



2015

URBAN WATER MANAGEMENT PLAN

FINAL

JUNE 2016

A large, solid orange geometric shape in the bottom right corner of the page. It is a right-angled triangle with its hypotenuse running from the bottom left towards the top right. A thin white line runs parallel to the hypotenuse, creating a smaller, similar triangle within the larger one.

2015 URBAN WATER MANAGEMENT PLAN

Trabuco Canyon Water District

FINAL



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- J CUWCC BMP Report

ACRONYMS AND ABBREVIATIONS

20 by 2020	20% water use reduction in GPCD by year 2020
Act	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
AMP	Allen McColloch Pipeline
AMR	Automatic Meter Reading
AWWA	American Water Works Association
BDCP	Bay-Delta Conservation Plan
BMP	Best Management Practice
CCC	California Coastal Commission
CDR	Center for Demographic Research
CII	Commercial/Industrial/Institutional
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWWRP	Chiquita Wastewater Reclamation Plant
Delta	Sacramento-San Joaquin River Delta
District	Trabuco Canyon Water District
DMM	Demand Management Measure
DOF	Department of Finance
DWR	Department of Water Resources
EIR	Environmental Impact Report
ETWD	El Toro Water District
FY	Fiscal Year
GCM	General Circulation Model
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
GWRP	Groundwater Recovery Plant
HECW	High Efficiency Clothes Washers
HET	High Efficiency Toilet
IPR	Indirect Potable Reuse
IRP	Integrated Water Resource Plan
IRWD	Irvine Ranch Water District
IWA	International Water Association
LBCWD	Laguna Beach County Water District
LRP	Local Resources Program
LTFP	Long-Term Facilities Plan
MAF	Million Acre-Feet

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Metropolitan	Metropolitan Water District of Southern California
MNWD	Moulton Niguel Water District
MGD	Million Gallons per Day
MHI	Median Household Income
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
MWDOC	Municipal Water District of Orange County
MWELO	Model Water Efficient Landscape Ordinance
NDMA	N-nitrosodimethylamine
NPDES	National Pollution Discharge Elimination System
OC	Orange County
OCWD	Orange County Water District
Ordinance	Water Conservation Ordinance No. 2008-18
Poseidon	Poseidon Resources LLC
PPCP	Pharmaceuticals and Personal Care Product
RRWWTP	Robinson Ranch Wastewater Treatment Plant
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCWD	South Coast Water District
SDCWA	San Diego County Water Authority
SDP	Seawater Desalination Program
SMWD	Santa Margarita Water District
Study	Colorado River Basin Water Supply and Demand Study
SWP	State Water Project
SWRCB	California State Water Resources Control Board
TDS	Total Dissolved Solids
TRSC	Temporary Revenue Stabilization Charge
UBS	Utility Billing System
US	Upper Schwendeman
UV	Ultraviolet
UWMP	Urban Water Management Plan
WBIC	Weather Based Irrigation Controller
WEROC	Water Emergency Response Organization of Orange County
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management

EXECUTIVE SUMMARY

This report serves as the 2015 update of Trabuco Canyon Water District's (District) Urban Water Management Plan (UWMP). The UWMP has been prepared consistent with the requirements under Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act and is due to the California Department of Water Resources (DWR) by July 1, 2016.

Service Area and Facilities

The District provides water to a population of 12,712 throughout its 8,200 acre service area. It covers portions of the City of Rancho Santa Margarita, City of Lake Forest, City of Mission Viejo, Trabuco Canyon and other areas of unincorporated Orange County. The District receives its water from several sources, local groundwater from Trabuco Creek and imported water from the Municipal Water District of Orange County (MWDOC). The majority of the District's imported water is untreated surface water from the Colorado River. The untreated surface water is treated at the Dimension Water Treatment Plant, the local groundwater is treated at the Trabuco Creek Wells Facility, and the treated water is imported from the Diemer Filtration Plant operated by the Metropolitan Water District of Southern California (Metropolitan).

Water Demand

In FY 2014-15, the total water demand for retail customers served by the District was approximately 3,700 acre-feet (AF). The District's entire potable demand was met through 2,900 AF of imported water; the remaining non-potable demand was met through recycled water. The District is projecting a 29 percent increase in total potable and non-potable demand in the next 25 years accompanying a projected 25 percent population growth.

SBx7-7

With MWDOC's assistance, the District has selected to comply with Option 1 of the SBx7-7 compliance option and is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. This regional alliance consists of 29 retail agencies in Orange County. With the District's current 204 GPCD shows compliance with its 2015 interim target and is on track to meeting the 2020 water use target of 200 GPCD.

Water Sources and Supply Reliability

The District's main sources of water supply are a combination of imported water, local groundwater, and recycled water. In FY 2014-15, the District relied on 22 percent recycled water and 78 percent imported water as no groundwater has been used in the past two years. It is projected that through 2040, local groundwater will increase to 5 percent, recycled water will make up 20 percent, and imported water will decrease to 75 percent of the total water supply. The sources of imported water supplies include the

Colorado River and the State Water Project (SWP). Metropolitan has outlined a water resource strategy that can be used to meet retail demands under all possible hydrologic conditions from 2020 out to 2040.

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. Metropolitan's 2015 UWMP finds that Metropolitan is able to meet full service demands of its member agencies with existing supplies from 2020 through 2040 during normal, single-dry, and multiple-dry years. The District is therefore capable of meeting the water demands of its customers under the same hydrological conditions out to 2040, as shown in Table 3-6, Table 3-7, and Table 3-8, respectively.

Future Water Supply Projects

The District has direct involvement with two projects that may help increase water security in the future. The first is the Plano Trabuco Recycled Waterline Extension Project; intended to lower potable water use by providing recycled water to the nurseries and to common area landscaping along Plano Trabuco Road. The second project is the Baker Water Treatment Plant, a new drinking water treatment plant to be located in Lake Forest with a capacity of 28 MGD. The District is one of five agencies with ownership capacity in the Plant. The plant will treat a mix of imported and surface water for potable use in order to increase reliability during emergencies and extended facility shutdowns as well as provide operational flexibility. Construction of the project is expected to conclude by end of 2016.

1 INTRODUCTION

1.1 Urban Water Management Plan Requirements

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act) require every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare, adopt, and file an UWMP with DWR every five years in the years ending in zero and five. The 2015 UWMP updates are due to DWR by July 1, 2016.

This UWMP provides DWR with a detailed summary of present and future water resources and demands within the District's service area and assesses the District's water resource needs. Specifically, the UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis must identify supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years. The District's 2015 UWMP updates the 2010 UWMP in compliance with the requirements of the Act as amended in 2009, and includes a discussion of:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures (DMM)
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan
- Recycled Water Use

Since the original Act's passage in 1983, several amendments have been added. The most recent changes affecting the 2015 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. SBx7-7, or the Water Conservation Act of 2009, is part of the Delta Action Plan that stemmed from the Governor's goal to achieve a 20 percent statewide reduction in urban per capita water use by 2020 (20 by 2020). Reduction in water use is an important part of this plan that aims to sustainably manage the Sacramento-San Joaquin River Delta (Delta) and reduce conflicts between environmental conservation and water supply; it is detailed in Section 3.2.2. SBx7-7 requires each urban retail water supplier to develop urban water use targets to achieve the 20 by 2020 goal and the interim ten percent goal by 2015. Each urban retail water supplier must include in its 2015 UWMPs the following information from its target-setting process:

- Baseline daily per capita water use
- 2020 Urban water use target

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- 2015 Interim water use target compliance
- Compliance method being used along with calculation method and support data
- An implementation plan to meet the targets

The other recent amendment, made to the UWMP on September 19, 2014, is set forth by SB 1420, Distribution System Water Losses. SB 1420 requires water purveyors to quantify distribution system losses for the most recent 12-month period available. The water loss quantification is based on the water system balance methodology developed by the American Water Works Association (AWWA).

The sections in this UWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the District’s water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included in Appendix A. This is an individual UWMP for a retail agency, as shown in Tables 1-1 and 1-2. Table 1-2 also indicates the units that will be used throughout this document.

Table 1-1: Plan Identification

Plan Identification			
Select Only One	Type of Plan		Name of RUWMP or Regional Alliance
<input checked="" type="checkbox"/>	Individual UWMP		
<input type="checkbox"/>	<input type="checkbox"/>	Water Supplier is also a member of a RUWMP	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

Table 1-2: Agency Identification

Agency Identification	
Type of Agency	
<input type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year	
<input type="checkbox"/>	UWMP Tables Are in Calendar Years
<input checked="" type="checkbox"/>	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
7/1	
Units of Measure Used in UWMP	
Unit	AF
NOTES:	

1.2 Agency Overview

The District is a water district organized and operating pursuant to Section 30000, and following, of the Water Code of the State of California. The District was organized on February 26, 1962, under Division XII of the California Water Code. The District currently employs 20 individuals in the Administration, Water, Wastewater, and Maintenance Departments. The District is governed by a five-member Board of Directors elected to alternating four year terms at elections held every two years. The current members of the Board of Directors are

- Stephen Dopudja - President
- Glenn Acosta - Vice President
- James Haselton - Director
- Edward Mandich - Director
- Michael Safranski - Director

Shortly after its formation, the District constructed a major transmission line into the central Trabuco Canyon area to provide water service to the few hundred residences along its route and in the canyon area. The western and eastern portions of the District both began urbanizing in the early to mid-1980's with the development of Robinson Ranch and Portola Hills located in the southern portion of Orange County.

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In addition to water service, the District was later enabled to provide wastewater treatment and recycled water service. The District constructed sewer collection facilities, and acquired treatment capacity from Santa Margarita Water District (SMWD) in the Chiquita Wastewater Reclamation Plant (CWWRP) for the western portion of the District. In the central portion of the District, consisting of areas within unincorporated Orange County, unincorporated areas are regulated by the County of Orange and primarily consist of individual septic systems. The eastern portion of the District is served through District-owned sewer system, wastewater treatment facilities, and recycled water facilities. The District treats the collected wastewater at the Robinson Ranch Wastewater Treatment Plant (RRWWTP), and has the capability to divert or convey wastewater to SMWD for treatment at their CWWRP. The District recycles the treated effluent from RRWWTP by pumping treated and stored flows to the recycled water customers.

The District's water sources include groundwater, recycled water and imported water from MWDOC. MWDOC is Orange County's wholesale supplier and is a member agency of the Metropolitan Water District of Southern California (Metropolitan). Figure 1.1 presents the general location of the District within southern California and Orange County.



Figure 1-1: Regional Location of Urban Water Supplier

1.3 Service Area and Facilities

1.3.1 Trabuco Canyon Water District Service Area

The District is located in the southeastern portion of Orange County at the foothills of the Santa Ana Mountains and encompasses approximately 8,200 acres. The service area includes communities within the City of Rancho Santa Margarita, City of Lake Forest, City of Mission Viejo, Trabuco Canyon and other areas of unincorporated Orange County.

Prior to 2000, the District was entirely within the unincorporated area of Orange County. In 2000, the City of Rancho Santa Margarita was incorporated and now covers the eastern portion of the District. The eastern portion of the District is accessed via Santa Margarita Parkway or Antonio Parkway and Plano Trabuco Road with the western portion of the District being accessed via El Toro Road or Santiago Canyon Road. Live Oak Canyon Road/Trabuco Canyon Road is the main artery through the central portion of the District between El Toro Road and Plano Trabuco Road.

The terrain is generally steep hills and canyons throughout the central area of the District. The east and west sides consist of more gentle terrain made up primarily of rolling hills. Elevations within the District range from approximately 985 feet above mean sea level in the lower Aliso Creek area and the southern area of Dove Canyon, to nearly 2,400 feet in the northeasterly portion of the District adjacent to the Cleveland National Forest. The District's service area is shown on Figure 1-2.

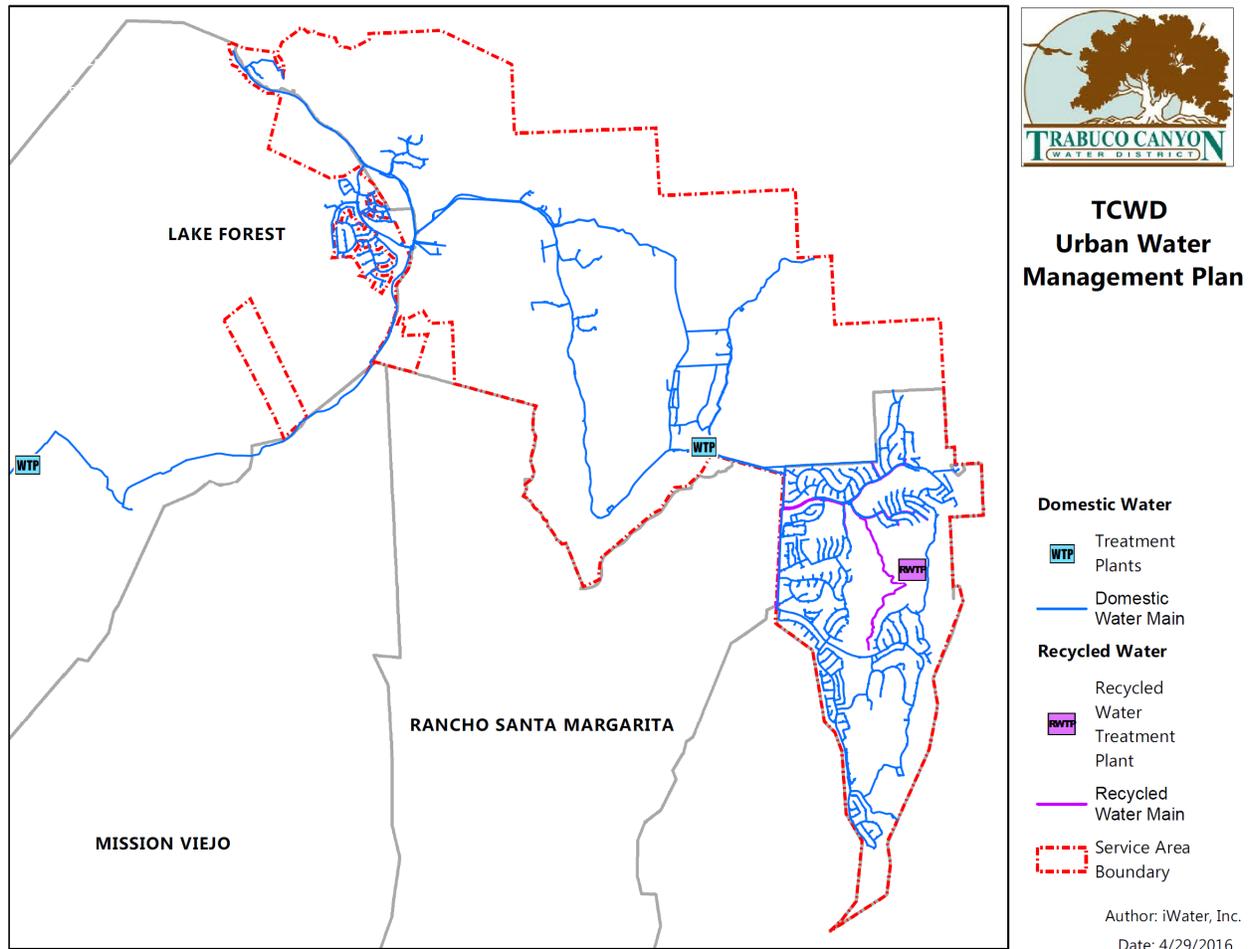


Figure 1-2: Trabuco Canyon Water District Service Area

1.3.2 Trabuco Canyon Water District Facilities

As discussed later in this report, the District imports both raw and treated surface water to its service area which is augmented with groundwater from the Arroyo Trabuco Creek, part of the San Juan Groundwater Basin, and non-potable recycled water from the RRWWTP. To treat the imported surface water, the District owns and operates the Dimension Water Treatment Plant. To treat the groundwater supply, the District constructed the Trabuco Creek Wells Facility which houses both the Rose Canyon Well and Lang Well as well as the treatment facilities. An additional privately owned well, the Upper Schwendeman (US) Well has been leased in the past but is not currently being used.

To distribute the treated water throughout the distribution system, the District has eight pump stations, seven treated water storage reservoirs, and approximately 66 miles of pipelines. The primary District water supply facilities are presented on Figure 1.2. The location of facilities has been generalized for security purposes.

District wastewater facilities include RRWWTP, a 0.85 million gallons per day (MGD) water reclamation facility, eight sewer lift stations and approximately 47 miles of sewers (gravity/force mains) and

interceptors. Recycled water from the RRWWTP is stored at the RRWWTP Reclaimed Water Reservoir. The RRWWTP Reclaimed Water Reservoir has an approximate storage capacity of 130 AF. The District's recycled water system is supplied with recycled water from the RRWWTP and supplemented with urban runoff captured and stored in Dove Lake. Dove Lake captures local runoff from the surrounding communities of Dove Canyon, Robinson Ranch, and Trabuco Highlands. In addition the District's Dry Season Water Recovery Project captures urban runoff and stores it in Dove Lake for use in augmenting the District's non-potable irrigation system.

The District currently serves a 2015 estimated population of 12,712. The District currently serves drinking water to an estimated 3,985 connections within the District. It provides sewer service to 3,688 connections within its boundaries plus 213 connections in the SMWD and up to 1647 connections in the Irvine Ranch Water District (IRWD) service areas. The District provides recycled water service to Dove Canyon golf course, Dove Canyon Master Association, the Trabuco Highlands Community Association, the Robinson Ranch Homeowners Association, Sakaida Nursery, and TY Nursery.

The system connections and total water volume supplied including non-potable are summarized in Table 1-3, and the wholesalers informed of this water use as required are displayed in Table 1-4. Note that year 2015 refers to Fiscal Year (FY) ending in 2015 throughout the UWMP report.

Table 1-3: Public Water Systems (AF)

Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3010094	Trabuco Canyon Water District	3,985	3,703
TOTAL		3,985	3,703
NOTES: Fiscal Year 14-15			

Table 1-4: Water Supplier Information Exchange

Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
MWDOC
Santiago Aqueduct Commission
NOTES:

2 DEMANDS

2.1 Overview

Since the last UWMP update, southern California's urban water demand has been largely shaped by the efforts to comply with the SBx7-7. This law requires all California retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve a 20 percent water demand reduction (from a historical baseline) by 2020. The District has been actively engaged in efforts to reduce water use in its service area to meet the 2015 interim 10 percent reduction and the 2020 final water use target. Meeting this target is critical to ensure the District's eligibility to receive future state water grants and loans.

In April 2015 Governor Brown issued an Emergency Drought Mandate as a result of one of the most severe droughts in California's history, requiring a collective reduction in statewide urban water use of 25 percent by February 2016 compared to water use in 2013, with each agency in the state given a specific reduction target by DWR. In response to the Governor's mandate, the District is carrying out more aggressive conservation efforts. It is also implementing higher (more restrictive) stages of its water conservation ordinance in order to achieve its demand reduction target of 28 percent set for the District itself and the Regional Alliance of all participating MWDOC utility agencies (discussed later in Section 2.5).

In addition to local water conservation ordinances, the District has engaged in activities that range from being a signatory member of the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMP) Memorandum of Understanding (MOU) to ongoing water audit and leak detection programs. The District has also partnered with MWDOC on educational programs, indoor retrofits and training.

These efforts have been part of statewide water conservation measures that include preventing water waste, limiting outdoor irrigation days and times, turf removal and replacement with drought tolerant landscapes, and service water in restaurants upon request only. Further discussion on the District's water conservation ordinance is covered in Section 5 Water Supplies Contingency Plan.

This section analyzes the District's current water demands by customer type, factors that influence those demands, and projections of future water demands for the next 20 years. In addition, to satisfy SBx7-7 requirements, this section provides details of the District's SBx7-7 compliance method selection, baseline water use calculation, and 2015 and 2020 water use targets.

2.2 Factors Affecting Demand

Water demands within the District's service area are dependent on many factors such as local climate conditions, demographics, land use characteristics, and economics. In addition to local factors, southern California's imported water sources are also experiencing drought conditions that impact availability of current and future water supplies.

2.2.1 Climate Characteristics

The District is located within the South Coast Air Basin (SCAB) that encompasses all of Orange County, and the urban areas of Los Angeles, San Bernardino, and Riverside counties. The SCAB climate is characterized by southern California’s “Mediterranean” climate: a semi-arid environment with mild winters, warm summers and moderate rainfall.

Local rainfall has limited impacts on reducing demand for the District. Water that infiltrates into the soil may enter groundwater supplies depending on the local geography. However, due to the large extent of impervious cover in southern California, rainfall runoff quickly flows to a system of concrete storm drains and channels that lead directly to the ocean.

Metropolitan's water supplies come from the SWP and the Colorado River Aqueduct (CRA), influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions with record low precipitation which directly impact water supplies to southern California.

2.2.2 Demographics

For the District’s demographics, two methodologies have been used, including 1) California State University at Fullerton’s Center for Demographic Research (CDR) census data and 2) State Water Board’s Simplified California Urban Water Service Area Population Methodology.

California State University at Fullerton Center for Demographic Research

The District has a 2015 population of 12,712 according to the CDR. Within the District there is still room for development. As of the 2010 UWMP three housing developments with under 250 dwelling units each were in the planning stages. There are also two commercial plant nurseries that may be developed into housing developments at some point in the future. Population is projected to increase 25 percent by 2040, representing an average growth rate of about 1 percent per year.

Current and projected growth has decreased since the 2010 UWMP. Table 2-1 shows the population projections in five-year increments out to 2040 within the District’s service area. However, historically areas of unincorporated Orange County have developed at lower than projected rates due to various factors pertaining to existing geology, hydrogeology, tree and wildlife preservation, and restrictions and conditions placed on development by the County of Orange, the Orange County Fire Authority, and environmental regulatory agencies.

Table 2-1: Population – Current and Projected

Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	12,712	13,200	14,115	14,735	15,876	15,861
NOTES: Center for Demographic Research, California State University, Fullerton 2015						

State Water Board's Simplified California Urban Water Service Area Population Methodology

This simplified population methodology was prepared by the DWR at the request of the State Water Resources Control Board (SWRCB) to provide general guidance in estimating water service area population for the Board's Emergency Drought Regulation. This method is not intended to replace DWR's Methodology 2 from the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, 2010) for the purposes of SBx7-7 calculations and compliance.

The District notes that this method resulted in a service area population of 13,175. This population was also used in determining the District's average gallons per capita for use by the SWRCB in calculating the District's water conservation demand reduction target of 28 percent.

2.2.3 Land Use

The District's service area can best be described as a predominately single and multi-family residential community located in southern Orange County. There are several golf courses, parks and a regional park in the District.

2.3 Water Use by Customer Type

An agency's water consumption can be projected by understanding the type of use and customer type creating the demand. Developing local water use profiles helps to identify quantity of water used, and by whom within the agency's service area. A comprehensive profile of the agency's service area enables the impacts of water conservation efforts to be assessed and to project the future benefit of water conservation programs.

The following sections of this UWMP provide an overview of the District's water consumption by customer account type as follows:

- Single-family Residential
- Multi-family Residential
- Commercial and Agriculture
- Institutional/ Government

Other water uses including sales to other agencies and non-revenue water are also discussed in this section.

2.3.1 Overview

There are 3,985 current customer active and inactive service connections in the District's water distribution system with all existing connections metered. Approximately 62 percent of the District's potable water demand is residential; commercial, including dedicated landscape, accounts for the remaining 38 percent of the potable water demand.

Table 2-2 contains a summary of the District's total water demand in FY 2014-15 for potable water.

Table 2-2: Demands for Potable and Raw Water - Actual (AF)

Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	1,766
Multi-Family		Drinking Water	35
Commercial	Includes District use for RW system and minor construction	Drinking Water	243
Landscape	HOA's common areas and Mandated Fuel Modification Zones (Irrigated zones for fire prevention per Fire Authority)	Drinking Water	387
Agricultural irrigation	Commercial Nurseries	Drinking Water	287
Losses	Includes hydrant flushing, line breaks, and sewer cleaning	Drinking Water	182
			2,900
NOTES: Data retrieved from District Customer Class Usage Data and FY 2014-2015 Retail Tracking.			

2.3.2 Non-Residential

Non-residential use includes commercial and dedicated landscape water demands. Commercial water use accounts for 8 percent of potable water demands and dedicated landscape accounts for 13 percent of potable water demand. The District has a mix of commercial uses (markets, restaurants, etc.), public entities (schools, fire stations and government offices) and office complexes.

2.3.3 Sales to Other Agencies

The District does not sell domestic water to other agencies except in the case of emergencies.

2.3.4 Non-Revenue Water

Non-revenue water is defined by the International Water Association (IWA) as the difference between distribution systems input volume (i.e. production) and billed authorized consumption. Non-revenue water consists of three components: unbilled authorized consumption (e.g. hydrant flushing, firefighting, and blow-off water from well start-ups), real losses (e.g. leakage in mains and service lines), and apparent losses (unauthorized consumption and metering inaccuracies).

A water loss audit was conducted per AWWA methodology for the District to understand the relation between water loss and revenue losses. This audit was developed by the IWA Water Loss Task Force as a universal methodology that could be applied to any water distribution system. This audit meets the

requirements of SB 1420 that was signed into law in September 2014. Understanding and controlling water loss from a distribution system is an effective way for the District to achieve regulatory standards and manage their existing resources.

Table 2-3 below is a result of the AWWA Water Audit completed for the District and the 2015 UWMP. The water loss summary was calculated over a one-year period from available data and the methodology explained above. The volume of water loss calculated for this period represents 8.9 percent of the District’s annual water supplied, this presents an opportunity to identify areas of high water loss and develop strategies to minimize it.

Table 2-3: Water Loss Audit Summary (AF)

Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
07/2014	235
NOTES: Includes real and apparent losses	

2.4 Demand Projections

Demand projections were developed by MWDOC for each agency within their service area based on available data as well as land use, population and economic growth. Three trajectories were developed representing three levels of conservation: 1) continued with existing levels of conservation (lowest conservation), 2) addition of future passive measures and active measures (baseline conservation), and 3) aggressive turf removal program - 20 percent removal by 2040 (aggressive conservation). The baseline demand projection was selected for the 2015 UWMP. The baseline scenario assumes the implementation of future passive measures affecting new developments, including the Model Water Efficient Landscape Ordinance (MWELO), plumbing code efficiencies for toilets, and expected plumbing code for high-efficiency clothes washers. It also assumes the implementation of future active measures, assuming the implementation of Metropolitan incentive programs at historical annual levels seen in Orange County.

2.4.1 Demand Projection Methodology

The water demand projections were an outcome of the Orange County (OC) Water Reliability Study led by MWDOC where demand projections were divided into three regions within Orange County: Brea/La Habra, Orange County Groundwater Basin, and South County. The demand projections were obtained based on multiplying a unit water use factor and a demographic factor for three water use sectors, including single-family and multi-family residential (in gallons per day per household), and non-residential (in gallons per day per employee). The unit water use factors were based on a survey of Orange County water agencies (FY 2013-14) and represent a normal weather, normal economy, and non-drought condition. The demographic factors are future demographic projections, including the number of housing units for single and multi-family residential areas and total employment (number of employees) for the non-residential sector, as provided by CDR.

The OC Water Reliability Study accounted for drought impacts on 2016 demands by applying the assumption that water demands will bounce back to 85 percent of 2014 levels i.e. pre-drought levels by 2020 and 90 percent by 2025 without future conservation, and continue at 90 percent of unit water use through 2040.

The unit water use factor multiplied by a demographic factor yields demand projections without new conservation. To account for new conservation, projected savings from new passive and active conservation were subtracted from these demands.

2.4.2 Agency Refinement

Demand projections were developed by MWDOC for the District as part of the OC Reliability Study. The future demand projections were reviewed and accepted by the District as a basis for the 2015 UWMP.

2.4.3 25 Year Projections

A key component of the 2015 UWMP is to provide insight into the District’s future water demand outlook. The District’s current potable water demand is 2,900 AFY, met through purchased imported water from MWDOC. Table 2-4 is a projection of the District’s water demand for the next 25 years.

Table 2-4: Demands for Potable and Raw Water - Projected (AF)

Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use				
		<i>Report To the Extent that Records are Available</i>				
		2020	2025	2030	2035	2040
Single Family		2,010	2,615	2,805	2,825	2,825
Multi-Family		45	55	55	55	55
Commercial	Includes District use for RW system and minor construction	300	300	300	300	300
Landscape	Large	300	400	400	400	400
Agricultural irrigation		110	10	10	10	10
Losses	Includes hydrant flushing, line breaks, and sewer	190	190	190	190	190
TOTAL		2,955	3,570	3,760	3,780	3,780

NOTES: Data retrieved from District Customer Class Usage Data and Retail Water Agency Projections.

The above demand values were provided by the District. As the regional wholesale supplier for much of Orange County, MWDOC works in collaboration with each of its retail agencies as well as Metropolitan, its wholesaler, to develop demand projections for imported water. The District will aim to decrease its reliance on imported water by pursuing a variety of water conservation strategies. Per capita water use is developed in Section 2.5 below.

Table 2-5: Inclusion in Water Use Projections

Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	Section 4.1
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

The demand data presented in this section accounts for passive savings in the future. Passive savings are water savings as a result of codes, standards, ordinances and public outreach on water conservation and higher efficiency fixtures. Passive savings are anticipated to continue for the next 25 years and will result in continued water saving and reduced consumption levels.

2.4.4 Total Water Demand Projections

Based on the information provided above, the total demand for potable and non-potable water is listed below in Table 2-6. The District plans to expand availability and use of recycled water in its service area as discussed in Section 6.

Table 2-6: Total Water Demands (AF)

Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	2,900	2,955	3,570	3,760	3,780	3,780
Recycled Water Demand	803	960	1,000	1,000	1,000	1,000
TOTAL WATER DEMAND	3,703	3,915	4,570	4,760	4,780	4,780
NOTES:						

2.4.5 Water Use for Lower Income Households

Since 2010, the UWMP Act has required retail water suppliers to include water use projections for single-family and multi-family residential housing for lower income and affordable households. This will assist the District in complying with the requirement under Government Code Section 65589.7 granting priority for providing water service to lower income households. A lower income household is defined as a household earning below 80 percent of the median household income (MHI).

The District does not anticipate any low income housing in its service area for the next 25 years. Therefore Table 2-7 reflects this.

Table 2-7: Projected Water Demands for Housing Needed for Low Income Households (AF)

Water Use Sector	Fiscal Year Ending				
	2020	2025	2030	2035	2040
Total Residential Demand	2,055	2,670	2,860	2,880	2,880
SF Residential Demand-Low Income Households	0	0	0	0	0
MF Residential Demand-Low Income Households	0	0	0	0	0
Total Low Income Households Demand	0	0	0	0	0

2.5 SBx7-7 Requirements

SBx7-7, signed into law on February 3, 2010, requires the State of California to reduce urban water use by 20 percent by the year 2020. The District must determine baseline water use during their baseline period and water use targets for the years 2015 and 2020 to meet the state’s water reduction goal. The District may choose to comply with SBx7-7 individually or as a region in collaboration with other retail water suppliers in Orange County. Under the regional compliance option, the District is still required to report its individual water use targets. The District is required to be in compliance with SBx7-7 either individually or as part of the alliance, or demonstrate they have a plan or have secured funding to be in compliance, in order to be eligible for water related state grants and loans on or after July 16, 2016.

For the 2015 UWMP, the District must demonstrate compliance with its 2015 water use target to indicate whether or not they are on track to meeting the 2020 water use target. The District also revised their baseline per capita water use calculations using 2010 U.S. Census data. Changes in the baseline calculations also result in updated per capita water use targets.

DWR also requires agencies to submit SBx7-7 Verification Forms, a set of standardized tables to demonstrate compliance with the Water Conservation Act in this 2015 UWMP.

2.5.1 Baseline Water Use

The baseline water use is the District’s gross water use divided by its service area population, reported in gallons per capita per day (GPCD). Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area
- Indirect recycled water
- Water placed in long term storage
- Water conveyed to another urban supplier
- Water delivered for agricultural use
- Process water

Water suppliers must report baseline water use for two baseline periods, the 10- to 15-year baseline (baseline GPCD) and the five-year baseline (target confirmation) as described below.

2.5.1.1 Ten to 15-Year Baseline Period (Baseline GPCD)

The first step to calculating the District's water use targets is to determine its base daily per capita water use (baseline water use). This baseline water use is essentially the District's gross water use divided by its service area population, reported in GPCD. The baseline water use is calculated as a continuous (rolling) 10-year average during a period, which ends no earlier than December 31, 2004 and no later than December 31, 2010. Water suppliers whose recycled water made up 10 percent or more of their 2008 retail water delivery can use up to a 15-year average for the calculation. Recycled water use was 31 percent of the District's retail delivery in 2008; therefore, a 15-year baseline period is used.

The District's baseline water use is 267 GPCD, obtained from the 15-year period July 1, 1990 to June 30, 2005 as shown in Table 2-8.

2.5.1.2 Five-Year Baseline Period (Target Confirmation)

Water suppliers are required to calculate water use, in GPCD, for a five-year baseline period. This number is used to confirm that the selected 2020 target meets the minimum water use reduction requirements. Regardless of the compliance option adopted by the District, it will need to meet a minimum water use target of 5 percent reduction from the five-year baseline water use. This five-year baseline water use is calculated as a continuous five-year average during a period, which ends no earlier than December 31, 2007 and no later than December 31, 2010. The District's five-year baseline water use is 210 GPCD, obtained from the five-year period July 1, 2003 to June 30, 2008. The minimum target it needs to meet is 200 GPCD as shown in Table 2-8.

2.5.1.3 Service Area Population

The District's service area boundaries correspond with the boundaries for a city or census designated place. This allows the District to use service area population estimates prepared by the Department of Finance (DOF). CDR is the entity which compiles population data for Orange County based on DOF data. The calculation of the District's baseline water use and water use targets in the 2010 UWMP was based on the 2000 U.S. Census population numbers obtained from CDR. The baseline water use and water use targets in this 2015 UWMP have been revised based on the 2010 U.S. Census population obtained from CDR in 2012.

2.5.2 SBx7-7 Water Use Targets

In the 2015 UWMP, the District may update its 2020 water use target by selecting a different target method than what was used in 2010. The target methods and determination of the 2015 and 2020 targets are described below.

2.5.2.1 SBx7-7 Target Methods

DWR has established four target calculation methods for urban retail water suppliers to choose from. The District is required to adopt one of the four options to comply with SBx7-7 requirements. The four options include:

- *Option 1* requires a simple 20 percent reduction from the baseline by 2020 and 10 percent by 2015.
- *Option 2* employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics
 - Residential indoor water use of 55 GPCD
 - Landscape water use commensurate with the Model Landscape Ordinance
 - 10 percent reduction in baseline commercial/industrial/institutional (CII) water use
- *Option 3* is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State’s 20 by 2020 Water Conservation Plan.
- *Option 4* requires the subtraction of Total Savings from the baseline GPCD:
 - Total savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

With MWDOC’s assistance in the calculation of the District’s base daily per capita use and water use targets, the District selected to comply with Option 1 consistent with the option selected in 2010.

2.5.2.2 2015 and 2020 Targets

Under Compliance Option 1, the simple 20 percent reduction from the baseline, the District’s 2015 target is 233 GPCD and the 2020 target is 200 GPCD as summarized in Table 2-8. The 2015 target is the midway value between the 10-year baseline and the confirmed 2020 target. In addition, the confirmed 2020 target needs to meet a minimum of 5 percent reduction from the five-year baseline water use.

Table 2-8: Baselines and Targets Summary

Baselines and Targets Summary <i>Retail Agency</i>					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1991	2005	267	233	200
5 Year	2004	2008	210		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES: Trabuco Canyon Water District 2015 Verification Form					

Table 2-9 compares the District’s 2015 water use target to its actual 2015 consumption. Based on this comparison, the District is in compliance with its 2015 interim target and is on track to meeting the 2020 water use target.

Table 2-9: 2015 Compliance

2015 Compliance Retail Agency		
Actual 2015 GPCD	2015 Interim Target GPCD	Did Supplier Achieve Targeted Reduction for 2015? Y/N
204	233	Yes
<i>*All values are in Gallons per Capita per Day (GPCD)</i>		
NOTES: Trabuco Canyon Water District 2015 Verification Form		

2.5.3 Regional Alliance

A retail supplier may choose to meet the SBx7-7 targets on its own or it may form a regional alliance with other retail suppliers to meet the water use target as a region. Within a Regional Alliance, each retail water supplier will have an additional opportunity to achieve compliance under both an individual target and a regional target.

- If the Regional Alliance meets its water use target on a regional basis, all agencies in the alliance are deemed compliant.
- If the Regional Alliance fails to meet its water use target, each individual supplier will have an opportunity to meet their water use targets individually.

The District is a member of the Orange County 20 by 2020 Regional Alliance formed by MWDOC, its wholesaler. This regional alliance consists of 29 retail agencies in Orange County as described in MWDOC’s 2015 UWMP. MWDOC provides assistance in the calculation of each retail agency’s baseline water use and water use targets.

In 2015, the regional baseline and targets were revised to account for any revisions made by the retail agencies to their individual 2015 and 2020 targets. The regional water use target is the weighted average of the individual retail agencies’ targets (by population). The Orange County 20 by 2020 Regional Alliance weighted 2015 target is 176 GPCD and 2020 target is 158 GPCD. The actual 2015 water use in the region is 125 GPCD, i.e. the region has already met its 2020 GPCD goal.

3 WATER SOURCES AND SUPPLY RELIABILITY

3.1 Overview

The District relies on a combination of imported water, local groundwater, and recycled water to meet its water needs. The District works together with two primary agencies, Metropolitan and MWDOC, to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the SWP provided by Metropolitan and delivered through MWDOC. The District’s projected water supply portfolio is shown on Figure 3-1.

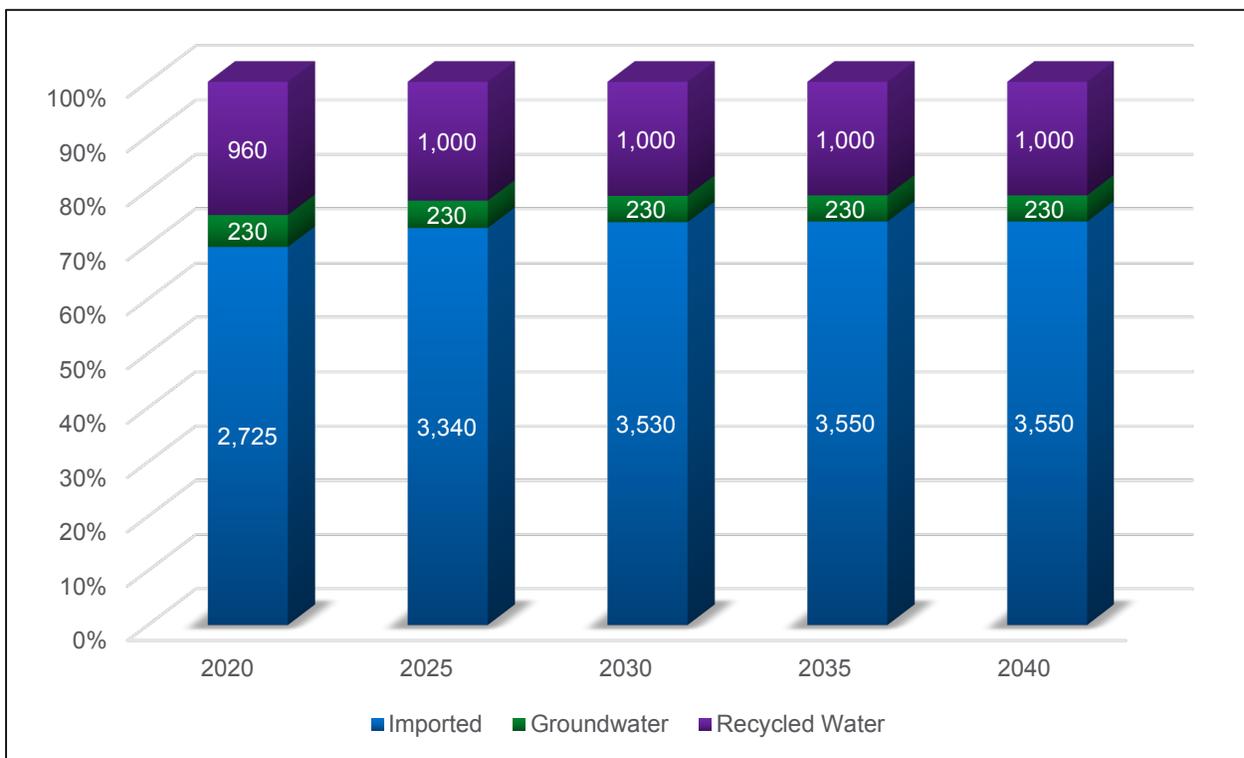


Figure 3-1: Water Supply Sources in the District (AF)

The following sections provide a detailed discussion of the District’s water sources as well as projections to the District’s future water supply portfolio for the next 25 years. Additionally, the District’s projected supply and demand under various hydrological conditions are compared to determine the District’s supply reliability for the 25 year planning horizon.

3.2 Imported Water

The District supplements its water supply through 2,968 AFY of imported water purchased wholesale by Metropolitan through MWDOC. Imported water represents a majority of the District’s water supply. Metropolitan’s principal sources of water are the Colorado River via the CRA and the Lake Oroville

watershed in Northern California through the SWP. The raw water obtained from these sources is, for Orange County, treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder. The treated water is conveyed through the Allen McColloch pipeline (AMP) to the District. The District has an annual capacity of 2,900 AFY in the AMP and an additional 1,450 AFY should additional water become available.

3.2.1 Colorado River Supplies

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. The CRA, which is owned and operated by Metropolitan, transports water from the Colorado River to its terminus at Lake Mathews in Riverside County. The actual amount of water per year that may be conveyed through the CRA to Metropolitan's member agencies is subject to the availability of Colorado River water for delivery.

The CRA includes supplies from the implementation of the Quantification Settlement Agreement and related agreements to transfer water from agricultural agencies to urban uses. The 2003 Quantification Settlement Agreement enabled California to implement major Colorado River water conservation and transfer programs, stabilizing water supplies for 75 years and reducing the state's demand on the river to its 4.4 MAF entitlement. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 million acre-feet (MAF) on an as-needed basis. Water from the Colorado River or its tributaries is available to users in California, Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as well as to Mexico. California is apportioned the use of 4.4 MAF of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California, and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to but not used by Arizona or Nevada. Metropolitan has a basic entitlement of 550,000 AFY of Colorado River water, plus surplus water up to an additional 662,000 AFY when the following conditions exist (Metropolitan, 2015 UWMP, June 2016):

- Water unused by the California holders of priorities 1 through 3
- Water saved by the Palo Verde land management, crop rotation, and water supply program
- When the U.S. Secretary of the Interior makes available either one or both:
 - Surplus water is available
 - Colorado River water is apportioned to but unused by Arizona and/or Nevada

Unfortunately, Metropolitan has not received surplus water for a number of years. The Colorado River supply faces current and future imbalances between water supply and demand in the Colorado River Basin due to long term drought conditions. Over the past 16 years (2000-2015), there have only been three years when the Colorado River flow has been above average (Metropolitan, 2015 UWMP, June 2016). The long-term imbalance in future supply and demand is projected to be approximately 3.2 MAF by the year 2060.

Approximately 40 million people rely on the Colorado River and its tributaries for water with 5.5 million acres of land using Colorado River water for irrigation. Climate change will affect future supply and demand as increasing temperatures may increase evapotranspiration from vegetation along with an

increase in water loss due to evaporation in reservoirs, therefore reducing the available amount of supply from the Colorado River and exacerbating imbalances between increasing demands from rapid growth and decreasing supplies.

The Colorado River Basin Water Supply and Demand Study (Study) assessed the historical water supply in the Colorado River Basin through two historical streamflow data sets, from the year 1906 through 2007 and the paleo-reconstructed record from 762 through 2005. The following are findings from the study:

- Increased temperatures in both the Upper and Lower Colorado River Basins since the 1970s has been observed.
- Loss of springtime snowpack was observed with consistent results across the lower elevation northern latitudes of the western United States. The large loss of snow at lower elevations strongly suggest the cause is due to shifts in temperature.
- The deficit between the two year running average flow and the long-term mean annual flow that started in the year 2000 is more severe than any other deficit in the observed period, at nine years and 28 MAF deficit.
- There are deficits of greater severity from the longer paleo record compared to the period from 1906 through 2005. One deficit amounted to 35 MAF through a span of 16 years.
- A summary of the trends from the observed period suggest declining stream flows, increases in variability, and seasonal shifts in streamflow that may be related to shifts in temperature.

Findings concerning the future projected supply were obtained from the Downscaled GCM Projected scenario as the other methods did not consider the impacts of a changing climate beyond what has occurred historically. These findings include:

- Increased temperatures are projected across the Colorado River Basin with larger changes in the Upper Basin than in the Lower Basin. Annual Basin-wide average temperature is projected to increase by 1.3 degrees Celsius over the period through 2040.
- Projected seasonal trends toward drying are significant in certain regions. A general trend towards drying is present in the Colorado River Basin, although increases in precipitation are projected for some higher elevation and hydrologically productive regions. Consistent and expansive drying conditions are projected for the spring and summer months throughout the Colorado River Basin, although some areas in the Lower Basin are projected to experience slight increases in precipitation, which is thought to be attributed to monsoonal influence in the region. Upper Basin precipitation is projected to increase in the fall and winter, and Lower Basin precipitation is projected to decrease.
- Snowpack is projected to decrease due to precipitation falling as rain rather than snow and warmer temperatures melting the snowpack earlier. Areas where precipitation does not change or increase is projected to have decreased snowpack in the fall and early winter. Substantial decreases in spring snowpack are projected to be widespread due to earlier melt or sublimation of snowpack.
- Runoff (both direct and base flow) is spatially diverse, but is generally projected to decrease, except in the northern Rockies. Runoff is projected to increase significantly in the higher elevation Upper Basin during winter but is projected to decrease during spring and summer.

The following future actions must be taken to implement solutions and help resolve the imbalance between water supply and demand in areas that use Colorado River water (U.S. Department of the Interior Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study, December 2012):

- Resolution of significant uncertainties related to water conservation, reuse, water banking, and weather modification concepts.
- Costs, permitting issues, and energy availability issues relating to large-capacity augmentation projects need to be identified and investigated.
- Opportunities to advance and improve the resolution of future climate projections should be pursued.
- Consideration should be given to projects, policies, and programs that provide a wide-range of benefits to water users and healthy rivers for all users.

3.2.2 State Water Project Supplies

The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR and is an integral part of the effort to ensure that business and industry, urban and suburban residents, and farmers throughout much of California have sufficient water. The SWP is the largest state-built, multipurpose, user-financed water project in the United States. Nearly two-thirds of residents in California receive at least part of their water from the SWP with approximately 70 percent of SWP's contracted water supply going to urban users and 30 percent to agricultural users. The primary purpose of the SWP is to divert and store water during wet periods in Northern and Central California and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and southern California.

The availability of water supplies from the SWP can be highly variable. A wet water year may be followed by a dry or critically dry year and fisheries issues can restrict the operations of the export pumps even when water supplies are available.

The Sacramento-San Joaquin River Delta (Delta) is key to the SWP's ability to deliver water to its agricultural and urban contractors. All but five of the 29 SWP contractors receive water deliveries below the Delta (pumped via the Harvey O. Banks or Barker Slough pumping plants). However, the Delta faces many challenges concerning its long-term sustainability such as climate change posing a threat of increased variability in floods and droughts. Sea level rise complicates efforts in managing salinity levels and preserving water quality in the Delta to ensure a suitable water supply for urban and agricultural use. Furthermore, other challenges include continued subsidence of Delta islands, many of which are below sea level, and the related threat of a catastrophic levee failure as the water pressure increases, or as a result of a major seismic event.

Ongoing regulatory restrictions, such as those imposed by federal biological opinions (Biops) on the effects of SWP and the federal Central Valley Project (CVP) operations on certain marine life, also contributes to the challenge of determining the SWP's water delivery reliability. In dry, below-normal conditions, Metropolitan has increased the supplies delivered through the California Aqueduct by developing flexible CVP/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Harvey O. Banks

pumping plant capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. In addition, the California SWRCB has set water quality objectives that must be met by the SWP including minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity level.

Metropolitan’s Board approved a Delta Action Plan in June 2007 that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented. Currently, Metropolitan is working towards addressing three basin elements: Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development.

“Table A” water is the maximum entitlement of SWP water for each water contracting agency. Currently, the combined maximum Table A amount is 4.17 MAFY. Of this amount, 4.13 MAFY is the maximum Table A water available for delivery from the Delta pumps as stated in the State Water Contract. However, deliveries commonly are less than 50 percent of the Table A.

SWP contractors may receive Article 21 water on a short-term basis in addition to Table A water if requested. Article 21 of SWP contracts allows contractors to receive additional water deliveries only under specific conditions, generally during wet months of the year (December through March). Because an SWP contractor must have an immediate use for Article 21 supply or a place to store it outside of the SWP, there are few contractors like Metropolitan that can access such supplies. .

Carryover water is SWP water allocated to an SWP contractor and approved for delivery to the contractor in a given year but not used by the end of the year. The unused water is stored in the SWP’s share of San Luis Reservoir, when space is available, for the contractor to use in the following year.

Turnback pool water is essentially unused Table A water. Turnback pool water is able to be purchased by another contractor depending on its availability.

SWP Delta exports are the water supplies that are transferred directly to SWP contractors or to San Luis Reservoir storage south of the Delta via the Harvey O. Banks pumping plant. Estimated average annual Delta exports and SWP Table A water deliveries have generally decreased since 2005, when Delta export regulations affecting SWP pumping operations became more restrictive due to the Biops. A summary of SWP water deliveries from the years 2005 and 2013 is summarized in Table 3-1.

Table 3-1: Metropolitan Colorado River Aqueduct Program Capabilities

Year	Average Annual Delta Exports (MAF)	Average Annual Table A Deliveries (MAF)
2005	2.96	2.82
2013	2.61	2.55
Percent Change	-11.7%	-9.4%

The following factors affect the ability to estimate existing and future water delivery reliability:

- Water availability at the source: Availability depends on the amount and timing of rain and snow that fall in any given year. Generally, during a single dry year or two, surface and groundwater storage can supply most water deliveries, but multiple dry years can result in critically low water reserves.
- Water rights with priority over the SWP: Water users with prior water rights are assigned higher priority in DWR's modeling of the SWP's water delivery reliability, even ahead of SWP Table A water.
- Climate change: mean temperatures are predicted to vary more significantly than previously expected. This change in climate is anticipated to bring warmer winter storms that result in less snowfall at lower elevations, reducing total snowpack. From historical data, DWR projects that by 2050, the Sierra snowpack will be reduced from its historical average by 25 to 40 percent. Increased precipitation as rain could result in a larger number of "rain-on-snow" events, causing snow to melt earlier in the year and over fewer days than historically, affecting the availability of water for pumping by the SWP during summer.
- Regulatory restrictions on SWP Delta exports due to the Biops to protect special-status species such as delta smelt and spring- and winter-run Chinook salmon. Restrictions on SWP operations imposed by state and federal agencies contribute substantially to the challenge of accurately determining the SWP's water delivery reliability in any given year.
- Ongoing environmental and policy planning efforts: the California WaterFix involves water delivery improvements that could reduce salinity levels by diverting a greater amount of lower salinity Sacramento water to the South Delta export pumps. The EcoRestore Program aims to restore at least 30,000 acres of Delta habitat, and plans to be well on the way to meeting that goal by the year 2020.
- Delta levee failure: The levees are vulnerable to failure because most original levees were simply built with soils dredged from nearby channels and were not engineered. A breach of one or more levees and island flooding could affect Delta water quality and SWP operations for several months. When islands are flooded, DWR may need to drastically decrease or even cease SWP Delta exports to evaluate damage caused by salinity in the Delta (Department of Water Resources, The State Water Project Final Delivery Capability Report 2015, July 2015).

DWR has altered the SWP operations to accommodate species of fish listed under the Biops, and these changes have adversely impacted SWP deliveries. DWR's Water Allocation Analysis indicated that export restrictions are currently reducing deliveries to Metropolitan as much as 150 TAF to 200 TAF under median hydrologic conditions.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. New biological opinions for listed species under the Federal ESA or by the California Department of Fish and Game's issuance of incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and CVP operations. Additionally, new litigation, listings of additional species or new regulatory requirements could further adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations.

3.2.3 Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources.

Lake Oroville is the SWP's largest storage facility, with a capacity of about 3.5 MAF. The water is released from Oroville Dam into the Feather River as needed, which converges with the Sacramento River while some of the water at Bethany Reservoir is diverted from the California Aqueduct into the South Bay Aqueduct. The primary pumping plant, the Harvey O. Banks pumping plant, pumps Delta water into the California Aqueduct, which is the longest water conveyance system in California.

3.3 Groundwater

The District owns two wells that pump from the San Juan Groundwater Basin, the Rose Canyon Well and Lang Well. These two wells pump water from a maximum depth of about 40 feet from the Arroyo Trabuco aquifer that is part of the San Juan Basin. The Rose Canyon Well has been a District-owned facility since the mid-1960s, and the District has owned the Lang Well since the early 1980s. These wells were originally privately owned and were dedicated to the District for the beneficial use of its customers. The District has also used a third well, the US Well, in past years through a leasing arrangement with a private party. Currently, the District has no effective leasing agreement with the private party to use the US Well and is not included in projected supplies.

This groundwater source is highly desirable in terms of water quality, cost, and local energy resources. The water pumped from these wells is a valuable District's water supply, and it contributes to decreasing southern California's dependence on imported water supplies. However, due to ongoing drought conditions, the District has been unable to produce local groundwater during calendar years 2014 and 2015. The District is still projected to produce groundwater in the future albeit at lower rates.

3.3.1 San Juan Basin Characteristics

The Basin is located in the San Juan Creek Watershed and is comprised of four principal groundwater basins: 1) Lower Basin, 2) Middle Basin, 3) Upper Basin, and 4) Arroyo Trabuco. A map of the four principal groundwater basins is shown on Figure 3-2. The Middle Basin, Lower Basin, and Lower Trabuco consists of approximately 5.9 square miles of water bearing alluvium. Groundwater occurs in the relatively thin alluvial deposits along the valley floors and within the major stream channels. The younger alluvial deposits within the Basin consists of a heterogeneous mixture of sand, silts, and gravel.

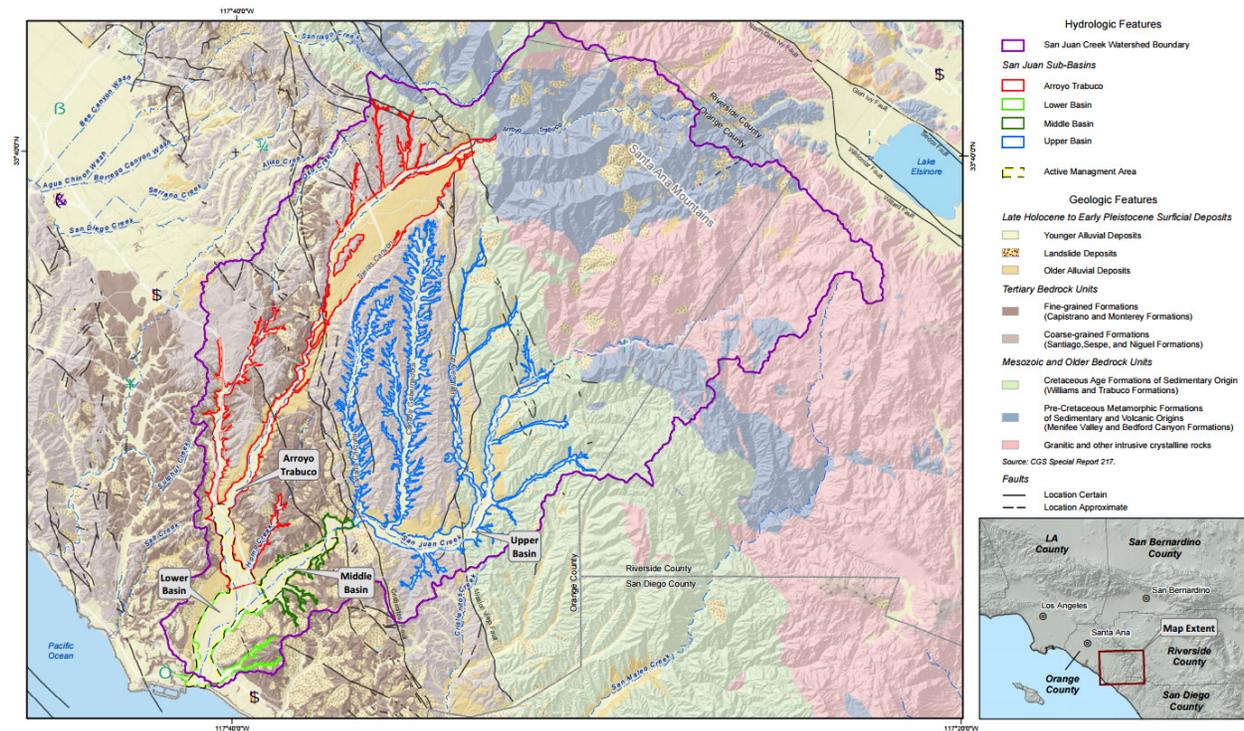


Figure 3-2: Principal Groundwater Basins for the San Juan Groundwater Basin

The physical boundaries of the Basin include the Santa Ana Mountain to the north, sedimentary rock formations to the sides of the Upper Basin and Arroyo Trabuco, and the Pacific Ocean to the south.

The Basin is recharged through a variety of sources such as:

- Streambed infiltration in San Juan Creek, Horno Creek, Oso Creek, and Arroyo Trabuco.
- Subsurface inflows along boundaries at the head of the tributaries upstream and other minor subsurface inflows from other boundaries.
- Precipitation and applied water.
- Flow from fractures and springs.

Discharge of groundwater from the Basin occurs from a variety of sources such as:

- Groundwater production
- Rising groundwater
- Evapotranspiration
- Outflow to Pacific Ocean

Currently, five agencies have groundwater rights to the Basin and uses this water for either municipal purposes or for irrigation. The agencies with groundwater rights to the Basin and their current rights are listed below:

- South Coast Water District: 1,300 AFY
- San Juan Basin Authority: 8,026 AFY
- Santa Margarita Water District: 643 AFY
- San Juan Hills Golf Course: 450 AFY
- City of San Juan Capistrano: 3,325 AFY

The Basin differs from many other adjudicated groundwater basins as it does not strictly follow the term “safe yield” in preventing undesirable results occurring as a result of over-production of groundwater. The Basin is governed by the SJBA and is a Joint Power Agency comprised of representatives from four local jurisdictions, Santa Margarita Water District (SMWD), Moulton Niguel Water District (MNWD), the City of San Juan Capistrano, and South Coast Water District (SCWD). The SJBA has recently adopted the concept of “adaptive management” of the San Juan Groundwater Basin to vary pumping from year to year based on actual basin conditions derived from monitoring efforts. This is due in part to the SWRCB characterization of the Basin as a “flowing underground stream” and because the storage in the Basin is small relative to recharge and production. The range of natural yield of the Basin is 7,000 AFY to 11,000 AFY. Work is underway to construct rubber dams and increase recharge with recycled water to increase the recharge of the Basin by 4,000 AFY to 7,000 AFY (SJBA, San Juan Basin Groundwater and Facilities Management Plan, November 2013).

3.3.2 Groundwater Historical Extraction

A summary of the volume of groundwater pumped by the District is shown in Table 3-2.

Table 3-2: Groundwater Volume Pumped (AF)

Retail: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Arroyo Trabuco Aquifer	476	365	44	0	0
TOTAL		476	365	44	0	0
NOTES:						

3.4 Transfer Opportunities

The District has the capability to transfer and exchange water to and from the District with neighboring districts, including IRWD, SMWD, and El Toro Water District (ETWD). Water can be transferred or exchanged to and other districts for short durations such as emergencies or water transmission line breaks. However, the District currently has no plans for contractually committing to any future short term or long term water transfers or exchanges due to current availability of supplies.

3.5 Summary of Existing and Planned Sources of Water

The actual sources and volume of water for the year 2015 is displayed in Table 3-3.

2015 URBAN WATER MANAGEMENT PLAN

Table 3-3: Water Supplies, Actual (AF)

Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Groundwater	San Juan Groundwater Basin	0	Drinking Water
Purchased or Imported Water	MWDOC	2,900	Drinking Water
Surface water	Irvine Lake	0	Raw Water
Recycled Water		803	Recycled Water
Total		3,703	
NOTES:			

2015 URBAN WATER MANAGEMENT PLAN

A summary of the current and planned sources of water for the District is shown in Table 3-4.

Table 3-4: Water Supplies, Projected (AF)

Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>				
		2020	2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater	San Juan Groundwater Basin	230	230	230	230	230
Purchased or Imported Water	MWDOC	2,725	3,340	3,530	3,550	3,550
Recycled Water		960	1,000	1,000	1,000	1,000
Total		3,915	4,570	4,760	4,780	4,780
NOTES:						

3.6 Recycled Water

The District produces non-potable water that provides a reliable and drought proof non-potable source of water, reducing the District's reliance on imported water supplies. The District's recycled water program is more fully described in Section 6.

3.7 Supply Reliability

3.7.1 Overview

Every urban water supplier is required to assess the reliability of their water service to its customers under normal, dry, and multiple dry water years. The District depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. Development of groundwater, groundwater recovery, and non-domestic water system opportunities augment the reliability of the imported water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. The water supplies are projected to meet full-service demands; Metropolitan's 2015 UWMP finds that Metropolitan is able to meet, with existing supplies, full-service demands of its member agencies starting 2020 through 2040 during normal years, single dry year, and multiple dry years.

Metropolitan's 2015 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2020 through 2040. The foundation of Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements.

3.7.2 Factors Impacting Reliability

The Act requires a description of water supply reliability and vulnerability to seasonal or climatic shortage. The following are some of the factors identified by Metropolitan that may have an impact on the reliability of Metropolitan supplies.

3.7.2.1 Environment

Endangered species protection needs in the Delta have resulted in operational constraints to the SWP system, as mentioned previously in the SWP Supplies section.

3.7.2.2 Legal

The addition of more species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations.

3.7.2.3 Water Quality

3.7.2.3.1 *Imported Water*

Metropolitan is responsible for providing high quality potable water throughout its service area. Over 300,000 water quality tests are performed per year on Metropolitan's water to test for regulated contaminants and additional contaminants of concern to ensure the safety of its waters. Metropolitan's supplies originate primarily from the CRA and from the SWP. A blend of these two sources, proportional to each year's availability of the source, is then delivered throughout Metropolitan's service area.

Metropolitan's primary water sources face individual water quality issues of concern. The CRA water source contains higher total dissolved solids (TDS) and the SWP contains higher levels of organic matter, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic matter, Metropolitan blends CRA and SWP supplies and has upgraded all of its treatment facilities to include ozone treatment processes. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA), and pharmaceuticals and personal care products (PPCPs). While unforeseeable water quality issues could alter reliability, Metropolitan's current strategies ensure the deliverability of high quality water.

The presence of Quagga Mussels in water sources is a water quality concern. Quagga Mussels are an invasive species that was first discovered in 2007 at Lake Mead, on the Colorado River. This species of mussels form massive colonies in short periods of time, disrupting ecosystems and blocking water intakes. They are capable of causing significant disruption and damage to water distribution systems. Controlling the spread and impacts of this invasive species within the CRA requires extensive maintenance and results in reduced operational flexibility. It also resulted in Metropolitan eliminating deliveries of CRA water into Diamond Valley Lake to keep the reservoir free from Quagga Mussels.

3.7.2.3.2 *Groundwater*

Groundwater quality from the Basin was determined through the analyses of available data from production and monitoring wells. Constituents of concern within the Basin include total dissolved solids (TDS), nitrate, manganese, and iron.

TDS consists of inorganic salts dissolved in water, with the major ions being sodium, potassium, calcium, magnesium, bicarbonates, chlorides, and sulfates under Title 22. The California secondary MCL for TDS is 500 mg/L. Four wells were tested for TDS and all of the wells exceeded the secondary MCL for TDS. The lower portion of the Basin exhibits relatively higher TDS levels due to irrigation return flows, fertilizer use, consumptive use, and dissolution of ions from weathered rock surfaces and salts.

Nitrate within groundwater can be both naturally-occurring and can also be associated with agriculture and other synthetic production. The primary MCL for nitrate in drinking water is 10 mg/L. Most groundwater wells monitored for nitrate exhibited levels below MCL except for two wells.

Manganese is a naturally-occurring inorganic constituent dissolved in water. Manganese is an essential micronutrient at low concentrations, but at higher concentrations in drinking water, manganese may lead

to objectionable aesthetic qualities such as bitter taste and staining of clothes. The California secondary MCL for manganese is 0.5 mg/L. Most wells monitored for manganese exceeded the secondary MCL for manganese by as much as 40 times with the exception of two wells in the Oso and Lower Trabuco area.

Iron is a naturally-occurring inorganic constituent dissolved in water. Similar to manganese, iron in low concentrations is an essential micronutrient, but iron in higher concentrations in drinking water leads to the same objectionable aesthetic qualities as those of manganese. The California secondary drinking water MCL for iron is 0.3 mg/L. With the exception of one groundwater well in the Oso area, all wells exceeded the secondary MCL for iron by as much as 60 times (San Juan Basin Authority, San Juan Basin Groundwater and Facilities Management Plan, November 2013).

3.7.2.4 Climate Change

Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning more challenging. The areas of concern for California include a reduction in Sierra Nevada Mountain snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of Delta levee failure, seawater intrusion of coastal groundwater basins, and potential cutbacks on the SWP and CVP.

Legal, environmental, and water quality issues may have impacts on Metropolitan supplies. It is felt, however, that climatic factors would have more of an impact than legal, water quality, and environmental factors. Climatic conditions have been projected based on historical patterns but severe pattern changes are still a possibility in the future.

3.7.3 Normal-Year Reliability Comparison

The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1), to project the 25-year demand for Orange County water agencies, also isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The explanatory variables of population, temperature, precipitation, unemployment rate, drought restrictions, and conservation measures were used to create the statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition. The average (normal) demand is represented by the average water demand of 1990 to 2014 (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016).

The District is 100 percent reliable for normal year demands from 2020 through 2040. The District has entitlements to receive imported water from Metropolitan through MWDOC via connections to Metropolitan's regional distribution system. Although pipeline and connection capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies are assumed available to the District from existing water transmission facilities.

3.7.4 Single-Dry Year Reliability Comparison

A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1) isolated the impacts that weather and future climate can have on water

demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a nine percent increase in demand for the South County area where the District's service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). Detailed information of the model is included in Appendix F.

The District has documented that it is 100 percent reliable for single dry year demands from 2020 through 2040 with a demand increase of nine percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation.

3.7.5 Multiple-Dry Year Period Reliability Comparison

Multiple-dry years are defined as three or more consecutive years with minimal rainfall within a period of average precipitation. The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a nine percent increase in demand for the South County area where the District's service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). It is conservatively assumed that a three-year multi dry year scenario is a repeat of the single dry year over three consecutive years (FY 2011-12 through FY 2013-14).

The District is capable of meeting all customers' demands with significant reserves held by Metropolitan, local groundwater supplies, and conservation in multiple dry years from 2020 through 2040 with a demand increase of nine percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation. The basis of the water year is displayed in Table 3-5.

Table 3-5: Basis of Water Year Data

Retail: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	1990-2014		100%
Single-Dry Year	2014		109%
Multiple-Dry Years 1st Year	2012		109%
Multiple-Dry Years 2nd Year	2013		109%
Multiple-Dry Years 3rd Year	2014		109%

NOTES: Based on OC Reliability Study

3.8 Supply and Demand Assessment

A comparison between the supply and demand for projected years between 2020 and 2040 is shown in Table 3-6. As stated above, the available supply will meet projected demand due to diversified supply and conservation measures.

Table 3-6: Normal Year Supply and Demand Comparison (AF)

Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	3,915	4,570	4,760	4,780	4,780
Demand totals	3,915	4,570	4,760	4,780	4,780
Difference	0	0	0	0	0

NOTES:

A comparison between the supply and the demand in a single dry year and multiple dry years is shown in Tables 3-7 and 3-8 respectively. As stated above, the available supply will meet projected demand due to diversified supply and conservation measures.

Table 3-7: Single Dry Year Supply and Demand Comparison (AF)

Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	4,267	4,981	5,188	5,210	5,210
Demand totals	4,267	4,981	5,188	5,210	5,210
Difference	0	0	0	0	0
NOTES:					

Table 3-8: Multiple Dry Years Supply and Demand Comparison (AF)

Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0
Second year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0
Third year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0
NOTES:						

4 DEMAND MANAGEMENT MEASURES

The goal of the DMM section is to provide a comprehensive description of the water conservation programs that a supplier has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets. The reporting requirements for DMM has been significantly modified and streamlined in 2014 by Assembly Bill 2067. For a retail agency such as the District the reporting requirements changed from having 14 specific measures to six more general requirements plus an “other” category.

4.1 Water Waste Prevention Ordinances

The District’s Board of Directors adopted the Water Conservation Ordinance No. 2008-18 (Ordinance) on December 18, 2008. The Ordinance established the *Permanent Water Conservation Requirements – Prohibition Against Waste* (Permanent Provisions) that are effective at all times while the Ordinance is in effect. The Permanent Provisions are as follows.

- **Limits on Watering Hours:**
 - Watering or irrigating of landscape with potable water is prohibited between the hours of 9:00 a.m. and 6:00 p.m.
- **Limit on Water Duration:**
 - Watering or irrigating of landscape with potable water that is not continuously attended, is limited to no more than ten minutes per station, per day.
- **No Watering While Raining:**
 - Watering or irrigating while raining is expressly prohibited.
- **No Excessive Water Flow or Runoff:**
 - Watering or irrigation of any landscaped area in a manner that allows excessive flow onto an adjacent hard surface is expressly prohibited.
- **No Washing Down Hard or Paved Surfaces:**
 - Prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of hand-held bucket or hose equipped with an automatic shut off nozzle.
- **Limits on Washing Vehicles:**
 - Using water to wash or clean a vehicle is prohibited except by use of hand-held bucket or hose equipped with an automatic shutoff nozzle.
- **Swimming Pools and Spas:**
 - No person shall empty and refill a swimming pool except to prevent or repair structural damage or to comply with public health regulations, or upon written recommendation of a pool maintenance repair professional.

- **No Indiscriminate Use:**
- No person shall cause or permit the indiscriminate running of water not otherwise prohibited above which is wasteful and without reasonable purpose.
- **Obligation to Fix Leaks or Malfunctions:**
 - Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape should have reasonably been discovered and corrected is prohibited. If unattended malfunctions are observed, the District may turn off the irrigation to the affected area until such time the property owner can respond to correct.
- **Water Fountains and/or Decorative Water Features:**
 - Must have a re-circulation water system.
- **Washing of Equipment and Machinery:**
 - Prohibited except with a hose equipped with an automatic shutoff nozzle – District notes National Pollution Discharge Elimination System (NPDES) requirement with City or County may apply.
- **Cleaning of Structures:**
 - Prohibited except with a hose equipped with an automatic shutoff nozzle – District notes NPDES requirements with City or County may apply.
- **Drinking Water Served Upon Request in Restaurants:**
 - Restaurants are only to serve and/or refill water upon request from patrons.
- **Commercial Car Wash**
 - Installation of non-recirculating water systems is prohibited in new commercial conveyor car wash.

The ordinance also established three stages of water supply shortage and response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies. This is further discussed in Section 5. Ordinance No. 2008-18 is included in Appendix D.

Table 4-1 summarizes the District's water waste prohibition efforts in the past five years and the projected number of site visits and expenditures related to regulating Ordinance No. 2008-18.

Table 4-1: Water Waste Prohibition

Actual	2011	2012	2013	2014	2015
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits					40
Actual Expenditures (\$)					\$80,000

Planned	2016	2017	2018	2019	2020
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits					
Planned Expenditures (\$)					

4.2 Metering

All customer connections are metered and billed by volume of use. The District records daily production and demand data, by zones, and reads all meters on a monthly basis. All metered sales and other system verifiable uses, e.g., backwash, flush water, and operations and maintenance, are recorded.

The District has a 15-year meter replacement or rebuilding program for one-inch and smaller meters. The District is implementing a testing program for all meters 1 ½ inches and larger, as of Calendar Year 2016. In addition, the District’s Utility Billing System (UBS) demonstrates when a meter is outside of its normal consumption range and alarms customer service that maintenance is necessary.

All landscape irrigation is metered. The District has implemented an Advanced Meter Reading program for all new developments.

4.3 Conservation Pricing

All of the District’s water connections are metered and billed based on commodity rates. The District’s water rate structure consists of a flat rate based on meter size and a commodity charge based on metered usage. The most recent pricing became effective on January 1, 2016. Commodity rates for single residential customers are based on a four-tier structure. Other customers are charged a uniform rate (Table 4-2).

Table 4-2: Water Usage Rates

Customer Sector	Pricing (\$/CCF)
Single-family Residential	
Tier 1 (0 – 8 ccf)	\$2.19
Tier 2 (9 -18 ccf)	\$2.43
Tier 3 (19 – 30 ccf)	\$4.84
Tier 4 (above 30 ccf)	\$5.99
Non-SRF (Uniform)	
Agriculture	\$3.05
Multi-Family	\$2.52
Commercial	\$2.64
Construction	\$3.84
Irrigation	\$2.99

4.4 Public Education and Outreach

The District maintains a very active public information program to promote and educate customers about water conservation. For the past 21 years, the District has published and forwarded its monthly newsletter, *On Tap*, to all customers. Water conservation is a key component of the text of the newsletter, and an irrigation watering table is provided in the newsletter. Brochures regarding water-wise gardening are made available to all customers. In 2007, the District constructed a demonstration garden consisting of native California drought-resistant plants and artificial turf at its Administration Office.

Each year the District publishes and distributes its Water Quality Report that is required by the California Department of Public Health. Water use efficiency and conservation information is included in the report along with water quality data.

The District's public education and outreach program is supplemented by MWDOC's regional education and outreach programs. MWDOC has established an extensive public education and outreach program to assist its retail agencies in promoting water use efficiency awareness within their service areas. MWDOC's public education and outreach programs consist of five primary activities as described below.

In addition to the primary programs it administers, MWDOC also maintains a vibrant public website (www.mwdoc.com) as well as a social media presence on Facebook, Twitter and Instagram. MWDOC's Facebook page has more than 1,200 followers. The social media channels are used to educate the public about water-efficiency, rates and other water-related issues.

MWDOC's public education and outreach programs are described below:

School Education Programs

MWDOC school education programs reach more than 100,000 students per year. The program is broken into elementary and high school components.

- *Elementary School Program* reaches 60,000 students throughout Orange County through assemblies hosted by the Discovery Science Center. MWDOC holds a \$220,000 contract with the Discovery Science Center, funded proportionally by the participating MWDOC retail agencies.
- *High School Program* is new in 2015-16 and will reach students in 20 high schools in Orange County. The program is administered by MWDOC and operated by two contractors, the OC Department of Education and the Ecology Center. Through the three-year contract, those agencies will train more than 100 county teachers on water education on topics such as, water sources, water conservation, water recycling, watersheds, and ecological solutions for the benefit of their current and future students. Teachers will learn a variety of water conservation methods, such as irrigation technology, rainwater harvesting, water recycling, and water footprinting through a tour at the Ecology Center facility. These trainings allow teachers to support student-led conservation efforts. The program will reach a minimum of 25,000 students by providing in-classroom water education and helping students plan and implement campus wide “Water Expos” that will allow peer-to-peer instruction on water issues. The \$80,000 program is funded by participating agencies.

Value of Water Communication Program

MWDOC administers this program on behalf of 14 agencies. The \$190,000 program involves the water agencies developing 30 full news pages that will appear weekly in the Orange County Register, the largest newspaper in the county, with a Sunday readership of 798,000. The campaign will educate OC residents and business leaders on water infrastructure issues and water efficiency measures, as well as advertise water related events and other pertinent information.

Quarterly Water Policy Dinners

The Water Policy Dinner events attract 225 to 300 water and civic leaders every quarter. The programs host speakers topical to the OC water industry, with recent addresses from Felicia Marcus of the state water board and Dr. Lucy Jones, a noted expert on earthquakes and their potential impact on infrastructure.

Annual Water Summit

The annual Water Summit brings together 300 Orange County water and civic leaders with state and national experts on water infrastructure and governance issues. The half-day event has a budget of \$80,000 per year. Portions of the cost are covered by attendance and sponsorships, while MWDOC splits a portion with its event partner, the Orange County Water District (OCWD).

Water Inspection Trips

Water Inspection trips take stakeholders on tours of the CRA, California Delta and other key water infrastructure sites. The public trips are required under Metropolitan’s regulations. While Metropolitan covers the cost of the trips, MWDOC has two members of the public affairs staff that work diligently on identifying OC residents and leaders to attend. MWDOC staff also attends each trip. In the past year,

MWDOC participated in a dozen trips, each taking an average of 30 residents. MWDOC also works with Metropolitan on special trips to educate County Grand Jurors the key water infrastructure.

4.5 Programs to Assess and Manage Distribution System Real Loss

The District does not have a leak detection program, and is reactive to leaks only. Results from the distribution system water loss is captured under Section 2.3.4 and a copy of the AWWA water audit worksheet is included as Appendix H.

4.6 Water Conservation Program Coordination and Staffing Support

The District's Administration Department consists of one full-time staff member who serves as the District's Water Conservation Coordinator and is responsible for a variety of tasks related to water use efficiency and community information. The District's Water Conservation Coordinator works closely with other District departments, such as Customer Service, Water and Wastewater Operations, as well as MWDOC's Water Use Efficiency staff in order to effectively develop and implement District and regional programs. Sources of funding for the District's water conservation program are included in the rate structure.

4.7 Other Demand Management Measures

During the past five years, FY 2010-11 to 2014-15, the District, with the assistance of MWDOC, has implemented many water use efficiency programs for its residential, CII, and landscape customers as described below. Appendix I provides quantities of rebates and installations achieved under each program since program inception. The District will continue to implement all applicable programs in the next five years.

4.7.1 Residential Programs

Water Smart Home Survey Program

The Water Smart Home Survey Program provides free home water surveys (indoor and outdoor). The Water Smart Home Survey Program uses a Site Water Use Audit program format to perform comprehensive, single-family home audits. Residents choose to have outdoor (and indoor, if desired) audits to identify opportunities for water savings throughout their properties. A customized home water audit report is provided after each site audit is completed and provides the resident with their survey results, rebate information, and an overall water score.

High Efficiency Clothes Washer Rebate Program

The High Efficiency Clothes Washer (HECW) Rebate Program provides residential customers with rebates for purchasing and installing WaterSense labeled HECWs. HECWs use 35-50 percent less water than standard washer models, with savings of approximately 9,000 gallons per year, per device. Devices must have a water factor of 4.0 or less, and a listing of qualified products can be found at ocwatersmart.com. There is a maximum of one rebate per home.

High Efficiency Toilet Rebate Program

The largest amount of water used inside a home, 30 percent, goes toward flushing the toilet. The High Efficiency Toilet (HET) Rebate Program offers incentives to residential customers for replacing their standard, water-guzzling toilets with HETs. HETs use just 1.28 gallons of water or less per flush, which is 20 percent less water than standard toilets. In addition, HETS save an average of 38 gallons of water per day while maintaining high performance standards.

4.7.2 CII Programs

Water Smart Hotel Program

Water used in hotels and other lodging businesses accounts for approximately 15 percent of the total water use in commercial and institutional facilities in the United States. The Water Smart Hotel Program provides water use surveys, customized facility reports, technical assistance, and enhanced incentives to hotels that invest in water use efficiency improvements. Rebates available include HETs, ultralow volume urinals, air-cooled ice machines, weather-based irrigation controllers (WBIC), and rotating nozzles.

Socal Water\$mart Rebate Program for CII

The District through MWDOC offers financial incentives under the Socal Water\$mart Rebate Program which offers rebates for various water efficient devices to CII customers, such as HETs, ultralow volume urinals, connectionless food steamers, air-cooled ice machines, pH-cooling towers controller, and dry vacuum pumps.

4.7.3 Landscape Programs

Turf Removal Program

The Orange County Turf Removal Program offers incentives to remove non-recreational turf grass from commercial properties throughout the County. This program is a partnership between MWDOC, Metropolitan, and local retail water agency. The goals of this program are to increase water use efficiency within Orange County, reduce runoff leaving the properties, and evaluate the effectiveness of turf removal as a water-saving practice. Participants are encouraged to replace their turf grass with drought-tolerant landscaping, diverse plant palettes, and artificial turf, and they are encouraged to retrofit their irrigation systems with Smart Timers and drip irrigation (or to remove it entirely).

Water Smart Landscape Program

MWDOC's Water Smart Landscape Program is a free water management tool for homeowner associations, landscapers, and property managers. Participants in the program use the Internet to track their irrigation meter's monthly water use and compare it to a custom water budget established by the program. This enables property managers and landscapers to easily identify areas that are over/under watered and enhances their accountability to homeowner association boards.

Smart Timer Rebate Program

Smart Timers are irrigation clocks that are either WBICs or soil moisture sensor systems. WBICs adjust automatically to reflect changes in local weather and site-specific landscape needs, such as soil type,

slopes, and plant material. When WBICs are programmed properly, turf and plants receive the proper amount of water throughout the year. During the fall months, when property owners and landscape professionals often overwater, Smart Timers can save significant amounts of water.

Rotating Nozzles Rebate Program

The Rotating Nozzle Rebate Program provides incentives to residential and commercial properties for the replacement of high-precipitation rate spray nozzles with low-precipitation rate multi-stream, multi-trajectory rotating nozzles. The rebate offered through this Program aims to offset the cost of the device and installation.

Spray to Drip Rebate Program

The Spray to Drip Pilot Rebate Program offers residential and commercial customers rebates for converting planting areas irrigated by spray heads to drip irrigation. Drip irrigation systems are very water-efficient. Rather than spraying wide areas, drip systems use point emitters to deliver water to specific locations at or near plant root zones. Water drips slowly from the emitters either onto the soil surface or below ground. As a result, less water is lost to wind and evaporation.

SoCal Water\$mart Rebate Program for Landscape

The District through MWDOC also offers financial incentives under the SoCal Water\$mart Rebate Program for a variety of water efficient landscape devices, such as Central Computer Irrigation Controllers, large rotary nozzles, and in-stem flow regulators.

5 WATER SHORTAGE CONTINGENCY PLAN

5.1 Overview

In connection to recent water supply challenges, the State Water Board found that California has been subject to multi-year droughts in the past, and the American Southwest is becoming drier, increasing the probability of prolonged droughts in the future. Due to current and potential future water supply shortages, Governor Brown issued a drought emergency proclamation on January 2014 and signed the 2014 Executive Order which directs urban water suppliers to implement drought response plans to limit outdoor irrigation and wasteful water practices if they are not already in place. Pursuant to California Water Code Section 106, it is the declared policy of the State that the use of water for domestic use is the highest use of water and that the next highest use is for irrigation. In southern California, the development of such policies has occurred at both the wholesale and retail level.

This section describes the water supply shortage policies Metropolitan and the District have in place.

5.2 Shortage Actions

5.2.1 Metropolitan

Metropolitan's imported supplies have been impacted by a number of water supply challenges. In response to these challenges, Metropolitan has implemented existing policies and developed new ones.

The first action that Metropolitan implements in the event of a water shortage is the suspension and/or reduction of its interruptible supplies, which are supplies sold at a discount in return for the buyers agreeing to be the first to be cutback in the event of a shortage.

Metropolitan's Board of Directors adopted the WSAP in February 2008 in the event that Metropolitan was unable to meet "firm demands" (non-interruptible supplies). The WSAP was updated in June 2009 but was terminated in April 2011 due to wet weather conditions in California.

Metropolitan's plan includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2015 UWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines in Metropolitan's 1999 Water Surplus and Drought Management (WSDM) Plan. The plan's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account the impact on retail customers and the economy, growth and population, changes in supply conditions, investments in local resources, demand hardening aspects of non-potable recycled water use, implementation of conservation savings program, participation in Metropolitan's interruptible programs, and investments in facilities.

The formula is calculated in three steps: 1) based period calculations, 2) allocation year calculations, and 3) supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of supply and demand is calculated using data from the three most recent non-shortage years, 2004-2006.

Step 2: Allocation Year Calculations – The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Step 3: Supply Allocation Calculations – The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula are discussed in detail in Metropolitan’s WSAP.

In order to implement the WSAP, the Metropolitan Board makes a determination on the level of the regional shortage, based on specific criteria, in April annually. The allocations, if deemed necessary, go into effect in July of the same year and remain in effect for a 12-month period. The schedule is made at the discretion of the Board.

Metropolitan’s 2015 UWMP forecasts that Metropolitan will be able to meet projected firm demands throughout the forecast period from 2020 to 2040. However, these projections do not mean that Metropolitan would not implement its WSAP during this period (Metropolitan, 2015 Draft UWMP, December 2015).

5.2.2 MWDOC

To prepare for the potential allocation of imported water supplies from Metropolitan, MWDOC worked collaboratively with its 28 retail agencies to develop its own WSAP that was adopted in January 2009. The MWDOC WSAP outlines how MWDOC will determine and implement each retail agency’s allocation during a time of shortage.

The MWDOC WSAP uses a similar method and approach, when reasonable, as that of the Metropolitan’s WSAP. However, MWDOC’s plan remains flexible to use as an alternative approach when Metropolitan’s method produces a significant unintended result for the member agencies. The MWDOC WSAP model follows five (5) basic steps to determine a retail agency’s imported supply allocation.

Step 1: Determine Baseline Information – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the last three non-shortage calendar years, 2004, 2005, and 2006.

Step 2: Establish Allocation Year Information – In this step, the model adjusts for each retail agency’s water need in the allocation year. This is done by adjusting the base period estimates for increased retail water demand based on growth and changes in local supplies.

Step 3: Calculate Initial Minimum Allocation Based on Metropolitan’s Declared Shortage Level – This step sets the initial water supply allocation for each retail agency. After a regional shortage level is established, MWDOC will calculate the initial allocation as a percentage of adjusted Base Period Imported water needs within the model for each retail agency.

Step 4: Apply Allocation Adjustments and Credits in the Areas of Retail Impacts, Conservation, and the Interim Agriculture Water Program – In this step, the model assigns additional water to address disparate impacts at the retail level caused by an across-the-board cut of imported supplies. It also applies a conservation credit given to those agencies that have achieved additional water savings at the retail level as a result of successful implementation of water conservation devices, programs and rate structures.

Step 5: Sum Total Allocations and Determine Retail Reliability – This is the final step in calculating a retail agency's total allocation for imported supplies. The model sums an agency's total imported allocation with all of the adjustments and credits and then calculates each agency's retail reliability compared to its Allocation Year Retail Demand.

The MWDOC WSAP includes additional measures for plan implementation, including the following:

- **Appeal Process** – An appeals process to provide retail agencies the opportunity to request a change to their allocation based on new or corrected information. MWDOC anticipates that under most circumstances, a retail agency's appeal will be the basis for an appeal to Metropolitan by MWDOC.
- **Melded Penalty Rate Structure** – At the end of the allocation year, MWDOC would only charge a penalty to each retail agency that exceeded their allocation if MWDOC exceeds its total allocation and is required to pay a penalty to Metropolitan. Metropolitan enforces allocations to retail agencies through a tiered penalty rate structure: penalty rates to a retail agency that exceeds its total annual allocation at the end of the twelve-month allocation period, according to a specified rate structure. MWDOC's penalty would be assessed according to the retail agency's prorated share (AF over usage) of MWDOC penalty amount with Metropolitan. Penalty funds collected by Metropolitan will be invested in water conservation and local resource development.
- **Tracking and Reporting Water Usage** – MWDOC will provide each retail agency with water use monthly reports that will compare each retail agency's current cumulative retail usage to their allocation baseline. MWDOC will also provide quarterly reports on it cumulative retail usage versus its allocation baseline.
- **Timeline and Option to Revisit the Plan** – The allocation period will cover 12 consecutive months and the Regional Shortage Level will be set for the entire allocation period. MWDOC only anticipates calling for allocation when Metropolitan declares a shortage; and no later than 30 days from Metropolitan's declaration will MWDOC announce allocation to its retail agencies.

Due to the complexity of calculating allocations and the potential for unforeseen circumstances that may occur during an allocation year, after one year of implementation, MWDOC staff and retail agencies have the opportunity to make recommendations to the MWDOC Board that will improve the method, calculation, and approach of the MWDOC WSAP.

5.2.3 Trabuco Canyon Water District

On January 1, 2009, the District adopted Water Conservation Ordinance Number 2008-18 (Ordinance) with the purpose of establishing a water conservation and supply shortage program to reduce water consumption within the District service area through conservation efforts, allow for effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water at all times, and

maximize the efficient use of water within the District to avoid and minimize the effects and hardship of water shortages to the greatest extent possible.

This Ordinance established permanent water conservation standards in order to reduce water use during non-shortage conditions and establish three levels of water supply shortage response actions. Each stage further restricts water use in response to worsening drought or emergency conditions as determined by the District Board of Directors. These three stages are summarized in Table 5-1 (Trabuco Canyon Water District, Ordinance No. 2008-18, December 2008).

Table 5-1: Stages of Water Shortage Contingency Plan

Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction ¹	Water Supply Condition
1	5% to 15%	A Level 1 Water Supply Shortage exists when the District determines that due to drought or other supply reduction, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure supplies will be available to meet anticipated demands.
2	15% to 30%	A Level 2 Water Supply Shortage exists when the District determines that due to drought or other supply reduction, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure supplies will be available to meet anticipated demands.
3	>30%	A Level 3 Emergency exists when the Board of Directors finds and declares a water shortage emergency condition pursuant to California Water Code, Section 350, and requires a 30% consumer reduction.
<i>¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.</i>		
NOTES:		

5.3 Three-Year Minimum Water Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates for the purposes of meeting the requirements of the Act.

Section 135 of the Metropolitan Water District Act declares that a member agency has the right to invoke its “preferential right” to water, which grants each member agency a preferential right to purchase a percentage of Metropolitan’s available supplies based on specified, cumulative financial contributions to Metropolitan. Each year, Metropolitan calculates and distributes each member agency’s percentage of preferential rights. However, since Metropolitan’s creation in 1927, no member agency has ever invoked these rights as a means of acquiring limited supplies from Metropolitan.

MWDOC has adopted a shortage allocation plan and accompanying allocation model that estimates firm demands on MWDOC. Assuming MWDOC would not be imposing mandatory restrictions if Metropolitan

is not, the estimate of firms demands in MWDOC’s latest allocation model has been used to estimate the minimum imported supplies available to each of MWDOC’s customer agencies for 2015-2018. Thus, the estimate of the minimum imported supplies available to the District is 1,455 AF (MWDOC, Water Shortage Allocation Model, August 2010).

As captured in its 2015 UWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan and MWDOC will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands through the year 2040. Additionally, through a variety of groundwater reliability programs local supplies are projected to be maintained at demand levels. Based on the MWDOC WSAP, the District is expected to fully meet demands for the next three years assuming Metropolitan is not in shortage and zero allocations are imposed for Imported Supplies. The Three Year Estimated Minimum Water Supply is listed in Table 5-2.

Table 5-2: Minimum Supply Next Three Years (AF)

Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	3,085	3,085	3,085
NOTES:			

5.4 Catastrophic Supply Interruption

Given the great distances that imported supplies travel to reach Orange County, the region is vulnerable to interruptions along hundreds of miles aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, the infrastructure in place to deliver supplies are susceptible to damage from earthquakes and other disasters.

5.4.1 Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM Plan and WSAP. Metropolitan also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the southern California region, including seismic events along the San Andreas Fault. In addition, Metropolitan is working with the State to implement a comprehensive improvement plan to address catastrophic occurrences that could occur outside of the southern California region, such as a maximum probable seismic event in the Delta that would cause levee failure and disruption of SWP deliveries. For greater detail on Metropolitan’s planned responses to catastrophic interruption, please refer to Metropolitan’s 2015 UWMP.

5.4.2 Water Emergency Response of Orange County

In 1983, the Orange County water community identified a need to develop a plan on how agencies would respond effectively to disasters impacting the regional water distribution system. The collective efforts of

these agencies resulted in the formation of the Water Emergency Response Organization of Orange County (WEROC) to coordinate emergency response on behalf of all Orange County water and wastewater agencies, develop an emergency plan to respond to disasters, and conduct disaster training exercises for the Orange County water community. WEROC was established with the creation of an indemnification agreement between its member agencies to protect each other against civil liabilities and to facilitate the exchange of resources. WEROC is unique in its ability to provide a single point of contact for representation of all water and wastewater utilities in Orange County during a disaster. This representation is to the county, state, and federal disaster coordination agencies. Within the Orange County Operational Area, WEROC is the recognized contact for emergency response for the water community.

5.5 Prohibitions, Penalties and Consumption Reduction Methods

5.5.1 Prohibitions

Conservation Ordinance 2008-18 lists water conservation requirements which shall take effect upon implementation by the District. These prohibitions shall promote the efficient use of water, reduce or eliminate water waste, and enable implementation of the District's Water Shortage Contingency Measures. The prohibitions and the stages at which they take effect can be found in Table 5-3.

Table 5-3: Restrictions and Prohibitions on End Uses

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
Permanent Year-Round	Landscape - Limit landscape irrigation to specific times	Watering of lawn, landscape or other turf areas except between the hours of 6:00 p.m. and 9:00 a.m. is prohibited, except by use of a hand -water shut -off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	No

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than ten (10) minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather-based controllers or stream rotor sprinklers that meet a seventy percent (70%) efficiency standard.	No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	No person shall allow lands, groundcover, shrubbery, other landscape material, or open ground, to be watered at any time while it is raining. Automatic irrigation controllers may be turned off manually. All irrigation controllers associated with dedicated landscape meters shall have a rain shutoff device which overrides the program in the event of rainfall.	No
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation		No
Permanent Year-Round	Other - Prohibit use of potable water for washing hard surfaces		No
Permanent Year-Round	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		No
Permanent Year-Round	Water Features - Restrict water use for decorative	Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.	No

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
	water features, such as fountains		
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		No
Permanent Year-Round	CII - Restaurants may only serve water upon request		No
Permanent Year-Round	CII - Lodging establishment must offer opt out of linen service		No
Permanent Year-Round	Other	Installation of single pass cooling systems is prohibited in buildings requesting new water service.	No
Permanent Year-Round	Other	Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry operations.	No
Permanent Year-Round	Other	Commercial car wash facilities shall not permit the washing of any boat or vehicle in such facility or on its premises, other than by the following methods: 1) use of mechanical automatic car wash facilities using water recycling equipment, 2) use of a hose that operates on a timer and shuts off automatically at the expiration of the time period, 3) use of a hose equipped with an automatic shutoff nozzle, and/or 4) use of bucket and hand washing.	No
Permanent Year-Round	Other	No person shall use a water hose to wash any type of equipment or machinery, or any portion thereof, unless the hose is equipped with an automatic shutoff nozzle.	No

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
Permanent Year-Round	Other	No person shall use a water hose, including pressure-washing, to clean the exterior of any building or structure unless such hose is equipped with an automatic shutoff nozzle.	No
Permanent Year-Round	Other water feature or swimming pool restriction	No person shall empty and refill a swimming pool except to prevent or repair structural damage or to comply with public health regulations or directives or upon written recommendations of a pool maintenance or repair professional.	No
Permanent Year-Round	CII - Commercial kitchens required to use pre-rinse spray valves		No
Permanent Year-Round	Other	No person may use water from any District fire hydrant for any purpose other than fire suppression or emergency aid, without first obtaining a District hydrant meter account or written approval from the Water Conservation Coordinator or his/her designee. Absent such a meter or written permission, current District water theft and meter tampering penalties, charges and policies will be applied based on the District's Rules and Regulations.	No
Permanent Year-Round	Other	Every person shall minimize runoff beyond the immediate area of use. Every person is deemed to have under their control at all times their distribution lines and facilities and to know the manner and extent of their water use and excess runoff. Gutter flooding is specifically prohibited.	No
Permanent Year-Round	Other	No person shall cause or permit the indiscriminate running of water not otherwise prohibited above which is wasteful and without reasonable purpose.	No

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific days	Watering or irrigation of lawn, landscape, or other vegetated area is limited to four (4) calendar days per week on a schedule established and posted by the District. During the months of November through March, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than three (3) days per week on a schedule established and posted by the District. This restriction does not apply to any landscape irrigation system that exclusively uses very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes
1	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape or other vegetated area is limited to five (5) minutes watering per station per day. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than seventy-two (72) hours of receiving notice from the District.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces		Yes

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Landscape - Limit landscape irrigation to specific days	Watering or irrigation of lawn, landscape, or other vegetated area is limited to two (2) calendar days per week on a schedule established and posted by the District. During the months of November through March, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and posted by the District. This restriction does not apply to any landscape irrigation system that exclusively uses very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than forty-two (42) hours of receiving notice from the District.	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	The operation of any ornamental fountain or similar structure is prohibited.	Yes
2	Other water feature or swimming pool restriction	Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life or to protect public health or sanitation, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage.	Yes
2	Other water feature or swimming pool restriction	Refilling of more than one (1) foot and initial filling of residential swimming pools or	Yes

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
		outdoor spas with potable water is prohibited.	
3	Landscape - Prohibit all landscape irrigation	This restriction does not apply to the maintenance of vegetation that are watered using a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water, the maintenance of existing landscape necessary for fire protection and for soil erosion control, maintenance of plant materials identified to be rare or essential to the well-being of rare animals, and actively irrigated environmental mitigation projects.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Using water to wash or clean a vehicle is prohibited.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than twenty-four (24) hours of receiving notice from the District.	Yes
3	Other	No new potable water service, new temporary meters, and statement of immediate ability to serve or provide water service will be issued except under the following circumstances: 1) a valid, unexpired building permit has been issued for the project, 2) the project is necessary to protect the public health, safety, and welfare, or 3) the applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.	Yes

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
NOTES:			

5.5.2 Penalties

A first violation of any provisions of the Ordinance will result in the District issuing a written warning that will be delivered in person or by mail.

A second violation, defined as a subsequent violation within the succeeding twelve calendar months after an initial violation, is punishable by a fine not exceeding one hundred dollars.

A third violation, defined as a subsequent violation within the succeeding twelve calendar months after an initial violation, is punishable by a fine not exceeding two hundred and fifty dollars.

Fourth and subsequent violations after an initial violation is punishable by a fine not exceeding five hundred dollars. In addition, the district may, at its discretion, install a water flow restrictor device of approximately one gpm capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight hours. The person in violation is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnective service per the District's schedule of charges then in effect. The device can only be removed after payment has been received for installing and/or removing any flow restricting device. Nonpayment shall be subject to the same remedies as nonpayment of basic water rates (Trabuco Canyon Water District, Ordinance No. 2008-18, December 2008).

5.5.3 Consumption Reduction Methods

Table 5-4 lists the consumption reduction methods that will be used to reduce water use in restrictive stages.

Table 5-4: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
1	Other	Level 1 Water Watch Conservation Measures
2	Other	Level 2 Water Alert Conservation Measures
3	Other	Level 3 Water Supply Emergency Conservation Measures
NOTES:		

5.6 Impacts to Revenue

During a catastrophic interruption of water supplies, prolonged drought, or water shortage of any kind, the District will experience a reduction in revenue due to reduced water sales. Throughout this period of time, expenditures may increase or decrease with varying circumstances. Expenditures may increase in the event of significant damage to the water system, resulting in emergency repairs. Expenditures may also decrease as less water is pumped through the system, resulting in lower power costs.

The District receives water revenue from a service charge and a commodity charge based on consumption. The service charge recovers costs associated with providing water to the serviced property. The service charge does not vary with consumption and the commodity charge is based on water usage. Rates have been designed to recover the full cost of water service in the charges. Therefore, the total cost of purchasing water would decrease as the usage or sale of water decreases.

However, there are significant fixed costs associated with maintaining a minimal level of service. The District will monitor projected revenues and expenditures should an extreme shortage and a large reduction in water sales occur for an extended period of time. To overcome these potential revenue losses and/or expenditure impacts, the District may use reserves. If necessary, the District may reduce expenditures by delaying implementation of its Capital Improvement Program and equipment purchases, and/or adjust the work force. In response to the mandated 25 percent reduction in potable water use due to the statewide drought declaration by the Governor in April 2015, the District proposed a Temporary Revenue Stabilization Charge (TRSC) as a part of the 2015 Cost of Service Study. The TRSC will recover the loss in revenue which is needed to cover the District's fixed costs. The TRSC was approved by the District in 2015 and will be implemented and maintained for the duration of the statewide drought.

5.7 Reduction Measuring Mechanism

The District implements its Ordinance, which imposes prohibitions, regulations of water use, and penalties for violations of water use during times of severe water shortages. Demands must be monitored frequently during emergency water shortages to enable the District to effectively manage the balance between supply and demand. All individual accounts in the District are metered, and overall water production and the status of the District's supply is continuously monitored through District facilities and its Supervisory Control and Data Acquisition System. Water production figures are recorded daily and weekly and monthly reports are prepared and monitored. The obtained data is used to measure actual

2015 URBAN WATER MANAGEMENT PLAN

water savings resulting from the effectiveness of any water shortage contingency stage that may be implemented.

6 RECYCLED WATER

Southern California discharges treated wastewater to the ocean every day that could potentially be reused, reducing reliance on imported water sources. Reuse opportunities have continued to grow with public acceptance and decreased imported water deliveries. Recycled water provides flexibility and reliability during drought conditions as imported water supplies diminish. Recycled water is wastewater that is purified through primary, secondary and tertiary treatment and is acceptable for most non-potable water purposes such as irrigation, commercial and industrial processes per Title 22 requirements. The District's existing recycled water system provides the service area with a supplemental irrigation supply.

6.1 Agency Coordination

There are a number of water agencies in south Orange County that provide potable water service as well as wastewater collection and treatment to recycled water standards. These agencies have been in the forefront of recycled water development to diversify water supplies because 1) they depend on imported water for the majority of their potable water supplies and 2) groundwater supplies are limited due to the local geography. Each of these agencies provides recycled water where feasible.

The District's non-potable water supply consists of urban runoff and recycled wastewater from the eastern and main portion of the District. In the eastern portion of the District, 100 percent of the wastewater is recycled at the RRWWTP. The central portion of the District is on septic and cannot be recycled and the western portion of the District's wastewater is blended with flows from IRWD and SMWD and sent to the CWWRP for treatment and disposal.

6.2 Wastewater Description and Disposal

The District generates approximately 0.65 MGD of wastewater. The District's wastewater collection system includes approximately 36 miles of sewers and interceptors ranging from 8 inches to 15 inches in diameter, 8 sewer lift stations, and 9 miles of force mains. The existing wastewater collection system consists of two separate areas/systems on the east and west. Wastewater collected in these areas are sent to one of two treatment plants based on location. The District's service area is shown on Figure 6-1.

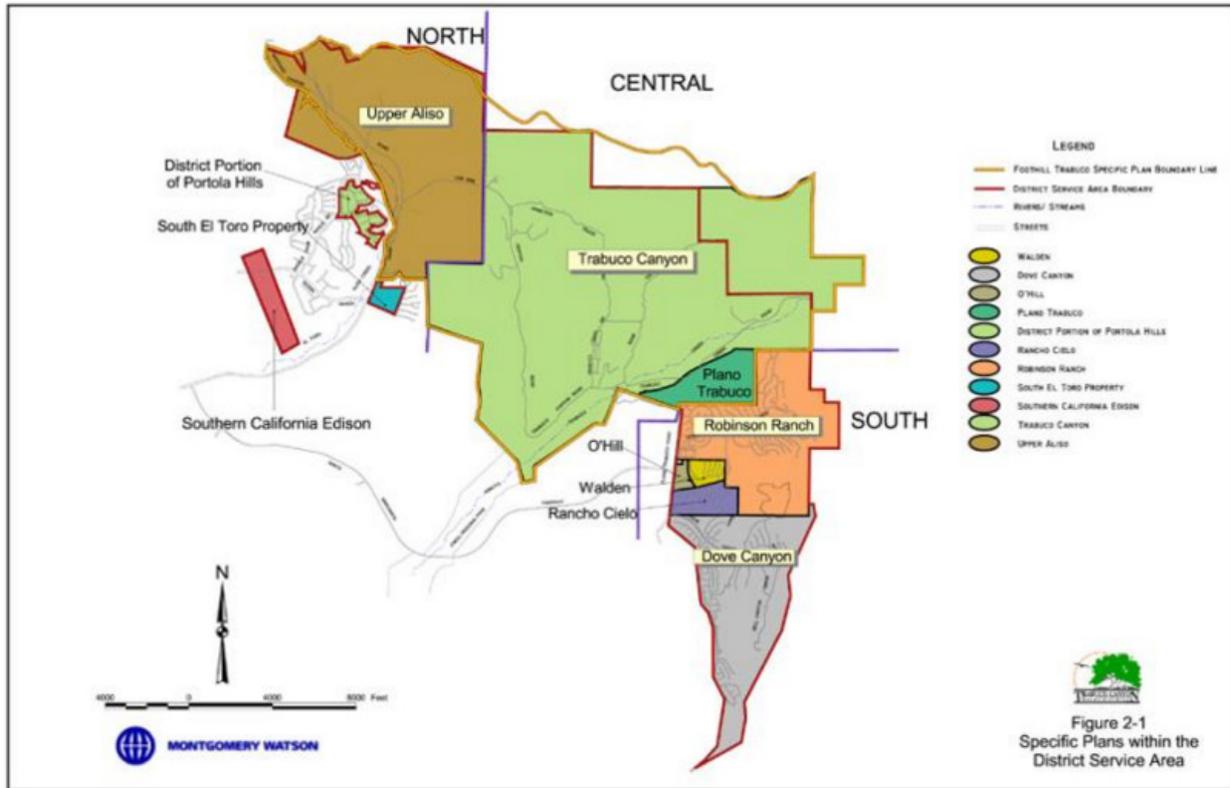


Figure 6-1: Recycled Water Service Area

The District owns and operates the RRWWTP that provides collection and treatment for developments on the east side of the service area. The RRWWTP is located in the Robinson Ranch development shown on Figure 6.1, has a treatment capacity of 0.85 MGD, and the tertiary treated water is fed into the recycled water reservoir that has a storage capacity of 130 AF.

The wastewater from the west side of the District's service area is sent to SMWD's CWWRP located in the City of San Juan Capistrano for treatment and disposal. The CWWRP has a capacity of 9 MGD, of which 5 MGD is recycled each day and distributed for irrigation in SMWD's service area. The District owns 125,000 GPD of capacity at the CWWRP. Effluent from the CWWRP is treated to secondary or tertiary levels depending on the disposal method, ocean outfall or beneficial reuse. The tertiary treated water is reused, while secondary effluent is conveyed to the San Juan Creek Ocean Outfall.

Table 6-1 summarizes the wastewater collected by the District in its collection system in 2015. Table 6-2 shows the amount of the District's wastewater treated, recycled and disposed of by the District and SMWD in 2015.

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Table 6-1: Wastewater Collected Within Service Area in 2015 (AF)

Retail: Wastewater Collected Within Service Area in 2015					
Wastewater Collection			Recipient of Collected Wastewater		
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?
Trabuco Canyon Water District	Estimated	630	Trabuco Canyon Water District	Robinson Ranch Wastewater Treatment Plant	Yes
Trabuco Canyon Water District	Estimated	112	SMWD	Chiquita Water Reclamation Plant	No
Total Wastewater Collected from Service Area in 2015:		742			
NOTES:					

2015 URBAN WATER MANAGEMENT PLAN

Table 6-2: Wastewater Treatment and Discharge within Service Area in 2015 (AF)

Retail: Wastewater Treatment and Discharge Within Service Area in 2015									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Robinson Ranch Wastewater Treatment Plant	No discharge	No discharge	Other	No	Tertiary	630	0	630	0
Chiquita Water Treatment Plant	San Juan Creek Ocean Outfall	Dana Point/Laguna Beach	Ocean outfall	Yes	Tertiary	112	0	0	112
					Total	742	0	630	112
NOTES:									

6.3 Current Recycled Water Uses

The District distinguishes between urban runoff and recycled water reclaimed at the treatment plant by designating the treated wastewater as reclaimed, and urban and captured runoff as recycled. This supply is used in the District's non-domestic water system. The District's recycled water system is supplied with tertiary treated water from the RRWWTP that is blended with urban runoff from Dove Lake as part of the District's Dry Season Water Recovery Project, also referred to as Urban Runoff Capture and Reuse Project. The local runoff from a section of Trabuco Highlands is captured at the Shadow Rock Detention Basin and conveyed to Dove Lake or recycled at the adjacent nursery. The remaining section of Trabuco Highlands plus most of Dove Canyon and Robinson Ranch is captured and stored in Dove Lake to augment the non-potable irrigation system. Aeration and vegetation controls in the lake improve the water quality. The urban runoff supply from FY 2014-15 was approximately 95 AF. The two non-potable supplies are blended in the recycled water storage reservoir prior to distribution or blended and treated and pumped into the recycled water distribution system.

Recycled water is used to irrigate parks, golf courses, and greenbelts in Robinson Ranch, Trabuco Highlands, and Dove Canyon Communities and offsets demand on imported potable water. The District's recycled water is delivered via pipelines to customers within the District service area. The District's recycled water distribution system consists of 5.1 miles of pipeline, two sets of booster pump stations with a total pumping capacity of 6,270 gpm, and two open reservoirs with a combined capacity of 545 million gallons.

The District annually produces approximately 800 AF of recycled water for their service area. This includes non-potable production from the Robinson Ranch treatment plant, urban runoff, and non-potable amounts pumped from Dove Lake. Projected recycled water use increase after 2015, but are consistent through 2040 as shown in Table 6-3.

2015 URBAN WATER MANAGEMENT PLAN

Table 6-3: Current and Projected Recycled Water Direct Beneficial Use within Service Area (AF)

Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area								
Name of Agency Producing (Treating) the Recycled Water:		TCWD						
Name of Agency Operating the Recycled Water Distribution System:		TCWD						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040
Agricultural irrigation			0	150	0	0	0	0
Landscape irrigation (excludes golf courses)	Parks and greenbelts	Tertiary	397	400	590	590	590	590
Golf course irrigation		Tertiary	406	410	410	410	410	410
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)								
Surface water augmentation (IPR)								
Direct potable reuse								
Other	Type of Use							
			Total:	803	960	1,000	1,000	1,000
<i>IPR - Indirect Potable Reuse</i>								
NOTES:								

The projected 2015 recycled water use from the District’s 2010 UWMP was compared to the 2015 actual recycled water use as shown in Table 6-4. Recycled water for 2015 was projected higher in the 2010 UWMP than the actual recycled water use in 2015.

Table 6-4: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (AF)

Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
Use Type	2010 Projection for 2015	2015 actual use
Agricultural irrigation		
Landscape irrigation (excludes golf courses)	1,035	397
Golf course irrigation		406
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Surface water augmentation (IPR)		
Direct potable reuse		
Other	Required for this use	
Total	1,035	803
NOTES:		

6.4 Potential Recycled Water Uses

Conversion customers are those that currently use potable water for demands that can also be met with recycled water such as landscape irrigation. Conversion customers are assessed based on their economical proximity to recycled water facilities. Table 6-5 provides a list of methods to expand future recycled water use.

Table 6-5: Expected Future Water Supply Projects or Programs (AF)

Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Sakaida Nursery	Shadow Rock Project-urban runoff from Trabuco Highlands	2016	20
TY Nursery	Conversion Project on Plano Trabuco	2016	130
Total			150
NOTES: Recycled demand is approximately 50% of the total water demands			

By 2025, Sakaida and TY Nursery may be developed to medium density developments that use recycled water for common area landscape. Medium density developments use approximately 0.42 AF per dwelling unit per year of water, based on the District's 2016 Domestic Water Storage and Reservoir Siting Study.

6.4.1 Direct Non-Potable Reuse

The District currently uses water from their recycled water system for direct non-potable reuse such as landscape irrigation and golf courses.

6.4.2 Indirect Potable Reuse

The District does not have the potential for indirect potable reuse (IPR) within their service area.

6.5 Optimization Plan

In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, businesses, and communal landscaping. Future recycled water use can be increased by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pump stations and transmission pipelines to reach areas that are further from treatment plants. Gains in implementing some of these projects have been made throughout the county. However, additional costs, large energy requirements, and capital costs for facilities all contribute to the high costs of such projects.

In order to determine if additional projects are feasible, studies must be performed to determine if the project should be pursued. Feasibility studies should include evaluation of alternatives with a present worth analysis consisting of capital costs (design, environmental reviews, construction, etc.) and operations and maintenance costs (electrical costs for pumps and equipment and maintenance required for the system).

The District will continue to conduct feasibility studies for recycled water and seek out creative solutions such as funding, regulatory requirements, institutional arrangement and public acceptance for recycled water use with MWDOC, Metropolitan and other cooperative agencies

7 FUTURE WATER SUPPLY PROJECTS AND PROGRAMS

7.1 Water Management Tools

With the improvements in the water recycling process, along with conservation efforts, the District can optimize its facilities and more effectively meet projected demands.

7.2 Transfer or Exchange Opportunities

Interconnections with other agencies result in the ability to share water supplies during short term emergency situations or planned shutdowns of major imported systems. The District has the capability to transfer and exchange water to and from the District with neighboring districts, SMWD and IRWD. Through various arrangements, water can be transferred/exchanged to and from these and other districts for short durations such as emergencies or water transmission line breaks.

MWDOC continues to help its retail agencies develop transfer and exchange opportunities that promote reliability within the system. Therefore, MWDOC will look to help its retail agencies navigate the operational and administrative issues of wheeling water through the Metropolitan distribution system. Currently, there are no additional transfer or exchange opportunities.

7.3 Planned Water Supply Projects and Programs

The District is committed to supporting programs to maximize existing water sources and minimize the region's dependency on imported water supplies. The District's planned water supply projects and programs are described below and summarized in Table 7-1.

Plano Trabuco Recycled Waterline Extension Project - This project will extend the existing recycled water distribution system along Plano Trabuco Road to provide recycled water to the TY Nursery and additional areas in Robinson Ranch. This project will reduce domestic water use and help the District meet mandated cutbacks.

Baker Water Treatment Plant – The Baker Water Treatment Plant is a new drinking water treatment plant to be located at the existing Baker Filtration Plant in the City of Lake Forest. This plant will have a capacity of 28.1 MGD and is a joint regional project that will increase the reliable drinking water supply for the ETWD, IRWD, Moulton Niguel Water District (MNWD), SMWD, and the District during emergencies and extended facility shutdowns and will provide operational flexibility. The plant will treat raw, imported water from Metropolitan and local surface water from Irvine Lake using advanced microfiltration and ultraviolet (UV) disinfection, resulting in high quality drinking water that exceeds current regulatory requirements. Construction is underway and is expected to be completed in mid-2016. The District's plant capacity ownership equates to approximately 1.3 (1,450) AFY if supply is available and capacity fully used. A location map of the Baker Treatment Plant and surrounding agencies is provided on Figure 7.1.



Figure 7.1 Baker Treatment Plant Location Map

Table 7-1: Expected Future Water Supply Projects or Programs (AF)

Retail: Expected Future Water Supply Projects or Programs					
Name of Future Projects or Programs	Joint Project with other agencies?		Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
Baker Water Treatment Plant	Yes	ETWD, IRWD, MNWD, SMWD	2016	Average Year	1,450
Plano Trabuco Recycled Waterline Extension Project	No	TCWD	2016	Average Year	130
NOTES:					

7.4 Desalination Opportunities

Desalination of ocean water provides a potentially large supply of drought-proof water that is restricted by coastal siting issues, system integration from the coastal areas inland and the cost competitiveness.

In 2001, Metropolitan developed a Seawater Desalination Program (SDP) to provide incentives for development of new seawater desalination projects in Metropolitan's service area. In 2014, Metropolitan modified the provisions of the Local Resources Program (LRP) to include incentives for locally produced seawater desalination projects that reduce the need for imported supplies. To qualify for the incentive, proposed projects must replace an existing demand or prevent new demand on Metropolitan's imported water supplies. In return, Metropolitan offers two incentive formulas under the program:

- Up to \$340 per AF for 25 years, depending on the unit cost of the seawater project cost compared to the cost of Metropolitan supplies
- Up to \$475 per AF for 15 years, depending on the unit cost of the seawater project cost compared to the cost of Metropolitan supplies

Development of local supplies within the Metropolitan service area are part of the overall goal of the IRP to improve water supply reliability in the region by creating new supplies that reduce pressure on imported supplies from the SWP and the Colorado River.

On May 6th, 2015, the SWRCB approved an amendment to the state's Water Quality Control Plan for the Ocean Waters of California (California Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities (Desalination Amendment). The amendment supports the use of ocean water as a reliable supplement to traditional water supplies while protecting marine life and water quality. The California Ocean Plan now formally acknowledges seawater desalination as a beneficial use of the Pacific Ocean and the Desalination Amendment provides a uniform, consistent process for permitting of seawater desalination facilities statewide.

If the following projects are developed, Metropolitan's imported water deliveries to Orange County could be reduced. These projects include the Huntington Beach Seawater Desalination Project, the Doheny Desalination Project, and the Camp Pendleton Seawater Desalination Project.

While the District is not a participant in a desalination project, the District is supportive of projects, like desalination, that reduce the region's reliance on imported water. In the sections that follow, background and information is provided on planned projects in Orange County that will result in improving water reliability in the region and reduce the region's reliance on imported water.

7.4.1 Groundwater (Brackish Sources)

The District's Trabuco Creek Wells Facility pumps and treats local and fresh or non-brackish groundwater, when available. The local groundwater is a fresh water source available on a seasonal basis and heavily reliant on precipitation. The District does not have any plans for groundwater desalination of a brackish water supply but is supportive of such projects that reduce the region's reliance on imported water and provide a local source of supply.

7.4.2 Ocean Water

Huntington Beach Seawater Desalination Project – Poseidon Resources LLC (Poseidon), a private company, is developing the Huntington Beach Seawater Desalination Project to be co-located at the AES Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water to provide approximately 10 percent of Orange County's water supply needs.

Over the past several years, Poseidon has been working with OCWD on the general terms and conditions for selling the water to OCWD. OCWD and MWDOD have proposed a few distribution options to agencies in Orange County. The northern option proposes the water be distributed to the northern agencies closer to the plant within OCWD's service area with the possibility of recharging/injecting a portion of the product water into the OC Groundwater Basin. The southern option builds on the northern option by delivering a portion of the product water through the existing OC-44 pipeline for conveyance to the south Orange County water agencies. A third option is also being explored that includes all of the product water to be recharged into the OC Groundwater Basin. Currently, a combination of these options could be pursued.

OCWD's current Long-Term Facilities Plan (LTFP) identifies the Huntington Beach Seawater Desalination project as a priority project and determined the plant capacity of 56,000 AFY as the single largest source of new, local drinking water available to the region. In addition to offsetting imported demand, water from this project could provide OCWD with management flexibility in the OC Groundwater Basin by augmenting supplies into the Talbert Seawater Barrier to prevent seawater intrusion.

In May 2015, OCWD and Poseidon entered into a Term Sheet that provided the overall partner structure in order to advance the project. Based on the initial Term Sheet, Poseidon would be responsible for permitting, financing, design, construction, and operations of the treatment plant while OCWD would purchase the production volume, assuming the product water quality and quantity meet specific contract parameters and criteria. Furthermore, OCWD would then distribute the water in Orange County using one of the proposed distribution options described above.

Currently, the project is in the late-stages of the regulatory permit approval process and Poseidon hopes to obtain the last discretionary permit necessary to construct the plant from the California Coastal Commission (CCC) in 2016. If the CCC permit is obtained, the plant could be operational as early as 2019.

Doheny Desalination Project – In 2013, after five years and \$6.2 million to investigate use of a slant well intake for the Doheny Desalination Project, it was concluded the project was feasible and could produce 15 MGD (16,800 AFY) of new potable water supplies to five participating agencies. These agencies consist of: South Coast Water District (SCWD), City of San Clemente, City of San Juan Capistrano, Laguna Beach County Water District (LBCWD) and MNWD.

Only SCWD and LBCWD expressed interest in moving forward after work was completed, with the other agencies electing to monitor the work and consider options to subsequently come back into the project while considering other water supply investments.

More recently, LBCWD has had success in using previously held water rights in the OC groundwater basin and may elect to move forward with that project instead of ocean desalination. A final decision is pending based on securing the necessary approvals on the groundwater project.

SCWD has taken the lead on the project and has hired a consulting team to proceed with project development for the Doheny Desalination Project. Major items scheduled over the next year include:

- Preliminary Design Report and Cost Estimate
- Brine Outfall Analysis
- Environmental Impact Report (EIR) Process
- Environmental Permitting Approvals
- Public Outreach
- Project Funding
- Project Delivery Method
- Economic Analysis

The aggressive schedule for this project includes start-up and operation of up to a 5 MGD (5,600 AFY) facility by the end of 2019. SCWD anticipates leaving the option open for other agencies to participate in a full 15 MGD facility with subsequent permitting and construction of additional wells and treatment capacity.

Camp Pendleton Seawater Desalination Project – San Diego County Water Authority (SDCWA) is studying a desalination project to be located at the southwest corner of Camp Pendleton Marine Corps Base adjacent to the Santa Margarita River. The initial project would be a 50 (56,000 AFY) or 100 (112,100) MGD plant with expansions in 50 MGD increments to a maximum capacity of 150 MGD (168,100 AFY), making this the largest proposed desalination plant in the US.

The project is currently in the feasibility study stage and SDCWA is conducting geological surveys, intake options, and studies of the effect on ocean life and routes to bring desalinated water to SDCWA's delivery system. MWDOC and south Orange County agencies are maintaining an interest in the project.

8 UWMP ADOPTION PROCESS

Recognizing that close coordination among other relevant public agencies is key to the success of its UWMP, the District worked closely with other entities such as MWDOC to develop and update this planning document. The District also encouraged public involvement by holding a public hearing for residents to learn and ask questions about their water supply.

This section provides the information required in Article 3 of the Water Code related to adoption and implementation of the UWMP. Table 8-1 summarizes external coordination and outreach activities carried out by the District and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix A.

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Encouraged public involvement (Public Hearing), Regular Board and Engineering and Operational Committee Meetings, Newspaper, and On-Tap Newsletter	5/27/16 & 6/3/16	Appendix E
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	3/8/16	Appendix E
Held public hearing	6/15/16	Appendix E
Adopted UWMP	6/15/16	Appendix F
Submitted UWMP to DWR	7/1/16	-
Submitted UWMP to the California State Library and city or county within the supplier's service area	8/1/16	-
Made UWMP available for public review	8/1/16	-

This UWMP was adopted by the Board of Directors on June 15, 2016. A copy of the adopted resolution is provided in Appendix F.

A change from the 2004 legislative session to the 2009 legislative session required the District to notify any city or county within its service area at least 60 days prior to the public hearing. As shown in Table 8-2, the District sent a Letter of Notification to the County of Orange, the City of Rancho Santa Margarita, the City of Lake Forest and the City of Mission Viejo on March 8, 2016 to state that it was in the process of preparing an updated UWMP (Appendix E).

Table 8-2: Notification to Cities and Counties

Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Rancho Santa Margarita	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lake Forest	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mission Viejo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name	60 Day Notice	Notice of Public Hearing
Orange County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NOTES:		

8.1 Public Participation

The District encouraged community and public interest involvement in the plan update through public hearings and inspection of the draft document. Public hearing notifications were distributed through the District’s On-Tap Newsletter included with the monthly utility bills and published in the local newspaper. A copy of the published Notice of Public Hearing is included in Appendix E. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the District’s plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the District’s main office. Plan discussion was also held on several monthly regular Board of Directors and Engineering and Operational Committee meetings with a public hearing held on June 15, 2016 for plan discussion, review, and adoption.

8.2 Agency Coordination

All of the District's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The District is dependent on imported water from Metropolitan through MWDOC, its regional wholesaler. The District is also dependent on groundwater from the Arroyo Trabuco aquifer. The District involved these aforementioned water providers in the development of its 2015 UWMP at various levels of contribution.

As the District is a member agency of MWDOC, MWDOC provided assistance to the District’s 2015 UWMP development by providing much of the data and analysis such as population projections, demand projections, and SBx7-7 modeling. The District’s UWMP was developed in collaboration with MWDOC’s

2015 RUWMP to ensure consistency between the two documents as well as Metropolitan's 2015 RUWMP and 2015 IRP.

8.3 UWMP Submittal

8.3.1 Review of Implementation of 2010 UWMP

As required by California Water Code, the District summarizes the implementation of the Water Conservation Programs to date, and compares the implementation to those as planned in its 2010 UWMP.

Comparison of 2010 Planned Water Conservation Programs with 2015 Actual Programs

As a signatory to the MOU regarding urban water use efficiency, the District's commitment to implement BMP-based water use efficiency program continues today. For the District's specific achievements in the area of conservation, please see Section 4 of this Plan.

Comparison of 2010 Projected Recycled Water Use with 2015 Actual Use

Current recycled water projections for the District in 2015 are about 24 percent less than previously forecasted for 2015 in the 2010 UWMP, as illustrated in Table 6-4.

8.3.2 Filing of 2015 UWMP

The Board of Directors reviewed the Final Draft Plan on June 15, 2016. The five-member Board of Directors approved the 2015 UWMP on June 15, 2016. See Appendix F for the resolution approving the Plan.

By July 1, 2016, the District's Adopted 2015 UWMP was filed with DWR. By August 1, 2016, the District's Adopted 2015 UWMP was filed with California State Library, County of Orange, and made available at its website www.tcwd.ca.gov.

REFERENCES

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- Trabuco Canyon Water District, 2015 Water Quality Report.
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- Urban Water Management Planning Act, California Water Code § 10610-10656 (2010).
- Water Conservation Act of 2009, California Senate SB x7-7, 7th California Congress (2009).
- Water Systems Optimization, 2016. California Department of Water Resources: Water Audit Manual.

APPENDIX A

UWMP Checklist



UWMP Checklist

This checklist is developed directly from the Urban Water Management Planning Act and SB X7-7. It is provided to support water suppliers during preparation of their UWMPs. Two versions of the UWMP Checklist are provided – the first one is organized according to the California Water Code and the second checklist according to subject matter. The two checklists contain duplicate information and the water supplier should use whichever checklist is more convenient. In the event that information or recommendations in these tables are inconsistent with, conflict with, or omit the requirements of the Act or applicable laws, the Act or other laws shall prevail.

Each water supplier submitting an UWMP can also provide DWR with the UWMP location of the required element by completing the last column of either checklist. This will support DWR in its review of these UWMPs. The completed form can be included with the UWMP.

If an item does not pertain to a water supplier, then state the UWMP requirement and note that it does not apply to the agency. For example, if a water supplier does not use groundwater as a water supply source, then there should be a statement in the UWMP that groundwater is not a water supply source.

Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	Section 1.1
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	Section 8.2
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	Section 8.1
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 1.3.1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 2.2.1
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	Section 2.2.2
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 2.2.2
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 2.2.2
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 2.3.1 and 2.4.3
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	Section 2.3.4 and Appendix G
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	Section 2.4.5
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	Section 2.5.2
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and	Baselines and Targets	Chapter 5 and App E	Section 2.5.2.2

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Section 2.5.2.2
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	Section 2.5.2.2
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	Section 2.5.2.2
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	N/A
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Section 2.5.2.2
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	Section 3.4
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Section 3.3
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	N/A
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	N/A
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	N/A
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	N/A
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of	System Supplies	Section 6.2.4	N/A

	groundwater pumped by the urban water supplier for the past five years			
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	Section 3.3
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	Section 7.2
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	Section 7
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 7.4
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	Section 3.4
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	N/A
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	Section 6.1
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	Section 6.2
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	Section 6.2
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	Section 6.3
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	Section 6.4
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in	System Supplies (Recycled Water)	Section 6.5.4	Section 6.3

	comparison to uses previously projected.			
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.4
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.5
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 7.1
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	Section 3.6
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	Section 3.6.5
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	Section 3.6
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	Section 3.6.2.3
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	Section 3.6
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	Section 5.2
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	Section 5.3
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	Section 5.4
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	Section 5.5.1
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	Section 5.5.3
10632(a)(6)	Indicated penalties or charges for excessive	Water Shortage Contingency	Section 8.3	Section

	use, where applicable.	Planning		5.5.2
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	Section 5.6
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	Appendix C
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	Section 5.7
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	Section 4
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	N/A
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	Section 4 and Appendix I
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	Section 8.1
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Appendix D
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	Section 8.3.3
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 8.3.3
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Section 8.1

	public hearing, and held a public hearing about the plan.			
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	Appendix D
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Appendix E
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	Section 8.3.3
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 8.2
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Section 8.3.3
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 8

APPENDIX B

Standardized Tables



Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3010094	Trabuco Canyon Water District	3,985	3,703
TOTAL		3,985	3,703

NOTES: Fiscal Year 14-15

Table 2-2: Plan Identification

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance <i>if applicable</i> <i>drop down list</i>
<input checked="" type="checkbox"/>	Individual UWMP		
	<input type="checkbox"/>	Water Supplier is also a member of a RUWMP	
	<input checked="" type="checkbox"/>	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)		

NOTES:

Table 2-3: Agency Identification

Type of Agency (select one or both)

<input type="checkbox"/>	Agency is a wholesaler
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<input checked="" type="checkbox"/>	Agency is a retailer
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Fiscal or Calendar Year (select one)

<input type="checkbox"/>	UWMP Tables Are in Calendar Years
--------------------------	-----------------------------------

<input checked="" type="checkbox"/>	UWMP Tables Are in Fiscal Years
-------------------------------------	---------------------------------

If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)

7/1

Units of Measure Used in UWMP (select from Drop down)

Unit	AF
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NOTES:

Table 2-4 Retail: Water Supplier Information Exchange
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The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.

MWDOC

Santiago Aqueduct Commission

NOTES:

Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040
	12,712	13,200	14,115	14,735	15,876	15,861

NOTES: Center for Demographic Research, California State University, Fullerton

Table 4-1 Retail: Demands for Potable and Raw Water - Actual

Use Type <i>(Add additional rows as needed)</i>	2015 Actual		
<p><u>Use Drop down list</u> <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i></p>	Additional Description <i>(as needed)</i>	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Single Family		Drinking Water	1,766
Multi-Family		Drinking Water	35
Commercial	Includes District use for RW system and minor construction	Drinking Water	243
Landscape	HOA's common areas and Mandated Fuel Modification Zones (Irrigated zones for fire prevention per Fire Authority)	Drinking Water	387
Agricultural irrigation	Commercial Nurseries	Drinking Water	287
Losses	Includes hydrant flushing, line breaks, and sewer cleaning	Drinking Water	182
			2,900
NOTES: Data retrieved from District Customer Class Usage Data and FY 2014-2015 Retail Tracking.			

Table 4-2 Retail: Demands for Potable and Raw Water - Projected

Use Type <i>(Add additional rows as needed)</i>	Additional Description <i>(as needed)</i>	Projected Water Use <i>Report To the Extent that Records are Available</i>				
<u>Use Drop down list</u> <i>May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>		2020	2025	2030	2035	2040
Single Family		2,010	2,615	2,805	2,825	2,825
Multi-Family		45	55	55	55	55
Commercial	Includes District use for RW system and minor construction	300	300	300	300	300
Landscape	Large	300	400	400	400	400
Agricultural irrigation		110	10	10	10	10
Losses	Includes hydrant flushing, line breaks, and sewer	190	190	190	190	190
TOTAL		2,955	3,570	3,760	3,780	3,780

NOTES: Data retrieved from District Customer Class Usage Data and Retail Water Agency Projections.

Table 4-3 Retail: Total Water Demands

	2015	2020	2025	2030	2035	2040
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	2,900	2,955	3,570	3,760	3,780	3,780
Recycled Water Demand <i>From Table 6-4</i>	803	960	1,000	1,000	1,000	1,000
TOTAL WATER DEMAND	3,703	3,915	4,570	4,760	4,780	4,780

NOTES:

Table 4-4 Retail: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
07/2014	235

NOTES:

Table 4-5 Retail Only: Inclusion in Water Use Projections

<p>Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i></p>	<p>Yes</p>
<p>If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.</p>	<p>Section 4.1</p>
<p>Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i></p>	<p>Yes</p>

NOTES:

Table 5-1 Baselines and Targets Summary*Retail Agency or Regional Alliance Only*

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1991	2005	267	233	200
5 Year	2004	2008	210		

*All values are in Gallons per Capita per Day (GPCD)

NOTES:

Table 5-2: 2015 Compliance
Retail Agency or Regional Alliance
*Only**

Actual 2015 GPCD	2015 Interim Target GPCD	Did Supplier Achieve Targeted Reduction for 2015? Y/N
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204	233	Yes
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**All values are in Gallons per Capita per*

NOTES:

Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type <i>Drop Down List</i> <i>May use each category multiple times</i>	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Arroyo Trabuco Aquifer	476	365	44	0	0
TOTAL		476	365	44	0	0

NOTES:

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015

Wastewater Collection			Recipient of Collected Wastewater		
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? <i>Drop Down List</i>	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? <i>Drop Down List</i>
Trabuco Canyon Water District	Estimated	630	Trabuco Canyon Water District	Robinson Ranch Wastewater Treatment Plant	Yes
Trabuco Canyon Water District	Estimated	112	SMWD	Chiquita Water Reclamation Plant	No
Total Wastewater Collected from Service Area in 2015:		742			

NOTES:

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level <i>Drop down list</i>	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Robinson Ranch Wastewater Treatment Plant	No discharge	No discharge	Other	No	Tertiary	630	0	630	0
Chiquita Water Treatment Plant	San Juan Creek Ocean Outfall	Dana Point/Laguna Beach	Ocean outfall	Yes	Tertiary	112	0	0	112
Total						742	0	630	112
NOTES:									

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

Name of Agency Producing (Treating) the Recycled Water:		TCWD						
Name of Agency Operating the Recycled Water Distribution System:		TCWD						
Beneficial Use Type <i>These are the only Use Types that will be recognized by the DWR online submittal tool</i>	General Description of 2015 Uses	Level of Treatment <i>Drop down list</i>	2015	2020	2025	2030	2035	2040
Agricultural irrigation			0	150	0	0	0	0
Landscape irrigation (excludes golf courses)	Parks and greenbelts	Tertiary	397	400	590	590	590	590
Golf course irrigation		Tertiary	406	410	410	410	410	410
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)								
Surface water augmentation (IPR)								
Direct potable reuse								
Other	Type of Use							
Total:			803	960	1,000	1,000	1,000	1,000
<i>IPR - Indirect Potable Reuse</i>								
NOTES:								

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

Use Type <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>	2010 Projection for 2015	2015 actual use
Agricultural irrigation		
Landscape irrigation (excludes golf courses)	1,035	397
Golf course irrigation		406
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Surface water augmentation (IPR)		
Direct potable reuse		
Other	Required for this use	
Total	1,035	803
NOTES:		

Table 6-6 Retail: Methods to Expand Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Sakaida Nursery	Shadow Rock Project-urban runoff from Trabuco Highlands	2016	20
TY Nursery	Conversion Project on Plano Trabuco	2016	130
Total			150
NOTES: Recycled demand is approximately 50% of the total water demands			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other agencies?		Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i> <i>User may select more than one.</i>	Expected Increase in Water Supply to Agency <i>This may be a range.</i>
Baker Water Treatment Plant	Yes	ETWD, IRWD, MNWD, SMWD	2016	Average Year	1,450
Plano Trabuco Recycled Waterline Extension Project	No	TCWD	2016	Average Year	130

NOTES:

Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015	
<i>Drop down list</i> <i>May use each category multiple times.</i> <i>These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Actual Volume	Water Quality <i>Drop Down List</i>
Groundwater	San Juan Groundwater Basin	0	Drinking Water
Purchased or Imported Water	MWDOC	2,900	Drinking Water
Surface water	Irvine Lake	0	Raw Water
Recycled Water		803	Recycled Water
Total		3,703	

NOTES:

Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>				
<i>Drop down list</i> <i>May use each category multiple times.</i> <i>These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		2020	2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater	San Juan Groundwater Basin	230	230	230	230	230
Purchased or Imported Water	MWDOC	2,725	3,340	3,530	3,550	3,550
Recycled Water		960	1,000	1,000	1,000	1,000
Total		3,915	4,570	4,760	4,780	4,780

NOTES:

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year <i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i>	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	1990-2014		100%
Single-Dry Year	2014		109%
Multiple-Dry Years 1st Year	2012		109%
Multiple-Dry Years 2nd Year	2013		109%
Multiple-Dry Years 3rd Year	2014		109%

NOTES: Based on OC Reliability Study

Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2020	2025	2030	2035	2040
Supply totals <i>(autofill from Table 6-9)</i>	3,915	4,570	4,760	4,780	4,780
Demand totals <i>(autofill from Table 4-3)</i>	3,915	4,570	4,760	4,780	4,780
Difference	0	0	0	0	0

NOTES:

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040
Supply totals	4,267	4,981	5,188	5,210	5,210
Demand totals	4,267	4,981	5,188	5,210	5,210
Difference	0	0	0	0	0
NOTES:					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040
First year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0
Second year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0
Third year	Supply totals	4,267	4,981	5,188	5,210	5,210
	Demand totals	4,267	4,981	5,188	5,210	5,210
	Difference	0	0	0	0	0

NOTES:

**Table 8-1 Retail
Stages of Water Shortage Contingency Plan**

Stage	Complete Both	
	Percent Supply Reduction ¹ <i>Numerical value as a percent</i>	Water Supply Condition <i>(Narrative description)</i>
1	5% to 15%	A Level 1 Water Supply Shortage exists when the District determines that due to drought or other supply reduction, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure supplies will be available to meet anticipated demands.
2	15% to 30%	A Level 2 Water Supply Shortage exists when the District determines that due to drought or other supply reduction, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure supplies will be available to meet anticipated demands.
3	>30%	A Level 3 Emergency exists when the Board of Directors finds and declares a water shortage emergency condition pursuant to California Water Code, Section 350, and requires a 30% consumer reduction.

¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.

NOTES:

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses

Stage	Restrictions and Prohibitions on End Users <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference <i>(optional)</i>	Penalty, Charge, or Other Enforcement? <i>Drop Down List</i>
Permanent Year-Round	Landscape - Limit landscape irrigation to specific times	Watering of lawn, landscape or other turf areas except between the hours of 6:00 p.m. and 9:00 a.m. is prohibited, except by use of a hand-water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than ten (10) minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather-based controllers or stream rotor sprinklers that meet a seventy percent (70%) efficiency standard.	No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	No person shall allow lands, groundcover, shrubbery, other landscape material, or open ground, to be watered at any time while it is raining. Automatic irrigation controllers may be turned off manually. All irrigation controllers associated with dedicated landscape meters shall have a rain shutoff device which overrides the program in the event of rainfall.	No
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation		No
Permanent Year-Round	Other - Prohibit use of potable water for washing hard surfaces		No
Permanent Year-Round	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		No
Permanent Year-Round	Water Features - Restrict water use for decorative water features, such as fountains	Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.	No
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		No
Permanent Year-Round	CII - Restaurants may only serve water upon request		No
Permanent Year-Round	CII - Lodging establishment must offer opt out of linen service		No
Permanent Year-Round	Other	Installation of single pass cooling systems is prohibited in buildings requesting new water service.	No
Permanent Year-Round	Other	Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry operations.	No

Permanent Year-Round	Other	Commercial car wash facilities shall not permit the washing of any boat or vehicle in such facility or on its premises, other than by the following methods: 1) use of mechanical automatic car wash facilities using water recycling equipment, 2) use of a hose that operates on a timer and shuts off automatically at the expiration of the time period, 3) use of a hose equipped with an automatic shutoff nozzle, and/or 4) use of bucket and hand washing.	No
Permanent Year-Round	Other	No person shall use a water hose to wash any type of equipment or machinery, or any portion thereof, unless the hose is equipped with an automatic shutoff nozzle.	No
Permanent Year-Round	Other	No person shall use a water hose, including pressure-washing, to clean the exterior of any building or structure unless such hose is equipped with an automatic shutoff nozzle.	No
Permanent Year-Round	Other water feature or swimming pool restriction	No person shall empty and refill a swimming pool except to prevent or repair structural damage or to comply with public health regulations or directives or upon written recommendations of a pool maintenance or repair professional.	No
Permanent Year-Round	CII - Commercial kitchens required to use pre-rinse spray valves		No
Permanent Year-Round	Other	No person may use water from any District fire hydrant for any purpose other than fire suppression or emergency aid, without first obtaining a District hydrant meter account or written approval from the Water Conservation Coordinator or his/her designee. Absent such a meter or written permission, current District water theft and meter tampering penalties, charges and policies will be applied based on the District's Rules and Regulations.	No
Permanent Year-Round	Other	Every person shall minimize runoff beyond the immediate area of use. Every person is deemed to have under their control at all times their distribution lines and facilities and to know the manner and extent of their water use and excess runoff. Gutter flooding is specifically prohibited.	No
Permanent Year-Round	Other	No person shall cause or permit the indiscriminate running of water not otherwise prohibited above which is wasteful and without reasonable purpose.	No

1	Landscape - Limit landscape irrigation to specific days	Watering or irrigation of lawn, landscape, or other vegetated area is limited to four (4) calendar days per week on a schedule established and posted by the District. During the months of November through march, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than three (3) days per week on a schedule established and posted by the District. This restriction does not apply to any landscape irrigation system that exclusively uses very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes
1	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape or other vegetated area is limited to five (5) minutes watering per station per day. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than seventy-two (72) hours of receiving notice from the District.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces		Yes
2	Landscape - Limit landscape irrigation to specific days	Watering or irrigation of lawn, landscape, or other vegetated area is limited to two (2) calendar days per week on a schedule established and posted by the District. During the months of November through march, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and posted by the District. This restriction does not apply to any landscape irrigation system that exclusively uses very low-flow drip irrigation where no emitter produces more than two (2) gallons of water per hour and by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than forty-two (48) hours of receiving notice from the District.	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	The operation of any ornamental fountain or similar structure is prohibited.	Yes

2	Other water feature or swimming pool restriction	Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needs to sustain aquatic life or to protect public health or sanitation, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage.	Yes
2	Other water feature or swimming pool restriction	Refilling of more than one (1) foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.	Yes
3	Landscape - Prohibit all landscape irrigation	This restriction does not apply to the maintenance of vegetation that are watered using a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water, the maintenance of existing landscape necessary for fire protection and for soil erosion control, maintenance of plant materials identified to be rare or essential to the well-being of rare animals, and actively irrigated environmental mitigation projects.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Using water to wash or clean a vehicle is prohibited.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than twenty-four (24) hours of receiving notice from the District.	Yes
3	Other	No new potable water service, new temporary meters, and statement of immediate ability to serve or provide water service will be issued except under the following circumstances: 1) a valid, unexpired building permit has been issued for the project, 2) the project is necessary to protect the public health, safety, and welfare, or 3) the applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.	Yes

NOTES:

**Table 8-3 Retail Only:
Stages of Water Shortage Contingency Plan - Consumption Reduction Methods**

Stage	Consumption Reduction Methods by Water Supplier <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference <i>(optional)</i>
1	Other	Level 1 Water Watch Conservation Measures
2	Other	Level 2 Water Alert Conservation Measures
3	Other	Level 3 Water Supply Emergency Conservation Measures
NOTES:		

Table 8-4 Retail: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	3,085	3,085	3,085

NOTES:

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Rancho Santa Margarita	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lake Forest	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mission Viejo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
Orange County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NOTES:		

APPENDIX C

Groundwater Management Plan



A copy of the SJBA GWMP can be found at
www.sjbauthority.com

APPENDIX D

District Ordinance



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Appendix:

ORDINANCE NO. 2008-18

ORDINANCE OF THE BOARD OF DIRECTORS OF THE TRABUCO CANYON WATER DISTRICT MAKING FINDINGS, ADOPTING A WATER CONSERVATION PROGRAM SUPERSEDING ORDINANCE NO. 91-14 AND TAKING RELATED ACTIONS

THE BOARD OF DIRECTORS OF THE TRABUCO CANYON WATER DISTRICT DOES ORDAIN AS FOLLOWS:

Section I: Authority:

This Ordinance No. 2008-18 ("Ordinance") is enacted pursuant to Sections 30000 *et seq.*, including, but not limited to, Sections 31026-31029, inclusive, and Sections 375-377, inclusive, of the Water Code of the State of California. The Trabuco Canyon Water District (TCWD or DISTRICT) may establish additional guidelines, penalties, cost recovery systems, enforcement procedures and other rules and regulations to assist in the conservation of water. TCWD has the power to restrict the use of water supplied to TCWD customers during any emergency caused by drought, or other threatened or existing water shortage, and to prohibit the wastage of water supplied to TCWD customers, or the use of water, during such periods. TCWD may prohibit use of such water during such periods for specific uses which TCWD may, from time to time, find to be nonessential.

Section II. Findings and Determinations:

The Board hereby finds and determines as follows:

- a. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the southern California region.
- b. Southern California is a semi-arid region and is largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State and western United States, make the region highly susceptible to water supply reliability issues and situations.
- c. Careful water management, which includes active water conservation measures not only in times of drought but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.
- d. Trabuco Canyon Water District is a county water district organized and operating pursuant to the laws of the State of California and which has, as one of its functions, the authority to provide for the provision of water and water services to its customers.
- e. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

- f. California Water Code Section 375 authorizes public agency water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.
- g. California Water Code Sections 31026-31029, inclusive, authorize county water districts to provide for restrictions and limitations on use of water during drought and/or threatened or existing water shortage situations.
- h. TCWD has undertaken various efforts, planning efforts and facilities projects to improve and support local water supplies, water re-use and imported water facilities and arrangements in order to meet water demands of TCWD's current and future customers; however, circumstances do occur, and may occur in the future, which necessitate planning and measures to address water shortages on state-wide and local levels.
- i. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the District's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the District. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.
- j. The protection, conservation, and management of local and imported water supplies are one of the main functions of TCWD as a public agency water provider. The Board of Directors of TCWD, based on the actions mandated by the Governor of the State of California, the Metropolitan Water District of Southern California (MWD) and the Municipal Water District of Orange County (MWDOC) and a review of the factual circumstances, has determined the necessity of adopting and implementing a comprehensive, mandatory water conservation plan to reduce overall District usage to meet mandated levels and have declared a water shortage emergency within the State of California.
- k. It is known that the public agencies supplying water to TCWD may mandate water rationing to the District because of limited supplies.
- l. It is known that the distribution or storage facilities of public agencies supplying water to TCWD may become inadequate to meet demands.
- m. That due to circumstances or events beyond the control of TCWD or other public agencies, a major failure of the supply, storage and distribution facilities of the public agencies supplying water to TCWD may occur.

Section III. Declaration of Purpose and Intent:

- a. The purpose of this Ordinance is to establish a water conservation and supply shortage program in order to (i) reduce water consumption within the District through conservation, (ii) allow for effective water supply planning, (iii) assure reasonable and beneficial use of water, (iv) prevent waste of water at all times, and (v) maximize the efficient use of water within the District to avoid and minimize the effect(s) and hardship of water shortage(s) to the greatest extent possible.
- b. This Ordinance establishes permanent water conservation standards intended to alter behavior related to water use efficiency for non-shortage conditions and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergencies, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies as determined by the Board.

Section IV. Definitions:

- a. The following words and phrases whenever used in this Ordinance shall have the meaning defined in this section:
1. **“Billing Unit”** means the unit of water used to apply water rates for purposes of calculating water charges for a person’s water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.
 2. **“Board”** means the Board of Directors of the District.
 3. **“District”** or **“TCWD”** means the Trabuco Canyon Water District, a county water district organized and operating pursuant to the laws of the State.
 4. **“Effective Date”** means the date this Ordinance becomes effective.
 5. **“Efficiency Standard”** means the percentage of water delivered to plant roots that is used beneficially.
 6. **“Enforcing attorney”** means TCWD’s General Legal Counsel, acting as counsel to the District and his/her/their designee(s), or the Orange County District Attorney, which counsel is authorized to take enforcement action as set forth herein.
 7. **“Impervious surface”** means a constructed or modified surface that cannot effectively infiltrate rainfall. The term includes, but is not limited to, sidewalks, driveways, parking lots, v-ditches, gutters and roadways.
 8. **“Landscape Irrigation System”** means an irrigation system which is used for watering landscape, greenbelts and similar which may include pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.
 9. **“Large Landscape Areas”** means a lawn, greenbelt, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.
 10. **“Major Water Users”** means those District customers within any specific customer classification which are using or consuming more than the allocated billing units for that classification.
 11. **“Non-essential water use”** means the application or usage of water for functions or additional activities which do not have any health or safety impacts, are not required by regulation, and are not part of the core function or business process at a site.
 12. **“Ordinance”** means this Ordinance No. 2008-18 as adopted, and as such may be amended by the District from time to time.
 13. **“Person”** means any natural person, property owner, renter, or lessee, as well as any corporation, partnership, government entity or subdivision, trust, estate, cooperative association, homeowners’ association, joint venture, business entity, or other similar entity, or the property management company, property manager, agent, employee or representative of any of the above.
 14. **“Potable Water”** means water which is suitable for drinking.

15. **“Properly programmed”** refers to a timer based, weather-based, and/or sensor-based irrigation controller that has been programmed according to the manufacturer’s instructions and site-specific conditions.
16. **“Quasi-Public Entity”** means an entity, other than a governmental agency, whether characterized by statute as a public corporation, public instrumentality, or otherwise, that is expressly created by statute for the purpose of administration of a State or local function.
17. **“Reclaimed Water”** means non-potable water which has been treated at a wastewater treatment facility and is available for irrigation use.
18. **“Recycled Water”** means non-potable water collected by the District from dry season water flow or storm water flow and is available for irrigation use.
19. **“Sensor-based irrigation controller”** means an irrigation controller that operates based on input received from any combination of sensors, such as rain, solar radiation, and soil moisture sensor, installed within and/or around the irrigated landscape area.
20. **“Single Pass Cooling Systems”** means equipment where water is circulated only once to cool systems and/or equipment before being disposed of.
21. **“State”** means the State of California.
22. **“Stormwater drainage system”** means any street, street gutter, sidewalk, alleyway, channel, storm drain, constructed drain, lined diversion structure, wash area, inlet, outlet or other facility, which is a part of or tributary to the county-wide stormwater runoff system and owned, operated, maintained or controlled by the County of Orange, the Orange County Flood Control District or any NPDES permit co-permittee city, and used for the purpose of collecting, storing, transporting, or disposing of stormwater.
23. **“Timer Based Irrigation Controller”** means an irrigation controller that is adjustable by day, date, and time per irrigation station.
24. **“Urban runoff”** means all flows in the stormwater drainage system and consists of stormwater and non-stormwater flows.
25. **“Water Waste”** means uses of water which are prohibited or limited, going beyond the purpose of necessary or intended use, including area runoff, and which could reasonably be prevented.
26. **“Water Conservation Coordinator”** is the District’s General Manager or his/her designee(s) or such other officer(s) or employee(s) of the District as the District shall direct.
27. **“Water Quality Regulations”** are the storm water regulations as defined by the respective jurisdiction of the County of Orange, the Orange County Flood Control District or any NPDES permit co-permittee city.
28. **“Weather-based irrigation controller”** means an irrigation controller that operates based on evapotranspiration rates and historic and/or real-time weather data.

Section V. Application:

- a. The provisions of this Ordinance apply to any person in the use of any Potable Water provided by the District.
- b. The provisions of this Ordinance shall apply within the District's boundaries and to District customers.
- c. The provisions of this Ordinance do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.
- d. The provisions of this Ordinance do not apply to the use of Reclaimed Water or Recycled Water, with the exception of Section VI(a).
- e. This Ordinance is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. This Ordinance shall not act to repeal, supersede or amend any federal, State or local law, ordinance or regulation relating to protection of water quality or control of drainage or runoff (including, but not limited to, any and all NPDES permits or requirements which may be applicable in such instance) or exempt any person or party from compliance therewith.

Section VI: Permanent Water Conservation Requirements – Prohibition Against Waste:

The following water conservation requirements shall be effective at all times while this Ordinance is in effect (unless otherwise specifically determined and directed by the Board). Violations of this section shall be considered waste and an unreasonable use of water.

- a. **Limits on Watering Hours:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 9:00 a.m. and 6:00 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- b. **Limit on Watering Duration:** Watering or irrigating of lawn, landscape or other vegetated area with potable water using a Landscape Irrigation System or a watering device that is not continuously attended is limited to no more than ten (10) minutes watering per station, per day. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.
- c. **No Watering While Raining:** No person shall allow lawns, groundcover, shrubbery, other landscape material, or open ground, to be watered at any time while it is raining. Automatic irrigation controllers may be turned off manually, or connected to a rain shutoff device. Effective July 1, 2010, all irrigation controllers associated with dedicated landscape meters shall have a rain shutoff device which overrides the program in the event of rainfall.
- d. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, parking lot, driveway, street, alley, gutter or ditch is prohibited.

- e. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device or a low-volume, high-pressure cleaning machine equipped to recycle water used by such machine(s).
- f. **Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected is prohibited. For irrigation applications, if unattended malfunctions are observed to be causing excessive loss of water, the District may, at its sole discretion, turn off the irrigation to the affected area until such time the property owner can respond to correct the malfunction.
- g. **Re-circulating Water Required for Water Fountains and Decorative Water Features:** Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.
- h. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.
- i. **Drinking Water Served Upon Request Only:** Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.
- j. **Commercial Lodging Establishments Must Provide Option to Not Launder Linen Daily:** Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments shall prominently display notice of this option in each bathroom using clear and easily understood language. Commercial visitor-serving facilities must also ensure that such facility displays, in places visible to all customers, placards or decals approved by the District, promoting public awareness of the need for water conservation.
- k. **No Installation of Single Pass Cooling Systems:** Installation of single pass cooling systems is prohibited in buildings applying for new water service from the District.
- l. **No Installation of Non-re-circulating Commercial Car Wash and Laundry Systems:** Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.
- m. **Commercial Car Washes.** Commercial car wash facilities shall not permit the washing of any boat or vehicle in such facility or on its premises, other than by the following methods:
 - i. Use of mechanical automatic car wash facilities utilizing water recycling equipment;
 - ii. Use of a hose that operates on a timer for limited time periods and shuts off automatically at the expiration of the time period;
 - iii. Use of a hose equipped with an automatic shutoff nozzle; and/or

iv. Use of bucket and hand washing.

(1) All wash/rinse water must be captured and recycled or discharged into the sanitary sewer system through an appropriate treatment system, after obtaining a special discharge permit from the appropriate wastewater Authority.

(2) All new commercial conveyor car wash facilities shall be equipped with a water recycling system.

n. **Washing of Equipment and Machinery:** No person shall use a water hose to wash any type of equipment or machinery, or any portion thereof, unless the hose is equipped with an automatic shutoff nozzle.

THE DISTRICT NOTES THAT APPLICABLE NPDES REQUIREMENTS

INCLUDE: All wash water from such washing/cleaning activity must be prevented from discharging to the stormwater drainage system. All wash water from such washing/cleaning containing chemicals shall be discharged into the sanitary sewer system through an appropriate treatment system. Any person discharging water containing chemicals is required to first obtain a special discharge permit from the South Orange County Wastewater Authority before such water can be discharged to the sanitary sewer.

o. **Cleaning of Structures:** No person shall use water through a hose, including pressure-washing, to clean the exterior of any building or structure unless such hose is equipped with an automatic shutoff nozzle.

THE DISTRICT NOTES THAT APPLICABLE NPDES REQUIREMENTS

INCLUDE: All wash water from such activity must be prevented from discharging to the stormwater drainage system, and shall comply with the City's Water Quality Regulations and Best Management Practices.

p. **Swimming Pools and Spas:** No person shall empty and refill a swimming pool except to prevent or repair structural damage or to comply with public health regulations or directives, or upon written recommendation of a pool maintenance or repair professional.

THE DISTRICT NOTES THAT APPLICABLE NPDES REQUIREMENTS

INCLUDE: Discharge of pool or spa water, other than directly to the sanitary sewer system, shall be consistent with the City's Water Quality Regulations and Best Management Practices. Discharge of pool or spa filter backwash water to the stormwater drainage system is prohibited. All pools and spas shall be equipped with a water recirculation device. The use of a pool/spa cover is strongly encouraged to prevent evaporative water loss, and for the additional energy and chemical saving benefits.

q. **Commercial Laundry Facilities, Laundromats and Common Area Laundry Rooms:** Commercial laundry facilities designed, constructed or reconstructed after the Effective Date of this Ordinance shall be equipped with a water reclamation system for reuse of rinse water. Laundromats and common area laundry rooms shall install high efficiency clothes washing machines as older machines are replaced.

r. **Food Service Facilities:**

1. **Drinking Water:** Food service facilities within the District's service area shall not serve or refill water to customers or patrons, except upon request of such customer(s) or patron(s).
2. **Restaurants Required to Use Water Conserving Dish Wash Spray Valves:** Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.
3. **Dishwashing and Garbage Disposals:** All commercial kitchens with dishwashing facilities shall encourage the activity of scraping food waste into a garbage can rather than using a garbage disposal. All existing pre-rinse spray nozzles shall be retrofitted to models using 1.6 gallons per minute or less, by July 1, 2010.
4. **Public Awareness:** The owner / manager of each restaurant, and other visitor-serving facility shall ensure that such facility displays, in places visible to all customers, placards or decals approved by the District, promoting public awareness of the need for water conservation and/or advising the public that waste of water is prohibited.
5. **Other Water Using Activities:** Defrosting food with running water shall be avoided and discouraged. If using a hose for wash down of kitchens, garbage areas, or any other area required by the health department or for sanitation reasons, it shall have a positive shut off nozzle. Scoop sinks shall be set at minimum flow at all times, and during hours of operation carefully monitored to avoid using water unnecessarily when the scoop sink is not in active use.
6. **New or Remodeled kitchens:** All other water using equipment in kitchens which are designed, constructed, reconstructed or remodeled after the Effective Date of this Ordinance shall use the best available water conserving technology.

s. **Construction:**

1. All water hoses used in connection with any construction activities shall be equipped with an automatic shutoff nozzle when an automatic shutoff nozzle can be purchased or otherwise obtained for the size or type of hose in use.

THE DISTRICT NOTES THAT APPLICABLE NPDES REQUIREMENTS INCLUDE: All water used on a construction site shall be prevented from entering any part of the stormwater drainage system.

- t. **Use of Hydrants:** No person may use water from any District fire hydrant for any purpose other than fire suppression or emergency aid, without first obtaining a District hydrant meter account or written approval from the Water Conservation Coordinator or his/her designee. Absent such a meter or written permission, current District water theft and meter tampering penalties, charges and policies will be applied based on the District's then-existing Rules and Regulations.
- u. **Water Spillage and Runoff:** Every person shall minimize runoff beyond the immediate area of use. Every person is deemed to have under his/her control at all times his/her water distribution lines and facilities, and to know the manner and extent of his/her water use and excess runoff. Gutter flooding is specifically prohibited.
- v. **Indiscriminate Use:** No person shall cause or permit the indiscriminate running of water not otherwise prohibited above which is wasteful and without reasonable purpose.

- w. **Public Health and Safety:** These regulations shall not be construed to limit water use which is immediately necessary to protect public health and/or safety.

Section VII: Level 1 Water Supply Shortage (WATER WATCH)

- a. A Level 1 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply reductions, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure sufficient supplies will be available to meet anticipated demands. Upon the declaration by the District of a Level 1 Water Supply Shortage condition, the District will direct implementation of those the mandatory Level 1 conservation measures as identified in this Section VII. The type of event that may prompt the District to declare a Level 1 Water Supply Shortage may include (but shall not be limited to), among other factors, a finding that the District's wholesale water provider(s) calls for extraordinary water conservation.
- b. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified in Section VI, the following water conservation requirements may be applied during a declared Level 1 Water Supply Shortage:
 - 1. **All non-essential water use shall cease.**
 - 2. **Limits on Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to four days per week on a schedule established and posted by the District. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than three days per week on a schedule established and posted by the District. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
 - 3. **Limit on Watering Duration:** Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than five (5) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard
 - 4. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made with the District.
 - 5. **Pavement/surface washing:** Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas except to alleviate immediate fire or sanitation hazards.

6. **Other Prohibited Uses:** The District may implement other prohibited water uses as determined by the District, after notice to customers.

The determination as to which of the water conservation requirements listed above shall apply during a Level 1 Water Supply Shortage shall either be made by the Board at the time the Level 1 Water Supply shortages declared or such determination may be delegated by the Board to the General Manager or the Water Conservation Coordinator, as the Board shall direct.

Section VIII. Level 2 Water Supply Shortage (WATER ALERT)

- a. A Level 2 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other supply reductions, a water supply shortage exists, or will exist, and a consumer demand reduction is necessary to ensure sufficient supplies will be available to meet anticipate demands. Upon the declaration by the District of a Level 2 Water Supply Shortage condition, the District will direct implementation of those mandatory Level 2 conservation measures as identified in this section.
- b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Sections VI and VII, the following additional water conservation requirements may be applied during a declared Level 2 Water Supply Shortage:
 1. **Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week on a schedule established and posted by the District. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the District. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
 2. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the District unless other arrangements are made with the District.
 3. **Lakes, ponds, fountains, and other water features.** The operation of any ornamental fountain or similar structure is prohibited.
 4. **Limits on Filling Ornamental Lakes or Ponds:** Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life or to protect public health or sanitation, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this Ordinance.
 5. **Limits on Filling Residential Swimming Pools & Spas:** Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.
 6. **Other Prohibited Uses:** The District may implement other prohibited water uses as determined by the District, after notice to District customers.

7. **Water Allocations / Water Budget:** The District, at its option, may establish a water allocation for property served by the District using a method that does not penalize persons for the implementation of conservation methods or the installation of water saving devices. The District shall provide written notice of such allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service.

Following the effective date of such water allocation as established by the District, any person that uses water in excess of the allocation will be subject to a penalty in the amount of 10% of the charge for each tier of water used. The penalty for excess water usage will be cumulative to any other remedy or penalty that may be imposed for violation of this ordinance.

8. **Mandatory Percentage Use Reduction:** During a Level 2 Water Supply Shortage condition, all customers will be required to reduce water consumption by a percentage determined by the District.

The determination as to which of the water conservation requirements listed above shall apply during a Level 2 Water Supply Shortage shall either be made by the Board at the time the Level 2 Water Supply shortage is declared or such determination may be delegated by the Board to the General Manager or the Water Conservation Coordinator, as the Board shall direct.

Section IX. Level 3 Water Supply Shortage – (WATER EMERGENCY)

- a. A Level 3 Water Supply Shortage condition is also referred to as a “Level 3 Emergency” condition. A Level 3 Emergency condition exists when the Board declares a water shortage emergency and notifies District residents, businesses and customers that a significant reduction in consumer demand is necessary to ensure sufficient supplies will be available to meet anticipated health and safety consumer demands. Upon the declaration of a Level 3 Water Supply Shortage Emergency condition, the District will direct implementation of the mandatory Level 3 conservation measures as identified in this Section.
- b. A Level 3 Emergency exists when the Board finds and declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that more than a 30% consumer demand reduction, based on customer type, is required to ensure sufficient supplies for human consumption, sanitation and fire protection. The Board must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code Section 350. in order for a Level 3 Emergency condition to exist for purposes of this Ordinance.
- c. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Sections VI, VII, and VIII, the following water conservation requirements may be applied during a declared Level 3 Emergency:
 1. **No Watering or Irrigating:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction shall not apply to the following categories of use unless the District has determined that recycled water is available and may be lawfully applied to the use:
 - i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation

systems when no emitter produces more than two (2) gallons of water per hour subject to the hour restrictions in Section VI(a).

- ii. Maintenance of existing landscape necessary for fire protection;
 - iii. Maintenance of existing landscape for soil erosion control;
 - iv. Maintenance of plant materials identified to be rare or essential to the well being of rare animals;
 - v. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section VIII(b)(1) and time restrictions in Section VI(a) and (b)(1);
 - vi. Public works projects and actively irrigated environmental mitigation projects.
2. **No Washing of Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited.
 3. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the District unless other arrangements are made with the District.
 4. **No New Potable Water Service:** Upon declaration of a Level 3 Emergency condition, no new potable water service will be provided by the District, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability) will be issued by the District, except under the following circumstances:
 1. A valid, unexpired building permit has been issued for the project;
 2. The project is necessary to protect the public's health, safety, and welfare; and/or
 3. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.

This subsection does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

5. **Discontinue Service:** The District, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this Section.
6. **Other Prohibited Uses:** The District may implement other prohibited water uses as determined by the District, after notice to customers.

The determination as to which of the water conservation requirements listed above shall apply during a Level 3 Water Supply Shortage shall either be made by the Board at the time the Level 3 Water Supply shortage s

declared or such determination may be delegated by the Board to the General Manager or the Water Conservation Coordinator, as the Board shall direct.

Section X. Procedures for Determination / Notification of Water Supply Shortage

- a. **Declaration and Notification of Level 1 & 2 Water Supply Shortage:** The existence of Level 1 and Level 2 Water Supply Shortage conditions may be declared by resolution adopted by the Board at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to the Level 1 or Level 2 conditions, as determined by the Board, shall take effect on the tenth day after the date the shortage level is declared and identified. Within five days following the declaration of the shortage level, the District shall publish a copy of the resolution in a newspaper used for publication of official notices. Upon the cessation of a Level 1 or Level 2 Water Supply Shortage condition shall be determined by the Board, and notice thereof provided in the same manner as set forth above. If the District establishes a water allocation, it shall provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. A water allocation shall be effective on the fifth day following the date of mailing or at such later date as specified in the notice.
- b. **Declaration and Notification of Level 3 Water Supply Shortage:** The existence of a Level 3 Emergency condition may be declared in accordance with the procedures specified in Water Code Sections 351 and 352. The mandatory conservation requirements applicable to the Level 3 conditions, as determined by the Board as set forth herein shall take effect on the tenth (10) day after the date such shortage emergency is declared. Within five (5) days following the declaration of such shortage emergency, the District shall publish a copy of the resolution in a newspaper used for the publication of official notices. If the District establishes a water allocation, it shall provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. A water allocation shall be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

Section XI. Other Provisions

- a. **Commercial Car Wash Systems:** Effective on January 1, 2011, all commercial conveyor car wash systems which use District water must have installed and operational re-circulating water systems or must have secured a waiver of this requirement from the District.
- b. **Large Landscape Areas – Rain Sensors:** Large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.
- c. **Reporting Mechanism - Hotline:** The District shall establish a water use/water waste hotline for residents and customers to report violations of this Ordinance or gross water waste.

Section XII. Hardship Waiver

- a. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of this Ordinance would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to District water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this Section XII.
- b. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.
 1. **Application:** Application for a waiver shall be on a form prescribed by the District and shall be accompanied by a non-refundable processing fee in an amount set by resolution of the District.
 2. **Supporting Documentation:** The application shall be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant in support of such application.
 3. **Required Findings for Variance:** An application for a waiver shall be denied unless the Water Conservation Coordinator finds, based in the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the District or its Agent, all of the following:
 - i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other District residents and businesses;
 - ii. That because of special circumstances applicable to the property or its use, the strict application of this Ordinance would have a disproportionate impact on the property or use that exceeds the impacts to District residents and businesses generally.
 - iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the District to effectuate the purpose of this Ordinance and will not be detrimental to the public interest; and
 - iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.
 4. **Approval Authority:** The Water Conservation Coordinator shall exercise approval authority and act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver shall be promptly notified in writing of any action(s) taken. Unless specified otherwise at the time a waiver is approved, the waiver applies to the subject property during the term of the mandatory water supply shortage condition.

5. **Appeals to the District:** An applicant may appeal a decision or condition of the Water Conservation Coordinator on a waiver application to the Board within 10 days of the decision upon written request for a hearing. The request shall state the grounds for the appeal. At a public meeting, the Board shall act as the approval authority and review the appeal de novo by following the regular waiver procedure. The decision of the Board shall be final.

Section XIII. Penalties and Violations

- a. **Civil Penalties:** Civil penalties for failure to comply with any provisions of the Ordinance shall be as follows:
 1. **First Violation:** The District shall issue a written warning and deliver a copy of this Ordinance in person or by mail.
 2. **Second Violation:** A second violation within the succeeding twelve (12) calendar months after an initial violation is punishable by a fine not to exceed one hundred dollars (\$100).
 3. **Third Violation:** A third violation within the succeeding twelve (12) calendar months after an initial violation is punishable by a fine not to exceed two hundred and fifty (\$250).
 4. **Fourth and Subsequent Violations:** A fourth and any subsequent violation after an initial violation is punishable by a fine not to exceed five hundred (\$500). In addition, the District may also undertake the following actions:
 - i. **Water Flow Restrictor:** In addition to any fines, the District may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.
 - ii. **Termination of Service:** In addition to any fines and the installation of a water flow restrictor, the District may disconnect and/or terminate a customer's water service.
- b. **Cost of Flow Restrictor and Disconnecting Service:** A person or entity that violates this Ordinance is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device shall be paid to the District before the device is removed. Nonpayment shall be subject to the same remedies as nonpayment of basic water rates.
- c. **Separate Offenses:** Each day that a violation of this Ordinance occurs is a separate violation.
- d. **Notice and Hearing:**
 1. The District shall issue a Notice of Violation by mail or personal delivery at least ten (10) days before taking any enforcement action described herein and such notice shall describe the enforcement action(s) to be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed shall be final. Upon receipt of a timely appeal, a hearing on the appeal shall be scheduled in a

timely manner, and the District shall mail written notice of the hearing to the customer at least ten (10) days before the date of the said hearing.

2. The process for an appeal of a notice of violation shall be established by the District in writing. The appeal may be before the Water Conservation Coordinator, the General Manager or the Board, or their respective designee(s), and shall involve such processes and presentation of information and evidence as the District shall so direct in writing.
3. Pending receipt or a written appeal or pending a hearing pursuant to an appeal, the District may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

Section XIV. Severability

If any section, subsection, sentence, clause or phrase in this Ordinance or the application thereof to any person or circumstance is for any reason held invalid, the validity of the remainder of the Ordinance or the application of such provision to other persons or circumstances shall not be affected thereby. The District hereby declares it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or the application thereof to any person or circumstance be held invalid.

Section XV. Application of Law

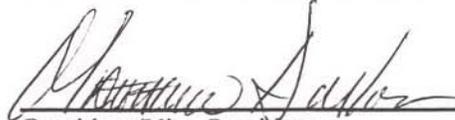
The terms, provisions and conditions of this Ordinance not otherwise set forth herein shall be interpreted pursuant to State law.

Section XVI. Superseding Prior Ordinance

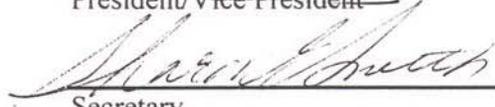
Ordinance No. 91-14 of the Trabuco Canyon water District is hereby repealed and superseded by this Ordinance No. 2008-18 upon this Ordinance No. 2008-18 becoming effective.

ORDAINED and APPROVED this 17th day of December, 2008.

TRABUCO CANYON WATER DISTRICT:



President/Vice-President

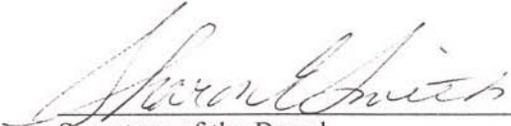


Secretary

STATE OF CALIFORNIA)
) ss.
COUNTY OF ORANGE)

I, Sharon E. Smith, Secretary of the Board of Trabuco Canyon Water District, do hereby certify that the foregoing ordinance was duly adopted by the Board of said District at a meeting of said Board held on the 17th day of December, 2008, of which meeting all of the members of the Board had due notice and at which a quorum thereof were present and acting throughout and for which notice and an agenda was prepared and posted as required by law and that at said meeting such resolution was adopted by the following vote:

AYES: DISSTON, SAFRANSKI, HASELTON, ACOSTA, MANDICH
NOES: NONE
ABSTAIN: NONE
ABSENT: NONE

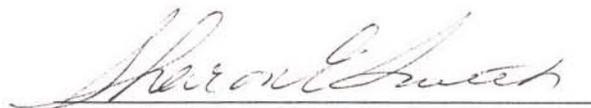


Secretary of the Board
Trabuco Canyon Water District

STATE OF CALIFORNIA)
) ss.
COUNTY OF ORANGE)

I, Sharon E. Smith, Secretary of the Board of Trabuco Canyon Water District, do hereby certify that the foregoing is a full, true and correct copy of Ordinance No. 2008-18 of such Board and that the same has not been amended or repealed.

Dated this 17th day of December, 2008.


Secretary of the Board
Trabuco Canyon Water District

APPENDIX E

Notification of Public and Service Area Suppliers



STAFF MEMBERS

Hector Ruiz, General Manager
Michael Perea, District Secretary
Cindy Byerrum, District Treasurer
Bowie, Arneson, Wiles & Giannone,
District General Legal Counsel



BOARD OF DIRECTORS

Stephen Dopudja, President
Glenn Acosta, Vice President
James Haselton, Director
Edward Mandich, Director
Michael Safranski, Director

March 8, 2016

City of Lake Forest
Planning Director, Gayle Ackerman
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Notice of Preparation of the Trabuco Canyon Water District's 2015 Urban Water Management Plan

Dear Ms. Ackerman:

The Trabuco Canyon Water District (TCWD) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMP's are prepared by California urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that provides over 3,000 acre-feet of water annually or serves 3,000 or more connections, is required to prepare an UWMP every 5 years.

Pursuant to the requirement of California Water Code Section 10621 (b), every water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter serves as your notification that TCWD is in the process of preparing the 2015 UWMP. The 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for June 15, 2016.

If you have any questions or comments regarding the preparation of this UWMP please feel free to contact me at (949) 858-0277, ext. 130.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lorrie Lausten".

Lorrie Lausten, P.E.
Engineer

STAFF MEMBERS

Hector Ruiz, General Manager
Michael Perea, District Secretary
Cindy Byerrum, District Treasurer
Bowie, Arneson, Wiles & Giannone,
District General Legal Counsel



BOARD OF DIRECTORS

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Glenn Acosta, Vice President
James Haselton, Director
Edward Mandich, Director
Michael Safranski, Director

March 8, 2016

County of Orange – OC Public Works
Planning Director, Colby Cataldi
300 North Flower Street
Santa Ana, CA 92703

Notice of Preparation of the Trabuco Canyon Water District's 2015 Urban Water Management Plan

Dear Mr. Cataldi:

The Trabuco Canyon Water District (TCWD) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMP's are prepared by California urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that provides over 3,000 acre-feet of water annually or serves 3,000 or more connections, is required to prepare an UWMP every 5 years.

Pursuant to the requirement of California Water Code Section 10621 (b), every water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter serves as your notification that TCWD is in the process of preparing the 2015 UWMP. The 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for June 15, 2016.

If you have any questions or comments regarding the preparation of this UWMP please feel free to contact me at (949) 858-0277, ext. 130.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lorrie Lausten".

Lorrie Lausten, P.E.
Engineer

STAFF MEMBERS

Hector Ruiz, General Manager
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Cindy Byerrum, District Treasurer
Bowie, Arneson, Wiles & Giannone,
District General Legal Counsel



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Glenn Acosta, Vice President
James Haselton, Director
Edward Mandich, Director
Michael Safranski, Director

March 8, 2016

City of Rancho Santa Margarita
Planning Director, Cheryl Kuta
22112 El Paseo
Rancho Santa Margarita, CA 92688

Notice of Preparation of the Trabuco Canyon Water District's 2015 Urban Water Management Plan

Dear Ms. Kuta:

The Trabuco Canyon Water District (TCWD) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMP's are prepared by California urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that provides over 3,000 acre-feet of water annually or serves 3,000 or more connections, is required to prepare an UWMP every 5 years.

Pursuant to the requirement of California Water Code Section 10621 (b), every water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter serves as your notification that TCWD is in the process of preparing the 2015 UWMP. The 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for June 15, 2016.

If you have any questions or comments regarding the preparation of this UWMP please feel free to contact me at (949) 858-0277, ext. 130.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lorrie Lausten".

Lorrie Lausten, P.E.
Engineer

STAFF MEMBERS

Hector Ruiz, General Manager
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Cindy Byerrum, District Treasurer
Bowie, Arneson, Wiles & Giannone,
District General Legal Counsel



BOARD OF DIRECTORS

Stephen Dopudja, President
Glenn Acosta, Vice President
James Haselton, Director
Edward Mandich, Director
Michael Safranski, Director

March 8, 2016

City of Mission Viejo
Planning Director, Elaine Lister
200 Civic Center
Mission Viejo, CA 92691

Notice of Preparation of the Trabuco Canyon Water District's 2015 Urban Water Management Plan

Dear Ms. Lister:

The Trabuco Canyon Water District (TCWD) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMP's are prepared by California urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that provides over 3,000 acre-feet of water annually or serves 3,000 or more connections, is required to prepare an UWMP every 5 years.

Pursuant to the requirement of California Water Code Section 10621 (b), every water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter serves as your notification that TCWD is in the process of preparing the 2015 UWMP. The 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for June 15, 2016.

If you have any questions or comments regarding the preparation of this UWMP please feel free to contact me at (949) 858-0277, ext. 130.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lorrie Lausten".

Lorrie Lausten, P.E.
Engineer

AFFIDAVIT OF PUBLICATION
STATE OF CALIFORNIA,)

) ss.

County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 27, 2016, June 3, 2016

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: June 3, 2016



Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF PUBLIC HEARING OF THE TRABUCO CANYON WATER DISTRICT TO RECEIVE PUBLIC COMMENTS REGARDING ITS 2015 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN, pursuant to Water Code Section 10642, that the Trabuco Canyon Water District invites the community to attend a public hearing regarding the adoption of its 2015 Urban Water Management Plan (UWMP).

Beginning June 1, 2016, the Draft UWMP will be available for public inspection at the District Administrative Facility during the normal business hours of 7:00 a.m. to 4:00 p.m. It will also be available on the District website, www.tcwcd.ca.gov. The draft UWMP will be discussed and public comments will be received at the following time and place.

WEDNESDAY, JUNE 16, 2016

At 7:00 PM

(or as soon thereafter as the Agenda permits) Trabuco Canyon Water District
32003 Dove Canyon Drive Trabuco Canyon, California 92679

Attendance is open to the general public. For more information, or if you would like assistance in presenting your comments to the Board at the public hearing, please contact the District's Engineer, Ms. Lorrie LaJsten, at (949) 858-0277.

By: Michael Perea
District Secretary

Published: Orange County Register May 27, June 3, 2016 R-949 10186757

AFFIDAVIT OF PUBLICATION
STATE OF CALIFORNIA,)

) ss.

County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 27, 2016, June 3, 2016

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: June 3, 2016



Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF PUBLIC HEARING OF THE TRABUCCO CANYON WATER DISTRICT TO RECEIVE PUBLIC COMMENTS REGARDING ITS 2015 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN, pursuant to Water Code Section 10642, that the Trabucco Canyon Water District invites the community to attend a public hearing regarding the adoption of its 2015 Urban Water Management Plan (UWMP).

Beginning June 1, 2016, the Draft UWMP will be available for public inspection at the District Administrative Facility during the normal business hours of 7:00 a.m. to 4:00 p.m. It will also be available on the District website, www.tcwd.ca.gov. The draft UWMP will be discussed and public comments will be received at the following time and place.

WEDNESDAY, JUNE 15, 2016

At 7:00 PM

(or as soon thereafter as the Agenda permits) Trabucco Canyon Water District
32003 Dove Canyon Drive Trabucco Canyon, California 92679

Attendance is open to the general public. For more information, or if you would like assistance in presenting your comments to the Board at the public hearing, please contact the District's Engineer, Ms. Lorrie Lausten, at (949) 858-0277.

By: Michael Perea
District Secretary

Published: Orange County Register May 27, June 3, 2016 R-949 10168787

APPENDIX F

Adopted UWMP Resolution



RESOLUTION NO. 2016-1223

**RESOLUTION OF THE BOARD OF DIRECTORS
OF THE TRABUCO CANYON WATER DISTRICT
ADOPTING 2015 URBAN WATER MANAGEMENT PLAN UPDATE**

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-84 Regular Session of the California Legislature (enacting California Water Code Sections 10610, *et. seq.*, and as amended subsequently, known as the "Urban Water Management Planning Act" hereinafter the "Act"), which mandates that every supplier providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan ("Plan"), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the Trabuco Canyon Water District ("District") is a county water district organized and operating pursuant to the provisions of California Water Code Sections 30000 and following; and

WHEREAS, the District is an urban supplier of water which is subject to the provisions and requirements of the Act; and

WHEREAS, the District previously adopted its Plan and 2010 Urban Water Management Plan Update; and

WHEREAS, the Act requires that an urban water suppliers Plan be periodically reviewed at least once every five years and that the urban water supplier shall make any amendments or changes to its Plan which are indicated by such review(s); and

WHEREAS, the District has caused to be prepared that District's 2015 Urban Water Management Plan Update ("2015 Update"); and

WHEREAS, the 2016 Update must be adopted by the Board of Directors ("Board") of the District by July 1, 2016, following public review and completion of a public hearing, and thereafter filed with the California Department of Water Resources ("DWR") within thirty (30) days following its adoption; and

WHEREAS, the District has therefore, prepared and circulated for public review a draft of the 2015 Update for public review and comment; and

WHEREAS, the District has properly noticed a public hearing regarding the consideration of the 2015 Update, which was conducted by this Board on June 15, 2016, and a full and fair hearing was held; and

WHEREAS, the Board, having considered the District's Plan and the 2015 Update thereto, desires to approve of the 2015 Update and direct its filing with the DWR.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF TRABUCO CANYON WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. The foregoing recitals are true and correct and are incorporated herein by this reference.

Section 2. The 2015 Update, attached hereto and incorporated herein by this reference, is hereby adopted as the 2015 Urban Water Management Plan Update of the District pursuant to the requirements of the Act.

Section 3. The Secretary of the District is authorized and directed to file copies of the 2015 Update with the DWR and the California State Library pursuant to Water Code Section 10644 within thirty (30) days after adoption of this Resolution.

Section 4. The General Manager, the District Secretary and the District's staff and consultants are authorized to take any and all actions necessary to implement the directives and intention of this Resolution.

ADOPTED, SIGNED AND APPROVED this 15th day of June, 2016.

TRABUCO CANYON WATER DISTRICT

By: 
President/Vice President

By: 
District Secretary

STATE OF CALIFORNIA)
) ss.
COUNTY OF ORANGE)

I, Michael Perea, District Secretary of the Trabuco Canyon Water District, do hereby certify that the foregoing resolution was duly adopted by the Board of said District at a regular meeting of such Board held on the 15th day of June, 2016, of which meeting all of the members of the Board had due notice and at which a quorum thereof were present and acting throughout and for which notice and an agenda was prepared and posted as required by law and that at said meeting such resolution was adopted by the following vote:

AYES: Dopudja, Acosta, Mandich, Safranski

NOES: None

ABSTAIN: None

ABSENT: Haselton



District Secretary,
Trabuco Canyon Water District

STATE OF CALIFORNIA)
) ss.
COUNTY OF ORANGE)

I, Michael Perea, District Secretary of the Trabuco Canyon Water District, do hereby certify that the foregoing is a full, true and correct copy of Resolution No. 2016-1223 of such Board and that the same has not been amended, rescinded or repealed.

Dated this 15th day of June, 2016.



District Secretary,
Trabuco Canyon Water District

APPENDIX G

Bump Methodology





Final Technical Memorandum #1

*To: Karl Seckel, Assistant Manager/District Engineer
Municipal Water District of Orange County*

From: Dan Rodrigo, Senior Vice President, CDM Smith

Date: April 20, 2016

Subject: Orange County Reliability Study, Water Demand Forecast and Supply Gap Analysis

1.0 Introduction

In December 2014, the Municipal Water District of Orange County (MWDOC) initiated the Orange County Reliability Study (OC Study) to comprehensively evaluate current and future water supply and system reliability for all of Orange County. To estimate the range of potential water supply gap (difference between forecasted water demands and all available water supplies), CDM Smith developed an OC Water Supply Simulation Model (OC Model) using the commercially available Water Evaluation and Planning (WEAP) software. WEAP is a simulation model maintained by the Stockholm Environment Institute (<http://www.sei-us.org/weap>) that is used by water agencies around the globe for water supply planning, including the California Department of Water Resources.

The OC Model uses indexed-sequential simulation to compare water demands and supplies now and into the future. For all components of the simulation (e.g., water demands, regional and local supplies) the OC Model maintains a given index (e.g., the year 1990 is the same for regional water demands, as well as supply from Northern California and Colorado River) and the sequence of historical hydrology. The planning horizon of the model is from 2015 to 2040 (25 years). Using the historical hydrology from 1922 to 2014, 93 separate 25-year sequences are used to generate data on reliability and ending period storage/overdraft. For example, sequence one of the simulation maps historical hydrologic year 1922 to forecast year 2015, then 1923 maps to 2016 ... and 1947 maps to 2040. Sequence two shifts this one year, so 1923 maps to 2015 ... and 1948 maps to 2040.

The OC Model estimates overall supply reliability for MET using a similar approach that MET has utilized in its 2015 Draft Integrated Resources Plan (MET IRP). The model then allocates available imported water to Orange County for direct and replenishment needs. Within Orange County, the OC Model simulates water demands and local supplies for three areas: (1) Brea/La Habra; (2) Orange County Basin; (3) South County; plus a Total OC summary (see Figure 1).



Figure 1. Geographic Areas for OC Study

The OC Model also simulates operations of the Orange County Groundwater Basin (OC Basin) managed by the Orange County Water District (OCWD). Figure 2 presents the overall model schematic for the OC Model, while Figure 3 presents the inflows and pumping variables included in the OC Basin component of the OC Model. A detailed description of the OC Model, its inputs, and all technical calculations is documented in Technical Memorandum #2: Development of OC Supply Simulation Model.

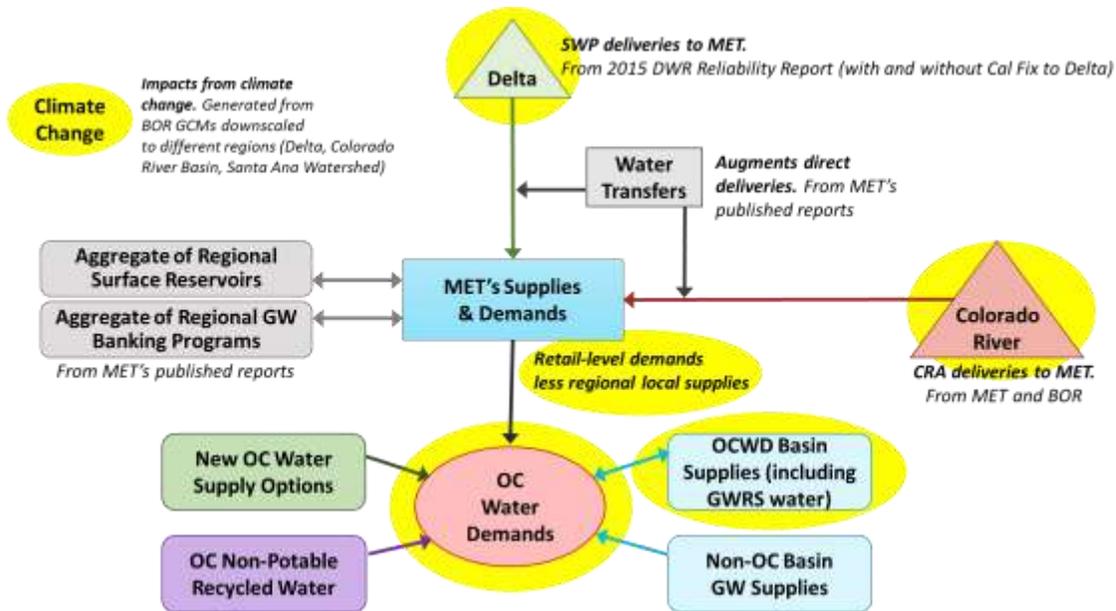


Figure 2. Overall Schematic for OC Model

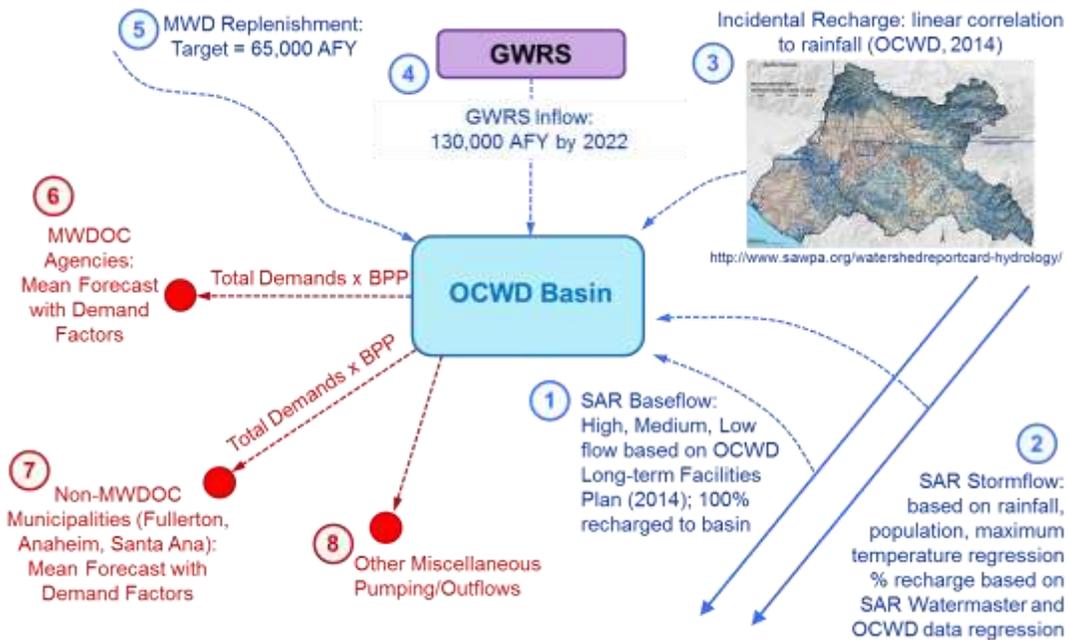


Figure 3. Inflows and Pumping Variables for OC Basin Component of OC Model

The modeling part of this evaluation is a necessity to deal with the number of issues impacting water supply reliability to Orange County. Reliability improvements in Orange County can occur due to water supply investments made by MET, the MET member agencies outside of Orange County, or by Orange County agencies. In this sense, future decision-making regarding reliability of supplies should not take place in a vacuum, but should consider the implications of decisions being made at all levels.

This technical memorandum summarizes the water demand forecast for Orange County and the water supply gap analysis that was generated using the OC Model. The outline for this technical memorandum is as follows:

- Section 1: Water Demand Forecast for Orange County
- Section 2: Planning Scenarios
- Section 3: Water Supply Gap
- Section 4: Conclusions
- Section 5: References

2.0 Water Demand Forecast for Orange County

The methodology for the water demand forecast uses a modified water unit use approach. In this approach, water unit use factors are derived from a baseline condition using a sample of water agency billing data and demographic data. In early 2015, a survey was sent by MWDOC to all water agencies in Orange County requesting Fiscal Year (FY) 2013-14 water use by billing category (e.g., single-family residential, multifamily residential, and non-residential). In parallel, the Center for Demographic Research (CDR) in Orange County provided current and projected demographics for each water agency in Orange County using GIS shape files of agency service areas. Water agencies were then placed into their respective areas (Brea/La Habra, OC Basin, South County), and water use by billing category were summed and divided by the relevant demographic (e.g., single-family water use ÷ single-family households) in order to get a water unit use factor (expressed as gallons per day/demographic unit).

In addition, the water agency survey collected information on total water production. Where provided, the difference between total water production and billed water use is considered non-revenue water. Table 1 summarizes the results of the water agency survey information and calculates the water unit use factors for the three areas within Orange County.

Table 1. Water Use Factors from Survey of Water Agencies in Orange County (FY 2013-14)

	SF Res		MF Res		Com/Instit.		Indust.		Non Revenue	
	Units ¹	Unit Use ²	Units	Unit Use	Units	Unit Use	Units	Unit Use	total acc	%
Basin Area										
ANAHEIM	50,030	441	58,618	193	169,902	90	19,260	160	63,004	7%
BUENA PARK	16,455	346	8,600	224	31,566	137	4,837	39	19,004	11%
FOUNTAIN VALLEY	12,713	336	6,964	141	30,282	124	2,093	134	17,149	13%
FULLERTON	26,274	454	22,575	176	60,839	115	6,251	398	31,557	5%
GARDEN GROVE	31,400	422	17,580	295	48,394	134	7,221	163		
GSWC	38,038	383	17,218	215	58,901	122	6,857	68	No data	
HUNTINGTON BEACH	44,605	297	35,964	154	69,266	99	10,355	58	52,855	6%
IRVINE RANCH WATER DISTRICT	39,182	444	80,854	196	263,393	80	39,484	207	85,508	9%
MESA WATER DISTRICT	16,585	320	23,173	215	80,999	97	4,832	87	No data	
NEWPORT BEACH	19,455	329	15,517	177	59,754	86			26,517	5%
ORANGE	28,545	470	15,483	246	96,606	97	No data		35,363	9%
SANTA ANA	35,547	461	42,027	288	151,008	96			No data	
TUSTIN	11,788	505	9,435	253	25,265	79	1,293	92	14,178	3%
WESTMINSTER	17,648	318	10,973	215	24,148	109	976	84	20,379	5%
YORBA LINDA WATER DISTRICT	22,046	586	3,746	249	22,164	120	2,745	230	No data	
Weighted Average		411		211		97		167		7.3%
South County										
IRVINE RANCH WATER DISTRICT	16,581	444	12,864	196	32,554	80			22,730	9%
MOULTON NIGUEL WATER DISTRICT	47,673	345	17,077	189	70,067	156	Included in		55,149	10%
SAN CLEMENTE	12,047	361	9,045	186	22,921	119	commerical/ institutional		No data	
SAN JUAN CAPISTRANO	7,176	502	6,146	206	16,483	158	category		11,277	3%
SANTA MARGARITA WATER DISTRICT	36,022	436	19,885	268	37,241	254			54,129	2%
Weighted Average		397		216		158				65%
Brea/La Habra										
BREA	9,094	425	6,898	160	42,654	93	5,931	140	No data	
LA HABRA	11,995	436	8,051	177	17,331	90	680	135	13,674	6%
Weighted Average		431.06		169.31		92.13		139.49		6%

¹Units represent:
 SF Res = SF accounts or SF housing (CDR) if SF account data looks questionable.
 MF Res = total housing (CDR) minus SF units.
 Com/Instit = total employment (CDR) minus industrial employment (CDR).
 Industrial = industrial employment (CDR).

²Unit Use represents billed water consumption (gallons/day) divided by units.

To understand the historical variation in water use and to isolate the impacts that weather and future climate has on water demand, a statistical model of monthly water production was developed. The explanatory variables used for this statistical model included population, temperature, precipitation, unemployment rate, presence of mandatory drought restrictions on water use, and a cumulative measure of passive and active conservation. Figure 4 presents the results of the statistical model for the three areas and the total county. All models had relatively high correlations and good significance in explanatory variables. Figure 5 shows how well the statistical model performs using the OC Basin model as an example. In this figure, the solid blue line represents actual per capita water use for the Basin area, while the dashed black line represents what the statistical model predicts per capita water use to be based on the explanatory variables.

Using the statistical model, each explanatory variable (e.g., weather) can be isolated to determine the impact it has on water use. Figure 6 presents the impacts on water use that key explanatory variables have in Orange County.

Regression Parameters	Basin Area	South Orange County	Brea / La Habra	OC Total
Adjusted R ² *	0.90	0.91	0.89	0.91
Standard Error **	0.07	0.09	0.09	0.07
Explanatory Variable Significance***	All at <0.0001	All at <0.0001	All at <0.0001	All at <0.0001

* Adjusted R² greater than 0.70 considered good overall correlation.
 ** Standard Errors less than 0.10 considered good overall predictive models.
 *** Explanatory Variables are considered statistically significant (valid) at the 0.05 level or less.

Figure 4. Results of Statistical Regression of Monthly Water Production

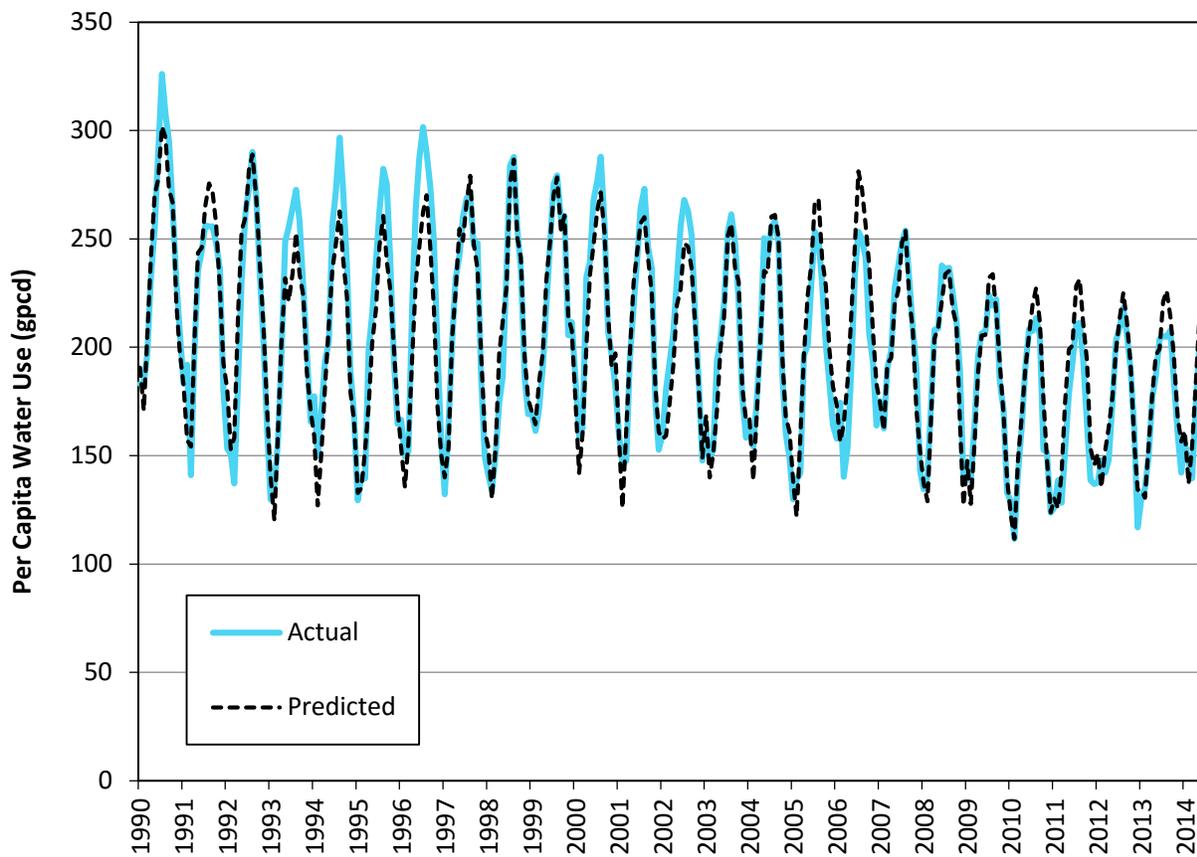


Figure 5. Verification of Statistical Water Use Model

Impacts (% impact on per capita use)	Basin Area	South Orange County	Brea / La Habra	OC Total
Hot/Dry Weather*	+6%	+9%	+6%	+6%
Cool/Wet Weather**	-4%	-7%	-5%	-5%
Economic Recession***	-13%	-12%	-13%	-13%
Drought Conservation	-6%	-5%	-5%	-6%
Passive/Active Cons. (Since 1990)	-20%	-17%	-7%	-19%

*FY 2013-14 for Hot/Dry Weather, relative to average (1990-2014).

**FY 1997-98 for Cool/Wet Weather, relative to average (1990-2014).

*** Comparing unemployment for FY 2009-10 to average (1990-2014).

Figure 6. Impacts of Key Variables on Water Use

2.1 Base Demand Forecast (No Additional Conservation post 2014)

For the purposes of this analysis three types of water conservation were defined. The first type is passive conservation, which results from codes and ordinances, such plumbing codes or model landscape water efficient ordinances. This type of conservation requires no financial incentives and grows over time based on new housing stock and remodeling of existing homes. The second type is active conservation, which requires incentives for participation. The SoCal WaterSmart grant that is administered by MET, through its member agencies, provides financial incentives for approved active water conservation programs such as high efficiency toilets and clothes washer retrofits. The third type is extraordinary conservation that results from mandatory restrictions on water use during extreme droughts. This type of conservation is mainly behavioral, in that water customers change how and when they use water in response to the mandatory restrictions. In droughts past, this type of extraordinary conservation has completely dissipated once water use restrictions were lifted—in other words curtailed water demands fully “bounced back” (returned) to pre-curtailed use levels (higher demand levels, within a relatively short period of time (1-2 years)).

The great California Drought, which started around 2010, has been one of the worst droughts on record. It has been unique in that for the last two years most of the state has been classified as extreme drought conditions. In response to this epic drought, Governor Jerry Brown instituted the first-ever statewide call for mandatory water use restrictions in April 2015, with a target reduction of 25 percent. Water customers across the state responded to this mandate, with most water agencies seeing water demands reduced by 15 to 30 percent during the summer of 2015. Water agencies in Southern California also ramped up incentives for turf removal during this time. Because of the unprecedented nature of the drought, the statewide call for mandatory water use restrictions, and the success of turf removal incentives it was assumed that the bounce back in water use after water use restrictions are lifted would take longer and not fully recover. For this study, it was assumed (hypothesized) that unit use rates would take 5 years to get to 85 percent

and 10 years to get to 90 percent of pre-drought water use levels. After 10 years, it was assumed that water unit use rates would remain at 90 percent of pre-drought use levels throughout the planning period—reflecting a long-term shift in water demands. Table 2 presents the assumed bounce back in water unit use rates (derived from Table 1) for this drought.

Table 2. Bounce Back in Water Unit Use from Great California Drought

Water Billing Sector	Time Period	Brea/La Habra Unit Use (gal/day)	OC Basin Unit Use (gal/day)	South County Unit Use (gal/day)
Single-Family Residential	2015	431	411	397
	2020	366	349	337
	2025 to 2040	388	369	357
Multifamily Residential	2015	169	211	216
	2020	144	179	183
	2025 to 2040	152	190	194
Commercial <i>(or combined commercial/ industrial for South County)</i>	2015	92	97	158
	2020	78	83	134
	2025 to 2040	83	87	142
Industrial	2015	139	167	NA
	2020	119	142	NA
	2025 to 2040	126	150	NA

* Units for single-family and multifamily are households, units for commercial and industrial are employment.

Table 3 presents the demographic projections from CDR for the three areas. These projections were made right after the most severe economic recession in the United States and might be considered low given that fact. In fact, *draft* 2015 demographic forecasts do show higher numbers for 2040.

Table 3. Demographic Projections

Demographic	Time Period	Brea/La Habra	OC Basin	South County	Total Orange County
Single-Family Housing	2020	20,463	386,324	133,989	540,776
	2030	20,470	389,734	138,709	548,913
	2040	20,512	392,387	142,008	554,907
Multifamily Housing	2020	18,561	453,758	118,306	590,625
	2030	19,113	468,972	125,030	613,115
	2040	19,585	478,362	126,736	624,683
Commercial Employment <i>(or combined commercial/ industrial employment for South County)</i>	2020	63,909	1,254,415	255,050	1,573,374
	2030	64,961	1,304,353	266,553	1,635,867
	2040	65,743	1,343,509	271,808	1,681,060
Industrial Employment	2020	6,583	138,474	NA	145,057
	2030	6,552	137,763	NA	144,315
	2040	6,523	137,066	NA	143,589

To determine the water demand forecast with no additional (post 2014) water conservation, the water unit use factors in Table 2 are multiplied by the demographic projections in Table 3; then a non-revenue percentage is added to account for total water use (see Table 1 for non-revenue water percentage). These should be considered normal weather water demands. Using the statistical results shown back in Figure 4, demands during dry years would be 6 to 9 percent greater; while during wet years demands would be 4 to 7 percent lower. Table 4 summarizes the demand forecast with no additional conservation post 2014. In year 2040, the water demand with no additional conservation for the total county is forecasted to be 617,466 acre-feet per year (afy). In 2014, the actual county water demand was 609,836; in 2015, the demand was 554,339 and the projected forecast for 2016 is 463,890. This represents a total water demand growth of only 1.25 percent from 2014 to 2040. In contrast, total number of households for the county is projected to increase 4.24 percent for the same period; while county employment is projected to increase by 6.22 percent.

Table 4. Normal Weather Water Demand Forecast with No Additional Conservation Post 2014

Brea / La Habra

	Baseline Demand Forecast (no new conservation)					
	SF	MF	COM	IND	Non Rev	Total
	AFY	AFY	AFY	AFY	AFY	AFY
2015	9,404	3,140	6,190	1,033	1,186	20,953
2020	8,397	2,992	5,605	874	1,072	18,941
2025	8,894	3,262	6,033	921	1,147	20,257
2030	8,913	3,342	6,105	917	1,157	20,434
2035	8,913	3,501	6,163	913	1,169	20,659
2040	8,919	3,513	6,205	909	1,173	20,719

South County

	Baseline Demand Forecast (no new conservation)					
	SF	MF	COM	IND	Non Rev	Total
	AFY	AFY	AFY	AFY	AFY	AFY
2015	56,181	26,940	41,990		7,507	132,616
2020	50,644	24,300	38,355		6,798	120,097
2025	55,512	27,191	42,443		7,509	132,655
2030	56,832	27,562	43,280		7,660	135,335
2035	57,350	27,884	43,970		7,752	136,956
2040	57,635	28,047	44,459		7,809	137,950

OC Basin

	Baseline Demand Forecast (no new conservation)					
	SF	MF	COM	IND	Non Rev	Total
	AFY	AFY	AFY	AFY	AFY	AFY
2015	175,544	100,997	127,252	26,027	30,087	459,907
2020	150,978	91,182	116,082	22,015	26,618	406,874
2025	161,270	99,782	127,803	23,190	28,843	440,889
2030	162,368	101,780	131,640	23,073	29,320	448,181
2035	162,772	103,766	134,543	22,958	29,683	453,722
2040	162,969	105,890	137,083	22,840	30,015	458,797

Total Orange County

	Baseline Demand Forecast (no new conservation)					
	SF	MF	COM	IND	Non Rev	Total
	AFY	AFY	AFY	AFY	AFY	AFY
2015	241,129	131,076	175,431	27,059	38,780	613,476
2020	210,019	118,473	160,042	22,889	34,488	545,911
2025	225,676	130,236	176,279	24,111	37,499	593,801
2030	228,113	132,685	181,025	23,990	38,137	603,950
2035	229,034	135,151	184,676	23,871	38,604	611,338
2040	229,524	137,450	187,747	23,750	38,996	617,466

2.2 Future Passive and Baseline Active Water Conservation

2.2.1 Future Passive Water Conservation

The following future passive water conservation estimates were made:

- High efficiency toilets – affecting new homes and businesses (post 2015) and remodels
- High efficiency clothes washers – affecting new homes (post 2015)
- Model Water Efficient Landscape Ordinance – affecting new homes and businesses (post 2015)

High Efficiency Toilets

A toilet stock model was built tracking different flush rates over time. All new homes (post 2015) are assumed to have one gallon per flush toilets. This model also assumes a certain amount of turn-over of older toilets due to life of toilet and remodeling rates. This analyses was done for single-family, multifamily and non-residential sectors. The following assumptions were made:

- Number of toilet flushes is 5.5 per person per day for single-family and multifamily homes.
- Household size is calculated from CDR data on persons per home. In single-family, household size decreases over time.
- Number of toilet flushes is 2.5 per employee per day for non-residential.
- Replacement/remodeling rates are 7% per year for 5 gal/flush toilet; 6% per year for 3.5 gal/flush toilets; and 5% per year for 1.6 gal/flush toilets.

Table 5 shows this toilet stock model for the OC Basin for single-family and non-residential sectors as an example.

Table 5. Toilet Stock Model for OC Basin (example)

OC Basin Single-Family										
# Flushes	Year	Total Housing	Portion of Homes with Gal/Flush Toilets					Av Flush	Savings (GPD/H)	Savings (AFY)
			7	5	3.5	1.6	1			
17.40	2000	348,114	3,133	53,261	123,232	168,487	-	2.84		
17.40	2013	379,999	-	4,794	27,111	348,094	-	1.78		
17.40	2015	381,806	-	4,122	23,858	313,285	40,541	1.69		
17.37	2020	386,324	-	2,680	16,700	234,964	131,980	1.50	3.32	1,435
17.31	2025	389,734	-	-	11,690	176,223	201,821	1.35	5.98	2,610
17.23	2030	392,387	-	-	8,183	132,167	252,037	1.25	7.54	3,312
17.14	2035	393,363	-	-	5,728	99,125	288,509	1.19	8.64	3,806
17.05	2040	393,840	-	-	4,010	74,344	315,486	1.14	9.43	4,159

OC Basin Non-Residential										
# Flushes	Year	Empl	Portion of Emp with Gal/Flush Toilets					Av Flush	Savings (GPD/E)	Savings (AFY)
			7	5	3.5	1.6	1			
3,298,440	2015	1,319,376	-	13,194	131,938	461,782	712,463	1.50		
3,510,508	2020	1,404,203	-	8,576	92,356	346,336	956,935	1.34	0.41	641
3,633,438	2025	1,453,375	-	5,574	64,649	259,752	1,123,399	1.23	0.67	1,083
3,729,448	2030	1,491,779	-	3,623	45,255	194,814	1,248,087	1.16	0.84	1,404
3,801,693	2035	1,520,677	-	2,355	31,678	146,111	1,340,533	1.12	0.96	1,635
3,864,600	2040	1,545,840	-	1,531	22,175	109,583	1,412,551	1.08	1.04	1,808

High Efficiency Clothes Washers

It was assumed that all new clothes washers sold after 2015 would be high efficiency and roughly save 0.033 afy per washer¹. These savings would only apply to new homes (post 2015), and only for the single-family sector.

Model Water Efficient Landscape Ordinance (2015)

The new California Model Water Efficient Landscape Ordinance (MWELo) will take place in 2016. For single-family and multifamily homes it will require that 75 percent of the irrigable area be California Friendly landscaping with high efficiency irrigation systems, with an allowance that the remaining 25 percent can be turf (high water using landscape). For non-residential establishments it will require 100 percent of the irrigable area to be California Friendly landscaping with high efficiency irrigation systems (and no turf areas). There are exemptions for non-potable recycled water systems and for parks and open space. To calculate the savings from this ordinance a parcel database provided by MWDOC was analyzed. This database had the total irrigable area and turf area delineated for current parcels. For each parcel, a target water savings was set depending on the sector. For residential parcels, 25 percent of the total irrigable area was assumed to be turf and the savings from a non-compliant parcel was estimated. For each square feet of turf conversion the estimate savings is 0.00013 afy¹. Table 6 summarizes the per parcel savings for the total county using this method.

Table 6. Estimated Parcel Savings from MWELo for Total Orange County

Parcel Type	Number of Parcels	Total Irrigable Area (sq. feet)	Current Turf Area (sq. feet)	Turf Conversion (sq. feet)*	Turf Conversion (sq. ft / parcel)	Conservation Savings (afy/parcel)
Single-Family Residential	527,627	2,114,679,368	897,177,779	368,507,937	698	0.091
Multifamily Residential	555,255	155,315,983	51,697,361	12,868,365	23	0.003
Businesses (Non-Residential)	1,623,307	499,127,269	212,043,667	212,043,667	131	0.017

* Assumes 25% turf conversion for single-family and multifamily, and 100% for businesses.

The conservation savings in afy/parcel where then multiplied by new homes and businesses (post 2015), assuming a 75 percent compliance rate.

2.2.2 Future Baseline Active Water Conservation

To estimate a baseline water savings from future active water conservation measures, the actual average annual water savings for the last seven years for the SoCal WaterSmart program within Orange County were analyzed. A continuation of this program through 2040 at similar annual implementation rates was assumed to be representative of a baseline estimate for active water conservation into the future.

¹ Per MET's SoCal WaterSmart conservation estimates, table provided by MWDOC (2015).

New active conservation measures or more aggressive implementation of existing active conservation will be evaluated as part of a portfolio analysis of water demand and supply options in Phase 2 of the OC Study.

2.2.3 Total Future Water Conservation Savings

Combining future passive and active water conservation results in a total estimated water savings, which is summarized in Table 7. The total passive and active conservation for the total Orange County is shown in Figure 7.

Table 7. Future Passive and Baseline Active Water Conservation Savings

Brea/La Habra Area

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELo	HEC Pass	Toilets	Active	Total	MWELo	Toilets	Active	Total	MWELo	Toilets	Active	Total
2020	186	32	78	8	304	11	51	5	67	63	32	17	112
2025	169	33	131	15	348	13	85	10	108	79	52	34	166
2030	166	34	163	30	394	16	106	20	142	91	67	68	226
2035	156	34	186	61	437	21	127	40	188	101	77	136	314
2040	149	34	203	79	465	21	137	53	211	108	85	177	370

OC Basin

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELo	HEC Pass	Toilets	Active	Total	MWELo	Toilets	Active	Total	MWELo	Toilets	Active	Total
2020	272	148	1,435	221	2,076	61	1,217	171	1,449	759	641	556	1,956
2025	430	260	2,610	441	3,742	96	2,165	342	2,603	1,199	1,083	1,112	3,394
2030	542	347	3,312	883	5,084	118	2,738	684	3,540	1,542	1,404	2,224	5,170
2035	557	379	3,806	1,766	6,509	139	3,182	1,369	4,690	1,801	1,635	4,447	7,883
2040	544	395	4,159	2,472	7,570	162	3,537	1,916	5,615	2,026	1,808	6,226	10,059

South County

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELo	HEC Pass	Toilets	Active	Total	MWELo	Toilets	Active	Total	MWELo	Toilets	Active	Total
2020	558	251	507	116	1,432	11	335	160	506	582	119	329	1,029
2025	812	406	877	232	2,326	22	599	321	942	960	202	657	1,819
2030	972	514	1,148	463	3,097	25	761	642	1,428	1,133	257	1,314	2,704
2035	990	556	1,332	927	3,805	27	876	1,283	2,187	1,275	298	2,628	4,201
2040	967	580	1,480	1,112	4,139	29	969	1,540	2,537	1,376	327	3,154	4,857

Total County

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELo	HEC Pass	Toilets	Active	Total	MWELo	Toilets	Active	Total	MWELo	Toilets	Active	Total
2020	1,017	431	2,020	344	3,812	83	1,602	337	2,022	1,404	792	901	3,097
2025	1,411	698	3,618	688	6,416	132	2,848	673	3,653	2,238	1,337	1,803	5,378
2030	1,680	895	4,624	1,377	8,575	159	3,606	1,346	5,111	2,766	1,728	3,606	8,100
2035	1,704	969	5,325	2,754	10,752	188	4,185	2,692	7,065	3,177	2,010	7,212	12,399
2040	1,660	1,009	5,842	3,663	12,175	212	4,643	3,509	8,363	3,510	2,219	9,557	15,286

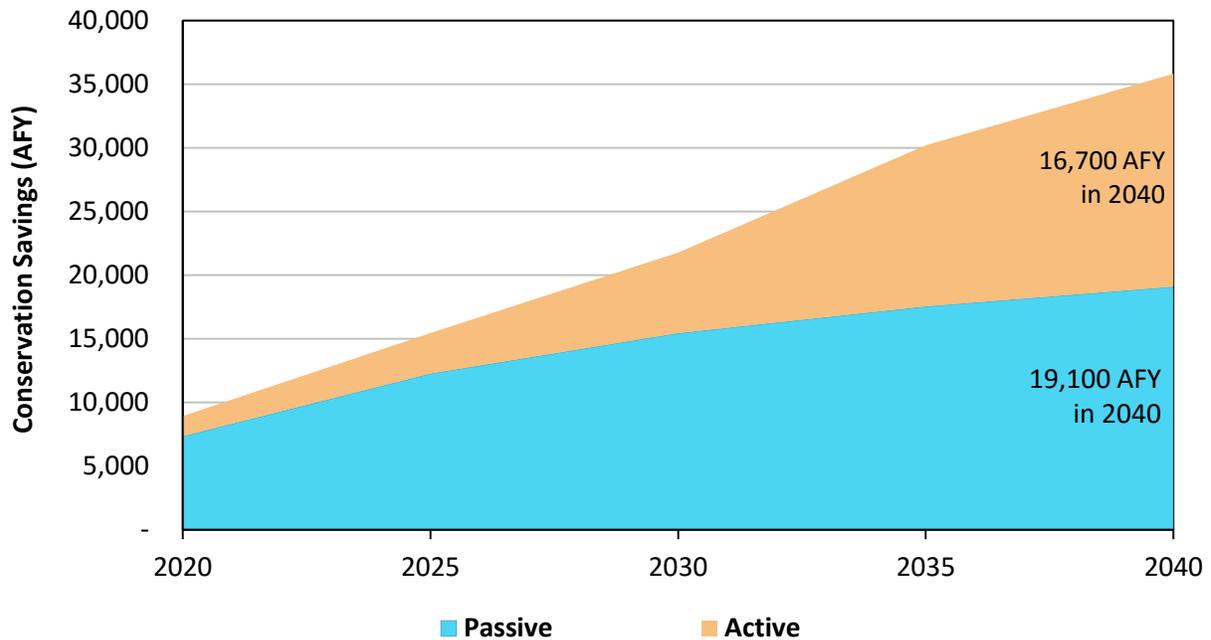


Figure 7. Total Water Conservation in Orange County

1.3 With Conservation Demand Forecast

Subtracting the future water conservation savings shown in Table 7 from the base water demand forecast shown in Table 4 results in the water demand forecast with conservation that is used to model potential water supply gaps for the OC Study. Table 8 presents the demand forecast by area and total Orange County, while Figure 8 presents the historical and forecasted water demands for total Orange County.

Note: Price elasticity of water demand reflects the impact that changes in retail cost of water has on water use. Theory states that if price goes up, customers respond by reducing water use. A price elasticity value of -0.2 implies that if the real price of water increases by 10%, water use would decrease by 2%. Price elasticity is estimated by detailed econometric water demand models, where price can be isolated from all other explanatory variables. Many times price is correlated with other variables making it difficult to estimate a significant statistical value. In addition, there is a potential for double counting reduction in water demand if estimates of future conservation from active programs are included in a demand forecast because customers who respond to price take advantage of utility-provided incentives for conservation. MET's 2015 IRP considers the impact of price elasticity in their future water demand scenarios, but does not include future active conservation in its demand forecast. The OC Study included future estimates of water conservation from active conservation, and thus did not include a price elasticity variable in its statistical modeling of water demand. Including both price elasticity and active conservation would have resulted in "double counting" of the future water savings.

Table 7. Water Demand Forecast with Conservation

Brea / La Habra

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	8,094	2,925	6,368	1,043	18,429
2025	8,546	3,154	6,789	1,109	19,598
2030	8,519	3,200	6,796	1,111	19,626
2035	8,475	3,313	6,762	1,113	19,663
2040	8,454	3,302	6,745	1,110	19,611

OC Basin

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	148,902	89,733	136,077	26,230	400,941
2025	157,528	97,180	147,532	28,157	430,396
2030	157,284	98,240	149,476	28,350	433,350
2035	156,263	99,076	149,552	28,342	433,233
2040	155,399	100,275	149,797	28,383	433,854

South County

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	49,212	23,793	37,326	6,620	116,951
2025	53,186	26,250	40,624	7,204	127,263
2030	53,735	26,135	40,575	7,227	127,672
2035	53,545	25,697	39,769	7,141	126,151
2040	53,496	25,509	39,602	7,116	125,725

Total Orange County

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	206,207	116,451	179,770	33,893	536,321
2025	219,260	126,583	194,945	36,470	577,257
2030	219,537	127,575	196,848	36,688	580,647
2035	218,283	128,086	196,082	36,596	579,047
2040	217,349	129,087	196,144	36,610	579,189

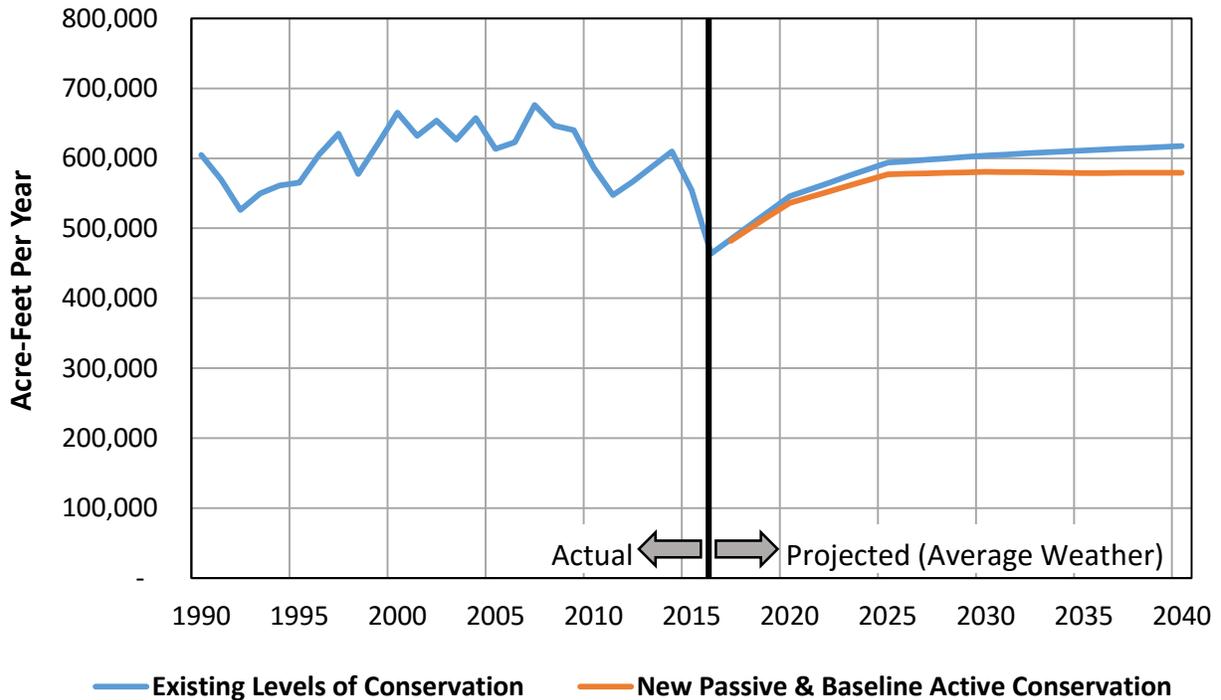


Figure 8. Water Demand Forecast for Total Orange County

3.0 Planning Scenarios

At the start of the Orange County Water Reliability Study, a workgroup was formed made up of representatives from Orange County water agencies. This OC Workgroup met 13 times during the

12-month Phase 1 of the study. During the first four meetings of the OC Workgroup, three basic planning scenarios emerged, each with and without a California WaterFix to the Delta—thus resulting in six scenarios in total. While there was discussion on assigning probabilities or weights to these planning scenarios, consensus was not reached on which scenario was more probable than the others. Assignment of the likelihood that one scenario is more probable than the others will be revisited in Phase 2 of the Orange County Reliability Study. There was, however, general agreement that all of the scenarios represent plausible future outcomes and thus all scenarios should be evaluated in terms of assessing potential water supply gaps (difference between forecasted water demands and existing water supplies). It is important to note that the purpose of estimating the water supply gaps for Orange County is to determine what additional MET and Orange County water supply investments are needed for future reliability planning. Thus, other than the California WaterFix to the Delta, all planning scenarios assume no new additional regional or Orange County water supply investments, with a couple of exceptions. In Orange County, it was assumed that existing and planned non-potable recycling projects would build additional supplies out into the future. It was also assumed that the OCWD GWRS Phase 3 expansion project would be implemented by 2022 to increase the recycled supplies for groundwater replenishment from 100,000 afy to 130,000 afy.

To develop the planning scenarios, the OC Workgroup considered the following parameters:

- California WaterFix to Sacramento-San Joaquin Delta (Cal Fix), which impacts the reliability of the State Water Project.
- Regional MET water demands and supplies, which impacts the availability of water from MET and supply reliability for Orange County.
- Orange County water demands, which impacts the supply reliability for Orange County.
- Santa Ana River baseflows, which impacts the replenishment of the OC Basin and the supply reliability for the water agencies within the OC Basin.
- Climate variability impacts on regional and local water demands and supplies, which impacts the availability of water from MET and the supply reliability for Orange County.

The definition of the six scenarios are:

- **Scenario 1a - Planned Conditions, No Cal Fix:** Essentially represents MET's IRP planning assumptions, with very little climate variability impacts (only impacting Delta supplies and not through 2040), no California Fix to the Delta, and no new regional or OC water supply investments.
- **Scenario 1b - Planned Conditions, with Cal Fix:** Same as Scenario 1a, but with new supply from the California Fix to the Delta beginning in 2030.

- **Scenario 2a - Moderately Stressed Conditions, No Cal Fix:** Moderate levels of climate variability impacts (affecting Delta, Colorado River, and Santa Ana watershed), slightly lower regional local supplies than MET assumes in IRP, 4% higher demand growth reflecting climate impacts and higher demographic growth, no California Fix to the Delta, and no new regional or OC water supply investments. The higher demand growth and fewer local supplies reflects potential future impacts if our existing demographics are low and if local supplies become more challenged, a continuation of the trend in recent times.
- **Scenario 2b - Moderately Stressed Conditions, with Cal Fix:** Same as 2a, but with new supply from California Fix to the Delta beginning in 2030.
- **Scenario 3a - Significantly Stressed Conditions, No Cal Fix:** Significant levels of climate variability impacts (affecting Delta, Colorado River, and Santa Ana watershed), 8% higher demand growth reflecting climate impacts and higher demographic growth, no California Fix to the Delta, and no new regional or OC water supply investments.
- **Scenario 3b - Significantly Stressed Conditions, with Cal Fix:** Same as 3a, but with new supply from California Fix to the Delta beginning in 2030.

All of these scenarios were deemed plausible and likely carry about the same likelihood of occurring. While no attempt was made to specifically assign the probability of any one of the six scenarios occurring over the others, some might postulate that Scenario 2 would be the most likely to occur given that most climate experts believe we are already seeing evidence of climate variability impacts today. But even with this postulation, assigning a probability to the success of the Cal Fix would be difficult at this time.

4.0 Water Supply Gap

To plan for future water supply reliability, a gap between forecasted water demands and existing supplies (plus planned projects that are a certainty) should be estimated. In past planning efforts, this gap is often done for average conditions or at best, using one reference drought condition. However, due to recent droughts and environmental restrictions in the Delta, a more sophisticated approach to estimating the potential water supply gap is needed. The OC Model, described in detail in TM #2: Development of OC Supply Simulation Model, uses “indexed-sequential” simulation to evaluate regional water demands and supplies, and Orange County water demands and supplies. All model demands and supply sources are referenced to the same hydrologic index—meaning that if a repeat of the year 1991 occurred, the OC Model would represent the availability of Delta water supplies in 1991 to MET, the availability of Colorado River water supplies in 1991 to MET, and the local Santa Ana watershed conditions in 1991. The OC Model also preserves the historical sequence of the hydrologic years. This is necessary because the source of availability of Delta and Colorado River water supplies are hydrologic models run by California Department of Water Resources (DWR) and the Bureau of Reclamation (BOR). These hydrologic models incorporate water rights (or contract rights) and storage conditions that are run using a specific sequence of hydrologic conditions. Both MET IRP and OC modeling of water supply maintain these sequences in order to

preserve the accuracy of the DWR and BOR model inputs. The hydrologic period used by the OC Model is 1922 to 2014 (which differs from MET’s IRP which is 1922 to 2012). The forecast period is 2015 to 2040. Thus, in the OC Model there are 93 25-year sequences that are mapped to the forecast period. When the year 2014 is reached in any of the sequences, the next year wraps back around starting in 1922. Table 8 illustrates how the indexed-sequential method works.

Table 8. Illustration of Indexed-Sequential Supply Simulation

Forecast Year	Hydrologic Simulation Year – Sequence 1	Hydrologic Simulation Year – Sequence 2	...	Hydrologic Simulation Year – Sequence 93
2015	1922	1923		2014
2016	1923	1924		1922
⋮	⋮	⋮		⋮
2040	1947	1948		1946

Using the SWP system as an index, approximately 12 of the 93 historical hydrologic years (13 percent) are considered critically dry; 20 years (22 percent) are considered very wet; and the remaining 61 years (65 percent) are along the below-normal, normal, and above-normal spectrum.

4.1 Assumptions for Supply Gap Analysis

Figure 9 presents the overall assumptions for the water supply gap analysis. Figure 10 presents more specific assumptions regarding groundwater in the OC Basin. In addition to these assumptions, the following summarizes some of the differences between the MET IRP and the supply gap analysis for the OC Study:

- **Simulation Period:** MET IRP uses a historical hydrology from 1922 to 2012; while the OC Study uses a historical hydrology from 1922 to 2014—capturing the recent drought.
- **Cal Fix:** When the Cal Fix is included, MET IRP assumes that new supply from Cal Fix begins in 2020, based on the assumption that a “commitment” to move forward with the Cal Fix project will result in regulatory relief, beginning in 2020; while the OC Study assumes that supplies from Cal Fix begins when project is fully operational in 2030.
- **Water Conservation:** MET IRP only includes new passive conservation in their demand forecast (with new active conservation being reserved as a new supply option); while the OC Study assumes new passive and baseline new active conservation for water demands in Orange County (additional new active conservation will be evaluated in Phase 2 of the OC Study).

- Climate Variability:** MET IRP only includes minimal impacts of climate variability for Delta water supplies through 2030; while the OC Study includes a range of climate scenario impacts on water supplies from Delta, Colorado River and Santa Ana Watershed through 2040.

Water Demands (AFY)	FY 2014 Actual	FY 2015 Actual	2025 Projected	2040 Projected
MET Demands*	2,300,000	1,850,000	1,920,000	2,028,000
OCWD Basin Demands**	453,000	410,000	425,000	434,000
OC Total Demands**	610,000	554,000	565,000	579,000

* With future passive conservation only

** With future passive and baseline new active conservation

OC Groundwater (AFY)	Brea/La Habra	Net OC Basin	South County	Total
Groundwater Supply	15,000*	188,500**	10,000	213,500

* Based on firm yield from La Habra Basin and groundwater purchases from Main San Gabriel Basin.

** Includes GWRS, SAR baseflows, SAR stormflows, incidental recharge, MET replenishment, and miscellaneous pumping.

OC Non-Potable Recycled Water (AFY)	2015	2040
OC Basin Recycled Water	22,000	27,700
South County Recycled Water	23,900	41,800
Total	45,900	69,500

Note: Irvine Ranch Water District (IRWD) is split between the Basin and South County

Figure 9. Overall Assumptions for Water Supply Gap Analysis

OC Basin Groundwater (AFY)	Near-Term	Long-Term	Range Within Model
Groundwater Replenishment System (GWRS)	100,000	130,000	100,000 to 130,000
SAR Baseflow (mid level assumption)	53,000	53,000	34,000 to 53,000
SAR Stormflow (average of all hydrologies)	53,000	53,000	6,000 to 150,000
SAR Incidental Recharge (average of all hydrologies)	59,000	59,000	20,000 to 140,000
MET Replenishment (average of all hydrologies)*	54,000	34,000	0 to 65,000
BEA Outflows	-22,000	-9,000	-22,000 to -9,000
Misc. Pumping (golf courses, etc.)	-8,500	-8,500	-8,500
Net Groundwater for OC Basin Agencies	288,500	311,500	168,000 to 455,000

* While OCWD replenishment target is 65,000 AFY, replenishment water is not assumed to be taken during very wet years when SAR stormflows are high, and only a portion of replenishment water is available during years in which MET is in allocation of imported water.

Figure 10. Assumptions for Groundwater in OC Basin

4.2 Availability of Water from MET

Key to the assessment of water reliability for Orange County is estimating the availability of imported water from MET under a wide range of scenarios. Availability of MET water to Orange County is a function of the water demands on MET and the reliability of imported water from the Colorado River and Delta to MET, supplemented by withdrawals from various MET storage accounts.

4.2.1 Demands on MET

MET water demands represent that difference between regional retail water demands (inclusive of groundwater replenishment) and regional local supplies (which includes groundwater, Los Angeles Aqueducts, surface reservoirs, groundwater recovery, recycled water, and seawater desalination). Table 9 presents the MET demand forecast under normal/average weather conditions.

A significant challenge for MET in terms of reliability planning is it represents the “swing” water supply for the region. This compounds the variability on demands on MET due to weather and hydrology. For retail water demands, variations in weather can cause water use to change ± 5 to 9 percent in any given year due to varying demands for irrigation and cooling. In addition to retail water demand variability, local supplies can vary ± 80 percent for the Los Angeles Aqueducts and ± 55 percent for surface reservoirs. Thus, the variability for demands on MET in any given year can be ± 15 to 25 percent. This fact alone makes storage so key in assuring supply reliability for MET and the region.

Table 9. Demands on MET

Total Demand (AFY)	2020	2030	2040
Retail M&I	3,707,546	3,865,200	3,954,814
Retail Agricultural	169,822	163,121	159,537
Seawater Barrier	66,500	66,500	66,500
Replenishment	292,777	272,829	272,847
Total Demand	4,236,645	4,367,650	4,453,698

Local Supplies (AFY)			
Groundwater Production	1,308,101	1,321,220	1,322,197
Surface Production	113,705	113,705	113,705
Los Angeles Aqueduct	261,100	264,296	267,637
Seawater Desalination	50,637	50,637	50,637
Groundwater Recovery	142,286	158,816	162,688
Recycled Water	425,131	468,862	495,698
Other Non-Metropolitan Imports	13,100	13,100	13,100
Total Local Supplies	2,314,061	2,390,637	2,425,663

Demand On MET (AFY)			
Consumptive Use	1,743,866	1,826,245	1,880,131
Seawater Barrier	11,635	8,708	5,877
Replenishment	167,083	142,060	142,027
Total Net Demand on Metropolitan	1,922,584	1,977,013	2,028,035

4.2.2 Supplies from Colorado River and Delta

MET's water supply from the Colorado River, via the Colorado River Aqueduct (CRA), has historically been the backbone to MET's supply reliability. Before the settlement agreement between lower Colorado River Basin states and water agencies that use Colorado River water within California, MET kept the CRA full at 1.2 million acre-feet (maf) per year or nearly at that level in many years. The settlement agreement requires California to live within its 4.4 maf apportionment, and dictates how Colorado River water within California is prioritized. This eliminated most of the surplus water that MET was using to keep the CRA full. To deal with this challenge, MET has developed a number of water transfers and land fallowing programs to mitigate the impacts of the settlement agreement. The 2015 MET IRP is assuming that it will maintain minimum CRA supply of 0.90 maf, with a goal of a full CRA during dry years, when needed (although it is not specified exactly how that will occur).

For the OC Study, we have assumed similar baseline assumptions as the MET IRP, but have added some uncertainties with regard to climate scenarios under Scenario 2 and more significant impacts under Scenario 3. Under significant climate scenario impacts (Scenario 3), where the BOR simulates that Lake Mead elevation would fall below 1,000 feet about 80 percent of the time, the OC Study assumed MET would get a proportionate share of shortages that are allocated by BOR. Exactly how BOR would manage water shortages when Lake Mead elevation falls below 1,000 is uncharted territory, but assuming some proportional allocation of Colorado River water among the Lower Basin states and within California is a plausible scenario. Figure 11 presents the assumed CRA water supplies to MET for the OC Study with (Scenario 3) and without (Scenarios 1 & 2) significant climate scenario impacts. Under the significant climate scenario (Scenario 3), there is a 50 percent probability that CRA deliveries would be below 815,000 afy and a 20 percent probability that CRA deliveries would be below 620,000 afy.

The other main source of imported water available to MET is from the Delta and is delivered to Southern California via the State Water Project (SWP). Although MET's contract for SWP water is 2.0 maf, it has never received that amount. Prior to the QSA (in 2003) when MET relied more heavily on CRA supplies, the maximum water taken by MET from the SWP exceeded 1.1 maf in only three years (1989, 1990 and 2000). Beginning in 2001, MET has tried to maximize their delivery of SWP water. In very wet years, MET typically receives about 1.7 maf of supply from the SWP (about 80 to 85% of their total contract). More typically, MET receives closer to 1.2 maf of supply from the SWP (about 60% of their maximum contract). Droughts and environmental regulatory restrictions in the Delta have greatly impacted the reliability of SWP supply. Biological opinions regarding endangered species not only limit Delta exports during dry years, but have greatly impacted exports during more normal years when water agencies such as MET are counting on such water for storage replenishment.

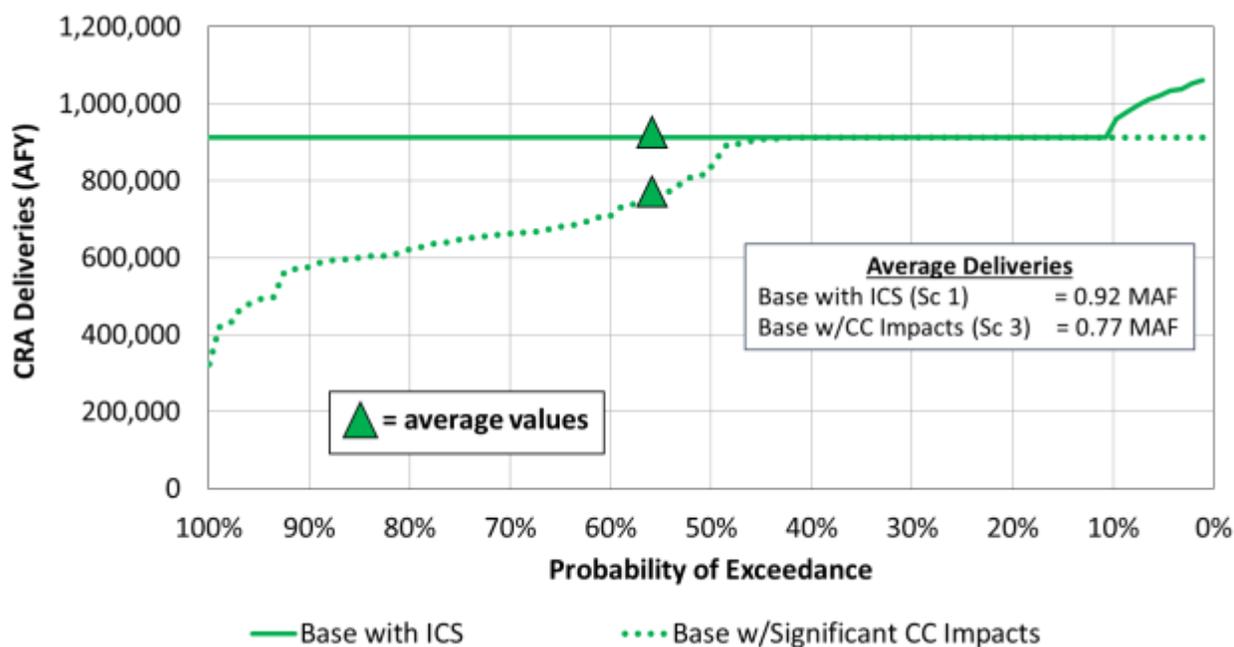


Figure 11. Colorado River Aqueduct Deliveries to MET

To stabilize the decline in SWP deliveries, California has committed to the California WaterFix (Cal Fix) and California EcoRestore. In the long-term, the preferred alternative identified in Cal Fix is expected to increase SWP deliveries (above what they otherwise would have been) by providing more flexible water diversions through improved conveyance and operations. It is important to note that the Cal Fix does not generate **NEW** water supplies per se, but allows supplies lost due to regulatory restrictions to be regained. This project would also provide much needed resiliency during seismic events in the Delta. The new conveyance and diversion facilities will allow for increased water supply reliability and a more permanent solution for flow-based environmental standards. The anticipated implementation of the Cal Fix is expected to be around 2030. Assuming a more flexible, adaptive management strategy, MET is assuming that if Cal Fix moves forward that regulatory relief from further biological opinions in the Delta would occur and SWP deliveries would return to pre-biological opinion deliveries as soon as 2020. However, some might argue this is an optimistic assumption, and there is no certainty that such relief would occur until the project is operational. Therefore for the GAP analysis, the OC Study assumed that improved SWP deliveries from Cal Fix would begin in 2030.

Climate variability can further reduce the reliability of SWP deliveries. The source of water that is pumped from the Delta originates in the Sierra Nevada Mountains as snowpack. It is widely accepted by climate and hydrology experts that climate scenario impacts on snowpack-driven water supplies is even more significant because even a fraction of a degree increase leads to early snowmelt which reduces the ability to capture river flows in surface reservoirs. Using methods described in TM#2, CDM Smith and its climate scenario expert Dr. David Yates estimated the potential impacts to the SWP under significant climate scenario. These estimates are similar to

earlier work that California DWR did on climate scenario impacts on SWP reliability. Figure 12 presents the full range of SWP deliveries to MET with and without Cal Fix and with and without significant climate scenario impacts. As shown, the Cal Fix greatly improves the reliability of SWP supplies to MET—with an average increase in supply (restoration of supplies compared to the no project alternative) of over 400,000 afy. Significant climate scenario reduces SWP deliveries by an average of 200,000 afy, even with the Cal Fix.

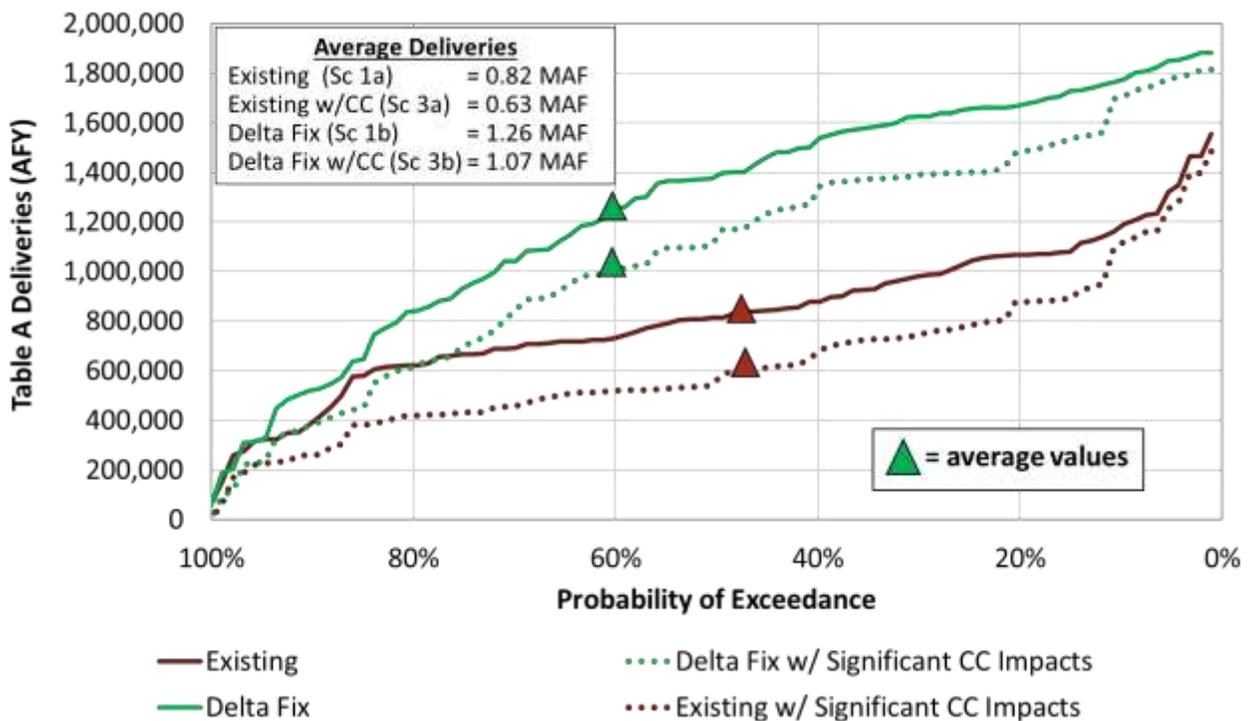


Figure 12. State Water Project Deliveries to MET

4.2.3 Overall MET Reliability

In addition to CRA and SWP water, MET has significant surface storage and groundwater storage programs. MET also has a number of water transfers in the Central Valley. These investments have been critical for the region’s supply reliability during droughts. However, since the first MET IRP in 1996 MET has had to allocate its imported water to its member agencies three in the last seven years.

Using the indexed-sequential simulation method described in TM#2, MET water reliability can be illustrated for several hydrologic sequences. Figures 13, 14 and 15 utilize just 2 of the 93 hydrology sequences to demonstrate how the analysis works. Figure 13 shows the MET demands and supplies without a Cal Fix for the forecast period 2015 to 2040 with the last 25-year hydrologic sequence of 1989 to 2014 imposed. In other words, forecast year 2015 is 1989, 2016 is 1990 ... and 2040 is 2014. Of all the 93 possible 25-year hydrologic sequences, this one is the worst in terms of cumulative supply shortages.

Figure 14 shows Met demands and supplies without a Cal Fix for a more normal hydrology sequence imposed on the forecast period (this sequence begins with 1950 and ends in 1975). Even with a normal hydrology, there are still some water shortages in the later years. Figure 15, shows this same hydrology (1950 to 1975) but with a Cal Fix. Under this scenario, regional storage replenishes greatly and shortages in the later years are eliminated.

When all 93 hydrologic sequences are simulated, and under all six scenarios representing various climate scenarios and Cal Fix assumptions, the probability of MET shortages exceeding 15 percent can be derived. A regional 15 percent shortage is similar to the allocation MET imposed in 2015. Figure 16 presents this probability of MET shortage. The results presented here for Scenario 1 with and without Cal Fix are similar to those presented in MET’s Draft IRP.

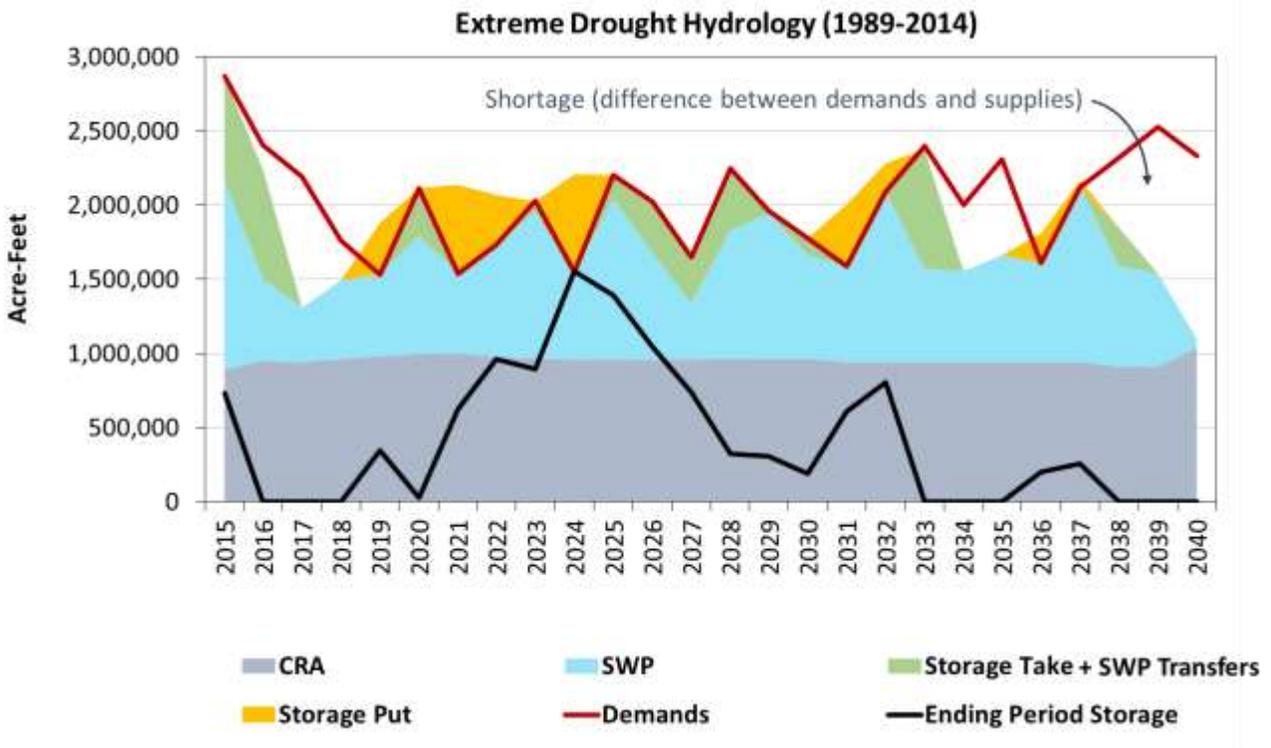


Figure 13. MET Reliability under Drought, for Scenario 1a (no Climate variability, no Cal Fix)

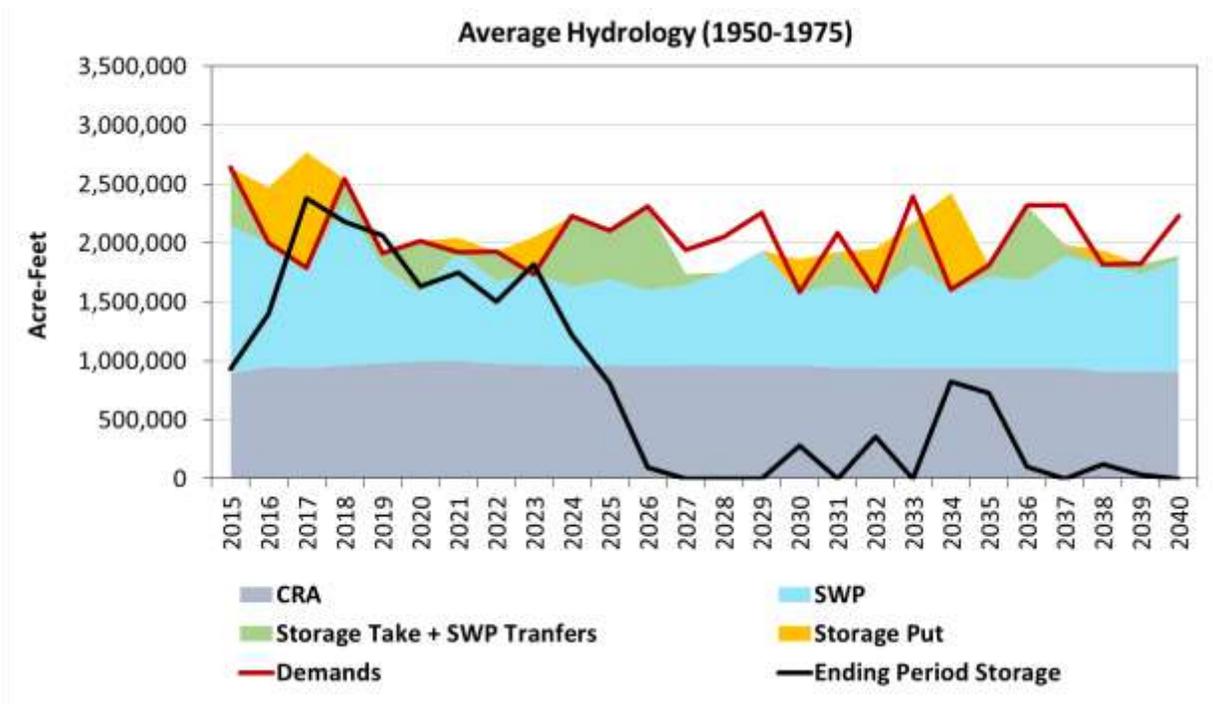


Figure 14. MET Reliability under Average Hydrology, for Scenario 1a (no Climate variability, no Cal Fix)

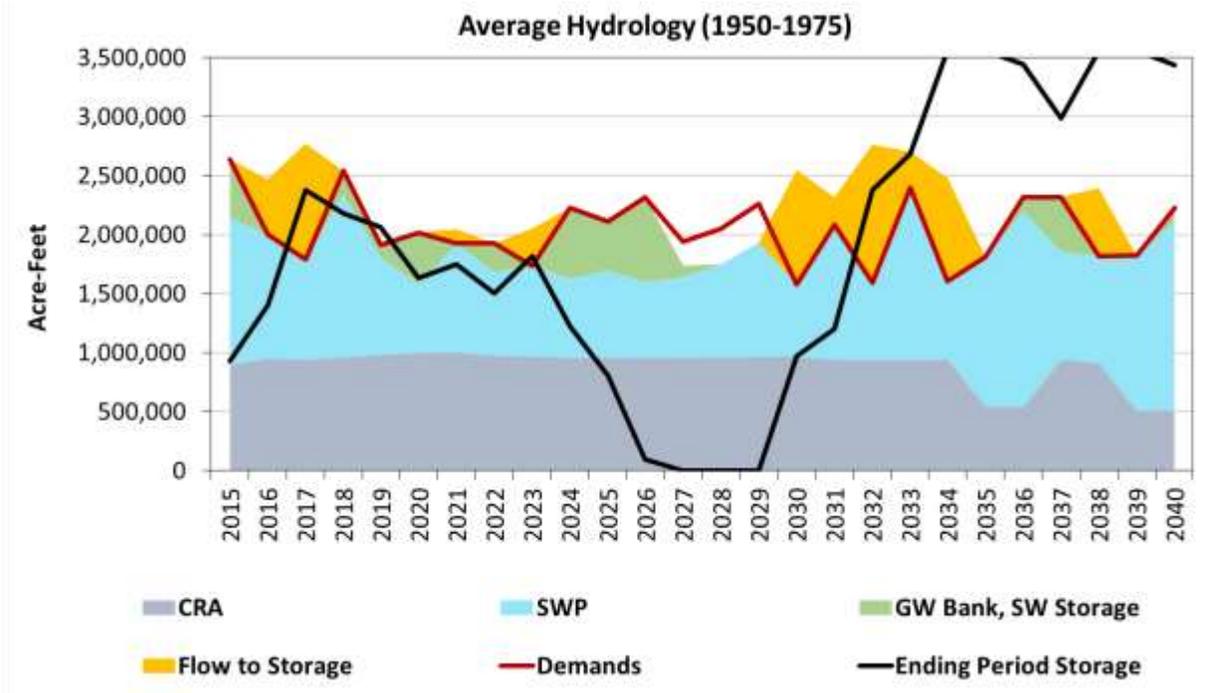


Figure 15. MET Reliability under Average Hydrology, for Scenario 1b (no Climate variability, with Cal Fix)

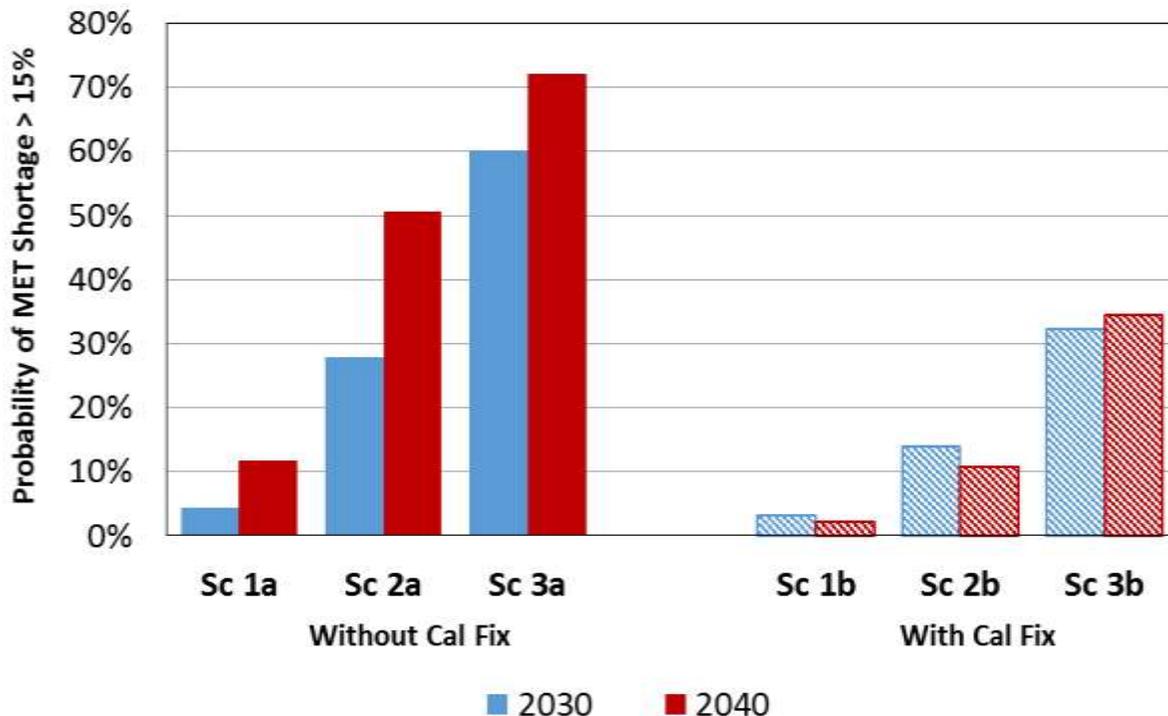


Figure 16. MET Supply Reliability (Percent of Time MET Supply Shortage Greater than 15%)

As shown in Figure 16, the impacts of climate variability (Scenarios 2 and 3) can be significant in increasing the probability and magnitude of MET shortages. In 2040, significant climate scenario (Scenario 3) can increase the probability of shortage by 60 percent without Cal Fix. The analysis also shows the enormous benefit that Cal Fix can have on MET reliability, decreasing the probability of shortage from 50 percent in 2040 to 10 percent under Scenario 2.

4.3 Orange County Water Supply Gap

When MET shortages occur, imported water is allocated to Orange County based on MET’s current drought allocation formula. For the OC Basin, the estimation of the water supply gap required that the OC Model be able to simulate the way OCWD manages the OC Basin. The OC Basin’s Basin Production Percentage (BPP) was set in the model to look forward each year and estimate all inflows to the basin, then set the BPP so that the cumulative overdraft in the basin would not exceed 500,000 af. In addition, the model does not allow the change in overdraft to exceed certain thresholds—essentially trying to keep some managed overdraft in the basin.

Note: Modeling the management of the OCWD basin is complex, especially with respect to future uncertainties. The discussion of this effort herein was an initial attempt to reflect on how the BPP could be set within the context of a modeling effort. Since this initial effort, CDM Smith and OCWD have met a number of times to refine the analysis for the Phase 2 effort. The refined analysis will be documented in the final Project Technical Memorandum.

Figure 17 presents a simulation of the OC Basin for the forecast period of 2015 to 2040, under an extreme drought hydrology of 1989 to 2014. Under Scenario 1, with no climate scenario and no Cal Fix, Figure 17 shows the pumping from the basin (blue line), the sources of inflows to the basin (shaded color areas), the cumulative basin overdraft (red line), and the BPP (dashed black line read on right-hand axis).

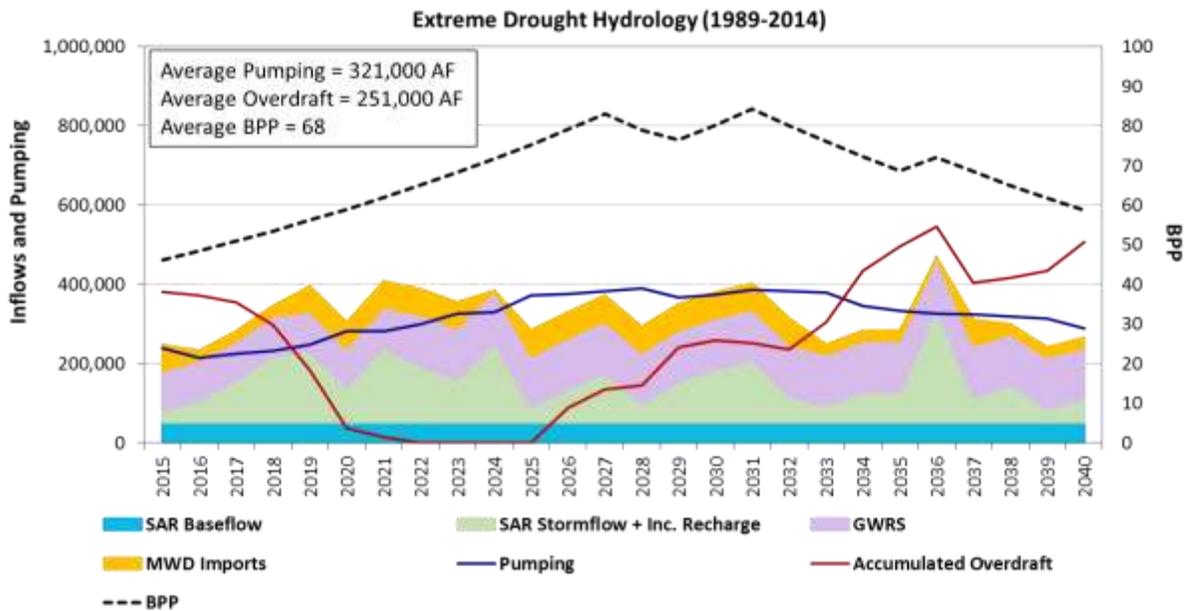


Figure 17. Simulation of OC Basin under Drought, for Scenario 1a (no Climate scenario, no Cal Fix)

When the other local Orange County water supplies from the Brea/La Habra and South County areas are added to the simulation, the OC Model estimates the overall supply reliability for the OC County total. Using all 93 hydrologic sequences, a probability chart can be created. The probability chart shows the percent time that any water shortage occurs and to what magnitude. Figure 18 shows the overall reliability for OC County total for Scenarios 1a, 2a and 3a (no Cal Fix) for the year 2040. As shown on this chart, there is a 50 percent chance that some level of shortage occurs for Scenario 1a. This probability of some shortage occurring increases to 80 percent for Scenario 2a and 98 percent for Scenario 3a. The average shortages are 32,000 afy, 74,000 afy, and 126,000 afy for Scenarios 1a, 2a, and 3a respectively.

Figure 19 compares Scenarios 1, 2, and 3 with and without the Cal Fix. As shown in Figure 19, the Cal Fix dramatically reduces the probability of shortages and thus the average shortages. The average shortages under the Cal Fix are 5,000 afy, 17,000 afy, and 64,000 afy for Scenarios 1b, 2b, and 3b respectively. The one thing to note, however, is that the maximum shortages (which occur about 1 to 3 percent of the time) are not reduced substantially with the Cal Fix. These maximum shortages may require a multipronged strategy to minimize or eliminate, such as new base-loaded supplies, storage, water transfers and mandatory restrictions on some water uses.



Figure 18. Probability of Water Shortages (Gap) for Orange County Total, No Cal Fix

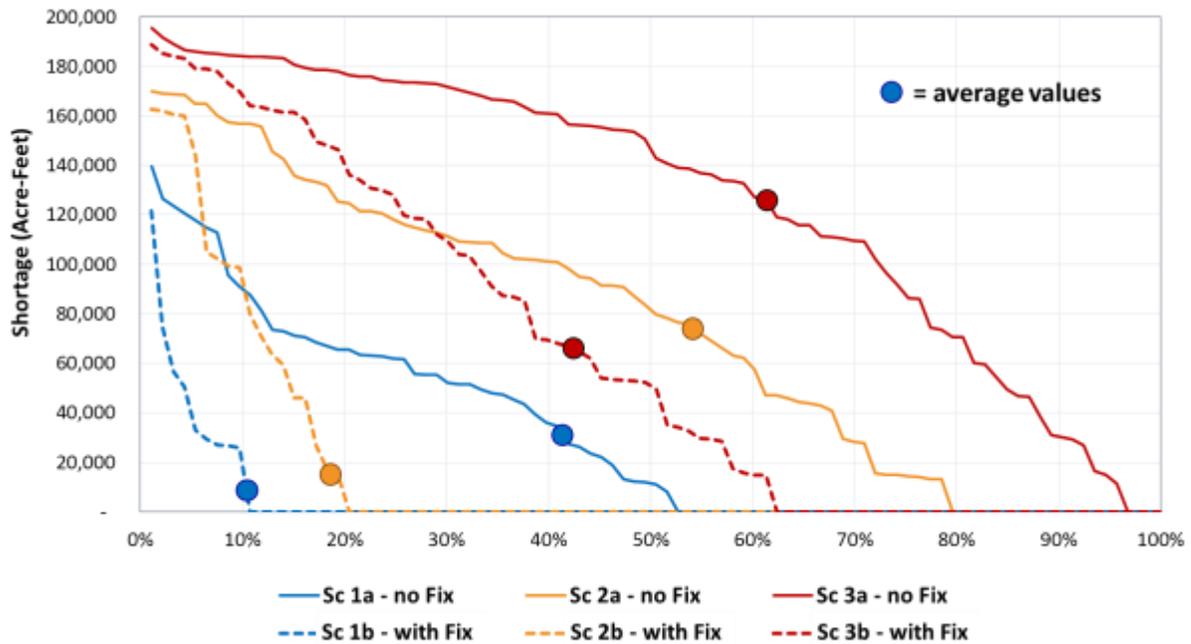


Figure 19. Probability of Water Shortages (Gap) for Orange County Total, with Cal Fix

This supply reliability analysis was done for all three areas of the Orange County, Brea/La Habra, OC Basin, and South County. The average water shortages (averaged for all 93 hydrologic sequences) are shown in Table 10 for all six scenarios.

Table 10. Summary of Average Water Supply Gap for Orange County Areas (acre-feet year)

Area	Scenario 1		Scenario 2		Scenario 3	
	a – no Fix	b – with Fix	a – no Fix	b – with Fix	a – no Fix	b – with Fix
Brea / La Habra						
2020	110 (1%)	110 (1%)	160 (1%)	160 (1%)	250 (1%)	250 (1%)
2040	820 (4%)	130 (1%)	1,800 (9%)	430 (2%)	3,100 (15%)	1,600 (8%)
OC Basin						
2020	3,800 (1%)	3,800 (1%)	5,300 (1%)	5,300 (1%)	9,300 (2%)	9,300 (2%)
2040	19,000 (5%)	2,800 (1%)	49,000 (12%)	11,000 (3%)	85,000 (20%)	42,000 (10%)
South County						
2020	2,100 (2%)	2,100 (2%)	3,000 (3%)	3,000 (3%)	4,800 (4%)	4,800 (4%)
2040	12,000 (9%)	1,900 (2%)	23,000 (18%)	5,600 (4%)	38,000 (28%)	20,000 (15%)
OC Total						
2020	6,000 (1%)	6,000 (1%)	8,500 (2%)	8,500 (2%)	14,000 (3%)	14,000 (3%)
2040	32,000 (6%)	4,800 (1%)	74,000 (13%)	17,000 (3%)	126,000 (21%)	64,000 (11%)

* Numbers in parentheses () represent % of water demand.

5.0 Conclusions

While no attempt was made during Phase 1 of the OC Study to assign the likelihood of any one of the six scenarios occurring over the others, some might postulate that Scenario 2 would be the most likely to occur given that most climate experts believe we are already seeing evidence of climate variability impacts today. This all said, a number of observations can be made from this study, which are:

1. The most sensitive model parameters are:
 - Whether or not the Cal Fix is implemented, and by when
 - The extent that climate variability impacts our supply reliability, which can take many forms:
 - Loss of the snowpack in the Sierras and Rocky’s affecting imported water
 - Higher reservoir evapotranspiration
 - Reduced groundwater recharge statewide and locally
 - Increased water demands for irrigation and cooling from higher temperatures
 - Requires increase storage to capture and utilize available supplies

2. The range in water supply gaps carry different implications, namely:
 - Under Scenario 1a (no climate variability, no Cal Fix), supply shortages are fairly manageable, with average shortages in 2040 being about 6% of demand with an occurrence of about 4 in 10 years.
 - Under Scenario 2a (moderate climate variability, no Cal Fix), supply shortages require moderate levels of new investments, with average shortages in 2040 being about 13% of demands with an occurrence of about 5 in 10 years.
 - Under Scenario 3a (significant climate variability, no Cal Fix), supply shortages require significant levels of new investments, with average shortages in 2040 being about 21% of demands with an occurrence of about 6 in 10 years.
 - Scenarios with Cal Fix significantly reduce average shortages by 85% for Scenario 1, by 77% for Scenario 2, and by 50% for Scenario 3 in 2040.
 - Modest shortages begin in 2020, 8,500 AF per year on average (about 2% of demands) with an occurrence of about 1 in 10 years
3. Decisions made by Orange County water agencies to improve water supply reliability with local water supply investments should consider the following:
 - The large influence of the Cal Fix. MET and Orange County are much more reliable with the Cal Fix; however, the following questions are posed:
 - What is the implication for triggering Orange County supply investments as long as the Cal Fix is an uncertainty?
 - How long should Orange County wait to see where the Cal Fix is headed? 3, 5 or 10 years?
 - What types of Orange County supply investment decisions would be beneficial whether or not the Cal Fix proceeds ahead?
 - MET is potentially undertaking a NEW Indirect Potable Reuse project.
 - What are the implications of this project for decision-making in Orange County?
 - Other MET investments in its recommended 2015 IRP.
 - What success rate does Orange County attribute to these planned MET water supply investments?
 - Will the success rate be influenced by the Cal Fix? (e.g., additional storage without Cal Fix may not provide much benefit if there is no replenishment water during normal hydrologic years)

Phase 2 of the OC Study seeks to address these observations in a collaborative way by providing insights as to the various cost implications of different portfolios made up from MET, the MET member agencies and Orange County water supply options and to discuss policy implications for MET and Orange County. The combined information from Phases 1 and 2 would give local decision

makers both an idea of the risk of water supply shortages under a wide range of plausible scenarios, and the range of cost implications for mitigating the shortages. The intent of the OC Study, however, is to not to make any specific recommendations as to which supply options should be implemented, but rather present common information in an objective manner for local decision making.

6.0 References

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APPENDIX H

AWWA Water Loss Audit Worksheet



AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:

Email Address:

Telephone (incl Ext.):

Name of City / Utility:

City/Town/Municipality:

State / Province:

Country:

Year: Financial Year

Start Date: Enter MM/YYYY numeric format

End Date: Enter MM/YYYY numeric format

Audit Preparation Date:

Volume Reporting Units:

PWSID / Other ID:

The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

<p><u>Instructions</u></p> <p>The current sheet. Enter contact information and basic audit details (year, units etc)</p>	<p><u>Reporting Worksheet</u></p> <p>Enter the required data on this worksheet to calculate the water balance and data grading</p>	<p><u>Comments</u></p> <p>Enter comments to explain how values were calculated or to document data sources</p>	<p><u>Performance Indicators</u></p> <p>Review the performance indicators to evaluate the results of the audit</p>	<p><u>Water Balance</u></p> <p>The values entered in the Reporting Worksheet are used to populate the Water Balance</p>	<p><u>Dashboard</u></p> <p>A graphical summary of the water balance and Non-Revenue Water components</p>
<p><u>Grading Matrix</u></p> <p>Presents the possible grading options for each input component of the audit</p>	<p><u>Service Connection Diagram</u></p> <p>Diagrams depicting possible customer service connection line configurations</p>	<p><u>Definitions</u></p> <p>Use this sheet to understand the terms used in the audit process</p>	<p><u>Loss Control Planning</u></p> <p>Use this sheet to interpret the results of the audit validity score and performance indicators</p>	<p><u>Example Audits</u></p> <p>Reporting Worksheet and Performance Indicators examples are shown for two validated audits</p>	<p><u>Acknowledgements</u></p> <p>Acknowledgements for the AWWA Free Water Audit Software v5.0</p>

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
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? Click to access definition
+ Click to add a comment

Water Audit Report for: Trabuco Canyon Water District
Reporting Year: 2014-2015 / 7/2014 - 6/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ? 7	2,466.004	acre-ft/yr
Water imported:	+ ? 5	274.820	acre-ft/yr
Water exported:	+ ? 3	90.630	acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	+ ? 3	Value:		acre-ft/yr
	+ ? 3	Value:		acre-ft/yr
	+ ? 1	Value:		acre-ft/yr

WATER SUPPLIED: 2,650.194 acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Billed metered:	+ ? 7	2,414.604	acre-ft/yr
Billed unmetered:	+ ? n/a	0.000	acre-ft/yr
Unbilled metered:	+ ? 8	0.467	acre-ft/yr
Unbilled unmetered:	+ ? 8	0.322	acre-ft/yr

AUTHORIZED CONSUMPTION: 2,415.393 acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt: 0.322 Value: 0.322 acre-ft/yr

Use buttons to select percentage of water supplied OR value

Pcnt: 0.25% Value: acre-ft/yr

1.50% Value: acre-ft/yr
0.25% Value: acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

234.801 acre-ft/yr

Apparent Losses

Unauthorized consumption: 6.625 acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ? 2	36.778	acre-ft/yr
Systematic data handling errors:	+ ? 5	6.037	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 49.440 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 185.361 acre-ft/yr

WATER LOSSES: 234.801 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 235.590 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ? 9	67.0	miles
Number of active AND inactive service connections:	+ ? 6	3,959	
Service connection density:	+ ?	59	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: 0 (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 1 90.0 psi

COST DATA

Total annual cost of operating water system:	+ ? 10	\$5,551,360	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ? 8	\$2.82	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ? 7	\$1,007.15	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Volume from own sources
- 2: Customer metering inaccuracies
- 3: Billed metered



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

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Water Audit Report for: **Trabuco Canyon Water District**
 Reporting Year: **2014-2015** | **7/2014 - 6/2015**

***** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 67 out of 100 *****

System Attributes:

	Apparent Losses:	49.440	acre-ft/yr
	+	Real Losses:	185.361
	=	Water Losses:	234.801

? Unavoidable Annual Real Losses (UARL): 96.41 acre-ft/yr

Annual cost of Apparent Losses: \$60,779

Annual cost of Real Losses: \$186,687

Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	8.9%	
		Non-revenue water as percent by cost of operating system:	4.5%	Real Losses valued at Variable Production Cost

Operational Efficiency:	{	Apparent Losses per service connection per day:	11.15	gallons/connection/day
		Real Losses per service connection per day:	41.80	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.46	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 185.36 acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 1.92

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: Water Balance

WAS v5.0

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Water Audit Report for:	Trabuco Canyon Water District	
Reporting Year:	2014-2015	7/2014 - 6/2015
Data Validity Score:	67	

Own Sources (Adjusted for known errors)	Water Exported 90.630	Billed Water Exported				Revenue Water 2,414.604
		Authorized Consumption 2,415.393	Billed Authorized Consumption 2,414.604	Billed Metered Consumption (water exported is removed) 2,414.604	Billed Unmetered Consumption 0.000	
2,466.004	Water Supplied 2,650.194	Water Losses 234.801	Unbilled Authorized Consumption 0.789	Unbilled Metered Consumption 0.467	Non-Revenue Water (NRW) 235.590	
			Apparent Losses 49.440	Unbilled Unmetered Consumption 0.322		
Water Imported 274.820			Real Losses 185.361	Unauthorized Consumption 6.625		
				Customer Metering Inaccuracies 36.778		
				Systematic Data Handling Errors 6.037		
				Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>		
				Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>		
				Leakage on Service Connections <i>Not broken down</i>		



AWWA Free Water Audit Software: Dashboard

WAS v5.0

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The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

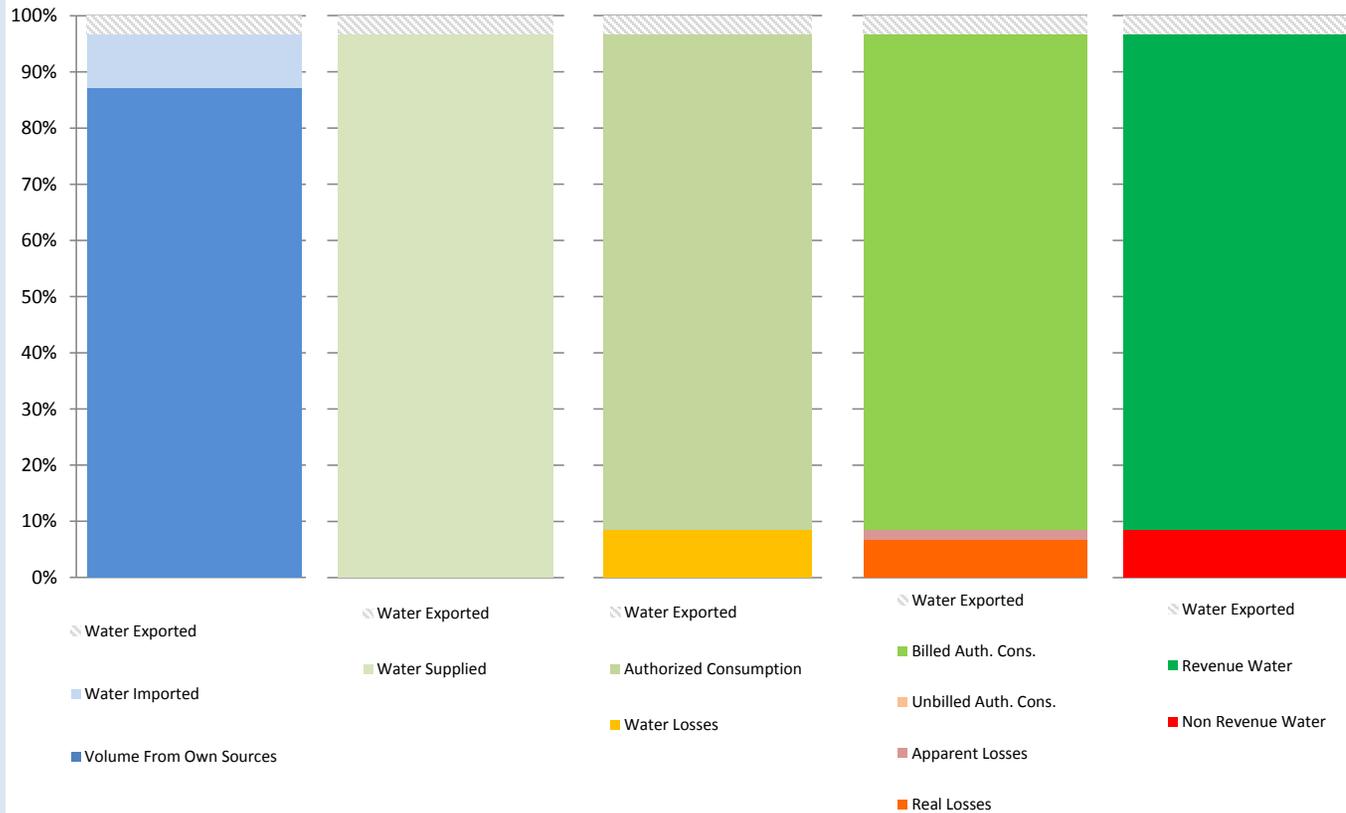
Water Audit Report for: **Trabuco Canyon Water District**

Reporting Year: **2014-2015** **7/2014 - 6/2015**

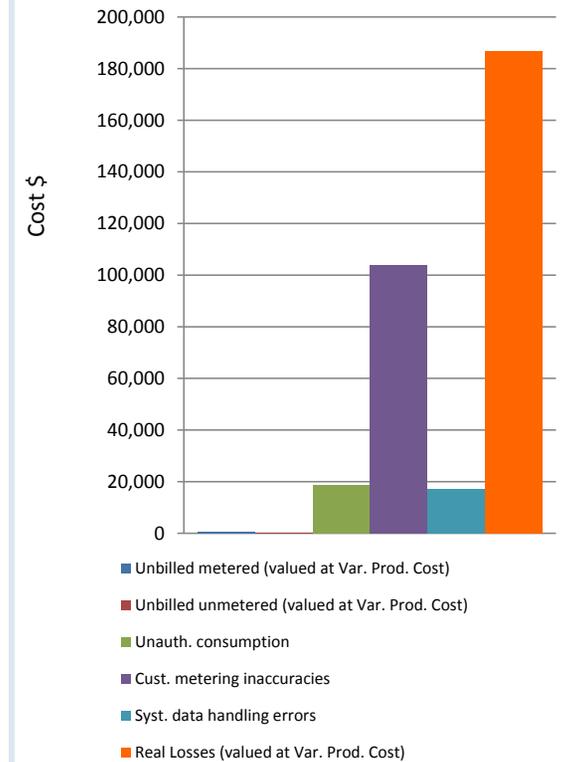
Data Validity Score: **67**

Show me the VOLUME of Non-Revenue Water

Show me the COST of Non-Revenue Water



Total Cost of NRW = \$327,012



Trabuco Canyon Water District: Data Validity Scoring

FY14-15



Overall Data Validity Score: 67

Weighted sum, normalized to 100

DATA INPUT	SCORE	DEFINITION PERTAINING TO SCORE	RATIONALE FOR SCORE
Volume from Own Sources	7	<p>Conditions between 6 and 8.</p> <p><i>Definition for a score of 6:</i> At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.</p>	<p>Trabuco Canyon produces water at the Dimension Water Treatment Plant. To arrive at a volume input into the distribution system, the volume registered by the backwash meter is subtracted from the volume registered by the effluent meter. Trabuco Canyon calibrates the backwash and effluent meters annually but does not perform volumetric tests.</p>
Volume from Own Sources – Master Meter Error Adjustment	3	<p>Conditions between 2 and 4.</p> <p><i>Definitions for a score of 2:</i> No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.</p>	<p>The production meters are manually read on a daily basis; daily totalizer reads are recorded in a master Excel spreadsheet. Net change in the volume of water in storage over the course of the audit period is incorporated in the Volume from Own Sources.</p>
Water Imported	5	<p>Conditions between 4 and 6.</p> <p><i>Definition for a score of 4:</i> 50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.</p>	<p>Trabuco Canyons imports from SMWD and IRWD through metered interconnections. Meter totalizers are read and recorded on a daily basis when interconnections are active. Interconnection meters are calibrated occasionally but not volumetrically tested. Calibration records were not available for the FY14-15 audit period.</p>

DATA INPUT	SCORE	DEFINITION PERTAINING TO SCORE	RATIONALE FOR SCORE
Water Imported – Master Meter Error Adjustment	3	<p>Conditions between 2 and 4.</p> <p><i>Definition for a score of 2:</i> No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.</p>	<p>Import meter totalizer readings are collected and recorded in an Excel spreadsheet on a daily basis when meters are active; totalizer reads are not collected during periods when no volume is imported. Errors in totalized volume or manual spreadsheet entry are caught when obvious, but subtle errors may go unnoticed.</p>
Water Exported	3	<p>Conditions between 2 and 4.</p> <p><i>Definition for a score of 2:</i> 25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.</p>	<p>Trabuco Canyon exports potable water as a supplement to the raw water system. A single meter registers export water, but no meter calibration or volumetric testing is conducted. Accuracy of the export meter is unknown.</p>
Water Exported – Master Meter Error Adjustment	1	<p>Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.</p>	<p>Trabuco Canyon reads the export meter on a monthly basis (daily reading would be required to achieve a higher data validity score). The accuracy of the meter is unknown and the meter is infrequently maintained, so the potential for erroneous registration cannot be determined.</p>
Billed Metered Authorized Consumption	7	<p>Conditions between 6 and 8.</p> <p><i>Definition for a score of 6:</i> At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.</p>	<p>All billed customers are metered and read manually with a high success rate. Minimal accuracy testing is conducted, usually in response to customer requests. Small meters are replaced on a 15-year schedule. Large meters are replaced when performance deteriorates, though no rigorous large-meter testing schedule exists to track accuracy. AMR implementation is in process.</p>
Billed Unmetered Authorized Consumption	n/a		<p>All billed consumption is metered.</p>

DATA INPUT	SCORE	DEFINITION PERTAINING TO SCORE	RATIONALE FOR SCORE
Unbilled Metered Authorized Consumption	8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Unbilled Metered Authorized Consumption is clearly limited to district uses at treatment plants. Meter reads are retrieved monthly, though the accuracy of these meters is unknown.
Unbilled Unmetered Authorized Consumption	8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Trabuco Canyon tracks water used for sewer flushing on a monthly basis using flow rate and time estimations. Other uses of Unbilled Unmetered Authorized Consumption may exist but are not consistently tracked.
Unauthorized Consumption	5	Default value of 0.25% of volume of Water Supplied is employed.	WSO selected the default value for Unauthorized Consumption.
Customer Metering Inaccuracies	2	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Audit software input is a guess. No customer meter testing program exists beyond infrequent tests in response to customer complaints. However, meter asset tracking is institutional practice and meter population demographics are readily available. The distribution of the age of customer meters was used to estimate the bulk percentage of under-registration.
Systematic Data Handling Errors	5	Default value of 0.25% of Authorized Consumption is employed.	WSO selected the default value for Systematic Data Handling Errors.
Length of Mains	9	Conditions between 8 and 10. <i>Definition for a score of 8:</i> Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Trabuco Canyon tracks mains using a GIS asset management system. The system was updated during the audit period to incorporate both new technology and confirm the accuracy of recorded information.

DATA INPUT	SCORE	DEFINITION PERTAINING TO SCORE	RATIONALE FOR SCORE
Number of Active and Inactive Service Connections	6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Computerized program manages account tracking, with count of meters in the ground serving as a proxy count of service connections. Limited field verification is conducted, but the potential for error is believed to be minimal.
Average Length of Customer Service Line	10	Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer ""Yes"" to the question on the Reporting Working asking about this condition. A value of zero and a grading of 10 are automatically entered in the Reporting Worksheet.	Customer meters are located at the curb stop.
Average Operating Pressure	1	Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain , high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Trabuco Canyon staff report an average system pressure ranging from 80 PSI to 100 PSI. Trabuco Canyon was unable to access SCADA system pressure data for this audit, so WSO took the midpoint of the anecdotal pressure range to serve as the audit input.
Total Annual Cost of Operating Water System	10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.	Financial data provided is comprehensive and tracked using industry-standard tools. Data is audited at least annually by utility personnel and a CPA.
Customer Retail Unit Cost	8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate , which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Total volumetric revenue was divided by total volume sold to determine a weighted-average customer retail unit cost. Retail structure is not reviewed by a third party knowledgeable in M36 methodology at least once every five years.

DATA INPUT	SCORE	DEFINITION PERTAINING TO SCORE	RATIONALE FOR SCORE
Variable Production Cost	7	<p>Conditions between 6 and 8.</p> <p><i>Definition for a score of 6:</i></p> <p>Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.</p>	<p>Industry-standard production cost accounting practices and tools are employed. All relevant costs have been incorporated in the variable production cost. However, variable production cost information has not been audited by a third-party knowledgeable in M36 methodology.</p>

APPENDIX I

Water Use Efficiency Implementation Report



Orange County

Water Use Efficiency Programs Savings and Implementation Report

Retrofits and Acre-Feet Water Savings for Program Activity

Program	Program Start Date	Retrofits Installed in	Month Indicated		Current Fiscal Year		Overall Program		
			Interventions	Water Savings	Interventions	Water Savings	Interventions	Annual Water Savings[4]	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	October-15	532	1.53	2,244	16.15	105,611	3,644	20,708
Smart Timer Program - Irrigation Timers	2004	October-15	1	0.00	371	15.65	13,438	4,655	28,933
Rotating Nozzles Rebate Program	2007	October-15	3,709	14.83	18,064	135.73	478,934	2,422	9,721
SoCal WaterSmart Commercial Plumbing Fixture Rebate Program	2002	September-15	2,767	7.65	3,622	18.06	51,788	3,518	34,157
Water Smart Landscape Program [1]	1997	September-15	12,690	905.55	12,690	2,710.58	12,690	10,632	71,574
Industrial Process Water Use Reduction Program	2006	September-15	0	11.26	1	11.26	14	357	1,357
Turf Removal Program ^[3]	2010	November-15	947,615	11.05	2,868,923	68	10,386,596	1,454	2,982
High Efficiency Toilet (HET) Program	2005	October-15	2,337	8.28	8,102	114.87	54,376	2,010	11,439
Home Water Certification Program	2013	October-15	11	0.022	42	0.147	301	7.080	15.007
Synthetic Turf Rebate Program	2007						685,438	96	469
Ultra-Low-Flush-Toilet Programs ^[2]	1992						363,926	13,452	162,561
Home Water Surveys ^[2]	1995						11,867	160	1,708
Showerhead Replacements ^[2]	1991						270,604	1,667	19,083
Total Water Savings All Programs				960	2,914,059	3,090	12,435,583	44,073	364,706

(1) Water Smart Landscape Program participation is based on the number of water meters receiving monthly Irrigation Performance Reports.

(2) Cumulative Water Savings Program To Date totals are from a previous Water Use Efficiency Program Effort.

(3) Turf Removal Interventions are listed as square feet.

(4) Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

HIGH EFFICIENCY CLOTHES WASHERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14	FY14/15	FY15/16	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	132	175	156	42	186	144	93	115	114	43	1,777	0.30	346.91	919
Buena Park	85	114	146	59	230	145	105	106	91	24	1,412	0.19	263.13	731
East Orange CWD RZ	18	22	17	3	23	10	10	8	8	4	185	0.03	38.21	96
El Toro WD	91	113	130	32	162	112	134	121	111	29	1,438	0.23	267.47	744
Fountain Valley	205	219	243	72	289	158	115	102	110	37	2,296	0.24	467.55	1,188
Garden Grove	238	304	332	101	481	236	190	162	165	42	3,227	0.36	641.93	1,670
Golden State WC	339	401	447	168	583	485	265	283	359	106	4,723	0.80	909.33	2,444
Huntington Beach	761	750	751	211	963	582	334	295	319	89	7,930	0.64	1,649.30	4,103
Irvine Ranch WD	1,972	2,052	1,844	1,394	2,621	2,170	1,763	1,664	1,882	676	22,448	4.63	4,161.08	11,615
La Habra	96	136	83	22	179	128	82	114	87	25	1,233	0.16	230.28	638
La Palma	33	35	51	25	76	46	34	25	34	10	429	0.07	78.92	222
Laguna Beach CWD	57	77	77	27	96	57	38	37	39	23	904	0.16	181.03	468
Mesa Water	239	249	246	73	232	176	114	86	89	27	2,352	0.21	498.68	1,217
Moulton Niguel WD	652	716	742	250	1,127	679	442	421	790	337	8,995	2.42	1,691.75	4,654
Newport Beach	245	270	259	57	197	142	116	92	95	36	2,533	0.28	540.91	1,311
Orange	366	365	403	111	349	262	218	163	160	54	3,748	0.44	781.73	1,939
Orange Park Acres	4	8	-	-	-	-	-	-	-	-	12	0.00	3.09	6
San Juan Capistrano	109	103	127	43	190	110	76	73	92	34	1,397	0.30	271.08	723
San Clemente	204	261	278	63	333	206	140	94	141	41	2,516	0.29	494.64	1,302
Santa Margarita WD	654	683	740	257	1,105	679	553	662	792	224	8,907	1.68	1,660.81	4,609
Seal Beach	47	46	57	7	81	51	31	29	38	12	582	0.10	113.15	301
Serrano WD	30	31	23	7	21	20	13	10	26	5	343	0.03	71.90	177
South Coast WD	107	130	148	43	183	112	89	79	68	25	1,522	0.18	297.39	788
Trabuco Canyon WD	69	60	62	28	82	62	30	45	47	19	755	0.14	146.53	391
Tustin	152	146	144	45	174	97	78	59	80	32	1,534	0.23	314.38	794
Westminster	213	171	233	74	329	208	121	82	109	30	2,383	0.20	480.73	1,233
Yorba Linda	288	350	367	117	394	273	181	167	156	64	3,637	0.47	750.09	1,882
MWDOC Totals	7,406	7,987	8,106	3,331	10,686	7,350	5,365	5,094	6,002	2,048	89,218	14.78	17,352.00	17,237
Anaheim	854	847	781	860	910	477	331	285	295	98	10,301	0.68	2,141.25	5,330
Fullerton	269	334	330	69	397	270	200	186	211	63	3,486	0.45	644.49	1,804
Santa Ana	236	235	257	87	355	190	163	131	132	35	2,606	0.25	570.33	1,348
Non-MWDOC Totals	1,359	1,416	1,368	1,016	1,662	937	694	602	638	196	16,393	1.37	3,356.08	3,167
Orange County Totals	8,765	9,403	9,474	4,347	12,348	8,287	6,059	5,696	6,640	2,244	105,611	16.15	20,708.07	20,404

SMART TIMERS INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 04/05		FY 05/06		FY 06/07		FY 07/08		FY 08/09		FY 09/10		FY 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		Total Program		Cumulative Water Savings across all Fiscal Years	
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.		
Brea	2	0	1	3	8	6	0	40	3	9	0	0	2	0	8	0	9	8	4	0	43	6	5	0	85	72	398.22	
Buena Park	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	19	3	0	0	0	4	10	0	0	14	30	85.75	
East Orange CWD RZ	1	0	2	0	0	0	0	0	0	0	0	1	0	0	5	0	2	0	0	0	2	0	0	0	13	0	3.55	
El Toro WD	1	0	8	0	4	95	1	174	0	25	2	18	5	5	26	2	7	2	11	0	8	9	4	0	77	330	1,976.03	
Fountain Valley	3	3	2	2	11	0	4	0	1	0	0	6	2	2	8	2	3	2	4	0	7	10	2	0	47	27	114.99	
Garden Grove	2	2	11	1	2	0	1	3	2	1	6	0	5	4	7	0	5	2	9	0	10	14	3	3	63	30	106.46	
Golden State WC	0	0	15	2	24	12	8	8	1	2	9	22	7	4	13	3	9	49	9	25	39	12	1	0	135	139	520.07	
Huntington Beach	5	2	21	9	12	12	7	1	13	1	6	27	6	36	15	4	18	33	20	35	19	2	11	0	153	162	665.38	
Irvine Ranch WD	2	2	68	111	160	434	66	183	29	56	14	145	28	153	267	71	414	135	71	59	67	310	9	0	1,195	1,659	7,923.73	
La Habra	0	0	0	0	7	1	1	0	0	0	0	21	0	0	3	0	4	7	2	0	4	7	57	43	78	79	171.24	
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	0	1	1	7	1	1.60	
Laguna Beach CWD	3	0	5	0	21	0	5	0	2	0	2	14	4	1	109	2	76	2	71	0	86	0	0	0	384	19	157.52	
Mesa Water	5	0	13	27	14	6	12	0	6	7	13	7	7	22	21	0	10	2	15	2	17	28	5	0	138	101	486.67	
Moulton Niguel WD	2	0	25	10	39	52	59	20	21	23	17	162	36	60	179	31	51	74	40	45	46	95	2	0	517	572	2,337.11	
Newport Beach	3	17	35	4	125	86	98	40	10	27	7	58	6	0	275	12	242	26	168	75	11	9	53	25	1,033	379	1,957.82	
Orange	8	4	37	13	28	38	4	0	5	2	2	13	5	8	25	0	20	24	13	9	18	31	4	0	169	142	667.97	
San Juan Capistrano	0	0	5	4	5	4	11	1	10	0	7	49	13	1	103	2	14	18	6	11	6	19	4	2	184	111	448.73	
San Clemente	4	0	483	1	46	7	21	60	81	20	13	209	46	11	212	17	26	7	28	2	28	24	16	6	1,004	364	2,056.38	
Santa Margarita WD	3	0	15	8	40	96	53	70	25	44	10	152	61	53	262	7	53	171	64	93	53	321	8	0	647	1,015	3,563.97	
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	1	1	31	1	2.10
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	1	0	1	36	1	12	0	0	0	3	52	104.07	
Serrano WD	0	0	0	0	0	0	0	0	0	0	11	0	4	0	3	0	1	0	0	0	4	0	1	0	0	24	0	5.95
South Coast WD	2	0	6	1	17	29	7	49	11	6	3	10	13	3	78	10	13	16	8	4	104	73	4	0	266	201	828.89	
Trabuco Canyon WD	0	0	29	0	10	93	4	0	1	0	2	0	2	10	12	0	6	0	2	0	6	1	6	0	0	80	104	695.27
Tustin	1	0	1	4	0	0	2	3	7	9	10	14	10	0	11	0	8	4	9	1	18	14	8	0	85	49	211.62	
Westminster	1	0	8	12	6	0	1	0	3	0	3	0	1	1	2	0	1	1	2	0	13	17	4	0	45	31	130.93	
Yorba Linda	0	0	30	6	31	5	20	41	8	5	5	21	25	0	22	0	20	0	12	5	32	2	15	1	220	86	529.19	
MWDOC Totals	48	30	820	218	610	976	385	693	242	238	142	949	289	374	1,671	185	1,017	583	571	402	648	1,026	254	82	6,697	5,756	26,151.20	
Non-MWDOC Totals	6	1	10	13	28	78	25	57	13	65	8	93	29	44	51	116	36	58	24	34	56	105	21	14	307	678	2,781.54	
Orange County Totals	54	31	830	231	638	1,054	410	750	255	303	150	1,042	318	418	1,722	301	1,053	641	595	436	704	1,131	275	96	7,004	6,434	28,933	
Anaheim	6	1	8	13	17	78	12	57	9	59	5	46	12	11	23	60	19	10	9	26	7	52	6	7	133	420	1,949.05	
Fullerton	0	0	2	0	10	0	10	0	2	2	2	39	9	33	22	51	9	29	8	0	40	26	5	6	119	186	641.99	
Santa Ana	0	0	0	0	1	0	3	0	2	4	1	8	8	0	6	5	8	19	7	8	9	27	10	1	55	72	190.50	

ROTATING NOZZLES INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 06/07			FY 07/08			FY 08/09			FY 10/11			FY 11/12			FY 12/13			FY 13/14			FY 14/15			FY 15/16			Total Program			Cumulative Water Savings across all Fiscal Years	
	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large	Small	Large	Large		
	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.		Res
Brea	0	0	0	0	0	0	22	0	0	32	0	0	130	0	0	65	120	0	84	0	0	157	45	0	0	842	0	498	1,107	0	13.71	
Buena Park	0	0	0	0	0	0	37	75	0	29	0	0	32	0	0	65	0	0	53	0	0	248	0	0	0	464	75	2,535	0	450.81		
East Orange	0	0	0	0	0	0	105	0	0	0	0	0	340	0	0	55	0	0	30	0	0	221	0	0	0	751	0	0	0	9.60		
El Toro	0	0	0	0	0	0	88	290	0	174	0	0	357	76	0	23	6,281	0	56	3,288	0	1,741	28,714	0	90	4,457	0	2,674	45,980	890	635.80	
Fountain Valley	0	0	0	51	0	0	83	0	0	83	0	0	108	0	0	35	0	0	0	0	0	107	0	0	18	0	0	506	0	0	7.95	
Garden Grove	0	0	0	44	0	0	153	106	0	38	0	0	119	0	0	95	0	0	80	0	0	88	50	0	44	0	0	812	201	0	17.16	
Golden State	0	0	0	161	0	0	83	0	0	303	943	0	294	0	0	257	2,595	0	192	0	0	583	1,741	0	65	0	0	2,218	5,308	0	102.89	
Huntington Beach	0	0	0	93	845	1,202	322	19	1,174	203	625	0	458	0	0	270	0	0	120	0	0	798	1,419	0	198	1,432	0	2,501	7,760	2,681	746.72	
Irvine Ranch	0	0	0	610	7,435	440	1,594	5,108	85	2,411	2,861	0	1,715	4,255	0	25,018	1,014	0	11,010	4,257	0	1,421	632	0	171	1,110	0	44,984	81,113	2,004	2,656.37	
La Habra	0	535	0	9	0	0	15	0	0	900	0	0	33	90	0	0	0	0	15	0	0	109	338	0	21	0	0	202	1,236	900	217.49	
La Palma	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0.24	
Laguna Beach	0	0	0	115	0	0	101	47	0	156	0	0	763	0	0	3,596	0	0	2,948	878	0	2,879	1,971	0	46	0	0	10,795	2,896	0	164.61	
Mesa Water	83	0	0	0	25	343	198	0	0	118	0	0	297	277	0	270	0	0	361	0	0	229	0	0	77	0	0	1,828	385	343	117.26	
Moulton Niguel	0	0	0	297	120	0	426	6,883	1,986	1,578	0	0	1,225	0	0	512	1,385	0	361	227	0	1,596	4,587	0	473	233	0	6,702	13,435	2,945	906.15	
Newport Beach	0	0	0	22	569	0	65	170	0	337	1,208	0	640	3,273	0	25,365	50	0	19,349	6,835	0	460	3,857	0	250	0	0	46,580	20,743	0	947.31	
Orange	0	0	0	158	0	0	961	163	0	135	30	0	343	0	0	264	0	0	245	120	0	304	668	0	271	0	0	2,810	981	0	58.18	
San Clemente	0	0	0	118	0	0	466	25	0	2,612	851	0	4,266	117	1,343	631	172	0	415	5,074	0	326	0	0	279	0	0	9,842	7,538	1,343	387.00	
San Juan Capistrano	0	0	0	70	0	0	434	1,660	0	1,452	0	0	949	0	0	684	30	0	370	0	0	495	737	0	15	0	0	5,125	8,136	0	239.81	
Santa Margarita	0	0	0	165	0	0	1,079	68	0	3,959	3,566	0	4,817	0	0	983	0	0	389	0	0	1,207	1,513	0	711	107	0	15,041	6,191	611	415.93	
Seal Beach	0	0	0	0	0	0	115	0	0	0	0	0	0	0	0	0	0	0	40	5,261	0	0	0	0	0	0	155	5,552	0	0	50.97	
Serrano	0	0	0	94	0	0	24	0	0	364	0	0	58	0	0	190	0	0	105	0	0	377	0	0	291	0	0	3,001	0	0	48.15	
South Coast	0	0	0	74	133	0	115	0	0	318	1,772	0	688	359	0	435	0	0	70	0	0	4,993	13,717	0	116	179	0	6,809	16,160	0	213.13	
Trabuco Canyon	0	0	0	130	0	0	0	0	0	0	0	0	379	0	0	34	0	0	0	0	0	56	0	0	77	0	0	2,033	791	0	52.43	
Tustin	0	0	0	23	0	0	549	0	0	512	0	0	476	1,013	0	378	0	0	329	0	0	408	0	0	120	45	0	3,109	1,058	0	60.05	
Westminster	0	0	0	0	0	0	111	0	0	0	0	0	26	0	0	15	0	0	0	0	0	54	0	0	57	0	0	343	0	0	5.47	
Yorba Linda	0	0	0	563	0	0	440	113	500	529	0	0	559	0	0	730	0	0	40	990	0	921	0	0	636	0	0	4,789	4,359	500	255.63	
MWDOC Totals	83	535	0	2,797	9,127	1,985	7,596	14,727	4,645	15,343	11,856	0	19,072	9,460	1,343	59,970	11,647	0	36,622	21,669	0	19,818	65,250	0	4,026	8,405	0	174,582	231,005	14,752	8,780.80	
Non-MWDOC Totals	0	0	0	68	0	0	329	0	0	372	382	0	742	38,554	0	459	813	0	338	0	0	498	712	0	152	5,221	0	3,231	45,846	105	575.88	
Fullerton	0	0	0	95	0	0	446	64	0	416	0	0	409	0	0	119	0	0	107	0	0	684	1,196	0	260	0	0	2,584	1,260	1,484	306.37	
Santa Ana	0	0	0	145	0	0	96	56	0	53	0	0	22	65	0	99	0	0	86	2,533	0	310	0	0	0	0	0	859	3,226	0	57.47	
Orange County Totals	83	535	0	3,105	9,127	1,985	8,467	14,847	4,645	16,184	12,238	0	20,245	48,079	1,343	60,647	12,460	0	37,153	24,202	0	21,310	67,158	0	4,438	13,626	0	181,256	281,337	16,341	9,720.51	

SOCAL WATER\$MART COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM^[1]
INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	Totals	Cumulative Water Savings across all Fiscal Years
Brea	27	113	24	4	1	234	0	10	53	593	346
Buena Park	153	432	122	379	290	5	23	56	94	1,859	908
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0	0
El Toro WD	0	92	143	1	137	0	212	6	1	760	512
Fountain Valley	17	35	0	2	314	0	0	1	0	623	517
Garden Grove	5	298	130	22	0	4	1	167	160	1,525	1,304
Golden State WC	46	414	55	68	135	0	1	0	182	1,986	1,685
Huntington Beach	48	104	126	96	156	104	144	7	451	1,981	1,368
Irvine Ranch WD	121	789	2,708	1,002	646	1,090	451	725	894	11,702	5,898
La Habra	191	75	53	4	0	0	0	0	109	652	478
La Palma	0	140	21	0	0	0	0	0	0	166	74
Laguna Beach CWD	20	137	189	0	0	0	27	0	0	446	281
Mesa Water	141	543	219	669	41	6	0	79	269	3,080	1,817
Moulton Niguel WD	9	69	151	6	0	0	0	3	0	583	722
Newport Beach	98	27	245	425	35	0	0	566	0	1,834	1,144
Orange	18	374	67	1	73	1	271	81	62	1,966	1,560
San Juan Capistrano	2	1	1	0	0	0	14	0	0	260	367
San Clemente	2	18	43	0	19	0	0	1	0	432	350
Santa Margarita WD	6	23	11	0	0	0	0	2	0	117	182
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	1	2	124	0	0	0	0	0	0	354	383
Serrano WD	0	0	0	0	0	0	0	0	0	0	0
South Coast WD	9	114	56	422	84	148	0	382	0	1,320	441
Trabuco Canyon WD	0	4	0	0	0	0	0	0	0	11	14
Tustin	115	145	25	230	0	0	0	75	0	832	720
Westminster	40	161	16	63	35	1	28	0	20	835	899
Yorba Linda	10	24	8	30	0	1	0	0	135	420	498
MWDOC Totals	1,079	4,134	4,537	3,424	1,966	1,594	1,172	2,161	2,430	34,337	22,466
Anaheim	766	3,298	582	64	48	165	342	463	959	11,331	6,099
Fullerton	133	579	29	4	0	94	0	178	55	1,736	1,427
Santa Ana	493	815	728	39	12	16	17	5	178	4,384	4,166
Non-MWDOC Totals	1,392	4,692	1,339	107	60	275	359	646	1,192	17,451	11,691
Orange County Totals	2,471	8,826	5,876	3,531	2,026	1,869	1,531	2,807	3,622	51,788	34,157

[1] Retrofit devices include ULF Toilets and Urinals, High Efficiency Toilets and Urinals, Multi-Family and Multi-Family 4-Liter HETs, Zero Water Urinals, High Efficiency Clothes Washers, Cooling Tower Conductivity Controllers, Ph Cooling Tower Conductivity Controllers, Flush Valve Retrofit Kits, Pre-rinse Spray heads, Hospital X-Ray Processor Recirculating Systems, Steam Sterilizers, Food Steamers, Water Pressurized Brooms, Laminar Flow Restrictors, and Ice Making Machines.

Water Smart Landscape Program
Total Number of Meters
in Program by Agency

Agency	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	Overall Water Savings To Date (AF)
Brea	0	0	0	0	0	0	0	22	22	22	22	22	62.80
Buena Park	0	0	0	0	0	17	103	101	101	101	101	101	455.49
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0	0	0	0.00
El Toro WD	88	109	227	352	384	371	820	810	812	812	812	812	4,798.99
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Garden Grove	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Golden State WC	0	0	0	14	34	32	34	32	32	32	32	32	198.31
Huntington Beach	0	0	0	0	0	31	33	31	31	31	31	31	146.22
Irvine Ranch WD	277	638	646	708	1,008	6,297	6,347	6,368	6,795	6,797	6,769	6,780	37,821.08
Laguna Beach CWD	0	0	0	0	57	141	143	141	124	124	124	124	724.23
La Habra	0	0	0	0	23	22	24	22	22	22	22	22	135.15
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Mesa Water	191	170	138	165	286	285	288	450	504	511	514	515	2,906.82
Moulton Niguel WD	80	57	113	180	473	571	595	643	640	675	673	695	4,073.55
Newport Beach	32	27	23	58	142	171	191	226	262	300	300	300	1,479.78
Orange	0	0	0	0	0	0	0	0	0	0	0	0	0.00
San Clemente	191	165	204	227	233	247	271	269	269	299	407	438	2,336.02
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Santa Margarita WD	547	619	618	945	1,571	1,666	1,746	1,962	1,956	2,274	2,386	2,386	14,007.83
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Serrano WD	0	0	0	0	0	0	0	0	0	0	0	0	0.00
South Coast WD	0	0	0	62	117	108	110	118	118	118	164	164	818.21
Trabuco Canyon WD	0	0	0	12	49	48	62	60	60	60	60	60	346.24
Tustin	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Westminster	0	0	0	10	18	18	20	18	18	18	18	18	115.17
Yorba Linda WD	0	0	0	0	0	0	0	0	0	0	0	0	0.00
MWDOC Totals	1,406	1,785	1,969	2,733	4,395	10,025	10,787	11,273	11,766	12,196	12,435	12,500	70,425.9
Anaheim	0	0	0	0	0	142	146	144	190	190	190	190	1,147.97
Fullerton	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	0	0	0	0	0	142	146	144	190	190	190	190	1,147.97
Orange Co. Totals	1,406	1,785	1,969	2,733	4,395	10,167	10,933	11,417	11,956	12,386	12,625	12,690	71,573.83

INDUSTRIAL PROCESS WATER USE REDUCTION PROGRAM

Number of Process Changes by Agency

Agency	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	1	0	0	0	0	0	0	0	1	54	365
East Orange	0	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	0	0	0	0	0	0
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0	0
Garden Grove	0	0	0	0	0	0	0	0	0	0	0	0
Golden State	1	0	0	0	0	0	0	0	0	1	3	22
Huntington Beach	0	0	0	0	0	2	0	1	0	3	127	234
Irvine Ranch	0	0	2	1	1	1	1	0	0	6	98	366
La Habra	0	0	0	0	0	0	0	0	0	0	0	0
La Palma	0	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	0	0	0	0	1	0	1	21	18
Orange	1	0	0	0	0	0	0	0	0	1	43	330
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	0	0	0	0	0	0	0	0
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	0	0	0	0	0
MWDOC Totals	2	1	2	1	1	3	1	2	0	13	346	1335
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	0	0	0	0	1	1	11	23
OC Totals	2	1	2	1	1	3	1	2	1	14	357	1357

[1] Acre feet of savings determined during a one year monitoring period.

If monitoring data is not available, the savings estimated in agreement is used.

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	2	7	43	48	8	0	0	38	146	115	407	56.69
Buena Park	0	1	2	124	176	7	0	0	96	153	75	634	126.10
East Orange CWD RZ	0	0	10	12	1	0	0	0	13	26	16	78	12.77
El Toro WD	0	392	18	75	38	18	0	133	218	869	159	1,920	346.39
Fountain Valley	0	69	21	262	54	17	0	0	41	132	144	740	169.64
Garden Grove	0	14	39	443	181	24	0	0	63	350	276	1,390	281.36
Golden State WC	2	16	36	444	716	37	80	2	142	794	385	2,654	514.92
Huntington Beach	2	13	59	607	159	76	0	0	163	1,190	455	2,724	443.98
Irvine Ranch WD	29	1,055	826	5,088	2,114	325	0	1,449	810	1,777	1,398	14,871	3,784.91
Laguna Beach CWD	0	2	17	91	28	11	0	0	45	112	42	348	66.56
La Habra	0	3	18	296	34	20	0	0	37	94	52	554	139.13
La Palma	0	1	10	36	26	13	0	0	21	59	34	200	36.73
Mesa Water	0	247	19	736	131	7	0	0	147	162	116	1,565	441.29
Moulton Niguel WD	0	20	104	447	188	46	0	0	400	2,497	1,455	5,157	593.83
Newport Beach	0	5	19	163	54	13	0	0	49	168	141	612	110.87
Orange	1	20	62	423	79	40	0	1	142	978	329	2,075	326.05
San Juan Capistrano	0	10	7	76	39	11	0	0	35	140	143	461	69.71
San Clemente	0	7	22	202	66	21	0	0	72	225	178	793	141.13
Santa Margarita WD	0	5	14	304	151	44	0	0	528	997	721	2,764	350.18
Seal Beach	0	678	8	21	12	1	0	2	17	50	45	834	311.28
Serrano WD	2	0	1	13	5	0	0	0	2	40	37	100	12.47
South Coast WD	2	2	29	102	41	12	23	64	102	398	175	950	133.04
Trabuco Canyon WD	0	0	4	23	23	0	0	0	10	108	107	275	31.24
Tustin	0	186	28	387	479	17	0	0	64	132	137	1,430	393.93
Westminster	0	17	25	541	167	23	0	0	35	161	287	1,256	287.02
Yorba Linda WD	0	14	89	323	96	18	0	0	40	280	278	1,138	223.99
MWDOC Totals	38	2,779	1,494	11,282	5,106	809	103	1,651	3,330	12,038	7,300	45,930	9,405.17
 	 	 	 	 	 	 	 	 	 	 	 	 	
Anaheim	0	255	78	2,771	619	114	0	0	156	1,188	400	5,581	1,433.43
Fullerton	0	4	28	286	60	23	0	0	61	293	193	948	174.49
Santa Ana	0	11	25	925	89	23	0	0	33	602	209	1,917	425.93
Non-MWDOC Totals	0	270	131	3,982	768	160	0	0	250	2,083	802	8,446	2,033.86
 	 	 	 	 	 	 	 	 	 	 	 	 	
Orange County Totals	38	3,049	1,625	15,264	5,874	969	103	1,651	3,580	14,121	8,102	54,376	11,439.03

TURF REMOVAL BY AGENCY^[1]
through MWDOC and Local Agency Conservation Programs

Agency	FY 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	0	0	3,397	9,466	7,605	0	5,697	0	71,981	30,617	12,421	0	101,101	40,083	46.12
Buena Park	0	0	0	0	0	0	0	0	11,670	1,626	5,827	0	17,497	1,626	4.54
East Orange	0	0	0	0	0	0	1,964	0	18,312	0	6,921	0	27,197	0	6.92
El Toro	0	0	4,723	0	4,680	72,718	4,582	0	27,046	221,612	15,277	86,846	56,308	381,176	132.49
Fountain Valley	0	0	1,300	0	682	7,524	4,252	0	45,583	5,279	5,869	0	57,686	12,803	22.35
Garden Grove	0	46,177	14,013	0	4,534	0	8,274	0	67,701	22,000	13,443	0	107,965	68,177	81.61
Golden State	0	0	42,593	30,973	31,813	3,200	32,725	8,424	164,507	190,738	29,919	0	301,557	233,335	192.04
Huntington Beach	801	3,651	27,630	48,838	9,219	12,437	20,642	0	165,600	58,942	54,016	7,426	277,908	131,294	149.53
Irvine Ranch	5,423	12,794	6,450	1,666	32,884	32,384	36,584	76,400	234,905	317,999	70,450	1,174,609	386,696	1,615,852	434.10
La Habra	0	7,775	0	8,262	0	0	0	0	14,014	1,818	6,127	2,936	20,141	20,791	18.02
La Palma	0	0	0	0	0	0	0	0	4,884	0	500	57,400	5,384	57,400	9.47
Laguna Beach	978	0	2,533	0	2,664	1,712	4,586	226	13,647	46,850	2,693	0	27,101	48,788	24.38
Mesa Water	0	0	6,777	0	10,667	0	22,246	0	131,675	33,620	18,947	0	190,312	33,620	68.99
Moulton Niguel	956	16,139	4,483	26,927	11,538	84,123	14,739	40,741	314,250	1,612,845	80,041	127,043	426,007	1,907,818	681.78
Newport Beach	0	0	3,454	0	3,548	2,346	894	0	33,995	65,277	1,064	55,287	42,955	122,910	41.78
Orange	0	0	12,971	0	15,951	8,723	11,244	0	120,093	281,402	19,781	0	180,040	290,125	142.80
San Clemente	0	0	21,502	0	16,062	13,165	18,471	13,908	90,349	1,137	18,718	392,742	165,102	420,952	128.24
San Juan Capistrano	0	0	22,656	103,692	29,544	27,156	12,106	0	101,195	32,366	13,778	19,598	179,279	182,812	167.35
Santa Margarita	4,483	5,561	1,964	11,400	10,151	11,600	17,778	48,180	211,198	514,198	104,454	178,666	350,028	769,605	300.42
Seal Beach	0	0	0	0	3,611	0	0	0	15,178	504	2,159	0	20,948	504	6.72
Serrano	0	0	0	0	0	0	2,971	0	41,247	0	32,545	0	76,763	0	17.35
South Coast	0	16,324	6,806	0	9,429	4,395	15,162	116,719	84,282	191,853	46,342	0	162,021	329,291	165.41
Trabuco Canyon	0	0	272	0	1,542	22,440	2,651	0	14,771	0	5,436	66,964	24,672	89,404	29.00
Tustin	0	0	0	0	9,980	0	1,410	0	71,285	14,137	13,567	1,700	96,242	15,837	32.24
Westminster	0	0	0	0	0	0	0	0	14,040	34,631	11,354	0	25,394	34,631	15.22
Yorba Linda	11,349	0	0	0	0	0	0	0	112,136	12,702	51,470	54,587	174,955	67,289	59.33
MWDOC Totals	23,990	108,421	183,524	241,224	216,104	303,923	238,978	304,598	2,195,544	3,692,153	643,119	2,225,804	3,501,259	6,876,123	2,978.20

Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Fullerton	0	0	0	0	0	0	0	9,214	0	0	0	0	0	9,214	3.87
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Non-MWDOC Totals	0	9,214	0	0	0	0	0	9,214	3.87						

Orange County Totals	23,990	108,421	183,524	241,224	216,104	303,923	238,978	313,812	2,195,544	3,692,153	643,119	2,225,804	3,501,259	6,885,337	2,982
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[1] Installed device numbers are listed as square feet

HOME WATER SURVEYS PERFORMED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 13/14		FY 14/15		FY 15/16		Total		Cumulative Water Savings
	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	
Brea	1	0	2	0	0	0	3	0	0.16
Buena Park	0	0	1	0	0	0	1	0	0.05
East Orange	19	0	1	0	0	0	20	0	1.39
El Toro	0	0	3	0	0	0	3	0	0.14
Fountain Valley	3	0	4	0	0	0	7	0	0.40
Garden Grove	0	0	6	0	1	0	7	0	0.31
Golden State	0	0	0	0	0	0	0	0	0.00
Huntington Beach	2	0	5	0	2	0	9	0	0.42
Irvine Ranch	1	0	3	0	5	0	9	0	0.33
La Habra	0	0	1	0	0	0	1	0	0.05
La Palma	0	0	0	0	0	0	0	0	0.00
Laguna Beach	4	0	8	0	1	0	13	0	0.68
Mesa Water	0	0	0	0	0	0	0	0	0.00
Moulton Niguel	4	0	4	0	0	0	8	0	0.47
Newport Beach	2	0	8	0	3	0	13	0	0.59
Orange	2	0	18	0	1	0	21	0	1.01
San Clemente	15	0	13	0	0	0	28	0	1.67
San Juan Capistrano	4	0	13	0	2	0	19	0	0.94
Santa Margarita	15	0	40	1	12	0	67	1	3.22
Seal Beach	0	0	1	0	1	0	2	0	0.07
Serrano	0	0	2	0	0	0	2	0	0.09
South Coast	6	0	4	0	1	0	11	0	0.64
Trabuco Canyon	0	0	4	0	0	0	4	0	0.19
Tustin	0	0	10	0	4	0	14	0	0.56
Westminster	0	0	0	0	0	0	0	0	0.00
Yorba Linda	0	0	13	0	8	0	21	0	0.80
MWDOC Totals	78	0	164	1	41	0	283	1	14.18

Anaheim	0	0	0	0	0	0	0	0	0.00
Fullerton	0	0	17	0	1	0	18	0	0.82
Santa Ana	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	0	0	17	0	1	0	18	0	0.82

Orange County Totals	78	0	181	1	42	0	301	1	15.007
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SYNTHETIC TURF INSTALLED BY AGENCY^[1]
through MWDOC and Local Agency Conservation Programs

Agency	FY 07/08		FY 08/09		FY 09/10		FY 10/11		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	0	0	2,153	2,160	500	0	0	0	2,653	2,160	3.30
Buena Park	0	0	1,566	5,850	0	0	0	0	1,566	5,850	5.19
East Orange	0	0	0	0	983	0	0	0	983	0	0.55
El Toro	3,183	0	2,974	0	3,308	0	895	0	10,360	0	6.98
Fountain Valley	11,674	0	1,163	0	2,767	0	684	0	16,288	0	12.46
Garden Grove	1,860	0	0	0	3,197	0	274	0	5,331	0	3.47
Golden State	6,786	0	13,990	0	15,215	0	2,056	0	38,047	0	24.88
Huntington Beach	15,192	591	12,512	0	4,343	1,504	0	0	32,047	2,095	25.29
Irvine Ranch	11,009	876	13,669	0	2,585	0	0	0	27,263	876	21.00
La Habra	0	0	0	0	0	0	0	0	0	0	-
La Palma	429	0	0	0	0	0	0	0	429	0	0.36
Laguna Beach	3,950	0	3,026	0	725	0	0	0	7,701	0	5.84
Mesa Water	4,114	0	3,005	78,118	4,106	0	2,198	0	13,423	78,118	63.46
Moulton Niguel	14,151	0	25,635	2,420	7,432	0	0	0	47,218	2,420	35.69
Newport Beach	2,530	0	6,628	0	270	0	0	0	9,428	0	6.92
Orange	4,169	0	7,191	0	635	0	0	0	11,995	0	8.89
San Clemente	9,328	0	11,250	455	2,514	1,285	500	0	23,592	1,740	18.37
San Juan Capistrano	0	0	7,297	639	2,730	0	4,607	0	14,634	639	9.02
Santa Margarita	12,922	0	26,069	0	21,875	0	7,926	0	68,792	0	44.68
Seal Beach	0	0	817	0	0	0	0	0	817	0	0.57
Serrano	7,347	0	1,145	0	0	0	0	0	8,492	0	6.97
South Coast	2,311	0	6,316	0	17,200	0	1,044	0	26,871	0	16.43
Trabuco Canyon	1,202	0	9,827	0	0	0	0	0	11,029	0	7.89
Tustin	6,123	0	4,717	0	2,190	0	0	0	13,030	0	9.67
Westminster	2,748	16,566	8,215	0	890	0	0	0	11,853	16,566	22.47
Yorba Linda	11,792	0	12,683	0	4,341	5,835	0	0	28,816	5,835	24.48
MWDOC Totals	132,820	18,033	181,848	89,642	97,806	8,624	20,184	0	432,658	116,299	384.83

Anaheim	4,535	0	7,735	20,093	13,555	65,300	4,122	0	29,947	85,393	69.18
Fullerton	4,865	876	5,727	0	6,223	0	105	0	16,920	876	12.36
Santa Ana	0	0	2,820	0	525	0	0	0	3,345	0	2.27
Non-MWDOC Totals	9,400	876	16,282	20,093	20,303	65,300	4,227	0	50,212	86,269	83.81

Orange County Totals	142,220	18,909	198,130	109,735	118,109	73,924	24,411	0	482,870	202,568	468.63
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[1] Installed device numbers are calculated in square feet

ULF TOILETS INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	Previous Years	FY 95-96	FY 96-97	FY 97-98	FY 98-99	FY 99-00	FY 00-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	Total	Cumulative Water Savings across all Fiscal Years
Brea	378	189	299	299	122	144	867	585	341	401	26	48	17	4	0	3,720	1,692.64
Buena Park	361	147	331	802	520	469	524	1,229	2,325	1,522	50	40	18	9	0	8,347	3,498.37
East Orange CWD RZ	2	0	33	63	15	17	15	50	41	44	19	18	13	2	0	332	138.23
El Toro WD	1,169	511	678	889	711	171	310	564	472	324	176	205	61	40	0	6,281	3,091.16
Fountain Valley	638	454	635	858	1,289	2,355	1,697	1,406	1,400	802	176	111	58	32	0	11,911	5,383.10
Garden Grove	1,563	1,871	1,956	2,620	2,801	3,556	2,423	3,855	3,148	2,117	176	106	67	39	0	26,298	12,155.41
Golden State WC	3,535	1,396	3,141	1,113	3,024	2,957	1,379	2,143	3,222	1,870	167	116	501	43	0	24,607	11,731.47
Huntington Beach	3,963	1,779	2,600	2,522	2,319	3,492	3,281	2,698	3,752	1,901	367	308	143	121	0	29,246	13,854.70
Irvine Ranch WD	4,016	841	1,674	1,726	1,089	3,256	1,534	1,902	2,263	6,741	593	626	310	129	0	26,700	11,849.23
Laguna Beach CWD	283	93	118	74	149	306	220	85	271	118	32	26	29	6	0	1,810	845.69
La Habra	594	146	254	775	703	105	582	645	1,697	1,225	12	31	6	7	0	6,782	2,957.73
La Palma	65	180	222	125	44	132	518	173	343	193	31	27	20	17	0	2,090	927.52
Mesa Water	1,610	851	1,052	2,046	2,114	1,956	1,393	1,505	2,387	988	192	124	56	14	0	16,288	7,654.27
Moulton Niguel WD	744	309	761	698	523	475	716	891	728	684	410	381	187	100	0	7,607	3,371.14
Newport Beach	369	293	390	571	912	1,223	438	463	396	1,883	153	76	36	16	0	7,219	3,166.77
Orange	683	1,252	1,155	1,355	533	2,263	1,778	2,444	2,682	1,899	193	218	88	53	4	16,600	7,347.93
San Juan Capistrano	1,234	284	193	168	323	1,319	347	152	201	151	85	125	42	39	0	4,663	2,324.42
San Clemente	225	113	191	65	158	198	667	483	201	547	91	66	37	34	0	3,076	1,314.64
Santa Margarita WD	577	324	553	843	345	456	1,258	790	664	260	179	143	101	29	0	6,522	3,001.01
Seal Beach	74	66	312	609	47	155	132	81	134	729	29	10	6	12	0	2,396	1,073.80
Serrano WD	81	56	68	41	19	52	95	73	123	98	20	15	14	2	0	757	338.66
South Coast WD	110	176	177	114	182	181	133	358	191	469	88	72	32	22	0	2,305	990.05
Trabuco Canyon WD	10	78	42	42	25	21	40	181	102	30	17	20	12	14	0	634	273.02
Tustin	968	668	557	824	429	1,292	1,508	1,206	1,096	827	69	89	26	12	0	9,571	4,423.88
Westminster	747	493	969	1,066	2,336	2,291	2,304	1,523	2,492	1,118	145	105	70	24	0	15,683	7,064.28
Yorba Linda WD	257	309	417	457	404	1,400	759	1,690	1,155	627	158	136	81	41	0	7,891	3,409.49
MWDOC Totals	24,256	12,879	18,778	20,765	21,136	30,242	24,918	27,175	31,827	27,568	3,654	3,242	2,031	861	4	249,336	113,878.61

Anaheim	447	1,054	1,788	3,661	1,755	7,551	4,593	6,346	9,707	5,075	473	371	462	341	1	43,625	18,359.52
Fullerton	1,453	1,143	694	1,193	1,364	2,138	1,926	2,130	2,213	1,749	172	77	44	23	2	16,321	7,435.23
Santa Ana	1,111	1,964	1,205	2,729	2,088	8,788	5,614	10,822	10,716	9,164	279	134	25	5	0	54,644	22,887.95
Non-MWDOC Totals	3,011	4,161	3,687	7,583	5,207	18,477	12,133	19,298	22,636	15,988	924	582	531	369	3	114,590	48,682.70

Orange County Totals	27,267	17,040	22,465	28,348	26,343	48,719	37,051	46,473	54,463	43,556	4,578	3,824	2,562	1,230	7	363,926	162,561.30
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APPENDIX J

CUWCC BMP Report





CUWCC BMP Retail Coverage Report 2013

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

225 Trabuco Canyon Water District

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Title:

Email:

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.tcwd.ca.gov/home/showdocument?id=562	1. Conservation Ordinance No. 2008-18 2. Ordinance Permanent Provisions
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As

Exemption

Comments:



CUWCC BMP Retail Coverage Report 2013
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

NOT ON TRACK

225 Trabuco Canyon Water District

Completed Standard Water Audit Using AWWA Software? No

AWWA File provided to CUWCC? No

AWWA Water Audit Validity Score?

Complete Training in AWWA Audit Method No

Complete Training in Component Analysis Process? No

Component Analysis? No

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. No

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
2				True		

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

NOT ON TRACK

225 Trabuco Canyon Water District

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	0
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date: 1/1/0001	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	No
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

Not On Track

225 Trabuco Canyon Water District

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	1927087.42	1252384.1
Multi-Family	Increasing Block	Yes	37312.36	20456.28
Commercial	Increasing Block	Yes	154404.67	73967.8
Dedicated Irrigation	Increasing Block	Yes	517227.75	91918.23
Agricultural	Increasing Block	Yes	486779.87	6505
Other	Increasing Block	Yes	4126.45	4082.46
			3126938.52	1449313.87

Calculate: $V / (V + M)$ 68 %

Implementation Option: Use Annual Revenue As Reported

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Uniform	Yes
Multi-Family	Uniform	Yes
Commercial	Uniform	Yes

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

225 Trabuco Canyon Water District

Retail

Does your agency perform Public Outreach programs? **Yes**

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Municipal Water District of Orange County

Agency Name	ID number
Municipal Water District of Orange County	168

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quarter of the reporting year? **No**

Public Outreach Program List	Number
Newsletter articles on conservation	4023
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	4023
General water conservation information	200
Total	8246

Did at least one contact take place during each quarter of the reporting year? **No**

Did at least one website update take place during each quarter of the reporting year? **Yes**

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Water Conservation	1000
Special Events	7500
Total Amount:	8500

Description of all other Public Outreach programs

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

225 Trabuco Canyon Water District

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Municipal Water District of Orange County

Agencies Name	ID number
Municipal Water District of Orange County	168

Materials meet state education framework requirements? Yes

All lessons are aligned with the California Science Content Standards to achieve the state education framework requirements.

Materials distributed to K-6? Yes

Grade-specific education booklets featuring mascot Ricki the Rambunctious Raindrop. Booklets contain lessons and hands-on activities that are designed to reinforce and augment the concepts taught in the large group assemblies (described below). Part

Materials distributed to 7-12 students? No (Info Only)

Annual budget for school education program: 1646.00

Description of all other water supplier education programs

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2013

BMP3 - Residential

NOT ON TRACK

Agency **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
1.77	0	1.77	0	

Residential Assistance

	Single Family Accounts	Single Family Target	Multi Family Units	Multi Family Target
Total Number Of Accounts/Units	0		0	
Total Participants during Reporting				
Number of Leak Detection Surveys or Assistance on Customer Property	0	0.00	0	0.00
Number of Faucet Aerators Distributed	0		0	
Number of WSS Showerheads Distributed	0			
Landscape Water Surveys	4	0.00	0	

Has agency reached a 75% market saturation for showerheads?

No

High Efficiency Clothes Washers

Single Family Accounts

Single Family Target

Number of installations for HECW

30

0.00

Are financial incentives provided for HECWs?

Yes

Has agency completed a HECW Market Penetration Study?

No

Water Sense Specification Toilets

Retrofit 'On Resale' Ordinance exists

No

75% Market Penetration Achieved

No

Single Family Units

Multi Family Units

Five year average Resale Rate

0.06

0.03

Number Toilets per Household

2.5

1.5

Number WSS Toilets Installed

0

0

Target Number of WSS Toilets

0.00

0.00

WSS for New Residential Development

Does an Ordinance Exists Requiring WSS Fixtures and Appliances in new SF and MF residences?

Single Family Units

Multi Family Units

No

No

Number of new SF & MF units built

0

0

Incentives



CUWCC BMP Coverage Report 2013

BMP3 - Residential

NOT ON TRACK

Unique Conservation Measures

Residential Assistance / Landscape Water Survey unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

High Efficiency Clothes Washers unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

WaterSense Specification toilets unique water savings

SF Measured water savings (AF/YR) MF Measured water savings (AF/YR)

Uploaded file name:

WaterSense Specification toilets for New Residential development unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

High bill contact with single-family and multi-family customers

Measured water savings (AF/YR)

Uploaded file name:

Educate residential customers about the behavioral aspects of water conservation

Measured water savings (AF/YR) 0

Uploaded file name:

Notify residential customers of leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide unique water savings fixtures that are not included in the BMP list above

Measured water savings (AF/YR) 0

Uploaded file name:

Install residence water use monitors

Measured water savings (AF/YR) 0

Uploaded file name:

Participate in programs that provide residences with school water conservation kits

Measured water savings (AF/YR) 0

Uploaded file name:

Implement in automatic meter reading program for residential customers



CUWCC BMP Coverage Report 2013

BMP3 - Residential

NOT ON TRACK

Measured water savings (AF/YR) 0

Uploaded file name:

OTHER Types of Measures

Measured water savings (AF/YR) 0

Uploaded file name:

Traditional Water Savings Calculation result:

Measures	Target Water Savings (AF):	Actual Water Savings (AF):
SF Leak Detection Surveys	0.00	0.00
MF Leak Detection Surveys	0.00	0.00
Landscape Water Surveys	0.00	0.09
SF WSS Toilets Installed	0.00	0.00
MF WSS Toilets Installed	0.00	0.00
HECW	0.00	1.68

Comments:

At Least As Effective As No

Exemption No



CUWCC BMP Coverage Report 2013

BMP4 - Commercial Industrial Institutional

NOT ON TRACK

Agency: **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

CII Baseline Water Use (AF): 549.15

CII Water Use Reduction(AF): 54.915

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
0	0	0		

<u>Water Efficiency Measures:</u>	<u>Quantity Installed:</u>	<u>Water Savings:</u>	<u>Accept Council's default value</u>
1 High Efficiency Toilets (1.2 GPF or less)	0		No
2 High Efficiency Urinals (0.5 GPF or less)	0		No
3 Ultra Low Flow Urinals	0.00		No
4 Zero Consumption Urinals	0.00		No
5 Commercial High Efficiency Single Load Clothes Washers	0.00		No
6 Cooling Tower Conductivity Controllers	0.00		No
7 Cooling Tower pH Controllers	0.00		No
8 Connectionless Food Steamers	0.00		No
9 Medical Equipment Steam Sterilizers	0.00		No
10 Water Efficient Ice Machines	0.00		No
11 Pressurized Water Brooms	0.00		No
12 Dry Vacuum Pumps	0.00		No

Total Water Savings: 0.00

Unique Conservation Measures

Industrial Process Water Use Reduction

Measured water savings (AF/YR)

Uploaded file name:

Commercial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Industrial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Filter Upgrades (for pools, spas and fountains)



CUWCC BMP Coverage Report 2013

BMP4 - Commercial Industrial
Institutional

NOT ON TRACK

Measured water savings (AF/YR)

Uploaded file name:

Car Wash Reclamation Systems

Measured water savings (AF/YR)

Uploaded file name:

Wet Cleaning

Measured water savings (AF/YR)

Uploaded file name:

Water Audits (to avoid double counting, do not include device/replacement water savings)

Measured water savings (AF/YR)

Uploaded file name:

Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

Measured water savings (AF/YR)

Uploaded file name:

Waterless Wok

Measured water savings (AF/YR)

Uploaded file name:

Alternative On-site Water Sources

Measured water savings (AF/YR)

Uploaded file name:

Sub-metering

Measured water savings (AF/YR)

Uploaded file name:

High Efficiency Showerheads

Measured water savings (AF/YR)

Uploaded file name:

Faucet Flow Restrictors

Measured water savings (AF/YR)

Uploaded file name:

Water Efficiency Dishwashers

Measured water savings (AF/YR)

Uploaded file name:

Hot Water on Demand

Measured water savings (AF/YR)

Uploaded file name:

Pre-rinse spray Valves of 1.3 gpm (gallons per minute) or less



CUWCC BMP Coverage Report 2013

BMP4 - Commercial Industrial

NOT ON TRACK

Institutional

Pre-rinse spray Valves of 1.3 gpm (gallons per minute) or less

Measured water savings (AF/YR)

Uploaded file name:

Central Flush Systems

Measured water savings (AF/YR)

Uploaded file name:

IOther Measures chosen by the Agency

Measured water savings (AF/YR)

Uploaded file name:

Comments:

At Least As Effective As No

Exemption No



CUWCC BMP Coverage Report 2013

BMP5 - Landscape

NOT ON TRACK

Agency **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	PRIOR ACTIVITIES CREDIT
0	0	0	0	0

1) Accounts with Dedicated Irrigation Meters

a) Number of dedicated irrigation meter accounts	74
b) Number of dedicated irrigation meter accounts with water budgets	0
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	0
d) Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	0
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	No
Unique measured water Savings (AF/YR) in this measure	
Uploaded the backup data if there are unique measured water savings?	No
Technical Assistance	
Number of Accounts 20% over-budget	
Number of Accounts 20% over-budget offered technical assistance	
Number of Accounts 20% over-budget accepting technical assistance	
Unique measured water Savings (AF/YR) in technical assistance	
Uploaded the backup data if there are unique measured water savings?	No

2) Commercial / Industrial / Institutional Accounts without Meters or with Mixed-Use Meters

Number of mixed use and un-metered accounts.	
Number of irrigation water use surveys offered	
Number of irrigation water use surveys accepted	
Type: Incentives numbers received by customers:	\$ Value: 0
Type: Rebates numbers received by customers:	\$ Value: 0
Type No- or low-Interest loan offered numbers received by customers:	\$ Value: 0
Annual water savings by customers receiving irrigation water savings surveys and implementing recommendations	
Estimated annual water savings by customers receiving surveys and implementing recommendations	



CUWCC BMP Coverage Report 2013

BMP5 - Landscape

NOT ON TRACK

Unique measured water Savings (AF/YR) in this measure

Uploaded the backup data if there are unique measured water savings? No

Financial Incentives

Unique measured water Savings (AF/YR) in Financial incentives

Uploaded the backup data if there are unique measured water savings? No

Unique Conservation Measures

1. Monitor and report on landscape water use

1a. Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1c. Establish agency-wide water budget. (Include in Help notes: ETo based water budget in the MWEL0 changed in 2010 from .8ETo to .7ETo.)

Uploaded file name:

1d. Establish agency-wide, sector-based irrigation goal to reduce water use, based on season.

Uploaded file name:

2. Provide technical landscape resources and training

2a. Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

Uploaded file name:

2b. Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Uploaded file name:

2c. Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Uploaded file name:

2d. Establish time-of-day irrigation restrictions.

Uploaded file name:

2e. Establish day-of-week irrigation restrictions.

Uploaded file name:

3. Provide incentives



CUWCC BMP Coverage Report 2013

BMP5 - Landscape

NOT ON TRACK

3a. Establish landscape budget-based rates.

Uploaded file name:

3b. Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Uploaded file name:

3c. Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

Uploaded file name:

3d. Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

Uploaded file name:

3e. Provide incentives for conversions from potable to recycled water.

Uploaded file name:

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

Uploaded file name:

4. Participate in local and regional planning and regulatory activities

4a. Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

4b. Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Uploaded file name:

6. Other Measures

Other Landscape Measures.

Uploaded file name:

Comments:



CUWCC BMP Coverage Report 2013

BMP5 - Landscape

NOT ON TRACK

At Least As Effective As No

Exemption No



CUWCC BMP Retail Coverage Report 2014

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

225 Trabuco Canyon Water District

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Title:

Email:

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.tcwd.ca.gov/home/showdocument?id=562	1. Conservation Ordinance No. 2008-18 2. Ordinance Permanent Provisions
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As

Exemption

Comments:



CUWCC BMP Retail Coverage Report 2014
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

NOT ON TRACK

225 Trabuco Canyon Water District

Completed Standard Water Audit Using AWWA Software? No

AWWA File provided to CUWCC? No

AWWA Water Audit Validity Score?

Complete Training in AWWA Audit Method No

Complete Training in Component Analysis Process? No

Component Analysis? No

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. No

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
3				True		

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

NOT ON TRACK

225 Trabuco Canyon Water District

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	0
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date: 1/1/0001	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	No
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

225 Trabuco Canyon Water District

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Charges
Single-Family	Increasing Block	Yes	1952651.84	1250301.24
Multi-Family	Increasing Block	Yes	40656	20456
Commercial	Increasing Block	Yes	195402.99	73728.31
Dedicated Irrigation	Increasing Block	Yes	574361.29	91596.84
Agricultural	Increasing Block	Yes	647721.66	6505.44
Other	Increasing Block	Yes	2089.36	3897.65
			3412883.14	1446485.48

Calculate: $V / (V + M)$ 70 %

Implementation Option: Use Annual Revenue As Reported

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Uniform	Yes
Multi-Family	Uniform	Yes
Commercial	Uniform	Yes

At Least As effective As

Exemption

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

225 Trabuco Canyon Water District

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Municipal Water District of Orange County

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
Newsletter articles on conservation	4023
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	4023
General water conservation information	200
Total	8246

Did at least one contact take place during each quarter of the reporting year? No

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Water Conservation	1000
Special Events	7500
Total Amount:	8500

Description of all other Public Outreach programs

Comments:

At Least As effective As

Exemption



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

225 Trabuco Canyon Water District

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Municipal Water District of Orange County

Agencies Name	ID number
Municipal Water District of Orange County	168

Materials meet state education framework requirements? Yes

All lessons are aligned with the California Science Content Standards to achieve the state education framework requirements.

Materials distributed to K-6? Yes

Grade-specific education booklets featuring mascot Ricki the Rambunctious Raindrop. Booklets contain lessons and hands-on activities that are designed to reinforce and augment the concepts taught in the large group assemblies (described below). Part

Materials distributed to 7-12 students? No (Info Only)

Annual budget for school education program: 1878.00

Description of all other water supplier education programs

Comments:

At Least As effective As No

Exemption No 0



CUWCC BMP Coverage Report 2014

BMP3 - Residential

NOT ON TRACK

Agency **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
4.65	0	4.65	0	

Residential Assistance

	Single Family Accounts	Single Family Target	Multi Family Units	Multi Family Target
Total Number Of Accounts/Units	0		0	
Total Participants during Reporting				
Number of Leak Detection Surveys or Assistance on Customer Property	0	0.00	0	0.00
Number of Faucet Aerators Distributed	0		0	
Number of WSS Showerheads Distributed	0			
Landscape Water Surveys	4	0.00	0	

Has agency reached a 75% market saturation for showerheads?

No

High Efficiency Clothes Washers

Single Family Accounts

Single Family Target

Number of installations for HECW

45

0.00

Are financial incentives provided for HECWs?

Yes

Has agency completed a HECW Market Penetration Study?

No

Water Sense Specification Toilets

Retrofit 'On Resale' Ordinance exists No

75% Market Penetration Achieved No

Single Family Units

Multi Family Units

Five year average Resale Rate

0.06

0.03

Number Toilets per Household

2.5

1.5

Number WSS Toilets Installed

10

0

Target Number of WSS Toilets

0.00

0.00

WSS for New Residential Development

Does an Ordinance Exists Requiring WSS Fixtures and Appliances in new SF and MF residences?

Single Family Units

Multi Family Units

No

No

Number of new SF & MF units built

0

0

Incentives



CUWCC BMP Coverage Report 2014

BMP3 - Residential

NOT ON TRACK

Unique Conservation Measures

Residential Assistance / Landscape Water Survey unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

High Efficiency Clothes Washers unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

WaterSense Specification toilets unique water savings

SF Measured water savings (AF/YR) MF Measured water savings (AF/YR)

Uploaded file name:

WaterSense Specification toilets for New Residential development unique water savings

Measured water savings (AF/YR) 0

Uploaded file name:

High bill contact with single-family and multi-family customers

Measured water savings (AF/YR)

Uploaded file name:

Educate residential customers about the behavioral aspects of water conservation

Measured water savings (AF/YR) 0

Uploaded file name:

Notify residential customers of leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide unique water savings fixtures that are not included in the BMP list above

Measured water savings (AF/YR) 0

Uploaded file name:

Install residence water use monitors

Measured water savings (AF/YR) 0

Uploaded file name:

Participate in programs that provide residences with school water conservation kits

Measured water savings (AF/YR) 0

Uploaded file name:

Implement in automatic meter reading program for residential customers



CUWCC BMP Coverage Report 2014

BMP3 - Residential

NOT ON TRACK

Measured water savings (AF/YR) 0

Uploaded file name:

OTHER Types of Measures

Measured water savings (AF/YR) 0

Uploaded file name:

Traditional Water Savings Calculation result:

Measures	Target Water Savings (AF):	Actual Water Savings (AF):
SF Leak Detection Surveys	0.00	0.00
MF Leak Detection Surveys	0.00	0.00
Landscape Water Surveys	0.00	0.16
SF WSS Toilets Installed	0.00	0.29
MF WSS Toilets Installed	0.00	0.00
HECW	0.00	4.20

Comments:

At Least As Effective As No

Exemption No



CUWCC BMP Coverage Report 2014

BMP4 - Commercial Industrial Institutional

NOT ON TRACK

Agency: **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

CII Baseline Water Use (AF): 549.15

CII Water Use Reduction(AF): 54.915

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
0	0	0	23.61	

<u>Water Efficiency Measures:</u>	<u>Quantity Installed:</u>	<u>Water Savings:</u>	<u>Accept Council's default value</u>
1 High Efficiency Toilets (1.2 GPF or less)	0		No
2 High Efficiency Urinals (0.5 GPF or less)	0		No
3 Ultra Low Flow Urinals	0.00		No
4 Zero Consumption Urinals	0.00		No
5 Commercial High Efficiency Single Load Clothes Washers	0.00		No
6 Cooling Tower Conductivity Controllers	0.00		No
7 Cooling Tower pH Controllers	0.00		No
8 Connectionless Food Steamers	0.00		No
9 Medical Equipment Steam Sterilizers	0.00		No
10 Water Efficient Ice Machines	0.00		No
11 Pressurized Water Brooms	0.00		No
12 Dry Vacuum Pumps	0.00		No

Total Water Savings: 0.00

Unique Conservation Measures

Industrial Process Water Use Reduction

Measured water savings (AF/YR)

Uploaded file name:

Commercial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Industrial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Filter Upgrades (for pools, spas and fountains)



CUWCC BMP Coverage Report 2014

BMP4 - Commercial Industrial
Institutional

NOT ON TRACK

Measured water savings (AF/YR)

Uploaded file name:

Car Wash Reclamation Systems

Measured water savings (AF/YR)

Uploaded file name:

Wet Cleaning

Measured water savings (AF/YR)

Uploaded file name:

Water Audits (to avoid double counting, do not include device/replacement water savings)

Measured water savings (AF/YR)

Uploaded file name:

Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

Measured water savings (AF/YR)

Uploaded file name:

Waterless Wok

Measured water savings (AF/YR)

Uploaded file name:

Alternative On-site Water Sources

Measured water savings (AF/YR)

Uploaded file name:

Sub-metering

Measured water savings (AF/YR)

Uploaded file name:

High Efficiency Showerheads

Measured water savings (AF/YR)

Uploaded file name:

Faucet Flow Restrictors

Measured water savings (AF/YR)

Uploaded file name:

Water Efficiency Dishwashers

Measured water savings (AF/YR)

Uploaded file name:

Hot Water on Demand

Measured water savings (AF/YR)

Uploaded file name:

Pre-rinse spray Valves of 1.3 gpm (gallons per minute) or less



CUWCC BMP Coverage Report 2014

BMP4 - Commercial Industrial

NOT ON TRACK

Institutional

Pre-rinse spray Valves of 1.3 gpm (gallons per minute) or less

Measured water savings (AF/YR)

Uploaded file name:

Central Flush Svstems

Measured water savings (AF/YR)

Uploaded file name:

Other Measures chosen by the Agency

Measured water savings (AF/YR)

Uploaded file name:

Comments:

At Least As Effective As No

Exemption No



CUWCC BMP Coverage Report 2014

BMP5 - Landscape

NOT ON TRACK

Agency **Trabuco Canyon Water District**

Date Agency Signed MOU: 8/21/1991

Coverage Option: Traditional

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	PRIOR ACTIVITIES CREDIT
0	0	0	0	0

1) Accounts with Dedicated Irrigation Meters

a) Number of dedicated irrigation meter accounts	74
b) Number of dedicated irrigation meter accounts with water budgets	0
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	0
d) Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	0
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	No
Unique measured water Savings (AF/YR) in this measure	
Uploaded the backup data if there are unique measured water savings?	No
Technical Assistance	
Number of Accounts 20% over-budget	
Number of Accounts 20% over-budget offered technical assistance	
Number of Accounts 20% over-budget accepting technical assistance	
Unique measured water Savings (AF/YR) in technical assistance	
Uploaded the backup data if there are unique measured water savings?	No

2) Commercial / Industrial / Institutional Accounts without Meters or with Mixed-Use Meters

Number of mixed use and un-metered accounts.	
Number of irrigation water use surveys offered	
Number of irrigation water use surveys accepted	
Type: Incentives numbers received by customers:	\$ Value: 0
Type: Rebates numbers received by customers:	\$ Value: 0
Type No- or low-Interest loan offered numbers received by customers:	\$ Value: 0
Annual water savings by customers receiving irrigation water savings surveys and implementing recommendations	
Estimated annual water savings by customers receiving surveys and implementing recommendations	



CUWCC BMP Coverage Report 2014

BMP5 - Landscape

NOT ON TRACK

Unique measured water Savings (AF/YR) in this measure

Uploaded the backup data if there are unique measured water savings? No

Financial Incentives

Unique measured water Savings (AF/YR) in Financial incentives

Uploaded the backup data if there are unique measured water savings? No

Unique Conservation Measures

1. Monitor and report on landscape water use

1a. Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1c. Establish agency-wide water budget. (Include in Help notes: ETo based water budget in the MWEL0 changed in 2010 from .8ETo to .7ETo.)

Uploaded file name:

1d. Establish agency-wide, sector-based irrigation goal to reduce water use, based on season.

Uploaded file name:

2. Provide technical landscape resources and training

2a. Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

Uploaded file name:

2b. Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Uploaded file name:

2c. Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Uploaded file name:

2d. Establish time-of-day irrigation restrictions.

Uploaded file name:

2e. Establish day-of-week irrigation restrictions.

Uploaded file name:

3. Provide incentives



CUWCC BMP Coverage Report 2014

BMP5 - Landscape

NOT ON TRACK

3a. Establish landscape budget-based rates.

Uploaded file name:

3b. Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Uploaded file name:

3c. Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

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3d. Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

Uploaded file name:

3e. Provide incentives for conversions from potable to recycled water.

Uploaded file name:

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

Uploaded file name:

4. Participate in local and regional planning and regulatory activities

4a. Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

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4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Uploaded file name:

6. Other Measures

Other Landscape Measures.

Uploaded file name:

Comments:



CUWCC BMP Coverage Report 2014

BMP5 - Landscape

NOT ON TRACK

At Least As Effective As No

Exemption No

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A decorative graphic consisting of three thin orange lines: one horizontal line extending across the width of the page, and two parallel diagonal lines extending from the bottom left towards the top right.