Laguna Beach County Water District

2015 Urban Water Management Plan

Karen E. Johnson, Water Resources Planning

June 2016

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LAGUNA BEACH
COUNTY WATER DISTRICT

2015 Urban Water Management Plan

June 2016

Prepared With Assistance From:
Karen E. Johnson, Water Resources Planning

Contact Sheet

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Date of Public Hearing:	June 14, 2016
Plan Adoption Date:	June 15, 2016
Resolution Number:	813
Plan Submitted to Department of Water Resources:	by July 1, 2016
The water supplier is a:	Special District – retailer
Utility services provided by the water supplier include:	Water
Public Water System Number:	3010017
Is the agency a Bureau of Reclamation Contractor?	No
Is the agency a State Water Project Contractor?	No
Plan Preparer:	Karen E. Johnson, Water Resources Planning kejwater@aol.com

Laguna Beach County Water District
Orange County, California

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Laguna Beach County Water District

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Chapter 1 – Introduction and Overview

1.1 Background

The Laguna Beach County Water District (District/LBCWD) was incorporated as a County Water District in 1925 and operates as a Special District under the Water Code Section 30000 et. seq. On June 3, 1998, the District and City of Laguna Beach filed an application with the Local Agency Formation Commission (LAFCO) of Orange County California for the District to operate as a subsidiary district of the city while continuing to exist as a special district with all the powers, rights, duties, obligations, and functions provided for by the Water Code.

The reorganization of the District became effective November 1, 2000 with the Laguna Beach City Council members sworn into office as the Ex-Officio Board of Directors (Board). The Board meets quarterly. A five-member Commission is appointed by the Board to serve in an advisory capacity. The Commission meets once per month.

The District serves potable water to a population of approximately 19,225 people within a portion of the City of Laguna Beach, including small areas of unincorporated lands, through 8,636 service connections. Since the 1940's, the District has relied 100 percent on imported water from the Metropolitan Water District of Southern California (MWD) through the Municipal Water District of Orange County (MWDOC). The District's service area, shown on Figure 1, is largely built out with primarily single-family homes and some commercial uses. This boundary is the same as the Orange County Local Agency Formation Commission designated Sphere of Influence for the District. The service area has a vibrant downtown business district, neighborhood commercial uses along Coast Highway, and professional office buildings and additional retail uses scattered throughout the City. The District does not serve the southern portion of Laguna Beach. The District also sells potable water and provides contract services to Emerald Bay Service District (EBSD), a community services district, under a service contract. The District works closely with the City of Laguna Beach as most of the District's service area is within the city.

This Urban Water Management Plan (UWMP) was prepared in response to the Urban Water Management Planning Act (Act), Water Code Sections 10610 through 10657, which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. The Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt an UWMP. The Act requires suppliers to describe and evaluate sources of water supply, efficient use of water, demand management measures, implementation strategies and schedules, and

other relevant information and programs. Sections of this UWMP that correspond to the Act are summarized in Appendix A - UWMP Checklist.

Amendments have been added to the Act since its inception. The most significant change to the Act was the Water Conservation Act of 2009, also known as SB X7-7. This act requires urban suppliers to establish water use targets for 2015 and 2020 that would reduce the statewide average per capita daily water consumption by 20 percent by December 31, 2020, and track its progress with an incremental goal of 10 percent by December 31, 2015.

Amendments to the Act since the 2011 UWMP include new submittal requirements involving standardized forms and mandatory electronic submittals, a water loss analysis using the American Water Works Association template, and optional tasks to address energy intensity reporting and climate change vulnerability. In addition, a different method of describing District demand management measures is required and water suppliers are required to comply with SB X7-7 water conservation requirements to be eligible for State water grants or loans.

This UWMP was prepared in accordance with the requirements under the Act that urban water purveyors submit an UWMP to the DWR every five years. This 2015 version is an update to the District's 2010 UWMP. Although not required to look beyond 20 years, the District included supply and demand data to the year 2040 to be consistent with other MWDOC member agencies.

District staff, with the assistance of a consultant – Karen E. Johnson, Water Resources Planning – prepared the 2015 UWMP. In preparing the UWMP, staff utilized the Department of Water Resources *Guidebook for Urban Water Suppliers* (DWR, 2016), and other references listed in Appendix B. The format of the UWMP has changed since the 2010 UWMP to succinctly integrate DWR's mandatory tables into the text.

1.3 Utilization of Other Planning Documents

This 2015 UWMP was prepared by utilizing relevant planning documents prepared by the District and other entities within the service area and region. These include documents such as the District's Water Master Plan, City of Laguna Beach General Plan, Orange County Water District (OCWD) groundwater management plan, MWDOC 2015 UWMP, MWD 2015 UWMP, among others.

Chapter 2 – Plan Preparation

2.1 District Public Water System

The District is a public water system regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. Public water systems are defined as a system providing water for human consumption with 15 or more service connections or regularly serving at least 25 individuals daily at least 60 days out of the year. As described in Chapter 1, retail water systems with 3,000 or more connections or 3,000 acre-feet of water supplied are required to prepare an UWMP. Table 2-1 presents the system identification, number of connections, and amount of water supplied in 2015.

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
3010017	Laguna Beach County Water District	8,636	3,630
	TOTAL	8,636	3,630
NOTES:			

2.2 Coordination

The District is a member of MWDOC. MWDOC is a member agency of MWD, the regional wholesaler of imported water. MWDOC serves all of Orange County except for the cities of Anaheim, Fullerton, and Santa Ana, which are member agencies of MWD. The District coordinated the development of this UWMP with MWDOC. In accordance with the Act, the District provided its imported water needs to MWDOC. MWDOC and MWD documented available quantities of imported supplies, including the reliability of those supplies for retailers in their respective regional UWMPs. References are made to these documents.

As a wholesale water supplier to 28 member agencies, MWDOC prepared an UWMP for its service area and developed a Regional Alliance to address the requirements of the SB X7-7 reporting requirements for the 2015 and 2020 water use targets. MWDOC purchases imported water from MWD and distributes the water to its member agencies, which provide retail water services to the public. Table 2-2 indicates that the District's UWMP is an individual plan, and is a part of MWDOC's Regional Alliance.

An individual agency, such as Laguna Beach County Water District, can meet its urban water use target within its retail service area or through a Regional Alliance. Although the Orange County 20X2020 Regional Alliance reports the achievement of SB X7-7 targets and baseline estimates as a group, and thus compliance with the targets is adequate for individual agencies pursuing grants and loans, this document also presents the individual District compliance with targets.

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Table 2-3 indicates that the District is first and foremost a retail agency that also sells a small amount of water to EBSD. This UWMP presents water consumption and production data in calendar years ending with 2015. The quantities presented in this document are consistently presented in acre-feet (AF).

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

The District worked with MWDOC to provide consistency in its exchange of data and information, as presented in Table 2-4. Compliance with the coordination, noticing, and reporting requirements for the UWMP is presented in Chapter 10.

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
Municipal Water District of Orange County (MWDOC)
Orange County Water District (OCWD)
NOTES:

Chapter 3 – System Description

3.1 District History

Until the early 1920's, the residents of Laguna Beach relied on a few privately owned shallow wells and intermittent rainfall for their water supply. By 1924, growth in Laguna Beach had been so rapid that the private water system could not produce an adequate supply. The heavy pumping exhausted the supply and soon saltwater intrusion and well failure forced the company to discontinue water service. Conditions were so bad that many residents drove to the old county well in Laguna Canyon for water; demand was so great in the summer that residents had to wait for hours before they could draw water.

By the fall of 1924, village residents formed a citizen's committee to search for a reliable water supply with the search pointing toward the Santa Ana River Basin. These pioneer leaders, pretending to be duck hunters, bought 120 acres in Huntington Beach to form a duck-hunting club, but really purchased the City's future water supply.

The Board of Supervisors called for an election on May 4, 1925, and residents went to the polls and approved the formation of the LBCWD by a vote of 359 to 0. One year later, District voters approved a bond issue to purchase the land in Huntington Beach and construct facilities required to pump and convey the water 20 miles south to the District's service area. The system was completed by spring 1927. The original bond was paid off in 1955.

Introduction of water from wells in the Lower Santa Ana River Basin solved Laguna's water problems for several years. However, other water producers in the Basin sued the District to prevent the groundwater production and export to Laguna Beach. In 1933, the Orange County Superior Court determined the right of the District to pump and export 2,025 acre-feet of groundwater from the Lower Santa Ana River Basin each year. Over time, pumping throughout the basin increased, groundwater elevations fell, and seawater intruded into the Lower Santa Ana River Basin. By 1941, Laguna's water supply had again become salty and unreliable.

Deterioration in the quality of the groundwater caused the District to assist in the formation of Coastal Municipal Water District (CMWD) and to purchase Colorado River water through CMWD from MWD in 1943. The District's well field in the Santa Ana River Basin remained in operation until 1948. The District then relied entirely on the imported supply purchased from CMWD through MWD. In January 2001, CMWD consolidated with MWDOC and the District continued to be 100 percent reliant on imported water from MWD through MWDOC. Recently, the District has clarified its rights and intent to exercise its groundwater rights in the Lower Santa Ana River basin as a near term source of water. This is described under system supplies in Chapter 4.

3.2 Service Area Physical Description

The District's service area includes northern Laguna Beach with a portion of Crystal Cove State Park, the main urbanized area of Laguna Beach not including the south end of the city, and along Laguna Canyon Road north to Sycamore Hills neighborhood off El Toro Road. The service area is characterized by gently rolling areas to steep hillsides climbing from sea level to 1,000 feet above sea level. The service area is edged to the north and east by the Laguna Greenbelt, which encompasses 10,000 acres of largely undeveloped lands, separating the service area from other communities in the county. The greenbelt is primarily under the land use authority of the County of Orange and the State of California. To the north, the service area extends beyond the City of Laguna Beach into this greenbelt to include the Crystal Cove State Park. Laguna Canyon separates the Laguna Coast Wilderness Park from the Aliso and Wood Canyons Wilderness Park.

The service area, presented on Figure 1, covers almost 8.5 square miles and has 8,636 service connections for 19,225 residents as well as businesses. The District provided 3,630 acre-feet per year (afy) or 3.24 million gallons per day (mgd) of potable water to its service area and EBSD. Although the service area does not include the unincorporated community of Emerald Bay, the District wholesales water to EBSD; 260 afy was provided to EBSD in 2015. South Laguna, which was annexed to the City in 1987 but not the District, is served by South Coast Water District (SCWD). The service area boundary has not changed since the last UWMP.

There are 21 storage reservoirs with a total storage capacity of 33.5 million gallons (mgal) within five pressure zones within the District. These reservoirs are used for daily fluctuations in demand while providing approximately ten days of water to the community in the event of an emergency. The Zitnik Reservoir, completed in 2000, further improves distribution supply by increasing emergency water storage 22 percent. The District's efforts have resulted in superior fire suppression and water supply ratings, which have benefited the community with reduced insurance costs.

District staff operates and maintains 36 pumps in 14 pumping stations. The distribution system includes 136 miles of pipelines ranging in diameter from 4 to 16 inches. Transmission lines bringing imported water to the District include the Aufdenkamp and Coast Supply transmission lines which range from 24 to 42 inches in diameter. The District is the lead agency in a joint powers partnership with SCWD, Irvine Ranch Water District (IRWD), the City of Newport Beach, and the Santa Margarita Water District (SMWD) to convey water from MWD in these jointly held facilities.

Figure 1: Laguna Beach County Water District Service Area

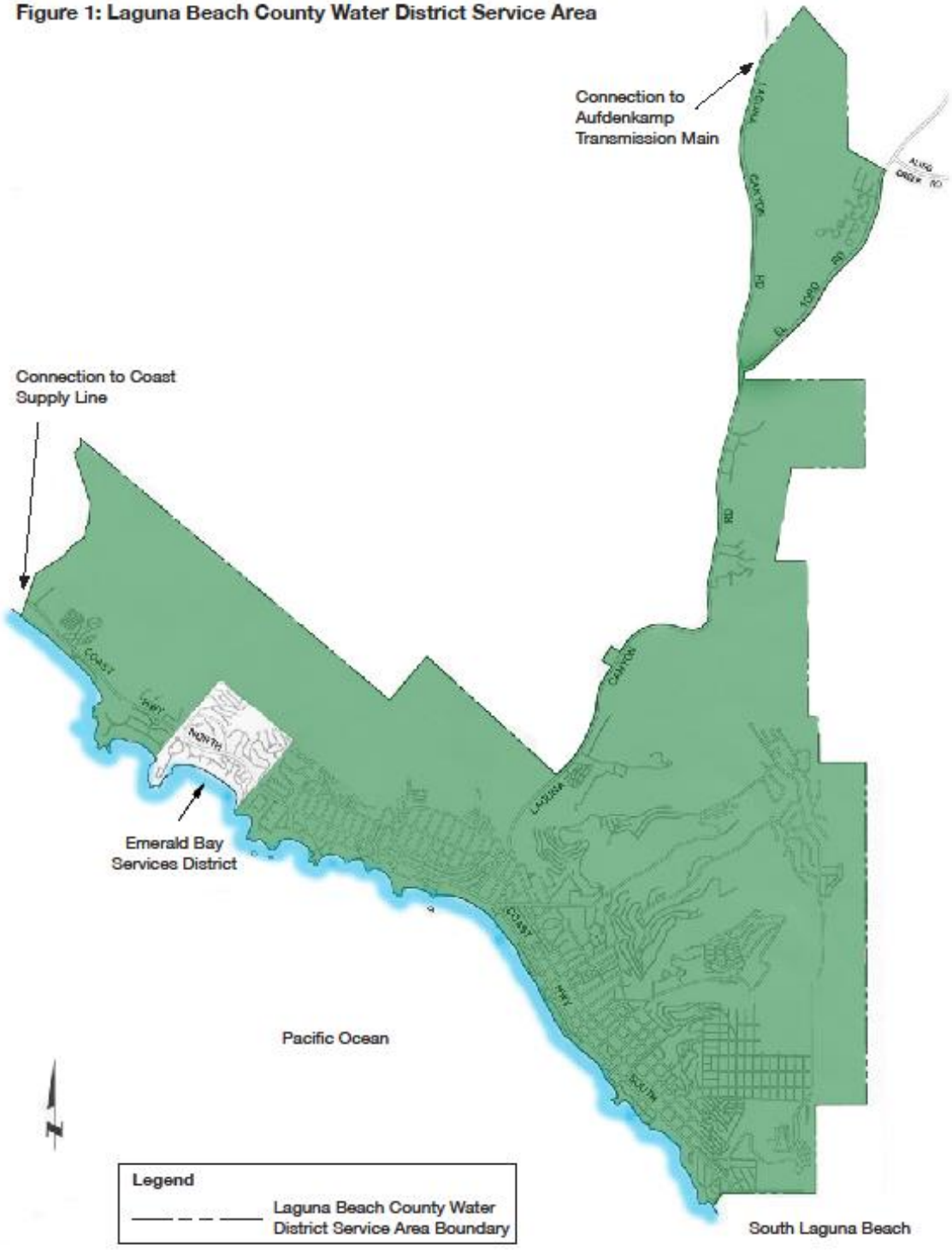

Figure 2. MWD Feeders and Transmission Mains

Source: MWDOC, 2016

3.3 Service Area Climate

Climate plays an important role in the demand for water within the District's service area. Temperature, rainfall, and wind are typical of the Mediterranean climate characterized by mild winters, warm summers, moderate rainfall and general year round sun (with the exception of coastal morning fog during the spring and summer months). Temperatures in Laguna Beach average 62° Fahrenheit year round, 69° Fahrenheit during summer months, and 55° Fahrenheit in the winter. The annual standard average evapotranspiration rate is 47.56 inches.

Average annual rainfall in Laguna Beach is 12 to 13 inches, depending on the location within the service area. Over 90 percent of the rainfall occurs between late October and early April. Higher elevations of the San Joaquin Hills generally receive an annual rainfall of 14 to 15 inches. Distribution of rainfall in the hills is extremely irregular and can vary by more than two inches per year. Torrential downpours can occur in one section of the hills, while another section receives only light showers. Much of the rain that falls on the crest and on the side slopes of the San Joaquin Hills emerges in wet years as springs and seepages near the foot of the northern slopes and generally at the base of the terrace deposits where impermeable rock is encountered. These springs remain active during most of the summer.

Wind, in combination with other climatic and geographic features, is a significant aspect of the District's physical setting. Prevailing winds in Laguna Beach are sea breezes that are generally low in velocity, attaining speeds of 10 to 20 mph. Typically, sea breezes are beneficial to the community because they propel air pollutants inland and provide a cooling effect during the warm summer months, thus keeping outdoor irrigation demands low. In addition to prevailing sea breezes, Laguna Beach occasionally experiences seasonal winds during the fall and winter months referred to as Santa Ana winds. Santa Ana winds are hot, dry northerly to northeasterly winds, which often attain velocities in excess of 40 mph. Santa Ana winds are particularly damaging because they frequently occur during the driest season of the year, increasing the risk of rapidly spreading fires. These wind driven fires cause damage to structures and natural vegetation in the canyon areas and along the edges of the District's service area adjacent to the greenbelt, and increase fire fighting water demands.

3.4 Climate Change Impacts

Climate change and or greenhouse gas emissions are considered in city and county general plans, California Environmental Quality Act documents, and integrated regional watershed management plans (IRWMP). By considering potential water supply impacts resulting from climate changes in its UWMP, the District integrates this UWMP with these documents and supports water management functions. The District is a member of the IRWMP for South Orange County Watershed Management Area; the South Orange County Watershed

Management Area IRWMP document contains climate change objectives. Water conserved under the District's water use efficiency program has a direct correlation with reduced greenhouse gas emissions as energy is required to move, treat, use, and discharge water.

Information on the vulnerability of its water supplies and service area water demands is provided here to aid the District in preparing for and adapting to expected climate change impacts. By reducing reliance on imported MWD supplies, and relying on the heavily managed Orange County groundwater basin to meet its water demands, the District is reducing its vulnerability to climate change.

Because climate change is such a gradual process, it can be difficult to distinguish the changes described below from the usual variability in supplies and demands. However, MWD is increasing its water supply options to compensate for State Water Project (SWP) and Colorado River reductions. The District will continue to adapt to changing conditions within its service area, as well as maintain its aggressive water use efficiency efforts to reduce greenhouse gas.

3.4.1 Imported Supply and Service Area Impacts

According to the Public Policy Institute of California,

> "…Air temperatures are projected to increase throughout the state over the coming century. Sea level is expected to rise 39 to 55 inches by 2100, and the frequency of extreme events such as heat waves, wildfires, floods, and droughts is expected to increase. Higher temperatures will result in more rain and less snow, diminishing the reserves of water held in the Sierra Nevada snowpack."(PPIC, 2011)

The following impacts to the District's imported supply are anticipated, resulting in reduced SWP deliveries and supply outages. MWD is anticipating these impacts and is diversifying its supply portfolio and increasing groundwater banking to compensate for reduced SWP deliveries. The District, understanding its vulnerability, has reduced its reliance on imported supplies by accessing the groundwater supply.

- An increase in average surface temperatures of 5.5 to 10.4 degrees Fahrenheit is anticipated by the end of the century, resulting in up to four times as many heat wave days in urban centers.
- Heat waves will increase in frequency, magnitude, and duration.
- Longer, drier, and more frequent periods of droughts anticipated with up to 2.5 times the number of critically dry years by the end of the century. Modest changes in precipitation can have a large impact on runoff. Lower inflows will make it more difficult to repel salinity in the Sacramento River - San Joaquin River Delta (Delta).

- About 25 to 40 percent of the Sierra snowpack may be lost by 2050. Higher temperatures increase the ratio of rain to snow, accelerate the rate of spring snowmelt, and shorten the overall snowfall season, leading to more rapid and earlier seasonal runoff.
- Over 55 percent increase in risk of large wildfires is anticipated. Fires result in changes in vegetation and eventually a reduction in water supply and storage capacity in the Sierras.
- More severe (e.g., frequency, intensity) and warmer winter storms are likely to occur, increasing runoff and flooding which could cause Delta levee failure.
- Increased tidal salinity intrusion to the Delta from sea level rise, lower inflows, and Delta levee failures. Without major changes to in-Delta facilities, more fresh water will be needed to repel seawater and maintain water quality standards, especially during drier years.
- Degraded water quality of Delta supplies is anticipated due to changing temperatures, flows, runoff rates and timing, and the ability of watersheds to assimilate wastes and pollutants. Lower Delta inflows during certain times of the year will degrade water quality by increasing temperatures and minimizing the dilution effects of runoff and wastewater discharges. Warmer water can accelerate some biological and chemical processes, increasing growth of algae and microorganisms. Higher winter flows will increase contaminant loadings from nonpoint sources. Intense rainfall following wildfires can degrade water quality. (Santa Barbara, 2009)

Since winter snowpack in the Sierra Nevada functions as a major water storage system, this will have serious consequences to annual supply availability in all systems that rely on the runoff. These impacts to statewide water supplies originating from the Delta watershed, as well as current flood control practices on Sierra Nevada reservoirs, will reduce MWD's supplies from the SWP. In addition, flooding in the Delta could have devastating impacts on the reliability of Delta exports with supply outages anticipated for up to one year.

MWD also obtains water from the Colorado River. Colorado River flows are anticipated to decrease by 5 to 20 percent in the next 40 years, according to Brad Udall, director of the University of Colorado Western Water Assessment. Earlier runoff and lower flows from the Rocky Mountains later in the year are also anticipated (Zeilinski, 2010).

3.4.2 Groundwater Supply

Due to sea level rise, the District's groundwater supplies will have increased pressure on the seawater barriers, perhaps requiring more injection supply to prevent contamination of Orange County Basin groundwater supplies. OCWD's conjunctive use management of the Basin will take on even greater importance as increased quantities of imported surface water will likely be

required to recharge the Basin, and as more frequent and more intense heat waves and extended dry periods deplete resources and increase demands for those resources. With the reduced Sierra snowpack, groundwater storage throughout the state will be more important as early thaws will require new storage facilities to be made available.

3.4.3 Sea Level Rise

The Pacific Institute analyzed impacts from sea level rise of 55 inches and indicated that the most serious impacts to Laguna Beach will be along Main Beach and downtown, just south of the El Moro Visitor Center/campground in Crystal Cove State Park, and south of the District service area along Aliso Creek and Country Club Road along the SOCWA Aliso Creek ocean outfall alignment. Flooding and/or erosion along the coast, depending on specific areas of impact, will affect water and sewer pipelines and pumping facilities.

3.4.4 Water Demands

Climate change is anticipated to impact water demands through more frequent and more intense heat waves and extended dry periods, which will cause increases in demands in the District's service area. This is evident in demand patterns associated with the first dry water year. It is not known yet if changes in precipitation patterns will offset these increases. In addition, with drier conditions, wildfires in the San Joaquin Hills will likely be more frequent, thus increasing demands for District water supplies used to contribute to suppression. For long-term planning, DWR recommends that local agencies assume a 20 percent increase in the frequency and duration of future dry conditions.

3.5 Service Area Population and Demographics

The District has experienced continuous growth in population since its formation in 1925. In 1927, the population of the City of Laguna Beach approached 1,500 people; the City's total population in 2015 was 23,300; this population includes areas outside of the District service area. Laguna Beach has changed from a rural agricultural, weekend and summer resort area to a permanent, year-round, urbanized area. The total permanent residential population in the District service area is relatively constant at 19,225. However, because Laguna Beach is a popular vacation and recreation area proximate to Southern California metropolitan areas, the seasonal population can double or triple in the summer. During July and August, the resident population within the City of Laguna Beach increases to approximately 45,000 with a daily influx of visitors estimated between 25,000 and 35,000 people (Laguna Beach, 2010).

The City of Laguna Beach General Plan guides development within the majority of the District's service area. The City is essentially built out, except for limited infill development of vacant legal parcels in the existing residential neighborhoods and commercial areas. Some increase in

water demands is also anticipated for redevelopment of existing, underutilized lands with increased densities. The majority of vacant land is constrained by steep terrain and access difficulties. Most open space around the City has been acquired by the City or the County with easements for park and open space uses.

Historical population estimates prepared for MWDOC by the Center for Demographic Research at California State University Fullerton (CDR) indicate a 2015 District service area population of 19,225. This estimate does not include South Laguna. The community of Emerald Bay is not included in the CDR population estimates; its separate population is estimated to be approximately 1,200. Emerald Bay was deannexed from the LBCWD in 2004. The EBSD is responsible for providing the community of Emerald Bay with water and is a District wholesale customer under contract to the District. Emerald Bay is a gated community with common facilities such as pool, tennis courts, and landscaping and is fully built out. The current and projected LBCWD service area population is presented in Table 3-1.

Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040 *(opt)*
	19,225	19,907	19,915	19,931	19,929	19,926

NOTES: Population from CSUF Center for Demographic Research, 2016. Does not include EBSD and South Laguna.

Water usage due to new development is not expected to substantially increase over the next 20 years. In fact, through the District's encouragement of drought resistant landscaping, water use efficiency, and changes in behavior to limit urban runoff and improve the quality of ocean water, it is anticipated that existing water use will decline. With most of Laguna Beach developed and no change anticipated to the District's LAFCO Sphere of Influence for expansion, water demand projections were based on population projections adapted to reflect developable lands consistent with the General Plan.

Demand projections presented in Chapter 4 reflect the development of all vacant parcels with the remainder of the increase in projected population, assumed to be absorbed by increased densities of existing uses (e.g., new Second Residential Units, more multigenerational households and other causes of increased people per households, redevelopment or reuse of existing development, etc.).

Chapter 4 – System Water Use

The past, current, and projected water demands are discussed in this section, along with system losses, and projected water demands for planned low-income households.

4.1 Water Demands

The District has several billing classifications: single family residential, multi-family residential, commercial (which includes industrial, hotels, and institutional/government), landscape, and mixed uses. Mixed uses have a residential use along with commercial or other use. Table 4-1 presents the actual 2015 deliveries by water use sector including sales to EBSD and water losses. Losses are described in Section 4.3 and were approximately 9.8 percent in 2015.

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

Use Type *(Add additional rows as needed)*	2015 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family		Drinking Water	1,875
Multi-Family		Drinking Water	474
Commercial		Drinking Water	456
Institutional/Governmental		Drinking Water	121
Landscape		Drinking Water	115
Sales/Transfers/Exchanges to other agencies	Emerald Bay Service District	Drinking Water	260
Losses		Drinking Water	329
		TOTAL	3,630

NOTES: Commercial includes industrial and mixed uses.

The District wholesales potable water to EBSD by contract agreement. Actual water sales in 2015 to EBSD were identified and quantified in Table 4-1. The Agreement between the District and EBSD is located in Appendix C.

4.2 Demand Projections

Table 4-2 presents water demand projections through 2040 estimated by MWDOC for the District service area. The projected increase in population within the District service area between 2015 and 2040 is 701 additional people. There is limited land available for new

development. Sales to EBSD of 272 afy reflect average sales over the previous five years. Water losses are assumed to be seven percent for future conditions with greater efficiencies.

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

Use Type *(Add additional rows as needed)* ***Drop down list*** *May select each use multiple times* *These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
		2020	2025	2030	2035	2040
Single Family		1,688	1,851	1,858	1,834	1,827
Multi-Family		426	467	469	463	461
Commercial		410	450	451	445	444
Institutional/Governmental		109	119	120	118	118
Landscape		103	113	114	112	112
Sales/Transfers/Exchanges to other agencies		272	272	272	272	272
Losses		226	246	247	244	243
TOTAL		3,234	3,519	3,531	3,488	3,477

NOTES: Commercial includes institutional/government and industrial uses.

Total water use for the District is comprised of water deliveries, sales to EBSD, and unmetered uses and losses. Table 4-3 presents the total actual and projected water demands summed from Tables 4-1 and 4-2. Table 4-3 also includes current and projected recycled water demands discussed in Chapter 6.

Table 4-3 Retail: Total Water Demands

	2015	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	3,630	3,234	3,519	3,531	3,488	3,477
Recycled Water Demand* *From Table 6-4*	0	70	70	70	70	70
TOTAL WATER DEMAND	3,630	3,304	3,589	3,601	3,558	3,547

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

4.3 Distribution System Water Losses

Losses presented in Table 4-1 reflect the physical water losses from the water distribution system and storage facilities, up to the customer meter. This difference between water production and billed consumption has been quantified for the District in accordance with a water system balance methodology developed by American Water Works Association. This analysis reflects the most recent 12 month period available consistent with the District's year reporting: CY2015 and is presented in Table 4-4. The worksheet is provided in Appendix D.

Losses are projected in Table 4-2 in five-year increments, based on 7.0 percent. For this 2015 UWMP, an estimate of 2015 distribution system water losses is required; for the 2020 UWMP, the District will report losses for each of the years 2016 through 2020.

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

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2015	329
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES:	

4.4 Estimating Future Water Savings

Conservation savings were estimated by MWDOC and included in the water demand projections presented in Table 4-2. The projected demands accommodate the increase in population and an increase in future water savings associated with conservation outreach. Table 4-5 indicates factors included in the projections.

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

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	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.	2012 General Plan Land Use Element
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES: Low and very low income housing needs based on City of Laguna Beach Housing Element, 2014.	

4.5 Water Use for Lower Income Households

SB 1087 requires water providers to grant priority service hook-ups to lower income housing developments. The District passed a resolution in October 2006 (Resolution No. 701) establishing written policy for the provision of water service to developments that include housing units affordable to lower income households. The resolution states that if there is any shortfall in the capacity of the District to provide water service, then it will reserve from its then uncommitted water supplies, an amount equivalent to the demands of the planned housing units affordable to lower income households.

The UWMP Act requires documentation of future water demands associated with planned new lower income housing by the local land use planning jurisdiction. The City's updated Housing Element of the General Plan indicates the need for new construction of two total low- and very low-income units within the City by 2021. Water demands for planned low-income housing by 2021 were based on a ten percent reduction in existing per capita demands for 2021. New demands associated with planned low-income housing are less than one acre-foot by 2021 and are included in the District demand projections. This is indicated in Table 4-5.

Chapter 5 – Baselines and Targets

This section describes the base period ranges used to establish the baseline per capita water demands. Water use targets in conformance with SB X7-7 are described for 2020 and the interim target of 2015. Although the UWMP uses acre-feet as its unit of measurement throughout this document, gallons per capita per day (gpcd) is used frequently in this chapter. The gpcd is calculated by dividing total District water production by population, not just residential water use.

5.1 Establishing Baselines

Table 5-1 presents the base period ranges for the District's 10-year (1995-96 through 2004-05) and five-year (2003-04 through 2007-08) periods. A 10-year base period range was used instead of a 15-year base period range because the District was not using recycled water in 2008. The baseline daily per capita consumption for the 10-year period was 202 gpcd. This is an important number as the targets are based on reducing this consumption level.

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	*1995-96*	*2004-05*	*202*	*182*	*162*
5 Year	*2003-04*	*2007-08*	*196*		

*All values are in gallons per capita per day (GPCD)

NOTES: Historical population was updated by CDR and used in the SB X7-7 tables to calculate baseline.

The SB X7-7 worksheets were prepared and submitted to DWR. In these worksheets, found in Appendix E, the District population served, water supplied, and per capita consumption for each of the years within the 10-year range and the 5-year range were documented. The population estimates from the 2010 UWMP were recalculated to reflect updated Department of Finance estimates; MWDOC provided the population estimates from CDR, which reflected a change in population from 2000 through 2015. Data were reviewed to determine if a different 10-year baseline would be advantageous, but the period selected for the 2010 UWMP,

presented in Table 5-1, was found to still be the most appropriate. The resulting 10-year baseline did not change substantially between the 2010 UWMP and this 2015 UWMP, from 201 to 202 gpcd. Although the 5-year baseline increased from 187 to 196 gpcd, it does not change the targets.

The five-year baseline is a target confirmation. It is needed to determine whether the 2020 target meets the legislation's minimum water use reduction requirements of at least a five percent reduction per capita for a five-year continuous period that ends no earlier than December 31, 2007 and no later than December 31, 2010. The baseline daily per capita consumption for the five-year period was 196. Ninety-five percent of the five-year base is 186 gpcd. As discussed next under targets, 186 gpcd is higher than the 2020 target for the District of 162 gpcd, thus the District target is greater than a five percent reduction per capita over the five-year period.

5.2 Establishing Targets

DWR provided four different methods to establish water conservation targets.

- **Method 1– Baseline Reduction Method.** The 2020 water conservation target of this method is defined as a 20 percent reduction of average per capita demand during the ten-year baseline period described above. This equates to a 2020 target of 162 gpcd for the District.

- **Method 2 – Efficiency Standard Method.** This target is based on calculating efficiency standards for indoor use separately from outdoor use for residential sectors and an overall reduction of 10 percent for commercial, industrial, and institutional (CII) sectors. The aggregated total of the efficiency standards in each area is then used to create a conservation target.

- **Method 3 – Hydrologic Region Method.** This method uses the ten regional urban water use targets for the state. A static water use conservation target for both 2015 and 2020 is assigned for Region 4: South Coast. The target for the entire South Coast region is 149 gpcd. Method 3 is based on the District reaching 95 percent of the South Coast Region target or 142 gpcd.

- **Method 4 – BMP Based Method.** This method uses previous water supplier BMPs to establish a conservation target for 2020. Depending on how aggressively the water supplier has pursued water reduction and conservation in the past, a new conservation target for 2020 is assigned.

5.2.1 Individual District SB X7-7 Targets

Individual agency targets are needed to meet the goal of a 20 percent reduction in per capita use by 2020 and the interim water use efficiency target of 10 percent by 2015 as set forth in the Water Conservation Act of 2009 (SB X7-7). Although a 2020 target was calculated in the 2010 UWMP, DWR has allowed agencies to update their 2020 target by using a different method than that used in 2010. Methodology 1 was selected in 2010, and again here, as the most appropriate methodology for the District to establish water use reduction targets to meet the requirements set forth in SB X7-7. Methodology 2 requires landscaping data that is not currently available. Methodology 3 resulted in a lower target than that desired by the District; and Methodology 4 requires DMM data that are not currently available.

Methodology 1 requires a straightforward technical analysis of reducing the baseline per capita consumption by the targets. The District baseline per capita consumption identified in SB X7-7 tables is 202 gpcd. A 10 percent reduction by 2015 would result in a 182 gpcd target. A 20 percent reduction would result in 162 gpcd by 2020. The worksheets to determine these targets are presented in the SB X7-7 Verification Form tables submitted electronically to DWR upon the adoption of this UWMP and located in Appendix E.

Based on the District's 2015 water demands, per capita consumption was 169 gpcd. The District has worked hard since the last UWMP in targeting conservation efforts to meet its per capita target. The 2015 demand of 169 gpcd is below the 2015 target of 182 gpcd, thus the District met its 2015 target individually.

5.2.2 Regional Alliance

The District is participating in a regional alliance with MWDOC. MWDOC formed a regional alliance for its 28 member agencies, of which LBCWD is a member, plus three other retail agencies in Orange County. Under the Orange County 20x2020 Regional Alliance, the entire region is able to benefit from local and regional investments, such as the Groundwater Replenishment System, recycled water, and water use efficiency programs that MWDOC and member agencies are implementing. MWDOC provides annual monitoring and reporting for the Orange County region on progress toward compliance with the targets.

If the regional alliance meets its water use target, all agencies in that alliance are deemed compliant regardless of individual performance. If the Orange County 20x2020 Regional Alliance fails to meet its target, each individual supplier in Orange County, including LBCWD, will have to meet its individual target.

Based on the Draft 2015 UWMP, MWDOC calculated the regional target for the alliance as 178 at 2015 and 158 gpcd at 2020. Because the 2015 water use was 125 gpcd, the regional alliance target for 2015 of 178 was met (MWDOC, 2016).

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

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
169	182	0	0	0	0	169	169	Yes

**All values are in gallons per capita per day (GPCD)*

NOTES: Table 5-2 reflects the District target. The Regional Alliance target was also met.

Chapter 6 – System Supplies

The District has historically utilized imported MWD treated water to meet its demands but will be adding a groundwater supply to the portfolio in the near future. Current and future water supplies are described in this chapter.

6.1 Purchased or Imported Water

MWD imports supplies to the region for MWDOC to wholesale to the District. During the previous five years, the District purchased an annual average of 3,710 acre-feet of imported water, while the average amount purchased over the past 10 years was approximately 4,000 acre-feet.

6.1.1 MWD Wholesale Supplies

As described in MWDOC's Urban Water Management Plan, over 17 million Southern Californians rely on MWD for imported water. MWD wholesales imported water supplies to member cities and water districts in six Southern California counties. MWD has provided between 45 and 60 percent of the municipal, industrial, and agricultural water used in its nearly 5,200 square-mile service area. The remaining supply comes from local wells, local surface water, recycled water supplies, and from the City of Los Angeles's aqueduct in the eastern Sierra Nevada.

Historically, MWD has been responsible for importing water into the region through its operation of the Colorado River Aqueduct and its contract with the State of California for SWP supplies. The future reliability of these supplies is increasingly uncertain; however, MWD has been working to increase its ability to supply water, particularly in dry years. MWD increased supplies received from the SWP by developing flexible Central Valley/SWP storage and transfer programs to deliver additional dry year supplies that can be conveyed through the Delta during dry years and during times of Delta regulatory restrictions. The MWD 2015 RUWMP provides detailed documentation of current and projected MWD supplies and deliveries to ensure supply reliability (MWD, 2016).

6.1.2 MWDOC's Role

MWDOC is a regional water wholesaler and resource planning agency, managing all of Orange County's imported water supply to 28 water purveyors, with the exception of water imported to the cities of Anaheim, Fullerton, and Santa Ana. These MWDOC member agencies,

comprised of cities and water districts, provide water to approximately 2.3 million customers in a 600 square-mile service area.

MWDOC is MWD's second largest member agency. To aid in planning future water needs, MWDOC works with its member agencies each year to develop a forecast of future water demand. The result of this coordination effort allows MWDOC to forecast the imported demand by subtracting total demand from available local supplies. MWDOC then advises MWD annually on how much water MWDOC anticipates to purchase during the next five years (MWDOC, 2010).

6.1.3 LBCWD Imported Purchases

Currently, 100 percent of the District's supply needs are met by water imported by MWD and purchased from MWDOC. Lake Mathews is located in western Riverside County east of the Santa Ana Mountains, 10 miles southwest of the City of Riverside. Lake Mathews was constructed in the 1930's as the terminal reservoir for MWD's Colorado River Aqueduct. It also receives local runoff and has historically received about four percent from the SWP and, as of recently, is capable of receiving a greater quantity of SWP supply via MWD's Inland Feeder.

When the District purchases imported water, raw water is conveyed from Lake Mathews via the Lower Feeder to the Robert B. Diemer Treatment Plant in Yorba Linda. The treated water is conveyed through the East Orange County Feeder No 2 to both the Aufdenkamp Transmission Main (a jointly owned regional facility) and Coast Supply Line (also a jointly owned facility). Figure 1 presents where these two facilities enter the District service area.

The reliability of MWD's supply was addressed in its 2015 RUWMP and in MWDOC's 2015 RUWMP and is summarized in Chapter 7. MWD ensures a highly reliable supply of water – over 100 percent of average annual demands – to its member agencies during average, dry year, and multiple dry years.

6.1.4 Sales to Emerald Bay Services District

The District wholesales treated water to EBSD through District distribution system facilities and administers all billings, connections, and disconnections. The source of supply has historically been the MWD/MWDOC imported water conveyed through the Coast Supply Line to the District. Approximately 272 acre-feet was sold, on average, to EBSD over the previous five years. Water sales to EBSD are included in the total District water demands presented in Table 4-1 for 2015 and projected in Table 4-2.

6.2 Groundwater Resources

Groundwater resources available to the District include the Orange County Groundwater Basin.

6.2.1 Orange County Groundwater Basin

This section describes the District's entitlement to Basin water. The groundwater management agency, Orange County Water District, is described here.

Laguna Beach Wells in the Lower Santa Ana River Groundwater Basin

In 1933, the District obtained an adjudicated right to 2,025 acre-feet of underground water storage in the Lower Santa Ana River Basin within the Orange County Groundwater Basin (Basin). This groundwater right originated in 1926. The court Judgment is provided in Appendix F. The Basin is managed by the Orange County Water District (OCWD). Although the District's rights to this water were adjudicated, the Basin overall has not been adjudicated but is closely managed.

In early 2016, the District executed an agreement with OCWD to allow LBCWD to resume pumping within the groundwater basin. The purpose of the project is to augment the District's water supply portfolio with alternative local sources to imported water. It is anticipated that delivery of groundwater to the District will occur in 2016.

OCWD Basin Management

OCWD manages the Basin under the Orange County Water District Act, Water Code App., Ch 40, which is described in numerous OCWD documents including the MWDOC UWMP 2015. OCWD manages the basin for the benefit of municipal, agricultural, and private groundwater producers and is responsible for the protection of water rights on the Santa Ana River in Orange County, as well as the management and replenishment of the Basin. The groundwater basin, which underlies north and central Orange County, provides approximately 66 percent of the water needed in that area; imported water meets the balance of the water demand. Basin producers pump groundwater and deliver to customers.

Total groundwater production from the Basin is approximately 300,000 afy. The framework for the production management is based on establishing the Basin Production Percentage (BPP). BPP is the ratio of groundwater production to total water demands expressed as a percentage. Pumping below the BPP, the District is charged a fee on a per acre-foot basis, called the Replenishment Assessment (RA). Groundwater production above the BPP is charged the RA and the Basin Equity Assessment (BEA), which is set so that the cost of pumping above the BPP reflects the costs of importing water to use to replenish the Basin. Thus a financial disincentive is provided for production above the BPP. The OCWD Board of Directors can annually adjust the

BPP. The BPP was established at 75 percent from 1993 to 2007 and reduced to 62 percent in 2009. It was lowered to reduce the accumulated overdraft in the Basin. The BPP is not an extraction limitation - exceedances result in financial assessments on excess production.

Description of Basin. According to the MWDOC 2005 RUWMP, the Orange County Groundwater Basin is dominated by a deep structural depression, containing a thick accumulation of fresh water bearing inter-bedded marine and continental sand, silt, and clay deposits. The proportion of fine material generally increases toward the coast, dividing the Basin into Forebay and pressure areas. Consequently, most surface water recharge is through the coarser, more interconnected and permeable forebay deposits. Strata in this Basin are faulted and folded and may show rapid changes in grain size. The Newport-Inglewood fault zone parallels the coastline and generally forms a barrier to groundwater flow. Erosional channels filled with permeable alluvium break this barrier in selected locations called "Gaps'. In addition to this geologic feature, increased pumping from inland municipal wells causes the coastal gaps at Talbert, Bolsa, Sunset, and Alamitos to be susceptible to seawater intrusion. The sediments containing easily recoverable fresh water extend to about 2,000 feet in depth near the center of the Basin. Although water-bearing aquifers exist below that level, water quality and pumping lift make these materials economically unviable at present. Well yields range from 500 to 4,500 gallons per minute, but are generally 2,000 to 3,000 gallons per minute.

Upper, middle, and lower aquifer systems are recognized in the basin. The upper aquifer system has an average thickness of about 200 to 300 feet and consists mostly of sand, gravel, and conglomerate with some silt and clay beds. Generally, the upper aquifer system contains a lower percentage of water-bearing strata in the northwest and coastal portions of the area where clays and clayey silts dominate. Accordingly, recharge from the surface to the groundwater basin may be minor in these areas. Recharge to the upper aquifer system occurs primarily in the northeastern portions of the Basin. With the exception of a few large system municipal wells in the cities of Garden Grove, Anaheim, and Tustin, wells producing from the shallow aquifer system predominantly have industrial and agricultural uses. Production from the shallow aquifer system is typically about five percent of total Basin production.

The middle aquifer system, also known as the "principal" aquifer system, includes the lower Pleistocene Coyote Hills and San Pedro Formations, which have an average thickness of 1,000 feet and are composed of sand, gravel, and a minor amount of clay. The primary recharge of the middle aquifer system is derived from the Santa Ana River channel in the northeast of the County. The middle aquifer system provides 90 to 95 percent of the groundwater for the Basin.

Increasing accumulated overdraft of the Basin since the late 1990s has prompted increased evaluation of the Basin's yield and how the yield can be optimized through projects and programs. As a response to various factors, including a series of years with below average precipitation and the increased accumulated overdraft, in 2003 OCWD reduced the BPP to

decrease pumping from the Basin. Currently, groundwater is produced from approximately 500 active wells within the Basin, approximately 300 of which produce less than 25 afy. Groundwater production from approximately 200 large capacity or large system wells operated by the 21 largest water retail agencies account for an estimated 97 percent of the total production. All but three of these large retail agencies, the cities of Anaheim, Fullerton, and Santa Ana, are within the MWDOC service area.

Working closely with OCWD, MWDOC has developed a water balance model, which incorporates OCWD's operating policies in managing the Basin. It is used to project the groundwater production for each producer in the Basin based on a range of assumptions provided by OCWD. Most of the assumptions involve replenishment supplies to the Basin. Historical groundwater flow was generally toward the ocean in the southwest, but modern pumping has caused groundwater levels to drop below sea level inland of the Newport-Inglewood fault zone. This trough-shaped depression encourages seawater to migrate inland, which if unchecked, could contaminate the groundwater supply. Strategic lines of wells in the Alamitos and Talbert Gaps inject imported and reclaimed water to create a mound of water seaward of the pumping trough to protect the Basin from seawater intrusion. In addition to operating the percolation system, OCWD also operates the Talbert Barrier in Fountain Valley and Huntington Beach and participates in the financing operation of the Alamitos Barrier in Seal Beach and Long Beach. The barriers help prevent seawater intrusion and also help refill the Basin (MWDOC RUWMP 2005).

Recharge Supplies. Sources of recharge water include Santa Ana River base flow and storm flow, Santiago Creek flows, imported supplies purchased from MWD, supplemental supplies from the upper Santa Ana River watershed, and purified water primarily from the Groundwater Replenishment System (GWRS). The GWRS - the world's largest wastewater purification system for indirect potable reuse - is located in Fountain Valley and takes highly treated wastewater and purifies it. The recycled supply is then used to recharge the Basin through spreading grounds along the Santa Ana River. The OCWD Groundwater Management Plan Update can be found in the electronic version of Appendix F of this report.

Basin Overdraft. DWR has not identified the Basin as overdrafted. OCWD's Act defines annual basin overdraft to be the quantity by which production exceeds the natural replenishment of groundwater supplies during a water year. Efforts undertaken by OCWD to eliminate long-term overdraft in the Basin are described in OCWD's Master Plan and Groundwater Management Plan Update.

The accumulated overdraft is defined by the Act to be the quantity of water needed in the Basin Forebay to prevent landward movement of seawater into the fresh groundwater body. However, seawater intrusion control facilities have been constructed and are planned for

construction since the Act was written and have been effective in preventing landward movement of seawater into the fresh groundwater body. These facilities allow greater utilization of the Basin's storage capacity. In addition, spreading grounds adjacent to and within the Santa Ana River are managed to maintain groundwater levels.

6.2.2 Groundwater Recently Pumped

The District has not pumped groundwater since the 1940's. Historically, the District pumped and conveyed the supply to the service area, but this was discontinued when MWD imported supplies became available. As presented in Table 6-1, the District has not pumped groundwater in the past five years.

Table 6-1 Retail: Groundwater Volume Pumped

☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
	TOTAL	0	0	0	0	0
NOTES:						

6.2.3 Groundwater Projected to be Pumped

Approximately 2,025 afy are projected to be pumped from the Orange County Basin, based on the court-approved quantity of supply available to the District. The District is exploring options that may include either constructing new production and conveyance facilities or exchanging supplies with other OCWD/MWDOC member agencies.

Groundwater levels fluctuate depending on numerous factors including Basin storage and Santa Ana River water capture, which are somewhat influenced by climatic conditions. During past single dry year and multiple dry year events, groundwater supplies were available in this non-adjudicated Basin, but at a higher price (BEA).

6.3 Surface Water

There are no self-supplied surface water supplies being used by the District other than imported purchased water.

6.4 Stormwater

Stormwater is not currently being intentionally diverted and captured within the District service area for beneficial reuse.

6.5 Wastewater and Recycled Water Opportunities

Recycled water provides a reliable and drought proof water source and could greatly reduce the region's reliance on imported supplies. Currently the District does not utilize or serve directly applied recycled water to any of its customers. However, the District has been working with other agencies to potentially provide up to 70 afy to the northern District service area for irrigation use along El Toro Road and Laguna Canyon Road. This supply may be available from the El Toro Water District by 2020.

6.5.1 Recycled Water Coordination

One hundred percent of the wastewater generated within the District's service area is collected and conveyed by the City of Laguna Beach to South Orange County Wastewater Authority's (SOCWA) regional Coastal Treatment Plant (CTP). SOCWA is a joint powers authority formed to provide operational efficiency through consolidation and is comprised of 10 member agencies including the City of Laguna Beach, EBSD, and SCWD.

6.5.2 Wastewater Collection, Treatment, and Disposal

Quantities of wastewater generated within the District service area are generally proportional to the population and water use in the service area. An estimate of wastewater flows from the service area is presented in Table 6-2. Current wastewater flow from the District's service area, which does not include EBSD and South Laguna, is 1,938 afy (1.73 mgd). Flows were projected using population projections from Table 3-1 with a unit flow coefficient of 90 gpcd. As presented in Table 6-3, there is no wastewater treatment and discharge within the service area.

The 6.7 mgd CTP is located along Aliso Creek south of the District. The facility provides secondary treatment for all wastewater collected along the coast between Dana Point and Emerald Bay and has an average daily production of 3.47 mgd. The treatment unit operations at the plant include screening, aerated grit removal, primary clarification, activated sludge aeration, and secondary clarification. An average of 3.05 mgd of secondary treated wastewater is discharged into the Pacific Ocean through the Aliso Creek Ocean Outfall (SOCWA, 2011).

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
100	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Add additional rows as needed						
City of Laguna Beach	Estimated	1,938	South Orange County Wastewater Authority	Coastal Treatment Plant	No	No
Total Wastewater Collected from Service Area in 2015:		1,938				
NOTES: Based on a 90 gpcd flow factor.						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☑	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 *(optional)*	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level ***Drop down list***	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
						Total	0	0	0	0
NOTES:										

A portion of the secondary effluent, approximately 0.55 mgd, is reclaimed for irrigation use from the Advanced Wastewater Treatment Plant and used in the South Coast Water District (SCWD) service area. The recycled water supply is produced by SOCWA for SCWD. The tertiary treatment process consists of chemical addition, coagulation, flocculation, filtration, and chlorine disinfection. The rated capacity of the tertiary treatment facilities is 4.2 mgd.

In addition to the CTP, the Aliso Creek Ocean Outfall receives treated effluent from the SOCWA Joint Regional Plant (JRP), Los Alisos Water Reclamation Plant, El Toro Water Recycling Plant, and treated groundwater and brine discharges from the Irvine Desalter Project. The JRP is owned by SOCWA and MNWD and treats sewage generated in the MNWD service area. A portion of the JRP secondary effluent is recycled for irrigation, including the District's future recycled water supply. Additional information on this facility can be found in MNWD's 2015 UWMP.

6.5.3 Recycled Water System

The biggest constraint to using recycled water within the service is the distance from the source of this water supply. The SOCWA's CTP is located in the adjacent city of Dana Point, miles from the District's service area. In addition, there are few locations, which are scattered, of large irrigated turf areas within the service area, thus making delivery from any source cost prohibitive.

However, adjacent water districts with recycled water may be able to provide limited quantities to the District in the future. The District is coordinating with the El Toro Water District (ETWD) to identify common benefits to providing recycled water from its recycled water treatment facilities to the northeastern area of the District's system along El Toro Road (see Figure 1); this flow is currently discharged to the ocean. Approximately 70 afy of recycled water supply is being considered for delivery to the District after facilities are constructed by 2020. Table 6-4 presents the potential future direct use of recycled water in the District service area, which would be for landscape irrigation.

If it is determined to be cost effective, one to five miles of transmission mains would be constructed to serve the following potential customers over time.

- California Cove Homeowner's Association
- Caltrans District 12
- Terraces at Canyon Hill
- Southern California Edison
- Club Laguna/Shea Properties
- City of Laguna Beach

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area									
☐	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:	El Toro Water District								
Name of Agency Operating the Recycled Water Distribution System:	El Toro Water District								
Supplemental Water Added in 2015	NA								
Source of 2015 Supplemental Water	NA								
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation	none	Tertiary	0	70	70	70	70	70
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)*								
		Total:	0	0	0	0	0	0
**IPR - Indirect Potable Reuse*								
NOTES:								

Levels of treatment anticipated from the El Toro Water District plant are tertiary. The use of recycled water by the District would provide customers with a highly reliable irrigation supply.

As presented in Table 6-5, the 2010 UWMP anticipated that 200 afy of recycled water would be utilized by 2015. Up to 70 afy of this supply source is being studied to be integrated into the District's supply portfolio by 2020.

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

☐	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)		200	0
Other	*Type of Use*		
Total		200	0
NOTES:			

The District will provide specific methods to encourage recycled water use. These efforts include assurances of a highly reliable supply for landscape irrigation. Table 6-6 presents the plan of action for integrating recycled water into the District system.

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

☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
Section 6.5.3	Provide page location of narrative in UWMP

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
Obtain RW supply	Work with ETWD to obtain supply	2020	70
		Total	70
NOTES:			

6.6 Desalinated Water Opportunities

Two desalination water projects are being studied for Orange County: the South Orange County Coastal Ocean Desalination Project and the Huntington Beach (Poseidon) Seawater Desalination Project. The District may be interested in purchasing up to 1,000 afy of desalinated supply.

6.6.1 Huntington Beach Seawater Desalination Project

The Huntington Beach Seawater Desalination Project is a proposed 50 mgd/56,000 afy desalination project, located on property adjacent to the AES Generating Station on Pacific Coast Highway, which is planned to be operational by 2025. Poseidon Resources LLC, a private company, is developing this project. In addition to offsetting imported water demand, water from this project could provide OCWD with management flexibility in the Orange County 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 to provide the overall partner structure to advance the project. 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 in 2016. If this permit is obtained, the plant could be operational as early as 2019 (MWDOC, 2016).

6.6.2 Doheny Desalination Project

The South Coast Water District is pursuing a regional ocean desalination plant in Dana Point called the Doheny Desalination Project. This facility would produce a new water supply of 15 mgd/16,800 afy, which would not only improve system reliability but would improve water quality by providing a lower level of total dissolved solids (TDS). A lower level TDS supply also benefits recycled water opportunities by improving the quality of the wastewater effluent being treated. The use of slant well intakes adjacent to San Juan Creek at Doheny State Beach was investigated and concluded it was feasible. The 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 larger, 15 MGD facility, with subsequent permitting and construction of additional slant wells and treatment capacity.

6.7 Exchange or Transfer Opportunities

MWD, MWDOC, and OCWD have and will continue to explore opportunities for water exchanges and transfers that benefit the region. These opportunities are discussed under Future Water Projects at the end of this section. Water transfer opportunities using MWDOC and MWD facilities, as well as in-lieu options with OCWD and others are possible.

The District has several connections with neighboring water agencies that can be used as points of water transfer during short term and long term needs. These connections were designed for emergency purposes only and not for permanent transfers. Water has been transferred in the past and could be transferred again on an emergency basis to adjoining purveyors. Since the District is a joint partner with several other agencies for imported water transmission facilities, opportunities for transfer exist using the two transmission mains. In the past, for example, the jointly owned Coast Supply Line, which supplies the District, City of Newport Beach, and IRWD, was used to deliver approximately eight cubic feet per second (cfs) of water to the District and South Coast Water District from the City of Newport Beach during a seven-day shutdown of MWD's Diemer Treatment Plant in Yorba Linda.

Similar opportunities exist using the Aufdenkamp Transmission Main for transfers between IRWD, SMWD, SCWD, and the District. MWDOC spearheaded the South Orange County Water Reliability Study, which identified the potential for emergency exchanges between these agencies. No long-term transfers or exchanges are identified at this time for the District.

6.8 Future Water Projects

The District has obtained clearance to use its Santa Ana River Basin groundwater supply and is coordinating with other agencies to pursue the use of recycled water. In addition, MWD and MWDOC are pursuing water supply projects and programs, which will increase the reliability of imported supplies and augment supplies with regional projects.

6.8.1 LBCWD Projects

As discussed previously, the District is expanding its supply portfolio to utilize its adjudicated water right to groundwater, and integrate a new recycled water supply for non-potable uses. In addition, the District is considering participating in a regional desalination project. These future water supplies are presented in Table 6-7.

6.8.2 Regional Agency Projects

The MWDOC 2015 UWMP discusses a number of water supply opportunities in Orange County undertaken to enhance supplies, including transfers and exchanges, desalination, and further uses of recycled water. MWD's 2015 RUWMP discusses opportunities to enhance and maintain imported supplies in conjunction with its Integrated Water Resources Plan.

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	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.					
☐	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.					
Page 6-14	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implemen-tation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Agency *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						
OC Groundwater Basin	No		In text	2018	All Year Types	2,025
Recycled water	Yes	ETWD	In text	2020	All Year Types	70
Desalinated water	Yes	MWDOC and others	In text	2025	All Year Types	1,000
NOTES:						

MWD

According to MWD's 2015 RUWMP, it is continuing to diversify its supply resource mix to increase long-term regional water supply reliability. The following list of MWD projects could improve the reliability of imported supplies to the region.

- Metropolitan Indirect Potable Reuse Project to provide water to OCWD
- Metropolitan Palo Verde Irrigation District Land Purchase
- USBR Colorado River Basin Plan
- Metropolitan Emergency Water Storage South of the Tehachapi's
- California WaterFix

MWDOC

Potential projects were identified during the development of the OC Water Reliability Study in 2015. Projects listed below could benefit individual agencies and the region.

- Huntington Beach Seawater Desalination Project
- Doheny Ocean Desalination Project
- Prado Basin Operations with the Corps of Engineers
- Expansion of Water Recycling in Orange County
- Lower San Juan Creek Groundwater Management
- Production in San Mateo Groundwater Basin
- Other Water Banking Projects (e.g., Semi-Tropic)
- San Diego County/Camp Pendleton Ocean Desalination
- West Orange County Enhanced Pumping Project
- Capture of Storm Flows
- Purchase and Storage of Imported water in the OCWD Basin for Drought Protection and Enhanced Yield
- Santa Ana River Conservation and Conjunctive Use Program

6.9 Summary of Existing and Planned Sources of Water

Currently, the only supply source is purchased imported water. Table 6-8 presents the water supply source – imported water – and volume (3,630 acre-feet) utilized by the District in 2015.

Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Purchased or Imported Water		3,630	Drinking Water	NA
	Total	3,630		0
NOTES:				

Table 6-9 presents the supplies available to the District under its projected supply portfolio. The potable supplies reflect water that enters the District distribution system as production quantities. Purchased imported water quantities presented in Table 6-9 represent the average amount of water purchased by the District from MWDOC/MWD in the past ten years, which was 3,998 acre-feet. The projected groundwater supply is the Santa Ana River Basin

Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report to the Extent Practicable*									
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2020**		**2025**		**2030**		**2035**		**2040** *(opt)*	
		Reasonably Available Volume	Right or Yield (opt)	Reasonably Available Volume	Right or Yield (opt)	Reasonably Available Volume	Right or Yield (opt)	Reasonably Available Volume	Right or Yield (opt)	Reasonably Available Volume	Right or Yield (opt)
Add additional rows as needed											
Groundwater	Santa Ana River Basin	2,025		2,025		2,025		2,025		2,025	
Purchased or Imported Water	Based on average purchase in past 10 years	3,998		3,998		3,998		3,998		3,998	
Recycled Water	From ETWD	70		70		70		70		70	
Desalinated Water		0		1,000		1,000		1,000		1,000	
Total		6,093	0	7,093	0	7,093	0	7,093	0	7,093	0
NOTES:											

entitlement of 2,025 afy. Even though the groundwater will reduce the amount of imported water, for supply planning purposes the imported water will still be available to the District if needed. The potential recycled water supply project being considered would be provided by ETWD through a nonpotable distribution system; quantities reflect production estimates entering its separate distribution system. The planned desalinated water would be from either of the two projects with conveyance details to be worked out at a later date.

Chapter 7 - Water Supply Reliability Assessment

During the past decade, Southern Californians have faced significant challenges to their water supply. Because of the potential for water shortages, water allocations for MWDOC were imposed by MWD. These water shortage allocations were then imposed on MWDOC member agencies, including LBCWD. Because of the reliance on imported water, the District's supply has been vulnerable to water shortage allocations, seasonal or climatic shortages, as well as catastrophic events during conveyance. These challenges resulted in the District being proactive about its supply planning and pursuing use of its groundwater rights.

7.1 Constraints on Water Sources

The District historically has been dependent on imported water supplies. Most of the supply has come from the Colorado River, although improvements were made to MWD's system to allow greater flexibility in conveying northern California supplies from the SWP to Lake Mathews. The imported water conveyed from the Delta has been curtailed in recent years due to drought conditions in the Feather River watershed and court ordered Delta pumping restrictions. As a result, MWD has aggressively pursued and obtained additional supplies to augment these two sources for its entire service area and is continuing to acquire additional supplies.

7.1.1 Imported Supply

Factors that could potentially influence the reliability of District imported supplies include environmental, water quality, and climatic factors. Although climatic factors affect all water supplies, only severe climatic influences on the reliability of imported surface waters, as with a drought or court mandated pumping restrictions, will directly affect District supply availability. The following are factors identified by MWD that may have an impact on the reliability of imported supplies.

- The region and Colorado River Basin have been experiencing drought conditions for multiple years. In the past 16 years (2000 to 2015), there have been only three years when the Colorado River flow has been above average. The last above average year was 2011, when the unregulated water year inflow to Lake Powell was 139 percent of average.
- Endangered species protection needs in the Sacramento-San Joaquin River Delta have resulted in operational constraints to the SWP system. The Bay-Delta's declining

ecosystem caused by agricultural runoff, operation of water pumps and other factors has led to historical restrictions in SWP supply deliveries.

- Water imported from the Colorado River Aqueduct contains high level of salts. Blending with SWP supplies aids in meeting the target salinity of 500 mg/L of TDS. Controlling the spread and impacts of Quagga mussels within the Colorado River Aqueduct has requires extensive maintenance and reduces MWDs operational flexibility.
- Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning even more challenging. As discussed in Chapter 3 under Climate Change, the areas of concern for California and the District include the reduction in Sierra Nevada snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of levee failure in the Delta or shoreline erosion and rising sea levels in Laguna Beach.

The primary constraint to the District on the availability of imported supplies during times of supply shortages is the cost, particularly when MWD's Water Supply Allocation Plan is in effect. As previously discussed, in terms of quantity and reliability, MWD has an extensive supply augmentation program to assure its member agencies that imported supplies will be 100 percent reliable through 2040.

The District has historically imported all of its water supply from MWD through MWDOC. MWD has been active in responding to water quality concerns by protecting source water quality and developing water management programs that maintain and enhance water quality. Efforts have been focused on managing total organic carbon, bromide concentrations, pathogenic microbes and TDS. Contaminants that cannot be sufficiently controlled through protection of source waters are handled through changed water treatment protocols or blending. These practices increase costs to the District, and can reduce operational flexibility and safety margins to MWD. MWD anticipates no significant reductions in water supply availability from new sources due to water quality concerns (MWD, 2016). A description of the water quality of MWD's supplies can be found in its 2015 RUWMP.

7.1.2 Groundwater Supply

The District's Basin groundwater supply is managed by the OCWD. OCWD has an extensive program to protect Basin water quality, which includes groundwater monitoring, participating in and supporting regulatory programs, remediation projects, working with groundwater producers, and providing technical assistance. A groundwater protection policy was adopted in 1987 in recognition of the serious threat posed by groundwater contamination (OCWD, 2009). Efforts have been focused on managing salinity and nitrates, along with synthetic organic contaminants. According to the OCWD Groundwater Management Plan, the water from this

aquifer continues to be of high quality. No water quality impacts are anticipated with the imported water supply or with the District's Basin groundwater supply.

7.2 Reliability by Type of Year

Climatological data in California have been recorded since the year 1858. During the twentieth century, California experienced four periods of severe drought: 1928-34, 1976-77, 1987-92, and 2011-current. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the Delta and are the source waters for the SWP, thus MWD's selection as the single driest base year. However, Southern California and, in particular Orange County, sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water and groundwater stored in the Basin. The 1987 to 1992, 2000 to 2003, 2007 to 2009, and 2011 to current droughts had a greater impact on Southern California and Orange County.

To analyze the variability of reliability due to climate, hydrologic conditions that define year types were determined. The years identified in Table 7-1 reflect these year types: average, single dry year, and multiple dry years. The year types were selected by MWD and used here since MWD's imported supplies were the predominant District water supply and are more vulnerable to shortages than the District's groundwater supply and future recycled water and desalination supplies, thus presenting the most conservative levels of reliability. As presented in Table 7-1, the MWD 2015 RUWMP assumes 100 percent reliability under all three hydrologic conditions in the future. The District's groundwater supply is also 100 percent reliable during all year types based on MWDOCs 2015 UWMP.

Average/Normal Water Year: The normal year most closely represents median runoff levels and patterns. Supply quantities for this condition are derived from historical average yields. MWD used 1922 through 2004 to establish this normal year.

Single Dry Water Year: This is defined as the year with the minimum useable supply. The supply quantities for this condition are derived from the minimum historical annual yield. MWD identified 1977 as the single driest year since 1922.

Multiple Dry Water Years: This is defined as three consecutive years with the minimum useable yield or supply. Water systems are more vulnerable to these droughts of long duration, because they deplete water storage reserves in local and state reservoirs and groundwater basins. MWD identified 1990 to 1993 as the driest multiple years since 1922 when the least amount of imported water was available.

Table 7-1 Retail: Basis of Water Year Data			
Year Type	**Base Year** *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*	**Available Supplies if Year Type Repeats**	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Chapter 7.
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	**% of Average Supply**
Average Year	Average of 1922 to 2004		100%
Single-Dry Year	1977		100%
Multiple-Dry Years 1st Year	1990		100%
Multiple-Dry Years 2nd Year	1991		100%
Multiple-Dry Years 3rd Year	1992		100%
NOTES: MWD assumption of 100% reliability based on MWD 2015 RUWMP. Assumption of 100% reliability of groundwater based on MWDOC 2015 UWMP.			

7.3 Supply and Demand Assessment

Responses to an actual drought or the continuation of the current drought would follow the water use efficiency mandates of MWD's Water Surplus and Drought Management Plan (WSDM Plan), along with implementation of the appropriate stage of the District's water shortage ordinance discussed in Chapter 8. An assessment of the District's water supply reliability during each of the water year types for the next twenty-five years is presented here.

7.3.1 District Capabilities: Normal Year

Based on the District's groundwater, imported water, and recycled water supplies available in the future, average water year availability was compared to projected average year water demands through 2040 in Table 7-2. This comparison indicates that water supplies will be available to meet District demands during a normal water year. Future water supplies were presented in Table 6-9 and include imported water quantities based on the 10-year average of District purchases. As discussed in Chapter 4, the few vacant lots available for residential development in the District's service area, result in very little increase to demands, offset by the anticipated target conservation savings. Even without the 20 percent target reduction in demands associated with additional conservation savings as discussed in Chapter 5, demands can be met with existing supplies.

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals (*autofill from Table 6-9)*	6,093	7,093	7,093	7,093	7,093
Demand totals *(autofill from Table 4-3)*	3,304	3,589	3,601	3,558	3,547
Difference	2,789	3,504	3,492	3,535	3,546
NOTES:					

7.3.2 District Capabilities: Single Dry Year

Supplies and demands for the District service area were analyzed to determine impacts associated with a single dry year. The projected single dry year water supply is based on 100 percent availability of the three sources presented in Table 6-9. This 100 percent reliable total supply is presented in Table 7-3.

For reliability planning, MWDOC estimated an increase in member agency demands associated with a single dry year. The 15.6 percent "bump" for the District, including wholesale sales to EBSD, was based on the highest per capita usage over the ten year period of 2006 to 2015 compared with the annual average usage over the same period. Water demands typically increase during the first dry year before additional conservation outreach is implemented. This single dry year of 2007, which did not follow a dry year, was near the beginning of a decade that included many dry years and a recession, thus reducing the average demands significantly. The second single dry year not following a dry year during this decade was 2012. If this year were used to calculate the bump, demands were actually 5 percent lower for this single dry year than the 10-year average. However, to plan conservatively as MWDOC has, the 15.6 percent bump was added to the combined Total Water Use from Table 4-3 to reflect an increase in demands associated with a future first year of drier weather, before additional conservation outreach is implemented.

Table 7-3 indicates that the region can provide reliable water supplies under the single driest year hydrology to meet the bumped increase in demands.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	6,093	7,093	7,093	7,093	7,093
Demand totals	3,819	4,149	4,163	4,114	4,101
Difference	2,274	2,944	2,930	2,979	2,992
NOTES: Demands were bumped by 15.6 percent, provided by MWDOC, to reflect increased demands associated with drier weather conditions.					

7.3.3 District Capabilities: Multiple Dry Years

Supplies and demands for the District service area were analyzed to determine impacts associated with multiple consecutive dry years. The projected multiple dry year water supply is based on 100 percent availability of the three sources presented in Table 6-9, as discussed under the single dry year scenario. Supply totals for the 25-year period are presented in Table 7-4 for the multiple dry year scenario.

Water demands were also analyzed for this multiple dry year scenario. As was done with the single dry year demands, projected water demands from Table 4-3 were increased during the first year to reflect a dry year bump associated with drier weather, before additional conservation programs are implemented.

MWDOC calculated the multiple dry year bump to reflect the three highest per capita usage years during the same ten year period of 2006 to 2015 as compared with the annual average usage over the same period. This resulted in a 10.4 percent increase in demands over the ten-year average for the multiple dry year scenario. MWDOC is planning conservatively for its RUWMP analysis: it applied the multiple dry year increase in demands to all three years of the multiple dry year scenario demands. However, only the first year of increased demands at 10.4 percent were included in Table 7-4 because the District's demand pattern over this same dry period resulted in decreases in demands the second and third years. Since the bump was calculated on a 10-year period that had significant impacts to water demands associated with two droughts and the Great Recession, this is considered a conservatively high increase in demands. Although there was a strong customer response to District conservation outreach in 2007 and 2008, the second and third dry year water demands presented in Table 7-4 reflect normal water year water demands, not the decrease which actually occurred.

Table 7-4 presents a comparison of projected multiple dry year water supply availability over the next 25 years to the multiple dry year water demands which were increased for the first of the three years.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	6,093	7,093	7,093	7,093	7,093
	Demand totals	3,648	3,963	3,976	3,929	3,916
	Difference	2,445	3,130	3,117	3,164	3,177
Second year	Supply totals	6,093	7,093	7,093	7,093	7,093
	Demand totals	3,304	3,589	3,601	3,558	3,547
	Difference	2,789	3,504	3,492	3,535	3,546
Third year	Supply totals	6,093	7,093	7,093	7,093	7,093
	Demand totals	3,304	3,589	3,601	3,558	3,547
	Difference	2,789	3,504	3,492	3,535	3,546
NOTES: Demands were bumped by 10.4 percent, provided by MWDOC, in the first year to reflect increased demands associated with drier weather conditions.						

7.4 Regional Supply Reliability

MWDOC has undertaken the "OC Water Reliability Study" to identify regional supply reliability levels, address supply and system gaps with investments, and provide input to MWD's Integrated Resources Plan process. Interim results provided an assessment of 2040 demands and the potential gap in supplies. Preliminary results indicate that, except for the groundwater recovery expansion program, with no new projects by MWD, MWDOC, and member agencies, and without the California WaterFix, there may be supply shortages of 13 percent by 2040. However, the UWMPs for both MWD and MWDOC highlight the numerous projects currently in the planning stages to increase supplies to prevent shortages.

Phase 2 of the study, starting in 2016, will result in a quantification of reliability improvements and costs from project portfolios to allow for stakeholders to determine the most appropriate projects. This reliability study is not taking the place of current supply projects underway. The MWDOC reliability study offers participants the opportunity to further enhance reliability levels.

The District is capable of meeting its customers' demands in all hydrologic year types through 2040, even with the overly conservative bump in dry year demands. The highly reliable supplies reflect not only regional projects, but also the forward thinking planning the District has undertaken to develop its groundwater supply, thus greatly reducing reliance on imported supplies.

Chapter 8 – Water Shortage Contingency Planning

Actions that will be taken by the District in the event of a reduction in water supplies are presented here.

8.1 Stages of Action

On June 16, 2009, the District's Board of Directors approved Ordinance No. 100 establishing a Water Use Efficiency & Water Supply Shortage Program. The purpose of this ordinance was to provide for increasingly serious stages of water shortages and to define voluntary and mandatory water conservation measures to be implemented during these stages. Key elements of the District's Ordinance include the following: permanent mandatory restrictions, staged responses to water supply shortages, and enforcements and penalties. The ordinance can be found in Appendix G.

8.1.1 Permanent Mandatory Restrictions

Permanent mandatory restrictions are in effect at all times and if not adhered to represent waste and unreasonable use of water. These measures are designed to optimize water use efficiency even when there is no water supply shortage. All District customers are required to adhere to these restrictions throughout the year. The permanent year-round actions designed to alter behavior during non-shortage conditions are described here, and identified in Ordinance 100.

General Restrictions

- **Limits on Watering Hours.** Watering or irrigating is prohibited any day of the week between 8am and 8pm. This applies to lawns, landscaping, and all other vegetated areas.
- **Water Flow or Runoff.** It is prohibited to water lawns, landscaping, and vegetated areas in a manner that causes or allows water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.
- **Obligation to Fix Leaks, Breaks or Malfunctions in Lines, Fixtures or Facilities**. Loss or escape of water through breaks, leaks, or malfunctions in the water user's plumbing, distribution or irrigation system is prohibited for any period of time after such water waste should have reasonably been discovered and corrected. Leaks, breaks, or malfunctions must be corrected in no more than three days of District notification. The

District, at its sole discretion, may temporarily shut-off service if unable to contact the account holder on record.

- **Water Served Only Upon Request.** Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, clubs or other public places where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

- **Option Not To Have Towels/Linens Laundered.** Hotels, motels, and other commercial lodging establishments must provide guests the option of not having their used towels and linens laundered. Lodging establishments must prominently display notice of this option in each room and/or bathroom, using clear and easily understood language.

- **Hosing or Washing Down Hard or Paved Surfaces.** It is prohibited to use water to hose or wash down hard or paved surfaces, such as sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, unless using a bucket or automatic shut-off hose nozzle, with a few exemptions.

- **Hosing or Washing Down Vehicles**. It is prohibited to use water to hose or wash down a motorized or non-motorized vehicle, including but not limited to automobiles, trucks, vans, buses, motorcycles, boats or trailers, unless using a bucket or automatic shut-off hose nozzle, with a few exemptions.

- **Re-Circulating Decorative Water Fountains and Features.** All new decorative water fountains and water features must re-circulate water - or users must secure a waiver from the District.

- **Unauthorized Use of Fire Hydrants Prohibited.** No person may use water from any fire hydrant for any purpose other than fire suppression or emergency aid, without first requesting and posting the appropriate fees at the District and obtaining a hydrant meter to record all water consumption for a specified project. Absent a meter, water theft and meter tampering fees will be applied as appropriate.

Commercial Kitchen Requirements

- **Water-Efficient Pre-Rinse Kitchen Spray Valves.** All new food preparation establishments, such as restaurants, cafes, and hotels, are prohibited from using non-water efficient kitchen spray valves.

- **Best-Available Water-Conserving Technology**. All water using equipment in new commercial kitchens must use the best available, water conserving technology.

- **Automatic Shut-Off Hose Nozzles.** When hosing or washing kitchen, garbage areas, or other areas for sanitary reasons as required by the Health Department, hoses shall be equipped with automatic shut-off hose nozzles.

Commercial Water Recirculation Requirements

- **No Installation of Non-recirculating Water Systems in Car Wash and Laundry Systems.** Installation of non-recirculating water systems is prohibited in new commercial conveyor car wash and new laundry systems.
- **No Installation of Single-Pass Cooling Systems.** Installation of single-pass cooling systems is prohibited in buildings requesting new water service.

Construction Site Requirements

- **Recycled or non-potable water** must be used, when available.
- **No potable water may be used for soil compaction or dust control** where there is a reasonably available source of recycled or non-potable water approved by the Department of Public Health and appropriate for such use.
- **Water hoses shall be equipped with automatic shut-off nozzles,** given such devices are available for the size and type of hoses in use.

Wasteful Water Use

- Upon notice by the District, persons shall cease to cause or permit the indiscriminate use of water not otherwise prohibited above which is wasteful and without reasonable purpose.

8.1.2 Staged Responses to Supply Shortages

The ordinance details four levels of District response to escalating water shortages. Depending upon the degree of water supply shortage, the District could enact any of the four levels listed below and summarized in Table 8-1. This would trigger additional water use efficiency measures for District customers, over and above the permanent measures. These stages are discussed more below.

- **Water Watch** voluntary measures enacted in times of shortage to achieve a 5 to 15 percent reduction in water use.
- **Level 1 Water Alert** mandatory restrictions enacted in times of shortage to achieve a 15 to 30 percent reduction in water use.

- **Level 2 Water Warning** mandatory restrictions enacted in times of shortage to achieve a 30 to 50 percent reduction in water use.
- **Level 3 Water Emergency** mandatory restrictions enacted in times of shortage to achieve over 50 percent reduction in water use.

The District is vulnerable to potential disaster situations that could result in catastrophic interruption of water supplies. Catastrophic supply interruptions are discussed in Section 8.8. These situations include, but are not limited to drought, a regional power outage, earthquakes, landslides, interruption or reduction of imported supply, and water contamination. This can result in extreme shortage for water available for fire fighting and consumption. Since various actions will need to be taken to continue water service, especially for key functions such as fire fighting, the District has a staged response plan to invoke during declared water shortages.

Table 8-1 Retail Stages of Water Shortage Contingency Plan

Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description)*
Add additional rows as needed		
Water Watch	5 to15 percent	Total deliverable supply is 85 to 95% of normal
Level 1 Alert	15 to 30 percent	Total deliverable supply is 70 to 85% of normal
Level 2 Warning	30 to 50 percent	Total deliverable supply is 50 to 70% of normal
Level 3 Emergency	Over 50 percent	Total deliverable supply is 50% of normal
[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES:		

8.1.3 Enforcement and Penalties

Enforcement and penalties are in place for failure to comply with any provisions of the Ordinance. First offenses will bring warnings. Subsequent offenses will draw fines increasing up to $500. Noncompliance could be prosecuted as a misdemeanor.

On August 7, 2014, the District's Board of Directors approved Ordinance No. 797 implementing the Level 1 – Water Supply Shortage Alert. The ordinance can be found in Appendix G. The purpose of this ordinance was to augment existing conservation efforts with the following Level 1 measures.

1) Limits on Watering Days. Watering lawns, landscaping and other vegetated areas is limited to no more than three (3) days per week.
2) Timeframe to Fix Leaks, Breaks or Malfunctions in water users' pipelines, fixtures, or facilities. Loss or escape of water through breaks, leaks or other malfunctions in the water users' plumbing, distribution, or irrigation system must be fixed in no more than forty-eight (48) hours following notification from the District – unless other arrangements are made with the District or the system is shut off while waiting for repairs. The District, at its sole discretion, may temporarily shut-off service if unable to contact the account holder on record. (District, 2014)

8.2 Prohibitions on End Users

Table 8-2 lists the mandatory prohibitions against specific water use practices. Information pertaining to specific prohibitions and reduction methods for each of the stages can be found in the District's Water Use Efficiency & Water Supply Shortage Program (Ordinance 100) provided in Appendix G. There are exemptions allowed for many of the actions listed in Table 8-2. For example, under Level 3 Water Alert, all watering is prohibited, but watering with a hand held bucket and maintenance of existing landscaping for fire protection are allowed.

8.3 Penalties, Charges, and Other Enforcement of Prohibitions

Any violation of the District's Water Use Efficiency & Water Supply Shortage Program, including waste of water and excessive use, is a misdemeanor punishable by imprisonment in the county jail for not more than 30 days or by a fine or both. In addition to any other remedies that the District may have for enforcement, service of water would be discontinued or appropriately limited to any customer who willfully uses water in violation of any provision of the plan.

To enforce the prohibitions listed in Table 8-2, Ordinance 100 identifies specific steps the District must take. For the first instance of non-compliance, the District will issue a written warning and deliver a copy of the Ordinance by mail or door hanger. For the second violation within the preceding 12 months, a fine to not exceed $100 is issued. For the third violation, the fine increases to $250. For the fourth and subsequent violations, the fine is not to exceed $500, a water flow restrictor device may be installed, and/or water service may be disconnected. Penalties for violation of any prohibitions can be found in the ordinance located in Appendix G.

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed			
Permanent measures	Landscape - Limit landscape irrigation to specific times		Yes
Permanent measures	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
Permanent measures	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Within 3 days	Yes
Permanent measures	Other - Prohibit use of potable water for washing hard surfaces		Yes
Permanent measures	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
Permanent measures	Water Features - Restrict water use for decorative water features, such as fountains	Water features must be recirculating	Yes
Permanent measures	CII - Commercial kitchens required to use pre-rinse spray valves		Yes
Permanent measures	CII - Restaurants may only serve water upon request		Yes
Permanent measures	CII - Lodging establishment must offer opt out of linen service		Yes
Permanent measures	CII - Other CII restriction or prohibition	Commercial kitchens must use best available technology	Yes
Permanent measures	CII - Other CII restriction or prohibition	No installation of non-recirculating water systems in car wash and laundry; no single pass cooling systems	Yes
Permanent measures	Other - Require automatic shut of hoses		Yes
Permanent measures	Other - Prohibit use of potable water for construction and dust control	When available	Yes
Level 1	Landscape - Limit landscape irrigation to specific days	Limit to up to 3 days per week	Yes
Level 1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Within 48 hours	Yes
Level 2	Landscape - Limit landscape irrigation to specific days	Limit up to 2 days per week	Yes
Level 2	Water Features - Restrict water use for decorative water features, such as fountains		Yes
Level 2	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	More than one foot of water is prohibited	Yes
Level 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
Level 2	Other	New service, new meters, or will serve letters will not be provided	Yes
Level 3	Landscape - Prohibit all landscape irrigation		Yes
NOTES: Each level includes the restrictions from the previous level plus new restrictions. All levels include permanent water use efficiency measures.			

8.4 Consumption Reduction Methods

Consumption reduction methods to be used to reduce water use in the most restrictive stage of Level 3 are listed in Table 8-3. Because outdoor watering constitutes about 50 percent of District residential demands, it is anticipated that total demands will be reduced by 50 percent under the Level 3 watering restrictions alone in order to meet potential supply reductions of 50 percent.

Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
Add additional rows as needed		
Level 3	Other	No watering allowed
Level 3	Expand Public Information Campaign	
NOTES:		

8.5 Determining Water Shortage Reductions

A water supply shortage or threat of shortage exists when the District determines, in its sole discretion that it exists, due to drought, catastrophe, or other water supply condition. The District's Board of Directors may declare a Water Watch, Level 1 Water Alert, or Level 2 Water Warning at a regular or special public meeting in accordance with State law. The District may declare a Level 3 Water Emergency in accordance with Water Code Sections 350, 351, and 352. For notification of a Level 3 Water Emergency, except as otherwise provided by State law, the District must publish a copy of the water emergency resolution in a newspaper used for the publication of official notices within the jurisdiction of the District within ten business days of the date that the emergency is declared. Except as otherwise provided by State law, additional mandatory water use efficiency requirements will take effect on the tenth business day after the date that the emergency is declared.

Demands must be monitored frequently during emergency water shortages to enable the District to effectively manage the balance between supply and demand. All individual accounts in the District are metered, and overall water production and the status of the District's supply is continuously monitored through District facilities and its Supervisory Control and Data Acquisition System. Water production figures are recorded daily; weekly and monthly reports are prepared and monitored. These data are available to measure actual water savings resulting from the effectiveness of any water shortage contingency stage that may be implemented.

Level 1 and 2 Water Shortages

Weekly production figures are forwarded to the Operations Manager during Level 1 and 2 shortages. The weekly production figures are compared to the target weekly production to verify that the reduction goal is being met. Weekly reports are sent to the General Manager. If reduction goals are not met, the General Manager will notify the Commission so that corrective action can be taken.

Level 3 Water Shortages

During a Level 3 emergency, the procedure above will be followed with the addition of a daily production report to the Operations Manager and General Manager.

MWD/MWDOC Water Shortages

As stages of water shortage are declared by MWDOC, the District follows implementation of those stages and continues to monitor water demand levels. It is not until MWD's Shortage Stage 5 that MWD may call for extraordinary conservation. During this stage, MWD's Drought Program Officer will coordinate public information activities with MWDOC and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided to MWDOC. The District will participate in member agency meetings with MWDOC to monitor and discuss water allocations. This will enable the District to be aware of imported water use on a timely basis as a result of specific actions taken in response to MWD's Water Shortage Contingency Plan. As done in the past, the District will follow the Water Supply Allocation Plan guidelines of MWD once an extreme shortage is declared. This allocation plan is enforced by MWD using rate surcharges. MWDOC follows the guidelines of the allocation plan and imposes the surcharge that MWD applies to its member agencies that exceed their water allocation. This results in higher costs to the District if its purchases exceed its allocation.

8.6 Revenue and Expenditure Impacts

During an interruption of water supplies, prolonged drought, or water shortage of any kind, the District will experience a reduction in revenue due to reduced water sales. Expenditures may increase as additional water must be purchased at a higher rate or damage to the water system requires emergency repairs. Expenditures may also go down as less water is pumped through the system, resulting in lower power costs. Water purchase expenses could also be lower during a catastrophic event as the availability of imported water is restricted.

The District receives water revenue from a service charge and a commodity charge based on consumption. The service charge recovers costs associated with providing water to the serviced

property, which does not vary with consumption. The commodity charge is based on water usage. Rates have been designed to recover the full cost of water service in the service and commodity charges. Therefore, the total cost of purchasing water would decrease as the usage or sale of water decreases.

However, there are significant fixed costs associated with maintaining a minimal level of service. Should an extreme shortage be declared and a large reduction in water sales occur for an extended period of time, the District would monitor projected revenues and expenditures. To overcome these potential revenue losses and/or expenditure impacts, the District may utilize reserves. The District has an Operating Contingency Reserve Fund and Rate Stabilization Fund. These funds have been used in the past to stabilize rates during periods of reduced water sales. If necessary, the District will reduce expenditures by delaying implementation of its Capital Improvement Program and equipment purchases, and as a last resort adjust the work force, implement a drought surcharge, and/or make adjustments to its water rate structure.

8.7 Resolution or Ordinance

The water shortage contingency ordinances discussed throughout this chapter are provided in Appendix G.

8.8 Catastrophic Supply Interruption

The most likely events triggering a catastrophic supply interruption include a regional power outage, wildfires, reservoir outages, and landslides. Other catastrophic events include an earthquake in the Delta affecting imported water supplies; an earthquake in Southern California affecting the District service area, facilities, and local supplies; flooding, and other disasters.

An example of a catastrophic event impacting water supplies can be found with the firestorm of 1993. On October 27, 1993, a fire started near Laguna Canyon Road about one mile north of El Toro Road. Pushed by Santa Ana winds, the fire reached the community of Emerald Bay and entered the perimeter of the District's Moorhead Reservoir. The fire continued north into Crystal Cove State Park and south into Laguna Beach where it reached Park Avenue. By the time it was contained (about 3:30 a.m. on October 28), the fire had destroyed 366 homes, damaged over 500 more homes and burned over 17,000 acres of brush land. Approximately 16 million gallons of water over normal usage was needed during the period of the firestorm. This included additional flow to South Coast Water District. MWD supplied all the water the District could take with no flow restrictions. Because of the dry and windy conditions, all reservoirs were filled. Storage within the District was at about 80 percent when the fire entered Laguna Beach. Normal operating levels would have been between 50 percent and 70 percent.

It was extremely difficult to determine exactly how much water was used at any one time during the fire. However, it was roughly estimated that the peak demand placed on the water system to supply firefighters was approximately 20,000 gallons per minute (gpm). The District also had to contend with broken or melted pipes in burned homes, as well as running sprinklers and hoses that were left abandoned when people had to evacuate the area. The demand on the District's water system was great. In fact, everywhere the fire was being fought, reservoirs were being drained faster than they could be filled. Six of the District's twenty-two reservoirs were completely drained during the fire. The capabilities of the water system were tested during the firestorm of 1993. As a result of the information gathered during the firestorm, upgrades to the system were implemented to minimize the impact of another such event. Since the 1993 firestorm the District has:

- Built two reservoirs totaling 8 million gallons.
- Purchased 3 additional fixed and portable emergency generators for pump stations.
- Purchased 4 additional portable, large capacity pumps.
- Installed parallel pipelines in strategic areas for fire flow improvement.
- Identified low-pressure areas within the District, some of which (but not all) can be improved.

The District can deal with both planned and unplanned power outages. In the event of an unplanned power outage within the service area, water supply can be maintained by gravity from the treated water reservoirs located throughout the distribution system. The lower zone reservoirs can continue to be filled by gravity from the imported water supply lines (Coast Supply Line and Aufdenkamp Transmission Main). Public outreach to reduce demands would occur immediately. Mobile generators that the District owns or can obtain quickly from neighboring agencies would be transported to key locations to allow for transfers to upper zones. In the event of a regional power outage affecting the imported water supply, the distribution system would be relied on until imported supply deliveries return to normal. A more aggressive level of public outreach and water use restrictions would occur with a regional outage, as described under Level 3 response.

8.9 Minimum Supply Next Three Years

Table 8-4 presents the District's minimum supply availability for the next three years under the multiple dry year scenario. The imported supply is considered to be 100 percent reliable per MWD, and the District groundwater may be available in 2016. Therefore, the average imported water supplies of 3,998 afy and the groundwater supply of 2,025 afy from Table 6-9 were utilized. Recycled water will be available in 2020; it was not included in Table 8-4.

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	6,023	6,023	6,023
NOTES: The District's groundwater supply will be available 2016.			

Chapter 9 - Demand Management Measures

9.1 Background

The District is committed to water use efficiency (WUE) as a means to maintain its reliable supply sources for its service area. WUE has become a major part of the District's current and future programs to reduce demand and increase water supply reliability. The District plans to continue implementation of its WUE programs in conjunction with MWDOC. As a member agency of MWDOC, the District benefits from various regional programs performed by MWDOC on behalf of its member agencies.

MWDOC became a signatory to the Best Management Practices (BMP) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) in 1991. MWDOC has made the State-mandated Demand Management Measures (DMMs) monitored by the California Urban Water Conservation Council (CUWCC) the cornerstone of its conservation programs for its member agencies. Retail water agencies throughout Orange County recognize the need to use existing water supplies efficiently. Implementation of BMP-based efficiency programs makes good economic sense and reflects responsible stewardship of the region's water resources. Most of the cost of implementing these programs is incorporated in MWDOC's rate surcharges.

The District's and MWDOC's commitment to implement BMP-based water use efficiency programs continues today. To help facilitate implementation of BMPs throughout Orange County, MWDOC's efforts focus on the following three areas that both comply with and go beyond the basic wholesaler assistance requirements.

Regional Program Implementation. MWDOC develops, obtains funding for, and implements regional BMP programs on behalf of all retail water agencies in Orange County. This approach minimizes confusion to consumers by providing the same programs with the same participation guidelines, and also maintains a consistent message to the public to use water efficiently. Further, MWDOC helps build partnerships to accomplish conservation.

Local Program Assistance. When requested, MWDOC assists retail agencies to develop and implement local programs within their individual service areas. This assistance includes collaboration with each retail agency to design a program to fit that agency's local needs, which may include providing staffing, targeting customer classes, acquiring grant funding from a variety of sources, and implementing, marketing, reporting, and evaluating the program. MWDOC provides assistance with a variety of local programs including, but not limited to, Home Water Surveys, Large Landscape Water Use Reports, Drip Irrigation Pilot Program, Public Agency Water Smart Landscape Incentives, HOA and Public Information, School Education,

Conservation Pricing, and Water Waste Prohibitions. Many of these local programs have also been structured through Integrated Regional Water Management Planning processes in north, central and south Orange County.

Research and Evaluation. An integral component of any water use efficiency program is the research and evaluation of potential and existing programs. Research allows an agency to measure the water savings benefits of a specific program and then compare those benefits to the costs of implementing the program in order to evaluate the economic feasibility of the program when compared to other efficiency projects or existing or potential sources of supply. Furthermore, in 2013 MWDOC published its first Orange County Water Use Efficiency Master Plan to define how Orange County will comply with, or exceed, the state mandate of a 20 percent reduction in water use by 2020, and how MWDOC will achieve its share of Metropolitan's Integrated Resources Plan water savings goal. The Master Plan is being utilized to achieve the water savings goal at the lowest possible costs while maintaining a mix of programs desired by water agencies and consumers throughout Orange County.

9.2 Demand Management Measures

Urban water conservation practices are intended to reduce long-term urban demands from what they would have been without implementation of these practices. They are in addition to programs that may be instituted during occasional water supply shortages. The District and the Water Use Efficiency Department at MWDOC take pride in providing programs to assist customers in reducing the amount of water used. The District's DMM activities, as well as programs administered by MWDOC's Water Use Efficiency Department to assist in promoting regional water use efficiency, are summarized in the following order.

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support
- Other demand management measures

9.2.1 Water Waste Prevention Ordinances

The Board of Directors (Board) passed Ordinance No. 100 on June 16, 2009 prohibiting waste and unreasonable use of water. These provisions are incorporated into the District's water use

efficiency program located in Appendix G. Section III specifies that the ordinance is designed to prevent waste of potable water and maximize efficient use in the District. It includes specific requirements, in Section VI under permanent mandatory measures that are effective at all times, regarding the prohibition of wasting water. Water waste refers to "uses of water that are limited or prohibited under the Ordinance because they exceed necessary or intended use and could reasonably be prevented, such as runoff from outdoor watering".

9.2.2 Metering

The District requires meters for all customers. The District will continue to require metering of all connections.

The District has a meter replacement program to replace water meters throughout the distribution system. Each year, LBCWD budgets $150,000 to fund replacements. During the 2015/16 Budget process, the LBCWD Board directed staff to investigate an Advanced Metering Infrastructure System (AMI/Smart Meters) to replace/retrofit the District's current water meters with a "turn-key" AMI fixed network system. The District is currently in the process of investigating upgrading its meter reading system to move from a manual read system to an AMI System. If approved, the District hopes to have a fully functional AMI system in place by 2017.

9.2.3 Conservation Pricing

Metering with commodity rates by wholesale and retail agencies has been an industry standard throughout Orange County for many years. Beginning January 1, 2011, the District implemented a tiered rate structure based on property specific water budgets. Tiered rates provide customers with an economic incentive to use water efficiently and pass on the higher costs associated with conservation programs and development of supplemental water sources to those who use water inefficiently.

Water budgets promote efficient water use by providing enough water for typical, yet efficient, water use indoors and outdoors without penalty. Budgets are property specific and take into account different water use factors depending on whether it is a single family, multi-family, CII, mixed use, hotel/motel, or irrigation-only water account.

The District's water rates meet the CUWCC definition of "conservation pricing" that includes "rates designed to recover the cost of providing service." The District bills bi-monthly based on a fixed service charge based on meter size, plus a commodity charge. The District's Budget Based Water Allocation Rate Structure consists of individualized budgets for all customer accounts. Single-family residential customers receive a bi-monthly customized water budget based on the number of people in the home, the property's irrigated acreage, and seasonal weather data. Water budgets for single meter multi-family, dual use, commercial/industrial/

institutional accounts are based on a three-year rolling historical average for each meter. Hotel/motel accounts are allotted 144 gallons of water per guest room based on the number of rooms. Irrigation only customers have an outdoor water budget set according to the property's landscaped area and seasonal weather data. Customers who use more than their budget allotment pay for the additional use at an Inefficient Use Rate. Customers may apply for a variance to their water budget to adjust number of people in household, irrigated area, or for other special circumstances.

The fixed portion of the monthly charge is designed to cover the cost of water distribution, meter reading, and maintenance of the distribution system and a portion of the capital improvement program. The commodity component is structured to recover the actual cost of water, including imported water charges, and energy and maintenance costs for water production facilities. The second tier is structured to recover the cost of additional conservation programs and new supplies.

9.2.4 Public Education and Outreach

Public education and outreach addresses public information programs to promote water use efficiency and educate customers about water use. The District considers its public education and school programs to be essential components of a water use efficiency program. The District operates an extensive public information program and associated schools program, which provide materials, speakers and outreach activities to the general public.

Outreach activities include publications, public meetings, District participation at community events, multi-media campaigns, inter-agency partnerships, facilities tours, regional press releases, water quality reports, feature story ideas, water conservation workshops and seminars, and a speaker's bureau.

Low water use landscaping at LBCWD

Bill Inserts. The District produces bill inserts periodically promoting conservation programs, services, events, and rebates. Water use efficiency messages are also printed on the bill itself. Consumption Information on water bills are bi-monthly and show consumption in gallons and cubic feet, as well as a comparison to last year's consumption, where applicable.

Social Media and Electronic Communication Outreach. The District employs several different social media platforms to inform and engage customers including Facebook, Twitter, and Instagram. In addition, the District communicates messages through email blasts and a Text Message alert system.

WaterSmart Letters. In 2015, the District contracted with *WaterSmart* to implement a customer engagement program to serve its residential population. The program engages customers about their water use while improving customer satisfaction and water-use efficiency. The program is comprised of customized Home Water Reports mailed or emailed to District customers and an online Customer Portal, which provides additional engagement and information for residents. The WaterSmart solution provides program reporting and data analytics to the District.

New Customer Welcome Packet. The District provides a "New Customer Welcome Packet" containing important information for new customers. A welcome letter, signed by the General Manager, explains the District's current water situation and the need for water use efficiency. In addition, information on the District's water use restrictions, Auto Pay service, billing information, District contact information, and water use efficiency materials are included. New customers receive the Welcome Packet upon signing up for service with the District.

Press Releases. The District provides press releases on District issues to the three local newspapers on a frequent basis.

Letters to State Legislature. The District coordinates efforts with MWDOC and the Association of California Water Agencies to lobby the state legislature on pending legislative issues that could impact the District.

Outreach Materials. Customers can help themselves to a selection of indoor and outdoor water conservation literature, devices, rebate forms, and resource lists located inside the District lobby.

Water Use Efficiency Hotline. The District has established a dedicated Water Use Efficiency Hotline where customers can call to get rebate program information and report water waste.

Water-wise and Fire-safe Demonstration Garden. The District's Waterwise and Fire Safe Demonstration Garden was created to encourage public acceptance, desire for, and use of water-wise/California friendly landscaping. Local residents and tourists stroll through the grounds regularly and gather gardening inspiration from the District's selection of water-wise and fire-safe plants. Signs with pictures and information for each plant help make the garden visitor-friendly. Tours of the District's Water-wise and Fire-safe Demonstration Garden are scheduled upon request.

Speakers Bureau. Upon request, the General Manager, Assistant General Manager, or Water Use Efficiency staff will speak to groups on a variety of water-related topics. The following groups typically request speakers from the District: Laguna Beach Rotary Club, Village Laguna, Transition Laguna, Chamber of Commerce, and Laguna Canyon Conservancy.

Door Hangers. Two types of door hangers are used to help customers save water. One alerts customers when their usage is above normal, such as a leak or other condition that needs attention. A second door hanger is a water waste reminder to inform residents when their landscape irrigation systems cause runoff into the street or when meter boxes are obstructed by overgrown landscaping.

California Friendly Landscape Training (Residential). The California Friendly Landscape Training provides education to residential homeowners and professional landscape contractors on a variety of landscape water efficiency practices. These classes are hosted by MWDOC and/or the retail agencies that encourage participation across the county. The residential training program consists of either a half-day mini class or individual, topic-specific four-hour classes. The topics presented include the following.

- Basic Landscape Design
- California Friendly Plants
- Efficiency Irrigation Systems
- Soils, Watering, Fertilizing

California Friendly Landscape Training (Professionals). The California Friendly Landscape Training for professionals educates professional landscape contractors on a variety of landscape water efficiency practices they can employ. The professional training program course consists of four consecutive classes in landscape water management, each building upon principles presented in the preceding class. Each participant receives a bound handbook containing educational materials for each class. These classes are offered throughout the year and are taught in both English and Spanish. Each class covers irrigation principles, irrigation system troubleshooting, controller programming, and irrigation scheduling. Upon completion of the course, participants receive a certificate listing all classes completed. Participants are eligible for continuing education credits as certified by the Irrigation Association.

Participation in the Local Farmers Market. District staff provides water use efficiency literature, rebate forms, and answers questions at the local farmers' market once a month. The farmers' market is held every Saturday from 8 am to 12 pm year-round in downtown Laguna.

EPA Watersense Program. The District is a direct partner with EPA's WaterSense Partnership Program actively promoting the value of water efficiency by providing our customers with easy ways to identify water efficient products through their WaterSense Approved product labels

and materials. This partnership helps consumers make smart water choices that save money and maintain high environmental standards without compromising performance. Products and services that have earned the WaterSense label have been certified to be at least 20 percent more efficient without sacrificing performance. The District's water conservation rebate programs promote only the use of WaterSense labeled devices in order to ensure maximum water savings and efficiency.

"Roll Out the Rain Barrel" Contest. In 2010, the District launched its first annual "Roll out the Rain Barrel" art contest to Laguna Beach students and District customers. Participants create an original drawing that, if chosen, can be painted on an actual working rain barrel. Winners are recognized at a District Commission meeting and in local newspapers, and their rain barrels are displayed in storefront windows around Laguna Beach during February and in the District's lobby during May. The contest brings attention to rainwater harvesting, the collection and storage of rainwater from rooftops that would otherwise become contaminated runoff conveyed to storm drains and the ocean. Rainwater harvesting by customers does not have a significant impact on reducing potable water use but it does raise awareness of water supplies and landscape consumption, often resulting in the replacement of plant materials with more low water using materials.

SmartScape Info/Expo. Now in its sixth year, the District's *SmartScape Info/Expo* highlights and promotes the benefits of using California native plants and efficient irrigation techniques in residential and commercial landscape settings. Attendees have the opportunity to meet face-to-face with knowledgeable landscape and irrigation professionals, attend hands-on demonstrations and free workshops, and meet representatives from local companies exhibiting the latest water efficient landscape products.

Waterwise Garden Mini Grant. As a part of its outreach efforts, the District offers mini-grants up to $2,500 to non-profit organizations, schools, and public agencies with public access gardens. The mini-grant can be used to increase irrigation efficiency, create new water-wise plantings, or promote water efficient gardening.

Wyland Mayor's Challenge for Water Conservation. Each year, the District participates in the Wyland Mayor's Challenge for Water Conservation. The month-long Challenge for Water Conservation is a nationwide competition to promote the importance of using water efficiently. The challenge, held every Earth Month (April 1-30), is a competition that encourages cities across the nation to see who can be the most water wise by asking their residents to take a series of informative, easy to use pledges online to conserve water, energy, and other natural resources. The challenge has become widely recognized as one of the most engaging, zero-cost outreach tools especially designed for cities and water utilities to encourage conservation in the United States. The District won the competition in 2012 and 2013.

Children's Water Education Festival. For the past 10 years, the District has participated and sponsored the Children's Water Education Festival. The Festival, the largest of its kind in the United States, takes place March 25-26, at the University of California, Irvine. More than 7,000 third, fourth, and fifth grade students and their teachers attend the event, presented by OCWD, Disneyland Resort, National Water Research Institute, and OCWD Groundwater Guardian Team. Students from the District's service area attend the Festival thanks to funding provided by the District for bus transportation. The Festival presents a unique opportunity to educate students about local water issues and help them understand how they can protect water supplies and their environment. Since its inception, more than 100,000 children from schools throughout Orange County have been able to experience the Festival and all it has to offer. Throughout the Festival, participating organizations engage the students through interactive educational presentations that are taught to California State Science Standards. Because of this, educators consistently rate the education value of the Festival very high. The Festival is provided at no cost to Orange County schools.

MWDOC Programs. Although the District has an extensive public outreach program, MWDOC also assists its member agencies in reaching the public with accurate, consistent information regarding present and future water supplies and the importance of implementing water efficient techniques and behaviors. MWDOC also assists its member agencies in publicizing the availability of water use efficiency programs and technologies throughout Orange County. MWDOC conducts the following activities on behalf of, and in coordination with, its member agencies.

- Public affairs workgroup
- Poster/slogan contest
- Local and regional events
- Speakers bureau
- Facility inspection trips of MWD, SWP, and GWRS facilities
- Information materials
- Water quality reports
- Media relation

The District participates in the monthly Public Affairs Workgroup meetings conducted by MWDOC to coordinate public outreach efforts and share information on a countywide basis.

School Education Programs. The District has been continuously active in this area by providing free classroom presentations and tours of District facilities to schools within the service area. The objective is to teach students about water conservation, water supply, watershed stewardship, and flood protection. The District also provides school curricula to area educators, including workbooks and videos, as well as hands-on training for teachers. Since 2004, Project WET training has been available through the District for groups of elementary, middle, and high

school educators. Other outreach efforts include letters to science department chairs. Lesson plans, videos, activity guides, and water maps are available to teachers and other group leaders of K-12 students.

One of the most successful and well-recognized water education curricula in Southern California is MWDOC's School Education Program. The District has participated in this program since its inception in January 1973. It reaches nearly 90,000 Orange County students annually. These programs promote water conservation and water conservation related benefits. MWDOC teachers, assisted by its mascot "Ricki the Rambunctious Raindrop," have been educating students in grades kindergarten through high school about the water cycle, the importance and value of water, and the personal responsibility we all have as environmental stewards. MWDOC also formed an exciting partnership with the Discovery Science Center that has allowed both organizations to reach additional Orange County students and provide them with even greater educational experiences in the areas of water and science.

WAVE Program. The District's WAVE Program (Water Awareness Visitor Education Program) is a free voluntary program for businesses designed to educate visitors of Laguna Beach about the importance of water use efficiency. Guests of participating establishments are introduced to the program through the placement of "tent cards," which announce that water will be served only upon request and bed and bath linen will be changed only upon request. These measures save an enormous amount of water, especially in dishwashing operations and in hotel and motel laundry rooms. It is estimated that a single glass of water served in a restaurant or dining room requires four additional glasses of water to wash and rinse each glass.

Water Smart Hotel Program. MWDOC has received grants from DWR and USBR to conduct the Water Smart Hotel Program, designed to provide Orange County hotels and motels with commercial and landscape water saving surveys, incentives for retrofits, and customer follow-up and support. The Program is offered to hotels in MWDOC's service area as identified by retail water agencies. Participating hotels receive survey reports that recommend indoor and outdoor retrofits, upgrades, and other changes that should, based on the survey, result in significant water savings. Quantities of each device and associated fixture and installation costs, water savings and payback information (based on rebate amount Incentives offered through the Save Water Save a Buck Rebate Program) will be augmented using DWR and USBR WUE grant funds. These funds bridge the gap between existing incentives and the actual costs of hotel water survey recommendations.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

The District maintains an emergency response program that aggressively repairs main breaks, hydrant leaks or breaks, and meter leaks. A team is available to permanently repair breaks and

promptly restore water service. All meter leaks are investigated and repaired the same day unless unable to do so; then next day service is performed.

MWDOC was awarded a grant to implement a study titled "Water Loss Management Program Assessment: Potable Water System Audits." This study used the AWWA and International Water Association Water Audit Methodology. A system water audit for the District was conducted to determine current water losses and areas for improvement. Results are described in Chapter 4. The District's 2014 Water Master Plan also includes improvements to help further reduce unaccounted for water loss.

9.2.6 Water Conservation Program Coordination and Staffing Support

The District's Administration Department consists of two full-time staff members who handle a variety of tasks related to water use efficiency and community information. District staff works closely with MWDOC's Water Use Efficiency staff to develop and implement District and regional programs.

Public Affairs Specialist (Full-time) – Assists in performing a variety of public outreach and community relations activities, including implementing the school education program and assisting in water use efficiency programs.

Water Use Efficiency Administrator (Full-time) – Assists in implementing the school education program and various water use efficiency programs for the District and participates in public outreach activities designed to promote water conservation.

9.2.7 Other Demand Management Measures

The District offers numerous residential, commercial, industrial, and institutional (CII) rebate programs and provides supplemental funding to offset the cost to our customers. As a member agency of MWDOC, the District also takes advantage of regional programs offered through the wholesaler. Rebate programs are discussed below.

Survey Programs. In 2009, the District implemented its Waterwise House Call residential survey program. A direct mailing offering the free program to the District's top 10 percent water users was completed in 2013. Currently, the District conducts residential surveys on an informal basis following a high water bill complaint, a higher than normal meter reading, or by customer request. As part of the District's water budget allocation rate structure, customers requesting an increase in their water budget may be required to participate in the Waterwise House Call program before being considered for a variance. In addition to our Waterwise House Call program, from 2013 through 2015 the District partnered with MWDOC to offer the countywide Hone Certification Program, which provided a customized indoor and outdoor water survey.

Reports helped residential customers identify potential water saving actions that could be taken. Water efficient properties were recognized as a Certified Water Smart Home.

Direct Install Program. In partnership with MWDOC, the District has participated in the Metropolitan-Funded Member Agency Administered Program (MFMAA) to offer tailored direct-install programs. These programs target high water using, outdated irrigation devices at single-family properties and retrofits them with newer, water saving technologies such as Weather-Based Irrigation Controllers (WBIC) and Low-Precipitation Rate High-Efficiency Sprinkler Nozzles. In addition to the retrofits, each participant selects a program approved landscape contractor to survey their irrigation system and identify potential improvements in water savings. The contractors are then working one-on-one with each participant to schedule installations of new devices.

Smart Timer Rebate Program. Under this regional program, residential and small commercial properties are eligible for a rebate when they purchase and install a weather-based irrigation controller. These controllers have the potential to save 41 gallons per day per residence and can reduce runoff and pollution by 49 percent. Post installation verification is provided, along with any necessary smart timer scheduling corrections. The site's irrigation system is also evaluated, providing important educational advice on what needs to be improved.

Rotating Nozzle Rebate Program. Through this program, residential and commercial site owners purchase and install high efficiency rotary nozzles in existing irrigation systems. The rebate offsets the cost of the devices and installation. Following the submittal of a rebate application, water bill, and original purchase receipt, MWDOC directs the contractor to perform installation verifications of the sites. Verifications include both residential and commercial properties. As a final step in the program, a qualitative and quantitative evaluation is conducted on the rotary nozzles installed within the three-year program time line when there is sufficient time to gather consumption data for a 12-month post-installation period.

Rain Barrel Incentive Program. The District offers homeowners the opportunity to install 50-gallon rain harvesting barrels to connect directly to their property's downspouts and use rain water to hand-water their landscapes. This program helps reduce potable water use while providing an alternate source of irrigation water and further engages residents to their landscapes and gardens. Residents who have participated in this program consider it a low-cost approach to water use efficiency and have been open to more water use efficiency practices in the landscape which include device driven rebate programs such as our SmartTimer, High-Efficiency Rotating Nozzle, and Spray to Drip rebate programs.

Turf Removal Program. Through a partnership between MWDOC, MWD, and local retail water agencies, residential and commercial customers were eligible to receive up to $3 per square

foot for turf removed for qualifying projects. The program goals were to increase water use efficiency, reduce runoff, and evaluate the effectiveness of water-saving practices in landscapes.

Residential Plumbing Retrofits. Low-flow showerhead saturation is estimated at nearly 100 percent and 94 percent saturation in single and multi-family homes, respectively. As a result, water agencies throughout Orange County have achieved the 75 percent saturation requirement for this BMP. No further low-flow showerhead distribution or installation activity has occurred. Free devices are offered to District customers by request at the District office.

Residential Premium High Efficiency Toilets. The District participates MWDOC's regional Premium High Efficiency Toilet Rebate Program. The program offers incentives to replace old toilets with premium high efficiency toilets that use just 1.06 gallons or less per flush. Premium high efficiency toilets use almost 20 percent less water than the WaterSense standard and flush the same amount of waste just as, if not more, effectively.

Large Landscape Conservation Programs and Incentives. MWDOC offers landscape water use efficiency programs aimed at both residential and commercial customers, with irrigated landscapes greater than 1 acre. MWDOC also offers programs in Orange County to specifically assist retail agencies and their large landscape customers to use water efficiently through a landscape performance certification program and California Friendly Landscape Training for professionals. MWDOC's unique and innovative landscape performance certification program is primarily targeted to homeowner associations within the District. Sites sign up to receive customized water budget reports to track irrigation usage and identify over-watering to maximize water savings.

High Efficiency Washing Machine Rebates. The District participates in the SoCal Water$mart residential rebate program offered by MWD. This program offers financial incentives to single family and multi-family residential customers through the form of a rebate. Orange County residents are eligible to receive a rebate when they purchase a new high efficiency clothes washer (HECW). Rebates are available on a first-come, first-served basis, while funds last. Participants must agree to an inspection of the installed machine for verification of program compliance. Machines must have a water factor of 3.7 or less. Depending on use, these machines can save 10,000 gallons of water per year.

Ultra Low and Zero Water Urinal Program. Through the partnership with MWDOC, the District offers up to $200 in rebates for ultra low water and zero water urinals. Ultra low water urinals utilize only 1 pint (0.125 gallons) of water to flush. These systems combine the vitreous china fixture with either a manual or sensor-operated flush valve. Zero water urinals use no water at all, saving an average of 45,000 gallons of water per year.

Commercial/Industrial Rebate Programs. In partnership with MWDOC and MWD, the District offers rebates to assist CII customers in replacing high-flow plumbing fixtures with low-flow fixtures. Installation of devices is the responsibility of each participant. Participants may purchase and install as many of the water saving devices as is applicable to their site. Rebates are available only on the following devices and must replace higher water use devices; current rebate amounts are provided.

- High efficiency toilet: $40
- Ultra low water or zero water urinal: $200
- Connectionless food steamers: $485 per compartment
- Air-cooled ice machines (Tier III): $1,000
- Cooling tower conductivity controller: $625
- pH/conductivity controller: $1,750
- Dry vacuum pumps: $125 per 0.5 horsepower
- Laminar Flow Restrictors: $10 per restrictor
- Soil Moisture Probe: up to $35 per station
- In -Stem Flow Regulators: $1 each
- Drip Irrigation: $0.20 per square foot

9.3 Implementation over Past Five Years

The DMMs implemented by the District are described in Section 9.2. This section provides a quantification of the implementation of DMMs over the previous five years of 2011 through 2015. The nature and extent of the DMM programs (e.g., toilet replacement rebate values, number of customers obtaining a rebate or number of school presentations given by the District, etc.) are provided.

Water waste prevention ordinances. The District's water waste prevention ordinance is described in Section 9.2.1. In response to the Governor's drought declaration implementing mandatory water restrictions across California, the District's Board adopted Resolution 797 in 2014 declaring a water supply shortage alert as defined in District Ordinance 100, Water Shortage Contingency Plan, in accordance with Water Code Section 375 et. seq. The Water Shortage Alert put into place mandatory restrictions to achieve a 15 to 30 percent reduction in water use.

Metering. All customers are metered as described in Section 9.2.2.

Conservation pricing. The District has conservation pricing as described in Section 9.2.3. In 2014, the District's Board of Directors revised the Area Factor used to calculate customer's outdoor water allocations. The Board voted to reduce the Area Factor from an assumed 60 percent of the total property square footage as irrigated to 50 percent irrigated.

Public education and outreach. Public education and outreach efforts since 2011 are described in Section 9.2.4.

Programs to assess and manage distribution system real loss. As described in Section 9.2.5, the District is proactive in managing its distribution system losses. During the previous five years, the District developed the 2014 water master plan which includes improvements to help further reduce unaccounted for water loss.

Water conservation program coordination and staffing support. The District has two full-time staff members dedicated to Water Use Efficiency and Public Outreach. Their efforts over the previous five years are described in Section 9.2.

Other demand management measures. During the previous five years, the District has continued to implement the programs described in Section 9.2. Data on activities that can be quantified are provided here.

- **Survey Programs.** Since 2011, the District has conducted 505 waterwise surveys.
- **SmartTimer Rebate Program.** Since 2011, the District has installed 417 SmartTimers (413 residential, 4 commercial).
- **Rotating Nozzle Rebate Program.** Since 2011, the District has installed 14, 410 high efficiency rotating nozzles (11,561 residential, 2,849 commercial).
- **Turf Removal Program.** Since 2011, 93,628 square feet of turf has been removed from the District's service area (44,840 sq. ft. residential, 48,788 sq. ft. commercial).
- **Residential Plumbing Retrofits.** Since 2011, the District has distributed approximately 2,000 low-flow showerheads and 500 low-flow faucet aerators to residents and hotels.
- **Residential ULFT Replacement Programs/Water-Sense Toilets.** Since 2011, District customers have received rebates for the installation of 215 high-efficiency toilets through the regional SoCal WaterSmart Rebate program.
- **Large Landscape Conservation Programs and Incentives.** Since 2011, the District has had an average of 127 dedicated irrigation meters signed up to receive customized water budget reports to track irrigation usage and identify over-watering through MWDOC's WaterSmart Landscape program.
- **High Efficiency Washing Machine Rebates.** Since 2011, 198 high-efficiency clothes washers have been installed through the regional SoCal WaterSmart Rebate program.

- **Commercial/Industrial Rebate Programs.** Since 2011, 27 commercial plumbing fixtures/devices have been retrofitted through the regional SoCal WaterSmart Rebate program.

9.3 Planned Implementation to Achieve Water Use Targets

Because the District's conservation efforts have been so successful, resulting in the ability to meet the 2015 water use target, it will continue to implement the current programs described above. In addition, the District's Board will consider additional conservation programs during the 2016/17 Budget process, which may include a laundry-to-landscape greywater program, direct-install app-based smart-timer pilot program, and landscape design assistance for irrigation system retrofits.

9.4 California Urban Water Conservation Council

The District is not a member of CUWCC, therefore it does not have the option of submitting its annual reports in lieu of the above DMM descriptions.

Chapter 10 – Plan Adoption, Submittal, and Implementation

This chapter discusses the UWMP adoption, submittal, and implementation process. It is organized to reflect the 2015 UWMP Guidebook sections and requirements to aid DWR in its review.

10.1 Inclusion of all 2015 Data

Data provided in this UWMP reflects calendar years. Data utilized is current through the end of the last full year – December 31, 2015.

As required by *California Water Code* Section 10631(k), MWDOC provided its member agencies information that quantified water availability to meet their projected demands over the next 25 years. Based on the projections of retail demand and local supply development provided by MWDOC's member agencies and the imported supply availability described in MWD's 2015 RUWMP, MWDOC provided data specific to each member agency to be used by that agency to update its own UWMP. These data were used wherever possible for consistency between documents.

10.2 Notice of Public Hearing

To provide public opportunities to participate in the UWMP process, the District provided notification of the preparation of the updated document and public noticing of the public hearing. These steps were consistent with all California Water Code requirements for notification of availability of this document in its draft and final forms as discussed here.

10.2.1 Notice to City and County

The District notified several agencies of the preparation of this UWMP. As presented in Table 10-1, the City of Laguna Beach, the primary city within the District's service area, and the County of Orange were notified at least 60 days prior to the public hearing data of June 14, 2016, of the fact that the UWMP was under preparation, of the hearing time and place, and of the availability of the UWMP to review prior to the hearing. In addition to the city and county who were required to be notified, the District also notified wholesale water suppliers of projected water use.

A copy of the 60 -day notification is provided in Appendix H. The following entities received the 60-day notification of the preparation of the Laguna Beach County Water District 2015 UWMP.

- City of Laguna Beach
- County of Orange
- El Toro Water District
- Emerald Bay Services District
- Laguna Beach Chamber of Commerce
- MWD
- MWDOC
- Orange County Water District
- South Coast Water District

Upon preparation of the document, a draft UWMP was emailed to these same entities along with a notification of the public hearing. A copy of the Draft UWMP was made available for public review at the District headquarters' counter during normal business hours. Noticing for the hearing was provided in compliance of Act requirements, as discussed in Section 10.2.2.

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Laguna Beach	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Orange County	☑	☑

10.2.2 Notice to the Public

The District encouraged public participation in the UWMP development process through the noticing of the public hearing and by encouraging the review of the draft document. A legal notice of the public hearing and the availability of the draft UWMP was provided approximately 30 days prior to the June 14, 2016 public hearing at the Water Commission. The public notice, provided in Appendix H, provided the time and place of the hearing as well as the location where the UWMP was available for public review during normal business hours. This notice was published in the *Coastline Pilot* and the *Laguna Beach Independent* once a week for two consecutive weeks with at least five days between each notice.

10.3 Public Hearing and Adoption

The public hearing was held at a regularly scheduled Water Commission meeting on June 14, 2016 at 5:00 p.m. at the District headquarters. Adoption of the plan occurred on June 15, 2016 by the Board of Directors at a regularly scheduled meeting at 5:00 p.m. at District headquarters. During the public hearing, information was provided on District baseline values, water use targets, and implementation plan. Documentation of the letters notifying the public and agencies, along with public notices of the hearing encouraging the involvement of various community groups, letters of correspondence, and the adoption resolution are included in Appendix H.

10.4 Plan Submittal and Public Availability

The draft UWMP was made available for public review before the public hearing; the adopted plan was made available for public review during normal business hours at the District office for at least 30 days following submittal to DWR. The adoption resolution is provided in Appendix H.

The final 2015 UWMP was provided electronically to DWR, the California State Library, MWDOC, EBSD, City of Laguna Beach, County of Orange, local public library, and other entities listed in Section 10.2.1, within 30 days after adoption or by July 1, 2016. It was also posted on the District's website. DWR received the adopted UWMP (text and the data tables) electronically through the WUEdata online submittal tool that DWR developed. The District submitted a CD of the adopted 2015 UWMP to the California State Library within 30 days of adoption.