential Fixture Current Installation Rates</b>	U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Key Reference: California Urban Water Conservation Council Potential Best Management Practice Report "High Efficiency Plumbing Fixtures – Toilets and Urinals" (Koeller, 2005 – Page 42, Table 8 and Table 9: Residential toilet installation rates in California). Key Reference: Consortium for Efficient Energy ( <a href="http://www.cee1.org">www.cee1.org</a> ). Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.
<b>Water Savings for Fixtures, gal/capita/day</b>	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016).

Parameter	Resource
	<p>Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study" (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses). WCWCD supplied data on costs and savings; professional judgment was made where no published data was available.</p> <p>Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014.</p> <p>Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.</p>
<b>Non-Residential Fixture Efficiency Current Installation Rates</b>	<p>Key Reference: 2010 U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Assume commercial establishments built at same rate as housing, plus natural replacement.</p> <p>California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014.</p> <p>Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008.</p> <p>Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.</p>
<b>Residential Frequency of Use Data, Toilets, Showers, Faucets, Washers, Uses/user/day</b>	<p>Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Summary values can be found in the full report: <a href="http://www.waterrf.org/Pages/Projects.aspx?PID=4309">http://www.waterrf.org/Pages/Projects.aspx?PID=4309</a></p> <p>Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014.</p> <p>Key Reference: Alliance for Water Efficiency, The Status of Legislation, Regulation, Codes &amp; Standards on Indoor Plumbing Water Efficiency, January 2016.</p> <p>Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.</p>
<b>Non-Residential Frequency of Use Data, Toilets, Urinals, and Faucets, Uses/user/day</b>	<p>Key References: Estimated based on AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use).</p> <p>Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014.</p> <p>Fixture uses over a 5-day work week are prorated to 7 days.</p> <p>Non-residential 0.5gpm faucet standards per Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition, 2012. <a href="http://www.map-testing.com/content/info/menu/perc.html">http://www.map-testing.com/content/info/menu/perc.html</a></p> <p>Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model, and confirmed in each "Service Area Calibration End Use" worksheet by customer category.</p>
<b>Natural Replacement Rate of Fixtures (percent per year)</b>	<p>Residential Toilets 2 percent (1.28 gpf and lower), 3 percent (1.6 gpf toilets), 4 percent (3.5 gpf and higher toilets)</p> <p>Non-Residential Toilets 2 percent (1.6 gpf and lower), 3 percent (3.5 gpf and higher toilets)</p> <p>Residential Showers 4 percent (corresponds to 25-year life of a new fixture)</p> <p>Residential Clothes Washers 10 percent (based on 10-year washer life).</p> <p>Key References: "Residential End Uses of Water" (DeOreo, 2016) and "Bern Clothes Washer Study, Final Report" (Oak Ridge National Laboratory, 1998).</p>

Parameter	Resource
	Residential Faucets 10 percent and Non-Residential Faucets 6.7 percent (every 15 years). CEC uses an average life of 10 years for faucet accessories (aerators). A similar assumption can be made for public lavatories, though no hard data exists and since CII fixtures are typically replaced less frequently than residential, 15 years is assumed. CEC, Analysis of Standards Proposal for Residential Faucets and Faucet Accessories, a report prepared under CEC's Codes and Standards Enhancement Initiative, Docket #12-AAER-2C, August 2013.
	Model Input Value is found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
<b>Residential Future Water Use</b>	Increases Based on Population Growth and Demographic Forecast
<b>Non-Residential Future Water Use</b>	Increases Based on Employment Growth and Demographic Forecast

There are several aspects of the DSS Model that were not used in this analysis effort, which result in empty spreadsheets within the DSS Model. They remain available in the DSS Model should EVMWD choose to employ them in future efforts.

#### D.4 Fixture Estimates

As discussed in Section 3, the Business Plan incorporates the recent results from the Water Research Foundation REUWS study reflecting the water use change in residential homes and the implementation of more water efficient fixtures over the past 15 years. The REUWS results and EVMWD's historical rebate and billing data was combined to strengthen and justify assumptions made on all customer accounts, including saturation levels on toilets, urinals, showerheads, clothes washers, and faucets. The following tables and figures present the estimated current and projected proportions of these fixtures by efficiency level within EVMWD's service area. These proportions were calculated by:

- Using standards in place at the time of building construction;
- Taking the initial proportions of homes by age (corresponding to fixture efficiency levels);
- Adding the net change due to natural replacement; and
- Adding the change due to rebate measure minus the "free rider effect."

Again, the projected fixture proportions do NOT include any future active conservation measures implemented by EVMWD. More information about the development of initial and projected fixture proportions can be found in Section 3 as well as in the DSS Model "Codes and Standards" section.

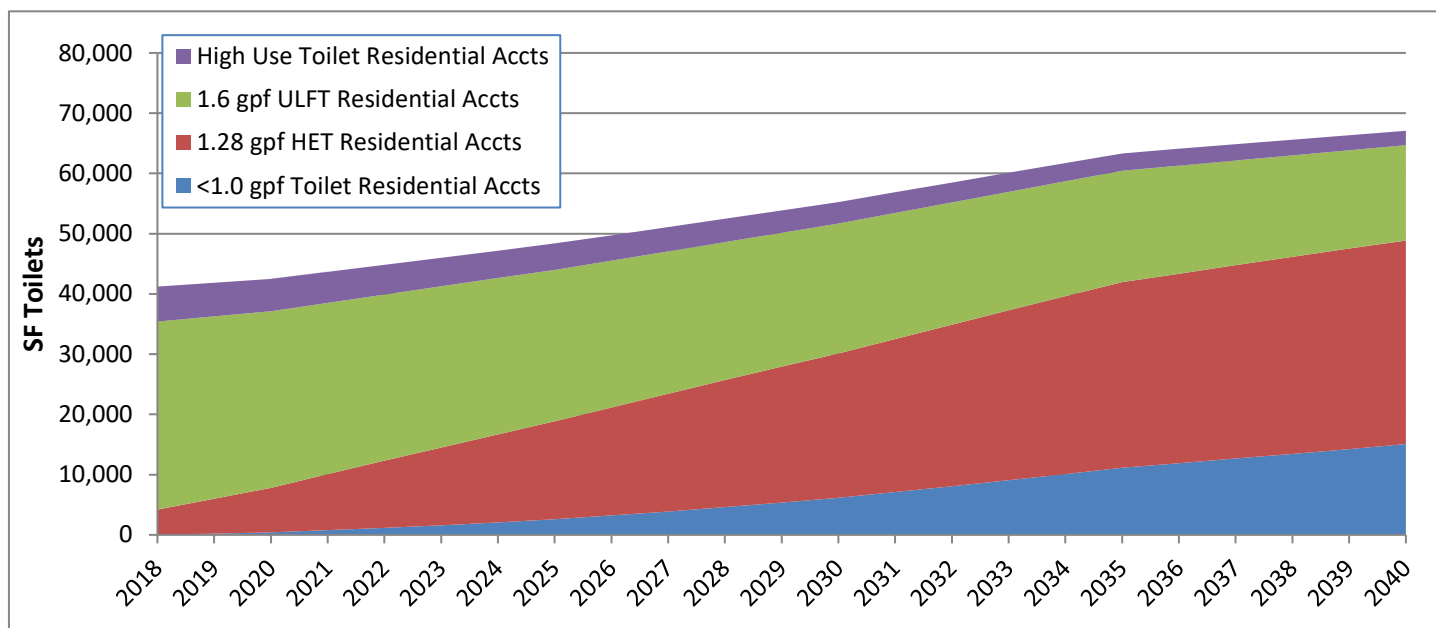
It is also important to note that in water conservation program management, free-ridership occurs when a customer, who would have purchased the targeted high efficiency fixture without a rebate, applies for and receives the rebate. In this case, the rebate was not the incentive in their purchase but a "bonus." Rebate measures are designed to target those customers needing financial incentive to install the more efficient fixture beyond current codes or standards.

##### D.4.1 Toilets

The following figures present the estimated number of current and projected toilets by customer category within the service area based on the effects of current and estimated plumbing codes and standards. Initial proportions are determined by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and rebate measures less any "free rider effect."

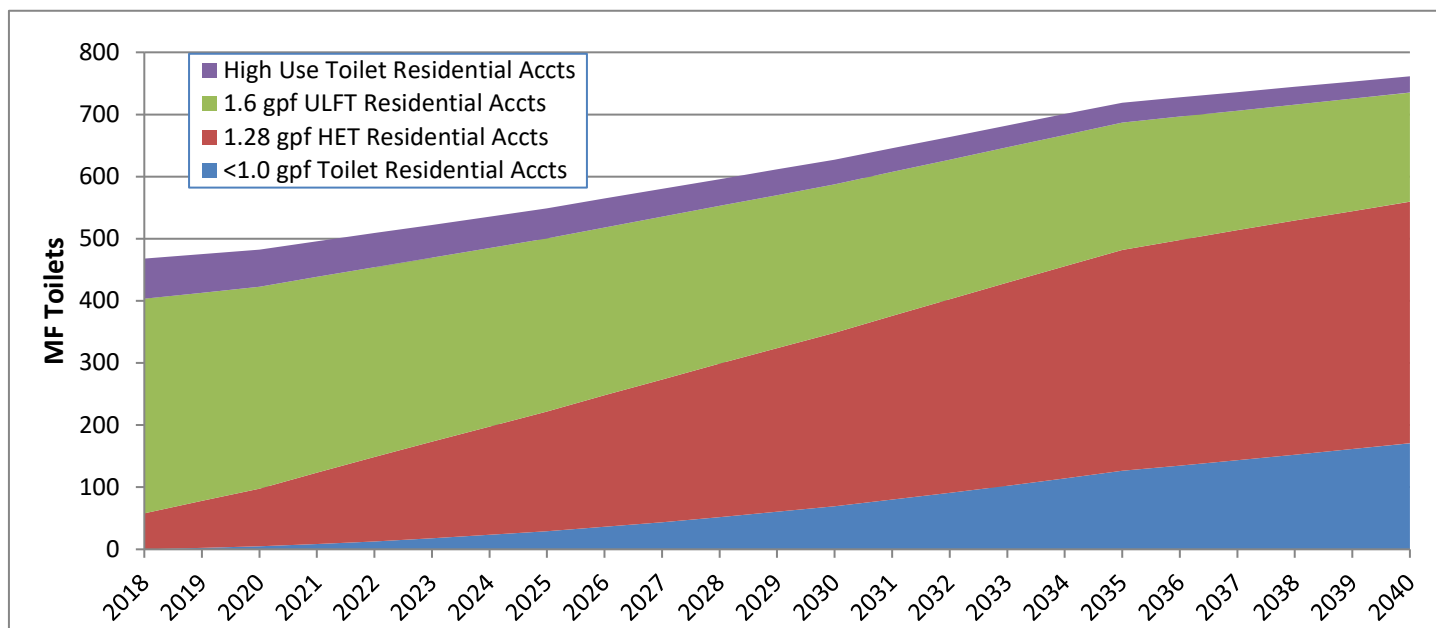
The following figure presents the estimated number of current and projected residential toilets for single family (SF) accounts.

**Figure D-1. Single Family Toilets**



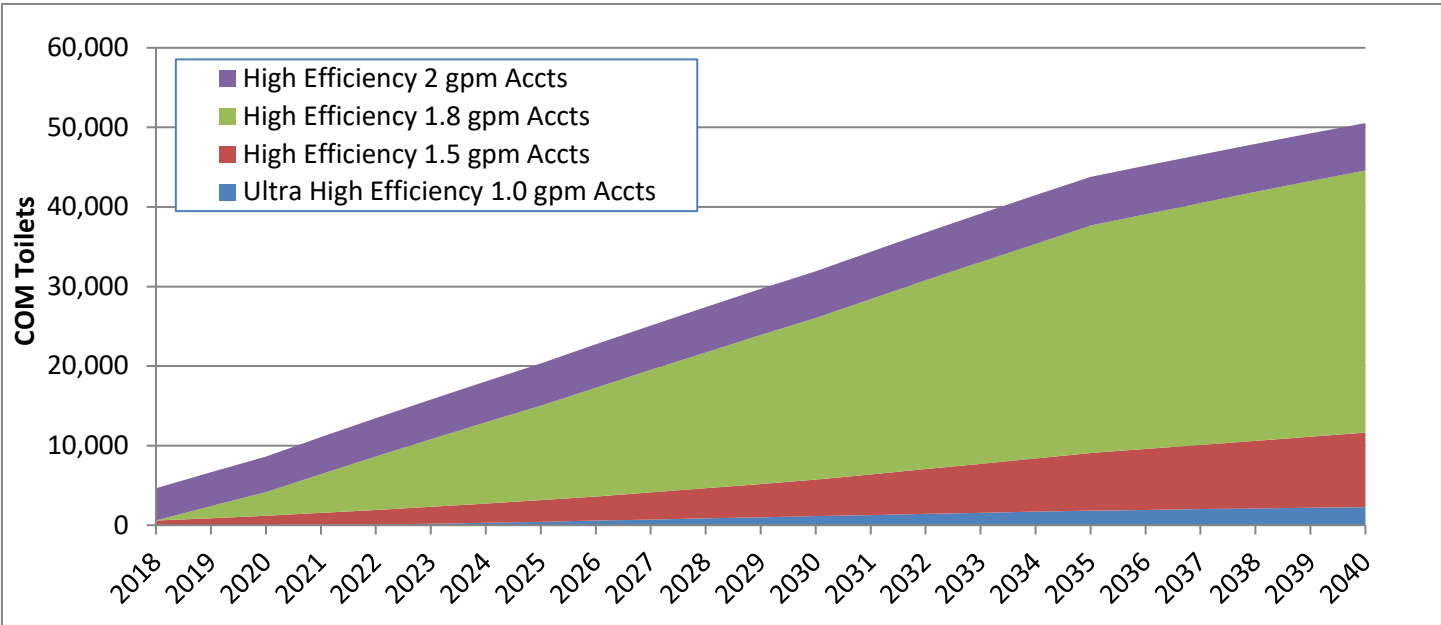
The following figure presents the estimated number of current and projected residential toilets for multifamily (MF) accounts based on the effects of current and estimated plumbing codes and standards.

**Figure D-2. Multifamily Toilets**



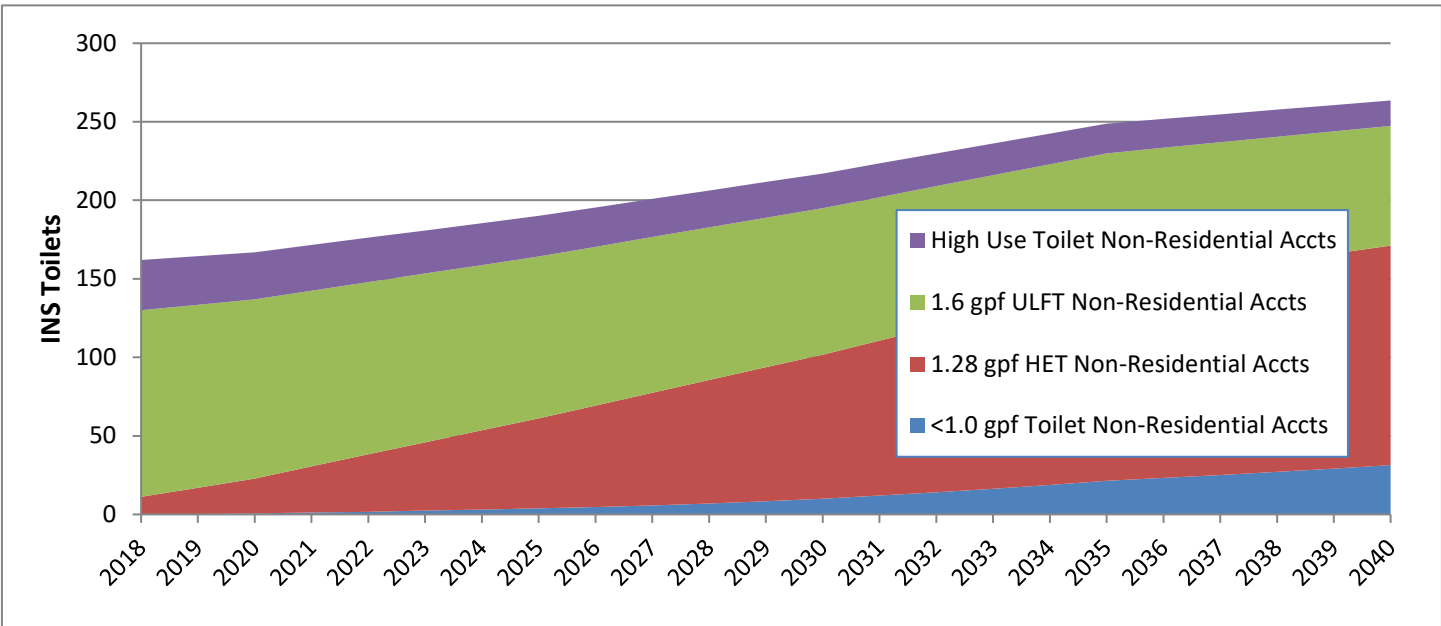
The following figure presents the estimated number of current and projected non-residential toilets for commercial (COM) accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-3. Commercial Toilets



The following figure presents the estimated number of current and projected non-residential toilets for institutional (INS) accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-4. Institutional Toilets



D.4.2 Showerheads

The following figures present the estimated number of current and projected showerheads by customer category within the service area based on the effects of current and estimated plumbing codes and standards. The initial proportions are determined by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and rebate measures less any "free rider effect."

Figure D-5 presents the estimated number of current and projected residential showerheads for SF accounts.

Figure D-5. Single Family Showerheads

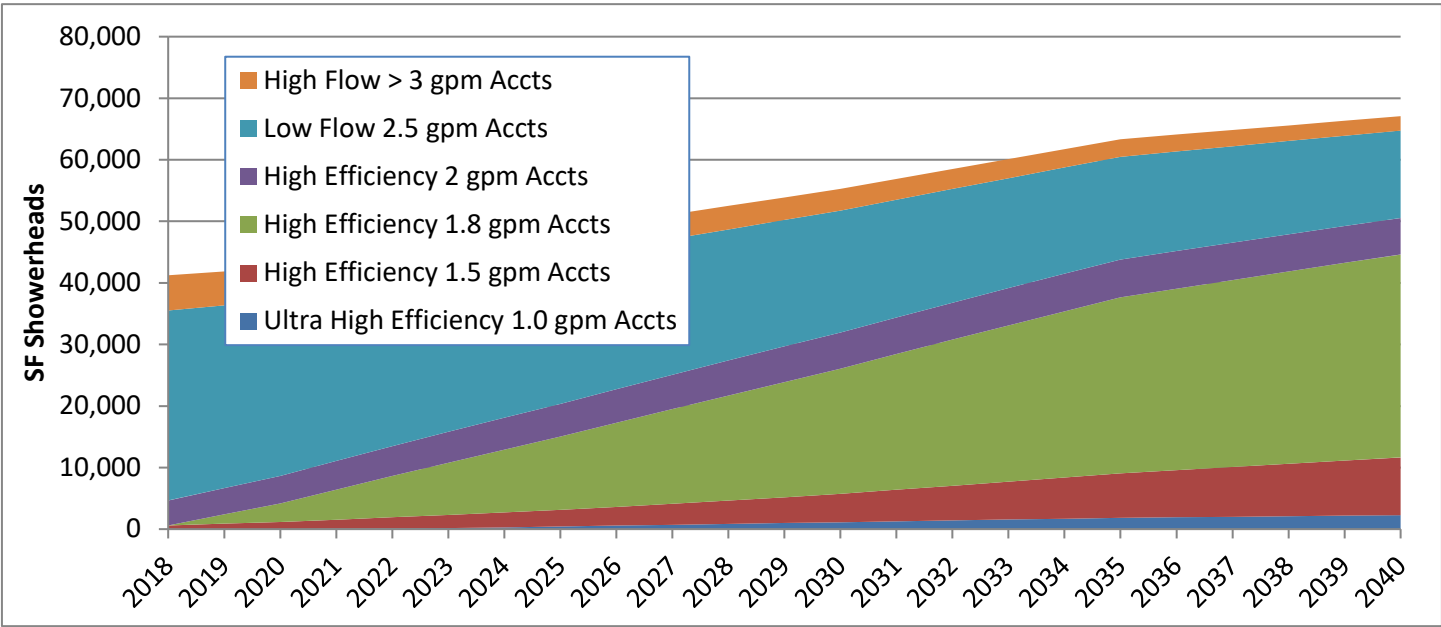
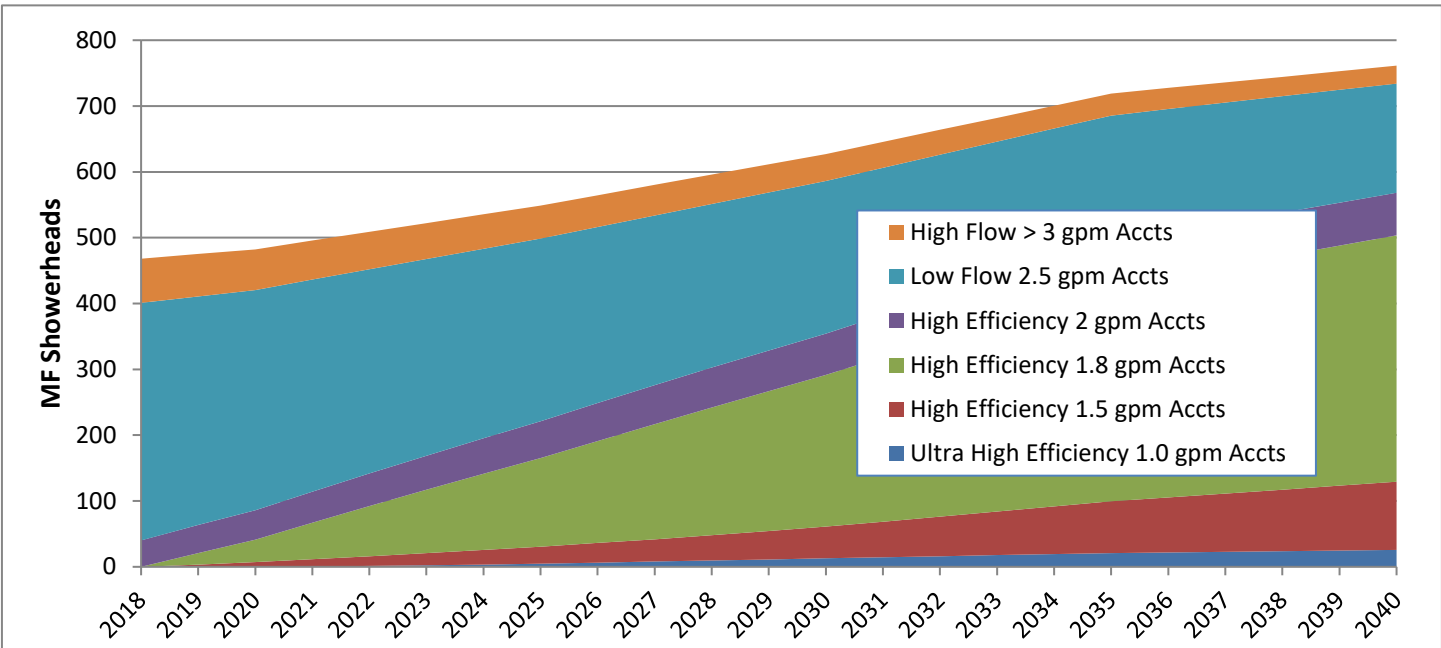


Figure D-6 presents the estimated number of current and projected residential showerheads for MF accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-6. Multifamily Showerheads



D.4.3 Urinals

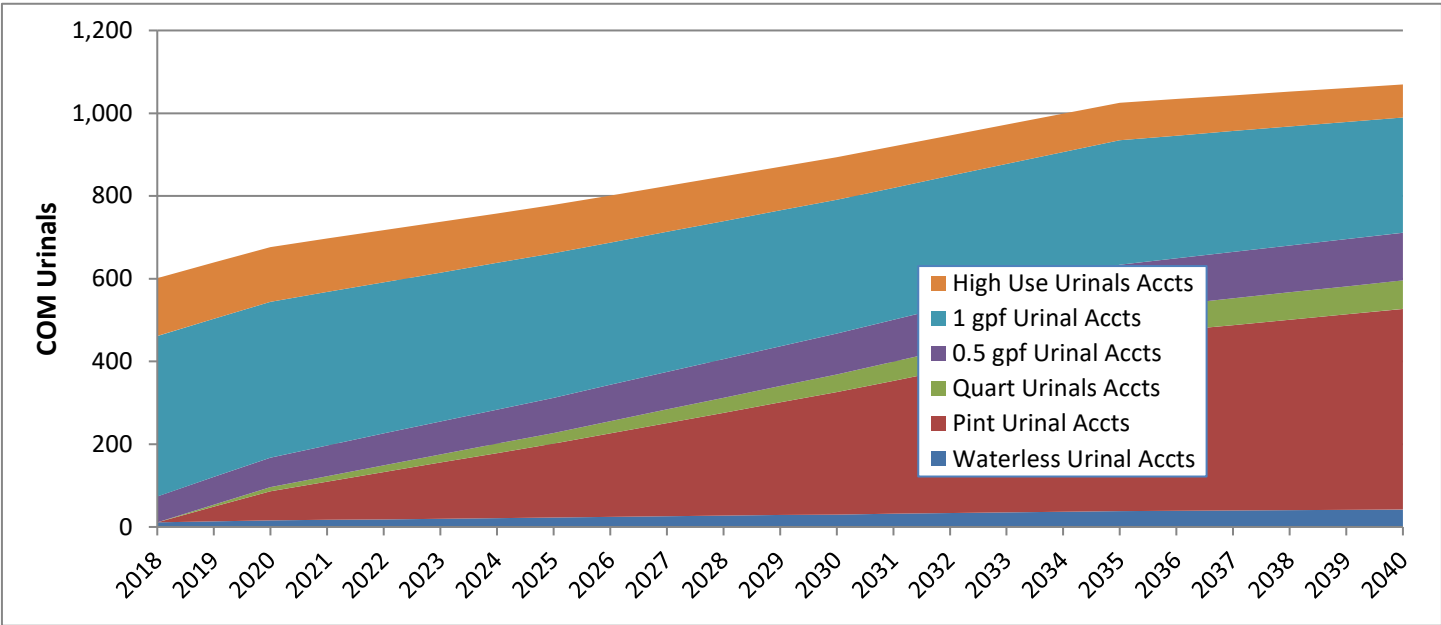
The following figures present the estimated number of current and projected urinals by customer category within the service area based on the effects of current and estimated plumbing codes and standards. Initial proportions are



determined by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding net change due to natural replacement and rebate measures less any "free rider effect."

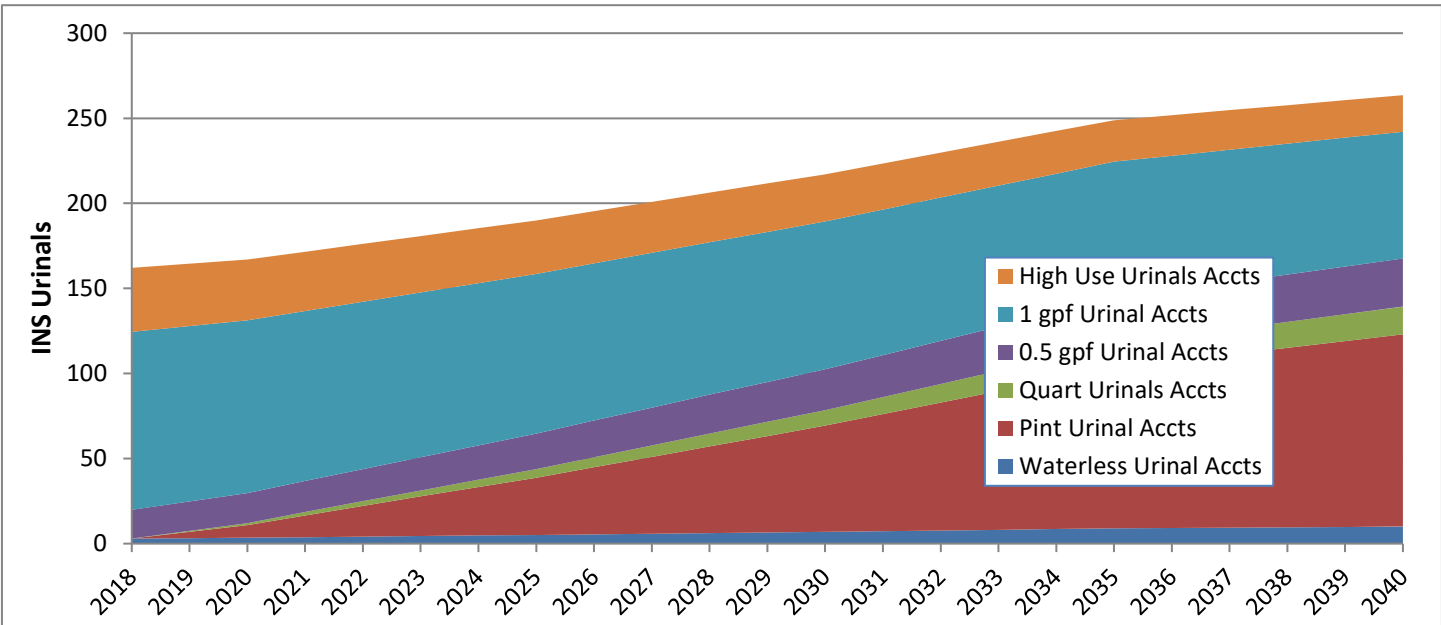
Figure D-7 presents the estimated number of current and projected urinals for COM accounts.

Figure D-7. Commercial Urinals



D-8 presents the estimated number of current and projected urinals for INS accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-8. Institutional Urinals



D.4.4 Residential Clothes Washers

The following figures present the estimated number of current and projected clothes washers by customer category within the service area based on the effects of current and estimated plumbing codes and standards. The initial

proportions are determined by taking the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and rebate measures less any "free rider effect."

Figure D-9 presents the estimated number of current and projected clothes washers for SF accounts.

Figure D-9. Single Family Clothes Washers

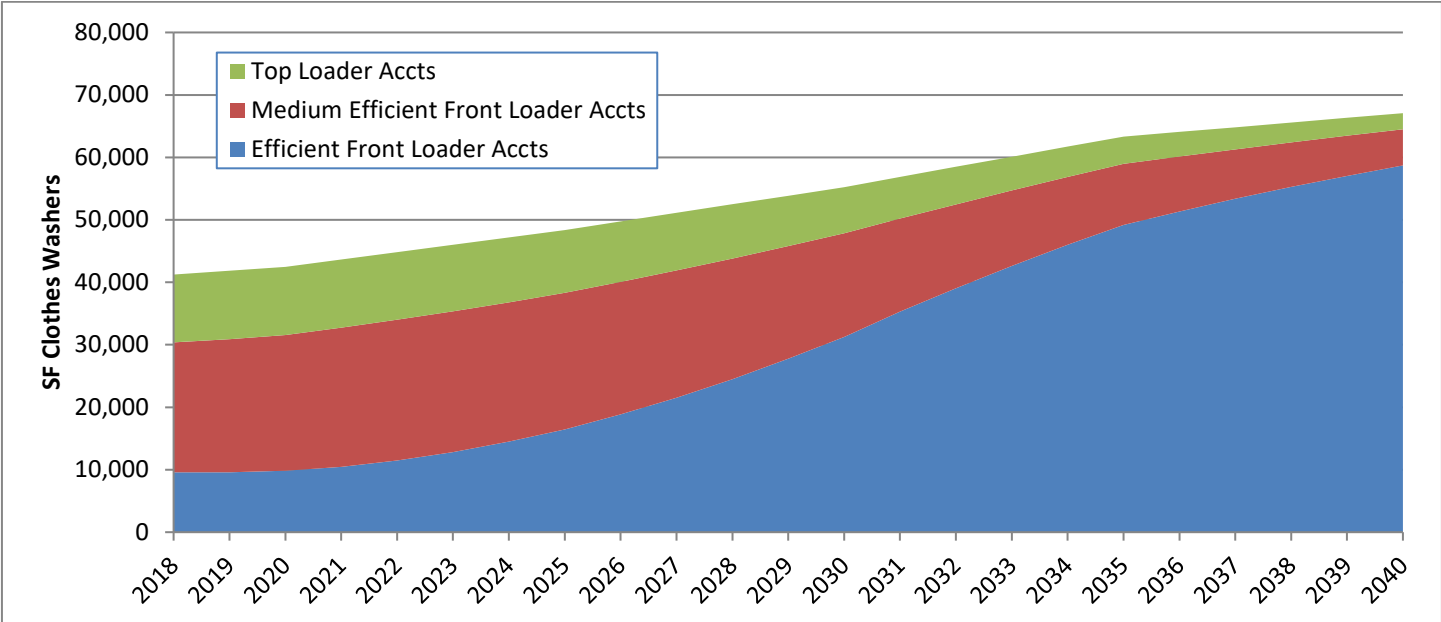
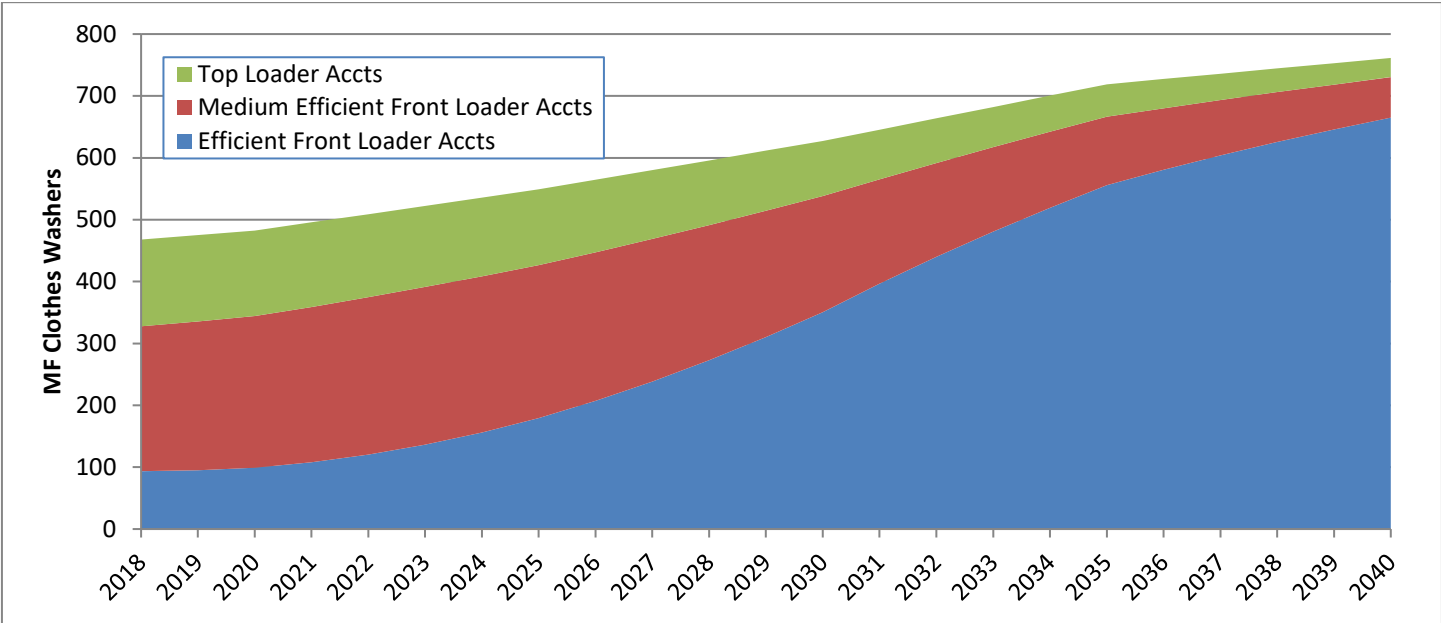


Figure D-10 presents the estimated number of current and projected clothes washers for MF accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-10. Multifamily Clothes Washers



D.4.5 Faucets

The following figures present the estimated number of current and projected residential and non-residential lavatory and non-lavatory faucets by customer category within the service area. The initial proportions are determined by taking

the initial proportions of homes by age (corresponding to efficiency levels) and adding the net change due to natural replacement and rebate measures less any "free rider effect."

Figures D-11 and D-12 present the estimated number of current and projected faucets for SF accounts.

Figure D-11. Single Family Lavatory Faucets

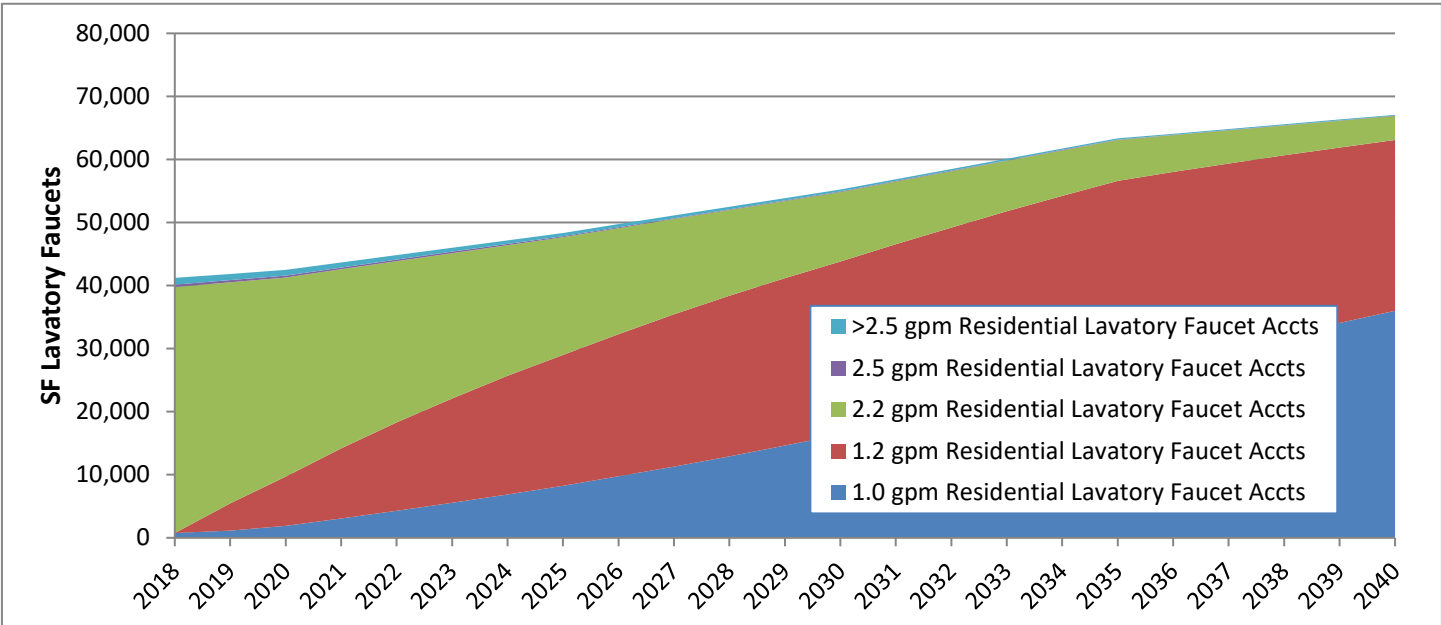
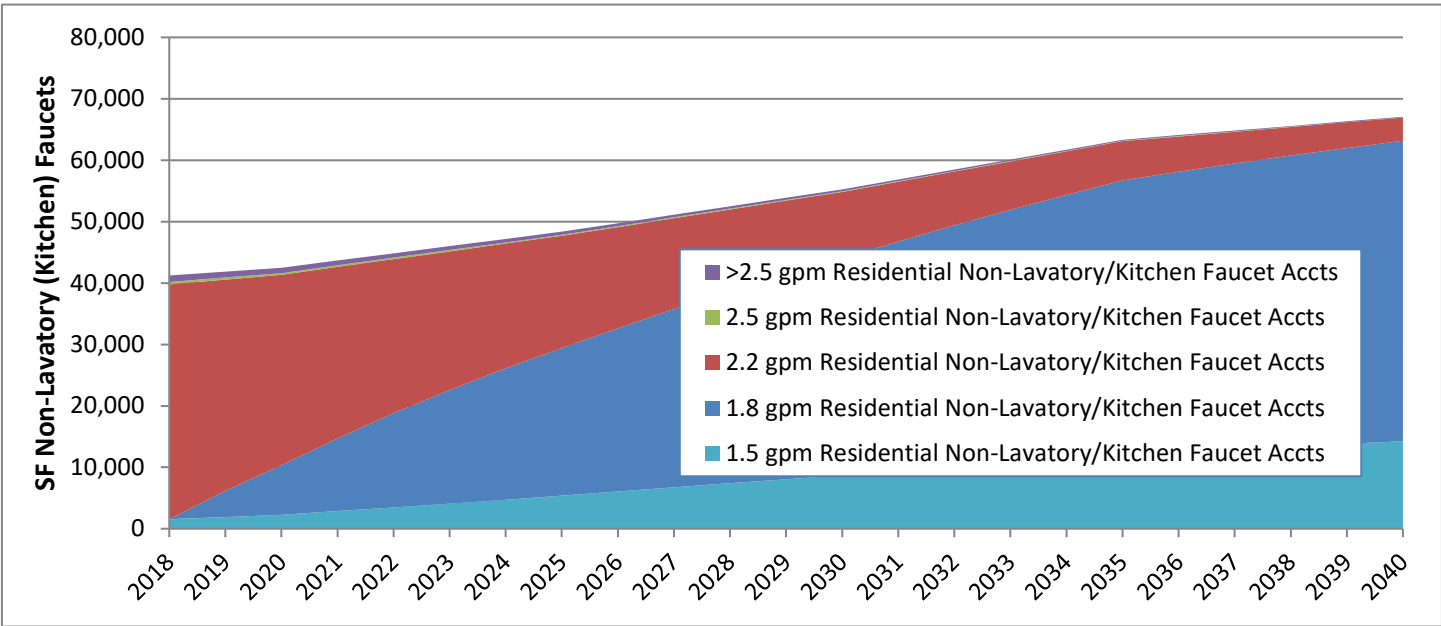


Figure D-12. Single Family Non-Lavatory (Kitchen) Faucets



Figures D-13 and D-14 present the estimated number of current and projected faucets for MF accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-13. Multifamily Lavatory Faucets

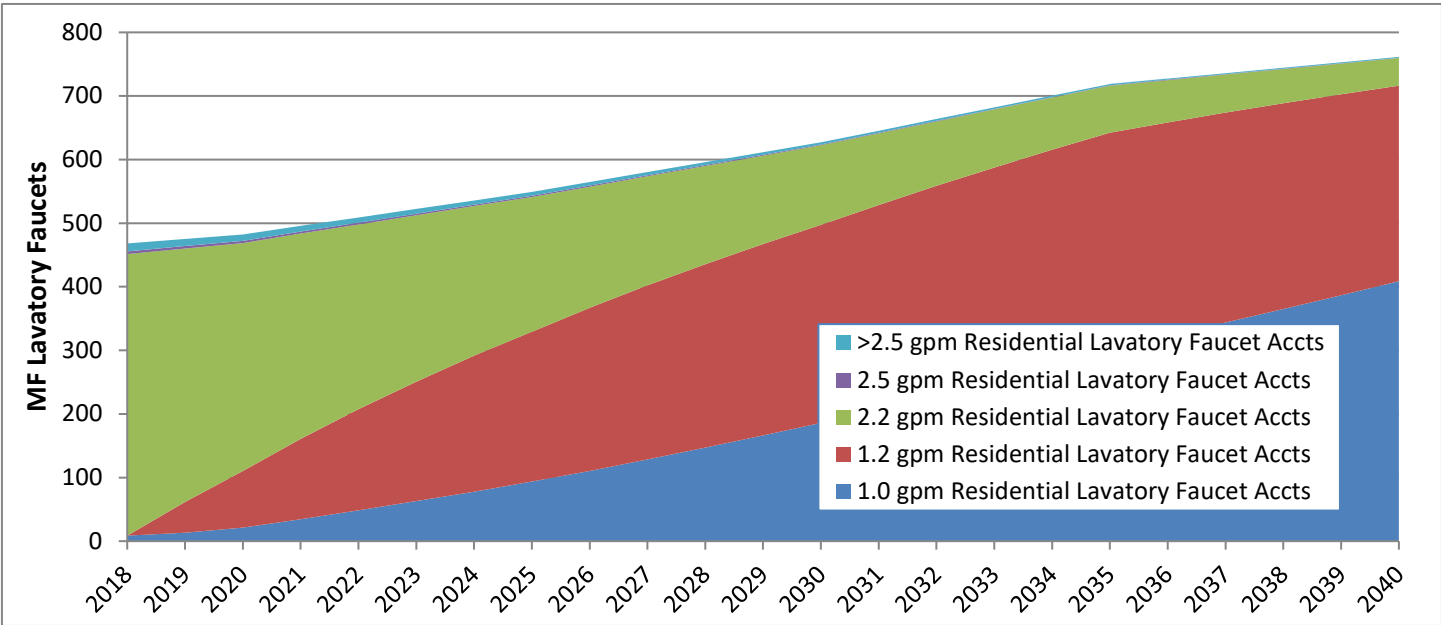
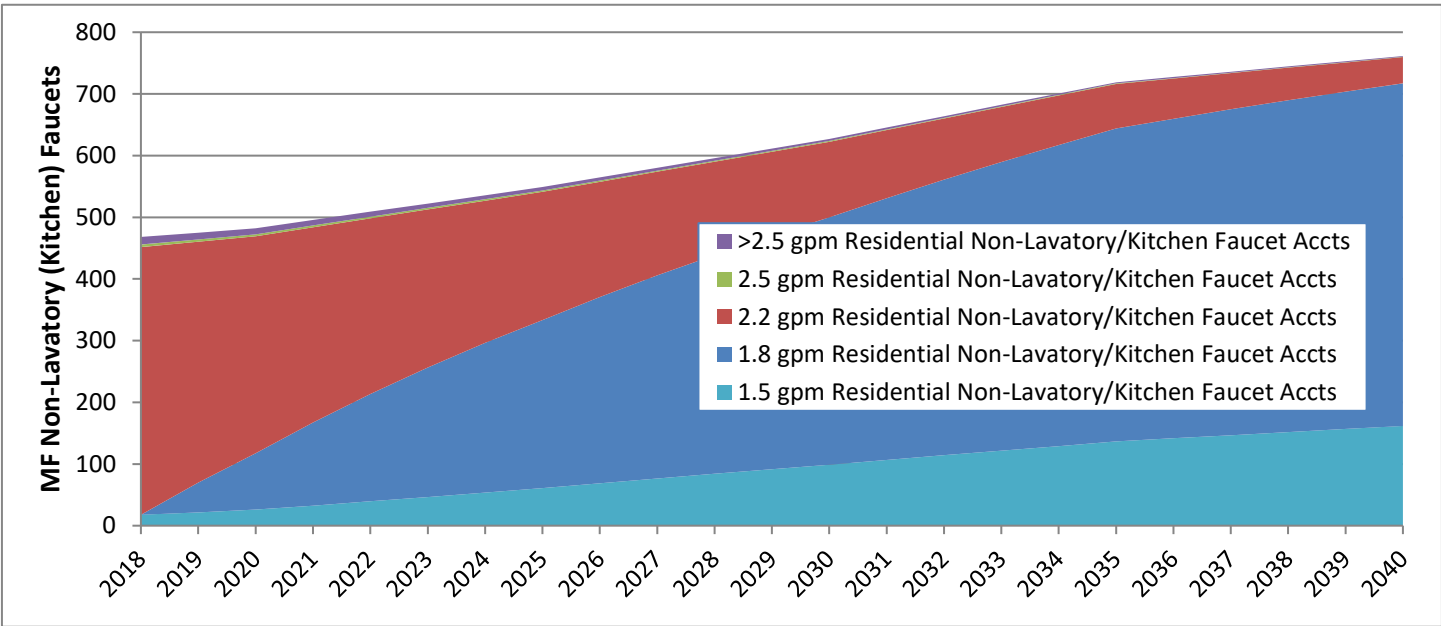


Figure D-14. Multifamily Non-Lavatory (Kitchen) Faucets



Figures D-15 and D-16 present the estimated number of current and projected faucets for COM accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-15. Commercial Lavatory Faucets

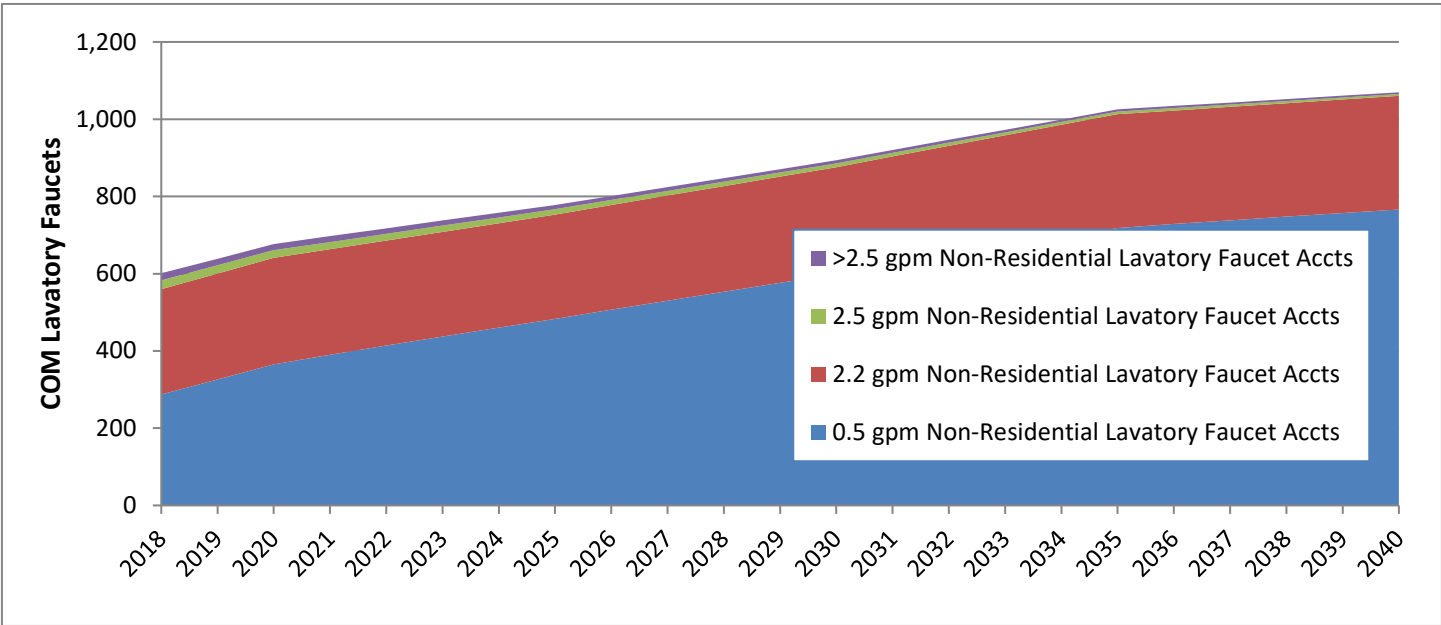
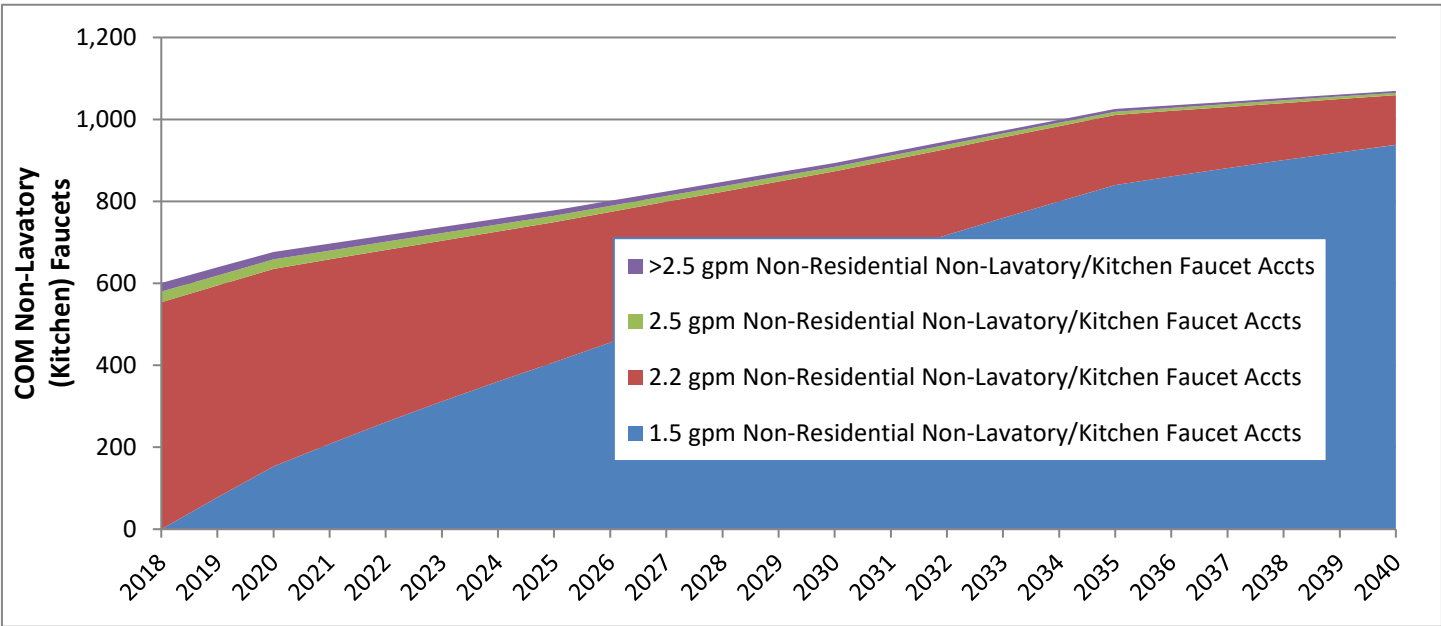


Figure D-16. Commercial Non-Lavatory (Kitchen) Faucets



Figures D-17 and D-18 present the estimated number of current and projected faucets for INS accounts based on the effects of current and estimated plumbing codes and standards.

Figure D-17. Institutional Lavatory Faucets

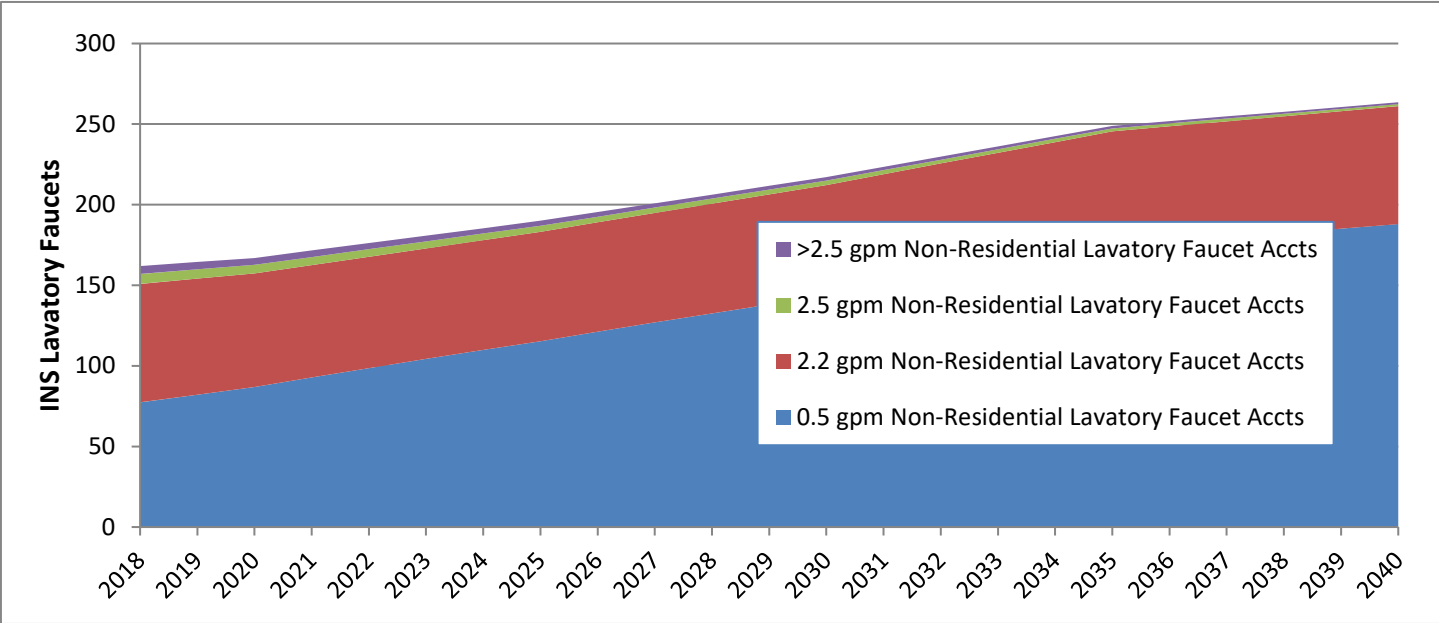
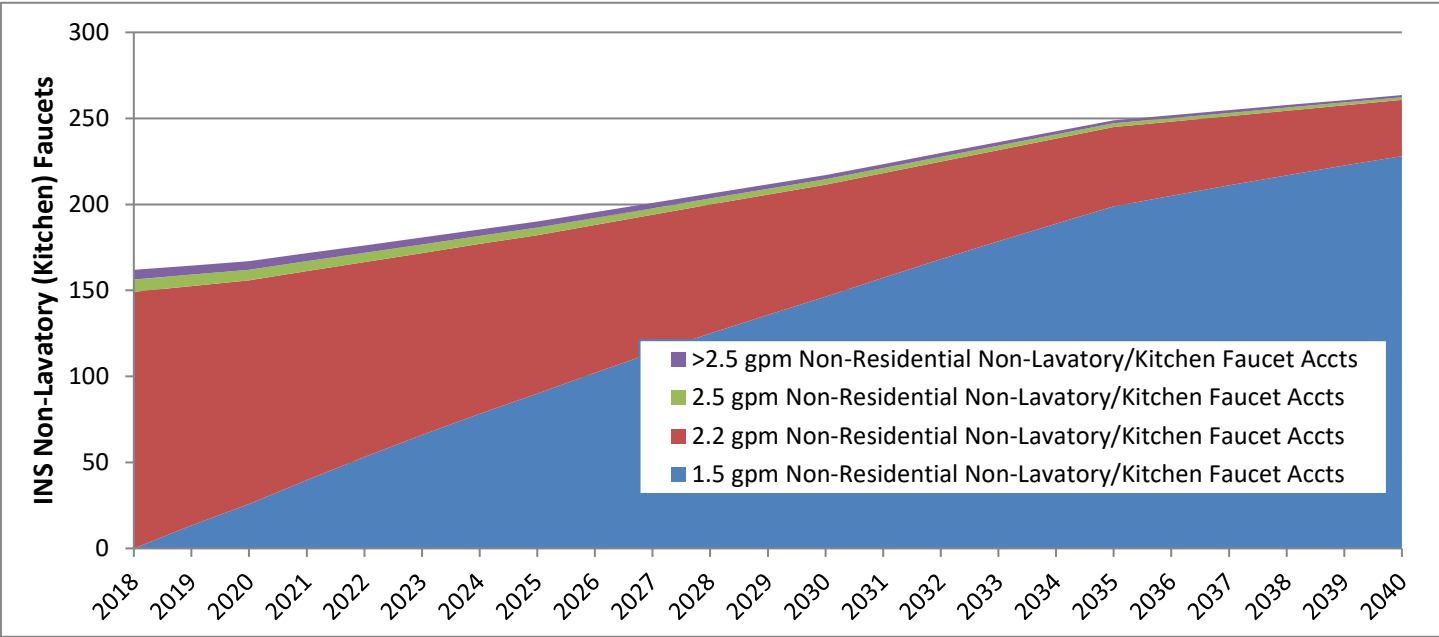


Figure D-18. Institutional Non-Lavatory (Kitchen) Faucets





## APPENDIX E – CONSERVATION MEASURE SCREENING LIST

This table contains a preliminary list of measures suggested by MWM for EVMWD's consideration, 25 of which were chosen for further evaluation.

**Table E-1. Conservation Measure Screening List**

ID #	Equipment or Program Type	Specific Program	Focus of Program
1A	Water Loss Plus	Conduct Annual System Water Use Accounting	System
1B	Water Loss	Compute ILI on an Annual Basis	System
2A	Water Loss	Apparent Loss Reduction - Billing System	System
2B	Water Loss	Apparent Loss Reduction - Meter Testing	System
3	Water Loss	Real Water Loss Reduction	System
4	Water Loss	Real Water Loss Reduction - Leak Repair Assistance	SF
5A	Water Loss - Pressure Regulation	Distribution System Pressure Regulation	System
5B	Water Loss - Pressure Regulation	Pressure Regulation at Individual Properties	ALL
5C	Water Loss - Pressure Regulation	Pressure Regulation at Individual Properties	ALL
6A	AMI	Install AMI	ALL
6B	AMI	Install AMI New Development	ALL
6C	AMI	Targeted AMI to Irrigation or Large User Accounts	ALL
6D	AMI	Targeted AMI data to specified customer categories	ALL
7A	Water Rates	Rate Structure Evaluation	ALL
7B	Water Rates	Modification to or Implementation of Tiered Rate Conservation Pricing	SF Indoor/Outdoor
7C	Water Rates	Modification to or Implementation of Tiered Rate Conservation Pricing	Multifamily CII Outdoor is Primary Focus
7D	Water Rates	Establish Separate Pricing Structure for Irrigation Accounts	ALL Outdoor
8	Water Rates	Water budget based billing	ALL or selected categories; Outdoor is primary focus
9A	Submetering	Mobile Home Park Submetering	MF Indoor
9B	Submetering	MF Submeter Incentive	Existing MF Indoor
9C	Submetering	MF Submeter Incentive	New MF Indoor
9D	Submetering	Require Multifamily Submetering for New Developments	New MF Indoor
10A	Indoor Plumbing Fixtures	Single Family Water Surveys	SF Indoor
10B	Indoor Plumbing Fixtures	Multifamily Water Surveys	MF Indoor
11A	Indoor Plumbing Fixtures	High Efficiency Faucet/Aerator/Showerhead Giveaway	SF MF CII
11B	Indoor Plumbing Fixtures	Require High Efficiency Faucets and Showerheads in New Development	ALL
11C	Indoor Plumbing Fixtures	Real Customer Water Loss Reduction - Leak Repair and Plumbing Emergency Assistance	SF, MF
11D	Indoor Plumbing Fixtures	Pressure Reduction	ALL

ID #	Equipment or Program Type	Specific Program	Focus of Program
11E	Indoor Plumbing Fixtures	Leak Detection Technology	SF, MF
12A	Indoor Plumbing Fixtures	High Efficiency Toilet Rebates	SF MF CII
12B	Indoor Plumbing Fixtures	High Efficiency Urinal Rebates	CII
12C	Indoor Plumbing Fixtures	High Efficiency Toilet and/or Urinal Bulk Purchase Program	ALL
12D	Indoor Plumbing Fixtures	High Efficiency Toilet and/or Urinal Exchange Day	ALL
12E	Indoor Plumbing Fixtures	Plumber Initiated High Efficiency Toilet and/or Urinal Retrofit Program	ALL
12F	Indoor Plumbing Fixtures	High Efficiency Toilet Rebates	CII
13A	Indoor Plumbing Fixtures	Install High Efficiency Fixtures in Government Buildings	CII Indoor
13B	Indoor Plumbing Fixtures	Install High Efficiency Toilets, Urinals, and Showerheads in Commercial Buildings	CII Indoor
14A	Indoor Plumbing Fixtures	Require High Efficiency Toilets in New Development	ALL (New Development)
14B	Indoor Plumbing Fixtures	Fixture Retrofit on Resale or Name Change on Water Account	ALL
14C	Indoor Plumbing Fixtures	Require <0.125 gal/flush urinals in new development	CII (New Development)
14D	Indoor Plumbing Fixtures	Require Fixture Replacement by a Deadline	ALL
15A	Indoor Plumbing Fixtures	Garbage Disposal	SF Indoor
15B	Indoor Plumbing Fixtures	Non-Regenerative Water Softeners Incentives	SF Other
16A	Hot Water on Demand	Require Hot Water on Demand/Structured Plumbing in New Developments	SF Indoor
16B	Hot Water on Demand	Provide a Rebate for Hot Water on Demand Pump Systems	SF Indoor
17A	Clothes Washers	Residential Washer Rebate	SF, MF Indoor
17B	Clothes Washers	High Efficiency Washer Rebate	CII Indoor
17C	Clothes Washers	Require High Efficiency Clothes Washers in New Development	New SF Indoor
18A	Dishwashers	Efficient Dishwasher Rebates	SF Indoor
18B	Dishwashers	Require Efficient Dishwashers in New Development	SF Indoor
19	Irrigation	Outdoor Water Surveys	SF MF
20	Irrigation	Outdoor Water Audit	Large Irrigation Customers – Outdoor Only
21	Irrigation	Water Budgeting/Monitoring	Large Landscape
21A	Irrigation	Water Budgeting	ALL
21B	Irrigation	Landscape Area Measurements	ALL
22	Irrigation	Financial Incentives for Irrigation and Landscape Upgrades	ALL
23A	Irrigation	Landscape Conversion or Turf Removal	SF
23B	Irrigation	Landscape Conversion or Turf Removal	MF CII
23C	Irrigation	Artificial Turf Sports Fields	IRR Outdoor
23D	Irrigation	Shade Tree Program	ALL
24	Irrigation	Weather-Based Irrigation Controller Rebates	ALL

ID #	Equipment or Program Type	Specific Program	Focus of Program
25A	Irrigation	Require Weather Adjusting Smart Irrigation Controllers and/or Rain Sensors in New Development	ALL
25B	Irrigation	Rebate or Free Rain Sensors	Outdoor ALL or Selected
25C	Irrigation	Require Rain Sensors	Outdoor ALL or Selected
25D	Irrigation	Rotating Sprinkler Nozzle Rebates	ALL Outdoor
25E	Irrigation	Rebate or Free Soil Moisture Sensors	Outdoor ALL or Selected
25F	Irrigation	Drip Irrigation	SF
25G	Irrigation	Pressure Regulation	ALL
26A	Irrigation	Water Conserving Landscape and Irrigation Codes	ALL
26B	Irrigation	Require Irrigation Designers/Installers be Certified (possibly by Irrigation Association or CA Landscape Contractor's Association)	CII Outdoor
26C	Irrigation	Landscape irrigation restricted to designated days and times	ALL Outdoor
27	Irrigation	NetZero Landscape Ordinance	ALL Outdoor
27A	Irrigation	Dedicated Irrigation Meters	ALL Outdoor
27B	Irrigation	New Zero Runoff Landscape - Mulch Program	ALL Outdoor
27C	Irrigation	Z-Zones	ALL Outdoor
27D	Irrigation	Soil Amendment	ALL Outdoor
27E	Irrigation	Tap Fee Credit	ALL Outdoor
28A	Rainwater Catchment	Provide Rain Barrel Incentive	SF Outdoor
28B	Rainwater Catchment	Provide Incentive for Large Rainwater Catchment Systems	MF CII IRR Outdoor
28C	Rainwater Catchment	Require Rain Barrel	SF Outdoor
29A	Gray water	Gray water Retrofit SF	SF Outdoor
29B	Gray water	Require Plumbing for Gray Water in New SF Development	SF Outdoor
29C	Gray water	Rebate for Gray Water Systems in New CII Development	CII Outdoor
29D	Gray water	Rebate Lavatory Sink Water Recycle System for Toilet Flushing	SF, MF
29E	Gray water	Point of Use Recycling	SF, MF
30	Other Outdoor	Require or Rebate Swimming Pool Covers	ALL Outdoor
31	Other Outdoor	Prohibit Water Waste and Practices	All Outdoor
32	CII Equipment	Top 25 Water Users Program (Top 25 customers from each individual district)	CII Indoor/Outdoor
33A	CII Equipment	Customized Top Users Incentive Program	CII Indoor/Outdoor
33B	CII Equipment	CII Rebates to Replace Inefficient Equipment	Existing Customers CII
33C	CII Equipment	Water Savings Performance Program	CII Indoor
34	CII Equipment	Require Plan Review for new CII	CII Indoor/Outdoor
35	CII Equipment	Promote Restaurant Spray Nozzles	CII Indoor

ID #	Equipment or Program Type	Specific Program	Focus of Program
36	CII Equipment	School Building Retrofit	CII Indoor/Outdoor
37A	CII Equipment	Focused Water Audits for Hotels/Motels	CII Indoor/Outdoor
37B	CII Equipment	Hotels/Motels Retrofit w/Financial Assistance	CII Indoor
37C	CII Equipment	Hotels/Motels Retrofit	CII Indoor
38A	CII Equipment	Rebates for Sub meters on Cooling Towers	CII Indoor
38B	CII Equipment	Cooling Tower Regulations	CII Indoor
38C	CII Equipment	Rebates for Conductivity Controllers on Cooling Towers	CII Indoor
39	CII Equipment	Dry Vacuum Pump	CII Indoor
39A	CII Equipment	Dry Heat Sterilization in the Pharmaceutical Industry (versus steam)	CII Indoor
40A	Public Education	Conservation Print Media	ALL
40B	Public Education	Electronic Conservation Options/Web Site/Social Media	ALL
40C	Public Education	Conservation Print Media, Electronic Conservation Options/Web Site/Social Media, Speakers Bureau/Event Participation, Media Campaign: such as the "Use Only What You Need" or "Beat the Peak", Billing Report Educational Tool	ALL
40D	Public Education	Speakers Bureau/Event Participation	ALL
40E	Public Education	Schools Education Programs	SF, MF
41	Public Education	Media Campaign: such as the "Beat the Peak" or "Twenty Gallon Challenge"	ALL
41B	Public Education	Media Campaign: such as "Take Control of your Controller"	ALL
41C	Public Education	Billing Report Educational Tool	ALL
42A	Public Education	Recognition Programs for Water Savings by Residences & Apartments Program, Recognition Programs for Water Savings by Businesses	SF Outdoor, CII Indoor/Outdoor
42B	Public Education	Recognition Programs for Water Savings by Residences & Apartments Program	SF Outdoor
42C	Public Education	Recognition Programs for Water Savings by Businesses	CII Indoor/Outdoor
43A	Public Education - Irrigation Focus	Outdoor Residential Focused Public Awareness Information Program	SF Outdoor Only
43B	Public Education - Irrigation Focus	Efficient Outdoor Use Education and Training Programs	SF/MF/CII Outdoor
43C	Public Education - Irrigation Focus	Train Landscape Maintenance Workers (Green Gardener Program)	ALL Outdoor
44	Public Education - Irrigation Focus	Networking with Landscaping Industry	ALL Outdoor
45	Public Education - Irrigation Focus	Landscape Water Calculator	ALL
46	Public Education - Irrigation Focus	Xeriscape Demonstration Gardens	ALL
47	Public Education	Promote Green Buildings	ALL
48	Other	Developer Financed Zero Footprint New Development	ALL
49	Other	Prohibit Once through Cooling, Non-Recycling Fountains, Water Wasting Fixtures and Practices	CII
50	Other	Water conservation policy in new/existing supply contracts	System
51	Other	Low Impact New and Remodeled Development	ALL
52	Other	Encourage "Life Cycle Analysis" Mentality of Sustainability and Reliability	ALL
53	Other	Partnership with Energy Utilities	ALL

Note: "All" = Single Family, Multifamily, and Commercial, Industrial and Institutional; "System" = utility's distribution system

## APPENDIX F – WATER NEUTRALITY RESOURCE INDEX

This appendix represents a resource index for water neutrality related information from the Alliance for Water Efficiency (AWE), the City and County of San Francisco and the City of Santa Monica below. Please also note that at a minimum there are water neutrality ordinances in the following areas: Lompoc, Morro Bay, Napa, St. Helena; San Luis Obispo County, San Francisco; and water districts in Cambria, Monterey and Soquel Creek.

### Alliance for Water Efficiency – Net Blue

The Alliance for Water Efficiency (AWE) Net Blue is a collaborative initiative of the Alliance for Water Efficiency, the Environmental Law Institute (ELI), and River Network to support sustainable community growth.

#### Summary – AWE Net Blue

The Net Blue template for a model ordinance requires or incentivizes offsetting the impact of new development's water use via water efficiency measures. Building on AWE's initial research report, Water Offset Policies for Water-Neutral Community Growth, ELI did the following: analyzed the legal language used in existing water offset ordinances; identified potentially useful supplemental language in other ordinances; assessed a variety of institutional configurations that may influence the adoption and implementation of a water offset ordinance; and examined legal opportunities for and constraints on expanding the concept to new places.

The final work product resulted in a model ordinance worksheet, a user's guide, and three examples of customized ordinances. Due to the variety of circumstances that occur in a county, municipality, or utility, and the diversity of legal constraints and authorities that can dictate the form of such an ordinance, a "one size fits all" approach does not work in this context. Thus, the model ordinance is in the form of a dynamic worksheet, developed in consultation with land use law experts, municipal planners, and experienced developers, to ensure its practicality, accuracy, and ease-of-use in customizing the ordinance for the needs of the community.

The Model Ordinance worksheet leads a user through the sections of the ordinance, and flags the decisions that need to be made by the user to develop a tailored product that addresses the specific challenges and circumstances of the locality.

The Model Ordinance User's Guide details how the worksheet functions, explains the various cues, and provides tips for maximizing the potential of the worksheet.

Three Net Blue ordinance examples demonstrate the diverse outputs of the worksheet and some of the many problems, actors, and constraints that it can accommodate.

#### List of Resources – AWE Net Blue

Background information about the program as well as programmed Excel spreadsheets can be found on the MWM FTP site. To request the model ordinance worksheet, user guide, and example ordinances and the offset methodology, user guide, and example offsets, go to the following link and fill out the form, and hit "Submit"

<http://www.allianceforwaterefficiency.org/netblue-request.aspx>. Accessing AWE's resources this way, as opposed to using the same resources posted to the MWM FTP site, will ensure your team receives relevant updates to the tools.

More online resources with background information on the tools can be found here:

<http://www.allianceforwaterefficiency.org/net-blue.aspx>

<http://www.allianceforwaterefficiency.org/net-blue-landing-page.aspx>

<http://www.allianceforwaterefficiency.org/net-blue-research.aspx>

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## City of Santa Monica – Water Neutrality Ordinance

The City of Santa Monica Office of Sustainability and the Environment created a Water Neutrality Stakeholder Committee to develop this Water Neutrality Ordinance. It is comprised of representatives of residents, water agencies, non-governmental organizations, sustainability consultants, architects, developers, manufacturers, engineers, plumbers, The County of Los Angeles; the City’s Water Advisory Committee; and staff from the Public Works Department, Planning and Community Development Department, and the City Attorney’s Office.

### Summary – Santa Monica Water Neutrality Ordinance

On July 1, 2017, the Water Neutrality Ordinance went into effect capping water use for new developments to an average of the past five-year historical use for that individual parcel. A stakeholder committee of residents, building industry professionals, non-profits, manufacturers, and local governments created the proposed ordinance to meet Council's directive. This ordinance is one strategy to achieve the City's goal for water self-sufficiency by 2020. By maximizing water-efficiency, local groundwater and alternate water supplies, the city will no longer need to import water to meet all its needs. Only new developments (residential and commercial) will need to comply with this ordinance. New developments, in this case, are defined as new buildings with plumbing fixtures, existing buildings that demolish 50 percent or more the exterior walls/structural support, and new or enlarged pools, spas, ponds, water features.

To comply new development projects must be as water-efficient as possible so that they will not use more water than the historical use of the development site. The five-year average water use for the existing property will be used as the baseline. Each new development is responsible for calculating how much water it is projected to use each year. The difference between the baseline and the projected water use is called the “new water demand.” If the new water demand is equal to or less than the baseline, then the project is compliant. If the difference is greater than the baseline, the new development will need to rethink its design, perhaps adding more efficient toilets, showerheads, clothes washers, etc. to lower the projected use; or incorporating more advanced technologies like graywater, rainwater or recycled water systems. The City provides a technical design assistance program to guide applicants through the process and make them aware of technologies that could help them achieve compliance.

If the final design shows the new water demand is greater than the historical usage for the site, then the applicant will need to offset that water somewhere else in the city. The options for offsets are the following:

City Direct Install Option – A fee-based turn-key solution with a pre-certified contractor that installs water saving toilets, showerheads, and faucet aerators at other properties throughout the city to offset your project’s water use.

Developer Installation Option – The applicant will find properties in the City to retrofit, determine the water saving calculations, pay for the installations and permit fee for each device installed, and have each device inspected by the City.

### List of Resources – Santa Monica Water Neutrality Ordinance

Background information about the program as well as programmed Excel spreadsheet Water Neutrality Calculators can be found here: [https://www.smgov.net/Departments/OSE/Categories/Water/Water\\_Neutrality.aspx](https://www.smgov.net/Departments/OSE/Categories/Water/Water_Neutrality.aspx) and on the MWM ftp site.

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## San Francisco – Non-potable Water Program

In September 2012, the City and County of San Francisco adopted the Onsite Water Reuse for Commercial, Multi-Family, and Mixed-Use Development Ordinance. Commonly known as the Non-potable Water Ordinance, it added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable uses in buildings. Since 2012, the Non-potable Water Ordinance has been amended to allow for district-scale projects, where two or more parcels can share alternate water sources. In 2015, Article 12C became a mandatory requirement for new development projects over 250,000 square feet of gross floor area to install and operate an onsite non-potable water system.

Onsite non-potable water systems, also referred to as alternate water source systems, provide a myriad of benefits such as reducing potable water use for toilet flushing and irrigation, meeting Stormwater Management Ordinance requirements, and helping San Francisco achieve greater water supply resiliency and reliability. The Non-potable Water Program was established to create a streamlined permitting process for onsite non-potable water systems and help designers and developers assess a project's available alternate water sources and non-potable demands. The program also supports San Francisco's OneWater approach of matching the right water source for the right use and looking holistically at the utility's services to develop programs and policies that provide multiple benefits to conserve resources and promote ecosystem health.

### Summary – San Francisco Non-potable Water Program

Requirements for onsite non-potable water systems apply to new development projects with 250,000 square feet or more of gross floor area that were issued a site permit after November 1, 2016. The project must meet its toilet and urinal flushing and irrigation demands through the collection, treatment, and use of available graywater, rainwater, and foundation drainage. While not required, projects may use treated blackwater or stormwater if desired. Projects under 250,000 square feet may install an onsite non-potable water system to reduce the use of potable water and meet the requirements of the Stormwater Management Ordinance. The 8 steps for successfully implementing the onsite non-potable water system are:

1. Submit a Water Budget Application to the San Francisco Public Utilities Commission (SFPUC)
2. Submit a Non-potable Implementation Plan to SFPUC (district-scale projects only)
3. Submit Engineering Report, Permit Application, and Application Fee to San Francisco Department of Public Health-Environmental Health (SFDPH-EH)
4. Obtain Plumbing Plan Check and Permits from the San Francisco Department of Building Inspection-Plumbing Inspection Division (SFDPI) and Complete System Construction
5. Obtain Encroachment Permit from San Francisco Public Works (SFPW) (if applicable)
6. Conduct a Cross Connection Test with SFPUC and SFDPH-EH
7. Obtain a Permit to Operate from SFDPH-EH
8. Conduct Ongoing Monitoring, Reporting, and Inspections

### List of Resources – San Francisco Non-potable Water Program

Background information including the Program guidebook, case studies, Grant Program application and the Water Budget Applications and Water Use Calculators for single-building and district-scale non-potable water systems (per Step 1) can be found on the MWM FTP site and are located here: <https://sfwater.org/index.aspx?page=686>.

The Non-potable Water Program Guidebook "A Guide for Implementing Onsite Non-potable Water Systems in San Francisco" can be found online here: <https://sfwater.org/Modules/ShowDocument.aspx?documentID=11629>.

#### CONTACT

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(415) 551-4734

SFDPH Non-potable Water Program  
[dph.nonpotable@sfdph.org](mailto:dph.nonpotable@sfdph.org)  
Program Website  
<https://sfwater.org/index.aspx?page=686>

## APPENDIX G – BEST MANAGEMENT PRACTICES FOR COOLING TOWERS

To support the implementation of the Cooling Tower Regulations measure, the following table contains a list of actions or measures related to best management practices to be reviewed when examining cooling towers. This list of practices can be used as a question list when interviewing facility staff or a cooling tower vendor. The cooling tower evaluation can be conducted by EVMWD staff or by a contracted consultant.

**Table G-1. Best Management Practices for Cooling Towers**

Action or Measure	Present/ Active Currently	Currently Under Way but Incomplete	Implement in Near Future	Not Applicable	Comments
Cooling tower is free of leaks; check all seals pumps, casings, ducts; check monthly					
Cooling towers have submeters (makeup and blow-down)					
Cooling tower cycles are at least 5 for make-up with a total hardness of less than 11 grams/gallon (188 milligrams/liter [mg/L])					
Cooling tower cycles are at least 5 for make-up with a total hardness equal to or exceeding 11 grams/gallon (188 mg/L)					
Cooling towers have conductivity meters					
Cooling tower meters monitoring routine regularly scheduled					
Cooling towers set to shut down during off hours (typically 21:30-5:00 for an 8am-6pm workday)					
Use of side-stream filtration considered					
Use of sulfuric acid considered					
A regular visual inspection routine is scheduled					
The make-up float should be inspected to ensure it is performing at the optimal level					
The water distribution feedline is checked and ensured to be clean and maintains even, consistent flow across the cooling system (this includes across multiple towers)					
Conductivity probes should be cleaned monthly to ensure unnecessary blowdown is reduced					
The blowdown line should be cleaned monthly to avoid biofouling					
Cooling tower is cleaned monthly					
Consider reusing cooling water (bleed off) for other (non-potable) needs					

## APPENDIX H – DSS MODEL MEASURE INPUTS AND ASSUMPTIONS FOR CONSERVATION MEASURES

This appendix presents each modeled measure's design as included in the DSS Model. The provided screen shots present the analysis assumptions and inputs that were used to evaluate each of the water conservation measures selected by EVMWD. Specific water savings estimates and assumptions are provided. Measure utility costs include unit costs (incentives and rebates) as well as administrative costs. Costs covered by SoCal Water\$mart and other partners are NOT included.

All analyzed measures are presented in this appendix regardless of the conservation program (A, B or C) in which they are included. It is important to note that savings from measures that address the same end use(s) are NOT additive when combined in the same program. As explained in Section 5, the DSS Model uses impact factors to avoid double counting in estimating the water savings from programs of measures.



### Public and School Education

Overview	
Name	Public and School Education
Abbr	1
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input type="checkbox"/>
Last Year	2040	Years	2
Measure Length	23	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$2.90	\$0.00	1

Administration Costs	
Markup Percentage	35%

Description
Public and school education is used to raise awareness of water use efficiency measures available to customers. This measure includes: inserts/flyers, video production ads, landscape classes, signs for demonstration gardens, conservation advertising through giveaways including pens, books, etc., poster contests for schools, science fair program for schools, Solar Cup education program, educational materials and supplies for curriculums such as Admiral Splash and Potter the Otter educational books.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input checked="" type="checkbox"/>						
Urinals	<input checked="" type="checkbox"/>						
Lavatory Faucets	<input checked="" type="checkbox"/>						
Showers	<input checked="" type="checkbox"/>						
Dishwashers	<input checked="" type="checkbox"/>						
Clothes Washers	<input checked="" type="checkbox"/>						
Process							
Kitchen Spray Rinse							
Internal Leakage	<input checked="" type="checkbox"/>						
Baths	<input checked="" type="checkbox"/>						
Other	<input checked="" type="checkbox"/>						
Irrigation	<input checked="" type="checkbox"/>						
Pools	<input checked="" type="checkbox"/>						
Wash Down	<input checked="" type="checkbox"/>						
Cooling							
Car Washing	<input checked="" type="checkbox"/>						
External Leakage	<input checked="" type="checkbox"/>						
Outdoor							
tory/Kitchen Faucets	<input checked="" type="checkbox"/>						

Comments
> Cost assumes SF category but impacts all customer classes.
> Breakdown of 2017 costs: inserts/flyers (\$7,000), video production ads (\$5,000), landscape classes (\$10,000), signs for demo gardens (\$20,000), conservation advertising through giveaways including pens, books, etc. (\$20,000), poster contest for schools (\$1,850), science fair program for schools (\$650), Solar Cup education program (\$400), educational materials including pens, paper, etc. (\$5,000) and educational supplies for curriculums such as Admiral Splash and Potter the Otter educational books (\$5,000) = overall total \$74,900. Does not include staffing. The remaining cost is EVMWD staff funds to support the program.
> Basis of water savings: Assume baseline of 0.5% per year average single family home use. Confirm utility costs based on staffing support, education materials cost and website.
> Cost varies from \$0.23/acct (Bay Area Water Supply & Conservation Agency (BAWSCA)) to \$4 (Santa Cruz) to \$6 (Anaheim) per account. Markups vary as well 50% (Santa Cruz), 15% (BAWSCA), 75% (Anaheim).

Results	
Average Water Savings (mgd)	0.079402
Lifetime Savings - Present Value (\$)	
Utility	\$2,070,475
Community	\$3,281,475
Lifetime Costs - Present Value (\$)	
Utility	\$1,739,839
Community	\$1,739,839
Benefit to Cost Ratio	
Utility	1.19
Community	1.89
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$2,608


End Use Savings Per Replacement	
	% Savings per Account
SF Toilets	0.5%
SF Lavatory Faucets	0.5%
SF Showers	0.5%
SF Dishwashers	0.5%
SF Clothes Washers	0.5%
SF Internal Leakage	0.5%
SF Baths	0.5%
SF Other	0.5%
SF Irrigation	0.5%
SF Pools	0.5%
SF Wash Down	0.5%
SF Car Washing	0.5%
SF External Leakage	0.5%
on-Lavatory/Kitchen Fa	0.5%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	50.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$59,782	\$20,924	\$80,706
2019	\$60,694	\$21,243	\$81,937
2020	\$61,606	\$21,562	\$83,167
2021	\$63,308	\$22,158	\$85,466
2022	\$65,011	\$22,754	\$87,765
2023	\$66,714	\$23,350	\$90,064
2024	\$68,416	\$23,946	\$92,362
2025	\$70,119	\$24,542	\$94,661

Targets		
View	Accounts	
	SF	Total
2018	20,615	20,615
2019	20,929	20,929
2020	21,243	21,243
2021	21,830	21,830
2022	22,418	22,418
2023	23,005	23,005
2024	23,592	23,592
2025	24,179	24,179

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.034031
2019	0.068005
2020	0.068470
2021	0.069281
2022	0.070533
2023	0.071781
2024	0.073026
2025	0.074266

 <b>District System Optimization Review</b>	Overview	
	Name	District System Optimization Review
	Abbr	2
	Category	Default
	Measure Type	Water Loss Measure
	Time Period	
	First Year	2018
	Backlog Costs	
	Total Backlog Work Costs	\$0
	Years to Complete Backlog	0
	Maintenance Costs	
	Annual Maintenance Costs	\$80,750
	Target	
	Total GPCD Reduction	0.5
	Costs	
		Utility
	2018	\$80,750
	2019	\$80,750
	2020	\$80,750
	2021	\$80,750
2022	\$80,750	
2023	\$80,750	
2024	\$80,750	
2025	\$80,750	
Targets		
	Projected NRW Percent	
2018	7.8%	
2019	7.8%	
2020	7.8%	
2021	7.8%	
2022	7.8%	
2023	7.8%	
2024	7.8%	
2025	7.8%	
Results		
Average Water Savings (mgd)		
0.103197		
Lifetime Savings - Present Value (\$)		
Utility	\$2,549,706	
Community	\$2,549,706	
Lifetime Costs - Present Value (\$)		
Utility	\$1,366,405	
Community	\$1,366,405	
Benefit to Cost Ratio		
Utility	1.87	
Community	1.87	
Cost of Savings per Unit Volume (\$/mg)		
Utility	\$1,576	
Comments		
Meter Repairs and Services Budget: > \$80,750 is the estimated budget but \$34,445 has been spent, though an additional \$32,827 is committed. This budget covers more than just repairs. A breakdown of services is not available. The superintendent will try to drill down further, but for now this is what is available. "Backlogged" items and budgets are NOT tracked.		
Water Savings (MG/d)		
	Total Savings	
2018	0.078508	
2019	0.079706	
2020	0.080903	
2021	0.083139	
2022	0.085375	
2023	0.087611	
2024	0.089847	
2025	0.092084	

Elsinore Valley Municipal Water District's 2018 Water Conservation Business Plan 103





### CII Indoor Water Efficiency Evaluation

Overview	
Name	CII Indoor Water Efficiency Evaluation
Abbr	4
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2020	Permanent	<input type="checkbox"/>
Last Year	2040	Years	10
Measure Length	21	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$2,500.00	\$1,500.00	1
INST	\$2,500.00	\$1,500.00	1

Administration Costs	
Markup Percentage	30%

**Description**

Conduct a multi-step process for identifying customers, including: online pre-screening, phone call screening, on-site evaluation, incentives offering, and follow-up/site visit and water use tracking. This measure includes documenting inventory of current water using fixtures to support commercial program design and benchmarking.

Top water user customers from each category would be offered a professional water evaluation that would evaluate ways to save water and money. The evaluation would be for large accounts (i.e., accounts that use more than 5,000 gallons of water per day) such as microbreweries, hotels, restaurants, stores and schools. Measure to encourage participation in inefficient equipment upgrade and rebate measure for water efficient equipment including x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity controller on cooling towers.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Urinals			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Lavatory Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Showers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Dishwashers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Clothes Washers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Process			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Kitchen Spray Rinse			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Internal Leakage			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Baths			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Other			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Irrigation			<input type="checkbox"/>	<input type="checkbox"/>			
Pools			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Wash Down			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Cooling			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Car Washing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
External Leakage			<input type="checkbox"/>	<input type="checkbox"/>			
Outdoor			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
tory/Kitchen Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

**Comments**

> Assume \$2,500 cost for site evaluation and \$1,500 for CII customer to address recommendations.

> Costs and savings assume actual site visit customer water efficiency evaluations are conducted, and do NOT include prescreened-only customers (online and phone calls).

Results	
Average Water Savings (mgd)	
0.007719	
Lifetime Savings - Present Value (\$)	
Utility	\$192,068
Community	\$348,173
Lifetime Costs - Present Value (\$)	
Utility	\$525,084
Community	\$767,430
Benefit to Cost Ratio	
Utility	0.37
Community	0.45
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$8,097

End Use Savings Per Replacement	
	% Savings per Account
COM Toilets	15.0%
INST Toilets	15.0%
COM Urinals	15.0%
INST Urinals	15.0%
COM Lavatory Faucets	15.0%
INST Lavatory Faucets	15.0%
COM Showers	15.0%
INST Showers	15.0%
COM Dishwashers	15.0%
INST Dishwashers	15.0%
COM Clothes Washers	15.0%
INST Clothes Washers	15.0%
COM Process	15.0%
COM Kitchen Spray Rins	15.0%
INST Kitchen Spray Rins	15.0%
COM Internal Leakage	15.0%
INST Internal Leakage	15.0%
COM Other	15.0%
INST Other	15.0%
INST Pools	15.0%
COM Cooling	15.0%
INST Cooling	15.0%
Non-Lavatory/Kitchen Fa	15.0%
Non-Lavatory/Kitchen Fa	15.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$21,092	\$6,328	\$27,419
2021	\$21,714	\$6,514	\$28,228
2022	\$22,337	\$6,701	\$29,037
2023	\$22,959	\$6,888	\$29,847
2024	\$23,581	\$7,074	\$30,656
2025	\$24,204	\$7,261	\$31,465

Targets			
View	Accounts		
	COM	INST	Total
2018	0	0	0
2019	0	0	0
2020	7	2	8
2021	7	2	9
2022	7	2	9
2023	7	2	9
2024	8	2	9
2025	8	2	10

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.000000
2020	0.000934
2021	0.001881
2022	0.002839
2023	0.003810
2024	0.004791
2025	0.005784



### CII Rebates to Replace Inefficient Equipment

Overview	
Name	CII Rebates to Replace Inefficient
Abbr	5
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	23		

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$175.00	\$3,500.00	1
INST	\$175.00	\$3,500.00	1

Administration Costs	
Markup Percentage	35%

Description
Measure to offer rebates for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, dry vacuum pump and conductivity controller on cooling towers. Eligible project costs include labor, hardware and may include annual water management fees. This measure is planned to evolve as technology changes.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Urinals			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Lavatory Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Showers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Dishwashers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Clothes Washers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Process			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Kitchen Spray Rinse			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Internal Leakage			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Baths			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Other			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Irrigation			<input type="checkbox"/>	<input type="checkbox"/>			
Pools			<input type="checkbox"/>	<input type="checkbox"/>			
Wash Down			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Cooling			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Car Washing			<input type="checkbox"/>	<input type="checkbox"/>			
External Leakage			<input type="checkbox"/>	<input type="checkbox"/>			
Outdoor			<input type="checkbox"/>	<input type="checkbox"/>			
tory/Kitchen Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

Comments
> Water Districts such as the East Bay Municipal Utility District and Metropolitan Water District of Southern California provide about \$0.50 per 748 gallons (1 billing unit) saved to sites within the utility's service area.
> Incentives to follow-up field evaluation recommendations, but a site visit (evaluation) is NOT required.
> The marketing for this will be included in the CII Water Efficiency Evaluation measure.
> This measure is paid for and conducted by SoCal WaterSmart.
> Utility cost represents 2-3 hour/acct to track participation (\$45/hr including benefits).
> Customer costs will vary

Results	
Average Water Savings (mgd)	0.015829
Lifetime Savings - Present Value (\$)	
Utility	\$389,069
Community	\$707,772
Lifetime Costs - Present Value (\$)	
Utility	\$83,629
Community	\$1,322,579
Benefit to Cost Ratio	
Utility	4.65
Community	0.54
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$629


End Use Savings Per Replacement	
	% Savings per Account
COM Toilets	10.0%
INST Toilets	10.0%
COM Urinals	10.0%
INST Urinals	10.0%
COM Lavatory Faucets	10.0%
INST Lavatory Faucets	10.0%
COM Showers	10.0%
INST Showers	10.0%
COM Dishwashers	10.0%
INST Dishwashers	10.0%
COM Clothes Washers	10.0%
INST Clothes Washers	10.0%
COM Process	10.0%
COM Kitchen Spray Rins	10.0%
INST Kitchen Spray Rins	10.0%
COM Internal Leakage	10.0%
INST Internal Leakage	10.0%
COM Other	10.0%
INST Other	10.0%
COM Cooling	10.0%
INST Cooling	10.0%
Non-Lavatory/Kitchen Fa	10.0%
Non-Lavatory/Kitchen Fa	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$2,671	\$935	\$3,605
2019	\$2,812	\$984	\$3,796
2020	\$2,953	\$1,034	\$3,986
2021	\$3,040	\$1,064	\$4,104
2022	\$3,127	\$1,094	\$4,222
2023	\$3,214	\$1,125	\$4,339
2024	\$3,301	\$1,155	\$4,457
2025	\$3,388	\$1,186	\$4,574

Targets			
View:	Accounts		
	COM	INST	Total
2018	12	3	15
2019	13	3	16
2020	14	3	17
2021	14	3	17
2022	14	4	18
2023	15	4	18
2024	15	4	19
2025	16	4	19

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.001148
2019	0.002325
2020	0.003535
2021	0.004770
2022	0.006020
2023	0.007286
2024	0.008568
2025	0.009863



**Public Agency Program**

Overview			
Name	Public Agency Program		
Abbr	6		
Category	Default		
Measure Type	Standard Measure		

Time Period		Measure Life	
First Year	2019	Permanent	<input checked="" type="checkbox"/>
Last Year	2023		
Measure Length	5		

Fixture Costs			
	Utility	Customer	Fix/Acct
INST	\$135.00	\$10,000.00	1

Administration Costs	
Markup Percentage	30%

Description
Measure will provide government facilities with enhanced financial incentives to replace indoor fixtures and upgrade landscape irrigation systems. To encourage agencies that have not already installed water-efficient landscape equipment to do so, SoCal WaterSmart has a Public Agency program, offering enhanced incentives paid up-front for public agencies to install water-efficient devices at their facilities and on their grounds. EVMWD staff will assist with rebate applications as needed.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets				<input checked="" type="checkbox"/>			
Urinals				<input checked="" type="checkbox"/>			
Lavatory Faucets				<input checked="" type="checkbox"/>			
Showers				<input checked="" type="checkbox"/>			
Dishwashers				<input checked="" type="checkbox"/>			
Clothes Washers				<input checked="" type="checkbox"/>			
Process							
Kitchen Spray Rinse				<input checked="" type="checkbox"/>			
Internal Leakage				<input checked="" type="checkbox"/>			
Baths							
Other				<input checked="" type="checkbox"/>			
Irrigation				<input checked="" type="checkbox"/>			
Pools				<input checked="" type="checkbox"/>			
Wash Down							
Cooling				<input checked="" type="checkbox"/>			
Car Washing							
External Leakage				<input checked="" type="checkbox"/>			
Outdoor							
tory/Kitchen Faucets				<input checked="" type="checkbox"/>			

Comments
> Targeted rebate.
> No site survey or follow-up visit assuming/trusting that government buildings already have a dedicated maintenance person to do this.
> Savings based on potential average savings per site/account - will vary significantly.
> Costs include 2-3 hours of conservation staff time per account for assisting with the rebate application.

Results	
Average Water Savings (mgd)	0.004283
Lifetime Savings - Present Value (\$)	
Utility	\$109,972
Community	\$158,053
Lifetime Costs - Present Value (\$)	
Utility	\$3,450
Community	\$200,021
Benefit to Cost Ratio	
Utility	31.88
Community	0.79
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$96

End Use Savings Per Replacement	
	% Savings per Account
INST Toilets	20.0%
INST Urinals	20.0%
INST Lavatory Faucets	20.0%
INST Showers	20.0%
INST Dishwashers	20.0%
INST Clothes Washers	20.0%
INST Kitchen Spray Rins	20.0%
INST Internal Leakage	20.0%
INST Other	20.0%
INST Irrigation	20.0%
INST Pools	20.0%
INST Cooling	20.0%
INST External Leakage	20.0%
Non-Lavatory/Kitchen Fa	20.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.500%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$555	\$167	\$722
2020	\$563	\$169	\$732
2021	\$579	\$174	\$753
2022	\$595	\$178	\$773
2023	\$610	\$183	\$793
2024	\$0	\$0	\$0
2025	\$0	\$0	\$0

Targets		
View	Accounts	
	INST	Total
2018	0	0
2019	4	4
2020	4	4
2021	4	4
2022	4	4
2023	5	5
2024	0	0
2025	0	0

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.000990
2020	0.001996
2021	0.003027
2022	0.004073
2023	0.005138
2024	0.005113
2025	0.005081



### Require Plan Review for New CII

Overview	
Name	Require Plan Review for New CII
Abbr	7
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2020	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	21		

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$45.00	\$500.00	1
INST	\$45.00	\$500.00	1

Administration Costs	
Markup Percentage	30%

Description
Require plan reviews for water use efficiency for all new business customers.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Urinals			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Lavatory Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Showers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Dishwashers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Clothes Washers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Process			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Kitchen Spray Rinse			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Internal Leakage			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Baths			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Other			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Irrigation			<input type="checkbox"/>	<input type="checkbox"/>			
Pools			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Wash Down			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Cooling			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Car Washing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
External Leakage			<input type="checkbox"/>	<input type="checkbox"/>			
Outdoor			<input type="checkbox"/>	<input type="checkbox"/>			
tory/Kitchen Faucets			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

Comments
> Assume 1 hour of plan review by EVMWD staff. \$45 equals hourly rate plus benefits. > Customer cost reflects average increased cost to address plan review results. > 1% savings assumes Elsinore will catch items (savings opportunities) in their plan review - some would be clean and save 0% - others would NOT be clean and could save more than 5-10%. To be conservative assume 1%. > Irrigation and External Leakage is covered in MWEL0 measure

Results	
Average Water Savings (mgd)	0.001885
Lifetime Savings - Present Value (\$)	
Utility	\$46,104
Community	\$83,881
Lifetime Costs - Present Value (\$)	
Utility	\$22,755
Community	\$217,247
Benefit to Cost Ratio	
Utility	2.03
Community	0.39
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$1,437

End Use Savings Per Replacement	
	% Savings per Account
COM Toilets	1.0%
COM Urinals	1.0%
COM Lavatory Faucets	1.0%
COM Showers	1.0%
COM Dishwashers	1.0%
COM Clothes Washers	1.0%
COM Process	1.0%
COM Kitchen Spray Rins	1.0%
COM Internal Leakage	1.0%
COM Other	1.0%
COM Cooling	1.0%
Non-Lavatory/Kitchen Fa	1.0%
INST Toilets	1.0%
INST Urinals	1.0%
INST Lavatory Faucets	1.0%
INST Showers	1.0%
INST Dishwashers	1.0%
INST Clothes Washers	1.0%
INST Kitchen Spray Rins	1.0%
INST Internal Leakage	1.0%
INST Other	1.0%
INST Pools	1.0%
INST Cooling	1.0%
Non-Lavatory/Kitchen Fa	1.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Accts	<input checked="" type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$1,815	\$545	\$2,360
2021	\$1,120	\$336	\$1,456
2022	\$1,120	\$336	\$1,456
2023	\$1,120	\$336	\$1,456
2024	\$1,120	\$336	\$1,456
2025	\$1,120	\$336	\$1,456

Targets			
View	Accounts		
	COM	INST	Total
2018	0	0	0
2019	0	0	0
2020	38	2	40
2021	20	5	25
2022	20	5	25
2023	20	5	25
2024	20	5	25
2025	20	5	25

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.000000
2020	0.000295
2021	0.000474
2022	0.000651
2023	0.000825
2024	0.000996
2025	0.001165



## CII Leak Alert

Overview	
Name	CII Leak Alert
Abbr	8
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2019	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	22		

Fixture Costs			
	Utility	Customer	Fix/Acct
IRR	\$90.00	\$250.00	1
RES_IRR	\$90.00	\$250.00	1
CII_IRR	\$90.00	\$250.00	1

Administration Costs	
Markup Percentage	30%

Description
This measure will use AMI data through the AquaHawk Alerting Portal to identify leaks in CII and dedicated Irrigation accounts. EVWMD requires all new CII developments to install dedicated irrigation meters.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets							
Urinals							
Lavatory Faucets							
Showers							
Dishwashers							
Clothes Washers							
Process							
Kitchen Spray Rinse							
Internal Leakage							
Baths							
Other							
Irrigation					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools							
Wash Down							
Cooling							
Car Washing							
External Leakage					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor							
tory/Kitchen Faucets							

Comments
> Leakage savings can be VERY high for high users. Targeting high users and so saving more. Targeting only dedicated landscape accounts since other accounts/properties already have separate dedicated landscape meters.
> Since this ordinance has been in place for a while, we'll target leakage only and not irrigation use.
> This is already a measure being implemented at EVWMD. No threshold volume for installing a dedicated landscape meter; admin code states dedicated landscape meters for the use of irrigating outside landscape. Residential properties do NOT have them - NEW CII properties must have dedicated landscape meters if they have landscape; developer pays to have the meter services put in.
> Cost represents monthly time spent to identify leaking accounts and connect with them - approx. 1-2 hr/acct to: review usage, send email notice or call, and possibly schedule a site evaluation if interested. \$45/hour.
> Target 10% of dedicated landscape accts per year, so roughly 68/year or 5-6 accts/month to be contacted regarding high usage/leak alerts and to also offer water efficiency evaluations.

Results	
Average Water Savings (mgd)	0.099422
Lifetime Savings - Present Value (\$)	
Utility	\$2,209,159
Community	\$2,209,159
Lifetime Costs - Present Value (\$)	
Utility	\$120,685
Community	\$378,559
Benefit to Cost Ratio	
Utility	18.31
Community	5.84
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$144


End Use Savings Per Replacement	
	% Savings per Account
IRR External Leakage	60.0%
ES_IRR External Leakage	60.0%
CII_IRR External Leakage	60.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	5.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$4,361	\$1,308	\$5,669
2020	\$4,618	\$1,385	\$6,003
2021	\$4,756	\$1,427	\$6,183
2022	\$4,894	\$1,468	\$6,363
2023	\$5,033	\$1,510	\$6,542
2024	\$5,171	\$1,551	\$6,722
2025	\$5,309	\$1,593	\$6,902

Targets				
View	Accounts			
	IRR	RES_IRR	CII_IRR	Total
2018	0	0	0	0
2019	36	0	12	48
2020	38	0	13	51
2021	39	0	13	53
2022	40	0	14	54
2023	42	0	14	56
2024	43	0	14	57
2025	44	0	15	59

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.007178
2020	0.014777
2021	0.022604
2022	0.030659
2023	0.038942
2024	0.047452
2025	0.056189



**Cooling Tower Regulations**

Overview			
Name	Cooling Tower Regulations		
Abbr	9		
Category	Default		
Measure Type	Standard Measure		

Time Period	
First Year	2020
Last Year	2040
Measure Length	21

Measure Life	
Permanent	<input checked="" type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$350.00	\$1,000.00	1
INST	\$350.00	\$1,000.00	1

Administration Costs	
Markup Percentage	30%

Description
This measure will prohibit the discharge of cooling tower blow down unless the TDS of the water is at least a certain level (that would ensure a minimum of 5 cycles of concentration). Available cooling tower equipment rebates will be promoted.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets			<input type="checkbox"/>	<input type="checkbox"/>			
Urinals			<input type="checkbox"/>	<input type="checkbox"/>			
Lavatory Faucets			<input type="checkbox"/>	<input type="checkbox"/>			
Showers			<input type="checkbox"/>	<input type="checkbox"/>			
Dishwashers			<input type="checkbox"/>	<input type="checkbox"/>			
Clothes Washers			<input type="checkbox"/>	<input type="checkbox"/>			
Process			<input type="checkbox"/>	<input type="checkbox"/>			
Kitchen Spray Rinse			<input type="checkbox"/>	<input type="checkbox"/>			
Internal Leakage			<input type="checkbox"/>	<input type="checkbox"/>			
Baths			<input type="checkbox"/>	<input type="checkbox"/>			
Other			<input type="checkbox"/>	<input type="checkbox"/>			
Irrigation			<input type="checkbox"/>	<input type="checkbox"/>			
Pools			<input type="checkbox"/>	<input type="checkbox"/>			
Wash Down			<input type="checkbox"/>	<input type="checkbox"/>			
Cooling			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Car Washing			<input type="checkbox"/>	<input type="checkbox"/>			
External Leakage			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Outdoor			<input type="checkbox"/>	<input type="checkbox"/>			
tory/Kitchen Faucets			<input type="checkbox"/>	<input type="checkbox"/>			

Comments
> Savings depend on existing practices. Assumes many will be able to at least double if not triple their cycles. Increased savings values further since targeting above average CII cooling end use (versus avg site cooling). > Very often significant leaks are identified inside the tower and/or inside the piping. > Utility costs represent site visit and education (for staff and site) as well as regulation set-up. Approx 8 hrs/acct. > Customer costs will vary and represent costs to meet regulations - may be higher initially and then after a few years of the regulation being enforced, lessen. > Target approximately 20% of eligible sites per year, approx. 40 accounts. > Might pattern regulations after the State of Arizona or LACWD.

Results			
Average Water Savings (mgd)			
0.016527			
Lifetime Savings - Present Value (\$)			
Utility	\$363,775		
Community	\$363,775		
Lifetime Costs - Present Value (\$)			
Utility	\$367,559		
Community	\$1,175,379		
Benefit to Cost Ratio			
Utility	0.99		
Community	0.31		
Cost of Savings per Unit Volume (\$/mg)			
Utility	\$2,647		

End Use Savings Per Replacement	
	% Savings per Account
COM Cooling	75.0%
INST Cooling	75.0%
COM External Leakage	50.0%
INST External Leakage	50.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	5.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$14,764	\$4,429	\$19,194
2021	\$15,200	\$4,560	\$19,760
2022	\$15,636	\$4,691	\$20,326
2023	\$16,071	\$4,821	\$20,893
2024	\$16,507	\$4,952	\$21,459
2025	\$16,942	\$5,083	\$22,025

Targets			
View:	Accounts		
	COM	INST	Total
2018	0	0	0
2019	0	0	0
2020	34	8	42
2021	35	9	43
2022	36	9	45
2023	37	9	46
2024	38	9	47
2025	39	10	48

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.000000
2020	0.001363
2021	0.002766
2022	0.004208
2023	0.005689
2024	0.007210
2025	0.008770





### Financial Incentives for CII Irrigation and Landscape Upgrades

Overview	
Name	Financial Incentives for CII Irrigation and Land
Abbr	10
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input type="checkbox"/>
Last Year	2040	Years	10
Measure Length	23	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$560.00	\$5,000.00	1
INST	\$560.00	\$5,000.00	1
IRR	\$560.00	\$5,000.00	1
CII_IRR	\$560.00	\$5,000.00	1

Administration Costs	
Markup Percentage	35%

**Description**

After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be on-site or via a pre-screening online step. Staff may provide assistance with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns. Rebates primarily offered through SoCal WaterSmart with Elsinore offering drip irrigation system rebates.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	CII_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	CII_IRR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
atory/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments**

> Savings will range from 5% (for solely mulch) to >20% (for drip irrigation and combinations of devices).  
 > Soil moisture sensor device savings are estimated to be 20% of irrigation use based on more than 10 California site water use reports conducted over multiple months in years 2015-2017 as provided by Brian Holland [www.sustainablewatersavings.com](http://www.sustainablewatersavings.com). Studies show a range of 20%-60% savings for trained device installation and site management. The lower savings estimate is assumed for layperson usage and non-drought normal planning years. The manufacturer claims device batteries last 10-12 years.  
 > Utility cost represents Elsinore's average rebate amount per account (not SoCal WaterSmart) and allows for multiple devices to be rebated.  
 > Target represents SoCal WaterSmart and Elsinore combined measure participation.

Results	
Average Water Savings (mgd)	
0.306635	
Lifetime Savings - Present Value (\$)	
Utility	\$7,153,055
Community	\$7,153,055
Lifetime Costs - Present Value (\$)	
Utility	\$1,476,799
Community	\$11,243,990
Benefit to Cost Ratio	
Utility	4.84
Community	0.64
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$573


End Use Savings Per Replacement	
	% Savings per Account
COM Irrigation	18.0%
INST Irrigation	18.0%
IRR Irrigation	18.0%
CII_IRR Irrigation	18.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	5.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$46,676	\$16,337	\$63,013
2019	\$49,400	\$17,290	\$66,690
2020	\$52,125	\$18,244	\$70,368
2021	\$53,676	\$18,786	\$72,462
2022	\$55,227	\$19,329	\$74,556
2023	\$56,778	\$19,872	\$76,650
2024	\$58,329	\$20,415	\$78,744
2025	\$59,880	\$20,958	\$80,838

Targets					
View	Accounts				
	COM	INST	IRR	CII_IRR	Total
2018	30	8	34	11	83
2019	32	8	36	12	88
2020	34	8	38	13	93
2021	35	9	39	13	96
2022	36	9	40	14	99
2023	37	9	42	14	101
2024	38	9	43	14	104
2025	39	10	44	15	107

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.027797
2019	0.057319
2020	0.088566
2021	0.120748
2022	0.153865
2023	0.187916
2024	0.222903
2025	0.258825



**Large Landscape Outdoor Water Efficiency Evaluation**

Overview			
Name	Large Landscape Outdoor Water Efficiency Evaluation		
Abbr	11		
Category	Default		
Measure Type	Standard Measure		

Time Period	
First Year	2018
Last Year	2040
Measure Length	23

Measure Life	
Permanent	<input type="checkbox"/>
Years	10
Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
IRR	\$2,500.00	\$500.00	1
RES_IRR	\$2,500.00	\$500.00	1
CII_IRR	\$2,500.00	\$500.00	1

Administration Costs	
Markup Percentage	35%

**Description**

All public and private irrigators of large landscapes, including residential and commercial, will be eligible for free landscape water efficiency evaluations. Customers with high water use will be targeted and provided a customized report. Evaluations include irrigation system assessment, irrigation schedule, and report. A consultant will be used to conduct the evaluation.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets							
Urinals							
Lavatory Faucets							
Showers							
Dishwashers							
Clothes Washers							
Process							
Kitchen Spray Rinse							
Internal Leakage							
Baths							
Other							
Irrigation					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Pools							
Wash Down							
Cooling							
Car Washing							
External Leakage					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Outdoor							
tory/Kitchen Faucets							

**Comments**

> Usage history is provided to person doing the evaluation. Currently there is no screening process, but typically it is only offered to properties with high usage. No charge from WMWD who offers about 3 per year. This is offered to any property with a landscape.

> No site water budget will be offered.

> Incentives are limited to the full cost of the evaluation; no restriction on application for additional landscape device rebates.

> Utility costs assume all large landscape accounts apply.

> Customer costs represent cost to implement evaluation suggestions.

> Haley 2/16/18: Only include "IRR", "RES\_IRR" and "CII\_IRR" accounts. \$1500-\$2500 for consultant to conduct evaluation. Target 25 per year (and assume 2-3 are done by Western). Start 2019.

Results	
Average Water Savings (mgd)	0.137087
Lifetime Savings - Present Value (\$)	
Utility	\$3,197,855
Community	\$3,197,855
Lifetime Costs - Present Value (\$)	
Utility	\$1,454,081
Community	\$1,669,500
Benefit to Cost Ratio	
Utility	2.20
Community	1.92
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$1,263

End Use Savings Per Replacement	
	% Savings per Account
IRR Irrigation	20.0%
RES_IRR Irrigation	20.0%
CII_IRR Irrigation	20.0%
IRR External Leakage	10.0%
ES_IRR External Leakage	10.0%
CII_IRR External Leakage	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	2.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$45,600	\$15,960	\$61,560
2019	\$48,454	\$16,959	\$65,413
2020	\$51,308	\$17,958	\$69,266
2021	\$52,845	\$18,496	\$71,340
2022	\$54,381	\$19,033	\$73,414
2023	\$55,918	\$19,571	\$75,489
2024	\$57,454	\$20,109	\$77,563
2025	\$58,991	\$20,647	\$79,637

Targets				
View:	Accounts			
	IRR	RES_IRR	CII_IRR	Total
2018	14	0	5	18
2019	14	0	5	19
2020	15	0	5	21
2021	16	0	5	21
2022	16	0	5	22
2023	17	0	6	22
2024	17	0	6	23
2025	18	0	6	24

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.012417
2019	0.025610
2020	0.039579
2021	0.053966
2022	0.068772
2023	0.083996
2024	0.099638
2025	0.115698



### Landscape Conversion or Turf Removal - CII

Overview	
Name	Landscape Conversion or Turf Removal - CII
Abbr	12
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2019	Permanent	<input checked="" type="checkbox"/>
Last Year	2023		
Measure Length	5		

Fixture Costs			
	Utility	Customer	Fix/Acct
COM	\$135.00	\$15,000.00	1
INST	\$135.00	\$15,000.00	1
IRR	\$135.00	\$15,000.00	1
CII_IRR	\$135.00	\$15,000.00	1

Administration Costs	
Markup Percentage	30%

Description
Turf grass is one of the most water intensive plant types in landscape. It's high water uses and frequent maintenance make it a time consuming and expensive landscape option. By replacing turf with a California Friendly landscape, customers can save money on their water bill, reduce landscape maintenance costs and demonstrate that they care about conserving water. This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit per account. Measure includes a pre- and post inspection of the landscape retrofit.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	CII_IRR
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	CII_IRR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
toilet/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
> Savings estimates range from 15%- over 50%. Depends on what's eligible. VWC estimates 25%, Liberty Utilities (Park Water Company) estimates 18%.
> Synthetic turf not eligible.
> Discontinued by SoCal WaterSmart, but will start again 2018.
> Include "IRR" and "CII_IRR".
> Assume some reduction in external leakage with turf replacement.
> Rebate most likely \$1/sq/ft since CII properties tend to have larger landscapes, need to reduce rebate so we can fund more projects.
> Met will offer \$1/sqft with max of \$10K
> Assume SoCal WaterSmart pays and does all.
> Target ~ 15 per year
> Utility costs assume 2-3 hours per account (@\$45/hr) to track participation.

Results	
Average Water Savings (mgd)	
0.038651	
Lifetime Savings - Present Value (\$)	
Utility	\$939,051
Community	\$940,453
Lifetime Costs - Present Value (\$)	
Utility	\$15,306
Community	\$1,323,469
Benefit to Cost Ratio	
Utility	61.35
Community	0.71
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$47


End Use Savings Per Replacement	
	% Savings per Account
COM Internal Leakage	5.0%
INST Internal Leakage	5.0%
COM Irrigation	25.0%
INST Irrigation	25.0%
IRR Irrigation	25.0%
CII_IRR Irrigation	25.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$2,382	\$715	\$3,096
2020	\$2,513	\$754	\$3,267
2021	\$2,588	\$776	\$3,364
2022	\$2,663	\$799	\$3,462
2023	\$2,738	\$821	\$3,559
2024	\$0	\$0	\$0
2025	\$0	\$0	\$0

Targets					
View	Accounts				
	COM	INST	IRR	CII_IRR	Total
2018	0	0	0	0	0
2019	6	2	7	2	18
2020	7	2	8	3	19
2021	7	2	8	3	19
2022	7	2	8	3	20
2023	7	2	8	3	20
2024	0	0	0	0	0
2025	0	0	0	0	0

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.008223
2020	0.016927
2021	0.025891
2022	0.035116
2023	0.044601
2024	0.044601
2025	0.044601



**Landscape Conversion or Turf Removal - Residential**

Overview			
Name	Landscape Conversion or Turf Removal		
Abbr	13		
Category	Default		
Measure Type	Standard Measure		

Time Period		Measure Life	
First Year	2019	Permanent	<input checked="" type="checkbox"/>
Last Year	2023		
Measure Length	5		

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$90.00	\$1,500.00	1
MF	\$90.00	\$1,500.00	3
RES_IRR	\$90.00	\$1,500.00	3

Administration Costs	
Markup Percentage	35%

Description
Turf grass is one of the most water intensive plant types in landscape. It's high water uses and frequent maintenance make it a time consuming and expensive landscape option. By replacing turf with a California Friendly landscape, customers can save money on their water bill, reduce landscape maintenance costs and demonstrate that they care about conserving water. This measure provides a per square foot incentive for supporting the customer's cost to remove turf and replace with low water use plants or permeable hardscape. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence. Measure includes a pre- and post inspection of the landscape retrofit.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laundry/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
Will participate in SoCal WaterSmart program if reopened in July 2018; if it doesn't re-open, will change EVWMD rebate/cost to \$2/sqft assuming average sqft removed is 1,500 sqft. > Elsinore will support SoCal WaterSmart \$2/sqft rebate, and not provide any additional funding. > Based on recent landscape measure low participation (drip conversion), target set to ~50/year > Synthetic turf likely NOT eligible since limits groundwater recharge. > Savings estimates range from 15%- over 50%. Depends on what's eligible. VWC estimates 25%, Liberty Utilities (Park Water Company) estimates 18%. > Assume some reduction in external leakage with turf replacement. > Utility costs represents two hours per account to track participation.

Results	
Average Water Savings (mgd)	0.006512
Lifetime Savings - Present Value (\$)	
Utility	\$158,234
Community	\$158,234
Lifetime Costs - Present Value (\$)	
Utility	\$30,186
Community	\$402,859
Benefit to Cost Ratio	
Utility	5.24
Community	0.39
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$552

End Use Savings Per Replacement	
	% Savings per Account
SF Irrigation	25.0%
SF External Leakage	5.0%
MF Irrigation	25.0%
MF External Leakage	5.0%
RES_IRR Irrigation	25.0%
ES_IRR External Leakage	5.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.120%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$4,677	\$1,637	\$6,314
2020	\$4,747	\$1,662	\$6,409
2021	\$4,879	\$1,708	\$6,586
2022	\$5,010	\$1,753	\$6,763
2023	\$5,141	\$1,799	\$6,941
2024	\$0	\$0	\$0
2025	\$0	\$0	\$0

Targets				
View:	Accounts			
	SF	MF	RES_IRR	Total
2018	0	0	0	0
2019	50	1	0	51
2020	51	1	0	52
2021	52	1	0	53
2022	54	1	0	54
2023	55	1	0	56
2024	0	0	0	0
2025	0	0	0	0

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.001436
2020	0.002893
2021	0.004391
2022	0.005929
2023	0.007507
2024	0.007507
2025	0.007507

Overview			
Name	Water Conserving Landscape and Irrigation Codes		
Abbr	14		
Category	Default		
Measure Type	Standard Measure		
Time Period		Measure Life	
First Year	2018	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	23		
Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$90.00	\$2,000.00	1
MF	\$90.00	\$5,000.00	1
COM	\$90.00	\$5,000.00	1
INST	\$90.00	\$5,000.00	1
IRR	\$90.00	\$5,000.00	1
RES_IRR	\$90.00	\$2,000.00	1
CII_IRR	\$90.00	\$5,000.00	1
Administration Costs			
Markup Percentage	35%		
Description			
<p>Enforce Model Water Efficient Landscape Ordinance (MWEO). Standards specify that development projects subject to design review be landscaped according to climate appropriate principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers.</p> <p>In California, about half of the urban water is used for landscape irrigation. Substantial water savings can be gained by proper landscape design, installation and maintenance. To improve water savings in this sector, DWR updated the Model Water Efficient Landscape Ordinance. MWEO promotes efficient landscapes in new developments and retrofitted landscapes while increasing water efficiency standards for new and retrofitted landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. MWEO also requires reporting on the implementation and enforcement of local ordinances. To reduce the complexity and costs for the smaller landscapes now subject to ordinance, the 2015 revised MWEO has a prescriptive compliance approach for landscapes between 500 and 2,500 sq. ft. Landscapes within this size range can comply either through meeting the traditional MWEO approach or through the prescriptive approach. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 square feet. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the ordinance.</p> <p>In typical non-residential landscapes, the reduction in MAWA limits the planting of high water use plants to special landscape areas. The revised MWEO still uses a water budget approach and larger areas of high water use plants can be installed if the water use is reduced in the other areas provided the overall landscape stays within the budget. The use of special landscape areas (SLA) was not changed in the revised MWEO. The SLA provides for an extra water allowance in non-residential areas for specific functional landscapes, such as recreation, areas for public assembly and edible gardens or for areas irrigated with recycled water. The revised MWEO allows the irrigation efficiency to be entered for each area of the landscape.</p>			
Customer Classes			
	SF	MF	COM
	INST	IRR	MISC
	RES_IRR	CII_IRR	
End Uses			
	SF	MF	COM
	INST	IRR	MISC
	RES_IRR	CII_IRR	
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lory/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
<p>&gt; Haley 2/13/18: measure to be enforced by the City Planning Dept. who receives the developer requests.</p> <p>&gt; The cities in the service area have written in their ordinances for new developments to follow certain water efficient landscape so this would just be added to those guidelines.</p> <p>&gt; Minimal utility costs (about 1-2 staff hours as requested by new account / developer) to cover double checking the code is followed correctly. Currently, the engineering group receives plans for new developments and will send comments to the City to add to their Conditions of Approval - this is where conservation will add water use efficiency comments and guidelines for the account/development. Utility staff hour at 45\$ including benefits.</p> <p>&gt; Assume average additional customer cost to build landscape by MWEO standards.</p> <p>&gt; Target 90% of new accounts since some are not eligible and some sneak around ordinance.</p> <p>&gt; Assume some external leakage reduction (since new dev would not have much) in addition to irrigation water use reduction. Assume end use savings as compared to existing account irrigation water end use.</p> <p>&gt; Savings based on the following:</p> <p>The maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ETo) to 55% for residential landscape projects, and to 45% of ETo for non-residential projects. Savings are simplified to be the difference from the prior standard to the new MWEO standard budget difference of 70-55% for residential or 70-45% for non-residential. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. The site-wide irrigation efficiency of the previous ordinance (2010) was 0.71; for the purposes of estimating total water use, the revised MWEO defines the irrigation efficiency (IE) of drip irrigation as 0.81 and overhead irrigation and other technologies must meet a minimum IE of 0.75. Also assumed that the amount of irrigated landscape per new development for each individual parcel is reducing over time (meaning that the lot size for homes/businesses is shrinking when comparing existing homes versus new homes/businesses.)</p>			
Results			
Average Water Savings (mgd)			
0.705156			
Lifetime Savings - Present Value (\$)			
Utility	\$16,032,084		
Community	\$16,032,084		
Lifetime Costs - Present Value (\$)			
Utility	\$2,248,696		
Community	\$42,715,041		
Benefit to Cost Ratio			
Utility	7.13		
Community	0.38		
Cost of Savings per Unit Volume (\$/mg)			
Utility	\$380		
End Use Savings Per Replacement			
	% Savings per Account		
SF Irrigation	25.0%		
MF Irrigation	25.0%		
COM Irrigation	25.0%		
INST Irrigation	25.0%		
IRR Irrigation	25.0%		
RES_IRR Irrigation	25.0%		
CII_IRR Irrigation	25.0%		
SF External Leakage	5.0%		
MF External Leakage	5.0%		
COM External Leakage	5.0%		
INST External Leakage	5.0%		
IRR External Leakage	5.0%		
ES_IRR External Leakag	5.0%		
CII_IRR External Leakag	5.0%		
Targets			
Target Method	Percentage		
% of Accts Targeted / yr	90.000%		
Only Effects New Accts	<input checked="" type="checkbox"/>		
Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$59,400	\$20,790	\$80,191
2019	\$59,400	\$20,790	\$80,191
2020	\$59,400	\$20,790	\$80,191
2021	\$100,703	\$35,246	\$135,950
2022	\$100,703	\$35,246	\$135,950
2023	\$100,703	\$35,246	\$135,950
2024	\$100,703	\$35,246	\$135,950
2025	\$100,703	\$35,246	\$135,950
Targets			
View:	Accounts		
	SF	MF	COM
	INST	IRR	RES_IRR
	CII_IRR	Total	
2018	566	6	34
2019	566	6	34
2020	566	6	34
2021	1,057	12	18
2022	1,057	12	18
2023	1,057	12	18
2024	1,057	12	18
2025	1,057	12	18
Water Savings (mgd)			
	Total Savings (mgd)		
2018	0.059949		
2019	0.119899		
2020	0.179848		
2021	0.233791		
2022	0.287733		
2023	0.341676		
2024	0.395619		
2025	0.449561		

Overview			
Name	Require Weather Adjusting Smart Irrigation Controllers and / or Rain Sensors in New Development		
Abbr	15		
Category	Default		
Measure Type	Standard Measure		
Time Period		Measure Life	
First Year	2020	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	21		
Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$67.50	\$200.00	1
MF	\$67.50	\$3,000.00	1
COM	\$67.50	\$3,000.00	1
INST	\$67.50	\$3,000.00	1
IRR	\$67.50	\$3,000.00	3
RES_IRR	\$67.50	\$3,000.00	3
CII_IRR	\$67.50	\$3,000.00	3
Administration Costs			
Markup Percentage		30%	
Description			
Measure would require new development customers to install weather adjusting smart irrigation controllers and/or rain sensors. Might offer training class on how to install and program the device. The WBICs have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly.			
Customer Classes			
	SF	MF	COM
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	INST	IRR	MISC
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	RES_IRR	CII_IRR	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
End Uses			
	SF	MF	COM
Toilets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Urinals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lavatory Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Showers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dishwashers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clothes Washers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Process	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Kitchen Spray Rinse	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Internal Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Baths	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wash Down	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cooling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Car Washing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
External Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lavatory/Kitchen Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
<p>&gt; This measure to be enforced by the City Planning Dept who receives the developer requests</p> <p>&gt; EVWMD to incorporate notification process so can double check that developer plans &gt;</p> <p>The cities in the service area have ordinances for new developments to follow certain water efficient landscape and so this would just be added to those guidelines.</p> <p>&gt; Minimal utility costs (1-2 staff hours as requested by new account / developer) to cover double checking the code is followed correctly. Currently, the engineering group receives plans for new developments and will send comments to the City to add to their Conditions of Approval - this is where conservation will add water use efficiency comments and guidelines for the account/development. Utility staff hour at 45\$ including benefits.</p> <p>&gt; Customer costs includes device and installation. Assume less landscape and so less savings on non-"IRR" meter accounts.</p> <p>&gt; SF: SF WBICs can cost &gt;\$100. Santa Clara Valley Water District (SCVWD) has background information for SF WBICs in a summary report. SF savings based on Valencia Water Company experience; savings have been considered as high as 15% per account.</p> <p>&gt; CII customer costs include cost to install and cost of unit approx. Assume \$100/active station. Fixture costs assume CII accounts have 12 stations total and CII irrigation accounts have 3 controllers each. Per CLWA 2014 past CII WBIC costs average approximately \$3,100; with 3 per account. CII WBIC 10% savings based on VWC recent experience.</p>			
Results			
Average Water Savings (mgd)			
0.291528			
Lifetime Savings - Present Value (\$)			
Utility	\$6,470,301		
Community	\$6,470,301		
Lifetime Costs - Present Value (\$)			
Utility	\$1,586,044		
Community	\$10,340,891		
Benefit to Cost Ratio			
Utility	4.08		
Community	0.63		
Cost of Savings per Unit Volume (\$/mg)			
Utility	\$648		
End Use Savings Per Replacement			
	% Savings per Account		
SF Irrigation	15.0%		
MF Irrigation	10.0%		
COM Irrigation	10.0%		
INST Irrigation	10.0%		
IRR Irrigation	10.0%		
RES_IRR Irrigation	10.0%		
CII_IRR Irrigation	10.0%		
Targets			
Target Method	Percentage		
% of Accts Targeted / yr	90.000%		
Only Effects New Accts	<input checked="" type="checkbox"/>		
Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$51,486	\$15,446	\$66,931
2021	\$79,261	\$23,778	\$103,040
2022	\$79,261	\$23,778	\$103,040
2023	\$79,261	\$23,778	\$103,040
2024	\$79,261	\$23,778	\$103,040
2025	\$79,261	\$23,778	\$103,040
Targets			
View:	Accounts		
	SF	MF	COM
2018	0	0	0
2019	0	0	0
2020	566	6	34
2021	1,057	12	18
2022	1,057	12	18
2023	1,057	12	18
2024	1,057	12	18
2025	1,057	12	18
Water Savings (mgd)			
	Total Savings (mgd)		
2018	0.000000		
2019	0.000000		
2020	0.026668		
2021	0.053612		
2022	0.080555		
2023	0.107499		
2024	0.134442		
2025	0.161386		



Overview			
Name	Require Irrigation Designers / Installers be Certified (possibly by Irrigation Association or CA Landscape Contractor's Association)		
Abbr	16		
Category	Default		
Measure Type	Standard Measure		
Time Period		Measure Life	
First Year	2020	Permanent	<input type="checkbox"/>
Last Year	2040	Years	15
Measure Length	21	Repeat	<input type="checkbox"/>
Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$22.00	\$100.00	1
MF	\$22.00	\$100.00	1
COM	\$22.00	\$100.00	1
INST	\$22.00	\$100.00	1
IRR	\$22.00	\$100.00	1
RES_IRR	\$22.00	\$100.00	1
CII_IRR	\$22.00	\$100.00	1
Administration Costs			
Markup Percentage		30%	
Description			
Require the design and installation of irrigation systems by trained certified contractors. Certification might be through the CLCA, Irrigation Association (IA) and/or specialized training provided by utility.			
Customer Classes			
	<input checked="" type="checkbox"/> SF	<input checked="" type="checkbox"/> MF	<input checked="" type="checkbox"/> COM
	<input checked="" type="checkbox"/> INST	<input checked="" type="checkbox"/> IRR	<input checked="" type="checkbox"/> MISC
	<input checked="" type="checkbox"/> RES_IRR	<input checked="" type="checkbox"/> CII_IRR	
End Uses			
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laundry/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
> Model after Cary, North Carolina's program. > Update cost based on how tracking, training, etc. > Target new development. > Savings based on how targeted. Assume 5%-10%. > Update certification every 10-15 years. Would equal measure savings life. > Utility cost represents one half hour of staff time spent per account. > Per Haley Munson 2/28/18 "this can be included in our measures but per conversation with the City, this may not be feasible to do so this measure may not be implemented in the future"			
Results			
Average Water Savings (mgd)			
0.117453			
Lifetime Savings - Present Value (\$)			
Utility	\$2,646,459		
Community	\$2,646,459		
Lifetime Costs - Present Value (\$)			
Utility	\$546,802		
Community	\$2,458,698		
Benefit to Cost Ratio			
Utility	4.84		
Community	1.08		
Cost of Savings per Unit Volume (\$/mg)			
Utility	\$554		
End Use Savings Per Replacement			
	% Savings per Account		
MF Irrigation	5.0%		
COM Irrigation	5.0%		
INST Irrigation	5.0%		
IRR Irrigation	5.0%		
RES_IRR Irrigation	5.0%		
CII_IRR Irrigation	5.0%		
SF Irrigation	5.0%		
Targets			
Target Method	Percentage		
% of Accts Targeted / yr	100.000%		
Only Effects New Accts	<input checked="" type="checkbox"/>		
Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$16,133	\$4,840	\$20,974
2021	\$27,352	\$8,205	\$35,557
2022	\$27,352	\$8,205	\$35,557
2023	\$27,352	\$8,205	\$35,557
2024	\$27,352	\$8,205	\$35,557
2025	\$27,352	\$8,205	\$35,557
Targets			
View:	Accounts		
	SF	MF	COM
2018	0	0	0
2019	0	0	0
2020	629	7	38
2021	1,174	13	20
2022	1,174	13	20
2023	1,174	13	20
2024	1,174	13	20
2025	1,174	13	20
Water Savings (mgd)			
	Total Savings (mgd)		
2018	0.000000		
2019	0.000000		
2020	0.013117		
2021	0.024915		
2022	0.036712		
2023	0.048509		
2024	0.060306		
2025	0.072103		



### Hot Water Recirculating Pump Rebate

Overview	
Name	Hot Water Recirculating Pump Re
Abbr	17
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2019	Permanent	<input checked="" type="checkbox"/>
Last Year	2023		
Measure Length	5		

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$175.00	\$300.00	1

Administration Costs	
Markup Percentage	35%

Description
Measure will provide a rebate to equip homes with efficient hot water recirculating pumps (hot water on demand systems). These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to reduce hot water waiting times by having an on-demand pump on a recirculation line. Can be installed on kitchen sink or master bath, wherever hot water waiting times are more than 1/2 minute. Requires an electrical outlet under the sink, which is not common on older home bathrooms but is on kitchen sinks.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory/Kitchen Faucets	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
EVMWD Board is very interested in this measure. Lots of interest in FY 15/16 when offered a rebate program as part of a grant. Approx. 363 applications were approved out of over 880 applications submitted. Many applicants did not fully complete the application process. Expected measure launch in 2019 if not sooner. \$175/unit total incentive representing (\$100/unit and \$75 for permitting). Customer cost represents (\$199/unit+\$200 installation+\$75 permitting) so approx. \$300 remaining after incentive. 35% admin cost. Water savings based on Jim Lutz paper and information from Gary Klein and David Grieshop. See spreadsheet titled "Hot Water On Demand Water Savings Estimate_2013" includes 1750 sq ft house saves 1571 gallons per year or 4.3 gpd/acct and a total of 99.5 gpd per SF home, equates to ~4.3% savings per home. Based on a EVMWD's SF indoor water use this results in an equivalent savings of approximately 14.2 gpd savings or 17.4% on shower and faucet end uses. More information on ACT system at: <a href="http://www.gothotwater.com">www.gothotwater.com</a>

Results	
Average Water Savings (mgd)	0.020605
Lifetime Savings - Present Value (\$)	
Utility	\$555,875
Community	\$1,269,508
Lifetime Costs - Present Value (\$)	
Utility	\$432,662
Community	\$982,075
Benefit to Cost Ratio	
Utility	1.28
Community	1.29
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$2,500

End Use Savings Per Replacement	
	% Savings per Account
SF Lavatory Faucets	17.4%
SF Showers	17.4%
on-Lavatory/Kitchen Fa	17.4%

Targets	
Target Method	Count
# of Accts Targeted / yr	400

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$70,000	\$24,500	\$94,500
2020	\$70,000	\$24,500	\$94,500
2021	\$70,000	\$24,500	\$94,500
2022	\$70,000	\$24,500	\$94,500
2023	\$70,000	\$24,500	\$94,500
2024	\$0	\$0	\$0
2025	\$0	\$0	\$0

Targets		
View	Accounts	
	SF	Total
2018	0	0
2019	400	400
2020	400	400
2021	400	400
2022	400	400
2023	400	400
2024	0	0
2025	0	0

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.005770
2020	0.011272
2021	0.016483
2022	0.021465
2023	0.026254
2024	0.025730
2025	0.025255



### Residential Outdoor and Indoor Water Efficiency Evaluation

Overview	
Name	Residential Outdoor and Indoor W
Abbr	18
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input type="checkbox"/>
Last Year	2040	Years	5
Measure Length	23	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$100.00	\$25.00	1
MF	\$300.00	\$75.00	1

Administration Costs	
Markup Percentage	30%

Description
Measure will provide indoor and outdoor water efficiency evaluations for single family and multi-family residential customers. Evaluations will be conducted by an outside contractor. Target those with high water use and provide a customized report to owner. This measure includes a multi-step process for identifying customers, including an online pre-screening and phone call screening before the field evaluation to identify high water using customers.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tory/Kitchen Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
> 2017 budget for outdoor evaluations only was \$50,000 for 500 accounts. However, 500 could never be reached. The last 3 years the most done is 44 (in 2015), so roughly double to target 100. > MF costs account for 3 units per account. > No direct-installs; no giveaways included. > If a customer doesn't "pass" the online screening, might offer online do-it-yourself evaluation to customers who have reasonable use. <a href="http://www.evmwd.com/about/departments/conservation/use_water_wisely_inside_and_out/indoor_water_conservation.asp">http://www.evmwd.com/about/departments/conservation/use_water_wisely_inside_and_out/indoor_water_conservation.asp</a>

Results	
Average Water Savings (mgd)	0.013672
Lifetime Savings - Present Value (\$)	
Utility	\$343,326
Community	\$488,962
Lifetime Costs - Present Value (\$)	
Utility	\$298,699
Community	\$356,141
Benefit to Cost Ratio	
Utility	1.15
Community	1.37
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$2,601


End Use Savings Per Replacement	
	% Savings per Account
SF Toilets	5.0%
MF Toilets	5.0%
SF Lavatory Faucets	5.0%
MF Lavatory Faucets	5.0%
SF Showers	5.0%
MF Showers	5.0%
SF Dishwashers	5.0%
MF Dishwashers	5.0%
SF Clothes Washers	5.0%
MF Clothes Washers	5.0%
SF Internal Leakage	5.0%
MF Internal Leakage	5.0%
SF Baths	5.0%
MF Baths	5.0%
SF Other	5.0%
MF Other	5.0%
SF Irrigation	10.0%
MF Irrigation	10.0%
SF Pools	10.0%
MF Pools	10.0%
SF Wash Down	10.0%
MF Wash Down	10.0%
SF Car Washing	10.0%
MF Car Washing	10.0%
SF External Leakage	10.0%
MF External Leakage	10.0%
on-Lavatory/Kitchen Fa	5.0%
on-Lavatory/Kitchen Fa	5.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.250%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$10,658	\$3,197	\$13,856
2019	\$10,821	\$3,246	\$14,067
2020	\$10,983	\$3,295	\$14,278
2021	\$11,287	\$3,386	\$14,673
2022	\$11,590	\$3,477	\$15,068
2023	\$11,894	\$3,568	\$15,462
2024	\$12,198	\$3,659	\$15,857
2025	\$12,501	\$3,750	\$16,252

Targets			
View:	Accounts		
	SF	MF	Total
2018	103	1	104
2019	105	1	106
2020	106	1	107
2021	109	1	110
2022	112	1	113
2023	115	1	116
2024	118	1	119
2025	121	1	122

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.002497
2019	0.005002
2020	0.007514
2021	0.010057
2022	0.012638
2023	0.012839
2024	0.013072
2025	0.013336



**Financial Incentives for Residential Irrigation and Landscape Upgrades**

Overview			
Name	Financial Incentives for Residential		
Abbr	19		
Category	Default		
Measure Type	Standard Measure		

Time Period		Measure Life	
First Year	2018	Permanent	<input type="checkbox"/>
Last Year	2040	Years	10
Measure Length	23	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$200.00	\$120.00	1
MF	\$200.00	\$120.00	2
RES_IRR	\$550.00	\$3,000.00	1

Administration Costs	
Markup Percentage	35%

Description
After the free water use evaluation has been completed, recommendations will be analyzed and provided to the customer. Free evaluations may be on-site or via a pre-screening online step. Customers are only eligible for rebates after this evaluation. Staff may provide assistance with completing rebate applications. Rebates may include such items as sprinkler nozzles, weather based irrigation controllers ("smart timers"), soil moisture sensors, mulch, drip irrigation, rain barrels and cisterns.

Customer Classes									
	SF	MF	COM	INST	IRR	MISC	RES_IR	CIL_IRR	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

End Uses									
	SF	MF	COM	INST	IRR	MISC	RES_IR	CIL_IRR	
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
latory/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments	
<p>&gt; Savings will range from 5% (for mulch) to &gt;20% (for drip irrigation and combinations of devices)</p> <p>&gt; Costs per account will vary significantly.</p> <p>&gt; SF &amp; MF 2015-2017 average drip irrigation conversion rebate amount by EVWMD was approx. \$300 (max \$500). Not all measure participants will be EVWMD drip conversions - many will solicit rebates from SoCal WaterSmart. Utility cost represents Elsinore's average rebate amount per account (not SoCal WaterSmart's) and allows for multiple devices to be rebated.</p> <p>&gt; Target represents SoCal WaterSmart and Elsinore combined measure participation.</p> <p>&gt; Customer costs represent potential average remaining cost of fixtures and installation.</p> <p>&gt; Since 2014, SoCal WaterSmart rebated rotating nozzles (178/yr @ \$2.50/ea.) and WBICs (60/yr @ \$145/ea.). No other device rebates were requested.</p> <p>&gt; Elsinore rebated approx. 8 drip conversions per year 2014-2017.</p> <p>&gt; Soil moisture savings may be 20% of irrigation use is based on more than 10 California site water use reports conducted over multiple months in years 2015-2017 as provided by Brian Holland <a href="http://www.sustainablewatersavings.com">www.sustainablewatersavings.com</a>. Studies show a range of 20%-60% savings for trained soil moisture sensor device installation and site management. A lower savings estimate is assumed for layperson usage and non-drought normal planning years. The manufacturer claims device batteries last 10-12 years.</p>	

Results			
Average Water Savings (mgd)			
0.018666			
Lifetime Savings - Present Value (\$)			
Utility	\$436,425		
Community	\$436,425		
Lifetime Costs - Present Value (\$)			
Utility	\$491,108		
Community	\$710,299		
Benefit to Cost Ratio			
Utility	0.89		
Community	0.61		
Cost of Savings per Unit Volume (\$/mg)			
Utility	\$3,132		

End Use Savings Per Replacement	
	% Savings per Account
SF Irrigation	20.0%
MF Irrigation	20.0%
RES_IRR Irrigation	20.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.200%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$16,875	\$5,906	\$22,781
2019	\$17,132	\$5,996	\$23,128
2020	\$17,390	\$6,086	\$23,476
2021	\$17,870	\$6,255	\$24,125
2022	\$18,351	\$6,423	\$24,774
2023	\$18,831	\$6,591	\$25,422
2024	\$19,312	\$6,759	\$26,071
2025	\$19,793	\$6,927	\$26,720

Targets				
View	Accounts			
	SF	MF	RES_IRR	Total
2018	82	1	0	83
2019	84	1	0	85
2020	85	1	0	86
2021	87	1	0	88
2022	90	1	0	91
2023	92	1	0	93
2024	94	1	0	95
2025	97	1	0	98

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.001855
2019	0.003737
2020	0.005648
2021	0.007612
2022	0.009629
2023	0.011699
2024	0.013821
2025	0.015996



# High Efficiency Device Giveaway

Overview	
Name	High Efficiency Device Giveaway
Abbr	20
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input checked="" type="checkbox"/>
Last Year	2040		
Measure Length	23		

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$30.00	\$0.00	1
MF	\$30.00	\$0.00	3

Administration Costs	
Markup Percentage	35%

Description
EVMWD buys high-efficiency devices in bulk and gives them away at the administrative office. Devices include low-flow showerheads (1.5 gallons per minute), faucet aerators (kitchen and bath), 5 Min shower timers, toilet dye tabs, and automatic shut off nozzles for garden hoses. This measure is planned to evolve as technology changes. Kits are distributed as requested to approximately 100 accounts per year in addition to all new service accounts who register at the administrative office.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory/Kitchen Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
> Costs and savings per "kit". > 1 "kit" includes: 2 showerhead (1.5 gpm), 1 kitchen aerator (1.5 gpm), 2 bathroom aerators (1.0 gpm), 2 timers, toilet dye tabs and 2 nozzles. > Savings assume the following fixtures are replaced: 2.2 gpm showerhead and 2.2 gpm lavatory and non-lavatory faucet aerators. > Assume only half of kit devices are either needed, used or installed and so kit device savings is halved. > Cost of "kit" per: aerators \$1.99/ea., showerhead \$9.95, shower timer \$5, hose nozzle \$6.25, toilet dye tabs \$0.50 > Target approx. 120 kits including all residential customers that start a new acct/water service (or at least those customers that physically come into the admin office to start services)

Results	
Average Water Savings (mgd)	0.027275
Lifetime Savings - Present Value (\$)	
Utility	\$673,986
Community	\$1,484,993
Lifetime Costs - Present Value (\$)	
Utility	\$111,667
Community	\$111,667
Benefit to Cost Ratio	
Utility	6.04
Community	13.30
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$487

End Use Savings Per Replacement	
	% Savings per Account
SF Lavatory Faucets	27.3%
MF Lavatory Faucets	27.3%
SF Showers	20.0%
MF Showers	20.0%
SF Internal Leakage	1.0%
MF Internal Leakage	1.0%
SF Irrigation	1.0%
MF Irrigation	1.0%
on-Lavatory/Kitchen Fa	15.9%
on-Lavatory/Kitchen Fa	15.9%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.300%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$3,837	\$1,343	\$5,180
2019	\$3,895	\$1,363	\$5,259
2020	\$3,954	\$1,384	\$5,338
2021	\$4,063	\$1,422	\$5,485
2022	\$4,173	\$1,460	\$5,633
2023	\$4,282	\$1,499	\$5,781
2024	\$4,391	\$1,537	\$5,928
2025	\$4,500	\$1,575	\$6,076

Targets			
View:	Accounts		
	SF	MF	Total
2018	124	1	125
2019	126	1	127
2020	127	1	129
2021	131	1	132
2022	135	2	136
2023	138	2	140
2024	142	2	143
2025	145	2	147

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.002436
2019	0.004789
2020	0.007070
2021	0.009291
2022	0.011482
2023	0.013653
2024	0.015813
2025	0.017969



Partnership  
with Energy  
Utilities

Overview	
Name	Partnership with Energy Utilities
Abbr	21
Category	Default
Measure Type	Standard Measure

Time Period	Measure Life
First Year	2019
Last Year	2028
Measure Length	10
	Permanent <input checked="" type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$11.25	\$0.00	1
MF	\$11.25	\$0.00	3

Administration Costs	
Markup Percentage	30%

Description
Partnerships with local energy utilities to offer incentives to customers to save both water and energy. SoCalGas provides kits with three faucet aerators and a low-flow showerhead at no cost.

Customer Classes									
	SF	MF	COM	INST	IRR	MISC	RES	IR	CIL
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses									
	SF	MF	COM	INST	IRR	MISC	RES	IR	CIL
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory/Kitchen Faucets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
Utility cost represents one quarter hour spent per unit.
> Over the past 5 years, approx. 2,400 aerators and 1,830 showerheads have been distributed per year.
> SoCalGas also offer a free "Energy-efficiency Starter Kit" with 3 faucet aerators and 1 low-flow showerhead. Request flow rates.
> Assume 1 kit per SF acct and 3 per MF (assume 3 units per MF account).
> 1 "kit" includes: 1 showerhead (1.5 gpm), 1 kitchen aerator (1.5 gpm), and 2 bathroom aerators (1.2 gpm).
> Savings assume the following fixtures are replaced: 2.2 gpm showerhead and 2.2 gpm lavatory and non-lavatory faucet aerators.
> Assume only half of kit devices are either needed, used or installed and so kit device savings is halved.
> Customer cost reflects incremental purchase and installation cost
> SoCalGas rebates: <a href="http://www.socalgas.com/save-money-and-energy/rebates-and-incentives/natural-gas-appliance-rebates">www.socalgas.com/save-money-and-energy/rebates-and-incentives/natural-gas-appliance-rebates</a>
> SoCal Edison rebates: <a href="http://www.sce.com">www.sce.com</a>
> In order for EVMWD to obtain data on SoCalGas devices installed for EVMWD customers, EVMWD must have an official partnership agreement with SoCal Gas' program (~ \$50,000/year, though typically only about half of that is actually used). SoCalGas does not market for EVMWD, but they do their own promotion of their program.

Results	
Average Water Savings (mgd)	0.063840
Lifetime Savings - Present Value (\$)	
Utility	\$1,656,876
Community	\$3,730,051
Lifetime Costs - Present Value (\$)	
Utility	\$89,896
Community	\$89,896
Benefit to Cost Ratio	
Utility	18.43
Community	41.49
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$168

End Use Savings Per Replacement	
	% Savings per Account
SF Lavatory Faucets	22.7%
MF Lavatory Faucets	22.7%
SF Showers	15.9%
MF Showers	15.9%
on-Lavatory/Kitchen Fa	15.9%
on-Lavatory/Kitchen Fa	15.9%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.500%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$7,304	\$2,191	\$9,495
2020	\$7,414	\$2,224	\$9,638
2021	\$7,619	\$2,286	\$9,904
2022	\$7,824	\$2,347	\$10,171
2023	\$8,028	\$2,409	\$10,437
2024	\$8,233	\$2,470	\$10,703
2025	\$8,438	\$2,531	\$10,970

Targets			
View:	Accounts		
	SF	MF	Total
2018	0	0	0
2019	628	7	635
2020	637	7	645
2021	655	7	662
2022	673	8	680
2023	690	8	698
2024	708	8	716
2025	725	8	734

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.009541
2020	0.018745
2021	0.027685
2022	0.036455
2023	0.045102
2024	0.053665
2025	0.062178





# Residential High Efficiency Toilet Rebate

Overview	
Name	Residential High Efficiency Toilet
Abbr	22
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input checked="" type="checkbox"/>
Last Year	2027		
Measure Length	10		

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$35.00	\$260.00	2
MF	\$35.00	\$260.00	4

Administration Costs	
Markup Percentage	35%

Description
Rebates are available for \$40 (1.06 GPF or lower). Rebates are handled by SoCal WaterSmart.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IRR
Toilets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tory/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
> Savings conservatively assume 1.06 gpf toilets replace 50% 1.6 gpf and 50% 1.28 gpf toilets. Could be 0.8 gpf replacing a >3.5 gpf in some cases. > Target based on 2016 SoCal WaterSmart "Res Premium HET" participation (NOT SoCal WaterSmart HET measure participation) > Customer cost represents the balance of the fixture cost after the rebate amount plus installation. Typical toilets < 1.06 gpf cost approx. \$200 or more. Assume installation is \$100/ea. > Utility cost represents staff time spent per unit. > SoCal WaterSmart may increase rebate to 100\$ for a limited time in the near future.

Results	
Average Water Savings (mgd)	0.003055
Lifetime Savings - Present Value (\$)	
Utility	\$80,773
Community	\$80,773
Lifetime Costs - Present Value (\$)	
Utility	\$38,513
Community	\$250,436
Benefit to Cost Ratio	
Utility	2.10
Community	0.32
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$1,501


End Use Savings Per Replacement	
	% Savings per Account
SF Toilets	25.5%
MF Toilets	25.5%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.100%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$2,952	\$1,033	\$3,985
2019	\$2,997	\$1,049	\$4,045
2020	\$3,042	\$1,065	\$4,106
2021	\$3,126	\$1,094	\$4,220
2022	\$3,210	\$1,123	\$4,333
2023	\$3,294	\$1,153	\$4,447
2024	\$3,378	\$1,182	\$4,560
2025	\$3,462	\$1,212	\$4,674

Targets			
View	Accounts		
	SF	MF	Total
2018	41	0	42
2019	42	0	42
2020	42	0	43
2021	44	0	44
2022	45	1	45
2023	46	1	47
2024	47	1	48
2025	48	1	49

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000432
2019	0.000854
2020	0.001269
2021	0.001675
2022	0.002076
2023	0.002474
2024	0.002870
2025	0.003263



**Clothes Washer Rebate**

Overview			
Name	Clothes Washer Rebate		
Abbr	23		
Category	Default		
Measure Type	Standard Measure		

Time Period	
First Year	2018
Last Year	2040
Measure Length	23

Measure Life	
Permanent	<input checked="" type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$45.00	\$600.00	1
MF	\$45.00	\$600.00	3

Administration Costs	
Markup Percentage	35%

Description
Rebates will be provided for residential clothes washers. Rebates are available through and handled by SoCal Water Smart and SoCalGas. SoCal WaterSmart Rebates start at \$85; SoCalGas rebates start at \$50.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urinals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lavatory Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dishwashers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clothes Washers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen Spray Rinse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wash Down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Washing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External Leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
atory/Kitchen Faucets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments
> SoCal WaterSmart has distributed approx. 188 rebates per year since 2014. SoCalGas has distributed approx. 164 rebates per year since 2014.
> Per SoCal WaterSmart website "High-Efficiency clothes washers use 55% less water than standard clothes washers."
> Customer cost represents the balance of the fixture cost after the rebate amount plus installation. Clothes washers can cost ~\$600 or more. Assume installation is \$100/ea.
> Utility cost represents staff time spent per unit.
> <a href="http://www.socalwatersmart.com">http://www.socalwatersmart.com</a>
> <a href="https://www.socalgas.com/save-money-and-energy/rebates-and-incentives/natural-gas-appliance-rebates">https://www.socalgas.com/save-money-and-energy/rebates-and-incentives/natural-gas-appliance-rebates</a>
> Promote SoCalGas' water use efficiency rebates in addition so SoCal Water Smart's rebate, no additional rebate from EVMWD
> SoCalGas \$75 rebate for ENERGY STAR Most Efficient 2016 clothes washers with IMEF>2.76 AND IWF< 3.2.
> SoCalGas \$50 rebate on select Higher Efficiency ENERGY STAR certified clothes washers.
> SoCalGas \$200 rebate on the Whirlpool Cold Water Technology Washer (Model Number WTW4715EW).

Results	
Average Water Savings (mgd)	0.083388
Lifetime Savings - Present Value (\$)	
Utility	\$2,094,500
Community	\$5,569,906
Lifetime Costs - Present Value (\$)	
Utility	\$558,337
Community	\$6,072,779
Benefit to Cost Ratio	
Utility	3.75
Community	0.92
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$797

End Use Savings Per Replacement	
	% Savings per Account
SF Clothes Washers	55.0%
MF Clothes Washers	55.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$19,185	\$6,715	\$25,900
2019	\$19,477	\$6,817	\$26,295
2020	\$19,770	\$6,920	\$26,690
2021	\$20,316	\$7,111	\$27,427
2022	\$20,863	\$7,302	\$28,165
2023	\$21,409	\$7,493	\$28,903
2024	\$21,956	\$7,685	\$29,640
2025	\$22,502	\$7,876	\$30,378

Targets			
View	Accounts		
	SF	MF	Total
2018	412	5	417
2019	419	5	423
2020	425	5	430
2021	437	5	442
2022	448	5	453
2023	460	5	465
2024	472	5	477
2025	484	5	489

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.007575
2019	0.015261
2020	0.022978
2021	0.030733
2022	0.038455
2023	0.046078
2024	0.053546
2025	0.060806



## Pool Cover Rebate

Overview	
Name	Pool Cover Rebate
Abbr	24
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2018	Permanent	<input type="checkbox"/>
Last Year	2020	Years	6
Measure Length	3	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$25.00	\$70.00	1

Administration Costs	
Markup Percentage	35%

Description
Rebates will be provided for residential pool covers. Customers must submit a completed Rebate Request with a photo of their pool, a copy of the pool cover receipt and a copy of their current water bill.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input type="checkbox"/>						
Urinals	<input type="checkbox"/>						
Lavatory Faucets	<input type="checkbox"/>						
Showers	<input type="checkbox"/>						
Dishwashers	<input type="checkbox"/>						
Clothes Washers	<input type="checkbox"/>						
Process	<input type="checkbox"/>						
Kitchen Spray Rinse	<input type="checkbox"/>						
Internal Leakage	<input type="checkbox"/>						
Baths	<input type="checkbox"/>						
Other	<input type="checkbox"/>						
Irrigation	<input type="checkbox"/>						
Pools	<input checked="" type="checkbox"/>						
Wash Down	<input type="checkbox"/>						
Cooling	<input type="checkbox"/>						
Car Washing	<input type="checkbox"/>						
External Leakage	<input type="checkbox"/>						
Outdoor	<input type="checkbox"/>						
tory/Kitchen Faucets	<input type="checkbox"/>						

Comments
> Current Elsinore measure while funding is available. > Rebate amount is approx. \$50. Funding split 50/50 with Western MWD. > Assume a pool cover costs ~ \$120 and lasts about 6 years. > Target based on 2015-2017 participation. > Conservative savings estimate of 30% based on 30-50% savings range from evaporation and landscape design/yard layout per 2001 AWWA Annual Conference paper "Splash or Sprinkle? A Comparison of Water Use of Swimming Pools and Irrigated Landscape Area" by Peter Mayer and Lisa Maddaus.

Results	
Average Water Savings (mgd)	0.000064
Lifetime Savings - Present Value (\$)	
Utility	\$2,000
Community	\$2,000
Lifetime Costs - Present Value (\$)	
Utility	\$10,286
Community	\$31,619
Benefit to Cost Ratio	
Utility	0.19
Community	0.06
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$19,144

End Use Savings Per Replacement	
	% Savings per Account
SF Pools	30.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.250%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$2,577	\$902	\$3,479
2019	\$2,616	\$916	\$3,532
2020	\$2,655	\$929	\$3,585
2021	\$0	\$0	\$0
2022	\$0	\$0	\$0
2023	\$0	\$0	\$0
2024	\$0	\$0	\$0
2025	\$0	\$0	\$0

Targets		
View:	Accounts	
	SF	Total
2018	103	103
2019	105	105
2020	106	106
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000080
2019	0.000162
2020	0.000245
2021	0.000245
2022	0.000245
2023	0.000245
2024	0.000165
2025	0.000083



**Leak Repair and Plumbing Emergency Assistance for Low-Income Customers**

Overview	
Name	Leak Repair and Plumbing Emerge
Abbr	25
Category	Default
Measure Type	Standard Measure

Time Period		Measure Life	
First Year	2020	Permanent	<input type="checkbox"/>
Last Year	2040	Years	5
Measure Length	21	Repeat	<input type="checkbox"/>

Fixture Costs			
	Utility	Customer	Fix/Acct
SF	\$90.00	\$480.00	1
MF	\$90.00	\$480.00	3

Administration Costs	
Markup Percentage	30%

Description
Customer leaks can go uncorrected at properties where owners are least able to pay costs of repair. This program will require that customer leaks be repaired, but for low-income customers, be paid for with Rate Assistance for Residents of Elsinore Valley (RARE) funds that are paid back with customer monthly water bills over time.

Customer Classes							
	SF	MF	COM	INST	IRR	MISC	RES_IR
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End Uses							
	SF	MF	COM	INST	IRR	MISC	RES_IR
Toilets	<input type="checkbox"/>	<input type="checkbox"/>					
Urinals	<input type="checkbox"/>						
Lavatory Faucets	<input type="checkbox"/>						
Showers	<input type="checkbox"/>						
Dishwashers	<input type="checkbox"/>						
Clothes Washers	<input type="checkbox"/>						
Process							
Kitchen Spray Rinse							
Internal Leakage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Baths	<input type="checkbox"/>						
Other	<input type="checkbox"/>						
Irrigation							
Pools	<input type="checkbox"/>						
Wash Down	<input type="checkbox"/>						
Cooling							
Car Washing	<input type="checkbox"/>						
External Leakage	<input type="checkbox"/>						
Outdoor							
tory/Kitchen Faucets	<input type="checkbox"/>						

Comments
> Coordinate with RARE program. RARE budget would include up to a certain dollar amount for leaks to be fixed but the customer will have to pay back the cost. This cost would be added as a monthly fee to the customer's water bill until they pay it back.
> # of people on RARE program = 1,514. Assume 2% of these have leaks annually (approx. 30 accounts)
> Customer costs assume average cost of \$500 to repair leak
> Utility costs represent approx 2 hours of staff time to track participation (at \$45/hr)

Results	
Average Water Savings (mgd)	0.009365
Lifetime Savings - Present Value (\$)	
Utility	\$239,803
Community	\$375,929
Lifetime Costs - Present Value (\$)	
Utility	\$146,441
Community	\$747,225
Benefit to Cost Ratio	
Utility	1.64
Community	0.50
Cost of Savings per Unit Volume (\$/mg)	
Utility	\$1,861

End Use Savings Per Replacement	
	% Savings per Account
SF Internal Leakage	100.0%
MF Internal Leakage	100.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.150%
Only Effects New Accts	<input type="checkbox"/>

Costs			
View:	Utility Details		
	Fixture Costs	Admin Costs	Util Total
2018	\$0	\$0	\$0
2019	\$0	\$0	\$0
2020	\$5,931	\$1,779	\$7,710
2021	\$6,095	\$1,828	\$7,923
2022	\$6,259	\$1,878	\$8,137
2023	\$6,423	\$1,927	\$8,350
2024	\$6,587	\$1,976	\$8,563
2025	\$6,751	\$2,025	\$8,776

Targets			
View	Accounts		
	SF	MF	Total
2018	0	0	0
2019	0	0	0
2020	64	1	64
2021	65	1	66
2022	67	1	68
2023	69	1	70
2024	71	1	72
2025	73	1	73

Water Savings (mgd)	
	Total Savings (mgd)
2018	0.000000
2019	0.000000
2020	0.001776
2021	0.003600
2022	0.005474
2023	0.007397
2024	0.009369
2025	0.009614

## APPENDIX I – EVMWD CONSERVATION PROGRAM UTILITY COSTS

This appendix presents EVMWD’s Programs A, B and C utility costs, including both fixture/incentive and administrative costs.

**Table I-1. Conservation Program Utility Costs**

Year	Program A	Program B	Program C
2018	\$445,000	\$445,000	\$445,000
2019	\$470,000	\$575,000	\$575,000
2020	\$481,000	\$727,000	\$836,000
2021	\$542,000	\$854,000	\$1,014,000
2022	\$551,000	\$864,000	\$1,025,000
2023	\$560,000	\$875,000	\$1,036,000
2024	\$569,000	\$779,000	\$941,000
2025	\$578,000	\$789,000	\$951,000
2026	\$612,000	\$853,000	\$1,040,000
2027	\$623,000	\$865,000	\$1,052,000
2028	\$628,000	\$872,000	\$1,059,000
2029	\$626,000	\$871,000	\$1,059,000
2030	\$636,000	\$882,000	\$1,071,000
2031	\$676,000	\$957,000	\$1,176,000
2032	\$687,000	\$970,000	\$1,189,000
2033	\$699,000	\$983,000	\$1,203,000
2034	\$711,000	\$996,000	\$1,217,000
2035	\$722,000	\$1,009,000	\$1,231,000
2036	\$625,000	\$785,000	\$902,000
2037	\$630,000	\$791,000	\$907,000
2038	\$635,000	\$796,000	\$912,000
2039	\$639,000	\$801,000	\$918,000
2040	\$644,000	\$806,000	\$923,000