



**2015**

# **URBAN WATER MANAGEMENT PLAN**

**FINAL**

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November 2017 Amendment

## 2015 URBAN WATER MANAGEMENT PLAN

City of Fullerton

**FINAL**



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J	CUWCC BMP Report
K	Energy and Resource Management Committee Memorandum

## ACRONYMS AND ABBREVIATIONS

20x2020	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
AMR	Automatic Meter Reading
AWWA	American Water Works Association
BEA	Basin Equity Assessment
Biops	Biological Opinions
BMP	Best Management Practice
BPP	Basin Production Percentage
CARL	Current Annual Real Losses
CCC	California Coastal Commission
CDR	Center for Demographic Research
CEC	Contaminants of Emerging Concern
CII	Commercial/Industrial/Institutional
City	City of Fullerton
CRA	Colorado River Aqueduct
CUP	Conjunctive Use Program
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
Delta	Sacramento-San Joaquin River Delta
DMM	Demand Management Measure
DOF	Department of Finance
DWR	Department of Water Resources
EIR	Environmental Impact Report
FY	Fiscal Year
GAP	Green Acres Project
GPCD	Gallons per Capita per Day
GWRs	Groundwater Replenishment System
H <sub>2</sub> O <sub>2</sub>	Hydrogen Peroxide
HCF	Hundred Cubic Feet
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
ILI	Infrastructure Leakage Index
IPR	Indirect Potable Reuse
IRP	Integrated Water Resource Plan
IWA	International Water Association
LBCWD	Laguna Beach County Water District

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LRP	Local Resources Program
LTFP	Long-Term Facilities Plan
MAF	Million Acre-Feet
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MF	Microfiltration
MGD	Million Gallons per Day
MHI	Median Household Income
MTBE	Methyl Tertiary Butyl Ether
NDMA	N-nitrosodimethylamine
NTU	Nephelometric Turbidity Units
OC	Orange County
OC Basin	Orange County Groundwater Basin
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
Poseidon	Poseidon Resources LLC
PPCP	Pharmaceuticals and Personal Care Product
RA	Replenishment Assessment
RHNA	Regional Housing Needs Assessment
RO	Reverse Osmosis
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCWD	South Coast Water District
SDCWA	San Diego County Water Authority
SDP	Seawater Desalination Program
Study	Colorado River Basin Water Supply and Demand Study
SWP	State Water Project
SWRCB	California State Water Resources Control Board
TDS	Total Dissolved Solids
UARL	Unavoidable Annual Real Losses
UV	Ultraviolet
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WBIC	Weather-Based Irrigation Controller
WEROC	Water Emergency Response Organization of Orange County
WF-21	Water Factory 21
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management
WSSCP	Water Shortage Conservation Plan

# 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 Urban Water Management Plan (UWMP) with the California Department of Water Resources (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 2015 UWMP provides a detailed summary of present and future water resources and demands and provides an assessment of the City of Fullerton's (City) 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 City'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
- 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 (20x2020). Reduction in water use is an important part of this plan that aims to sustainably manage the Bay 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 20x2020 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
- 2015 Interim water use target compliance

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- 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 City'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"/> 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)	



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

## 1.2 Agency Overview

The City is governed by a five-member council elected at large, who serves four-year staggered terms. As the City's legislative body, the Council is responsible for all municipal programs and services, as well as local policy decisions. Current Council Members include:

- Jennifer Fitzgerald, Mayor
- Jan M. Flory, Mayor Pro Tem
- Doug Chaffee, Council Member
- Greg Sebourn, Council Member
- Bruce Whitaker, Council Member

The City had a 2015 population of 140,827 and the total water demand was 27,244 acre-feet per year (AFY). The City receives its water from two main sources, local well water from the Lower Santa Ana River Groundwater Basin, which is managed by the Orange County Water District (OCWD), and imported water from the Metropolitan Water District of Southern California (Metropolitan). The City is a member agency of Metropolitan. The City's location is shown on Figure 1-1.

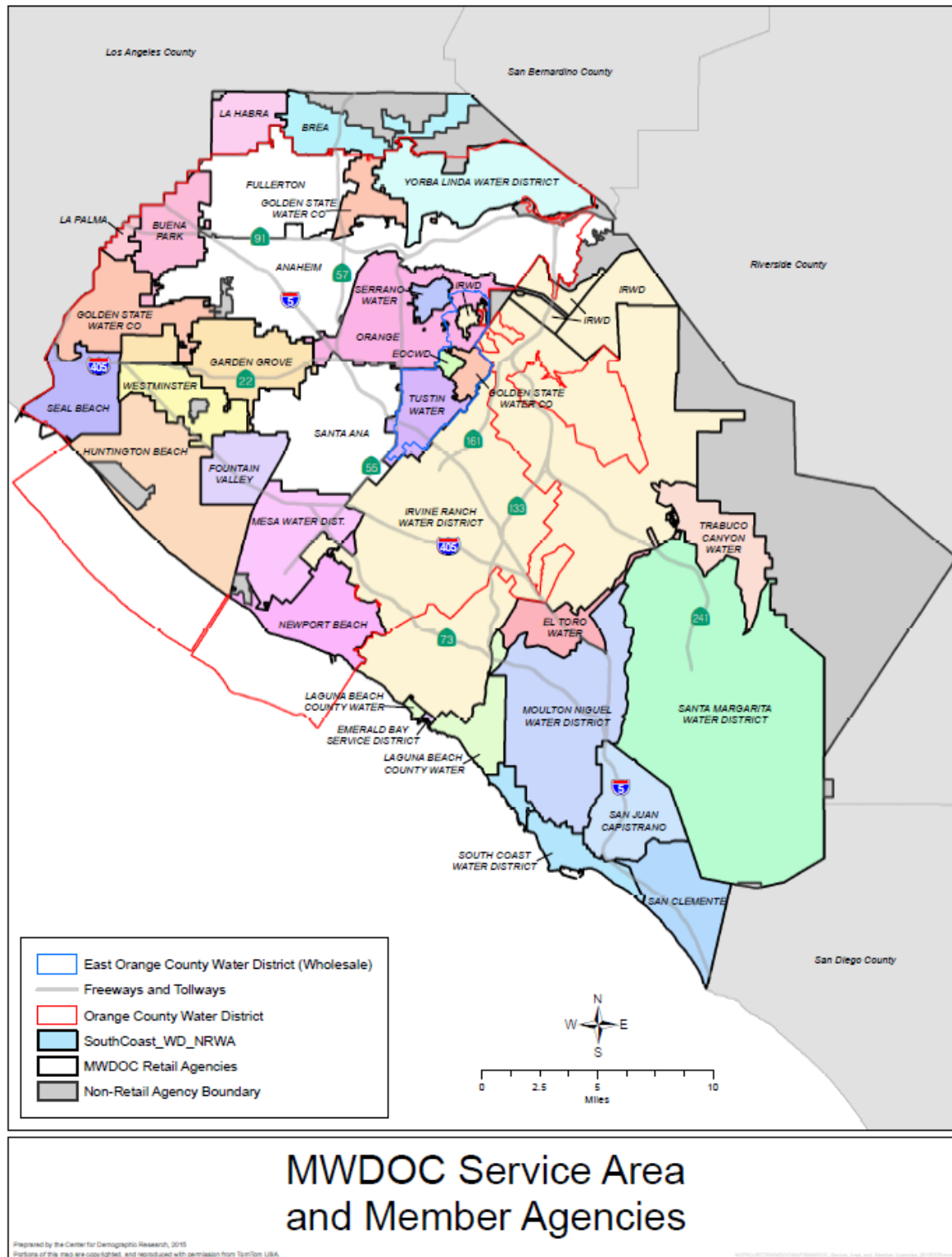


Figure 1-1: Regional Location of Urban Water Supplier

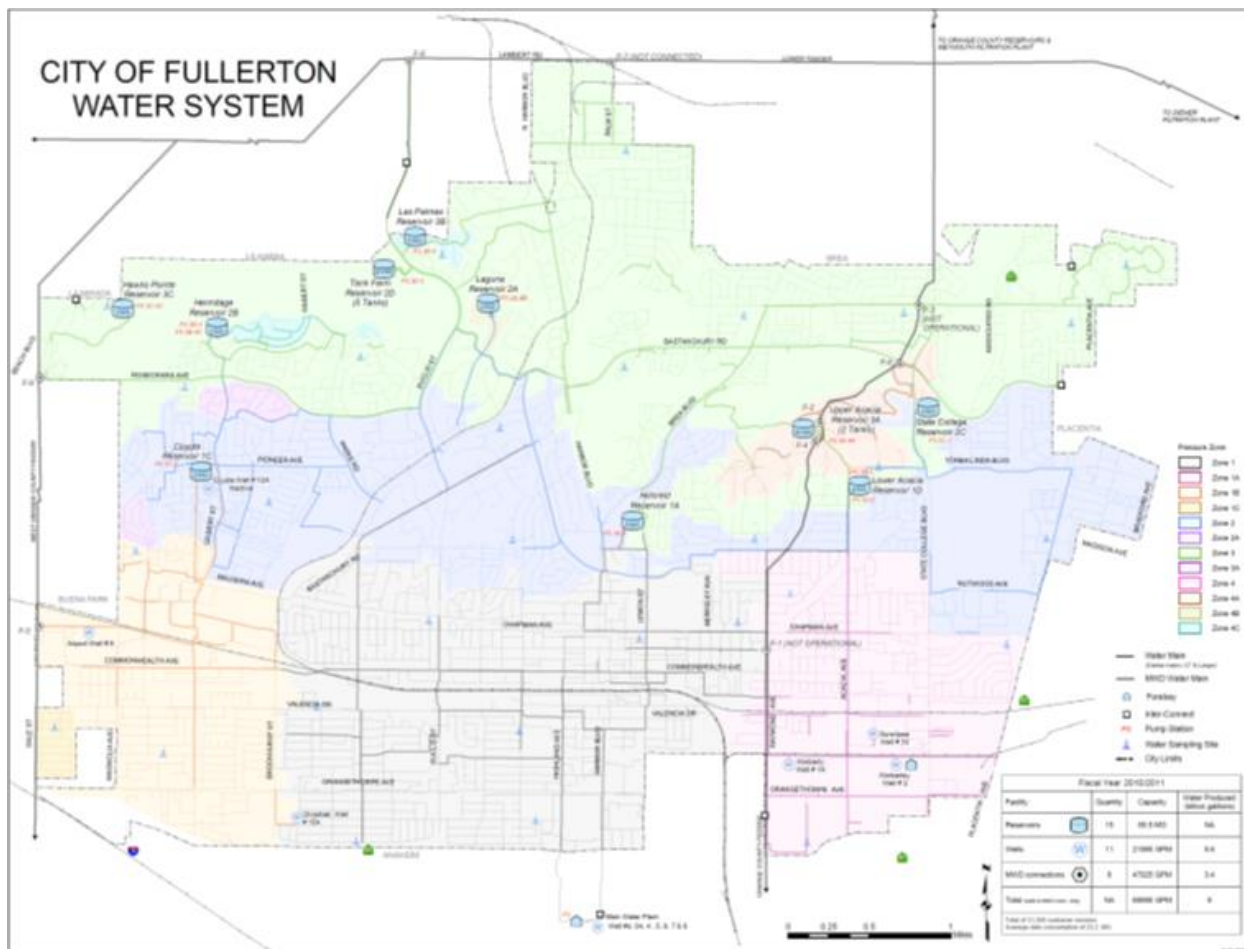
### 1.3 Service Area and Facilities

The City regards an adequate supply of water as an essential service to ensure public health and safety, economic growth, and community wellbeing. Water supply goals of the City are as follows:

- Quality - to provide water to the customer that complies with State and Federally mandated water quality regulations
- Reliability - to provide water service with minimum interruptions at acceptable pressures
- Efficient Operation - to operate the Water Utility at the lowest feasible cost

### 1.3.1 City of Fullerton Service Area

The City is located in north Orange County bounded to the north by the Cities of La Habra and Brea, Placentia to the east, Buena Park to the west, and Anaheim to the south. The City's Water Utility provides water service within its 22.3-square mile service area, which is contiguous with the City boundary. A map of the City's service area is shown on Figure 1-2.



### Figure 1-2: City of Fullerton Service Area

### 1.3.2 City of Fullerton Water Facilities

Since the formation of the City's Water Utility in 1906, millions of dollars of water facilities have been installed. Today, the City has over 420 miles of transmission and distribution mains, 15 reservoirs with a capacity of 69.5 million gallons, 12 booster pumping stations, and 11 active wells. The City has six imported water connections to Metropolitan and six emergency interconnections with other utilities.

The City has 11 wells, located in the southern sector of the City. Six of these wells are located at the main plant in the City of Anaheim just south of the City boundary. Five of these six wells pump into a forebay before pumping the water into the distribution system. Water pumped from these wells has been naturally filtered as it passes through underlying aquifers of sand, gravel, and soil. This well water delivered into the City's water system only requires disinfection.

The system connections and water volume supplied are summarized in Table 1-3, and the wholesalers informed of this water use as required are displayed in Table 1-4.

**Table 1-3: Public Water Systems**

<b>Retail Only: Public Water Systems</b>			
Public Water System Number	Public Water System Name	Number of Municipal Connections Fiscal Year 2014-15	Volume of Water Supplied Fiscal Year 2014-15
CA3010010	City of Fullerton	32,000	27,244
<b>TOTAL</b>		<b>32,000</b>	<b>27,244</b>

**Table 1-4: Water Supplier Information Exchange**

<b>Retail: Water Supplier Information Exchange</b>
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Metropolitan

## 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 SBx7-7. This law requires all California retail urban water suppliers serving more than 3,000 AFY or 3,000 service connections to achieve a 20 percent water demand reduction (from a historical baseline) by 2020. The City 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 City'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, with each agency in the state given a specific reduction target by DWR. In response to the Governor's mandate, the City 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 City 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 City 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 since 2000 to ongoing water audit and leak detection programs. The City has also partnered with Metropolitan on educational programs, indoor retrofits and training.

These efforts have been part of statewide water conservation ordinances that require limited landscape watering, serving water in restaurants and bars only on request, and reducing the amount of laundry cleaned by hotels. Further discussion on the City's water conservation ordinance is covered in Section 5 Water Supplies Contingency Plan.

This section analyzes the City'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 City'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 City's service area are dependent on many factors such as local climate conditions and the evolving hydrology of the region, 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 City 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 City. 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. OCWD is one agency that has successfully captured stormwater along the Santa Ana River and in recharge basins for years and used it as an additional source of supply for groundwater recharge.

Metropolitan's water supplies come from the State Water Project (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

The City has a 2015 population of 140,827 according to the California State University at Fullerton's Center of Demographics Research (CDR). The City's population is projected to increase by 14 percent in the next 25 years, representing an average growth rate of 0.56 percent annually as shown in Table 2-1.

Due to proactive water conservation efforts, future water demands are expected to increase at a much lower rate compared to the population growth. Multi-family housing units are expected to increase at a faster rate than the single-family housing units. In the older areas of the City, multi-family and mixed use units are increasingly replacing older single-family dwellings.

Table 2-1: Population – Current and Projected

Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	140,827	145,791	152,026	155,464	158,421	160,545

### 2.2.3 Land Use

The City's service area can best be described as a predominately residential single and multi-family community located along the coast in northern Orange County.

## 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 when, where, how, 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 City's water consumption by customer account type as follows:

- Single-family Residential
- Multi-family Residential
- Commercial
- 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 approximately 32,000 current customer active and inactive service connections in the City's water distribution system with all existing connections metered. Approximately 59 percent of the City's water demand is residential; CII including dedicated landscape but excluding industrial accounts for 26 percent of the total demand.

Table 2-2 contains a summary of the City's total water demand in the fiscal year (FY) of 2014-15 for potable water volumes.

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

Retail: Demands for Potable and Raw Water - Actual		
Use Type	FY 2014-15 Actual	
	Level of Treatment When Delivered	Volume
Single Family	Drinking Water	11,729
Multi-Family	Drinking Water	4,335
Institutional/Governmental	Drinking Water	605
Commercial	Drinking Water	5,095
Industrial	Drinking Water	2,647
Landscape	Drinking Water	1,249
Other	Drinking Water	34
Losses	Drinking Water	1,550
<b>TOTAL</b>		<b>27,244</b>

### 2.3.2 Non-Residential

Non-residential demands include commercial/industrial/institutional (CII), excluding industrial water demand. Government and Institutional water demand accounts for 2 percent of total water demands and commercial accounts for 19 percent of total water demand. The City has a mix of commercial uses (markets, restaurants, etc.), public entities (schools, fire stations and government offices), office



complexes, light industrial, warehouses and facilities serving the public. Within the non-residential sector, commercial uses are the most dominant of the City's total demand.

### **2.3.3 Sales to Other Agencies**

The City does not sell water to other agencies. The City has connections to surrounding cities for emergency purposes only. The City has the following emergency interconnections: 2-Anaheim, 1-La Habra, 1-Brea, 1-Golden State Water (Placentia), and 1-Suburban Water System (La Mirada).

The City serves a small portion of Buena Park and La Habra directly and the City receives service in a small portion from Anaheim, Page Mutual Water and La Mirada-(Suburban Water).

### **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 storage tank overflows), and apparent losses (unauthorized consumption, customer metering inaccuracies and systematic data handling errors).

A water loss audit was conducted per AWWA methodology for the City to understand the relationship between water loss, operating costs 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 City to achieve regulatory standards and manage their existing resources.

#### **2.3.4.1 AWWA Water Audit Methodology**

There are five data categories that are part of the AWWA Water Audit: 1) Water Supplied 2) Authorized Consumption 3) Water Losses 4) System Data and 5) Cost Data. Data was compiled from questionnaires, invoices, meter test results, and discussion with the City. Each data value has a corresponding validation score that evaluates the City's internal processes associated with that data entry. The scoring scale is 1-10 with 10 representing best practice.

The Water Supplied section represents the volume of water the City delivered from its own sources, purchased imported water, or water that was either exported or sold to another agency. Validation scores for each supply source correspond to meter accuracy and how often the meters are calibrated. If the calibration results of supply meters were provided, a weighted average of errors was calculated for master meter adjustment. This adjustment factor was applied to reported supply volumes for meters that were found to register either over or under the true volume. Validity scores for meter adjustment are based on how often the meter is read and what method is used.

The Authorized Consumption section breaks down consumption of the volume of Water Supplied. Billed metered water is billed and delivered to customers and makes up the majority of an agency's consumption. Billed unmetered water is water that is delivered to a customer for a set fee but the actual



quantity of water is not metered. Customer accounts for this type of use are typically determined by utility policy. Unbilled metered water is the volume used and recorded, but the customer is not charged. This volume is typically used for City facilities per City policy. Unbilled unmetered water is authorized use that is neither billed nor metered which typically includes activities such as firefighting, flushing of water mains and sewers, street cleaning, and fire flow testing. The AWWA Water Audit recommends using the default value of 1.25 percent to represent this use, as calculating an accurate volume is often tedious due to the many different components involved and it represents a small portion of the City's overall use. For each consumption type listed above the associated validation score reflects utility policy for customer accounts, frequency of meter testing and replacement, computer-based billing and transition to electronic metering systems.

Water Losses are defined as the difference between the volume of water supplied and the volume of authorized consumption. Water losses are further broken down into apparent and real losses. Apparent losses include unauthorized consumption, customer meter inaccuracies and systematic data handling errors. Default percentages were provided for the Audit by AWWA for unauthorized consumption and systematic data handling error as this data is not often available. The corresponding default validation score assigned is 5 out of 10. A discrete validation score was included for customer meter inaccuracies to represent quality of meter testing records, testing procedures for meter accuracy, meter replacement cycles, and inclusion of new meter technology.

System Data includes information about the City's physical distribution system and customer accounts. The information included is: length of mains, number of active and inactive service connections, location of customer meters in relation to the property line, and the average operating pressure of the system. The number of service connections is automatically divided by the length of mains to find the service connection density of the system. The calculated service connection density determines which performance indicators best represent a water system's real loss performance. The validity scores in this section relate to the water system's policies and procedures for calculating and documenting the required system data, quality of records kept, integration with an electronic database including GIS and SCADA, and how often this data is verified.

The final section is Cost Data and contains three important financial values related to system operation, customer cost and water production. The total annual cost of operating the water system, customer retail unit cost and the variable production cost per AF are included. The customer retail unit value is applied to the apparent losses to determine lost revenue, while the variable production cost is typically applied to real losses. In water systems with scarce water supplies, a case can be made for real losses to be valued at the retail rate, as this volume of water could be sold to additional customers if it were not lost.] Validity scores for these items consider how often audits of the financial data and supporting documents are compiled and if third-party accounting professionals are part of the process.

Calculations based on the entered and sufficiently valid data produce a series of results that help the City quantify the volume and financial impacts of water loss and facilitate comparison of the City's water loss performance with that of other water systems who have also performed water loss audits using the AWWA methodology. The City's Data Validity Score was 74 out of 100, with a total water loss volume of 1,515 AFY. The Non-Revenue Water volume represents 8 percent of the total water supplied by the City. The value of non-revenue water is calculated to be \$1,489,649 per year.

The Infrastructure Leakage Index (ILI) is a performance indicator developed from the ratio of Current Annual Real Losses (CARL) to the Unavoidable Annual Real Losses (UARL). CARL was developed as part of the workbook and explained as real losses above. UARL is developed on a per system basis with an equation based on empirical data, developed by IWA that factors in the length of mains (including fire hydrant laterals), number of service connections, average distance of customer service connection piping between the curb stop and the customer meter and the total length of customer service piping, all multiplied by average system pressure. The City received an ILI score of 1.56 which taken at face value is a very high score and indicates that real losses are well managed. This value suggests that the City's real loss volume is beneath the technically achievable minimum, which is possible but unlikely. This requires further field investigation of leakage if leakage detection and control practices are not extensively implemented and/or, given the Data Validity Score for some components in the Audit, further investigation/confirmation of entries such as water supplied/accuracy of supply meters, accuracy of customer meters, systematic data handling errors, and applicability of the default percentages applied in the audit.

Apparent losses make up a significant portion of the City's total water loss at 34 percent; as most of this was developed from default percentages provided by the AWWA Water Audit. Based on this information, the City can improve water loss by taking a closer look at apparent losses and developing a strategy to better quantify this data in the future. The overall Water Audit score can also be improved by meeting the standards AWWA has developed for each data point through clear City procedures and reliable data.

The result of the AWWA Water Audit completed for the City as required by the 2015 UWMP is summarized in Table 2-4. The water loss summary was calculated over a one-year period from available data and the methodology explained above.

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

<b>Retail: 12 Month Water Loss Audit Reporting</b>	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
07/2014	1,515

## 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, 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) Reliability Study led by MWDOC where demand projections were divided into three regions within Orange County: Brea/La Habra, Orange County Groundwater Basin (OC 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 the 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 sectors and the total employment (number of employees) for the non-residential sector, as provided by CDR.

The OC 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 implementation conservation, projected savings from new passive and active conservation as a result of plumbing codes, water model efficiency landscape ordinance, and rebates from Metropolitan were excluded from these demands.

As described above, the OC Reliability Study provided demand projections for three regions within Orange County: Brea/La Habra, the OC Basin, and South County. The City's water demand represents a portion of the OC Groundwater Basin region total demand. The City's portion was estimated as the percentage of the City's five-year (FY 2010-11 to FY 2014-15) average usage compared to the OC Groundwater Basin region total demand for the same period.

### **2.4.2 Agency Refinement**

Demand projections were developed by MWDOC for the City as part of the OC Reliability Study. The future demand projections were reviewed and accepted by the City 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 City's future water demand outlook. The City's current total water demand is 27,244 AFY, met through locally pumped groundwater and purchased imported water from Metropolitan. Table 2-4 is a projection of the City'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	Projected Water Use (FYE)				
	2020	2025	2030	2035	2040
Single Family	11,494	12,339	12,424	12,420	12,438
Multi-Family	4,248	4,560	4,592	4,591	4,597
Institutional/Governmental	593	636	641	641	642
Commercial	4,993	5,360	5,397	5,395	5,403
Industrial	2,594	2,785	2,804	2,803	2,807
Landscape	1,224	1,314	1,323	1,323	1,325
Other	33	36	36	36	36
Losses	1,519	1,631	1,642	1,641	1,644
<b>TOTAL</b>	<b>26,699</b>	<b>28,661</b>	<b>28,858</b>	<b>28,850</b>	<b>28,891</b>

The above demand values were provided by MWDOC and reviewed by the City as part of the UWMP effort. As the regional wholesale supplier 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 City will aim to decrease its reliance on imported water by pursuing a variety of water conservation strategies and with population expected to increase minimally, the City's per capita water use is projected to decrease as detailed 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.	Location in UWMP: 4.1
Are Lower Income Residential Demands Included In Projections?	Yes

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, or Transportation and Land Use Plans as well as 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 water is listed below in Table 2-6 below. At this time, recycled water is not projected within the City's service area.

Table 2-6: Total Water Demands (AF)

Retail: Total Water Demands (FYE)						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	27,244	26,699	28,661	28,858	28,850	28,891
Recycled Water Demand	0	0	0	0	0	0
<b>TOTAL WATER DEMAND</b>	<b>27,244</b>	<b>26,699</b>	<b>28,661</b>	<b>28,858</b>	<b>28,850</b>	<b>28,891</b>

## 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 City 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).

DWR recommends retail suppliers rely on the housing elements of city or county general plans to quantify planned lower income housing with the City's service area (DWR, 2015 UWMP Guidebook, February 2016). The Regional Housing Needs Assessment (RHNA) assists jurisdictions in updating general plan's housing elements section. The RHNA identifies housing needs and assesses households by income level for the City through 2010 decennial Census and 2005-2009 American Community Survey data. The fifth cycle of the RHNA covers the planning period of October 2013 to October 2021. The Southern California Association of Governments (SCAG) adopted the RHNA Allocation Plan for this cycle on October 4, 2012 requiring housing elements updates by October 15, 2013. The California Department of Housing and Community Development reviewed the housing elements data submitted by jurisdictions in the SCAG region and concluded the data meets statutory requirements for the assessment of current housing needs.

The housing elements from the RHNA includes low income housing broken down into three categories: extremely low (less than 30 percent MHI), very low (31 percent - 50 percent MHI), and lower income (51 percent - 80 percent MHI). The report gives the household distribution for all households of various income levels in the City which can be seen in Table 2-7. Altogether the City has 44.23 percent low income housing (SCAG, RHNA, November 2013).

Table 2-7: Household Distribution Based on Median Household Income

Number of Households by Income	
Extremely Low Income	6,424
Very Low Income	5,687
Lower Income	7,451
Moderate Income	8,363
Above Income	16,308
<b>Total Households</b>	<b>44,233</b>

Table 2-8 provides the projected water needs for low income single family and multifamily units. The projected water demands shown here represent 44.23 percent of the projected water demand for the single-family and multifamily categories provided in Table 2-4 above. For example, the total low income single family residential demand is projected to be 5,084 AFY in 2020 and 5,502 AFY in 2040.

Table 2-8: 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	15,743	16,900	17,016	17,011	17,035
SF Residential Demand-Low Income Households	5,084	5,458	5,495	5,494	5,502
MF Residential Demand-Low Income Households	1,879	2,017	2,031	2,030	2,033
<b>Total Low Income Households Demand</b>	<b>6,963</b>	<b>7,475</b>	<b>7,526</b>	<b>7,524</b>	<b>7,535</b>

## 2.5 SBx7-7 Requirements

The Water Conservation Act of 2009, 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 City 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 City may choose to comply with SBx7-7 individually or as a region in collaboration with other retail water suppliers. Under the regional compliance option, the City is still required to report its individual water use targets. The City 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 and after July 16, 2016.

For the 2015 UWMP, the City 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 City 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 the submittal of 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 City'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 within the OCWD Groundwater Basin, including the City, have the option of choosing to deduct recycled water used for indirect potable reuse from their gross water use to account for the recharge of recycled water into the OC Basin by OCWD, historically through Water Factory 21, and now by the Groundwater Replenishment System (GWRS).

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 City's water use targets is to determine its base daily per capita water use (baseline water use). This baseline water use is essentially the City'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. The City did not have recycled water use in 2008; therefore, a 10-year baseline period is used.

The City's baseline water use is 223 GPCD, obtained from the 10-year period July 1, 1995 to June 30, 2005.

### 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 City, 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 City's five-year baseline water use is 215 GPCD, obtained from the five-year period July 1, 2003 to June 30, 2008.

### 2.5.1.3 Service Area Population

The City's service area boundaries correspond with the boundaries for a city or census designated place. This allows the City to use service area population estimates prepared by the Department of Finance (DOF). The CDR at California State University, Fullerton is the entity which compiles population data for Orange County based on DOF data. The calculation of the City'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 City 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 City 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 CII water use
- *Option 3* is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 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 City's base daily per capita use and water use targets, the City 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, the City's 2015 target is 201 GPCD and the 2020 target is 179 GPCD as summarized in Table 2-9. 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 2-9: Baselines and Targets Summary**

<b>Baselines and Targets Summary <i>Retail Agency</i></b>					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1996	2005	223	201	179
5 Year	2004	2008	215		
*All values are in Gallons per Capita per Day (GPCD)					

Table 2-11 compares the City's 2015 water use target to its actual 2015 consumption. Based on this comparison, the City is in compliance with its 2015 interim target and has also already met the 2020 water use target.

**Table 2-10: 2015 Compliance**

<b>2015 Compliance <i>Retail Agency</i></b>		
Actual 2015 GPCD*	2015 Interim Target GPCD*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
146	201	Yes
*All values are in Gallons per Capita per Day (GPCD)		
NOTES:		

### 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 City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. 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 20x2020 Regional Alliance weighted 2015 target is 176 GPCD and 2020 target is 156 GPCD. The actual 2015 water use in the region is 129 GPCD, i.e. the region has already met its 2020 GPCD goal.

### 3 WATER SOURCES AND SUPPLY RELIABILITY

#### 3.1 Overview

Historically, the City was an agricultural community that specialized in growing oranges and walnuts. In order to serve this growing agricultural and domestic community, a municipal water system was formed on August 25, 1906. As the City continued to grow and change from an agricultural community to an urban community, the need for additional sources of water was needed for economic growth.

The City relies on a combination of imported water and local groundwater to meet its water needs. The City works together with two primary agencies, Metropolitan and OCWD 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 the Colorado River and the SWP provided by Metropolitan.

The City's main source of water supply is groundwater from the Lower Santa Ana River Groundwater Basin, also known as the OC Basin. Currently, the City relies on 70 percent groundwater and 30 percent imported. It is projected that through 2040, the water supply mix will remain roughly the same. The City's projected water supply portfolio is shown on Figure 3-1.

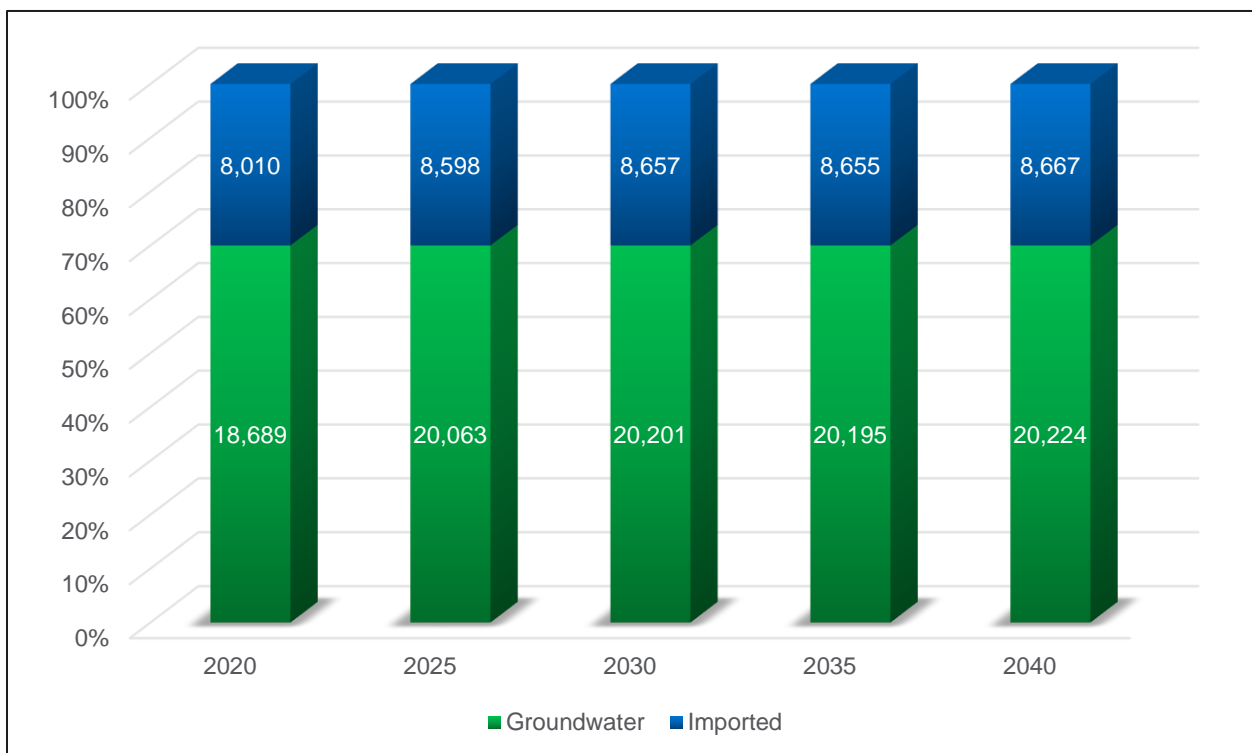


Figure 3-1: Water Supply Sources in the City (AF)

The following sections provide a detailed discussion of the City's water sources as well as the future water supply portfolio for the next 25 years. Additionally, the City's projected supply and demand under

various hydrological conditions are compared to determine the City's supply reliability for the 25 year planning horizon.

## **3.2 Imported Water**

The City supplements its local groundwater with imported water purchased wholesale from Metropolitan. Imported water represents approximately 30 percent of the City's total 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 City currently maintains six connections to the Metropolitan system along the Orange County, West Orange County, and Second Lower Feeder pipelines. The total available capacity is 107 cfs.

### **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, May 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, May 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 also 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 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 State Water Resources Control Board (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 Table A water that has been allocated to SWP contractors that has exceeded their demands. This water can then 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 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
<b>Percent Change</b>	<b>-11.7%</b>	<b>-9.4%</b>

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**

Historically, local groundwater has been the cheapest and most reliable source of supply for the City. The City relies on approximately 18,948 AFY of groundwater from the OC Basin. The OC Basin has historically provided over 300,000 AFY of groundwater to residents in Orange County.

### **3.3.1 Basin Characteristics**

The OC Basin underlies the northerly half of Orange County beneath broad lowlands. The OC Basin managed by OCWD covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The OC Basin boundary extends to the Orange County-Los Angeles Line to the northwest, where groundwater flows across the county line into the Central Groundwater Basin of Los Angeles County. The total thickness of sedimentary rocks in the OC Basin is over 20,000 feet, with only the upper 2,000 to 4,000 feet containing fresh water. The Pleistocene or younger aquifers comprising this OC Basin are over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits. The OC Basin's full volume is approximately 66 MAF.

There are three major aquifer systems that have been subdivided by OCWD, the Shallow Aquifer System, the Principal Aquifer System, and the Deep Aquifer System. These three aquifer systems are hydraulically connected as groundwater is able to flow between each other through intervening aquitards or discontinuities in the aquitards. The Shallow Aquifer system occurs from the surface to approximately 250 feet below ground surface. Most of the groundwater from this aquifer system is pumped by small water systems for industrial and agricultural use. The Principal Aquifer system occurs at depths between

200 and 1,300 feet below ground surface. Over 90 percent of groundwater production is from wells that are screened within the Principal Aquifer system. Only a minor amount of groundwater is pumped from the Deep Aquifer system, which underlies the Principal Aquifer system and is up to 2,000 feet deep in the center of the OC Basin. The three major aquifer systems are shown on Figure 3-2.

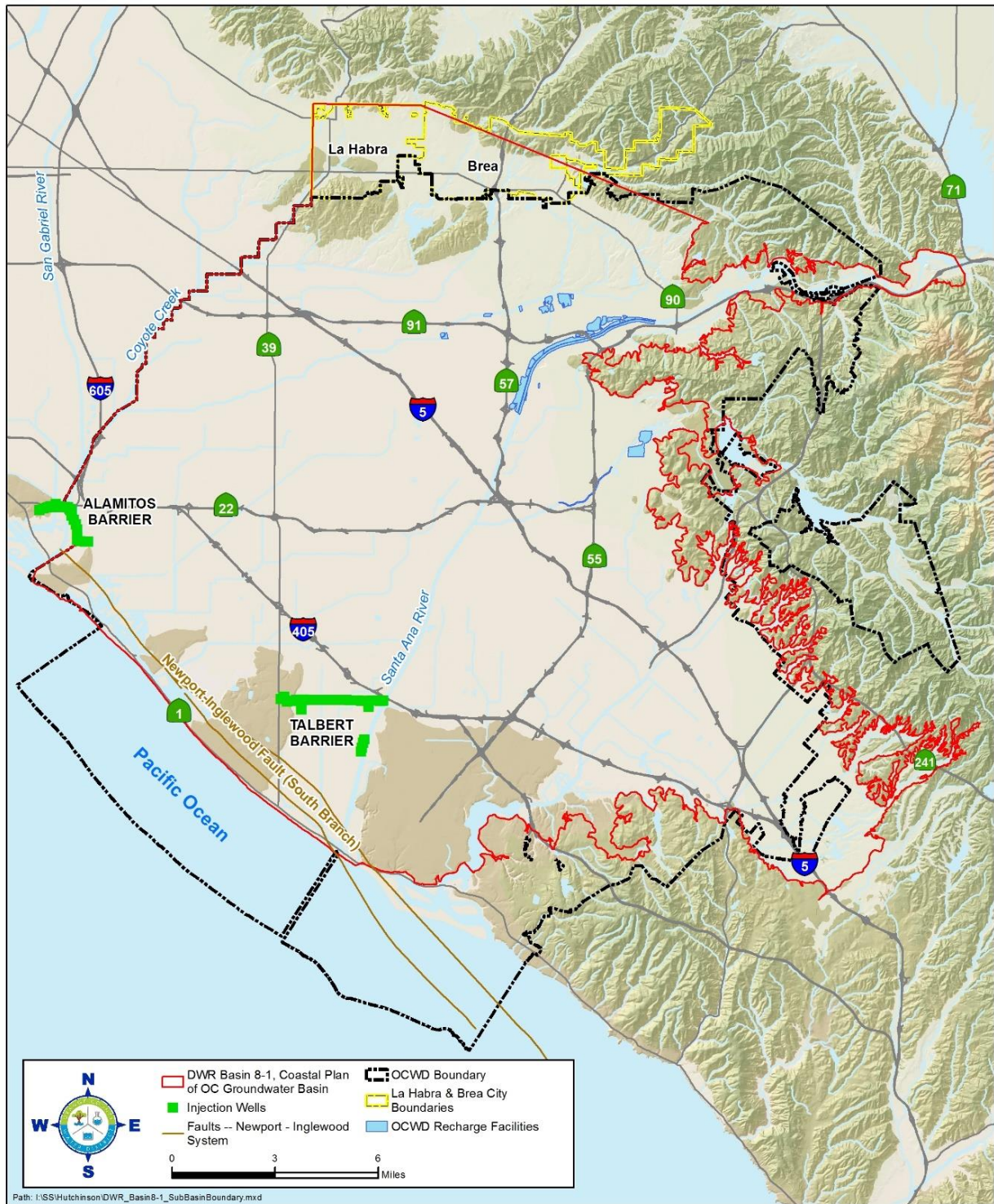


Figure 3-2: Map of the Orange County Groundwater Basin and its Major Aquifer Systems

The OCWD was formed in 1933 by a special legislative act of the California State Legislature to protect and manage the County's vast, natural, groundwater supply using the best available technology and defend its water rights to the OC Basin. This legislation is found in the State of California Statutes, Water – Uncodified Acts, Act 5683, as amended. The OC Basin is managed by OCWD under the Act, which functions as a statutorily-imposed physical solution.

Groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the OC Basin and to protect against land subsidence. OCWD regulates groundwater levels in the OC Basin by regulating the annual amount of pumping (OCWD, Groundwater Management Plan 2015 Update, June 2015).

### **3.3.2 Basin Production Percentage**

The OC Basin is not adjudicated and as such, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. The framework for the financial incentives is based on establishing the basin production percentage (BPP), the percentage of each Producer's total water supply that comes from groundwater pumped from the OC Basin. Groundwater production at or below the BPP is assessed a Replenishment Assessment (RA). While there is no legal limit as to how much an agency pumps from the OC Basin, there is a financial disincentive to pump above the BPP. Agencies that pump above the BPP are charged the RA plus the Basin Equity Assessment (BEA), which is calculated so that the cost of groundwater production is greater than MWDOC's full service rate. The BEA can be increased to discourage production above the BPP. The BPP is set uniformly for all Producers by OCWD on an annual basis.

The BPP is set based on groundwater conditions, availability of imported water supplies, and Basin management objectives. The supplies available for recharge must be estimated for a given year. The supplies of recharge water that are estimated are: 1) Santa Ana River stormflow, 2) Natural incidental recharge, 3) Santa Ana River baseflow, 4) GWRS supplies, and 5) other supplies such as imported water and recycled water purchased for the Alamitos Barrier. The BPP is a major factor in determining the cost of groundwater production from the OC Basin for that year.

In some cases, OCWD encourages treating and pumping groundwater that does not meet drinking water standards in order to protect water quality. This is achieved by using a financial incentive called the BEA Exemption. A BEA Exemption is used to clean up and contain the spread of poor quality water. OCWD uses a partial or total exemption of the BEA to compensate a qualified participating agency or Producer for the costs of treating poor quality groundwater. When OCWD authorizes a BEA exemption for a project, it is obligated to provide the replenishment water for the production above the BPP and forgoes the BEA revenue that OCWD would otherwise receive from the producer (OCWD, Groundwater Management Plan 2015 Update, June 2015).

#### **3.3.2.1 2015 OCWD Groundwater Management Plan**

OCWD was formed in 1933 by the California legislature to manage and operate the OC Basin in order to protect and increase the OC Basin's sustainable yield in a cost-effective manner. As previously mentioned, the BPP is the primary mechanism used by OCWD to manage pumping in the OC Basin. In 2013, OCWD's Board of Directors adopted a policy to establish a stable BPP with the intention to work



toward achieving and maintaining a 75 percent BPP by FY 2015-16. Although BPP is set at 75 percent, based on discussions with OCWD a conservative BPP of 70 percent is assumed through 2040. Principles of this policy include:

- OCWD's goal is to achieve a stable 75 percent BPP, while maintaining the same process of setting the BPP on an annual basis, with the BPP set in April of each year after a public hearing has been held and based upon the public hearing testimony, presented data, and reports provided at that time.
- OCWD would endeavor to transition to the 75 percent BPP between 2013 and 2015 as construction of the GWRS Initial Expansion Project is completed. This expansion will provide an additional 31,000 AFY of water for recharging the groundwater basin.
- OCWD must manage the OC Basin in a sustainable manner for future generations. The BPP will be reduced if future conditions warrant the change.
- Each project and program to achieve the 75 percent BPP goal will be reviewed individually and assessed for their economic viability.

The OC Basin's storage levels would be managed in accordance to the 75 percent BPP policy. It is presumed that the BPP will not decrease as long as the storage levels are between 100,000 and 300,000 AF from full capacity. If the OC Basin is less than 100,000 AF below full capacity, the BPP will be raised. If the OC Basin is over 350,000 AF below full capacity, additional supplies will be sought after to refill the OC Basin and the BPP will be lowered.

The OC Basin is managed to maintain water storage levels of not more than 500,000 AF below full condition to avoid permanent and significant negative or adverse impacts. Operating the OC Basin in this manner enables OCWD to encourage reduced pumping during wet years when surface water supplies are plentiful and increase pumping during dry years to provide additional local water supplies during droughts.

OCWD determines the optimum level of storage for the following year when it sets the BPP each year. Factors that affect this determination include the current storage level, regional water availability, and hydrologic conditions. When the OC Basin storage approaches the lower end of the operating range, immediate issues that must be addressed include seawater intrusion, increased risk of land subsidence, and potential for shallow wells to become inoperable due to lower water levels (OCWD, Groundwater Management Plan 2015 Update, June 2015).

### 3.3.2.2 OCWD Engineer's Report

A BPP level above 75 percent may be difficult to achieve. Therefore, a BPP ranging from 65 percent to 70 percent is currently being proposed for the ensuing FY 2015-16. Analysis of the groundwater basin's projected accumulated overdraft, the available supplies to the OC Basin (assuming average hydrology) and the projected pumping demands indicate that this level of pumping can be sustained for 2015-16 without harming the OC Basin.

A BPP of 70 percent corresponds to approximately 320,000 AF of groundwater production including 22,000 AF of groundwater production above the BPP to account for several groundwater quality enhancement projects discussed earlier.

In FY 2015-16 additional production of approximately 22,000 AF above the BPP will be undertaken by the City of Tustin, City of Garden Grove, Mesa Water District, and Irvine Ranch Water District. These agencies use the additional pumping allowance in order to accommodate groundwater quality improvement projects. As in prior years, production above the BPP from these projects would be partially or fully exempt from the BEA as a result of the benefit provided to the OC Basin by removing poor-quality groundwater and treating it for beneficial use (OCWD, 2013-2014 Engineer's Report, February 2015).

### **3.3.3 Groundwater Recharge Facilities**

Recharging water into the OC Basin through natural and artificial means is essential to support pumping from the OC Basin. Active recharge of groundwater began in 1949, in response to increasing drawdown of the OC Basin and consequently the threat of seawater intrusion. The OC Basin's primary source of recharge is flow from the Santa Ana River, which is diverted into recharge basins and its main Orange County tributary, Santiago Creek. Other sources of recharge water include natural infiltration, recycled water, and imported water. Natural recharge consists of subsurface inflow from local hills and mountains, infiltration of precipitation and irrigation water, recharge in small flood control channels, and groundwater underflow to and from Los Angeles County and the ocean.

Recycled water for the OC Basin is from two sources. The main source of recycled water is from the GWRS and is recharged in the surface water system and the Talbert Seawater Barrier. The second source of recycled water is the Leo J. Vander Lans Treatment Facility which supplies water to the Alamitos Seawater Barrier. Injection of recycled water into these barriers is an effort by OCWD to control seawater intrusion into the OC Basin. Operation of the injection wells forms a hydraulic barrier to seawater intrusion.

Untreated imported water can be used to recharge the OC Basin through the surface water recharge system in multiple locations, such as Anaheim Lake, Santa Ana River, Irvine Lake, and San Antonio Creek. Treated imported water can be used for in-lieu recharge, as was performed extensively from 1977 to 2007 (OCWD, Groundwater Management Plan 2015 Update, June 2015).

### **3.3.4 Metropolitan Groundwater Replenishment Program**

OCWD, MWDOC, and Metropolitan have developed a successful and efficient groundwater replenishment program to increase storage in the OC Basin. The Groundwater Replenishment Program allows Metropolitan to sell groundwater replenishment water to OCWD and make direct deliveries to agency distribution systems in lieu of producing water from the groundwater basin when surplus surface water is available. This program indirectly replenishes the OC Basin by avoiding pumping. In the in-lieu program, OCWD requests an agency to halt pumping from specified wells. The agency then takes replacement water through its import connections, which is purchased by OCWD from Metropolitan (through MWDOC). OCWD purchases the water at a reduced rate, and then bills the agency for the amount it would have had to pay for energy and the RA if it had produced the water from its wells. The deferred local production results in water being left in local storage for future use.

### 3.3.5 Metropolitan Conjunctive Use Program

Since 2004, OCWD, MWDOC, and certain groundwater producers have participated in Metropolitan's Conjunctive Use Program (CUP). This program allows for the storage of Metropolitan water in the OC Basin. The existing Metropolitan program provides storage up to 66,000 AF of water in the OC Basin in exchange for Metropolitan's contribution to improvements in basin management facilities. These improvements include eight new groundwater production wells, improvements to the seawater intrusion barrier, and construction of the Diemer Bypass Pipeline. The water is accounted for via the CUP program administered by the wholesale agencies and is controlled by Metropolitan such that it can be withdrawn over a three-year time period (OCWD, 2013-2014 Engineer's Report, February 2015).

### 3.3.6 Groundwater Historical Extraction

The City pumps groundwater through its eleven wells. Pumping limitations set by the BPP and the pumping capacity of the wells are the only constraints affecting the groundwater supply to the City. A summary of the groundwater volume pumped by the City is shown in Table 3-2.

Table 3-2: Groundwater Volume Pumped (AF)

Retail: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	Fiscal Year 2010-11	Fiscal Year 2011-12	Fiscal Year 2012-13	Fiscal Year 2013-14	Fiscal Year 2014-15
Alluvial Basin	Orange County Groundwater Basin	16,229	17,341	19,489	21,279	18,946
<b>TOTAL</b>		16,229	17,341	19,489	21,279	18,946

### 3.3.7 Overdraft Conditions

Annual groundwater basin overdraft, as defined in OCWD's Act, is the quantity by which production of groundwater supplies exceeds natural replenishment of groundwater supplies during a water year. This difference between extraction and replenishment can be estimated by determining the change in volume of groundwater in storage that would have occurred had supplemental water not been used for any groundwater recharge purpose, including seawater intrusion protection, advanced water reclamation, and the in-Lieu Program.

The annual analysis of basin storage change and accumulated overdraft for water year 2013-14 has been completed. Based on the three-layer methodology, an accumulated overdraft of 342,000 AF was calculated for the water year ending June 30, 2014. The accumulated overdraft for the water year ending June 30, 2013 was 242,000 AF, which was also calculated using the three-layer storage method. Therefore, an annual decrease of 100,000 AF in stored groundwater was calculated as the difference between the June 2013 and June 2014 accumulated overdrafts (OCWD, 2013-2014 Engineer's Report, February 2015).

## 3.4 Summary of Existing and Planned Sources of Water

The actual sources and volume of water for FY 2014-15 is displayed in Table 3-3.

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

Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	FY 2014-15	
		Actual Volume	Water Quality
Groundwater	Orange County Groundwater Basin	18,946	Drinking Water
Purchased or Imported Water	Metropolitan	8,298	Drinking Water
<b>Total</b>		<b>27,244</b>	



## 2015 URBAN WATER MANAGEMENT PLAN

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

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

<b>Retail: Water Supplies — Projected</b>						
Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2020	2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater	Orange County Groundwater Basin	18,689	20,063	20,201	20,195	20,224
Purchased or Imported Water	Metropolitan	8,010	8,598	8,657	8,655	8,667
<b>Total</b>		<b>26,699</b>	<b>28,661</b>	<b>28,858</b>	<b>28,850</b>	<b>28,891</b>

## 3.5 Recycled Water

The City does not own or operate any wastewater or recycled water facilities. More information concerning how the City handles its wastewater can be found in Section 6.

## 3.6 Supply Reliability

### 3.6.1 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 City 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 numerous local 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, 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 resources 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.

### 3.6.2 Factors Impacting Reliability

The following are some of the factors identified by Metropolitan that may have an impact on the reliability of Metropolitan supplies.

#### 3.6.2.1 Environment

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

#### 3.6.2.2 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.

### 3.6.2.3 Water Quality

#### 3.6.2.3.1 *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 (PPCP). 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.

#### 3.6.2.3.2 *Groundwater*

OCWD is responsible for managing Basin. To maintain groundwater quality, OCWD conducts an extensive monitoring program that serves to manage the OC Basin's groundwater production, control groundwater contamination, and comply with all required laws and regulations. A network of nearly 700 wells provides OCWD a source for samples, which are tested for a variety of purposes. OCWD collects 600 to 1,700 samples each month to monitor Basin water quality. These samples are collected and tested according to approved federal and state procedures as well as industry-recognized quality assurance and control protocols.

Salinity is a significant water quality problem in many parts of southern California, including Orange County. Salinity is a measure of the dissolved minerals in water including both TDS and nitrates.

OCWD continuously monitors the levels of TDS in wells throughout the OC Basin. TDS currently has a California Secondary Maximum Contaminant Level (MCL) of 500 mg/L. The portions of the OC Basin with the highest levels are generally located in the Cities of Irvine, Tustin, Yorba Linda, Anaheim, and Fullerton. There is also a broad area in the central portion of the OC Basin where TDS ranges from 500 to 700 mg/L. Sources of TDS include the water supplies used to recharge the OC Basin and from onsite

wastewater treatment systems, also known as septic systems. The TDS concentration in the OC Basin is expected to decrease over time as the TDS concentration of GWRS water used to recharge the OC Basin is approximately 50 mg/L.

Nitrates are one of the most common and widespread contaminants in groundwater supplies, originating from fertilizer use, animal feedlots, wastewater disposal systems, and other sources. The MCL for nitrate in drinking water is set at 10 mg/L. OCWD regularly monitors nitrate levels in groundwater and works with producers to treat wells that have exceeded safe levels of nitrate concentrations. OCWD manages the nitrate concentration of water recharged by its facilities to reduce nitrate concentrations in groundwater. This includes the operation of the Prado Wetlands, which was designed to remove nitrogen and other pollutants from the Santa Ana River before the water is diverted to be percolated into OCWD's surface water recharge system.

Although water from the Deep Aquifer System is of very high quality, it is amber-colored and contains a sulfuric odor due to buried natural organic material. These negative aesthetic qualities require treatment before use as a source of drinking water. The total volume of the amber-colored groundwater is estimated to be approximately 1 MAF.

Other contaminants that OCWD monitors within the OC Basin include:

- **Methyl Tertiary Butyl Ether (MTBE)** – MTBE is an additive to gasoline that increases octane ratings but became a widespread contaminant in groundwater supplies. The greatest source of MTBE contamination comes from underground fuel tank releases. The primary MCL for MTBE in drinking water is 13 µg/L.
- **Volatile Organic Compounds (VOC)** – VOCs come from a variety of sources including industrial degreasers, paint thinners, and dry cleaning solvents. Locations of VOC contamination within the OC Basin include the former El Toro marine Corps Air Station, the Shallow Aquifer System, and portions of the Principal Aquifer System in the Cities of Fullerton and Anaheim.
- **NDMA** – NDMA is a compound that can occur in wastewater that contains its precursors and is disinfected via chlorination and/or chloramination. It is also found in food products such as cured meat, fish, beer, milk, and tobacco smoke. The California Notification Level for NDMA is 10 ng/L and the Response Level is 300 ng/L. In the past, NDMA has been found in groundwater near the Talbert Barrier, which was traced to industrial wastewater dischargers.
- **1, 4-Dioxane** – 1, 4-Dioxane is a suspected human carcinogen. It is used as a solvent in various industrial processes such as the manufacture of adhesive products and membranes.
- **Perchlorate** – Perchlorate enters groundwater through application of fertilizer containing perchlorate, water imported from the Colorado River, industrial or military sites that have perchlorate, and natural occurrence. Perchlorate was not detected in 84 percent of the 219 production wells tested between the years 2010 through 2014.
- **Selenium** – Selenium is a naturally occurring micronutrient found in soils and groundwater in the Newport Bay watershed. The bio-accumulation of selenium in the food chain may result in deformities, stunted growth, reduced hatching success, and suppression of immune systems in fish and wildlife. Management of selenium is difficult as there is no off-the-shelf treatment technology available.

- **Constituents of Emerging Concern (CEC)** – CECs are either synthetic or naturally occurring substances that are not currently regulated in water supplies or wastewater discharged but can be detected using very sensitive analytical techniques. The newest group of CECs include pharmaceuticals, personal care products, and endocrine disruptors. OCWD's laboratory is one of a few in the state of California that continuously develops capabilities to analyze for new compounds (OCWD, Groundwater Management Plan 2015 Update, June 2015).

### 3.6.2.4 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. The major impact in California is that without additional surface storage, the earlier and heavier runoff (rather than snowpack retaining water in storage in the mountains), will result in more water being lost to the oceans. A heavy emphasis on storage is needed in the State of California.

In addition, the Colorado River Basin supplies have been inconsistent since about the year 2000, resulting in 13 of the last 16 years of the upper basin runoff being below normal. Climate models are predicting a continuation of this pattern whereby hotter and drier weather conditions will result in continuing lower runoff.

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.

### 3.6.3 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 City is 100 percent reliable for normal year demands from 2020 through 2040. The City 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 City from existing water transmission facilities. The demand and supplies listed below also include local

groundwater supplies that are available to the City through OCWD by a pre-determined pumping percentage.

### **3.6.4 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 six percent increase in demand for the OC Basin area where the City'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 G.

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

### **3.6.5 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 six percent increase in demand for the OC Basin area where the City'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 City 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 six 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	FY 1990-14		100%
Single-Dry Year	FY 2013-14		106%
Multiple-Dry Years 1st Year	FY 2011-12		106%
Multiple-Dry Years 2nd Year	FY 2012-13		106%
Multiple-Dry Years 3rd Year	FY 2013-14		106%

### 3.7 Supply and Demand Assessment

A comparison between the supply and the 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 (FYE)					
	2020	2025	2030	2035	2040
Supply totals	26,699	28,661	28,858	28,850	28,891
Demand totals	26,699	28,661	28,858	28,850	28,891
Difference	0	0	0	0	0

A comparison between the supply and the demand in a single dry year is shown in Table 3-7. 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 (FYE)					
	2020	2025	2030	2035	2040
Supply totals	28,301	30,381	30,589	30,581	30,624
Demand totals	28,301	30,381	30,589	30,581	30,624
Difference	0	0	0	0	0

A comparison between the supply and the demand in multiple dry years is shown in Table 3-8.

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

Retail: Multiple Dry Years Supply and Demand Comparison (FYE)						
		2020	2025	2030	2035	2040
First year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0
Second year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0
Third year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0



## 4 DEMAND MANAGEMENT MEASURES

The goal of the Demand Management Measures (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 City the requirements changed from having 14 specific measures to six more general requirements plus an “other” category.

### 4.1 Water Waste Prevention Ordinances

City Council adopted a Water Supply Shortage Conservation Plan also known as the Emergency Water Conservation Plan (Ordinance No. 3118 and Municipal Code Section 12.06) in 2008. The municipal code established provisions for prohibitions against waste and water supply shortage implementations.

The ordinance has a permanent water conservation clause i.e. the City’s water conservation ordinance is effective at all times and is not dependent upon a water shortage for implementation. In an event of a water supply shortage, the ordinance established provisions for four water conservation phases associated with increasingly restrictive prohibitions. The provisions and water conservation measures to be implemented in response to each shortage phase are described in Section 5 of the UWMP. The City’s Water Supply Shortage Conservation Plan is included in Appendix D.

In accordance with Ordinance 3118, the following uses of water are prohibited at all times:

- Permitting the excess use or loss of water through breaks, leaks, or other malfunctions in the water user’s plumbing or distribution system for any period of time after such loss of water should have reasonably been discovered and corrected;
- No water runoff from landscaped areas into adjoining streets, sidewalks, or other paved areas due to incorrectly-directed or incorrectly-maintained sprinklers or excessive watering shall be allowed;
- No water shall be used to clean, fill, or maintain levels in decorative fountains, or other similar aesthetic structures, unless such water is part of a recycling system;
- Washing of motor vehicles, trailers, boats, and other types of mobile equipment shall be done only with a hand-held water container or a hose equipped with a positive shut-off nozzle for quick rinses, except for washing done at the immediate premises of a commercial car wash or with reclaimed water;
- Installation of single pass cooling systems in buildings requesting new water connections; and
- Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems.

Table 4-1 summarizes the City’s water waste prohibition efforts in the past five years and the projected number of site visits and expenditures related to Water Conservation and Supply Level Regulations.

Table 4-1: Water Waste Prohibition

Actual	Fiscal Year 2010-11	Fiscal Year 2011-12	Fiscal Year 2012-13	Fiscal Year 2013-14	Fiscal Year 2014-15
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits	0	0	0	0	622

Planned	Fiscal Year 2015-16	Fiscal Year 2016-17	Fiscal Year 2017-18	Fiscal Year 2018-19	Fiscal Year 2019-20
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits*	622	622	622	622	622

\*Assumes current drought conditions

## 4.2 Metering

All water service connections supplied by the City are fully metered and customers are billed by volume of water used.

The City's on-going large water meter upgrade program and the aggressive testing of these meters has been the single most important factor in reducing unaccounted water losses to below 5 percent. The City replaces 1½" and smaller meters every 15 years. The City has a meter testing schedule in place: 2" meters are tested every three years; 3" and 4" tested every year; and 6", 8" and 10" tested every 6 months. The City has budgeted for a pilot project to evaluate an innovative metering program consisting of Advanced Metering Infrastructure (AMI) and Automatic Meter Reading (AMR).

## 4.3 Conservation Pricing

The City's water rate schedules consist of two component charges: the customer charge, which varies by the size of the meter; and the water commodity charge, which depends on the actual consumption of water. Commodity charges are based on an increasing block rate for single-family and multi-family residential customers and uniform rate for CII customers, including dedicated landscape. Table 4-2 shows the City's water rates effective as of July 1, 2015.

Table 4-2: Water Usage Rates

Customer Class	Tier	Commodity Charge
Single-family Residential	I	\$2.895/1,000 gal for first 7,500 gal/month
	II	\$3.187/1,000 gal for next 12,500 gal/month
	III	\$3.471/1,000 gal for over 20,000 gal/month
Multi-family Residential	I	\$2.895/1,000 gal for first 4,000 gal/month
	II	\$3.187/1,000 gal for next 6,000 gal/month
	III	\$3.471/1,000 gal for over 10,000 gal/month
Commercial		\$2.728/1,000 gal
Commercial Outside City Limits		\$3.774/1,000 gal

## 4.4 Public Education and Outreach

The City's public education and outreach program is administered by MWDOC. MWDOC has established an extensive public education and outreach program to assist its retail agencies and the three Metropolitan's member agencies in Orange County 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](http://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.

### **Water Inspection Trips**

Water Inspection trips take stakeholders on tours of the Colorado River Aqueduct, 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.

The City also supplements MWDOC's program with its own public outreach and education activities, such as distribution of conservation literature at City Hall and hosting or participating in a number of other public venues. Monthly bill inserts and messages on water bills furnish customers tips and information on the efficient use of water. The City's Water Service website provides information on the City's water conservation programs and links to Metropolitan's rebate programs. The website also provides water conservation related news, water saving tips as well as helpful information to customers who suspect water leaks and other problems.

The City has also participated with the Fullerton Arboretum and Metropolitan to provide landscape irrigation classes that promote efficient use of irrigation systems. Currently, the Arboretum offers a class on California Native Landscaping twice per year.

### **4.5 Programs to Assess and Manage Distribution System Real Loss**

The City has developed and maintained a water system hydraulic model to evaluate and assess where water loss projects should be performed.

Senate Bill 1420 signed into law in September 2014 requires urban water suppliers that submit UWMPs to calculate annual system water losses using the water audit methodology developed by the AWWA. AB 1420 requires the water loss audit be submitted to DWR every five years as part of the urban water supplier's UWMP. Water auditing is the basis for effective water loss control. DWR's UWMP Guidebook include a water audit manual intended to help water utilities complete the AWWA Water Audit on an annual basis. A Water Loss Audit was completed for the City which identified areas for improvement and quantified total loss. Based on the data presented, the three priority areas identified were water imported, customer retail unit cost (applied to Apparent Losses), and billed metered water. Multiple criteria are a part of each validity score and a system wide approach will need to be implemented for the City's improvement. Quantified water loss for the FY 2014-15 was 1,515 AFY which is a significant volume and presents opportunities for improvement.

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

The City has assigned staff with the responsibilities to handle water conservation programs. During the droughts these responsibilities were increased, and extra staff was provided. Presently, the City has a designated water conservation coordinator responsible for managing and implementing the City's Water Use Efficiency BMPs. This involves coordinating and working closely with DWR, MWDOC, Metropolitan, OCWD, and CUWCC.

Sources of funding for the City's water conservation program include using water fund reserves.

### **4.7 Other Demand Management Measures**

During the past five years, FY 2010-11 to 2014-15, the City, with the assistance of MWDOC, has implemented many water use efficiency programs for its residential, CII, and landscape customers as described below. The City 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](http://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 high efficiency toilets, ultralow volume urinals, air-cooled ice machines, weather-based irrigation controllers, and rotating nozzles.

##### **Socal Water\$mart Rebate Program for CII**

The City 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 high efficiency toilets, 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 weather-based irrigation controllers (WBIC) 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 City 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 with recent water supply challenges, the State Water Resources Control Board found that California has been subject to multi-year droughts in the past, and the 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 that 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 domestic water use is the highest use of water and the next highest use is irrigation. This section describes the water supply shortage policies Metropolitan and the City have in place to respond to events including catastrophic interruption and reduction in water supply.

### 5.2 Shortage Actions

#### 5.2.1 Metropolitan Water Surplus and Drought Management Plan

Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage annually. Each stage is associated with specific resource management actions to avoid extreme shortages to the extent possible and minimize adverse impacts to retail customers should an extreme shortage occur. The sequencing outlined in the Water Surplus and Drought Management (WSDM) Plan reflects anticipated responses towards Metropolitan's existing and expected resource mix.

Surplus stages occur when net annual deliveries can be made to water storage programs. Under the WSDM Plan, there are four surplus management stages that provides a framework for actions to take for surplus supplies. Deliveries in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage.

The WSDM Plan distinguishes between shortages, severe shortages, and extreme shortages. The differences between each term is listed below.

- Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands using stored water or water transfers as necessary.
- Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.
- Extreme Shortage: Metropolitan must allocate available supply to full-service customers.

There are six shortage management stages to guide resource management activities. These stages are defined by shortfalls in imported supply and water balances in Metropolitan's storage programs. When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Figure 5-1 gives a summary of actions under each surplus and shortage stages when



an allocation plan is necessary to enforce mandatory cutbacks. The goal of the WSDM Plan is to avoid Stage 6, an extreme shortage.

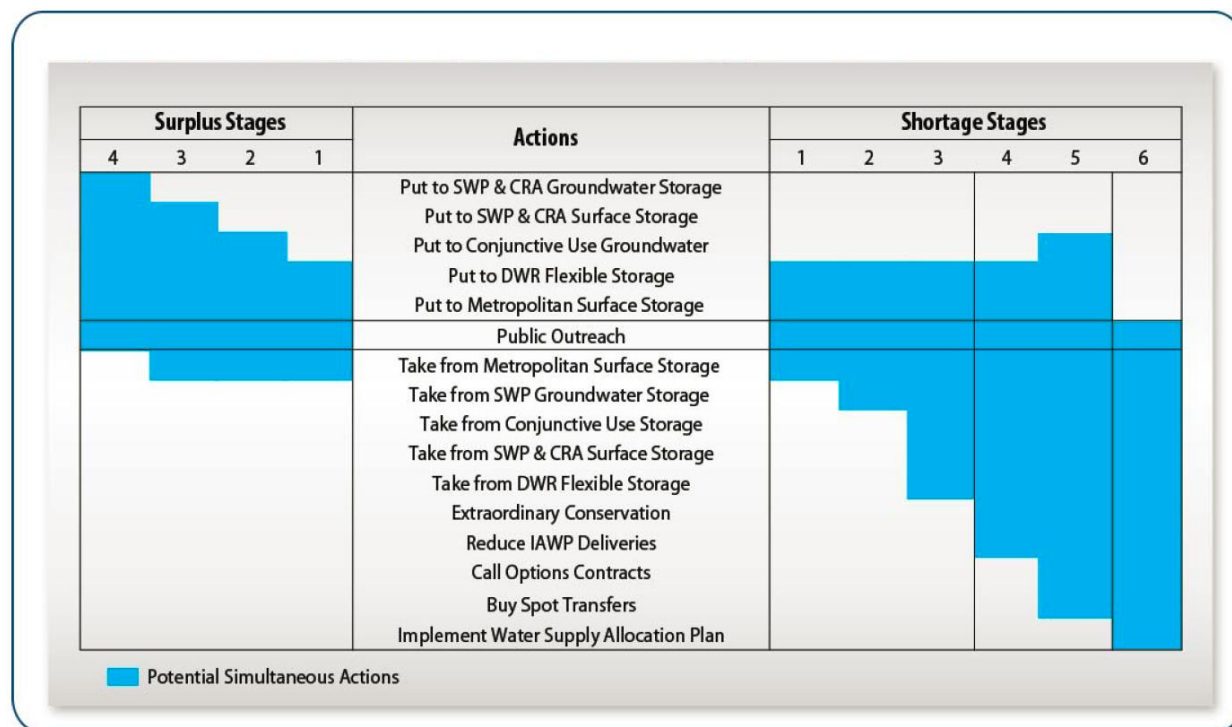


Figure 5-1: Resource Stages, Anticipated Actions, and Supply Declarations

Metropolitan's Board of Directors adopted a Water Supply Condition Framework in June 2008 in order to communicate the urgency of the region's water supply situation and the need for further water conservation practices. The framework has four conditions, each calling increasing levels of conservation. Descriptions for each of the four conditions are listed below:

- **Baseline Water Use Efficiency:** Ongoing conservation, outreach, and recycling programs to achieve permanent reductions in water use and build storage reserves.
- **Condition 1 Water Supply Watch:** Local agency voluntary dry-year conservation measures and use of regional storage reserves.
- **Condition 2 Water Supply Alert:** Regional call for cities, counties, member agencies, and retail water agencies to implement extraordinary conservation through drought ordinances and other measures to mitigate use of storage reserves.
- **Condition 3 Water Supply Allocation:** Implement Metropolitan's WSAP

As noted in Condition 3, should supplies become limited to the point where imported water demands cannot be met, Metropolitan will allocate water through the WSAP (Metropolitan, 2015 Final UWMP, May 2016).

### 5.2.2 Metropolitan Water Supply Allocation Plan

Metropolitan's imported supplies have been impacted by a number of water supply challenges as noted earlier. In case of extreme water shortage within the Metropolitan service area is the implementation of its WSAP.

Metropolitan's Board of Directors adopted the WSAP in February 2008 to fairly distribute a limited amount of water supply and applies it through a detailed methodology to reflect a range of local conditions and needs of the region's retail water consumers.

The WSAP 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 WSDM Plan with the core objective of creating an equitable "needs-based allocation". The WSAP'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 a number of factors, such as the impact on retail customers, growth in population, changes in supply conditions, investments in local resources, demand hardening aspects of water conservation savings, recycled water, extraordinary storage and transfer actions, and groundwater imported water needs.

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 member agency's water supply allocation is to estimate their 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 two most recent non-shortage fiscal years ending 2013 and 2014.

**Step 2: Allocation Year Calculations** – The next step in calculating the member agency's 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 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.

In order to implement the WSAP, Metropolitan's Board of Directors makes a determination on the level of the regional shortage, based on specific criteria, typically in April. The criteria used by Metropolitan includes, current levels of storage, estimated water supplies conditions, and projected imported water demands. 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 of Directors.

Although Metropolitan's 2015 UWMP forecasts that Metropolitan will be able to meet projected imported demands throughout the projected period from 2020 to 2040, uncertainty in supply conditions can result

in Metropolitan needing to implement its WSAP to preserve dry-year storage and curtail demands (Metropolitan, 2015 UWMP, May 2016).

### **5.2.3 City of Fullerton**

The City's Water Supply Shortage Conservation Plan (WSSCP) was established to provide procedures, rules and regulations for mandatory conservation to minimize the effect of a water supply shortage emergency on the City's water customers. The City Council will vote to implement the WSSCP if it finds and determines one or more of the following: a shortage could exist due to increased demand or limited supplies; storage or distribution facilities of the City become inadequate; a major local or regional supplier experiences a major failure or contamination; or the City's wholesale water providers call for an allocation of water supply combined with a penalty rate and/or extraordinary water conservation measures. When a water shortage appears imminent, the City Manager shall notify the City Council and recommend holding a public hearing to determine whether a shortage exists and determine the appropriate phase of the water supply shortage.

There are four shortage phases and supply conditions. The water supply conditions for the phases to be implemented include:

- Increased demand or limited supply
- Distribution or storage facilities of the City become inadequate
- A major failure or contamination of the supply
- Shortage
- Failure of storage and/or distribution facilities of Metropolitan, OCWD, and/or the City occurs
- The City's whole sale water providers, Metropolitan and OCWD, call for an allocation of water supply combined with an allocation penalty rate
- Other extraordinary water conservation measures

A summary of the stages of water shortage is displayed in Table 5-1 (Fullerton, Municipal Code Chapter 12.06, 2008).

Table 5-1: Stages of Water Shortage Contingency Plan

Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction <sup>1</sup>	Water Supply Condition
1	Up to 10 %	The City may determine that a Phase I "Mild Water Shortage" exists when there is reasonable probability that the City will not be able to meet all of the water demands of its customers or the City's wholesale water providers call for a water supply reduction as described in the City's Ordinance No. 3118, Phase I Water supply shortage.
2	Up to 20 %	The City may determine that a Phase II "Moderate Water Shortage" exists when there is an increase in demand or a decrease in supplies, a distribution or storage facilities of the City become inadequate, a major failure or contamination of the supply, storage, and/or distribution facilities of Metropolitan, OCWD, or the City occurs, or the City's wholesale water providers call for a water supply reduction of up to 20% in aggregate as described in the City's Ordinance No. 3118, Phase II Water supply shortage.
3	Up to 30 %	The City may determine that a Phase III "Severe Water Shortage" exists when due to a prolonged drought or other water supply conditions, a water supply shortage or threatened shortage exists and a water demand reduction is necessary to make more efficient use of water as an appropriate response to existing water conditions, or when the City's wholesale water providers call for a water supply reduction of up to 30% in aggregate as described in the City's Ordinance No. 3118, Phase III Water supply shortage.
4	31 - 50%	The City may determine that a Phase IV "Water Shortage Emergency" exists when there is a water shortage emergency due to a prolonged drought, a declared "State of emergency" or other water supply conditions and that a significant reduction in water demand is necessary to maintain sufficient water supplies for public health and safety or the City's wholesale water providers call for a water supply reduction of 31% or greater in aggregate as described in the City's Ordinance No. 3118, Phase IV Water shortage emergency.
<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		

### 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.

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 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 conducted by OCWD and participated in by the City, local supplies are projected to be maintained at demand levels. Based on Metropolitan's WSAP, the City is expected to fully meet demands for the next three years assuming Metropolitan is not in shortage, a Basin Production Percentage of 70 percent for Local Supplies, 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)**

<b>Retail: Minimum Supply Next Three Years</b>			
	2016	2017	2018
Available Water Supply	28,986	28,986	28,986

## 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 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, including the City.

### 5.4.3 City of Fullerton

The City relies on Metropolitan's catastrophic planning, based on a major earthquake damaging the aqueduct that transports southern California water. The adopted criteria assume that damage from such an event could render the aqueducts out of service for six months. To safeguard the region from catastrophic losses of water, Metropolitan has made substantial investments in emergency storage. Metropolitan completed construction of Diamond Valley Lake, which reached its capacity in 2002. Metropolitan has reserved half of Diamond Valley Lake storage capacity to meet emergencies. Metropolitan can deliver emergency supply throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake.

## 5.5 Prohibitions, Penalties and Consumption Reduction Methods

### 5.5.1 Prohibitions

The WSSCP lists water conservation requirements that shall take effect upon implementation by the City Council. These prohibitions shall promote the efficient use of water, reduce or eliminate water waste, complement the City's Water Quality regulations and urban runoff reduction efforts, and enable implementation of the City's Water Shortage Contingency Measures.

Water conservation measures become more restrictive per each progressive stage in order to address the increasing differential between the water supply and demand.

A list of restrictions and prohibitions that are applicable to each stage is displayed 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	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	-	Yes
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation	-	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?
Permanent Year-Round	Water Features - Restrict water use for decorative water features, such as fountains	No water shall be used to clean, fill, or maintain levels in decorative fountains, or other similar aesthetic structures unless such water is part of a recycling system.	Yes
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Washing of vehicles may only be performed with a hand-held water container, with a hose equipped with a positive shutoff nozzle for quick rinses, or at the immediate premises of a commercial car wash.	Yes
Permanent Year-Round	Other	Installation of single pass cooling systems in buildings requesting new water connections is prohibited.	Yes
Permanent Year-Round	Other	Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems is prohibited.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Does not apply to situations where washing is for health and safety purposes.	Yes
1	CII - Restaurants may only serve water upon request	-	Yes
1	Landscape - Limit landscape irrigation to specific times	Watering of landscape or other turf area shall not be allowed between ten a.m. and four p.m., except that this provision shall not apply to commercial nurseries, golf courses, and other water-dependent industries; except that there shall be no restriction on watering using reclaimed water, provided that signs are posted the identify reclaimed water is being used.	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	-	Yes
3	Landscape - Limit landscape irrigation to specific times	Restrictions on watering of lawns, landscape or other turf areas shall be modified to prohibit watering more often than every other day and to prohibit watering between the hours of eight a.m. and six p.m.	Yes
3	Landscape - Limit landscape irrigation to specific times	Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering between the	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?
		hours of ten a.m. and four p.m., except that there shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.	
4	Landscape - Prohibit all landscape irrigation	There shall be no residential watering of lawn, landscaping, and other turf areas at any time except by hand-held watering containers.	Yes
4	Landscape - Limit landscape irrigation to specific times	Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering between the hours of eight a.m. and six p.m., except that there shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.	Yes

A general exception is made to all the prohibitions for all four Water Shortage Emergency Phases should the City deem the use of water as necessary to maintain an adequate level of public health and safety and is necessary to provide an essential government service such as police, fire, and emergency repairs (Fullerton, Municipal Code Chapter 12.06, 2008).

### 5.5.2 Penalties

Any customer who violates provisions of the WSSCP by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by the City and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination. It is unlawful for any customer of the Utility to fail to comply with any of the provisions following a violation.

A first and second violation of the Water Shortage Emergency Phases by any person shall result in the Utility issuing a written notice along with a possible fine. The City may install a flow restrictor or discontinue water service to the customer in violation of the Water Shortage Conservation Measures after three violations within a twelve month period (Fullerton, Water Supply Shortage Conservation Plan).

### 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
All	Expand Public Information Campaign	The City provides public education through MWDOC. Along with a public website, MWDOC oversees school programs, posts water news in the local newspaper, holds quarterly Water Policy Dinners, hosts an annual Water summit, and shows water facilities to the public.
All	Provide Rebates on Plumbing Fixtures and Devices	Program administered by MWDOC offers rebates to CII and residential customers on devices such as laminar flow restrictors, dry vacuum pumps, premium high efficiency toilets.
All	Provide Rebates for Landscape Irrigation Efficiency	Program administered by MWDOC offers rebates to CII and residential customers on devices such as spray nozzles, drip irrigation, smart irrigation timers, soil moisture sensor, in-stem flow regulator.
All	Provide Rebates for Turf Replacement	Program administered by MWDOC offers turf removal rebates to CII and residential customers.
All	Offer Water Use Surveys	Program administered by MWDOC.
1	Expand Public Information Campaign	
1	Decrease Line Flushing	The City's line flushing program may be reduced or even put on hold.
2	Offer Water Use Surveys	
2	Increase Water Waste Patrols	City staff will be on alert for any water waste and notify any violating customers.
3	Moratorium or Net Zero Demand Increase on New Connections	New developments must demonstrate equal or less water usage as the prior customer or fund water savings elsewhere within the city.
4	Implement or Modify Drought Rate Structure or Surcharge	City Council may make adjustments to water rates.
NOTES:		

## 5.6 Impacts to Revenue

The actions described above to address a range of water shortage conditions have the potential to impact the City's revenues and expenditures. To assess these impacts, the City calculated the revenue impacts resulting from a 10, 25, and 50 percent reduction in sales as compared to a base year that was based on an estimate of normal year baseline. Other factors incorporated into the analysis included water losses, pricing structure, and avoided costs. The results of this analysis are shown below in Table 5-5.

## 2015 URBAN WATER MANAGEMENT PLAN

**Table 5-5. Revenue Impacts Analysis**

Rate Type	Demand	Baseline	10%	25%	50%
	Water Produced (HCF)	11,867,283	10,478,794	8,732,328	5,821,552
37%	Purchased MWD (37%)	4,390,895	3,877,154	3,230,961	2,153,974
63%	Pumped OCWD (63%)	7,476,388	6,601,640	5,501,367	3,667,578
5.8	Water Losses (HCF)	689,902	419,152	349,293	232,862
	Water Sales (HCF)	11,177,380	10,059,642	8,383,035	5,588,690
	Water Sales (kgal)	8,360,680	7,524,612	6,270,510	4,180,340
1	Residential, Single-Family (%)	46.60%	46.60%	46.60%	46.60%
2	Residential, Multifamily (%)	16.42%	16.42%	16.42%	16.42%
3	Residential, Outside City (%)	0.00%	0.00%	0.00%	0.00%
4	Commercial (%)	18.60%	18.60%	18.60%	18.60%
5	Commercial, Outside City (%)	0.01%	0.01%	0.01%	0.01%
6	Temporary Connections - Metered (%)	0.08%	0.08%	0.08%	0.08%
7	Temporary Connections - Unmetered (%)	0.00%	0.00%	0.00%	0.00%
8	Industrial (%)	10.32%	10.32%	10.32%	10.32%
9	Industrial, Outside City (%)	0.00%	0.00%	0.00%	0.00%
10	Municipal (%)	2.14%	2.14%	2.14%	2.14%
11	Agricultural (%)	0.03%	0.03%	0.03%	0.03%
12	Residential/Agricultural (%)	0.02%	0.02%	0.02%	0.02%
13	Fire Line (%)	0.02%	0.02%	0.02%	0.02%
14	Fire Line - Outside City (%)	0.00%	0.00%	0.00%	0.00%
15	Single/Multi-Family Landscape (%)	4.83%	4.83%	4.83%	4.83%
16	Single Family w/ Fire Sprinkler (%)	0.91%	0.91%	0.91%	0.91%
17	Multi-Family w/ Manual Rubbish Serv. (%)	0.00%	0.00%	0.00%	0.00%
1	Residential, Single-Family (kgal)	3,896,077	3,506,469	2,922,058	1,948,039
2	Residential, Multifamily (kgal)	1,372,824	1,235,541	1,029,618	686,412
3	Residential, Outside City (kgal)	0	0	0	0
4	Commercial (kgal)	1,555,087	1,399,578	1,166,315	777,543
5	Commercial, Outside City (kgal)	836	752	627	418
6	Temporary Connections - Metered (kgal)	6,689	6,020	5,016	3,344
7	Temporary Connections - Unmetered (kgal)	0	0	0	0
8	Industrial (kgal)	862,822	776,540	647,117	431,411

# 2015 URBAN WATER MANAGEMENT PLAN

Rate Type	Demand	Baseline	10%	25%	50%
9	Industrial, Outside City (kgal)	0	0	0	0
10	Municipal (kgal)	178,919	161,027	134,189	89,459
11	Agricultural (kgal)	2,508	2,257	1,881	1,254
12	Residential/Agricultural (kgal)	1,672	1,505	1,254	836
13	Fire Line (kgal)	1,672	1,505	1,254	836
14	Fire Line - Outside City (kgal)	0	0	0	0
15	Single/Multi-Family Landscape (kgal)	403,821	363,439	302,866	201,910
16	Single Family w/ Fire Sprinkler (kgal)	76,082	68,474	57,062	38,041
17	Multi-Family w/ Manual Rubbish Serv. (kgal)	0	0	0	0
	<b>Total</b>	<b>8,359,008</b>	<b>7,523,107</b>	<b>6,269,256</b>	<b>4,179,504</b>
	<b>Commodity Charge Revenue</b>				
		<b><u>\$/1000 Gals</u></b>			
1	Residential, Single-Family (\$)	<b>\$2.86</b>	\$2.86	\$2.86	\$2.86
85%	First 7,500 gallons	2.81	\$2.81	\$2.81	\$2.81
10%	Next 12,500 gallons	3.10	\$3.10	\$3.10	\$3.10
5%	Over 20,000 gallons	3.38	\$3.38	\$3.38	\$3.38
2	Residential, Multifamily (\$)	<b>\$2.86</b>	\$2.86	\$2.86	\$2.86
85%	First 4,000 gallons	2.81	\$2.81	\$2.81	\$2.81
10%	Next 6,000 gallons	3.10	\$3.10	\$3.10	\$3.10
5%	Over 10,000 gallons	3.38	\$3.38	\$3.38	\$3.38
3	Residential, Outside City (\$)	<b>\$3.68</b>	\$3.68	\$3.68	\$3.68
4	Commercial (\$)	<b>\$2.62</b>	\$2.62	\$2.62	\$2.62
5	Commercial, Outside City (\$)	<b>\$3.68</b>	\$3.68	\$3.68	\$3.68
6	Temporary Connections - Metered (\$)	<b>\$3.01</b>	\$3.01	\$3.01	\$3.01
7	Temporary Connections - Unmetered (\$)	<b>\$3.21</b>	\$3.21	\$3.21	\$3.21
8	Industrial (\$)	<b>\$2.58</b>	\$2.58	\$2.58	\$2.58
9	Industrial, Outside City (\$)	<b>\$3.68</b>	\$3.68	\$3.68	\$3.68
10	Municipal (\$)	<b>\$2.51</b>	\$2.51	\$2.51	\$2.51
11	Agricultural (\$)	<b>\$2.82</b>	\$2.82	\$2.82	\$2.82
12	Residential/Agricultural (\$)	<b>\$2.51</b>	\$2.51	\$2.51	\$2.51
	First 20,000 gallons	2.51	\$2.51	\$2.51	\$2.51
	Over 20,000 gallons	2.80	\$2.80	\$2.80	\$2.80
13	Fire Line (\$)	<b>\$2.88</b>	\$2.88	\$2.88	\$2.88
14	Fire Line - Outside City (\$)	<b>\$3.68</b>	\$3.68	\$3.68	\$3.68
15	Single/Multi-Family Landscape (\$)	<b>\$3.35</b>	\$3.35	\$3.35	\$3.35
16	Single Family w/ Fire Sprinkler (\$)	<b>\$2.81</b>	\$2.81	\$2.81	\$2.81
	First 7,500 gallons	2.81	\$2.81	\$2.81	\$2.81
	Next 12,500 gallons	3.10	\$3.10	\$3.10	\$3.10
	Over 20,000 gallons	3.38	\$3.38	\$3.38	\$3.38
17	Multi-Family w/ Manual Rubbish Serv. (\$)	<b>\$2.81</b>	\$2.81	\$2.81	\$2.81

# 2015 URBAN WATER MANAGEMENT PLAN

Rate Type	Demand	Baseline	10%	25%	50%
	First 4,000 gallons	2.81	\$2.81	\$2.81	\$2.81
	Next 6,000 gallons	3.10	\$3.10	\$3.10	\$3.10
	Over 10,000 gallons	3.38	\$3.38	\$3.38	\$3.38
	Rate 1 Revenue	\$11,161,676	\$10,045,509	\$8,371,257	\$5,580,838
	Rate 2 Revenue	\$3,932,934	\$3,539,641	\$2,949,700	\$1,966,467
	Rate 3 Revenue	\$0	\$0	\$0	\$0
	Rate 4 Revenue	\$4,078,992	\$3,671,093	\$3,059,244	\$2,039,496
	Rate 5 Revenue	\$3,080	\$2,772	\$2,310	\$1,540
	Rate 6 Revenue	\$20,112	\$18,101	\$15,084	\$10,056
	Rate 7 Revenue	\$0	\$0	\$0	\$0
	Rate 8 Revenue	\$2,229,533	\$2,006,579	\$1,672,149	\$1,114,766
	Rate 9 Revenue	\$0	\$0	\$0	\$0
	Rate 10 Revenue	\$449,264	\$404,338	\$336,948	\$224,632
	Rate 11 Revenue	\$7,061	\$6,355	\$5,295	\$3,530
	Rate 12 Revenue	\$4,192	\$3,773	\$3,144	\$2,096
	Rate 13 Revenue	\$4,822	\$4,340	\$3,617	\$2,411
	Rate 14 Revenue	\$0	\$0	\$0	\$0
	Rate 15 Revenue	\$1,353,204	\$1,217,883	\$1,014,903	\$676,602
	Rate 16 Revenue	\$213,563	\$192,206	\$160,172	\$106,781
	Rate 17 Revenue	\$0	\$0	\$0	\$0
	Total	\$23,458,433	\$21,112,590	\$17,593,825	\$11,729,217
	Fixed Monthly/Bimonthly Charge Revenue	\$4,400,000	\$4,400,000	\$4,400,000	\$4,400,000
		15.8%			
	Total Rate Revenue	\$27,858,433	\$25,512,590	\$21,993,825	\$16,129,217
	Revenue Lost		(\$2,345,843)	(\$5,864,608)	(\$11,729,217)
	Variable Costs				
		FY16 Proj. from FY14 COS			
	Purchased Water (MWD) (\$/yr)	\$10,946,996	\$9,666,182	\$8,055,152	\$5,370,101
	Pumped Water (OCWD)				
	Electricity (\$/yr)	\$1,458,891	\$1,288,199	\$1,073,499	\$715,666
	Water (\$/yr)	\$5,028,884	\$4,440,497	\$3,700,414	\$2,466,943
		\$17,434,771	\$15,394,878	\$12,829,065	\$8,552,710
	Unit Costs (\$/AF)				
	Purchased Water (MWD)	\$1,086.00	\$1,086.00	\$1,086.00	\$1,086.00
	Pumped (OCWD)				
	Electricity	\$85.00	\$85.00	\$85.00	\$85.00
	Water	\$293.00	\$293.00	\$293.00	\$293.00

Rate Type	Demand	Baseline	10%	25%	50%
	<b>Unit Costs (\$/HCF)</b>				
	<u>Water Produced:</u>				
	Purchased Water (MWD)	\$2.49	\$2.49	\$2.49	\$2.49
	Pumped (OCWD)				
	Electricity	\$0.20	\$0.20	\$0.20	\$0.20
	Water	\$0.67	\$0.67	\$0.67	\$0.67
	<b>Avoided Costs</b>		<b>\$2,039,893</b>	<b>\$4,605,706</b>	<b>\$8,882,061</b>
	<b>Net Revenue Change</b>		<b>(\$305,951)</b>	<b>(\$1,258,903)</b>	<b>(\$2,847,156)</b>
	<b>Rate Revenue Increase Required</b>		<b>1.11%</b>	<b>4.73%</b>	<b>11.38%</b>

The following measures can be implemented by the City to overcome each reduction in water sales scenario outlined above depending on anticipated short-term and long-term financial impacts.

- The City can draw needed funds from its emergency operation and maintenance fund, which are kept in reserve to provide adequate revenue to allow the water system to function for up to 120 days of normal operations.
- The City can defer non-mission critical capital improvement projects and reallocate the funds to cover the cost of operations and critical maintenance.
- The City Manager can recommend the City Council to declare a water shortage and implement the City's WSSCP. Depending on the severity of the shortage and impact on revenue, the City Council may increase water rates, other than Tier 1 Lifeline rates, by an amount necessary as determined by the City Council. The subsequent rate increases enacted will remain in effect until such time the City Council declares a water shortage no longer exists.

## 5.7 Reduction Measuring Mechanism

The City will use its CIS Infinity Customer Information and Billing Software to determine actual reductions in water use pursuant to the urban water shortage contingency analysis. By using the data management capabilities of the CIS software the city can prepare detailed reports regarding present and historical data on a monthly, quarterly, semi-annual, and annual basis, including water consumption, sales, and revenues.

## 6 RECYCLED WATER

Southern California discharges treated wastewater to the ocean every day that could potentially be reused and reduces 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.

### 6.1 Agency Coordination

The City does not own or operate any wastewater treatment facilities and sends all collected wastewater to Orange County Sanitation District (OCSD) for treatment and disposal. The City relies on the OC Basin for the majority of its water supply. OCWD is the manager of the OC Basin and strives to maintain and increase the reliability of the OC Basin through replenishment with advanced treated wastewater. OCWD and OCSD have jointly constructed and expanded two water recycling projects to meet this goal that include: 1) OCWD Green Acres Project (GAP) and 2) OCWD and OCSD GWRS.

#### 6.1.1 OCWD Green Acres Project

OCWD owns and operates the GAP, a water recycling effort that provides up to 8,400 AFY of recycled water for irrigation and industrial uses. GAP further treats secondary treated effluent from OCSD to tertiary standards, providing an alternate source of water that is mainly delivered to golf courses, greenbelts, cemeteries, and nurseries in the Cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach, and Santa Ana. Approximately 100 sites use GAP water and some of the current water users include Mile Square Park and Golf Courses in Fountain Valley, Costa Mesa Country Club, Chroma Systems carpet dyeing, Kaiser Permanente, and Caltrans. The City does not receive any GAP water.

#### 6.1.2 OCWD Groundwater Replenishment System

The GWRS is a result of the collaborative effort between OCWD and OCSD. The GWRS receives secondary treated wastewater from OCSD and purifies it to levels that meet and exceed all state and federal drinking water standards. The GWRS plant has been operational since January 2008 and uses a three-step advanced treatment process consisting of microfiltration (MF), reverse osmosis (RO), and ultraviolet (UV) light with hydrogen peroxide. A portion of the treated water is injected into the seawater barrier to prevent seawater intrusion into the groundwater basin. The other portion of the water is pumped to percolation ponds where the water percolates into deep aquifers and becomes part of Orange County's water supply. The treatment process described on OCWD's website is provided below (OCWD, GWRS, 2015).

### GWRS Treatment Process

The first step of the treatment process after receiving the secondary treated wastewater is a separation process called MF that uses hollow polypropylene fibers with 0.2 micron diameter holes in the sides. Suspended solids, protozoa, bacteria and some viruses are filtered out when drawing water through the holes to the center of the fibers.

The second step of the process consist of RO, semi-permeable polyamide polymer (plastic) membranes that water is forced through under high pressure. RO removes dissolved chemicals, viruses and pharmaceuticals in the water resulting in near-distilled-quality water that requires minerals be added back in to stabilize the water. This process was used by OCWD from 1975 to 2004 at their Water Factory 21 (WF-21) to purify treated wastewater from OCSD for injection into the seawater intrusion barrier.

The third step of the process involves water being exposed to high-intensity UV light with hydrogen peroxide ( $H_2O_2$ ) for disinfection and removal of any trace organic compounds that may have passed through the RO membranes. The trace organic compounds may include NDMA and 1-4 Dioxane, which have been removed to the parts-per trillion level. UV disinfection with  $H_2O_2$  is an effective disinfection/advanced oxidation process that keeps these compounds from reaching drinking water supplies.

The GWRS has a current production capacity of 112,100 AFY with the expansion that was completed in 2015. Approximately 39,200 AFY of the highly purified water is pumped into the injection wells and 72,900 AFY is pumped to the percolation ponds in the city of Anaheim where the water is naturally filtered through sand and gravel to deep aquifers of the groundwater basin. The OC Basin provides approximately 72 percent of the potable water supply for north and central Orange County.

The design and construction of the first phase (78,500 AFY) of the GWRS project was jointly funded by OCWD and OCSD; Phase 2 expansion (33,600 AFY) was funded solely by OCWD. Expansion beyond this is in discussion and could provide an additional 33,600 AFY of water, increasing total GWRS production to 145,700 AFY. The GWRS is the world's largest water purification system for indirect potable reuse (IPR).

## **6.2 Wastewater Description and Disposal**

The City does not provide wastewater services within its service area, but relies on OCSD for collection and treatment at their plants located in the Cities of Huntington Beach and Fountain Valley.

OCSD's Plant No. 1 in Fountain Valley has a capacity of 358,700 AFY and Plant No. 2 in Huntington Beach has a capacity of 349,700 AFY. Both plants share a common ocean outfall, but Plant No. 1 currently provides all of its secondary treated wastewater to the GWRS for beneficial reuse. The 120-inch diameter ocean outfall extends 4 miles off the coast in Huntington Beach. A 78-inch diameter emergency outfall also exists that extends 1.3 miles off the coast.

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?
City of Fullerton	Estimated	10,898	OCSD	Plant No. 1 & 2	No
Total Wastewater Collected from Service Area in 2015:		10,898			
NOTES: The City typically assumes sewer return is 40 percent of water usage to estimate the volume of wastewater collected.					

### 6.3 Current Recycled Water Uses

There are currently no recycled water uses within the City's service area.

### 6.4 Potential Recycled Water Uses

While the City recognizes the potential for beneficial reuse in their service area, recycled water infrastructure does not exist to support recycled water use. The recycled water analyses that have been performed over the years have shown recycled water infrastructure are not feasible at this time. The City supports, encourages, and contributes to the continued development of recycled water and potential uses throughout the region with the GWRS. Currently, the City does not have any potential or projected uses for recycled water.

#### 6.4.1 Direct Non-Potable Reuse

The City does not have any direct non-potable uses within their service area and do not currently have the potential for non-potable reuse.

#### 6.4.2 Indirect Potable Reuse

The City benefits from the GWRS system that provides indirect potable reuse through replenishment of Orange County's Groundwater Basin with water that meets and exceeds state and federal drinking water standards.

### 6.5 Optimization Plan

Because the City is not currently using recycled water, there is no immediate need for a recycled water 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.

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).

Analyses have indicated that present worth costs to incorporate recycled water within the City are not cost effective. The City 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 OCWD, Metropolitan and other cooperative agencies.

## 7 FUTURE WATER SUPPLY PROJECTS AND PROGRAMS

### 7.1 Water Management Tools

Resource optimization such as desalination and IPR minimize the City and regional reliance on imported water. Optimization efforts are typically lead by the regional agencies in collaboration with local/retail agencies.

Replacement of older wells with new, more efficient wells will increase the capacity of existing booster stations and reduce water waste so the City can meet projected demands with their facilities and distribution system more efficiently.

### 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 City maintains six emergency interconnections with other utilities.

The City relies on its wholesalers, Metropolitan and OCWD, to be the responsible parties for negotiating water transfers and exchanges. Currently, there are no additional transfer or exchange opportunities.

### 7.3 Planned Water Supply Projects and Programs

The City's 5 Year Capital Improvement Program identifies planned design and construction projects as described below. At this time, the city does not have any planned water supply projects or water supply programs; however, OCWD's North Basin Groundwater Remediation Project may end up connecting into the City's system and provide the system with more groundwater.

### 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 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, Metropolitans 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.

The City has not attempted to investigate seawater desalination on its own due to economic and physical impediments.

### **7.4.1 Groundwater**

There are currently no brackish groundwater opportunities within the City's service area.

### **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 million gallons per day (MGD), or 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 MWDOC 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 Moulton Niguel Water District.

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 City worked closely with other entities such as Metropolitan to develop and update this planning document. The City 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 City 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)	5/5/16 & 5/12/16	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)	2/16/16	Appendix E
Held public hearing	5/17/16	Appendix E
Adopted UWMP	5/17/16	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 City Council on May 17, 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 City to notify any city or county within its service area at least 60 days prior to the public hearing. As indicated in Table 8-2, the City sent a Letter of Notification to the County of Orange on February 16, 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
OCWD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metropolitan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MWDOC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suburban Water Systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GSWC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Placentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
La Mirada	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
La Habra	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Brea	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Buena Park	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anaheim	<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"/>

## 8.1 Public Participation

The City encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document on May 17, 2016. Public hearing notifications were published in local newspapers. 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 City's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the City Clerk's and Utilities Department offices.

## **8.2 Agency Coordination**

All of the City's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The City is dependent on imported water from Metropolitan, its regional wholesaler. The City is also dependent on groundwater from OCWD, the agency that manages the Orange County Basin. As such, the City involved these water providers in the development of its 2015 UWMP at various levels of contribution as summarized in Table 8-3.

## **8.3 UWMP Submittal**

### **8.3.1 Review of Implementation of 2010 UWMP**

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

### **8.3.2 Comparison of 2010 Planned Water Conservation Programs with 2015 Programs**

As a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California regarding urban water use efficiency, the City's commitment to implement BMP-based water use efficiency program continues today. For the City's specific achievements in the area of conservation, please see Section 4 of this Plan.

### **8.3.3 Filing of 2015 UWMP**

The City Council reviewed the Final Draft Plan on May 17, 2016. The five-member City Council approved the 2015 UWMP on May 17, 2016. See Appendix F for the resolution approving the Plan.

By July 1, 2016, the City's Adopted 2015 UWMP was filed with DWR. By August 1, 2016, the City's Adopted 2015 UWMP was filed with the California State Library, County of Orange, and cities within its service area.

## **8.4 UWMP Amendment Process**

### **8.4.1 Resubmitting UWMP**

As requested by DWR, the City resubmitted their 2015 UWMP to address certain sections of the California Water Code that were not covered by the original plan. After making edits to the UWMP, the City went through the adoption process once more. Table 8-3 presents a summary of the steps taken by the City in adopting the amended UWMP.



**Table 8-3: External Coordination and Outreach for Resubmitting UWMP**

External Coordination and Outreach	Date	Reference
Public notification	10/12/17	Appendix E-1
Held public hearing	11/7/17	Appendix E-1
Adopted UWMP	11/7/17	Appendix F-1
Submitted UWMP to DWR	1/5/18	-
Submitted UWMP to the California State Library and city or county within the supplier's service area	1/5/18	-
Made UWMP available for public review	2/1/18	-

Again, the opportunity was presented to the public for comments and questions concerning the UWMP. The City published a public hearing notification in the local newspaper for the amended UWMP which can be viewed in Appendix E-1. After the public hearing, the City Council reviewed and approved the Amended UWMP on November 7, 2017. Appendix F-1 includes the resolution approving the Amended UWMP. By January 5, 2018, the City's Amended UWMP will be resubmitted to DWR, California State Library, and County of Orange. The Amended UWMP will be available for public review no later than 30 days after filing with DWR.

## REFERENCES

- California Department of Water Resources, 2015. Urban Water Management Plans, Guidebook for Urban Water Suppliers.
- CDM Smith, 2016. Final Technical Memorandum #1 of Orange County Reliability Study.
- Department of Water Resources, 2015. State Water Project Final Delivery Capability Report 2015.
- Fullerton, California Municipal Code Chapter 12.06, (2008).
- Metropolitan Water District of Southern California, 2016. Metropolitan Urban Water Management Plan 2015.
- Municipal Water District of Orange County, 2015. Orange County Reliability Study.
- Orange County Water District, 2014. OCWD Engineer's Report.
- Orange County Water District, 2015. OCWD Groundwater Management Plan 2015 Update.
- Orange County Water District. (2015). Groundwater Replenishment Study [Brochure].
- San Diego County Water Authority, 2003. Quantification Settlement Agreement.
- Southern California Association of Governments, 2012. 5<sup>th</sup> Cycle Regional Housing Needs Assessment Final Allocation Plan.
- U.S. Department of the Interior Bureau of Reclamation, 2012. Colorado River Basin Study.
- Urban Water Management Planning Act, California Water Code § 10610-10656 (2010).
- Water Conservation Act of 2009, California Senate SB x7-7, 7<sup>th</sup> 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>
<b>10620(b)</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	<b>Section 1.1</b>
<b>10620(d)(2)</b>	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	<b>Section 8.2</b>
<b>10642</b>	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	<b>Section 8.1</b>
<b>10631(a)</b>	Describe the water supplier service area.	System Description	Section 3.1	<b>Section 1.3.1</b>
<b>10631(a)</b>	Describe the climate of the service area of the supplier.	System Description	Section 3.3	<b>Section 2.2.1</b>
<b>10631(a)</b>	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	<b>Section 2.2.2</b>
<b>10631(a)</b>	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	<b>Section 2.3</b>
<b>10631(a)</b>	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	<b>Section 2.2.2</b>
<b>10631(e)(1)</b>	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	<b>Section 2.3.1 and 2.4.3</b>
<b>10631(e)(3)(A)</b>	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	<b>Section 2.3.4 and Appendix H</b>
<b>10631.1(a)</b>	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	<b>Section 2.4.5</b>
<b>10608.20(b)</b>	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	<b>Section 2.5.2.1</b>
<b>10608.20(e)</b>	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	<b>Section 2.5.2.2</b>

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
<b>10608.22</b>	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	<b>Section 2.5.2.2</b>
<b>10608.24(a)</b>	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	<b>Section 2.5.2.2</b>
<b>10608.24(d)(2)</b>	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	<b>Section 2.5.2.2</b>
<b>10608.36</b>	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	<b>N/A</b>
<b>10608.40</b>	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	<b>Section 2.5.2.2</b>
<b>10631(b)</b>	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	<b>Section 3.4</b>
<b>10631(b)</b>	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	<b>Section 3.3</b>
<b>10631(b)(1)</b>	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	<b>Section 3.3.2.1</b>
<b>10631(b)(2)</b>	Describe the groundwater basin.	System Supplies	Section 6.2.1	<b>Section 3.3.1</b>
<b>10631(b)(2)</b>	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	<b>Section 3.3.2</b>
<b>10631(b)(2)</b>	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	<b>Section 3.3.7</b>
<b>10631(b)(3)</b>	Provide a detailed description and analysis of the location, amount, and sufficiency of	System Supplies	Section 6.2.4	<b>Section 3.3.6</b>

	groundwater pumped by the urban water supplier for the past five years			
<b>10631(b)(4)</b>	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	<b>Section 3.3 and 3.3.2</b>
<b>10631(d)</b>	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	<b>Section 7.2</b>
<b>10631(g)</b>	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	<b>Section 7</b>
<b>10631(h)</b>	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	<b>Section 7.4</b>
<b>10631(j)</b>	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	<b>Section 3.4</b>
<b>10631(j)</b>	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	<b>N/A</b>
<b>10633</b>	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	<b>Section 6.1</b>
<b>10633(a)</b>	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	<b>Section 6.2</b>
<b>10633(b)</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	<b>Section 6.2</b>
<b>10633(c)</b>	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	<b>Section 6.3</b>
<b>10633(d)</b>	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	<b>Section 6.4</b>
<b>10633(e)</b>	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	<b>Section 6.3 and 6.4</b>

	comparison to uses previously projected.			
<b>10633(f)</b>	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	<b>Section 6.4</b>
<b>10633(g)</b>	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	<b>Section 6.5</b>
<b>10620(f)</b>	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	<b>Section 3.3, 4, 7</b>
<b>10631(c)(1)</b>	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	<b>Section 3.6</b>
<b>10631(c)(1)</b>	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	<b>Section 3.6.5</b>
<b>10631(c)(2)</b>	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	<b>Section 3.6</b>
<b>10634</b>	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	<b>Section 3.6.2.3</b>
<b>10635(a)</b>	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	<b>Section 3.7</b>
<b>10632(a) and 10632(a)(1)</b>	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	<b>Section 5.2</b>
<b>10632(a)(2)</b>	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	<b>Section 5.3</b>
<b>10632(a)(3)</b>	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	<b>Section 5.4</b>
<b>10632(a)(4)</b>	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	<b>Section 5.5.1</b>
<b>10632(a)(5)</b>	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	<b>Section 5.5.3</b>
<b>10632(a)(6)</b>	Indicated penalties or charges for excessive	Water Shortage Contingency	Section 8.3	<b>Section</b>



	use, where applicable.	Planning		<b>5.5.2</b>
<b>10632(a)(7)</b>	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	<b>Section 5.6</b>
<b>10632(a)(8)</b>	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	<b>Appendix D</b>
<b>10632(a)(9)</b>	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	<b>Section 5.7</b>
<b>10631(f)(1)</b>	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	<b>Section 4</b>
<b>10631(f)(2)</b>	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	<b>N/A</b>
<b>10631(i)</b>	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	<b>Section 4 and Appendix J</b>
<b>10608.26(a)</b>	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	<b>Section 8.1</b>
<b>10621(b)</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	<b>Appendix E</b>
<b>10621(d)</b>	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	<b>Section 8.3.3</b>
<b>10635(b)</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	<b>Section 8.3.3</b>
<b>10642</b>	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	<b>Section 8.1</b>

	public hearing, and held a public hearing about the plan.			
<b>10642</b>	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	<b>Appendix E</b>
<b>10642</b>	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	<b>Appendix F</b>
<b>10644(a)</b>	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	<b>Section 8.3.3</b>
<b>10644(a)(1)</b>	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	<b>Section 8.2</b>
<b>10644(a)(2)</b>	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	<b>Section 8.3.3</b>
<b>10645</b>	<b>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.</b>	<b>Plan Adoption, Submittal, and Implementation</b>	<b>Section 10.5</b>	<b>Section 8</b>

# 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	<b>Section 1.1</b>
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	<b>Section 8.2</b>
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	<b>Section 8.1</b>
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	<b>Section 1.3.1</b>
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	<b>Section 2.2.1</b>
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	<b>Section 2.2.2</b>
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	<b>Section 2.3</b>
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	<b>Section 2.2.2</b>
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	<b>Section 2.3.1 and 2.4.3</b>
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	<b>Section 2.3.4 and Appendix H</b>
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	<b>Section 2.4.5</b>
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	<b>Section 2.5.2.1</b>
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	<b>Section 2.5.2.2</b>

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
<b>10608.22</b>	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	<b>Section 2.5.2.2</b>
<b>10608.24(a)</b>	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	<b>Section 2.5.2.2</b>
<b>10608.24(d)(2)</b>	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	<b>Section 2.5.2.2</b>
<b>10608.36</b>	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	<b>N/A</b>
<b>10608.40</b>	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	<b>Section 2.5.2.2</b>
<b>10631(b)</b>	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	<b>Section 3.4</b>
<b>10631(b)</b>	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	<b>Section 3.3</b>
<b>10631(b)(1)</b>	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	<b>Section 3.3.2.1</b>
<b>10631(b)(2)</b>	Describe the groundwater basin.	System Supplies	Section 6.2.1	<b>Section 3.3.1</b>
<b>10631(b)(2)</b>	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	<b>Section 3.3.2</b>
<b>10631(b)(2)</b>	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	<b>Section 3.3.7</b>
<b>10631(b)(3)</b>	Provide a detailed description and analysis of the location, amount, and sufficiency of	System Supplies	Section 6.2.4	<b>Section 3.3.6</b>

	groundwater pumped by the urban water supplier for the past five years			
<b>10631(b)(4)</b>	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	<b>Section 3.3 and 3.3.2</b>
<b>10631(d)</b>	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	<b>Section 7.2</b>
<b>10631(g)</b>	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	<b>Section 7</b>
<b>10631(h)</b>	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	<b>Section 7.4</b>
<b>10631(j)</b>	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	<b>Section 3.4</b>
<b>10631(j)</b>	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	<b>N/A</b>
<b>10633</b>	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	<b>Section 6.1</b>
<b>10633(a)</b>	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	<b>Section 6.2</b>
<b>10633(b)</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	<b>Section 6.2</b>
<b>10633(c)</b>	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	<b>Section 6.3</b>
<b>10633(d)</b>	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	<b>Section 6.4</b>
<b>10633(e)</b>	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	<b>Section 6.3 and 6.4</b>

	comparison to uses previously projected.			
<b>10633(f)</b>	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	<b>Section 6.4</b>
<b>10633(g)</b>	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	<b>Section 6.5</b>
<b>10620(f)</b>	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	<b>Section 3.3, 4, 7</b>
<b>10631(c)(1)</b>	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	<b>Section 3.6</b>
<b>10631(c)(1)</b>	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	<b>Section 3.6.5</b>
<b>10631(c)(2)</b>	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	<b>Section 3.6</b>
<b>10634</b>	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	<b>Section 3.6.2.3</b>
<b>10635(a)</b>	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	<b>Section 3.7</b>
<b>10632(a) and 10632(a)(1)</b>	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	<b>Section 5.2</b>
<b>10632(a)(2)</b>	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	<b>Section 5.3</b>
<b>10632(a)(3)</b>	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	<b>Section 5.4</b>
<b>10632(a)(4)</b>	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	<b>Section 5.5.1</b>
<b>10632(a)(5)</b>	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	<b>Section 5.5.3</b>
<b>10632(a)(6)</b>	Indicated penalties or charges for excessive	Water Shortage Contingency	Section 8.3	<b>Section</b>



	use, where applicable.	Planning		<b>5.5.2</b>
<b>10632(a)(7)</b>	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	<b>Section 5.6</b>
<b>10632(a)(8)</b>	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	<b>Appendix D</b>
<b>10632(a)(9)</b>	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	<b>Section 5.7</b>
<b>10631(f)(1)</b>	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	<b>Section 4</b>
<b>10631(f)(2)</b>	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	<b>N/A</b>
<b>10631(i)</b>	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	<b>Section 4 and Appendix J</b>
<b>10608.26(a)</b>	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	<b>Section 8.1</b>
<b>10621(b)</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	<b>Appendix E</b>
<b>10621(d)</b>	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	<b>Section 8.3.3</b>
<b>10635(b)</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	<b>Section 8.3.3</b>
<b>10642</b>	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	<b>Section 8.1</b>



	public hearing, and held a public hearing about the plan.			
<b>10642</b>	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	<b>Appendix E</b>
<b>10642</b>	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	<b>Appendix F</b>
<b>10644(a)</b>	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	<b>Section 8.3.3</b>
<b>10644(a)(1)</b>	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	<b>Section 8.2</b>
<b>10644(a)(2)</b>	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	<b>Section 8.3.3</b>
<b>10645</b>	<b>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.</b>	<b>Plan Adoption, Submittal, and Implementation</b>	<b>Section 10.5</b>	<b>Section 8</b>

# APPENDIX B

Standardized Tables



**Table 2-1 Retail Only: Public Water Systems**

Public Water System Number	Public Water System Name	Number of Municipal Connections Fiscal Year 2014-15	Volume of Water Supplied Fiscal Year 2014-15
CA3010010	City of Fullerton	32,000	27,244
<b>TOTAL</b>		<b>32,000</b>	<b>27,244</b>
NOTES:			

Table 2-2: Plan Identification		
Select Only One	Type of Plan	Name of RUWMP or Regional Alliance <i>if applicable 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
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)	Orange County 20x2020 Regional Alliance
NOTES:		

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
<input type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
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
NOTES:	

<b>Table 2-4 Retail: Water Supplier Information Exchange</b>
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name <i>(Add additional rows as needed)</i>
Metropolitan
NOTES:

### Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040(opt)
	140,827	145,791	152,026	155,464	158,421	160,545

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

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

Use Type (Add additional rows as needed)	FY 2014-15 Actual	
<u><b>Use Drop down list</b></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>	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Single Family	Drinking Water	11,729
Multi-Family	Drinking Water	4,335
Institutional/Governmental	Drinking Water	605
Commercial	Drinking Water	5,095
Industrial	Drinking Water	2,647
Landscape	Drinking Water	1,249
Other	Drinking Water	34
Losses	Drinking Water	1,550
<b>TOTAL</b>		<b>27,244</b>
NOTES: Data retrieved from MWDOC Customer Class Usage Data and FY 2014-		



Table 4-2 Retail: Demands for Potable and Raw Water - Projected					
Use Type <i>(Add additional rows as needed)</i>	Projected Water Use (FYE) <i>Report To the Extent that Records are Available</i>				
<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>	2020	2025	2030	2035	2040
Single Family	11,494	12,339	12,424	12,420	12,438
Multi-Family	4,248	4,560	4,592	4,591	4,597
Institutional/Governmental	593	636	641	641	642
Commercial	4,993	5,360	5,397	5,395	5,403
Industrial	2,594	2,785	2,804	2,803	2,807
Landscape	1,224	1,314	1,323	1,323	1,325
Other	33	36	36	36	36
Losses	1,519	1,631	1,642	1,641	1,644
<b>TOTAL</b>	26,699	28,661	28,858	28,850	28,891
NOTES: Data retrieved from MWDOC 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</i> <i>Tables 4-1 and 4-2</i>	27,244	26,699	28,661	28,858	28,850	28,891
Recycled Water Demand* <i>From Table 6-4</i>	0	0	0	0	0	0
<b>TOTAL WATER DEMAND</b>	27,244	26,699	28,661	28,858	28,850	28,891

NOTES:

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
07/2014	1,515
* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.	
NOTES:	

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

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i>	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.	Location in UWMP: 4.1
Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i>	Yes
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	1996	2005	223	201	179
5 Year	2004	2008	215		
*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
146	201	Yes
<i>*All values are in Gallons per Capita per</i>		
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	Fiscal Year 2010-11	Fiscal Year 2011-12	Fiscal Year 2012-13	Fiscal Year 2013-14	Fiscal Year 2014-15
Alluvial Basin	Orange County Groundwater Basin	16,229	17,341	19,489	24,279	18,946
<b>TOTAL</b>		16,229	17,341	19,489	24,279	18,946
NOTES:						

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015					
<input type="checkbox"/>		There is no wastewater collection system. The supplier will not complete the table below.			
		Percentage of 2015 service area covered by wastewater collection system <i>(optional)</i>			
		Percentage of 2015 service area population covered by wastewater collection system <i>(optional)</i>			
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>
<i>Add additional rows as needed</i>					
City of Fullerton	Estimated	10,898	OCSD	Plant No. 1 & 2	No
<b>Total Wastewater Collected from Service Area in 2015:</b>		10,898			
NOTES: The City typically assumes sewer return is 40 percent of water usage to estimate the volume of wastewater collected.					



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

<input checked="" type="checkbox"/>		No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number <i>(optional)</i>	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	
Total							0	0	0	0	
NOTES:											

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

<input checked="" type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:								
Name of Agency Operating the Recycled Water Distribution System:								
Supplemental Water Added in 2015								
Source of 2015 Supplemental Water								
Beneficial Use Type <small><i>These are the only Use Types that will be recognized by the DWR online submittal tool</i></small>	General Description of 2015 Uses	Level of Treatment <small><i>Drop down list</i></small>	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)								
Golf course irrigation								
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 (Provide General Description)								
		<b>Total:</b>	0	0	0	0	0	0
<small>*IPR - Indirect Potable Reuse</small>								
NOTES:								

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

<input checked="" type="checkbox"/>	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 actual use
Agricultural irrigation		
Landscape irrigation (excludes golf courses)		
Golf course irrigation		
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	<i>Type of Use</i>	
<b>Total</b>	0	0
NOTES:		

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

<input checked="" type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
<i>Add additional rows as needed</i>			
Total			0
NOTES:			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i>	Expected Increase in Water Supply to Agency <i>This may be a range</i>
	<i>Drop Down List (y/n)</i>	<i>If Yes, Agency Name</i>				
<i>Add additional rows as needed</i>						
NOTES:						

**Table 6-8 Retail: Water Supplies — Actual**

Water Supply	Additional Detail on Water Supply	FY 2014-15	
<b><i>Drop down list</i></b> <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	Orange County Groundwater Basin	18,946	Drinking Water
Purchased or Imported Water	Metropolitan	8,298	Drinking Water
<b>Total</b>		27,244	
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>				
<b>Drop down list</b> <i>May use each category multiple times.</i> <i>These are the only water supply categories that will be recognized by the WUdata 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	Orange County Groundwater Basin	18,689	20,063	20,201	20,195	20,224
Purchased or Imported Water	Metropolitan	8,010	8,598	8,657	8,655	8,667
<b>Total</b>		26,699	28,661	28,858	28,850	28,891
NOTES:						

**Table 7-1 Retail: Basis of Water Year Data**

Year Type	<b>Base Year</b> <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		106%
Multiple-Dry Years 1st Year	2012		106%
Multiple-Dry Years 2nd Year	2013		106%
Multiple-Dry Years 3rd Year	2014		106%
NOTES: Developed by MWD OC as 2015 Bump Methodology			



Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals (autofill from Table 6-9)	26,699	28,661	28,858	28,850	28,891
Demand totals (autofill from Table 4-3)	26,699	28,661	28,858	28,850	28,891
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	28,301	30,381	30,589	30,581	30,624
Demand totals	28,301	30,381	30,589	30,581	30,624
Difference	0	0	0	0	0
NOTES: Developed by MWDOC as 2015 Bump Methodology					

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

		2020	2025	2030	2035	2040
First year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0
Second year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0
Third year	Supply totals	28,301	30,381	30,589	30,581	30,624
	Demand totals	28,301	30,381	30,589	30,581	30,624
	Difference	0	0	0	0	0

NOTES: Developed by MWDOC as 2015 Bump Methodology

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

Stage	Complete Both	
	Percent Supply Reduction <sup>1</sup> <i>Numerical value as a percent</i>	Water Supply Condition <i>(Narrative description)</i>
1	Up to 10 %	The City may determine that a Phase I "Mild Water Shortage" exists when there is reasonable probability that the City will not be able to meet all of the water demands of its customers or the City's wholesale water providers call for a water supply reduction as described in the City's Ordinance No. 3118, Phase I Water supply shortage.
2	Up to 20 %	The City may determine that a Phase II "Moderate Water Shortage" exists when there is an increase in demand or a decrease in supplies, a distribution or storage facilities of the City become inadequate, a major failure or contamination of the supply, storage, and/or distribution facilities of Metropolitan, OCWD, or the City occurs, or the City's wholesale water providers call for a water supply reduction of up to 20% in aggregate as described in the City's Ordinance No. 3118, Phase II Water supply shortage.
3	Up to 30 %	The City may determine that a Phase III "Severe Water Shortage" exists when due to a prolonged drought or other water supply conditions, a water supply shortage or threatened shortage exists and a water demand reduction is necessary to make more efficient use of water as an appropriate response to existing water conditions, or when the City's wholesale water providers call for a water supply reduction of up to 30% in aggregate as described in the City's Ordinance No. 3118, Phase III Water supply shortage.
4	31 - 50%	The City may determine that a Phase IV "Water Shortage Emergency" exists when there is a water shortage emergency due to a prolonged drought, a declared "State of emergency" or other water supply conditions and that a significant reduction in water demand is necessary to maintain sufficient water supplies for public health and safety or the City's wholesale water providers call for a water supply reduction of 31% or greater in aggregate as described in the City's Ordinance No. 3118, Phase IV Water shortage emergency.
<sup>1</sup> 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	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
Permanent Year-Round	Water Features - Restrict water use for decorative water features, such as fountains	No water shall be used to clean, fill, or maintain levels in decorative fountains, or other similar aesthetic structures unless such water is part of a recycling system.	Yes
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Washing of vehicles may only be performed with a hand-held water container, with a hose equipped with a positive shutoff nozzle for quick rinses, or at the immediate premises of a commercial car wash.	Yes
Permanent Year-Round	Other	Installation of single pass cooling systems in buildings requesting new water connections is prohibited.	Yes
Permanent Year-Round	Other	Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems is prohibited.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Does not apply to situations where washing is for health and safety purposes.	Yes
1	CII - Restaurants may only serve water upon request		Yes

1	Landscape - Limit landscape irrigation to specific times	Watering of landscape or other turf area shall not be allowed between ten a.m. and four p.m., except that this provision shall not apply to commercial nurseries, golf courses, and other water-dependent industries; except that there shall be no restriction on watering using reclaimed water, provided that signs are posted the identify reclaimed water is being used.	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
3	Landscape - Limit landscape irrigation to specific times	Restrictions on watering of lawns, landscape or other turf areas shall be modified to prohibit watering more often than every other day and to prohibit watering between the hours of eight a.m. and six p.m.	Yes
3	Landscape - Limit landscape irrigation to specific times	Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering between the hours of ten a.m. and four p.m., except that there shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.	Yes

4	Landscape - Prohibit all landscape irrigation	There shall be no residential watering of lawn, landscaping, and other turf areas at any time except by hand-held watering containers.	Yes
4	Landscape - Limit landscape irrigation to specific times	Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering between the hours of eight a.m. and six p.m., except that there shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.	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>
All	Expand Public Information Campaign	The City provides public education through its wholesaler MWDOC. Along with a public website, MWDOC oversees school programs, posts water news in the local newspaper, holds quarterly Water Policy Dinners, hosts an annual Water summit, and shows water facilities to the public.
All	Provide Rebates on Plumbing Fixtures and Devices	Program administered by MWDOC offers rebates to CII and residential customers on devices such as laminar flow restrictors, dry vacuum pumps, premium high efficiency toilets.
All	Provide Rebates for Landscape Irrigation Efficiency	Program administered by MWDOC offers rebates to CII and residential customers on devices such as spray nozzles, drip irrigation, smart irrigation timers, soil moisture sensor, in-stem flow regulator.
All	Provide Rebates for Turf Replacement	Program administered by MWDOC offers turf removal rebates to CII and residential customers.
All	Offer Water Use Surveys	Program administered by MWDOC.
1	Expand Public Information Campaign	
1	Decrease Line Flushing	
2	Offer Water Use Surveys	
2	Increase Water Waste Patrols	
3	Moratorium or Net Zero Demand Increase on New Connections	
4	Implement or Modify Drought Rate Structure or Surcharge	

NOTES:



**Table 8-4 Retail: Minimum Supply Next Three Years**

	2016	2017	2018
Available Water Supply	28,986	28,986	28,986

NOTES: Metropolitan's WSAP

**Table 10-1 Retail: Notification to Cities and Counties**

City Name	60 Day Notice	Notice of Public Hearing
OCWD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metropolitan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MWDOC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suburban Water Systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GSWC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Placentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
La Mirada	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
La Habra	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Brea	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Buena Park	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anaheim	<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 OCWD GWMP can be found at  
<http://www.ocwd.com/what-we-do/groundwater-management/groundwater-management-plan/>

# APPENDIX D

City Ordinance



**Chapter 12.06**  
**WATER SUPPLY SHORTAGE CONSERVATION PLAN**

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Sections:

- 12.06.010. Statement of policy, declaration of purpose and objectives.
- 12.06.020. Water supply shortage findings.
- 12.06.030. CEQA exemption.
- 12.06.040. Definitions.
- 12.06.050. Application.
- 12.06.060. Water supply shortage notice and implementation.
- 12.06.070. Public communication.
- 12.06.080. Water supply shortage conservation Plan Fund Established.
- 12.06.090. Prohibited uses of water at all times.
- 12.06.100. Water supply shortage phases.
- 12.06.110. Sudden catastrophic water supply shortage.
- 12.06.120. Failure to comply.
- 12.06.130. Notice of violation.
- 12.06.140. Relief from compliance.
- 12.06.150. General provisions.
- 12.06.160. Public nuisance.
- 12.06.170. Severability.

**12.06.010. Statement of policy, declaration of purpose and objectives.**

A. Water supplies in the city and at the source of Fullerton's water are now and from time to time in the future expected to be in a state of shortage. The general welfare requires that water resources available to the City must be put to their maximum beneficial use, and waste or unreasonable uses must be prevented. The conservation of water must be practiced so that the limited supply of water will be available to serve the interests of the people of the City and for the public welfare.

B. The purpose of this chapter is to provide procedures, rules and regulations for mandatory water conservation to minimize the effect of a water supply shortage emergency on the City's water customers.

C. The objectives of this chapter are:

1. To prevent water supply shortages through aggressive and effective water management programs such as water conservation, water education, and use of reclaimed water;
2. To minimize the impact of a water supply shortage on the City's population and economy;
3. To provide first for public health, fire protection, and other essential services, then to provide for the economic health of the City, and then provide for other uses of water;
4. To ensure that water users who conserve water during normal-year rainfall and wet-year rainfall are not disadvantaged during

water supply shortages requiring mandatory water conservation.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.020. Water supply shortage findings.**

The City Council finds and determines that a water supply shortage could exist based upon the occurrence of one or more of the following conditions:

- A. A general water supply shortage takes place due to increased demand or limited supplies.
- B. Distribution or storage facilities of the City become inadequate.
- C. A major failure or contamination of the supply, storage and/or distribution facilities of the Metropolitan Water District of Southern California, the Orange County Water District and/or the City occurs.
- D. The City's wholesale water providers, MWD and OCWD, call for an allocation of water supply combined with an allocation penalty rate and/or other extraordinary water conservation measures.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.030. CEQA exemption.**

The City Council finds that this chapter and actions taken hereafter pursuant to this chapter are exempt from the provisions of the California Environmental Quality Act of 1970 as specific actions necessary to prevent or mitigate an emergency pursuant to Section 15307 of the CEQA Guidelines.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.040. Definitions.**

The following words and phrases, whenever used in this chapter, shall be construed as defined in this section, unless from the context a different meaning is intended, or unless a different meaning is specifically defined within the individual sections of this chapter:

- A. "Applicant" means the person, association, developer, corporation or governmental agency applying for water service.
- B. "Billing unit" equals one thousand gallons of water: this is the unit amount of water used to calculate commodity charges for customer usage.
- C. "Citizens Appeals Board" means a board, consisting of at least three but not more than five members, appointed by the City Council to hear appeals concerning applications for relief or violations that a customer or water user cannot resolve with the Hearing Officer.
- D. "City" means the City of Fullerton, California, a municipal corporation.
- E. "City Council" means the City Council of the City of Fullerton, California.
- F. "City Manager" means the chief administrative officer of the City appointed by the City Council.
- G. "Cost" means the actual cost to the Utility, including all labor, material, supplies, equipment and miscellaneous items, together with any applicable indirect and general charges, plus the general administrative overhead, in accordance with the accounting practices of the Utility.
- H. "Customer" means water customer or water user.
- I. "Director of Engineering" means the chief administrative officer of the Engineering Department of the City.
- J. "Director of Administrative Services" means the chief administrative officer of the Administrative Services Department of the City.

- K. "Flow restricting device" or "flow restrictor" means a fitting inserted into the service connection to reduce flow capacity.
- L. "Hearing Officer" means the person appointed by the City Manager at the utility level to resolve applications for relief.
- M. "Lifeline rate" means the tier one (1) rate of the applicable rate schedule for single family and multifamily residential customers.
- N. "Person" means any individual, group, developer or organization operating as a single entity.
- O. "Premises" means the integral property or area, including improvements thereon, to which water service is provided, or for which an application for service is filed.
- P. "Process water" means water used to manufacture, alter, convert, clean, heat or cool a product, or the equipment used for such purpose; water used for plant and equipment washing and for transporting the raw materials and products; and water used to grow trees or plants for sale or installation.
- Q. "Reclaimed water" means the process of recapturing or treating water, degraded or contaminated groundwater, or other nonpotable water.
- R. "Recycled water" means the process of recirculating or reusing water with a minimum of waste occurring.
- S. "Service connection" means the pipe or tubing, fittings, and valves necessary to conduct water from the distribution main to and through the meter.
- T. "Utility" means the municipal water organization, its staff and the system serving the city.
- U. "Utility rates, rules and regulations" means the rate structure of the Utility and any rules and regulations as approved by the City Council.
- V. "Water customer" means the person in whose name service is rendered as evidenced by the signature on the application, contract or agreement for that service, or in the absence of a signed instrument, by the receipt and payment of bills regularly issued in his/her name, regardless of the identity of the actual user of the service.
- W. "Water supply shortage rates" means the retail price of water determined by the City Council during a City Council declared Phase I, II, III or IV water supply shortage.
- X. "Water user" means any user of water including a water customer.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.050. Application.**

The provisions of this chapter shall apply to all customers, water users and premises served by the Utility wherever situated and shall also apply to all premises and facilities owned, maintained, operated or under the jurisdiction of the various officers, boards, departments or agencies of the City.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.060. Water supply shortage notice and implementation.**

A. The Utility staff shall monitor any water shortage and evaluate the supply and demand for water by its customers and shall recommend to the City Manager the extent of water conservation required for the Utility to plan for and supply water to its customers. When a water shortage appears imminent, the City Manager shall notify the City Council and recommend holding a public hearing for the purpose of determining whether a water shortage exists and determining the appropriate phase of the water supply shortage and to protect the public welfare and safety. The public hearing shall be noticed by publishing said notice one time only in a newspaper of general circulation. Upon completion of the hearing, the City Council shall make its decision on said phase implementation by Council resolution. Said resolution shall be published one time only in a newspaper of general circulation, and the prohibited use provisions shall become effective immediately upon such publication.

B. The implemented phase of the water supply shortage shall be in effect until the City Council declares the water supply shortage has ended or until another phase has been implemented pursuant to this chapter.



(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.070. Public communication.**

Once a water supply shortage phase is in effect, the Utility will inform its customers of the effective date of the prohibited uses of water and the water supply shortage rates associated with the relevant phase, and will encourage its customers to take additional voluntary actions to conserve water. The Utility will inform and prepare its customers about possible restrictions on use of water and rate increases related to the higher levels of water conservation required by this Plan. The Utility will continue to educate its customers for the duration of any water supply shortage phase. The Utility will communicate effectively with its diverse customer base.

(Ord. 3118 (part), 2008)

#### **12.06.080. Water supply shortage conservation plan fund established.**

The Director of Administrative Services shall hereby establish a Water Supply Conservation Plan Fund, within the Utility's account system, to be used for the Utility's costs and expenses of administering and enforcing this chapter, and for any revenue shortfall due to water shortages and conservation measures. Revenue collected from water supply shortage rates associated with Phases I, II, III, and IV that exceed the revenue that pre-water shortage rates would have provided, shall be placed in the fund. The fund may also be used to offset the cost of, and provide a Council-approved citywide incentive for, customer conservation efforts and retrofits.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.090. Prohibited uses of water at all times.**

A. The following uses of water are prohibited at all times:

1. Permitting the excess use or loss of water through breaks, leaks, or other malfunctions in the water user's plumbing or distribution system for any period of time after such loss of water should have reasonably been discovered and corrected;
2. No water runoff from landscaped areas into adjoining streets, sidewalks, or other paved areas due to incorrectly-directed or incorrectly-maintained sprinklers or excessive watering shall be allowed;
3. No water shall be used to clean, fill, or maintain levels in decorative fountains, or other similar aesthetic structures, unless such water is part of a recycling system;
4. Washing of motor vehicles, trailers, boats, and other types of mobile equipment shall be done only with a hand-held water container or a hose equipped with a positive shut-off nozzle for quick rinses, except for washing done at the immediate premises of a commercial car wash or with reclaimed water,

B. Effective one (1) year after the adoption of this chapter, the following uses of water are prohibited:

1. Installation of single pass cooling systems in buildings requesting new water connections; and
2. Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems.

(Ord. 3118 (part), 2008)

#### **12.06.100. Water supply shortage phases.**

No water user or water customer of the City shall use, cause the use, or permit the use of water from the Utility in a manner contrary to any provision of this chapter which has been mandated by the City Council in accordance with the provisions of this chapter.

A. Phase I water supply shortage.

1. Prohibited uses: In addition to the prohibited uses of water identified in Section 12.06.090, the following prohibited uses are applicable to all Utility users:

- a. There shall be no hose washing of sidewalks, walkways, driveways, parking areas, or other paved surfaces, except as required for health and safety purposes;
- b. No restaurant, hotel, café, cafeteria, or other public place where food is sold, served, or offered for sale, shall serve drinking water to any customer unless expressly requested;
- c. All leaks from indoor and outdoor plumbing fixtures shall be promptly repaired;
- d. Watering of landscape or other turf area shall not be allowed between ten a.m. and four p.m., except that this provision shall not apply to commercial nurseries, golf courses, and other water-dependent industries; except that there shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.

2. Water supply shortage rates: During a Phase I water supply shortage, the City Council may increase water rates, other than Tier 1 Lifeline rates, by an amount necessary, as determined by the City Council. The increase in water rates, which could average approximately up to 10 percent above the pre-water shortage rates, may vary among categories of customers. Examples of categories are single family residential, multi-family residential, commercial, industrial, agricultural, temporary service, municipal, landscape, and fire lines.

B. Phase II water supply shortage.

1. Prohibited uses applicable to all Utility users: All the provisions of Phase I are applicable.
2. Water supply shortage rates. During a Phase II water supply shortage, the City Council may increase water rates, other than Tier 1 Lifeline rates, by an amount necessary, as determined by the City Council. The increase in water rates, which could average approximately 10 to 15 percent above the pre-water shortage rates, may vary among categories of customers.

C. Phase III water supply shortage.

1. Prohibited uses applicable to all Utility users: All the provisions of Phase II shall apply except that the restrictions on watering of lawns, landscape or other turf areas shall be modified to prohibit watering on days other than Monday, Thursday, or Saturday, except for short periods of time for adjusting or repairing the irrigation system, and to prohibit watering between the hours of eight a.m. and six p.m. Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering their stock on days other than Monday, Thursday, or Saturday, except for short periods of time for adjusting or repairing the irrigation system, and prohibited from watering between the hours of ten a.m. and four p.m. There shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used.

2. Water supply shortage rates. During a Phase III water supply shortage, the City Council may increase water rates, other than Tier 1 Lifeline rates, by an amount necessary, as determined by the City Council. The increase in water rates, which could average approximately 15 to 20 percent above the pre-water shortage rates, may vary among categories of customers.

D. Phase IV water shortage emergency.

1. Prohibited uses applicable to all Utility users: All the provisions of Phase III shall apply except there shall be no residential watering of lawn, landscaping, and other turf areas at any time except by hand-held watering containers. Commercial nurseries, golf courses, and other water-dependent industries shall be prohibited from watering lawn, landscaping, and other turf areas on days other than Monday or Thursday, except for short periods of time for adjusting or repairing the irrigation system, and prohibited from watering between the hours of eight a.m. and six p.m. There shall be no restriction on watering using reclaimed water, provided that signs are posted that identify reclaimed water is being used. During a Phase IV water supply shortage, the City Council may, in its sole discretion, impose additional restrictions or prohibitions on the use of water.

2. Water supply shortage rates. During a Phase IV water supply shortage, the City Council may, in its sole discretion, make additional adjustments to the water rates.

E. General Exception. The prohibitions described in this chapter are waived when such use of water is necessary, as determined by the Utility, to maintain an adequate level of public health and safety, and is necessary to provide an essential government service such as police, fire and emergency repairs.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

**12.06.110. Sudden catastrophic water supply shortage.**

When the City Manager determines that a sudden event has, or threatens to, significantly diminish the reliability or quality of the City's water supply, the City Manager may declare a catastrophic water supply shortage and impose whatever emergency water allocation or conservation actions deemed necessary, in the City Manager's professional judgment, to protect the reliability and quality of the City's water supply, until the emergency passes or the City Council takes other action.

(Ord. 3118 (part), 2008)

#### **12.06.120. Failure to comply.**

A. Penalties. It shall be unlawful for any customer of the Utility to fail to comply with any of the provisions of this chapter. The penalties set forth in this section shall be additional to those penalties provided in any other section of this code. The penalties for failure to comply with any of the prohibited use provisions of this chapter shall be as follows:

1. For the first violation by any person of any of the provisions of Sections 12.06.090, 12.06.100, and 12.06.110 the Utility shall issue a written notice, pursuant to Section 12.06.130, of the fact of such violation to the customer whose water has been used.

2. For a second violation by any person of any of the provisions of Sections 12.06.090, 12.06.100, and 12.06.110 within the preceding twelve calendar months, the Utility shall issue a written notice, pursuant to Section 12.06.130 of the fact of such second violation to the customer whose water has been used.

3. For a third violation by any person of any of the provisions of Sections 12.06.090, 12.06.100, and 12.06.110 within the preceding twelve calendar months, the Utility shall issue a third written notice, pursuant to Section 12.06.130, of its intent to install a flow restrictor no earlier than ten working days after the notice date. Thereafter, the Utility may install a flow restricting 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, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight hours. The charge for installing and removing flow-restricting devices shall be the actual cost based upon the size of the meter and the reasonable cost of installation, but shall not be less than twenty-five dollars each during regular hours and forty dollars each during any other time. The Utility may use a schedule of charges based on meter size and average installation cost. The charge shall be paid along with the regular bill.

4. For any subsequent violation, by any customer of the Utility, of any of the provisions of Sections 12.06.090, 12.06.100, and 12.06.110 within the preceding twelve calendar months, the Utility shall issue a written notice, pursuant to Section 12.06.130, of its intent to install a flow restrictor no earlier than ten working days after the notice, and thereafter the Utility may either install a flow restricting device for a period of time of not less than one hundred sixty-eight hours or discontinue water service to that customer at the premises at which the violation occurred. The charges shall be the same as detailed in Subsection A.3 of this section.

B. Hearing. Any customer against whom (1) a penalty has been levied pursuant to this section, or (2) a notice on flow restrictor installation has been served, shall have a right to a hearing by the Utility upon the written request of that customer to the Utility. Said request must be received within ten days of notification of the violation. If the issue is not resolved to the customer's satisfaction then the customer shall have the right to appeal to the Citizen's Appeals Board, as provided in Section 12.06.140.

C. Reservation of Rights. The rights of the Utility hereunder shall be in addition to any other rights of the Utility, including those to discontinue service.

D. Use of Penalty Funds. All monies collected by the Utility pursuant to any of the penalty provisions of this chapter shall be deposited in the Water Supply Shortage Conservation Plan Fund.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.130. Notice of violation.**

Except as otherwise provided in this section, any written notice required by the Water Supply Shortage Conservation Plan to be given to a customer for failure to comply with the provisions hereof shall set forth the fact of the customer's failure to comply with the applicable provision or provisions of the plan, and any proposed action taken by the Utility for such failure to comply. The notice shall inform the customer of his/her right to a hearing and the procedure to be followed to obtain such hearing. The Utility shall give notice of each violation to the customer committing such violation as follows:

A. For a first or second violation of the provisions of Sections 12.06.090, 12.06.100, and 12.06.110 the Utility shall give written notice of the fact of such violation to the customer, either personally or by regular mail, to the customer's billing address.

B. If the penalty assessed is or includes the installation of a flow restrictor or the discontinuance of water service to the customer, for any period of time whatsoever, notice of the violation shall be given in the following manner:

1. By delivering a written notice to the customer personally; or

2. If the customer is absent from or unavailable at the premises at which the violation occurred, by leaving a copy with a responsible person at the premises and sending a copy through the regular mail to the address at which the customer is normally billed; or

3. If a responsible person cannot be found, then by affixing a copy in a conspicuous place at the premises at which the violation occurred, and also sending a copy through the mail to the address at which the customer is normally billed.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.140. Relief from compliance.**

A. Administrative Relief. A customer may file an application for relief from any provisions of this chapter. The Utility shall appoint a Hearing Officer for all such cases, and shall develop such procedures as it considers necessary to resolve such applications at the department level. Upon the filing by a customer of an application for relief, the Hearing Officer shall take such steps as he/she deems reasonable to resolve the application. The application may include requests for relief from penalties and prohibited uses, and requests for relief from an increase in water bill associated with the water supply shortage rate provisions of Sections 12.06.090, 12.06.100, and 12.06.110.

A written decision of the Hearing Officer, including notice to the customer of his right to appeal to the Citizens Appeals Board, shall be given to the customer personally or by mail within fifteen days. A customer shall exhaust all administrative remedies provided by this section prior to filing an appeal with the Citizens Appeals Board.

B. Citizens Appeals Board(s) Established. The City Council shall establish one or more Citizens Appeals Boards, consisting of at least three but not more than five members, to hear appeals concerning applications for relief of violations that a customer or water user cannot resolve with the Hearing Officer. The City Council shall adopt such rules and regulations as it, in its sound discretion, deem reasonable and necessary to the formation, procedure and operation of the Citizens Appeals Board.

In all cases where a customer has filed an application for relief from the provisions of this chapter or has appealed a violation, and has failed to resolve said application or violation appeal with the Hearing Officer, the customer shall have the right to appeal the decision of the Hearing Officer to the Citizens Appeals Board by filing a written request for appeal within ten days after receipt of the decision of the Hearing Officer. This shall automatically stay the implementation of the proposed course of action by the Utility pending the decision of the Citizens Appeals Board. The Citizens Appeals Board shall hear the appeal, within fifteen days after receipt of such a request, and shall issue a written decision within fifteen days, which decision shall be final.

C. Determining relief from an increase in water bill associated with the Water Supply Shortage Rate Provisions. In determining whether relief shall be granted, the Utility and the Citizens Appeals Board shall take into consideration all relevant factors, including but not limited to, whether the customer's total water bill was significantly greater than the bill normally received, coupled with a compelling reason for the account not conserving an amount of water such that, had it been conserved, the total bill would not have been significantly greater than the normal pre-water shortage bill.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

#### **12.06.150. General provisions.**

A. Reports: The Utility may, by written request, require all commercial and industrial customers of the Utility using twenty thousand or more billing units per year to submit a water conservation plan to the Director of Engineering and to submit quarterly to said Director a report on the progress of their conservation plans.

B. City Conservation Reports: All City departments shall submit to the City Manager monthly reports on their water conservation efforts. Their reports shall be consolidated by the City Manager and reported from time to time to the City Council.

C. Additional Water Conservation Measures: The City Council may order implementation of water conservation measures in addition to those set forth in Sections 12.06.090, 12.06.100, and 12.06.110. Such additional water conservation measures shall be implemented in the manner provided in Section 12.06.060.

D. Enforcement. The Utility shall enforce the provisions of this chapter.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

**12.06.160. Public nuisance.**

In addition to the penalties provided in this chapter, any condition caused or permitted to exist in violation of any of the provisions of this chapter shall be deemed a public nuisance and may be, by the City, summarily abated as such, and each day such condition continues shall be regarded as a new and separate offense.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

**12.06.170. Severability.**

If any part of this chapter, or the application thereof to any person or circumstances, is for any reason held invalid by a court of competent jurisdiction, the validity of the remainder of the chapter or the application of such provision to other persons or circumstances shall not be affected.

(Ord. 3118 (part), 2008; Ord. 2752 (part), 1991).

# APPENDIX E

Notification of Public and Service Area Suppliers





## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Mike Markus  
General Manager  
Orange County Water District  
PO Box 8300  
Fountain Valley, CA 92728

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Markus,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Fullerton's 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for May 17, 2016. Please contact us if you would a copy of the draft.

If you would like more information or have any questions, please contact Gar Huang at (714) 738-6895 or via email at [GarH@ci.fullerton.ca.us](mailto:GarH@ci.fullerton.ca.us).

Sincerely,

A handwritten signature in blue ink, appearing to read "David Schickling".

David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

**THE EDUCATION COMMUNITY**

303 West Commonwealth Avenue, Fullerton, California 92832-1775  
(714) 738-6845 • Fax (714) 738-3115 • Web Site: [www.ci.fullerton.ca.us](http://www.ci.fullerton.ca.us)





## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Deven Upadhyay  
Manager, Water Resource Management Group  
Metropolitan Water District  
PO Box 54153  
Los Angeles, CA 90054-0153

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Upadhyay,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Fullerton's 2015 UWMP will be available for review prior to the public hearing, which is tentatively scheduled for May 17, 2016. Please contact us if you would a copy of the draft.

If you would like more information or have any questions, please contact Gar Huang at (714) 738-6895 or via email at [GarH@ci.fullerton.ca.us](mailto:GarH@ci.fullerton.ca.us).

Sincerely,

A handwritten signature in blue ink, appearing to read "David Schickling".

David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

**Public Works Department - Engineering Division**

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February 16, 2016

Rob Hunt  
General Manager  
Metropolitan Water District of Orange County  
PO Box 20895  
Fountain Valley, CA 92728

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Hunt,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

Public Works Department - Engineering Division

February 16, 2016

Michael Moore  
Assistant General Manager  
City of Anaheim  
201 S. Anaheim Boulevard, Suite 601  
Anaheim, Ca 92805

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Moore,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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If you would like more information or have any questions, please contact Gar Huang at (714) 738-6895 or via email at [GarH@ci.fullerton.ca.us](mailto:GarH@ci.fullerton.ca.us).

Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

THE EDUCATION COMMUNITY





## CITY OF FULLERTON

**Public Works Department - Engineering Division**

---

February 16, 2016

Jim Biery  
Director of Public Works  
City of Buena Park  
6650 Beach Blvd  
Buena Park, CA 90622

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Biery,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Bill Gallardo  
City Manager  
City of Brea  
1 Civic Center Cr  
Brea, CA 92821

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Gallardo,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Elias Saykali  
Director of Public Works  
City of La Habra  
201 E La Habra Blvd  
La Habra, CA 90633

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Saykali,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Luis Estevez  
Public Works Manager  
City of Placentia  
401 E Chapman Ave  
Placentia, CA 92870

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Estevez,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

**Public Works Department - Engineering Division**

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February 16, 2016

Jeff Boynton  
City Manager  
City of La Mirada  
13700 La Mirada Blvd  
La Mirada CA 90638

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Boynton,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## CITY OF FULLERTON

Public Works Department - Engineering Division

February 16, 2016

Ken Vecchiarelli  
District Manager  
Golden State Water District  
1920 W Corporate Way  
Anaheim, CA 92801

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Vecchiarelli,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

THE EDUCATION COMMUNITY





## CITY OF FULLERTON

**Public Works Department - Engineering Division**

February 16, 2016

Craig Gott  
Vice President of Operations  
Suburban Water District  
15088 Rosecrans Ave  
La Mirada, CA 90638

Re: Fullerton's 2015 Urban Water Management Plan Preparation

Mr. Gott,

This letter serves as a notification that the City of Fullerton Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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Sincerely,

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David Schickling  
Water System Manager/Deputy Director of Public Works  
City of Fullerton

cc: Don Hoppe, Director of Public Works  
File

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## 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 **Fullerton News Tribune**, a newspaper that has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, on February 29, 1952, Case No. A-21215 in and for the City of Fullerton, County of Orange, State of California; 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 5, 12, 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: May 12, 2016**

*L. P.*

Signature

**Fullerton News Tribune**  
625 N. Grand Ave.  
Santa Ana, CA 92701  
(714) 796-2209

## PROOF OF PUBLICATION

## NOTICE OF PUBLIC HEARING

**NOTICE IS HEREBY GIVEN** that the Fullerton City Council will hold a public hearing in the Council Chambers of the Fullerton City Hall, 303 West Commonwealth Avenue, on Tuesday, May 17, 2016, at the hour of 6:30 o'clock p.m. to **receive input on the 2015 Urban Water Management Plan Draft**. A copy of the Draft can be viewed at the Public Works Engineering Counter on the second floor at City Hall.

ALL INTERESTED PERSONS are invited to attend said hearing and express opinions or submit evidence for or against the proposal outlined above.

Pursuant to California Government Code Section 65009, if you challenge the decision of the City Council in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Fullerton at, or prior to, the public hearing.

Further information may be obtained from the Public Works Engineering Department, Gar Huang (714) 738-6895.

FULLERTON CITY COUNCIL

FULLERTON CITY COUNCIL  
By: Lucida Williams  
City Clerk

Publish: Fullerton News Tribune May 5, 12, 2016 10157969

# APPENDIX E-1

Public Hearing Notice for Amended UWMP



## 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 **Fullerton News Tribune**, a newspaper that has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, on February 29, 1952, Case No. A-21215 in and for the City of Fullerton, County of Orange, State of California; 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:

**October 12, 2017**

"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: October 12, 2017**

Paul

Signature

**Fullerton News Tribune**  
625 N. Grand Ave.  
Santa Ana, CA 92701  
(714) 796-2209

## PROOF OF PUBLICATION

## NOTICE OF PUBLIC HEARING

**NOTICE IS HEREBY GIVEN** that the Fullerton City Council will hold a public hearing in the Council Chambers of the Fullerton City Hall, 303 West Commonwealth Avenue, on Tuesday, November 7, 2017, at the hour of 6:30 p.m. to receive input on the Amendment to the 2015 Urban Water Management Plan.

**ALL INTERESTED PERSONS** are invited to attend said hearing and express opinions or submit evidence for or against the proposal outlined above.

Pursuant to California Government Code Section 65009, if you challenge the decision of the City Council in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Fullerton at, or prior to, the public hearing.

Further information may be obtained from the Public Works Engineering Department, Gar Huang (714) 738-6895.

**FULLERTON CITY COUNCIL**

By: Lucinda Williams  
City Clerk

Publish: Fullerton News Tribune October 12, 2017 11020112

# APPENDIX F

Adopted UWMP Resolution





# CITY COUNCIL AGENDA

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806


MEETING DATE: MAY 17, 2016

TO: CITY COUNCIL/CITY MANAGER

FROM: PUBLIC WORKS DEPARTMENT

SUBJECT: ADOPTION OF THE CITY OF FULLERTON 2015 URBAN WATER  
MANAGEMENT PLAN

Approved for Agenda:

  
City Manager's Office

---

## SUMMARY

Hold a public hearing regarding the adoption of the revised Urban Water Management Plan. The Plan is a general information document intended to complement the Metropolitan Water District's plan by analyzing water supply and conservation issues unique to Fullerton's service area.

## RECOMMENDATION

Adopt the City of Fullerton 2015 Urban Water Management Plan.

## FISCAL IMPACT

There are no associated costs with this item.

## DISCUSSION

The Urban Water Management Planning Act (UWMPA), which became effective January 1, 1984, requires that most urban water suppliers providing water for municipal purposes prepare and adopt an updated Urban Water Management Plan, with the latest one due by July 1, 2016. The rationale behind the legislature's action was:

- The water of the State is a limited and renewable resource subject to ever-increasing demands;
- The conservation and efficient use of urban water supplies are of statewide concern.

It was understood that the planning for this use and the implementation of these types of plans is best accomplished at the local level. The legislature further declared the following three statements as State policy:

- A. The conservation and efficient use of water shall be actively pursued to protect both the people of the State and their water resources.
- B. The conservation and efficient use of urban water suppliers shall be a guiding criterion in public decisions.
- C. Urban water suppliers shall develop water management plans to achieve conservation and efficient use.

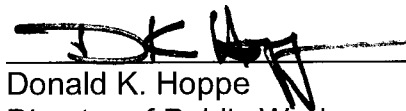
The Plan is required to be updated every five years in order to adapt to changing needs and demand, and ordinarily it should be adopted by December 31<sup>st</sup> of the fifth year. However, due to the recent drought efforts, the 2015 deadline was extended to July 1, 2016.

In compliance with the Act, the City of Fullerton Water Utility prepared an initial Urban Water Management Plan in November 1985 with updates in January 1990, December 1995, 2000, 2005 and July 2011. It includes a description of those water conservation and water management activities that the City currently conducts or may conduct within the next twenty years.

## FULLERTON PLAN

The intent of the City's Urban Water Management Plan is to assist in planning for future water supplies while encouraging the efficient use of water today. The Plan includes coordination and facilitation of a number of key tasks with the Municipal Water District of Orange County (MWDOC), Metropolitan Water District (MWD), OCWD, the Orange County Sanitation District (OCSD), and the Department of Water Resources

The Plan was presented to the Energy and Resource Management Committee (ERMC) on May 13, 2016 and their comments have been incorporated in preparation of the Plan before the Council.



---

Donald K. Hoppe  
Director of Public Works

DKH/GH/ls

## Attachments

- Attachment 1 – PowerPoint Presentation
- Attachment 2 – Urban Water Management Plan (Draft)



**CITY OF FULLERTON  
CITY COUNCIL / SUCCESSOR AGENCY /  
PUBLIC FINANCING AUTHORITY  
REGULAR MEETING MINUTES  
MAY 17, 2016 - 6:30 P.M.  
Council Chamber  
303 West Commonwealth Avenue  
Fullerton, California**

6:30 p.m.

**CALL TO ORDER**

Mayor / Chair Fitzgerald called the meeting to order at 6:30 p.m.

All Present

**ROLL CALL**

Present: Mayor / Chair Fitzgerald, Mayor Pro Tem /  
Vice Chair Flory, Council Members  
Sebourn, Whitaker, Chaffee

Absent: None

Staff Present: City Manager Joe Felz, City Attorney  
Richard D. Jones, City Clerk Lucinda  
Williams

**INVOCATION** given by Mayor Fitzgerald.

**PLEDGE OF ALLEGIANCE** led by Ed Paul.

**CLOSED SESSION REPORT**

None.

**EX PARTE COMMUNICATIONS REPORT PURSUANT TO  
FMC 2.33.040 - TRANSPARENCY AND ACCOUNTABILITY  
IN LABOR NEGOTIATIONS**

None.

Presented

**PRESENTATIONS**

1. **PRESENTATION: Memorial Day Program**
2. **PRESENTATION: Nicolas Junior High School Social  
Enterprise Business Projects**



## **PUBLIC COMMENTS**

Joe Imbriano spoke about the Vector Control Board and read a statement from Barry Levinson addressing the Polly's Pies site.

## **CITY COUNCIL / SUCCESSOR AGENCY / STAFF COMMUNICATIONS**

Council Member Chaffee said he served as the City's voting delegate at the Southern California Association of Governments annual meeting and at the City Selection Committee meeting, announced his appointment to the Rivers and Mountains Conservancy Board and reported on Airport Days, the Muckenthaler Car Show, an upcoming Community of Friends fundraiser and Rotary Club Hoedown.

Council Member Sebourn reported that the Arco Station on Harbor Boulevard will have a homecoming celebration for members of the military and wished a happy birthday to his daughter.

Council Member Whitaker reported on the Airport Day and Muckenthaler Auto Show events.

Mayor Fitzgerald congratulated Pacific Drive teachers and parents for their dedication, noted awards she handed out to Pacific Drive students and reported that she attended a meeting of the main Rotary young professional's organization.

## **APPOINTMENTS**

None.

## **PUBLIC HEARINGS (Items 1 – 2)**

Approved

### **1. CITY OF FULLERTON 2015 URBAN WATER MANAGEMENT PLAN**

Mayor Fitzgerald opened the public hearing at 9:00 p.m.

- Joe Imbriano spoke about weather modification, a geo-engineered drought and contingency plans during a disaster.
- Matt Leslie asked about the role of desalination in the plan.

Mayor Fitzgerald closed the public hearing at 9:06 p.m.

Flory moved, seconded by Sebourn, to adopt the City of Fullerton 2015 Urban Water Management Plan as amended to show the Orange County Sanitation District

as a partner in the Groundwater Replenishment System.  
Motion carried 5 – 0.

Continued to June 7, 2016 2.  
at 6:30 p.m. in the City  
Council Chambers

**DISTRICT ELECTIONS MAPPING PROCESS -  
VOTING DISTRICTS FORMATION** *(Item taken out of  
agenda order)*

Mayor Fitzgerald opened the public hearing at 7:14 p.m.

- Taylor Cox, Fullerton, spoke in support of Public Submission Map 8 as it allows each district to represent Harbor Boulevard.
- Jane Rands spoke in support of Public Submission Map 10 as it met the same goals as Public Submission Map 2B.
- Matt Leslie spoke in support of Public Submission Map 10 for the same reasons listed by Jane Rands and opposed Public Submission Map 2B because it puts residents near Euclid Avenue in the same district as the colleges.
- Jeremy Popoff, Fullerton, expressed concerns with Public Submission Map 2B because it put the downtown area in one district, had concerns with Public Submission Map 2C because two incumbents would live in the same district and supported Public Submission Map 8 because each district contained a part of the downtown area.
- Larry Houser, Fullerton business owner, expressed support for Public Submission Map 8.
- Debra Pember, Fullerton, expressed support for Public Submission Map 8 so each district contains a portion of the downtown area.
- Evangelina Rosales, Fullerton, spoke in support of Map 2B because it is similar to the school district map.
- Larry Bennett, Fullerton, spoke in opposition to districts in general but supported Public Submission Map 8 as it represents historical boundaries such as Harbor Boulevard and gives each district a part of downtown.
- Glenda Flock, Fullerton, spoke in support of Map 2B and opposed increasing the size of the City Council.
- Robert Marshall and Brian Gonzalez, Fullerton business owners, spoke in support of Public Submission Map 8 because each district contains a part of the downtown area.

- Joey Gomez, Fullerton, spoke in support of Public Submission Map 8.
- Alan Popoff, Fullerton, spoke in support of Public Submission Map 8 because each district contains a part of the downtown area.
- Don Chung spoke in support of Public Submission Map 2B because it uses main roads to divide districts and is similar to the school district map.
- Arenel Dino, Fullerton, opposed increasing the size of the City Council and spoke in support of Public Submission Map 2B because it was developed with the input of community members.
- Yung Shin, Fullerton, spoke in support of Public Submission Map 2B because it was the outcome of the public participation process and similar to the school district map.
- Mario Villamil spoke in support of Public Submission Map 2B because it represents all the communities in the City.
- Blandy Morales, Fullerton, spoke in support of Public Submission Map 2B because it is a fair map.
- Patty Burton, Fullerton, spoke in support of Public Submission Map 8 and said she didn't think focus on legality of the map should overshadow the fair representation of the downtown area.
- Alma Chavez, Fullerton, spoke in support of Public Submission Map 2B to represent the rights of those in her community.
- Kitty Jaramillo, Fullerton, spoke in support of Public Submission Map 2B as it serves the City in the best possible way.
- Jonathan Paik, Fullerton, spoke in support of Public Submission Map 2B because it follows the school district map and meets legal criteria.
- Gretchen Cox spoke in support of Public Submission Map 8 because it meets the criteria for Latino and Asian majority districts, creates an education district and allows every district to touch Harbor Boulevard.
- Abel Rivera, Fullerton, spoke in support of Public Submission Map 2B because it looks like the school district map.
- Ande Stone, Fullerton, spoke in support of Public Submission Map 8 because it includes the downtown

area in every district.

- Eric Walters, Fullerton, spoke in support of Public Submission Map 8 as it best represents what he would like for his district.
- David Curlee did not support district elections, asked City Council to select a map that uses the largest streets possible to divide districts, supported an at-large Mayor and asked City Council to choose a map that would not result in future litigation.
- Joe Florentine challenged Public Submission Map 2B and its representation of the downtown area and spoke in support of Public Submission Map 8 because it represents the downtown area in more than one district.
- Elgeth Nuncci, Fullerton, spoke in support of Public Submission Map 2B because it mirrors the school district map.
- George Mankewitz urged City Council to follow the law in selecting a map and spoke in support of Public Submission Map 2B.
- Sam Han, Fullerton, spoke in support of Public Submission Map 8 which divides the downtown area between all districts.
- Charles Kim, Fullerton, spoke in support of Public Submission Map 8 because it connects the downtown area to every district.
- Tony Package, Fullerton, questioned the importance of a downtown district to those that do not live in the downtown area.
- Munish Bharadwaja, Fullerton, did not support district elections and spoke in support of Public Submission Map 8 as it seems to be the most fair.
- Jeanette Vasquez, Fullerton, spoke in support of Public Submission Map 2B because it keeps neighborhoods together.
- Joe Imbriano spoke in support of Public Submission Map 2B because it closely resembles the school district map.

Mayor Fitzgerald closed the public hearing at 8:21 p.m.

Flory moved, seconded by Fitzgerald, to continue this Public Hearing to June 7, 2016 at 6:30 p.m. in the City Council Chambers to consider Public Submission Maps 2B, 8, 10 and 11 and allow revisions to only those four

maps until May 24, 2016.

Chaffee made a substitute motion, seconded by Whitaker, to continue the Public Hearing to June 21, 2016 at 6:30 p.m. in the City Council Chambers to consider all submitted maps.

Substitute motion failed 2 – 3 (Ayes: Chaffee, Whitaker).

Original motion carried 4 – 1 (No: Chaffee).

### **REGULAR BUSINESS (Items 3 – 4)**

Approved

#### **3. CHAPMAN AVENUE AND COMMONWEALTH AVENUE SAFETY ENHANCEMENTS**

- Jo Ann Woodard, Fullerton, suggested re-signing instead of restriping the street, asked for permit only parking on Commonwealth Avenue, asked to reduce the speed limit to 30 miles per hour and asked for lights on the cross walk.
- Karen (no last name given), Fullerton, asked to have residential parking by permit only on Commonwealth Avenue.
- Elizabeth Hansburg, Transportation and Circulation Commission, said many residents supported one lane in each direction as well as a turn-lane at the Commission meeting and noted that this plan allows for a full bicycle lane.
- Tom Graham, Fullerton, supports the restriping of Commonwealth Avenue and a 30 mile per hour speed limit.
- Ramsey Pajarez spoke in support of restriping to one lane in each direction and in support of parking permits.
- Sean Paden, Transportation and Circulation Commission, spoke in support of this item.

Sebourn moved, seconded by Fitzgerald, to authorize implementation of various safety enhancements including but not limited to reconfiguration of pavement striping between State College Boulevard and Chapman Avenue and make safety enhancements to traffic signal at Chapman Avenue and Commonwealth Avenue.

Motion carried 5 – 0.

Approved

#### **4. ANIMAL CARE PARTICIPATION AGREEMENT AND SERVICES AGREEMENT BETWEEN THE CITY OF FULLERTON AND THE COUNTY OF ORANGE – NEW**

## REGIONAL ANIMAL SHELTER

- Sean Paden, Fullerton, asked why OC Animal Control proposes to move to a new location, why they proposed to charge cities for the new location, asked about alternate animal control services and opposed evergreen contracts.
- Mike Richey, Fullerton, supported having the Public Works Department pick up dead animals, suggested the City consider alternate animal control services and asked why the County double charges for stray animal pick up.
- David Curlee expressed concerns with the proposed shelter, asked about the annual operating costs of the shelter and suggested working with a nonprofit organization to care for stray animals.

Fitzgerald moved, seconded by Chaffee, to approve the Animal Control Services Agreement with the County of Orange and approve Participation Agreement for the construction of new regional animal shelter at the former Tustin Air Base.

Motion carried 4 – 1 (No: Whitaker).

## CONSENT CALENDAR (Items 5 - 13)

Flory moved, seconded by Fitzgerald, to approve Consent Calendar Items 5, 8, 10, 11, 12 and 13.

Motion carried 5 – 0.

Approved

### 5. MAY 3, 2016 MEETING MINUTES

Recommendation by the City Clerk's Office:

Approve May 3, 2016 City Council / Successor Agency / Public Financing Authority Meeting Minutes.

Received and filed

### 8. MONTHLY LEGISLATIVE UPDATE

Recommendation by the City Clerk's Office:

Receive and file.

Approved

### 10. ORANGE COUNTY TRANSPORTATION AUTHORITY (OCTA) MEASURE M2 ENVIRONMENTAL CLEAN UP TIER 1 GRANT PROGRAM FISCAL YEAR 2015-16

Recommendation by the Public Works Department:

1. Authorize staff to execute letter of agreement with OCTA under the Measure M2 master funding agreement accepting grant funds.

2. Authorize staff to execute contract with Bio Clean Environmental Services, Inc. and G2 Construction.

Approved

**11. MEASURE M2 FUNDING ELIGIBILITY**

Recommendation by the Public Works Department:

Approve the seven-year Capital Improvement Program plan to comply with Measure M2 funding eligibility renewal requirements.

Resolution No. 2016-26  
adopted

**12. RESOLUTION OF INTENTION - BEEKEEPING IN RESIDENTIAL ZONES**

Recommendation by the Community Development Department:

Adopt Resolution No. 2016-26.

RESOLUTION NO. 2016-26 – A RESOLUTION OF INTENTION OF THE CITY COUNCIL OF THE CITY OF FULLERTON, CALIFORNIA, TO CONSIDER AMENDMENTS TO TITLE 15 OF THE FULLERTON MUNICIPAL CODE TO DEFINE TERMS AND SET FORTH REGULATIONS FOR BEEKEEPING AS AN ALLOWABLE AGRICULTURE USE IN RESIDENTIAL ZONES

Approved

**13. RESIDENTIAL STREET RECONSTRUCTION 2015-16: PATTERSON, LAWRENCE TRUSLOW AND WALNUT**

Recommendation by the Public Works Department:

1. Approve plans and specifications for Residential Street Reconstruction 2015-16 Project.
2. Approve budget transfer of \$375,452 Successor Agency Fund Balance, \$324,548 Successor Agency from Project 46015 Street Light Replacements and \$134,000 Sewer Enterprise from Project 51417 Annual Sewer Replacement Program 2015-16 to Project 44030 Residential Street Reconstruction 2015-16.
3. Award \$678,684 construction contract to Vido Samartzich Inc. for Project 44030 Residential Street Reconstruction 2015-16.

**ITEMS REMOVED FROM THE CONSENT CALENDAR**

Received and filed

**6. APRIL 2016 CHECK REGISTERS**

David Curlee discussed the wire transfer information

included in the check registers.

Flory moved, seconded by Chaffee, to receive and file.

Motion carried 5 – 0.

Ordinance 3229 adopted

**7. PROPOSED ZONING TOOL FOR INFILL SITES – SECOND READING OF ORDINANCE**

Flory moved, seconded by Fitzgerald, to adopt Ordinance No. 3229.

ORDINANCE NO. 3229 – AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FULLERTON, CALIFORNIA, ADDING OR AMENDING SPECIFIED SECTIONS OF THE FULLERTON MUNICIPAL CODE RELATED TO THE CREATION OF THE ZONING CLASSIFICATION OF PLANNED RESIDENTIAL DEVELOPMENT – INFILL (PRD-I), SPECIFICALLY AMENDING CHAPTERS 15.04, 15.08 AND 15.20 AND ADDING CHAPTERS 15.10 AND 15.12

Motion carried 4 – 1 (No: Whitaker).

Approved

**9. ACCEPTANCE OF GRANT FUNDS**

David Curlee asked about the type of equipment purchased with this grant.

Fitzgerald moved, seconded by Flory, to accept \$9800 Wilson W. Phelps grant on behalf of the Police Department and increase 2015-2016 appropriations in the same amount.

Motion carried 5 – 0.

**AGENDA FORECAST *(tentative)***

**Tuesday, June 7, 2016**

- PRESENTATION: Memorial Day Program
- St. Jude Medical Center Healthy Communities Initiative Grant Agreement
- 2014-15 Employee Compensation Report
- District Elections Update
- West Coyote Hills Update
- SCE Easement – Amerige Heights (Standard Pacific Homes)
- Development Agreement Between LSF II Fullerton, LLC and Fullerton Hughes, LLC and City of Fullerton
- Budget Public Hearing



- Downtown Core and Corridor Specific Plan Replacement
- Fee Resolution

## **Tuesday, June 21, 2016**

- Contract Change Order for Construction Management Services for State College and Raymond Grade Separation Projects
- Hillcrest Park Renovation, Area 2 – Stair Project
- Legislative Update
- Resolution Terminating the Tri City Park Authority Joint Powers Agreement
- Short-term Vacation Rental Ordinance
- Call November 2016 Election (Including district election and marijuana dispensary measures)
- Landmarks Property Owner Approval Ordinance
- Insurance Program Report and Recommendations
- Executive Compensation Resolution
- Budget, CIP, Gann Limit, Fee Study Adoption


10:36 p.m.

## **ADJOURNMENT**

Mayor / Chair Fitzgerald recessed the Closed Session meeting at 10:36 p.m.

The next City Council / Successor Agency closed session meeting is June 7, 2016 at 5:00 p.m. in the Council Chamber, 303 West Commonwealth Avenue, Fullerton, California.

The next regular City Council / Successor Agency / Public Financing Authority meeting is June 7, 2016 at 6:30 p.m. in the Council Chamber, 303 West Commonwealth Avenue, Fullerton, California.

  
\_\_\_\_\_  
Lucinda Williams, City Clerk

  
\_\_\_\_\_  
Jennifer Fitzgerald, Mayor

# APPENDIX F-1

Resolution of the Amended UWMP Adoption



RESOLUTION NO. 2017-71

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF  
FULLERTON, CALIFORNIA, ADOPTING AMENDMENTS TO  
THE 2015 URBAN WATER MANAGEMENT PLAN

THE CITY COUNCIL OF THE CITY OF FULLERTON HEREBY RESOLVES AS  
FOLLOWS:

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act or the "Act") during the 1983-1984 Regular Session, and as amended subsequently, 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, the primary objective of which is to plan for the conservation and efficient use of water; and,

WHEREAS, the City of Fullerton is an urban supplier of water providing over 22,000 acre feet of water to over 140,000 residents, and it is therefore subject to the requirements of the Act; and,

WHEREAS, the Act requires that an Urban Water Management Plan be periodically reviewed at least once every five years, and it also requires urban water suppliers to make any amendments or changes to their plan which are required as a result of their review; and,

WHEREAS, on May 17, 2016, the City Council adopted the City of Fullerton's 2015 Urban Water Management Plan ("2015 Urban Water Management Plan") which was submitted to the California Department of Water Resources (DWR) for review; and,

WHEREAS, after the DWR completed its review, it requested amendments to the 2015 Urban Water Management Plan through an advisory letter; and,


WHEREAS, in response to the advisory letter, staff prepared revisions to Sections 5.2.3, 5.5.3, 6.1.1, 6.2, and the addition of Section 8.4 of the 2015 Urban Water Management Plan; these amendments are attached as Attachment 1 ("Amendments"); and,

WHEREAS, in compliance with the requirements of the Act, the City of Fullerton circulated for public review the draft Amendments, and the City of Fullerton held a properly noticed public hearing on November 7, 2017 ("Public Hearing") to consider them.

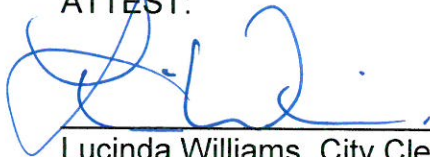
NOW THEREFORE BE IT RESOLVED THAT the CITY OF FULLERTON does hereby adopt the Amendments and thereby amends Sections 5.2.3, 5.5.3, 6.1.1, 6.2, and 8.4 of

the 2015 Urban Water Management Plan as set forth in Attachment 1 of this Resolution, including any modifications to these sections made after the Public Hearing by the Water System Manager or designee limited to such changes to address public input received (if any) at the Public Hearing.

ADOPTED BY THE FULLERTON CITY COUNCIL ON NOVEMBER 7, 2017.

  
\_\_\_\_\_  
Bruce Whitaker, Mayor

ATTEST:

  
\_\_\_\_\_  
Lucinda Williams, City Clerk

Date November 22, 2017

## **Attachment 1**

City of Fullerton

# Amendments to 2015 Urban Water Management Plan

November 2017



## **City of Fullerton**

### **Amendments to 2015 Urban Water Management Plan (UWMP)**

#### **Contents**

**Revisions to Section 5.2.3 Table 5-1** – Provides an outline of specific water supply conditions applicable to each stage of water supply reduction as well as assigning percent reduction in water supply to each stage up to a 50 percent reduction to address CWC 10632.

**Revisions to Section 5.5.3 Table 5-4** – Consumption reduction methods included to address CWC 10632 (a) (5) and provide context for the stages for water supply reduction.

**Revisions to Section 6.1.1** – Explicitly states that the City does not receive any water from the OCWD Green Acres Project.

**Revisions to Section 6.2 Table 6-1** – Specifies the volume of wastewater collected in the service area to address CWC 10633.

**Addition of Section 8.4** – Provides an outline of the steps the City is taking to adopt the Amended UWMP including publicizing a public hearing, holding a public hearing, adopting the UWMP, and submitting the UWMP to the appropriate agencies.

#### **Appendices**

**Revisions to Appendix B Table** – DWR Standardized Tables 6-2, 8-1, and 8-3 updated.

**Addition of Appendix E-1** – Notice of Public Hearing Notice for Amended UWMP.

**Addition of Appendix F-1** – Resolution of the Amended UWMP adoption.



### **5.2.3 City of Fullerton**

The City's Water Supply Shortage Conservation Plan (WSSCP) was established to provide procedures, rules and regulations for mandatory conservation to minimize the effect of a water supply shortage emergency on the City's water customers. The City Council will vote to implement the WSSCP if it finds and determines one or more of the following: a shortage could exist due to increased demand or limited supplies; storage or distribution facilities of the City become inadequate; a major local or regional supplier experiences a major failure or contamination; or the City's wholesale water providers call for an allocation of water supply combined with a penalty rate and/or extraordinary water conservation measures. When a water shortage appears imminent, the City Manager shall notify the City Council and recommend holding a public hearing to determine whether a shortage exists and determine the appropriate phase of the water supply shortage.

There are four shortage phases and supply conditions. The water supply conditions for the phases to be implemented include:

- Increased demand or limited supply
- Distribution or storage facilities of the City become inadequate
- A major failure or contamination of the supply
- Shortage
- Failure of storage and/or distribution facilities of Metropolitan, OCWD, and/or the City occurs
- The City's whole sale water providers, Metropolitan and OCWD, call for an allocation of water supply combined with an allocation penalty rate
- Other extraordinary water conservation measures

A summary of the stages of water shortage is displayed in Table 5-1 (Fullerton, Municipal Code Chapter 12.06, 2008).



Table 5-1: Stages of Water Shortage Contingency Plan

Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction <sup>1</sup>	Water Supply Condition
1	Up to 10 %	The City may determine that a Phase I "Mild Water Shortage" exists when there is reasonable probability that the City will not be able to meet all of the water demands of its customers or the City's wholesale water providers call for a water supply reduction as described in the City's Ordinance No. 3118, Phase I Water supply shortage.
2	Up to 20 %	The City may determine that a Phase II "Moderate Water Shortage" exists when there is an increase in demand or a decrease in supplies, a distribution or storage facilities of the City become inadequate, a major failure or contamination of the supply, storage, and/or distribution facilities of Metropolitan, OCWD, or the City occurs, or the City's wholesale water providers call for a water supply reduction of up to 20% in aggregate as described in the City's Ordinance No. 3118, Phase II Water supply shortage.
3	Up to 30 %	The City may determine that a Phase III "Severe Water Shortage" exists when due to a prolonged drought or other water supply conditions, a water supply shortage or threatened shortage exists and a water demand reduction is necessary to make more efficient use of water as an appropriate response to existing water conditions, or when the City's wholesale water providers call for a water supply reduction of up to 30% in aggregate as described in the City's Ordinance No. 3118, Phase III Water supply shortage.
4	31 - 50%	The City may determine that a Phase IV "Water Shortage Emergency" exists when there is a water shortage emergency due to a prolonged drought, a declared "State of emergency" or other water supply conditions and that a significant reduction in water demand is necessary to maintain sufficient water supplies for public health and safety or the City's wholesale water providers call for a water supply reduction of 31% or greater in aggregate as described in the City's Ordinance No. 3118, Phase IV Water shortage emergency.
<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES:		



### 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
All	Expand Public Information Campaign	The City provides public education through MWDOC. Along with a public website, MWDOC oversees school programs, posts water news in the local newspaper, holds quarterly Water Policy Dinners, hosts an annual Water summit, and shows water facilities to the public.
All	Provide Rebates on Plumbing Fixtures and Devices	Program administered by MWDOC offers rebates to CII and residential customers on devices such as laminar flow restrictors, dry vacuum pumps, premium high efficiency toilets.
All	Provide Rebates for Landscape Irrigation Efficiency	Program administered by MWDOC offers rebates to CII and residential customers on devices such as spray nozzles, drip irrigation, smart irrigation timers, soil moisture sensor, in-stem flow regulator.
All	Provide Rebates for Turf Replacement	Program administered by MWDOC offers turf removal rebates to CII and residential customers.
All	Offer Water Use Surveys	Program administered by MWDOC.
1	Decrease Line Flushing	The City's line flushing program may be reduced or even put on hold.
2	Increase Water Waste Patrols	City staff will be on alert for any water waste and notify any violating customers.
3	Moratorium or Net Zero Demand Increase on New Connections	New developments must demonstrate equal or less water usage as the prior customer or fund water savings elsewhere within the city.
4	Implement or Modify Drought Rate Structure or Surcharge	City Council may make adjustments to water rates.
NOTES:		

### **6.1.1 OCWD Green Acres Project**

OCWD owns and operates the GAP, a water recycling effort that provides up to 8,400 AFY of recycled water for irrigation and industrial uses. GAP further treats secondary treated effluent from OCSD to tertiary standards, providing an alternate source of water that is mainly delivered to golf courses, greenbelts, cemeteries, and nurseries in the Cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach, and Santa Ana. Approximately 100 sites use GAP water and some of the current water users include Mile Square Park and Golf Courses in Fountain Valley, Costa Mesa Country Club, Chroma Systems carpet dyeing, Kaiser Permanente, and Caltrans. The City does not receive any GAP water.



## 6.2 Wastewater Description and Disposal

The City does not provide wastewater services within its service area, but relies on OCSD for collection and treatment at their plants located in the Cities of Huntington Beach and Fountain Valley. OCSD's Plant No. 1 in Fountain Valley has a capacity of 358,700 AFY and Plant No. 2 in Huntington Beach has a capacity of 349,700 AFY. Both plants share a common ocean outfall, but Plant No. 1 currently provides all of its secondary treated wastewater to the GWRS for beneficial reuse. The 120-inch diameter ocean outfall extends 4 miles off the coast in Huntington Beach. A 78-inch diameter emergency outfall also exists that extends 1.3 miles off the coast.

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?
City of Fullerton	Estimated	10,898	OCSD	Plant No. 1 & 2	No
Total Wastewater Collected from Service Area in 2015:		10,898			
NOTES: The City typically assumes sewer return is 40 percent of water usage to estimate the volume of wastewater collected.					

## 8.4 UWMP Amendment Process

### 8.4.1 Resubmitting UWMP

As requested by DWR, the City resubmitted their 2015 UWMP to address certain sections of the California Water Code that were not covered by the original plan. After making edits to the UWMP, the City went through the adoption process once more. Table 8-3 presents a summary of the steps taken by the City in adopting the amended UWMP.

Table 8-3: External Coordination and Outreach for Resubmitting UWMP

External Coordination and Outreach	Date	Reference
Public notification	11/7/17	Appendix E-1
Held public hearing	11/7/17	Appendix E-1
Adopted UWMP	11/7/17	Appendix F-1
Submitted UWMP to DWR	12/1/17	-
Submitted UWMP to the California State Library and city or county within the supplier's service area	12/1/17	-
Made UWMP available for public review	12/31/17	-

Again, the opportunity was presented to the public for comments and questions concerning the UWMP. The City published a public hearing notification in the local newspaper for the amended UWMP which can be viewed in Appendix E-1. After the public hearing, the City Council reviewed and approved the Amended UWMP on November 7, 2017. Appendix F-1 includes the resolution approving the Amended UWMP. By December 1, 2017, the City's Amended UWMP will be resubmitted to DWR, California State Library, and County of Orange. The Amended UWMP will be available for public review no later than 30 days after filing with DWR.

## **Revisions to Appendix B**



**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?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?
City of Fullerton	Estimated	10,898	OCSD	Plant No. 1 & 2	No
Total Wastewater Collected from Service Area in 2015:		10,898			
NOTES: The City typically assumes sewer return is 40 percent of water usage to estimate the volume of wastewater collected.					

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

Stage	Complete Both	
	Percent Supply Reduction <sup>1</sup>	Water Supply Condition
1	Up to 10 %	The City may determine that a Phase I "Mild Water Shortage" exists when there is reasonable probability that the City will not be able to meet all of the water demands of its customers or the City's wholesale water providers call for a water supply reduction as described in the City's Ordinance No. 3118, Phase I Water supply shortage.
2	Up to 20 %	The City may determine that a Phase II "Moderate Water Shortage" exists when there is an increase in demand or a decrease in supplies, a distribution or storage facilities of the City become inadequate, a major failure or contamination of the supply, storage, and/or distribution facilities of Metropolitan, OCWD, or the City occurs, or the City's wholesale water providers call for a water supply reduction of up to 20% in aggregate as described in the City's Ordinance No. 3118, Phase II Water supply shortage.
3	Up to 30 %	The City may determine that a Phase III "Severe Water Shortage" exists when due to a prolonged drought or other water supply conditions, a water supply shortage or threatened shortage exists and a water demand reduction is necessary to make more efficient use of water as an appropriate response to existing water conditions, or when the City's wholesale water providers call for a water supply reduction of up to 30% in aggregate as described in the City's Ordinance No. 3118, Phase III Water supply shortage.
4	31 - 50%	The City may determine that a Phase IV "Water Shortage Emergency" exists when there is a water shortage emergency due to a prolonged drought, a declared "State of emergency" or other water supply conditions and that a significant reduction in water demand is necessary to maintain sufficient water supplies for public health and safety or the City's wholesale water providers call for a water supply reduction of 31% or greater in aggregate as described in the City's Ordinance No. 3118, Phase IV Water shortage emergency.

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

NOTES:



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

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
All	Expand Public Information Campaign	The City provides public education through MWDOC. Along with a public website, MWDOC oversees school programs, posts water news in the local newspaper, holds quarterly Water Policy Dinners, hosts an annual Water summit, and shows water facilities to the public.
All	Provide Rebates on Plumbing Fixtures and Devices	Program administered by MWDOC offers rebates to CII and residential customers on devices such as laminar flow restrictors, dry vacuum pumps, premium high efficiency toilets.
All	Provide Rebates for Landscape Irrigation Efficiency	Program administered by MWDOC offers rebates to CII and residential customers on devices such as spray nozzles, drip irrigation, smart irrigation timers, soil moisture sensor, in-stem flow regulator.
All	Provide Rebates for Turf Replacement	Program administered by MWDOC offers turf removal rebates to CII and residential customers.
All	Offer Water Use Surveys	Program administered by MWDOC.
1	Decrease Line Flushing	The City's line flushing program may be reduced or even put on hold.
2	Increase Water Waste Patrols	City staff will be on alert for any water waste and notify any violating customers.
3	Moratorium or Net Zero Demand Increase on New Connections	New developments must demonstrate equal or less water usage as the prior customer or fund water savings elsewhere within the city.
4	Implement or Modify Drought Rate Structure or Surcharge	City Council may make adjustments to water rates.
NOTES:		

City of Fullerton  
RESOLUTION CERTIFICATION

STATE OF CALIFORNIA    )  
COUNTY OF ORANGE    ) SS  
CITY OF FULLERTON    )

RESOLUTION NO. 2017-71

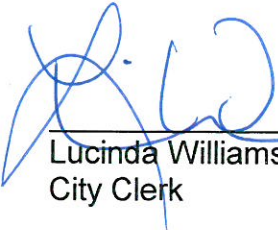
I, Lucinda Williams, City Clerk and ex-officio Clerk of the City Council of the City of Fullerton, California, hereby certify that the whole number of the members of the City Council of the City of Fullerton is five; and that the City Council adopted the above and foregoing Resolution No. 2017-71 at a regular meeting of the City Council held on the November 7, 2017 by the following vote:

COUNCIL MEMBER AYES:                   Whitaker, Chaffee, Fitzgerald, Sebourn, Silva

COUNCIL MEMBER NOES:                 None

COUNCIL MEMBER ABSTAINED:         None

COUNCIL MEMBER ABSENT:             None

  
\_\_\_\_\_  
Lucinda Williams, MMC  
City Clerk

# 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.



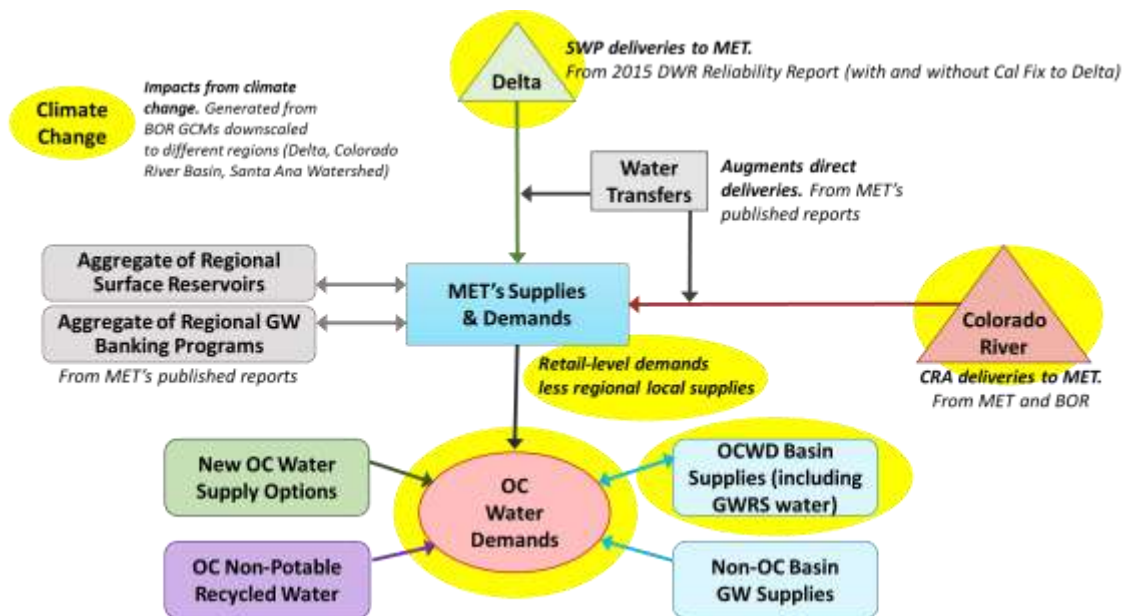


Figure 2. Overall Schematic for OC Model

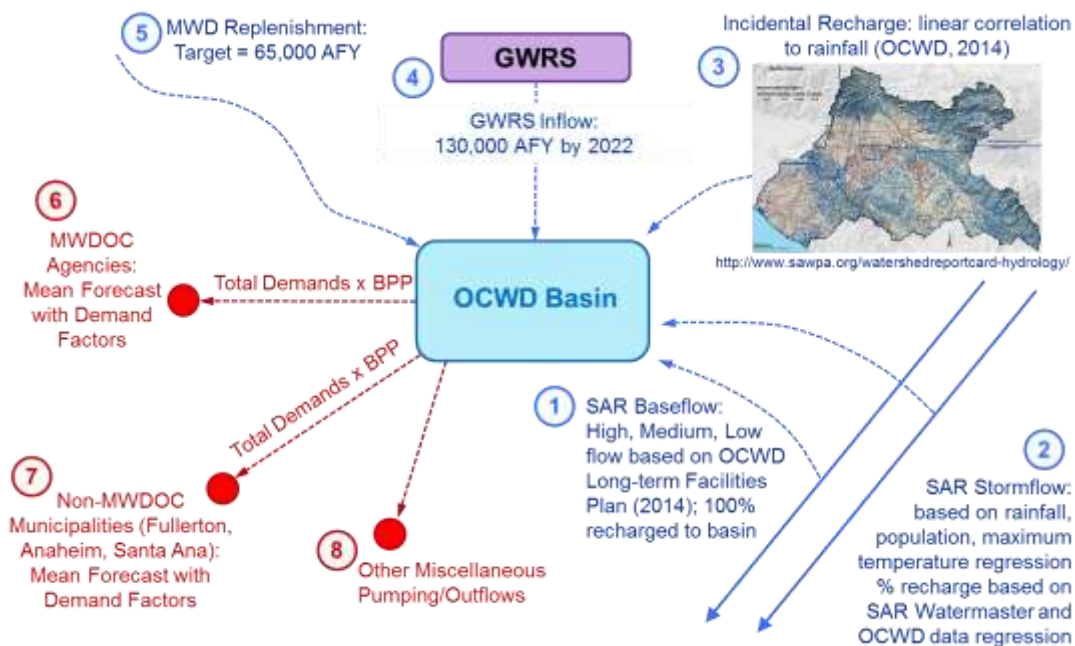


Figure 3. Inflows and Pumping Variables for OC Basin Component of OC Model

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 <sup>1</sup>	Unit Use <sup>2</sup>	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	No data	
GSWC	38,038	383	17,218	215	58,901	122	6,857	68		
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	No data		26,517	5%
ORANGE	28,545	470	15,483	246	96,606	97			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				
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	Included in commercial/ institutional category		22,730	9%
MOULTON NIGUEL WATER DISTRICT	47,673	345	17,077	189	70,067	156			55,149	10%
SAN CLEMENTE	12,047	361	9,045	186	22,921	119			No data	
SAN JUAN CAPISTRANO	7,176	502	6,146	206	16,483	158			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%

<sup>1</sup>Units 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).

<sup>2</sup>Unit 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.



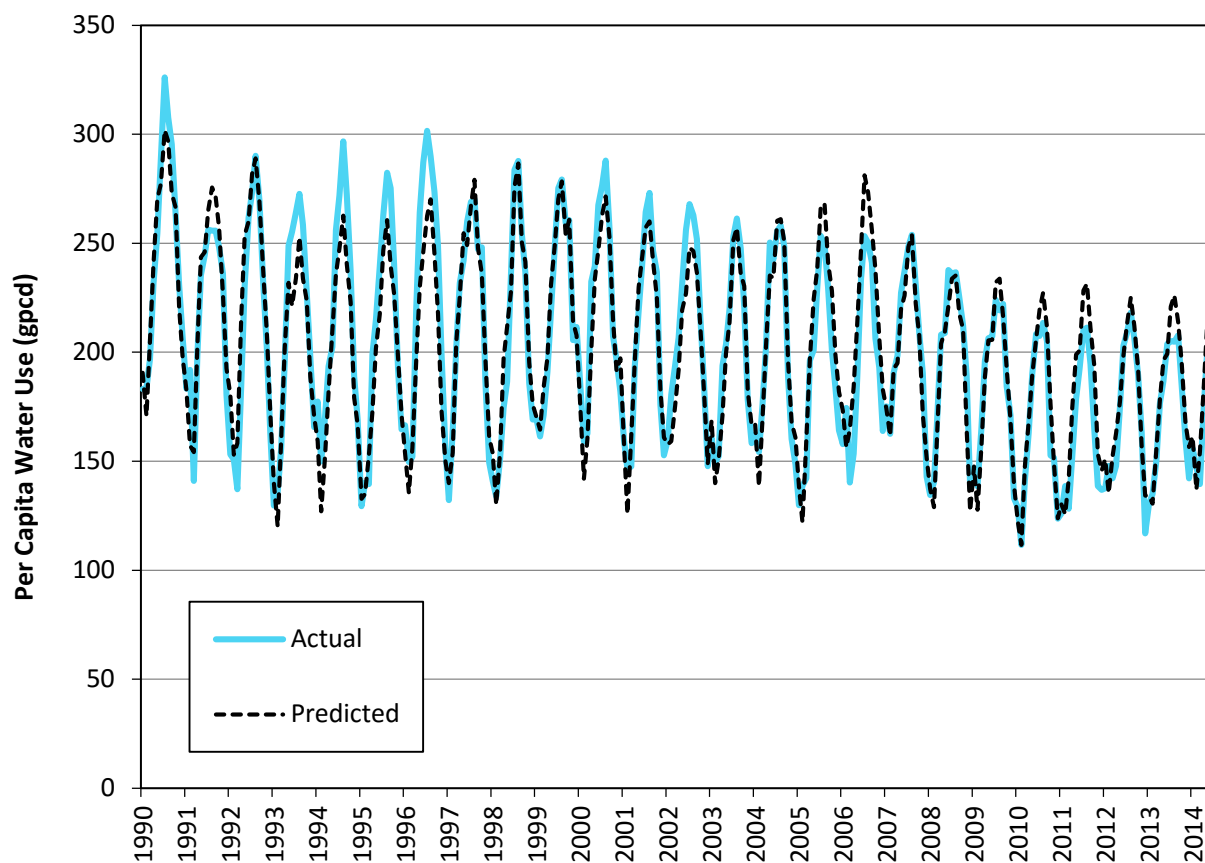
Regression Parameters	Basin Area	South Orange County	Brea / La Habra	OC Total
Adjusted R <sup>2</sup> *	0.90	0.91	0.89	0.91
Standard Error **	0.07	0.09	0.09	0.07
Explanatory Variable Significance***	All at <0.0001	All at <0.0001	All at <0.0001	All at <0.0001

\* Adjusted R<sup>2</sup> 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 Water\$mart 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)
<b>Single-Family Residential</b>	2015	431	411	397
	2020	366	349	337
	2025 to 2040	388	369	357
<b>Multifamily Residential</b>	2015	169	211	216
	2020	144	179	183
	2025 to 2040	152	190	194
<b>Commercial</b> <i>(or combined commercial/ industrial for South County)</i>	2015	92	97	158
	2020	78	83	134
	2025 to 2040	83	87	142
<b>Industrial</b>	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
<b>Single-Family Housing</b>	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
<b>Multifamily Housing</b>	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
<b>Commercial Employment</b> <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
<b>Industrial Employment</b>	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 AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total 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 AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total 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 AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total 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 AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total 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)**

<b>OC Basin Single-Family</b>										
# Flushes	Year	Total Housing	Portion of Homes with Gal/Flush Toilets						Savings (GPD/H)	Savings (AFY)
			7	5	3.5	1.6	1	Av Flush		
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

<b>OC Basin Non-Residential</b>										
# Flushes	Year	Empl	Portion of Emp with Gal/Flush Toilets						Savings (GPD/E)	Savings (AFY)
			7	5	3.5	1.6	1	Av Flush		
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 washer<sup>1</sup>. 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 MWD OC 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 afy<sup>1</sup>. 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 were 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.

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<sup>1</sup> Per MET's SoCal WaterSmart conservation estimates, table provided by MWD OC (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



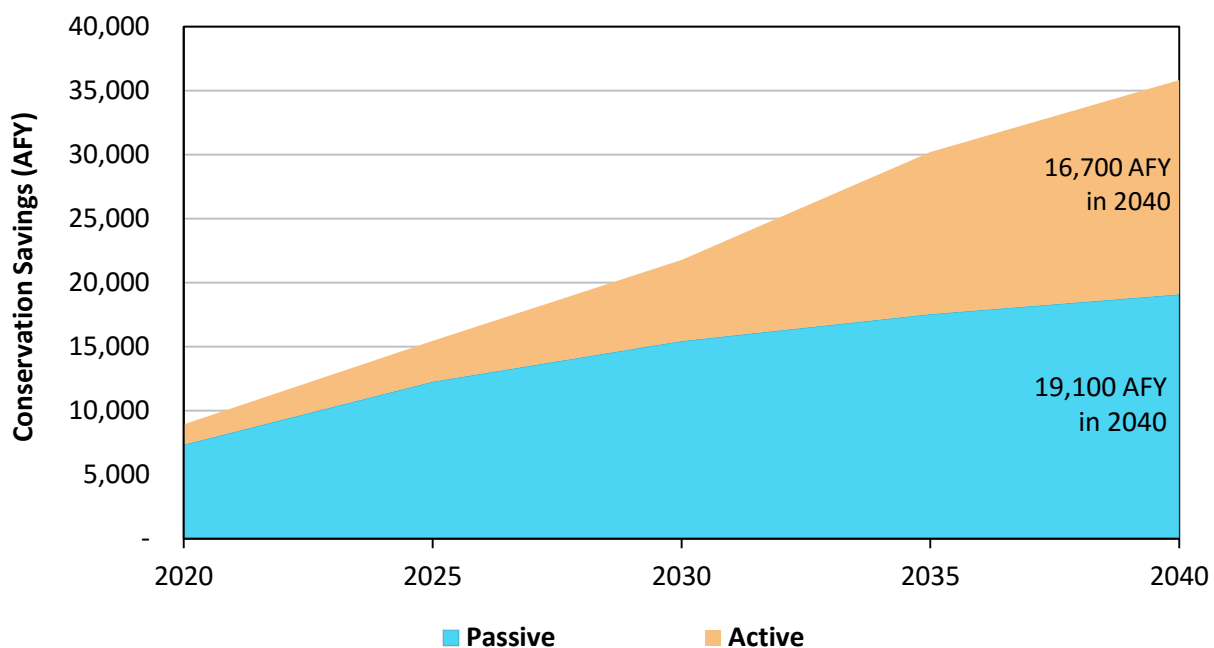


Figure 7. Total Water Conservation in Orange County

### 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**

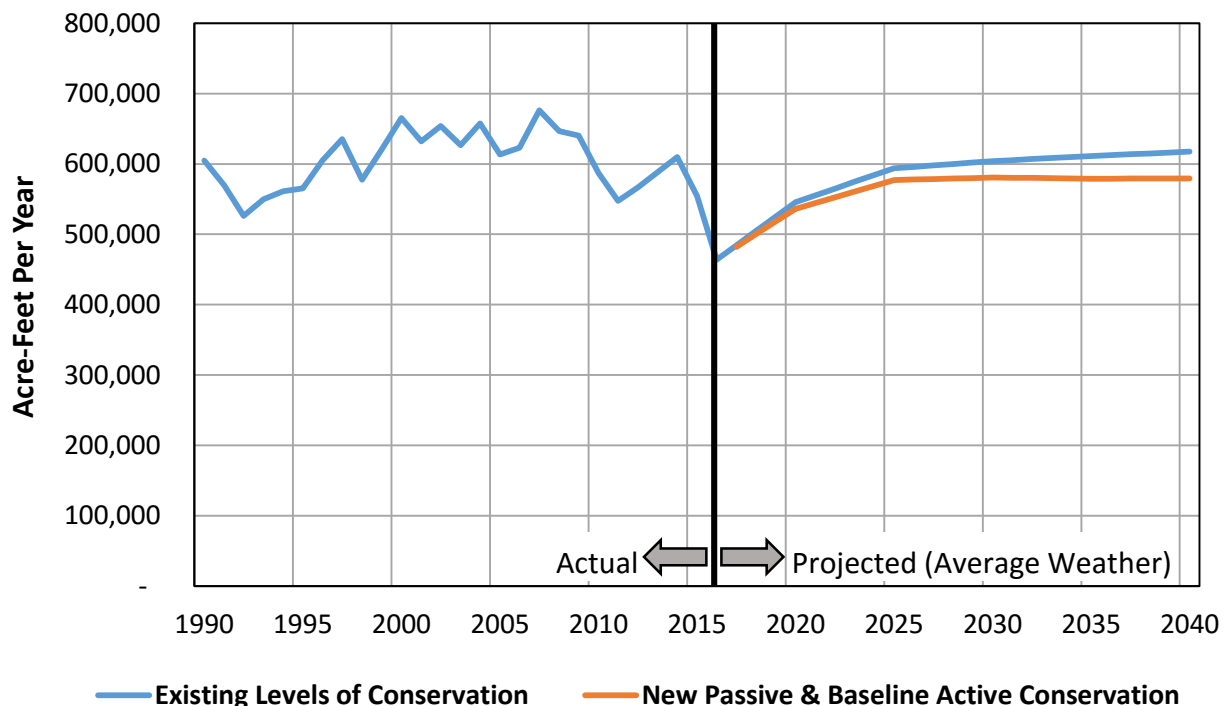
	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	148,902	89,733	136,077	26,230	400,941
2025	157,528	97,180	147,532	28,157	430,396
2030	157,284	98,240	149,476	28,350	433,350
2035	156,263	99,076	149,552	28,342	433,233
2040	155,399	100,275	149,797	28,383	433,854

**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
<b>Net Groundwater for OC Basin Agencies</b>	<b>288,500</b>	<b>311,500</b>	<b>168,000 to 455,000</b>

\* 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  $\pm 5$  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  $\pm 80$  percent for the Los Angeles Aqueducts and  $\pm 55$  percent for surface reservoirs. Thus, the variability for demands on MET in any given year can be  $\pm 15$  to 25 percent. This fact alone makes storage so key in assuring supply reliability for MET and the region.

**Table 9. Demands on MET**

<b>Total Demand (AFY)</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>
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
<b>Total Demand</b>	<b>4,236,645</b>	<b>4,367,650</b>	<b>4,453,698</b>

<b>Local Supplies (AFY)</b>			
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
<b>Total Local Supplies</b>	<b>2,314,061</b>	<b>2,390,637</b>	<b>2,425,663</b>

<b>Demand On MET (AFY)</b>			
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
<b>Total Net Demand on Metropolitan</b>	<b>1,922,584</b>	<b>1,977,013</b>	<b>2,028,035</b>



#### 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.

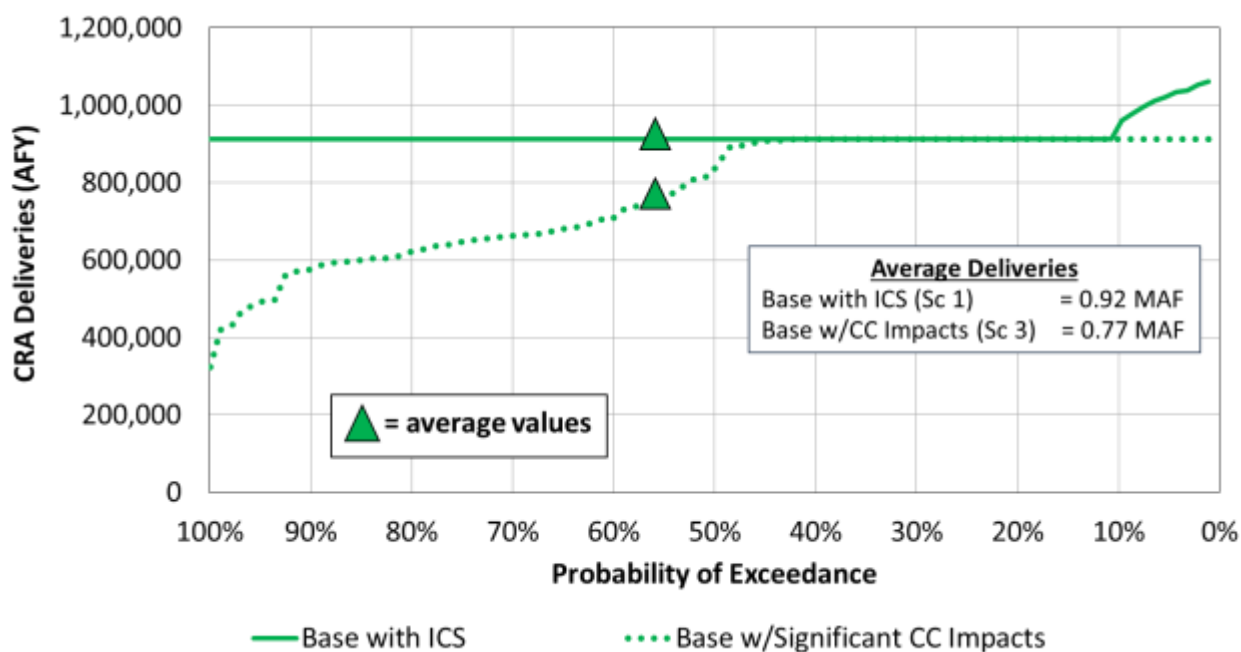


Figure 11. Colorado River Aqueduct Deliveries to MET

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.

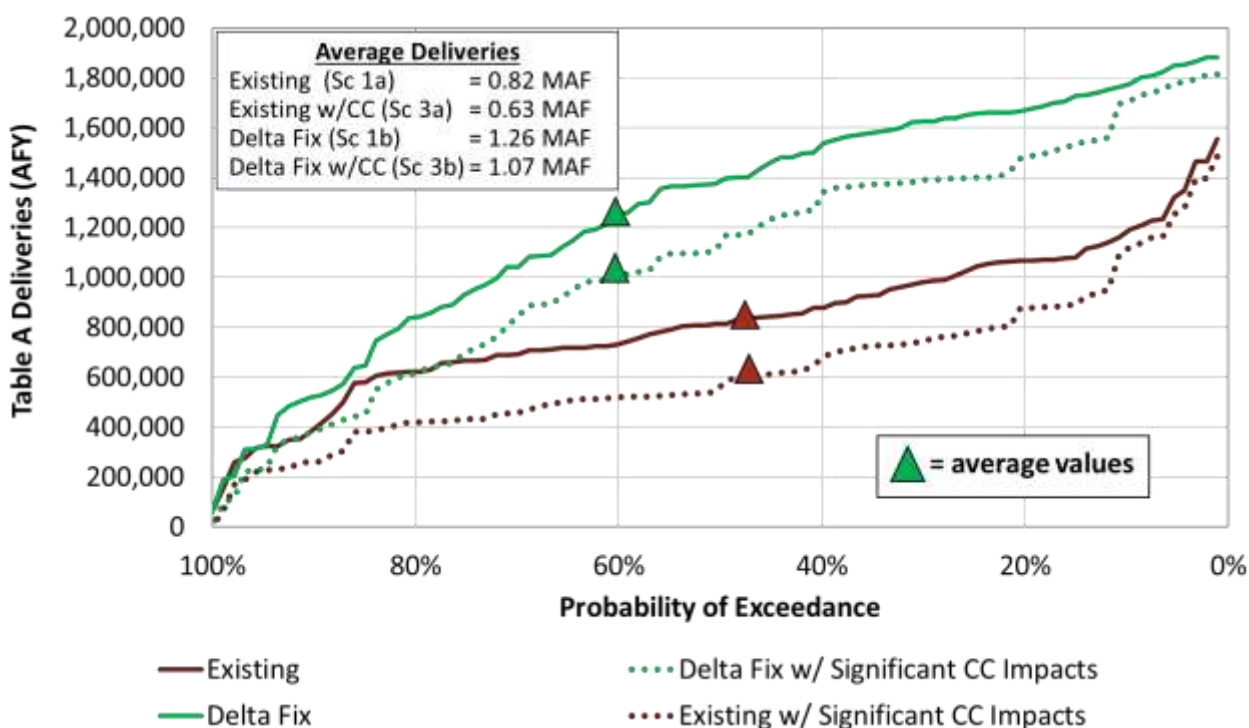


Figure 12. State Water Project Deliveries to MET

#### 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.

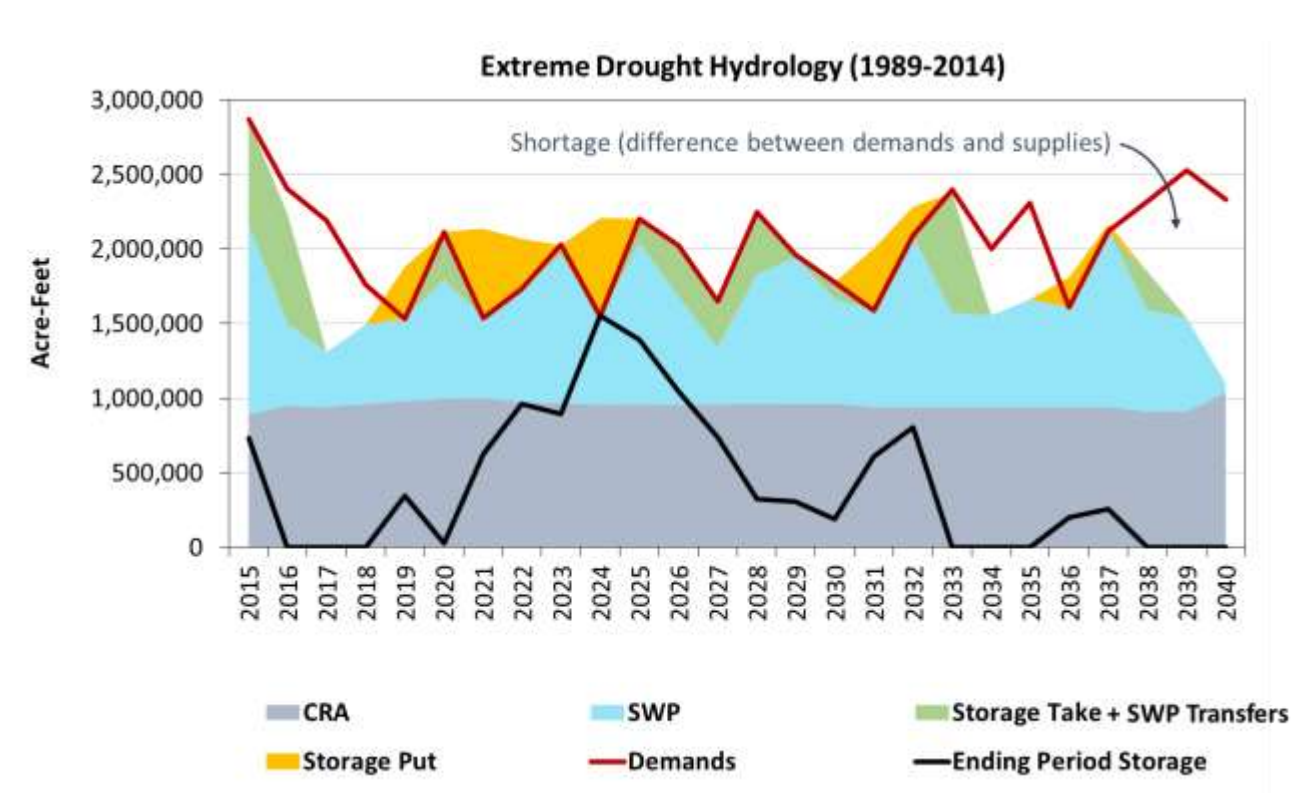


Figure 13. MET Reliability under Drought, for Scenario 1a (no Climate variability, no Cal Fix)

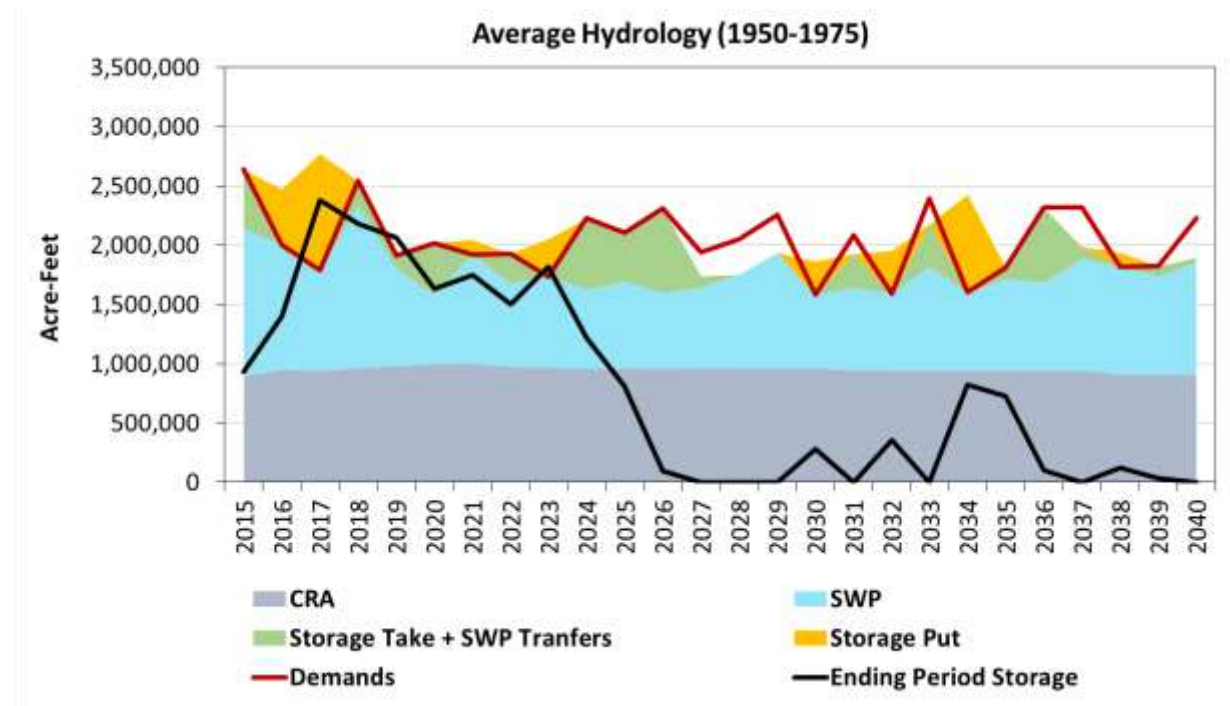


Figure 14. MET Reliability under Average Hydrology, for Scenario 1a (no Climate variability, no Cal Fix)

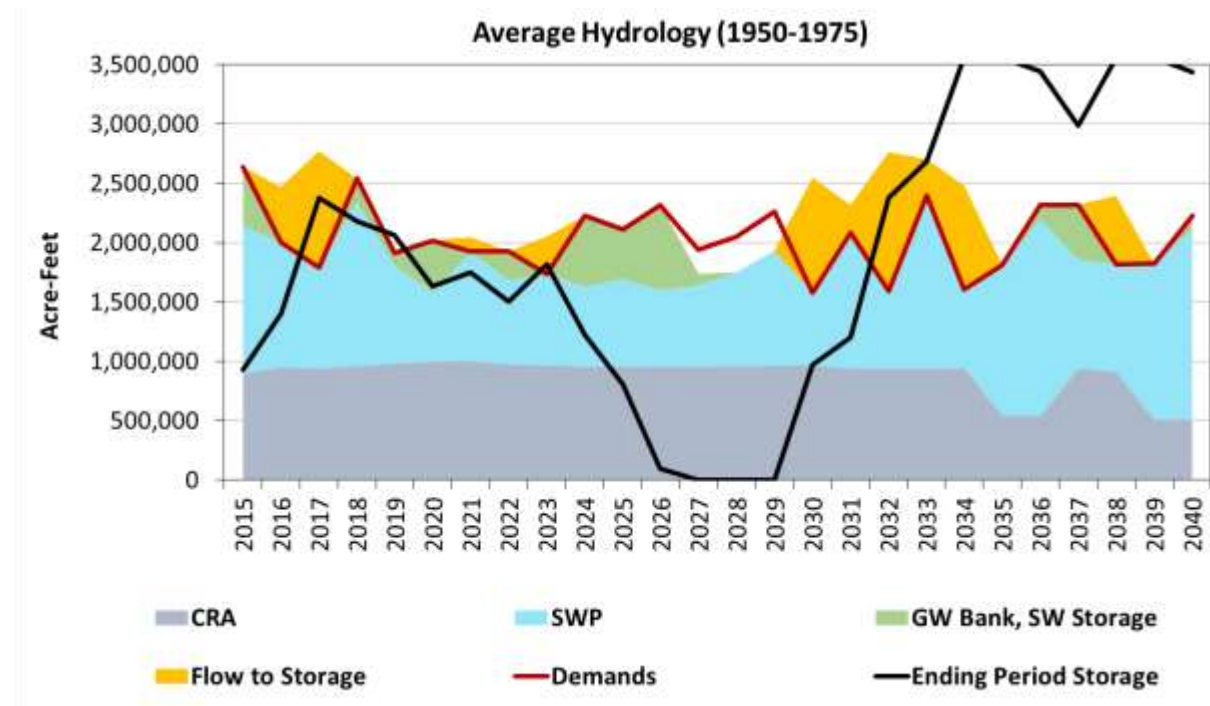
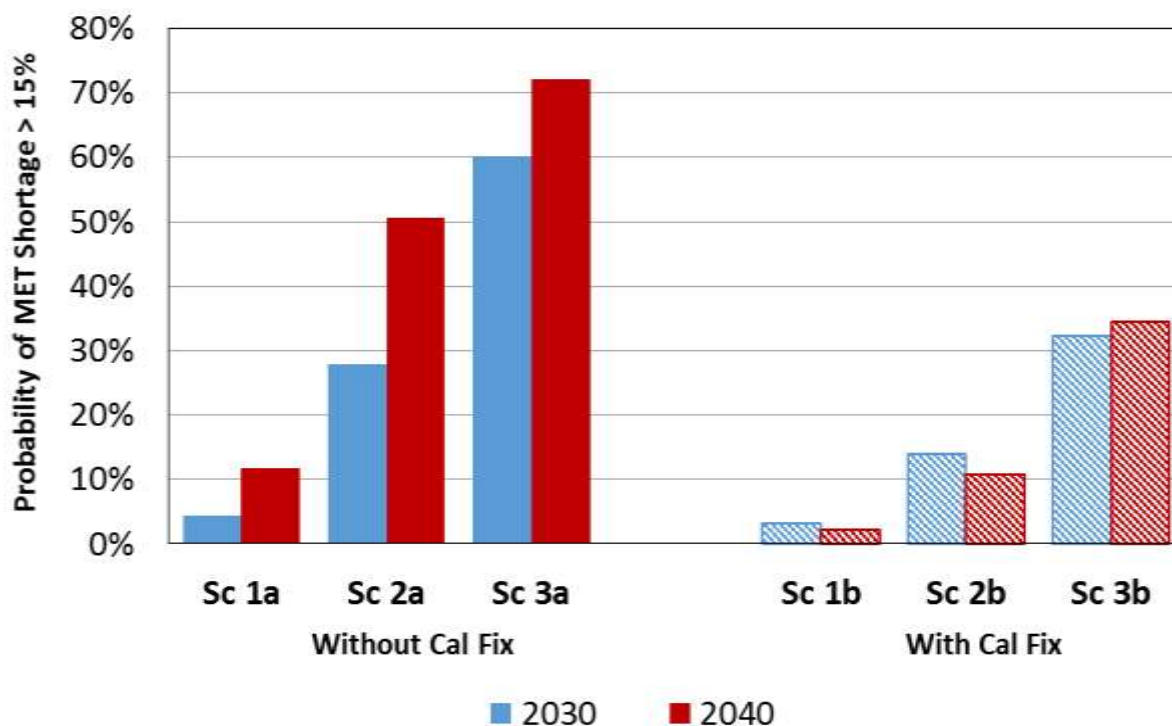


Figure 15. MET Reliability under Average Hydrology, for Scenario 1b (no Climate variability, with Cal Fix)



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

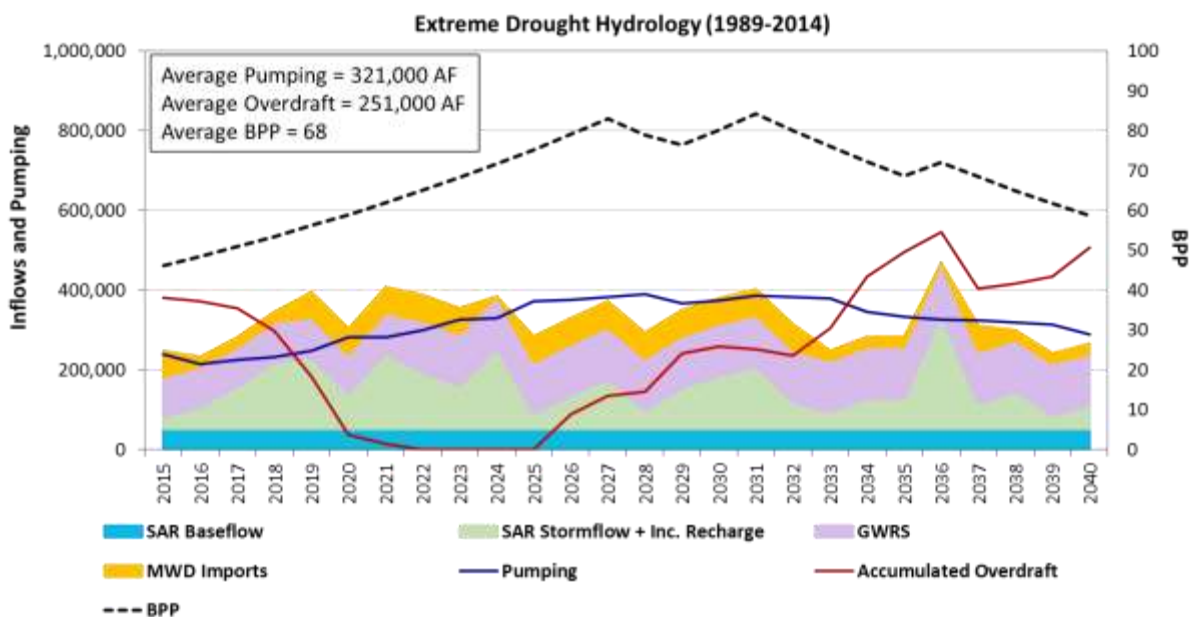
As shown in Figure 16, the impacts of climate variability (Scenarios 2 and 3) can be significant in increasing the probability and magnitude of MET shortages. In 2040, significant climate scenario (Scenario 3) can increase the probability of shortage by 60 percent without Cal Fix. The analysis also shows 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

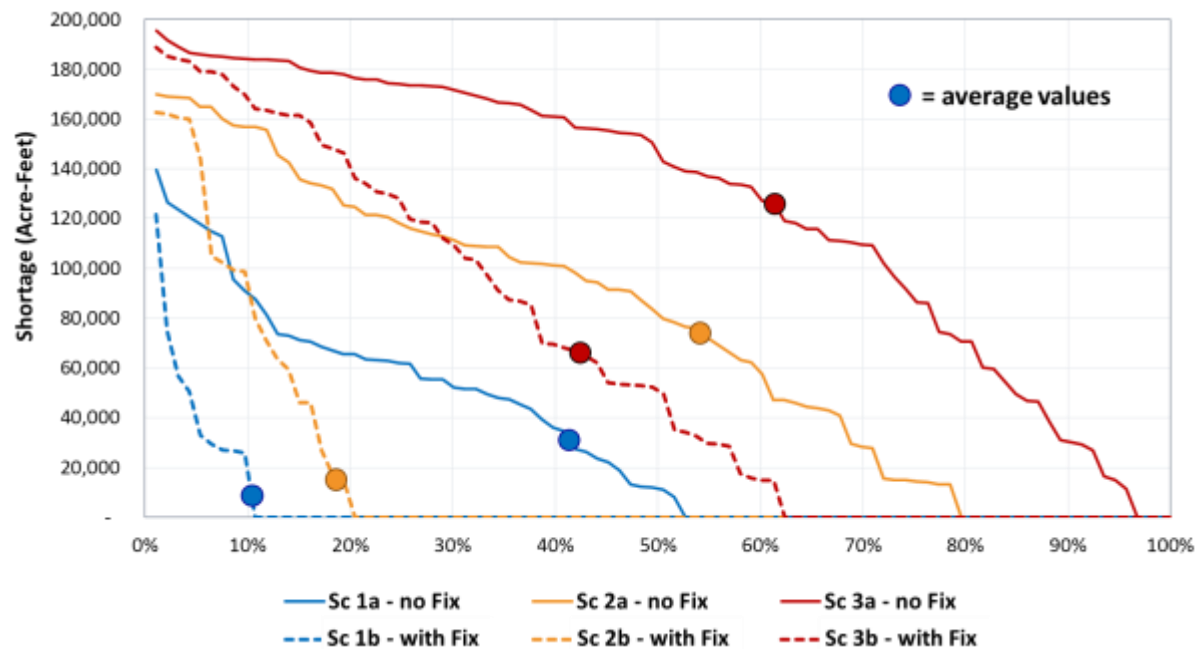


Figure 19. Probability of Water Shortages (Gap) for Orange County Total, with Cal Fix

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	
Brea / La Habra	a – no Fix	b – with Fix	a – no Fix	b – with Fix	a – no Fix	b – with Fix
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	a – no Fix	b – with Fix	a – no Fix	b – with Fix	a – no Fix	b – with Fix
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	a – no Fix	b – with Fix	a – no Fix	b – with Fix	a – no Fix	b – with Fix
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	a – no Fix	b – with Fix	a – no Fix	b – with Fix	a – no Fix	b – with Fix
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.

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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:	Gar Huang	
Email Address:	garh@ci.fullerton.ca.us	
Telephone   Ext.:	7147386895	
Name of City / Utility:	City of Fullerton	
City/Town/Municipality:	City of Fullerton	
State / Province:	California (CA)	
Country:	USA	
Year:	FY14-15	Financial Year
Start Date:	07/2014	Enter MM/YYYY numeric format
End Date:	06/2014	Enter MM/YYYY numeric format
Audit Preparation Date:	4/9/2015	
Volume Reporting Units:	Acre-feet	
PWSID / Other ID:		

## The following guidance will help you complete the Audit

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

<input type="text"/>	Value can be entered by user
<input type="text"/>	Value calculated based on input data
<input type="text"/>	These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% 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

### Instructions

The current sheet.  
Enter contact information and basic audit details (year, units etc)

### Reporting Worksheet

Enter the required data on this worksheet to calculate the water balance and data grading

### Comments

Enter comments to explain how values were calculated or to document data sources

### Performance Indicators

Review the performance indicators to evaluate the results of the audit

### Water Balance

The values entered in the Reporting Worksheet are used to populate the Water Balance

### Dashboard

A graphical summary of the water balance and Non-Revenue Water components

### Grading Matrix

Presents the possible grading options for each input component of the audit

### Service Connection Diagram

Diagrams depicting possible customer service connection line configurations

### Definitions

Use this sheet to understand the terms used in the audit process

### Loss Control Planning

Use this sheet to interpret the results of the audit validity score and performance indicators

### Example Audits

Reporting Worksheet and Performance Indicators examples are shown for two validated audits

### Acknowledgements

Acknowledgements for the AWWA Free Water Audit Software v5.0

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





## AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: **City of Fullerton**Reporting Year: **FY14-15** **7/2014 - 6/2014****\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 74 out of 100 \*\*\***

### System Attributes:

Apparent Losses:	522.217	acre-ft/yr
+ Real Losses:	992.625	acre-ft/yr
= <b>Water Losses:</b>	<b>1,514.842</b>	acre-ft/yr

? Unavoidable Annual Real Losses (UARL): 635.69 acre-ft/yr

Annual cost of Apparent Losses: \$573,456

Annual cost of Real Losses: \$916,193

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: 8.0%

Non-revenue water as percent by cost of operating system: 7.1%

Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: 14.28 gallons/connection/day

Real Losses per service connection per day: 27.15 gallons/connection/day

Real Losses per length of main per day\*: N/A

Real Losses per service connection per day per psi pressure: 0.34 gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 992.63 acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 1.56

\* 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: User Comments

WAS v5.0

American Water Works Association.  
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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

<b>General Comment:</b>	
<b>Audit Item</b>	<b>Comment</b>
<a href="#">Volume from own sources:</a>	Fullerton produces water from 11 different wells, each of which are tested annually. Monthly tabulations of well water production inform this volume.
<a href="#">Vol. from own sources: Master meter error adjustment:</a>	Annual tests are conducted at each well site, but none of the test results for FY14-15 presented errors of significant magnitude. As such, no gross corrections were applied.
<a href="#">Water imported:</a>	During FY14-15, Fullerton imported water from MWD (F-2, F-4, F-6, F-8, F-9). All imported water is metered. Imports meters are calibrated annually, but no volumetric accuracy testing is conducted.
<a href="#">Water imported: master meter error adjustment:</a>	MWD logs flow data at least every 15 minutes, accessible through their website. Meters are not tested for volumetric accuracy, so only gross errors in volumetric registration are detected and corrected.
<a href="#">Water exported:</a>	Fullerton does not export water to any neighboring agencies.
<a href="#">Water exported: master meter error adjustment:</a>	N/A
<a href="#">Billed metered:</a>	
<a href="#">Billed unmetered:</a>	
<a href="#">Unbilled metered:</a>	

Audit Item	Comment
<a href="#">Unbilled unmetered:</a>	
<a href="#">Unauthorized consumption:</a>	
<a href="#">Customer metering inaccuracies:</a>	
<a href="#">Systematic data handling errors:</a>	
<a href="#">Length of mains:</a>	
<a href="#">Number of active AND inactive service connections:</a>	
<a href="#">Average length of customer service line:</a>	
<a href="#">Average operating pressure:</a>	
<a href="#">Total annual cost of operating water system:</a>	
<a href="#">Customer retail unit cost (applied to Apparent Losses):</a>	
<a href="#">Variable production cost (applied to Real Losses):</a>	





# AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for: **City of Fullerton**Reporting Year: **FY14-15****7/2014 - 6/2014**Data Validity Score: **74**

		Water Exported <i>0.000</i>	Billed Water Exported				Revenue Water <b>0.000</b>
			Authorized Consumption <b>25,763.315</b>	Billed Authorized Consumption <b>25,089.970</b>	Billed Metered Consumption (water exported is removed) <b>25,089.970</b>	Billed Unmetered Consumption <b>0.000</b>	Revenue Water <b>25,089.970</b>
Own Sources (Adjusted for known errors)  <b>18,945.987</b>	System Input <b>27,278.157</b>	Water Supplied <b>27,278.157</b>	Water Losses <b>1,514.842</b>	Unbilled Authorized Consumption <b>673.345</b>	Unbilled Metered Consumption <b>605.150</b>	Unbilled Unmetered Consumption <b>68.195</b>	Non-Revenue Water (NRW)  <b>2,188.187</b>
				Apparent Losses <b>522.217</b>	Unauthorized Consumption <b>68.195</b>	Customer Metering Inaccuracies <b>391.296</b>	
Water Imported  <b>8,332.170</b>				Real Losses <b>992.625</b>	Systematic Data Handling Errors <b>62.725</b>	Leakage on Transmission and/or Distribution Mains <b>Not broken down</b>	
					Leakage and Overflows at Utility's Storage Tanks <b>Not broken down</b>	Leakage on Service Connections <b>Not broken down</b>	



## AWWA Free Water Audit Software: Dashboard

WAS v5.0  
American Water Works Association.  
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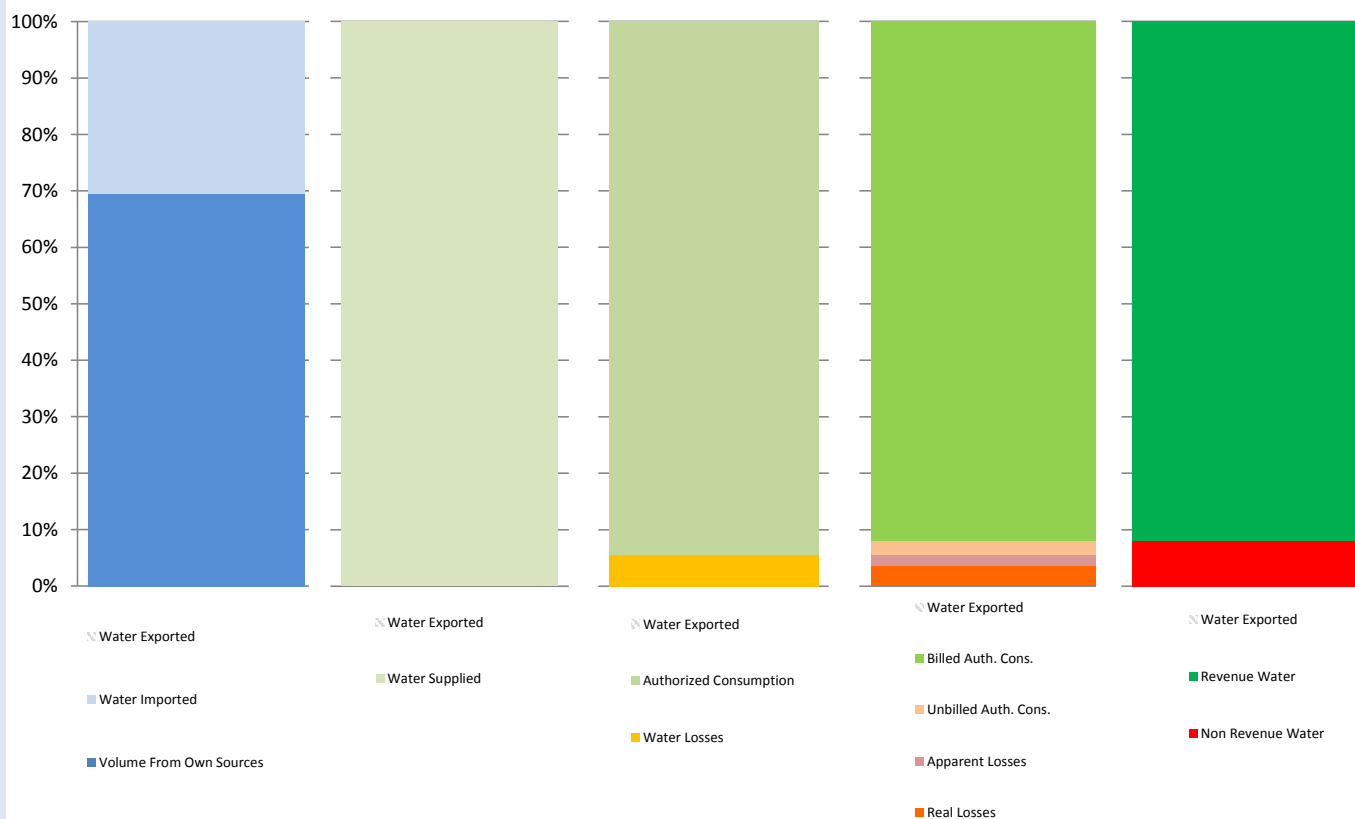
The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

Water Audit Report for: **City of Fullerton**

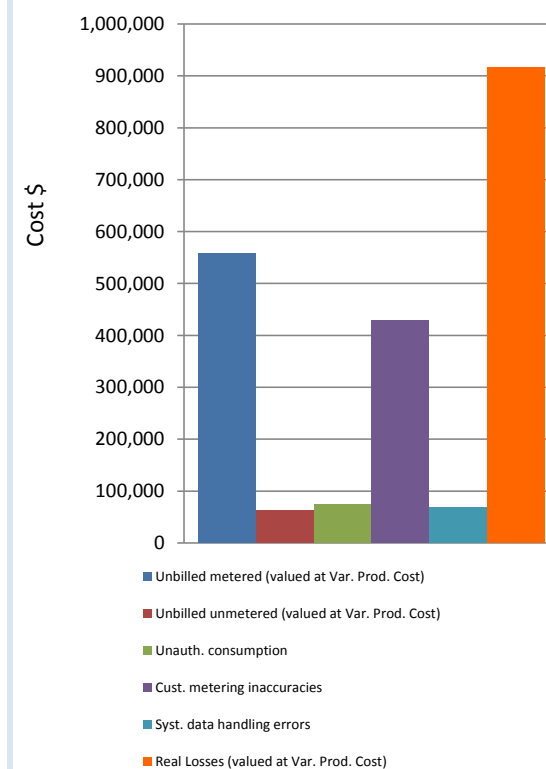
Reporting Year: **FY14-15** **7/2014 - 6/2014**

Data Validity Score: **74**

- ☐ Show me the VOLUME of Non-Revenue Water
- ☒ Show me the COST of Non-Revenue Water



Total Cost of NRW = \$2,111,147



# 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 <sup>[3]</sup>	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 <sup>[2]</sup>	1992						363,926	13,452	162,561
Home Water Surveys <sup>[2]</sup>	1995						11,867	160	1,708
Showerhead Replacements <sup>[2]</sup>	1991						270,604	1,667	19,083
<b>Total Water Savings All Programs</b>				<b>960</b>	<b>2,914,059</b>	<b>3,090</b>	<b>12,435,583</b>	<b>44,073</b>	<b>364,706</b>

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

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

<sup>(3)</sup> Turf Removal Interventions are listed as square feet.

<sup>(4)</sup> 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
<b>MWDOC Totals</b>	<b>7,406</b>	<b>7,987</b>	<b>8,106</b>	<b>3,331</b>	<b>10,686</b>	<b>7,350</b>	<b>5,365</b>	<b>5,094</b>	<b>6,002</b>	<b>2,048</b>	<b>89,218</b>	<b>14.78</b>	<b>17,352.00</b>	<b>17,237</b>
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
<b>Non-MWDOC Totals</b>	<b>1,359</b>	<b>1,416</b>	<b>1,368</b>	<b>1,016</b>	<b>1,662</b>	<b>937</b>	<b>694</b>	<b>602</b>	<b>638</b>	<b>196</b>	<b>16,393</b>	<b>1.37</b>	<b>3,356.08</b>	<b>3,167</b>
<b>Orange County Totals</b>	<b>8,765</b>	<b>9,403</b>	<b>9,474</b>	<b>4,347</b>	<b>12,348</b>	<b>8,287</b>	<b>6,059</b>	<b>5,696</b>	<b>6,640</b>	<b>2,244</b>	<b>105,611</b>	<b>16.15</b>	<b>20,708.07</b>	<b>20,404</b>

**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	0	1	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	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	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	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	2	0	13	17	4	0	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
<b>MWDOC Totals</b>	<b>48</b>	<b>30</b>	<b>820</b>	<b>218</b>	<b>610</b>	<b>976</b>	<b>385</b>	<b>693</b>	<b>242</b>	<b>238</b>	<b>142</b>	<b>949</b>	<b>289</b>	<b>374</b>	<b>1,671</b>	<b>185</b>	<b>1,017</b>	<b>583</b>	<b>571</b>	<b>402</b>	<b>648</b>	<b>1,026</b>	<b>254</b>	<b>82</b>	<b>6,697</b>	<b>5,756</b>	<b>26,151.20</b>
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
<b>Non-MWDOC Totals</b>	<b>6</b>	<b>1</b>	<b>10</b>	<b>13</b>	<b>28</b>	<b>78</b>	<b>25</b>	<b>57</b>	<b>13</b>	<b>65</b>	<b>8</b>	<b>93</b>	<b>29</b>	<b>44</b>	<b>51</b>	<b>116</b>	<b>36</b>	<b>58</b>	<b>24</b>	<b>34</b>	<b>56</b>	<b>105</b>	<b>21</b>	<b>14</b>	<b>307</b>	<b>678</b>	<b>2,781.54</b>
<b>Orange County Totals</b>	<b>54</b>	<b>31</b>	<b>830</b>	<b>231</b>	<b>638</b>	<b>1,054</b>	<b>410</b>	<b>750</b>	<b>255</b>	<b>303</b>	<b>150</b>	<b>1,042</b>	<b>318</b>	<b>418</b>	<b>1,722</b>	<b>301</b>	<b>1,053</b>	<b>641</b>	<b>595</b>	<b>436</b>	<b>704</b>	<b>1,131</b>	<b>275</b>	<b>96</b>	<b>7,004</b>	<b>6,434</b>	<b>28,933</b>

**ROTATING NOZZLES INSTALLED BY AGENCY**  
through MWD OC 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	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		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.	
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	0	464	75	2,535	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	0	751	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	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	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	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	900	0	0	0	33	90	0	0	0	0	15	0	0	109	338	0	21	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	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	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	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	0	0	0	40	5,261	0	0	0	0	155	5,552	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
MWD OC 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
Anaheim	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
Non-MWD OC Totals	0	0	0	308	0	0	871	120	0	841	382	0	1,173	38,619	0	677	813	0	531	2,533	0	1,492	1,908	0	412	5,221	0	6,674	50,332	1,589	939.71
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<sup>[1]</sup>**  
**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
<b>MWDOC Totals</b>	<b>1,079</b>	<b>4,134</b>	<b>4,537</b>	<b>3,424</b>	<b>1,966</b>	<b>1,594</b>	<b>1,172</b>	<b>2,161</b>	<b>2,430</b>	<b>34,337</b>	<b>22,466</b>
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
<b>Non-MWDOC Totals</b>	<b>1,392</b>	<b>4,692</b>	<b>1,339</b>	<b>107</b>	<b>60</b>	<b>275</b>	<b>359</b>	<b>646</b>	<b>1,192</b>	<b>17,451</b>	<b>11,691</b>
<b>Orange County Totals</b>	<b>2,471</b>	<b>8,826</b>	<b>5,876</b>	<b>3,531</b>	<b>2,026</b>	<b>1,869</b>	<b>1,531</b>	<b>2,807</b>	<b>3,622</b>	<b>51,788</b>	<b>34,157</b>

[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
<b>MWDOC Totals</b>	<b>1,406</b>	<b>1,785</b>	<b>1,969</b>	<b>2,733</b>	<b>4,395</b>	<b>10,025</b>	<b>10,787</b>	<b>11,273</b>	<b>11,766</b>	<b>12,196</b>	<b>12,435</b>	<b>12,500</b>	<b>70,425.9</b>
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
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>142</b>	<b>146</b>	<b>144</b>	<b>190</b>	<b>190</b>	<b>190</b>	<b>190</b>	<b>1,147.97</b>
<b>Orange Co. Totals</b>	<b>1,406</b>	<b>1,785</b>	<b>1,969</b>	<b>2,733</b>	<b>4,395</b>	<b>10,167</b>	<b>10,933</b>	<b>11,417</b>	<b>11,956</b>	<b>12,386</b>	<b>12,625</b>	<b>12,690</b>	<b>71,573.83</b>

# 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
<b>MWDOC Totals</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>13</b>	<b>346</b>	<b>1335</b>
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
<b>OC Totals</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>14</b>	<b>357</b>	<b>1357</b>

[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
<b>MWDOC Totals</b>	<b>38</b>	<b>2,779</b>	<b>1,494</b>	<b>11,282</b>	<b>5,106</b>	<b>809</b>	<b>103</b>	<b>1,651</b>	<b>3,330</b>	<b>12,038</b>	<b>7,300</b>	<b>45,930</b>	<b>9,405.17</b>
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
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>270</b>	<b>131</b>	<b>3,982</b>	<b>768</b>	<b>160</b>	<b>0</b>	<b>0</b>	<b>250</b>	<b>2,083</b>	<b>802</b>	<b>8,446</b>	<b>2,033.86</b>
<b>Orange County Totals</b>	<b>38</b>	<b>3,049</b>	<b>1,625</b>	<b>15,264</b>	<b>5,874</b>	<b>969</b>	<b>103</b>	<b>1,651</b>	<b>3,580</b>	<b>14,121</b>	<b>8,102</b>	<b>54,376</b>	<b>11,439.03</b>

**TURF REMOVAL BY AGENCY<sup>[1]</sup>**  
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
<b>MWDOC Totals</b>	<b>23,990</b>	<b>108,421</b>	<b>183,524</b>	<b>241,224</b>	<b>216,104</b>	<b>303,923</b>	<b>238,978</b>	<b>304,598</b>	<b>2,195,544</b>	<b>3,692,153</b>	<b>643,119</b>	<b>2,225,804</b>	<b>3,501,259</b>	<b>6,876,123</b>	<b>2,978.20</b>

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	-
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,214</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,214</b>	<b>3.87</b>

<b>Orange County Totals</b>	<b>23,990</b>	<b>108,421</b>	<b>183,524</b>	<b>241,224</b>	<b>216,104</b>	<b>303,923</b>	<b>238,978</b>	<b>313,812</b>	<b>2,195,544</b>	<b>3,692,153</b>	<b>643,119</b>	<b>2,225,804</b>	<b>3,501,259</b>	<b>6,885,337</b>	<b>2,982</b>
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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
<b>MWDOC Totals</b>	<b>78</b>	<b>0</b>	<b>164</b>	<b>1</b>	<b>41</b>	<b>0</b>	<b>283</b>	<b>1</b>	<b>14.18</b>

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
<b>Non-MWDOC Totals</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>0.82</b>

<b>Orange County Totals</b>	<b>78</b>	<b>0</b>	<b>181</b>	<b>1</b>	<b>42</b>	<b>0</b>	<b>301</b>	<b>1</b>	<b>15.007</b>
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**SYNTHETIC TURF INSTALLED BY AGENCY<sup>[1]</sup>**  
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
<b>MWDOC Totals</b>	<b>132,820</b>	<b>18,033</b>	<b>181,848</b>	<b>89,642</b>	<b>97,806</b>	<b>8,624</b>	<b>20,184</b>	<b>0</b>	<b>432,658</b>	<b>116,299</b>	<b>384.83</b>

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
<b>Non-MWDOC Totals</b>	<b>9,400</b>	<b>876</b>	<b>16,282</b>	<b>20,093</b>	<b>20,303</b>	<b>65,300</b>	<b>4,227</b>	<b>0</b>	<b>50,212</b>	<b>86,269</b>	<b>83.81</b>

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

**ULF TOILETS INSTALLED BY AGENCY**  
through MWD OC 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
<b>MWD OC Totals</b>	<b>24,256</b>	<b>12,879</b>	<b>18,778</b>	<b>20,765</b>	<b>21,136</b>	<b>30,242</b>	<b>24,918</b>	<b>27,175</b>	<b>31,827</b>	<b>27,568</b>	<b>3,654</b>	<b>3,242</b>	<b>2,031</b>	<b>861</b>	<b>4</b>	<b>249,336</b>	<b>113,878.61</b>

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
<b>Non-MWD OC Totals</b>	<b>3,011</b>	<b>4,161</b>	<b>3,687</b>	<b>7,583</b>	<b>5,207</b>	<b>18,477</b>	<b>12,133</b>	<b>19,298</b>	<b>22,636</b>	<b>15,988</b>	<b>924</b>	<b>582</b>	<b>531</b>	<b>369</b>	<b>3</b>	<b>114,590</b>	<b>48,682.70</b>

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





Reported as of 11/

**Water Supply & Reuse**

Reporting Unit:

**City of Fullerton**

Year:

**2001****Water Supply Source Information****Supply Source Name****Quantity (AF) Supplied****Supply Type**

Groundwater

23914.1

Groundwater

MWD

7704.9

Imported

**Total AF: 31619**

Reported as of 11/

**Accounts & Water Use**

Reporting Unit Name:  
**City of Fullerton**

Submitted to  
 CUWCC  
**02/19/2003**

Year:  
**2001**

**A. Service Area Population Information:**

1. Total service area population 128500

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	24424	13998	0	0
2. Multi-Family	1945	5470	0	0
3. Commercial	1954	5890	0	0
4. Industrial	136	3442	0	0
5. Institutional	239	611	0	0
6. Dedicated Irrigation	269	1031	0	0
7. Recycled Water	0	0	0	0
8. Other	399	47	0	0
9. Unaccounted	NA	1130	NA	0
<b>Total</b>	29366	31619	0	0

**Metered****Unmetered**

Reported as of 11/

Reported as of 11/

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2001**

### A. Implementation

- |   |            |
|---|------------|
| 1. Based on your signed MOU date, 01/02/1996, your Agency STRATEGY DUE DATE is:   | 01/01/1998 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no         |
| a. If YES, when was it implemented?   |            |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?  | no         |
| a. If YES, when was it implemented?   |            |

### B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0

#### Indoor Survey:

- |   |    |    |
|---|----|----|
| 3. Check for leaks, including toilets, faucets and meter checks   | no | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary   | no | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | no | no |

#### Outdoor Survey:

- |  |    |      |
|--|----|------|
| 6. Check irrigation system and timers  | no | no   |
| 7. Review or develop customer irrigation schedule  | no | no   |
| 8. Measure landscaped area (Recommended but not required for surveys)  | no | no   |
| 9. Measure total irrigable area (Recommended but not required for surveys)   | no | no   |
| 10. Which measurement method is typically used (Recommended but not required for surveys)                                |    | None |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no   |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?                     | no | no   |
| a. If yes, in what form are surveys tracked?   |    | None |

b. Describe how your agency tracks this information.

### C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Reported as of 11/

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: 68%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 60%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

**B. Low-Flow Device Distribution Information**

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

a. If YES, when did your agency begin implementing this strategy? 7/1/1995

b. Describe your targeting/ marketing strategy.

Low-flow showerheads at the Engineering office and through special events such as the annual street market (Fullerton Market).

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
---	-------------	----------

2. Number of low-flow showerheads distributed:	43	0
--	----	---

3. Number of toilet-displacement devices distributed:	10	0
---	----	---

4. Number of toilet flappers distributed:	0	0
---	---	---

5. Number of faucet aerators distributed:	0	0
---	---	---

6. Does your agency track the distribution and cost of low-flow devices? yes

a. If YES, in what format are low-flow devices tracked? Manual Activity

b. If yes, describe your tracking and distribution system :

The City keeps a written record of low flow showerheads and toilet tummies.

**C. Low-Flow Device Distribution Expenditures****This Year****Next Year**

1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

The low flow showerheads and toilet tumblers are provided by the Metropolitan Water District.

Reported as of 11/

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 30489
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 31619
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? no
  - a. If yes, describe the leak detection program:

**B. Survey Data**

1. Total number of miles of distribution system line. 400
2. Number of miles of distribution system line surveyed. 0

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

## BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

BMP Form Status:  
**100% Complete**

Year:  
**2001**

### A. Implementation

- |   |     |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use?                         | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no  |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?  |     |
| b. Describe the program:  |     |
| 3. Number of previously unmetered accounts fitted with meters during report year.                             | 0   |

## B. Feasibility Study

- |  |      |
|--|------|
| <p>1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?</p> <p style="padding-left: 80px;">a. If YES, when was the feasibility study conducted?<br/>(mm/dd/yy)</p> <p style="padding-left: 40px;">b. Describe the feasibility study:</p> | no   |
| <p>2. Number of CII accounts with mixed-use meters.</p>  | 2017 |
| <p>3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.</p>   | 0    |

### C. Meter Retrofit Program Expenditures

### This Year Next Year

- |                          |   |   |
|--------------------------|---|---|
| 1. Budgeted Expenditures | 0 | 0 |
| 2. Actual Expenditures   | 0 |   |

#### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

## E. Comments



Reported as of 11/

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2001**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 269 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |     |
|--|-----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no  |
| a. If YES, when did your agency begin implementing this strategy?                    |     |
| b. Description of marketing / targeting strategy:                                    |     |
| 2. Number of Surveys Offered.  | 0   |
| 3. Number of Surveys Completed.  | 0   |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |     |
| a. Irrigation System Check   | yes |
| b. Distribution Uniformity Analysis  | yes |
| c. Review / Develop Irrigation Schedules   | yes |
| d. Measure Landscape Area  | yes |
| e. Measure Total Irrigable Area  | yes |
| f. Provide Customer Report / Information   | yes |
| 5. Do you track survey offers and results?   | yes |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no  |
| a. If YES, describe below:   |     |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   | 0   |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates			0
b. Loans			0
c. Grants			0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			yes
a. If YES, describe below:			
Landscape literature is available at City Hall.			
6. Do you have irrigated landscaping at your facilities?			yes
a. If yes, is it water-efficient?			yes
b. If yes, does it have dedicated irrigation metering?			no
7. Do you provide customer notices at the start of the irrigation season?			yes
8. Do you provide customer notices at the end of the irrigation season?			yes

#### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	3200	3200
2. Actual Expenditures	3200	

#### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

#### F. Comments

Landscape conservation program spending consists of articles in City newsletter.

Reported as of 11/

## **BMP 06: High-Efficiency Washing Machine Rebate Programs**

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2001**

### **A. Implementation**

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Edison provides rebates.

2. Does your agency offer rebates for high-efficiency washers? no

3. What is the level of the rebate?

4. Number of rebates awarded.

### **B. Rebate Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Reported as of 11/

**BMP 07: Public Information Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The City distributes conservation literature at a number of public venues, including the annual street fair market, City Hall, and through the monthly newsletter.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

**B. Conservation Information Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	9600	9600
2. Actual Expenditures	9600	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 08: School Education Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

<b>Grade</b>	<b>Are grade-appropriate materials distributed?</b>	<b>No. of class presentations</b>	<b>No. of students reached</b>	<b>No. of teachers' workshops</b>
Grades K-3rd	yes	56	4052	0
Grades 4th-6th	yes	24	1998	0
Grades 7th-8th	yes	36	2312	0
High School	yes	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 1/1/1989

**B. School Education Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	12000	12000
2. Actual Expenditures	11935	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

**Option A: CII Water Use Survey and Customer Incentives Program**

- |   |    |
|---|----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | no |
|---|----|

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes			
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

## Option B: CII Conservation Program Targets

---

- |   |     |
|---|-----|
| 5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?    | yes |
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | yes |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.  | 0   |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.                                      | 0   |

## B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

## C. "At Least As Effective As"

- |  |    |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |    |

## D. Comments

Fullerton participates on Metropolitan Water District's rebate program. We have included the number of rebates but not the associated dollar amounts or acre/feet. These are tracked by MWD.

Reported as of 11/

**BMP 09a: CII ULFT Water Savings**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001**

1. Did your agency implement a CII ULFT replacement program in the reporting year?

Yes

If No, please explain why on Line B.

10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Although this program is available in the Fullerton service area, this program is not actively marketed.

2. How does your agency advertise this program?

Other print media

Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Literature is available at Fullerton City Hall. The program is not actively marketed.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.)

no

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency?

Yes

3. What is the total number of customer accounts participating in the program during the last year ?

0

4.	CII Subsector	Number of Toilets Replaced				
		Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount	Type Not Specified
a.	Offices	0	0	0	0	0
b.	Retail / Wholesale	0	0	0	0	0
c.	Hotels	0	0	0	0	0
d.	Health	0	0	0	0	0



e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern- ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

## 5. Program

design.

Direct distribution with customer co-payment

6. Does your agency use outside services to  
implement this program?

No

a. If yes, check all that  
apply.7. Participant tracking and  
follow-up.

No follow-up

8. Based on your program experience, please rank on a scale of 1 to  
5, with 1 being the least frequent cause and 5 being the most  
frequent cause, the following reasons why customers refused to  
participate in the program.

a. Disruption to business	1
b. Inadequate payback	1
c. Inadequate ULFT performance	1
d. Lack of funding	1
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	5

9. Please describe general program acceptance/resistance by  
customers, obstacles to implementation, and other issues affecting  
program implementation or effectiveness.

Fullerton participates in the regional program sponsored  
by the Municipal Water District of Orange County and  
the Metropolitan Water District. Fullerton does not  
actively market this program.

10. Please provide a general assessment of the program for this  
reporting year. Did your program achieve its objectives? Were your  
targeting and marketing approaches effective? Were program costs  
in line with expectations and budgeting?

See 9 above

**C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget &amp; Expenditure Data

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0

d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		0
b. State agency contribution		0
c. Federal agency contribution		0
d. Other contribution		0
e. Total		0

**D. Comments**

Reported as of 11/

**BMP 11: Conservation Pricing**

Reporting Unit:  
**City of Fullerton**

BMP Form  
Status:  
**100% Complete**

Year:  
**2001**

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$10222496
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$2080000

**2. Commercial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$3063366
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$228800

**3. Industrial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$1665070
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$83200

**4. Institutional / Government**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$332156
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$26000

**5. Irrigation**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$533733
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$39520

**6. Other**

a. Water Rate Structure	Uniform
-------------------------	---------

b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$24172
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$94120

### **B. Conservation Pricing Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	35200
2. Actual Expenditures	0	

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
---	----

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Revenues above include 25% Sanitation Fund surcharge

Reported as of 11/

**BMP 12: Conservation Coordinator**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 10%
  - b. Coordinator's Name John Carlson
  - c. Coordinator's Title Water System Manager
  - d. Coordinator's Experience and Number of Years 4 years with City; 1 year as Conservation Coordinator
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	9000	9500
2. Actual Expenditures	9000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 13: Water Waste Prohibition**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Ordinance 2436-Fullerton Municipal Code Section 12.04.090 -- No person, firm, or corporation shall waste, cause, permit, or allow to be wasted, any water in any cooling system

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Fullerton

None

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding yes

b. Single-pass cooling systems for new connections yes

c. Non-recirculating systems in all new conveyor or car wash systems yes

d. Non-recirculating systems in all new commercial laundry systems yes

e. Non-recirculating systems in all new decorative fountains yes

f. Other, please name no

2. Describe measures that prohibit water uses listed above:

This ordinance is part of the Fullerton Municipal Code. The City reviews new construction and tenant improvement plans for potential water efficiency violations.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

### **C. Water Waste Prohibition Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **E. Comments**

Reported as of 11/

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2001****A. Implementation**

	<b>Single-Family Accounts</b>	<b>Multi- Family Units</b>
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

**Number of Toilets Replaced by Agency Program During Report Year**

<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	144	43
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	1654	85
<b>Total</b>	<b>1798</b>	<b>128</b>

6. Describe your agency's ULFT program for single-family residences.

Fullerton participates in a region wide ULFT rebate program for both SF & MF. The Municipal Water District of Orange County administers the program on our behalf. MWDOC contracts with a vendor to market the program and facilitate the rebate process for our customers. The "other program is a distribution program for SF and MF that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULFT's to our customers. These ULFT's are free to the customer.

7. Describe your agency's ULFT program for multi-family residences.

See #6 above.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**





Reported as of 11/

**Water Supply & Reuse**

Reporting Unit:

**City of Fullerton**

Year:

**2002****Water Supply Source Information****Supply Source Name****Quantity (AF) Supplied****Supply Type**

Groundwater

23988.4

Groundwater

MWD

8589.2

Imported

**Total AF: 32577.6**

Reported as of 11/

**Accounts & Water Use**

Reporting Unit Name:  
**City of Fullerton**

Submitted to  
 CUWCC  
**02/19/2003**

Year:  
**2002**

**A. Service Area Population Information:**

1. Total service area population 128500

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	24424	14756	0	0
2. Multi-Family	1945	5501	0	0
3. Commercial	1954	5892	0	0
4. Industrial	136	3660	0	0
5. Institutional	239	720	0	0
6. Dedicated Irrigation	269	1047	0	0
7. Recycled Water	0	0	0	0
8. Other	399	47	0	0
9. Unaccounted	NA	955	NA	0
<b>Total</b>	29366	32578	0	0

**Metered****Unmetered**

Reported as of 11/

Reported as of 11/

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2002**

### A. Implementation

- |   |            |
|---|------------|
| 1. Based on your signed MOU date, 01/02/1996, your Agency STRATEGY DUE DATE is:   | 01/01/1998 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no         |
| a. If YES, when was it implemented?   |            |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?  | no         |
| a. If YES, when was it implemented?   |            |

### B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0

#### Indoor Survey:

- |   |    |    |
|---|----|----|
| 3. Check for leaks, including toilets, faucets and meter checks   | no | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary   | no | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | no | no |

#### Outdoor Survey:

- |  |    |      |
|--|----|------|
| 6. Check irrigation system and timers  | no | no   |
| 7. Review or develop customer irrigation schedule  | no | no   |
| 8. Measure landscaped area (Recommended but not required for surveys)  | no | no   |
| 9. Measure total irrigable area (Recommended but not required for surveys)   | no | no   |
| 10. Which measurement method is typically used (Recommended but not required for surveys)                                |    | None |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no   |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?                     | no | no   |
| a. If yes, in what form are surveys tracked?   |    | None |

b. Describe how your agency tracks this information.

### C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Reported as of 11/

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: 68%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 60%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

**B. Low-Flow Device Distribution Information**

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no

a. If YES, when did your agency begin implementing this strategy? 7/1/1995

b. Describe your targeting/ marketing strategy.

Low flush showerheads at the Engineering office and through special events such as the annual street market (Fullerton Market).

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices?		yes

a. If YES, in what format are low-flow devices tracked? Manual Activity

b. If yes, describe your tracking and distribution system :

The City keeps a written record of low flow showerheads and toilet tumblers.

**C. Low-Flow Device Distribution Expenditures****This Year****Next Year**

1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

The lowflow showerheads and toilet tummies are provided by the Metropolitan Water District.

Reported as of 11/

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 31623
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 32578
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? no
  - a. If yes, describe the leak detection program:

**B. Survey Data**

1. Total number of miles of distribution system line. 400
2. Number of miles of distribution system line surveyed. 0

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**



## BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

BMP Form Status:  
**100% Complete**

Year:  
**2002**

### A. Implementation

- |   |     |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use?                         | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no  |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?  |     |
| b. Describe the program:  |     |
| 3. Number of previously unmetered accounts fitted with meters during report year.                             | 0   |

## B. Feasibility Study

- |  |      |
|--|------|
| <p>1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?</p> <p>a. If YES, when was the feasibility study conducted?<br/>(mm/dd/yy)</p> <p>b. Describe the feasibility study:</p> | no   |
| <p>2. Number of CII accounts with mixed-use meters.</p>  | 2017 |
| <p>3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.</p>   | 0    |

### C. Meter Retrofit Program Expenditures

### This Year Next Year

- |                          |   |   |
|--------------------------|---|---|
| 1. Budgeted Expenditures | 0 | 0 |
| 2. Actual Expenditures   | 0 |   |

#### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

## E. Comments

Reported as of 11/

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2002**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 269 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |     |
|--|-----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no  |
| a. If YES, when did your agency begin implementing this strategy?                    |     |
| b. Description of marketing / targeting strategy:                                    |     |
| 2. Number of Surveys Offered.  | 0   |
| 3. Number of Surveys Completed.  | 0   |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |     |
| a. Irrigation System Check   | yes |
| b. Distribution Uniformity Analysis  | yes |
| c. Review / Develop Irrigation Schedules   | yes |
| d. Measure Landscape Area  | yes |
| e. Measure Total Irrigable Area  | yes |
| f. Provide Customer Report / Information   | yes |
| 5. Do you track survey offers and results?   | yes |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no  |
| a. If YES, describe below:   |     |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   | 0   |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates			0
b. Loans			0
c. Grants			0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No

a. If YES, describe below:

Landscape literature is available at City Hall.

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	no
7. Do you provide customer notices at the start of the irrigation season?	yes
8. Do you provide customer notices at the end of the irrigation season?	yes

#### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	3200	3200
2. Actual Expenditures	3200	

#### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

#### F. Comments

Reported as of 11/

## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2002**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Edison provides rebates

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 100

4. Number of rebates awarded. 40

### B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Agency rebates provided by MWD.

Reported as of 11/

**BMP 07: Public Information Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The City distributes conservation literature at a number of public venues, including the annual street fair market, City Hall, and through the monthly newsletter.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

**B. Conservation Information Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	9600	9600
2. Actual Expenditures	9600	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 08: School Education Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

<b>Grade</b>	<b>Are grade-appropriate materials distributed?</b>	<b>No. of class presentations</b>	<b>No. of students reached</b>	<b>No. of teachers' workshops</b>
Grades K-3rd	yes	53	4437	0
Grades 4th-6th	yes	35	3407	0
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 1/1/1989

**B. School Education Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	12000	12000
2. Actual Expenditures	11766	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

**Option A: CII Water Use Survey and Customer Incentives Program**

- |   |    |
|---|----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | no |
|---|----|

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates	0	6	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

### Option B: CII Conservation Program Targets

---

- |   |     |
|---|-----|
| 5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?    | yes |
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | yes |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.  | 0   |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.                                      | 0   |

### B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

- |  |    |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |    |

### D. Comments

Fullerton participates in Metropolitan Water District's rebate program. We have included the number of rebates but not the associated dollar amounts or acre/feet. These are not tracked by MWD.



Reported as of 11/

**BMP 09a: CII ULFT Water Savings**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002**

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes  
 If No, please explain why on Line B.  
 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply. CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Although this program is available in the Fullerton service area, this program is not actively marketed.

2. How does your agency advertise this program? Other print media  
 Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Literature is available at Fullerton City Hall. The program is not actively marketed.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) no
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? No
3. What is the total number of customer accounts participating in the program during the last year ? 1

4.	CII Subsector	Number of Toilets Replaced				
		Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount	Type Not Specified
a.	Offices	0	0	0	0	0
b.	Retail / Wholesale	0	0	0	0	0
c.	Hotels	0	0	0	0	0
d.	Health	0	0	0	0	0

e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern- ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

## 5. Program

design.

Direct distribution with customer co-payment

6. Does your agency use outside services to  
implement this program?

No

a. If yes, check all that  
apply.7. Participant tracking and  
follow-up.

No follow-up

8. Based on your program experience, please rank on a scale of 1 to  
5, with 1 being the least frequent cause and 5 being the most  
frequent cause, the following reasons why customers refused to  
participate in the program.

a. Disruption to business	1
b. Inadequate payback	1
c. Inadequate ULFT performance	1
d. Lack of funding	1
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	5

9. Please describe general program acceptance/resistance by  
customers, obstacles to implementation, and other issues affecting  
program implementation or effectiveness.

Fullerton participates in the regional program  
sponsored by the Municipal Water District of Orange  
County and the Metropolitan Water District. Fullerton  
does not actively market this program

10. Please provide a general assessment of the program for this  
reporting year. Did your program achieve its objectives? Were your  
targeting and marketing approaches effective? Were program costs  
in line with expectations and budgeting?

See 9 above

**C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget &amp; Expenditure Data

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0

d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		0
b. State agency contribution		0
c. Federal agency contribution		0
d. Other contribution		0
e. Total		0

**D. Comments**

Reported as of 11/

**BMP 11: Conservation Pricing**

Reporting Unit:  
**City of Fullerton**

BMP Form  
Status:  
**100% Complete**

Year:  
**2002**

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$11335075
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$2120000

**2. Commercial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$3033055
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$233200

**3. Industrial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$1736228
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$84800

**4. Institutional / Government**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$368086
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$26500

**5. Irrigation**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Increasing Block
c. Total Revenue from Volumetric Rates	\$621247
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$40280

**6. Other**

a. Water Rate Structure	Uniform
-------------------------	---------

b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$17870
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$95930

### **B. Conservation Pricing Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	35200	35200
2. Actual Expenditures	19078	

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
---	----

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Numbers above include 25% sanitation fee surcharge.

Reported as of 11/

**BMP 12: Conservation Coordinator**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 10%
  - b. Coordinator's Name John Carlson
  - c. Coordinator's Title Water System Manager
  - d. Coordinator's Experience and Number of Years 5 years with City; 2 years as Conservation Coordinator
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	9500	10000
2. Actual Expenditures	9500	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 13: Water Waste Prohibition**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Cordinance 2436-Fullerton Municipal Code Section 12.04.090-No person, firm, or corporation shall waste, cause, permit, or allow to be wasted, any water in any cooling system.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Fullerton

None

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding yes

b. Single-pass cooling systems for new connections yes

c. Non-recirculating systems in all new conveyor or car wash systems yes

d. Non-recirculating systems in all new commercial laundry systems yes

e. Non-recirculating systems in all new decorative fountains yes

f. Other, please name no

2. Describe measures that prohibit water uses listed above:

This ordinance is part of the Fullerton Municipal Code. The City reviews new construction and tenant improvement plans for potential water effeciency violations.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

### **C. Water Waste Prohibition Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **E. Comments**



Reported as of 11/

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2002****A. Implementation**

	<b>Single-Family Accounts</b>	<b>Multi- Family Units</b>
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

**Number of Toilets Replaced by Agency Program During Report Year**

<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	201	54
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	1526	349
<b>Total</b>	<b>1727</b>	<b>403</b>

6. Describe your agency's ULFT program for single-family residences.

Fullerton participates in a region wide ULFT rebate program for both SF & MF. The Municipal Water District of Orange County administers the program on your behalf. MWDOC contracts with a vendor to market the program and facilitate the rebate process for our customers. The "other" program is a distribution program that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULFT's to our customers. These ULFT's are free to the customer.

7. Describe your agency's ULFT program for multi-family residences.

See #6 above

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**



Reported as of 11/

**Water Supply & Reuse**

Reporting Unit:

**City of Fullerton**

Year:

**2003****Water Supply Source Information**

Supply Source Name

Quantity (AF) Supplied

Supply Type

**Total AF:**

Reported as of 11/

**Accounts & Water Use**

Reporting Unit Name:  
**City of Fullerton**

Submitted to  
 CUWCC  
**12/01/2004**

Year:  
**2003**

**A. Service Area Population Information:**

1. Total service area population 129000

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	24550	14262	0	0
2. Multi-Family	1940	5190	0	0
3. Commercial	1934	5765	0	0
4. Industrial	134	3489	0	0
5. Institutional	242	719	0	0
6. Dedicated Irrigation	275	1140	0	0
7. Recycled Water	0	0	0	0
8. Other	442	64	0	0
9. Unaccounted	NA	0	NA	0
<b>Total</b>	29517	30629	0	0

**Metered****Unmetered**

Reported as of 11/

Reported as of 11/

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

### A. Implementation

- |   |            |
|---|------------|
| 1. Based on your signed MOU date, 01/02/1996, your Agency STRATEGY DUE DATE is:   | 01/01/1998 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no         |
| a. If YES, when was it implemented?   |            |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?  | no         |
| a. If YES, when was it implemented?   |            |

### B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0

#### Indoor Survey:

- |   |    |    |
|---|----|----|
| 3. Check for leaks, including toilets, faucets and meter checks   | no | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary   | no | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | no | no |

#### Outdoor Survey:

- |  |    |       |
|--|----|-------|
| 6. Check irrigation system and timers  | no | no    |
| 7. Review or develop customer irrigation schedule  | no | no    |
| 8. Measure landscaped area (Recommended but not required for surveys)  | no | no    |
| 9. Measure total irrigable area (Recommended but not required for surveys)   | no | no    |
| 10. Which measurement method is typically used (Recommended but not required for surveys)                                |    | Other |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no    |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?                     | no | no    |
| a. If yes, in what form are surveys tracked?   |    | None  |

b. Describe how your agency tracks this information.

### C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Reported as of 11/

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? yes

3. Estimated percent of single-family households with low-flow showerheads: 91.7%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? yes

5. Estimated percent of multi-family households with low-flow showerheads: 79.9%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

In 2000, MWDOC and MET conducted the OC Saturation Survey and found county wide low flow showerhead saturation rates of 66.9% in single-family and 59.8% in multifamily dwelling units. Saturation rates provided above represent linear extrapolations of saturation survey results for 02-03 and 03-04.

**B. Low-Flow Device Distribution Information**

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

a. If YES, when did your agency begin implementing this strategy? 07/01/1995

b. Describe your targeting/ marketing strategy.

Low flow showerheads are distributed at the Engineering office and through special events such as the annual street market (Fullerton Market).

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	2	0
3. Number of toilet-displacement devices distributed:	1	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices?		yes
a. If YES, in what format are low-flow devices tracked?		Manual Activity
b. If yes, describe your tracking and distribution system :		

City keeps written records of low-flush shower heads and toilet tummies.

**C. Low-Flow Device Distribution Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?

No

  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**



Reported as of 11/

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 30681
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 31522
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? no
  - a. If yes, describe the leak detection program:

**B. Survey Data**

1. Total number of miles of distribution system line. 495
2. Number of miles of distribution system line surveyed. 0

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 11/

## **BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

### **A. Implementation**

- |   |     |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use?                         | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no  |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?  |     |
| b. Describe the program:  |     |
| 3. Number of previously unmetered accounts fitted with meters during report year.                             | 0   |

### **B. Feasibility Study**

- |  |      |
|--|------|
| 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? | no   |
| a. If YES, when was the feasibility study conducted?<br>(mm/dd/yy)   |      |
| b. Describe the feasibility study:   |      |
| 2. Number of CII accounts with mixed-use meters.   | 2310 |
| 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.  | 0    |

### **C. Meter Retrofit Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **D. "At Least As Effective As"**

- |  |    |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |    |

### **E. Comments**

Reported as of 11/

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 126 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |    |
|--|----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no |
| a. If YES, when did your agency begin implementing this strategy?                    |    |
| b. Description of marketing / targeting strategy:                                    |    |
| 2. Number of Surveys Offered.  | 0  |
| 3. Number of Surveys Completed.  | 0  |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |    |
| a. Irrigation System Check   | no |
| b. Distribution Uniformity Analysis  | no |
| c. Review / Develop Irrigation Schedules   | no |
| d. Measure Landscape Area  | no |
| e. Measure Total Irrigable Area  | no |
| f. Provide Customer Report / Information   | no |
| 5. Do you track survey offers and results?   | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no |
| a. If YES, describe below:   |    |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   | 0   |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No
a. If YES, describe below:			
6. Do you have irrigated landscaping at your facilities?			no
a. If yes, is it water-efficient?			
b. If yes, does it have dedicated irrigation metering?			
7. Do you provide customer notices at the start of the irrigation season?			yes
8. Do you provide customer notices at the end of the irrigation season?			yes

#### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	7000
2. Actual Expenditures	0	

#### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

#### F. Comments

The meters listed above are under budget as part Municipal Water district of Orange County's Landscape Certification Program. This has been a two-year effort covering 2003 & 2004. Included in the program is an informal survey process. Since it is informal, under B above, #2 & #3 are listed as zero, while the components of the informal process are marked as yes in #4

Reported as of 11/

## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Edison, in conjunction with MWD, offers rebate application marketing material at point of purchase. The customer calls an 800 number and receives the rebate application.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 100

4. Number of rebates awarded. 196

### B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 11/

**BMP 07: Public Information Programs**

Reporting Unit:

**City of Fullerton**

BMP Form Status:

**100% Complete**

Year:

**2003****A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The City distributes conservation literature at a number of public venues, including the annual street fair market, City Hall, and through the monthly newsletter.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	0
b. Public Service Announcement	no	0
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

**B. Conservation Information Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	16000	16000
2. Actual Expenditures	16000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 08: School Education Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

<b>Grade</b>	<b>Are grade-appropriate materials distributed?</b>	<b>No. of class presentations</b>	<b>No. of students reached</b>	<b>No. of teachers' workshops</b>
Grades K-3rd	yes	44	4625	3
Grades 4th-6th	yes	44	3772	2
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 01/01/1989

**B. School Education Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Implementation**

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | no  |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

**Option A: CII Water Use Survey and Customer Incentives Program**

- |   |    |
|---|----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | no |
|---|----|

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates	0	173	17820
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0



### Option B: CII Conservation Program Targets

---

- |   |       |
|---|-------|
| 5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?    | yes   |
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | yes   |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.  | 3.64  |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.                                      | 32.75 |

### B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	21346	

### C. "At Least As Effective As"

- |  |    |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |    |

### D. Comments

Reported as of 11/

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **City of Fullerton**      BMP Form Status: **100% Complete**      Year: **2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes  
 If No, please explain why on Line B. 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply. CII Sector or subsector  
CII ULFT Study subsector targeting

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

We found CII sectors and sub sectors most effective because we were able to version our marketing efforts appropriately.

2. How does your agency advertise this program? Other print media  
Direct letter  
Bill insert  
Newsletter  
Web page  
Newspapers  
Trade publications  
Trade shows and events  
Telemarketing  
 Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

For the purposes of this program, Trade Allies have proven to be the most effective overall marketing tool, as well as the most effective per dollar expended. Trade Allies include plumbers, distributors, retail home improvement stores and product manufacturers.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes
3. What is the total number of customer accounts participating in the program during the last year ? 1

**CII                      Number of Toilets Replaced**

**Subsector**

4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount	Type Not Specified
a. Offices	0	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0
c. Hotels	22	0	0	0	0
d. Health	0	0	0	0	0
e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern-ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program?

Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up.

Telephone

Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- |                                     |   |
|-------------------------------------|---|
| a. Disruption to business           | 1 |
| b. Inadequate payback               | 3 |
| c. Inadequate ULFT performance      | 2 |
| d. Lack of funding                  | 5 |
| e. American's with Disabilities Act | 0 |
| f. Permitting                       | 0 |

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

Customers are generally more willing to participate in the program if the cost of the retrofit is in balance with the amount of the rebate, and the projected water savings is significant. Resistance occurs if the out-of-pocket expense for the retrofit is too costly and the rebate amount is too low.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs

in line with expectations and budgeting?

Either Metropolitan or its Agencies to provide this response.

### **C. Conservation Program Expenditures for CII ULFT**

#### **1. CII ULFT Program: Annual Budget & Expenditure Data**

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

#### **2. CII ULFT Program: Annual Cost Sharing**

a. Wholesale agency contribution	1320
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	1320

### **D. Comments**

Reported as of 11/

**BMP 11: Conservation Pricing**

Reporting Unit:  
**City of Fullerton**

BMP Form  
 Status:  
**100% Complete**

Year:  
**2003**

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$10987205
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$212000

**2. Commercial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$2658781
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$233200

**3. Industrial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$1385058
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$84800

**4. Institutional / Government**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$340997
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$26500

**5. Irrigation**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$593042
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$40280

**6. Other**

a. Water Rate Structure	Uniform
-------------------------	---------

- b. Sewer Rate Structure Uniform
- c. Total Revenue from Volumetric Rates \$135384
- d. Total Revenue from Non-Volumetric  
Charges, Fees and other Revenue \$95930  
Sources

## **B. Conservation Pricing Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	35200	35200
2. Actual Expenditures	35200	

## **C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

## **D. Comments**

Reported as of 11/

**BMP 12: Conservation Coordinator**

Reporting Unit:

**City of Fullerton**

BMP Form Status:

**100% Complete**

Year:

**2003****A. Implementation**

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 10%
  - b. Coordinator's Name John Carlson
  - c. Coordinator's Title Water System Manager
  - d. Coordinator's Experience and Number of Years 6 years with the City; 3 year as Conservation Coordinator
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 13: Water Waste Prohibition**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Cordinance 2436-Fullerton Municipal Code Section 12.04.090-No person, firm, or corporation shall waste, cause, permit, or allow to be wasted, any water in any cooling system.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Fullerton

None

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- a. Gutter flooding yes
- b. Single-pass cooling systems for new connections yes
- c. Non-recirculating systems in all new conveyor or car wash systems yes
- d. Non-recirculating systems in all new commercial laundry systems yes
- e. Non-recirculating systems in all new decorative fountains yes
- f. Other, please name no

2. Describe measures that prohibit water uses listed above:

This ordinance is part of the Fullerton Municipal Code. The City reviews new construction and tenant improvement plans for potential water efficiency violations.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no
- b. Develop minimum appliance efficiency standards that:
- i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no
- ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no



4. Does your agency include water softener checks in home water audit programs? no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

### **C. Water Waste Prohibition Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **E. Comments**

Reported as of 11/

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2003****A. Implementation**

	<b>Single-Family Accounts</b>	<b>Multi- Family Units</b>
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

**Number of Toilets Replaced by Agency Program During Report Year**

<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	168	196
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	1520	329
<b>Total</b>	<b>1688</b>	<b>525</b>

6. Describe your agency's ULFT program for single-family residences.

The City of Fullerton participates in a region wide ULET rebate program for both SF & MF. MWDOC administers the program on our behalf. They contract with a vendor to market the program and facilitate the rebate process for our customers. The "other" program is a distribution program that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULET's to our customers.

7. Describe your agency's ULFT program for multi-family residences.

The City of Fullerton participates in a region wide ULET rebate program for both SF & MF. MWDOC administers the program on our behalf. They contract with a vendor to market the program and facilitate the rebate process for our customers. The "other" program is a distribution program that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULET's to our customers.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	7000	7000
2. Actual Expenditures	7000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP

differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**Water Supply & Reuse**

Reporting Unit:

**City of Fullerton**

Year:

**2004****Water Supply Source Information**

Supply Source Name

Quantity (AF) Supplied

Supply Type

**Total AF:**

Reported as of 11/

**Accounts & Water Use**

Reporting Unit Name:  
**City of Fullerton**

Submitted to  
 CUWCC  
**12/01/2004**

Year:  
**2004**

**A. Service Area Population Information:**

1. Total service area population 134000

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	25426	14680	0	0
2. Multi-Family	1937	5175	0	0
3. Commercial	1950	6062	0	0
4. Industrial	135	3845	0	0
5. Institutional	254	727	0	0
6. Dedicated Irrigation	424	1323	0	0
7. Recycled Water	0	0	0	0
8. Other	699	98	0	0
9. Unaccounted	NA	0	NA	0
<b>Total</b>	<b>30825</b>	<b>31910</b>	<b>0</b>	<b>0</b>

**Metered****Unmetered**

Reported as of 11/

Reported as of 11/

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2004**

### A. Implementation

- |   |            |
|---|------------|
| 1. Based on your signed MOU date, 01/02/1996, your Agency STRATEGY DUE DATE is:   | 01/01/1998 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no         |
| a. If YES, when was it implemented?   |            |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?  | no         |
| a. If YES, when was it implemented?   |            |

### B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0

#### Indoor Survey:

- |   |    |    |
|---|----|----|
| 3. Check for leaks, including toilets, faucets and meter checks   | no | no |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary   | no | no |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | no | no |

#### Outdoor Survey:

- |  |    |       |
|--|----|-------|
| 6. Check irrigation system and timers  | no | no    |
| 7. Review or develop customer irrigation schedule  | no | no    |
| 8. Measure landscaped area (Recommended but not required for surveys)  | no | no    |
| 9. Measure total irrigable area (Recommended but not required for surveys)   | no | no    |
| 10. Which measurement method is typically used (Recommended but not required for surveys)                                |    | Other |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no    |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?                     | no | no    |
| a. If yes, in what form are surveys tracked?   |    | None  |

b. Describe how your agency tracks this information.

### C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Reported as of 11/

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? yes

3. Estimated percent of single-family households with low-flow showerheads: 100%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? yes

5. Estimated percent of multi-family households with low-flow showerheads: 86.6%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

In 2000, MWDOC and MET conducted the OC Saturation Survey and found county wide low flow showerhead saturation rates of 66.9% in single-family and 59.8% in multifamily dwelling units. Saturation rates provided above represent linear extrapolations of saturation survey results for 02-03 and 03-04.

**B. Low-Flow Device Distribution Information**

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

a. If YES, when did your agency begin implementing this strategy? 07/01/1995

b. Describe your targeting/ marketing strategy.

Low flow showerheads are distributed at the Engineering office and through special events such as the annual street market (Fullerton Market).

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	2	0
3. Number of toilet-displacement devices distributed:	1	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices?		yes
a. If YES, in what format are low-flow devices tracked?		Manual Activity
b. If yes, describe your tracking and distribution system :		



City keeps written records of low-flush shower heads and toilet tumblers.

**C. Low-Flow Device Distribution Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?

No

  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 11/

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 31929
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 33352
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? no
  - a. If yes, describe the leak detection program:

**B. Survey Data**

1. Total number of miles of distribution system line. 504
2. Number of miles of distribution system line surveyed. 0

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

## BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

BMP Form Status:  
**100% Complete**

Year:  
**2004**

### A. Implementation

- |   |     |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use?                         | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no  |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?  |     |
| b. Describe the program:  |     |
| 3. Number of previously unmetered accounts fitted with meters during report year.                             | 0   |

## B. Feasibility Study

- |  |      |
|--|------|
| <p>1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?</p> <p style="padding-left: 80px;">a. If YES, when was the feasibility study conducted?<br/>(mm/dd/yy)</p> <p style="padding-left: 40px;">b. Describe the feasibility study:</p> | no   |
| <p>2. Number of CII accounts with mixed-use meters.</p>  | 2339 |
| <p>3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.</p>   | 0    |

### C. Meter Retrofit Program Expenditures

This Year   Next Year

- |                          |   |   |
|--------------------------|---|---|
| 1. Budgeted Expenditures | 0 | 0 |
| 2. Actual Expenditures   | 0 |   |

#### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

## E. Comments

Reported as of 11/

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2004**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 126 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |    |
|--|----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no |
| a. If YES, when did your agency begin implementing this strategy?                    |    |
| b. Description of marketing / targeting strategy:                                    |    |
| 2. Number of Surveys Offered.  | 0  |
| 3. Number of Surveys Completed.  | 0  |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |    |
| a. Irrigation System Check   | no |
| b. Distribution Uniformity Analysis  | no |
| c. Review / Develop Irrigation Schedules   | no |
| d. Measure Landscape Area  | no |
| e. Measure Total Irrigable Area  | no |
| f. Provide Customer Report / Information   | no |
| 5. Do you track survey offers and results?   | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no |
| a. If YES, describe below:   |    |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   |     |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No
a. If YES, describe below:			
6. Do you have irrigated landscaping at your facilities?			no
a. If yes, is it water-efficient?			
b. If yes, does it have dedicated irrigation metering?			
7. Do you provide customer notices at the start of the irrigation season?			yes
8. Do you provide customer notices at the end of the irrigation season?			yes

#### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	7000
2. Actual Expenditures	0	

#### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

#### F. Comments

The meters listed above are under budget as part Municipal Water district of Orange County's Landscape Certification Program. This has been a two-year effort covering 2003 & 2004. Included in the program is an informal survey process. Since it is informal, under B above, #2 & #3 are listed as zero, while the components of the informal process are marked as yes in #4

Reported as of 11/

## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:  
**City of Fullerton**

BMP Form Status:  
**100% Complete**

Year:  
**2004**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Edison, in conjunction with MWD, offers rebate application marketing material at point of purchase. The customer calls an 800 number and receives the rebate application.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 100

4. Number of rebates awarded. 369

### B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 11/

**BMP 07: Public Information Programs**

Reporting Unit:

**City of Fullerton**

BMP Form Status:

**100% Complete**

Year:

**2004****A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The City distributes conservation literature at a number of public venues, including the annual street fair market, City Hall, and through the monthly bill insert.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	0
b. Public Service Announcement	no	0
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

**B. Conservation Information Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	16000	16000
2. Actual Expenditures	16000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 11/

**BMP 08: School Education Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

<b>Grade</b>	<b>Are grade-appropriate materials distributed?</b>	<b>No. of class presentations</b>	<b>No. of students reached</b>	<b>No. of teachers' workshops</b>
Grades K-3rd	yes	19	1940	3
Grades 4th-6th	yes	19	1106	2
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 01/01/1989

**B. School Education Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**



Reported as of 11/

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | no  |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

**Option A: CII Water Use Survey and Customer Incentives Program**

- |   |    |
|---|----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | no |
|---|----|

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates	0	92	10450
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	

### Option B: CII Conservation Program Targets

---

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	1.97
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	17.75

### B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	12356	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 11/

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **City of Fullerton**      BMP Form Status: **100% Complete**      Year: **2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes  
 If No, please explain why on Line B. 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply. CII Sector or subsector  
CII ULFT Study subsector targeting

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

We found CII sectors and sub sectors most effective because we were able to version our marketing efforts appropriately.

2. How does your agency advertise this program? Other print media  
Direct letter  
Bill insert  
Newsletter  
Web page  
Newspapers  
Trade publications  
Trade shows and events  
Telemarketing  
 Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

For the purposes of this program, Trade Allies have proven to be the most effective overall marketing tool, as well as the most effective per dollar expended. Trade Allies include plumbers, distributors, retail home improvement stores and product manufacturers.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes
3. What is the total number of customer accounts participating in the program during the last year ? 0

**CII                      Number of Toilets Replaced**

**Subsector**

4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount	Type Not Specified
a. Offices	0	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0
c. Hotels	0	0	0	0	0
d. Health	0	0	0	0	0
e. Industrial	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0
g. Eating	0	0	0	0	0
h. Govern-ment	0	0	0	0	0
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program?

Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up.

Telephone

Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- |                                     |   |
|-------------------------------------|---|
| a. Disruption to business           | 1 |
| b. Inadequate payback               | 3 |
| c. Inadequate ULFT performance      | 2 |
| d. Lack of funding                  | 5 |
| e. American's with Disabilities Act | 0 |
| f. Permitting                       | 0 |

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

Customers are generally more willing to participate in the program if the cost of the retrofit is in balance with the amount of the rebate, and the projected water savings is significant. Resistance occurs if the out-of-pocket expense for the retrofit is too costly and the rebate amount is too low.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs

in line with expectations and budgeting?

Either Metropolitan or its Agencies to provide this response.

### **C. Conservation Program Expenditures for CII ULFT**

#### **1. CII ULFT Program: Annual Budget & Expenditure Data**

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

#### **2. CII ULFT Program: Annual Cost Sharing**

a. Wholesale agency contribution	0
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

### **D. Comments**

Reported as of 11/

**BMP 11: Conservation Pricing**

Reporting Unit:  
**City of Fullerton**

BMP Form  
Status:  
**100% Complete**

Year:  
**2004**

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$11858512
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$21200

**2. Commercial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$2998013
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$233200

**3. Industrial**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$1648640
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$84800

**4. Institutional / Government**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$370883
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$26500

**5. Irrigation**

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$726793
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$40280

**6. Other**

a. Water Rate Structure	Uniform
-------------------------	---------

b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$172523
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$95930

### **B. Conservation Pricing Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	35200	35200
2. Actual Expenditures	35200	

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
---	----

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Reported as of 11/

**BMP 12: Conservation Coordinator**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 10%
  - b. Coordinator's Name David Schickling
  - c. Coordinator's Title Water System Manager
  - d. Coordinator's Experience and Number of Years 11 months with the City; 11 months as Conservation Coordinator
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**



Reported as of 11/

**BMP 13: Water Waste Prohibition**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Cordinance 2436-Fullerton Municipal Code Section 12.04.090-No person, firm, or corporation shall waste, cause, permit, or allow to be wasted, any water in any cooling system.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Fullerton

None

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- |  |     |
|--|-----|
| a. Gutter flooding   | yes |
| b. Single-pass cooling systems for new connections                   | yes |
| c. Non-recirculating systems in all new conveyor or car wash systems | yes |
| d. Non-recirculating systems in all new commercial laundry systems   | yes |
| e. Non-recirculating systems in all new decorative fountains         | yes |
| f. Other, please name  | no  |

2. Describe measures that prohibit water uses listed above:

This ordinance is part of the Fullerton Municipal Code. The City reviews new construction and tenant improvement plans for potential water efficiency violations.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- |  |    |
|--|----|
| a. Allow the sale of more efficient, demand-initiated regenerating DIR models.   | no |
| b. Develop minimum appliance efficiency standards that:  |    |
| i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.  | no |
| ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.   | no |
| c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. | no |

4. Does your agency include water softener checks in home water audit programs? no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

### **C. Water Waste Prohibition Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **E. Comments**

Reported as of 11/

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit:

BMP Form Status:

Year:

**City of Fullerton****100% Complete****2004****A. Implementation**

	<b>Single-Family Accounts</b>	<b>Multi- Family Units</b>
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

**Number of Toilets Replaced by Agency Program During Report Year**

<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	64	17
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	881	1149
<b>Total</b>	<b>945</b>	<b>1166</b>

6. Describe your agency's ULFT program for single-family residences.

The City of Fullerton participates in a region wide ULET rebate program for both SF & MF. MWDOC administers the program on our behalf. They contract with a vendor to market the program and facilitate the rebate process for our customers. The "other" program is a distribution program that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULET's to our customers.

7. Describe your agency's ULFT program for multi-family residences.

The City of Fullerton participates in a region wide ULET rebate program for both SF & MF. MWDOC administers the program on our behalf. They contract with a vendor to market the program and facilitate the rebate process for our customers. The "other" program is a distribution program that MWDOC administers on our behalf. They contract with a separate vendor that facilitates the distribution of ULET's to our customers.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	7000	7000
2. Actual Expenditures	7000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP

differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

# APPENDIX K

Energy and Resource Management Committee Memorandum





## ENERGY & RESOURCE MANAGEMENT COMMITTEE

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May 13, 2016

City of Fullerton  
303 W. Commonwealth Ave  
Fullerton, CA 92832

Honorable City Council,

At its regular meeting on May 13, 2016, the Energy and Resource Management Committee (ERMC) received a presentation from the City's consultant, Arcadis, Inc, on the Urban Water Management Plan (UWMP).

The ERMC unanimously voted to recommend to the City Council approval of the UWMP.

Sincerely,

A handwritten signature in blue ink, reading "Patrick W. McNelly", is written over a horizontal line.

Patrick McNelly, Chairman  
Fullerton Energy and Resource Management Committee

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Chairman Patrick McNelly, Vice-Chair Sheridan George  
Wesley Smith, Gretchen Cox, Leena Rai, William Kahng  
Kristin Prior, Charles Kim, Aaruni Thakur, Monica Robledo

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