City of
Santa Monica®

2015 URBAN WATER MANAGEMENT PLAN

June 2016

2015

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City of Santa Monica

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SECTION 1: INTRODUCTION

The City's water service area (pictured) comprises 100% of the City's boundaries. The estimated current resident population served by the City's water system is approximately 93,283 persons

SECTION 1 INTRODUCTION

1.1 PURPOSE AND SUMMARY

This is the 2015 Urban Water Management Plan (UWMP) for the City of Santa Monica (City). This plan has been prepared in compliance with the Urban Water Management Planning Act (Act), which has been codified at California Water Code sections 10610 through 10657 and can be found in **Appendix B** to this 2015 Plan.

As part of the Act, the legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The Act requires "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, to prepare and adopt, in accordance with prescribed requirements, an urban water management plan." These plans must be filed with the California Department of Water Resources (DWR) every five years describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. (*See* Wat. Code § 10631).

The Act has been amended on several occasions since its initial passage in 1983. New requirements of the Act due to SBx7-7 state that per capita water use within an urban water supplier's service area must decrease by 20% by the year 2020 in order to receive grants or loans administered by DWR or other state agencies. The legislation sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020. The state shall make incremental progress towards this goal by reducing per capita water use by at least 10% by December 31, 2015. Effective 2016, urban

retail water suppliers who do not meet the water conservation requirements established by this bill are not eligible for state water grants or loans.

As part of the City's past and current sustainability goals, the City is currently implementing all facets of this plan with the goal to be 100% sustainable (import-free) by 2020.

1.2 COORDINATION

In preparing this 2015 Plan, the City has encouraged broad community participation. Copies of the City's draft plan were made available for public review at City Hall, local public libraries in the City, and on the City's Public Works/Water Resources website. The City noticed a public hearing to review and accept comments on the draft plan with more than two weeks in advance of the hearing. The notice of the public hearing was published in the local press on March 29, 2016 and April 5th, 2016, and mailed to the City Clerk. On May 24th, 2016, the City held a noticed public hearing to review and accept comments on the draft plan.

Table 1.1
Coordination and Public Involvement

	Participated In Plan Preparation	Contacted for Assistance	Commented on Draft	Notified of Public Hearing	Attended Public Hearing
City Water Resources Division	x	x	x	x	x
City Public Works Dept.		x	x	x	x
City Manager's Office				x	x
Santa Monica City Council				x	x
The Metropolitan Water District of Southern California		x		x	x
CA Dept. of Water Resources				x	
LADWP				x	
LA County Waterworks				x	
LACSD				x	
Interested General Public			x	x	x

Following the consideration of public comments received at the public hearing (**Appendix N**), the City adopted the 2015 Plan on May 24th, 2016. A copy of the City Council resolution approving the 2015 Plan is included in **Appendix D**.

As required by the Act, the 2015 Plan is being provided by the City to DWR, the California State Library, and the public within 30 days of the City's adoption.

1.3 FORMAT OF THE PLAN

The sections and information contained in this 2015 UWMP correspond to the items in the UWMP Act and other amendments to the Water Code, including SBx7-7, as follows:

Section 1 - Introduction

This section describes the UWMP Act, the City's planning and coordination process, the history of the City's water supply system, and a description of its existing water service area. This section also describes the local climate, population served, and the City's water distribution system.

Section 2 - Water Sources & Supplies

This section describes the City's water supplies, including imported water purchased from the Metropolitan Water District of Southern California (MWD), local groundwater extracted from the Santa Monica Basin, and recycled dry weather urban runoff produced at the Santa Monica Urban Runoff Recycling Facility (SMURRF). This section also discusses potential future water supplies.

Section 3 – Water Quality

This section discusses the quality of the City's imported and groundwater sources, including a discussion on the treatment and testing of water. This section also discusses water quality effects on management strategies and supply reliability.

Section 4 – Water Demands

This section describes past, current, and projected future water demands within the City's service area prior to the implementation of future demand management measures. This chapter also discusses the requirements of the Water Conservation Act of 2009 (SBx7-7) and the City's own 100% sustainability goals.

Section 5 – Reliability Planning

This section presents an assessment of the reliability of the City's water supplies by comparing projected future water demands with expected water supplies under three different hydrologic conditions: a normal year; a single dry year; and multiple dry

years. This 2015 Plan concludes that if projected imported and local supplies are developed or maintained as anticipated, no water shortages are anticipated in the City's service area during the planning period.

Section 6 – Conservation Measures

This section addresses the City's compliance with water conservation measures as a member of the California Urban Water Conservation Council (CUWCC) with the current Best Management Practices (BMPs).

Section 7 – Contingency Planning

This section describes the City's current conservation activities, as well as those efforts that will be utilized in the event of a water supply interruption, such as drought. The City's water shortage contingency plan (Water Shortage Response Plan), adopted by Council in 2009 and updated in 2015, was developed in consultation and coordination with other MWD member agencies. In addition, MWD's Water Surplus and Drought Management Plan (WSDM) is also described.

Section 8 – Climate Change

This section discusses climate change, its overall impacts on society, and its impact on City water supplies and finances. This section also discusses alternate water sources the City can consider to offset the adverse effects of climate change, and also existing City policies on climate change.

Appendices

The appendices contain references and specific documents that contain the data used to prepare this 2015 Plan.

1.4 UPDATES TO THE 2015 PLAN

In addition to updated data, the City's UWMP has undergone several changes from 2010-2015 UWMP years (2011-2016 calendar years). A summary of the changes to the UWMP, by section, are provided below:

- **Section 2:** Updated information on groundwater, including the new Santa Monica Water Treatment Plant (Arcadia Treatment Plant and Charnock Treatment Unit)
- **Section 2:** Added a discussion on energy required to produce water
- **Section 4:** Updated information on the City's SBx7-7 targets and its 2020 sustainability goals
- **Section 5:** Added a discussion on the recent California drought
- **Section 8 (New):** Added Section 8 (Climate Change) to the UWMP

In addition to the above changes, there are multiple minor changes. The changes reflect both those that are required by the Water Code and those that the City elected to include or modify.

1.5 WATER SYSTEM HISTORY

The City of Santa Monica was founded in 1875 on the site of a land grant by Don Francisco Sepulveda and occupies 8.3 square miles (5,312 acres). The City of Santa Monica started primarily as a seaside resort and gradually became integrated into the Los Angeles Metropolitan Area as development in the Los Angeles Basin grew. During the first half of the twentieth century, Santa Monica's population (along with most of California) grew at a tremendous pace, averaging over a 120% increase in growth. To meet the needs of the expanding population, the City of Los Angeles constructed aqueducts to bring water from the Owens Valley to supply the needs of Los Angeles. Much of the western Los Angeles area was unincorporated around the early part of the twentieth century, which prompted the City of Los Angeles to offer a reliable water supply as an incentive for annexation to the City of Los Angeles. For many areas, this was a welcomed opportunity; however, the City desired to remain independent and purchased several existing small water purveyors, such as the Arcadia Water Company and the Venice Water Company, to create its own water supply and administrative agency.

Figure 1.1: City of Santa Monica (circa 1920)

The City of Santa Monica along with 12 other local governments formed the Metropolitan Water District (MWD) in 1928. MWD was originally created to build the Colorado River Aqueduct to supplement the water supplies of the original founding members. In 1972, MWD augmented its supply sources to include deliveries from the State Water Project via the California Aqueduct. Today, MWD serves more than 145 cities and 94 unincorporated communities.

The City of Santa Monica continues to purchase MWD water to supplement its water supply. From 1960 to 1980, Santa Monica's population growth slowed dramatically, with the City experiencing a small decline in population from 1980 to 1990. This slow growth rate was largely

Figure 1.2: City of Santa Monica Today

due to Santa Monica's limited size and the limited availability of land to be developed.

1.6 CITY WATER SERVICE AREA

The City is an urban coastal community, bordered to the west by the Pacific Ocean and the City of Los Angeles to the north, east, and south. The City's water service area consists entirely of the City of Santa Monica with limited service in the City of Los Angeles. Land use is principally composed of single and multi-family residences, a centralized business and commercial district, and some institutional and industrial areas as shown in **Figure 1.5**. Since the area is mostly under built-out conditions, changes in land use types will result from re-development of existing lots. The City has 3,752 Multi-family units and 213 Single Family Homes that are considered low income. At an allocation of 11 HCF and 22 HCF respectively, the City projects 41,272 HCF and 4,686 HCF per bi-monthly billing period to be allocated towards low-income units.

1.7 CLIMATE

The City has a Mediterranean climate with moderate, dry summers with an average temperature of about 68°F and cool, wet

winters with an average temperature of 58°F. The average annual rainfall for the City of Santa Monica is approximately 12.6 inches. Evapotranspiration (ETo) in the region averages approximately 50 inches annually. **Table 1.2** lists the historical average rainfall for the City from 1937 to 2015—data acquired from Western Regional Climate Center using US COOP Station ID: 047950.

Table 1.2
Historical Climate Characteristics
(www.wrc.dri.edu)

Month	Rainfall (in)
Jan	2.7
Feb	3.0
Mar	2.0
Apr	0.7
May	0.2
Jun	0.0
Jul	0.0
Aug	0.1
Sep	0.2
Oct	0.3
Nov	1.4
Dec	2.0
Totals:	**12.6**

Historically, the City receives slightly less rainfall than other cities in the Los Angeles area (about 1 inch less historically). As the State of California and the LA region has undergone a several-year drought, rainfall has been much lower in the City. Rainfall and ETo data gathered from California Irrigation Management Information System (CIMIS, Station 99) is reflected in **Table 1.3** below:

Table 1.3
Recent Climate Characteristics
(www.cimis.water.ca.gov)

Month	Rainfall (in)	ETo (in)
Feb '15	0.6	2.9
Mar '15	1.5	4.6
Apr '15	0.3	5.3
May '15	0.5	4.9
Jun '15	0.1	5.2
Jul '15	0.2	5.6
Aug '15	0.0	5.9
Sep '15	2.0	5.0
Oct '15	0.0	4.1
Nov '15	0.1	3.2
Dec '15	0.9	2.6
Jan '16	2.7	2.0
Totals:	**8.9**	**51.3**

1.8 POPULATION

According to the most recent California Department of Finance (DOF) figures, the current 2015 resident population of the City is approximately 93,283 persons. Since the City serves only 25 customers in the City of

Los Angeles, the total service area population essentially equals that of the City. Thus, the total current resident population served by the City's water system is approximately 93,308 persons. Population is expected to expand very modestly with an annual growth rate of less than 1.0% annually over the next 25 years as shown in **Table 1.4** below:

Table 1.4
Population Projections
(Based on 0.12% Growth Rate* since 1990)

Year	Estimated Population
2020	93,868
2025	94,431
2030	94,998
2035	95,568
2040	96,141

Per CA DOF DATA

Despite the slow population growth rate, since Santa Monica is a major commercial and cultural center for the region, the City has estimated daytime populations of up to 200,000. During peak summer months, it has seen maximum daytime populations of 500,000, due in large part to the number of businesses & attractions located in the City.

Figure 1.3: Daytime Visitors to Santa Monica

The large daytime populations place pressure on the City to supply adequate water to meet peaks in water demands.

1.9 WATER SYSTEM

The City distributes its water to its 18,000 service customers through a 250-mile network of distribution mains ranging in size from 6 to 36 inches. The water system consists of three pressure zones that provide sufficient water pressure to customers. The water service area and districting map are shown in **Figures 1.4** and **1.5** on the following pages.

Imported Water

The City's imported water supply is delivered through two 24-inch connections to MWD. MWD provides the City and the region with imported water via its Santa Monica, Sepulveda, and Culver City Feeder Systems. The City's connections with MWD are designated as SM-1 and SM-2. SM-1 is

located at the Santa Monica Water Treatment Facility and SM-2 is located at the Charnock Well Field; both in West Los Angeles. **Table 1.5** lists the capacities of the City's imported connections:

Table 1.5
Imported Connections with MWD

Description	Capacity (cfs)
SM-1	30
SM-2	25

Groundwater

The City receives groundwater from ten groundwater wells that pump water from the Santa Monica Basin. The City's wells are located in the Charnock, Arcadia, and Olympic Sub-basins. The City's wells range in pumping capacity from 200 gpm to 1,675 gpm as listed in **Section 2**.

Recycled Dry Weather Urban Runoff

The City receives dry weather urban runoff from its Pico-Kenter and Pier storm drains and treats it at its Santa Monica Urban Runoff Recycling Facility (SMURRF). The SMURRF has an average capacity of 0.5 MGD and provides water treated at Title 22 levels to various commercial and landscape customers in the City.

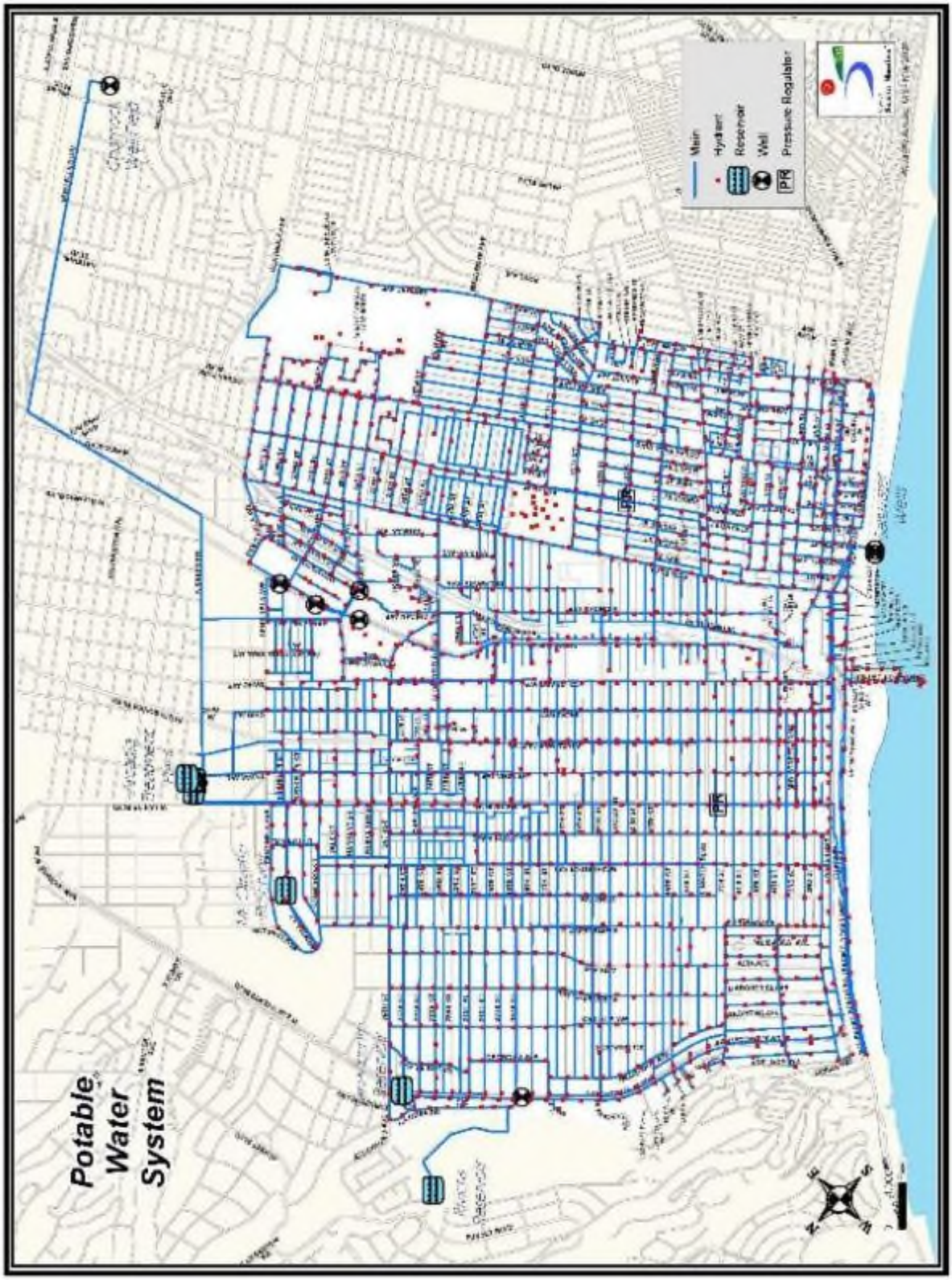

Figure 1.4: City of Santa Monica Water System

Figure 1.5: City of Santa Monica Districting Map

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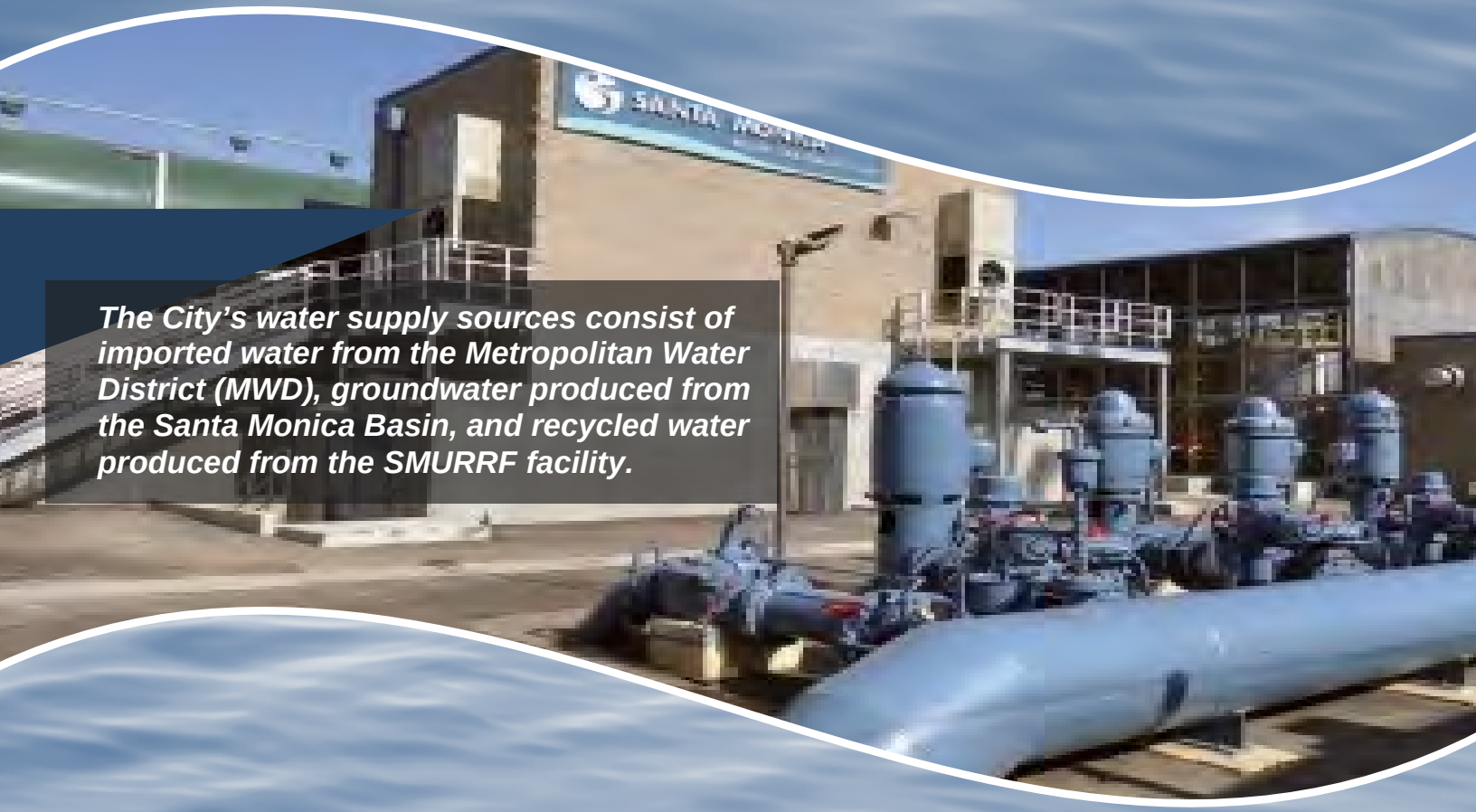
SECTION 2: WATER SOURCES & SUPPLIES



The City's water supply sources consist of imported water from the Metropolitan Water District (MWD), groundwater produced from the Santa Monica Basin, and recycled water produced from the SMURRF facility.

SECTION 2 WATER SOURCES & SUPPLIES

2.1 INTRODUCTION

The City's water supply consists of imported water purchased from MWD, groundwater produced from the Santa Monica Basin, and recycled dry weather urban runoff produced at its SMURRF facility.

2.2 WATER SUPPLY SOURCES

2.2.1 Imported Water

The City has access to imported water from the Colorado River and the Sacramento-San Joaquin River Delta in Northern California. These two water systems provide Southern California with over 2 million acre-feet (MAF) of water annually for urban uses.

Colorado River

The Colorado River supplies several states with a valuable source of water, including Colorado, Utah, Nevada, Arizona, & California. Approximately 40 million people are dependent on water from the Colorado River for agricultural, industrial, or domestic needs. From a State legislative act in 1929, California's allotment from the Colorado River is about 4.4 MAF annually, and is used for agricultural and urban uses with approximately 3.85 MAF used for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 - 800,000 acre-feet (AF)) is used for urban purposes in MWD's service area. MWD was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the Colorado River Aqueduct.

Figure 2.1: Parker Dam at Colorado River

The Colorado River Basin has been experiencing a prolonged drought, where runoff above Lake Powell has been below average for twelve of the last sixteen years. Within those sixteen years, runoff in the

Figure 2.2: Sacramento-San Joaquin Bay Delta

Colorado River Basin above Lake Powell from 2000 through 2007 was the lowest eight-year runoff on record. Runoff from 2000 through 2007 was the lowest eight-year runoff on record. While runoff returned to near normal conditions during 2008-2010, drought returned in 2012 with runoff in 2012 being among driest years in history. During these drought conditions, Colorado River system storage has decreased to 50 percent of capacity.

Bay Delta

In addition to the Colorado River, the Sacramento-San Joaquin River Delta provides a significant amount of supply annually to Southern California. The Delta is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary.

The Delta is often considered the nexus of California's statewide water system. About half the total river flow in the state passes through this region, from which water is exported to the San Joaquin Valley, Southern California and portions of the Bay area to supply some 1,130,000 acres of farmland and 23 million people in central and Southern California. The Delta provides an estimated 7 million acre feet (MAF) of water per year, of which about 100,000 AF

are exported to the San Francisco Bay Area, 1.7 MAF are used locally, and over 5 MAF are exported to the San Joaquin Valley, coastal Central and Southern California via the State Water Project.

Aqueduct Systems

In order to provide Southern California imported water, two separate aqueduct systems (one for each source of supply) are utilized to obtain supplies. These two aqueduct systems convey water from each source into separate reservoirs whereupon the water is pumped to one of several treatment facilities before entering MWD's distribution system. One of these aqueduct systems is known as the Colorado River Aqueduct (CRA), and the other is known as the California Aqueduct or the State Water Project (SWP). The CRA is managed by MWD and the SWP is managed by DWR.

The idea for the CRA initially began in the early 1920s. As a result of the growing water needs of the Los Angeles area, MWD was formed in 1928. The CRA was considered to be the first order of business shortly after MWD's incorporation. MWD initially considered eight different routes for the CRA, but ultimately the existing route was chosen since it was the safest and most economical. Construction began in 1933 after a $220 million bond was approved in 1931. The CRA is 242 miles long and consists of open channels, tunnels, pipeline, two reservoirs, and five pumping stations. At the pumping stations, water is lifted in some cases by over 400 feet in order to account for the elevation differences. The CRA carries water from the Colorado River at the Parker Dam to Lake Matthews.

In addition to the CRA, MWD receives water from Northern California via the California Aqueduct, also known as the State Water Project (SWP). Operated by DWR, the SWP is 444 miles long water storage and delivery system of reservoirs, aqueducts, power-plants and pumping plants and carries water from the Delta to Southern California and is operated by DWR. Its main purpose is to store water and distribute it to 29 urban and agricultural water suppliers, also known as "contractors" in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California. Of the contracted water supply, 70 percent goes to urban users and 30 percent goes to agricultural users.

Financing for the construction of SWP facilities was authorized in 1959, when the State Legislature enacted the California Water Resources Development Act (known

Figure 2.3: State Water Project (California Aqueduct)

as the Burns-Porter Act). The Burns-Porter Act, formally known as the California Water Resources Development Bond Act, was placed on the November 1960 ballot. Also known as Proposition One, its chances for passage were unpredictable. Heated and continuous negotiations were still ongoing, with Metropolitan Water District (MWD) withholding its endorsement until days before the election. The San Francisco Chronicle strongly opposed the proposition. California's North-South regional rivalry was a strong factor in the election.

The first SWP water deliveries were made in 1962, two years after construction began. The State of California Department of Water Resources (DWR) and MWD signed the first water supply contract in 1960. Today 29 agencies have long-term water supply contracts with DWR. The service areas of these long-term water supply contractors vary widely in size, location, climate, and population. The contractors' uses for SWP water also differ. In the San Joaquin Valley, SWP water is used primarily for agriculture; in the Feather River area, San Francisco South Bay, the North Bay areas, and in Southern California, SWP water is used primarily for urban and industrial needs.

Today, the SWP includes 34 storage facilities, reservoirs and lakes; 20 pumping

plants; 4 pumping-generating plants; 5 hydroelectric power plants; and about 701 miles of open canals and pipelines.

The previously mentioned aqueducts supply Southern California with a significant amount of its water and are crucial to its sustainability. In addition to these two water systems, there are also several other aqueducts that are vital to the State, including the Los Angeles Aqueduct (managed by LADWP). The major aqueducts in California are shown in **Figure 2.4** on the following page.

Imported Water Purchases

As a wholesale agency, MWD distributes imported water to its 26 member agencies throughout Southern California as shown in **Figure 2.5** on Page 2-7. The City is one of 15 Retail agencies served by MWD and receives imported water at two locations: the Arcadia Treatment Unit and the Charnock Treatment Unit. Both of these connections are 24 inches in size and are capable of serving 100 percent of the City's water needs. The connections maintain a hydraulic grade capable of direct service to all three (3) pressure zones within the City's service area.

Table 2.1 presents the City's recent five-year imported water purchases from 2010 to 2015. Imported water over this time period has accounted for over 85 percent of the City's supply totals. The City brought a new treatment plant online in 2010, and the percentage of imported water saw a sharp decline in 2011. With optimization of the treatment facilities and drought conservation the City has seen imported water decline to less than 30% of the City's supply totals.

Table 2.1
Five-Year Imported Water Supply
(Purchases from MWD)

Year	Purchases (AF)
2015	3,298
2014	5,108
2013	5,842
2012	6,549
2011	6,389
2010	9,812
Average:	**6,166**
2005-2009 Average:	**12,582**

The City's Tier 1 limit from MWD is 7,409 AFY. As indicated by **Table 2.1**, the City's imported water purchases are well under the limit during each of the past five years thanks to the re-activation of the City's wells.

Figure 2.4: Aqueduct Systems in California

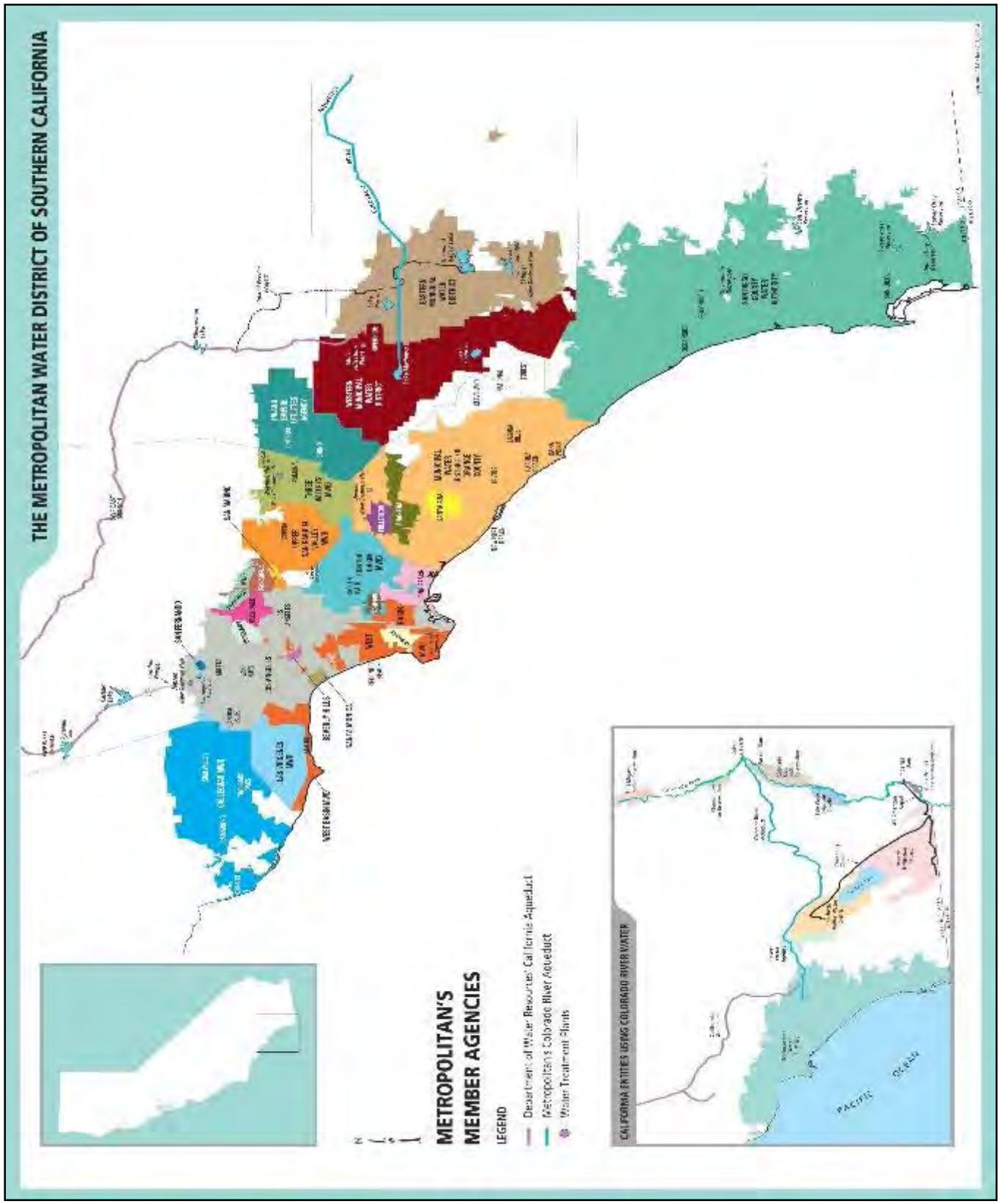


Figure 2.5: MWD Service Area

Figure 2.6: Main Santa Monica Basin and Subbasins

2.2.2 Groundwater

The City obtains its groundwater from the Santa Monica Basin (Basin). The basin is located in western Los Angeles County and overlies the entire City of Santa Monica, Culver City, Beverly Hills, and portions of western Los Angeles. The basin has a surface area of 50.2 square miles of mostly flat to mildly hilly terrain. The basin is bounded by impermeable rocks of the Santa Monica Mountains to the north, the Ballona Escarpment (Bluffs) to the south, the Newport-Inglewood fault to the east, and the Pacific Ocean to the west. Extensive faulting within the basin results in five distinct subbasins as shown in **Figure 2.6**.

The main water bearing formations of the Santa Monica Basin include the Ballona and Silverado aquifers underneath the clay-rich Bellflower aquiclude. The Lakewood Formation, which includes the Ballona Aquifer, is a significant aquifer formation within some areas of Los Angeles County and is present in the Arcadia and Olympic Subbasins in northern half of the Santa Monica Basin. The Silverado Aquifer within the San Pedro Formation is the main potable production aquifer in the Santa

Figure 2.7: Santa Monica Mountains (Northerly Border of Santa Monica Basin)

Monica Basin. The estimated current combined water storage in the basin 300,000 AF [RCS, 2013 Groundwater Assessment]. Groundwater in the basin is replenished by percolation from precipitation, receiving a regional average annual precipitation of about 14 inches, and by surface runoff from the Santa Monica Mountains.

The Inglewood fault restricts some of the groundwater inflows from the Central Basin to the East that would have otherwise replenished the Santa Monica Basin. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, only a small portion of basin soils are capable of transmitting water to the water-bearing formations below.

Groundwater flow is generally from the Santa Monica Mountains in the north to the West Coast Basin in the south. Groundwater outflows to the West Coast Basin are estimated to be about 1,000 AFY. However, there are no formal agreements governing this outflow. Additional outflow to the Hollywood and Central Basins is restricted by the Newport-Inglewood Uplift.

Figure 2.8: Ballona Creek (Southerly Border of Santa Monica Basin)

The total storage capacity of the basin is estimated to be approximately 340,000 acre-feet (AF). Although no formal sustainable yield determination has been made for the Santa Monica Basin, USGS estimates a sustainable yield to be 12,500 AF/yr.

Groundwater levels in each subbasin are generally at or above mean sea level (MSL), although low water levels at or below MSL in the Coastal Subbasin allow for the possibility of seawater intrusion to occur in that subbasin. Water levels at or below MSL in the Charnock Subbasin, however, do not pose a high risk for seawater intrusion.

Due to the local geology and the highly urbanized nature of the City, there are no spreading basins in the Santa Monica Basin, although during the 1980s the City injected up to 2,148 AFY of imported water from MWD into the Charnock Subbasin using an aquifer storage and recovery (ASR) well. The City, however, ceased this operation in 1990 and the City does not currently provide additional groundwater recharge into the Basin.

Since groundwater levels are typically at or above mean sea level and since the City does not operate any wells in the Coastal Subbasin, seawater intrusion does not pose a significant risk to the City's groundwater supply. Therefore there are no seawater intrusion barriers or desalters in the Santa Monica Basin; however, due to the relative brackish nature of the Basin, the City maintains a blending plan to meet federal and state drinking water standards.

Basin Management

The Santa Monica Basin is currently unadjudicated and the management of water resources in the Santa Monica Basin is provided by the City. No formal groundwater management plan has been adopted by the City. The basin has not been identified as being in overdraft conditions in the most recent Department of Water Resources Bulletin 118. The California State Water Resources Control Board's Division of Drinking Water and the Regional Water Quality Control Board provide additional oversight of the basin's groundwater quality and help monitor contaminant levels. The City intends to prepare a Groundwater Management Plan as required by the Sustainable Groundwater Management Act (SGMA) of 2014.

Basin Summary

The key characteristics of the Santa Monica Basin are summarized in **Table 2.2**:

Table 2.2
Santa Monica Basin
Summary of Characteristics

Item	Amount
Max. Depth to Groundwater	500 ft.
Thickness of Groundwater Table	30-280 ft.
Storage Capacity	340,000 AF
Sustainable Yield**	Up to 12,500 AFY
Spreading Basins (Total)	0
Wells (Active)	10
Well Pump Capacities (Total) ***	9,525 gpm

* Well SM 7 inactive and used for monitoring
**USGS estimate
***Different from total pumping capacity as not all wells are pumped simultaneously (see section 2.3)

Groundwater Production

For nearly 100 years, the City has been producing groundwater from wells located within the different subbasins of the Santa Monica Basin. This reliable local source has helped the City during its formative years to maintain independence while other cities or agencies were overtaken by the City of Los Angeles. The City's groundwater capabilities also helped it to survive the Northridge earthquake of 1994 without any interruptions in water service. Over the

Figure 2.9: Santa Monica Water Treatment Plant

years, groundwater has been a clean and reliable source of water for the City. In the mid-1990s, however, while testing its groundwater, the City discovered contamination of its groundwater in the form of the gasoline additive Methyl Tertiary Butyl Ether (MTBE). Years earlier, MTBE had been added to gasoline as part of the state of California's Clean Air Act. In 1996, the City shut down its Charnock wells while an investigation into MTBE began.

After some investigation, the City discovered that MTBE added to gasoline had leaked from underground storage tanks at gas stations or from gasoline pipelines. Once it escaped, MTBE readily traveled through soil and into the groundwater aquifers. Once it reached water, it bonded almost completely with the water. Under natural conditions, MTBE biodegraded slowly, if at all. Many current and former gas stations and pipelines surrounded the City's water wells, which provided numerous potential sources for any MTBE leaks.

In 2006, the City reached an agreement with the parties responsible for the MTBE contamination to restore the Charnock Well Field so that it could once again be a viable drinking water source. This restoration

came in the form of the new Charnock Granular Activated Carbon (GAC) treatment unit at the Charnock well field and re designed and constructed Santa Monica Water Treatment Plant (shown in **Figures 2.9**). These facilities comprise a water treatment system to remove groundwater contamination from the Charnock Subbasin and restore this resource as a water supply for the City. The Charnock treatment system uses filtration with granular activated carbon to treat water from the three contaminated wells at the Charnock Well Field, followed by additional treatment at the Reverse Osmosis (RO) facilities at the Santa Monica Water Treatment Plant.

As of February 2011, the City extracts groundwater from ten (10) active groundwater wells with an estimated combined maximum production capacity of 9,525 gpm (i.e. all wells pumping simultaneously). Two of these wells are located in the Arcadia Subbasin (500 gpm total capacity), three are located in the Olympic Subbasin (1,600 gpm total capacity), and five are located in the Charnock Subbasin (7,425 gpm total capacity). As previously mentioned, the five Charnock wells had been shut down from 1995-2010 due to MTBE contamination and groundwater production during that period occurred only in the Arcadia and Olympic Subbasins (refer to **Figure 2.6**). The City completed the construction of the Charnock and Arcadia Water Treatment Units in December 2010, and have returned the Charnock wells to service. These new facilities allow the City to remove contaminants found in the Charnock Subbasin and deliver water that meets or exceeds water all quality standards set by the State of California and the Federal Government. The City's groundwater well statistics are listed below in **Table 2.3**:

Table 2.3
City Groundwater Wells

Well Name/No.	Subbasin	Capacity (gpm)
Charnock 13	Charnock	1,600
Charnock 16	Charnock	1,500
Charnock 18	Charnock	1,675
Charnock 19	Charnock	1,400
Charnock 20	Charnock	1,250
Arcadia 4	Arcadia	250
Arcadia 5	Arcadia	250
Santa Monica 1	Olympic	200
Santa Monica 3	Olympic	400
Santa Monica 4	Olympic	1,000
	Total Capacity:	**9,525**

Table 2.3 provides a sum of maximum individual capacities of each of the City's wells, not the total pumping capacity.

The wells are not all run simultaneously for two main reasons: 1) some wells are too close in proximity and would cause interference or overdraft 2) the sustainable yield of the Charnock Subbasin was identified at 5,000 gpm by Worley Parsons in 2011.

It should be noted that though the wells in Charnock are capable of producing 7,425 gpm, a yield number of 5,000 gpm causes 2,425 gpm in that basin to be redundant. Also Arcadia Subbasin can only produce from one well at a time, so 250 gpm is redundant in that subbasin. The maximum groundwater supply given the existing wells is 6,850 gpm.

The City's wells are equipped with flow meters to measure water production and provide wellhead treatment. The water from all but one well (SM-1) is treated appropriately by the Charnock Treatment Unit and at the Santa Monica Water Treatment Plant before being sent into the distribution system. Water production is recorded monthly by City water staff and reported annually to the Department of Water Resources (DWR). Over the past six years, groundwater extraction has ranged from 3,228 AF to 8,879 AF (average of 7,307 AF). **Table 2.4** shows the City's groundwater production for the past six years:

Table 2.4
Recent Groundwater Production
(Total All Wells)

Year	Production (AF)
2015	8,539
2014	8,879
2013	8,236
2012	8,282
2011	6,676
2010	3,228
Average:	**7,307**
2005-2009 Average:	**1,951**

It should be noted that the maximum production capacity is approximately 9,000 AFY. With the re-activation of the City's Charnock wells, groundwater production is expected to increase significantly within the next five years. Historically, the Charnock wells have produced well over half of the City's groundwater.

2.2.3 Recycled Urban Runoff Water

The City of Santa Monica completed its Santa Monica Urban Runoff Recycling Facility (SMURRF) in 2001. The primary objectives of the facility were to eliminate contamination of Santa Monica Bay caused by urban runoff and to provide cost-effective treatment for producing high-quality water for reuse in landscape irrigation and indoor plumbing. The

SMURRF project was funded by the cities of Santa Monica and Los Angeles, State Water Resources Control Board loan, Metropolitan Water District recycled water rebate program, and federal ISTEA and Los Angeles County Proposition "A" grants; it is operated by Santa Monica, though operating costs and revenues are shared jointly with the City of Los Angeles.

Figure 2.10: Water Treatment at SMURRF

The facility treats dry weather urban runoff from the Pico-Kenter and Pier drains year-round and is designed to routinely treat approximately 500,000 gallons per day (0.5MGD). Current production has been approximately 180,000 gallons per day (0.18 MGD). SMURRF treats urban runoff contaminants that previously discharged into Santa Monica Bay, and is considered a BMP by the Regional Water Quality Control Board. The treated water is pumped through a City-wide distribution system that serves parks, medians, Woodlawn Cemetery and dual-plumbed buildings. Treated water is also used by City operations for street sweeping, sewer jetting, and pressure washing. The facility has helped the City in increasing land use densities while decreasing its need for additional potable supplies.

Figure 2.11: Treatment in Action at SMURRF

In addition to reducing pollutants entering the Bay and increasing supply reliability, SMURRF was designed to increase public awareness of Bay pollution and alternative water uses. SMURRF is located in a prominent tourist location adjacent to the Santa Monica Pier and provides a new access to the beach through a walkway from which visitors can view the facility. As a walk-through facility, visitors can see the

array of the equipment at two separate overlook points. Each piece of equipment is laid out in a logical format and water is day-lighted at five separate points allowing visitors to view the purification process. Educational material about the workings of the facility is also available. SMURRF is show in **Figure 2.10 and Figure 2.11**. Due to its strategic location, the SMURRF has enhanced community pride and indirectly increased water conservation awareness.

There are twenty (20) recipients of recycled water, two include commercial/institutional users receiving recycled water for indoor use through a dual-plumbed system. Current dual-plumbed and landscape uses include the City's Public Safety Facility and the RAND Corporation. The Water Gardens, an office-professional campus near the City's eastern boundary with Los Angeles, currently accepts recycled water for its water features and landscape areas. Recent additional users include Tongva Park, City Hall, Colorado Ave., and Esplanade landscape areas.

SMURRF Production

Over the past five years, recycled dry weather urban runoff has accounted for 0.6 percent to 2.4 percent of the City's overall water supply (potable plus recycled). However, recycled dry weather urban runoff accounted for up to 19% of dedicated irrigation connection supply totals. **Table 2.5** below lists the total production (effluent) from the SMURRF:

Table 2.5
Six-Year Production
(SMURRF Effluent)

Year	Production (AF)
2015	186
2014	134
2013	96
2012	86
2011	79
2010	91
Average:	**112**

With a maximum production capacity of 560 AFY, the SMURRF has been operated at an average of 21 percent capacity over the past five years, and has increased its production each year since 2011. Efforts are underway to secure a more reliable source water for the SMURRF plant and increase the average production-to-capacity ratio. The City recently received a Clean Beaches Initiative (CBI) Grant to build a 1.6 MG stormwater storage tank next to the Santa Monica Pier, scheduled to begin construction in 2017. When completed the CBI project will convey harvested stormwater directly to SMURRF for treatment.

2.2.4 Water Supply Summary

With the re-activation of its Charnock wells, and the lower flows to the SMURRF due to the recent drought, the City has relied heavily on groundwater over the past five years as indicated by **Table 2.6** below:

Table 2.6
Water Supply Averages (Percentages)
2010-2015 vs. 2005-2009

MWD (AF) % of Total	Ground (AF) % of Total	Recycled (AF) % of Total
6,166	7,307	94
45% (2010-2015)	54% (2010-2015)	1% (2010-2015)
86% (2005-2009)	13% (2005-2009)	1% (2005-2009)

As noted by **Table 2.6**, the City has made great strides towards reducing its reliance on imported water. It should be noted that the figures in **Table 2.6** present annual averages over a six year period, and include an "outlier" year when the treatment plant was not running, which drives the average lower. On a single year basis, the City's advancement toward self-sufficiency is much stronger. In calendar year 2015, for example, groundwater represented over 70% (8,539 AF) of the city's water supply, with imported water being reduced to less than 30% (3,298 AF) of the water for the city.

Additionally, during the months of December 2015 through March 2016, due to conservation and cooler weather, the City sources provided 100% of the City's potable water for 59 days out of those four months.

2.3 ENERGY TO PRODUCE WATER

Producing water is not only an engineering challenge for the City, but also a financial one. The City must maintain the financial viability of its water system during time of increasing conservation. Not only must the City consider means of additional revenue, but also ways to reduce operating costs. One of the largest costs the City deals with is energy (electricity) costs. In a typical distribution or supply system the largest consumers of energy are treatment plants, followed by pumping and booster stations. On the other hand, water storage facilities such as reservoirs or distribution facilities such as pressure regulating stations, typically have relatively insignificant energy consumption in comparison. Typical annual energy costs incurred by the City to produce an AF of water into its distribution system are presented in **Table 2.7** on the following page.

Table 2.7
Recent (2015) Energy Costs for Water Production*

MWD (AF)	Ground (AF)	Recycled (AF)
2,591 kWh/AF	1,671 kWh/AF	5,267 kWh/AF
$0 Elec. Cost	$2.7M Elec. Cost	$45,949 Elec. Cost
$923/AF Purchase Cost	$0 Purchase Cost	$0 Purchase Cost
$923/AF Energy Cost*	**$320/AF Energy Cost***	**$247/AF Energy Cost***

**Costs are not total costs (i.e. maintenance, operations, capital, land, etc.)*

As noted by **Table 2.7**, groundwater is the most expensive form of water in terms of energy. However, groundwater is actually by far the cheapest source of water, especially when considering the costs to purchase water from MWD. The City continues to look into the most cost-effective ways to produce its water.

2.4 PROJECTED WATER SUPPLY

As population and land-use densities increase, the City understands the need to discover and support local water supply projects to augment imported supplies. As part of this process, the City completed its MTBE remediation effort in February 2011 and re-activated its five wells in the Charnock Subbasin. In 2013, a groundwater assessment study was conducted to review the status of the City's groundwater supplies in the Santa Monica Basin. The study included a literature review of prior investigations into the sustainable yield of the basin. In the near future, the City intends to conduct a more formal assessment of the sustainable yield of the basin with more current data. In its effort to become independent from imported water, the City developed in 2014 a Sustainable Water Master Plan (SWMP) to provide a roadmap to becoming water self-sufficient by 2020. **Table 2.8** presents the City's projected water supplies available from all sources from 2015-2040:

Table 2.8
Projected Water Supply Available

Year	Imported (AF)	Ground (AF)	Recycled (AF)
2020	7,409	12,500	560
2025	7,409	12,500	560
2030	7,409	12,500	560
2035	7,409	12,500	560
2040	7,409	12,500	560

The City's decision to become import-free will offset the economic burdens of purchasing imported water. Moreover, since the City will continue to have access to imported water, the City's decision will also add to its supply reliability over the next 25 years. The City will also benefit indirectly from regional conservation efforts and also through MWD's efforts to augment

its supplies and improve storage capacities.

2.5 ALTERNATE WATER SOURCES

This section provides an overview of alternative water sources and their potential uses. Alternative water sources include recycled wastewater, greywater, and desalinated seawater.

2.5.1 Recycled Wastewater

Background

The City participated in a regional study that examined the feasibility of comprehensive reclamation in Southern California. The study was called Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRS) and was cost-shared between eight (8) agencies, which included cities and water districts. The United States Bureau of Reclamation along with the eight cost-sharing agencies and over 60 local water and wastewater agencies participated in the development of the SCCWRRS. The study included four regions: Los Angeles Basin, Orange County, San Diego County and the Inland Empire. In addition to the SCCWRRS, the City participated in the Recycled Water Master Plan for the West Basin Municipal Water District and Los Angeles Department of Water and Power. The study included the evaluation of expanding the facilities into Santa Monica as a long-term option. City staff has attended Los Angeles County Reclaimed Water Advisory Committee (LACRWAC) meetings. The LACRWAC is an official chapter of the Water Reuse Association, which has helped implement water recycling in California.

Wastewater Collection & Treatment System

The City of Santa Monica Water Resources Division manages the wastewater collection system for Santa Monica. All of the wastewater flows from the City (excluding a percentage of dry weather runoff) is collected by the City's local sewer mains and delivered to the Hyperion Wastewater Treatment Plant. Santa Monica wastewater flow is metered and averages about 11 million gallons per day (MGD). Santa Monica is a contracting entity to the City of Los Angeles Amalgamated Sewerage System, which includes Hyperion.

The treatment applied at Hyperion includes primary, secondary and tertiary treatment for the production of recycled water (reclaimed water). In addition to Hyperion, the City of Los Angeles operates three other treatment plants capable of producing recycled water.

Figure 2.12: Wastewater Treatment at Hyperion

Recycled Wastewater Use

Recycled water is a growing water resource in California. As local water supplies and the availability of imported water become more stressed, many agencies have explored and invested in recycling as a local and sustainable water resource. The City has used SMURRF in this capacity, albeit limited over the years.

For most applications, water recycling means treating wastewater so that it can be safely used for irrigation and some industrial purposes. In some cases this resource is also used for open reservoir augmentation, groundwater replenishment, and groundwater management as a barrier against seawater intrusion. Since the City's wastewater is conveyed to the City of Los Angeles for treatment, the City does not have immediate access to recycled water in the City.

Currently the City benefits from the use of recycled dry weather urban runoff and does not use recycled wastewater. However, the City benefits indirectly from regional uses of recycled water, and is assessing a small scale (1.0 MGD) recycled water facility as part of its water reuse strategy.

Potential and Projected Uses of Recycled Wastewater

As indicated in the 2014 Sustainable Water Master Plan (Appendix K), a market assessment was performed in order to determine the potential for additional recycled water use within the City. The assessment combined results of a billing data analysis with a GIS analysis to identify potential recycled water customers and estimate total potential recycled water demand within the City. Once customers were identified, a conceptual recycled water distribution system was developed in order to estimate preliminary costs associated with expanded recycled water distribution in the City.

A conceptual recycled water system was developed in the Sustainable Water Master Plan that could serve the majority of the City's largest dedicated landscape irrigation customers with recycled water. The system utilizes and expands upon the existing

SMURRF distribution system, receiving water from the City of Los Angeles' potential Westside recycled water distribution system located to the southeast of the City. In order to estimate the amount of recycled water the conceptual system might be able to deliver as well as develop a preliminary cost estimate, the conceptual system was divided into seven separate demand areas. Recycled water demand was estimated by selecting the dedicated landscape irrigation customers located within each demand area using GIS and totaling their annual demand. A preliminary cost estimate was developed by estimating the daily flow rate and velocity for each pipe segment in order to estimate an appropriate pipe diameter. Once the pipe diameter was determined, cost estimates were developed based on estimates of the length of pipe needed to construct the system. The total estimated water demand for the conceptual recycled water distribution system is 390 AFY. The estimated demand consists of 290 AFY of demand from current customers, including existing SMURRF recycled water customers, and an additional 100 AFY of future opportunities. Specific summary data is included in Appendix K

Future Plans for Recycled Wastewater

Recognizing that to become independent of imported water, the City will have to utilize all of its available water resources including stormwater, municipal wastewater and brackish/saline impaired groundwater, the City has proposed an integrated water reuse project called the Sustainable Water Infrastructure Project (SWIP) One element of the SWIP would include modifying its SMURRF facility to be able to produce a more consistent level of non-potable water supply, and fully utilizing the current 560 AFY capacity. Another is the construction of a small scale below grade recycled water treatment facility. This is envisioned through utilizing distributed advanced water treatment technologies (e.g. Reverse Osmosis (RO), ultra and nanofiltration, biomembrane reactors and ultraviolet disinfection, among others) to produce potable quality water. Initially the treated water will be utilized for immediate non-potable reuse (irrigation and toilets, when properly permitted) and indirect potable reuse (via aquifer storage and recovery, and/or salt water intrusion barrier maintenance).

2.5.2 Stormwater & Rainwater Harvesting

As presented in the 2014 Sustainable Water Master Plan (Appendix K), rainwater harvesting is the accumulation and storage of rainwater for reuse before it reaches the

public right-of-way. Rainwater harvesting can ensure a limited independent water supply for activities such as irrigation, indoor flushing, and other non-potable uses. This helps to offset potable water demands by ensuring a renewable source during regular and water restrictive times. In addition, it produces beneficial effects by reducing peak stormwater runoff and related processing costs.

This alternative was evaluated as a water supply option for offsetting potable water demand in addition to reducing the amount of polluted runoff from entering Santa Monica Bay. The City actively promotes the use of rainwater for landscape irrigation through numerous free workshops for professionals and homeowners in addition to rebates for rain barrels and cisterns. In recent years the City initiative has been very successful in promoting rebates on rain harvesting. The City also promotes rainwater and stormwater harvesting for irrigation and indoor flushing in public projects, as demonstrated by the new Pico Branch Library, and two new projects slated for construction in the new year.

Santa Monica's mediterranean climate is characterized by seasonal rainfall, with the majority of rain falling in the winter months of November through March. Conversely, landscape water demands are highest in the warmer, drier months of April through September. Thus, indoor uses of harvested rain is a more sustainable strategy to use the supplemental water when not needed outdoors. When combined with low volume irrigation systems and adequate storage, stored rain volume can match almost 100% of many non-potable needs. Analyses were performed to evaluate and compare the potential for rainwater harvesting based on average monthly precipitation data and monthly landscape water demand for residential and commercial customers.

Figure 2.13: Captured Rainwater Helps Irrigate Home

Results of the above analysis indicate that the potential for residential or small scale onsite rainwater harvesting as a supply option in Santa Monica is limited by the large size of cisterns and customers' motivation to install them. Accordingly, it is estimated that the rainwater harvesting incentive program may provide only 1-2 AFY.

A larger City-wide scale stormwater capture program offers a seasonal additional water supply option for the City. The City's Clean Beaches Initiative (CBI) project is one such program. The CBI project will install a below grade stormwater storage tank adjacent to the Santa Monica Pier, which will be capable of harvesting up to 1.6 million gallons of runoff from any single storm event. The harvested runoff will be piped to SMURRF for treatment and non-potable reuse. Further improvements proposed in the City's SWIP would include a shallow brackish/saline groundwater well to replenish the CBI tanks during dry weather and an upgrade to SMURRF by adding a containerized saltwater RO unit. These improvements would ensure that SMURRF would produce 560 AFY of advanced treated water. When properly permitted the advanced treated water could be utilized for reinjection. A scenario has been developed in which stormwater, captured through the City's storm drain system, would be routed to SMURRF for distribution to landscape irrigation and indoor flushing customers. As mentioned above, two City projects will divert stormwater and dry weather runoff from the storm drain system to use at parks for irrigation and bathroom flushing. It is estimated that a City-wide stormwater capture program could generate an additional 160 AF of supply per year. This alternate water supply would reduce potable water demand while reducing the amount of polluted stormwater runoff from entering the Santa Monica Bay.

2.5.3 Greywater

Greywater has been used as an alternate source of water in California since its adoption in 1995. Greywater is used as irrigation water in order to reduce potable water use. The City has promoted its use actively since 2004 via free bi-annual workshops for professionals and homeowners. The 2013 California Plumbing Code (CPC) also allows treated greywater to be used indoors for uses such as toilet flushing. The City was a lead contributor to the Los Angeles County Department of Public Health Guidelines for Alternate Water Sources, which was published to establish regional consistency for permitting and maintaining onsite alternate water reuse systems like treated greywater for toilet flushing.

The City rebated three residential greywater systems for irrigation between 2004 and 2007 and realized that the existing laws made it very difficult and costly for homeowners to install simple systems. Furthermore, few off-the-shelf

greywater systems were available making it harder for people to comply with the rigorous permitting process. The City advocated for changes to the law and with the recent passage of SB 1258, it is now easier for homeowners to reuse this water supply for landscape irrigation. The City began offering rebates for simple greywater systems starting in 2011 and continues to encourage developers to consider the implementation of greywater systems in large construction projects.

Figure 2.14: Home Irrigated with Greywater

2.5.4 Desalinated Water

Seawater desalination is a process whereby seawater is treated to remove salts and other contents to develop both potable and non-potable supplies. There are over 10,000 desalination facilities worldwide that produce over 13 million AFY. Desalinated water can add to Southern California's supply reliability by diversifying its water supply sources and mitigating against possible supply reductions due to conservation.

Figure 2.15: Seawater Desalination Plant

With its Seawater Desalination Program (SDP), MWD facilitates progress and provides financial incentives for the development of seawater desalination facilities within its service area. A total of five member agencies submitted projects totaling 142,000 AFY. In 2004, MWD adopted an Integrated IRP update which included a desalination goal of 150,000 AFY by the year 2025. Currently, the five member agency projects are in various levels of development.

Although the City is located adjacent to the ocean, the economics of building and operating an oceanfront desalinization plant would prohibit its construction in Santa Monica, as most oceanfront plants are constructed adjacent to existing power plants, and take advantage of the existing discharge. In addition, Santa Monica does

not have adequate perched brackish water and energy availability to encourage the construction of brackish desalinization plants. Therefore, the City does not have any current plans to develop any desalination facilities.

2.6 TRANSFERS OR EXCHANGES

The City of Santa Monica has not considered water transferring as an option for its produced groundwater. Santa Monica believes that through pro-active water conservation policies and programs, and the recycling of urban runoff, the reliability of its water supply will increase even as housing densities increase. Water conservation and recycled water are considered additional sources of water because they free up water that would otherwise be used inefficiently. With this stance, Santa Monica avoids being an additional draw on imported water, which benefits the region at large.

2.7 PLANNED SUPPLY PROJECTS

The City of Santa Monica supplies the majority of its potable water via its local groundwater production following MTBE remediation. The 2014 Sustainable Water Master Plan (SWMP) identified a goal of achieving water self-sufficiency through the development of a water supply portfolio of additional groundwater development (4820 AF), conservation (1440 AF), and SMURRF/stormwater harvesting (240 AF). In the future the City may consider recycling additional urban runoff from Los Angeles County drains that are presently discharging into the Bay, such as the Wilshire Boulevard and Montana Avenue drains. A longer term scenario for additional supply includes receiving recycled water from a regional system that is in near proximity to the City borders. **Figure 2.16**, Option 1, presents the proposed portfolio (section 5.4 of the SWMP). This Option would close the gap of 6,500 AF and achieve self-sufficiency by 2020 through increased activity in existing water conservation programs, new water conservation programs, new rainwater harvesting and stormwater capture programs. This would achieve the goal of an estimated 123 gallons per capita per day in 2020. The full analysis can be found in the SWMP, in Appendix K of this report.

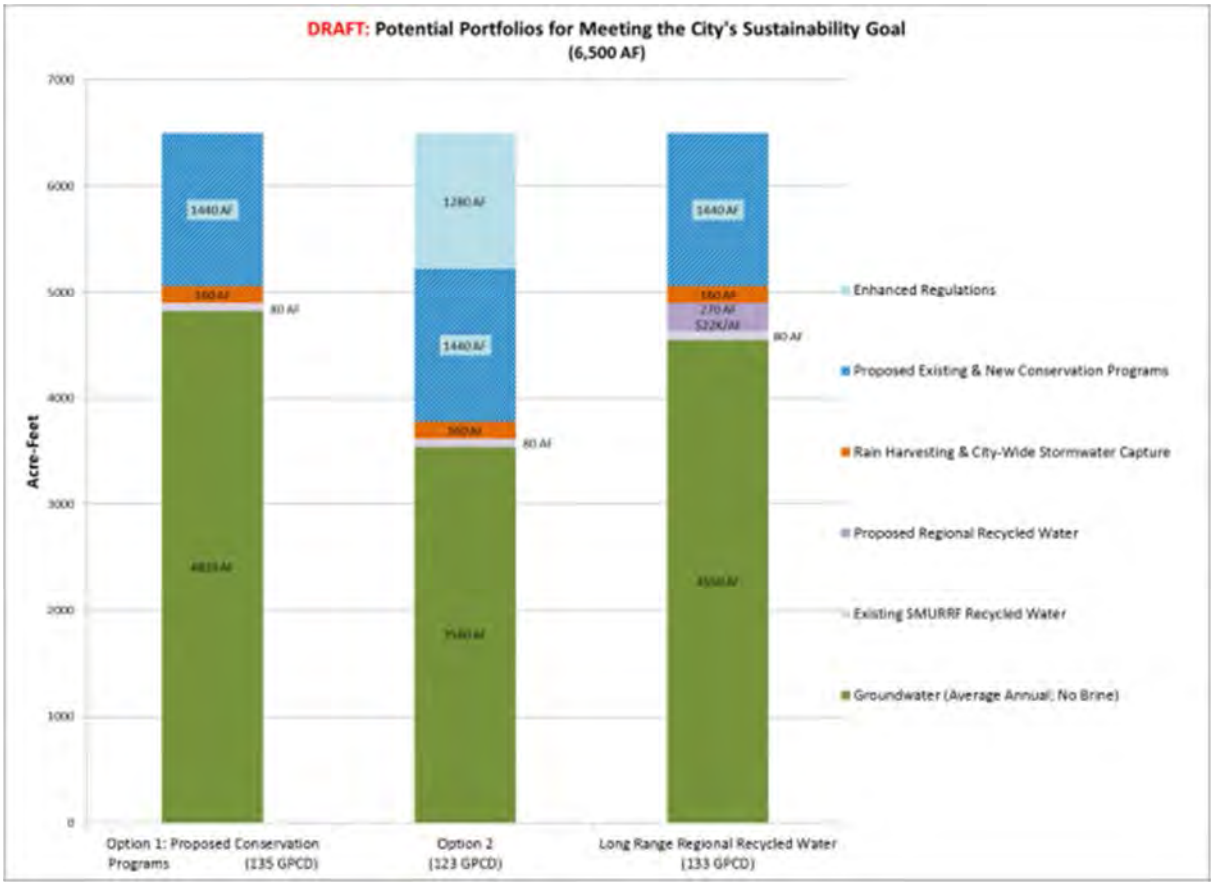
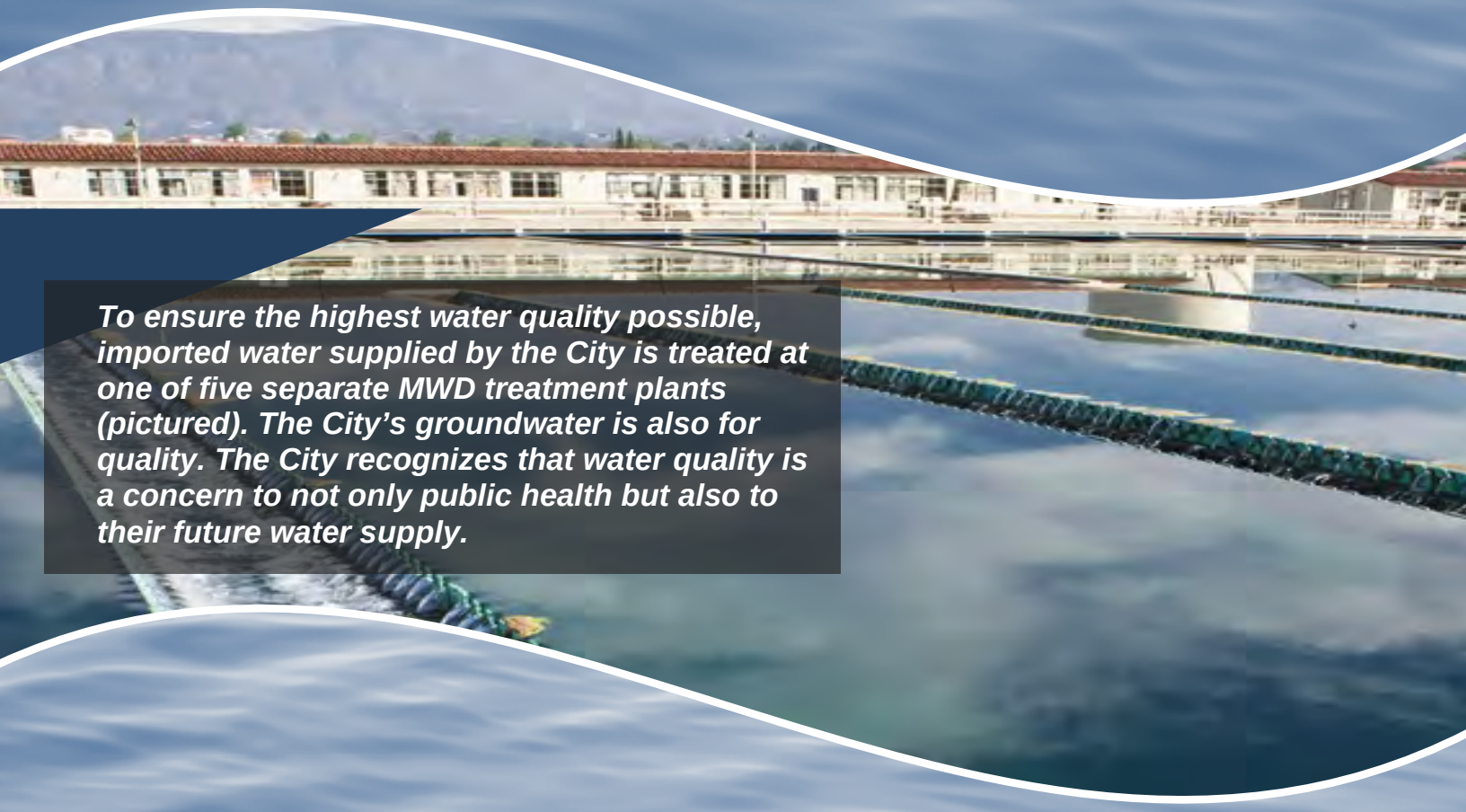


Figure 2.16 Potential Supply/Demand Management Portfolios

SECTION 3: WATER QUALITY



To ensure the highest water quality possible, imported water supplied by the City is treated at one of five separate MWD treatment plants (pictured). The City's groundwater is also for quality. The City recognizes that water quality is a concern to not only public health but also to their future water supply.

SECTION 3 WATER QUALITY

3.1 WATER QUALITY SUMMARY

In 1974, Congress passed the Safe Drinking Water Act in order to protect public health by regulating the nation's drinking water supply. As required by the Safe Drinking Water Act, the City provides annual Water Quality Reports to its customers. Currently, all of the water that the City distributes to its customers meet federal EPA standards and State Water Resources Control Board's Division of Drinking Water (DDW).

The quality of water distributed to the City's water system is directly related to the quality of the supply sources from which the City obtains its water. This section explores the quality of the City's supply sources and examines important water contaminants that the City actively monitors as part of its efforts to supply safe drinking water to its customers.

3.1.1 Transfer of Authority

The California Department of Public Health (CDPH) previously oversaw the water quality of the State's drinking water program and the environmental laboratory accreditation program. As of July 2014, those programs were transferred to the State Water Resources Control Board (SWRCB). Under the SWRCB, the Division of Drinking Water (DDW) regulates public drinking water systems, including setting the maximum contaminant levels (MCLs) and regulating the operation of water systems.

Figure 3.1: Health Standards Protect Drinking Water

3.2 QUALITY OF SOURCES

3.2.1 Imported Water

The City receives imported water from MWD in order to supplement its groundwater supplies and for blending needs to meet Federal and DDW standards.

Imported water obtained from the SWP and the CRA contain specific contaminants which are characteristic of the Bay Delta and the Colorado River regions. Some of the contaminants of concern include: salinity, biological loads, disinfection by-products, perchlorate, uranium, and arsenic. MWD's 2010 RUWMP discusses the water quality concerns of its supplies.

To provide safe drinking water to its customers, MWD treats its water supply at five (5) separate treatment plants, three of which blend a mixture of SWP and CRA water. Of the five plants that serve Southern California, the City has access to treated effluent from the Weymouth Treatment Plant via MWD's Middle Feeder pipeline.

Figure 3.2: Weymouth Treatment Plant

Although MWD water meets all regulatory requirements, MWD understands the need for strong testing and quality assurance for its customers. Water is analyzed and tested at one central, state-of-the-art treatment facility in addition to five satellite laboratories at each treatment facility to ensure the quality and safety of its water.

3.2.2 Groundwater

Groundwater extracted from the Santa Monica Basin and its subbasins contain various levels of contaminants specific to the basin which include, Total Dissolved Solids (TDS), Nitrate, Volatile Organic Compounds (VOCs), and methyl tertiary butyl ether (MTBE). Overall TDS concentrations in the Santa Monica Basin are typically high and exceed the secondary maximum contaminant level (MCL) of 500 mg/l in all three of the subbasins.

Ensuring the Safety of the City's Water

For about 15 years (1995-2010), the City was significantly impacted as a result of MTBE contamination. The City eventually settled with Potentially Responsible Parties (PRPs) of the MTBE contamination in order to construct and operate a treatment facility to clean up residual MTBE contamination.

In 2010 the City completed construction of its new Santa Monica Water Treatment Plant. The plant combines the use of

Granular Activated Carbon (GAC) filtration system, which removes MTBE and another potential gasoline additive, tert-Butyl alcohol (TBA), and also a Reverse Osmosis (RO) softening system and final adjustments including fluoridation and disinfection. Water quality is scrutinized throughout the treatment plant with many online analyzers monitoring the process as well as various daily, weekly and monthly samples to verify the quality of the water.

Figure 3.3: Santa Monica Laboratory Testing

The City has reached agreements with two PRPs who will pay for remediation of the Olympic Subbasin. The City is currently studying various remediation efforts through a pilot treatment study. In 2016 the City will complete its Pilot Study for the treatment of TCE, PCE, and 1,4-dioxane in the Olympic Subbasin. This study will guide the City in the development of an advanced oxidation treatment plant in the Olympic Subbasin which will, once source water is developed, produce approximately 3.5 MGD to bridge the gap between current production and overall demand.

In addition to MTBE, the City has also detected other contaminants of concern at or near maximum concentration levels. In particular, the City detected TCE (a VOC) in its Olympic Subbasin in 1979. Air strippers were installed during the 1980s in the Olympic wells. More recently, the City has also detected 1,4 dioxane in its Olympic wells. Other common groundwater contaminants of the region, such as nitrates and perchlorate, either meet drinking water standards or have not been detected (perchlorate not detected). **Table 3.1** below summarizes the City's groundwater treatment activities for its major contaminants:

Table 3.1
Santa Monica Basin
Major Contaminants

Subbasin	Contaminant Treated
Arcadia	None
Charnock	MTBE, TCE, PCE
Olympic	TCE, PCE, 1,4-Dioxane
All	TDS

More than 10,000 water quality tests are conducted each year at Santa Monica's

State-certified laboratory by qualified chemists and technicians to ensure the safety of the City's supply.

The City of Santa Monica Water Resources Division expends considerable resources keeping its water treatment system up to date and performing properly. Due to the City's efforts, all groundwater supplied to the City's distribution system meets federal and state drinking water standards.

Recycled Dry Weather Urban Runoff

The City's SMURRF uses a state-of-the-art treatment process to treat dry weather urban runoff in a seven-step treatment process to California Title 22 standards. The City's SMURRF is considered to be a Best Management Practice (BMP) to reduce pollutants by the Regional Water Quality Control Board (RWQCB).

3.3 WATER QUALITY EFFECTS

The previous section discussed water quality issues affecting the City's water supply operations. Due to advanced treatment procedures and the availability of supplemental water from MWD, the City does not anticipate any reductions in its water supplies due to water quality issues in the near future. Future regulatory changes enacted by the EPA and/or the State legislature will be met through additional mitigation and treatment actions in order to meet the standards and to maintain water supply to the City's customers. Thus, the City does not expect water quality to be a major factor in its supply reliability considerations. However, water quality issues will continue to influence day-to-day water operations and management decisions as mitigation and treatment procedures are evaluated to determine their cost and treatment effectiveness against alternative procedures.

SECTION 4: WATER DEMANDS

The City supports water conservation while maintaining the beauty of its community parks, schools, and recreational facilities. The City's water conservation goals, set in 2011, have already exceeded 20%. The City anticipates this will help them achieve their sustainability targets.

SECTION 4 WATER DEMANDS

4.1 FACTORS AFFECTING DEMAND

Water use within the City is variable and depends on a number of factors ranging from residential and daytime population, size and types of businesses, unemployment rate, droughts, climate change, plumbing code changes and customer water usage habits. This section explores the water usage trends within the City and quantifies total usage per customer type.

Urbanization's Effect on Water Use

The City of Santa Monica, like most of Southern California, began as a small, suburban town with plenty of room for development. Previous land uses in the City at that time were mostly residential with some commercial use for hotels. By 1875, the City's population reached 1,000 persons and the City continued to grow as a seaside sanctuary for wealthy vacationers.

The City was incorporated in 1887 and began its water operations during the early 1900s. By 1920, the City's population soared to 37,000, and the City continued to experience significant population growth. In 1928, the City joined 12 other local cities in forming the Metropolitan Water District (MWD). Through these steps, the City paved the way for continued urban development and population expansion. By the 1960s, the City's population growth slowed as the City's development expanded. The City is now mostly developed but can accommodate denser developments in some parcels per the City's Land Use Circulation Element (LUCE).

Figure 4.1: Early Santa Monica

Through urbanization, the City has become one of the key coastal cities in Los Angeles County. The City's adjacent location to the

Figure 4.2: Santa Monica Today

Santa Monica Mountains provides additional supply reliability through surface runoff and subsurface inflows, which has sustained its past population and economic growth. Due to current "built-out" conditions, additional growth can only be expected through re-development.

Water Use within the City

The City has a long history of sustainability including conserving its natural resources like water and energy. Santa Monica's City Council has adopted several plans to achieve water conservation including the Sustainable City Plan, the Sustainable Water Master Plan, the Water Shortage Response Plan, the Green Building Ordinance and the Water Conservation Ordinance. In 2016, City staff will likely be proposing a water neutrality ordinance to mitigate additional water use demand that may occur from new construction. Each of these plans is enforced.

The City is largely residential with approximately 93,000 permanent residents, about 18,000 individual businesses and an average daytime population of 200,000. During holidays and some summer weekends, this number can be closer to 500,000. Businesses are mostly comprised of offices, lodging, restaurants, and retail with very few industrial water users. In addition, there are institutional and public agency water customers including

University of California, private hospitals, the City of Santa Monica, Santa Monica College, The Santa Monica Malibu Unified School District, Los Angeles County Courthouse, and Caltrans. For single-family homes, it is estimated that 40% to 60% of the water use is for landscape irrigation. Much of that water could be conserved with the installation of climate-appropriate plants and drip irrigation. The City has programs and regulations to encourage the installation of sustainable landscaping across all property types.

Figure 4.3: Residential Irrigation

4.2 WATER DEMANDS IN CITY

Past Water Use

Historically, water use in the City has reflected the balance of its identity as a densely populated residential community with a diversified commercial and cultural hub with its identity as an environmentally conscious City. Annual water use since 1996 to 2009 has ranged from about 13,700 AF to 15,200 AF as shown below in **Table 4.1**:

Table 4.1
City of Santa Monica
Past Water Use

Year	Total Consumption (AF)
2009	13,748
2008	14,383
2007	15,009
2006	14,967
2005	14,561
2004	15,201
2003	14,884
2002	14,936
2001	14,342
2000	15,028
1999	14,732
1998	14,081
1997	14,888
1996	14,970
Average:	**14,695**

Given its size and culture, and the increase in the City's population from 1996 to 2009 (over 10%), the City should have expected to experience at least a slight upward trend in water use. As indicated by the relatively constant numbers in **Table 4.1**, water use did not increase during this time. Instead overall water use dropped by 8.1% from 1996 to 2009.

Recent Water Use

Recent water use has been trending downward in the City, primarily due to increased awareness of drought, stricter State and City conservation requirements, and City offered resources and incentives for water customers to make permanent water savings changes. A small rise in water use occurred between 2011 and 2013 as the City rebounded from the recession and unemployment dropped, but overall water use dropped by 9.1% from 2010-2015 as indicated by **Table 4.2** below

Table 4.2
Six-Year Recent Water Use
(Service Area Total)

Year	Potable Demand (AF)
2015	11,837
2014	13,987
2013	14,078
2012	14,831
2011	13,065
2010	13,040
Average:	**13,473**
2005-2009 Average:	**14,534**

4.3 DISTRIBUTION SYSTEM WATER LOSSES

Distribution system water losses are the physical water losses from the distribution system up to the point of customer consumption. A portion of the amount is due to water losses resulting from pressure testing, main flushing, leaks ruptures and meter inaccuracies. System water loss for the year 2015 was calculated as 5.2% based on the water system balance methodology developed by the America Water Works Association (AWWA). The AWWA water audit reporting worksheet is included as an appendix in this UWMP.

4.4 WATER DEMANDS BY SECTOR

Service Accounts

The City maintains approximately 18,000 service accounts with a mixture of residential, commercial, institutional, and landscape accounts. Since these are billing accounts, the accounts can vary on a yearly or monthly basis. The current number of accounts are shown in **Table 4.3** below:

Table 4.3
Current Number of Service Connections
(Active Accounts)

Sector	Accounts
Single Family Residential	7,504
Multi-Family Residential	6,368
Commercial/Institutional	2,017
Landscape (Potable)	583
Other(Fire)	1,108
Recycled	20
Current Total No. of Service Connections:	**17,600**

Nearly 80% of the total service connections are either single-family or multi-family

residential as over half of the City is zoned for residential use. Commercial and institutional accounts comprise about 11% of the total accounts.

Water Demand by Sector

The City maintains records of water consumption and bills its customers on a bi-monthly basis for its water service. The water use by each connection type for the past six years and the total number of service connections is listed on **Table 4.4**. The proportions of water use by sector listed in this table are utilized to analyze projected water use in **Section 4.6.**

Table 4.4
Historic Demand by Sector (AF)

Sector	2010	2011	2012	2013	2014	2015
Single Family Residential	2931	2,798	3,113	3,142	3,216	2,545
Multi-Family Residential	5,100	5,517	5,503	5,554	5,441	4,959
Commercial/Institutional	3,003	3,152	3,544	3,704	3,721	3,405
Landscape Irrigation	538	531	604	604	643	408
Subtotal:	**11,323**	**11,998**	**12,764**	**13,004**	**13,021**	**11,317**
System Losses	1,286	1,086	561	1,013	925	624
Total Water Use:	**12,609**	**13,519**	**13,325**	**14,017**	**13,485**	**11,941**

**"System losses" represents a portion of the City's overall water use at around 5.2%. A portion of this amount is due to water losses such as fire testing, main flushing, and pressure testing. While water losses cannot be prevented entirely, the City actively monitors for unusual water demand such as what may result from leaks and ruptures, and is investigating Advanced Meter Infrastructure (AMI) with a customer interface to continue minimizing lost water.*

As noted by **Table 4.4** above, the Multi-Family Residential sector represents the highest water use sector, but customers in this class use water the most efficiently. In 2015, there were 6,072 accounts that serviced approximately 62,000 residents. The approximate per capita daily use for multi-family was 71 gallons. In comparison, single-family accounts numbered 7,464 and serviced approximately 29,000 residents. Single-family per capita daily use was about 78 gallons.

4.5 WATER CONSERVATION ACT

Due to reductions of water in the San Joaquin Delta, the Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to

protect statewide water sources. The legislation called for a 20% reduction in water use in California by the year 2020. The legislation amended the water code to call for 2020 and 2015 water use targets in the 2010 UWMPs, updates or revisions to these targets in the 2015 UWMPs, and allowed the Department of Water Resources (DWR) to enforce compliance to the new water use standards. Beginning this year (2016) failure to comply with interim and final targets will make the City ineligible for grants and loans from the State needed to attain water self-sufficiency by 2020.

Figure 4.4: SBX7-7 Signing

The State provided four different methodologies to achieve compliance. The City chose the most aggressive water conservation method (Method 1), which utilizes a 20% reduction from a ten-year baseline shown in **Table 4.5** and which results in a gallons per capita per day (GPCD) target of 123 instead of other methods which would allow for a GPCD of 141.

The City is not only meeting its SBx7-7 requirements, but also exceeding them. In 2015, GPCD was 113. For SBx7-7, GPCD is calculated by totaling all the water produced in the city divided by the number of residents. This differs from the GPCD numbers calculated in Section 4.3 where GPCD was calculated using the amount of water used by residents divided by the number of residents.

The City is not revising its interim or 2020 SBx7-7 targets.

Table 4.5 on the following page shows historic (1996-2010) as well as recent (2010-2015) water use, and includes the baseline statistics**:**

Table 4.5
City of Santa Monica
Recent & Past GPCPD Water Use

Year	Total Consumption (AF)	Per Capita (GPCD)
2015	11,837	113
2014	13,987	135
2013	14,078	138
2012	14,831	146
2011	13,065	129
2010	13,040	130
2009	13,748	133
2008	14,383	141
2007	15,009	148
2006	14,967	148
2005	14,561	143
2004	15,201	150
2003	14,884	149
2002	14,936	152
2001	14,342	150
2000	15,028	160
1999	14,732	160
1998	14,081	153
1997	14,888	162
1996	14,970	162
10-yr. Baseline (1996-2005) (SB7: 10608.20)		**154**
5-yr. Baseline (2003-2007) (SB7: 10608.22)		**148**
South Coast HR:		**180**

As determined previously in the City's 2010 UWMP, the City's 10-yr baseline was determined to be 154 GPCD. Thus, the same SBx7-7 targets apply, as indicated in **Table 4.6** below:

Table 4.6
City of Santa Monica
2020 Water Use Targets

20% Target (10608.20) (b)(1)	
2020 Per Capita Target:	**123**
2015 Interim Target:	**139**
Recent (2010-2015) Per Capita Water Use:	**132**
2015 Per Capita Water Use:	**113**

Methods to Achieve SBx7-7 Target

Although the requirements of SBx7-7 seem stringent, it is noteworthy that the City has seen an increase in water efficiency from 1996-2015. This is due in part to the success of long-term conservation measures, implementation and enforcement of emergency drought regulations, overall water conservation awareness and water conservation efforts by water customers in all sectors.

The City understands the unique needs of its customers and the importance of efficient water use. As a result, the City will utilize management strategies specific to the needs of its residents. The methods to be used by the City in achieving its 2020

reduction requirements consist of the CUWCC Best Management Practices (BMPs) listed in **Section 6** and additional City conservation programs (if different from the CUWCC BMPs) and additional measures included in the Sustainable Water Master Plan.

In addition, the City may enact additional water use restrictions in accordance with its Water Shortage Response Plan (WSRP), which was recently updated in 2015. With increased public awareness of Governor Brown's 25% mandate in April 2015, it is likely that the public will continue to enact permanent conservation measures.

Impacts on Bay-Delta

Through adherence to conservation measures, the City can participate in statewide efforts to conserve Sacramento-San Joaquin Bay-Delta Water and to protect the ecological habitat of the region. The Bay-Delta is crucial to the health of the state's natural environment, its residents, and the economy. As an estuary (an inland body of water where fresh river water mixes with salty seawater), the Delta and its islands create a habitat for hundreds of aquatic and terrestrial species, some of which are unique to the region. Delta water irrigates local farms where much of the nation's domestic fresh produce is grown. Finally, freshwater originating in the Sierra Nevada flows through the Delta, providing water supplies for 25 million Californians and the economies in the San Francisco Bay Area, the Central Valley, and of course Southern California.

Figure 4.5: Bay-Delta Water Must Be Preserved

Through conservation measures and the use of renewable, local groundwater supplies, the City can reduce demand for Bay-Delta water. The City will also continue to push for sustainability from local water sources by 2020 to safeguard the State's imported water sources, including the Bay-Delta as well as the Colorado River.

4.6 WATER SELF-SUFFICIENCY BY 2020

The City intends to continue its conservation efforts while ramping up its treatment and reuse of various impaired water resources such as municipal wastewater, wet and dry weather runoff,

and brackish/saline groundwater. In addition, the City plans to increase its groundwater production capacity by installing new water supply wells over the next 3-4 years. Taken together these integrated efforts will close the gap between its water consumption and local production capacity in order to achieve 100% local sustainability. In September 2010, the Santa Monica Task Force on the Environment unanimously adopted a motion regarding water self-sufficiency. The motion recommended that the City Council direct staff to develop a plan to reach a 100% sustainable water supply (100% water self-sufficiency from local sources) by 2020.

Based on previous investigations reported in a 2010 Water Supply Assessment (WSA), the City has tentatively estimated the maximum sustainable (sustainable yield) groundwater production capacity of the Santa Monica Basin to be 12,500 AFY. The City is in the process of initiating the necessary hydrogeologic studies to refine the sustainable yield for the Santa Monica Basin. Current groundwater production capacity, however, has not met the minimum estimated level of 12,500 AFY due to pumping constraints that limit groundwater pumping to approximately 9,000 AFY. The current gap between local groundwater production and water demand of about 5,000 AFY will need to be addressed if the City is to achieve its water self-sufficiency goal. For the short term, the City will have to account for this production difference by purchasing imported water from MWD.

Most of the measures needed for the City's sustainability goal are already in place. The City prepared a Watershed Management plan in 2006, a Water Shortage Response Plan (updated in 2015), the City's Water Resources Division Asset Management Plan, the Water Supply Assessment in the 2010

Figure 4.6: Lake Oroville Reservoir

Land Use and Circulation Element, the 2014 Sustainable Water Master Plan (SWMP) and this 2015 Urban Water Management Plan. The City previously merged some of the documents listed above into its 2014 SWMP. In spite of these documents, the City will also need to conduct a formal sustainable yield analysis of its subbasins.

Current Potential to Achieve 100% Self-Sufficiency Goal

With Conservation Programs anticipated to conserve 1,443 AFY by 2020 and the development of an additional 5,000 AFY from local groundwater and reuse sources, the City anticipates meeting its self-sufficiency target by 2020. This is additional to the City's current production capacity of 9,000 AFY.

While the SBx7-7 conservation target is 123 GPCD, the City's 2020 goal for water self-sufficiency is 124 GPCD. Furthermore, if the recent reductions in water use are maintained at or even a little above their current levels (113 GPCD for 2015), the City is on track to achieve its 100% sustainability goal, provided of course that groundwater capacity is maximized.

4.7 PROJECTED WATER USE

Future water use projections must consider significant factors on water demand, such as cyclical droughts, development and/or redevelopment, and changes in climate patterns, among other factors that affect water demand. Although redevelopment is expected to be an ongoing process, should the City adopt a water neutrality ordinance any additional water use would be offset within the city and therefore the impact would be negligible.

Rainfall and warmer temperatures, however, will continue to extend a major influence on demand as drought conditions and climate change could increase demand at a time when these supplies are limited. Therefore, it is imperative to continue implementing water conservation policies and programs to ensure permanent water savings not just short-term behavior change.

For planning purposes, the City's projected water use for 2020-2040 is broken down by sector, these water demands are included in future water demand projections for single and multi-family homes and listed in **Table 4.7** on the following page.

Table 4.7
Projected Water Use by Sector Based on SBx7-7 Consumption Requirement of 123 GPCD*

Sector	2020	2025	2030	2035	2040
Water Service Area Population	93,868	94,431	94,998	95,568	96,141
Demands					
Single Family Residential	2,677	2,693	2,709	2,726	2,742
Multi-Family Residential	5,096	5,126	5,157	5,188	5,219
Commercial/Institutional	3,000	3,018	3,037	3,055	3,073
Landscape Irrigation	538	541	544	548	551
Subtotal:	**11,311**	**11,379**	**11,447**	**11,516**	**11,585**
System Losses	1,622	1,632	1,641	1,651	1,661
Projected Total Water Use:	**12,933**	**13,010**	**13,089**	**13,167**	**13,246**

**Based on consumption rate of 123 GPCD, City should expect 100 percent sustainability through 2040 and beyond if local production is maximized. The estimated consumption rate of 123 GPCD not only accounts for the City's SBx7-7 goals, but also accounts for changes in water use trends in the City due to the City's own policies, codes, ordinances and planning efforts related to land use. These are known as "passive savings" of approximately 418 AFY (Sustainable Water Master Plan 2014). Projections include low income use of 65 AFY for single family residential units and 7 AFY for multi-family residential units.*

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SECTION 5: RELIABILITY PLANNING

The recent drought (pictured) has resulted in significant impacts on the State's water supplies. The Water Conservation Act of 2009 (SBx7-7) was signed into law by Gov. Schwarzenegger which requires mandatory water conservation up to 20% by 2020. The City desires to increase water reliability by becoming 100% sustainable on local (groundwater) sources by 2020.

SECTION 5 RELIABILITY PLANNING

5.1 INTRODUCTION

Proper water management is essential for safeguarding current and future water supplies and curbing demand especially with the uncertainties of climate change and recurring droughts. The City's Sustainable Water Master Plan is a roadmap for resiliency and includes maximizing groundwater, alternate water supplies and water conservation. In addition, the City's Water Shortage Response Plan lays out regulations for curbing water use during a declared water emergency.

This section discusses local and regional efforts to ensure a reliable supply of water and compares projected supply to projected demand up to the year 2040. The City's demand and supply projections are provided in **Tables 5.3 – 5.9** on the following pages.

5.2 HISTORIC DROUGHTS

California experienced a drought during 1976-77. At that time, the City of Santa Monica enacted a Drought Ordinance in July 1977 as a direct response to the drought conditions. The ordinance declared that Santa Monica was suffering from a drought emergency and structured water use reduction in five phases, culminating in overall goal of a 25 percent reduction. The ordinance also declared that Phase I, a reduction of 10 percent overall water usage, was in effect. The ordinance mainly targeted residential customers and used a straight percentage allocation plan requiring usage reduction.

Figure 5.1: Lake Oroville: 2009 Drought

The local region experienced the next prolonged drought from 1987 through 1992. The City met its customers' needs by investing in an aggressive water demand

Figure 5.2: Effects of Recent Drought on California's Reservoirs

reduction program during the summer of 1988. The program, titled "Just Say No to Drips" was developed in response to the drought and to an overall need for conservation. Several measures were developed in 1988 and all fell under the "Just Say No to Drips" program. The City adopted a "No Water Waste" Ordinance in 1989. This "No Water Waste" Ordinance established water conservation statutes and provided punitive measures for failure to observe the statutes. This ordinance was issued to help the City achieve a goal of 10% reduction in water consumption.

In 1990, the City enacted an Emergency Water Conservation Plan, which augmented the 1989 "No Water Waste" Ordinance by initiating several other water conservation activities. On September 20, 1994, the City adopted the Santa Monica Sustainable City Program, which was updated by the Sustainable City Plan, most recently in 2014 (**see Appendix F**). To say the least, the City of Santa Monica is committed to protecting, preserving, and restoring the natural environment.

5.3 RECENT DROUGHT (2011-2015)

A significant drought has hit the state of California since 2011. While in recent months there has been some increase in reservoir levels, overall the drought has

depleted reservoir levels all across the state, as reflected by **Figure 5.2** above. In January of 2014, Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought prolonged into 2015, to help cope with the drought, Governor Brown gave an executive order in April 2015 which mandated a statewide 25% reduction in water use.

Figure 5.3: Governor Brown Gives 25% Order

In January of 2016, the California Department of Water Resources and the U.S. Bureau of Reclamation finalized the 2016 Drought Contingency Plan that outlines State Water Project and Central Valley Project operations for February 2016 to November 2016. The plan was developed in coordination with staff from State and federal agencies. One of the key purposes of this plan is to communicate goals for 2016 water management and the potential operations needed to achieve those goals for water resources stakeholders and the public.

Although the drought has more significantly impacted surface waters and other agencies that use water for agriculture, the City of Santa Monica is still affected by the drought, primarily due to lack of groundwater replenishment, less SMURRF production, and reduced reliability of imported water.

To date, Californians have reduced water use by about 25 percent since emergency conservation regulations took effect in June. This continues to meet Governor Brown's 25 percent mandate (despite a decline in the statewide water-savings rate for the last two months).

5.4 REGIONAL SUPPLY RELIABILITY

As a result of continued challenges to its water supplies, MWD and its member agencies, including the City of Santa Monica have developed new projects to increase the capacity of its supplies while encouraging its member agencies to develop local supply projects to meet the needs of their customers. Also, MWD is

Figure 5.4: MWD's 800,000 AF Diamond Valley Lake

committed to developing and maintaining high-capacity storage reservoirs, such as Diamond Valley Lake, to meet the needs of the region during times of drought and emergency.

MWD operates Diamond Valley Lake, an 800,000 AF reservoir, to avoid the repercussions of reduced supplies from the SWP and CRA. In addition, MWD operates several additional storage reservoirs in Riverside, San Bernardino, and San Diego Counties to store water obtained from the SWP and the CRA. Storage reservoirs like these are a key component of MWD's supply capability and are crucial to MWD's ability to meet projected demand without having to implement the Water Supply Allocation Plan (WSAP). This is crucial since the SWP and CRA have become more restricted, which could render the City's supplies more vulnerable to shortage.

Colorado River Aqueduct Reliability

Water supply from the CRA continues to be a critical issue for Southern California as MWD competes with several agricultural water agencies in California for unused water rights to the Colorado River. Although California's allocation has been established at 4.4 million acre-feet (MAF) per year, MWD's allotment stands at 550,000 AFY with additional amounts, which increase MWD's allotment to 842,000 AFY if there is any unused water from the agricultural agencies.

Figure 5.5: State Water Project

Competition from other states and other agencies within California has decreased the CRA's supply reliability. In 2003, the Quantification Settlement Agreement (QSA) was signed, which facilitated the transfer of water from agricultural agencies to urban uses. This historic agreement provides California the means to implement transfers and supply programs that will allow California to live within the state's 4.4 MAF basic annual apportionment of Colorado River water

State Water Project Reliability

The reliability of the SWP impacts MWD's member agencies' ability to plan for future growth and supply. DWR's Bulletin 132-03, December 2004, provides certain SWP reliability information, and in 2002, the DWR Bay-Delta Office prepared a report specifically addressing the reliability of the SWP. This report, The State Water Project Delivery Reliability Report, provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns. This report was most recently updated in 2013.

On an annual basis, each of the 29 SWP contractors including MWD request an amount of SWP water based on their anticipated yearly demand. In most cases, MWD's requested supply is equivalent to its

full Table A Amount. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the SWP annual delivery of water to contractors has ranged from 552,600 AF in 1991 to 4.2 MAF in 2015. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply.

Each December, DWR provides the contractors with their first estimate of allocation for the following year. As conditions develop throughout the year, DWR revises the allocations. Currently, 2016's allocation is set at 4.2 MAF.

Due to the variability in supply for any given year, it is important to understand the reliability of the SWP to supply a specific amount of water each year to the contractors.

Current Reservoir Levels

Statewide, storage reservoir levels rise and fall due to seasonal climate changes, which induce increase in demand. During periods of drought, reservoir levels can drop significantly and can limit the amount of supplies available. As a result, both DWR and MWD monitor their reservoir levels regularly. Reservoir levels, at the time this document was prepared, are indicated by **Figures 5.6** and **5.7** on the following pages

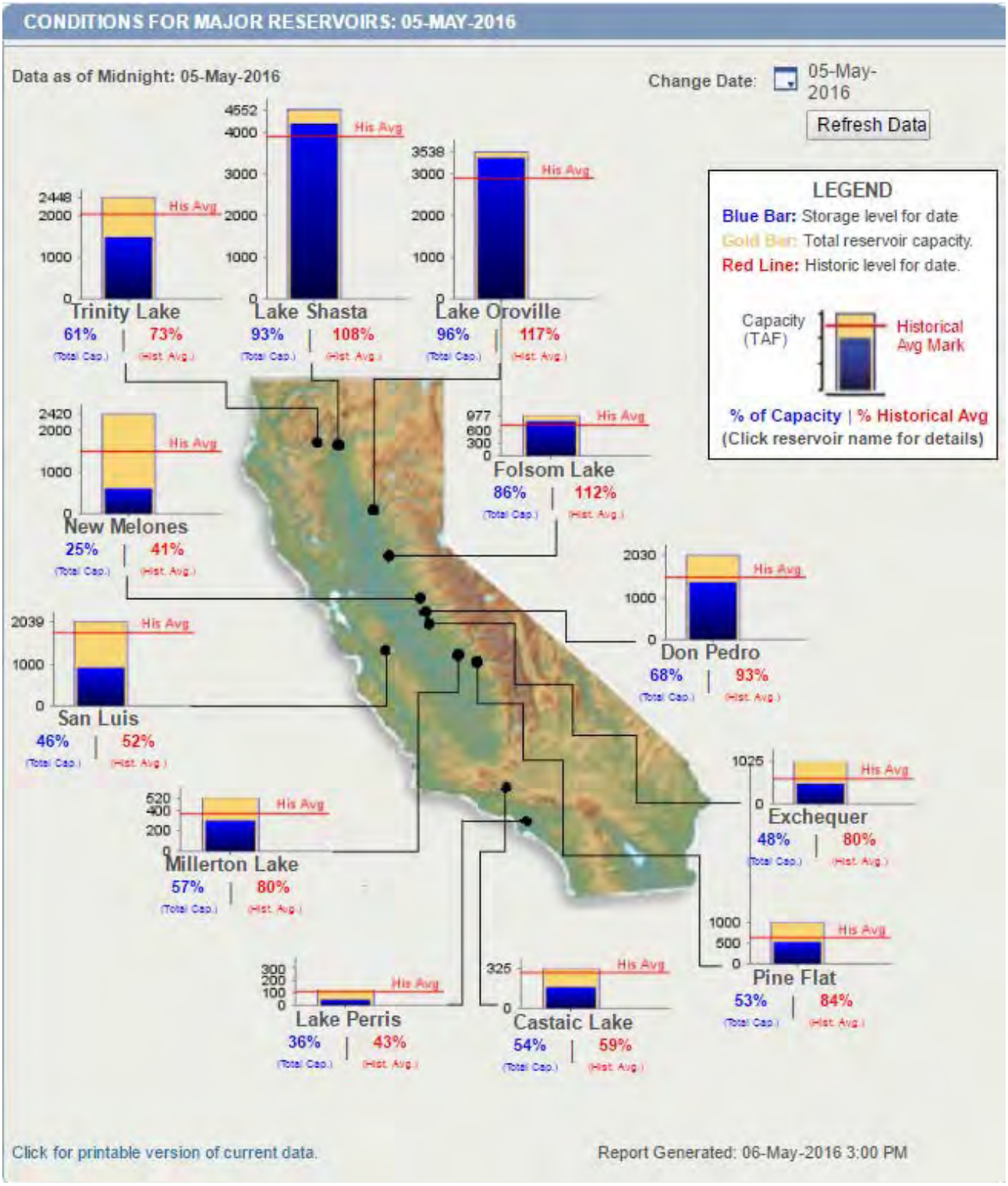

Figure 5.6: California State Reservoir Levels

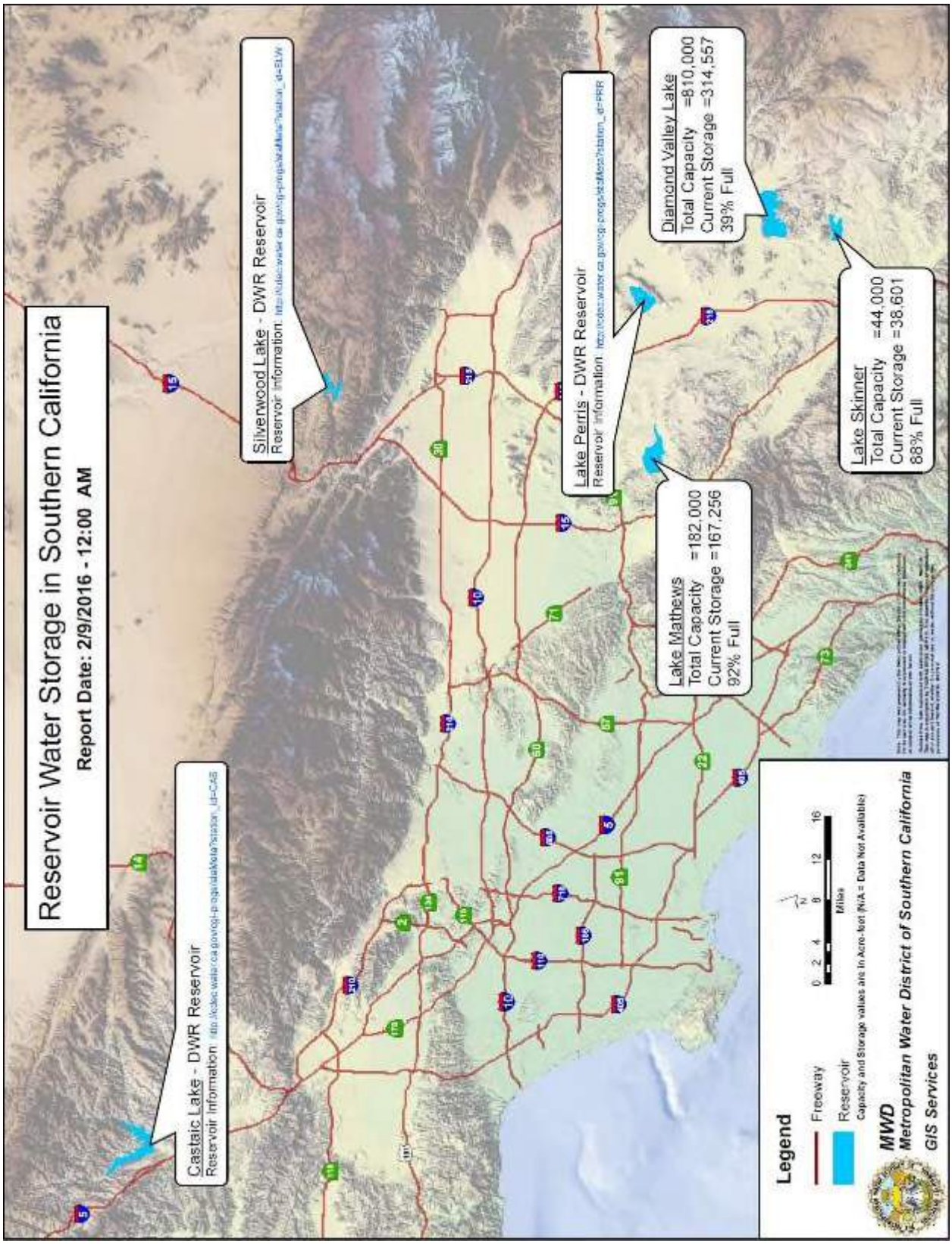

Figure 5.7: MWD Reservoir Levels

5.5 SUPPLY VS. DEMAND

As the City obtains its water sources from local groundwater, imported water purchased from MWD, and SMURRF, the City's water supply reliability is not entirely within its control or based solely on local conditions. The capacity and vulnerability of its infrastructure in addition to seasonal demand changes brought about by periods of drought influence supply. Population growth will also potentially impact future reliability projections. Since the City is pursuing 100% local water sustainability, having continued access to imported water increases the City's supply reliability.

Regional Supply Reliability

Southern California is expected to experience an increase in regional demands in the years 2015 through 2040 as a result of population growth. Although increases in demand are expected, they are limited due to the requirements of SBx7-7, which provides a cap on water consumption rates (i.e. per capita water use). It can be reasonably expected that the majority of agencies will be at or near their compliance targets by 2020 and thereafter as conservation measures are more effectively enforced.

Tables 2.3 – **2.5** of MWD's 2015 UWMP shows supply reliability projections for average and single dry years through the year 2040. The data in these tables is important to effectively project and analyze supply and demand over the next 25 years for many regional agencies, including the City.

Figure 5.8: MWD Headquarters

It is noteworthy that Projected Supplies During a Single Dry Year and Multiple Dry Years indicates MWD's projected supply will exceed its projected single dry year and multiple dry year demands in all years. Likewise, for average years, MWD supply exceeds projected demands for all years. The data contained in these tables has an indirect effect on the City's imported supply capacity, and thus this data will also be used to develop the City's own projected supply and demand over the next 25 years. **Tables 5.1** and **5.2** on the following pages show MWD's supply reliability.

City Supply Reliability

To project future supply and demand comparisons, it is assumed that demand will increase annually based on population growth and a constant of 123 GPCD in accordance with SBx7-7 requirements, although a water neutrality ordinance may significantly alter these assumptions. During times of drought, however, demand may increase at a time when supply will decrease. In such situations emergency regulations can be implemented to mitigate this potential increase. To project demands during drought periods, the following factors measured from actual demand data from dry years 2012-2014 will be assumed:

- **Single Dry Year Demand Increase**: 109% of Normal
- **Multiple Dry Year Demand Increases (Years 1, 2, & 3)**: 113%, 108 %, 107% of Normal

Tables **5.1** to **5.9**, shown on the following pages, provide an analysis of MWD and City supply and demand projections.

5.6 Sustainable Groundwater Management Act of 2014 (SGMA)

The Sustainable Groundwater Management Act (SGMA) of 2014 gives local agencies the authorities to manage groundwater in a sustainable manner and allows for limited state intervention when necessary to protect groundwater resources. The SGMA requires the creation of groundwater sustainability agencies to develop and implement local plans allowing 20 years to achieve sustainability. The SGMA provides a state framework to regulate groundwater for the first time in California history. The SGMA specifically:

- Establishes a definition of sustainable groundwater management
- Establishes a framework for local agencies to develop plans and implement strategies to sustainably manage groundwater resources
- Prioritizes basins with the greatest problems (ranked as high- and medium-priority)
- Sets a 20-year timeline for implementation.

The SGMA includes provisions to promote engagement by interested parties in the formation of a GSA and development and implementation of a Groundwater Sustainability Plan (GSP). GSAs have to identify key parties and maintain records

that spell out plans on how to include their interests in GSA operations and GSP development. The Act requires the GSA to provide this information to DWR. The GSA is the primary agency responsible for achieving sustainability within the timeframe. The SGMA includes many new authorities and tools for GSAs. For example, in developing a GSP, a GSA may opt to conduct investigations, measure and limit extraction, require registration of wells or impose fees for groundwater management. Under the Act, DWR has the lead role in working with local agencies in implementing its provisions.

The reliability estimates projected in **Tables 5.3-5.9** project only on the basis of full production of the basin's sustainable yield of 12,500 Acre Feet per year. The required development of a Sustainable Groundwater Agency for the Santa Monica Basin by June 2017, and the subsequent development of a Sustainable Groundwater Plan by January 2022 may impact the City's ability to draw from the basin in this amount. Future Urban Water Management Plans will address in fuller detail the effects of SGMA compliance.

Table 5.1
MWD Regional Imported Water Supply Reliability Projections
Average and Single Dry Years (AF)

Row	Region Wide Projections	2020	2025	2030	2035	2040
Supply Information						
A	Projected Supply: Average Year	3,653,000	3,755,000	3,925,000	4,055,000	4,091,000
B	Projected Supply: Dry Year	2,537,000	2,639,000	2,744,000	2,874,000	2,910,000
C = B/A	Projected Avg. Yr. / Dry Yr. Supply (%)	**69.4%**	**70.3%**	**69.9%**	**70.9%**	**71.1%**
Demand Information						
D	Projected Average Year Demand	1,860,000	1,918,000	1,959,000	2,008,000	2,047,000
E	Projected Dry Year Demand	2,005,000	2,066,000	2,108,000	2,160,000	2,201,000
F = E/D	Projected Dry Year / Average Year (%)	**107.8%**	**107.7%**	**107.6%**	**107.6%**	**107.5%**
Surplus						
G = A-D	Projected Surplus: Average Year	1,793,000	1,837,000	1,966,000	2,047,000	2,044,000
H = B-E	Projected Surplus: Dry Year	532,000	573,000	636,000	714,000	709,000
Programs Under Development						
I	Projected Capability of Programs (Average Year)	63,000	100,000	343,000	385,000	425,000
J	Projected Capability of Programs (Dry Year)	63,000	100,000	316,000	358,000	398,000
Potential Surplus						
K=A+I-D	Projected Surplus: Average Year	1,856,000	1,937,000	2,309,000	2,432,000	2,469,000
L=B+J-E	Projected Surplus: Dry Year	532,000	573,000	636,000	714,000	709,000
Comparisons						
I = A/D	Projected Avg. Yr. Supply/Demand (%)	**196.4%**	**195.8%**	**200.4%**	**201.9%**	**199.9%**
J = A/E	Projected Dry Yr. Supply/Demand (%)	**126.5%**	**127.7%**	**130.2%**	**133.1%**	**132.2%**

Table 5.2
MWD Regional Imported Water Supply Reliability Projections
Average and Multiple Dry Years (AF)

Row	Region Wide Projections	2020	2025	2030	2035	2040
Supply Information						
A	Projected Supply: Average Yr.	3,653,000	3,755,000	3,925,000	4,055,000	4,091,000
B	Projected Supply: Multiple Dry Yr.	2,151,000	2,202,000	2,246,000	2,298,000	2,316,000
C = B/A	Proj. Avg. Yr./Mult. Dry Yr. Supply (%)	**58.9%**	**58.6%**	**57.2%**	**56.7%**	**56.6%**
Demand Information						
D	Projected Average Year Demand	1,860,000	1,918,000	1,959,000	2,008,000	2,047,000
E	Projected Dry Year Demand	2,001,000	2,118,000	2,171,000	2,216,000	2,258,000
F = E/D	Projected Dry Year / Average Year (%)	**107.6%**	**110.4%**	**110.8%**	**110.4%**	**110.3%**
Surplus						
G = A-D	Projected Surplus: Average Year	1,793,000	1,837,000	1,966,000	2,047,000	2,044,000
H = B-E	Projected Surplus: Multiple Dry Year	150,000	84,000	75,000	82,000	58,000
Programs Under Development						
I	Projected Capability of Programs (Average Year)	63,000	100,000	343,000	385,000	425,000
J	Projected Capability of Programs (Multiple Dry Year)	43,000	80,000	204,000	245,000	286,000
Potential Surplus						
K=A+I-D	Projected Surplus: Average Year	1,856,000	1,937,000	2,309,000	2,432,000	2,469,000
L=B+J-E	Projected Surplus: Multiple Dry Year	150,000	84,000	75,000	82,000	58,000
Comparisons						
I = A/D	Projected Avg. Yr. Supply/Demand (%)	**196.4%**	**195.8%**	**200.4%**	**201.9%**	**199.9%**

Table 5.3
City of Santa Monica Water Supply Availability & Demand Projections
Normal Water Year (AF)

Water Sources	2020	2025	2030	2035	2040
Population					
Water Service Area Population	93,868	94,431	94,998	95,568	96,141
Supply					
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**20,469**	**20,469**	**20,469**	**20,469**	**20,469**
Demand					
Total Normal Demand	**12,933**	**13,010**	**13,089**	**13,167**	**13,246**
% of 2005-2009 Avg. Demand (14,687)	88.06%	88.59%	89.12%	89.65%	90.19%
Supply/Demand Comparison					
Supply/ Demand Difference	**7,433**	**7,356**	**7,277**	**7,199**	**7,120**
Supply/Demand (%)	**157.5%**	**156.5%**	**155.6%**	**154.7%**	**153.8%**

Table is intended only to show City has the capacity to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above.

2. Imported Water Supply represents contractually available supply for the City, if needed, based on the City's MWD Tier 1 Limit of 7,409 AFY (Tier 1 Limit Differs from 2010 UWMP).

3. Groundwater Supplies based on previous safe yield estimates (12,500 AFY) *assuming* City will maximize well production from its current rate (2015) of 8,500 AFY to 12,500 AFY.

4. Recycled Dry Weather Urban Runoff Supplies based on the average capacity of the SMURRF (500,000 GPD) operating 365 days per year.

5. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from 12,500 AFY pending the results of a pending perennial yield study and conditions developed in future groundwater sustainability plans, compliant with SGMA.*

Table 5.4
City of Santa Monica Water Supply Availability & Demand Projections
Single Dry Year (AF)

Water Sources	2020	2025	2030	2035	2040
Population					
Water Service Area Population	93,868	94,431	94,998	95,568	96,141
Supply					
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**20,469**	**20,469**	**20,469**	**20,469**	**20,469**
Normal Year Supply	20,366	20,366	20,366	20,366	20,366
% of Normal Year	99.5%	99.5%	99.5%	99.5%	99.5%
Demand					
Total Dry Demand	**14,097**	**14,181**	**14,267**	**14,352**	**14,438**
Normal Year Demand	12,933	13,010	13,089	13,167	13,246
% of Normal Year	109.0%	109.0%	109.0%	109.0%	109.0%
Supply/Demand Comparison					
Supply/Demand Difference	5,809	5,725	5,639	5,554	5,468
Supply/Demand (%)	141.2%	140.4%	139.5%	138.7%	137.9%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by single dry year increase of 109%.

2. Recycled Dry Weather Urban Runoff Supplies based on production data (560 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**See notes below Table 5.3 for explanation of groundwater supply / overall demand.*

Table 5.5
City of Santa Monica Water Supply Availability & Demand Projections
Multiple Dry Years (2016-2020) (AF)

Water Sources	2016	2017	2018	2019	2020
Population					
Water Service Area Population	93,420	93,532	93,644	93,757	93,869
Supply					
	Normal Years		Multiple Dry Years		
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	9,000	9,000	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**16,969**	**16,969**	**19,909**	**19,909**	**19,909**
Normal Year Supply	16,966	16,966	19,909	19,909	19,909
% of Normal Year	100%	100%	98%	98%	98%
Demand					
	Normal Years		**Multiple Dry Years**		
Total Normal / Mult. Dry Demand	**12,871**	**12,887**	**14,579**	**13,951**	**13,838**
Normal Year Demand	12,871	12,887	12,902	12,918	12,933
% of Normal Year	100.0%	100.0%	113.0%	108.0%	107.0%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	7,495	7,479	5,327	5,955	6,068
Supply/Demand (%)	158.2%	158.0%	136.5%	142.7%	143.8%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by multiple dry year increases of 113%, 108%, and 107%.

2. Recycled Dry Weather Urban Runoff Supplies based on production data (560 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.
**See notes below Table 5.3 for explanation of groundwater supply / overall demand.*

Table 5.6
City of Santa Monica Water Supply Availability & Demand Projections
Multiple Dry Years (2021-2025) (AF)

Water Sources	2021	2022	2023	2024	2025
Population					
Water Service Area Population	93,982	94,095	94,208	94,321	94,434
Supply					
	Normal Years		Multiple Dry Years		
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,400
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**20,366**	**20,366**	**19,906**	**19,906**	**19,906**
Normal Year Supply	20,366	20,366	20,366	20,366	20,366
% of Normal Year	100%	100%	98%	98%	98%
Demand					
	Normal Years		**Multiple Dry Years**		
Total Normal / Mult. Dry Demand	**12,949**	**12,964**	**14,667**	**14,035**	**13,922**
Normal Year Demand	12,949	12,964	12,980	12,995	13,011
% of Normal Year	100.0%	100.0%	113.0%	108.0%	107.0%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	7,417	7,402	5,239	5,871	5,984
Supply/Demand (%)	157.3%	157.1%	135.7%	141.8%	143.0%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by multiple dry year increases of 113%, 108%, and 107%.

2. Recycled Dry Weather Urban Runoff Supplies based on production data (560 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**See notes below Table 5.3 for explanation of groundwater supply / overall demand.*

Table 5.7
City of Santa Monica Water Supply Availability & Demand Projections
Multiple Dry Years (2026-2030) (AF)

Water Sources	2026	2027	2028	2029	2030
Population					
Water Service Area Population	94,547	94,661	94,774	94,888	95,002
Supply					
	Normal Years		Multiple Dry Years		
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**20,366**	**20,366**	**19,906**	**19,906**	**19,906**
Normal Year Supply	20,366	20,366	20,366	20,366	20,366
% of Normal Year	100%	100%	98%	98%	98%
Demand					
	Normal Years		**Multiple Dry Years**		
Total Normal / Mult. Dry Demand	**13,026**	**13,042**	**14,755**	**14,119**	**14,005**
Normal Year Demand	13,026	13,042	13,058	13,073	13,089
% of Normal Year	100.0%	100.0%	113.0%	108.0%	107.0%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	7,340	7,324	5,151	5,787	5,901
Supply/Demand (%)	156.3%	156.2%	134.9%	141.0%	142.1%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by multiple dry year increases of 113%, 108%, and 107%.

2. Recycled Dry Weather Urban Runoff Supplies based on production data (560 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**See notes below Table 5.3 for explanation of groundwater supply / overall*

Table 5.8
City of Santa Monica Water Supply Availability & Demand Projections
Multiple Dry Years (2031-2035) (AF)

Water Sources	2031	2032	2033	2034	2035
Population					
Water Service Area Population	95,116	95,230	95,344	95,459	95,573
Supply					
	Normal Years		Multiple Dry Years		
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	560	560	560
Total Supply	**20,366**	**20,366**	**19,906**	**19,906**	**19,906**
Normal Year Supply	20,366	20,366	20,366	20,366	20,366
% of Normal Year	100%	100%	98%	98%	98%
Demand					
	Normal Years		**Multiple Dry Years**		
Total Normal / Mult. Dry Demand	**13,105**	**13,121**	**14,844**	**14,204**	**14,090**
Normal Year Demand	13,105	13,121	13,136	13,152	13,168
% of Normal Year	100.0%	100.0%	113.0%	108.0%	107.0%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	7,261	7,245	5,062	5,702	5,816
Supply/Demand (%)	155.4%	155.2%	134.1%	140.1%	141.3%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by multiple dry year increases of 113%, 108%, and 107%.

2. Recycled Dry Weather Urban Runoff Supplies based on production data (560 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**See notes below Table 5.3 for explanation of groundwater supply / overall demand.*

Table 5.9
City of Santa Monica Water Supply Availability & Demand Projections
Multiple Dry Years (2036-2040) (AF)

Water Sources	2036	2037	2038	2039	2040
Population					
Water Service Area Population	95,688	95,803	95,918	96,033	96,148
Supply					
	Normal Years		Multiple Dry Years		
Imported Water	7,409	7,409	7,409	7,409	7,409
Groundwater	12,500	12,500	12,500	12,500	12,500
Recycled Dry Weather Urban Runoff	560	560	100	100	100
Total Supply	**20,366**	**20,366**	**19,906**	**19,906**	**19,906**
Normal Year Supply	20,366	20,366	20,366	20,366	20,366
% of Normal Year	100%	100%	98%	98%	98%
Demand					
	Normal Years		**Multiple Dry Years**		
Total Normal / Mult. Dry Demand	**13,184**	**13,199**	**14,933**	**14,290**	**14,174**
Normal Year Demand	13,184	13,199	13,215	13,231	13,247
% of Normal Year	100.0%	100.0%	113.0%	108.0%	107.0%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	7,182	7,167	4,973	5,616	5,732
Supply/Demand (%)	154.5%	154.3%	133.3%	139.3%	140.4%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 123 GPCD (SBx7-7) multiplied by population projections shown above and by multiple dry year increases of 113%, 108%, and 107%.

2. Recycled Dry Weather Urban Runoff Supplies based on previous dry year supplies in 2007 (about 100 AF).

3. All other items derived in similitude to Table 5.3.

4. Population forecasts are based upon California Department of Finance figures as required by the State for this plan.

**See notes below Table 5.3 for explanation of groundwater supply / overall demand*

Based on the data contained in **Tables 5.3 – 5.9**, the City can expect to meet future demands through 2040 by fully implementing the Sustainable Water Master Plan and other water reuse projects in planning. Projected groundwater and imported water supply capacities are not expected to be significantly affected during times of low rainfall and over short term dry periods of up to three years; however, during drought or other water supply interruptions, MWD may reduce the allocation of imported water the City receives.

While the data shown in **Tables 5.3 – 5.9** identifies water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of the City's Water Shortage Response Plan (WSRP) along with implementation of the appropriate stage of regional plans, such as the WSDM Plan (MWD). These programs are discussed in **Section 7**.

5.7 WATER SUPPLY OPPORTUNITIES

City Projects

In general, the City continually reviews practices that will provide its customers with adequate and reliable supplies. As discussed in previous sections, the City is dedicated to maximizing its supply sources to help meet its 100 percent sustainability goals. In the 2010 UWMP, the City did not have any specific plans for additional water supply projects other than ongoing maintenance and upgrades to its existing wells, storage reservoirs, and SMURRF. However, the City has identified in its 2014 Sustainable Water Master Plan (SWMP) that conservation alone will not allow the City to meet its sustainability goals. Thus, the City has considered several supply opportunities, including traditional sources such as groundwater and alternate sources such as recycled, greywater, and rainwater harvesting. The City may also consider recycling additional urban runoff from Los Angeles County drains that are presently discharging into Santa Monica Bay, such as the Wilshire Boulevard and Montana Avenue drains. However, the economics of purchasing or repurposing the necessary land and construction costs to build future recycling plants will be an important factor in assessing the economic viability of these projects. The 2014 SWMP goes into detail on the groundwater options for the City.

Regional Projects (MWD)

MWD is implementing water supply alternative strategies for the region and on

behalf of member agencies to ensure available water in the future, including:

- Conservation
- Water recycling & groundwater recovery
- Storage and groundwater management programs within the region
- Storage related to SWP & CRA
- Other water supply management programs outside of the region

MWD has made investments in conservation and supply augmentation as part of its long-term water management strategy. MWD's approach to a long-term water management strategy was to develop an Integrated Resource Plan (IRP) to include many supply sources. A brief description of the various programs implemented by MWD to improve reliability is included in **Table 5.10** on the following page.

Table 5.10
MWD IRP Regional Resources Status

Supply	Description	
Colorado River Aqueduct (CRA)	MWD holds a basic apportionment of Colorado River water and has priority for an additional amount depending on availability of surplus supplies. Water management programs supplement these apportionments.	
State Water Project (SWP)	MWD receives water delivered under State Water Contract provisions, including Table A contract supplies, use of carryover storage in San Luis Reservoir, and Article 21 interruptible supplies.	
Conservation	MWD and the member agencies sponsor numerous conservation programs in the region that involve research and development, incentives, and consumer behavior modification.	
	Code-Based Conservation	Water savings resulting from plumbing codes and other institutionalized water efficiency measures.
	Active Conservation	Water saved as a direct result of programs and practices directly funded by a water utility, e.g., measures outlined by the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). Water savings from active conservation completed through 2008 will decline to zero as the lifetime of those devices is reached. This will be offset by an increase in water savings for those devices that are mandated by
	Price Effect Conservation	Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water.
Local Resources	*Groundwater*	Member-agency produced groundwater from the groundwater basins within the service area.
	Groundwater Recovery	Locally developed and operated, groundwater recovery projects treat contaminated groundwater to meet potable use standards. MWD offers financial incentives to local and member agencies through its Local Resources Program for recycled water and groundwater recovery.
	Los Angeles Aqueduct (LAA)	A major source of imported water is conveyed from the Owens Valley via the LAA by Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of MWD's service area, MWD classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
	Recycling	Recycled water projects recycle wastewater for M&I use.
	Surface Water	Surface water used by member agencies comes from stream diversions and rainwater captured in reservoirs.
Groundwater Conjunctive Use Storage Programs	MWD sponsors various groundwater storage programs, including, cyclic storage programs, long-term replenishment storage programs, and contractual conjunctive use programs.	
Surface Water Storage	MWD reservoirs (Diamond Valley Lake, Lake Mathews, Lake Skinner) and flexible storage in California Department of Water Resources (DWR) reservoirs (Castaic Lake, Lake Perris).	
Central Valley Storage & Transfers	Central Valley storage programs consist of partnerships with Central Valley water districts to allow MWD to store SWP supplies in wetter years for return in drier years. MWD's Central Valley transfer programs consist of partnerships with Central Valley Project and SWP settlement contractors to allow MWD to purchase water in drier years.	

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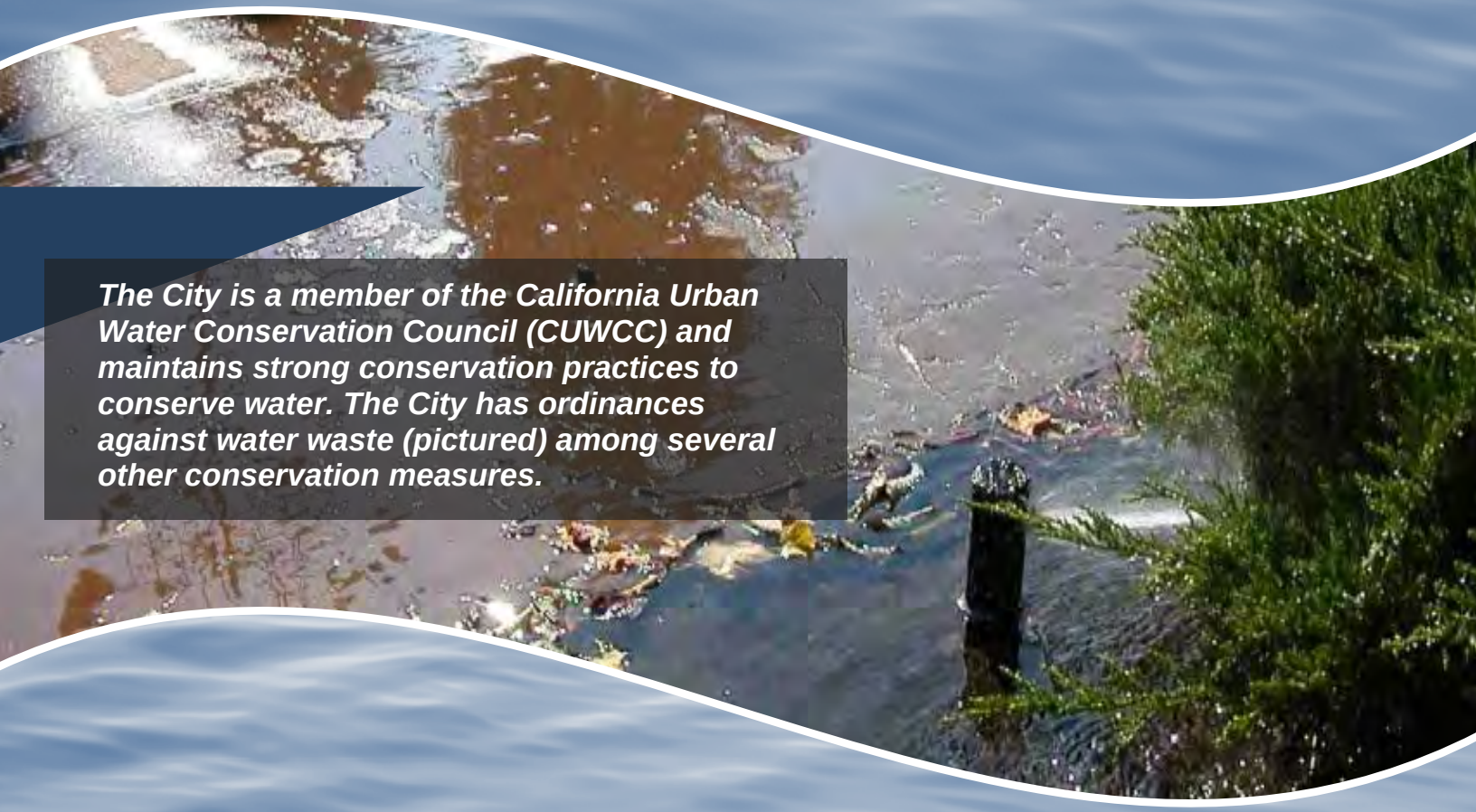
SECTION 6: CONSERVATION MEASURES



The City is a member of the California Urban Water Conservation Council (CUWCC) and maintains strong conservation practices to conserve water. The City has ordinances against water waste (pictured) among several other conservation measures.

SECTION 6 CONSERVATION MEASURES

6.1 INTRODUCTION

As a result of diminished existing supplies and difficulty in developing new supplies, water conservation is important to Southern California's sustainability. Therefore, the City acknowledges that efficient water use is the foundation of its current and future water planning and operations policies. The City implements water conservation through a combination of programs, resources, and policies.

Figure 6.1: Water waste is prohibited by City Code

To conserve California's water resources, several public water agencies and other interested parties of the California Urban Water Conservation Council (CUWCC) drafted the Memorandum of Understanding Regarding Urban Water Conservation (MOU) in 1991. The MOU establishes 14 Best Management Practices (BMPs) which are defined roughly as policies, programs, practices, rules, regulations, or ordinances that result in the more efficient use or conservation of water.

Updates to BMPs for 2015 UWMPs

In previous years, the 14 CUWCC BMPs coincided with the 14 Demand Management Measures (DMMs) defined in the UWMP Act. The DMMs are intended to reduce long-term urban demands from what they would have been without their implementation. The DMMs are in addition to programs which may be instituted during occasional water supply shortages.

For 2015 UWMPs, the Department of Water Resources (DWR) has refined the list of DMMs required to be reported in the 2015 UWMPs.

- ***Water Waste Prohibition Ordinances***
- ***Metering***
- ***Conservation Pricing***

- ***Public Education & Outreach***
- ***Programs to Assess and Manage Distribution System Real Loss***
- ***Water Conservation Program Coordination and Staffing Support***
- ***Other Demand Management Measures*** *(that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented)*

As with previous UWMPs, agencies that are members of the CUWCC can submit the annual reports in lieu of providing details on the agency's DMMs. That is, in lieu of providing a description of each DMM, provide data on recent implementation and plans for future implementation. The City has attached its CUWCC BMP Coverage Reports to satisfy this requirement. The City is on track for each of the CUWCC BMPs.

6.2 CUWCC MEMBERSHIP

In 1991, the City became a signatory of the CUWCC by signing the MOU and has expedited implementation of water conservation measures. The City actively implements all five of the measures listed below with good faith effort by achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in each BMP's definition as described in the MOU. Water conservation is an integral part of the City's water policies.

As a member of CUWCC, the City is required to submit bi-annual reports to the CUWCC that document the implementation of each BMP. The City has maintained compliance with the BMPs since becoming a signatory. **Appendix E** includes the CUWCC reports.

Updates to CUWCC BMPs

As with the DMMs, the CUWCC BMPs have changed for CUWCC members. The BMPs are now listed as

- ***BMP 1****: Utility Operations*
- ***BMP 2****: Public Education & Outreach*
- ***BMP 3****: Residential Programs*
- ***BMP 4****: Commercial, Institutional, and Industrial Programs*
- ***BMP 5****: Landscape Programs*

The changes listed above are reflected in the City's annual CUWCC BMP reports from 2010-2015.

6.3 CONSERVATION MEASURES

As signatory to the MOU, the City has committed to use good-faith efforts to

implement the BMPs. In addition, the City has continued to work with the Metropolitan Water District (MWD) to increase the effectiveness of its DMM programs and educate people on the importance of water conservation.

Table 6.1
City BMPs (CUWCC)

BMP
BMP 1: Utility Operations *Deals with water waste prohibitions, water efficiency ordinances, metering, conservation pricing, and other items related to managing water use*
BMP 2: Public Education & Outreach *Deals with outreach efforts including emails, newsletters, advertisements, presentations, promotions, etc. related to outreach & education*
BMP 3: Residential Programs *Deals with showerheads, faucets, toilets, and leak detection surveys related to residential water use and rebates for water conserving fixtures*
BMP 4: Commercial, Institutional, & Industrial Programs *Deals with toilets, urinals, steamers, cooling towers, food/restaurant equipment, medical equipment, and items related to commercial, institutional, and industrial water use*
BMP 5: Landscape Programs *Deals with establishing parameters for large landscapes, including measurements, budgets, audits, prohibitions, incentives, etc., related to large landscapes*

In addition to the BMPs listed above, the City also implements the following programs defined in the Sustainable Water Master Plan:

City of Santa Monica Water-Efficient Programs

- Rain Harvest Rebates: Property owners are eligible for up to $2,000 for the installation of rain barrels and/or cisterns and up to $1,000 for the installation of rain/rock gardens.

  Cash for Grass Rebates: Property owners are eligible for up $3.50 per square foot of lawn and sprinklers removed in the yard and parkway. Multi-family and commercial properties may be eligible for $1 for each additional square foot converted. The City received co-funding from MWD for this program.

- Landscape Consultations: In combination with the landscape rebate, applicants may have a 2-hour consultation for a small fee with a landscape professional to discuss the rebate process and provide specific ideas for retrofitting their landscape.

- Landscape Design, Installation, and Maintenance Classes are provided for residents and landscape professionals.

- Multi-family Toilet Direct Install Program: Provides free toilets and installations of ultra-high-efficiency toilets. The City received co-funding from MWD for this program.
- Rebates: Water customers may be eligible for qualified indoor and outdoor water-saving products. The City co-funds rebates through MWD's regional rebate programs.
- Water Consultations: City staff provide free water audits for homeowners, multi-family owners, and businesses to identify water-saving opportunities.
- Santa Monica Malibu Unified School District: Water audits and retrofits are being implemented to assist the District in saving at minimum 5% of their annual water use.
- Municipal landscapes and buildings continue to be retrofitted with water conserving fixtures/materials.
- Outreach and Marketing: The City implements a comprehensive outreach and marketing campaign including social media, ads, bus ads, targeted direct calls and mailings, educational workshops, community presentations, and free water-saving product distributions.
- Consumer Engagement Program: This pilot program is designed to provide specific water use analysis and tips to single-family water customers through bi-monthly reports via mail or email. In addition, customers can get more detailed information and manage their profile through the on-line website.

Additional information on the City's conservation programs can be found at: www.sustainablesm.org/water.

6.4 CITY CONSERVATION POLICIES

The City has adopted several plans and ordinances to implement water conservation programs and policies including the Sustainable City Plan, the Sustainable Water Master Plan, the Water Shortage Response Plan, the Green Building Ordinance and the Water Conservation Ordinance. In 2016 and in response to direction from the City Council, City staff will be proposing a water neutrality ordinance to mitigate additional water use for many new construction projects.

In 2014, the City updated the Sustainable City Plan (SCP), which includes goals for the City's government and the community to conserve and enhance the City's local resources, safeguard human health and the environment, maintain a healthy and

diverse economy, and improve the livability and quality of life for all of the community. The guiding principles of the SCP are:

1. The concept of sustainability guides City policy.
2. Protection, preservation, and restoration of the natural environment are high priorities of the City.
3. Environmental quality, economic health and social equity are mutually dependent.
4. All decisions have implications to the long-term sustainability of the City.
5. Community awareness, responsibility, participation, and education are key elements of a sustainable community.
6. The City recognizes its linkage with the regional, national, and global community.
7. Those sustainability issues most important to the community will be addressed first, and the most cost-effective programs and policies will be selected.
8. The City is committed to procurement decisions, which minimize negative environmental and social impacts.
9. Cross-sector partnerships are necessary to achieve sustainable goals.
10. The Precautionary Principle provides a complimentary framework to help guide City decision makers in the pursuit of Sustainability **(New as of 2014)**
11. Santa Monica is committed to Sustainable Rights for its Residents, Natural Communities, and Ecosystems **(New as of 2014)**

The system level indicators for water use and their target goals are as follows:

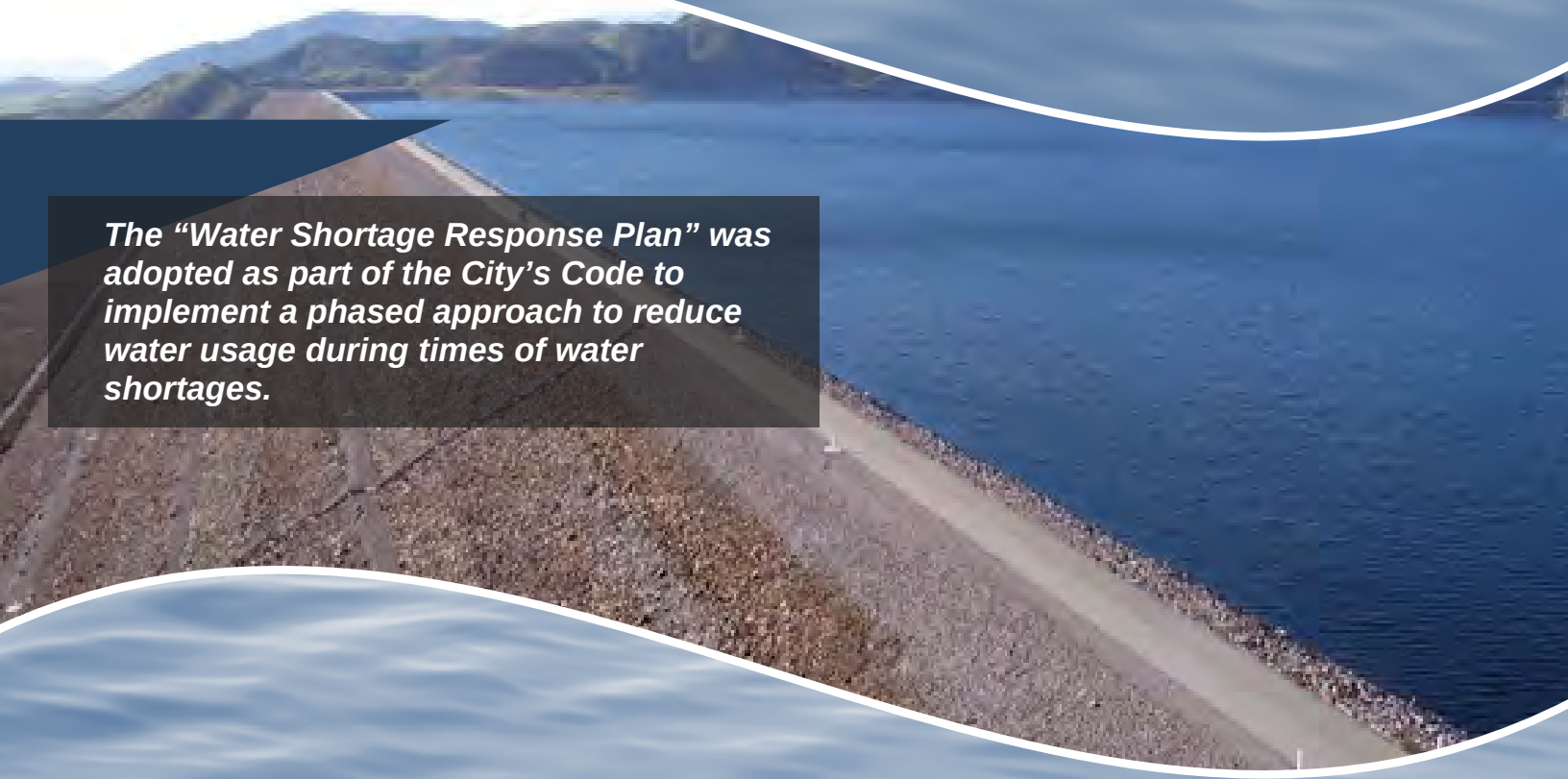
Table 6.2
System Level Indicators & Targets

Indicators	Targets for 2020
Total Citywide use (Self Sufficiency)	Reduce demand by 1,300,000 gallons per day (GPD)
Total Citywide use (Per Capita)	Reduce per capita use to 123 gallons per capita per day (GPCD)
Percent local vs. imported	Increase up to 100% local
Potable vs. non-potable	Upward trend in non-potable use

The OSE also enforces the City's water conservation rules and regulations, which include:

1. The Bay Saver Fee Ordinance, which assesses a fee on water bills until fixtures are replaced with water conserving fixtures and a free water saving assessment, is performed by City staff.
2. The Good Housekeeping Ordinance, which includes anti-runoff provisions for irrigation and a prohibition of washing down paved areas with potable water.
3. The Water Conservation Ordinance, which prohibits irrigation between 10:00 am and 4:00 pm, prohibits the watering down of paved or hard-surfaced areas, prohibits irrigation runoff, prohibits the filling of decorative fountains, prohibits the draining and re-filling of pools, requires water leaks to be repaired immediately, prohibits the washing of vehicles with a running hose, and mandates that restaurants serve water only upon request. Staff assesses penalties in accordance with provisions of the ordinance and assists community members with voluntary compliance.
4. The Green Building Ordinance, which requires the most water-efficient plumbing fixtures, irrigation, and landscaping for new construction, major remodels, and new or remolded landscapes. The landscape and irrigation standards are at least as effective as the State Model Efficient Landscape Ordinance. This ordinance applies to all existing and new landscapes and irrigation. Landscape plans are required for all new developments (major remodels and new construction) and at least 2 inspections are performed prior to approval and Certificate of Occupancy.

SECTION 7: CONTINGENCY PLANNING



The "Water Shortage Response Plan" was adopted as part of the City's Code to implement a phased approach to reduce water usage during times of water shortages.

SECTION 7 CONTINGENCY PLANNING

7.1 INTRODUCTION

Water supplies may be interrupted or reduced significantly in a number of ways. Droughts, earthquakes, and power outages can each hinder a water agency's ability to effectively deliver water. The ability to manage water supplies in times of drought or other emergencies is an important part of water resources management for a community.

Figure 7.1: Conservation Alerts Are Used By Many Agencies

As the City receives imported water from MWD and extracts groundwater from the Santa Monica Basin, the City's response to an emergency will be a coordinated effort of its own staff in conjunction with other local and regional water agencies. During water shortage emergencies, the City will implement its Water Shortage Response Plan, which imposes up to a 50 percent reduction in the total water supply. The City will also work in conjunction with MWD to implement water shortage plans on a regional level.

7.2 CITY RESPONSE PLAN

In 2015, the Santa Monica City Council updated its Water Shortage Response Plan (WSRP), pursuant to City Municipal Code 7.16.010 to 7.16.100 (specifically 7.16.030), which establishes five stages of water shortage severity based on predicted or actual water supply reductions. Each stage establishes water use reductions through voluntary or mandatory measures. Triggers for implementing the WSRP may include such events as a state or local emergency; natural disaster; a localized event that critically impacts the water supply; drought or the City's wholesale water agency imposing water allocation restrictions.

The objectives of the WSRP are to:.

1. Prioritize essential uses of available water

2. Avoid irretrievable loss of natural resources
3. Manage current water supplies to meet ongoing and future needs
4. Maximize local municipal water supplies
5. Eliminate water waste city-wide
6. Create equitable demand reduction targets
7. Minimize adverse financial effects

The following priorities for use of available water are listed in order from highest to lowest priority:

1. Health and Safety including: consumption and sanitation for all water users; fire suppression; hospitals, emergency care, nursing/convalescent homes and other similar health care facilities; shelters and water treatment.
2. Institutions, including government facilities and schools such as public safety facilities, essential government operations, public pools and recreation areas
3. All non-essential commercial and residential water uses
4. New water demand

Stages of Action

The WSRP establishes five (5) stages of severity based on predicted or actual water supply reductions. Each stage establishes water use reductions either through voluntary or mandatory measures. Mandatory water restrictions include water use allowances for each water customer category. **Table 7.1** on the following page outlines the stages of water shortage and water use reduction goals.

Table 7.1
Shortage Reduction Targets

Stage	Water Use Restrictions	Total Water Supply Reduction Percentage	City Wide Use Reduction Goal
Advisory	Voluntary	Shortage is Probable	10%
Stage 1	Mandatory	5-10%	15%
Stage 2	Mandatory	10-20%	20%
Stage 3	Mandatory	20-30%	30%
Stage 4	Mandatory	30+%	50%

The City Council may declare by resolution that an Advisory or Stage 1, 2, 3 or 4 Water Supply Shortage exists and that the actions outlined in the WSRP are necessary. The type of event which may prompt the City Council to declare an Advisory or Stage1, 2, 3, or 4 Water Supply Shortage may include, among other factors: drought, state or local emergency, a natural disaster that critically impacts the water treatment or water distribution system, and a localized event that critically impacts the water supply. The water supply can be impacted due to deficient water treatment and/or water quality, and problems with storage, transmission, or the water distribution system. Also, restricted use could be triggered by the City's wholesale water agency requesting extraordinary water conservation efforts in order to avoid mandatory water allocations in accordance with the Water Supply Allocation Plan (WSAP). The City adopted Stage 2 of its WSRP in August 2014.

Metropolitan WSDM Plan

In addition to the provisions of the City's WSRP, the City will also work in conjunction with MWD to implement conservation measures within the framework of MWD's Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan was developed in 1999 by MWD with assistance and input from its member agencies. The plan addresses both surplus and shortage contingencies.

The WSDM Plan guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. The plan guides the operations of water resources (local groundwater and surface water resources, Colorado River, State Water Project, and regional storage) to ensure

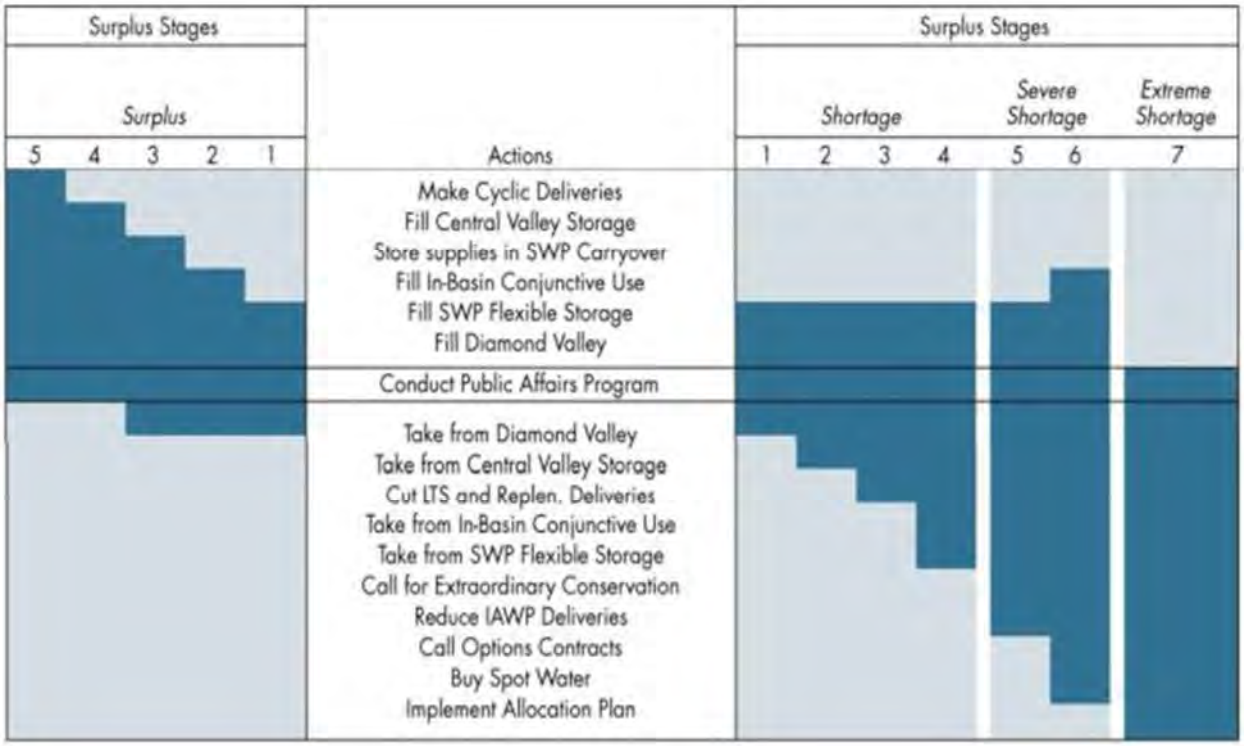


Figure 7.2: MWD's WSDM Stages of Action

regional reliability. It identifies the expected sequence of resource management actions MWD will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable; however, in the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

7.3 THREE-YEAR MINIMUM SUPPLY

Due to the inflows received from the Santa Monica Mountains (in addition to percolation) and limited outflows, the water in storage in the Santa Monica Basin has remained more or less consistent. The City's groundwater supply is considered to be 100% reliable. Imported water, on the other hand, is contingent upon demand variances and available supplies during dry years. However, MWD predicts 100% reliability of its supplies in the near future to meet demands during all climatic seasons.

Based on the conditions described above, the City's three-year minimum supply estimate is listed in **Table 7.2** on the following page:

Table 7.2
Projected 3-yr Minimum Water Supply (AF)

Source	Supply (AF) 2016	Supply (AF) 2017	Supply (AF) 2018
Imported	7,409	7,409	7,409
Ground	9,000	9,000	12,500
Recycled	560	560	560
Total	**16,969**	**16,969**	**20,469**

The City can expect supply reliability during a three-year drought as citizens have responded well to conservation measures, and groundwater in the Charnock Subbasin may be extracted beyond perennial yield estimates for up to 7.5 years (2001 Komex H20 Science report).

7.4 CATASTROPHIC INTERRUPTIONS

If water shortages are due to a catastrophic event such as a severe drought, earthquake, flood, or power outage, the City will take actions in accordance with its Water Shortage Response Plan for the appropriate water shortage severity. Additionally, the City will work in conjunction with other local and regional agencies. **Table 7.3** below lists the actions the City will take during a catastrophic interruption of its water supply:

Table 7.3
Catastrophic Interruption Preparation Actions

No.	Preparation Action
1	Stretch existing water supply
2	Obtain additional water supplies
3	Develop alternative water supplies
4	Determine where the funding will come from
5	Contact and coordinate with other agencies
6	Create an Emergency Response Team/Coordinator
7	Create a catastrophe preparedness plan
8	Place employees/contractors on call
9	Develop methods to communicate with the public
10	Develop methods to prepare for water quality interruptions

In 2004, the City completed its Emergency Response Plan for its water system. The City updates its City-wide Emergency Response Plan annually. All actions to be undertaken during an emergency will follow the City's Emergency Response Plans and the WSRP

7.5 PROHIBITIONS

Mandatory Prohibitions

In accordance with the WSRP, the City has enacted several water use restrictions which are permanently enforced as part of the City's Municipal Code. Restrictions include the following:

- No landscape watering (10am-4pm) unless drip irrigation is used.
- No runoff or overspray from excessive irrigation.
- No watering down hardscapes for cleaning.
- No washing of cars except with a hand-held bucket and positive action quick release shutoff valve.
- No filling of fountains, lakes, or ponds unless such features have a recycling system.
- Pools and spas must be covered to prevent evaporation.

Eating establishments shall serve water only upon request.

The City's prohibitions on water use can be found in Section 7.16.020 of the City code.

Consumption Reduction Methods

In addition to the City's demand management measures, the following is a list of some of the consumption reduction methods the City may implement during a water shortage:

- Reduce pressure in water mains
- Flow restrictions
- Restrict building permits
- Restrict for only priority uses
- Mandatory Water Use Allowances

The City's consumption reduction methods are included in the City's Water Shortage Response Plan for its water system.

Penalties or Charges

Violation of the regulations and restrictions on water use set forth in the Water Conservation Ordinance constitutes a penalty starting at $250. Each day that a violation occurs constitutes a separate offense, with the second and third penalties escalating. Any willful misrepresentation constitutes a misdemeanor punishable by a fine not to exceed five hundred dollars or by imprisonment for a period not to exceed six months or both for any person to knowingly misrepresent any material fact to

any representative of the City in any attempt or effort to circumvent or otherwise diminish the effectiveness of any of the requirements imposed by any part of the Water Conservation Ordinance.

Violation of the WSRP may result in penalties of $250, $500, or $1,000 for exceeding water use allowances in addition to mandatory water audits, flow restriction, civil and/or criminal prosecution for multiple exceedances.

7.6 FISCAL IMPACTS

The City has an established rate stabilization structure, which includes rate increases to compensate the City of Santa Monica for operational expenses. When water use is down, fixed operational costs result in rate increases based upon usage to compensate the City for its expenses. Under normal water supply conditions, potable water production figures are recorded daily. Totals are reported monthly to the Water Resources Division Manager and incorporated into the water supply report. As previously mentioned, the City updated its Water Shortage Response Plan particularly addressing water allowances, reduction goals, and triggering mechanisms. The City's revised plan is consistent with the provisions outlined in MWD's emergency response plan and included in the Urban Water Management Plan after adoption.

7.7 COUNCIL ORDINANCE

On September 8, 2015, the Santa Monica City Council passed a resolution updating the Water Shortage Response Plan (WSRP), pursuant to City Municipal Code 7.16.010 to 7.16.100 (specifically 7.16.030). Additionally, the City Council may implement the provisions of this plan by resolution, following a public hearing to determine the appropriate water shortage stage. A copy of the City's WSRP is included in Appendix G.

7.8 MECHANISMS TO DETERMINE REDUCTIONS IN WATER USE

Reductions in water use are tracked through the City's billing system, which tracks bi-monthly use for all metered connections. The use of a tiered rate structure also discourages high water use, and OSE works with the public to reduce consumption.

The City is also beginning to implement AMI technologies as funding becomes available. AMI will allow customers to engage with WaterSmart software and assist the City in leak detection.

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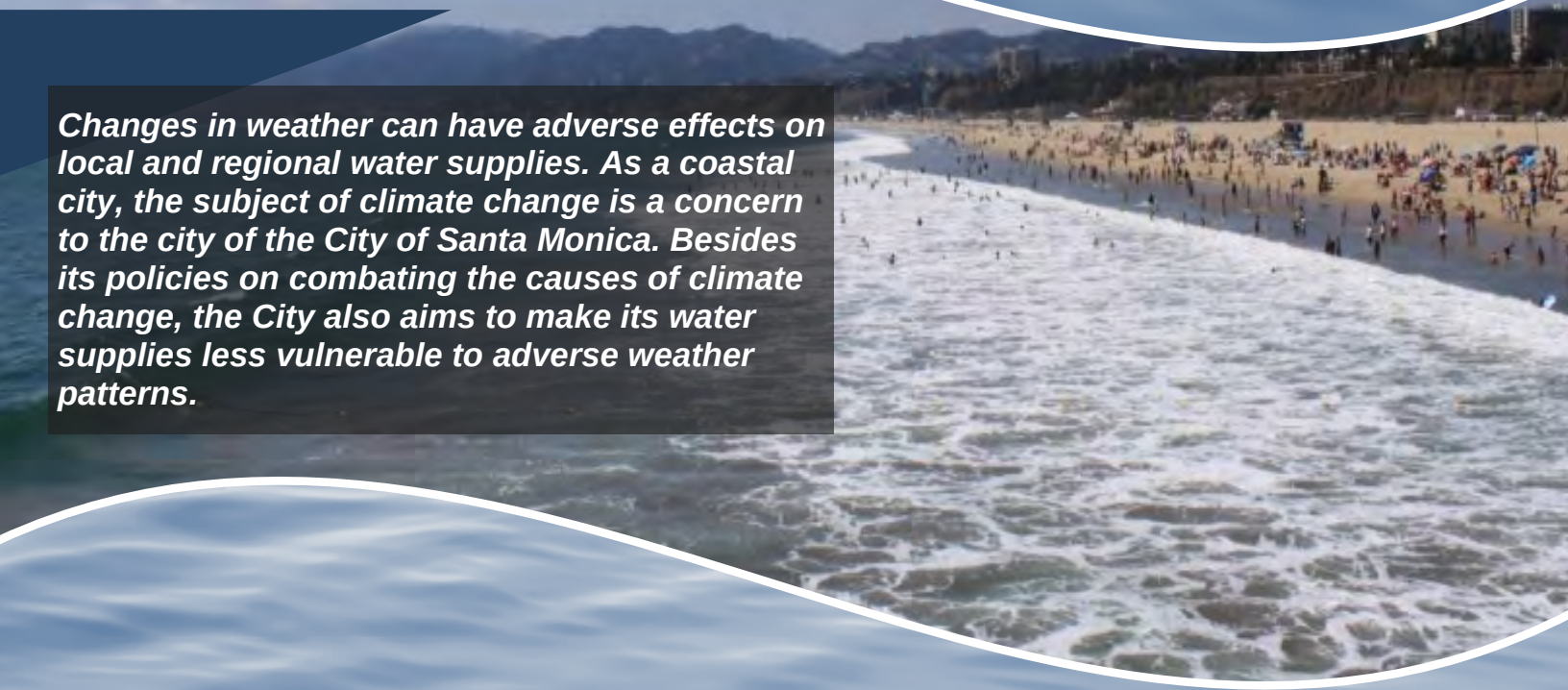
SECTION 8: CLIMATE CHANGE



Changes in weather can have adverse effects on local and regional water supplies. As a coastal city, the subject of climate change is a concern to the city of the City of Santa Monica. Besides its policies on combating the causes of climate change, the City also aims to make its water supplies less vulnerable to adverse weather patterns.

SECTION 8 CLIMATE CHANGE

8.1 INTRODUCTION

Climate change is not only a weather issue, but also a water supply issue. Changes in weather can have adverse effects on local and regional water supplies. Climate change has become an increasingly important topic of interest in recent years as it has the potential to bring about drought, which hinders a water agency's ability to effectively deliver water. The ability to manage water supplies in times of drought is an important part of water resources management for a community. As a coastal city, the subject of climate change is a concern to the City of Santa Monica. The City is concerned with combating the causes of climate change and preparing for the impacts brought about by climate change.

8.2 CLIMATE CHANGE IMPACTS

The increasing amount of human activities producing carbon dioxide in the world has changed the earth's climate by emitting greenhouse gasses responsible for global warming. This has resulted in extreme weather events occurring more frequently. The severity and frequency of climate change impacts on temperature and precipitation patterns can be difficult to forecast due to dramatic shifts in weather patterns as a result of increased concentrations of carbon dioxide in the atmosphere.

Figure 8.1: Climate Effects on California

While the precise timing, severity, and regional impacts of these temperature and precipitation changes are uncertain, climate researchers have identified several important issues of concern for water planners in California. The climate change impacts of concern are as follows:

- Reduced snowpack in Sierra Nevada
- Increased intensity and frequency of extreme weather events

- Rising sea levels resulting in:
  - Increased risk of damage from storms, high-tide events, and the erosion of levees
  - Potential pumping cutbacks on the California State Water Project (SWP) and Central Valley Project (CVP)

Additional areas of concern resulting from global climate change include:

- Effects on local supplies such as groundwater
- Changes in urban and agricultural demand levels and patterns
- Impacts to human health from waterborne pathogens and water quality degradation
- Declines in ecosystem health and function
- Alterations to power generation and pumping regimes

8.3 CLIMATE IMPACTS ON CITY WATER SUPPLIES

Concerning the City of Santa Monica, the impacts of a changing climate could result in rising temperatures, unpredictable precipitation patterns, and a rise in sea level, which would affect any sea-bordering city. A rise in sea level is likely to lead to a loss of clean groundwater supply. As sea water rises, the flow can infiltrate the aquifers in low-lying coastal areas and mix fresh water making it undrinkable. Furthermore, rising temperatures will bring about warmer and drier spring and autumn seasons, resulting in shorter groundwater recharge seasons. During hot summers, water demand will increase affecting the City's local groundwater supply, which the City has historically relied on heavily upon. In addition to affecting the City's local water supplies, climate change severely impacts the Metropolitan Water District's (MWD) water supply, which then in turn affects the City's imported water supply from MWD.

Figure 8.2: Drier, Hotter Climate Effects on the City

Recent Climate (California Drought) Impacts on City Water Supplies

Additionally, since the Santa Monica Basin is an unadjudicated basin, the lack of pumping restrictions allows for water supply reliability during dry seasons. Thus, the City's groundwater supply is considered to be reliable during climatic variations.

Table 8.1
Drought Impacts on City Groundwater Basins

Item	2011 Before Drought	2015 After Drought
Depth to Groundwater (Average)	500 ft	500 ft
Basin Capacity (Range)	12,500 AFY	12,500 AFY

Although the City desires to become independent of imported water, the City expects supply reliability during a three-year drought as groundwater may be extracted.

8.4 POTENTIAL CITY WATER SUPPLIES TO DEAL WITH LONG TERM CLIMATE CHANGE

If water shortages are due to a severe drought, earthquake or terrorism, the City will work in conjunction with other local and regional agencies. **Table 7.3** in the previous section (**Section 7**) lists the actions the City will take during a catastrophic interruption of its water supply, such as an earthquake or terrorist event. **Table 8.2** below describes the potential water sources that may be developed to respond to a severe drought or other catastrophic event.

Table 8.2
Potential City Water Sources
(For Long-Term Climate Change)

Potential Source	Action Required
Brackish (Saline) Groundwater	Construct Oceanfront Wells Construct Saltwater RO Construct Brackish Water Disposal Equipment
Water Storage	Construct additional Tanks or Participate in Regional Reservoir
Recycled Water	Construct Recycled Water Facility Evaluate use of regional recycled water supply

In 2004, the City completed its Emergency Response Plan for its water system and also updates its City-wide Emergency Response Plan annually. In 2015 the City's Water Shortage Response Plan (WSRP) was reevaluated and approved. All actions to be undertaken during an emergency will follow the City's Emergency Response Plans and WSRP. Violation of the regulations and restrictions on water use set forth in the "No Water Waste" Ordinance.

Other (Privately Owned) Water Supplies

Capturing rainwater in rain barrels and/or cisterns is one way for the City's community to save and store water while reducing their use of the City's water supply.

The City offers a landscape rebate ranging from $200 to $2,000 to any single-family or business that installs a barrel or cistern for harvesting rainwater on their property providing they adhere to the terms of the Rainwater Harvesting Program.

Figure 8.3: Rainfall Cistern in Santa Monica

8.5 EXISTING CITY POLICIES ON CLIMATE CHANGE

Addressing climate change by minimizing the City's impact on the environment has been a priority of the City for the past 20 years. Since 1994, the year the City adopted the Sustainable City Plan, the City has been committed to demonstrating leadership in the practice of sustainability. For instance, the City of Santa Monica was the first city in the U.S. to buy green power, 100 percent renewable energy, for all of its municipal electricity needs.

As a guiding principle of the Sustainable City Plan, the notion of sustainability directs existing City policy. The City takes into account any possible long-term impacts a policy choice or program may have to ensure the sustainability of its community.

Figure 8.4: Santa Monica's Eco-Friendly Fleet

In February 2013, the City published its 15x15 Climate Action Plan, which identifies 15 measures to reduce community greenhouse gas emissions 15 percent below 1990 levels by 2015. The 15 measures are summarized as follows:

1. Increase energy efficiency of new buildings.
2. Reduce energy use in existing buildings.
3. Increase citywide solar capacity.
4. Divert 80 percent of waste from landfills.
5. Reduce daily vehicle miles traveled within the City by 13,000.

6. Increase biking and walking mode share to 15 percent.
7. Expand the support electric vehicle technology.
8. Create vibrant mixed use villages.
9. Expand the number of trees in the urban forest.
10. Reduce water demand by 200,000 gallons per day.
11. Reduce consumption of carbon intensive foods.
12. Increase the production and consumption of local food.
13. Reduce municipal greenhouse gas emissions (**Figure 8.4**)
14. Monitor greenhouse gas emissions.
15. Adapt to the effects of climate change.

An Implementation Update detailing the results of the 15x15 Climate Action Plan was developed in November 2014. The Climate Action Plan was implemented through 2015 and is scheduled to be evaluated by mid-2016. In 2017, the City will release a new Climate Action & Adaptation Plan to achieve carbon neutrality by 2050 or sooner and to prepare for climate change impacts that are unavoidable. Increasing water conservation efforts and enhancing supply reliability will be highlighted among these efforts.

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APPENDICES A - M

Appendix A: City Council Resolution Adopting 2015 UWMP

City of Santa Monica 2015 Urban Water Management Plan

City Council Meeting: May 24, 2016 Santa Monica, California

RESOLUTION NUMBER _____ (CCS)

(City Council Series)

A RESOLUTION OF THE CITY COUNCIL
OF THE CITY OF SANTA MONICA ADOPTING THE
2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Sections 10610 et seq., known as the Urban Water Management Planning Act (the "Act") during the 1983-84 Regular Session; and

WHEREAS, the Act requires every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (Plan), the primary objective of which is for the conservation of water; and

WHEREAS, the City of Santa Monica is an urban supplier of water to a population of over 90,000; and

WHEREAS, the Act requires Plans to be reviewed at least once every five years, and requires cities to make any amendments or changes to the Plan which are indicated by the review; and

WHEREAS, the City adopted its last Urban Water Management Plan on June 28, 2011; and

WHEREAS, a new Urban Water Management Plan must be adopted by the Council, after public review and hearing, and filed with the California Department of Water Resources by July 1, 2016; and

WHEREAS, the City of Santa Monica has prepared and circulated for public review a draft 2015 Urban Water Management Plan, and a properly noticed public hearing regarding the Plan was held by the City Council on May 24, 2016.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SANTA MONICA DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The City Council finds that the City is in conformance with all applicable requirements of the Urban Water Management Planning Act.

SECTION 2. The City Council hereby adopts the City's 2015 Urban Water Management Plan and orders it to be kept on file in the office of the City Clerk.

SECTION 3. The Water Resources Manager is hereby authorized and directed to file the 2015 Urban Water Management Plan with the California Department of Water Resources by July 1, 2016.

SECTION 4. That the City Clerk shall certify to the adoption of this Resolution of the City Council of the City of Santa Monica adopting the 2015 Urban Water Management Plan, and thenceforth and thereafter the same shall be in full force and effect.

APPROVED AS TO FORM:

MARSHA JONES MOUTRIE
City Attorney

Appendix B: UWMP Act

City of Santa Monica 2015 Urban Water Management Plan

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

All California Codes have been updated to include the 2010 Statutes.

CHAPTER 1.	GENERAL DECLARATION AND POLICY	10610-10610.4
CHAPTER 2.	DEFINITIONS	10611-10617
CHAPTER 3.	URBAN WATER MANAGEMENT PLANS	
Article 1.	General Provisions	10620-10621
Article 2.	Contents of Plans	10630-10634
Article 2.5.	Water Service Reliability	10635
Article 3.	Adoption and Implementation of Plans	10640-10645
CHAPTER 4.	MISCELLANEOUS PROVISIONS	10650-10656

WATER CODE
SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

WATER CODE
SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city

and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

WATER CODE
SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water

supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE
SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.
(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic

sequence for the agency's water supply.
(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
(6) Penalties or charges for excessive use, where applicable.
(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
(8) A draft water shortage contingency resolution or ordinance.
(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.
(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:
(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
(e) The projected use of recycled water within the supplier's

service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

WATER CODE SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

WATER CODE
SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

WATER CODE
SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

Appendix C: DWR Data Tables & Checklist

City of Santa Monica 2015 Urban Water Management Plan

Appendix F

UWMP Checklist

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

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

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

Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 1.1 "Purpose and Summary"**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 1.2 Coordination**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Section 1.2 Coordination Appendix I**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Sections 1.4 and 1.5**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 1.6**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 1.7, Table 1.3**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 1.8 Water System**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Section 1.7**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 4.4, Table 4.4 & Section 4.6, Table 4.9**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 4.3, Table 4.4**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 4.6**
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Section 4.4**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target,	Baselines and Targets	Chapter 5 and App E	**Section 4.5, Table 4.5/6**

	interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 4.4 Appendix C**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 4.4, Table 4.7**
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**N/A (no adjustment)**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**N/A**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 4.4 Appendix C**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Section 2.4, Table 2.7**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 2.2.2**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 2.2.2,**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Section 2.2.2**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 2.2.2, basin is unajudicated**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**Section 2.2.2, basin is unajudicated**

10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	**Section 2.2.2, Table 2.4**
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Section 2.4, Table 2.7. Well capacities: Table 2.3**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 2.6**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Section 5.7, Table 5.10**
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 2.5.4**
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	**PENDING**
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**N/A**
N/A	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	**Section 2.2.3 Section 2.5.1**
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	**Section 2.2.3 Section 2.5.1 "Wastewater Collection & Treatment Systems"**
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	**Section 2.5.1**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	**Section 2.2.3 Section 2.5.1 "Recycled Wastewater Use"**

10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	**Section 2.5.1 "Potential & Projected Uses of Recycled Wastewater"**
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	**Section 2.4, Table 2.7. and Section 2.2.4 Table 2.6**
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	**Section 2.5.1**
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	**Section 2.5.1 "Future Plans for Recycled Wastewater"**
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Section 2.4 *Projected Water Supply,* Section 5.5**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Section 5: *Reliability Planning* Section 8: *Climate Change***
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	**Section 5.5, Tables 5.1 – 5.9**
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Section 5.7 *Water Supply Opportunities***
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Sections 3.2 and 3.3**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 5.5, Tables 5.2 – 5.10**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of	Water Shortage Contingency Planning	Section 8.1	**Section 7.2**

	action and an outline of specific water supply conditions at each stage.			
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Section 7.3**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Section 7.4**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 7.5** ***Mandatory Prohibitions***
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 7.5** ***Consumption Reduction Methods***
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Section 7.5** ***Penalties or Charges***
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Section 7.6**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Section 7.7**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Section 7.8**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Section 6.3** ***Conservation Measures***
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**N/A**
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**Section 6.2, (CUWCC member)** **City submits bi-annual reports which document DMM implementa-tion**

10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Section 1.2**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 1.2 Appendix I**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Section 1.1 Appendix A**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 1.2 PENDING**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Section 1.2 Appendix I**
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Section 1.2 Appendix I**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Section 1.2 Appendix A**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**Section 1.2 PENDING**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 1.2 PENDING**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**Section 1.2 PENDING**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	**Section 1.2 PENDING**

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
1910146	City of Santa Monica	17,833	11,917
	TOTAL	17,833	11,917
NOTES: # of Connections (PG 1-6, "Imported Water"), Volume(PG 2-2, Table 2.1). MWD (PWID 1910087) is the only other agencies with facilities in the City's service area and provides 3,298 AF of the total supplies through two (2) connections.			

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	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

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:	

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)*
Metropolitan Water District of Southern California
NOTES:

Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	93,283	93,868	94,431	94,998	95,568	96,141
NOTES: PG 1-6, Table 1.3						

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			2,545
Multi-Family			4,959
Commercial			3,012
Institutional/Governmental	Combined w/ Above		
Landscape			408
Losses			624
		TOTAL	11,548
NOTES: PG 4-4, Table 4.4, 2015 not yet avaliable			

Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
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*		2020	2025	2030	2035	2040-opt
Single Family		2,677	2,693	2,709	2,726	2,742
Multi-Family		5,096	5,126	5,157	5,188	5,219
Commercial	w/ insti & govt	3,000	3,018	3,037	3,055	3,073
Landscape		538	541	544	548	551
Losses		1,622	1,632	1,641	1,651	1,661
	TOTAL	12,933	13,010	13,088	13,168	13,246

NOTES: PG 4-12, Table 4.9, may change since 2014 values aren't inputted into table 4.4

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	11,548	12,933	13,010	13,088	13,168	13,246
Recycled Water Demand* *From Table 6-4*	80	560	560	560	560	560
TOTAL WATER DEMAND	11,628	13,493	13,570	13,648	13,728	13,806

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

NOTES:

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2015	166 AFY
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES:	

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *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.	See note on PG 4-12
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES: Are future water savings included in projections: Pertain to Tables 5.4 - 5.10 and using 123 GPCD? 2nd Question: Are lower income residential demands included in projections: PG 4-11, section 4.6, last paragraph.	

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

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*1996*	*2005*	*154*	*139*	*123*
5 Year	*2003*	*2007*	*148*		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES: PG 4-8/9, Tables 4.6 & 4.7					

Table 5-2: 2015 Compliance *Retail Agency or Regional Alliance Only*								
Actual 2015 GPCD*	2015 Interim Target GPCD*	**Optional Adjustments to 2015 GPCD** Enter "0" if no adjustment is made *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*		
113	139	0	0	0	0	113	113	Yes
**All values are in Gallons per Capita per Day (GPCD)*								
NOTES: PG 4-9, Table 4.7								

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						
Alluvial Basin	Santa Monica Basin	6,676	8,282	8,236	8,879	8,539
	TOTAL	6,676	8,282	8,236	8,879	8,539
NOTES: PG 2-9, Table 2.4.						

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.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	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						
Santa Monica Water Resources Division	Metered	12,322	Los Angeles County Sanitation District	Hyperion Wastewater Treatment Plant	No	Yes
Total Wastewater Collected from Service Area in 2015:		12,322				
NOTES:						

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.									
							2015 volumes			
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*	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:										

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:		Santa Monica Urban Runoff Recycling Facility						
Name of Agency Operating the Recycled Water Distribution System:		City of Santa Monica						
Supplemental Water Added in 2015								
Source of 2015 Supplemental Water								
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)	Parks, Medians, Cemetary	Advanced	80	560	560	560	560	560
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 Recycled Water use							
		Total:	80	560	560	560	560	560
**IPR - Indirect Potable Reuse*								
NOTES: PG 2-13, Table 2.7. No breakdown however has projected recycled water								

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)		91	80
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	*Type of Use*		
	Total	91	80
NOTES:			

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.		
	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			
Additional SMURRF Production	Per 2014 Sustainable Water Master Plan	2018	100
		Total	100
NOTES:			

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.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *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						
Groundwater	No		Wells and Treatment	2018	All Year Types	3,500
NOTES:						

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	From MWD	3,298	Drinking Water	7,409
Groundwater	All Wells	8,539	Drinking Water	12,500
Recycled Water	SMURRF	80	Recycled Water	560
	Total	11,917		20,469
NOTES: MWD (PG 2-2, Table 2.1), GW (PG 2-9, Table 2.4), RW (PG 2-12, Table 2.5)				

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	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Purchased or Imported Water	MWD	7,409		7,409		7,409		7,409		7,409	
Groundwater	All Wells	12,500		12,500		12,500		12,500		12,500	
Recycled Water	SMURRF	560		560		560		560		560	
	Total	20,469	0	20,469	0	20,469	0	20,469	0	20,469	0
NOTES: PG 2-13, Table 2.7											

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 _____
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	**% of Average Supply**
Average Year			
Single-Dry Year			
Multiple-Dry Years 1st Year			
Multiple-Dry Years 2nd Year			
Multiple-Dry Years 3rd Year			
Multiple-Dry Years 4th Year *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			
Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals (*autofill from Table 6-9)*	20,469	20,469	20,469	20,469	20,469
Demand totals *(autofill from Table 4-3)*	13,493	13,570	13,648	13,728	13,806
Difference	6,976	6,899	6,821	6,741	6,663
NOTES:					

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	20,469	20,469	20,469	20,469	20,469
Demand totals	14,707	14791	14,876	14,964	15,049
Difference	5,762	5,678	5,593	5,505	5,420
NOTES:					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	20,469	20,469	20,469	20,469	20,469
	Demand totals	15,247	15,334	15,422	15,513	15,601
	Difference	5,222	5,135	5,047	4,956	4,868
Second year	Supply totals	20,469	20,469	20,469	20,469	20,469
	Demand totals	14,572	14,656	14,740	14,826	14,910
	Difference	5,897	5,813	5,729	5,643	5,559
Third year	Supply totals	20,469	20,469	20,469	20,469	20,469
	Demand totals	14,438	14,520	14,603	14,689	14,772
	Difference	6,031	5,949	5,866	5,780	5,697
Fourth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
NOTES:						

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		
Advisory	10%	Voluntary
Stage 1	15%	Mandatory
Stage 2	20%	Mandatory
Stage 3	30%	Mandatory
Stage 4	50%	Mandatory
[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: PG 7-2, Table 7.1, & "Resolution for WSRP Sept 9 2015-10913" (Design Data>OSE Files), also PG 7-2, table 7.1		

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			
	Landscape - Restrict or prohibit runoff from landscape irrigation	7.16.020, (a-2)	Yes
	Landscape - Limit landscape irrigation to specific times	7.16.020, (a-1)10AM - 4PM	Yes
	Other - Prohibit use of potable water for washing hard surfaces	7.16.020, (b-1)	Yes
	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		No
	Other	7.16.020, (b-2) Vehicle wash allow only with bucket	Yes
	Water Features - Restrict water use for decorative water features, such as fountains	7.16.020, (c-1), only for the first time, unless feature uses recycled water	Yes
	Pools and Spas - Require covers for pools and spas	PG 7-4, Section 7.5	Yes
	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		
	CII - Restaurants may only serve water upon request	PG 7-4, Section 7.5	Yes
NOTES: Used SMMC 7.16 Water Conservation Ordinance(Design Data > OSE Files)			

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		
Advisory	Provide Rebates for Landscape Irrigation Efficiency	PG 6-2, "City of Santa Monica Water-Efficient Landscape Programs" shows a variety of rebates
Advisory	Provide Rebates on Plumbing Fixtures and Devices	PG 6-3, "City Water-Efficient Indoor Programs", MWD Rebate Programs
Advisory	Offer Water Use Surveys	PG 6-3, Water Audits
Advisory	Provide Rebates for Turf Replacement	PG 6-2, "City of Santa Monica Water-Efficient Landscape Programs" - Cash for Grass Rebates
	Other	
NOTES:		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	20,469	20,469	20,469
NOTES: PG 7-3, Table 7.2			

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Santa Monica	☑	☑
	☐	☐
	☐	☐
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Los Angeles County	☑	☑
	☐	☐

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	14,383	Acre Feet
	2008 total volume of delivered recycled water	107	Acre Feet
	2008 recycled water as a percent of total deliveries	0.74%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1996	
	Year ending baseline period range[3]	2005	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. [2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES: PG 4-8, Table 4.6. 2008 Recycled water delivery obtained from 2010 UWMP

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: PG 1-5, Population, 95% of city	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1996	82,496
Year 2	1997	82,044
Year 3	1998	82,162
Year 4	1999	82,199
Year 5	2000	83,851
Year 6	2001	85,358
Year 7	2002	87,724
Year 8	2003	89,179
Year 9	2004	90,471
Year 10	2005	90,904
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	89,179
Year 2	2004	90,471
Year 3	2005	90,904
Year 4	2006	90,282
Year 5	2007	90,535
2015 Compliance Year Population		
2015		93,308
NOTES: Population determined by calculation based on GPCD and Consumption values from PG 4-8, Table 4.6		

SB X7-7 Table 4: Annual Gross Water Use *								
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1996	14,970			-		-	14,970
Year 2	1997	14,888			-		-	14,888
Year 3	1998	14,081			-		-	14,081
Year 4	1999	14,732			-		-	14,732
Year 5	2000	15,028			-		-	15,028
Year 6	2001	14,342			-		-	14,342
Year 7	2002	14,936			-		-	14,936
Year 8	2003	14,884			-		-	14,884
Year 9	2004	15,201			-		-	15,201
Year 10	2005	14,561			-		-	14,561
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**14,762**
5 Year Baseline - Gross Water Use								
Year 1	2003	14,884			-		-	14,884
Year 2	2004	15,201			-		-	15,201
Year 3	2005	14,561			-		-	14,561
Year 4	2006	14,967			-		-	14,967
Year 5	2007	15,009			-		-	15,009
5 year baseline average gross water use								**14,924**
2015 Compliance Year - Gross Water Use								
2015		11,837	-		-		-	**11,837**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Groundwater, MWD, SMURRF Combined			
This water source is:				
☑	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1996	14970		14,970
Year 2	1997	14888		14,888
Year 3	1998	14081		14,081
Year 4	1999	14732		14,732
Year 5	2000	15028		15,028
Year 6	2001	14342		14,342
Year 7	2002	14936		14,936
Year 8	2003	14884		14,884
Year 9	2004	15201		15,201
Year 10	2005	14561		14,561
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	14884		14,884
Year 2	2004	15201		15,201
Year 3	2005	14561		14,561
Year 4	2006	14967		14,967
Year 5	2007	15009		15,009
2015 Compliance Year - Water into Distribution System				
2015		11,837		11,837

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1996	82,496	14,970	162
Year 2	1997	82,044	14,888	162
Year 3	1998	82,162	14,081	153
Year 4	1999	82,199	14,732	160
Year 5	2000	83,851	15,028	160
Year 6	2001	85,358	14,342	150
Year 7	2002	87,724	14,936	152
Year 8	2003	89,179	14,884	149
Year 9	2004	90,471	15,201	150
Year 10	2005	90,904	14,561	143
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**154**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	89,179	14,884	149
Year 2	2004	90,471	15,201	150
Year 3	2005	90,904	14,561	143
Year 4	2006	90,282	14,967	148
Year 5	2007	90,535	15,009	148
5 Year Average Baseline GPCD				**148**
2015 Compliance Year GPCD				
2015		93,308	11,837	**113**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	154
5 Year Baseline GPCD	148
2015 Compliance Year GPCD	113
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
154	**123**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
148	140	123	**123**

[1]Maximum 2020 Target is 95% of the 5 Year Baseline GPCD [2]2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
123	154	**139**

NOTES:

SB X7-7 Table 9: 2015 Compliance								
		Optional Adjustments *(in GPCD)*						
		Enter "0" if Adjustment Not Used						
Actual 2015 GPCD	2015 Interim Target GPCD	Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
113	139	-	-	-	-	113	113	**YES**

NOTES:

Appendix D: CUWCC Reports

City of Santa Monica 2015 Urban Water Management Plan

Reporting Unit:City of Santa Monica
Signatory:City of Santa Monica
RU Type:Retail

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Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Review / Submit

Potable Water Sources

Online Help

Form Complete

Submited to CUWCC 11/24/2015 4:19:49 PM

Form Status: Submitted

Service Area Population: 92,185

Copy from previous year | Save

Potable

Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
	5,136.6	Surface	Imported Water from MWD

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
City of Santa Monica	8,878.60	Groundwater	Potable water from local groundwater supplies
Total: 8,878.60			

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Signatory:City of Santa Monica
RU Type:Retail

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Water Sources and Usage

- Potable Water Sources
- **Non Potable Water Sources**
- Potable Water Uses
- Non Potable Water Uses

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BMP 4 - CII

- 4 Traditional / FlexTrack

BMP 5 - Landscape

- 5 Traditional / FlexTrack

GPCD

- GPCD

Review / Submit

Non Potable Water Sources

Online Help

Form Complete

Submited to CUWCC 10/30/2015 6:01:20 PM

Form Status: Submitted

Service Area Population: 92,185

Copy from previous year | Save

Non Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
No data to display			

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
City of Santa Monica	133.94	Recycled Non Potable	Treated Urban Runoff produced at the Santa Monica Urban Runoff Recycling Facility
Total: 133.94			

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RU Type:Retail

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- Potable Water Sources
- Non Potable Water Sources
- **Potable Water Uses**
- Non Potable Water Uses

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- 1.4 Retail Conservation Pricing

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- 2.2 School Education

BMP 3 - Residential

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BMP 4 - CII

- 4 Traditional / FlexTrack

BMP 5 - Landscape

- 5 Traditional / FlexTrack

GPCD

- GPCD

Review / Submit

Potable Water Uses

Online Help

Form Complete **Submited to CUWCC 10/30/2015 6:01:20 PM**

Copy from previous year | Save

Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Single-Family	7,512	3,216.33	0	0.00	
Multi-Family	6,338	5,440.83	0	0.00	
Commercial	2,017	3,260.26	0	0.00	
Dedicated Irrigation	580	642.76			
Fire Lines	1,096	1.71			
Institutional	236	461.02			
		Total : 13,022.91		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Commercial	17	5.33			
		Total : 5.33		Total : 0.00	

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Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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Non Potable Water Uses

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Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Recycled	20	133.94			
		Total : 133.94		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
No data to display					
		Total : 0.00		Total : 0.00	

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Non Potable Water Sources

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Non Potable Water Uses

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BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

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BMP 1.1 Operations Practices

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11/17/2015 2:43:59 PM

Form Complete

Form Status: Submitted

Conservation Coordinator

Conservation Coordinator ◉ Yes ○ No ○ N/A ON TRACK

Contact Information

First Name	Kimberly
Last Name	O'Cain
Title	Water Resources Specialist
Phone	3104588459
Email	kim.ocain@smgov.net

Water Waste Prevention

An agency MUST do at least one or more of the following six strategies; although water agencies are encouraged to do them all when possible.

Option A: Describe (upload or provide an electronic link) the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP. ON TRACK

Upload File

NA

URL http://qcode.us/codes/santamonica/

Describe Ordinance or Terms *6 characters remaining*

Ordinance prohibiting water waste - SMMC 7.16
Ordinance requiring water efficient design - SMMC 8.106 and SMMC 8.108
Support regulations that prohibit water waste - update to SMMC 8.108 exceeding CalGreen
Water Shortage Ordinance - SMMC 7.16

Option B: Describe (upload or provide an electronic link) any water waste prevention ordinances or requirements adopted by your local jurisdiction(s) or regulatory agencies within your service area.

Upload File

NA

URL http://qcode.us/codes/santamonica/

Describe Ordinances or Requirements *6 characters remaining*

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Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

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BMP 5 - Landscape

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NA

URL http://qcode.us/codes/santamonica/

Describe Ordinances or Requirements

6 characters remaining

Ordinance prohibiting water waste - SMMC 7.16
Ordinance requiring water efficient design - SMMC 8.106 and SMMC 8.108
Support regulations that prohibit water waste - update to SMMC 8.108 exceeding CalGreen
Water Shortage Ordinance - SMMC 7.16

☐ **Option C:** Describe (upload or provide an electronic link) any documentation of support for legislation or regulations that prohibit water waste.

Upload File

NA

URL

Describe the support provided for legislation or regulations that prohibit water waste.

250 characters remaining

☑ **Option D:** Describe your agency's efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.

Upload File

NA

Describe Efforts

41 characters remaining

The City of Santa Monica's Office of Sustainability and the Environment actively enforces the City's Water Conservation and Green Building Ordinances and issues warning and fines for violations of those codes.

☐ **Option E:** Describe your agency's support positions with respect to adoption of legislation and/or regulations that are consistent with this BMP.

Upload File

NA

Describe Legislation

250 characters

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Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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BMP 4 - CII

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BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

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Upload File

NA

Describe Legislation

250 characters remaining

Option F: Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation

130 characters remaining

The City's Green Building Ordinance updated in 2011 requires any newly installed plumbing fixture to be water-efficient.

At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type :

Select an Exemption Type

Please Upload Document(s) for Exemption

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Non Potable Water Sources

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BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

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GPCD

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Option F: Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation

130 characters remaining

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At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type :

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

250 characters remaining

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BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

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BMP 1.2 Water Loss Control

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Form Complete Form Status: Submitted

AWWA Water Audit

Agency to complete a water audit and balance using the AWWA software — Yes No N/A — ON TRACK

Upload Worksheets (AWWA Water Audit) — ON TRACK

Uploaded filename: AWWA-WAS-v5-2014csm(3).xls

Water Audit Validity Score 81

Agency Completed Training In The AWWA Water Audit Method — Yes No N/A — ON TRACK

Agency Completed Training In The Component Analysis Process — Yes No N/A — ON TRACK

Completed/Updated the Component Analysis (at least every 4 years) (Effective from 2013) — Yes No N/A — ON TRACK

Component Analysis Completed/Updated Date: 11/01/2015 format:mm/dd/yyyy

Water Loss Performance

Agency repaired all reported leaks & breaks to the extent cost effective — Yes No N/A — ON TRACK

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported	Yes No N/A	Leak Location	Yes No N/A
Type of Leaking Pipe Segment or Fitting	Yes No N/A	Leak Running Time From Report to Repair	Yes No N/A
Leak Volume Estimate :	Yes No N/A	Cost of Repair:	Yes No N/A
Do you have an infrastructure rehabilitation and renewal program ?	Yes No N/A		

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective — Yes No N/A — ON TRACK

Type of Program Activities Used to Detect Unreported Leaks — *1 character remaining*

We have 18 Water Operations staff and Water Conservation inspectors in the field that will report any discovered leaks. Water Res. Div. uses a Subsurface correlator to identify leaks. Extensive community outreach related to the reporting of leaks.

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Water Sources and Usage

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Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Review / Submit

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective — Yes No N/A — ON TRACK

Type of Program Activities Used to Detect Unreported Leaks — *1 character remaining*

We have 18 Water Operations staff and Water Conservation inspectors in the field that will report any discovered leaks. Water Res. Div. uses a Subsurface correlator to identify leaks. Extensive community outreach related to the reporting of leaks.

Does your agency maintain in-house records of audit or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? — Yes No N/A — ON TRACK

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances? — Yes No N/A

Annual Summary Information — ON TRACK

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of RealLoss	Economic Value Of AppLoss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Intervention	Linear feet of pipe renewal and rehabilitation	Water Saved (AF/Year)
63				☐		5,509.00	

Please describe your infrastructure rehabilitation and renewal activity below *9 characters remaining*

We have an active asset management plan and a five year Capital Improvement Program for renewal of water line segments, valves and related appurtenances. The Asset Mgmt. Team actively meet on a regular basis and discuss future CIP projects.

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:	0.00
Real Losses per service connection per day:	0.00
Real Losses per length of main per day:	0.00
Real Losses per service connection per day per psi pressure:	0.00
Unavoidable Annual Real Losses(UARL):	0.00
Above, Real Losses=Current Annual Real Losses(CARL):	0.00

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Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Review / Submit

Please describe your infrastructure rehabilitation and renewal activity below *9 characters remaining*

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AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:	0.00
Real Losses per service connection per day:	0.00
Real Losses per length of main per day:	0.00
Real Losses per service connection per day per psi pressure:	0.00
Unavoidable Annual Real Losses(UARL):	0.00
Above, Real Losses=Current Annual Real Losses(CARL):	0.00
Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.00
WATER SUPPLIED:	14082.17
Reporting Units:	

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

70 characters remaining

We have staff educated to look for leaks in the field. Staff reponse to leaks or main breaks within 1 hour by after hours standby staff. Response during regular hours is 15-30 min.

Please Upload Document As Effective As

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments: *250 characters remaining*

Reporting Unit:City of Santa Monica
Signatory:City of Santa Monica
RU Type:Retail

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Role:Editor

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Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

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Provisional Coverage Indication ON TRACK

BMP 1.3 Metering with Commodity Rates

Online Help

Submited to CUWCC
11/17/2015 2:43:59 PM

Form Complete

Form Status: Submitted

Implementation

ON TRACK

Does your agency have any unmetered service connections? Yes No N/A

If YES, has your agency completed a meter retrofit plan? Yes No N/A

If YES, number of previously unmetered accounts fitted with meters during reporting year:

ON TRACK

Are all new service connections being metered? Yes No N/A

Are all new service connections being billed volumetrically? Yes No N/A

ON TRACK

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No N/A

NA

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# Estimated Bills/Year	# Of Meter Readings per Year
Multi-Family	6,338.00	6,338.00	6,338.00	Bi-monthly	6.00	6.00
Commercial	2,017.00	2,017.00	2,017.00	Bi-monthly	6.00	6.00
Institutional	236.00	236.00	236.00	Bi-monthly	6.00	6.00
Dedicated Irrigation	580.00	580.00	580.00	Bi-monthly	6.00	6.00
Fire Lines	1,096.00	1,096.00	1,096.00	Bi-monthly	6.00	6.00
Recycled	20.00	20.00	20.00	Bi-monthly	6.00	6.00
Single-Family	7,512.00	7,512.00	7,512.00	Bi-monthly	6.00	6.00

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Irrigation	580.00	580.00	580.00	Bi-monthly	6.00	6.00
Fire Lines	1,096.00	1,096.00	1,096.00	Bi-monthly	6.00	6.00
Recycled	20.00	20.00	20.00	Bi-monthly	6.00	6.00
Single-Family	7,512.00	7,512.00	7,512.00	Bi-monthly	6.00	6.00

Number of CII Accounts with Mixed-used Meters: 2593

Number of CII Accounts with Mixed-used Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

ON TRACK

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? Yes No N/A

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 12/17/2013

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe *250 characters remaining*

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP? Yes No N/A

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

145 characters remaining

Current incentive for a dedicated landscape meter is that water use will not be subject to sewer charges.

Please Upload Document(s)

NA

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If YES, please fill in the following information:

A. When was the Feasiblity Study conducted 12/17/2013

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe *250 characters remaining*

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP? Yes No N/A

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

145 characters remaining

Current incentive for a dedicated landscape meter is that water use will not be subject to sewer charges.

Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

Comments On Metering with Commodity Rates *250 characters remaining*

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BMP 1.4 Retail Conservation Pricing

Online Help

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11/17/2015 2:43:59 PM

Form Complete

Form Status: Submitted

A. Implementation (Water Rate Structure)

Based on Rate Structure Not On Track
Based on Revenue Not On Track

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges	New
Increasing Block	Single-Family	5,016,454.25		Edit Delete
Increasing Block	Multi-Family	8,308,062.34		Edit Delete
Increasing Block	Commercial	5,312,255.92		Edit Delete
Increasing Block	Institutional	724,244.11		Edit Delete
Increasing Block	Dedicated Irrigation	1,110,376.34		Edit Delete
Uniform	Fire Lines	1,311,375.64		Edit Delete
Uniform	Other	196,583.33		Edit Delete
		$21,979,351.93	$0.00	

B. Implementation Options (Compliance with Conservation Pricing Options (Water))

Please Select an Option

(•) Option 1: Annual Revenue As Reported ( ) Option 2: Canadian Water Wastewater Assn Rate Design Model

[ ] Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

NA

Canadian Water & Wastewater Association Rate Design Model Implementation

C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges

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Non Potable Water Sources

Potable Water Uses

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5 Traditional / FlexTrack

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C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

D. Retail Waste Water (Sewer) Rate Structure by Customer Class

On Track

Does your agency provide sewer service? (•) Yes ( ) No ( ) N/A

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
Uniform	Single-Family	3,282,570.29	
Uniform	Multi-Family	10,178,644.78	
Uniform	Commercial	5,928,761.66	
Uniform	Institutional	687,466.59	
Uniform	Other	15,807.68	
		$20,093,251.00	$0.00

Option 3: Click here to use option 3 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? ( ) Yes ( ) No (•) N/A

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

250 characters remaining

Please Upload Document(s)

NA

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Review / Submit

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
Uniform	Single-Family	3,282,570.29	
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		$20,093,251.00	$0.00

Option 3: Click here to use option 3 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? ○ Yes ○ No ◉ N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Request

If agency has requested an exemption then please select a exemption type.

Exemption Type * Select an Exemption Type

Please Upload Document(s)

NA

Comments on Conservation Pricing BMP

250 characters remaining

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Signatory:City of Santa Monica
RU Type:Retail

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Online Help

BMP 2.1 Public Information Programs

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10/30/2015 6:01:20 PM

Form Complete

Form Status: Submitted

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP?

Yes No N/A

If "Yes" please select council wholesale agencies;

Metropolitan Water District of SC

Please provide the name of agency , contact name and email address if not A Council Group 1 member.

200 characters remaining

Report a minimum of four water conservation related contacts your agency had with the public during the year.

ON TRACK

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs
270,000	Newsletter articles on conservation
19,305	Website
54,000	Email Messages
25,000	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
368,305	

Contact with the Media

Yes No N/A

ON TRACK

Media Contacts List

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Media Contacts Type
7	Articles or stories resulting from outreach
1	News releases
5	Newspaper contacts
1	Television contacts
8	Online Advertising

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Water Sources and Usage

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7	Articles or stories resulting from outreach
1	News releases
5	Newspaper contacts
1	Television contacts
8	Online Advertisings
22	

Agency Website Updates

216 characters remaining

Enter your agency's URL (website address): http://www.sustainablesm.org/water

67 characters remaining

Describe a minimum of four water conservation related updates to your agency's website that took place during the year: Updates to landscape information.Updates to rebate programs. "Every Drop Counts" campaign banner placed on City's main home page. Posted new water self-sufficiency campaign materials.

Did at least one website update take place during each quarter of the reporting year? Yes No N/A

ON TRACK

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount	Personnel Costs Included?	Comments
Water Efficiency Outreach	25,000.00	☐	Includes - Ongoing, Baysaver, Incentives, Retrofit, Miscellaneous
2020 Plan - Support, Educational	10,000.00	☐	
LA Coastal Gardens Website	1,250.00	☐	
	$36,250.00		

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

ON TRACK

Expense Category	Expense Amount	Personnel Costs Included?
Water Efficiency Outreach	24,362.84	☐

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Water Sources and Usage

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Non Potable Water Sources

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Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

ON TRACK

Expense Category	Expense Amount	Personnel Costs Included?
Water Efficiency Outreach	24,362.84	☐
Water Conservation Outreach	6,478.97	☐
LA Coastal Gardens Website	1,250.00	☐
	$32,091.81	

ALL DATA BELOW ARE OPTIONAL

Additional Public Information Program

You may report additional public information contacts. Please list these additional contacts in order of how your agency views their importance/effectiveness with respect to conserving water, with the most important/effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ◉ Yes ○ No ○ N/A

Public Outreach Additional Information

Public Information Programs	Importance
Presentations	8
Fairs, festivals, conventions	7
High water usage notifications	2
Reverse 911 phone calls to turn off sprinklers after a rain	6
Water waste notifications	1
Landscape workshops	5
Rebate Incentives (SoCalWaterSmart.com)	4
Fix-a-Leak-Week	9
CA Friendly Landscape Training	3
Movie Screening - Last Call at the Oasis	11
Rain Barrel Promotion and Sale	10

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ◉ Yes ○ No ○ N/A

103 characters remaining

Describe the brand, theme or mascot.

Every Drop Counts. Use Less Water. This is an overall branding strategy to address both the drought and the goal of water self-sufficiency by 2020.

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Describe the brand, theme or mascot.

Every Drop Counts. Use Less Water. This is an overall branding strategy to address both the drought and the goal of water self-sufficiency by 2020.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ◉ No ○ N/A

Market Research Topic

100 characters remaining

Brand Message

100 characters remaining

Brand Mission Statement

Community Committees

Do you have a community conservation committee? ◉ Yes ○ No ○ N/A

Enter the names of Community Committees:

21 characters remaining

Task Force on the Environment; Sustainable Water Master Plan Advisory Committee

Training

Training Type	# of Trainings	# of Attendees	Description of Other
Professional Landscapers	4	50	Landscape Workshop for Professionals
Homeowners	5	75	CA Friendly Landscape Training

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
General		twitter, Facebook, YouTube

Partnering Programs

Name	Type of Program

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General		twitter, Facebook, YouTube

Partnering Programs

Name	Type of Program
☑ CLCA?	Sustainable Landscape Professional Program
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☑ Local Colleges?	Santa Monica College - Sustainable Landscape Professional Progr
☐ Other	
☑ Retail and wholesale outlet; name(s) and type(s) of programs:	Rain Barrel promotion and sale, rebates

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers reached per year

Partnering with Other Utilities

131 characters remaining

Describe other utilities your agency partners with, including electrical utilities

City of Long Beach Water Department, City of Torrance, West Basin Municipal Water District for www.lacoastalgardens.com

Conservation Gardens

100 characters remaining

Describe water conservation gardens at your agency or other high traffic areas or new homes.

City Hall Demonstration Garden: features climate appropriate plants and drip irrigation. Airport Demonstration Garden: free plans and material lists.

Landscape Contests or Awards

100 characters remaining

Describe water wise landscape contests or awards program conducted by your agency.

250 characters remaining

Additional programs supported by agency but not mentioned above.

At Least As Effective As

Is your agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ○ No ◉ N/A

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Conservation Gardens

100 characters remaining

Describe water conservation gardens at your agency or other high traffic areas or new homes.

City Hall Demonstration Garden: features climate appropriate plants and drip irrigation.
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Additional programs supported by agency but not mentioned above.

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Is your agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ○ No ◉ N/A

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

150 characters remaining

Please Upload Document AsEffectiveAs

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments:

250 characters remaining

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Signatory:City of Santa Monica
RU Type:Retail

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BMP 2.2 School Education Programs, Retail Agencies

Online Help

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10/30/2015 6:01:20 PM

Form Complete

Form Status: Submitted

Does your agency implement a school education program? (•) Yes ( ) No ( ) N/A

Are there one or more wholesale agencies performing school education programs which can be counted to help your agency comply with the BMP?

Metropolitan Water District of SC

Please provide the name of Agency, contact name and email address if not CUWCC Group 1 members.

ON TRACK

☑ Materials meet state education framework requirements.

Description: *115 characters remaining*

Every Drop Counts - Student Poster Contest.
Presentations Given - 28
Posters submitted - 650
Ceremony Attendees - 106 (inc. adults)

ON TRACK

☑ Materials distributed to K-6 students.

Description of materials distributed to K-6 students: *132 characters remaining*

Every Drop Counts - Student Poster Contest.
Presentations Given - 20
Posters submitted - 500
Ceremony Attendees - 30

Number of student reached. 7800

☑ Materials distributed to 7-12 students. (optional)

Description of materials distributed to 7-12 students *133 characters remaining*

Every Drop Counts - Student Poster Contest.
Presentations Given - 8
Posters submitted - 150
Ceremony Attendees - 15

Annual budget for school education program.

ON TRACK

$2000.00

ON TRACK

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Signatory:City of Santa Monica
RU Type:Retail

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Annual budget for school education program. ON TRACK

$2000.00

ON TRACK

224 characters remaining

Description of all other water supplier education programs. Fix-a-leak Week Bookmarks.

School Program Activities

Classroom presentations:

Number of presentations: 32

Number of attendees: 900

185 characters remaining

Describe the topics covered in your classroom presentations: Water self-sufficiency, drought, saving water at school and home.

Large group assemblies:

Number of presentations:

Number of attendees:

Children's water festivals or other events:

Number of presentations: 1

Number of attendees: 10000

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations:

Number of attendees:

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description 250 characters remaining

Number distributed:

Staffing children's booths at events and festivals:

Number of booths:

Number of attendees:

Water conservation contests such as poster and photo:

Description 117 characters remaining

Number of Participants

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Review / Submit

Staffing children's booths at events and festivals:

Number of booths

Number of attendees

Water conservation contests such as poster and photo:

Description *117 characters remaining*

Every Drop Counts - Student Poster Contest.
Presentations Given - 28
Posters submitted - 650
Ceremony Attendees - 106 (inc. adults)

Number of Participants: 650

Offer monetary awards/funding or scholarships awards to students:

Number offered

Total funding

Teacher training workshops:

Number of presentations

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 19

Number of participants: 643

College internships in water conservation offered:

Number of internships

Total funding

Career fair/workshops:

Number of presentations

Number of attendees

Additional program(s) supported by agency:

Not mentioned above
250 characters remaining

Number of events (if applicable)

Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs):

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

150 characters remaining

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Number of tours or field trips: 19

Number of participants: 643

College internships in water conservation offered:

Number of internships:

Total funding:

Career fair/workshops:

Number of presentations:

Number of attendees:

Additional program(s) supported by agency:

Not mentioned above

250 characters remaining

Number of events (if applicable):

Number of participants:

Total reporting period budget expenditures for school education programs (include all agency costs):

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Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

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Please Upload Document AsEffectiveAs

NA

Exemption Type

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Comments:

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Online Help

BMP 3 Residential

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11/24/2015 4:26:12 PM

Form Complete

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Coverage Option Flextrack

Total Measured Water Savings (AF/Year)

Form Status: Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities Credit
13.45	0	13.45	72.48	-252.34

From the Coverage Option drop down menu to the right, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Residential Assistance / Landscape Water Survey

Traditional

	Single Family Accounts	Target	Coverage	Multi Family Units	Target	Coverage
Total Number	7512			6308		
Total Number Of Leak Det Surveys	0	56.34		0	47.31	
Total Number Of Showerheads	0					
Total Number Of Faucet Aerators	0			0		
Total Number of Landscape Water Survey	0	56.34		0		

Has your agency reached a 75% market saturation for showerheads? (•) Yes ( ) No ( ) N/A

Flex

Number of Other Measures 0

50 characters remaining

Description of Other Measures Distributed

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

NA

Measured water savings AF/YR 0

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Spreadsheet that you have created.

0

NA

High Efficiency Clothes Washers HECW

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

Target	Coverage
45.07	

Number of installations for HECWs: 126

Enter the Average Water Factor for all installations if it is less than 5.0: 3

Are financial incentives provided for HECWs ? Yes No N/A

Has your agency completed a HECW Market Penetration Study ? Yes No N/A

HECW Market Penetration Study Documents

NA

Flex

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

Measured Water Savings AF/YR: 0

NA

WaterSense Specification (WSS) toilets

Traditional

Retrofit on Resale Ordinance is in Place Yes No N/A

If Yes, Choose A File

NA

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If Yes, Choose A File

NA

A 75% Market Saturation Achieved Yes No N/A

If Yes, Choose A File

NA

WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	43	16
Target number of WSS toilets	841.344	104.7128
Coverage		

Flex

	SingleFamily	MultiFamily
Measured Water Savings AF/YR		

250 characters remaining

Describe your Flex Track toilet program

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

NA

WSS for New Residential Development

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

	Single Family	Multi Family
Residential Development Rebates	Yes No N/A	Yes No N/A

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Traditional

	Single Family	Multi Family
Residential Development Rebates	Yes No N/A	Yes No N/A
Recognition Programs	Yes No N/A	Yes No N/A
Reduced Connection Fees	Yes No N/A	Yes No N/A
Ordinances	Yes No N/A	Yes No N/A

New development ordinance/regulation

NA

Number of new single-family units built in service area 57

Number of new multi-family units built in service area 493

In the following table, enter one row for each incentive type program you offer.

List of Incentive Amounts

Incentive Type	Incentive amount	Number of WSS fixtures installed	Number of Participating Single-Family	Number of Participating Multi-Family
No data to display				

Flex

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

Measured water savings AF/YR: 0

NA

Unique Conservation Measures

High bill contact with single-family and multi-family customers.

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- **High bill contact with single-family and multi-family customers.**
- **Educate residential customers about the behavioral aspects of water conservation.**
- **Notify residential customers of leaks on the customer's side of the meter.**
- **Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.**
- **Provide unique water saving fixtures that are not included in the BMP list above.**
- **Install residence water use monitors.**
- **Participate in programs that provide residences with school water conservation kits.**
- **Implement an automatic meter reading program for residential customers.**
- **OTHER Types of Measures.**

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

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- Notify residential customers of leaks on the customer's side of the meter.
- Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.
- Provide unique water saving fixtures that are not included in the BMP list above.
- Install residence water use monitors.
- Participate in programs that provide residences with school water conservation kits.
- Implement an automatic meter reading program for residential customers.
- OTHER Types of Measures.

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Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type

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NA

Comments

250 characters remaining

Total Measured Water Savings (AF/Year)

Traditional	FlexTrack	Total	FlexTrack Target
13.45	0	13.45	72.48

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BMP 4 CII

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Save All

Form Complete

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option: Flextrack | Calculate

Total Measured Water Savings (AF/Year)

Traditional	FlexTrack	Total
0	0.02	0.02

Prior Activities Credit 155.29

FlexTrack Target 152.09

Form Status: Submitted

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

	Measured water savings (AF/Year)
A) High-Efficiency Toilets.	0.02
B) High-Efficiency Urinals (0.5 gpf)	
C) Ultra Low Volume Urinals(0.125 gpf)	
D) Zero Consumption Urinals (0.0 gpf)	
E) Commercial High - Efficiency Single Load Clothes Washers	
F) Cooling Tower Conductivity Controllers	
G) Cooling Tower pH Controllers	
H) Connectionless Food Steamers	
I) Medical Equipment Steam Sterilizers	

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G) Cooling Tower pH Controllers

H) Connectionless Food Steamers

I) Medical Equipment Steam Sterilizers

J) Water - Efficient Ice Machines

K) Pressurized Water Brooms

L) Dry Vaccum Pumps.

Unique Conservation Measures

M) Industrial Process Water Use Reduction.

N) Commercial Laundry Retrofits.

O) Industrial Laundry Retrofits

P) Filter Upgrades (for pools,spas and fountains)

Q) Car Wash Reclamation Systems

R) Wet Cleaning.

S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

T) Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

U) Waterless Wok

V) Alternative On-site Water Sources (For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

W) Sub-metering

X) High Efficiency Showerheads

Y) Faucet Flow Restrictors 1.495

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W) Sub-metering	
X) High Efficiency Showerheads	
Y) Faucet Flow Restrictors	1.495
Z) Water Efficient Dishwashers	
AA) Hot Water on Demand	
BB) Pre-rinse Spray Valves of 1.3 gpm (gallons per minute) or less	0.765
CC) Central Flush Systems	
Other Measures chosen by the Agency	

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type: Select an Exemption Type

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NA

Comments *250 characters remaining*

Total Measured Water Savings (AF/Year)

Traditional	FlexTrack	Total	FlexTrack Target
0	0.02	0.02	152.09

Save All

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BMP 5 Landscape

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Form Complete

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option Flextrack

Total Measured Water Savings (AF/Year)

Form Status: Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities
0	14.65	14.65	0	149.51

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

1) Accounts with Dedicated Irrigation Meters Not On Track

Traditional

a)Number of dedicated irrigation meter accounts	571
b)Number of dedicated irrigation meter accounts with water budgets	0
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	0
d)Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	0
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	0
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	Yes No N/A

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

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NA

Technical Assistance

Traditional

e) Number of Accounts 20% over-budget

f) Number of accounts 20% over-budget offered technical assistance

g) Number of accounts 20% over-budget accepting technical assistance

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

2) Commercial/Industrial/Institutional(CII) Accounts Without Meters or with Mixed -Use Meters

Traditional

Number of mixed use and un-metered accounts

Number of irrigation water use surveys offered

Number of irrigation water use surveys accepted

Type: Incentives numbers received by customers — $Value 0

Type: Rebates numbers received by customers — $Value 0

Type: No- or Low-Interest loan offered numbers received by customers — $Value 0

Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations

Estimated annual water savings by customers receiving irrigation water save surveys and implementing recommendations

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

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Estimated annual water savings by customers receiving irrigation water save surveys and implementing recommendations

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

Financial Incentives

Traditional

Have you implemented and maintained an irrigation equipment retrofits incentive program? Yes No N/A

Number of incentives	Dollar value of incentives	Incentive Type
154	162,851.50	Rebstes

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

5.83

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

Landscape Flex Track Measure Types

1. Monitor and report on landscape water use

1a. Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

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need to adjust irrigation schedules.

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

1c. Establish agency-wide water budget. (Include in Help notes: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

1d. Establish agency-wide, sector-based irrigation goal to reduce water use, based on season.

2. Provide technical landscape resources and training

2a. Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

2b. Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

2c. Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

2d. Establish time-of-day irrigation restrictions.

2e . Establish day-of-week irrigation restrictions.

3. Provide incentives

3a. Establish landscape budget-based rates.

3b. Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

3c. Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

3d. Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

3e. Provide incentives for conversions from potable to recycled water.

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

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3e. Provide incentives for conversions from potable to recycled water.

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

4. Participate in local and regional planning and regulatory activities

4a. Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

4b. Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

6. Other Measures

Other Landscape Measures.

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

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BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

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such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

4b. Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

6. Other Measures

Other Landscape Measures.

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

250 characters remaining

Total Measured Water Savings(AF/Year) 14.65

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Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

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Potable Water Sources

Online Help

Form Complete

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10/30/2015 5:59:34 PM

Form Status: Submitted

Service Area Population: 92,185

Copy from previous year | Save

Potable

Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
	5,842.5	Surface	Imported Water from MWD

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
City of Santa Monica	8,236.10	Groundwater	Potable water from local groundwater supplies
	Total: 8,236.10		

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Non Potable Water Sources

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Non Potable Water Sources

Online Help

Form Complete

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Form Status: Submitted

Service Area Population: 92,185

Copy from previous year | Save

Non Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
No data to display			

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
City of Santa Monica	96.29	Recycled Non Potable	Treated Urban Runoff produced at the Santa Monica Urban Runoff Recycling Facility
Total: 96.29			

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Potable Water Uses

Online Help

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Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Single-Family	7,512	3,141.84	0	0.00	
Multi-Family	6,308	5,554.35	0	0.00	
Commercial	2,008	3,274.66	0	0.00	
Dedicated Irrigation	576	604.21			
Fire Lines	1,080	3.12			
Institutional	236	428.84			
		Total : 13,007.02		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Commercial	15	10.71			
		Total : 10.71		Total : 0.00	

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- Potable Water Sources
- Non Potable Water Sources
- Potable Water Uses
- **Non Potable Water Uses**

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Non Potable Water Uses

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Copy from previous year | Save

Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Recycled	15	96.29			
		Total : 96.29		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
No data to display					
		Total : 0.00		Total : 0.00	

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BMP 1.1 Operations Practices

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Conservation Coordinator

Conservation Coordinator ● Yes ○ No ○ N/A

ON TRACK

Contact Information

First Name	Kimberly
Last Name	O'Cain
Title	Water Resources Specialist
Phone	3104588459
Email	kim.ocain@smgov.net

Water Waste Prevention

An agency MUST do at least one or more of the following six strategies; although water agencies are encouraged to do them all when possible.

Option A: Describe (upload or provide an electronic link) the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.

ON TRACK

Upload File

NA

URL http://qcode.us/codes/santamonica/

Describe Ordinance or Terms

6 characters remaining

Ordinance prohibiting water waste - SMMC 7.16
Ordinance requiring water efficient design - SMMC 8.106 and SMMC 8.108
Support regulations that prohibit water waste - update to SMMC 8.108 exceeding CalGreen
Water Shortage Ordinance - SMMC 7.16

Option B: Describe (upload or provide an electronic link) any water waste prevention ordinances or requirements adopted by your local jurisdiction(s) or regulatory agencies within your service area.

Upload File

NA

URL http://qcode.us/codes/santamonica/

Describe Ordinances or Requirements

6 characters remaining

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Non Potable Water Uses

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NA

URL http://qcode.us/codes/santamonica/

Describe Ordinances or Requirements *6 characters remaining*

Ordinance prohibiting water waste - SMMC 7.16
Ordinance requiring water efficient design - SMMC 8.106 and SMMC 8.108
Support regulations that prohibit water waste - update to SMMC 8.108 exceeding CalGreen
Water Shortage Ordinance - SMMC 7.16

☐ **Option C:** Describe (upload or provide an electronic link) any documentation of support for legislation or regulations that prohibit water waste.

Upload File

NA

URL

Describe the support provided for legislation or regulations that prohibit water waste. *250 characters remaining*

☑ **Option D:** Describe your agency's efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.

Upload File

NA

Describe Efforts *41 characters remaining*

The City of Santa Monica's Office of Sustainability and the Environment actively enforces the City's Water Conservation and Green Building Ordinances and issues warning and fines for violations of those codes.

☐ **Option E:** Describe your agency's support positions with respect to adoption of legislation and/or regulations that are consistent with this BMP.

Upload File

NA

Describe Legislation *250 characters*

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Water Sources and Usage

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NA

Describe Legislation

250 characters remaining

Option F: Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation

130 characters remaining

The City's Green Building Ordinance updated in 2011 requires any newly installed plumbing fixture to be water-efficient.

At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type :

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

250 characters remaining

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- Potable Water Sources
- Non Potable Water Sources
- Potable Water Uses
- Non Potable Water Uses

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- **1.2 Retail Water Loss Control**
- 1.3 Retail Metering with Commodity
- 1.4 Retail Conservation Pricing

BMP 2

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BMP 1.2 Water Loss Control

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Form Complete | Form Status: Submitted

AWWA Water Audit

Agency to complete a water audit and balance using the AWWA software — Yes / No / N/A

Upload Worksheets (AWWA Water Audit)

Uploaded filename: Copy of SantaMonica_audit_Final(2A)201312312014PublicWaterSystemStats.xls

Water Audit Validity Score: 75

Agency Completed Training In The AWWA Water Audit Method — Yes / No / N/A

Agency Completed Training In The Component Analysis Process — Yes / No / N/A

Completed/Updated the Component Analysis (at least every 4 years) (Effective from 2013) — Yes / No / N/A — NOT

Component Analysis Completed/Updated Date: format:mm/dd/yyyy

Water Loss Performance

Agency repaired all reported leaks & breaks to the extent cost effective — Yes / No / N/A

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported	Yes / No / N/A	Leak Location	Yes / No
Type of Leaking Pipe Segment or Fitting	Yes / No / N/A	Leak Running Time From Report to Repair	Yes / No
Leak Volume Estimate :	Yes / No / N/A	Cost of Repair:	Yes / No
Do you have an infrastructure rehabilitation and renewal program ?	Yes / No / N/A		

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective — Yes / No / N/A

Type of Program Activities Used to Detect Unreported Leaks

We have 18 Water Operations staff and Water Conservation inspectors in the field that will report any discovered leaks. Water Res. Div. uses a Subsurface Correlator to identify leaks.

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Agency Located and Repaired Unreported Leaks to the Extent Cost Effective — Yes No N/A

Type of Program Activities Used to Detect Unreported Leaks *1 charac*

We have 18 Water Operations staff and Water Conservation inspectors in the field that will report any discovered leaks. Water Res. Div. uses a Subsurface Correlator to identify leaks. Extensive community outreach related to the reporting of leaks.

Does your agency maintain in-house records of audit or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? — Yes No N/A

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances? — Yes No N/A

Annual Summary Information

Complete the following table with annual summary information (required for reporting years

Total Leaks Repaired	Economic Value Of RealLoss	Economic Value Of AppLoss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventior	Linear feet of pipe renewal and rehabilitation	Water Saved (AF/Year)
59				☐		4,380.00	

Please describe your infrastructure rehabilitation and renewal activity below *97 characters remaining*

We have an active asset management plan and a five year Capital Improvement Program for renewal of water line segments, valves and related appurtenances.

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:	15.29
Real Losses per service connection per day:	26.81
Real Losses per length of main per day:	N/A
Real Losses per service connection per day per psi pressure:	0.45

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AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:	15.29
Real Losses per service connection per day:	26.81
Real Losses per length of main per day:	N/A
Real Losses per service connection per day per psi pressure:	0.45
Unavoidable Annual Real Losses(UARL):	261.75
Above, Real Losses=Current Annual Real Losses(CARL):	532.41
Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.03
WATER SUPPLIED:	14126.75
Reporting Units:	Acre-feet

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

69 characters remaining

We have staff educated to look for leaks in the field. Staff responds to leaks or main breaks within 1 hour by after hours standby staff. Response during regular hours is 15-30 min.

Please Upload Document As Effective As

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments: *250 chara*

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BMP 1.3 Metering with Commodity Rates

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Form Complete

Form Status: Submitted

Implementation

ON TRACK

Does your agency have any unmetered service connections? Yes No N/A

If YES, has your agency completed a meter retrofit plan? Yes No N/A

If YES, number of previously unmetered accounts fitted with meters during reporting year:

ON TRACK

Are all new service connections being metered? Yes No N/A

Are all new service connections being billed volumetrically? Yes No N/A

ON TRACK

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No N/A

NA

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# Estimated Bills/Year	# Of Meter Readings per Year
Single-Family	7,512.00	7,512.00	7,512.00	Bi-monthly	6.00	6.00
Multi-Family	6,308.00	6,308.00	6,308.00	Bi-monthly	6.00	6.00
Commercial	2,008.00	2,008.00	2,008.00	Bi-monthly	6.00	6.00
Institutional	236.00	236.00	236.00	Bi-monthly	6.00	6.00
Dedicated Irrigation	576.00	576.00	576.00	Bi-monthly	6.00	6.00
Fire Lines	1,080.00	1,080.00	1,080.00	Bi-monthly	6.00	6.00
Recycled	15.00	15.00	15.00	Bi-monthly	6.00	6.00

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Dedicated Irrigation	576.00	576.00	576.00	Bi-monthly	6.00	6.00
Fire Lines	1,080.00	1,080.00	1,080.00	Bi-monthly	6.00	6.00
Recycled	15.00	15.00	15.00	Bi-monthly	6.00	6.00

Number of CII Accounts with Mixed-used Meters: 2247

Number of CII Accounts with Mixed-used Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period:

Feasibility Study

ON TRACK

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? Yes No N/A

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 12/17/2013

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe *250 characters remaining*

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP? Yes No N/A

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

145 characters remaining

Current incentive for a dedicated landscape meter is that water use will not be subject to sewer charges.

Please Upload Document(s)

NA

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If YES, please fill in the following information:

A. When was the Feasiblity Study conducted 12/17/2013

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe *250 characters remaining*

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP? Yes No N/A

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

145 characters remaining

Current incentive for a dedicated landscape meter is that water use will not be subject to sewer charges.

Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

Comments On Metering with Commodity Rates *250 characters remaining*

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BMP 1.4 Retail Conservation Pricing

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Form Status: Submitted

A. Implementation (Water Rate Structure)

Based on Rate Structure Not On Track
Based on Revenue Not On Track

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges	New
Increasing Block	Single-Family	4,786,892.32		Edit Delete
Increasing Block	Multi-Family	8,424,289.03		Edit Delete
Increasing Block	Commercial	5,302,826.54		Edit Delete
Increasing Block	Institutional	675,808.49		Edit Delete
Increasing Block	Dedicated Irrigation	1,037,642.72		Edit Delete
Uniform	Other	139,508.20		Edit Delete
Uniform	Fire Lines	1,278,463.30		Edit Delete
		$21,645,430.60	$0.00	

B. Implementation Options (Compliance with Conservation Pricing Options (Water))

Please Select an Option

(•) Option 1: Annual Revenue As Reported ( ) Option 2: Canadian Water Wastewater Assn Rate Design Model

[ ] Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

NA

Canadian Water & Wastewater Association Rate Design Model Implementation

C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges

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C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

D. Retail Waste Water (Sewer) Rate Structure by Customer Class

On Track

Does your agency provide sewer service? (•) Yes ( ) No ( ) N/A

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
Uniform	Single-Family	3,155,498.06	
Uniform	Multi-Family	10,195,475.95	
Uniform	Commercial	5,892,510.28	
Uniform	Institutional	645,600.80	
Uniform	Other	15,794.59	
		$19,904,879.68	$0.00

Option 3: Click here to use option 3 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? ( ) Yes ( ) No (•) N/A

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

250 characters remaining

Please Upload Document(s)

NA

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Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

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1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

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Review / Submit

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
Uniform	Single-Family	3,155,498.06	
Uniform	Multi-Family	10,195,475.95	
Uniform	Commercial	5,892,510.28	
Uniform	Institutional	645,600.80	
Uniform	Other	15,794.59	
		$19,904,879.68	$0.00

Option 3: Click here to use option 3 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? ○ Yes ○ No ◉ N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Request

If agency has requested an exemption then please select a exemption type.

Exemption Type * Select an Exemption Type

Please Upload Document(s)

NA

Comments on Conservation Pricing BMP

250 characters remaining

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Signatory:City of Santa Monica
RU Type:Retail

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Role:Editor

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Provisional Coverage Indication ON TRACK

Online Help

BMP 2.1 Public Information Programs

Submited to CUWCC
10/30/2015 5:59:34 PM

Form Complete

Form Status: Submitted

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP?

Yes No N/A

If "Yes" please select council wholesale agencies;

Metropolitan Water District of SC

Please provide the name of agency , contact name and email address if not A Council Group 1 member.

200 characters remaining

Report a minimum of four water conservation related contacts your agency had with the public during the year.

ON TRACK

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year?

Number of Public Contacts	Public Information Programs
360,000	Newsletter articles on conservation
15,276	Website
90,000	Landscape water conservation media campaigns
28,600	Email Messages
25,000	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
518,876	

Contact with the Media

Yes No N/A

ON TRACK

Media Contacts List

Did at least one contact take place during each quarter of the reporting year?

Number of Media Contacts	Media Contacts Type
5	Articles or stories resulting from outreach
1	News releases
5	Newspaper contacts
1	Television contacts

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Number of Media Contacts	Media Contacts Type
5	Articles or stories resulting from outreach
1	News releases
5	Newspaper contacts
1	Television contacts
5	Online Advertisings
17	

Agency Website Updates

216 characters remaining

Enter your agency's URL (website address): http://www.sustainablesm.org/water

66 characters remaining

Describe a minimum of four water conservation related updates to your agency's website that took place during the year: Updates to landscape information.Updates to rebate programs. "Every Drop Counts" campaign banner placed on City's main home page. Posted new water self-sufficiency campaign materials.

Did at least one website update take place during each quarter of the reporting year? Yes No N/A

ON TRACK

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount	Personnel Costs Included?	Comments
Water Efficiency Outreach	20,600.00	☐	Includes - Ongoing, Baysaver, Incentives, Retrofit, Miscellaneous
Sustainable Landscaping Outreach	7,000.00	☐	
Landscape Video	4,000.00	☐	
AltBuild Event	5,000.00	☐	
LA Coastal Gardens Website	6,500.00	☐	
	$43,100.00		

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

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Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

ON TRACK

Expense Category	Expense Amount	Personnel Costs Included?
Water Efficiency Outreach	6,744.00	☐
Sustainable Landscaping	3,090.00	☐
LA Coastal Gardens Website	6,005.00	☐
	$15,839.00	

ALL DATA BELOW ARE OPTIONAL

Additional Public Information Program

You may report additional public information contacts. Please list these additional contacts in order of how your agency views their importance/effectiveness with respect to conserving water, with the most important/effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ◉ Yes ○ No ○ N/A

Public Outreach Additional Information

Public Information Programs	Importance
Presentations	9
Fairs, festivals, conventions	8
High water usage notifications	3
Reverse 911 phone calls to turn off sprinklers after a rain	7
Water waste notifications	2
Landscape workshops	6
Green Garden Academy	4
Residential Water Customer Survey	1
Spanish language Landscape Workshop for Professionals	11
Smart Irrigation Month - July	10
Rebate Incentives (SoCalWaterSmart.com)	5

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ◉ Yes ○ No ○ N/A

103 characters remaining

Every Drop Counts. Use Less Water. This is an overall branding strategy to address both the drought and the goal of water self-sufficiency by 2020.

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Branding

Does your agency have a water conservation "brand," "theme" or mascot? (•) Yes ( ) No ( ) N/A

103 characters remaining

Describe the brand, theme or mascot.: Every Drop Counts. Use Less Water. This is an overall branding strategy to address both the drought and the goal of water self-sufficiency by 2020.

Market Research

Have you sponsored or participated in market research to refine your message? (•) Yes ( ) No ( ) N/A

57 characters remaining

Market Research Topic: Residential Water Customer Use (via survey)

70 characters remaining

Brand Message: Water Self-Sufficiency by 2020

23 characters remaining

Brand Mission Statement: Achieve water self-sufficiency by eliminating reliance on MWD supply by 2020.

Community Committees

Do you have a community conservation committee? (•) Yes ( ) No ( ) N/A

21 characters remaining

Enter the names of Community Committees: Task Force on the Environment; Sustainable Water Master Plan Advisory Committee

Training

Training Type	# of Trainings	# of Attendees	Description of Other
Professional Landscapers	5	50	English + Spanish Language Landscape Workshop for Professionals
Homeowners	2	150	Green Garden Academy: Wise Irrigation + Lawn be Gone

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
General		twitter, facebook, YouTube

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Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
General		twitter, facebook, YouTube

Partnering Programs

Name	Type of Program
☑ CLCA?	Sustainable Landscape Professional Program
☑ Green Building Programs?	USGBC - AltBuild
☐ Master Gardeners?	
☐ Cooperative Extension?	
☑ Local Colleges?	Santa Monica College - Sustainable Landscape Professional Progr
☐ Other	

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year
Number of customers reached per year

Partnering with Other Utilities

131 characters remaining

Describe other utilities your agency partners with, including electrical utilities

City of Long Beach Water Department, City of Torrance, West Basin Municipal Water District for www.lacoastalgardens.com

Conservation Gardens

3 characters remaining

Describe water conservation gardens at your agency or other high traffic areas or new homes.

City Hall Demonstration Garden: features climate appropriate plants and drip irrigation. garden\garden: two side-by-side bungalows showing the sustainable landscape uses 80% less water. Airport Demonstration Garden: free plans and material lists.

Landscape Contests or Awards

100 characters remaining

Describe water wise landscape contests or awards program conducted by your agency.

250 characters remaining

Additional programs supported by agency but not mentioned above.

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At Least As Effective As

Is your agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ○ No ◉ N/A

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

150 characters remaining

Please Upload Document AsEffectiveAs

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments:

250 characters remaining

Reporting Unit: City of Santa Monica
Signatory: City of Santa Monica
RU Type: Retail

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Provisional Coverage Indication ON TRACK

BMP 2.2 School Education Programs, Retail Agencies

Online Help

Submited to CUWCC
10/30/2015 5:59:34 PM

Form Complete

Form Status: Submitted

Does your agency implement a school education program? (•) Yes ( ) No ( ) N/A

Are there one or more wholesale agencies performing school education programs which can be counted to help your agency comply with the BMP?

Metropolitan Water District of SC

Please provide the name of Agency, contact name and email address if not CUWCC Group 1 members.

ON TRACK

☑ Materials meet state education framework requirements.

Description: *130 characters remaining*

Watch the Water activity sheets for k-12 with water conservation related activities and information for school and home.

ON TRACK

☑ Materials distributed to K-6 students.

Description of materials distributed to K-6 students: *150 characters remaining*

Watch the Water activity sheets for k-6 which included information on how to perform a water audit.

Number of student reached.

7800

☐ Materials distributed to 7-12 students. (optional)

Description of materials distributed to 7-12 students *149 characters remaining*

Watch the Water activity sheets for 7-12 which included information on how to perform a water audit.

Annual budget for school education program.

ON TRACK

$2000.00

ON TRACK

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Annual budget for school education program.

ON TRACK

$2000.00

ON TRACK

148 characters remaining

Description of all other water supplier education programs.

Staff provided guidance for water audits for k-6 student council members and 7-12 AP science students.

School Program Activities

Classroom presentations:

Number of presentations: 2

Number of attendees: 38

204 characters remaining

Describe the topics covered in your classroom presentations:

Water audits, saving water at school and home.

Large group assemblies:

Number of presentations:

Number of attendees:

Children's water festivals or other events:

Number of presentations: 1

Number of attendees: 10000

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations:

Number of attendees:

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description — 250 characters remaining

Number distributed:

Staffing children's booths at events and festivals:

Number of booths:

Number of attendees:

Water conservation contests such as poster and photo:

Description — 250 characters remaining

Number of Participants

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Water Sources and Usage

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Staffing children's booths at events and festivals:

Number of booths

Number of attendees

Water conservation contests such as poster and photo:

Description *250 characters remaining*

Number of Participants

Offer monetary awards/funding or scholarships awards to students:

Number offered

Total funding

Teacher training workshops:

Number of presentations

Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 27

Number of participants: 399

College internships in water conservation offered:

Number of internships

Total funding

Career fair/workshops:

Number of presentations

Number of attendees

Additional program(s) supported by agency:

Not mentioned above

250 characters remaining

Number of events (if applicable)

Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs):

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

150 characters remaining

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Number of internships:

Total funding:

Career fair/workshops:

Number of presentations:

Number of attendees:

Additional program(s) supported by agency:

Not mentioned above

250 characters remaining

Number of events (if applicable):

Number of participants:

Total reporting period budget expenditures for school education programs (include all agency costs):

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

150 characters remaining

Please Upload Document AsEffectiveAs

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments:

250 characters remaining

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Role:Editor

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Online Help

BMP 3 Residential

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11/24/2015 4:24:06 PM

Form Complete

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Coverage Option: Flextrack

Total Measured Water Savings (AF/Year)

Form Status: Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities Credit
12.16	0	12.16	74.59	-189.91

From the Coverage Option drop down menu to the right, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Residential Assistance / Landscape Water Survey

Traditional

	Single Family Accounts	Target	Coverage	Multi Family Units	Target	Coverage
Total Number	7512			6308		
Total Number Of Leak Det Surveys	95	56.34		184	47.31	
Total Number Of Showerheads	0			0		
Total Number Of Faucet Aerators	0			0		
Total Number of Landscape Water Survey	0	56.34		0		

Has your agency reached a 75% market saturation for showerheads? (•) Yes ( ) No ( ) N/A

Flex

Number of Other Measures: 0

50 characters remaining

Description of Other Measures Distributed:

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

NA

Measured water savings AF/YR: 0

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Spreadsheet that you have created.

0

NA

High Efficiency Clothes Washers HECW

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

Target	Coverage
45.07	

Number of installations for HECWs: 123

Enter the Average Water Factor for all installations if it is less than 5.0: 3

Are financial incentives provided for HECWs ? Yes No N/A

Has your agency completed a HECW Market Penetration Study ? Yes No N/A

HECW Market Penetration Study Documents

NA

Flex

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

Measured Water Savings AF/YR: 0

NA

WaterSense Specification (WSS) toilets

Traditional

Retrofit on Resale Ordinance is in Place Yes No N/A

If Yes, Choose A File

NA

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If Yes, Choose A File

NA

A 75% Market Saturation Achieved Yes No N/A

If Yes, Choose A File

NA

WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	34	2
Target number of WSS toilets	841.344	104.7128
Coverage		

Flex

	SingleFamily	MultiFamily
Measured Water Savings AF/YR		

250 characters remaining

Describe your Flex Track toilet program

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

NA

WSS for New Residential Development

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

	Single Family	Multi Family
Residential Development Rebates	Yes No N/A	Yes No N/A

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Traditional

	Single Family	Multi Family
Residential Development Rebates	Yes No N/A	Yes No N/A
Recognition Programs	Yes No N/A	Yes No N/A
Reduced Connection Fees	Yes No N/A	Yes No N/A
Ordinances	Yes No N/A	Yes No N/A

New development ordinance/regulation

NA

Number of new single-family units built in service area 33

Number of new multi-family units built in service area 337

In the following table, enter one row for each incentive type program you offer.

List of Incentive Amounts

Incentive Type	Incentive amount	Number of WSS fixtures installed	Number of Participating Single-Family	Number of Participating Multi-Family
No data to display				

Flex

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

NA

Measured water savings AF/YR

0

Unique Conservation Measures

High bill contact with single-family and multi-family customers.

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- **High bill contact with single-family and multi-family customers.**
- **Educate residential customers about the behavioral aspects of water conservation.**
- **Notify residential customers of leaks on the customer's side of the meter.**
- **Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.**
- **Provide unique water saving fixtures that are not included in the BMP list above.**
- **Install residence water use monitors.**
- **Participate in programs that provide residences with school water conservation kits.**
- **Implement an automatic meter reading program for residential customers.**
- **OTHER Types of Measures.**

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

250 characters remaining

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Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

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1.4 Retail Conservation Pricing

BMP 2

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GPCD

Review / Submit

⊞ **Notify residential customers of leaks on the customer's side of the meter.**

⊞ **Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.**

⊞ **Provide unique water saving fixtures that are not included in the BMP list above.**

⊞ **Install residence water use monitors.**

⊞ **Participate in programs that provide residences with school water conservation kits.**

⊞ **Implement an automatic meter reading program for residential customers.**

⊞ **OTHER Types of Measures.**

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Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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Comments

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Total Measured Water Savings (AF/Year)

Traditional	FlexTrack	Total	FlexTrack Target
12.16	0	12.16	74.59

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Non Potable Water Sources

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Non Potable Water Uses

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BMP 4 - CII

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BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

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Review / Submit

Provisional Coverage Indication ON TRACK

Online Help

BMP 4 CII

Submited to CUWCC
10/30/2015 5:59:34 PM

Form Complete

Save All

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option: Flextrack | Calculate

Total Measured Water Savings (AF/Year)

Prior Activities Credit 52.67

Form Status: Submitted

Traditional	FlexTrack	Total	FlexTrack Target
0	0.05	0.05	N/A

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

	Measured water savings (AF/Year)
A) High-Efficiency Toilets.	0.05
B) High-Efficiency Urinals (0.5 gpf)	
C) Ultra Low Volume Urinals(0.125 gpf)	
D) Zero Consumption Urinals (0.0 gpf)	
E) Commercial High - Efficiency Single Load Clothes Washers	
F) Cooling Tower Conductivity Controllers	
G) Cooling Tower pH Controllers	
H) Connectionless Food Steamers	
I) Medical Equipment Steam Sterilizers	

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G) Cooling Tower pH Controllers

H) Connectionless Food Steamers

I) Medical Equipment Steam Sterilizers

J) Water - Efficient Ice Machines

K) Pressurized Water Brooms

L) Dry Vaccum Pumps.

Unique Conservation Measures

M) Industrial Process Water Use Reduction.

N) Commercial Laundry Retrofits.

O) Industrial Laundry Retrofits

P) Filter Upgrades (for pools,spas and fountains)

Q) Car Wash Reclamation Systems

R) Wet Cleaning.

S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

T) Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

U) Waterless Wok

V) Alternative On-site Water Sources (For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

W) Sub-metering

X) High Efficiency Showerheads

Y) Faucet Flow Restrictors 3.772

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W) Sub-metering	
X) High Efficiency Showerheads	
Y) Faucet Flow Restrictors	3.772
Z) Water Efficient Dishwashers	
AA) Hot Water on Demand	
BB) Pre-rinse Spray Valves of 1.3 gpm (gallons per minute) or less	0.45
CC) Central Flush Systems	
Other Measures chosen by the Agency	

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type: Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments 250 characters remaining

Total Measured Water Savings (AF/Year)

Traditional	FlexTrack	Total	FlexTrack Target
0	0.05	0.05	N/A

Save All

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Provisional Coverage Indication ON TRACK

Online Help

BMP 5 Landscape

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Form Complete

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option Flextrack

Total Measured Water Savings (AF/Year)

Form Status: Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities
0	14.65	14.65	0	134.86

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

1) Accounts with Dedicated Irrigation Meters

Traditional

a)Number of dedicated irrigation meter accounts	570
b)Number of dedicated irrigation meter accounts with water budgets	0
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	0
d)Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	0
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	0
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	Yes No N/A

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

Technical Assistance

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NA

Technical Assistance

Traditional

e) Number of Accounts 20% over-budget	0
f) Number of accounts 20% over-budget offered technical assistance	0
g) Number of accounts 20% over-budget accepting technical assistance	0

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

2) Commercial/Industrial/Institutional(CII) Accounts Without Meters or with Mixed -Use Meters

Traditional

Number of mixed use and un-metered accounts		
Number of irrigation water use surveys offered		
Number of irrigation water use surveys accepted		
Type: Incentives numbers received by customers		$Value 0
Type: Rebates numbers received by customers		$Value 0
Type: No- or Low-Interest loan offered numbers received by customers		$Value 0
Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations		
Estimated annual water savings by customers receiving irrigation water save surveys and implementing recommendations		

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

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customers receiving irrigation water save surveys and implementing recommendations

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

Financial Incentives

Traditional

Have you implemented and maintained an irrigation equipment retrofits incentive program? Yes No N/A

Number of incentives	Dollar value of incentives	Incentive Type
84	93,883.75	Rebate

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

NA

2.66

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

Landscape Flex Track Measure Types

1. Monitor and report on landscape water use

1a. Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

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need to adjust irrigation schedules.

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

1c. Establish agency-wide water budget. (Include in Help notes: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

1d. Establish agency-wide, sector-based irrigation goal to reduce water use, based on season.

2. Provide technical landscape resources and training

2a. Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

2b. Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

2c. Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

2d. Establish time-of-day irrigation restrictions.

2e . Establish day-of-week irrigation restrictions.

3. Provide incentives

3a. Establish landscape budget-based rates.

3b. Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

3c. Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

3d. Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

3e. Provide incentives for conversions from potable to recycled water.

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

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3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

4. Participate in local and regional planning and regulatory activities

4a. Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

4b. Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

6. Other Measures

Other Landscape Measures.

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes No N/A

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

250 characters remaining

Please Upload Document(s)

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Exemption Type

Exemption Type

Select an Exemption Type

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Comments *250 characters remaining*

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Non Potable Water Uses

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Exemption Type

Exemption Type

Select an Exemption Type

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NA

Comments

250 characters remaining

Total Measured Water Savings(AF/Year) 14.65

Appendix E: Sustainable City Plan

City of Santa Monica 2015 Urban Water Management Plan

Sustainable City Plan
City of Santa Monica

Using the power of community to enhance our resources, prevent harm to the natural environment and human health, and benefit the social and economic well-being of the community for the sake of current and future generations.

Adopted September 20, 1994
Updated February 11, 2003
Revised October 24, 2006
Updated January 14, 2014

1994–2014 20 YEARS OF PROGRESS

SANTA MONICA
SUSTAINABLE CITY PLAN
sustainablesm.org

Introduction

We live in a time in which increased population growth, high levels of consumption and the desire to feed growing economies have created escalating demands on our resources - natural, human and social - on a local, regional, and global scale.

We live in a time in which increased population growth, high levels of consumption and the desire to feed growing economies have created escalating demands on our resources - natural, human and social - on a local, regional, and global scale. These demands negatively impact the natural environment, our communities and the quality of our lives. In the face of these challenges, people worldwide have developed a growing concern for the environment and a desire to live sustainably.

In 1994, the Santa Monica City Council took steps to address these pressures locally by adopting the Santa Monica Sustainable City Program. The Sustainable City Program was initially proposed in 1992 by the City's Task Force on the Environment to ensure that Santa Monica can continue to meet its current needs – environmental, economic and social - without compromising the ability of future generations to do the same. It is designed to help us as a community begin to think, plan and act more sustainably – to help us address the root causes of problems rather than the symptoms of those problems, and to provide criteria for evaluating the long-term rather than the short-term impacts of our decisions – in short, to help us think about the future when we are making decisions about the present.

The program includes goals and strategies, for the City government and all sectors of the community, to conserve and enhance our local resources, safeguard human health and the environment, maintain a healthy and diverse economy, and improve the livability and quality of life for all community members in Santa Monica. To check our progress toward meeting these goals, numerical indicators were developed and specific targets were set for the city to achieve by the year 2000 in four goal areas – 1) Resource Conservation, 2) Transportation, 3) Pollution Prevention and Public Health Protection, and 4) Community and Economic Development.

In reviewing the progress made since the 1994 adoption of the program, the Task Force on the Environment recognized the need to update and expand the Sustainable City goals and indicators to provide a more complete picture of community sustainability, and to develop new indicator targets for 2010. The Task Force felt that a comprehensive update would allow Santa Monica to build on its initial success and to better address the challenges to sustainability that remain.

The update process began in July 2001 with the formation of the Sustainable City Working Group - a large group of community stakeholders that included elected and appointed officials, city staff, and representatives of neighborhood organizations, schools, the business community and other community groups. The Working Group met numerous times over the course of 15 months to discuss the myriad issues related to the sustainability of the community. They evaluated the long-term sustainability of Santa Monica using a framework comprised of three forms of community capital, that need to be managed with care, in order to ensure that the community does not deteriorate. These include natural capital – the natural environment and natural resources of the community; human and social capital – the connectedness among people in the community and the education, skills and health of the population; and financial and built capital – manufactured goods, buildings, infrastructure, information resources, credit and debt.

The group proposed significant changes to the initial Sustainable City Program goals and indicators, and assisted with the creation of new indicator targets. Early drafts of the proposed update were revised based on a large amount of public input received during the summer of 2002.

The result of this process was the updated, Santa Monica Sustainable City Plan, which represents the community's vision of Santa Monica as a sustainable city. The change in name from Sustainable City Program to Sustainable City Plan was made to better reflect the long-term comprehensive nature of Santa Monica's vision and the community's efforts to become a sustainable city.

Since its inception, the Santa Monica Sustainable City Program has achieved much success. Many of the initial targets have been met or exceeded and Santa Monica is now recognized worldwide as a role model for sustainability. However, we are not "there" yet. While we have made progress in the right direction, Santa Monica's economy and the activities of its residents, businesses, institutions and visitors continue to negatively impact human health and the environment. And our community does not yet provide for the basic needs of all its members. Many challenges remain before Santa Monica can truly call itself a Sustainable City. The Sustainable City Program is a call to action for all of us to work together as a community and create change that will realize a Sustainable Santa Monica.

"I think any goal this community sets for itself, and is willing to work to accomplish, will be accomplished... whether in my time or another time. That's the beauty of this city."

Ken Edwards, 1941-1985

City Council Member and Mayor

Leadership, Guidance and Implementation of the Sustainable City Plan

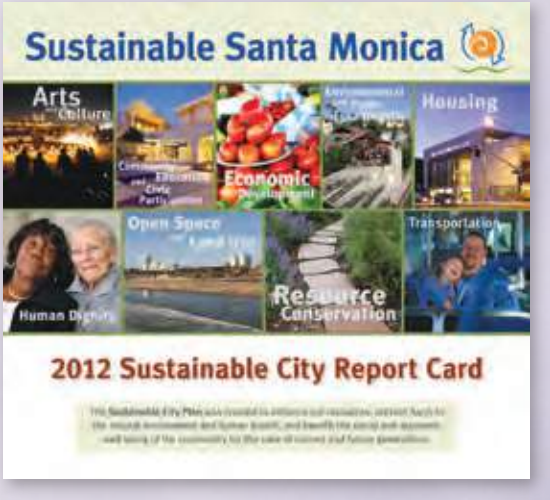
The City's Task Force on the Environment (ETF) assumed the initial leadership role on behalf of the community for the Sustainable City Plan (SCP).

With the update and expansion of the SCP into new and more diverse goal areas, the ETF recommended the creation of a Sustainable City Task Force (SCTF) that includes broad representation from community stakeholders with expertise in all of the SCP goal areas The SCTF was created in 2003 to provide leadership and guidance for implementation of the SCP. In 2009, the SCTF sunset and this role was again assumed by the ETF.

At the city staff level, an interdepartmental Sustainability Advisory Team (SAT) was created to coordinate existing city activities so they are consistent with the Sustainable City goals and facilitate the future implementation of innovative programs and policies to achieve the goals. Members of this group serve as Sustainable City liaisons to their respective departments.

Together, these groups are responsible for developing a comprehensive implementation plan, both interdepartmentally, and between the City and community stakeholder groups.

Reporting



The city developed two reporting tools. The tools are intended to provide useful information to City Council, City staff, and community members on progress being made toward meeting goals and targets of the Plan, and will provide a basis for decision-making about policies and actions that influence the City's ability to meet the goals and targets. The first tool is the Sustainable City Progress Report. The second tool is the Sustainable City Report Card.

- The Sustainable City Progress Report is a web based tool that provides current, detailed analysis of the data for each indicator in the Santa Monica Sustainable City Plan. Visit www.sustainablesm.org/scpr

- The Sustainable City Report Card is a summary document that provides an overview of our progress toward, and challenges to, becoming a sustainable community. The Report Card presents goal area summaries and grades based on the specific indicator data.

Together, these two tools are the definitive resource for community decision makers. In order to become a sustainable community all community members must be educated and empowered to achieve our sustainability goals.

Sustainable City Plan Structure

Goal Areas

The Santa Monica Sustainable City Plan is organized into nine Goal Areas:

- **Resource Conservation**
- **Environmental and Public Health**
- **Transportation**
- **Sustainable Local Economy**
- **Open Space and Land Use**
- **Housing**
- **Community Education and Civic Participation**
- **Human Dignity**
- **Arts and Culture**

GOALS:
Within each Goal Area are specific goals which comprise the core of the community vision and represent what Santa Monica must achieve in order become a sustainable city.

INDICATORS:
For each goal area specific indicators have been developed to measure progress toward meeting the goals. Indicators are tools that help to determine the condition of a system, or the impact of a program, policy or action. When tracked over time indicators tell us if we are moving toward sustainability and provide us with useful information to assist with decision-making. Two types of indicators are tracked as part of the Sustainable City Plan: 1) System level indicators measure the state, condition or pressures on a community-wide basis for each respective goal area. 2) Program level indicators measure the performance or effectiveness of specific programs, policies or actions taken by the city government or other stakeholders in the community.

Specific Targets have been created for many of the indicators. The targets represent aggressive yet achievable milestones for the community. Unless otherwise noted, the targets are for the year 2020 using 2010 as a baseline. For some indicators no specific numerical targets have been assigned. This was done where development of a numerical target was determined to be not feasible or where limits on data type and availability made it difficult to set a numerical target. In many of these cases a trend direction was substituted for a numerical target.

Terms throughout this document that may be unfamiliar to the general reader are defined in the Glossary.

Guiding Principles

The Santa Monica Sustainable City Plan is founded on eleven Guiding Principles that provide the basis from which effective and sustainable decisions can be made. These Guiding Principles have been revised and updated from the versions initially adopted in 1994.

1 The Concept of Sustainability Guides City Policy

Santa Monica is committed to meeting its existing needs without compromising the ability of future generations to meet their own needs. The long-term impacts of policy choices will be considered to ensure a sustainable legacy.

2 Protection, Preservation, and Restoration of the Natural Environment is a High Priority of the City

Santa Monica is committed to protecting, preserving and restoring the natural environment. City decision-making will be guided by a mandate to maximize environmental benefits and reduce or eliminate negative environmental impacts. The City will lead by example and encourage other community stakeholders to make a similar commitment to the environment.

3 Environmental Quality, Economic Health and Social Equity are Mutually Dependent

Sustainability requires that our collective decisions as a city allow our economy and community members to continue to thrive without destroying the natural environment upon which we all depend. A healthy environment is integral to the city's long-term economic and societal interests. In achieving a healthy environment, we must ensure that inequitable burdens are not placed on any one geographic or socioeconomic sector of the population and that the benefits of a sustainable community are accessible to all members of the community.

4 All Decisions Have Implications to the Long-term Sustainability of Santa Monica

The City will ensure that each of its policy decisions and programs are interconnected through the common bond of sustainability as expressed in these guiding principles. The policy and decision-making processes of the City will reflect our sustainability objectives. The City will lead by example and encourage other community stakeholders to use sustainability principles to guide their decisions and actions.

5 Community Awareness, Responsibility, Participation and Education are Key Elements of a Sustainable Community

All community members, including individual citizens, community-based groups, businesses, schools and other institutions must be aware of their impacts on the environmental, economic and social health of Santa Monica, must take responsibility for reducing or eliminating those impacts, and must take an active part in community efforts to address sustainability concerns. The City will therefore be a leader in the creation and sponsorship of education opportunities to support community awareness, responsibility and participation in cooperation with schools, colleges and other organizations in the community.

6 Santa Monica Recognizes Its Linkage with the Regional, National, and Global Community

Local environmental, economic and social issues cannot be separated from their broader context. This relationship between local issues and regional, national and global issues will be recognized and acted upon in the City's programs and policies. The City's programs and policies should therefore be developed as models that can be emulated by other communities. The City will also act as a strong advocate for the development and implementation of model programs and innovative approaches by regional, state and federal government that embody the goals of sustainability.

7 Those Sustainability Issues Most Important to the Community Will be Addressed First, and the Most Cost-Effective Programs and Policies Will be Selected

The financial and human resources which are available to the City are limited. The City and the community will reevaluate its priorities and its programs and policies annually to ensure that the best possible investments in the future are being made. The evaluation of a program's cost-effectiveness will be based on a complete analysis of the associated costs and benefits, including environmental and social costs and benefits.

8 The City is Committed to Procurement Decisions which Minimize Negative Environmental and Social Impacts

The procurement of products and services by the City, and Santa Monica residents, businesses and institutions results in environmental, social and economic impacts both in this country and in other areas of the world. The City will develop and abide by an environmentally and socially responsible procurement policy that emphasizes long-term values and will become a model for other public as well as private organizations. The City will advocate for and assist other local agencies, businesses and residents in adopting sustainable purchasing practices.

9 Cross-sector Partnerships Are Necessary to Achieve Sustainable Goals

Threats to the long-term sustainability of Santa Monica are multi-sector in their causes and require multi-sector solutions. Partnerships among the City government, businesses, residents and all community stakeholders are necessary to achieve a sustainable community.

10 The Precautionary Principle Provides a Complimentary Framework to Help Guide City Decision-Makers in the Pursuit of Sustainability

The precautionary principle requires a thorough exploration and careful analysis of a wide range of alternatives, and a full cost accounting beyond short-term and monetary transaction costs. Based on the best available science, the precautionary principle requires the selection of alternatives that present the least potential threat to human health and the City's natural systems. Where threats of serious or irreversible damage to people or nature exist, lack of full scientific certainty about cause and effect shall not be viewed as sufficient reason for the City to not adopt mitigating measures to prevent the degradation of the environment or protect the health of its citizens. Public participation and an open and transparent decision making process are critical to finding and selecting alternatives.

11 Santa Monica is Committed to Sustainable Rights for its Residents, Natural Communities and Ecosystems

The Sustainability Bill of Rights codifies the commitments made in the Sustainable City Plan and asserts the fundamental rights of all Santa Monica residents regarding sustainability. It establishes the rights of natural communities and ecosystems to exist and flourish in Santa Monica and asserts the rights of residents to enforce those rights on behalf of the environment.

Resource Conservation

Goals

1. Significantly decrease overall community consumption, specifically the consumption of non-local, non-renewable, non-recyclable and non-recycled materials, water, and energy and fuels.

2. The City should take a leadership role in encouraging sustainable procurement, extended producer responsibility and should model innovative strategies to become a zero waste city.

3. Within renewable limits, encourage the use of local, non-polluting, renewable and recycled resources (water, energy, and material resources).

Indicators	Targets for 2020
Solid Waste • Generation • Landfilled • Diversion	**Solid Waste** • Do not exceed year 2000 levels • Reduce per capita generation to 2.4 lbs/person/day • Achieve 85% diversion rate
Water Use • Total citywide use (Self Sufficiency) • Total citywide use (Per Capita) • Percent local vs. imported • Potable vs. non-potable	**Water Use** • Reduce water demand by 1,300,000 gallons per day (GPD) • Reduce per capita use to 123 gallons per capita per day (GPCD) (500,000 GPD) • Increase to 100% local • Upward trend in non-potable use
Energy Use • Total municipal use • Total citywide use • Efficiency • Efficiency	**Energy Use** • Reduce use 10% • Reduce use 10% • Demonstrate incremental progress towards achieving reduction in energy use intensity • Increase efficiency in existing buildings to achieve reductions of 1 million kWh annually

Indicators	Targets for 2020
Renewable Energy use • Total use • Total use from clean distributed generation in Santa Monica	**Renewable Energy use** • At least 50% of all electricity should come from renewable sources • Total use from clean distributed generation in SM- Install 7.5MW of solar citywide • Total use from clean distributed generation in SM – Install 1 MW of solar on city operated facilities
Greenhouse Gas Emissions • Community • Corporate	**Greenhouse Gas Emissions (GHG)** • Reduce community GHG emissions 20% below 1990 levels • Reduce corporate GHG emissions 30% below 1990 levels
Ecological Footprint	**Ecological Footprint** • No net increase
Green Construction • New Construction • O&M • Residential • Non-Residential	**Green Construction** • 100% of new municipal buildings achieving LEED GOLD certification • Demonstrate 100% of existing municipal buildings achieving LEED GOLD certification • Demonstrate incremental increase in the percentage of residential buildings achieving energy efficiency and green construction certifications • Demonstrate incremental increase in the percentage of non-residential buildings achieving energy efficiency and green construction certifications

Environmental and Public Health

Goals

1. Protect and enhance environmental health and public health by minimizing and where possible eliminating:
   a. The use of hazardous or toxic materials by residents, businesses and city operations;
   b. The levels of pollutants entering the air, soil and water; and
   c. The risks that environmental problems pose to human and ecological health.

2. Ensure that no one geographic or socioeconomic group in the city is being unfairly impacted by environmental pollution.

3. Increase consumption of fresh, locally produced, organic produce to promote public health and to minimize resource consumption and negative environmental impacts.

Indicators	Targets for 2020
Santa Monica Bay • Wet weather: No rain • Wet weather: Rain event • Dry weather	**Santa Monica Bay** • No rain - 3 days • Rain event - 17 days • Zero days
Marine Debris • Trash: Presence of cigarettes, plastic packaging, single-use bags, lids and straws	**Marine Debris** • Zero trash (cigarettes, plastic packaging, single-use bags, lids and straws)
Air Quality • # Days ambient air quality standards exceeded	**Air Quality** • Zero days ambient air quality standards exceeded
Residential Household Hazardous Waste • Total volume collected • Number and percent of households participating • Cumulative number of participants	**Residential Household Hazardous Waste** • No target • Number and percent of households participating- Upward trend • Cumulative number of participants - 50% cumulative participation
City Purchase of Sustainable Products • Proportion of procurement budget spent on sustainable products annually	**City Purchase of Sustainable Products** • Upward trend

Indicators	Targets for 2020
Urban Runoff Reduction • Effective impervious area • Total acreage treated • Gallons polluted runoff treated	**Urban Runoff Reduction** • Annual reduction • Annual increase • Annual increase
Fresh, Local, Organic Produce • Percent of fresh, local, organic produce served at city facilities • Percent fresh, local, organic produce served at community institutions: (SMMUSD, SMC, Hospitals) • Sustainable food commitment	**Fresh, Local, Organic Produce** • 15% of total • 15% of total • 100% of City food purchases comply with Santa Monica Sustainable Food Commitment
Farmers Markets • Total sales • Percent organic • Percent low chemical • Percent conventional	**Farmers Markets** • Annual increase • Annual increase • Annual increase • No target
Food Choices • Residential reduction in meat and dairy consumption	**Food Choices** • 15% reduction
Community Gardens • Number of people participating • Average wait time for plot • Number of gardens connected	**Community Gardens** • Tracking number of people • Annual decrease • Annual increase

Transportation

Goals

1. Create a multi-modal transportation system that minimizes and, where possible, eliminates pollution and motor vehicle congestion while ensuring safe mobility and access for all without compromising our ability to protect public health and safety.

2. Facilitate a reduction in automobile dependency in favor of affordable alternative, sustainable modes of travel.

Indicators	Targets for 2020
Modal Split • Number of trips by type, citywide • Average vehicle ridership (AVR) of Santa Monica businesses with more than 50 employees • Pedestrian travel volumes • Bike traffic volumes	**Modal Split** • An upward trend in the use of sustainable (bus, bike, pedestrian, rail) modes of transportation - Drive alone max: 60%, Bike + Walk + Transit minimum: 25%, Bike + Walk: 15% • 2 for Santa Monica businesses with more than 50 employees • Annual increase • Annual increase
Vehicle Miles Traveled • Total • Total per capita	**Vehicle Miles Traveled** • Downward trend • Downward trend
Residential Use of Sustainable Transportation • Percent of residents who have intentionally not used their car but have instead used a sustainable mode of transportation in the past month	**Residential Use of Sustainable Transportation** • Upward trend
Sufficiency of Transportation Options • Percent of households with high quality transit service within ½ and ¼ mile	**Sufficiency of Transportation Options** • 100% of households within ½ mile
Pedestrian Facilities • Complete sidewalks • Public/private pathways • Crosswalk enhancements • Signal Timing enhancements	**Pedestrian Facilities** • Annual increase

Indicators	Targets for 2020
Bike Facilities • Percent of bike network completed • Total miles of bike lanes and paths installed or upgraded • Total Bikeshare usage • Number of bikes parked by bike valet	**Bike Facilities** • 100% • Annual increase • Annual increase • Annual increase
Vehicle Use • Total number of automobiles maintained per person • Percent of total automobiles that are qualified ZEV/PZEV or better • Total Carshare usage	**Vehicle Use** • 10% reduction • Annual percentage increase • Annual increase
Transit Service • Annual ridership on Santa Monica Big Blue Bus (BBB) • Percent of residents who have ridden the BBB in the past year • Annual ridership on MTA routes originating in Santa Monica • Annual Expo light rail ridership	**Transit Service** • Annual increase • Annual increase • Annual increase • Annual increase
Alternative Fueled Vehicles • Percent of the city fleet vehicles using alternative fuels	**Alternative Fueled Vehicles** • 80% of fleet
Travel Volumes • Auto corridor travel times • Peak Hour Trips • Signal Timing • Bus travel time	**Travel Volumes** • No increase • No net new PM trips • 100% completion • No increase
Street Safety • Number of collisions o Vehicle-Vehicle o Vehicle-Pedestrian o Vehicle-Bicyclist o Bicyclist-Pedestrian o Bicyclist-Bicyclist	**Street Safety** • Downward trend
Traffic Impacts to Emergency Response Average emergency response times for public safety vehicles • Police • Fire	**Traffic Impacts to Emergency Response** • No increase • No increase

Sustainable Local Economy

Goals

1. Nurture a diverse, stable, local economy that supports basic needs of all segments of the community.

2. Businesses, organizations and local government agencies within Santa Monica continue to increase the efficiency of their use of resources through the adoption of sustainable business practices.

Indicators	Targets for 2020
Economic Diversity • Percent of total economic activity/output by business sector (expressed as a percent of total wages)	**Economic Diversity** • No single sector shall be greater than 25% of total economic activity/output; and the top three sectors shall not be greater than 50% of total economic activity/output
Jobs / Housing Balance • Ratio of the number of jobs in Santa Monica to the amount of housing • Percent of Santa Monica employees who reside in Santa Monica	**Jobs / Housing Balance** • Ratio should approach 1 • Upward trend
Cost of Living • Median household income in relation to cost of living • Median household income in relation to living wage standard • Percent of tenants rent-burdened	**Cost of Living** • No target • 90% of median household incomes meet or exceed the living wage standard
Quality Job Creation • Percent of new jobs created in Santa Monica that pay greater than or equal to the cost of living	**Quality Job Creation** • Upward trend
Income Diversity • Percent of Santa Monica households earning less than $35,000/year • Percent of households earning more than $100,000/year	**Income Diversity** • No target

Indicators	Targets for 2020
Economic Health • Number of businesses • Number of employees • Annual payroll	**Economic Health** • No net loss • No net loss • Increasing trend
Resource Efficiency of Local Business • Ratio of energy use to total economic activity by business sector • Ratio of total water use to total economic activity by business sector	**Resource Efficiency of Local Business** • Downward trend • Downward trend
Local Employment of City Staff • Percent of city employees who live in SM • Distance city employees travel to work	**Local Employment of City Staff** • No target
Sustainable Business Community • Number of Certified Green Businesses • Number of Business Greening Program participants • Number of Buy Local business participants • Number of Sustainable Quality Award winning businesses • Number of Santa Monica Alliance events	**Sustainable Business Community** • 200 total • 200 total • 10% annual increase • No target • 5 % annual increase

Open Space and Land Use

Goals

1. Develop and maintain a sufficient open space system so that it is diverse in uses and opportunities and includes natural function/wildlife habitat as well as passive and active recreation with an equitable distribution of parks, trees and pathways throughout the community.

2. Implement land use and transportation planning and policies to create compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of existing and future public transit systems.

3. Residents recognize that they share the local ecosystem with other living things that warrant respect and responsible stewardship.

Indic ators	Targets for 2020
Open Space • Number of acres of public open space by type (including beaches, parks, public gathering places, gardens, and other public lands utilized as open space) • Percent of open space that is permeable	**Open Space** • Upward trend • Upward trend
Trees • Total trees planted • Net tree gain • Percent of tree canopy coverage by neighborhood	**Trees** • 2,000 total trees • 750 total trees • Upward trend
Parks Accessibility • Percent of households and population within ¼ and ½ mile of a park by neighborhood	**Parks Accessibility** • Percent of residents within ½ mile - 95% of residents • Percent of residents within ¼ mile- 90% of residents
Land Use and Development • Percent of residential, mixed-use projects that are within ¼ mile of transit nodes and are otherwise consistent with Sustainable City Plan goals	**Land Use and Development** • Upward trend
Regionally Appropriate Vegetation • Percent of new or replaced, non-turf, public landscaped area and non-recreational turf area planted with regionally appropriate plants	**Regionally Appropriate Vegetation** • 80 percent of new or replaced, non-turf, public landscaped area and non-recreational turf area

Housing

Goal

1. Achieve and maintain a mix of affordable, livable and green housing types throughout the city for people of all socioeconomic/cultural/household groups (including seniors, families, singles, and disabled).

Indicators	Targets for 2020
Production of Affordable Housing • Number of new housing units produced in Santa Monica affordable to: o Very low income households o Low income households o Moderate o Market rate	**Production of Affordable Housing** • Number of new housing units produced in Santa Monica affordable to: o At least 428 o At least 263 o At least 283 o At least 700
Availability of Affordable Housing • Percent of existing housing in Santa Monica affordable to: o Very low income households o Low income households o Moderate income households o Upper income households	**Availability of Affordable Housing** • No target
Distribution of Affordable Housing • Distribution of low income housing by neighborhood	**Distribution of Affordable Housing** • No target
Affordable Housing for Special Needs • Number of new or rehabilitated affordable housing units for families, seniors, the disabled and other special needs groups as a percentage of all new or rehabilitated affordable housing development	**Affordable Housing for Special Needs** • Upward trend
Production of "Livable" Housing • Percent of new units within ¼ mile of: o Transit stop o Open space o Grocery store	**Production of "Livable" Housing** • Upward trend
Production of Green Housing • Percent of new and substantially-rehabilitated housing that achieves LEED certification at LEED Silver or higher	**Production of Green Housing** • Upward trend

Community Education and Civic Participation

Goals

1. Community members of all ages participate actively and effectively in civic affairs and community improvement efforts.

2. Community members of all ages understand the basic principles of sustainability and use them to guide their decisions and actions - both personal and collective.

Indicators	Targets for 2020
Voter Participation • Percent of registered Santa Monica voters who vote in scheduled elections	**Voter Participation** • Increase to 68% in off year elections
Participation in Civic Affairs • Attendance at a city-sponsored meeting of any kind in the past year, including City Council meetings, city commission meetings, or special-topic workshops	**Participation in Civic Affairs** • Upward trend
Empowerment • Percent of Santa Monica residents who feel they have the opportunity to voice their concerns in the city on major community decisions that affect their lives	**Empowerment** • Upward trend
Resident Satisfaction • Percent of Santa Monica residents who are positive about the city as a place to live	**Resident Satisfaction** • 95% of residents surveyed
Participation in Neighborhood Organizations • Percent of Santa Monica residents that are represented by an active neighborhood organizations	**Participation in Neighborhood Organizations** • Upward trend
Sustainable Community Involvement • Number of residents who participate in Residential Greening Program • Number of Santa Monica College students who participate in Student Greening Program • Number of residents who participate in Community Sustainability Programs	**Sustainable Community Involvement** • 1,500 residents • 3,000 students • 1,000 residents

Human Dignity

Goals

1. Community members are able to meet their basic needs and are empowered to enhance the quality of their lives;

2. There is access among community members to housing, health services, education, economic opportunity, and cultural and recreational resources; and

3. There is respect for and appreciation of the value added to the community by differences among its members in race, religion, gender, age, economic status, sexual orientation, disabilities, immigration status and other special needs.

Indicators	Targets for 2020
Homelessness • Number of homeless living in Santa Monica • Number of homeless served by city shelters • Number of previously homeless individuals assisted by Project Homecoming	**Homelessness** • No target • Upward trend • Upward trend
Public Safety • Crime rate per capita – report by district and by type (property, violent, hate)	**Public Safety** • Downward trend
Residents' Perception of Safety • Percent of Santa Monica residents who are satisfied with city efforts to reduce crime and protect public safety	**Residents' Perception of Safety** • Upward trend
Incidents of Abuse • Number of incidents of abuse (domestic, child, youth and elder abuse)	**Incidents of Abuse** • Downward trend

Indicators	Targets for 2020
Youth Education • Grade 3 students proficient in language arts • SMMUSD student graduation rate • SMMUSD student suspension rates • Percent of SMMUSD students who attend school daily • Percent of SMMUSD students who feel safe at school • Percent of SMMUSD students that complete college admission requirements • Percent of SMMUSD students that receive environmental education consistent with the Education and the Environment Initiative	**Youth Education** • At least 85% • At least 91% • Not to exceed 4.4% • At least 87% • At least 67% • At least 77% • At least 50%, per grade
Empowerment • Women, minorities and people with disabilities in leadership positions	**Empowerment** • Upward trend
Ability to Meet Basic Needs • Percent of Santa Monica Residents who are satisfied with services for: o Emergency services o Affordable housing o Services for seniors o Services for youth o Public transportation o Mobility	**Ability to Meet Basic Needs** • Percent of Santa Monica Residents who are satisfied with services for: o Upward trend o Upward trend o Upward trend o Upward trend o Upward trend o Upward trend

Arts and Culture

Goals

1. Retain and nurture Santa Monica's arts community and resources.
2. Increase cultural participation and provide greater access to a diversity of cultural programs for all ages.
3. Enhance the long-term sustainability of the Santa Monica creative sector.

Indicators	Targets for 2020
Presence of artists	**Presence of artists** No net loss
Creative Sector Activity • People employed in the creative sector • Number of businesses • Revenue produced	**Creative Sector Activity** • Annual Increase • No net loss • No net loss
Presence of Opportunities for Cultural Participation • Number of non-profit cultural organizations • Number of retail arts venues • Classes for life-long learning in the arts	**Presence of Opportunities for Cultural Participation** • Annual Increase (blended)
Support for the Arts • Financial support for city arts grants • Charitable giving in the arts • Square footage of city property leased for cultural uses at below market rates	**Support for the Arts** • Annual Increase (blended)
Attendance and Participation • Number of families in SM who subscribe, buy tickets, etc. to cultural events (LA Stage Alliance data/study) • Participation at city or city-funded cultural events • Participation at non city-funded cultural events	**Attendance and Participation** • At least 50% of adults attend a live performance annually and at least 30% attend a museum annually • Annual increase • Annual increase

Glow 2010, photo by Bill Short

Glossary

active recreation: recreational opportunities including sports and other activities that typically require playing fields, facilities or equipment.

affordable housing: any housing that is deed restricted for, and occupied by, households earning less than 120% of the Los Angeles County median family income.

alternative fuel vehicles: vehicles that operate on fuels other than gasoline or diesel in order to reduce greenhouse gas emissions and pollution. Alternative fuel vehicles include those that operate using compressed natural gas (CNG), liquid natural gas (LNG), propane, electricity, hybrid of gasoline and electricity, and hydrogen.

alternative (and/or sustainable) modes of transportation: transportation by public transit (bus or rail), bicycle or walking.

average vehicle ridership (AVR): a measurement of vehicle occupancy indicating the average number of persons traveling in a measured number of vehicles. AVR is an indicator of the effectiveness of and participation in ridesharing programs.

bike lane/path/route/sharrow: As defined in the City's Bike Action Plan, a bike lane is a signed and striped lane along a roadway for use by bicycles. Other types of bicycle ways in the city are bike paths and bike routes. A bike path is a dedicated bicycle way that completely separates bicycles from motor vehicles. Bike routes are signed routes which bicyclists share with motor vehicles. Bike routes differ from bike lanes in that routes do not include any striping on the roadway - they are only designated by signage. Sharrows are a pavement marking consisting of a directional arrow or "chevron," and a bicycle symbol similar to those seen in bicycle lanes. Sharrows demonstrate that bicyclists should "take the lane" by directing them into safe, shared-lane positioning.

business greening: program that involves consultation and implementation of measures to reduce energy and water use and waste, purchase environmentally preferable products, and educate staff and customers.

community: for the purpose of this document, whenever the term community is used it is meant to include the following groups: individuals of all ages, races and abilities; organizations; government agencies; businesses; employers; employees; residents; property owners; renters; visitors; schools; students; public and private service agencies; faith communities; and local media.

clean distributed generation: distributed generation refers to generation of electricity at or near the location where that electricity will be used. This differs from traditional electricity generation, which occurs at centralized power plants and is distributed over hundreds of miles to millions of customers through the electricity "grid". For the purpose of this document, clean distributed generation (in order of preferred technology type) refers to: 1) renewable distributed generation, including electricity generated by solar photovoltaic systems, fuel cells (powered by hydrogen generated from solar, wind, or other non-fossil fuel, renewable energy technologies), and small wind generators; 2) electricity generated by high efficiency (i.e., meeting or exceeding efficiency of large natural gas power plants) natural gas generators and fuel cells using hydrogen generated through a natural gas catalyst; and 3) medium scale, high-efficiency co-generation systems (powered by natural gas) serving many properties located within close proximity of each other. Clean distributed generation does not include electricity generated by gasoline or diesel powered generators.

diversion: in reference to solid waste, diversion refers to all waste that is kept out of a landfill through recycling, beneficial reuse, composting, or other means.

ecological footprint: The ecological footprint is a tool to help measure human impacts on local and global ecosystems. The ecological footprint of a given population (household, community, country) is the total area of ecologically productive land and water used exclusively to produce all the resources (including food, fuel, and fiber) consumed and to assimilate all the wastes generated by that population. Since we use resources from all over the world and affect faraway places with our wastes, the footprint is a sum of these ecological areas — wherever that land and water may be on the planet. Thus the ecological foot¬print of Santa Monica is that area of productive land inside and outside its borders that is appropriated for its resource consumption or waste assimilation. There is a finite area of ecologically productive land and water on the Earth, which must be shared among 7 billion people as well as all of the planet's other species. The amount of ecologically productive land available globally at today's current population is approximately 5 acres per person. The ecological footprint of the average American is approximately 25 acres, far exceeding the "fair earthshare". The ecological footprint is an excellent tool for illustrating the magnitude of the change necessary for our world to become sustainable. It is also useful for evaluating and comparing the total environmental impact of specific activities and in this way, helpful for decision-making.

environmentally preferable: a product, service, activity or process that has a lesser or reduced effect on human health and the environment when compared to other products, services, activities or processes that serve the same purpose.

extended producer responsibility: responsibility of producers or manufacturers across the entire life cycle of their products, particularly to the post-consumer stage (after products are discarded and become waste). Typically once a product is sold to a consumer, the responsibility of disposing of that product becomes the responsibility of the consumer. Extended producer responsibility requires that the producer of the product maintain responsibility for recycling or proper disposal of the product once it has surpassed its useful life.

green: for the purpose of this document, green is used as shorthand to refer to any environmentally preferable product, activity, service or process.

(certified) green business: Santa Monica businesses that have met a higher standard of environmental performance, verified by SustainableWorks and the City of Santa Monica. Businesses must complete mandatory and additional measures in areas concerning staff education, waste reduction, energy efficiency, water efficiency, pollution prevention, sustainable procurement and transportation.

green housing: housing that meets or exceeds the requirements of the City's Green Building Standards Code.

greenhouse gas (GHG): greenhouse gases are natural and man-made gases in the earth's atmosphere that allow incoming solar radiation to pass through the atmosphere and warm the earth but trap radiant heat given off by the earth. The radiant heat absorbed by these gases heats the atmosphere. This is a natural process known as the "greenhouse effect" that keeps the earth habitable. The four primary greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and chlorofluorocarbons (CFCs). Since the industrial period, human activities have led to sharp increases in the levels of GHGs in the atmosphere, enhancing the greenhouse effect and contributing to rising global temperatures.

hazardous material: a material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.

hazardous waste: a waste or combination of wastes which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may cause or significantly contribute to an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health, safety, welfare or to the environment when improperly treated, stored, transported, used or disposed of, or otherwise managed.

household hazardous waste (HHW): hazardous waste that is generated by residents through the use of hazardous or potentially hazardous products in the home. Typical household hazardous wastes include spent batteries, cleaning products, pesticides, paints and solvents.

HHW programs: refers to City operated programs to reduce use of hazardous materials and safely collect and dispose of community-generated HHW. These programs include the HHW Center, which was permanently closed in 2013, home collection services, used oil collection, pharmaceutical disposal, sharps collection and establishment of local drop-off sites.

income levels: With respect to the indicators of housing affordability the following are definitions of the income levels mentioned in this document:

Very low income: annual earnings between 0 and 50% of the Los Angeles County Median Family income (MFI)

Low income: annual earnings between 51 and 80% MFI

Moderate income: annual earnings between 81 and 120% MFI

Upper income: annual earnings above 120% MFI

LEED™ certification (Leadership in Energy & Environmental Design): A rating system developed by the United States Green Building Council (USGBC) that sets definitive standards for what constitutes a green or environmentally preferable building. The certification system is self-assessing and is designed for rating new and existing commercial, institutional, and high-rise residential buildings. It evaluates environmental performance of the entire building over the building's life cycle. LEED certifications are awarded at various levels (certified, silver, gold, and platinum) according to a point-based scoring system.

livable housing: housing that is within close proximity to neighborhood serving commercial areas, transit stops and community resources such as parks and open space.

local: the term local has different definitions depending upon the context in which it is used in this document. These are described below:

1) Where local is used in reference to the economy ("local economy" or "local businesses") it refers to Santa Monica's economy or businesses located within Santa Monica.

2) Local government agencies refer to any agencies or departments of the Santa Monica city government.

3) Where local refers to food production ("locally produced") it refers to food grown in the southern half of the state of California.

4) Where local refers to resources, it refers to resources obtained or impacted within a 500-mile radius of Santa Monica.

mixed-use projects: developments which incorporate both residential and commercial uses.

modal split: the split in use of various transportation modes including: single passenger vehicles; carpools of more than one passenger; bus; rail; bicycle; and pedestrian modes.

multi-modal transportation system: a transportation system that includes affordable, alternative modes of transportation such as public transit, and infrastructure and access for alternative fueled vehicles, bicycles and pedestrians, in addition to standard vehicular transportation.

native species: plant or animal species native to the Southern California bioregion.

natural function/wildlife habitat: geographic areas that provide life-supportive functions associated with atmospheric, biological, biochemical and hydrological processes that keep our air and water clean, process waste, and support survival and reproduction of plant and animal life.

non-renewable resources: natural resources that have a finite availability worldwide. Examples include coal, oil and other petroleum products.

open space: for the purpose of this document open space refers to all land uses defined as open space in the Open Space Element of the City of Santa Monica's General Plan. These include beaches, parks, public gathering places, usable green open space in street medians, scenic highway corridors, gardens, and other publicly accessible land.

passive recreation: recreational opportunities that occur in a natural setting which require minimal development or facilities, and the importance of the environment or setting for the activities is greater than in developed or active recreation settings.

PBTs (persistent bioaccumulative toxics): chemicals that are toxic, persist in the environment and bioaccumulate in food chains and, thus, pose risks to human health and the environment. The term PBT is used primarily by the US Environmental Protection Agency (EPA), as part of its preparation of a list of such chemicals that will receive special regulatory emphasis in the United States.

POPs (persistent organic pollutants): Organic chemical substances that persist in the environment and bioaccumulate in food chains and pose a risk of causing adverse effects to human health and the environment. The term POPs is commonly used in the context of the United Nations Environment Program (UNEP) and are subject to international negotiations aiming toward their global elimination.

Note: The primary difference between PBTs and POPs is that the list of PBTs includes non-organic toxins that are not included on the list of POPs.

potable: suitable for drinking.

qualified low emission / alternative fuel vehicles: Vehicles recognized by the State of California as being low emission and/or alternative fuel vehicles. These vehicles exceed the basic standards all new vehicles must meet to be sold in California and include low emission vehicles (LEVs), ultra low emission vehicles (ULEVs), super ultra low emission vehicles (SULEVs) and zero emission vehicles (ZEVs).

rainy day: for the purpose of this document, a rainy day is any day with recorded precipitation greater than .1" in 24 hours.

regionally appropriate vegetation: plant and tree species that are environmentally appropriate for the Southern California region and that do not negatively impact native plants or animals.

rehabilitated housing: rehabilitation that increases by 25% or more the after-rehab value of the property; or a rehabilitation in which at least fifty percent of exterior walls have been removed or relocated for any duration of time.

renewable limits: harvesting resources within renewable limits refers to harvesting a renewable resource at a rate that is lower than the rate the resource can replace itself (e.g. catching fish at a rate that will allow the fish population to be maintained over time. If too many fish are caught, exceeding renewable limits, the fish population will decline). The terms renewable limits and sustainable limits are synonymous.

renewable resources: natural resources that have an unlimited supply (such as solar radiation) or that can be renewed indefinitely if ecosystem health is maintained (e.g. fisheries or forests).

rent-burdened: households that spend more than 30 percent of gross income on rent.

routine: for the purpose of this document, routine, when describing generation of hazardous waste by City government operations, refers to regular and consistent operational practices such as vehicle maintenance, regular cleaning procedures, etc. Non-routine refers to hazardous waste generated during unanticipated events such as chemical spills or leaks.

significant emissions source: sources of toxic air contaminants and other air emissions that pose a threat to human health and the environment.

SMMUSD: Santa Monica-Malibu Unified School District.

special needs groups: with respect to affordable housing, special needs groups refers to the elderly, disabled persons, large families, female-headed families, and the homeless.

sustainable: sustainable can mean slightly different things depending on the context in which it is used. For the purpose of this document, the following definitions are used: sustainable (in reference to resource use): a method of harvesting or using a resource so that resource is not depleted or permanently damaged.

sustainable business: for the purpose of this document, sustainable business refers to a business that provides goods and services, and/or has incorporated into its daily operations practices that result in cleaner air and water, less waste and pollution, conservation of energy and natural resources, less traffic, improved quality of life for residents and workers, and contribute to a strong and viable local economy.

sustainable community/city: a community or city that meets its present needs without sacrificing the ability of future generations to meet their own needs. More specifically, a sustainable community is one that improves and enhances its natural, social and economic resources in ways that allow current and future members of the community to lead healthy, productive and satisfying lives.

sustainable modes of transportation/travel: same as alternative modes of transportation above.

sustainable procurement: procurement of environmentally preferable goods and services in a way that also takes into consideration social responsibility and sustainable economic development issues in the manufacture, transportation, sale and use of those goods and services.

Sustainable Quality Awards (SQAs): The SQA is an annual event that promotes the efforts of local businesses that have made significant achievements in the areas of sustainable economic development, social responsibility, and stewardship of the natural environment. By recognizing these achievements, this awards program educates and inspires other businesses to adopt their own sustainable practices, thus helping Santa Monica become a model sustainable community, providing its residents and visitors with a healthy economy and environment.

toxic material: a substance that causes illness, injury or death by chemical means. A poison.

toxic air contaminants (TACs): air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health.

transit node: a station for public transportation along a regional transit corridor (usually rail or rapid bus) with access routes for buses, taxis, automobiles, bicycles and pedestrians.

urban villages: mixed-use developments in walkable, livable and transit-oriented districts that balance the need for sufficient density to support convenient, high-frequency transit service within the scale of the adjacent community.

vehicle miles traveled (VMT): one vehicle traveling one mile constitutes a vehicle mile. VMT is primarily an indicator of automobile use. Increasing VMT typically corresponds with increases in traffic and vehicle-related pollution.

zero emissions vehicle (ZEV): motor vehicle that produces neither tailpipe nor evaporative pollutant emissions.

zero waste: recycling or reusing over 90% of all natural and man-made materials back into nature or the marketplace rather than sending those materials to landfills or similar disposal options.

Background

On September 20, 1994 Santa Monica's City Council adopted the city's first Sustainable City Program to ensure that Santa Monica can continue to meet its current environmental, economic and social needs without compromising the ability of future generations to do the same. The program has evolved since its adoption and has been responsible for many positive changes in the community. In 2003, City Council adopted an expanded version of the program called the Sustainable City Plan (SCP), which was developed by a diverse group of community stakeholders and lays out far reaching sustainability goals for the community.
Visit www.sustainablesm.org for more details.

Measuring Sustainability

In order to reach our goals, community members must be informed, empowered and motivated. Informing the public is our primary job, and two tools were developed for accomplishing this task: the Sustainable City Report Card and the Sustainable City Progress Report.

Sustainable City Report Card: The Report Card, which is issued bi-annually, summarizes and grades our progress in meeting the Sustainable City Plan goals. The summaries are very helpful in providing a snapshot of the community's efforts to date, and the grades are a tough-minded and fair assessment of how far we have come and what challenges lay ahead.

Sustainable City Progress Report: The Progress Report is a comprehensive, web-based repository of all the data available to date on indicators used to measure our progress toward sustainability. The Progress Report website is the definitive resource for community decision makers and residents.

For more information please visit **sustainablesm.org**

City of Santa Monica

City of Santa Monica
A Sustainable Community
sustainablesm.org

Photographs provided by Greg Peterson, David Cowan, Amy Williams and City Staff

Appendix F: Water Shortage Response Plan

City of Santa Monica 2015 Urban Water Management Plan

ATTACHMENT A
City Council Meeting: September 8, 2015 Santa Monica, California

RESOLUTION NUMBER 10913 (CCS)

(City Council Series)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA MONICA ADOPTING A WATER SHORTAGE RESPONSE PLAN

WHEREAS, the State of California requires all urban water suppliers providing municipal water either directly or indirectly to more than 3,000 customers, or supplying more than 3,000 acre feet of water annually, to develop an Urban Water Shortage Contingency Plan ("WSRP"); and

WHEREAS, the City of Santa Monica is an urban water supplier providing water directly to more than 17,000 customers; and

WHEREAS, conservation of water is critically important if the City of Santa Monica is to sustain itself; and

WHEREAS, effective and equitable management of limited water supplies during a water supply shortage minimizes the impact on the people and economy of the City, in addition to the region and State; and

WHEREAS, the City of Santa Monica is granted the authority by State Water Code sections 350 et seq. and by Santa Monica Municipal Code Chapter 7.16 to declare a water supply shortage and to adopt by resolution regulations and restrictions on the delivery and consumption of water; and

WHEREAS, on June 9, 2009 Council adopted the WSRP and declared a Water Shortage Advisory calling for a voluntary 10 percent reduction in water use in response to the drought; and

WHEREAS, on January 17, 2014, the Governor declared a Drought Emergency and asked all Californians to voluntarily reduce water use by 20% in support of the Governor's efforts; and

WHEREAS, on January 29, 2014, the City increased its voluntary conservation target from 10% to 20%; and

WHEREAS, on March 1, 2014, the Governor signed Senate Bill 104, a state drought relief legislation which implements numerous drought relief measures; and

WHEREAS, on July 15, 2014, the SWRCB adopted an emergency regulation which requires urban retail water agencies, such as the City of Santa Monica, to implement all requirements and actions of their water shortage contingency plans to preserve and conserve potable water; and

WHEREAS, on August 12, 2014, the City Council adopted a resolution declaring a Stage 2 Water Supply Shortage which changed the drought response from a voluntary 20% reduction in water use to a mandatory 20% reduction and directed staff to return with a detailed Stage 2 Water Supply Shortage implementation plan; and

WHEREAS, on January 13, 2015, the City Council adopted the Water Shortage Response Plan and re-declared a Stage 2 Water Shortage Advisory; and

WHEREAS, on April 1, 2015 Governor Brown issued an Executive Order directing the State Water Resources Control Board (SWRCB) to implement restrictions for a

statewide cutback in potable urban water use of 25% through 2016. The SWRCB was directed to establish a framework of reduction levels for individual water supplies; and

WHEREAS, on April 14, 2015 the Metropolitan Water District of Southern California (MWD) approved a 15% reduction in water supplied to its member agencies from July 1, 2015 through June 30, 2016. Recognizing Santa Monica's water conservation efforts, the MWD modified the City's allocation reduction to 14%; and

WHEREAS, on May 5, 2015 the SWRCB set the City's mandatory water reduction level at 20% through February 2016. The City is required to provide SWRCB monthly reports to track progress; and

WHEREAS, on June 8, 2015 the City's Water Use Allowances went into effect for water customers, excluding recycled water customers; and

WHEREAS, prompt implementation of a Stage 2 Water Supply Shortage remains essential to combat the ongoing water shortage; and

WHEREAS, City staff has actively solicited public participation and input in the formulation of these proposed regulations as required by Water Code Section 10642; and

WHEREAS, public notice of the public hearing regarding these proposed regulations and the Stage 2 Water Supply Shortage Declaration has been duly provided as required by Water Code Section 10642; and

WHEREAS, the City Council finds that it is necessary to adopt these additional regulations to preserve and conserve the City's potable water resources.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF SANTA MONICA DOES RESOLVE AS FOLLOW:

SECTION 1: Adoption of Water Shortage Response Plan. Pursuant to Water Code section 375 et seq. and Santa Monica Municipal Code Chapter 7.16, the City Council adopts a Water Shortage Response Plan, attached as Attachment A to this Resolution.

SECTION 2. If any section, subsection, sentence, clause, or phrase of this Resolution or of the WSRP is for any reason held to be invalid, such determination shall not affect the validity of the remaining portions of this Resolution or of the WSRP. The City Council hereby declares that it would have passed this Resolution and the WSRP and each and every section, subsection, sentence, clause, or phrase not declared invalid without regard to whether any portion of the resolution would be subsequently declared invalid or unconstitutional.

SECTION 3. The City Clerk shall attest to the passage of this Resolution and thenceforth and thereafter the same shall be in full force and effect. In accordance with Water code section 376 the City Clerk shall cause the same to be published once in the official newspaper within 10 days after its adoption. This Resolution shall become effective upon adoption.

APPROVED AS TO FORM:

MARSHA JONES MOUTRIE
City Attorney

Attachment ~~B~~A

City of
Santa Monica®

CITY OF SANTA MONICA

WATER SHORTAGE RESPONSE PLAN

Department of Public Works
Water Resources Division
1212 5th St., Third Floor
Santa Monica, CA 90401
(310) 458-8975
www.smgov.net/water

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Attachment: Water Shortage Response Plan (1369 : Update to the Water Shortage Response Plan)

Section 1: Introduction

The City of Santa Monica City Council adopts this Water Shortage Response Plan (WSRP) pursuant to Santa Monica Municipal Code ("SMMC") section 7.16.030. The WSRP is intended both as an action plan and as the implementing regulations for water conservation as authorized by Section 7.16.030. It is designed to reduce water demand during water shortages. The WSRP is based in part on the State of California Department of Water Resources *2007 Urban Drought Guidebook.* The Urban Water Management Planning Act (Section 10632 of the California Water Code) requires water shortage contingency planning as a component of the Urban Water Management Plan, which is updated every five years.

The WSRP establishes five stages of water shortage severity based on predicted or actual water supply reductions. Each stage establishes water use reductions through voluntary or mandatory measures. Triggers for implementing the WSRP may include such events as a state or local emergency; natural disaster; a localized event that critically impacts the water supply; drought or the City's wholesale water agency imposing water allocation restrictions.

Section 2: Objectives and Priorities of Water Use

A. The objectives of the WSRP are to:

(1) Prioritize essential uses of available water;
(2) Avoid irretrievable loss of natural resources;
(3) Manage current water supplies to meet ongoing and future needs;
(4) Maximize local municipal water supplies;
(5) Eliminate water waste city-wide;
(6) Create equitable demand reduction targets; and
(7) Minimize adverse financial effects.

B. The following priorities for use of available water are listed in order from highest to lowest priority:

(1) Health and Safety including: consumption and sanitation for all water users; fire suppression; hospitals, emergency care, nursing and other convalescent homes and other similar health care facilities; shelters and water treatment;
(2) Institutions, including government facilities and schools such as public safety facilities, essential government operations, public pools and recreation areas;
(3) All non-essential commercial, institutional, and residential water uses;
(4) New water demand.

Section 3: Triggers for Implementation

The City Council may declare by resolution that an Advisory or Stage 1, 2, 3 or 4 Water Supply Shortage exists and that the actions outlined in this WSRP are necessary. Upon Council adoption by resolution, any Advisory or Stage may be rescinded. The type of event which may prompt the City Council to declare an Advisory or Stage1, 2, 3, 4 Water Supply Shortage may include, among other factors:

- Drought;
- State or local emergency;
- A natural disaster that critically impacts the water treatment or water distribution system;
- A localized event that critically impacts the water supply, water quality, water treatment or water distribution system;
- The City's wholesale water agency requests extraordinary water conservation efforts in order to avoid mandatory water allocations;
- The City's wholesale water agency implements a water allocation.

Section 4: Stages of Water Shortage Supply

The WSRP establishes five stages of severity based on predicted or actual water supply reductions. Each stage establishes water use reductions either through voluntary or mandatory measures. Mandatory water restrictions include water use allowance for each water customer category. Table 1 below outlines the stages and water use reduction goals.

Table 1: Water Shortage Reduction Targets

Water Shortage Stage	Water Use Restrictions	City-wide Use Reduction Goal
Advisory	Voluntary	10%
Stage 1	Mandatory	15%
Stage 2	Mandatory	20%
Stage 3	Mandatory	30%
Stage 4	Mandatory	50%

Section 5: Water Use Restrictions for All Stages

The water conservation requirements in SMMC Section 7.16~~d~~ are permanently enforced.

Section 6: City of Santa Monica Staff Responsibilities

(A) City staff will be informed of the water supply shortage. Each staff member will be expected to use water efficiently.

(B) The City's landscaped areas will be efficiently irrigated based on the Irrigation Association's Best Management Practices.

(C) Each staff member will be expected to notify the appropriate City department immediately of any leaks seen on City property or private property.

Section 7: Water Allowances for Stages 1, 2, 3, 4

A Water Use Allowance (WUA) is established for each water customer.
The WUA shall not apply to:

(A) Any water customer of the City of Santa Monica during an Advisory water supply shortage stage;
(B) Any water customer account designated for municipal non-potable water.

Summary of Allowances
A WUA is the maximum allowable amount of water that could be used by a water customer and it is calculated as a percent reduction in the amount of water available for each water customer in the City of Santa Monica for the duration of a declared water shortage.

The WUA is calculated as a percentage of the baseline year's water usage. The baseline is calendar year 2013. Each water customer will receive a WUA for each billing period. A billing period is approximately 60-days.

Public agency, including but not limited to the City of Santa Monica, Caltrans, Santa Monica-Malibu Unified School District, individual landscape only accounts will be combined and receive one WUA. Water Use Allowances for new water accounts, new water customers, properties vacant in 2013, and water accounts with zero usage in 2013 will be based on the average usage of water customers in the same water customer class (single-family, multi-family, mixed-use, commercial, industrial, landscape, etc.) with the same meter size.

For example a single-family water customer whose home was vacant due to a remodel in 2013 and as a result of the remodel their meter size increased from ¾ inch to two inch because the house size increased significantly, shall get a WUA that is the average of other single-family homes with a two inch meter.

Water Use Allowances

The Water Use Allowance formula for residential water customers is:

The average daily baseline use per billing period x the % of water available or the residential threshold; whichever is higher

The Water Use Allowance formula for commercial and landscape water customers is:

The average daily baseline use per billing period x the % of water available

Table 2: Water Use Allowance for all Water Customers*

	~~Stage 1~~	~~Stage 2~~	~~Stage 3~~	~~Stage 4~~
~~% Water Available per Customer~~	~~85%~~	~~80%~~	~~70% or~~	~~50%~~
	Stage 1	Stage 2	Stage 3	Stage 4
	85% Water Available Per Customer	80% Water Available Per Customer	70% Water Available Per Customer	50% Water Available Per Customer
Single-Family	average daily baseline use x 0.85 or 22 HCF; whichever is higher	average daily baseline use x 0.8 or 22 HCF per billing period; whichever is higher	average daily baseline use x 0.7 or 16 HCF; whichever is higher	average daily baseline use x 0.5 or 16 HCF; whichever is higher
Multi-Family	average daily baseline use x 0.85 or 11 HCF per unit; whichever is higher	average daily baseline use x 0.8 or 11 HCF per unit; whichever is higher	average daily baseline use x 0.7 or 8 HCF per unit; whichever is higher	average daily baseline use x 0.5 or 8 HCF per unit; whichever is higher
Commercial	average daily baseline use x 0.85	average daily baseline use x 0.8	average daily baseline use x 0.7	average daily baseline use x 0.5
Landscape	average daily baseline use x 0.85	average daily baseline use x 0.8	average daily baseline use x 0.7	average daily baseline use x 0.5

*HCF is hundred cubic feet

Residential Water Conservation Thresholds – see Exhibit 1 for calculations

Water Shortage Supply Stage 1 & 2

Penalties will not be imposed for single family customers using less than 22 HCF per bi-monthly billing period and each multi-family unit per building using less than 11 HCF per bi-monthly billing period.

Water Shortage Supply Stage 3 & 4

Penalties will not be imposed for single family customers using less than 16 HCF per bi-monthly billing period and each multi-family unit per building using less than 8 HCF per bi-monthly billing period.

Section 8: Penalties

When a Responsible Party exceeds the applicable WUA during a billing period, a Penalty may be imposed through the issuance of. ~~The notice of the penalty may be issued to the responsible party in the same mailing as the utility bill~~ an administrative citation. The citation fine amount ~~and~~ will be calculated as set forth below.

~~$10 per HCF used in excess of the Water Use Allowance up to the total bi-monthly water charges or $1,000, whichever is less.~~

- first violation penalty: $250
- second violation penalty (within twelve months of the first violation): $500
- third violation penalty (within twelve months of the second violation): $1,000

Any Responsible party that exceed the WUA three times may be required to have a water audit performed by a licensed engineering firm having water audit experience and all related expenses paid by the Responsible Party. The audit must be performed and a full report submitted to the City of Santa Monica within 30-days of notice. The audit report must include how the audit was administered, list all interior and exterior uses of domestic and non-domestic water uses, results of the audit, recommendations, and return on investment calculations. The City may require the implementation of the audit recommendations as a precondition to granting any request for a WUA Adjustment.

Any Responsible Party that exceed the WUA seven or more times may have a flow restrictor installed in the meter which restricts the flow of water going into the building, be charged with a Civil Penalty, and/or be charged with a criminal penalty.

Section 9: Waiver of Penalty

Any Responsible Party that receives a first violation WUA exceedance penalty may choose to attend a City offered water school. Upon successful completion of the water school, the penalties associated with the first violation shall be waived. The City Manager or his or her designee is authorized to develop regulations to implement the water school program consistent with the policies, objectives and priorities of this Plan.

Section ~~9~~10: Water Use Allowance Adjustment

Application for Water Use Allowance Adjustment

- Comply with requirements listed under Required Finding for an Adjustment.
- Fill out a Water Use Allowance Adjustment Application available at ~~www.smgov.net/water and~~ 1717 4th St., Suite 150, Santa Monica, CA 90401.
- Submit completed application and required supporting documentation (such as photographs, itemized receipts, maps, drawings, engineering reports, water audit reports, utility bill showing participation in any low income assistance program, or other pertinent information) by mail or in-person at 1717 4th St., Suite 150, Santa Monica, CA 90401.

Approval Authority
The Adjustment Administrator will exercise approval authority and act upon any completed Water Use Allowance Adjustment Application after submittal and may approve, conditionally approve, or deny the adjustment request. The applicant requesting the adjustment will be notified in writing of any action taken.
The decision of the Adjustment Administrator shall be issued within sixty days after the conclusion of the hearing or the submission of all written materials if no hearing is conducted. The applicant may appeal any such decision pursuant to Chapter 6.16 of this Code. Unless specified otherwise at the time the adjustment is approved, the adjustment applies to the subject property during the term of the applicable stage of the WSRP.

Factors to be considered by the Approval Authority in Reviewing a Water Use Allowance Adjustment Application:

- Whether denial of the application would create an undue hardship which could create an emergency condition relating to health or safety; or
- Whether an undue financial hardship to a water customer would result; or
- A new water account is requested by a new user; or
- The property was vacant (or otherwise devoid of water use) during 2013 but is now being inhabited; or
- There has been an increase in household size or change in tenancy

Required Findings for an Adjustment
An application for an adjustment will be denied unless the approving authority finds, based on the information provided in the application, supporting documentation, and/or such additional information as may be requested, and on water use information for the property as shown by the records of the City of Santa Monica, all the following:

1. The subject property has implemented all practical water saving measures at minimum, unless unique circumstances that makes meeting these requirements impossible:
    a. High-efficiency toilets (uses1.28 gallons per flush or less)
    b. High-efficiency urinals (uses 0.5 gallons or less per flush or is waterless)
    c. High-efficiency showerheads (uses 2.0 gallons per minute or less)
    d. High-efficiency faucets (uses 1.5 gallons per minute or less for residential or guest rooms; uses 0.5 gallons per minute or less for commercial)
    e. No leaks anywhere on the property
    f. No irrigation runoff and overspray
2. That the adjustment does not constitute a grant of special privilege inconsistent with the limitations placed upon other City of Santa Monica water customers.
3. That because of special circumstances applicable to the property or its use, the requirements of the Water Shortage Response Plan would have a disproportionate impact on the property or use that exceeds the impacts to customers generally.
4. That the adjustment will not materially affect the ability of the City of Santa Monica to effectuate the purpose of the Water Shortage Response Plan and will not be detrimental to the public interest.

Section 101: Definitions

Billing Period. The billing period is approximately 60 days between water meter readings;

Commercial Water Customer. Any water customer whose property is not designated as single family, multi-family or landscape only. This may include mixed-use properties, schools, businesses;

HCF. The billing measurement for water in hundred cubic feet. One HCF is equal to 748 gallons;

Irrigation. Any system for distribution of pressurized water in the landscape, including but not limited to any system in which any portion is installed below grade or affixed to any structure;

Landscape. Modification of the ground surface with live planting materials such as trees, shrubs, turf, groundcover or other horticultural materials; as well as non-living materials such as mulch, synthetic turf, hardscape, or stone;

Landscape Only Account. Any water meter installed to measure the flow of water for irrigation and landscape purposes only;

Master Meter Account. A meter that serves multiple tenants in a building and may include but is not limited to water used for common areas such as toilets, urinals, laundry, irrigation equipment and pools;

Multi-Family. A residential property with two or more units on the premises. This may include master metered or individually metered units;

Multi-Family Individual Meter Account. A meter that serves only one unit and does not include outdoor or landscape water use;

New Water Account. A new water service connection where one was not previously installed;

Responsible Person or Party. Also referred to as the water customer or any other party responsible for the violation.

Potable Water. Water suitable or intended for human consumption;

Single-Family. A residential property with one unit;

Shortage. The actual or projected demand for water placed upon the water supply system by water customers which exceeds the actual supply, where the actual supply of

water is the amount of water available for delivery from the municipal water supply system for subsequent delivery to water customers;

Water: All potable water supplied from the municipal water supply system to any water customer. Non-potable water that is metered separately is excluded;

Water Customer. The person designated on the water account records maintained by the City as the person responsible for payment of charges incurred for the use of the water supply system.

Water Demand. The amount of water used by water customers;

Water Use Allowance. The amount of water assigned to water customers based on a percentage of the baseline water usage.

Attachment: Water Shortage Response Plan (1369 : Update to the Water Shortage Response Plan)

Exhibit 1 – Residential Water Conservation Threshold Calculations

The water use allowance is a percentage of 2013 water usage. Each water customer will receive a WUA for each billing period. Residential water customers that are at or below the residential water conservation threshold outlined in Section 7 will not need to reduce water use.

The residential water conservation thresholds are calculated based on the following:

Assumptions for Calculating the Water Conservation Thresholds:

1. Number of Single Family Residents per Home = 4 (based on 2010 Census data)
2. Number of Multi-Family Residents per Unit = 2 (based on 2010 Census data)

Table 5: Water Use Gallons Per Capita Day Calculation Stage 1 & 2 based on AWWA Residential End Uses Report and pre-2013 plumbing code standards

Allocated water use is 68 gallons per capita per day (gpcd)		
Toilets	5 flushes x 1.6 gallons per flush	8.0
Shower/bath	5 min x 2.5 gallons per minute	12.5
Clothes Washer	1/3 load	6.0
Kitchen/Dishwasher	4 gpcd	4.0
Bathroom Sinks	4 gpcd	4.0
Inside Total (gpcd)		34.5
Cleaning/outdoor Use		33.5
TOTAL		68.0 gpcd

Table 6: Water Use Gallons Per Capita Day Calculation Stage 3 & 4 based on AWWA Residential End Uses Report and 2013 plumbing code standards

Allocated water use is 50 gallons per capita per day (gpcd)		
Toilets	5 flushes x 1.6 gallons per flush	8.0
Shower/bath	5 min x 2.5 gallons per minute	12.5
Clothes Washer	1/3 load	6.0
Kitchen/Dishwasher	4 gpcd	4.0
Bathroom Sinks	4 gpcd	4.0
Inside Total (gpcd)		34.5
Cleaning/outdoor Use		15.5
TOTAL		50.0 gpcd

Single-family Water Customer Threshold Calculation:
68 gallons gpcd x 4 people x 60 days (bi-monthly billing period) x 748 gallons (HCF) = 22 HCF

Multi-family Water Customer Threshold Calculation:
68 gallons gpcd x 2 people/unit x 60 days (bi-monthly billing period) x 748 gallons (HCF) = 11 HCF/unit

Table 7: Threshold Water Use Billing Unit (HCF) Calculations

	Stage 1 & 2	**Stage 3 & 4**
Single Family Water Account	22 HCF/bi-monthly billing period	16 HCF/ bi-monthly billing period
Multi-Family Master Meter Water Account	11 HCF//unit/ bi-monthly billing period	8HCF/ unit/bi-monthly billing period

Attachment: Water Shortage Response Plan (1369 : Update to the Water Shortage Response Plan)

Adopted and approved this 8th day of September, 2015.

Kevin McKeown

Kevin McKeown, Mayor

I, Sarah P. Gorman, City Clerk of the City of Santa Monica, do hereby certify that the foregoing Resolution No. 10913 (CCS) was duly adopted at a meeting of the Santa Monica City Council held on the 8th day of September, 2015, by the following vote:

AYES:	Councilmembers:	Davis, Himmelrich, O'Connor, O'Day, Winterer, Mayor McKeown, Mayor Pro Tem Vazquez
NOES:	Councilmember:	None
ABSENT:	Councilmember:	None

ATTEST:

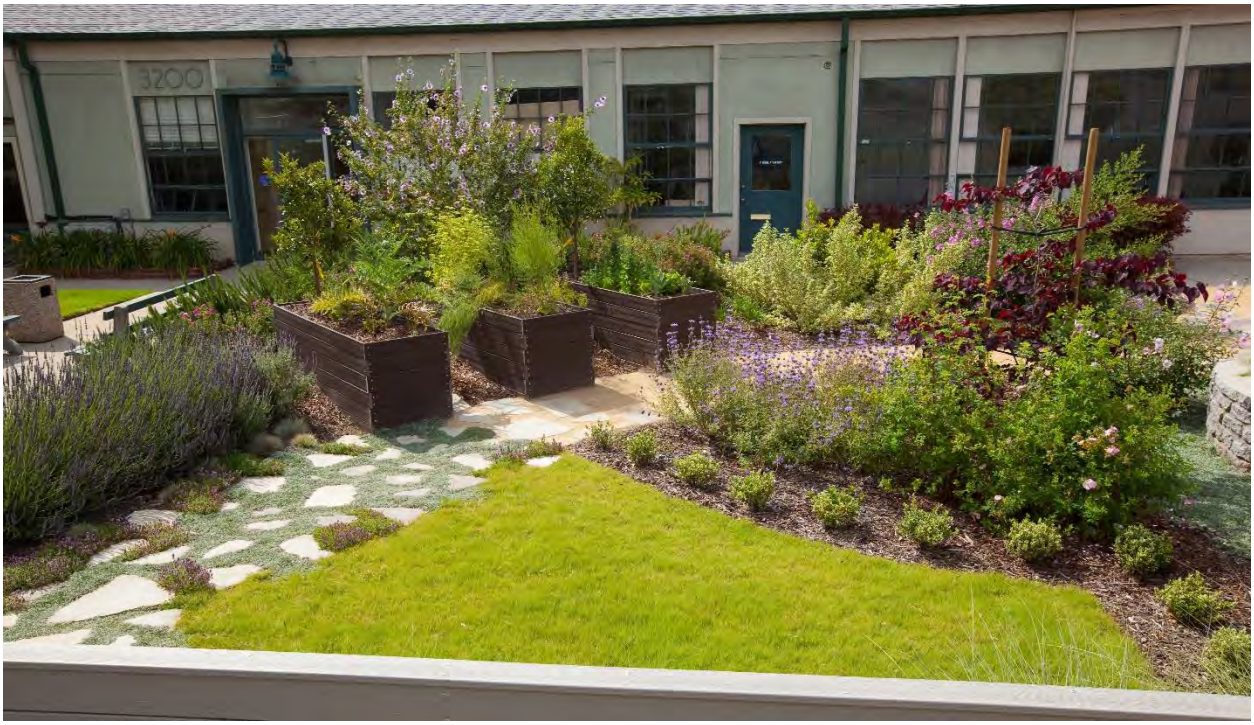
Sarah P. Gorman, City Clerk

Appendix G: Water Efficient Landscape & Irrigation Standards

City of Santa Monica 2015 Urban Water Management Plan

Water-Efficient Landscape and Irrigation Standards

Revised 10/27/2015



The following <u>standards</u> apply to the design, installation and maintenance of landscape and irrigation systems in the City of Santa Monica per the Santa Monica Municipal Code (SMMC) 8.108.

These requirements are based on the California Department of Water Resources State Model Water Efficient Landscape Ordinance and the Irrigation Association's *Turf & Landscape Irrigation Best Management Practices*, 2014 edition and tailored to the ordinances, policies and climate of the City of Santa Monica.

Published by the City of Santa Monica
Office of Sustainability and the Environment
www.sustainablesm.org/landscape

Photo by Amy Williams Photography of the Airport Demonstration Garden at 3200 Airport Avenue, Santa Monica, CA 90405

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Section 1: Definitions

For purposes of the Water-Efficient Landscape and Irrigation Standards, the following words or phrases shall be defined as follows:

A. **Alternate Water Supply or Source.** Non-potable water supply such as, but not limited to, graywater, municipal recycled water, rainwater, and urban runoff.

B. **Anti-Siphon Valve.** Backflow device configured with a single moving part, a float, which moves up or down to allow atmospheric air into the piping system to prevent back siphoning of water from irrigation lines into the drinking water. Must be installed at least six inches (6") above the highest sprinkler, elevated piping or emission outlet.

C. **Artificial turf.** A surface of synthetic fibers made to look like natural grass.

D. **As-builts.** A set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other information furnished by the contractor.

E. **Automatic Irrigation Controller.** An automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

F. **Backflow Prevention Device.** A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

G. **Bubbler.** Water emission device that tends to bubble water directly to the ground or that throw water a short distance, on the order of one foot, (300 mm) before water contacts the ground surface at a flow rate of half gallon per minute (0.50 gpm) or less.

H. **Certified Irrigation Designer.** A person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as, but not limited to, the US Environmental Protection Agency's WaterSense Irrigation Designer Certification program and Irrigation Association's Certified Irrigation Designer program.

I. **Check Valve or Anti-drain Valve.** A one-way valve located in an irrigation system, including but not limited to, the lateral line, sprinkler head, or drip emitter, designed to hold water in the system to prevent drainage from the system when the remote control valve is deactivated.

J. **Compost.** The safe and stable product of controlled biologic decomposition of organic materials that is beneficial to plant growth.

K. **Container Planting.** Pots or containers, not permanently installed, containing soil for growing plants.

L. **Commercial Landscape.** Landscapes associated with commercial, industrial, and institutional properties, and mixed-use development projects.

Section 1: Definitions

M. **Drip Irrigation.** Method of micro irrigation wherein water is applied to the soil surface as drops or small streams through emitters on or within polyethylene tubing at a rate of two (2) gallons per hour or less.

N. **Drip Irrigation Zone.** The landscape area irrigated by a drip irrigation system.

O. **Drip Irrigation System.** All the equipment required to convey water to a drip irrigation zone including but not limited to the backflow prevention assembly, valve, filter, pressure regulator, pipe, lateral line, tubing, emitters, stakes and flushing mechanism.

P. **Edible Plants.** Plants grown for the sole purpose of being consumed as food by human beings.

Q. **Emission outlet or emission device.** A watering device or location where water is discharging from an emitter or watering device.

R. **Establishment Period.** The first six to eight weeks after installing plant material in the landscape area, containers, or planters.

S. **Existing Landscapes.** A landscape area in which the plant material has developed significant root growth after one year.

T. **Flow sensor.** An inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves.

U. **Graywater.** Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

V. **Green Roof.** A roof of a building that is partially or completely covered with vegetation and a growing medium planted over a waterproof membrane.

W. **Hydrozone.** A portion of the landscaped area having plants that are grouped according to similar water needs based on microclimate, irrigation type, and plant water requirements among other factors.

X. **Impermeable Hardscape**. Any form of pavement or other surface which is not designed to permit water to pass through it to the soil below.

Y. **Institutional Landscapes.** Commercial landscapes associated with a private school, church, hospital or public institution.

Z. **Irrigation System.** Any system, excluding water features for distribution of water through a pressurized system within the landscape area, including but not limited to any system in which any portion is installed below grade or affixed to any structure.

Section 1: Definitions

AA. **Landscape Area.** Means all water features and the planting areas irrigated with a permanent, temporary, or non-permanent irrigation system which could include turf areas, planter beds, green roofs or walls, planters, raised beds and vegetated paths. It also includes pervious hardscapes (sidewalks, driveways, decks, patios, gravel or stone walks) and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation). The landscape area does not include footprints of buildings or structures, non-pervious sidewalks, driveways, parking lots, parkways, decks, patios, walks, other non-pervious hardscapes.

BB. **Landscape water service meter.** An inline device installed at the irrigation point of connection that measures the flow of water into the irrigation system to record water use. "Dedicated" landscape water service meters are installed and maintained by the City of Santa Monica.

CC. **Landscaping.** Modification of the ground surface, planters, containers or raised beds with live planting materials such as trees, shrubs, turf, groundcover or other horticultural materials; as well as non-living materials such as, but not limited to, artificial turf, mulch, permeable hardscape, or stone.

DD. **Lateral line.** The water delivery pipeline that supplies water downstream from the valve to the emitters or sprinklers.

EE. **Maintenance.** The upkeep of any landscaped area, landscaping or irrigation system.

FF. **Manual Shut-off Valve.** A valve manually operated and installed at the irrigation point of connection which controls water flow into the irrigation system and when closed, water will not be supplied to the irrigation system to minimize water loss in case of an emergency (such as a main line break) or to perform repairs.

GG. **Master Shut-off Valve**. An automatic valve installed at the irrigation point of connection upstream from the remote control valves which controls water flow into the irrigation system and when closed, water will not be supplied to the remote control valves to minimize water loss when excessive flow conditions from a leak or broken emission device are detected by a flow sensing device.

HH. **Micro-Spray.** Method of low pressure, low volume micro-irrigation in which water is applied in a very fine spray or stream.

II. **Mixed-Use Development.** The development of a parcel or building with two or more different land uses such as, but not limited to, a combination of residential, office, manufacturing, retail, public or entertainment in a single or physically integrated group of structures as defined by Section 9.04.02.030.500.

JJ. **Modifications.** Replacement or addition to any existing landscaping or irrigation system.

Section 1: Definitions

KK. **Mulch**. Any organic material such as leaves, bark, wood chips, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

LL. **Multi Outlet Emitter.** A point source emission device consisting of two or more drip emitters connected to one quarter inch (1/4") or one eighth inch (1/8") distribution tubing.

MM. **New Development.** New construction projects as defined by Article 9 of the Santa Monica Municipal Code.

NN. **Overhead Irrigation.** Method of irrigation in which the water is sprayed, or sprinkled, through the air to the ground surface, including but not limited to spray heads, rotors, and micro-sprays.

OO. **Parkway.** The portion of the public right-of-way as defined by Section 7.24.030 of this Code.

PP. **Peak Demand Month.** Month with highest reference evapotranspiration and least amount of rainfall.

QQ. **Permeable Hardscape.** Any form of pavement or other surface that allows the passage of water and air through the material and into the underlying soil, such as but not limited to, driveways, walkways, patios, streets and alleys.

RR. **Plant Factor or Plant Water Use Factor.** A factor, when multiplied by the reference evapotranspiration (ETo), estimates the amount of water needed by plants. For purposes of these Standards, the plant factor range for very low water use plants is 0 to 0.1, the plant factor range for low water use plants is 0.1 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the California Department of Water Resources (DWR) publication Water Use Classification of Landscape Species. Plant factors may also be obtained from horticultural researchers from academic institutions or professional associations as approved by (DWR).

SS. **Plant Material.** Living plants, trees, shrubs, groundcovers, grasses, bulbs and edible plants excluding those made from plastic or man-made products.

TT. **Planter.** Permanently installed planting structures with an impermeable bottom and drain, excluding green roofs.

UU. **Point of Connection.** Location where irrigation system is connected to the water supply.

VV. **Precipitation Rate.** The rate at which water is applied to a landscape area by an irrigation system or watering device measured in inches per hour. Also known as the application rate.

WW. **Public Right-of-Way.** As defined by SMMC Section 6.28.020.

Section 1: Definitions

XX. **PVC.** Polyvinyl chloride.

YY. **Raised Bed.** A planting bed that has been raised above the surface of the ground, typically enclosed by some type of barrier such as wood or stones, for the intent of growing edible plants.

ZZ. **Recreational Area**. Landscape areas, excluding residential areas, designated for active play, recreation, and public assembly such as in parks, sports fields, picnic grounds, and amphitheaters.

AAA. **Recreational Turfgrass.** Landscape areas, excluding residential areas, dedicated to active play such as courtyards, parks, sports fields, and golf courses where turf provides a surface for active play and public assembly.

BBB. **Remote Control Valve.** Valve which is actuated by an automatic controller by electric or hydraulic means.

CCC. **Residential Landscape.** Landscapes associated with single and multi-family homes or units.

DDD. **Soil Moisture Sensing Device or Soil Moisture Sensor.** A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

EEE. **Soil Texture.** The classification of soil based on its percentage of sand, silt, and clay.

FFF. **Spray Head**. A sprinkler head that does not rotate.

GGG. **Sprinkler.** Any watering device which distributes water by projecting it into the air.

HHH. **Sprinkler Irrigation Zone.** The landscape area irrigated by a sprinkler irrigation system.

III. **Sprinkler Irrigation System.** All the equipment required to convey water to a sprinkler irrigation zone including but not limited to the backflow prevention assembly, valve, pipe, lateral line, risers, swing joint, and sprinkler or spray head.

JJJ. **Subsurface Drip Irrigation**: Drip irrigation installed below grade.

KKK. **Turfgrass.** Also called turf or lawn. Any plant material listed as turf in WUCOLS or a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

LLL. **Urban Runoff.** Water and suspended or dissolved materials deposited on surfaces and washed by storms or other sources of flowing water, through the flood control system.

Section 1: Definitions

MMM. **Water Feature.** A design element in which open water performs an aesthetic or recreational function. Water features may include waterfalls, fountains, and streams, where water is artificially supplied. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and are used solely for water treatment or stormwater retention are not water features. Hot tub, spa, permanent swimming or wading pool are not considered water features.

NNN. **Watering Device.** Any device for distribution of pressurized water to landscaping.

OOO. **WUCOLS.** Water Use Classification of Landscape Species, an evaluation of the irrigation water use needs of select plants, published by the California Department of Water Resources.

PPP. **Valve.** A device that opens and closes to allow pressurized water to flow through pipes.

Section 2: New Development Project Plan Submittal Requirements

The following items will be required prior to the issuance of a building permit for all new development projects. Any revisions to the city-approved plans will require re-submittal and approval. Do not include landscape plants, hardscape, or irrigation systems within the parkway on the plan set.

A. **General Plan requirements**
   a. **Cover Sheet ***
   b. **Construction Plan ***
   c. **Landscape Planting Plan** *
   d. **Landscape Planting Detail and Specification Plan ***
   e. **Landscape Elevation Drawings ***
   f. **Hydrozone Matrix ****
   g. Irrigation Plan **
   h. Irrigation Detail and Specifications Plan **

***** Must bear the signature of a licensed architect, licensed landscape architect, licensed landscape contractor, licensed engineer or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)
** Must bear the signature of a certified irrigation designer, licensed architect, licensed landscape architect, licensed landscape contractor, licensed engineer or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

B. **Plan requirements for landscapes without permanent automated irrigation systems**
   a. Landscapes installing new plant material but without a permanent, automated irrigation system, where water is accessed only through a hose bib or quick coupler connection, are not required to submit a hydrozone matrix, an irrigation plan, or an irrigation detail and specifications plan. On the Landscape Planting Plan add this note: “No permanent, automated irrigation system to be installed. Any future irrigation system installation will require a full landscape plan submittal for City of Santa Monica review and approval prior to installation.”
   b. Individual single family dwellings installing no new landscaping, other than mulch and artificial turf, and no new irrigation system, shall be required only to submit a construction plan with this note: “No new permanent, automated irrigation system to be installed. A minimum 3 inch (3”) layer

Section 2: New Development Project Plan Submittal Requirements

of mulch shall be applied on all exposed soil surfaces of existing planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications, where mulch is not appropriate. Any revisions to approved plans will require re-submittal and approval and must comply with the current Water-Efficient Landscape and Irrigation Standards. Call (310) 458-8405 to schedule an inspection."

i. If designating insect habitat, up to five percent (5%) of the landscape area may be left without mulch. Designated insect habitat must be clearly identified on the construction plan.

Section 3: New Development Project General Requirements

A. Any revisions to approved plans will require re-submittal and approval by City staff prior to installation.
B. Contact all appropriate utility companies prior to beginning installation, to locate underground utilities including gas lines, electrical, telephone, cable, and so forth. State laws require anyone who digs to notify utility companies before starting. The installation should not be started until all underground utilities are located and marked and plans have been approved.
C. Install the irrigation system according to the approved design, specifications and manufacturer's published performance standards.
D. Open Trench Inspection
    a. An open-trench inspection by City staff is required prior to covering below grade pipes, laterals, and mains. The designer of the landscape, or their designee, and general contractor performing the installation must attend the open trench inspection.
E. Prior to Final Inspection
    a. Installer shall test the irrigation system to verify that it meets the approved design and specifications.
    b. Installer must program the irrigation controller.
F. Final Inspection
    a. A final inspection by City staff is required prior to Certificate of Occupancy to ensure that the system was built to approved plans and specifications. The following items will be required at final inspection prior to the issuance of a Certificate of Occupancy:
        i. Post-installation soil test results which must contain the percentage (%) of organic matter; may also include but is not limited to soil texture; infiltration rate or soil texture infiltration rate table; pH; total soluble salts; sodium; and recommendations determined by laboratory test. Exception: Landscapes contained entirely in planters are exempt from this requirement.
        ii. A detailed irrigation controller map must be installed inside or near the irrigation controller with at minimum a description for each zone including: plant material, watering device, valve or station number, run time for peak demand month and precipitation rate.
        iii. Irrigation schedules including establishment period start and end dates, must be posted inside the irrigation controller housing unit by the installer.
        iv. Electronic submission of an As-Built set of plans to the City is required if requested by City inspector.

Section 4 Water Feature Requirements

A. Any outdoor water feature installed in any landscaped area after the effective date of these Standards shall:
    a. Use a water recirculation system;
    b. Not have any water that is sprayed into the air visibly land outside the water features; and
    c. Not have any water spray or run onto surrounding landscape or impermeable hardscape areas.
B. The total cumulative surface area of all water features on a site may not exceed 25 square feet unless the feature uses water from an approved alternative water source and delivery system.
C. Existing water features may be repaired but the cumulative surface area may not increase.
D. Public agencies shall be exempt from this requirement.

Section 5:
Residential Landscapes

Photo by Amy Williams Photography

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Section 5A: Residential Landscapes
Requirements for Residential New Development Projects

A. **Plant Material Requirements**

a. The total maximum area permitted for installation of turfgrass and high water need plants defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the California Department of Water Resources (DWR) is twenty percent (20%) of the total landscaped area, including existing plant material. Alternative documentation of water use from horticultural researchers at academic institutions or professional associations as approved by DWR may be presented for plants not listed in WUCOLS.

b. The total cumulative landscape area of all high and moderate water using plants, including existing plant material, shall not exceed forty percent (40%) of the total landscape, excluding edibles and areas watered with an approved alternate water supply.

c. Turfgrass, including existing plant material, is not allowed on slopes greater than twenty-five percent (25%) where the toe of the slope is adjacent to an impermeable hardscape and where twenty-five percent (25%) means one foot (1') of vertical elevation change for every four feet (4") of horizontal length (rise divided by run x 100 = slope %).

d. Turfgrass, including existing plant material, is prohibited in narrow, irregularly shaped spaces with an average width of ten feet (10') or less.

e. Plant material listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization are prohibited, including existing plant material, except for known non-fruiting, non-invasive, sterile varieties, cultivars or selections.

f. Plant material shall be grouped together into hydrozones based on similar watering needs.

B. **Amendments and Mulch Requirements**

a. For landscape installations, compost at a rate of a minimum of four cubic yards (4 yd^3) per one thousand square feet (1000 ft^2) of permeable area shall be incorporated to a depth of six inches (6") into the soil. Soils with greater than six percent (6%) organic matter in the top six inches (6") of soil are exempt from adding compost and tilling. A post installation soil test must show a six percent (6%) organic matter content or greater.

b. A minimum three inch (3") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications where mulch is not

Section 5A: Residential Landscapes
Requirements for Residential New Development Projects

appropriate. To provide habitat for beneficial insects and other wildlife, up to five percent (5%) of the landscape area may be left without mulch. Designated insect habitat must be clearly identified on the construction or landscape plan.

c. No mulch shall be applied within six inches (6”) of the base of trees.
d. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.
e. Areas designated as mulch on approved landscape plans, including areas covered by wood chips, gravel, stone, decomposed granite, and areas designated as artificial turf on approved landscape plans cannot be replaced with turfgrass or high water use plants as defined in the current edition of WUCOLS, once mulch or artificial turf has been installed.

C. **Irrigation System Requirements**

a. **General Irrigation Requirements**

i. All existing sprinklers and spray heads shall be removed.
ii. The installation of new sprinkler irrigation systems are prohibited, including parkways. Exception: Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.
iii. Hoses used for irrigation shall be equipped with an automated, shut off nozzle.
iv. Hose bibbs shall be equipped with a built-in pressure vacuum breaker.
v. Drip irrigation and bubblers must be on separate valves.
vi. Design landscape and irrigation systems in parkways according to all local, state, and federal laws and regulations. Installation of an irrigation system within a parkway cannot result in the damage of the roots of any existing street trees.
vii. Trees shall be irrigated on a separate valve unless the tree is located in a planter.
viii. Graywater irrigation systems must conform to Chapter 16 of the California Plumbing Code.
ix. Root vegetables shall not be irrigated with graywater.
x. Alternate water supply irrigation systems must conform to all local, state, and federal laws and regulations.
v. Low-head drainage is prohibited. Anti-drain valves or check valves in drip emitter devices are required to prevent low-head drainage.

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Requirements for Residential New Development Projects

vi. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

xi. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance. If the water pressure is below the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is not required.

xii. Pressure regulation may include a single master pressure regulator and may be used for the entire system if the dynamic pressure at each emission device has the same manufacturer's recommended pressure range for optimal performance. It must be located after the master backflow prevention device, if present.

xiii. A single large capacity master filter may be used but must be located after the master backflow prevention device and master pressure regulator, if present.

b. **Water Supply, Meter & Valve Requirements**

i. Label all types of water proposed including potable and alternative water supplies per local, state and federal laws and regulations.

ii. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply.

iii. A master shut-off valve is required for all automatic irrigation systems except in systems that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features. A master shut off valve show be installed as close as possible to the point of connection of the water supply but upstream from the remote control valve(s) which control(s) water flow into the irrigation zones.

vii. Cross-Connection Prevention (Backflow Prevention) as required by SMMC Section 7.12.370.

Section 5A: Residential Landscapes
Requirements for Residential New Development Projects

viii. Dedicated landscape water service meters shall be installed on residential landscape areas greater than five thousand square feet. (5,000 ft^2).
iv. A flow sensor that detects high flow conditions created by system damage or malfunction is required for all automatic irrigation systems.
v. All irrigation valves must be appropriately tagged and labelled in accordance with all local, state, and federal laws and regulations.
vi. Valve boxes, if installed, must be large enough to service irrigation equipment inside and be installed over a layer of coarse stone or gravel while maintaining an air space between valves and the layer of stone.

c. **Pipe Requirements**
i. Specify main and lateral pipe sizes that will result in the velocity of water moving through these pipes at a rate not exceeding five feet (5') per second for pipes under three inch (3") in diameter and not exceeding seven feet (7') per second for pipes three inch (3") or greater in diameter.
ii. Use Schedule 40 or Class 315 solvent weld-type PVC pipe for mains, below grade laterals, or piping under roadways. Class 125 pipe is not permitted.
iii. IPS flexible PVC pipe or flexible HDPE pipe may be substituted for rigid PVC pipe below grade in lateral lines only to avoid underground obstructions encountered during trenching or tunneling.
iv. Use Schedule 40 UV resistant PVC, Schedule 80 PVC or metal piping for all above grade pipes.
v. Pipe in the same trench must be laid side-by-side and not overlapped. Provide three inch (3") vertical and horizontal clearance between irrigation lines and six inch (6") clearance between lines of other work. Do not install parallel lines directly over any other line.
vi. PVC fittings must be of the same chemical compound as pipe on which they are installed.
ix. PVC cement must be have the proper adhesive value for the pipe on which it is used.

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Requirements for Residential New Development Projects

vii. Backfill shall not have rocks or debris greater than half inch (½") in size next to the pipe.

x. Under vehicle paving or sidewalks, install a sleeve made of permanent rigid material (PVC Sch 40 or Class 160) that is twice the size of the pipe it will hold and should extend one foot (1') beyond the edge of the hard surfaces.

viii. Properly identify any applicable alternative water supply discharge piping, system components and area(s) of distribution.

ix. Trench or tunnel depth must be sufficient to obtain a minimum depth of cover over the installed pipe and control wire which conforms to the following dimensions. Where pipe and/or conduit are placed below paving or hardscape, the minimum burial depths are:

Pressure Lines ≤2 inches in landscaping	12 inch
Pressure Lines >2 inches in landscaping	18 inch
Pressure Lines under non-vehicular paving	18 inch
Pressure Lines under vehicular paving	24 inch
Non-pressure Lines ≤2 inches in landscaping	12 inch
Non-pressure Lines >2 inches in landscaping	12 inch
Non-pressure Lines under non-vehicular paving	12 inch
Non-pressure Lines under vehicular paving	18 inch
Conduit in landscaping	12 inch
Conduit under non-vehicular paving	18 inch
Conduit under vehicular paving	24 inch

d. **Automatic Irrigation Controller Requirements**

i. Refer to the California Green Building Standards Code (Cal Green)

e. **Drip Irrigation Requirements**

i. If installing new irrigation zones or systems, drip irrigation is required for all plant material. Exception: Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for trees of a size twenty-four inch (24") box or larger. A maximum of

Section 5A: Residential Landscapes
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two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.

ii. Drip irrigation shall have a minimum operational emission uniformity of eighty-one percent (81%).
iii. Drip irrigation emitters shall emit no more than two gallons per hour (2 gph).
iv. Multi-outlet emitters are prohibited.
v. Only container plantings, raised beds, and edible plant areas irrigated with micro-spray may use one quarter inch (1/4") or one-eighth inch (1/8") solid tubing (also referred to as "spaghetti tubing").
vi. Drip irrigation valve assemblies are required for each drip irrigation zone and must include:
    1. Anti-siphon valve, if a master backflow protection device is not specified;
    2. In-line remote control valves only if there is a master backflow prevention device at the point of connection;
    3. Pressure regulator, if a master pressure regulator for the entire irrigation system is not specified;
    4. Filter with a one hundred-fifty to two hundred (150 – 200) mesh, wye or tee filter, if a master filter for the entire irrigation system is not specified;
    5. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.
vii. A flushing mechanism for each drip irrigation zone is required.
viii. For sub-surface drip irrigation zones, an operational indicator is required.
ix. Wire stakes shall be U-shaped galvanized steel wire stakes and shall be installed at minimum every three feet (3').
x. Drip tubing shall be made of polyethylene or PVC.

Section 5B: Residential Landscapes
Modifications to Existing Residential Landscaped Areas Excluding New Development Projects

There is no landscape permit or plan submittal requirement. The following requirements apply when new plant materials and/or irrigation are installed on existing landscapes or existing plant materials and/or irrigation are replaced:

A. **Plant Material Requirements For Modified Landscaped Areas**

i. The total square footage of turfgrass and high water need plants defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the Department of Water Resources (DWR) shall not exceed eighty percent (80%) of the landscape area. Alternative documentation of water use from horticultural researchers at academic institutions or professional associations as approved by DWR may be presented for plants not listed in WUCOLS.

ii. Turfgrass installations are not allowed on slopes greater than four percent (4%) where the toe of the slope is adjacent to an impermeable hardscape or property line and where four percent (4%) means one foot (1') of vertical elevation change for every twenty-five feet (25') of horizontal length (rise divided by run x 100 = slope %).

iii. Turfgrass installations are prohibited in narrow, irregularly shaped spaces with an average width of ten feet (10') or less.

iv. Plant material listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization are prohibited, except for known non-fruiting, non-invasive, sterile varieties, cultivars or selections.

v. When replacing diseased or dead plant materials, these plants may be replaced in kind or may be replaced with plant materials that have lower water needs, as rated in the current edition of the Water Use Classification of Landscape Species published by the California Department of Water Resources, or equivalent documentation.

B. **Amendments and Mulch Requirements For Modified Landscaped Areas**

i. A minimum three inch (3") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications

Section 5B: Residential Landscapes
Modifications to Existing Residential Landscaped Areas Excluding New Development Projects

where mulch is not appropriate. To provide habitat for beneficial insects and other wildlife, up to five percent (5%) of the landscape area may be left without mulch.

ii. No mulch shall be applied within six inches (6”) of the base of trees.

iii. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.

C. **Irrigation System Requirements For Modified Landscaped Areas**

a. **Requirements for New Irrigation Systems or Replacement of Existing Irrigation Systems**

i. The installation of new sprinkler irrigation systems are prohibited, including parkways. Exception: Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.

ii. Hoses used for irrigation shall be equipped with an automated, shut off nozzle.

iii. Hose bibbs shall be equipped with a built-in pressure vacuum breaker.

iv. All new irrigation systems must conform to SMMC Section 7.12.370 Cross-Connection Prevention and SMMC Section 7.16.020 Water Conservation Requirements.

v. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer’s recommended pressure range for optimal performance.

vi. Pressure regulation may include a single master pressure regulator and may be used for the entire system if the dynamic pressure at each emission device has the same manufacturer’s recommended pressure range for optimal performance. It must be located after the master backflow prevention device, if present.

vii. A single large capacity master filter may be used but must be located after the master backflow prevention device and master pressure regulator, if present.

viii. Low-head drainage is prohibited. Anti-drain valves or check valves in sprinkler heads and drip emitter devices are required to prevent low-head drainage.

ix. Design landscape and irrigation systems in parkways according to

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all local, state, and federal laws and regulations. Installation of an irrigation system within a parkway cannot result in the damage of the roots of any existing street trees.

x. Alternate water supply irrigation systems must conform to all local, state, and federal laws and regulations.

xi. Root vegetables shall not be irrigated with graywater.

xii. For new plant material where a new irrigation system is installed for that hydrozone, the irrigation system must be a drip irrigation system.
    1. Exception:
        a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for new tree sizes twenty-four inch (24”) box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
        b. Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to new edible plants.

xiii. For existing plant material where a new irrigation system is installed for that hydrozone, the irrigation system must be a drip irrigation system.
    1. Exception:
        a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for tree sizes twenty-four inch (24”) box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
        b. Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.

xiv. Newly planted trees shall be irrigated on a separate irrigation valve unless in a planter or where the existing irrigation layout makes it impractical. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for tree sizes twenty-four

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inch (24") box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.

xv. Drip Irrigation Zone:
   1. The installation of new drip irrigation systems require drip valve assemblies for each drip irrigation zone and must include:
      a. Anti-siphon valve if a master backflow protection device is not specified;
      b. In-line remote control valves only if there is a master backflow prevention device at the Point of connection;
      c. Pressure regulator if a master pressure regulator is not specified for the entire irrigation system;
      d. Filter with a one hundred-fifty to two hundred (150 – 200) mesh, wye or tee filter, if a master filter for the entire irrigation system is not specified;
      e. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.
   2. A flushing mechanism for each new drip irrigation zone is required.
   3. For subsurface drip irrigation zones, an operational indicator is required.

xvi. Drip Tubing:
   1. Drip tubing shall be made of polyethylene or PVC.
   2. Drip irrigation emitters shall emit no more than two gallons per hour (2gph).
   3. Only container plantings, raised beds and edible plant areas irrigated with micro-spray may use one quarter inch (1/4") or one eighth inch (1/8") solid tubing (also referred to as "spaghetti" tubing).
   4. Wire stakes shall be U-shaped galvanized steel wire stakes and installed every three feet (3').
   5. The installation of multi-outlet emitters is prohibited.

D. **Automatic Irrigation Controller Requirements**

Refer to the California Building Standards Code (Cal Green).

Section 5C: Residential Landscapes
Maintenance Requirements for Existing Residential Landscaped Areas

A. **General Maintenance Requirements**
   a. Irrigation systems must be maintained according to the manufacturers' specifications and in accordance with all local, state and federal laws and regulations.
   b. When replacing diseased or dead plant materials, replacements may be in kind or may be replaced with plant materials that have lower water needs, as rated in the current edition of the Water Use Classification of Landscape Species published by the California Department of Water Resources, or equivalent documentation.

B. **Requirements for Replacement of Existing Sprinkler Heads and Sprinkler Systems**
   a. Individual sprinkler heads, nozzles or valves in need of repair may be replaced; however, the installation of a new sprinkler irrigation system is prohibited, including parkways. Exception: Micro-sprays not exceeding thirty gallons per hour (30gph) may be installed on areas solely dedicated to edible plants.
   b. All replaced sprinkler heads on the same valve shall have matched precipitation rates.
   c. Repaired sprinkler irrigation zones shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).
   d. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.

Section 6:
Commercial Landscapes

Photo by Amy Williams Photography

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Section 6A: Commercial Landscapes
Requirements for Commercial New Developments

A. **Plant Material Requirements**

a. Turfgrass and high water need plants, including existing plant material, defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the Department of Water Resources (DWR) are prohibited, excluding areas watered by graywater, captured rain on site or other approved alternative water sources. Alternative documentation of water use from horticultural researchers at academic institutions or professional associations as approved by DWR may be presented for plants not listed in WUCOLS.

i. Exception:

1. Institutional landscapes and Mixed-Use Development projects may install recreational turfgrass areas.

a. High water using turf grass as defined by WUCOLS is not allowed on slopes greater than four percent (4%) where the toe of the slope is adjacent to an impermeable hardscape or property line and where four percent (4%) means one foot (1') of vertical elevation change for every twenty-five feet (25') of horizontal length (rise divided by run x 100 = slope %).

b. Turfgrass is prohibited in narrow, irregularly shaped spaces with an average width of ten feet (10') or less.

b. The total maximum area permitted for installation of moderate water need plants, including existing plant material, defined for Region 3 in the current edition of the WUCOLS issued by the Department of Water Resources is thirty percent (30%) of the total landscaped area, excluding edibles and areas watered with recycled water or other approved alternative water sources. Alternative documentation of water use from horticultural researchers at academic institutions or professional associations as approved by DWR may be presented for plants not listed in WUCOLS.

c. Plant material listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization, including existing plant material, are prohibited, except for known non-fruiting, non-invasive, sterile varieties or cultivars or selections.

d. Plant material shall be grouped together into hydrozones based on similar watering needs.

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Requirements for Commercial New Developments

B. **Amendments and Mulch Requirements**
   a. For landscape installations, compost at a rate of a minimum of four cubic yards (4 yd^3) per one thousand square feet (1,000 ft^2) of permeable area shall be incorporated to a depth of six inches (6”) into the soil. Soils with greater than six percent (6%) organic matter in the top six inches (6”) of soil are exempt from adding compost and tilling. A post installation soil test must show a six percent (6%) organic matter content or greater.
   b. A minimum three inch (3”) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications where mulch is not appropriate. To provide habitat for beneficial insects and other wildlife, up to five percent (5%) of the landscape area may be left without mulch. Designated insect habitat must be clearly identified on the construction or landscape plan.
   c. No mulch shall be applied within six inches (6”) of the base of trees.
   d. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.
   e. Areas designated as mulch on approved landscape plans, including areas covered by wood chips, gravel, stone and decomposed granite, and areas designated as artificial turf on approved plans cannot be replaced with turfgrass or high water use plants as defined in the current edition of WUCOLS, once mulch or artificial turf has been installed.

C. **Irrigation System Requirements**
   a. **General Irrigation Requirements**
      i. All existing sprinklers and spray heads shall be removed.
      ii. The installation of new sprinkler irrigation systems are prohibited, including parkways.
         1. Exceptions:
            a. Micro-sprays not exceeding thirty gallons per hour (30gph) may be used on areas solely dedicated to edible plants.
            b. Recreational turfgrass areas for Institutional and Mixed-Use Development project landscapes. Must be designed and installed in such a manner that a precipitation rate of one inch (1”) per hour is not exceeded unless using approved alternate water supply irrigation system.

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Requirements for Commercial New Developments

iii. Hoses used for irrigation shall be equipped with an automated, shut off nozzle.
iv. Hose bibbs shall be equipped with a built-in pressure vacuum breaker.
v. Sprinkler, drip irrigation, and bubblers must be on separate valves.
vi. Design landscape and irrigation systems in parkways according to all local, state, and federal laws and regulations. Installation of an irrigation system within a parkway cannot result in the damage of the roots of any existing street trees.
vii. Trees shall be irrigated on a separate valve unless the tree is located in a planter.
viii. Graywater irrigation systems must conform to Chapter 16 of the California Plumbing Code.
ix. Root vegetables shall not be irrigated with graywater.
x. Alternative water supply irrigation systems must conform to all local, state, and federal laws and regulations.
xi. Low-head drainage is prohibited. Anti-drain valves or check valves in sprinkler heads and drip emitter devices are required to prevent low-head drainage.
xii. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
xiii. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance. If the water pressure is below the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is not required.
xiv. Pressure regulation may include a single master pressure regulator and may be used for the entire system if the dynamic pressure at each emission device has the same manufacturer's recommended pressure range for optimal performance. It must be located after the master backflow device, if present.

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xv. A single large capacity grade master filter may be used but must be located after the master backflow device and master pressure regulator, if present.

b. Water Supply, Meter & Valve Requirements

vii. Label all types of water proposed including potable and alternative water supplies per local, state and federal laws and regulations.

viii. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply.

ix. A master shut-off valve is required for all automatic irrigation systems except in systems that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features. A master shut off valve show be installed as close as possible to the point of connection of the water supply but upstream from the remote control valve(s) which control(s) water flow into the irrigation zones.

i. Cross-Connection Prevention (Backflow Prevention) as required by SMMC Section 7.12.370.

ii. Dedicated landscape water service meters shall be installed on commercial landscape areas, unless landscape area is completely contained in a planter(s).

iii. A flow sensor that detects high flow conditions is required for all automatic irrigation systems.

iv. All irrigation valves must be appropriately tagged and labelled in accordance with all local, county and state laws and regulations.

v. Any valve or set of valves installed below grade shall be enclosed in a valve box. Valve boxes must be large enough to service irrigation equipment inside and be installed over a layer of coarse stone or gravel while maintaining an air space between valves and the layer of stone.

c. Pipe Requirements

i. Specify main and lateral pipe sizes that will result in the velocity of water moving through these pipes at a rate not exceeding five feet (5’) per second for pipes under three inch (3”) in diameter and not exceeding seven feet (7’) per second for pipes three inch (3”) or

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greater in diameter.

ii. Use Schedule 40 or Class 315 solvent weld-type PVC pipe for mains, below grade laterals, or piping under roadways. Class 125 pipe is not permitted.

iii. IPS flexible PVC pipe or flexible HDPE pipe may be substituted for rigid PVC pipe below grade in lateral lines only to avoid underground obstructions encountered during trenching or tunneling.

iv. Use Schedule 40 UV resistant PVC, Schedule 80 PVC or metal piping for all above grade pipes.

v. Pipe in the same trench must be laid side-by-side and not overlapped. Provide three inch (3”) vertical and horizontal clearance between irrigation lines and six inch (6”) clearance between lines of other work. Do not install parallel lines directly over any other line.

vi. PVC fittings must be of the same chemical compound as pipe on which they are installed.

vii. PVC cement must have the proper adhesive value for the pipe on which it is used.

viii. Backfill shall not have rocks or debris greater than half inch (½”) in size next to the pipe.

ix. Under vehicle paving or sidewalks, install a sleeve made of permanent rigid material (PVC Sch 40 or Class 160) that is twice the size of the pipe it will hold and should extend one foot (1’) beyond the edge of the hard surfaces.

x. Properly identify any applicable alternative water supply discharge piping, system components and area(s) of distribution;

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xi. Trench or tunnel depth must be sufficient to obtain a minimum depth of cover over the installed pipe and control wire which conforms to the following dimensions. Where pipe and/or conduit are placed below paving or hardscape the minimum burial depths are:

Pressure Lines ≤2 inches in landscaping	12 inch
Pressure Lines >2 inches in landscaping	18 inch
Pressure Lines under non-vehicular paving	18 inch
Pressure Lines under vehicular paving	24 inch
Non-pressure Lines ≤2 inches in landscaping	12 inch
Non-pressure Lines >2 inches in landscaping	12 inch
Non-pressure Lines under non-vehicular paving	12 inch
Non-pressure Lines under vehicular paving	18 inch
Conduit in landscaping	12 inch
Conduit under non-vehicular paving	18 inch
Conduit under vehicular paving	24 inch

d. Automatic Irrigation Controller Requirements

i. Refer to the California Green Building Standards Code (Cal Green)

e. Sprinkler Irrigation Requirements for Institutional and Mixed Use Development Landscapes with Recreational Turfgrass Areas

i. Must be designed and installed in such a manner that a precipitation rate of one inch (1”) per hour is not exceeded unless using approved alternate water supply irrigation system.

ii. Sprinklers shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).

iii. No sprinklers shall be located within twenty-four inches (24”) of any trees or impermeable hardscape, including but not limited to sidewalks, driveways, alleys, streets, walkways, fencing. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.

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iv. Sprinkler heads on the same valve shall have matched precipitation rates.
v. Sprinkler heads with or without multi-stream, multi-trajectory rotating nozzles, shall have built-in pressure regulation in the body or stem or shall have pressure regulating swing joints.
vi. Sprinkler heads shall have swing joints or other riser-protection components.
vii. Sprinkler heads must have a minimum of head-to-head coverage (minimum of fifty percent (50%) of diameter). Wind de-rating, if used, should be based on wind criteria for the time period that the system is normally operated.

f. **Drip Irrigation Requirements**
   i. If installing new irrigation zones or system, drip irrigation is required for all plant material.
      1. Exceptions:
         a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for new trees of a size twenty-four inch (24”) box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
         b. Recreational turfgrass in Institutional and Mixed-Use Development project landscapes.
         c. Micro-sprays not exceeding thirty gallons per hour (30gph) may be used on areas solely dedicated to new edible plants.
   ii. Drip Irrigation Zone:
      1. The installation of new drip irrigation systems require drip valve assemblies for each drip zone and must include:
         a. Anti-siphon valve if a master backflow protection device is not specified;
         b. In-line remote control valves only if there is a master backflow prevention device at the Point of connection;
         c. Pressure regulator if a master pressure regulator is not specified for the entire irrigation system;

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d. Filter with a one hundred-fifty to two hundred (150 – 200 mesh), wye or tee filter if a master filter for the entire irrigation system is not specified;
e. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.

2. Drip irrigation shall have a minimum operational lower quarter emission uniformity of eighty-one percent (81%).
3. A flushing mechanism for each new drip irrigation zone is required.
4. For subsurface drip irrigation zones an operational indicator is required.

iii. Drip Tubing:

1. Drip tubing shall be made of polyethylene or PVC.
2. Drip irrigation emitters shall emit no more than two gallons per hour (2gph).
3. Only container plantings, raised beds and edible plant areas irrigated with micro-spray may use one quarter inch (1/4”) or one eighth inch (1/8”) inch solid tubing (also referred to as ”spaghetti” tubing).
4. Wire stakes shall be U-shaped galvanized steel wire stakes and installed every three feet (3’).
5. Multi-outlet emitters are prohibited.

Section 6B: Commercial Landscapes
Modifications to Existing Landscaped Areas Excluding Commercial New Development

Permits and submittal of plans may be required under certain circumstances. The following requirements apply when new plant materials or irrigation are installed on an existing landscape or existing plant materials or irrigation are replaced:

A. **Plant Material Requirements For Modified Landscaped Areas**
   a. The installation of new turfgrass and high water need plants defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the Department of Water Resources (DWR) is prohibited, excluding areas watered by graywater, captured rain on site or other approved alternative water sources. Alternative documentation of water use from horticultural researchers at academic institutions or professional associations as approved by DWR may be presented for plants not listed in WUCOLS.
      i. Exception:
         1. Institutional and Mixed-Use Development projects may install new recreational turfgrass areas.
            a. High water using turf grass as defined by WUCOLS is not allowed on slopes greater than 4% where the toe of the slope is adjacent to an impermeable hardscape or property line and where four percent (4%) means one foot (1') of vertical elevation change for every twenty-five feet (25') of horizontal length (rise divided by run x 100 = slope %).
            b. Turfgrass is prohibited in narrow, irregularly shaped spaces with an average width of ten feet (10') or less.
   b. Plant material listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization are prohibited, except for known non-fruiting, non-invasive, sterile varieties or cultivars or selections.
   c. Root vegetables shall not be irrigated with graywater.
   d. When replacing diseased or dead plant materials, replacements may be in kind or may be replaced with plant materials that have lower water needs, as rated in the current edition of the Water Use Classification of Landscape Species published by the California Department of Water Resources, or equivalent documentation.

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Modifications to Existing Landscaped Areas Excluding Commercial New Development

B. **Amendments and Mulch Requirements For Modified Landscaped Areas**
   a. A minimum three inch (3”) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications where mulch is not appropriate. To provide habitat for beneficial insects and other wildlife, up to five percent (5%) of the landscape area may be left without mulch. No mulch shall be applied within six inches (6”) of the base of trees.
   b. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.
   c. No mulch shall be applied within six inches (6”) of the base of trees.

C. **Irrigation System Requirements For Modified Landscaped Areas**
   a. **General Irrigation System Requirements**
      i. The installation of new sprinkler irrigation systems are prohibited, including parkways.
         1. Exception:
            a. Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.
            b. Recreational turfgrass areas of Institutional and Mixed-Use Development project landscapes. Must be designed and installed in such a manner that a precipitation rate of one inch (1”) per hour is not exceeded unless using approved alternate water supply irrigation system.
      ii. Hoses used for irrigation shall be equipped with an automated, shut off nozzle.
      iii. Hose bibbs shall be equipped with a built-in pressure vacuum breaker.
      iv. All new irrigation systems must conform to SMMC Section 7.12.370 Cross-Connection Prevention and SMMC Section 7.16.020 Water Conservation Requirements.
      v. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer’s recommended pressure range for optimal performance. If the water pressure is below the recommended pressure of the specified irrigation

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devices, the installation of a pressure regulating device is not required.

vi. Pressure regulation may include a single master pressure regulator and may be used for the entire system if the dynamic pressure at each emission device has the same manufacturer's recommended pressure range for optimal performance. It must be located after the master backflow device, if present.

vii. A single large capacity grade master filter may be used but must be located after the master backflow device and master pressure regulator, if present.

viii. Design landscape and irrigation systems in parkways according to all local, state, and federal laws and regulations. Installation of an irrigation system within a parkway cannot result in the damage of the roots of any existing street trees.

ix. Low-head drainage is prohibited. Anti-drain valves or check valves in sprinkler heads and drip emitter devices are required to prevent low-head drainage.

b. **Requirements for New Irrigation Systems or Replacement of Existing Irrigation Systems**

i. For new plant material where a new irrigation system is installed for that hydrozone, the irrigation system must be a drip irrigation system.

1. Exception:

a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for new tree sizes twenty-four inch (24") box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.

b. Micro-sprays not exceeding thirty gallons per hour (30gph) may be used on areas solely dedicated to new edible plants.

c. Sprinkler irrigation may be used on new recreational turfgrass areas only but must be designed and installed in such a manner that a precipitation rate of

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one inch (1”) per hour is not exceeded unless using approved alternate water supply irrigation system.

ii. For existing plant material where a new irrigation system is installed for that hydrozone, the irrigation system must be a drip irrigation system.
    1. Exception:
        a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for tree sizes twenty-four inch (24”) box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
        b. Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.
        c. Sprinkler irrigation may be used on recreational turfgrass areas only but must be designed and installed in such a manner that a precipitation rate of one inch (1”) per hour is not exceeded unless using approved alternate water supply irrigation system.

iii. Newly planted trees shall be irrigated on a separate irrigation valve unless located in a planter. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for tree sizes twenty-four inch (24”) box or larger. A maximum of two (2) bubblers per tree. Bubblers must have fixed emission outputs and cannot be variable or adjustable.

iv. Drip Irrigation Zone:
    1. The installation of new drip irrigation systems require drip valve assemblies for each drip zone and must include:
        a. Anti-siphon valve if a master backflow protection device is not specified;
        b. In-line remote control valves only if there is a master backflow prevention device at the Point of connection;
        c. Pressure regulator if a master pressure regulator is not specified for the entire irrigation system;

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d. Filter with a one hundred-fifty to two hundred (150 – 200 mesh), wye or tee filter if a master filter for the entire irrigation system is not specified;
e. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.

2. A flushing mechanism for each new drip irrigation zone is required.
3. For subsurface drip irrigation zones an operational indicator is required.

v. Drip Tubing:

1. Drip tubing shall be made of polyethylene or PVC
2. Drip irrigation emitters shall emit no more than two gallons per hour (2 gph).
3. Only container plantings. raised beds and edible plant areas irrigated with micro-spray may use one quarter inch (1/4”) or one eighth inch (1/8”) solid tubing (also referred to as ”spaghetti” tubing).
4. Wire stakes shall be U-shaped galvanized steel wire stakes and installed every three feet (3’).
5. Multi-outlet emitters are prohibited.

c. **Requirements for Replacement of Existing Sprinkler Heads on Institutional and Mixed Use Development Projects with Recreational Turfgrass Areas**

i. Sprinklers shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).
ii. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.
iii. When a sprinkler head is changed, all of the sprinkler heads on the same irrigation valve must be changed to the same manufacturer make and type.
iv. All replaced sprinkler heads on the same valve shall have matched precipitation rates.

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v. All replaced sprinkler heads must have a minimum head-to-head coverage (minimum of fifty percent (50%) of diameter). Wind de-rating, if used, should be based on wind criteria for the time period that the system is normally operated.
vi. All replaced sprinkler heads, with or without multi-stream, multi-trajectory rotating nozzles, shall have built-in pressure regulation in the body or stem or shall have pressure regulating swing joints.
vii. All replaced sprinkler heads shall have swing joints or other riser-protection components.

d. **Automatic Irrigation Controller Requirements**
   i. Refer to the California Building Standards Code (Cal Green).

Section 6C: Commercial Landscapes
Maintenance Requirements for Existing Commercial Landscaped Areas

A. **General Maintenance Requirements**
   a. Irrigation systems must be maintained according to the manufacturers' specifications and in accordance with all local, state and federal laws and regulations.
   b. When replacing diseased or dead plant materials, replacements may be in kind or may be replaced with plant materials that have lower water needs, as rated in the current edition of the Water Use Classification of Landscape Species published by the California Department of Water Resources, or equivalent documentation.

B. **Requirements for Replacement of Existing Sprinkler Heads**
   a. Individual sprinkler heads, nozzles and valves in need of repair may be replaced however the installation of a new sprinkler irrigation system is prohibited.
      i. Exception:
         1. Micro-sprays not exceeding thirty gallons per hour (30 gph) may be used on areas solely dedicated to edible plants.
         2. Recreational turfgrass areas of Institutional and Mixed-Use Development project landscapes.
            a. Must be designed and installed in such a manner that a precipitation rate of one inch (1") per hour is not exceeded unless using approved alternate water supply irrigation system.
   b. Sprinkler irrigation zones shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).
   c. All replaced sprinkler heads on the same valve shall have matched precipitation rates.
   d. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.

Section 7:
City of Santa Monica Public Landscapes

Photo by Tim Street Porter

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Section 7A: City of Santa Monica Public Landscapes Requirements for New Landscaped Areas for Public Landscape Areas

New Landscaping Requirements - The following requirements apply when landscape is designed for and installed by City of Santa Monica Public Landscape Areas, including but not limited to parks, open spaces, and medians:

A. **Landscape and Irrigation Design**

a. The Director of Public Works may specify plant material, soil amendments or irrigation device requirements for new public landscape sites that reduce overall water use on the site, including new plant cultivars, products, or technologies that may be used in pilot demonstration projects to verify best management practices.

B. **Plant Material Requirements**

a. Turfgrass defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the Department of Water Resources shall be limited to recreational turfgrass areas only. All other plant material with the exception of trees, shall have an average plant factor of 0.4 or below.
b. Turfgrass is prohibited in public street medians and narrow, irregularly shaped spaces with an average width of ten feet (10') or less.
c. Plants listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization are prohibited, except for known non-fruiting, non-invasive, sterile varieties or cultivars or selections.
d. Plants shall be grouped together into hydrozones. Maximize the number of hydrozones based on plant water needs, soil infiltration rates, water windows, and the hydraulic demands of the irrigation system.

C. **Amendments and Mulch Requirements**

a. For landscape installations, compost at a rate of a minimum of four cubic yards (4 yd^3) per one thousand square feet (1,000 ft^2) of permeable area shall be incorporated to a depth of six inches (6") into the soil. Soils with greater than six percent (6%) organic matter in the top six inches (6") of soil are exempt from adding compost and tilling. A post installation soil test must show a six percent (6%) organic matter content or greater.
b. A minimum three inch (3") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, over creeping or rooting groundcovers, or in direct seeding applications where mulch is not appropriate. To provide habitat for beneficial insects and other wildlife, up

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to five percent (5%) of the landscape area may be left without mulch. Designated insect habitat must be clearly identified on the construction or landscape plan.

c. No mulch shall be applied within six inches (6”) of the base of trees.
d. Organic mulch shall be applied in a minimum two foot (2’) radius around the tree base.
e. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.

D. **Irrigation System Requirements**

a. **General Irrigation Requirements**

i. Irrigation systems must be designed and installed in such a manner that a precipitation rate of one inch (1”) per hour is not exceeded in any portion of the landscape unless using approved alternate water supply irrigation system.
ii. Sprinklers, drip irrigation and bubblers must be on separate valves.
iii. Graywater irrigation systems must conform to Chapter 16 of the California Plumbing Code
iv. Approved alternate water supply irrigation systems must conform to all local, state, and federal laws and regulations.
v. Low-head drainage is prohibited. Anti-drain valves or check valves in sprinkler heads or drip emitter devices are required to prevent low-head drainage.
vi. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer’s recommended pressure range for optimal performance.
vii. For drip irrigation zones, pressure regulation may include a single master pressure regulator and may be used for the entire system, and must be located after the master backflow device. Pressure regulators that can tolerate constant pressurization must be used.
viii. For drip irrigation zones, a single large capacity grade master filter may be used but must be located after the master backflow device and master pressure regulator, if present. Filters that can tolerate constant pressurization must be used.
ix. For overhead and bubbler irrigation zones, pressure regulation shall be at the zone valve by use of a valve pressure regulating module or similar device that achieves pressure regulation at the

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valve.

b. Water Supply, Meter & Valve Requirements

i. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, and at each valve manifold, to minimize water loss in case of an emergency (such as a main line break) or routine repair.
ii. Cross-Connection Prevention (Backflow Prevention) as required by SMMC Section 7.12.370.
iii. A dedicated landscape meter is required for new landscape areas.
iv. All irrigation valves must be appropriately tagged and labelled in accordance with the local, state, and federal laws and regulations.
v. Valve boxes, if installed, must be large enough to service irrigation equipment inside and be installed over a layer of coarse stone or gravel while maintaining an air space between valves and the layer of stone.
vi. All valve box lids must be labelled with the appropriate valve, program and station numbers.
vii. Quick coupler valves must be specified according to site conditions that ensure proper maintenance of the area.
viii. A master shut-off valve shall be installed whenever corresponding irrigation controller has master shut-off valve operation capability.
ix. A flow sensor shall be installed whenever corresponding irrigation controller has flow sensing capability.
x. Scrubber or ‘dirty water’ valves are required if the water source for the irrigation system uses approved alternate water supply.

c. Pipe Requirements

i. Specify main and lateral pipe sizes that will result in the velocity of water moving through these pipes at a rate not exceeding five feet (5’) per second for pipes under three inch (3”) in diameter and not exceeding seven feet (7’) per second for pipes three inch (3”) or greater in diameter.
ii. Use Schedule 40 or Class 315 solvent weld-type PVC pipe for mains, below grade laterals, or piping under roadways. Class 125 pipe is not permitted.

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iii. IPS flexible PVC pipe or flexible HDPE pipe may be substituted for rigid PVC pipe below grade in lateral lines only to avoid underground obstructions encountered during trenching or tunneling.
iv. Use Schedule 40 UV resistant PVC, Schedule 80 PVC or metal piping for all above grade pipes.
v. Pipe in the same trench must be laid side-by-side and not overlapped. Provide three inch (3”) vertical and horizontal clearance between irrigation lines and six inch (6”) clearance between lines of other work. Do not install parallel lines directly over any other line.
vi. PVC fittings must be of the same chemical compound as pipe on which they are installed.
vii. PVC cement must have the proper adhesive value for the pipe on which it is used.
viii. Backfill shall not have rocks or debris greater than half an inch (½”) in size next to the pipe.
ix. Under vehicle paving or sidewalks, install a sleeve made of permanent rigid material (PVC Sch 40 or Class 160) that is twice the size of the pipe it will hold and should extend one foot (1’) beyond the edge of the hard surfaces.

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x. Trench or tunnel depth must be sufficient to obtain a minimum depth of cover over the installed pipe and control wire which conforms to the following dimensions. Where pipe and/or conduit are placed below paving or hardscape the minimum burial depths are:

Pressure Lines ≤2 inches in landscaping	12 inch
Pressure Lines >2 inches in landscaping	18 inch
Pressure Lines under non-vehicular paving	18 inch
Pressure Lines under vehicular paving	24 inch
Non-pressure Lines ≤2 inches in landscaping	12 inch
Non-pressure Lines >2 inches in landscaping	12 inch
Non-pressure Lines under non-vehicular paving	12 inch
Non-pressure Lines under vehicular paving	18 inch
Conduit in landscaping	12 inch
Conduit under non-vehicular paving	18 inch
Conduit under vehicular paving	24 inch

d. Automatic Irrigation Controller Requirements

i. A weather-based irrigation controller (WBIC) with central control capability and soil moisture sensors (SMS) readiness is required, site parameters permitting. Then only Smart Water Application Technologies tested and published WBICs and SMSs or EPA Watersense labeled WBICs or SMSs are permitted and must be compatible with existing City infrastructure. Once installed disabling the climate-based sensor or moisture-based sensor features on the controller is prohibited.

e. Sprinkler Irrigation Requirements

i. Sprinklers shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).

ii. No sprinklers shall be located within twenty-four inches (24”) of any trees or impermeable hardscape, including but not limited to sidewalks, driveways, alleys, streets, walkways, fencing.

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iii. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.
iv. Sprinkler heads on the same valve shall have matched precipitation rates. The precipitation rate shall not exceed one inch (1”) per hour unless using approved alternate water supply irrigation system.
v. Sprinkler heads with or without multi-stream, multi-trajectory rotating nozzles, shall have built-in pressure regulation in the body or stem or shall have pressure regulating swing joints.
vi. Sprinkler heads shall have swing joints or other riser-protection components.
vii. Sprinkler heads must have a minimum of head-to-head coverage (minimum of fifty percent (50%) of diameter). Wind de-rating, if used, should be based on wind criteria for the time period that the system is normally operated.

f. **Drip Irrigation Requirements**
   i. Drip irrigation is required for all new plant material except groundcovers, including turfgrass, and trees.
      1. Exception:
         a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for new trees of a size twenty-four inch (24”) box or larger. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
         b. Micro-sprays not exceeding thirty gallons per hour (30gph) may be used on areas solely dedicated to edible plants.
   ii. Trees shall be irrigated on a separate valve.
   iii. Drip Irrigation Zone:
      1. The installation of new drip irrigation systems require drip valve assemblies for each drip zone and must include:
         a. In-line remote control valves connection;
         b. Pressure regulator if a master pressure regulator is not specified for the entire irrigation system or pressure regulating filter is not specified;

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c. Filter with at minimum, an one hundred-fifty to two hundred (150-200) mesh, wye or tee filter if a master filter for the entire irrigation system or a pressure regulating filter is not specified; disc filters may be used if the water source for the irrigation system is reclaimed, recycled, rain water or greywater.
d. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.

2. Drip irrigation shall have a minimum operational lower quarter emission uniformity of eighty-one percent (81%).
3. An air relief valve for each drip irrigation zone is required.
4. A manual flushing mechanism for each new drip irrigation zone is required.

iv. Drip Tubing:

1. Drip tubing shall be made of polyethylene or PVC.
2. Drip irrigation emitters shall emit no more than two gallons per hour (2 gph).
3. Only container plantings, raised beds and edible plant areas irrigated with micro-spray may use one quarter inch (1/4”) or one eighth inch (1/8”) solid tubing (also referred to as ”spaghetti” tubing).
4. Drip tubing shall be designed for sub-surface installation unless site conditions are prohibit below grade installation.
5. Wire stakes shall be U-shaped galvanized steel wire stakes and installed every five feet (5’).
6. Multi-outlet emitters are prohibited.

Section 7B: City of Santa Monica Public Landscapes
Modifications to Existing Landscaped Areas for Public Landscape Areas

Existing Landscaping Requirements - The following requirements apply when existing landscaping is replaced by City public landscape agencies:

A. Landscape and Irrigation Improvements

The Director of Public Works may specify plant material, soil amendments or irrigation device requirements for new public landscape sites that reduce overall water use on the site, including new plant cultivars, products, or technologies that may be used in pilot demonstration projects to verify best management practices.

B. Plant Material Requirements

a. If turfgrass defined for Region 3 in the current edition of the Water Use Classification for Landscape Species (WUCOLS) issued by the Department of Water Resources that is not designated recreational turfgrass is removed, it must be replaced with plant material, with the exception of trees, that have an average plant factor of 0.4 or below or with mulch.
b. Plants listed in the current Invasive Plant Inventory for the southwest region by the California Invasive Plant Council or listed for the South Coast region by the PlantRight organization are prohibited, except for known non-fruiting, non-invasive, sterile varieties or cultivars or selections.

C. Amendments and Mulch Requirements

a. A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to five percent (5%) of the landscape area may be left without mulch.
b. No mulch shall be applied within six inches (6”) of the base of trees.
c. No plant material shall be installed within twenty-four (24”) inches of the base of a tree.

D. Irrigation System Requirements

a. **General Irrigation System Requirements**
    i. Hoses used for irrigation shall be equipped with an automated, shut off nozzle.

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ii. All new irrigation systems must conform to SMMC Section 7.12.370 Cross-Connection Prevention and SMMC Section 7.16.020 Water Conservation Requirements.
iii. Specify pressure regulation to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
iv. Pressure regulation may include a single master pressure regulator for the entire system, and must be located after the master backflow device. Pressure regulators that can tolerate constant pressurization must be used.
v. Low-head drainage is prohibited. Anti-drain valves or check valves in sprinkler heads and drip emitter devices are required to prevent low-head drainage.

b. **Requirements for Replacement of Existing Sprinkler Heads**
   i. Sprinklers shall have a minimum operational lower quarter distribution uniformity of seventy-five percent (75%).
   ii. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.
   iii. All replaced and existing sprinkler heads on the same zone shall have matched precipitation rates.
   iv. When replacing or repairing a remote control valve on a sprinkler zone, the zone must be equipped with pressure regulating device(s) to insure that the dynamic pressure at each emission device is within the manufacture's recommended pressure range for optimal performance.
   v. All replaced sprinkler heads shall have swing joints or other riser-protection components.

b. **Requirements for New Irrigation Systems or Replacement of Existing Irrigation Systems**
   i. For existing plant material that is one (1) gallon or larger, excluding groundcovers, and a new irrigation system is installed for that hydrozone, the irrigation system must be a drip irrigation system.
      1. Exception:

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Modifications to Existing Landscaped Areas for Public Landscape Areas

a. Sub-surface tree bubblers emitting half a gallon per minute (0.5 gpm) or less may be used for tree sizes twenty-four (24”) box or larger. Bubblers must have fixed emission outputs and cannot be variable or adjustable.
b. Micro-sprays not exceeding thirty gallons per hour (30gph) may be used on areas solely dedicated to edible plants.

ii. Drip Irrigation Zone:
1. The installation of new drip irrigation systems require drip valve assemblies for each drip zone and must include:
    a. In-line remote control valves connection;
    b. Pressure regulator if a master pressure regulator is not specified for the entire irrigation system or pressure regulating filter is not specified;
    c. Filter with at minimum, an one hundred-fifty to two hundred (150-200) mesh, wye or tee filter if a master filter for the entire irrigation system or a pressure regulating filter is not specified; disc filters may be used if the water source for the irrigation system is reclaimed, recycled, rain water or greywater.
    d. Pressure regulator and remote control valve must have a minimum flow rate that is lower than the zone flow rate.
2. Drip irrigation shall have a minimum operational lower quarter emission uniformity of eighty-one (81%).
3. Drip irrigation emitters shall emit no more than two gallons per hour (2 gph) unless using for approved alternate water supply irrigation.
4. An air relief valve for each drip irrigation zone is required.
5. A manual flushing mechanism for each new drip irrigation zone is required.

iii. Drip Tubing:
1. Drip tubing shall be made of polyethylene or PVC.
2. Drip irrigation emitters shall emit no more than two gallons per hour (2gph).

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Modifications to Existing Landscaped Areas for Public Landscape Areas

3. Only container plantings, raised beds and edible plant areas irrigated with micro-spray may use one quarter inch (1/4”) or one eighth inch (1/8”) solid tubing (also referred to as ”spaghetti” tubing).
4. Drip tubing shall be designed for sub-surface installation unless site conditions are prohibit below grade installation.
5. Wire stakes shall be U-shaped galvanized steel wire stakes and installed every five feet (5’).
6. Multi-outlet emitters are prohibited.

Section 7C: City of Santa Monica Public Landscapes Maintenance Requirements for Public Landscape Areas

A. Irrigation systems must be maintained according to the manufacturers' specifications and in accordance with all local, state and federal laws and regulations.
B. Landscapes shall be maintained to ensure water use efficiency using sustainable or environmentally-friendly practices for overall landscape maintenance.
C. Chemical products used for plant pest control or fertilizing plant material shall meet EPA approval.
D. Irrigation shall not runoff nor overspray onto impermeable surfaces including but not limited to buildings, fencing, property line, public right-of-way.

Appendix H: MWD RUWMP Sections II & IV

City of Santa Monica 2015 Urban Water Management Plan

Planning for the Future

2

The purpose of this section is to show how Metropolitan plans to meet Southern California's water supply needs in the future. In its role as supplemental supplier to the Southern California water community, Metropolitan faces ongoing challenges in meeting the region's needs for water supply reliability and quality. Increased environmental regulations and competition for water from outside the region have resulted in changes in delivery patterns and timing of imported water supply availability. At the same time, the Colorado River watershed has experienced a protracted drought since 2000.

As described in the previous chapter, the water used in Southern California comes from a number of sources. From 2006 through 2015, Metropolitan has provided 50 percent to 60 percent of the water needs in its service area from the Colorado River via the CRA, and from the Sacramento-San Joaquin River Watershed via the SWP. As Metropolitan continues to face various water supply challenges, development of adaptable strategies for managing resources to meet the range of estimated demands into the future and for adjusting to changing resource conditions is ongoing.

Metropolitan's continued progress in developing a diverse resource mix enables the region to meet its water supply needs. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. Metropolitan's actions have been focused on the following:

- Pursuing long-term solutions for the Delta
- Developing storage programs related to the SWP and the Colorado River
- Developing storage and groundwater management programs within the Southern California region
- Increasing conservation
- Increasing water recycling, groundwater recovery, and seawater desalination
- Developing water supply management programs outside of the region

Metropolitan has undertaken a number of planning initiatives over the years. This section summarizes these efforts, which include the Integrated Water Resources Plan (IRP), three IRP Updates, the Water Surplus and Drought Management Plan, and the Water Supply Allocation Plan. Collectively, they provide a policy framework guidelines and resource targets for Metropolitan to ensure regional water supply reliability.

While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses – including their own urban water management plans – and may develop projects independently of Metropolitan. Appendix 5 shows a list of potential local projects provided to Metropolitan by its member agencies.

2.1 Integrated Water Resource Planning

In 1993, Metropolitan commenced an Integrated Water Resources Planning process as the beginning of a new era of regional reliability planning. As this planning process began, Metropolitan held a series of three regional assemblies from 1993 through 1995 addressing strategic planning issues. Attendance at these regional assemblies included Metropolitan's Board, Metropolitan's senior management, member agency managers, local retail water providers, groundwater basin managers, and invited public representatives. The purpose of these regional assemblies was to gain consensus on resource policy issues, provide direction for future work, and to endorse regional objectives, principles, and strategies.

A key outcome of the regional assemblies was the establishment and adoption of water supply principles which provided critical guidance for the development and adoption of future Metropolitan IRPs. In summary, these principles state:

- No water supplier in Southern California is an isolated, independent entity unto itself, and all, to varying degrees, are dependent upon a regional system of water importation, storage, and distribution.
- Metropolitan is Southern California's lead agency in regional water management, having the responsibility for importing water from outside the region and convening dialogues on regional water issues, encouraging local water development and conservation, advocating the region's interests to the state and federal governments, and leading the region's water community.
- Water suppliers at all levels have a responsibility to promote a strong water ethic both within the water community and among the public, developing plans through open processes, committing to achieving adopted regional goals and strategies, and committing to a policy of equity and fairness in development and implementation of water management programs.

These regional assemblies laid the foundation for Metropolitan's integrated regional planning path from 1996 to the present. This path has guided Metropolitan's water resources strategy from the initial adoption of the Metropolitan's IRP in 1996 to successive IRP updates in 2004, 2010, and 2015.

The 1996 IRP

Metropolitan's IRP established a long-term, comprehensive water resources strategy to provide the region with a reliable and affordable water supply. One of the fundamental outcomes of the 1996 IRP was the implementation of a diverse portfolio of resource investments in both imported and in-region supplies, and in water conservation measures. The 1996 IRP further emphasized the construction and creation of a network of water storage facilities, both below and above ground.

The 1996 IRP process identified cost-effective solutions that offered long-term reliability to the region. Having identified the need for a portfolio of different supplies to meet its demands, the 1996 IRP analyzed numerous resource portfolios seeking to find a "Preferred Resource Mix" that would provide the region with reliable and affordable water supplies through 2020. The analysis determined the best mix of resources based on cost-effectiveness, diversification, and reliability. Establishing the "Preferred Resource Mix" was an integral part of the 1996 IRP, and subsequent updates have continued to focus on how best to diversify Metropolitan's water portfolio and establish the broad resource targets for the region.

The 2004 IRP Update

The 2004 IRP Update reviewed the goals and achievements of the 1996 IRP, identified the changed conditions for water resource development, and updated resource development targets through 2025. These targets included increased conservation savings and planned increases in local supplies. The 2004 IRP Update also explicitly recognized the need to handle uncertainties inherent in any planning process. Some of these uncertainties include:

- Fluctuations in population and economic growth
- Changes in water quality regulations
- Discovery of new chemical contaminants
- Regulation of endangered species affecting sources of supplies
- Changes in climate and hydrology

As a result, a key component of the 2004 IRP Update was the addition of a 10 percent "planning buffer." The planning buffer identified additional supplies, both imported and locally developed, that could be implemented to address uncertainty in future supplies and demands.

The 2010 IRP Update

In keeping with this reliability goal of meeting full-service demands at the retail level under all foreseeable hydrologic conditions, the 2010 IRP Update sought to stabilize Metropolitan's traditional imported water supplies and establish additional water resources to withstand California's inevitable dry cycles and growth in water demand. Metropolitan acknowledged the increasing impact that emerging challenges such as environmental regulations, threats to water quality, climate change, and economic unknowns and the uncertainty that these challenges would have on planning for a reliable, high quality, and affordable water supply. By 2010, the Colorado River had experienced below-average precipitation conditions for most of the previous decade, and the SWP was facing historic regulatory cutbacks that significantly reduced its supplies that pass through the Sacramento-San Joaquin Delta in Northern California. Recognizing that the conditions for developing and maintaining water supply reliability had changed, Metropolitan set out not only to update the IRP, but also to examine how best to adapt to the new water supply paradigm.

Adaptive Management Strategy

The 2010 IRP Update specifically planned for uncertainty with a range of adaptive management strategies that both meets demands under observed hydrology and responds to future uncertainty. The plan provided solutions by developing diverse and flexible resources that perform adequately under a wide range of future conditions. Specifically, the adaptive management strategy was a three-component plan that included the following:

- Core Resources Strategy – Designed to maintain reliable water supplies under known conditions. The Core Resources Strategy represented baseline efforts to manage water supply and demand conditions. This strategy was based on "what we know today," including detailed planning assumptions about future demographic scenarios, water supply yields, and a range of observed historical weather patterns. Under this strategy, Metropolitan and its member agencies would advance water use efficiency through conservation and recycled water, along with further local supply development such as groundwater recovery and seawater desalination. Metropolitan would also stabilize traditional imported supplies from the Colorado River and Northern California.

- Uncertainty Buffer – A suite of actions which help to mitigate short-term changes. The 2010 IRP set goals for a range of potential buffer supplies to protect the region from possible shortages in a cost-effective manner, starting with a further expansion of water use efficiency on a region-wide basis. The buffer would enable the region to adapt to future circumstances and foreseeable challenges that were not assumed under the Core Resources Strategy, such as short-term loss of local supplies or regulatory restrictions.
- Foundational Actions – Strategies for additional water resources to augment the core or buffer supplies. Foundational Actions were designed to prepare the region by determining viable alternative supply options for long-range planning. These preparatory actions, including feasibility studies, technological research, and regulatory review, were designed to lay the foundation for potential alternative resource development.

The 2015 IRP Update

Since the 2010 IRP, drought in California and across the southwestern United States has put the IRP adaptive management strategy to the ultimate stress test. Dry conditions in California have persisted into 2015, resulting in a fourth consecutive year of drought. The year 2015 began with the driest January on record, resulting in the earliest and lowest snowpack peak in recorded history at only 17 percent of the traditional snowpack peak on April 1st. In the ten years since 2006, there were only two wet years, with the other eight years having been below normal, dry, or critically dry. The Colorado River watershed has also experienced an extended reduction in runoff. Within Southern California, continuing dry conditions have impacted the region's local supplies, including its groundwater basins.

Southern California has a remarkable, unparalleled tradition of meeting its water challenges as a single cohesive region. Metropolitan serves as both importer of water and regional water planner. For the past generation, the IRP has served as the reliability road map for the region.

Throughout 2015, Metropolitan engaged in a comprehensive process with its Board of Directors and member agencies to review how conditions have changed since the 2010 IRP Update and to establish targets for achieving regional reliability, taking into account known opportunities and risks. Areas reviewed in the 2015 IRP Update include demographics, hydrologic scenarios, water supplies from existing and new projects, water supply reliability analyses, and potential resource and conservation targets. Metropolitan's Board of Directors adopted the 2015 IRP Update on January 12, 2016. [1]

The 2015 IRP Update approach explicitly recognizes that there are remaining policy discussions that will be essential to guiding the development and maintenance of local supplies and conservation. Following adoption of the 2015 IRP Update and its targets for water supply reliability, Metropolitan has begun a process to address questions such as how to meet the targets for regional reliability, what are local and what are regional responsibilities, how to finance regional projects, etc. This discussion will involve extensive interaction with Metropolitan's Board of Directors and member agencies, with input from the public.

Findings and Conclusions

The findings and conclusions of the 2015 IRP Update are:

- Action is needed – Without the investments in conservation, local supplies, and the California WaterFix targeted in the 2015 IRP Update, Metropolitan's service area would experience unacceptable level of shortage allocation frequency in the future.

[1] http://www.mwdh2o.com/PDF_About_Your_Water/2015_IRP_Update_Report.pdf

- Maintain Colorado River supplies – The plan to stabilize deliveries at 900,000 AF in a typical year will require more than 900,000 AF of planned actions.
- Stabilize SWP supplies – A collaborative approach with state and federal agencies to pursue better science for resolving questions about SWP operations and advancing coequal goals of Delta restoration and statewide water supply reliability in the near term. Also work collaboratively with state and federal agencies in the California WaterFix and EcoRestore efforts.
- Develop and protect local supplies and water conservation – The 2015 IRP Update embraces and advances the regional self-sufficiency ethics by increasing the targets for additional local supplies and conservation. These targets are discussed in detail in Section 3 of this UWMP.
- Maximize the effectiveness of storage and transfers – Rebuilding Metropolitan's supply of water reserves is imperative when the drought is over. A comprehensive water transfer approach that takes advantage of water when it is available will help to stabilize and build storage reserves, increasing the ability for Metropolitan to meet water demands in dry years.
- Continue with the adaptive management approach – The IRP is updated periodically to incorporate changed conditions, and an implementation report is prepared annually to monitor the progress in resources development. The 2015 IRP Update also includes Future Supply Actions that would advance a new generation of local supplies through public outreach; development of legislation and regulation; technical studies and support; and land and resource acquisitions.

2.2 Estimating Demands on Metropolitan

The Urban Water Management Planning Act requires that three basic planning analyses be conducted to evaluate supply reliability. The first is a water supply reliability assessment requiring development of a detailed evaluation of the supplies necessary to meet projected demands over at least a 20-year period. This analysis is to consider average, single-year, and multi-year drought conditions. The second is a water shortage contingency plan which documents the actions that would be implemented in addressing up to a 50 percent reduction in an agency's supplies. Finally, a plan must be developed specifying the steps that would be taken under a catastrophic interruption in water supplies.

To address these three requirements, Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 91 years (1922-2012) of historic hydrology. The 91-year period was chosen because the USBR modeling for Colorado River supplies is only available for a period starting in 1922 and ending in 2012. Supply and demand analyses for the single-dry and multiple-dry year cases were based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 91-year period of the SWP supply availability, 1977 is the single driest year and 1990-92 is the driest 3 consecutive years for SWP supplies to Metropolitan. In addition, staff analysis of the 8-river index indicated that 1977 is the single driest year and 1990-92 is the lowest 3 consecutive dry years from 1922 through 2015. The 8-river index is used widely by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Demand Forecast

Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.[2] Projections of local supplies then were derived using data from current and expected local supply programs and the IRP Local Resource Program Target. The resulting difference between total demands net of conservation and local supplies is the expected regional demands on Metropolitan supplies. These various estimates are shown in Tables 2-1 through 2-3. Major categories used in these tables are defined below.

Total Demands

Total demands are the sum of retail demand for M&I and agricultural, seawater barrier demand, and replenishment demand. Total demands represent the total amount of water needed by the member agencies. Total demands include:

- Retail Municipal and Industrial (M&I) Demand — Retail M&I demands represent the full spectrum of urban water use within the region. These include residential, commercial, industrial, institutional, and un-metered water uses. The demographic and economic data used in developing these forecasts were taken from the Southern California Association of Governments' (SCAG) 2012 Regional Transportation Plan/Sustainable Community Strategy (April 2012) and from the San Diego County Association of Governments' (SANDAG) Series 13: 2050 Regional Growth Forecast (October 2013). The SCAG and SANDAG regional growth forecasts are the core assumptions that drive the estimating equations in Metropolitan's Econometric Demand Model (MWD-EDM). SCAG's and SANDAG's projections undergo extensive local review and incorporate zoning information from city and county general plans and are backed by Environmental Impact Reports.

[2] Information generated as part of this analysis is contained in Appendix 1.

Impacts of potential annexation are not included in the demand projections for the 2015 UWMP. However, Metropolitan's Review of Annexation Procedures concluded that the impacts of annexation within the service area beyond 2020 would not exceed two percent of overall demands.

- Retail Agricultural Demand — Retail agricultural demands consist of water use for irrigating crops. Member agencies estimate agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates its agricultural demand differently, depending on the availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2015 UWMP.
- Seawater Barrier Demand — Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.
- Storage Replenishment Demand — Storage replenishment demands represent the amount of water member agencies plan to use to replenish their groundwater basins or surface reservoirs in order to maintain sustainable basin/reservoir heath and production. For the 2015 UWMP, replenishment deliveries are not included as part of firm demands.

Conservation Adjustment

Savings from conservation reduces total retail demand. Conservation savings consists of the following:

- Code-Based Conservation — Water savings resulting from plumbing codes and other institutionalized water efficiency measures. Sometimes referred to as "passive conservation," this form of conservation would occur as a matter of course without any additional financial incentives from water agencies. Water savings from codes, standards, and ordinances are discussed in Appendix 6.
- Active Conservation — Water saved as a direct result of programs and practices directly funded by a water utility (e.g., measures outlined by the California Urban Water Conservation Council's "Best Management Practices"). Active conservation is unlikely to occur without agency action.
- Price Effect Conservation — Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water. Because water has a positive price elasticity of demand, increases in water price will decrease the quantity demanded.
- Pre-1990 Savings — Conservation savings are commonly estimated from a base-year water-use profile. Beginning with the 1996 IRP, Metropolitan identified 1980 as the base year for estimating conservation because it marked the effective date of a new plumbing code in California requiring toilets in new construction to be rated at 3.5 gallons per flush or less. Between 1980 and 1990, Metropolitan's service area saved an estimated 250,000 acre-feet per year as the result of this 1980 plumbing code and unrelated water rate increases. Within Metropolitan's planning framework, these savings are referred to as "pre-1990 savings."

Local Supplies

Local supplies represent water produced by the member agencies to meet their total demands. Local supplies are a key component in determining how much Metropolitan supply is needed. Projections of local supplies relied on information gathered from a number of

sources including past urban water management plans, Metropolitan's annual local production surveys, and communications between Metropolitan and member agency staff. Local supplies include:

- Groundwater and Surface Water — Groundwater production consists of extractions from local groundwater basins. Surface water comes from stream diversions and rainwater captured in reservoirs.
- The Los Angeles Aqueduct — A major source of imported water is conveyed from the Owens Valley via the Los Angeles Aqueduct (LAA) by Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
- Seawater desalination — Highly treated seawater suitable for municipal and industrial potable use.
- Groundwater Recovery and Recycled Water — Developed and operated by local water agencies, groundwater recovery projects treat degraded groundwater to meet potable use standards. Recycled water projects recycle wastewater for municipal and industrial use.
- Non-Metropolitan Imports — Water supplies imported or exchanged by member agencies from sources outside of the Metropolitan service area.

The local supplies projections presented in demand tables include existing projects currently producing water, projects under construction, and Metropolitan's IRP Local Supply targets. The method for including local supply projects begins with an inventory of local supplies that have been identified within Metropolitan's service area. Appendix 5 contains the inventory of local supplies by type of supply, and includes a classification that shows the current stage of development for each supply in the inventory. The stages of development included in Appendix 5 are: Existing, Under Construction, Fully Designed with Appropriated Funds, EIR/EIS Certified, Feasibility, and Conceptual. The project inventory in Appendix 5 was updated and completed as part of the 2015 IRP Update survey completed by Metropolitan's member agencies in April and July 2015.

Projects, potential supply yields, and online dates from the local supply inventory in Appendix 5 are used in two ways. First, projects that are classified as Existing or Under Construction are included in forecasts that reflect local supply production that is expected to occur without any additional development actions from Metropolitan or the local agencies. Projects in these categories of development are included here because they have a higher level of certainty. Second, projects that are classified as Fully Designed with Appropriated Funds, EIR/EIS Certified, Feasibility, and Conceptual are considered, along with the associated information on supply yield and online dates, as the potential projects that could be developed and go toward meeting IRP Local Supply targets described in Metropolitan's IRP. The IRP Local Supply targets are characterized in forecasts and tables that include Programs Under Development, which are described in Appendix 3.3 in the IRP Development Targets Section under In-Basin Storage and Supplies. It is anticipated that a combination of regional and local approaches will be required in order to meet the IRP Local Supply targets. The local supply inventory provides a connection of the IRP Local Supply targets with potential projects that have been identified, but not developed to a point of relative certainty. The inventory of potential projects is important, as historical implementation, timing, and ultimate production of local supply projects in the service area have fallen short of projections. This is increasingly true with the projects in the less than certain Feasibility and Conceptual categories. It is important that the inventory of

potential projects is greater than the IRP Local Supply targets for new local supply, as the development of projects in the inventory will also be needed under conditions where other existing local supplies are lost or their yields are reduced.

Determining Demands on Metropolitan

Metropolitan serves imported water to its 26 member agencies. For most member agencies, they have other sources of water produced locally from groundwater basins, surface reservoirs, the LAA, recycled water projects, groundwater recovery projects, and seawater desalination projects. When local supplies are not enough to meet retail demands, member agencies purchase imported water from Metropolitan to meet their needs.

In determining demands for imported water, Metropolitan developed its Sales Model to calculate the difference between total forecasted retail demands and local supply projections. The balance is the demand on Metropolitan's imported water supply. The Sales Model calculates the difference between forecasted demands and projected local supplies after factoring in climate impacts. The Sales Model employs a modeling method using historical hydrologic conditions from 1922 to 2012 to simulate the expected demands on Metropolitan supplies based on hydrologic conditions. Each hydrologic condition results in one possible outcome for the forecast year in the planning horizon. For example, each forecast year, such as 2020, has 91 possible outcomes, one for each historical hydrology year during the period 1922 to 2012. This method of modeling produces a distribution of outcomes ranging from the driest to the wettest years within this historical period.

The Sales Model forecasts three types of demands on Metropolitan:

1. Consumptive Use – Metropolitan's supplies that are used to meet retail M&I demand.
2. Seawater Barrier – Imported water needed to hold back seawater intrusion into the coastal groundwater basins.
3. Replenishment – Water for groundwater or reservoir replenishment, when available, to meet replenishment demands.

For additional information on Metropolitan's demand forecast, see Appendix 1.

Table 2-1
Metropolitan Regional Water Demands
Single Dry-Year
(Acre-Feet)

		2020	2025	2030	2035	2040
A.	**Total Demands[1]**	**5,234,000**	**5,409,000**	**5,549,000**	**5,679,000**	**5,808,000**
	Retail Municipal and Industrial	4,739,000	4,874,000	5,016,000	5,148,000	5,279,000
	Retail Agricultural	131,000	168,000	164,000	162,000	160,000
	Seawater Barrier	72,000	72,000	72,000	72,000	72,000
	Storage Replenishment	292,000	295,000	297,000	297,000	297,000
B.	**Total Conservation**	**1,056,000**	**1,127,000**	**1,200,000**	**1,263,000**	**1,339,000**
	Existing Active (through 2015)[2]	210,000	196,000	184,000	166,000	159,000
	Code-based	381,000	423,000	462,000	497,000	532,000
	Price-Effect[3]	215,000	258,000	304,000	350,000	398,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,447,000**	**2,497,000**	**2,523,000**	**2,538,000**	**2,550,000**
	Groundwater	1,304,000	1,302,000	1,302,000	1,302,000	1,302,000
	Surface Water	107,000	107,000	107,000	107,000	107,000
	Los Angeles Aqueduct	127,000	127,000	127,000	127,000	127,000
	Seawater Desalination	56,000	56,000	56,000	56,000	56,000
	Groundwater Recovery	143,000	157,000	163,000	165,000	167,000
	Recycling[4]	436,000	466,000	486,000	499,000	509,000
	Other Imported Supplies[5]	274,000	282,000	282,000	282,000	282,000
D.	**Total Metropolitan Demands**	**1,731,000**	**1,784,000**	**1,826,000**	**1,878,000**	**1,919,000**
	Consumptive Use	1,560,000	1,616,000	1,658,000	1,710,000	1,751,000
	Seawater Barrier	5,000	2,000	2,000	2,000	2,000
	Replenishment	166,000	166,000	166,000	166,000	166,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 2050 Regional Growth Forecast.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[5] IID/SDCWA transfer and canal linings.

Table 2-2
Metropolitan Regional Water Demands
Multiple Dry-Year
(Acre-Feet)

		2020	2025	2030	2035	2040
A.	**Total Demands[1]**	**5,199,000**	**5,450,000**	**5,601,000**	**5,732,000**	**5,865,000**
	Retail Municipal and Industrial	4,701,000	4,920,000	5,063,000	5,197,000	5,332,000
	Retail Agricultural	128,000	164,000	169,000	166,000	164,000
	Seawater Barrier	72,000	72,000	72,000	72,000	72,000
	Storage Replenishment	298,000	294,000	297,000	297,000	297,000
B.	**Total Conservation**	**1,056,000**	**1,127,000**	**1,200,000**	**1,263,000**	**1,339,000**
	Existing Active (through 2015)[2]	210,000	196,000	184,000	166,000	159,000
	Code-based	381,000	423,000	462,000	497,000	532,000
	Price-Effect[3]	215,000	258,000	304,000	350,000	398,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,416,000**	**2,487,000**	**2,511,000**	**2,535,000**	**2,550,000**
	Groundwater	1,305,000	1,302,000	1,302,000	1,302,000	1,303,000
	Surface Water	102,000	102,000	102,000	102,000	102,000
	Los Angeles Aqueduct	113,000	129,000	125,000	131,000	133,000
	Seawater Desalination	56,000	56,000	56,000	56,000	56,000
	Groundwater Recovery	139,000	155,000	162,000	165,000	167,000
	Recycling[4]	427,000	461,000	482,000	497,000	507,000
	Other Imported Supplies[5]	274,000	282,000	282,000	282,000	282,000
D.	**Total Metropolitan Demands**	**1,727,000**	**1,836,000**	**1,889,000**	**1,934,000**	**1,976,000**
	Consumptive Use	1,547,000	1,668,000	1,721,000	1,766,000	1,808,000
	Seawater Barrier	6,000	2,000	2,000	2,000	2,000
	Replenishment	174,000	166,000	166,000	166,000	166,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1]Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 2050 Regional Growth Forecast.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[5] IID/SDCWA transfer and canal linings.

Table 2-3
Metropolitan Regional Water Demands
Average Year
(Acre-Feet)

		2020	2025	2030	2035	2040
A.	**Total Demands[1]**	**5,219,000**	**5,393,000**	**5,533,000**	**5,663,000**	**5,793,000**
	Retail Municipal and Industrial	4,725,000	4,859,000	5,001,000	5,133,000	5,264,000
	Retail Agricultural	130,000	167,000	163,000	161,000	160,000
	Seawater Barrier	72,000	72,000	72,000	72,000	72,000
	Storage Replenishment	292,000	295,000	297,000	297,000	297,000
B.	**Total Conservation**	**1,056,000**	**1,127,000**	**1,200,000**	**1,263,000**	**1,339,000**
	Existing Active (through 2015)[2]	210,000	196,000	184,000	166,000	159,000
	Code-based	381,000	423,000	462,000	497,000	532,000
	Price-Effect[3]	215,000	258,000	304,000	350,000	398,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,578,000**	**2,631,000**	**2,657,000**	**2,674,000**	**2,689,000**
	Groundwater	1,303,000	1,301,000	1,301,000	1,301,000	1,302,000
	Surface Water	110,000	110,000	110,000	110,000	110,000
	Los Angeles Aqueduct	261,000	264,000	264,000	266,000	268,000
	Seawater Desalination	51,000	51,000	51,000	51,000	51,000
	Groundwater Recovery	143,000	157,000	163,000	165,000	167,000
	Recycling[4]	436,000	466,000	486,000	499,000	509,000
	Other Imported Supplies[5]	274,000	282,000	282,000	282,000	282,000
D.	**Total Metropolitan Demands**	**1,586,000**	**1,636,000**	**1,677,000**	**1,726,000**	**1,765,000**
	Consumptive Use	1,415,000	1,468,000	1,509,000	1,558,000	1,597,000
	Seawater Barrier	5,000	2,000	2,000	2,000	2,000
	Replenishment	166,000	166,000	166,000	166,000	166,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 2050 Regional Growth Forecast.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[5] IID/SDCWA transfer and canal linings.

2.3 Water Supply Reliability

After estimating demands for single dry year, multiple dry years, and average years, the water reliability analysis requires urban water suppliers to identify projected supplies to meet these demands. Table 2-4 summarizes the sources of supply for the single dry year (1977 hydrology), while Table 2-5 shows the region's ability to respond in future years under a repeat of the 1990-92 hydrology. Table 2-5 provides results for the average of the three dry-year series rather than a year-by-year detail because most of Metropolitan's dry-year supplies are designed to provide equal amounts of water over each year of a three-year period. These tables show that the region can provide reliable water supplies under both the single driest year and the multiple dry-year hydrologies. Table 2-6 reports the expected situation on average over all of the historic hydrologies from 1922 to 2012. Appendix 3 contains detailed justifications for the sources of supply used for this analysis.

Metropolitan's supply capabilities are evaluated using the following assumptions:

Colorado River Aqueduct Supplies

CRA supplies include supplies that would result from existing and committed programs and from implementation of the QSA and related agreements. The QSA establishes the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. A detailed discussion of the QSA is included in Section 3.1. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.2 MAF on an as-needed basis.

State Water Project Supplies

SWP supplies are estimated using the 2015 SWP Delivery Capability Report distributed by DWR in July 2015. The 2015 SWP Delivery Capability Report presents current DWR estimates of the amount of water deliveries for current (2015) conditions and conditions 20 years in the future. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on December 15, 2008, and June 4, 2009, respectively. Under the 2015 SWP Delivery Capability Report with existing conveyance and low outflow requirements scenario, the delivery estimates for the SWP for 2020 conditions as percentage of Table A amounts are 12 percent, equivalent to 257 TAF for Metropolitan, under a single dry-year (1977) condition and 51 percent, equivalent to 976 TAF for Metropolitan, under long-term average condition.

The goal for the 2015 IRP Update for SWP supplies is to manage flow and export regulations in the near term and ultimately to achieve a long-term Bay-Delta solution. This goal involves continued engagement in collaborative science-based approaches to manage regulations in the near-term and continued participation in the long-term California WaterFix and the California EcoRestore efforts. This approach targets an average of 984 TAF of SWP supplies in the near-term and 1.2 MAF of supplies on average starting in 2030 when the long-term Delta solution is assumed to be in place. More detailed description of SWP supplies is included in Section 3.2.

In dry and below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Further descriptions of these programs can be found in Section 3.3.

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry-year and emergency storage capacity. Storage is a key component of water management. Storage enables the capture of surplus amounts of water in normal and wet climate and hydrologic conditions when it is plentiful for supply and environmental uses. Stored water can then be used in dry years and in conditions where augmented water supplies are needed to meet demands. Metropolitan's resource analysis model considers all the capacities and constraints of its storage facilities and programs and simulates the fill and withdrawal of these facilities through the 91 hydrologic conditions from 1922-2012.

Table 2-4
Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	693,000	774,000	852,000	956,000	992,000
California Aqueduct[2]	691,000	712,000	723,000	749,000	749,000
Colorado River Aqueduct					
Total Supply Available[3]	1,451,000	1,457,000	1,456,000	1,455,000	1,454,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**2,584,000**	**2,686,000**	**2,775,000**	**2,905,000**	**2,941,000**
Demands					
Total Demands on Metropolitan	1,731,000	1,784,000	1,826,000	1,878,000	1,919,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**2,005,000**	**2,066,000**	**2,108,000**	**2,160,000**	**2,201,000**
Surplus	**579,000**	**620,000**	**667,000**	**745,000**	**740,000**
Programs Under Development					
In-Region Supplies and Programs	43,000	80,000	118,000	160,000	200,000
California Aqueduct	20,000	20,000	198,000	198,000	198,000
Colorado River Aqueduct					
Total Supply Available[3]	155,000	125,000	75,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**63,000**	**100,000**	**316,000**	**358,000**	**398,000**
Potential Surplus	**642,000**	**720,000**	**983,000**	**1,103,000**	**1,138,000**

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.
[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-5
Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	239,000	272,000	303,000	346,000	364,000
California Aqueduct[2]	664,000	682,000	687,000	696,000	696,000
Colorado River Aqueduct					
Total Supply Available[3]	1,403,000	1,691,000	1,690,000	1,689,000	1,605,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**2,103,000**	**2,154,000**	**2,190,000**	**2,242,000**	**2,260,000**
Demands					
Total Demands on Metropolitan	1,727,000	1,836,000	1,889,000	1,934,000	1,976,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**2,001,000**	**2,118,000**	**2,171,000**	**2,216,000**	**2,258,000**
Surplus	**102,000**	**36,000**	**19,000**	**26,000**	**2,000**
Programs Under Development					
In-Region Supplies and Programs	36,000	73,000	110,000	151,000	192,000
California Aqueduct	7,000	7,000	94,000	94,000	94,000
Colorado River Aqueduct					
Total Supply Available[3]	80,000	75,000	50,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**43,000**	**80,000**	**204,000**	**245,000**	**286,000**
Potential Surplus	**145,000**	**116,000**	**223,000**	**271,000**	**288,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.

[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-6
Average Year
Supply Capability[1] and Projected Demands
Average of 1922-2012 Hydrologies
(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	693,000	774,000	852,000	956,000	992,000
California Aqueduct[2]	1,555,000	1,576,000	1,606,000	1,632,000	1,632,000
Colorado River Aqueduct					
Total Supply Available[3]	1,468,000	1,488,000	1,484,000	1,471,000	1,460,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**3,448,000**	**3,550,000**	**3,658,000**	**3,788,000**	**3,824,000**
Demands					
Total Demands on Metropolitan	1,586,000	1,636,000	1,677,000	1,726,000	1,765,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**1,860,000**	**1,918,000**	**1,959,000**	**2,008,000**	**2,047,000**
Surplus	**1,588,000**	**1,632,000**	**1,699,000**	**1,780,000**	**1,777,000**
Programs Under Development					
In-Region Supplies and Programs	43,000	80,000	118,000	160,000	200,000
California Aqueduct	20,000	20,000	268,000	268,000	268,000
Colorado River Aqueduct					
Total Supply Available[3]	5,000	25,000	25,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**63,000**	**100,000**	**386,000**	**428,000**	**468,000**
Potential Surplus	**1,651,000**	**1,732,000**	**2,085,000**	**2,208,000**	**2,245,000**

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.
[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

2.4 Water Shortage Contingency Analysis

In addition to the Water Supply Reliability analysis addressing average year and drought conditions, the Act requires agencies to document the stages of actions that they would undertake in response to water supply shortages, including up to a 50 percent reduction in their water supplies. Metropolitan has captured this planning in its Water Surplus and Drought Management (WSDM)[2] Plan which guides Metropolitan's planning and operations during both shortage and surplus conditions. Furthermore, Metropolitan developed the Water Supply Allocation Plan (WSAP)[3], which provides a standardized methodology for allocating supplies during times of shortage.

Water Surplus and Drought Management Plan

Metropolitan's Board adopted the WSDM Plan in April 1999, which provides policy guidance for managing regional water supplies to achieve the reliability goals of the IRP and identifies the expected sequence of resource management actions that Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and reduce the possibility of extreme shortages and shortage allocations. Unlike Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions with respect to both conditions.

WSDM Plan Development

Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999. This planning effort included more than a dozen half-day and full-day workshops and more than three dozen meetings between Metropolitan and member agency staff. The result of the planning effort is a consensus plan that addresses a broad range of regional water management actions and strategies.

<u>WSDM Plan Principles and Goals</u>

The guiding principle of the WSDM Plan is to manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle came the following supporting principles:

- Encourage efficient water use and economical local resource programs
- Coordinate operations with member agencies to make available as much surplus water as possible for use in dry years
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years
- Increase public awareness about water supply issues

The WSDM plan also declared that if mandatory import water allocations become necessary, they would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM plan contains the following considerations that would go into an allocation of imported water:

- Impact on retail consumers and regional economy
- Investments in local resources, including recycling and conservation

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[2] Metropolitan Water District of Southern California. *Water Surplus and Drought Management Plan,* Report No. 1150, August, 1999.

[3] Metropolitan Water District of Southern California, Water Supply Allocation Plan, December 2014.

- Population growth
- Changes and/or losses in local supplies
- Participation in Metropolitan's non-firm (interruptible) programs
- Investment in Metropolitan's facilities

WSDM Plan Implementation

Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource management actions designed to: (1) avoid an Extreme Shortage to the maximum extent possible; and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix.

Surplus Stages

Metropolitan's supply situation is considered to be in surplus as long as net annual deliveries can be made to water storage programs. The WSDM Plan further defines four surplus management stages that guide the storage of surplus supplies in Metropolitan's storage portfolio. Deliveries for storage in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

Shortage Stages

The WSDM Plan distinguishes between Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meanings relating to Metropolitan's ability to deliver water to its customers.

Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.

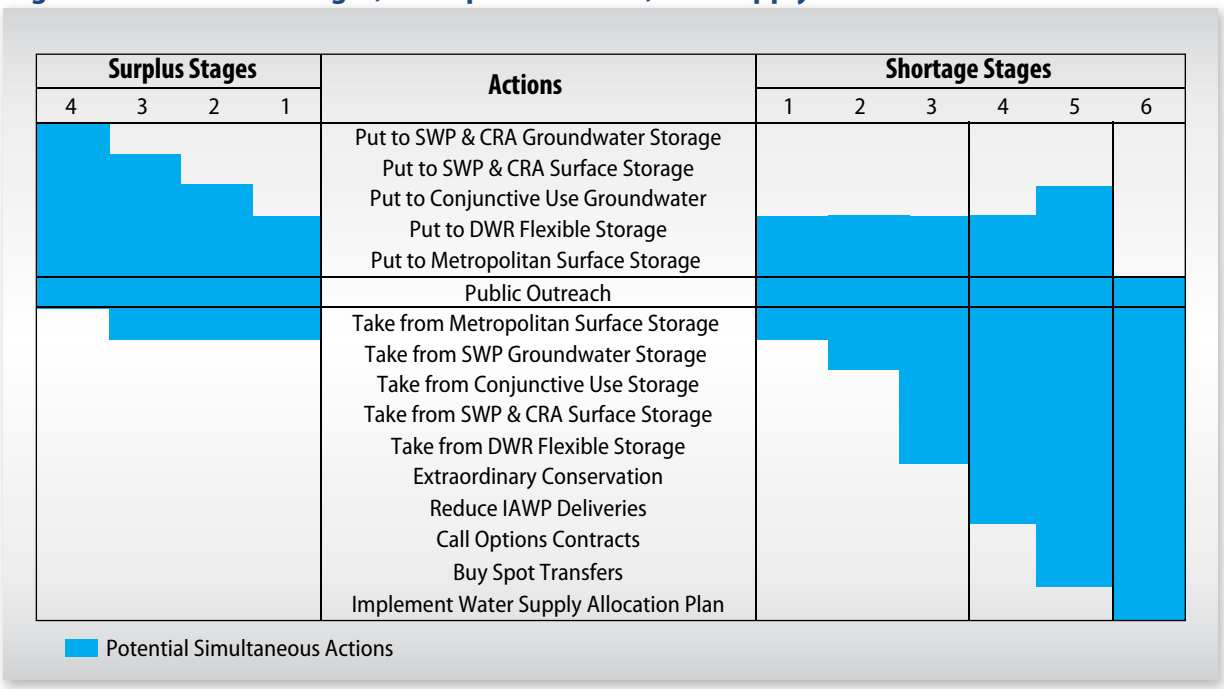
Extreme Shortage: Metropolitan allocates available supply to full-service customers.

The WSDM Plan also defines six shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage.

When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, Metropolitan is still able to meet all end-use demands for water. For shortage stages 1 through 3, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 4 and 5, Metropolitan may undertake additional shortage management steps, including issuing public calls for extraordinary conservation and exercising water transfer options, or purchasing water on the open market.

Figure 2-1 shows the actions under surplus and shortage stages and when an allocation plan would be necessary to enforce mandatory cutbacks. The overriding goal of the WSDM Plan is to avoid reaching Shortage Stage 6, an Extreme Shortage.

Figure 2-1 Resource Stages, Anticipated Actions, And Supply Declarations



Water Supply Condition Framework

Consistent with the WSDM Plan, Metropolitan's Board adopted a Water Supply Condition Framework in June 2008. The purpose of the framework is to communicate the urgency of the region's water supply situation and the need for further water conservation practices. The framework is intended to encourage proactive steps to reduce the region's water demand to mitigate the need for more severe actions, up to and including implementation of the WSAP to allocate water supply shortages to member agencies. The framework has four conditions, each calling for an increasingly heightened level of conservation response:

- Baseline Water Use Efficiency
- Condition 1: Water Supply Watch
- Condition 2: Water Supply Alert
- Condition 3: Water Supply Allocation

Table 2-7 below shows the framework and the associated conservation actions.

Table 2-7
Water Supply Condition Framework

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

The drought periods of 2007-2011 and 2012-2015 provide an example of how the Water Supply Condition Framework is used. In June 2008, Metropolitan's Board declared a Condition 2: Water Supply Alert to highlight that storage reserves were dropping and that drought conditions were building, corresponding to WSDM shortage stages 1-5. In April 2009 and again in April 2010, Metropolitan's Board moved deeper into a Condition 3: Water Supply Allocation, corresponding to an extreme shortage stage 6 in the WSDM Plan. The April 2010 Water Supply Allocation condition was later terminated by Metropolitan's Board in April 2011 when hydrologic conditions improved during the 2010/2011 water year. The region returned to the Baseline Water Use Efficiency condition following the improvement in water supply. As dry conditions returned in 2012 and 2013, Metropolitan returned to using regional storage and sponsoring outreach efforts with member agencies to encourage voluntary conservation. In 2014, record dry and hot conditions significantly impacted the water resources of both the State of California and Metropolitan. In light of these conditions, which precipitated the January 2014 Emergency Drought Declaration by Governor Brown, Metropolitan's Board declared a Condition 2: Water Supply Alert in February 2014 to again provide public messaging and to urge local water agencies within Metropolitan's service area to adopt and enact water savings ordinances. Extremely dry conditions continued in 2015. In support of the Governor's Executive Order B-29-15 calling for 25 percent reductions in statewide consumer water use, Metropolitan's Board declared a Condition 3: Water Supply Allocation in April 2015.

Water Supply Allocation Plan

The WSAP provides a formula for allocating available water supplies to the member agencies in case of extreme water shortages within Metropolitan's service area. The WSAP was approved by Metropolitan's Board in February 2008 and has since been implemented three times, most recently in April 2015. The WSAP was developed in consideration of the principles and guidelines described in the WSDM Plan, with the objective of creating an equitable needs-based allocation. The WSAP formula seeks to balance the impacts of a shortage at the retail level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account

growth, local investments, changes in supply conditions, and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs.

Water Supply Allocation Plan Development

Between July 2007 and February 2008, Metropolitan staff worked jointly with Metropolitan's member agencies to develop the WSAP. Throughout the development process, Metropolitan's Board was provided with regular progress reports on the status of the WSAP. The WSAP was adopted at the February 12, 2008 Board meeting. Since the WSAP's adoption in 2008, Metropolitan has worked extensively with the member agencies to periodically review the WSAP formula. Following Board-directed formal review of the WSAP at 12 months after initial implementation and at 3 years after initial adoption, the Board approved adjustments to the WSAP formula on August 17, 2010, and September 13, 2011. In light of drought conditions, Metropolitan staff convened a member agency working group between July and November 2014 to revisit the WSAP before possible implementation in 2015. On December 9, 2014, the Board approved additional adjustments to the formula.

The WSAP Formula

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

Step 1: Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from fiscal years (July through June) ending 2013 and 2014.

Step 2: Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population growth and changes in local supplies.

Step 3: Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. There are a number of adjustments that go into a member agency's water supply allocation. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

Annual Reporting Schedule on Supply/Demand Conditions

Managing Metropolitan's water supply resources to minimize the risk of shortages requires timely and accurate information on changing supply and demand conditions throughout the year. To facilitate effective resource management decisions, the WSDM Plan includes a monthly schedule for providing supply/demand information to Metropolitan's senior management and Board, and for making resource allocation decisions. Table 2-8 shows this schedule.

Table 2-8
Schedule of Reporting and Water Supply Allocation Decision-Making

Month	Information Report/Management Decision
January	Initial supply/demand forecasts for year
February - March	Update supply/demand forecasts for year
April - May	Finalize supply/demand forecasts Management decisions re: Contractual Groundwater and Option Transfer Programs Board decision re: Need for Extraordinary Conservation
October - December	Report on Supply and Carryover Storage

2.5 Catastrophic Supply Interruption Planning

The third type of planning needed to evaluate supply reliability is a catastrophic supply interruption plan that documents the actions necessary for a catastrophic interruption in water supplies. For Metropolitan, this planning is captured in the analysis that went into developing the Emergency Storage Requirements.

Emergency Storage Requirements

Metropolitan established its criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board approved both of these documents.

Emergency storage requirements are based on the potential of a major earthquake damaging the aqueducts that transport Southern California's imported water supplies (SWP, CRA, and Los Angeles Aqueduct). The adopted criteria assume that damage from such an event could render the aqueducts out of service for six months. Therefore, Metropolitan has based its planning on a 100 percent reduction in these imported supplies for a period of six months, which is a greater shortage than required by the Act.

To safeguard the region from catastrophic loss of water supply, Metropolitan has made substantial investments in emergency storage. The emergency plan outlines that under such a catastrophe, non-firm service deliveries would be suspended, and firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal-year demand levels. At the same time, water stored in surface reservoirs and groundwater basins under Metropolitan's program would be made available, and Metropolitan would draw on its emergency storage, as well as other available storage. In addition to DVL, Metropolitan has access to emergency storage at its other reservoirs, and at the SWP terminal reservoirs, and in its groundwater conjunctive use storage accounts. With few exceptions, Metropolitan can deliver this emergency supply throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake. The WSDM Plan shortage stages will guide Metropolitan's management of available supplies and resources during the emergency to minimize the impacts of the catastrophe. Additional discussion of emergency storage is included in Appendix A.3.3.

Electrical Outages

Metropolitan has also developed contingency plans that enable it to deal with both planned and unplanned electrical outages. These plans include the following key points:

- In event of power outages, water supply can be maintained by gravity feed from regional reservoirs such as DVL, Lake Mathews, Castaic Lake, and Silverwood Lake.
- Maintaining water treatment operations is a key concern. As a result, all Metropolitan treatment plants have backup generation sufficient to continue operating in the event of supply failure on the main electrical grid.
- Valves at Lake Skinner can be operated by the backup generation at the Lake Skinner treatment plant.
- Metropolitan owns mobile generators that can be transported quickly to key locations if necessary.

2.6 Other Supply Reliability Risks

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges. Among the challenges Metropolitan faces are the following:

Supplies

- The region and Colorado River Basin have been experiencing drought conditions for multiple years. In the past 16 years (2000-2015), 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 and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints that are particularly important because pumping restrictions impact many water resource programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage, and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects, and seawater desalination plants.
- Public perception of recycled water use.
- Opposition to local seawater desalination projects from environmental groups and community organizations.

Operations and Water Quality

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues like the quagga mussels within the CRA. Controlling the spread and impacts of the quagga mussels will require more extensive maintenance and reduced operational flexibility.
- Salt and concentrate balance from a variety of sources.

Demand

- Fluctuations in population and economic growth.
- Uncertain location of growth.
- Uncertain housing stock and density.
- Changes in outdoor water use patterns.

The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale regional solutions to providing water supply reliability. New solutions are potentially available in the form of dramatically improved water-use efficiency, indirect and direct potable use of recycled water, and large-scale application of ocean desalinization.

Distribution System Water Losses

Metropolitan followed the AWWA Water Audit methodology to track all sources of water and uses of water within its system. The AWWA Water Audit methodology quantifies real and apparent water system losses in an agency's distribution system. Section 10631(e)(3)(A) of the California Water Code requires that the 2015 Urban Water Management Plan update quantify distribution system water losses for the most recent 12-month period available.

For the distribution system water losses assessment, Metropolitan included its water balance audit for calendar years 2014 and 2013. In addition, Metropolitan also included a memorandum that provides water balance assessment for year 2012.

The results of Metropolitan's audit showed that the total amount of distribution system water losses in 2014 was approximately 6.4 TAF. A detailed discussion of Metropolitan's distribution system water losses for 2014 is included in Appendix 7 and summarized in Table A.7-1. In addition to the distribution system losses described in the AWWA tables, Metropolitan estimates that 37 TAF was lost from reservoir evaporation occurring in Lake Mathews, Lake Skinner, and DVL during CY 2014.

Climate Change

Climate change adds its own uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having almost one-hundred years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

Potential Impacts

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in Sierra Nevada snowpack;
- Increased intensity and frequency of extreme weather events; and
- Rising sea levels resulting in
    - Impacts to coastal groundwater basins due to seawater intrusion;
    - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
    - Potential pumping cutbacks on the SWP and Central Valley Project (CVP).

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater;
- Changes in urban and agricultural demand levels and patterns;
- Impacts to human health from water-borne pathogens and water quality degradation;
- Declines in ecosystem health and function; and
- Alterations to power generation and pumping regimes.

Metropolitan's Activities Related to Climate Change Concerns

Resource Planning

Under the 2015 IRP Update, Metropolitan recognizes additional risks and uncertainties from a variety of sources:

- Water quality
- Climate change
- Regulatory and operational changes
- Project construction and implementation issues
- Infrastructure reliability and maintenance
- Demographic and growth uncertainty

Any of these risks and uncertainties, should they occur individually or collectively, may result in a negative impact to water supply reliability. While it is impossible to know how much risk and uncertainty to guard against, the region's reliability will be more secure with a long-term plan that recognizes risk and provides resource development to offset that risk. Some risk and uncertainty will be addressed by following the findings of the 2015 IRP Update. But there are other risks that may take longer to manifest, like climate change or shifts in demographic growth patterns that increase or move the demands for water.

Metropolitan has established an intensive, comprehensive technical process to identify key vulnerabilities. This Robust Decision Making (RDM) approach was used with the 2010 IRP Update. The RDM approach can show how vulnerable the region's reliability is to longer-term risks and can also establish "signposts" that can be monitored to see when critical changes may be happening. Signposts include monitoring the direction of ever-changing impacts from improved Global Climate Models, and housing and population growth patterns. The RDM approach will be revisited with the new resource reliability targets identified in the 2015 IRP Update. Initial 2015 IRP analysis indicated an additional 200,000 AF of water conservation and local supplies may be needed to address these risks. This additional supply goal will be considered when examining implementation policies and approaches as the IRP process continues.

Knowledge Sharing and Research Support

Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of ten nationwide water providers collaborating on climate change adaptation and greenhouse gas mitigation issues. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

Member agencies of WUCA annually share individual agency actions to mitigate greenhouse gas emissions to facilitate further implementation of these programs. WUCA also monitors development of climate change-related research, technology, programs, and federal legislation.

In addition to supporting federal and regional efforts, WUCA released a white paper entitled "Options for Improving Climate Modeling to Assist Water Utility Planning for Climate Change" in January 2010. The purpose of this paper was to assess Global Circulation Models, identify key aspects for water utility planning, and make seven initial recommendations for how climate modeling and downscaling techniques can be improved so that these tools and techniques can be more useful for the water sector. Another recent WUCA publication related to water

planning is: "Embracing Uncertainty: A Case Study Examination of How Climate Change is Shifting Water Utility Planning" (2015). A fundamental goal of this recent white paper is to provide water professionals with practical and relevant examples, with insights from their peers, on how and why to modify planning and decision-making processes to better prepare for a changing climate.

In addition to these efforts, the member agencies of WUCA annually share individual agency actions to mitigate greenhouse gas emissions to facilitate further implementation of these programs. At a September 2009 summit at the Aspen Global Change Institute, WUCA members met with global climate modelers, along with federal agencies, academic scientists, and climate researchers, to establish collaborative directions to progress climate science and modeling efforts. WUCA continues to pursue these opportunities and partnerships with water providers, climate scientists, federal agencies, research centers, academia and key stakeholders.

Metropolitan also continues to pursue knowledge sharing and research support activities outside of WUCA. Metropolitan regularly provides input and direction on California legislation related to climate change issues. Metropolitan is active in collaborating with other state and federal agencies, as well as non-governmental organizations, on climate change related planning issues. The following list provides a sampling of entities that Metropolitan has recently worked with on a collaborative basis:

- USBR
- U.S. Army Corps of Engineers
- AWWA Research Foundation
- National Center for Atmospheric Research
- California Energy Commission
- California Department of Water Resources

Quantification of Current Research

Metropolitan continues to incorporate current climate change science into its planning efforts. A major component of the current IRP update effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, have been incorporated into the update. Overall, Metropolitan's planning activities strive to support the Board adopted policy principles on climate change by:

- Supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply,
- Supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts, and
- Evaluating staff recommendations regarding climate change and water resources under the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

Implementation of Programs and Policies

Metropolitan has made great efforts to implement greenhouse gas mitigation programs and policies for its facilities and operations. To date, these programs and policies have focused on:

- Exploring water supply/energy relationships and opportunities to increase efficiencies;
- Participating in The Climate Registry, a nonprofit greenhouse gas emissions registry for North America that provides organizations with the tools and resources to help them calculate, verify, report, and manage their greenhouse gas emissions in a publicly transparent and credible way;
- Acquiring "green" fleet vehicles, and supporting an employee Rideshare program;
- Developing solar power at both the Skinner water treatment plant (completed) and the Weymouth water treatment plant (in progress); and
- Identifying and pursuing development of "green" renewable water and energy programs that support the efficient and sustainable use of water.

Metropolitan also continues to be a leader in efforts to increase regional water use efficiency. Metropolitan has worked to increase the availability of incentives for local conservation and recycling projects, as well as supporting conservation Best Management Practices for industry and commercial businesses.

2.7 Pricing and Rate Structures

Revenue Management

A high proportion of Metropolitan's revenues come from volumetric water rates. Water sales revenues are approximately 80 percent of Metropolitan's total revenues. As a result, Metropolitan's revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009 and 2015 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales.

Another way to mitigate rate increases is by generating a larger portion of revenues from fixed sources. Metropolitan currently has two fixed charges, the Readiness-to-Serve Charge (RTS) and the Capacity Charge. Metropolitan also collects tax revenue from taxable property within its boundaries. The revenues from fixed charges generate approximately 18 percent of all Metropolitan revenues. RTS revenues have been increasing gradually, from $136 million in fiscal year 2011-12, to $155.5 million in fiscal year 2015-16.

Finally, Metropolitan generates revenue from interest income, hydroelectric power sales, and miscellaneous income such as rents and leases. For the last five fiscal years, these averaged approximately three percent of all Metropolitan revenues. These internally generated revenues are referred to as revenue offsets and reduce the amount of revenue that needs to be collected from rates and charges.

Elements of Rate Structure

This section provides an overview of Metropolitan's rate structure. The different elements of the rate structure are discussed below and summarized in Table 2-9.

System Access Rate (SAR)

The SAR is a volumetric system-wide rate levied on each acre-foot of water that moves through the Metropolitan system. All system users (member agency or third party) pay the SAR to use Metropolitan's conveyance and distribution system. The SAR recovers the cost of providing conveyance and distribution capacity to meet average annual demands.

Water Stewardship Rate (WSR)

The WSR recovers the costs of providing financial incentives for existing and future investments in local resources including conservation and recycled water. These investments or incentive payments are identified as the "demand management" service function in the cost of service process. The WSR is a volumetric rate levied on each acre-foot of water that moves through the Metropolitan system.

System Power Rate (SPR)

The SPR recovers the costs of energy required to pump water to Southern California through the SWP and CRA. The cost of power is recovered through a uniform volumetric rate. The SPR is applied to all deliveries to member agencies.

Treatment Surcharge

The treatment surcharge recovers the costs of providing treated water service through a uniform, volumetric rate. The treatment surcharge recovers all costs associated with providing treated water service, including commodity, demand, and standby related costs.

Capacity Charge

The capacity charge is levied on the maximum summer day demand placed on the system between May 1 and September 30 for a three-calendar year period. Demands measured for the purposes of billing the capacity charge include all firm demands, including wheeling service and exchanges.

The capacity charge is intended to pay for the cost of peaking capacity on Metropolitan's system, while providing an incentive for local agencies to decrease their use of the Metropolitan system to meet peak day demands and to shift demands into lower use time periods. Over time, a member agency will benefit from local supply investments and operational strategies that reduce its peak day demand on the system in the form of a lower total capacity charge.

Readiness-To-Serve Charge (RTS)

The costs of infrastructure projects needed to provide service, including emergency storage and those costs related to the conveyance and distribution system that are available but not used on average, are recovered by the RTS.

The RTS is allocated to the member agencies based on each agency's proportional share of a ten-year rolling average of all firm deliveries. A ten-year rolling average leads to a relatively stable RTS allocation that reasonably represents an agency's potential long-term need for standby service under different demand conditions. Member agencies may choose to have a portion of their total RTS obligation offset by standby charge collections levied by Metropolitan on behalf of the member agency. These standby charges are assessed on parcels of land within the boundaries of a given member agency.

Tier 1 Supply Rate

The costs of maintaining existing supplies and developing additional supplies are recovered through a two-tiered pricing approach. The Tier 1 Supply Rate recovers the cost of maintaining a reliable amount of supply. Each member agency has a predetermined amount of water that can be purchased at the lower Tier 1 Supply Rate. Purchases in excess of this limit will be made at the higher Tier 2 Supply Rate.

Tier 2 Supply Rate

The Tier 2 Supply Rate reflects Metropolitan's cost of purchasing water transfers north of the Delta. The Tier 2 Supply Rate encourages the member agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation.

Table 2-9
Rate Structure Components

Rate Design Elements	Service Provided/ Costs Recovered	Type of Charge
System Access Rate	Conveyance/Distribution (Average Capacity)	Volumetric ($/AF)
Water Stewardship Rate	Conservation/Local Resources	Volumetric ($/AF)
System Power Rate	Power	Volumetric ($/AF)
Treatment Surcharge	Treatment	Volumetric ($/AF)
Capacity Charge	Peak Distribution System Capacity	Fixed ($/cfs)
Readiness-To-Serve Charge	Conveyance/Distribution/Emergency Storage(infrastructure necessary to provide service)	Fixed ($Million)
Tier 1 Supply Rate	Supply	Volumetric ($/AF)
Tier 2 Supply Rate	Supply	Volumetric ($/AF)

The following tables provide further information regarding Metropolitan's rates. Table 2-10 summarizes the rates and charges effective January 1, 2014, January 1, 2015, and January 1, 2016. Average costs by member agency will vary depending upon an agency's RTS allocation, Capacity Charge, and relative proportions of treated and untreated Tier 1, and Tier 2 water purchases. Table 2-11 provides the details of the Capacity Charge, calculated for calendar year 2016.

Table 2-12 provides the details of the Readiness-to-Serve Charge calculation for calendar year 2016 by member agency. Table 2-13 provides the current Purchase Order commitment quantities that member agencies will purchase from Metropolitan over the 10-year period starting January 2015 through December 2024. Tier 1 annual average limits for each member agency are also shown in this table.

Table 2-10
Metropolitan Water Rates and Charges

Effective	Jan 1, 2014	Jan 1, 2015	Jan 1, 2016
Tier 1 Supply Rate ($/AF)	$148	$158	$156
Tier 2 Supply Rate ($/AF)	$290	$290	$290
System Access Rate ($/AF)	$243	$257	$259
Water Stewardship Rate ($/AF)	$41	$41	$41
System Power Rate ($/AF)	$161	$126	$138
Full Service Untreated Volumetric Cost ($/AF)			
Tier 1	$593	$582	$594
Tier 2	$735	$714	$728
Treatment Surcharge ($/AF)	$297	$341	$348
Full Service Treated Volumetric Cost ($/AF)			
Tier 1	$890	$923	$942
Tier 2	$1,032	$1,055	$1,076
Readiness-to-Serve Charge ($M)	$166	$158	$153
Capacity Charge ($/cfs)	$8,600	$11,100	$10,900

Table 2-11
Capacity Charge Detail Calendar Year 2016

	Peak Day Demand (cfs) (May 1 through September 30) Calendar Year				
Agency	2012	2013	2014	3-Year Peak	Calendar Year 2016 Capacity Charge ($10,900/cfs)
Anaheim	38.3	31.3	34.0	38.3	$417,470
Beverly Hills	32.7	30.8	30.6	32.7	$356,430
Burbank	20.9	19.7	22.6	22.6	$246,340
Calleguas	224.0	228.7	240.8	240.8	$2,624,720
Central Basin	74.5	73.6	61.0	74.5	$812,050
Compton	2.3	2.9	0.0	2.9	$31,610
Eastern	237.2	267.4	239.2	267.4	$2,914,660
Foothill	17.6	18.9	19.9	19.9	$216,910
Fullerton	24.4	20.0	22.2	24.4	$265,960
Glendale	41.5	44.9	43.7	44.9	$489,410
Inland Empire	126.7	153.9	144.0	153.9	$1,677,510
Las Virgenes	41.9	43.2	46.1	46.1	$502,490
Long Beach	60.4	66.9	67.8	67.8	$739,020
Los Angeles	512.9	767.1	782.5	782.5	$8,529,250
MWDOC	398.6	379.4	443.1	443.1	$4,829,790
Pasadena	52.1	52.5	48.5	52.5	$572,250
San Diego	961.5	967.4	1,138.2	1,138.2	$12,406,380
San Fernando	2.8	4.9	0.0	4.9	$53,410
San Marino	5.3	6.1	7.3	7.3	$79,570
Santa Ana	19.2	19.6	17.5	19.6	$213,640
Santa Monica	19.7	22.7	15.2	22.7	$247,430
Three Valleys	133.0	178.6	151.4	178.6	$1,946,740
Torrance	36.2	34.1	33.5	36.2	$394,580
Upper San Gabriel	15.2	16.1	45.4	45.4	$494,860
West Basin	222.6	230.2	217.5	230.2	$2,509,180
Western	193.7	198.6	176.6	198.6	$2,164,740
Total	3,515.3	3,879.5	4,058.5	4,196.0	$45,736,400

Totals may not foot due to rounding

Table 2-12
Readiness-to-Serve Charge (by Member Agency)
Calendar Year 2016

Member Agency	Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY2004-05 to FY2013-14	RTS Share	12 months @ $153 million per year (1/16-12/16)
Anaheim	21,646	1.26%	1,931,624
Beverly Hills	11,468	0.67%	1,023,387
Burbank	12,769	0.74%	1,139,430
Calleguas MWD	110,216	6.43%	9,835,288
Central Basin MWD	53,106	3.10%	4,739,002
Compton	2,222	0.13%	198,301
Eastern MWD	98,854	5.77%	8,821,351
Foothill MWD	9,999	0.58%	892,228
Fullerton	9,902	0.58%	883,599
Glendale	20,157	1.18%	1,798,733
Inland Empire Utilities Agency	60,390	3.52%	5,389,007
Las Virgenes MWD	22,702	1.32%	2,025,866
Long Beach	33,643	1.96%	3,002,172
Los Angeles	297,705	17.36%	26,566,040
Municipal Water District of Orange County	220,916	12.88%	19,713,676
Pasadena	21,506	1.25%	1,919,148
San Diego County Water Authority	377,077	21.99%	33,648,901
San Fernando	122	0.01%	10,914
San Marino	1,000	0.06%	89,227
Santa Ana	13,091	0.76%	1,168,155
Santa Monica	10,146	0.59%	905,408
Three Valleys MWD	66,509	3.88%	5,935,016
Torrance	18,514	1.08%	1,652,136
Upper San Gabriel Valley MWD	18,292	1.07%	1,632,281
West Basin MWD	128,160	7.47%	11,436,461
Western MWD	74,439	4.34%	6,642,650
Metropolitan Total	1,714,552	100.00%	$153,000,000

Totals may not foot due to rounding

Table 2-13
Purchase Order Commitments and Tier 1 Limits
(by Member Agency)
January 2015 through December 2024

Member Agency	Annual Average Tier 1 Maximum	Purchase Order Commitment (acre-feet)
Anaheim	24,439	148,268
Beverly Hills	13,380	89,202
Burbank	16,776	108,910
Calleguas MWD	118,228	788,185
Central Basin MWD[1]	71,770	
Compton[1]	3,372	
Eastern MWD	117,585	783,898
Foothill MWD	11,773	73,312
Fullerton	11,299	75,322
Glendale	26,222	174,809
Inland Empire Utilities Agency	93,283	398,348
Las Virgenes MWD	24,358	162,387
Long Beach	51,804	263,143
Los Angeles	373,623	2,033,132
Municipal Water District of Orange County	321,635	2,144,233
Pasadena	22,965	153,102
San Diego County Water Authority[1]	393,542	
San Fernando[1]	629	
San Marino	1,442	9,610
Santa Ana	19,617	80,858
Santa Monica[1]	7,406	
Three Valleys MWD	80,687	537,916
Torrance	19,204	128,027
Upper San Gabriel Valley MWD	67,228	110,077
West Basin MWD	135,417	902,783
Western MWD	105,784	705,224
Total	2,133,468	9,870,746

[1] No Purchase Order; Tier 1 maximum is annual, not cumulative.
Totals may not foot due to rounding.

Water Quality 4

Metropolitan's planning efforts have recognized the importance of the quality of its water supplies. To the extent possible, Metropolitan responds to water quality concerns by protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. These practices can increase costs and/or reduce operating flexibility. This section discusses source water quality and issues of concern affecting water management strategies and water supply reliability.

Background

Metropolitan's planning efforts for groundwater storage, recycled water, and other water management strategies require meeting specific water quality targets for imported water. Metropolitan has two major sources of water: the Colorado River and the State Water Project (SWP). Groundwater inflows are also received into the SWP through groundwater banking programs in the Central Valley. Each source has specific quality issues, which are summarized in this section. To date, Metropolitan has not identified any water quality risks that cannot be mitigated. As described in this section, the only potential effect of water quality on the level of water supplies based on current knowledge might be increases in the salinity of water resources. Under California's current drought conditions, decreased flows have altered Delta flow patterns and, while the effects of the drought have not been fully studied, there have been some observable changes in water quality such as increased salinity due to increased seawater intrusion. However, even under drought conditions, SWP salinity is significantly lower than Colorado River water salinity, and Metropolitan relies on blending imported water sources to mitigate for the higher salinity Colorado River water. During recent periods of drought, Metropolitan's SWP allocation has been reduced, including to a historical low of zero percent in January 2014, which affected blending operations. Metropolitan increased its reliance on Colorado River water in 2014 and 2015, and subsequently, salinity in treatment plant deliveries increased overall from the higher Colorado River salinity levels. Metropolitan anticipates no significant reductions in water supply availability from imported sources due to water quality concerns, such as salinity, over the next five years.

Colorado River

High salinity levels remain a significant issue associated with Colorado River supplies. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium-6, which are discussed later in this section. Metropolitan has also been active in efforts to protect these supplies from potential increases in nutrient loading due to agriculture and urbanization, as well as tracking the occurrence of constituents of emerging concern, such as N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan fully expects its source

water protection efforts to be successful, so the only foreseeable water quality constraint to the use of Colorado River water will be the need to blend (mix) it with SWP supplies to meet Metropolitan's Board-adopted salinity standards.

State Water Project

The key water quality issues for the SWP are disinfection byproduct precursors, in particular, total organic carbon and bromide. Metropolitan is working to protect the water quality of this source, but it has needed to upgrade its water treatment plants to deal adequately with disinfection byproducts. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant, and they may place some near-term restrictions on Metropolitan's ability to use SWP water. Metropolitan is overcoming these treatment restrictions through the use of ozone disinfection at its treatment plants. Ozone facilities have been completed at four of Metropolitan's treatment plants, and construction is underway for ozone facilities at the Weymouth water treatment plant. Arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP system than within the Colorado River, leading to the potential for algal related concerns that can affect water management strategies. Metropolitan is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants.

Local Agency Supplies and Groundwater Storage

Drinking water standards for contaminants, such as arsenic, chromium-6, and other emerging constituents, may add costs to the use of groundwater storage and may affect the availability of local agency groundwater sources. These contaminants are not expected to affect the availability of Metropolitan supplies, but they may affect the availability of local agency supplies. This could affect the level of demands on Metropolitan supplies if local agencies abandon supplies in lieu of treatment options. Metropolitan has not analyzed the effect that many of these water quality issues could have on local agency supply availability.

In summary, the major regional water quality concerns include the following:

- Salinity
- Perchlorate
- Total organic carbon and bromide (disinfection byproduct precursors)
- Nutrients (as they relate to algal productivity)
- Arsenic
- Uranium
- Chromium-6
- Constituents of Emerging Concern (e.g., NDMA and PPCPs)

Metropolitan has taken several actions and adopted programs to address these contaminants and to ensure a safe and reliable water supply. These actions, organized by contaminant, are discussed below, along with other water quality programs that Metropolitan has been engaged in to protect its water supplies.

Issues of Potential Concern

Salinity

The State Water Resources Control Board's Division of Drinking Water (DDW), formerly the California Department of Public Health, established a secondary drinking water standard for salinity, commonly expressed as total dissolved solids (TDS), with a recommended maximum contaminant level (MCL) of 500 milligrams per liter (mg/L) and upper limit MCL of 1,000 mg/L. Imported water from the Colorado River has high salinity levels, so it must be blended (mixed) with lower-salinity water from the SWP to meet salinity management goals. Higher salinity levels in Colorado River water would increase the proportion of SWP supplies required to meet Metropolitan's Board-adopted imported water salinity objectives. High levels of salinity can impact various water uses such as limiting groundwater and recycled water uses, reducing the lifespan of household appliances, and reducing crop yields. These salinity impacts affect various sectors including residential, agricultural, commercial, industrial, utility, groundwater, and recycled water. Metropolitan adopted an imported water salinity goal because higher salinity could increase costs and reduce operating flexibility. For example,

1. If diminished water quality causes a need for membrane treatment to remove TDS, the process typically results in losses of up to 15 percent of the water processed. These losses would result in both an increased requirement for additional water supplies and environmental constraints related to brine disposal. In addition, the process is costly. However, only a portion of the imported water would need to be processed, so the possible loss in supplies is small.
2. High TDS in water supplies leads to high TDS in wastewater, which lowers the usefulness and increases the cost of recycled water.
3. Water quality degradation of imported water supply could limit the use of local groundwater basins for storage because of standards controlling the quality of water recharged to the basins.

In addition to the link between water supply and water quality, Metropolitan has identified economic benefits from reducing the TDS concentrations of water supplies. Estimates show that a reduction in salinity concentrations of 100 mg/L in both the Colorado River and SWP supplies will yield economic benefits of $95 million per year (1999 dollars) within Metropolitan's service area.[12] This economic benefit provides an additional incentive to reduce salinity concentrations within the region's water supplies.

<u>The Salinity Management Policy</u>

Considering all of these factors, Metropolitan's Board approved a Salinity Management Policy on April 13, 1999. The policy set a goal of achieving salinity concentrations in delivered water of less than 500 mg/L TDS when practical, understanding that hydrologic conditions will make this infeasible at times. It also identified the need for both local and imported water sources to be managed comprehensively to maintain the ability to use recycled water and groundwater. To achieve these targets, lower TDS SWP water supplies are blended with Colorado River supplies. Using this approach, the salinity target could be met an estimated seven out of ten years. In the other three years, hydrologic conditions would result in a reduced volume of SWP supplies and increased salinity. Since 1999, Metropolitan has met the salinity objective, but due to drought conditions, the target goal was exceeded between 2008 and 2011 and again

[12] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

between 2013 and 2015. Metropolitan has alerted its local agencies that high salinity levels are inevitable under these drought conditions despite its best efforts. Metropolitan has also urged its member agencies to structure the operation of their local projects and groundwater supplies so they are prepared to mitigate the effect of higher salinity levels in imported waters. In addition, Metropolitan seeks to obtain better quality water in the spring/summer months (April through September) to maximize the use of recycled water in agriculture.

The adoption of the Salinity Management Policy resulted from the completion of a Salinity Management Study in 1999. Metropolitan worked collaboratively with multiple stakeholders to complete the salinity study which assessed regional salinity problems and developed management strategies. Metropolitan is currently working with the USBR and Southern California Salinity Coalition to update the study. The current study objectives include updating the economic impact model to complete a revised salinity economic damage assessment of Metropolitan's service area; developing regional salinity indicators to increase awareness and facilitate salinity management in groundwater basins; and assessing Metropolitan's long-term capability of delivering low-salinity water supplies and determining whether new salinity operational goals should be established.

Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals. The following sections discuss the salinity issues relevant to each of Metropolitan's major supply sources and other resources.

Colorado River

Water imported via the CRA has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L since 1976. Concern over salinity levels in the Colorado River has existed for many years.

To deal with the concern, the International Boundary and Water Commission approved Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River, in 1973, and the President approved the Colorado River Basin Salinity Control Act in 1974. High TDS in the Colorado River as it entered Mexico and the concerns of the seven Basin states regarding the quality of Colorado River water in the United States drove these initial actions. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system. The program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs. Examples of salinity control measures include improved irrigation practices, rangeland management, and the operation of a deep well brine injection project.

The Forum proposed, the states adopted, and the USEPA approved water quality standards in 1975, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels, while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three stations on the main stream of the lower Colorado River as appropriate points to measure the river's salinity. These stations and numeric

criteria are: (1) below Hoover Dam, 723 mg/L; (2) below Parker Dam, 747 mg/L; and (3) at Imperial Dam, 879 mg/L.

Per the Forum, concentrations of salts in the Colorado River cause approximately $382 million in quantified damages (2014 dollars) in the lower Basin each year.[13] The salinity control program has proven to be very successful and cost-effective. Salinity control projects remove over a million tons of salts from Colorado River water, resulting in reduced salinity concentrations of over 100 mg/L as a long-term average.

During the high water flows of 1983-1986, salinity levels in the CRA dropped to a historic low of 525 mg/L. However, during the 1987-1992 drought, higher salinity levels of 600 to 650 mg/L returned. TDS in Lake Havasu was measured at 626 mg/L in June 2015 and is projected to continue increasing as water development occurs throughout the Colorado River basin, particularly as the Upper Colorado River Basin States continue to develop their apportioned water reducing dilution in the Colorado River. Also, under drought conditions, Lake Powell has received higher salinity water, and as the system normalizes, salinity is expected to increase in the lower Colorado River as water from Lake Powell is released downstream.

State Water Project

Water supplies from the SWP have significantly lower TDS concentrations than the Colorado River, averaging approximately 250 mg/L in water supplied through the East Branch and 325 mg/L on the West Branch over the long-term, with short term variability as a result of hydrologic conditions.[14] Because of this lower salinity, Metropolitan blends SWP water with high salinity CRA water to reduce the salinity concentrations of delivered water. However, both the supply and the TDS concentrations of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

As indicated above, the TDS concentrations of SWP water can vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem for use of blending as a management tool to lower the higher TDS from the Colorado River supply. For example, during the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/L, and supplies became limited. During this same event, salinity at the SWP's Banks pumping plant exceeded 700 mg/L. Under future similar circumstances, Metropolitan's 500 mg/L TDS objective could only be achieved by reducing imported water from the CRA. Thus, it may not always be possible to maintain both the salinity objective and water supply reliability unless salinity concentrations of source supplies can be reduced.

A federal court ruling and a resulting biological opinion issued through consultation with U.S. Fish and Wildlife Service addressing the effects of the water supply pumping operations on sensitive fish species in the Delta has limited SWP exports at specified times of the year since December 2007. These restrictions have increased reliance on higher salinity Colorado River water, impacting the ability at times to meet Metropolitan's goal of 500 mg/L TDS at its blend plants. Drought conditions leading to lower SWP water supply allocations in recent years also affect Metropolitan's ability to meet its salinity goal. The target goal was exceeded between 2008 and 2011 when water supply allocations were reduced to 35-50 percent. Similarly, the target goal has been exceeded between 2013 and 2015 under current drought conditions with

[13] Colorado River Basin Salinity Control Program–Briefing Document (May 1, 2015)

[14] The higher salinity in the West Branch deliveries is due to salt loadings from local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes.

restricted annual water supply allocations reduced to 5-35 percent and briefly reduced to a historical zero percent allocation in January 2014.

TDS objectives in Article 19 of the SWP Water Service Contract specify a ten-year average of 220 mg/L and a maximum monthly average of 440 mg/L. These objectives have not been met, and Metropolitan is working with DWR and other agencies on programs aimed at reducing salinity in Delta supplies. These programs aim to reduce salinity on the San Joaquin River through modifying agricultural drainage and developing comprehensive basin plans. In addition, operable gates and channel barriers have been placed in strategic locations in the Delta to impede transport of seawater derived salt. For the first time since 1977, in response to California's drought emergency, DWR installed a temporary rock barrier across False River in May 2015 to help limit salt intrusion from the San Francisco Bay into the central Delta. DWR is also leading the development of the California WaterFix, which involves water delivery upgrades that could reduce SWP salinity levels by diverting a greater percentage of lower salinity Sacramento River flows to the South Delta export pumps.

Recycled Water

Wastewater flows always experience significantly higher salinity concentrations than the potable water supply. Typically, each cycle of urban water use adds 250 to 400 mg/L of TDS to the wastewater. Salinity increases tend to be higher where specific commercial or industrial processes add brines to the discharge stream or where brackish groundwater infiltrates into the sewer system.

Where wastewater flows have high salinity concentrations, the use of recycled water may be limited or require more expensive treatment (e.g., reverse osmosis). Landscape irrigation and industrial reuse become problematic at TDS concentrations over 1,000 mg/L. Some crops such as strawberries and avocados are particularly sensitive to high TDS concentrations, and the use of high-salinity recycled water may reduce yields of these crops. In addition, Basin Plan Objectives may lead to restrictions on the use of recycled water on lands overlying those groundwater basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies may increase salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable. Therefore, to maintain the cost-effectiveness of recycled water, the salinity level of the region's potable water sources and wastewater flows must be controlled.

In May 2009, the SWRCB adopted a Recycled Water Policy[15] to help streamline the permitting process and to help establish uniform statewide criteria for recycled water projects. The policy was amended in January 2013 to include monitoring requirements for constituents of emerging concern. This policy promotes the development of watershed- or basin-wide salt management plans (to be adopted by the respective Regional Boards) to meet water quality objectives and protect beneficial uses, rather than imposing project-by-project restrictions. The Recycled Water Policy identifies several criteria to guide recycled water irrigation or groundwater recharge project proponents in developing a salt (and nutrient) management plan (SNMP).

[15] http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/docs/recycledwaterpolicy_approved.pdf

Groundwater Basins

Increased TDS in groundwater basins occurs either when basins near the ocean are over drafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so where irrigation water is high in TDS or where the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. In addition, wastewater discharges in inland regions may lead to salt buildup from fertilizer and dairy waste. In the 1950s and 1960s, high-TDS Colorado River water was used to recharge severely overdrafted aquifers and prevent saltwater intrusion, resulting in significant salt loadings to the region's groundwater basins.

In the past, these high salt concentrations have caused some basins within Metropolitan's service area to be unsuitable for municipal uses if left untreated. The Arlington Basin in Riverside and the Mission Basin in San Diego required demineralization before they could be returned to municipal service. The capacity of the larger groundwater basins makes them better able to dilute the impact of increasing salinity. While most groundwater basins within the region still produce water of acceptable quality, this resource must be managed carefully to minimize further degradation. Even with today's more heightened concern regarding salinity, approximately 600,000 tons of salts per year accumulate within the region, leading to ever-increasing salinity concentrations in many groundwater basins.[16] Drought conditions have further impacted salinity levels in recycled water, reflective of increased salinity levels in source water. Increased recycled water salinity levels make it difficult for dischargers to comply with water quality objectives for groundwater basins.

To protect the quality of groundwater basins, Regional Boards often place restrictions on the salinity concentrations of water used for basin recharge or for irrigation of lands overlying the aquifers. Those situations may restrict water reuse and aquifer recharge, or they may require expensive mitigation measures. SNMPs offer an opportunity for stakeholders to work with Regional Boards to address salt and nutrient issues regionally. The SNMP development process is locally-driven and focuses on addressing all sources of salts and nutrients, instead of only regulating individual recycled water projects which may not address all sources impacting groundwater. The SNMP objectives include: optimizing recycled water use, protecting groundwater supply and beneficial uses, protecting agricultural beneficial uses, and protecting human health. SNMPs were to be completed by May 2014 with a possible two year extension. After completion, SNMPs may be adopted in a Basin Plan Amendment.

Several SNMPs were completed by the completion deadline, while other plans were granted an extension for completion in 2016. The Santa Ana Region Basin Plan updated its TDS and Nitrogen Management Plan with a subsequent SNMP amendment in 2014. This SNMP highlights efforts to implement extensive groundwater recharge projects using recycled water in the Chino Basin and expansion of the GWRS in Orange County. The Central Basin and West Coast Basin SNMP was approved as an amendment to the Los Angeles Region Basin Plan in February 2015. This SNMP highlights existing and planned implementation measures to ensure future compliance with water quality objectives including increased recharge at seawater intrusion barriers, increased groundwater pump and treat by the Goldsworthy and Brewer Desalters, and increased recycled water use for irrigation. Multiple SNMPs have been completed in the San Diego Region, and basin plan amendments are being considered. SNMPs are also being developed for the Main San Gabriel Basin, Raymond Basin, San Fernando Valley Basin, and Calleguas Creek and Oxnard Plains.

[16] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

Perchlorate

Perchlorate compounds are used as a main component in solid rocket propellant, and are also found in some types of munitions and fireworks. Perchlorate compounds quickly dissolve and become highly mobile in groundwater. Unlike many other groundwater contaminants, perchlorate neither readily interacts with the soil matrix nor degrades in the environment. Conventional drinking water treatment (as utilized at Metropolitan's water treatment plants) is not effective for perchlorate removal.

The primary human health concern related to perchlorate is its effect on the thyroid. Perchlorate can interfere with the thyroid's ability to produce hormones required for normal growth and development. Pregnant women who are iodine deficient and their fetuses, infants and small children with low dietary iodide intake, and individuals with hypothyroidism may be more sensitive to the effects of perchlorate.

DDW established a primary drinking water standard for perchlorate in 2007 with an MCL of 6 micrograms per liter (μg/L). In February 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) lowered the public health goal (PHG) for perchlorate from 6 μg/L to 1 μg/L. In response to the new PHG, DDW will review the perchlorate MCL. There is currently no federal drinking water standard for perchlorate, but the USEPA is in the process of developing a national primary drinking water regulation.

Perchlorate was first detected in Colorado River water in June 1997 and was traced back to Las Vegas Wash. The source of contamination was found to be emanating from a chemical manufacturing facility in Henderson, Nevada. Tronox, Inc. was responsible for the ongoing perchlorate remediation of the site, although contamination resulted from years of manufacturing operations from site predecessors. Another large perchlorate groundwater plume is also present in the Henderson area from a second industrial site. Remediation activities are ongoing for cleanup of that plume by American Pacific Corporation (AMPAC).

Following the detection of perchlorate in the Colorado River, Metropolitan, along with USEPA and agencies in Nevada including the Nevada Division of Environmental Protection (NDEP), organized the forces necessary to successfully treat and decrease the sources of perchlorate loading. Under NDEP oversight, remediation efforts began in 1998, and treatment operations became fully operational in 2004. These efforts have reduced perchlorate loading into Las Vegas Wash from over 1,000 lbs/day (prior to treatment) to 50-90 lbs/day since early 2007. This has resulted in over 90 percent reduction of the perchlorate loading entering the Colorado River system. In January 2009, Tronox filed for Chapter 11 bankruptcy protection citing significant environmental liabilities taken from the previous site owner. A settlement was reached in February 2011 which resulted in the formation of the Nevada Environmental Response Trust (NERT). NERT received $81 million for cleanup efforts while pursuing additional funding sources.

In April 2014, Tronox reached a $5.15 billion settlement with its predecessors which awarded approximately $1.1 billion, directed to NERT, to clean up perchlorate and other contaminants at the former Tronox site in Henderson. The settlement, which represents one of the largest environmental recoveries in history, went into effect in January 2015 and helps to ensure adequate funds are available for site cleanup and protection of the downstream Colorado River. NERT is currently conducting remedial investigations for long-term soil and groundwater cleanup, while NDEP is initiating a regional investigation of downstream perchlorate-contaminated areas to further reduce loading into Las Vegas Wash. The remedial plan has an established goal to reduce perchlorate loading into Las Vegas Wash to less than 10 lbs/day, which would result in levels well below 1 μg/L in the Colorado River. This would help ensure

compliance with any potential reduction of California's perchlorate MCL of 6 µg/L, in light of the new 1 µg/L public health goal.

As a result of the aggressive clean-up efforts, perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from a peak of 9 µg/L in May 1998. Levels have remained less than 6 µg/L since October 2002, and have been typically less than 2 µg/L since June 2006. Metropolitan routinely monitors perchlorate at over 30 locations within its system, and levels currently remain below 2 µg/L. Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

Perchlorate has also been found in groundwater basins within Metropolitan's service area, largely from local sources. The vast majority of locations where perchlorate has been detected in the groundwater are associated with the manufacturing or testing of solid rocket fuels for the Department of Defense and the National Aeronautics and Space Administration (NASA), or with the manufacture, storage, handling, or disposal of perchlorate (such as Aerojet in Azusa in the Main San Gabriel Basin and the Jet Propulsion Laboratory/NASA in the Raymond Basin). Past agricultural practices using fertilizers laden with naturally occurring perchlorate have also been implicated in some areas. Per SWRCB's water quality database, reported monitoring results from 2011 to 2014 indicate that 10 Metropolitan member agencies have detected perchlorate in their service areas at levels greater than 4 µg/L in 36 sources, while 7 member agencies have detected levels greater than 6 µg/L.

Metropolitan has investigated technologies to mitigate perchlorate contamination. Perchlorate cannot be removed using conventional water treatment. Nanofiltration and reverse osmosis do work effectively, but at a very high cost. AMPAC and NERT utilize a biological fluidized bed reactor (FBR) process train for the cleanup of their Henderson sites. A number of sites in Southern California have successfully installed ion exchange systems to treat perchlorate impacted groundwater. In November 2009, a study of biological treatment for perchlorate removal in the City of Pasadena's groundwater was completed with funding provided through a Congressional mandate from USEPA to Metropolitan. The City of Pasadena decided to continue using ion exchange treatment for perchlorate removal and expanded treatment to two well sites.

Treatment options are available to recover groundwater supplies contaminated with perchlorate. However, it is very difficult to predict whether treatment will be pursued to recover all lost production because local agencies will make decisions based largely on cost considerations, ability to identify potentially responsible parties for cleanup, and the availability of alternative supplies.

Total Organic Carbon and Bromide

Disinfection byproducts (DBPs) form when source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. While many DBPs have been identified and some are regulated under the Safe Drinking Water Act, there are others that are not yet known. Even for those that are known, the potential adverse health effects may not be fully characterized.

Water agencies began complying with new regulations to protect against the risk of DBP exposure in January 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in

January 2006 requiring systems to comply at terminus locations in the distribution system to be more representative of maximum residence time and to protect the public. Metropolitan has been in compliance with the Stage 2 D/DBP Rule since it became effective.

Existing levels of TOC and bromide in Delta water supplies present challenges for water utilities to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water increase several-fold due to agricultural drainage and seawater intrusion as water moves through the Delta.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plants: two that receive SWP water exclusively, and three that receive a blend of SWP and Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process minimizes the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water have met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limits the percentage of water from the SWP for plants utilizing chlorine as the primary disinfectant. In 2010 and 2015, Metropolitan completed ozone upgrades at Skinner and Diemer water treatment plants, respectively. Construction of ozonation facilities is underway at Weymouth water treatment plant and is expected to be completed in 2017. The estimated ozone retrofit cost for all five treatment plants is over $1.1 billion.

Nutrients

Elevated levels of nutrients (phosphorus and nitrogen compounds) can stimulate nuisance algal and aquatic weed growth that affects water system operations and consumer acceptability, including the production of noxious taste and odor compounds and algal toxins. In addition to taste and odor and toxin concerns, increases in algal and aquatic weed biomass can impede flow in conveyances, shorten filter run times, increase solids production at drinking water treatment plants, and add to organic carbon loading. Further, nutrients can provide an increasing food source that may lead to the proliferation of quagga and zebra mussels, and other invasive biological species. Studies have shown phosphorus to be the limiting nutrient in both SWP and Colorado River supplies. Therefore, any increase in phosphorus loading has the potential to stimulate algal growth, leading to the concerns identified above.

SWP supplies have significantly higher nutrient levels than Colorado River supplies. Wastewater discharges, agricultural drainage, and nutrient-rich soils in the Delta are primary sources of nutrient loading to the SWP. Metropolitan and other drinking water agencies receiving Delta water have been engaged in efforts to minimize the effects of nutrient loading from Delta wastewater plants. The Sacramento Regional County Sanitation District (SRCSD), the primary discharger to the Sacramento River, is in the process of constructing wastewater treatment plant upgrades to comply with its 2010 discharge permit requirements for ammonia and nitrate removal. Excessive levels of ammonia are suspected to be altering the Delta's food web which, in turn, has implications for SWP supply reliability. SRCSD expects to complete its EchoWater Project by 2023 and has stated that the project will serve multiple benefits including improving water quality in the Sacramento River, protecting the fragile Delta ecosystem, and expanding recycled water use opportunities. The improvements include a biological nutrient removal process for ammonia and nitrate removal. The project also includes tertiary treatment processes for filtration and enhanced disinfection. In 2014, the City of Stockton Wastewater

Treatment Plant, a discharger to the San Joaquin River, was issued a draft permit with a more stringent nitrate discharge limit consistent with the final discharge limits issued in SRCSD's permit. The City of Stockton may have to implement similar plant upgrades as SRCSD to comply with discharge permit requirements.

Metropolitan reservoirs receiving SWP water have experienced several taste and odor episodes in recent years. For example, between 2010 and 2014, Metropolitan reservoirs experienced 11 taste and odor events requiring treatment. A taste and odor event can cause a reservoir to be bypassed and potentially have a short-term effect on the availability of that supply. Metropolitan has a comprehensive program to monitor and manage algae in its source water reservoirs. This program was developed to provide an early warning of algae related problems and taste and odor events to best manage water quality in the system.

The issue of cyanotoxins has become a growing concern as a result of increasing occurrences both nationally and internationally. For example, in August 2014, an algae bloom producing Mycrocystin in Lake Erie significantly affected water supply for Toledo, Ohio, prompting the city to issue urgent notices to residents to not drink or boil the drinking water. This event stimulated state and federal legislation to develop health advisories and strategic plans for algal toxins. In June 2015, USEPA issued health advisories for two cyanobacterial toxins: Microcystins and Cylindrospermopsin. The health advisories serve as recommended precautionary levels and are not enforceable federal water quality standards. Cyanotoxins are included on the current Contaminant Candidate List (CCL3), which identifies contaminants considered for regulation under the Safe Drinking Water Act. USEPA is currently developing improved analytical methods for cyanotoxins to support nationwide monitoring for Microcystins, Anatoxin-a, and Cylindrospermopsin through the Unregulated Contaminant Monitoring Rule 4 program, which would be published in late 2016 and require monitoring to begin in January 2018. Metropolitan would comply with Unregulated Contaminant Monitoring Rule monitoring and reporting requirements.

Although phosphorus levels are much lower in the Colorado River than in the SWP, this nutrient is still of concern. Despite relatively low concentrations (Colorado River has been considered an oligotrophic, or low-productivity, system), any additions of phosphorus to Colorado River water can result in increased algal growth. In addition, low nutrient Colorado River water is relied upon by Metropolitan to blend down the high nutrient SWP water in Metropolitan's blend reservoirs. With population growth expected to continue in the Las Vegas area in the future, ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algal growth and protecting downstream drinking water uses. Metropolitan and other affected drinking water agencies collaborate with wastewater dischargers in the Las Vegas area to protect the phosphorus-limited Colorado River. Since 2001, wastewater dischargers have undertaken considerable efforts to improve treated effluent water quality by removing phosphorus on a year-round basis. In 2005, dischargers also began optimizing their treatment processes to remove greater amounts of phosphorus, maintaining levels well below current permit requirements.

Although current nutrient loading is of concern for Metropolitan and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal related issues, there should be no impact on availability of water supplies. Metropolitan's source water protection program will continue to focus on preventing future increases in nutrient loading as a result of urban and agricultural sources.

Arsenic

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

In April 2004, OEHHA set a public health goal for arsenic of 0.004 µg/L, based on lung and urinary bladder cancer risk. The MCL for arsenic in domestic water supplies was lowered to 10 µg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. Monitoring results submitted to California Department of Public Health (now DDW) since 2010 showed that arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. They also showed that many sources have arsenic detections above the 10 µg/L MCL. Southern California drinking water sources that contain concentrations of arsenic over 10 µg/L include San Bernardino (25 sources), Los Angeles (27 sources), Riverside (12 sources), San Diego (2 sources), Orange (2 sources), and Ventura (2 sources).[17]

The arsenic drinking water standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and did not require treatment changes or capital investment to comply with the standard. However, some of Metropolitan's water supplies from groundwater storage programs are at levels near the MCL. These groundwater storage projects are called upon to supplement flow only during low SWP allocation years. Under drought conditions, Metropolitan has further relied on groundwater storage programs and continues to participate in the California Aqueduct Pump-in Facilitation Group to ensure that water quality in the SWP is not adversely affected when considering water supply decisions. Metropolitan has had to restrict flow from one program to limit arsenic increases in the SWP. Implementation of an arsenic treatment facility, which is operated by a groundwater banking partner, has increased groundwater supply costs. Moreover, Metropolitan has invested in solids handling facilities at its treatment plants and implemented operational changes to manage arsenic in the treatment process residual solids.

The state detection level for purposes of reporting (DLR) of arsenic is 2 µg/L. Between 2009 and 2014, arsenic levels in Metropolitan's water treatment plant effluents ranged from non-detect (< 2 µg/L) to 3.9 µg/L. For Metropolitan's source waters, levels in Colorado River water have ranged from not detected to 3.5 µg/L, while levels in SWP water have ranged from non-detect to 4.4 µg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

Some member agencies may face greater problems with arsenic compliance due to naturally occurring arsenic in groundwater. Per the Water Replenishment District's 2013-2014 Regional Groundwater Monitoring Report, arsenic concentrations greater than the 10 µg/L MCL are detected in about a third of the Central Basin wells.[18] Water supplies imported by the Los Angeles Department of Water and Power may also contain arsenic above the MCL. The cost of arsenic removal from these supplies could vary significantly.

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[17] DDW data reported from web site: http://geotracker.waterboards.ca.gov. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

[18] *Regional Groundwater Monitoring Report Water Year 2013-2014, Los Angeles County, California*, prepared by Water Replenishment District, February 2015.

Uranium

The U.S. Department of Energy (DOE) has completed about 50 percent of a project to move a 16-million-ton pile of uranium mill tailings near Moab, Utah which lies approximately 750 feet from the Colorado River. Due to the proximity of the pile to the Colorado River, there is a potential for the tailings to enter the river as a result of a catastrophic flood event or other natural disaster. In addition, contaminated groundwater from the site is slowly seeping into the river. The DOE is responsible for remediating the site, which includes removal and offsite disposal of the tailings and onsite groundwater remediation.

Previous investigations have shown uranium concentrations contained within the pile at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the CRA and at its treatment plants since 1986. Monitoring at Lake Powell began in 1998. Uranium levels measured at Metropolitan's intake have ranged from 1 to 6 pCi/L, well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium; however, these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River. Public perception of drinking water safety is also of particular concern as to uranium.

Remedial actions at the site since 1999 have focused on removing contaminated water from the pile and groundwater. To date, over 4,400 pounds of uranium in contaminated groundwater have been removed. In July 2005, DOE issued its Final Environmental Impact Statement with the preferred alternative of permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site.

Rail shipment and disposal of the uranium mill tailings pile from the Moab site began in April 2009 using American Recovery and Reinvestment Act 2009 funding which helped to accelerate initial cleanup efforts. Through August 2015, DOE has shipped over 7.7 million tons of mill tailings to the Crescent Junction disposal cell. DOE estimates completing movement of the tailings pile by 2025, depending on annual appropriations. Metropolitan continues to track progress of the remediation efforts and work with Congressional representatives to support increased annual appropriations and expedite cleanup.

Another uranium-related issue began receiving attention in 2008 due to a renewed worldwide interest in nuclear energy and a resulting increase in uranium mining claims filed throughout the western United States. Of particular interest were thousands of mining claims filed near Grand Canyon National Park and the Colorado River. Metropolitan sent letters to the Secretary of the Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of the Interior Ken Salazar announced a two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In January 2012, Secretary Salazar formally signed a 20-year moratorium on new uranium and other hard rock mining claims. The moratorium has been challenged by a number of industry groups and was most recently upheld by a U.S. District Court in September 2014. Meanwhile, local conservation groups continue to defend the moratorium and are seeking additional protection of lands with mines that have been inactive for long periods of time, but may resume operations. Although of no direct impact to Metropolitan due to its upstream location and resulting dilution, in August 2015, an accidental release of wastewater from an abandoned mine in southwest Colorado demonstrated the potential threat that mining activities can have on public health and the environment.

Chromium-6

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium III is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium-6 is used in electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation, and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes, and leaching from hazardous waste sites. In drinking water, chromium-6 is very stable and soluble, whereas chromium III is not very soluble. Chromium-6 is the more toxic species and is known to cause lung cancer in humans when inhaled, but the health effects in humans from ingestion are still in question. There is evidence that when chromium-6 enters the stomach, gastric acids may reduce it to chromium III. However, recent studies conducted by the National Toxicology Program have shown that chromium-6 can cause cancer in animals when administered orally.

Effective July 1, 2014, California's Office of Administrative Law approved a primary drinking water standard of 10 μg/L for chromium-6. USEPA regulates chromium-6 as part of the total chromium drinking water standard of 100 μg/L and is currently evaluating whether a new federal drinking water standard for chromium-6 is warranted based on new health effects information.

Metropolitan utilizes an analytical method with a minimum reporting level of 0.03 μg/L, which is less than the State DLR of 1 μg/L. In the past 5 years, the results from all of Metropolitan's source and treated waters are less than the State DLR. The following summarizes chromium-6 levels found in Metropolitan's system:

In the past 5 years, results of source and treated water monitoring for chromium-6 indicate the following:

- Levels in Colorado River water are mostly not detected (<0.03 μg/L), but when detected, levels range from 0.03 to 0.08 μg/L. SWP levels range from 0.03 to 0.8 μg/L. Treated water levels range from 0.03 to 0.7 μg/L.
- There is a slight increase in chromium-6 in the treated water from the oxidation (chlorination and ozonation) of natural background chromium (total) to chromium-6.
- Colorado River monitoring results upstream and downstream of the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona (discussed below) have ranged from not detected (<0.03 μg/L) to 0.06 μg/L.
- Chromium-6 in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from not detected (< 1 μg/L) to 8.9 μg/L in 2014, with the average for the different programs ranging from < 1 μg/L to 3 μg/L.

PG&E used chromium-6 as an anti-corrosion agent in its cooling towers at the Topock site from 1951 to 1985. Wastewater from the cooling towers was discharged from 1951 to 1968 into a dry wash next to the station. Monitoring wells show the plume concentration has peaked as high as 16,000 μg/L in groundwater. Since 2004, PG&E has operated an interim groundwater extraction and treatment system that is protecting the Colorado River. Quarterly monitoring of the river has shown levels of chromium-6 less than 1 μg/L, which are considered background levels. The California Department of Toxic Substances Control (DTSC) and the U. S. Department of the Interior are the lead state and federal agencies overseeing the cleanup efforts. Metropolitan participates through various stakeholder workgroups and partnerships that

include state and federal regulators, Indian tribes, and other stakeholders (e.g., Colorado River Board) involved in the corrective action process. In January 2011, a final treatment remedy was selected, and an Environmental Impact Report was certified. In November 2015, PG&E completed the final remedy design based on the selected remedy which involves the installation of an in-situ bioremediation treatment system. In April 2015, DTSC required the preparation of a Subsequent Environmental Impact Report (EIR) to address new design details. The Subsequent EIR will be completed in Spring 2017. Construction is expected to be completed in early 2022, followed by operation of the treatment system for an estimated 30 years.

The federal- and state-approved technologies for removing total chromium from drinking water include coagulation/filtration, ion exchange, reverse osmosis, and lime softening. For several years, the cities of Glendale, Burbank, and Los Angeles have been voluntarily limiting chromium-6 levels in their drinking water to 5 μg/L, which is significantly lower than the state MCL of 10 μg/L that went into effect on July 1, 2014.

Constituents of Emerging Concern

N-Nitrosodimethylamine

N-Nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines. NDMA is a chloramine disinfection by-product, and it is the most abundantly detected nitrosamine in drinking water systems. Metropolitan utilizes chloramines as a secondary disinfectant at its treatment plants. Wastewater treatment plant discharges can contribute organic matter into source waters, which react with chloramines to form NDMA at drinking water treatment plants. Certain coagulation aid polymers used in water treatment, e.g., polydiallyldimethylammonium chloride (polyDADMAC), can also contribute to NDMA formation. Some NDMA control measures are being used to avoid adverse impacts on Southern California drinking water supplies. Metropolitan is involved in several projects to understand the impact of different treatment processes on NDMA and its precursors at drinking water treatment plants and in distribution systems. Certain pre-oxidation processes, such as chlorine and ozone, have been shown to destroy NDMA precursors. Additional studies are being conducted to better understand how polyDADMAC contributes to NDMA formation and to identify measures to reduce polymer-derived NDMA formation.

USEPA considers NDMA to be a probable human carcinogen. USEPA placed NDMA in the Unregulated Contaminant Monitoring Rule 2 (UCMR2) and on the Contaminant Candidate List 3 (CCL3). Although there is no federal regulation for nitrosamines in drinking water, DDW set a notification level of 0.01 µg/L each for NDMA and two other nitrosamines. Occurrences of NDMA in treated water supplies at concentrations greater than 0.01 µg/L are recommended to be included in a utility's annual Consumer Confidence Report. In December 2006, OEHHA set a public health goal for NDMA of 0.003 µg/L. Since 1999, Metropolitan has conducted voluntary monitoring of the five treatment plant effluents and representative distribution system locations semi-annually. In 2014, NDMA was the only detected nitrosamine in Metropolitan's treated water systems, and it was in a range of non-detect (<0.002 µg/L) to 0.005 µg/L. NDMA or a broader class of nitrosamines may likely be the next class of disinfection by-products to be regulated by USEPA.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in

treated wastewater, surface water, and sometimes, in finished drinking water in the United States and around the world. The use of ozone in treatment processes may have a beneficial effect on PPCP removal in drinking water. The sources of PPCPs in the aquatic environment include (but may not be limited to) treated wastewater and industrial discharge, agricultural run-off, and leaching of municipal landfills. Currently, there is no evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PPCPs found in some drinking water. Furthermore, there are no regulatory requirements for PPCPs in drinking water. USEPA included 13 PPCPs on the CCL3; however, currently there are no standardized analytical methods for these compounds. USEPA's strategy for addressing PPCPs involves strengthening analytical methods, conducting source studies, improving public understanding of PPCPs in water, building partnerships and promoting stewardship opportunities, and taking regulatory action when appropriate.

In 2007, Metropolitan implemented a short-term monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds. Currently, PPCP monitoring is conducted on an annual basis for Metropolitan's source waters and treatment plants. Some PPCPs have been detected at very low ng/L levels, which is consistent with reports from other utilities. However, analytical methods are still being refined, and more work is required to fully understand occurrence issues. Metropolitan has been actively involved in studies related to PPCPs, including analytical methods improvements, and characterization of drinking water sources in California.

Other Water Quality Programs

In addition to monitoring for and controlling specific identified chemicals in the water supply, Metropolitan has undertaken a number of programs to protect the quality of its water supplies. These programs are summarized below.

Source Water Protection

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, DDW requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for Metropolitan's water sources are the Colorado River Watershed Sanitary Survey – 2010 Update and the State Water Project Watershed Sanitary Survey – 2011 Update.[20] The next Sanitary Surveys for the watersheds of the Colorado River and the SWP will report on watershed and water quality issues through 2015.

Metropolitan has an active source water protection program and continues to advocate on numerous issues to protect and enhance SWP and Colorado River water quality. As part of its source water protection program, Metropolitan monitors and forecasts source water quality, including closely monitoring the biology and limnology of lakes and aqueducts. Monitoring is conducted to comply with regulatory requirements, respond to water quality events, assess temporal variability, advise operations, and investigate emerging constituents and invasive species.

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[20] Metropolitan Water District of Southern California, *Colorado River Watershed Sanitary Survey, 2010 Update*. For the State Water Project, the sanitary survey report was prepared on behalf of the State Water Project Contractors Authority, in 2011, and was titled *California State Water Project Watershed Sanitary Survey, 2011 Update*.

Colorado River Water Quality Partnerships

Metropolitan collaborates with external partners to asses and manage watershed threats to Colorado River water quality. Metropolitan is a member of the Clean Colorado River Sustainability Coalition, which was formed in 1997 and focuses on protecting and enhancing the Colorado River through monitoring and analysis of water quality to assure and sustain high quality water for all users of the Colorado River. In 2011, Metropolitan formed the Lower Colorado River Water Quality Partnership with SNWA and Central Arizona Project to identify and implement collaborative solutions to address water quality issues facing the Colorado River. Metropolitan also participates in the Lake Mead Water Quality Forum which was formed in 2012, and its Lake Mead Ecosystem Monitoring Workgroup subcommittee. The Lake Mead Water Quality Forum's goals are to support the protection of human health and the environment and to preserve and improve the water quality of the Las Vegas Wash, Las Vegas Bay, and Lake Mead (and as a result, the Colorado River). In addition, as discussed earlier, Metropolitan is a member of the Colorado River Basin Salinity Control Forum which facilitates coordination between Basin states and federal agencies on salinity matters and the implementation of the Colorado River Basin Salinity Control Program.

SWP Water Quality Programs

Metropolitan supports DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. In particular, Metropolitan supported the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct. In addition, Metropolitan has supported the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) and up to seasonally. The forecasting model is currently suitable for use in a planning mode. It is expected that with experience and model refinement, it will be suitable to use as a tool in operational decision making.

Metropolitan has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels have been a concern in one groundwater banking program, there are also short-term water quality benefits that can be realized through storage programs, such as groundwater pump-ins into the California Aqueduct with lower TOC levels (as well as lower bromide and TDS, in some programs).

Regulatory and Legislative Actions

Metropolitan conducts technical reviews of regulatory and legislative actions that may have an effect on the quality of Metropolitan's source waters. These may include changes in federal and state water quality standards; California Environmental Quality Act (CEQA) documents for projects or programs within Metropolitan's source watersheds; National Pollutant Discharge Elimination System permits for wastewater discharges into the Delta or Colorado River systems; and regulations or statewide policies and permits affecting source water quality or reservoir management issues. In addition, Metropolitan advocates and provides funding requests for key source water protection priorities, including the Moab uranium tailings cleanup and Colorado River salinity control.

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Appendix I: Public Notification

City of Santa Monica 2015 Urban Water Management Plan

Water Resources Division
1212 Fifth Street
3rd Floor
Santa Monica, California 90401

City of
Santa Monica®

Ms. Sachi A. Hamai
Chief Executive Officer
500 Temple Street, Room 358
Los Angeles, CA 90012

March 22, 2016

RE: Notice of Public Hearing on the Draft 2015 Urban Water Management Plan for the City of Santa Monica

Dear Ms. Hamai:

The City of Santa Monica is in the process of preparing its 2015 Urban Water Management Plan (UWMP). The 2015 UWMP presents the City's long-term strategy for managing its water resources, its water supply reliability, and maintaining water quality for water distributed throughout the City of Santa Monica. The UWMP meets the state requirement for the City to submit a UWMP every five years in compliance with the state of California Urban Water Management Planning Act.

You are cordially invited to participate and provide comments at a public hearing on the draft 2015 UWMP. The hearing will be held as part of a meeting of the Santa Monica City Council which will take place at:

Santa Monica City Hall
1685 Main Street, Santa Monica, CA 90401
Council Chambers - Room 213
Tuesday, May 24, 2016 at 5:30 p.m.

The draft UWMP will be posted on the City of Santa Monica's Water Division web site http://www.smgov.net/departments/publicworks/water.aspx

Public input is encouraged and will be considered during development and finalization of the 2015 UWMP. Public informational meetings are scheduled for April 5, 2016, and May 3, 2016 at:

Ken Edwards Center
1527 4th Street
Santa Monica, CA 90401
6:00 p.m.

Written comments are due by May 24, 2016. Please send comments to:

City of Santa Monica Water Resources Division
1212 5th Street, 3rd Floor
Santa Monica, CA 90401
Attn: Gil Borboa
via email, gil.borboa@smgov.net

If you would like additional information or have any questions, please contact the undersigned.

Sincerely,

Gilbert M. Borboa, Jr., P.E.
Water Resources Manager

tel: 310-458-8232 • fax: 310-393-6697

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Water Resources Division
1212 Fifth Street
3rd Floor
Santa Monica, California 90401

City of
Santa Monica®

Mr. Miguel Santana
City Administrative Officer
200 North Main Street, Suite 1500
Los Angeles, CA 90012

March 22, 2016

RE: Notice of Public Hearing on the Draft 2015 Urban Water Management Plan for the City of Santa Monica

Dear Mr. Santana:

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Sincerely,

Gilbert M. Borboa, Jr., P.E.
Water Resources Manager

tel: 310-458-8232 • fax: 310-393-6697

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Water Resources Division
1212 Fifth Street
3rd Floor
Santa Monica, California 90401

City of
Santa Monica®

March 22, 2016

Mr. Jeffrey Kightlinger
General Manager
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054

RE: Notice of Public Hearing on the Draft 2015 Urban Water Management Plan for the City of Santa Monica

Dear Mr. Kightlinger:

The City of Santa Monica is in the process of preparing its 2015 Urban Water Management Plan (UWMP). The 2015 UWMP presents the City's long-term strategy for managing its water resources, its water supply reliability, and maintaining water quality for water distributed throughout the City of Santa Monica. The UWMP meets the state requirement for the City to submit a UWMP every five years in compliance with the state of California Urban Water Management Planning Act.

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Sincerely,

Gilbert M. Borboa, Jr.

Gilbert M. Borboa, Jr., P.E.
Water Resources Manager
tel: 310-458-8232 ◦ fax: 310-393-6697

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OBITUARY

FROM PAGE 1

as a teacher to Dwayne Hickman and his pals in "The Many Loves of Dobie Gillis" and as the dad in "The Patty Duke Show."

"The Patty Duke Show" (1963-1966) was challenging for Duke, who had already achieved stardom on Broadway as the young Helen Keller in "The Miracle Worker" and repeated the role in the film, winning her a supporting actress Oscar. (Duke died in March at age 69.)

In the television series she played a double role, as Patty Lane, a typical American teenager, and as her cultured cousin, Cathy, who lives with Patty's family. Cathy was newly arrived from overseas, where, the theme song told viewers, she "adores a minuet, the Ballets Russes and crepes suzette." Patty just likes rock 'n' roll and hot dogs.

Schallert was cast as Patty's harried father (and Cathy's uncle), who was confused by the lookalike girls.

He was similarly frustrated as English teacher Mr. Pomfritt on "Dobie Gillis." The show, which ran from 1959 to 1963, starred Hickman as a teenager comically yearning for the perfect girl, and a strong supporting cast including Bob Denver as his beatnik pal, Maynard. "You ready, my young barbarians?" Mr. Pomfritt would ask his students, comically pining for the days of corporal punishment in the classroom.

In 1979, Schallert was elected president of the 46,000-member Screen Actors Guild, an honor held at one time or another by James Cagney, George Murphy, Ronald Reagan, Charlton Heston and other screen notables. Most of them had little to do but conduct meetings and issue statements. With Schallert it was different.

In 1980 he led the union as it staged a 13-week strike over such issues as actors' pay for films made for the then-new cable television industry.

He told the Los Angeles Times his message to actors was that "we have to respect ourselves as artists" and recalled the pre-union days when actors were sometimes expected to work until midnight and be back at work six hours later.

Schallert was defeated in his bid for a second two-year term as SAG president in 1981 by "Lou Grant" star Ed Asner, who had strongly criticized the agreement the union had reached to end the strike. Asner ran into his own controversies as SAG chief by taking stands critical of U.S. foreign policy, and he decided not to seek a third term in 1985. He was succeeded by none other than Schallert's former screen daughter, Duke.

Schallert said in 2008 that his greatest accomplishment as SAG president was the formation of a committee for performers with disabilities.

"We had established committees for all of the various ethnic minorities, women and seniors. I'm a big beneficiary of that right now because I'm 85 and I still work."

Among his later TV roles were guest shots on "Desperate Housewives" and "True Blood." In 2008, he played Supreme Court Justice John Paul Stevens in "Recount," HBO's Emmy-winning dramatization of the 2000 presidential election.

In all, Schallert appeared in hundreds of movies, television series and specials, playing characters and walk-ons. He was a messenger in "Singin' in the Rain," a Union soldier in "The Red Badge of Courage" and an admiral in "Get Smart." In addition to Justice Stevens, he played such real-life figures such as Gen. Mark Clark in "The War Years" and Gen. Robert E. Lee in "North and South Book II."

In an interview with the Los Angeles Times in 1966, Schallert lamented being cast as "the second man through the door," or supporting player.

"I did come close to a lead once," he said. "This was a pilot I made for a series named 'Filbert.' But when the producers calculated the series would cost $75,000 per episode, they figured a top name would be needed in the lead to assure success. So they gave up the project. It was a hard pill to swallow."

William Joseph Schallert was born in 1922, in Los Angeles. His father, Edwin, was drama editor of the Los Angeles Times from 1919 to 1958.

William spent his high school years in a seminary. After military service he graduated from UCLA and went to England on a Fulbright scholarship in 1952. He studied repertory theater and lectured on American theater at Oxford University.

In his early years he was a founding member of the Circle Theater in Hollywood. The director was Charlie Chaplin, whose son Sydney was a cast member.

Schallert recalled that after a preview performance Chaplin would suggest a couple of things to correct. "When it was about five or six in the morning," Schallert said, "Oona (Chaplin's wife) would say 'Come on, Charlie, let them go home. They've got a performance to do tonight.'"

Biographical material in this story was written by The Associated Press' late Hollywood correspondent Bob Thomas.

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City of Santa Monica

NOTICE OF PUBLIC HEARING
FOR DRAFT 2015 URBAN WATER MANAGEMENT
PLAN AND AVAILABILITY OF DRAFT PLAN FOR REVIEW

The City of Santa Monica hereby releases its Final Draft 2015 Urban Water Management Plan (UWMP) for public review. The plan will be available through **May 24, 2016** at all City of Santa Monica public libraries, City Hall, the City of Santa Monica Water Resources Division Administration Office (1212 5th Street, 3rd Floor, Santa Monica) and on the Water Resources Division's website:

http://www.smgov.net/departments/publicworks/water.aspx

The 2015 UWMP presents the City's long-term strategy for managing its water resources, its water supply reliability, and maintaining water quality for water distributed throughout the City of Santa Monica. The 2015 UWMP meets the requirement for the City to submit a UWMP every five years in compliance with the State of California Urban Water Management Planning Act.

A Public Hearing will be held to consider comments to the Draft 2015 UWMP; to consider and adopt the City's method for determining the City's water use targets under SBx7-7 (California Water Code Division 6, Part 2.55, Sections 10608-10608.64); and implementation of the 2015 UWMP including economic impacts, if any. The Public Hearing will be held as part of a meeting of the Santa Monica City Council which will take place at:

Santa Monica City Hall
1685 Main Street, Santa Monica, CA 90401
Council Chambers - Room 213
Tuesday, May 24, 2016 at 5:30 p.m.

The City of Santa Monica encourages the active involvement of its citizens. If you have any questions or comments on the 2015 UWMP or SBx7-7 compliance, please contact Gil Borboa, Water Resources Manager by May 24, 2016 at 310-458-8230, via e-mail to gil.borboa@smgov.net, or via mail to: City of Santa Monica Water Resources Division, 1212 5th Street, 3rd Floor, Santa Monica, CA 90401.

City Hall Council Chambers are wheelchair accessible. If you have any special disability-related needs/accommodations, including alternative formats of the Draft 2015 Urban Water Management Plan, please contact the Water Resources Division.

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Santa Monica wins airport appeal

The federal 9th Circuit Court of Appeals has ruled for the City of Santa Monica and against the Federal Aviation Administration in the City's lawsuit to establish its right to control use of the 227 acres of land now occupied by the Santa Monica Airport.

The decision comes two-and-a-half years into the case. The City filed suit in September 2013, seeking a judicial decision quieting title and establishing the City's right to control the land's future use. In February 2014, the District Court granted the federal government's motion to dismiss the case based on its conclusion that the case was untimely and barred by the statute of limitations. The City appealed. On appeal, the City argued that the merits of the City's lawsuit were "inextricably intertwined" with the statute of limitations issue. The 9th Circuit panel agreed. Its unanimous decision reverses the District Court ruling and remands the case back to the District Court for trial.

"This good news brings us one step closer to regaining control of City land now occupied by the Santa Monica Airport, and to keeping our community healthy and safe," said Mayor Tony Vazquez. "Now that the FAA's statute of limitations argument has been thrown out, the case will finally go to trial on the merits of our claims. This is what we've pushed for all along, and we remain totally committed to establishing control of this land and using it in service to the whole community."

Councilman Kevin McKeown said it was a very good day for Santa Monica.

"The 9th Circuit has pulled the rug out from under the FAA's stalling tactics. Residents can celebrate, because this moves our case forward, and on the facts, in front of an impartial court, we are confident we will win the right to do with our land as we wish," he said.

Gaining local control of the Santa Monica Airport is one of the Santa Monica City Council's top five strategic goals.

Neil Carrey, President of the Santa Monica Airport2Park Foundation said the decision was a major step forward in closing the airport.

"The Santa Monica Airport2Park Foundation, representing residents inside and outside of Santa Monica who want to see the 200 acres of the Santa Monica Airport turned into a public park to serve everyone, welcomes the unanimous decision of a three-judge panel of the Ninth Circuit to allow Santa Monica's lawsuit to proceed," he said in a statement. "The foundation is confident that the facts will show that the airport land, most of which was purchased with a park bond in the 1920s, has always been owned by the City of Santa Monica for the benefit of its residents, and that there is nothing in the legal record that will prevent Santa Monica from closing the airport. Under the terms of Measure LC, overwhelmingly passed by Santa Monica voters in 2014, the land is destined to become a park. The foundation looks forward to participating in that process."For more information on City of Santa Monica vs. FAA, including the 9th Circuit Court ruling, visit smgov.net.

- SUBMITTED BY FRANK GRUBER ON BEHALF OF AIRPORT2PARK & CONSTANCE FARRELL ON BEHALF OF THE CITY OF SANTA MONICA

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Appendix J: Portions of Sustainable Water Master Plan

City of Santa Monica 2015 Urban Water Management Plan

City of
Santa Monica®

Santa Monica CT No. 9563

December 2014

Sustainable Water Master Plan

for the:

City of Santa Monica, Water Resources Division

KJ Project No. 1283015*00

Kennedy/Jenks Consultants

Water Resources Division
1212 5th Street 3rd Floor
Santa Monica, California 90401

Sustainable Water Master Plan Forward

December 2014

Similar to most utility planning documents, the City's Sustainable Water Master Plan is prepared to provide the City with information and recommendations to form the basis of a roadmap for future system improvements and strategies. The information provided herein is designed to document the current information of the City's water system, key planning related assumptions, and forecast future conditions to form a basis of planning.

The challenges of planning and forecasting are magnified in the context of climate change, the severe drought currently in effect in California, and community behavioral changes as they relate to water use and demand patterns, among others. As such, this Sustainable Water Master Plan, as well as other recent water system asset management plans, is intended to be dynamic in nature, as new information, conditions, regulations, and policies may supplement and/or alter some of the conclusions and recommendations established in the plan.

With this in mind, the reader should consider this water plan as an information document that will continue to expand and evolve over time, with updates and amendments from time to time.

This comprehensive effort was an important collaborative undertaking by City staff, local advisory committees, the City's consultants, and guidance from the City Council. The plan was prepared to methodically guide the City towards self-sufficiency in accordance with the ambitious goals established by City Council.

I wish to thank everyone for all their input and hard work in the development and documentation of this strategic water plan for the City of Santa Monica. We look forward to its implementation over the next decade as we continue to improve the resiliency of the City's water system for our customers today and well into the future.

Gil Borboa, P.E.
Water Resources Manager
City of Santa Monica, Water Resources Division
310.458.8230

Kennedy/Jenks Consultants
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1 December 2014

Mr. Gil Borboa, P.E.
Water Resources Manager
City of Santa Monica, Water Resources Division
1212 Fifth Street, 3rd Floor
Santa Monica, California 90401

Subject: Final Report – Sustainable Water Master Plan
K/J 1283015*00

Dear Mr. Borboa:

Kennedy/Jenks Consultants is pleased to submit the Final Sustainable Water Master Plan to the City of Santa Monica (City). By way of process, we have submitted this report as a digital ".pdf" file for your distribution as appropriate.

This Master Plan Report is a compilation of the analysis and findings of the City's water utility and incorporates the City's comments obtained from previous draft work products and team discussions. The results of the study are intended to serve as a plan for future capital improvement program requirements and serve as a dynamic roadmap for the development and implementation of additional water system enhancements to assist the City meet its sustainability and self-sufficiency goals over the next 20 years.

It has been a pleasure working with you and City staff on this interesting project. Please contact us if you have any questions or need additional information.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Roger Null, V.P.
Vice President and Project Manager

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Kennedy/Jenks Consultants

3210 El Camino Real, Suite 150
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City of Santa Monica Sustainable Water Master Plan Final Report

December 2014

Prepared for

City of Santa Monica
Water Resources Division
1212 Fifth Street, Third Floor
Santa Monica, CA 90401

K/J Project No. 1283015*00

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Executive Summary

The City of Santa Monica (City) supplies imported and local water to approximately 91,000 residents covering an area of approximately 8 square miles. Looking to its future, the City hopes to eliminate its reliability on imported water by addressing the challenge of existing groundwater quality, identifying new sources of local water supply, and more effectively reduce and manage its water demands.

With an adopted goal of water self-sufficiency achieved by eliminating reliance on Metropolitan Water District of Southern California (MWD) supply by 2020, the City of Santa Monica retained Kennedy/Jenks Consultants to develop an integrated Sustainable Water Master Plan (SWMP). This SWMP combines relevant components of existing plans with an evaluation of a broad range of water supply and demand management options to assist the City in meeting its goals. This plan has been prepared with the objective of developing a comprehensive document to define supply and demand management options to cost effectively reduce future water demands and enhance local water supply production capabilities.

Goals and Purpose

The purpose of this planning effort is to provide an up-to-date, comprehensive look at the City's water system using recent planning information and the newly-developed distribution system hydraulic model to assess the City's water system infrastructure needs. In a March 2011 study session with the City Council, staff presented concepts and principles that would be involved in achieving water self-sufficiency goal by the year 2020. Since that time, the City has embarked on the development of a sustainable and proactive plan to accomplish this goal.

This SWMP includes an evaluation of expanded demand management measures and a variety of water supply alternatives including recycled water, storm water collection and treatment, rainwater harvesting, gray-water applications, and other water rights, supply and exchange opportunities to align with the above goal. A decision modeling approach was used to package these programs and projects into Supply-Demand Portfolios, where criteria were developed to provide portfolio ranking, economic analysis and ultimately, strategic direction. This plan illustrates projected water supply and demand scenarios, and characterizes the approximate magnitude of supply deficits or unpredictability that needs to be addressed to meet the City's self-sufficiency objectives by 2020. The recommendations resulting from this SWMP are designed to provide a roadmap of phased projects and programs to guide the City's water utility towards self-sufficiency.

Implementation of the SWMP is further supported through the conduct of financial planning services. These services, prepared and documented under a separate cover, included an evaluation of water and wastewater rates, rate structures for conservation support and financial stability, and an update to the City's water and wastewater facility capacity charges.

As discussed above, the development of the SWMP entails a multi-faceted approach to address the City's goal of achieving water self-sufficiency by the year 2020. With the City's current capability to meet approximately 70% of its water demand from local groundwater sources, the objective is to develop strategies to close the "gap" represented by the current purchase of

imported water. Through a combination of demand management approaches and water supply augmentation tactics, various portfolios were developed to represent permutations and combinations of options that best meet the program objectives and continue to support the City's Sustainability Plan. The SWMP documents the mix of strategies that could be undertaken to achieve water self-sufficiency by 2020, and recommends a portfolio of conservation/supply programs and capital projects to meet these self-sufficiency goals.

A summary of the primary goals of this project include:

- Perform a water demand analysis and generate water demand projections, which incorporate the most current information regarding population, land use and the Land Use and Circulation Element (LUCE) information for the City's service area projected to the year 2035. The water demand projections consider the effects of weather and economic conditions on future water demand in order to increase defensibility in a time of increased pressure to reduce potable water demands in response to State legislation,

- Perform an evaluation of the City's current and future Supply Alternatives and Demand Management Options to develop strategic Portfolios of alternative programs,

- Develop a comprehensive potable water system hydraulic model development, including calibration, and perform a hydraulic analysis under various system conditions,

- Perform an evaluation of infrastructure improvements to accommodate existing requirements and meet future needs, including an evaluation of system infrastructure fire flow (FF) requirements, and an updated capital improvement program to support the City's short and long-range capital improvement requirements,

- Perform a comprehensive financial evaluation of the City's water and wastewater utilities and associated rates and rate structures, and

- Prepare and submit separate reports documenting the findings and recommendations of the Sustainable Water Master Plan and the Water and Wastewater Rate and Revenue Studies.

Service Area Description

Santa Monica is a beachfront city in western Los Angeles County. It is situated on the Santa Monica Bay, and is surrounded by the City of Los Angeles on the Northeast, the Pacific Ocean on the west, Mar Vista on the east and Venice on the southeast. The City's service area consists entirely of the City of Santa Monica (City) with limited service in the City of Los Angeles. The City occupies 8.3 square miles (5,312 acres) of land. Figure ES-1 shows the Santa Monica City boundary and the vicinity areas.

Figure ES-1 Santa Monica Boundary and Vicinity Map

The City provides water service to approximately 91,000 residents through a combination of local and imported water supplies. In recent years the City has relied heavily upon MWD water (referred as imported water in this report) due to the presence of contamination in its groundwater supply, necessitating additional local groundwater treatment. Due to recent studies and efforts to mitigate this contamination, the City has started bringing wells back online and pumping more groundwater, which is helping create a more robust, reliable supply of water. The City has also continued to collect and recycle dry-weather urban runoff for use as a treated non-potable water source.

In terms of land use classification, single family and multi-family residential are the City's predominant user type. In addition to the residential land-use, the City also has centralized business, a commercial district, and institutional and industrial areas. Figure ES-2 below shows the current land-use map of the City. It is expected that future changes in growth and land-use type will result from re-development of the existing parcels since almost all of the City's area is at near built-out conditions.

Figure ES-2 Santa Monica Land-Use Map

Growth in Santa Monica

Given the near build-out condition, population growth in the City's service area is projected to be minimal, less than 1 percent per year. As a major commercial center for the region, the City experiences daytime populations of up to 200,000 due, in large part, to the number of businesses and attractions located within the City. This increase in population along with general non-residential growth rate will increase the City's water demands for indoor and outdoor use in future years. Table ES-1 below shows the City's projected population through the 2035 planning period.

Table ES-1 Projected Population

Year	2015	2020	2025	2030	2035
Projected Population	91,243	91,487	91,716	91,926	92,124

Source: 2010 Urban Water Management Plan. Note that the Department of Finance currently suggests higher population values than projected in 2010.

Historical Water Use

Since 2005, annual water use within the City have ranged from 13,000 to 15,000 acre feet (AF). As shown in Table ES-2, the average annual water consumption during this period has been approximately 13,930 AF. The decrease in demands that began in 2008 corresponds with statewide drought conditions promoting the need to conserve water resources and depressed economic conditions. Overall, the City's water use has been steadily declining since the early 1990's as a result of its successful water conservation programs.

Table ES-2 Historical Water Use

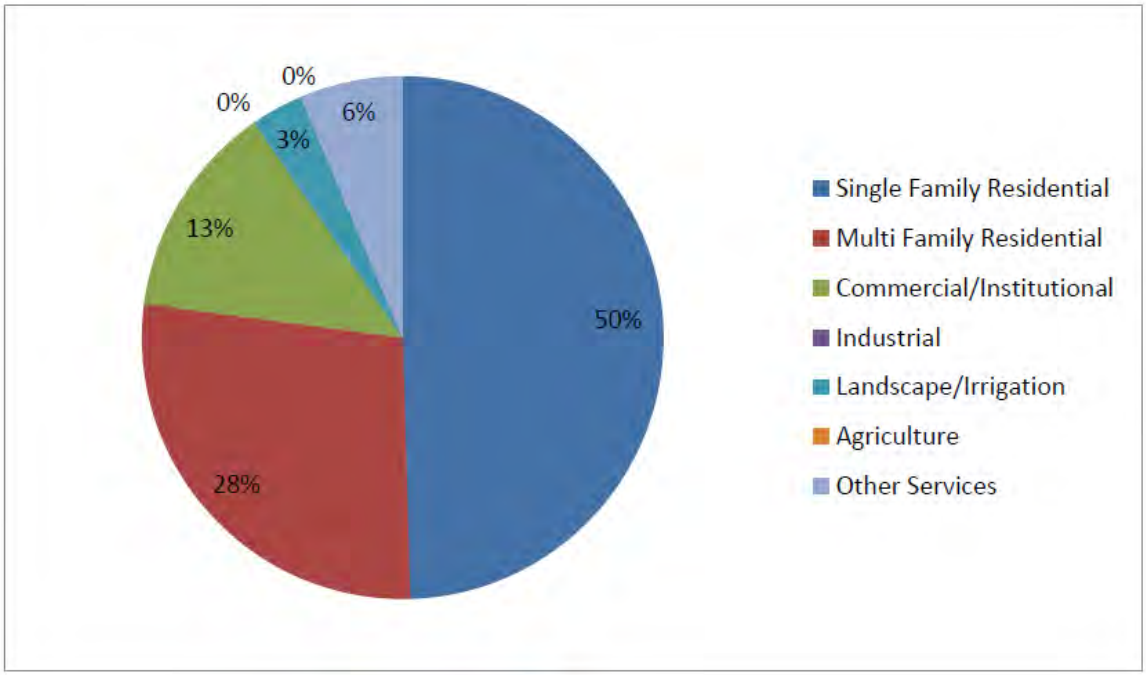
Year	Production (AF)[(a)]
2005	14,917
2006	15,061
2007	15,112
2008	14,491
2009	13,855
2010	13,065
2011	13,142
2012	13,874
2013	14,020
Average	13,934

(a) Source of data for years 2005-2009: City's 2010 UWMP. Source of data for years 2010-2013: City's Department of Water Resources Public Water System Statistics reports.

The City provides water service through over 18,000 metered service connections to a variety of customer types. These include: residential, commercial, institutional, landscape, and fire protection customers. Approximately 80 percent of the City's total service connections are used to serve the City's residential customers. Commercial and institutional accounts account for

approximately 12 percent of the service connections. Landscape irrigation, fire line services and various "other" accounts make up the remaining 8 percent of the City's water customers. Among the "other" accounts is a very small set of customers receiving recycled water from the Santa Monica Urban Runoff Recycling Facility (SMURRF). A graphical summary of the service connections by customer type is shown on Figure ES-3.

Figure ES-3 Service Connections by Customer Type



Source: City utility billing data; calendar year 2013

As expected, the majority of the City's water usage occurs within the residential sector (Table ES-3). As shown, residential usage accounts for approximately 61 percent of the City's total consumption.

Table ES-3 Historical Water Production (AF)

Customer Type	2006	2007	2008	2009	2010	2011	2012	2013
Single Family Residential	3,645	3,752	3,529	3,195	2,862	2,798	3,113	3,143
Multi-Family Residential	5,866	5,784	5,575	5,408	5,100	5,517	5,503	5,431
Commercial/Institutional	3,774	3,745	3,549	3,374	3,003	3,512	3,544	3,718
Landscape Irrigation[(a)]	626	728	698	652	538	606	604	606
Unaccounted for Water[(b)]	1,150	1,103	1,140	1,226	1,562	709	1,110	1,122
Total Water Use[(c)]	15,061	15,112	14,491	13,855	13,065	13,142	13,874	14,020

(a) Includes recycled water produced by the SMURRF.
(b) Unaccounted water for 2012 and 2013 based on average of unaccounted water from 2005 to 2011
(c) Source of data for years 2005-2009: City's 2010 UWMP. Source of data for years 2010-2013: City's Department of Water Resources Public Water System Statistics reports (Total water into the system," including recycled water).

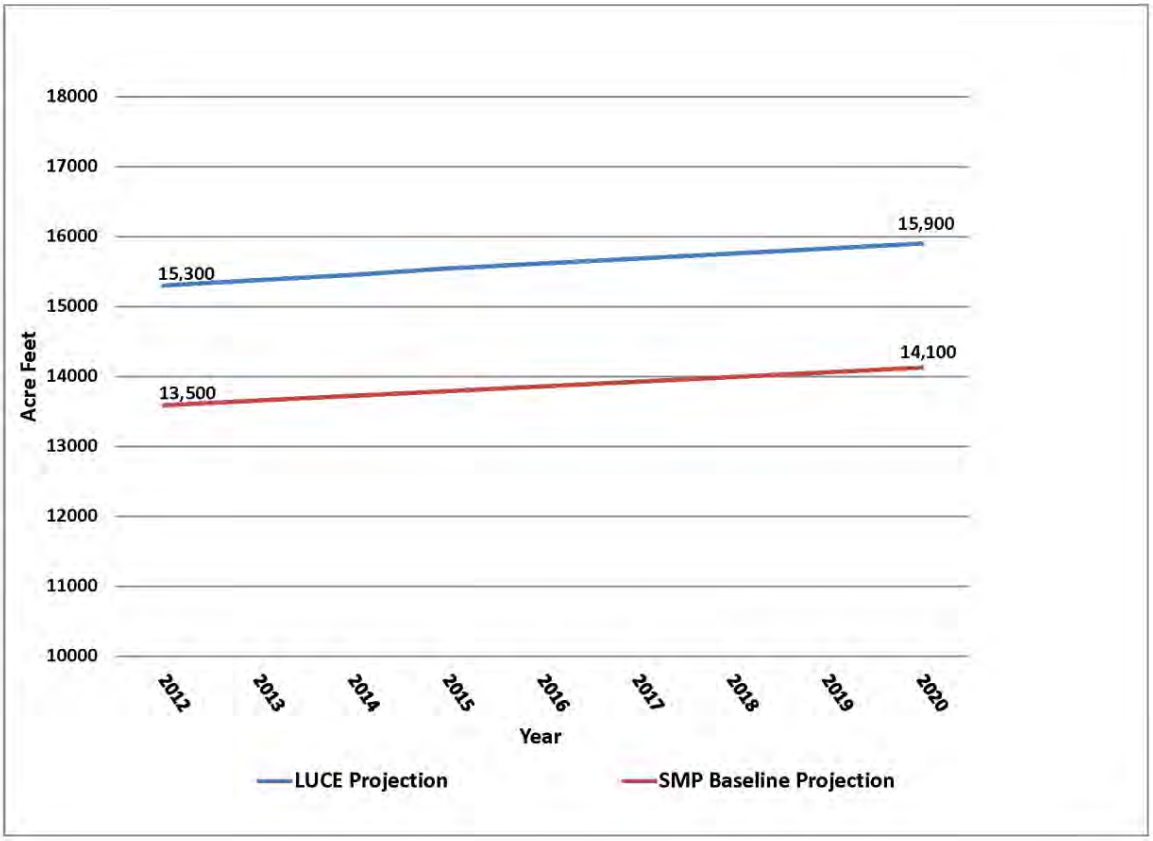
Water Demand Analysis and Projected Future Demands

To achieve water self-sufficiency by the year 2020, the City must have a clear understanding of its future water needs, or demands. The total amount of local water supplies needed to meet the City's sustainability goal includes water supplied to customers as well as an allowance for system water loss, and water lost through the water treatment process referred to as brine or production loss.

The City's initial estimate of the volume of water needed to meet the sustainability goal was approximately 3,700 AF; however, that estimate was based on the assumption that water demand would not increase in the future beyond current levels and did not consider the effects that economic activity and weather may have on historical and future water demands. While the extent of these effects may vary based on local conditions, there is a general increase in demands with increased economic activity and hotter, drier weather conditions. These effects were not incorporated in the demand projections available in current planning documents, including the 2010 Land Use and Circulation Element (LUCE).

To plan for future water supply needs, a comprehensive demand analysis was performed that reconciled prior demand projections with actual water usage in the last several years, and were adjusted for the potential effects of weather and economic activity applicable to Santa Monica. First, a new baseline demand projection was developed. This baseline water use projection begins with current actual demands of approximately 13,500 AF in 2012 and grows at the same rate as the water demand projection found in the LUCE. LUCE annual growth rates were used since it was developed based on the City's best estimates of demographic and development projections used in the City's General Plan and other planning documents. Figure ES-4 compares the water use projection found in the LUCE with the new baseline projection.

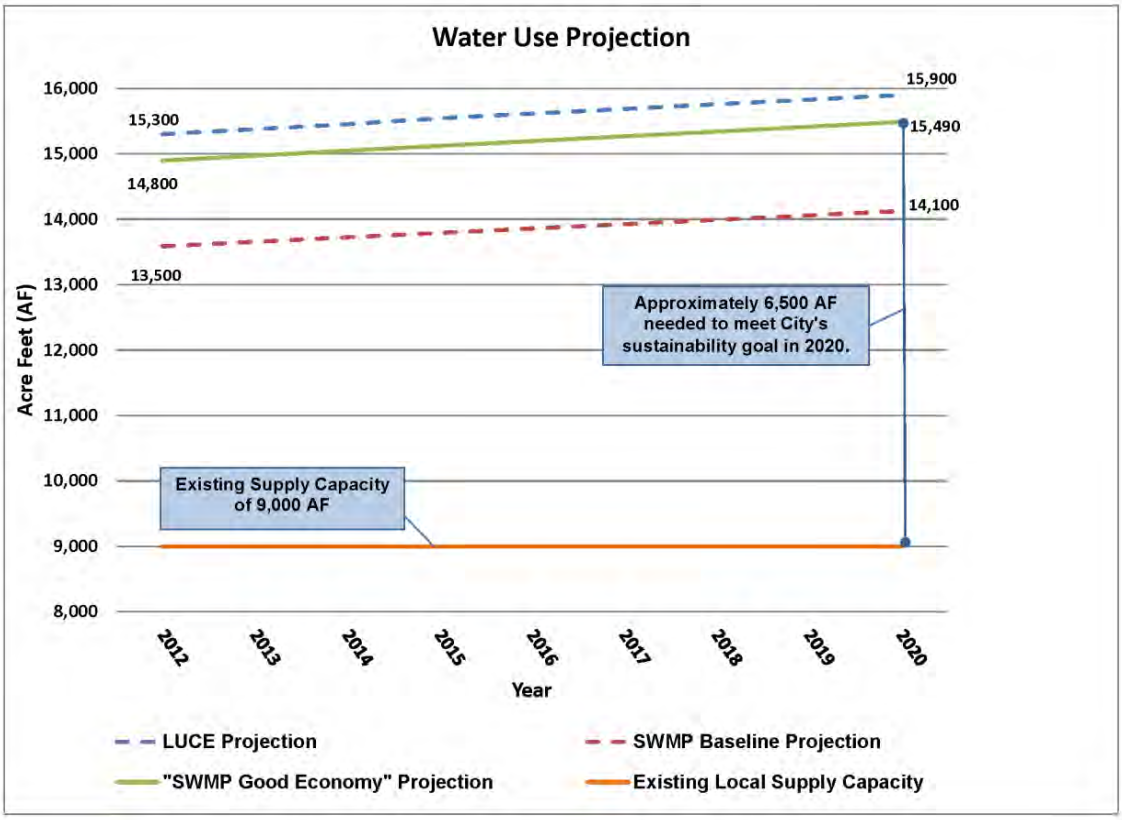
Figure ES-4 Comparison of LUCE Water Projection to Baseline Projection



Next, the effects of weather and economic conditions on the City's water demand were explored. Regression analyses were performed to evaluate the correlation between water use for various customer categories (single family, multi-family, commercial, institutional and landscape irrigation) and weather and economic (unemployment rate) factors. Data from the regression analyses indicated that there was no significant correlation observed with weather related parameters for the City. However, a better correlation was found between the City's unemployment rate and the water use of single family, multi-family and landscape irrigation customer classes. A decrease in the unemployment rate resulted in an increase in water use among these customers. The analysis suggests that an element of the City's reduction in water usage was due to the recent recession and higher unemployment rate.

Accordingly, the baseline water demand was adjusted to project future water demands under good economic conditions, as shown on Figure ES-5. The "good economy" demand projection is approximately 10 percent higher than the baseline water demand projection. Given that the City's existing local water supply capacity is approximately 9,000 AF, the demand analysis suggests that the gap between available local water supply from the Arcadia Water Treatment Plant, and the annual volume of water required to meet the City's sustainability goal in 2020 is closer to 6,500 AFY, rather than 3,700 AFY.

Figure ES-5 LUCE Projection, Baseline Projection and "Good Economy" Projection



Water Conservation Analysis and Effect of Future Demands

Water conservation modeling and analysis were performed to better define the City's opportunities to reduce the projected water demands described above through the implementation of water conservation programs. Following the completion of a detailed billing and historical conservation program and policy analysis, a comprehensive list of water conservation programs was developed and modeled using the Alliance for Water Efficiency's Water Conservation Tracking Tool. This model allows users to analyze the water savings potential and implementation costs of a collection of water conservation programs. The model also uses local demographic and housing characteristics to estimate water savings that could be attributable to enhanced efficiency requirements in State plumbing codes and water fixture usage standards, and predict reductions in demand from other applicable programs.

The suite of programs selected for analysis address each of the City's water customer sectors (single-family, multi-family, commercial, institutional, and landscape) with an emphasis on water users that shows opportunity for additional conservation. Since 1988, the City has invested millions of dollars in resources to retrofit nearly every indoor plumbing fixture in commercial, single-family and multi-family buildings with water saving products. As a result, water usage in

the City has declined even though the City's population and non-residential development have increased.

Results of the billing analysis indicated that the greatest remaining potential for water conservation exists among the City's commercial and institutional customers, as well as in landscape water use. Two specific large water users, St. John's Medical Center, the Santa Monica-Malibu Unified School District, and laundry facilities, were identified by City staff as customers with a high potential for additional water savings and programs were developed to target those potential water saving opportunities.

Implementation levels for each water conservation program modeled were based on analyses of saturation rate of existing water saving plumbing fixtures and landscapes, customer surveys, staff knowledge of the City's customers and their willingness to implement these programs, and products that will have long-term water savings that are not dependent on significant changes in the customer's behavior. The goal was to develop a diverse selection of programs that aggressively pursued demand reduction through retrofitting existing indoor plumbing with plumbing fixtures that save about twenty percent more water in addition to retrofitting landscape customers' with plants and irrigation approaches that can save up to eighty percent more water, compared to existing landscapes.

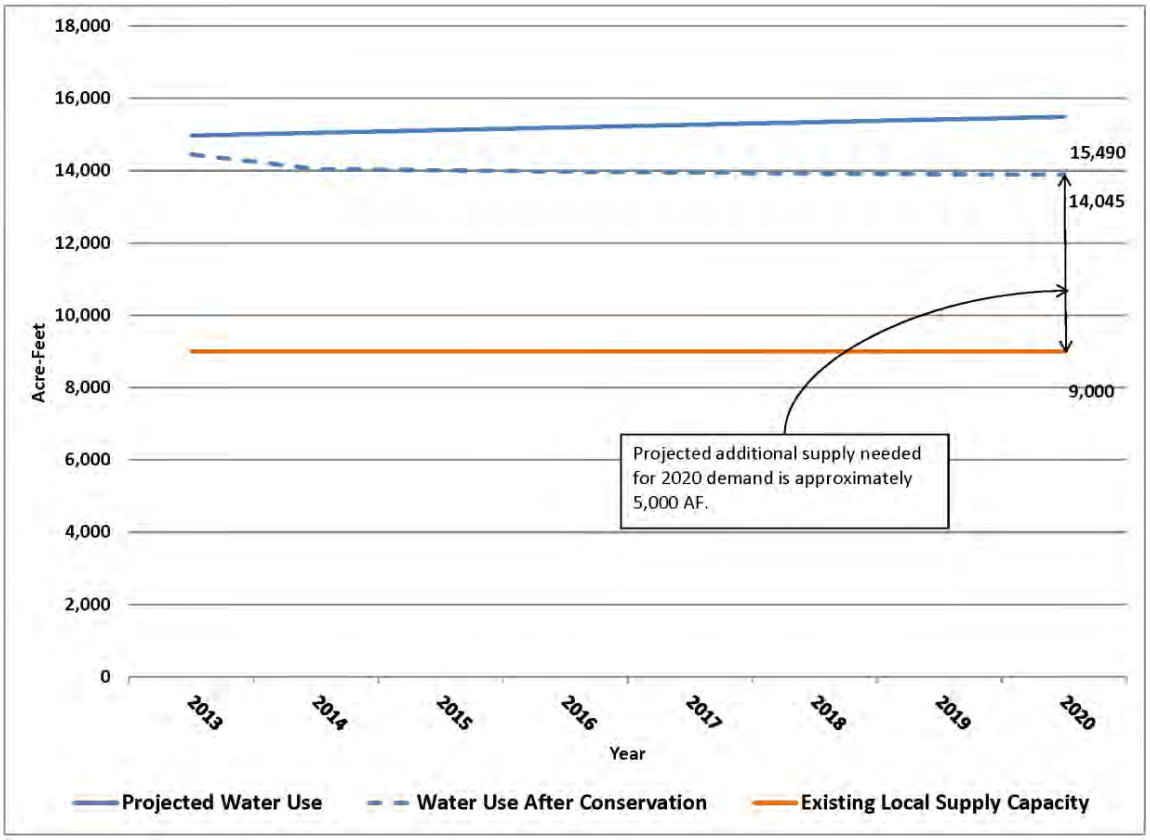
The resulting suite of conservation programs, shown in Table ES-4, is projected to annually save approximately 775 AFY of water by the year 2020. An additional 418 AFY of annual savings is expected by 2020 as a result of State plumbing and building code standards that require higher water saving fixtures. In addition, a reduction in system-wide leaks and non-revenue water through capital investment in the system is projected to annually save another 250 AFY of water for a total annual demand reduction of approximately 1,443 AFY by 2020.

Table ES-4 Water Conservation Programs

Conservation Activity	Class	Total Number of Activities Implemented by 2020	Total Conservation in 2020 (AF)	Estimated Average Annual Cost	Estimated Total Cost Through 2020
Residential HE Clothes Washer Rebate	Single Family	880	30	$24,100	$216,600
Residential HET Rebate	Single Family	3568	77	$14,400	$129,700
Residential WBIC Rebate	Single Family	1920	79	$29,300	$263,800
City's Cash for Grass Rebate Program	Single Family	1,100,000 square feet	51	$209,900	$1,889,100
City's Drip Irrigation Rebate Program	Single Family	1,100,000 square feet	24	$139,900	$1,259,400
City's HE Nozzle Rebate Program	Single Family	550,000 square feet	7	$52,500	$472,300
Water Smart Software - 5% Reduction in Water Use (NEW)	Single Family	3,040 customers	8	$26,600	$239,300
0.8 gpf Toilets (Direct Installation) (NEW)	Multi Family	5,496	73	$174,800	$1,573,100
Residential HE Clothes Washer Rebate	Multi Family	544	19	$9,800	$88,600
Residential HET Rebate	Multi Family	4,000	13	$16,200	$145,400
Laminar Flow Restrictors for St. John's Medical Center (NEW)	Commercial	664	6	$1,500	$13,600
Commercial Dry Vacuum Pump Rebate	Commercial	40	3	$1,400	$12,600
Commercial Connectionless Food Steamer Rebate	Commercial	2	1	$100	$500
Commercial Zero Water Urinal Rebate	Commercial	4	0.1	$25	$200
Commercial Ultra-Low Volume Urinal Rebate	Commercial	544	8	$3,500	$31,100
Commercial Conductivity Controller Rebate	Commercial	2	4	$0	$0
Commercial HET Rebate	Commercial	200	5	$2,500	$22,900
CII Cooling Tower Treatment - Zero Blowdown (NEW)	Commercial	2	1	$200	$1,400
Coin-Operated Laundry Machine Retrofit (NEW)	Commercial	45	360	$3,500	$31,800
HETs for St. John's Medical Center (NEW)	Commercial	10	0.1	$100	$1,100
0.125 gpf Urinals for St. John's Medical Center (NEW)	Commercial	7	0.1	$40	$400
1.5 gpm Faucet Aerators for St. John's Medical Center (NEW)	Commercial	158	0.3	$800	$6,900
SMMUSD Audits & Retrofits - Assumes 5% Reduction in Total H2O Use (NEW)	Institutional	Maintained through 2020	5	$94,400	$849,400
Total Active Water Savings (Programs Listed Above)			**775**	**$805,500**	**$7,249,100**
Total Passive Savings (Codes and Laws)			418		
25% Reduction in System Leaks and Non-Revenue Water			250		
Total Reduction in Demand			1443		

Figure ES-6 shows the potential effect of implementing the recommended water conservation programs on the City's projected water demand assuming the "good economy" water demand projection previously described. Implementation of the recommended water conservation programs reduces the annual volume of additional water the City must produce to meet its self-sufficiency goals from approximately 6,500 AF to approximately 5,000 AF. While water conservation alone will not enable the City to meet its water self-sufficiency goal, it can significantly reduce the volume of additional water supply required.

Figure ES-6 Demand Reduction from Recommended Conservation Programs



While conservation programs are often less expensive than physically constructing and operating new water supply or treatment facilities, the noted reductions in projected water demand are not without a cost. For the City of Santa Monica, these costs include the cost of the actual conservation program, increased staff and public outreach costs associated with new program implementation and management, and the associated loss in water sales revenues (this latter component is partially offset by reduced water supply production costs). Based on the City's current demands and water revenues, it is estimated that the total cost for the recommended water conservation program reflected in Table ES-6 is approximately $7.2 million through 2020.

Water Supply Analysis

Given the City's projected water supply demand conditions, a multi-faceted water supply portfolio is needed to meet the City's water self-sufficiency goal. This portfolio is projected to include both demand reduction measures through the implementation of water conservation programs, as well as new supply and water treatment options. New water supply options may include additional groundwater capacity, rainwater harvesting and stormwater capture, and additional recycled water sources. These current and future supply options are explored in greater detail herein.

Current Water Supply

The City's existing water supply consists of groundwater, purchased imported water, and a small amount of recycled dry weather urban runoff. Historically, groundwater made up the majority of the City's water supply portfolio; however, in 1995 when methyl tertiary butyl ether (MTBE) contamination was discovered in the Charnock Sub-basin, a sub-basin of the Santa Monica Basin, the City was forced to shut down five groundwater wells and purchase the majority of its water supply from MWD. In addition to local groundwater and purchased imported water, the City treats a small volume of dry weather urban runoff, yielding a source of recycled water that can be used for landscape irrigation and other approved uses, such as toilet flushing.

Imported Water

In recent years the main source of potable water supply for the City has been imported water purchased from MWD. MWD receives a negotiated allotment of water from the Colorado River and the San Joaquin River Delta. These allotments are then distributed among its 26 member agencies – a cooperative of municipalities and water agencies located throughout southern California.

The City has a current Tier 1 rate allocation of 11,515 acre feet per year (AFY) of water through MWD. Tier 1 water corresponds to the amount of water the City is entitled to purchase at the Tier 1 rate. MWD Tier 2 water is also normally available to the City; however, the cost per acre-foot is higher and there is less availability and reliability of Tier 2 water in periods of drought. The City has routinely exceeded its Tier 1 entitlement in recent years due to inactivity of many of its wells. Prior to the recent reactivation of its groundwater production, imported water represented approximately 85 percent of the City's total water supply. Table ES-5 shows the City's imported water purchases since 2005.

Table ES-5 Historical Imported Water Supply

Year	Purchases (AF)
2005	12,671
2006	13,216
2007	13,017
2008	12,323
2009	11,685
2010	9,812
2011	6,388
2012	6,550
2013	5,842

Source: City of Santa Monica Water Resources Division.

The City maintains two separate connections with MWD for its supply of imported water. These two connections are shown in Table ES-6.

Table ES-6 City of Santa Monica's MWD Connection Capacities

Description	SM-1	SM-2	Total Capacity
Capacity (AFY)	21,720	18,100	39,820

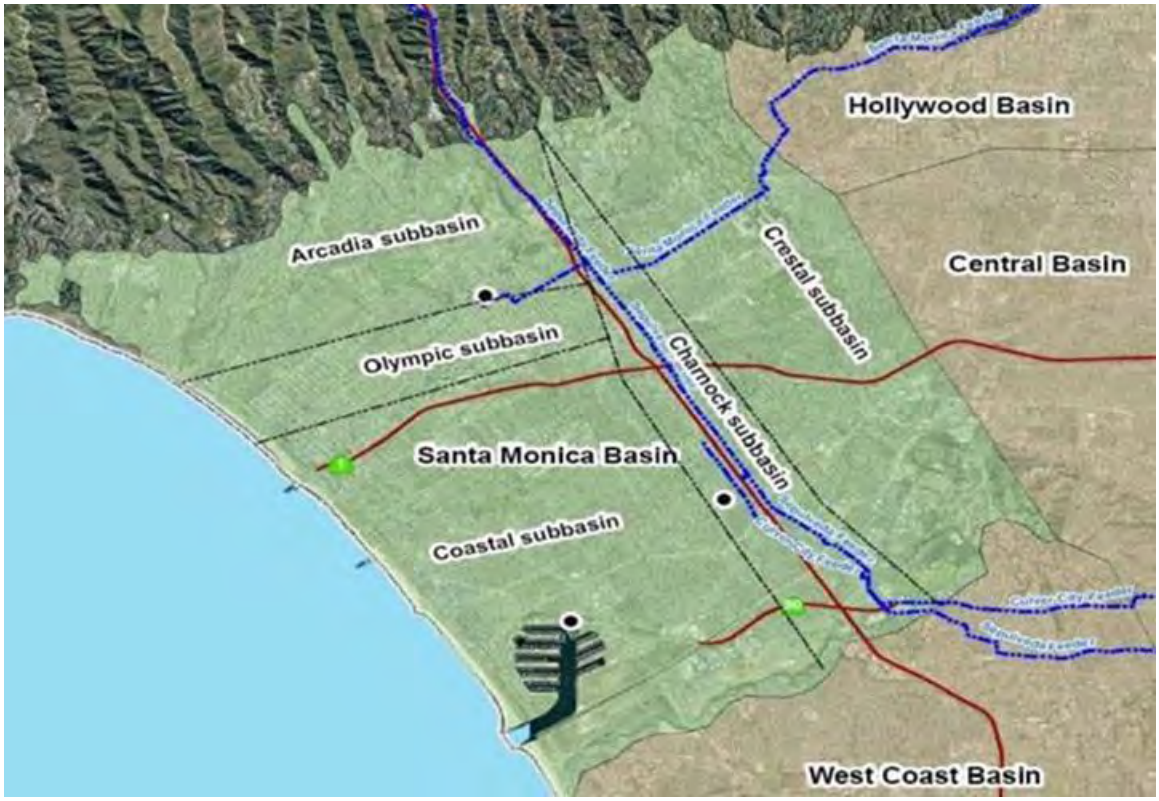
Source: City of Santa Monica Water Resources Division.

Local Groundwater

Local groundwater represents both an existing source of potable water as well as a potential source of future potable water supply. Local groundwater has, until recently, been underutilized due to the shutdown of five Charnock wells that reported MTBE contamination in 1995. Due to the completion of MTBE remediation efforts in February of 2011, the City has been able to bring the five Charnock wells back online.

The City obtains its groundwater supply from the Santa Monica Basin (Basin). The Basin is located in western Los Angeles County and overlies the entire City of Santa Monica, Culver City, Beverly Hills, and portions of western Los Angeles. The Basin has a surface area of 50.2 square miles and consists mostly of flat to mildly hilly terrain. The Basin is bounded by impermeable rocks of the Santa Monica Mountains to the north, the Ballona Escarpment (Bluffs) to the south, the Newport-Inglewood fault to the East, and the Pacific Ocean to the West. Extensive faulting within the Basin separates it into five sub-basins as shown on Figure ES-7.

Figure ES-7 Local Groundwater Basins and Subbasins



Groundwater in the Basin is replenished by percolation from precipitation, receiving an average annual precipitation of about 14 inches, and by surface runoff from the Santa Monica Mountains. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, only a small portion of basin soils are capable of transmitting water to the water-bearing formations below.

The City has historically pumped a long-term average volume of groundwater of 4,277 AFY. The historical combined capacity of the City's five wells located in the Charnock Sub-basin has been approximately 9,000 gallons per minute (GPM). An additional five wells, two in the Arcadia Sub-basin and 3 in the Olympic Sub-basin, remained online when the Charnock wells were shut down, and had the ability to produce approximately 3,300 GPM. These five wells have been responsible for approximately 1,950 AFY, or 13 percent of the City's water supply. In total, the City has the ability to pump groundwater at a rate of approximately 10,600 GPM. Table ES-7 shows the capacity of each of the City's groundwater wells.

Table ES-7 Groundwater Well Capacities

Well Name/No.	Sub-basin	Capacity (GPM)
Charnock 13	Charnock	1,800
Charnock 16	Charnock	1,675
Charnock 18	Charnock	1,675
Charnock 19	Charnock	1,840
Charnock 20	Charnock	1,330
Arcadia 4	Arcadia	250
Arcadia 5	Arcadia	180
Santa Monica 1	Arcadia	250
Santa Monica 3	Olympic	820
Santa Monica 4	Olympic	800
	Total Capacity	**10,620**

Source: City of Santa Monica Water Resources. Capacities are average values and vary over time.

Non-Potable Water

To protect the Santa Monica Bay from contamination caused by pollutants found in dry weather urban runoff the City built the Santa Monica Urban Runoff Recycling Facility (SMURRF). The SMURRF project produces a small volume of high-quality recycled water that is used to offset potable water demands for landscape irrigation and indoor plumbing. Designed to routinely treat 0.5 million gallons per day (MGD), with a peak treatment capacity of 0.75 MGD, the SMURRF removes urban contaminants and treats the influent water to Title 22 state standards for tertiary water. The water is then pumped through a separate water distribution system to serve a number of parks, medians, Woodlawn Cemetery and some dual-plumbed buildings.

The SMURRF has allowed the City to slightly reduce its reliance upon MWD water at a time when the City relied heavily upon imported water due to the lack of production from groundwater wells. However, since dry weather urban runoff is an unstable supply, the focus of this facility has been predominantly water quality improvements to Santa Monica Bay. Historically, SMURRF has had an average production of 154 AFY, with a high of approximately 354 AFY and a low of 94 AFY.

Future Opportunities and Portfolio Development

Additional Local Groundwater Opportunities

In addition to implementing the water conservation programs previously described, the City is also desirous of expanding use of its local groundwater resources. Currently, the City obtains local groundwater from the Arcadia and Olympic Sub - basins via five wells. These wells can produce approximately 3,000 AFY. Additionally, there are five wells located outside of the City limits in the Charnock Sub-basin with a combined average production capacity of approximately 6,000 AFY.

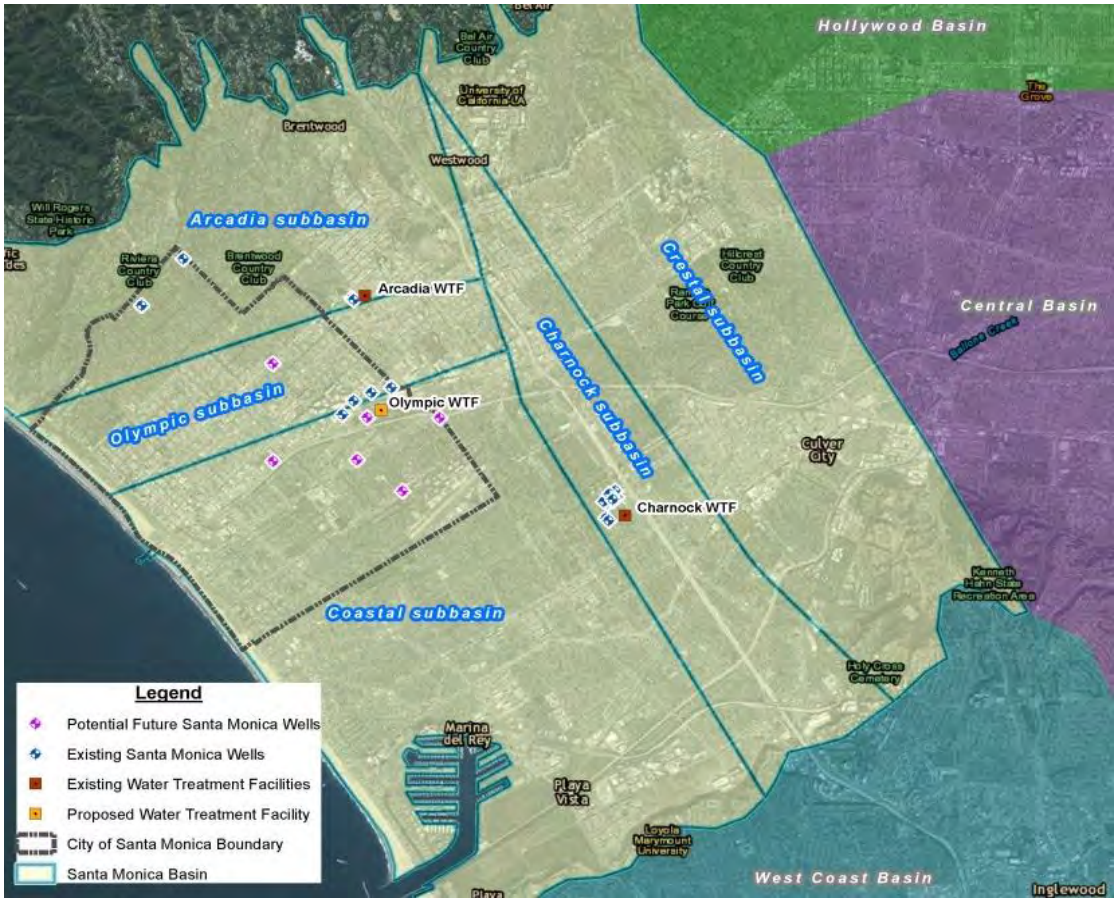
From 1995 to 2010, the City purchased most of its annual water supply needs from MWD as the Charnock well field was shut down due to methyl tertiary butyl ether (MTBE) contamination. The total average annual groundwater production capacity from these sub-basins for local treatment at the Arcadia Water Treatment Plant is approximately 9,000 AFY.

Another study of the groundwater basin was recently performed by Richard C. Slade and Associates, LLC (RCS). The study suggests the City may have additional local groundwater opportunities within the Olympic, Charnock and Coastal Sub-basins. The Coastal Sub-basin has not been utilized as a groundwater source to date due to salt water intrusion; additional treatment would be required to utilize water from this basin. Additional efforts are needed to assess potential sites and derive the potential quality and quantity of additional well production for the City's supply portfolio. Incorporating the RCS study with the SWMP's evaluations and discussions, has led to the following preliminary recommendations for additional local groundwater production and treatment facilities. These preliminary recommendations are:

- Expansion of the existing Arcadia Water Treatment Plant
- Design and construct the new Olympic Water Treatment Plant (Gillette/Boeing Settlement Project)
- Rehabilitate old wells and drill additional new wells in the Olympic, Charnock and Coastal Sub-basins
- Develop and implement improvements in treatment efficiency to reduce the amount of water lost to brine disposal during treatment (reduction of brine water losses from 18% to 9%)

While additional engineering and hydrogeologic studies will be required to determine a realistic production capacity for these wells, it is believed that the City could attain as much as an additional 6,000 AFY of local water if all of these strategies were implemented. Of course, an equivalent increase in local water treatment capacity is required to deliver this water to the City's customers, requiring an increase in the capacity of the Arcadia Water Treatment Plant and/or using settlement funds and other sources to construct a new water treatment plant (currently referred to as the Olympic Water Treatment Plant as it is designed to focus on treating water from the Olympic sub-basin). The current approach for siting some of these future water supplies is reflected graphically on Figure ES-8.

Figure ES-8 Groundwater Basins and Facilities



Beyond the additional local groundwater opportunities described above, potential exists for joint-development of nearby under-utilized groundwater basins, including the Hollywood and Central Basins. These are multi-jurisdictional opportunities that will require coordination between the City and the Los Angeles Department of Water and Power and/or the City of Beverly Hills. Given the nature of institutional-related projects, these opportunities are considered as more long-term water supply options which require additional development and are not included in the list of potential new groundwater opportunities available to the City to meet its self-sufficiency goal by 2020.

Rainwater Harvesting and Stormwater Capture

Given Santa Monica's Mediterranean climate, rainwater harvesting (the capture and onsite use of rainwater for landscape irrigation purposes) offers limited opportunity as a significant additional water supply within the City. However, to quantify the potential benefit of this resource, an analysis was performed to compare the potential for rainwater harvesting based on average monthly precipitation data and monthly landscape water demand for residential and commercial customers.

Results of the above analysis indicate that the potential for rainwater harvesting as a supply option in Santa Monica is limited by the large size of individual property owner cisterns required, and customers' motivation to install them. Historically, residential cistern installation, even with a rebate of $1,000 per cistern, has been minimally accepted by the City's customers. Accordingly, it is estimated that the rainwater harvesting incentive program may provide only 1-2 AFY.

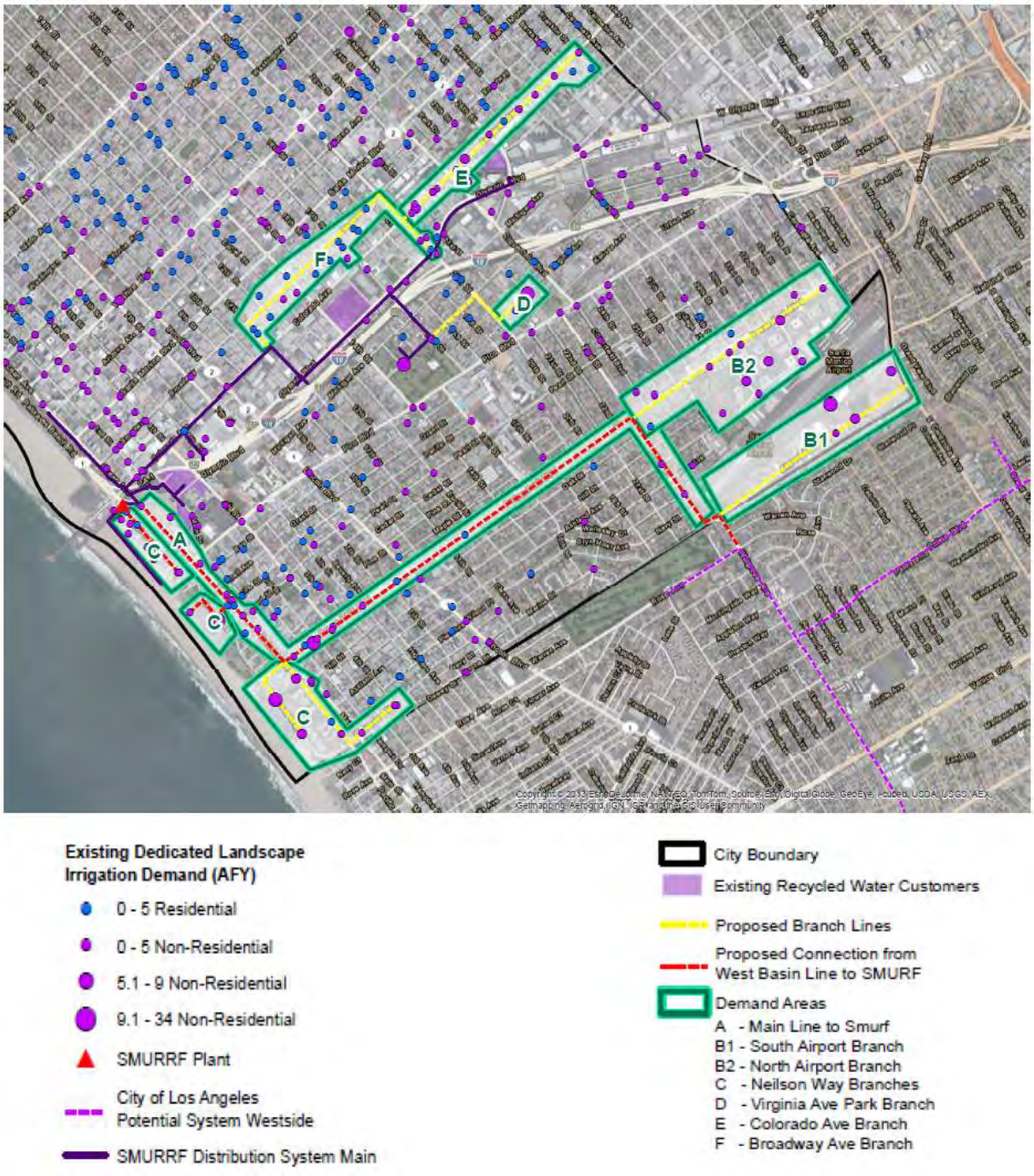
Similarly, a City-wide stormwater capture program offers a seasonal, unreliable additional water supply option for the City. A scenario was developed to rout local stormwater captured by the City's storm drain system to the Santa Monica Urban Runoff Recycling Facility (SMURRF) for distribution to landscape irrigation customers. It is estimated that a City-wide stormwater capture program may be able to generate an additional supply of 160 AFY.

Recycled Water

Currently, the City distributes approximately 85 AFY of recycled urban runoff to customers for landscape irrigation and indoor commercial use through the SMURRF and associated distribution system. The City does not operate a wastewater treatment plant and thus does not have a local source for additional recycled water supplies. However, the City could partner with adjacent agencies that currently produce recycled water in order to bring additional recycled water supplies to its customers. The West Basin Municipal Water District (WBMWD) operates a recycled water system that terminates near Marina Del Rey, which may provide the City with a potentially feasible source for recycled water. The Los Angeles Department of Water and Power (LADWP) also looked into utilizing this source and has prepared a master plan that suggests a potential for connection at this same location.

A recycled water market study was performed to estimate the potential for recycled water use within the City. Results of this study indicate that 350 AF of recycled water could be used by the City's dedicated landscape irrigation customers that reside along some key corridors into the City. Figure ES-9 provides a potential recycled water distribution system that focuses on delivering year-round recycled water to the City and serves a number of customers along the corridor of pipeline facilities.

Figure ES-9 Potential Local Recycled Water Supply System



In this potential system, the City may be able to partner with LADWP to jointly fund a new transmission and pumping system that connects to the WBMWD pipeline and bring recycled water to the southeast side of Santa Monica. The project would require approximately 5 miles of

pipeline from its current point of termination. Establishing the partnerships and agreements necessary to make this type of inter-agency program a reality will require time and funding. Accordingly, this option should be considered a long-range strategy for the City. It is unlikely that the City could deliver additional recycled water to its customers before 2020.

Portfolio Development

As shown in Figure ES-10, implementation of the strategies described herein suggest that the City can meet its self-sufficiency goal through a combination of water conservation programs, additional local groundwater production and additional supplies from rainwater harvesting and City-wide stormwater capture. In the future, the City may also be able to establish additional groundwater or recycled water supplies through inter-agency partnerships with adjacent water agencies and municipalities.

Figure ES-10 Water Supply and Demand Comparison Including New Supply Opportunities

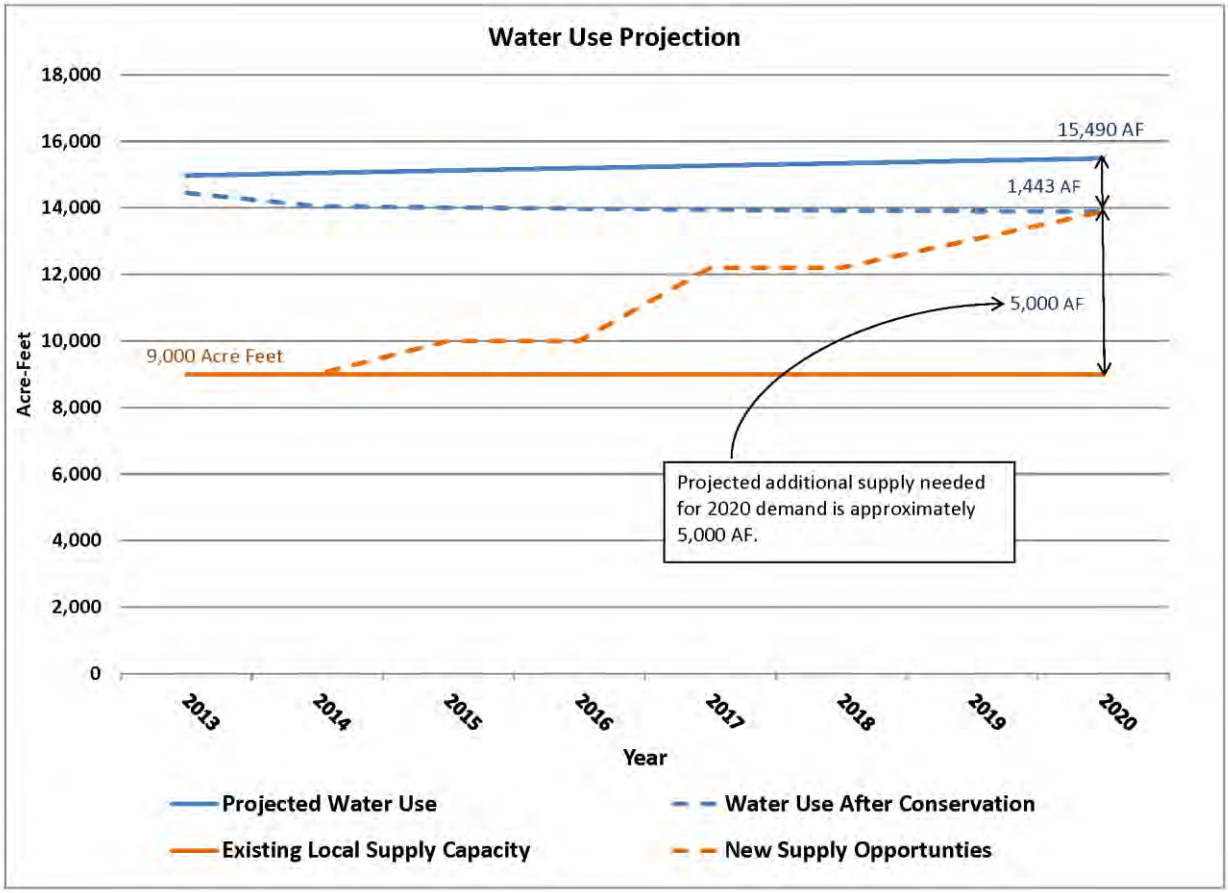
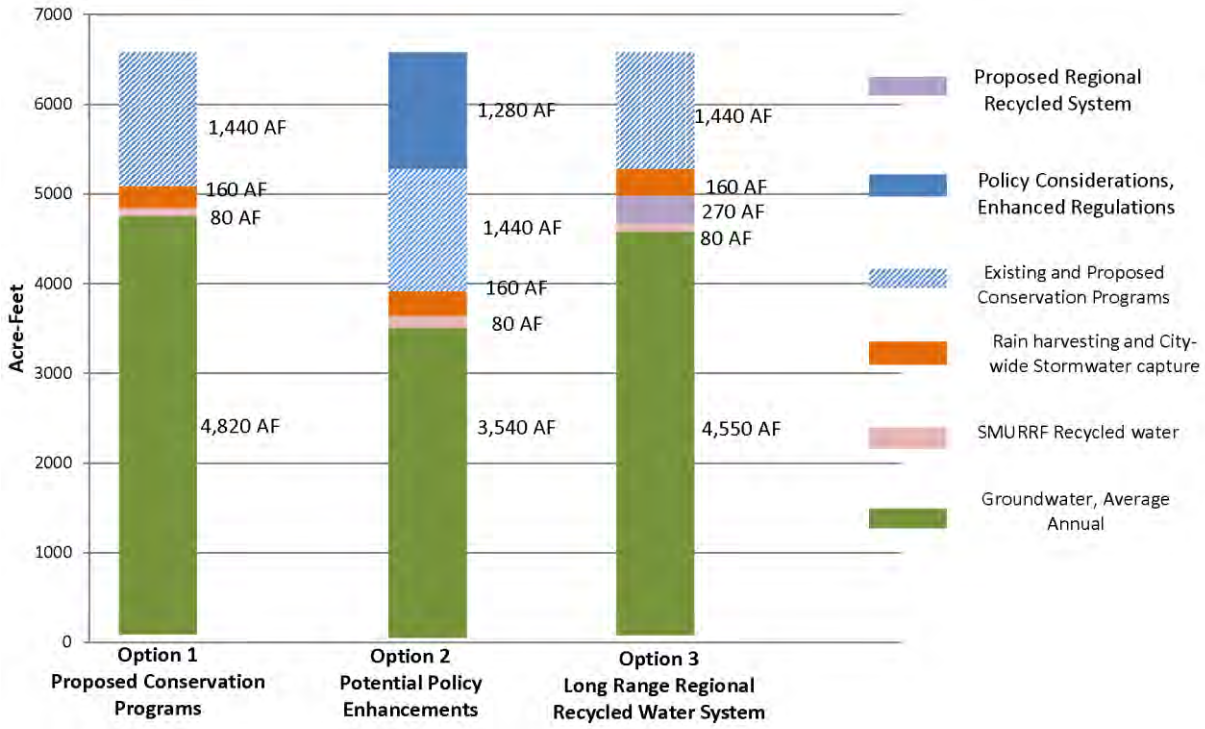


Figure ES-11 presents three different options for obtaining water self-sufficiency. These three portfolios were developed and presented to the City Council on May 14, 2013. At that meeting,

Council directed staff to proceed with the Sustainable Water Master Plan and further develop the demand management approaches and water supply augmentation tactics associated with Option 1 to support the City's sustainable plan goals and objectives. The primary elements of this plan include:

- Implement the identified demand management measures to promote additional water use efficiency,
- Expand groundwater extraction capacity to produce more local groundwater,
- Expand the existing Arcadia Water Treatment Plant capacity and construct the new Olympic Water Treatment Plant to treat the additional supply of local groundwater,
- Augment these core supply demand programs with other non-potable reuse opportunities to reduce potable water usage,
- Develop a roadmap for groundwater management sustainability, and
- Pursue applicable grant funding opportunities to lower the cost of self-sufficiency for the City's ratepayers.

Figure ES-11 Potential Supply/Demand Management Portfolios



Hydraulic System Analysis

To evaluate the potable water system, a computerized hydraulic model was developed using the City's Geographic Information System (GIS) data, facility information, operational controls, system demand curves, and water utility customer billing data. Following completion of the importing of all of the elements of the City's water distribution system into the hydraulic model databases, calibration of the hydraulic model was performed.

The goal of calibration was to develop a hydraulic model which reasonably represents actual conditions in the distribution system. Two phases of calibration were conducted: Steady state and extended period simulations. Steady state simulation calibration involved the process of simulating fire hydrant flow tests with the model so that it provides a reasonable match with the field generated findings. Extended period simulation modeling is associated with modifying the model until it simulates the operations of a specific day or multiple days with relative accuracy.

Upon completion of this task, the City's model was populated with projections of future water demands throughout the system, and used to reliably evaluate the performance of the City's water system under both current and future demand conditions. This modeling tool is now available to be used by the City to perform additional "what if" as-needed water system analysis activities.

System Pressure Zones and Facilities

The following pressure zone and system configuration was used to represent the City's hydraulic model. The City's system is divided into three pressure zones to regulate pressures in the water system. These pressure zones include: the 250, 350 and 500 foot zones. Each zone designation corresponds to ground elevations above the 250 foot, 350 foot, and 500 foot ground elevation contour within the City boundary. Each zone has its own primary sources of supply and facilities and is also hydraulically connected to the zone below it. A description of these zones and facilities follows.

500 Foot Pressure Zone

The 500 foot pressure zone (500 zone) lies at the northern most edge of the City and is the City's smallest zone. The 500 zone serves primarily single family, low density residential land uses. Since the 500 zone is both the smallest and lowest density zone in the system, it also serves the smallest demand of three zones.

The 500 zone is entirely developed, and due to the prohibitively high cost of acquiring land, storage was never built to serve this zone. To compensate for this condition, the 500 zone is served by both a direct connection to MWD which directly feeds the 500 zone and the San Vicente Booster Station which provides additional flow and pressure when conditions warrant.

The supply from MWD that serves the 500 zone typically exceeds the demands in this zone. This excess supply is normally relieved to the 350 foot zone where it serves as supply or goes into storage. The City normally uses the MWD connection to meet the storage needs of the 350 zone that are not satisfied by the output of the Arcadia Booster Pump Station.

350 Foot Pressure Zone

The 350 foot pressure zone (350 zone) is the largest of the three zones in the City and spans from the eastern most point in the City to the western most point. This zone serves low and high density single-family dwellings, commercial, industrial, and educational customers, and the Santa Monica Airport. It encompasses 57% of the City's land area and is supplied its water primarily from the Arcadia Water Treatment Plant (Arcadia WTP). Finished produced water from the Arcadia WTP is delivered to the Arcadia Booster Pump Station for final distribution to the customers in this zone.

The 350 foot zone has four storage reservoirs which provide 40 MG of storage capacity. In order of descending size, the 350 zone is served by the Riviera, San Vicente, Mt. Olivette, and Arcadia reservoirs, which have 25.0, 5.0, 5.0 and 5.0 MG capacities, respectively.

250 Foot Pressure Zone

The 250 foot pressure zone (250 zone) spans the length of the coastline within the City boundary and occupies the majority of the southwest corner of the City. It, like the 350 zone, contains a variety of land uses, most notably the Santa Monica downtown area and pier. Given the characteristics of the customers in this zone, this zone exhibits the largest ratio of water consumption per acre of land in the City.

The 250 zone is served primarily by a direct connection to the Arcadia WTP. The 250 zone is also served by two pressure relief/sustaining valves from the 350 zone, one each at the north and south ends of the zone. These valves supply the 250 zone if pressure in the 350 zone becomes too high and are used to sustain the pressure in the 250 zone should it drop too low.

Similar to the 500 zone, the 250 zone also contains no direct storage. It does however, have indirect access to the storage in the 350 zone by way of the two pressure sustaining valves which connect the two zones.

Summary of Water System Improvements

As discussed herein, the City's water system was evaluated under both current and future conditions with an overall focus of developing those programs and facilities needed to meet the City's water self-sufficiency and water use efficiency goals and objectives. To this end, a comprehensive demand analysis was performed to better understand the implications of the economy and weather on water demands over the last decade and incorporate this finding in a robust demand projection. This projection formed a basis of planning for the City's water use efficiency targets and the water supply and infrastructure needs related to a self-sufficient supply. To achieve both of these goals by 2020, a diverse set of water supply augmentation projects and demand management measures were derived and approved by City Council for further development and potential implementation.

In addition to these programs and projects, the Sustainable Water Master Plan also evaluated and developed programs and projects related to storing and distributing water to the City's customers. These identified improvements are typically prioritized into a capital improvement program (CIP) based on the assessment of a wide variety of factors. These factors include:

capacity considerations under current and future demand conditions, system reliability and performance, and support for the City's sustainability and self-sufficiency goals and objectives. A summary discussion of the City's water system storage and piping recommendations follows.

Water System Storage

As discussed, dedicated water system storage is contained in the 350 zone. This finding suggests a general need to increase the volume of available storage in various areas of the City to meet emergency and outage conditions and improve the resiliency of the City's water system. To this end, the City has performed various studies over the years to assess the potential siting of additional storage to mitigate this condition. At this time, it is believed that additional storage associated with the proposed Olympic Water Treatment Plant may be the most viable location for improving water storage and system resiliency.

Water System Pipelines

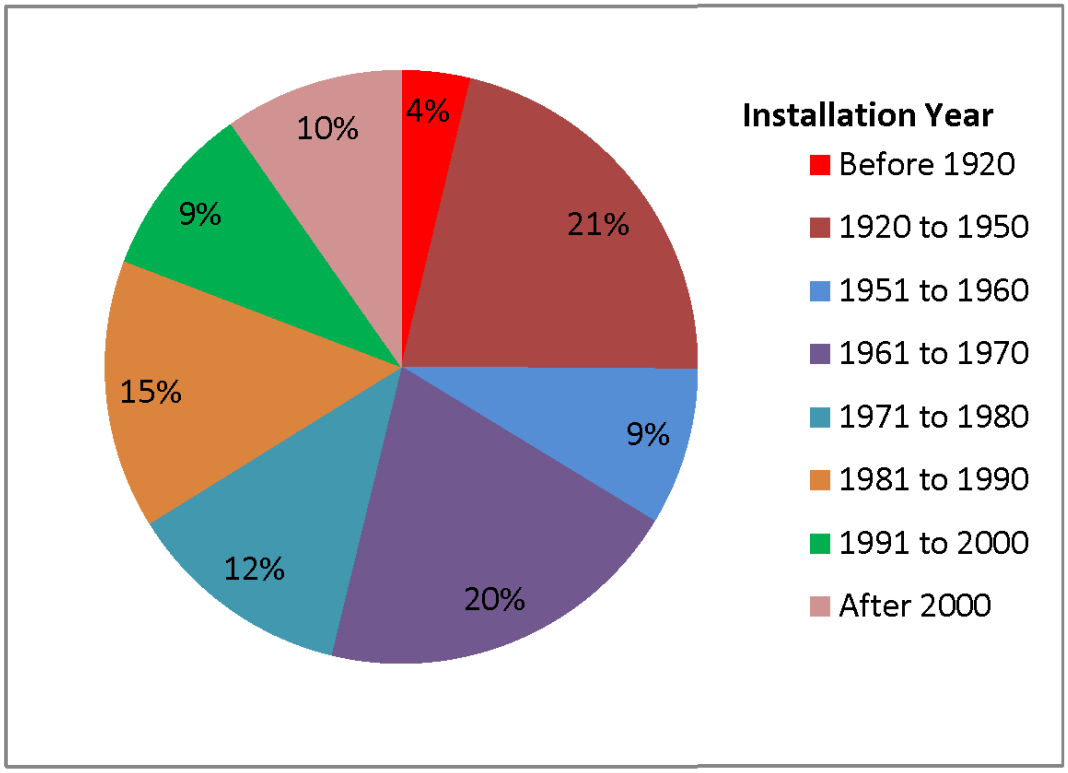
Water system pipeline improvements generally fall into two categories: improvements related to increased capacity or increased reliability.

- Capacity-related improvements were identified through the use of the newly developed water system hydraulic model. With the model, pipelines that did not meet a set of system performance or design criteria under either existing or future demand conditions were identified for replacement with larger diameter facilities.

- Reliability-related improvements were derived in this study based primarily on pipeline age and other asset condition and management related factors. Age information was attained through the City's water system GIS platform, while other condition and reliability information was attained through the City's water asset management system. To simplify the process and discussion in this Executive Summary, pipeline age is used herein to represent the potential reliability and vulnerability to condition-related service outages.

Figure ES-12 is developed to show the age distribution of the pipelines in the City's water distribution network. As shown, approximately twenty-five percent of the system was constructed before 1950 and is therefore in excess of 65 years old, with approximately 4% of the system approximately 100 years old. With a planning-level useful life of 80 to 100 years, the City should plan for the repair/replacement of many of the pipelines in the next 10 to 20 years.

Figure ES-12 Age Distribution of City Water System Pipelines



Source: City water system GIS data for underground pipelines, 2014.

It should be noted that the City has developed an asset management system of its underground water pipelines and has budgeted for the methodical replacement of underground infrastructure for many years. This budget item has historically been underfunded, increasing the risk of significant water main breaks and system losses similar to the ones experienced by other cities in the area.

A projection of the projected capital investment required over the next 30 years for the City's underground pipeline network was established in a 2010 Asset Management Plan. This plan projected the need to invest approximately $13 Million per year in the City's water system pipeline network. The current level of annual funding for this line item is approximately $2 Million, down from the original annual budget level of $3.8 Million to minimize the impacts on water rates at this time.

Working with the City to conduct this Sustainable Water Master Plan (SWMP) has supported the development and use of the City's current water system five-year Capital Improvement Plan. These programs and projects address the full range of capacity, reliability, sustainability, and self-sufficiency improvements. They are phased for implementation to support the methodical implementation of the SWMP to meet the City's needs while minimizing the financial impacts on its customers.

Other Water System Program Recommendations

In addition to the findings of the system hydraulic analysis and age assessment provided herein, there has been substantial discussion and analysis related to staging and operational requirements of the future water supply portfolio. In particular is the need to formalize a water supply plan that aligns with the City's proactive development of the Olympic Well Field Management Plan, the phasing of self-sufficiency improvements and demand management programs, the operational strategies to meet seasonal demands, and the adoption and implementation of appropriate water system funding.

As an implementation element of the SWMP, it is recommended the City consider the development of several additional programs that will support the success of the SWMP. These include:

- Prepare an operational plan that integrates the timing of various supply programs and facilities, documents the sequential priority of each new source of supply, establishes the baseline/peak relationship of the two water treatment plants, and evaluates the seasonal operational plan for each water treatment plant to meet average day, minimum day, and maximum day demands under various hydrologic conditions.

- Develop a Groundwater Management/Sustainability Roadmap to position the City to be the leader of the Santa Monica Groundwater Basin, enhancing its ability to control this local water resource.

- Prepare a Grant Funding Program Plan so that the use of grant funds can be utilized to lessen the impact of these program/facility costs on the City's water customers over the next 10 years.

- Develop an Olympic Water Treatment Plant (OWTP) Technical Oversight Team that will review and evaluate key technical information associated with the new OWTP. This panel of experts will support the City's development of this project and will convene periodically to facilitate the efficient integration of this facility into the City's water self-sufficiency program.

Section 1: Introduction

The City of Santa Monica (City) supplies imported and local water to approximately 91,000 residents within an area of approximately 8 square miles. Looking to its future, the City hopes to eliminate its reliability on imported water by addressing the challenge of existing groundwater quality, identifying new sources of local water supply, and more effectively reduce and manage its water demands.

With an adopted goal of water self-sufficiency achieved by eliminating reliance on Metropolitan Water District of Southern California (MWD) supply by 2020, the City of Santa Monica retained Kennedy/Jenks Consultants to develop an integrated Sustainable Water Master Plan (SWMP). The SWMP combines relevant components of existing plans with an evaluation of a broad range of water supply and demand management options to assist the City in meeting its goals. This plan has been prepared with the objective of developing a comprehensive document to define supply and demand management options to cost effectively reduce future water demands and enhance local water supply production capabilities.

1.1 Goals and Purpose

The purpose of this planning effort is to provide an up-to-date, comprehensive look at the City's water system using recent planning information and the newly-developed distribution system hydraulic model to assess the City's water system infrastructure needs. In a March 2011 study session with the City Council, staff presented concepts and principles that would be involved in achieving water self-sufficiency goal by the year 2020. Since that time, the City has embarked on the development of a sustainable and proactive plan to accomplish this goal.

This SWMP includes an evaluation of expanded demand management measures and a variety of water supply alternatives including recycled water, storm water collection and treatment, rainwater harvesting, greywater applications, and other water rights, supply and exchange opportunities to align with the above goal. A decision modeling approach was used to package these programs and projects into Supply/Demand Portfolios, where criteria were developed to provide portfolio ranking, economic analysis and ultimately, strategic direction. This plan illustrates projected water supply and demand scenarios, and characterizes the approximate magnitude of supply deficits or unpredictability that needs to be addressed to meet the City's self-sufficiency objectives by 2020. The recommendations resulting from this SWMP are designed to provide a roadmap of phased projects and programs to guide the City's water utility towards self-sufficiency.

Implementation of the SWMP is further supported through the conduct of financial planning services. These services, prepared and documented under a separate cover, included an evaluation of water and wastewater rates, rate structures for conservation support and financial stability, and an update to the City's water and wastewater facility capacity charges.

As discussed above, the development of a SWMP entails a multi-faceted approach to address the City's goal of achieving water self-sufficiency by the year 2020. With the City's current capability to meet approximately 70% of its water demand from local groundwater sources, the

objective is to develop strategies to close the "gap" represented by the current purchase of imported water. Through a combination of demand management approaches and water supply augmentation tactics, various portfolios were developed to represent permutations and combinations of options that best meet the program objectives and continue to support the City's Sustainability Plan[1]. The SWMP documents the mix of strategies that could be undertaken to achieve water self-sufficiency by 2020, and recommends a portfolio of conservation/supply programs and capital projects to meet these self-sufficiency goals.

The scope of services required to achieve the primary goals of the City's SWMP include:

- Perform a water demand analysis and generate water demand projections, which incorporate the most current information regarding population, land use and the Land Use and Circulation Element (LUCE) information for the City's service area projected to the year 2035. The water demand projections consider the effects of weather and economic conditions on future water demand in order to increase defensibility in a time of increased pressure to reduce potable water demands in response to State legislation,

- Conduct a rigorous evaluation of the City's current and future supply alternatives and demand management options to be able to build strategic portfolios for the future,

- Develop a comprehensive potable water system hydraulic model development, including calibration, and perform a hydraulic analysis under various system conditions,

- Perform an evaluation of infrastructure improvements to accommodate existing requirements and meet future needs, including an evaluation of system infrastructure fire flow (FF) requirements, and an updated capital improvement program to support the City's short and long-range capital improvement requirements,

- Perform a comprehensive financial evaluation of the City's water and wastewater utilities and associated rates and rate structures, and

- Prepare and submit two separate reports documenting the findings and recommendations of the Sustainable Water Master Plan and the Water and Wastewater Rate and Revenue Study.

1.2 City Background and Previous Studies

The City of Santa Monica provides water service to approximately 91,000 residents through a combination of local and imported water supplies. Historically, groundwater made up the majority of the City's water supply portfolio; however, in 1995 when methyl tertiary butyl ether (MTBE) contamination was discovered in the Charnock Sub-basin, a sub-basin of the Santa Monica Basin (Basin), the City was forced to shut down five groundwater wells and have to rely heavily on purchased water (or imported water) from Metropolitan Water District of Southern

[1] http://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Sustainability/Sustainable-City-Plan.pdf

California (MWD). With a proactive water treatment program now in place, the City is now returning to reliance on groundwater as its primary source of water supply. The City also collects dry-weather urban runoff for use as a treated non-potable water source.

The following background sub-section describes the details of the City's service area, topography, climatic conditions and historical growth patterns.

1.2.1 City's Service Area

Santa Monica is a beachfront city in western Los Angeles County. It is situated on the Santa Monica Bay, and is surrounded by the City of Los Angeles on the Northeast, the Pacific Ocean on the west, Mar Vista on the east and Venice on the southeast. The City's service area consists entirely of the City of Santa Monica with limited service in the City of Los Angeles. The City occupies 8.3 square miles (5,312 acres) of land. Figure 1-1 shows the Santa Monica City boundary and the vicinity areas.

Single family and multi-family residential are the City's predominant land-use type. In addition to the residential land-use, the City also has centralized business, a commercial district, and institutional and industrial areas. Figure 1-2 shows the current land-use map of the City. It is expected that future changes in growth and land-use type will result from re-development of the existing lots since almost all of the City's area is at near built-out conditions.

1.2.2 Topography and Climate

The City rests on mostly flat terrain that slopes down towards Ocean Avenue and towards the south. The north side of the City is separated from the beaches by the high bluffs.

Classified as a moderate Mediterranean climate, Santa Monica enjoys an average of 310 days of sunshine a year. Because of its location, nestled on the vast and open Santa Monica Bay, morning fog is common in May, June and early July (caused by ocean temperature variations and currents). Summers are dry with an average temperature of about 70°F, and winters are cool and wet with an average temperature of about 52°F. The beach temperatures tend to be about 5 to 10 degrees Fahrenheit (3 to 6 degrees Celsius) cooler than it is inland. September tends to be the warmest month of the year.

The City's average rainfall is approximately 14 inches. The rainy season is from late October through late March. Winter storms usually approach from the northwest and pass quickly through the Southland. There is very little rain during the rest of the year.

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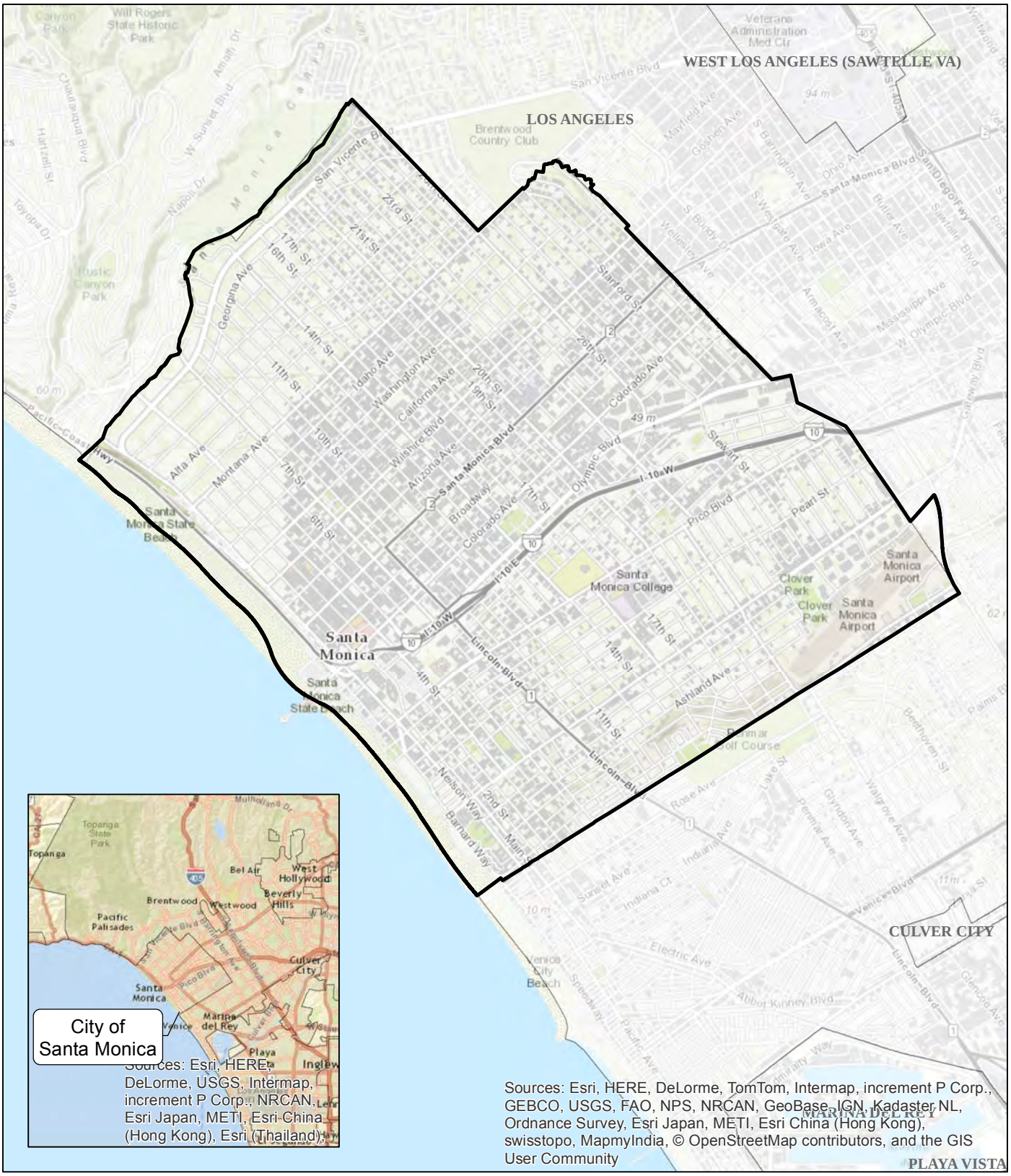

Path:

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

N

0 1,725 3,450

Feet

Kennedy/Jenks Consultants

Santa Monica Sustainable Water Master Plan
Los Angeles County, California

Site Vicinity Map

K/J 1283015*00

Figure 1-1

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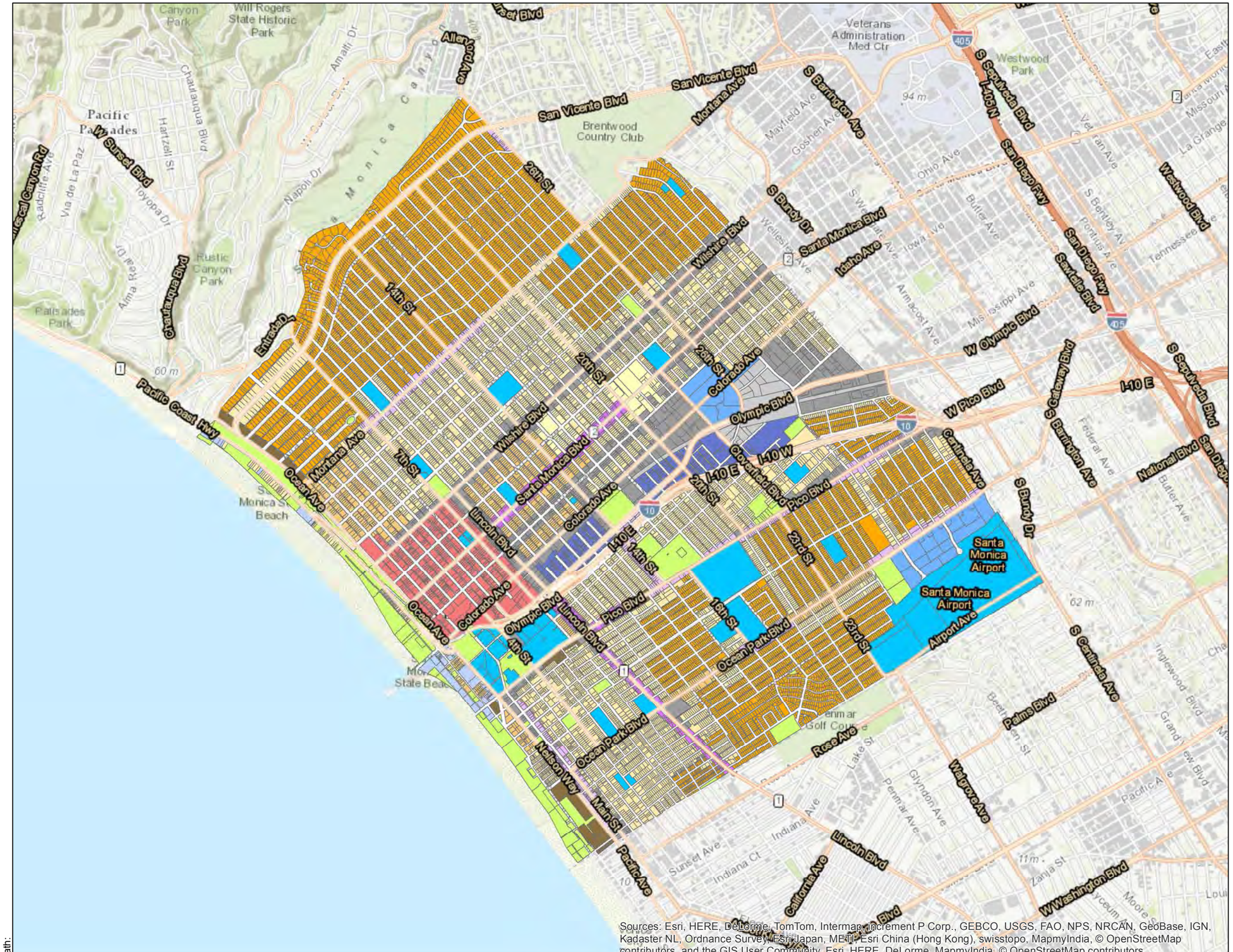

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

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Legend

City of Santa Monica Boundary

Landuse

- Downtown Core
- General Commercial
- Neighborhood Commercial
- Health Care Mixed Use
- Industrial Conservation
- Institutional/Public Lands
- Low Density Housing
- Medium Density Housing; Meduim Density Housing
- High Density Housing
- Single Family Housing
- Mixed Use Boulevard; Mixed Use Boulevard Low; Mixed Use Creative
- Oceanfront District
- Office Campus
- Parks and Open Space; San Vicente Blvd Median; Civic Main Street Park
- Transit Corridor; Transit Village

N

0 1,250 2,500

Scale: Feet

Kennedy/Jenks Consultants

Santa Monica Sustainable Water Master Plan
Los Angeles County, California

Santa Monica Landuse Map

K/J 1283015*00

Figure 1-2

1.2.3 Growth in Santa Monica Region

According to the United States Census Bureau, the 2010 residential population of the City is approximately 91,000 persons. Given the near build-out condition, population growth in the City's service area is projected to be minimal, less than 1 percent per year. As a result, population is projected to increase by approximately 1,000 people in the next 25 years. As a major commercial center for the region, the City experiences daytime populations of up to 200,000 due, in large part, to the number of businesses and attractions located within the City. This increase in population along with general non-residential growth rate will increase the City's water demands for indoor and outdoor use in future years. Table 1-1 below shows the City's projected population through the 2035 planning period.

Table 1-1 Projected Population

Year	2015	2020	2025	2030	2035
Projected Population	91,243	91,487	91,716	91,926	92,124

Source: 2010 Urban Water Management Plan. Note that the Department of Finance currently suggests higher population values than projected in 2010.

1.2.4 Previous Efforts and Studies

Reports on the water supply and groundwater conditions in and around the Santa Monica region were compiled and reviewed in preparation for this study. Some of the more useful reports that are referenced in this study include those recently completed by, SA Associates, Richard Slade and Associates, and GHD. A summary of the related reports regarding water supply/demand, water quality, and water utility assets include:

- The most recent (2011) update to the Urban Water Management Plan by SA Associates provided key insight into the status of the City's water supply. Items addressed included characterizations of the current water supply, groundwater supply, alternative water supply sources including recycled water, the future of each supply and reliability, conservation and water shortage plans for moving forward.

- In 2012, Richard Slade and Associates prepared a *Conceptual Groundwater Basin Model and Assessment of Available Groundwater Supplies Santa Monica Basin* for the City and a supplemental perennial yield assessment to support this Sustainable Water Master Plan. This material is provided to the City directly under a separate cover.

- In 2010 the City commissioned the development of an Asset Management Plan for the water distribution and wastewater collections systems by GHD. This study assessed the organization and management of the Operations and Maintenance (O&M) functions of the Water Resources Division. A key finding of this study was the development of a long-term capital investment strategy for the water and wastewater assets.

1.3 Report Organization

Section 1- Introduction

This section gives a brief overview of the City's service area, project background, customer demographics, climate, previous efforts and studies relevant to this master plan, and structure of the master plan report.

Section 2 and Section 3 – Historical, Current and Future Water Demands

These sections describes in detail the City's historical water use, demand projections for future, factors influencing the projections, demand management strategies (both current and future), existing and future demand management programs and their impacts etc. Various demand management strategies will be presented which can be used as planning tools to help reach the City's goal of water self-sufficiency and meeting the water use efficiency goals as prescribed in SBx7-7.

Section 4 and Section 5- Current and Future Water Sources, Supplies, and Strategies

These sections describe in detail the current supply sources the City is using to meet its water demands and explores potential new supply options, including but not limited to: groundwater, stormwater collection, greywater, wastewater recycling, non-potable reuse and other potential institutional arrangements that may further improve the reliability of the City's water supply. Portfolios of supply strategies are evaluated in terms of cost, reliability, sustainability, and diversity, and are set forth as potential supply plans for the City. These portfolios are ultimately elevated to the City Council to obtain direction on the strategy to be implemented in the City's sustainable water supply plan.

Section 6 - System Hydraulic Analysis

This section describes the master planning criteria used for hydraulic analysis of the City's water pipeline network and pumping/storage facilities. Design criteria include standard parameters for pipeline sizing, roughness coefficients per pipe type, minimum/maximum velocities, head-loss criteria, fire flow requirements, and storage criteria. This section also discusses the details of the hydraulic model construction using the Innovyze InfoWater software and model calibration using SCADA data, fire hydrant data and the corresponding results. System hydraulic deficiencies in terms of pipeline, pumping, storage, and fire flow are identified as part of this section.

Section 7- Capital Improvement Program

This section describes the results of the water system analysis and develops the Capital Improvement Program (CIP) recommendations. The CIP includes conceptual level costs, and prioritization, and phasing as appropriate.

Appendices

A series of appendices have been assembled to aid the reader in reviewing peripheral information that was useful in the development of the Sustainable Water Master Plan (SWMP). These appendices are located at the conclusion of the basic SWMP report.

Other Deliverables

As an element of the City's Sustainable Water Master Plan, a comprehensive financial evaluation of the City's water and wastewater utilities and associated rates and rate structures was also prepared. The results of these efforts are presented as separate reports and are not contained herein.

1.4 List of Acronyms

The following is the list of acronyms used in this report.

List of Acronyms	
AF	Acre-feet
AFY	Acre-feet per year
AWWA	American Water Works Association
BMP	Best Management Practices
CEQA	California Environmental Quality Act
CFS or cfs	Cubic feet per second
CIP	Capital Improvement Program
City	City of Santa Monica
CUWCC	California Urban Water Conservation Council
DDW	Division of Drinking Water
DO	Dissolved oxygen
ESP	Emergency Storage Project
FBS or fbs	Feet below Surface
FPS or fps	Feet Per Second
FY	Fiscal Year
GPD/FT or gpd/ft.	Gallons per day per foot
GPM or gpm	Gallons per minute
HP or hp	Horsepower
IRP	Integrated Resources Plan
IWRP	Integrated Water Resources Plan
KW or kw	Kilowatts
KWH or kwh	Kilowatt per hour
LF or lf	Linear Foot
MCLs	Maximum contaminant levels
MDD	Maximum Day Demand
MG	Million gallons
MGD or mgd	Million gallons per day
MG/L or mg/L	Milligrams per liter
MWD	Metropolitan Water District of Southern California

List of Acronyms	
M&I	Municipal & Industrial
NEPA	National Environmental Policy Act
PRV	Pressure Reducing Valve
PSI or psi	Pounds per Square Inch
O&M	Operation and maintenance
RWMP	Recycled Water Master Plan
RWQCB	Regional Water Quality Control Board
SWMP	Sustainable Water Master Plan
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total dissolved solids
TOC	Total organic carbon
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VOCs	Volatile Organic Compounds
WRF	Water Research Foundation
WRP	Water Reclamation Plant

Section 2: Historical and Current Water Use

To meet its sustainability goals by the year 2020, the City must have a clear understanding of its current and future water needs, or demands within its service area. Historical water demand data provide information on water use patterns and trends among the City's customers. These patterns and trends can then be analyzed, along with local land use data, to project the City's future water demand and production needs.

This section describes the City's historical water use[2]. A detailed analysis of the City's billing data was conducted to better understand patterns of use among the City's various customer types. Finally, the results of a demand analysis as it relates to the projection of future water needs are provided in Section 3.

2.1 Historical Water Use

Since 2005, annual water use within the City have ranged from 13,000 AF to 15,000 AF with an average annual water consumption of approximately 13,930 AF (Table 2-1). The decrease in demands that began in 2008 corresponds with statewide drought conditions promoting the need to conserve water resources and depressed economic conditions. Overall, the City's water use has been steadily declining since the early 1990's as a result of its successful water conservation programs.

Table 2-1 Historical Water Use

Year	Production (AF)[(a)]
2005	14,917
2006	15,061
2007	15,112
2008	14,491
2009	13,855
2010	13,065
2011	13,142
2012	13,874
2013	14,020
Average	13,934

(a) Source of data for years 2005-2009: City's 2010 UWMP. Source of data for years 2010-2013: City's Department of Water Resources Public Water System Statistics report.

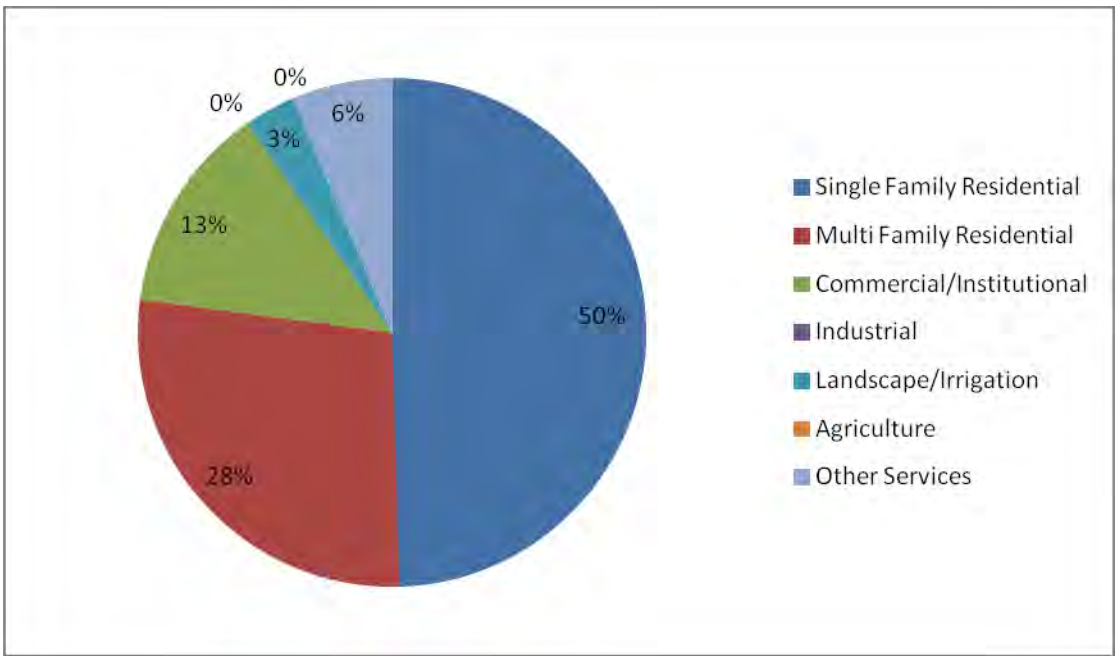
2.1.1 Historical and Current Water Use by Customer Type

The City provides water service to approximately 18,000 metered service connections to a variety of customer types. These include: residential, commercial, institutional, landscape, and

[2] Demand or consumption is used herein to reflect actual billing information. Production is metered water use (demand) plus unaccounted for and other non-revenue water.

fire protection customers. Approximately 80 percent of the City's total service connections are used to serve the City's residential customers. Commercial and institutional accounts account for approximately 12 percent of the service connections. Landscape irrigation, fire line services and various "other" accounts make up the remaining 8 percent of the City's water customers. Among the "other" accounts is a very small set of customers receiving recycled water from the Santa Monica Urban Runoff Recycling Facility (SMURRF). A graphical summary of the service connections by customer type is shown on Figure 2-1

Figure 2-1 Service Connections by Customer Type



Source: City utility billing data; calendar year 2013

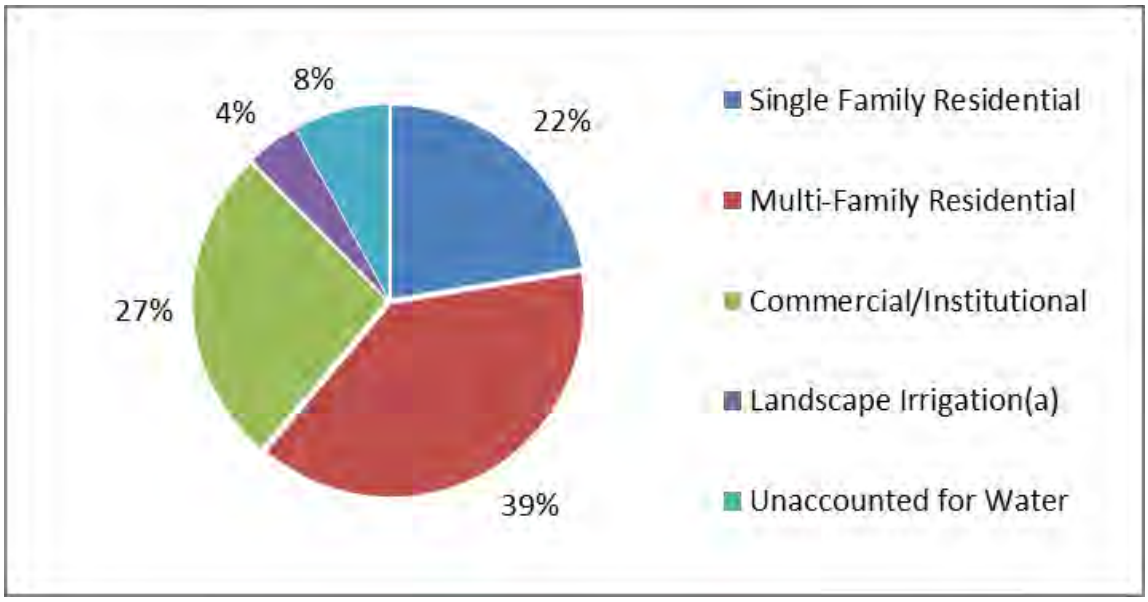
As shown in Table 2-2, the majority of the City's water use occurs within the residential sector, as residential usage accounts for approximately 61 percent of the City's total water consumption; with 23 percent of the usage by the single family customer class, and 38 percent from the multi-family customer class. Since multi-family connections typically serve multiple residences, their water use per service connection is expected to be larger than a typical single family account. Water use from system losses and demand by customer type is graphically depicted on Figure 2-2.

Table 2-2 Historical Water Production (AF)

Customer Type	2006	2007	2008	2009	2010	2011	2012	2013
Single Family Residential	3,645	3,752	3,529	3,195	2,862	2,798	3,113	3,143
Multi-Family Residential	5,866	5,784	5,575	5,408	5,100	5,517	5,503	5,431
Commercial/Institutional	3,774	3,745	3,549	3,374	3,003	3,512	3,544	3,718
Landscape Irrigation[(a)]	626	728	698	652	538	606	604	606
Unaccounted for Water[(b)]	1,150	1,103	1,140	1,226	1,562	709	1,110	1,122
Total Water Use[(c)]	15,061	15,112	14,491	13,855	13,065	13,142	13,874	14,020

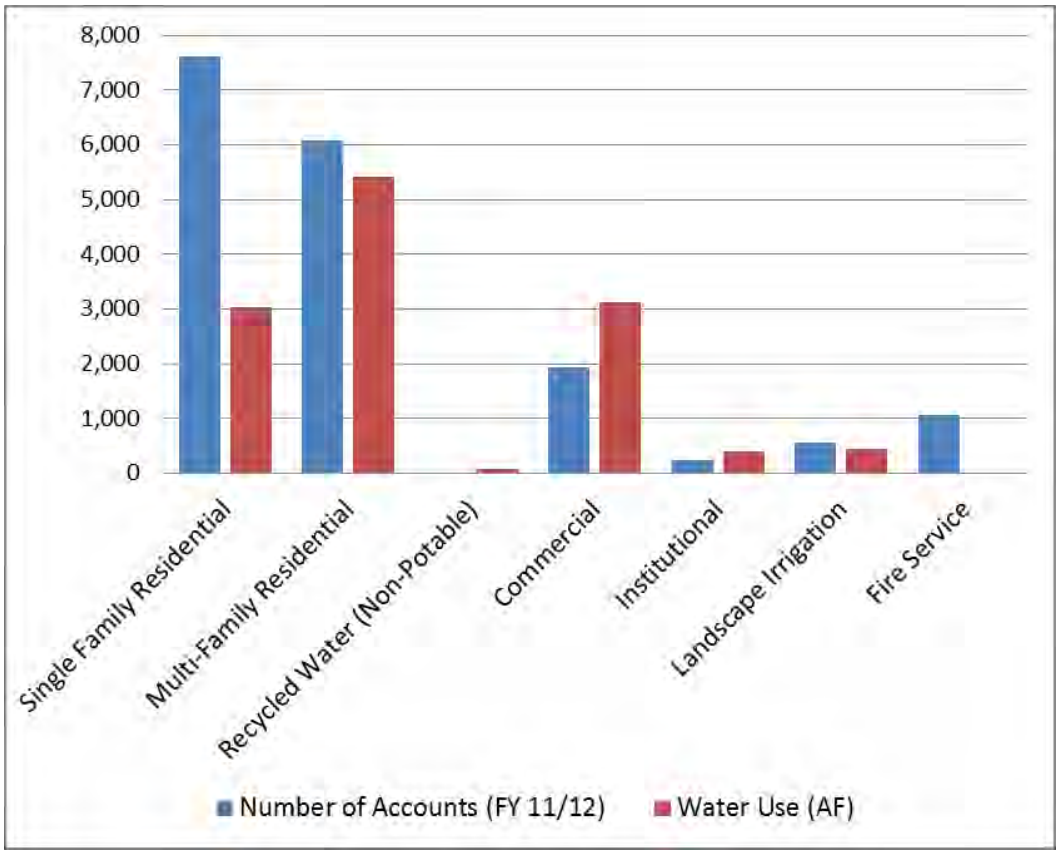
(a) Includes recycled water produced by the SMURRF.
(b) Unaccounted water for 2012 and 2013 based on average of unaccounted water from 2005 to 2011.
(c) Source of data for years 2005-2009: City's 2010 UWMP. Source of data for years 2010 to 2013: City's Department of Water Resources Public Water System Statistics report ("Total water into the system," including recycled water).

Figure 2-2 Water Use from Customer Types (Including System Losses)



While non-residential accounts comprise a little over ten percent of the City's service connections, these commercial and institutional customers account for approximately one-quarter of the City's water consumption. Figure 2-3 is derived to compare the number of active water system service connections with the water use for each of customer type. The City's institutional customers include several large institutions with large populations of water users, including the Santa Monica Civic Auditorium, Santa Monica College and two hospitals.

Figure 2-3 Comparison of Number of Service Connections and Demand



The City's dedicated landscape irrigation customers, customers with separate meters specifically for landscape water use, account for four percent of the City's total water use. Except for these few accounts equipped with dedicated landscape irrigation meters, outdoor water use is not metered separately from indoor use.

Unaccounted for water is the difference between the amount of water that enters the City's distribution system and the amount of water distributed to the City's customers. Unaccounted for water is water lost from the distribution system through a variety of ways, both authorized and unauthorized, including water for firefighting, pipe flushing, leakage from pipelines, meter error, and theft. The City's unaccounted for water is estimated to be 9 percent of total demand.

The City completed the American Water Works Association's M36 Water Loss analysis in order to better understand water loss within their system. Results indicate an Infrastructure Leakage Index (ILI) of 3.34 which, according to general guidelines, is within the "reasonable" range for utilities not exposed to severe limitations. An ILI between 3 and 5 is appropriate when water resources can be developed or purchased at a reasonable expense; existing water supply capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place; and water resources are believed to be sufficient but demand management measures are included in long-term planning. The audit highlights some strengths and weaknesses of the system.

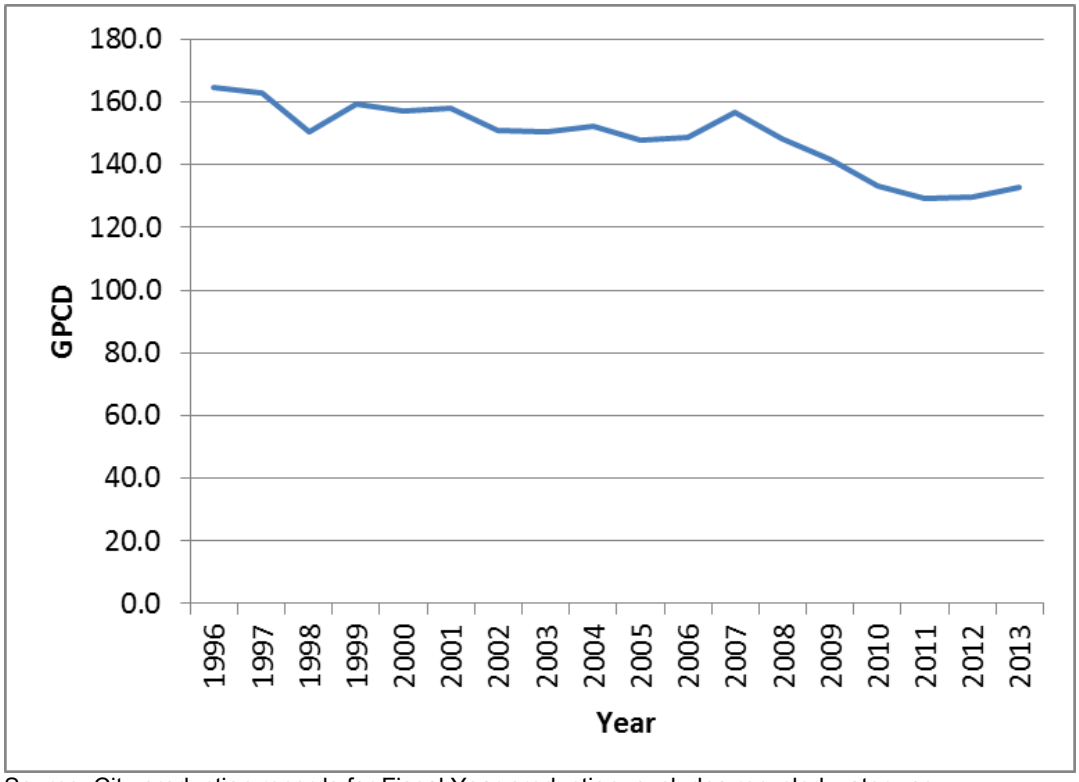
2.1.2 Historical Per Capita Water Use

The City's per capita water consumption has been declining steadily since the early 1990's. Water use in the City hit the lowest level on record in 2011 at 129 gallons per capita per day (gpcd) (Figure 2-4). The decrease in water use is attributed to a combination of factors including the economic downturn, customer awareness of water scarcity, the City's water conservation efforts and tiered water rates.

The California State Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to protect statewide water sources. The new legislation called for a 20 percent reduction in water use in California by the year 2020 and amended the water code to require water agencies to establish 2020 and 2015 per capita water use targets in their 2010 Urban Water Management Plans (UWMPs). These per capita targets included both residential and non-residential accounts.

To satisfy the provisions of SBx7-7, the City set water use targets for 2015 and 2020 at 139 and 123 gpcd, respectively. The City intends to achieve its reduction requirements through the implementation of the California Urban Water Conservation Council's (CUWCC's) Best Management Practices (BMPs) and additional programs designed to reduce landscape water use, including rebates for sustainable landscapes, water-saving irrigation systems, rain barrels and cisterns and free sustainable landscape workshops and classes.

Figure 2-4 Historical Per Capita Water Use (GPCD)



Source: City production records for Fiscal Year production, excludes recycled water use.
Population data is from the Department of Finance, January estimates.

2.2 Factors Affecting Water Use

The City's water use varies vary from year to year depending on a number of factors including population growth, climate conditions, economic activity, and water conservation.

2.2.1 Population

Typically, as population increases, so does the demand for water. Prior to 1990, population growth was a good indicator for total water demands, with water demands increasing in step with population. However in the early 1990's the City began implementing water conservation programs which, combined with new water use standards on plumbing fixtures, were extremely effective in reducing per capita water demands. The City has seen an 18 percent reduction in per capita water use from 1996 to 2010 due in part to the implementation of conservation measures, increased saturation of water-saving plumbing fixtures and general water conservation awareness among its customers. Population, therefore, is no longer a straight-forward indicator of estimated water demand.

2.2.2 Weather

Weather is a significant influence on year to year variation in water demand largely due to landscape requirements. In general, hotter, drier years result in increased water demands while in cooler, wetter years demand decreases. At the same time, during prolonged drought, this effect can be offset by increased public awareness and mandatory water use restrictions.

2.2.3 Economic Activity

Typically, poor economic conditions, characterized by high unemployment rates result in decreased water use; however, the degree of this effect for the City is unknown. It is suspected that recent decrease in water demand experienced in the City can be attributed, at least in part, to poor economic conditions as a result of the recession. In projecting water use for the future, it is important to consider eventual economic recovery and ensuing higher water demand. This is particularly important when considering the City's goal to meet state-mandated SBx7-7 per capita water use targets. If water demand increases as a result of economic recovery, the volume of water that must be conserved in order for the City to meet its targets will increase.

2.2.4 Water Conservation

Water conservation reduces water demand either by improving fixture and/or process efficiency or changing peoples' water using behaviors. Active conservation occurs through efforts such as rebate and incentive programs, system audits and repairs, outreach, education and more. Passive conservation occurs naturally as a result of legislation and plumbing codes when customers are required to replace or upgrade water using products and processes. The City has seen an 18 percent reduction in per capita water use from 1996 to 2010 due, in part, to the implementation of conservation measures, increased saturation of water-saving plumbing fixtures and general water conservation awareness among its customers. Since that time, the City has experienced a slight rise in demands per account, suggesting that the previously noted

impact of an improved economy on water demands is a practical consideration for long-range water supply planning.

2.2.4.1 Summary of Past Water Conservation Efforts

The City has been actively implementing water efficiency programs since 1988, was one of the original signatories to the CUWCC MOU in 1991 and continues in its effort to reach self-sufficiency and meet State requirements. The City has adapted its water use efficiency programs to meet changing customer needs, to take advantage of various opportunities, often funding related, and to capitalize on new processes and technologies.

The City's past water conservation efforts include a combination of incentive programs, regulations, and outreach and education programs. Outreach and education programs lay the foundation for the City's water conservation ethic, supporting the incentive programs that actively encourage water conserving behaviors, while effective regulations are used to support and reinforce conservation efforts when needed. This section briefly summarizes the City's water conservation efforts over the past decade; more detailed information is provided in Appendix A. Information regarding water use efficiency efforts prior to 2001 can be found in the City's 2002 Water Efficiency Strategic Plan.

2.2.4.1.1 Incentive Programs

Incentive programs are typically designed to motivate customers to purchase more efficient fixtures or devices by defraying the costs. Since 2001 the City's incentive programs have included a variety of devices typically delivered as rebates, but also included direct install programs when appropriate. A summary of the City's incentive programs is provided in Table 2-3. The water savings are estimates based on industry standards including those established by MWD.

Table 2-3 City's Water Conservation Incentive Programs 2001 to 2012

Device/Fixture	Incentive Type	Program Dates	Total Quantity Installed	Lifetime Estimated Water Savings (AF)
City Incentive Programs				
ULFT	Rebate	2001 – 2003	790	533.05
ULFT	Direct Installation	2002 – 2004	938	483.07
HET	Direct Installation	2004 – 2004	81	39.85
High Efficiency Showerhead	Direct Installation	2002 – 2004	283	8.49
Faucet Flow Restrictors	Rebate	2002 – 2004	330	0.99
Faucet Aerators	Rebate	2002 – 2004	170	0.51
High Efficiency Clothes Washer	Rebate	2004 – 2009	826	232.34

Device/Fixture	Incentive Type	Program Dates	Total Quantity Installed	Lifetime Estimated Water Savings (AF)
Landscape Retrofits (Irrigation and Plants)	Grant	2004	113 projects	76
Grey Water Conversion Kits	Rebate	2005	5	4.6
HET	Rebate	2006 -2009	316	155.47
Rain Barrel	Rebate	2009	319	1.4
Cisterns (Small)	Rebate	2009	3	0.02
Cisterns (Large)	Rebate	2009	3	0.02
Turf Replacement (Cash for Grass)	Rebate	2010 – 2012	3,170 sq. feet	2.14
Parkway Turf Replacement (Cash for Grass)	Rebate	2011	4,641 sq. feet	6.2
Residential Incentive Programs Operated by MWD				
HETs	Rebate	2008 – 2011	23	20.4
High Efficiency Clothes Washers	Rebate	2008 – 2012	333	145.52
Weather-Based Irrigation Controllers (WBICs)	Rebate	2008 – 2012	14	5.8
Synthetic Turf	Rebate	2008 – 2009	3,171 sq. feet	0.44
Rotary Nozzles	Rebate	2009 – 2012	149	4.18
CII Incentive Programs				
ULFT - Flushometer	Rebate	2000 - 2012	58	43.9
Ultra-Low Flow Urinal	Rebate	2000 – 2012	26	20.9
ULFT	Rebate	2002 – 2012	497	376.7
Flush Valve for Flushometer Toilet	Retrofit	2003 – 2004	9	1.4
HET – Dual Flush	Rebate	2003 – 2008	17	14.5
High Efficiency Clothes Washer	Rebate	2003 – 2010	154	127.5
HET – Tank Type (Multi-Family Customers)	Rebate	2003 – 2012	39	32.5
Pre-Rinse Spray Valves	Rebate	2004 – 2006	150	114.8
Conductivity Controllers	Rebate	2005	14	45.1
Conductivity Controllers – pH	Rebate	2005	3	16.1
Water Broom	Rebate	2005 – 2006	202	154.9
Zero Water Urinals	Rebate	2005 – 2012	386	947.2
HET	Rebate	2006	733	632.1
Dry Vacuum Pump	Rebate	2008	4	2.6

Device/Fixture	Incentive Type	Program Dates	Total Quantity Installed	Lifetime Estimated Water Savings (AF)
Food Steamers	Rebate	2008	3	7.5
High Efficiency Urinal	Rebate	2008	1	1.2
HET – Multi-family Upgrade	Rebate	2008 – 2012	1	0.15
Rotary Nozzles	Rebate	2009	1608	35.4
Synthetic Turf	Rebate	2009	3,000 sq. feet	4.2
Weather-Based Irrigation Controller (WBIC)	Rebate	2009 - 2012	4	3.16
Total Estimated Lifetime Water Savings (AF)				**4,203**

2.2.4.1.2 Audit and Assessment Programs

The City offers water use audits and assessments for both its residential and commercial customers to help identify opportunities to reduce their water use. Currently, three separate programs are available to City water customers:

- Bay Saver Water Assessments
- Green Business Certification Water Assessments
- Landscape Audits of City-Operated Dedicated Landscape Meters

These programs are described in detail in Appendix A.

2.2.4.1.3 Regulatory Programs

The City makes effective use of its rules and regulation to support its conservation efforts. The policies and ordinances listed below comprise one of the most comprehensive water efficiency-related packages in the state. Current regulations and policies programs include:

- Sustainable City Plan
- Parkway Policy
- Greywater Policy
- Retrofit Upon Sale Ordinance (SMMC 7.18)
- Bay Saver Fee Ordinance (SMMC 7.12)
- Water Conservation Ordinance (SMMC 7.16)
- Green Building Ordinance (SMMC 8.106 and SMMC 8.108)

- Water Shortage Response Plan (SMMC 7.16)

Various policies, ordinances, and supporting water conservation materials are provided in Appendix A.

2.2.4.1.4 Outreach and Education Programs

The City recognizes the importance of educating the public, including school-aged children, about the value of local water resources and the importance of water use efficiency. The City's public outreach and education programs are designed to educate about local water resources issues, water shortage advisories and the need to become less dependent upon imported water supplies, as well as inform residents about the various programs available to help reduce their water use.

The City operates a general public outreach program which includes the annual Santa Monica Festival, where staff distributes materials on water production, quality, and conservation, and hosts educational/informational tours of Arcadia and SMURRF treatment plants for schools, universities and other local agencies, and works closely in partnership with MWD in the offering of its water conservation school programs. The City also offers landscape workshop series for both residents and landscape professionals and maintains four different demonstration gardens. The City's outreach and education programs are also described in greater detail in Appendix A.

Section 3: Future Water Use

To meet its goal of achieving water supply self-sufficiency by 2020, the City requires a clear understanding of its future water supply and demand requirements. To sustainably “turn off the valve” to imported water, the City must be able to meet current water production needs, including peak summer water use, as well as those in the future, through local sources and water conservation alone. The total amount of local source water needed to meet the City’s sustainability goal includes water supplied to customers, unaccounted for water, or non-revenue water lost from the distribution system, and any water used in the production process but not provided to the customers, such as brine produced and disposed of as a result of the water treatment process.

The City provided projected water demands in five year increments through 2035 in its 2010 UWMP (Table 3-1). The water demand projections, shown in AF, include the amount of water needed to meet current and future customers’ needs and are based on expected growth within the City, including re-development. Most notable, is the fact that the projections also include the assumption that the City will meet its SBx7-7 water conservation targets described in Section 2.1.2, a stark contrast to the actual historical water usage previously shown in Table 2-2.

Although redevelopment is expected to be an ongoing process, it is not expected to significantly impact water use since the City is already near "built-out". As the City's population continues to grow, and as water conservation measures continue to be implemented, the City expects to experience minimal increases in water consumption due to population increases.

Table 3-1 2010 UWMP Water Demand Projections

	2015	2020	2025	2030	2035
Projected Demand (AF)	12,592	12,625	12,657	12,686	12,713

Source: 2010 Urban Water Management Plan.

The water demand projections included in the 2010 UWMP provide a good starting point for estimating the volume of water needed to meet the City’s sustainability goal; however, additional clarity related to the basis of this planning is needed to appropriately use this water demand projection. Some of the key underlying elements of the 2010 UWMP projection are:

- The water demand projections include an assumption that the City will meet both its interim 2015 and its 2020 SBx7-7 water use reduction goals. In an effort to comply with SBx7-7, the City has committed to reducing its water use to 123 gallons per capita per day by the year 2020. Total customer demand, prior to reductions through the City’s conservation efforts, are necessary to understand the total volume of water the City must produce in order to eliminate dependence on imported water supplies. Once the total volume of water is known, then the best mix of supplies and water conservation programs can be derived to meet the goals of SBx7-7 and cost effectively meet the water supply self-sufficiency goal by 2020.

- The water demand projections shown:
    - Do not include unaccounted for water lost during the distribution process.
    - Do not include the volume of water needed for production processes, including brine created during the treatment process.
    - Are annual average values, and therefore do not include seasonal demand variations, especially the maximum day demands that occur during the summer.
- Finally, the demand projections have not considered the effects of weather and economic conditions on historical demands, which are a core element of the basis of future demand projections. As noted, over the past few years, the City has seen a significant decrease in demand. What is unknown, is how much of this reduction can be attributed to the City's water conservation programs, the downturned economy, and/or the weather, and the public education related influence of California's drought conditions. A better understanding of the effects of these factors on the City's water demand is required to improve the reliability of future water demand projections.

At the inception of this Sustainable Water Master Plan, the City's initial estimate of the average annual volume of water needed to meet the sustainability goal was approximately 3,700 acre-feet per year (AFY). However, similar to the 2010 UWMP demand projection methodology, that estimate was based on the assumption that water demand would not increase in the future beyond current levels and did not consider the effects that economic activity and weather may have on future water demands. While the extent of these effects may vary based on local conditions, there is a general increase in demands with increased economic activity and hotter, drier weather conditions.

These effects were not incorporated in the baseline demand projections available in other planning documents, including the 2010 Land Use and Circulation Element (LUCE). A comparison of current water demands and the LUCE projected demands suggests that the estimates in the 2010 LUCE may actually be too high. The 2010 LUCE projected water demands of approximately 15,300 AF in 2012; a detailed billing data analysis shows actual demand in 2012 was approximately 13,500 AF – a difference of 1,800 AF.

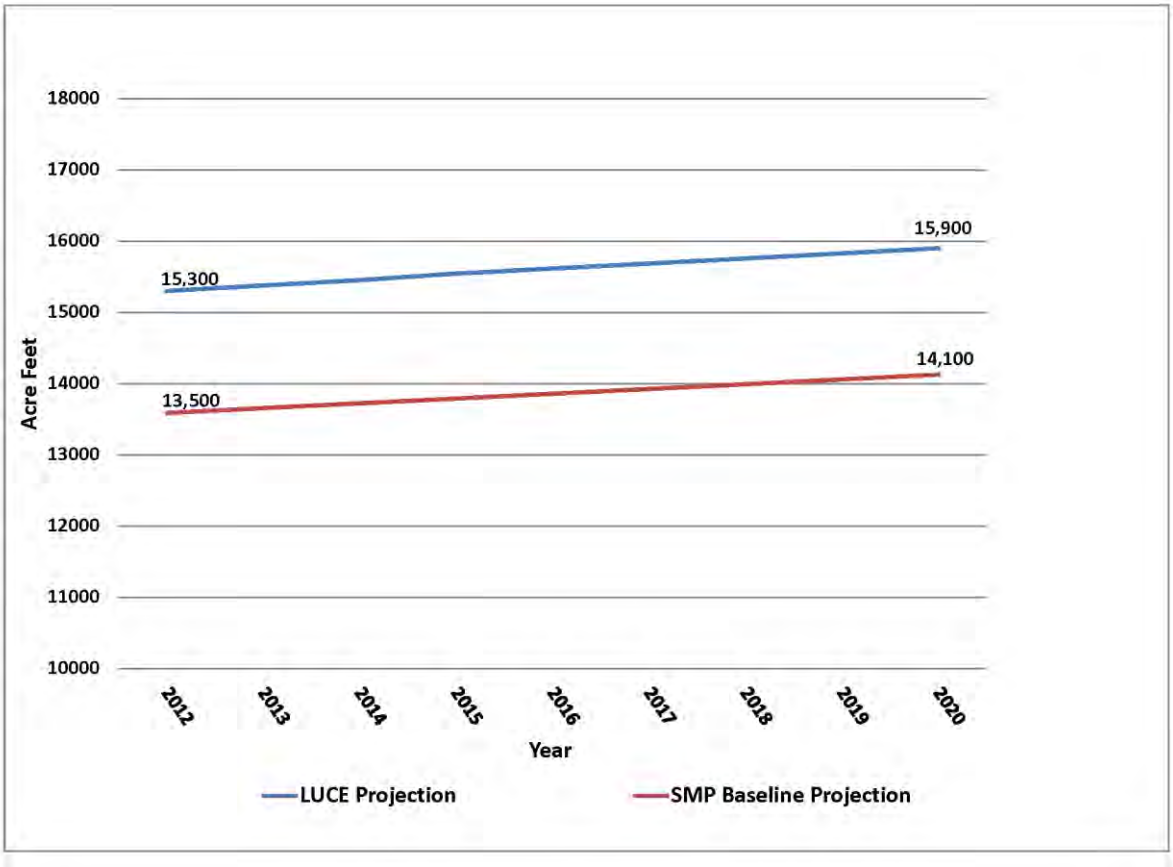
3.1 Water Use Analysis

To plan for future supply needs, a comprehensive demand analysis was performed in order to develop updated demand projections that align more closely with current demands and were adjusted for effects of weather and economic activity applicable to the City. The goal was to capture the total volume of source water the City would need to meet its water needs through local sources alone.

First, a new baseline demand projection was developed. This baseline water use projection begins with actual water production of approximately 13,500 AF (in FY 12-13) and grows at the same rate as the water demand projection found in the LUCE. LUCE annual growth rates were used since it was developed based on the City's best estimates of demographic and development projections used in the City's General Plan and other planning documents.

Figure 3-1 compares the water demand projection found in the LUCE with the new baseline projection developed herein.

Figure 3-1 Comparison of LUCE Water Projection with Baseline Projection

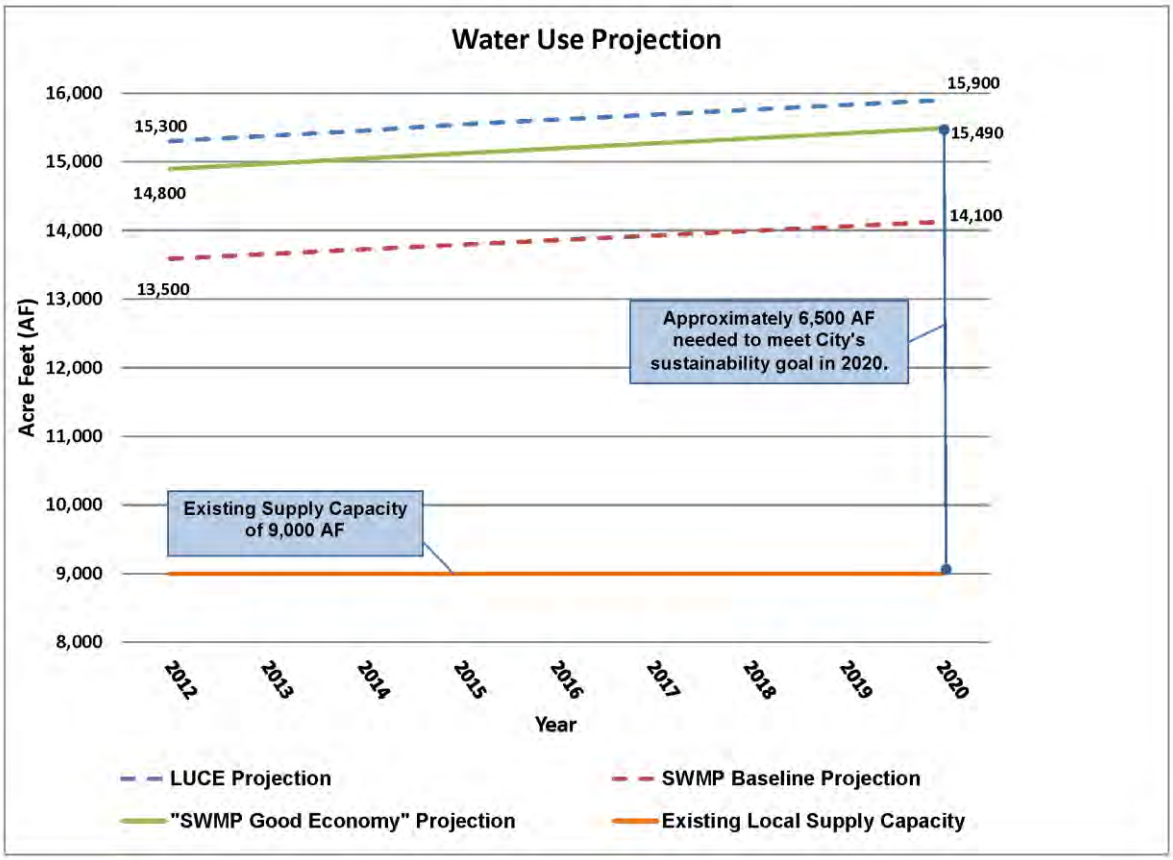


Next, the effects of weather and economic conditions on the City's water demands were explored. Regression analyses were performed to evaluate the correlation between water use for various customer categories (single family, multi-family, commercial, institutional and landscape irrigation) and weather and economic (unemployment rate) factors. Results of the analysis indicated that there was no significant correlation observed between weather related parameters (evapotranspiration (ET) and precipitation) and water use for the City (Appendix B). However, the analyses did find a reasonably high correlation with the City's unemployment rate (R^2 of 0.56 to 0.73) to water use for single family, multi-family and landscape irrigation customer classes. Specifically, water use decreased with an increase in the unemployment rate.

In projecting water use for the future, it is important to consider eventual economic recovery and an accompanying increase in water demand. Hence, compared to the baseline water usage conditions, additional conservation measures or water supplies would be required to meet the City's average annual water needs when economic conditions improve.

In concurrence with the results described above, the baseline water projections shown on Figure 3-1 was adjusted to project future production requirements under good economic conditions, as shown on Figure 3-2. The “good economy” projection is approximately 10 percent higher than the baseline water projection. Given that the City’s existing local water supply capacity is approximately 9,000 AF, the demand analysis suggests that the gap between available water supply and the volume of water required to meet the City’s sustainability goal in 2020 is actually closer to 6,500 AF, rather than 3,700 AF (Figure 3-2).

Figure 3-2 LUCE Projection, Baseline Projection, and "Good Economy" Projection



3.2 Projected Water Use

Table 3-2 presents a reasonable estimate of the City’s projected water usage. This estimate uses the City’s current water use, increases them by the annual growth rate found in the City’s Land Use and Circulation Element (LUCE, and normalizes or adjusts these values for the effects of economic influences. Thus, assuming good economic conditions (unemployment rate less than 4.1 percent) in the future, the City must be able to deliver an approximately15,500 AFY of water in the year 2020. The amount required will then increase to approximately 16,260 AFY in 2035 based on modest increase in demands projected by the 2010 LUCE.

Table 3-2 Projected Average Annual Water Production Requirements

	2015	2020	2025	2030	2035
Normalized Water Demand (AF)[(a)]	13,918	14,255	14,599	14,941	14,967
Unaccounted for Water (AF)[(b)]	1,202	1,233	1,261	1,291	1,294
Total Water Production (AF)	**15,120**	**15,488**	**15,860**	**16,232**	**16,261**

(a) Demand normalized for the 90th percentile unemployment rate (i.e. "good economic conditions," in which the unemployment rate is lower than 4.1 percent 90 percent of the time). Does not include demand reductions that will be achieved by the City's water conservation program as it works to meet SBx7-7.

(b) Assumes 9 percent system wide water loss based on the results of the City's AWWA Water Loss Audit.

It should be noted that Table 3-2 does not represent the total amount of water needed to meet full self-sufficiency through build-out. Additional water supplies are projected to be needed to meet maximum day demands in the summer, provide for water lost as brine during the water treatment system process, and other system losses that may occur over time. While some of these additional water needs are projected to be offset from additional water conservation programs and policies, it is not projected to offset the overall impact of these other water supply requirements. A discussion and analysis of the effect of water conservation programs on future demands follows. Water treatment related water supply requirements are further addressed in Section 5.

3.3 Water Conservation Analysis and Effect on Future Demands

Water conservation modeling and analysis were performed to better define the City's opportunities to reduce the projected water demands described above through the implementation of water conservation programs. Following the completion of a detailed billing and historical conservation program and policy analysis, a comprehensive list of water conservation programs was developed and modeled using the Alliance for Water Efficiency's Water Conservation Tracking Tool. This model allows users to analyze the water savings potential and implementation costs of a collection of water conservation programs. The model also uses local demographic and housing characteristics to estimate water savings that could be attributable to enhanced efficiency requirements in State plumbing codes and water fixture usage standards, and predict reductions in demand from other applicable programs.

The suite of programs selected for analysis address each of the City's water customer sectors (single-family, multi-family, commercial, institutional, and landscape) with an emphasis on water users that shows opportunity for additional conservation. Since 1988, the City has invested millions of dollars in resources to retrofit nearly every indoor plumbing fixture in commercial, single-family and multi-family buildings with water saving products. As a result, water usage in the City has declined even though the City's population and non-residential development have increased.

Results of the billing analysis indicate that the greatest remaining potential for water conservation exists among the City's commercial and institutional customers, as well as in overall landscape water use. Two specific large water users, St. John's Medical Center, the Santa Monica-Malibu Unified School District, and laundry facilities, were identified by City staff as customers with a high potential for additional water savings and programs were developed to target those potential water saving opportunities.

Implementation levels for each water conservation program modeled were based on analyses of saturation rate of existing water saving plumbing fixtures and landscapes, customer surveys, staff knowledge of the City's customers and their willingness to implement these programs, and products that will have long-term water savings that are not dependent on significant changes in the customer's behavior. The goal was to develop a diverse selection of programs that aggressively pursued demand reduction through retrofitting existing indoor plumbing with plumbing fixtures that save about twenty percent more water in addition to retrofitting landscape customers' with plants and irrigation approaches that can save up to eighty percent more water, compared to existing landscapes.

To support the development of development of the SWMP's self-sufficiency strategies, conservation program development, and financial planning requirements, input was obtained from the City's Task Force on the Environment and the SWMP Advisory Committee. Extensive discussions occurred with the Advisory Committee during the project via group meetings, emails and conference calls. This Committee is comprised of: Mark Gold, Chair of the City's Environmental Task Force, Associate Director UCLA Institute of the Environment and Sustainability; Andy Lipkis, Tree People Founder and President; Conner Everts, Southern California Watershed Alliance Executive Director; Ed Osann, Natural Resources Defense Council Senior Policy Analyst, Water Program; Judy Abdo, Santa Monica representative on the MWD Board of Directors, former Santa Monica Mayor and Councilmember; Caryn Mandelbaum, Environment Now Freshwater Program Director, Staff Attorney; and Tracy Quinn, Natural Resources Defense Council Policy Analyst, Water Program.

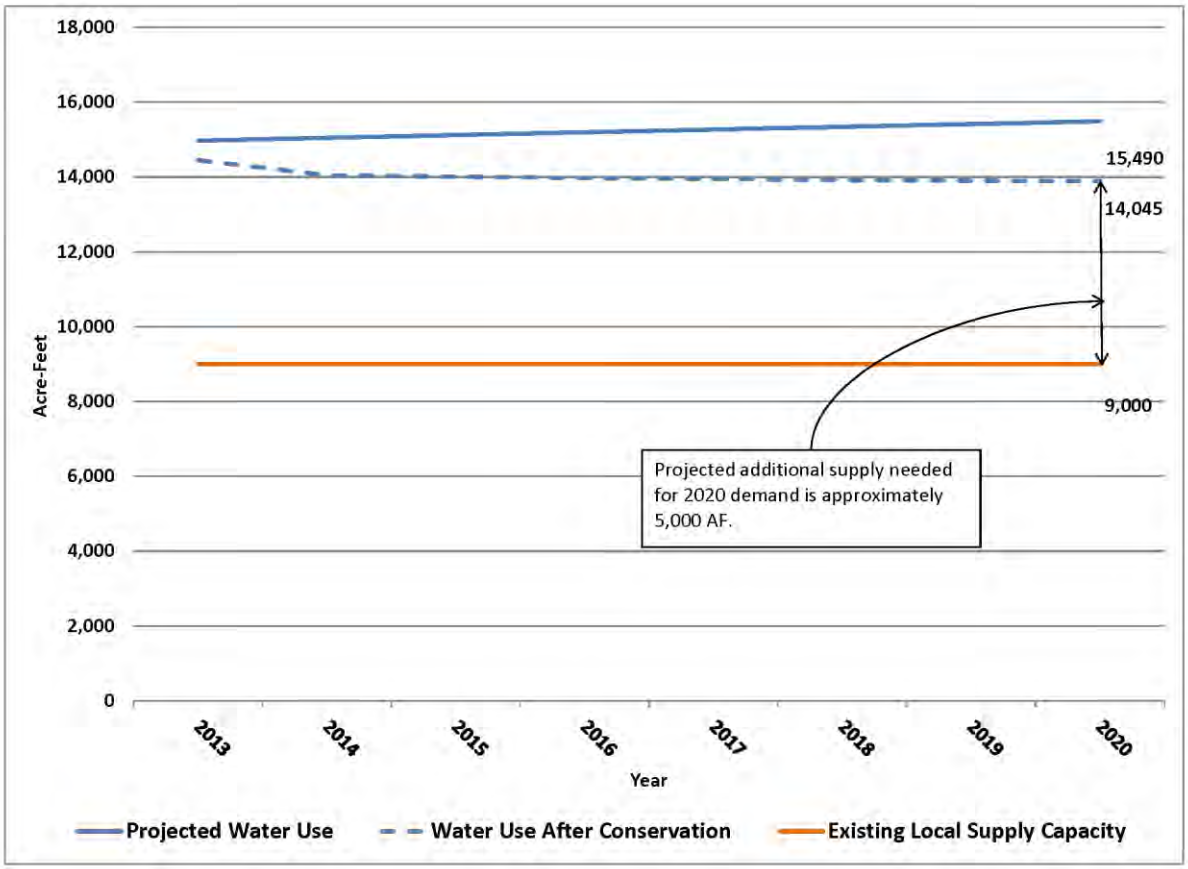
The resulting suite of conservation programs, shown in Table 3-3, is projected to save approximately 775 AFY of water by the year 2020. An additional 418 AFY of savings is expected by 2020 as a result of State plumbing and building code standards that require higher water saving fixtures. In addition, a reduction in system-wide leaks and unaccounted for water through capital investment in the system is projected to save another 250 AFY of water for a total demand reduction of approximately 1,443 AFY by 2020.

Table 3-3 Water Conservation Programs

Conservation Activity	Class	Total Number of Activities Implemented by 2020	Total Conservation in 2020 (AF)	Estimated Average Annual Cost	Estimated Total Cost Through 2020
Residential HE Clothes Washer Rebate	Single Family	880	30	$24,100	$216,600
Residential HET Rebate	Single Family	3568	77	$14,400	$129,700
Residential WBIC Rebate	Single Family	1920	79	$29,300	$263,800
City's Cash for Grass Rebate Program	Single Family	1,100,000 square feet	51	$209,900	$1,889,100
City's Drip Irrigation Rebate Program	Single Family	1,100,000 square feet	24	$139,900	$1,259,400
City's HE Nozzle Rebate Program	Single Family	550,000 square feet	7	$52,500	$472,300
Water Smart Software - 5% Reduction in Water Use (NEW)	Single Family	3,040 customers	8	$26,600	$239,300
0.8 gpf Toilets (Direct Installation) (NEW)	Multi Family	5,496	73	$174,800	$1,573,100
Residential HE Clothes Washer Rebate	Multi Family	544	19	$9,800	$88,600
Residential HET Rebate	Multi Family	4,000	13	$16,200	$145,400
Laminar Flow Restrictors for St. John's Medical Center (NEW)	Commercial	664	6	$1,500	$13,600
Commercial Dry Vacuum Pump Rebate	Commercial	40	3	$1,400	$12,600
Commercial Connectionless Food Steamer Rebate	Commercial	2	1	$100	$500
Commercial Zero Water Urinal Rebate	Commercial	4	0.1	$25	$200
Commercial Ultra-Low Volume Urinal Rebate	Commercial	544	8	$3,500	$31,100
Commercial Conductivity Controller Rebate	Commercial	2	4	$0	$0
Commercial HET Rebate	Commercial	200	5	$2,500	$22,900
CII Cooling Tower Treatment - Zero Blowdown (NEW)	Commercial	2	1	$200	$1,400
Coin-Operated Laundry Machine Retrofit (NEW)	Commercial	45	360	$3,500	$31,800
HETs for St. John's Medical Center (NEW)	Commercial	10	0.1	$100	$1,100
0.125 gpf Urinals for St. John's Medical Center (NEW)	Commercial	7	0.1	$40	$400
1.5 gpm Faucet Aerators for St. John's Medical Center (NEW)	Commercial	158	0.3	$800	$6,900
SMMUSD Audits & Retrofits - Assumes 5% Reduction in Total H2O Use (NEW)	Institutional	Maintained through 2020	5	$94,400	$849,400
Total Active Water Savings (Programs Listed Above)			**775**	**$805,500**	**$7,249,100**
Total Passive Savings (Codes and Laws)			418		
25% Reduction in System Leaks and Non-Revenue Water			250		
Total Reduction in Demand			1443		

Figure 3-3 shows the potential effect of implementing the recommended water conservation programs on the City's projected water demand assuming the "good economy" water demand projection previously described. Implementation of the recommended water conservation programs reduces the volume of additional water the City must produce to meet its self-sufficiency goals from approximately 6,500 AFY down to approximately 5,000 AFY. While water conservation alone will not enable the City to meet its water self-sufficiency goal, it can significantly reduce the volume of additional water supply required.

Figure 3-3 Water Demand Reduction from Recommended Conservation Programs



While conservation programs are often less expensive than physically constructing and operating new water supply or treatment facilities, the noted reductions in projected water demand are not without a cost. For the City, these costs include the cost of the actual conservation program, increased staff and public outreach costs associated with new program implementation and management, and the associated loss in water sales revenues (this latter component is partially offset by reduced water supply production costs). Based on the City's current demands and water revenues, it is estimated that the total cost for the recommended water conservation program reflected in Table 3-3 is approximately $7.2 million through 2020.

Section 4: Current Water Sources and Supplies

The City's current water supply consists of groundwater, purchased imported water, and a small amount of recycled dry weather urban runoff. Historically, groundwater made up the majority of the City's water supply portfolio; however, in 1995 when methyl tertiary butyl ether (MTBE) contamination was discovered in the Charnock Sub-basin, a sub-basin of the Santa Monica Basin, the City was forced to shut down five groundwater wells and purchase the majority of its water supply from MWD. In addition to local groundwater and purchased imported water, the City treats a small volume of dry weather urban runoff, yielding a source of recycled water that can be used for landscape irrigation and other approved uses, such as toilet flushing. With groundwater production from the Charnock Sub-basin renewed, local groundwater supplies makes up approximately two-thirds of the City's water supply, with the balance coming from the purchase of imported water form MWD.

4.1 Imported Water

In recent years, the main source of potable water supply for the City has been imported water purchased from MWD. MWD receives a negotiated allotment of water from the Colorado River and the Sacramento-San Joaquin Delta. These allotments are then distributed among its 26 member agencies which are comprised of municipalities and water agencies located throughout southern California.

The City has a current Tier 1 rate allocation of 11,515 AFY of water through MWD. Tier 1 water corresponds to the amount of water the City is entitled to purchase at the Tier 1 rate. MWD Tier 2 water is also normally available to the City; however, the cost per acre-foot is higher and there is less availability and reliability of Tier 2 water in periods of drought. The City has routinely exceeded its Tier 1 entitlement in recent years due to inactivity of many of its wells. As a result of this inactivity, imported water has made up, on average, 85 percent of the City's total water supply up until recently when local groundwater production was reinstated. Table 4-1 shows the City's imported water purchases since 2005.

Table 4-1 Historical Imported Water Supply

Year	Purchases (AF)
2005	12,671
2006	13,216
2007	13,017
2008	12,323
2009	11,685
2010	9,812
2011	6,388
2012	6,550
2013	5,842

Source: City of Santa Monica Water Resources

MWD provides water to the City through two separate turnouts. Transmission pipelines convey water to two separate reservoirs. The individual and total capacities of these 24-inch connections are shown in Table 4-2.

Table 4-2 Santa Monica's MWD Connection Capacities

	SM-1	SM-2	Total Capacity
Capacity (AFY)	21,720	18,100	39,820

Source: City of Santa Monica Water Resources Division.

4.1.1 Characteristics and Challenges

Fluctuation of available imported supply and drought conditions have and will likely continue to impact southern California's water supply. Imported water is both expensive and variable, and in times of drought, becomes even more scarce and uncertain. To compound the reduced availability of water during times of drought, drought conditions also increase water demand due to increased outdoor water use. The reliability of imported MWD water is a major source of concern and risk for most water agencies, and an important element of the City's self-goal for self-sufficiency.

4.1.2 Reliability

The reliability and availability of MWD water is affected by a large number of factors that are difficult to control and will, in all likelihood, continue to impact California well into the future. With heavy reliance on imported water, the City must examine the various risk elements associated with that supply. This assessment of risk is essential in understanding the importance of developing a water resources plan. Although the City's imported water supplies have been fairly reliable in the past, a number of factors suggest that it will become more difficult to ensure that imported water remains reliable in the future.

Foremost among the risk factors associated with this supply is the magnitude of competing interests for imported water from the State Water Project (SWP) and the Colorado River. This demand, coupled with periods of below-normal rainfall, have resulted in supply shortages over the past 30 years and culminated in a State drought declaration in June 2014. While the requirements of SBx7-7 may support a suppression of future demands, overall growth in southern California will continue to strain the reliability of MWD's water supply for the City.

In spite of the uncertainty present in imported water, the City receives a relatively reliable source of water through MWD. The City has exceeded its Tier 1 entitlement of MWD water frequently in the past ten years and has not had significant reliability problems. It is unclear how the current drought will affect the historical level of reliability in the coming years.

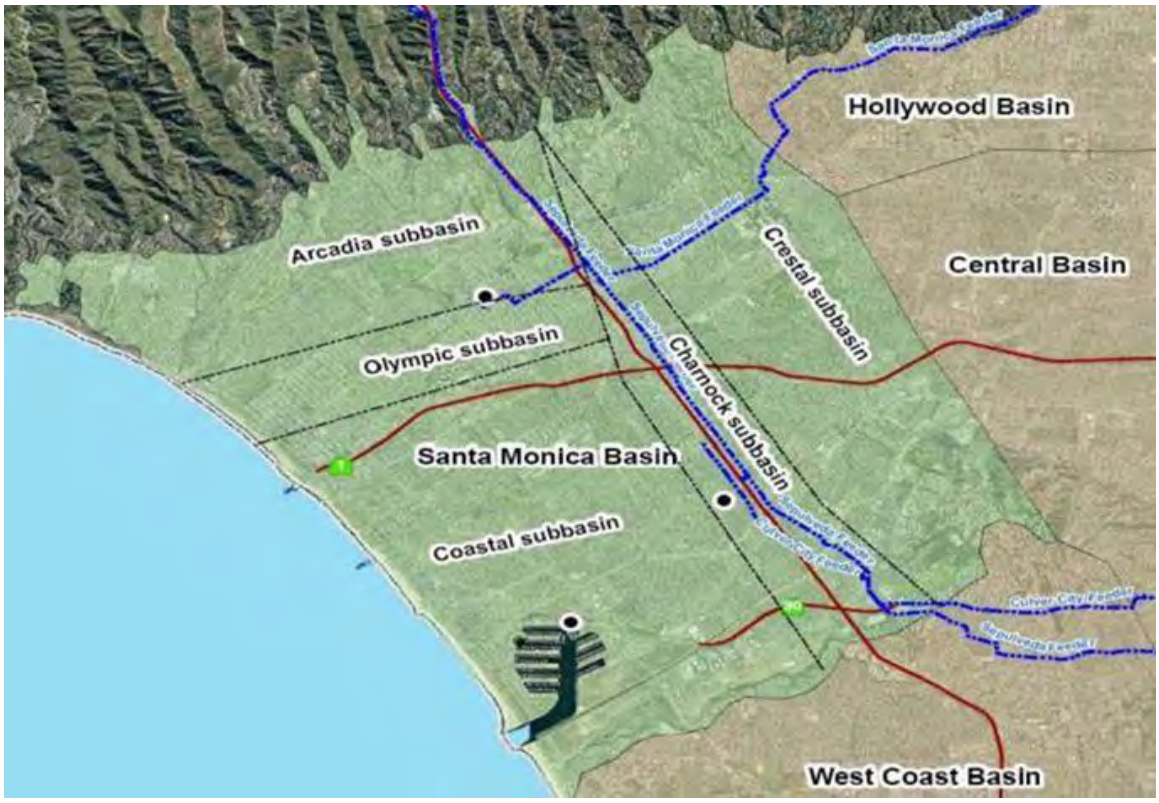
4.2 Local Groundwater

Local groundwater represents both an existing source of potable water as well as a potential source of future potable water supply. Local groundwater has, until recently, been underutilized due to the shutdown of five Charnock wells that reported MTBE contamination in 1995. Due to

the completion of MTBE remediation efforts in February of 2011, the City has been able to bring the five Charnock wells back online.

The City obtains its groundwater supply from the Santa Monica Basin (Basin). The Basin is located in western Los Angeles County and overlies the entire City of Santa Monica, Culver City, Beverly Hills, and portions of western Los Angeles. The Basin has a surface area of 50.2 square miles and consists mostly of flat to mildly hilly terrain. The basin is bounded by impermeable rocks of the Santa Monica Mountains to the north, the Ballona Encarpment (Bluffs) to the south, the Newport-Inglewood fault to the East, and the Pacific Ocean to the West. Extensive faulting within the Basin separates it into five sub-basins as shown on Figure 4-1.

Figure 4-1 Santa Monica Basin with Subbasins



Groundwater in the Basin is replenished primarily from recharge at the basin/mountain interface. Since the Basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, only a small portion of basin soils are capable of transmitting water to the water-bearing formations below.

The City has historically pumped a long-term average volume of groundwater of 4,277 AFY. The historical combined capacity of the City's five wells located in the Charnock Sub-basin has been approximately 9,000 gallons per minute (GPM). An additional five wells, two in the Arcadia Sub-basin and 3 in the Olympic Sub-basin, remained online when the Charnock wells were shut down, and had the ability to produce approximately 3,300 GPM. These five wells have been

responsible for approximately 1,950 AFY, or 13 percent of the City's water supply. In total, the City has the ability to pump groundwater at a rate of approximately 10,600 GPM. Table 4-3 shows the capacity of each of the City's groundwater wells.

Table 4-3 Groundwater Well Capacities

Well Name/No.	Sub-basin	Capacity (GPM)
Charnock 13	Charnock	1,800
Charnock 16	Charnock	1,675
Charnock 18	Charnock	1,675
Charnock 19	Charnock	1,840
Charnock 20	Charnock	1,330
Arcadia 4	Arcadia	250
Arcadia 5	Arcadia	180
Santa Monica 1	Arcadia	250
Santa Monica 3	Olympic	820
Santa Monica 4	Olympic	800
	Total Capacity	**10,620**

Source: City of Santa Monica Water Resources. Capacities are average values and vary over time.

4.2.1 Characteristics and Challenges

One common problem for coastal groundwater basins is salt water intrusion. Salt water intrusion can occur for a number of reasons, but the most common cause is associated with over pumping of the local groundwater basin. While there is no definitive estimate of the safe yield for the Santa Monica Basin and its five sub-basins, historical pumping/rainfall data and groundwater levels suggests that the Basin has an average perennial yield of approximately 19,000 AFY. The City and other pumpers of this Basin have not approached this level of pumping of the Basin as a whole during its long history of groundwater use.

Although there has been no problem with salt water contamination of the Basin, the City has faced problems with the level of brackish water extracted from much of the Basin. It is for this reason that the City abandoned its well production facilities near the ocean. For long-term management of water quality, the City has implemented and maintains a blending plan to ensure that water quality meets federal and state drinking water standards.

4.2.2 Reliability

The Basin receives inflow from the Santa Monica Mountains as well as percolation from rainfall events. Outflow occurs in the form of withdrawal by the City and outflow to the West Coast Basin. Outflow to the West Coast Basin has historically been minimal and is estimated to be about 1,000 AFY. Additional outflow to the neighboring Central Basin and Hollywood Basin are negligible due to natural restriction by the Newport-Inglewood uplift.

Due to the inflows received from the Santa Monica Mountains and limited outflows to other basins, the Basin is not significantly affected by dry seasons, as is the case with some neighboring basins.

4.2.3 Sustainable Groundwater Management Act of 2014

In response to the effects of the ongoing drought, the Sustainable Groundwater Management Act of 2014 (SGMA) fundamentally alters the management of groundwater basins in California. SGMA requires the designation of groundwater sustainability agencies (GSAs) by one or more local agencies and the adoption of groundwater sustainability plans (GSPs) for basins designated as medium- or high-priority by the Department of Water Resources (DWR). SGMA excludes adjudicated groundwater basins managed by the court and does not affect the water rights of any users. Deadlines are established for the actions required by SGMA. SGMA grants significant new powers to GSAs, including the power to adopt rules, regulations, ordinances, and resolutions; regulate groundwater extractions; and to impose fees and assessments. SGMA also allows the State Water Resources Control Board to intervene if local agencies will not or does not meet the SGMA requirements.

The Basin is expected to be designated as a medium priority basin. Because the City's recommended future water supply portfolio includes expanded use of groundwater in the Santa Monica Basin, SGMA provides the City with an opportunity to manage the Basin or its key sub-basins to sustain the City's expanded use of groundwater. Accordingly, it is recommended that the City develop a roadmap to be designated as the GSA for all or part of the Basin. Through its previous and ongoing hydrogeologic studies, the City has developed much of the information necessary to prepare the required GSP. Additional documentation related to the Sustainable Groundwater Management Act of 2014 is provided in Appendix C.

4.3 Non Potable Water

To protect the Santa Monica Bay from contamination caused by pollutants found in dry weather urban runoff –runoff that occurs when there is no measurable precipitation as a result of human activities such as landscape irrigation and car washing – the City built the Santa Monica Urban Runoff Recycling Facility (SMURRF). The SMURRF project produces a small volume of high-quality recycled water that is used to offset potable water demands for landscape irrigation and indoor plumbing. Designed to routinely treat 0.5 MGD, with a peak treatment capacity of 0.75 MGD, the SMURRF removes urban contaminants and treats the influent water to Title 22 state standards for tertiary water. The water is then pumped through a city wide distribution system that serves parks, medians, Woodlawn Cemetery and some dual-plumbed buildings.

The SMURRF has allowed the City to slightly reduce its reliance upon MWD water at a time when the City relied heavily upon imported water due to the lack of production from groundwater wells. However, dry weather urban runoff is an unstable supply, the focus of this facility has been predominantly water quality improvements to Santa Monica Bay. Historically SMURRF has had an average production of 154 AFY, with a high of 354 AFY and a low of 94 AFY.

4.4 Water Self-Sufficiency Supply Requirements

Prior to City Council's adoption of the goal for water self-sufficiency, all water supply planning documents, including the 2010 UWMP, assumed that imported water from MWD would make up a significant portion of the City's annual water supply.

Table 4-4 compares the total source water required to meet the City's self-sufficiency goal (Section 3.2, Table 3-2) to water supply projections that assume the City will maximize its current groundwater treatment capacity (9,000 AFY) while not relying on imported water from MWD. As shown, in order to become independent from imported water the City will need to significantly enhance current water production sources, develop new water supply sources, and/or significantly reduce water demand through very aggressive and proactive water conservation programs. Not shown herein is the additional supply lost as brine during the water treatment process. A discussion of the various challenges, opportunities, and strategies associated with meeting the City's self-sufficiency goals are provided in Section 5.

Table 4-4 Comparison of Projected Local Production Needs and Availability

	2015	2020	2025	2030	2035
Projected Production Needs(AF)[(a)]	**15,120**	**15,488**	**15,860**	**16,232**	**16,261**
Existing Supply (AF)					
Imported (AF)	0	0	0	0	0
Groundwater (AF)	9,000	9,000	9,000	9,000	9,000
Recycled Water (AF)[(b)]	150	150	150	150	150
Total Existing Supply	**9,150**	**9,150**	**9,150**	**9,150**	**9,150**
Difference Between Existing Supply Capabilities and Needed Production	*(5,970)*	*(6,338)*	*(6,710)*	*(7,082)*	*(7,111)*

(a) Demand normalized for the 90th percentile unemployment rate (i.e. "good economic conditions," in which the unemployment rate is lower than 4.1 percent 90 percent of the time). Does not include demand reductions that will be achieved by the City's water conservation program as it works to meet SBx7-7. Includes water loss; assumes 9 percent system wide water loss based on the results of the City's AWWA Water Loss Audit.

(b) Based on current average annual SMURRF production.

As previously discussed, total long-term water supply needs will vary with the development and implementation of various water conservation programs, the volume of water lost during the local water treatment process and the change in seasonal water demand and production requirements from peak summertime water use. Accordingly, as the City continues to develop its long-term water supply portfolio, these production related factors will need to be integrated with new information associated with the sustainable recharge of the City's local groundwater aquifers.

Section 5: Future Water Supply Options and Strategies

Having projected future water demands and quantified the potential benefits from enhanced water conservation programs, it was determined that the City can't meet its self-sufficiency goal through water conservation alone. Accordingly, additional local water resources are required to avoid purchasing imported water from MWD. This Section evaluates alternative supply sources and develops a set forth a set of options or portfolios for the City to consider for implementation to meet its self-sufficiency objectives. The water resources explored herein included:

- Additional local groundwater production and treatment
- Non-potable reuse opportunities
    - Rainwater harvesting and stormwater capture
    - Greywater
    - Recycled Water
- Multi-jurisdictional agreements

As discussed with City staff, the water resource that has the greatest potential as a viable, cost effective strategy for self-sufficiency is enhanced groundwater production. A discussion of local groundwater opportunities and other water resources options follows.

5.1 Additional Local Groundwater Opportunities

The City obtains its local groundwater from the Santa Monica Basin (Basin). There are multiple sub-basins within the Basin, each of which provides separate groundwater opportunities to the City. The five sub-basins which make up the Santa Monica Basin are the Arcadia, Olympic, Coastal, Charnock and Crestal sub-basins.

Currently, the City obtains local groundwater from the Arcadia and Olympic sub-basins via five wells. These wells can produce approximately 3,000 acre feet per year (AFY). Additionally, there are five wells located outside of the City limits in the Charnock Sub-basin with a combined average production capacity of approximately 6,000 AFY. From 1995 to 2010, the City purchased most of its annual water supply needs from MWD as the Charnock well field was shut down due to methyl tertiary butyl ether (MTBE) contamination. Water produced from these wells is delivered for polishing at the City's Arcadia Water Treatment Plant (Arcadia WTP).

The Arcadia WTP, located at Wilshire and Bundy, is just north of the City's municipal boundary in the City of Los Angeles. This modern plant facility provides pretreatment, filtration via a three-stage reverse osmosis (RO) filtration system, aeration and storage for the City's customers. The design capacity of this facility with three RO units in operation is approximately 9,000 AFY. Under this operational plan, the City is able to rotate the 4th RO unit into production for maintenance of the other three vessels. While not sustainable on a 24 hours/day, 7

days/week, 365 days/year basis, the design capacity of the WTP with four units in operation is approximately 13,000 AFY.

There have been a number of studies performed over the years to provide some clarity for the potential long-term yield from the Basin. In 2011 the City contracted with Richard C. Slade & Associates, LLC (Slade) to conduct additional research in order to better characterize the Basin and its potential for developing additional groundwater supplies, as well as identify possible locations for new well sites. Results of this study indicate that it is hydrogeologically feasible for the City to develop additional groundwater supplies from the aquifer system(s) that lie beneath the City and surrounding areas. This study (Slade Report) was published in June 2012.

A subsequent study was conducted by Slade in March of 2013 in order to determine the level the Basin can safely be pumped based on existing values from past reports for each of the Basin's main sub-basins, known historical groundwater extractions by the City, and hydrographs prepared for the June 2012 report. Slade's reports suggested that there is approximately 300,000 AF of water stored in the Basin, but that additional long-term data are needed to establish reliable perennial yield estimates. Given this need, the City has budgeted for a Groundwater Management Plan update to be performed over the next few years.

In addition to an upcoming assessment of the Basin, the City has taken a proactive commitment to improve local groundwater recharge. Given the City's urbanized condition, the City has incorporated the need for long-term aquifer recharge as a component of the City's water supply self-sufficiency plan. This recharge could come in the form of recharge from a local wastewater treatment plan, ocean desalination, brackish water treatment, additional rain water capture and treatment, and other potential supply programs to support a local seawater barrier intrusion program or sub-basin specific recharge. The merits of these programs will be evaluated over time through the implementation of the SWMP.

As identified in the Slade Report, there are some opportunities for siting new production wells, however, access to groundwater is difficult due to the density of the City. Currently, the City is built out and very little land is available for new wells. For this reason, rehabilitation of existing wells is also a potential method for enhancement of groundwater resources. The following sections describe potential opportunities for enhanced groundwater production in the City.

5.1.1 Charnock Well Field

The City's largest well field is the Charnock well field, which is located approximately 5,000 feet southeast of the southeastern boundary of the City in the Charnock Sub-basin. Though only five wells are currently active, this site has had 19 wells throughout its history. This well field was also recently brought back online after ten years of inactivity caused by VOC contamination. Treatment facilities were put in place at the site to treat the groundwater for VOC contamination prior to pumping it to the Arcadia WTP for further treatment. The Charnock Sub-basin is also the City's most productive well field. Though no formal study has been conducted, listed or original flow values for wells in this well field suggest transmissivity values of between 15,400 gpd/ft to 380,800 gpd/ft (Slade), which is relatively high in comparison to the other sub-basins in the Basin.

Existing wells in the Charnock well field are currently capable of extracting between 1,330 and 1,840 gpm. Casing depth in those wells ranges from 380 to 510 feet below ground surface (fbs). These wells are operated as necessary using variable frequency drives (VFDs) to serve variable plant demand. Under normal operation, four of the five wells are operating at one time. Wells are cycled on and off to keep well locations healthy and prevent over pumping of well locations. Though VOC treatment facilities would need to be expanded, enhancement of groundwater production in the Charnock Sub-basin could come in the form of increased frequency of extraction or additional well sites. While data are insufficient to quantify the safe yield of this basin with certainty, it is believed that the short term safe pumping yield is approximately 6,880 to 8,200 AFY.

5.1.2 Santa Monica Well Field (Olympic Sub-basin)

The Santa Monica well field is located along and around Olympic Boulevard in what is sometimes referred to as the Olympic Corridor. This well field is part of the Olympic sub-basin. As many as seven wells have been constructed in this well field, with only two remaining in operation today. Those two wells are Santa Monica #3 (SM 3) and Santa Monica #4 (SM 4). Though not a part of the Olympic Sub-basin like SM 3 and SM 4, Santa Monica #1 (SM 1) is also considered a part of the Santa Monica well field. Listed or original flow values for wells in this well field suggest that the transmissivity values in the Olympic aquifer are between 13,800 gpd/ft to 90,800 gpd/ft (Slade), which are well below what is estimated for the Charnock well field, but still more productive than the Arcadia Sub-basin.

Existing wells in the Olympic Corridor produce between 750 and 850 gpm under normal operation. SM #1 is continually operated and pumps in the range of 250 gpm. Casing depth for SM 3 and SM 4 are 530 and 550 fbs respectively. SM 3 and SM 4 are both operated using VFDs as necessary to serve plant demand. Additional investigation would be necessary to determine impacts upon the basin and potential water quality issues in order to extract additional flow from each of these wells.

5.1.2.1 Olympic Sub-basin Management Plan

It should be noted that groundwater quality in the Olympic Sub-basin has been adversely impacted from several overlying industrial users over the years. Over the last several years, the City has pursued relief from these responsible parties. Appropriate agreements and administrative orders have been attained and a settlement reached to support the cleanup of the Olympic well field. The process and findings associated with this effort are contained in the *Olympic Well Field Management Plan (ICF international 2012).*

In light of statewide and regional challenges to the supply and availability of imported water, the City's sustainability goals rely significantly upon becoming as self-reliant as possible with respect to its water supply portfolio. Consequently, it is the City's current plan to consider maximizing the production from all of its groundwater basins and supplement with imported water only as needed. As such, the City intends to not only continue to pump groundwater at its current level of 1,500 gpm, but evaluate the feasibility of increasing yield from the Olympic Well Field.

Under this plan, it is likely that groundwater production in the Olympic Well Field will increase over the next several years and be treated at the new Olympic Water Treatment Plant. The City recently commissioned a Preliminary Design Report, Olympic Water Treatment System, to evaluate options for building and operating a new facility to treat groundwater produced from the *Olympic Well Field (Worley Parsons 2012)*. The construction and operation of the facilities needed to mitigate the groundwater contamination in the Olympic Sub-basin are to be funded from settlement funds, and not an obligation of the Water Fund and the City ratepayers.

5.1.3 Arcadia Well Field (Arcadia Sub-basin)

The Arcadia well field is located at the Arcadia WTP just outside of the eastern edge of the City at Bundy Drive and Texas Ave. As many as ten wells have been drilled at this location with only two, Arcadia #4 and #5, remaining in operation today. Though it is not located within the Arcadia well field, Santa Monica #1 is also located in the Arcadia Sub-basin.

Degradation of this well has led to significantly decreased yields. To illustrate the capacity degradation of SM #1, when it was originally drilled it produced a yield of 850 gpm, more than three times the current yield. Due to the lack of production as well as quality issues experienced at SM #1 the City has considered re-drilling this well. Successful re-drilling of this well could provide several hundred additional AFY to the City.

5.1.4 Coastal Sub-basin

The Coastal Sub-basin underlies the southern portion of the City. This sub-basin has not been utilized as a groundwater source to date due to salt water intrusion, and the high cost of additional treatment that would be required to utilize this water source. In the 2012 Slade Report, Slade did consider additional production from this sub-basin and estimated various production parameters and site possibilities. The potential for additional groundwater production facilities has been programmed in the City's self-sufficiency plan.

5.1.5 Crestal Sub-basin

The City does not overlay the Crestal Sub-basin and has not and does not produce any of its water supply from this sub-basin. Given that condition, Slade did not consider this sub-basin in its 2012 study. Given the sub-basin location, probable inferior water quality, and lack of viable production data by other agencies, no groundwater production facilities have been programmed in the City's self-sufficiency plan from this sub-basin.

5.2 Non Potable Reuse

5.2.1 Recycled Water

Recycled water is a growing water resource in California. As local water supplies and the availability of imported water become more stressed, many agencies have explored and invested in recycling as a local and sustainable water resource. The City has used SMURFF in this capacity, albeit limited over the years.

For most applications, water recycling means treating wastewater so that it can be safely used for irrigation and some industrial purposes. In some cases this resource is also used for open reservoir augmentation, groundwater replenishment, and groundwater management as a barrier against seawater intrusion. Since the City's wastewater is conveyed to the City of Los Angeles for treatment, the City does not have immediate access to recycled water in the City, and must deliver this resource from outside the City. A general discussion of the regulatory requirements and other non-potable elements is included in Appendix D. A discussion of the applicability of this resource as a component of the City's water resources portfolio follows.

5.2.1.1 Analytical Approach

A market assessment was performed in order to determine the potential for additional recycled water use within the City. The assessment combined results of a billing data analysis with a GIS analysis to identify potential recycled water customers and estimate total potential recycled water demand within the City. Once customers were identified, a conceptual recycled water distribution system was developed in order to estimate preliminary costs associated with expanded recycled water distribution in the City.

5.2.1.1.1 Results

Billing data from fiscal year 2011/2012 were sorted and analyzed to provide information regarding specific uses and patterns among each of the City's billing classifications with the intent of identifying potential recycled water customers. Results of the billing analysis indicated that the greatest potential for recycled water use exists among the City's non-residential and residential dedicated landscape irrigation customers, with additional potential among some of the City's commercial customers, specifically for use within cooling towers. Use of recycled water by large industrial customers was not considered because the City does not have any large industrial water customers.

The City has 451 dedicated landscape irrigation accounts, or accounts with a separate meter used for landscape irrigation purposes only. Of these, 267 are classified as residential landscape accounts and the remaining 184 accounts are classified as non-residential, including commercial, public school, and City landscape uses. Table 5-1 summarizes this water use for the City's dedicated landscape irrigation accounts.

Table 5-1 Summary of Dedicated Landscape Irrigation Water Use

Account Type	Number of Accounts	Annual Water Use (AF)
Residential	267	94
Non-Residential	288	357
Total	**555**	**451**

Billing data for the City's dedicated landscape irrigation accounts were combined with parcel data from the City's GIS to spatially identify the City's dedicated landscape irrigation customers. Each account was classified by its annual water use into five different water use categories (Residential 0-5 AFY, Non-Residential 0-5 AFY, Non-Residential 5.1-9 AFY, Non-Residential 9.1-34 AFY). This was done in order to locate clusters of large water users within the City where

recycled water could be most cost-effectively delivered. Results of this analysis indicate that the City's largest dedicated landscape irrigation customers are located in the southern half of the City, south of the current SMURRF recycled water distribution system between Ocean Avenue and the Santa Monica Airport.

A conceptual recycled water system was developed that could serve the majority of the City's largest dedicated landscape irrigation customers with recycled water. The system utilizes and expands upon the existing SMURRF distribution system, receiving water from the City of Los Angeles's potential westside recycled water distribution system located to the southeast of the City. In order to estimate the amount of recycled water the conceptual system might be able to deliver, as well as develop a preliminary cost estimate, the conceptual system was divided into seven separate demand areas. Recycled water demand was estimated by selecting the dedicated landscape irrigation customers located within each demand area using GIS and totaling their annual demand. A preliminary cost estimate was developed by estimating the daily flow rate and velocity for each pipe segment in order to estimate an appropriate pipe diameter. Once the pipe diameter was determined, cost estimates were developed based on estimates of the length of pipe needed to construct the system.

The total estimated water demand for the conceptual recycled water distribution system is 390 AFY. The estimated demand consists of 290 AFY of demand from current customers, including existing SMURRF recycled water customers, and an additional 100 AFY of future opportunities. Table 5-2 shows the parameters used to determine the pipe diameter for each pipe section.

Table 5-2 Conceptual Recycled Water System Pipeline Network

Service Area	Demand Area	Demand (AFY)	Demand (Gal/Day)	Hrs/Day	Flow Rate (gpm)	Flow (cfs)	Pipe Diameter (in)	Area (sq. ft)	Velocity (fps)
A	Trunk Line to SMURF[(a)]	113	100,880	8	210	0.5	12	0.8	0.6
B1	South Airport Branch	26	23,211	8	48	0.1	2	0.0	4.9
B2	North Airport Branch	38	33,924	8	71	0.2	4	0.1	1.8
C	Neilson Ave Branches	58	51,779	8	108	0.2	4	0.1	2.8
D	Virginia Avenue Park Branch	16	14,284	8	30	0.1	2	0.0	3.0
E	Broadway Branch	28	24,997	8	52	0.1	2	0.0	5.3
F	Colorado Ave Branch	7	6,249	8	13	0.0	2	0.0	1.3
Subtotal		*290*							
Additional Future Demand		100							

Service Area	Demand Area	Demand (AFY)	Demand (Gal/Day)	Hrs/Day	Flow Rate (gpm)	Flow (cfs)	Pipe Diameter (in)	Area (sq. ft)	Velocity (fps)
Total Recycled Water Demand		**390**							

(a) Based on demand for existing SMURRF customers and new customers along proposed route.

Table 5-3 provides details regarding the cost estimate. In total, it is estimated that the cost to develop a new recycled water source for the City of Santa Monica is $12,699,600, including $1,638,000 in piping, 50 percent of the cost of the transmission main between West Basin's potential westside recycled water distribution system (estimated at $5.5 million), and a booster station with an estimated cost of $2 million. Thus, the total estimated cost to deliver recycled water to the City would be $32,560 per acre-foot – more than 32 times the current MWD Tier 2 cost for treated imported water. However, the receipt of grant funds and participation in MWD's Local Resources Program could mitigate this cost.

Table 5-3 Conceptual Recycled Water System Cost Estimate

Demand Area	Description	Cost ($/in Diameter)	Pipe Diameter (in)	Cost/ Linear Foot	LF	Total Cost	Demand (AFY)	Cost/AF
A	Trunk Line to SMURF	14	12	$168	15,000	$2,520,000		
	Misc. Branches	14	2	$28	500	$14,000		
					Area A Subtotal	**$2,534,000**	113	**$22,425**
B1	South Airport Branch	14	2	$28	4,400	$123,200		
	Misc. Branches	14	2	$28	500	$14,000		
					Area B1 Subtotal	**$137,200**	26	**$5,277**
B2	North Airport Branch	14	4	$56	4,500	$252,000		
	Misc. Branches	14	2	$28	500	$14,000		
					Area B2 Subtotal	**$266,000**	38	**$7,000**
C	Neilson Ave Branches	14	4	$56	7,700	$431,200		
	Misc. Branches	14	2	$28	500	$14,000		

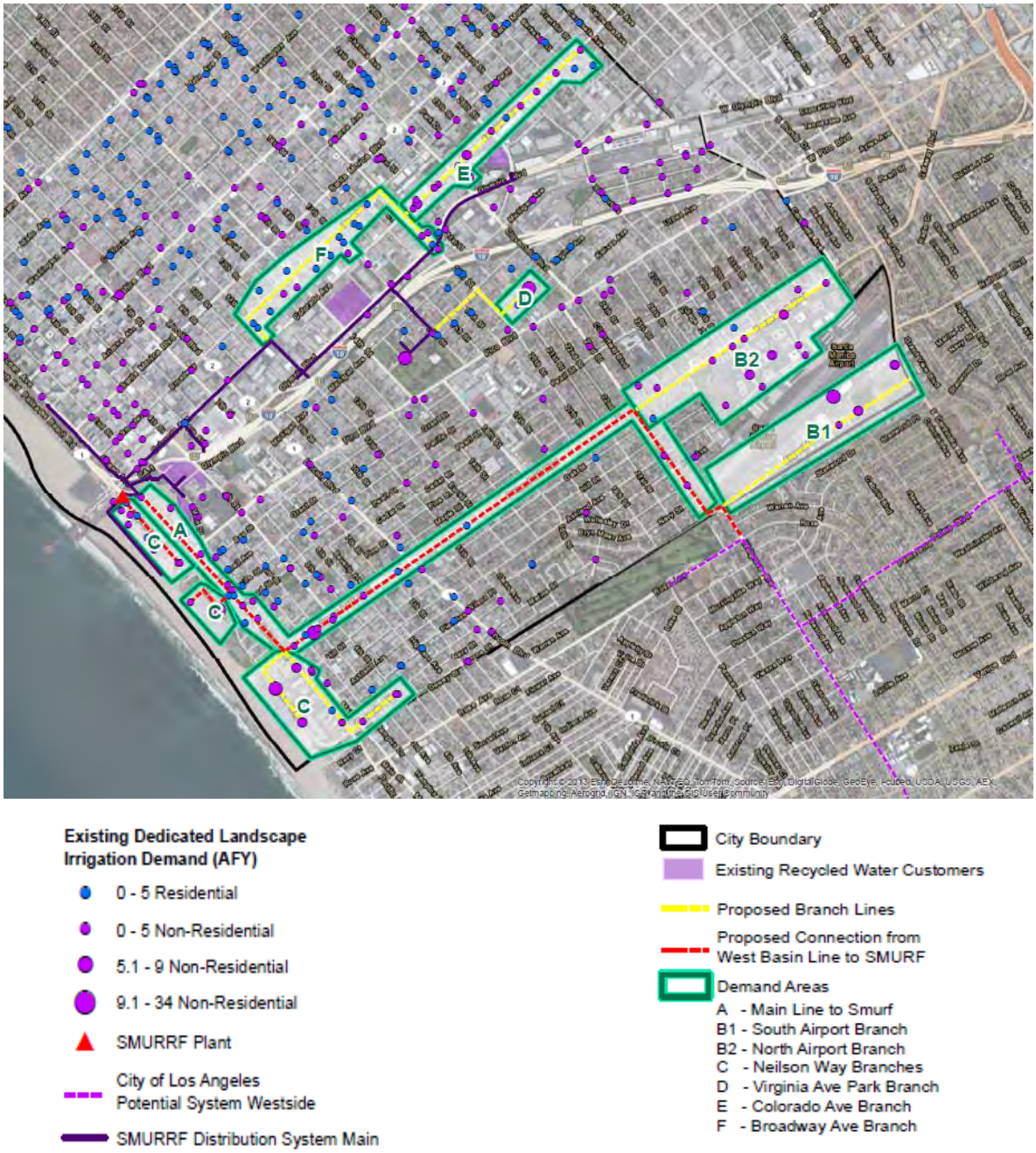
Demand Area	Description	Cost ($/in Diameter)	Pipe Diameter (in)	Cost/ Linear Foot	LF	Total Cost	Demand (AFY)	Cost/AF
					Area C Subtotal	**$445,200**	58	**$7,676**
D	Virginia Ave Park Branch	14	2	$28	700	$19,600		
	Misc. Branches	14	2	$28	500	$14,000		
					Area D Subtotal	**$33,600**	16	**$2,100**
E	Broadway Branch	14	2	$28	4,700	$131,600		
	Misc. Branches	14	2	$28	500	$14,000		
					Area E Subtotal	**$145,600**	28	**$5,200**
F	Colorado Ave Branch	14	2	$28	58,000	$1,624,000		
	Misc. Branches	14	2	$28	500	$14,000		
					Area F Subtotal	**$1,638,000**	7	**$234,000**
Total All Demand Areas						$5,199,600	290	$17,930
Transmission Main (50% of LADWP Estimated Cost)						$5,500,000		
Booster Station Estimate						$2,000,000		
Total Estimated Cost						$12,699,600	390	$32,560

Currently, the City distributes approximately 85 AFY of recycled urban runoff to customers for landscape irrigation and indoor commercial use through the SMURRF and associated distribution system. The City does not operate a wastewater treatment plant and thus does not have a local source for additional recycled water supplies. However, the City could partner with adjacent agencies that currently produce recycled water in order to bring additional recycled water supplies to its customers. The West Basin Municipal Water District (WBMWD) operates a recycled water system that terminates near Marina Del Rey, which may provide the City with a potentially feasible source for recycled water. The Los Angeles Department of Water and Power (LADWP) also looked into utilizing this source and prepared a plan that suggests a potential for connection at this same location.

A recycled water market assessment was performed to estimate the potential for recycled water use within the City. Results of this assessment indicate that approximately 350 AF of recycled water could be used by the City's dedicated landscape irrigation customers that reside along some key corridors into the City. Figure 5-1 shows a potential recycled water distribution

system that focuses on delivering year-round recycled water to the City's existing SMURRF facility and serves a number of customers along the way.

Figure 5-1 Potential Recycled Water System Map



In this potential system, the City may be able to partner with LADWP to jointly fund a new transmission and pumping system that connects to the WBMWD line and bring recycled water to the southeast side of Santa Monica (Figure 5-1). This project would require approximately 5

miles of pipeline to connect to its point of termination. Establishing the partnerships and agreements necessary to make this type of inter-agency program a reality will require time and funding. Accordingly, this option should be considered a long-range strategy for the City. It is unlikely that the City could deliver additional recycled water to its customers before 2020.

5.2.1.2 Stormwater and Rainwater Harvesting

Rainwater harvesting is the accumulating and storing of rainwater for reuse before it reaches the groundwater. Rainwater harvesting can ensure an independent water supply for activities such as irrigation and other non-potable uses. This helps to offset potable water demands by ensuring a renewable source during regular and water restrictive times. In addition, it produces beneficial effects by reducing peak storm water runoff and related processing costs. In municipalities with systems, reducing storm runoff is especially important, because excess runoff during heavy storms leads to the discharge of raw sewage when treatment plant capacity cannot handle the combined flow.

This alternative was evaluated as a water supply option for offsetting potable water demand in addition to reducing the amount of polluted storm water runoff from entering the Santa Monica Bay. The City actively promotes the use of rainwater for landscape irrigation through numerous free workshops for professionals and homeowners in addition to rebates for rain barrels and cisterns. In the recent years, the City initiative has been very successful in promoting rebates on rain harvesting products and the City has been awarded grant funding from the California Department of Water Resources.

Rainwater harvesting (the capture and onsite use of rainwater for landscape irrigation purposes) offers minimal opportunity as an additional water supply within the City. Santa Monica's Mediterranean climate is characterized by seasonal rainfall, with the majority of rain falling in the winter months of November through March. Conversely, landscape water demands are highest in the warmer, drier months of April through September. Analyses were performed to evaluate and compare the potential for rainwater harvesting based on average monthly precipitation data and monthly landscape water demand for residential and commercial customers.

Results of the above analysis indicate that the potential for rainwater harvesting as a supply option in Santa Monica is limited by the large size of cisterns and customers' motivation to install them. For most residential and commercial customers in the City, space is limited; therefore, it was assumed customers would install no more than 500 gallons of rainwater harvesting capacity. A cistern of this size is depleted quickly, even in the wetter winter months. In the drier summer months, rainwater supply is minimal, and when available, landscape irrigation demand far exceeds the capacity of the cistern therefore depleting this supply rapidly. Residential cistern installation, even with a rebate of $1,000 per cistern, has been minimally accepted by the City's customers. Accordingly, it is estimated that the rainwater harvesting incentive program may provide only 1-2 AFY.

Similarly, a City-wide stormwater capture program offers a seasonal, unreliable additional water supply option for the City. A scenario was developed in which stormwater would be captured and routed through the City's storm drain system to the Santa Monica Urban Runoff Recycling Facility (SMURRF) for distribution to landscape irrigation customers. It is estimated that a City-wide stormwater capture program could generate an additional supply of 160 AFY. The costs for this program are not yet developed. Documentation of the stormwater capture and rainwater harvesting analysis is provided in Appendix E.

5.2.1.3 Greywater

Greywater gets its name from its cloudy appearance and from its status as being between fresh, potable water (known as "white water") and sewage ("black water"). Greywater is generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site for uses such as landscape irrigation and constructed wetlands. Greywater differs from water from toilets which is designated sewage to indicate it contains human waste.

Since its adoption in 1995, greywater in California has been used as an alternative source for irrigation and other non-potable uses. Through biannual workshops for professionals and homeowners the City has actively promoted its use since 2004. The City rebated three residential greywater systems between 2004 and 2007 and realized that the existing laws made it very difficult and costly for homeowners to install simple systems. Furthermore, few off the-shelf greywater systems were available making it harder for people to comply with the rigorous permitting process. Because of the above reasons the City advocated for changes to the law and with the recent passage of SB 1258, it is now easier for homeowners to reuse this water supply for landscape irrigation. The City began offering rebates for simple greywater systems in 2011. To date, a minimal number of greywater systems have been installed in Santa Monica.

5.2.2 SMURRF Enhancements

As previously discussed, the City owns and operates the Santa Monica Urban Runoff Recycling Facility (SMURRF) to treat small volumes of dry weather urban runoff and deliver this water for irrigation purposes. While the focus of this facility has been predominantly water quality improvements to Santa Monica Bay, the City is considering modifying this facility to be able to produce a more consistent level of non-potable water supply, and fully utilizing the current 500 AFY capacity.

To this end, the City is considering utilizing distributed advanced water treatment technologies (e.g. Reverse Osmosis (RO), ultra and nanofiltration and ultraviolet disinfection) to produce potable quality water. Initially the treated water will be utilized for expanded non-potable reuse (irrigation, toilets, and indirect reuse such as aquifer storage and recovery, and/or salt water intrusion barrier maintenance).

The source water for this increased production is planned from multiple non-potable water sources that are currently underutilized or even wasted to the ocean. Specifically, the plan considers using stormwater, urban runoff and brackish/saline groundwater as feed water for the treatment units. The brackish/saline groundwater may be sourced by two extraction wells sited on the beach at existing City maintenance areas, or from existing abandoned wells along the coast. Proceeding under this plan, the City would expand its capture and treatment of stormwater and urban runoff to further enhance its efforts to improve the water quality of Santa Monica Bay and, more specifically, the waters around the Santa Monica Pier.

5.3 Administrative/ Institutional Options

In addition to the additional local groundwater production and other non-potable reuse opportunities, the City may be able to avail itself of other opportunities for water deliveries or exchanges through multi -jurisdictional agreements with nearby agencies. While the mechanics

and opportunities associated with such an arrangement are not defined herein, it is believed that the City could benefit from water resource options of this nature. Similar to the development and implementation of a large scale non-potable system, establishing the partnerships and agreements necessary to make this type of inter-agency program a reality are unlikely to deliver additional water to the City before 2020.

Although these opportunities are difficult to identify at this time, it is recommended that the City pursue these opportunities on a case-by-case basis. These opportunities may take a significant time to develop: however it would allow the City to benefit from the economy-of-scale and share development risks with other agencies. As successful opportunities are developed, the recommendations contained in this SWMP can be adjusted accordingly.

5.4 Water Self-Sufficiency Portfolios

As shown on Figure 5-2, implementation of the strategies described herein suggest that the City can meet its self-sufficiency goal through a combination of water conservation programs, additional local groundwater production, and additional supplies from rainwater harvesting and City-wide stormwater capture. In the future, the City may also be able to establish additional recycled water supplies through inter-agency partnerships with adjacent water agencies and municipalities. Figure 5-3 presents three different options for obtaining water self-sufficiency. Details for each option are presented in this section.

Figure 5-2 Water Supply and Demand Comparison Including New Supply Opportunities

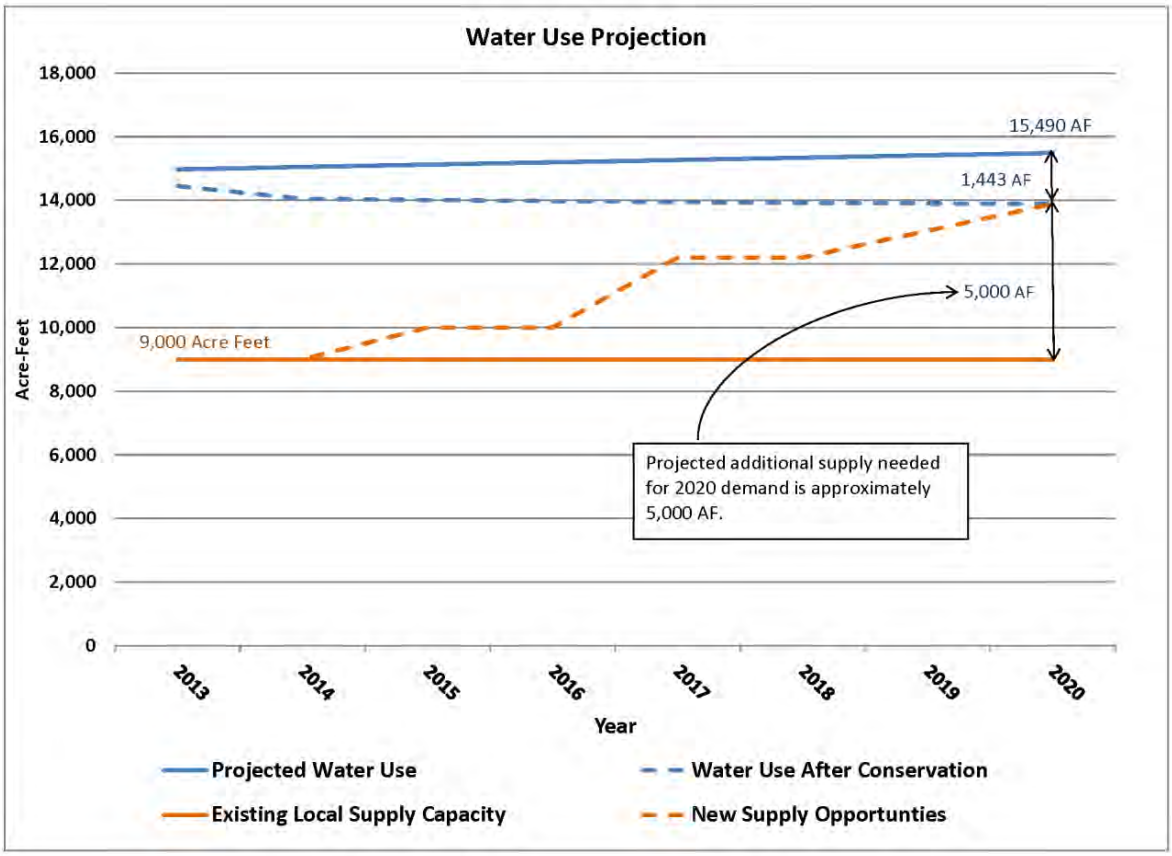
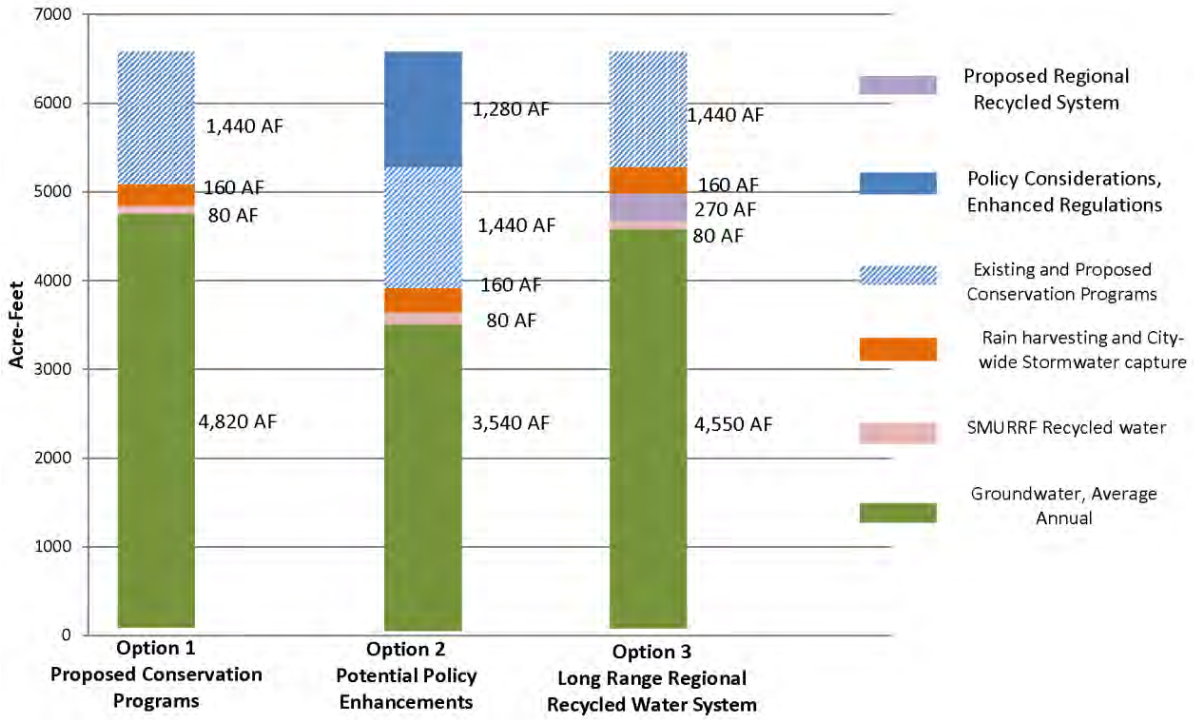


Figure 5-3 Potential Supply/Demand Management Portfolios



5.4.1 Option 1

To implement Option 1, "Staff Recommendation," the City would close the gap of 6,500 AF and achieve water self-sufficiency by 2020 through increased activity in existing water conservation programs, new water conservation programs, establish new groundwater supplies, new rainwater harvesting and stormwater capture programs described above. In this scenario, it is estimated that the City's per capita water use would be 135 gallons per capita per day (GPCD) in 2020. This portfolio should achieve the City's goal of water self-sufficiency by the year 2020, but will fall short of the City's current water use reduction target adopted in the 2010 Urban Water Management Plan (UWMP) in response to Senate Bill x7-7 (SBx7-7). In contrast, the City's adopted target per capita water use in 2020 is 123 GPCD.

The State formula for calculating GPCD is not the standard formula used in the water conservation field. The standard formula divides the water used by the residents by the number of residents. Following this formula, residents are only using 86 GPCD. The State formula divides all the water used by all of the customers (businesses, residents, and landscapes) and divides that by the number of residents. This does not allow the City to include the nearly 250,000 daily visitors to the City in the calculation.

5.4.2 Option 2

To implement Option 2, "Potential Policy Enhancements," the City would close the gap of 6,500 AF, achieve water self-sufficiency and meet the SBx7-7 target of 123 GPCD by 2020 through very aggressive water conservation programs and policies, limited new groundwater supplies, new rainwater harvesting and stormwater capture programs described above. In this scenario, it is estimated that the City's per capita water use would be 123 GPCD in 2020.

In order to reduce demand to levels low enough to permanently achieve a per capita water use of 123 GPCD, 2,880 AF of the City's potable water demand must be reduced or offset by non-potable sources and new regulations requiring residential and commercial property owners to retrofit plumbing fixtures, landscaping with water-saving plants and irrigation, or banning sprinklers and lawns before 2020. Staff is asking for Council's comments on the new policies proposed below by the Advisory Committee for the SWMP. The proposed policies target specific customer categories that have the highest potential for saving water.

- Ban sprinklers and lawns in residential properties - savings 1,280 AFY
- Ban sprinklers in the parkways but allow for hand-watering of street trees
- Require all hotels to retrofit plumbing fixtures to meet the City's current Green Building Ordinance requirements
- Require landscaping to meet the City's current Green Building Ordinance requirements before the sale of the property
- Require City-owned facilities and landscapes to reduce water use

Option 2 could reach the 123 GPCD goal but at a high cost to residents, businesses, and the City to pay for the required retrofits and increased staffing to enforce the requirements.

5.4.3 Option 3

To implement Option 3, "Long Range Regional Recycled Water," the City would develop additional recycled water through regional inter-agency partnerships as a means of reducing potable water use. This option should be considered a long range program and should not be relied upon to meet an adopted per capita water use requirement. As discussed earlier, it is unlikely that these partnerships could be established and the infrastructure completed by 2020.

5.4.4 Recommended Option and City Direction

On May 14, 2013, City staff presented an update on the progress of the Sustainable Water Master Plan and the process and tools developed to allow the Council and the community to evaluate the mix of supply strategies to achieve water self-sufficiency by 2020. Three water supply options were presented, with the following recommendations to Council from City Staff:

1. Direct staff to proceed with the Sustainable Water Master Plan and fully develop Option 1 – "Staff Recommendation." Action: Council directed staff to proceed with Option 1.

2. Review and comment on SBx7-7 water use goal of 123 GPCD and direct staff to change the next Urban Water Management Plan SBx7-7 water use goal from 123 GPCD to 141 GPCD at the UWMP 2015 update. Action: Council chose to continue with the stricter 20 percent reduction of 123 GPCD, and further evaluate this target with the 2015 UWMP.

3. Direct staff to proceed with the water and wastewater rate study. Action: Council directed staff to proceed with the water and wastewater rate studies.

The subsequent sections of this SWMP are based on this direction and are developed to align the City's self-sufficiency and water use efficiency goals. To that end, the two priority elements of the SWMP are:

- The development and construction of additional water supply/treatment through the use of the Olympic Basin settlement funds, and

- Proactively fund and implement the suite of conservation programs identified through the conduct of the SWMP to further reduce water usage prior to 2020.

While these two programs are cornerstone to the success of the City's SWMP, the plan incorporates other peripheral but integral water planning elements to build flexibility into the final water plan. In total, these programs are designed to build additional flexibility in the plan to aid the City in its ability to adapt to the dynamic nature of water system planning and evolving technologies and best management practices that may enhance the City's ability to cost effectively meet its goals for water self-sufficiency and sustainability.

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7.2.3 Booster Stations

The unit costs for pump station improvements are based on the system analysis estimate of additional pumping capacity and the associated increase in horsepower required. For the City, the unit cost is based on the estimated horsepower for the new pump station. Table 7-1 shows the unit cost data used to estimate the cost for each pump station. To these costs, a 35% allowance for design and management related costs should be included.

Table 7-1 Booster Station Unit Costs

Size (hp)	Construction Cost ($/hp)
10	$22,500
25	$18,500
50	$15,000
75	$12,000
100	$9,000
150	$7,500
200	$7,200
250	$6,750
300	$6,300
400	$6,000
500	$5,550
600	$5,250
750 or larger	$4,800

7.3 Recommended CIP

Like most cities, Santa Monica and its supporting infrastructure has continued to evolve over the years, resulting in a wide range of both asset type and asset age. To support the management of these assets, the City has been tracking its assets in Hansen's asset management software program, and in its GIS database.

7.3.1 Pipeline Replacement Program

To proactively move forward with improving long-term asset reliability, a capital rehabilitation program has been developed for the City's buried pipelines, often referred to as linear assets. With approximately 250 miles of buried pipelines, ranging from 1 to 100 years old, focusing on the asset type enables the City to enhance its asset management and reliability program in a proactive manner.

The broad purpose of this program is to maintain and/or enhance system reliability by replacing deteriorated and/or critical assets. In the absence of actual condition assessment data, age is being used to establish an initial pool of assets that are most apt to need additional attention. Since age in and of itself is not an appropriate predictor of pipeline performance, some additional general criteria is required to prioritize the vast number of pipelines that are greater than 50 years old, and effectively implement the capital replacement program. When practical,

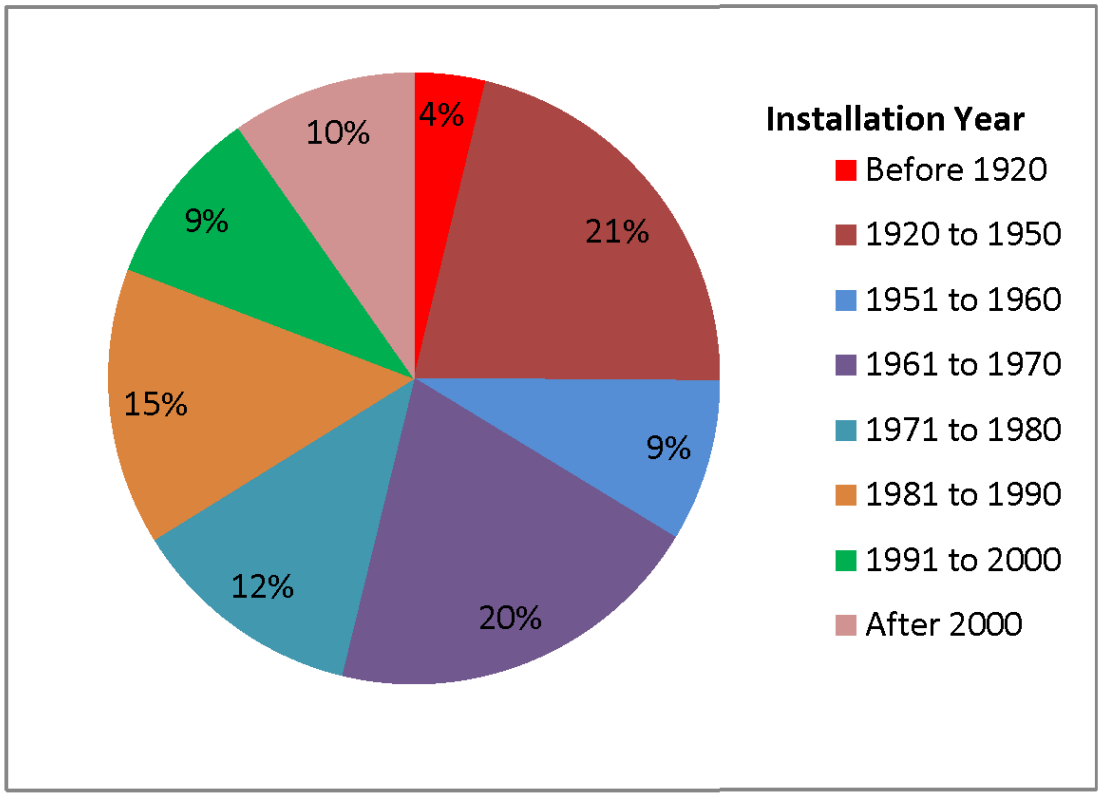
pipeline replacements should be implemented in groups rather than individual pipelines in various streets within the community.

The following criteria (excluding capacity considerations) are ranked in general order of importance and should be considered for the phased replacement of these assets:

1. Leak or main break history
2. Facilities that serve as critical transmission pipelines (if any),
3. Infrastructure or street repavement coordination to minimize community disruption, and
4. Pipelines constructed with Cast Iron.

Since a comprehensive condition assessment has not been performed, pipeline age is used herein been used to establish a programming level priority replacement plan and assess short and long-term funding needs. A summary of the compiled asset age of water system pipelines is shown on Figure 7-1.

Figure 7-1 Age Distribution of Water System Pipelines



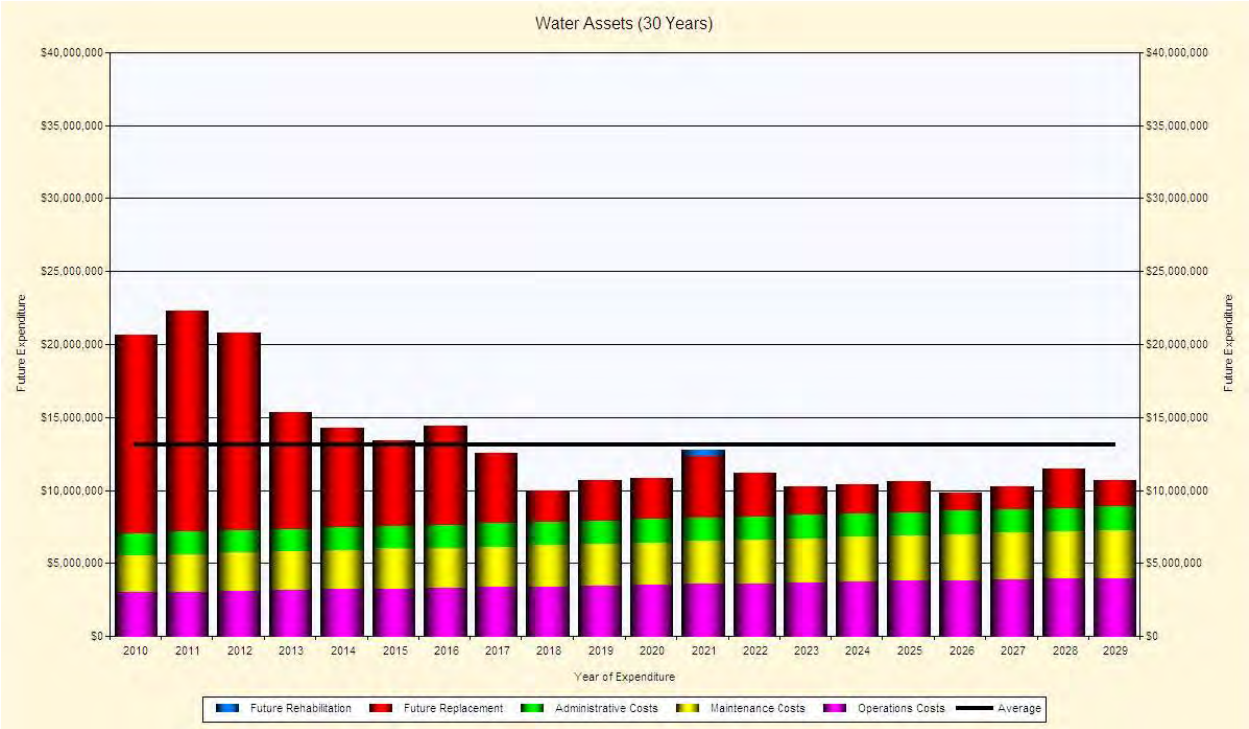
Source: City water system GIS data for underground pipelines, 2014.

As shown, approximately 25% of the water distribution system was constructed before 1950 and is therefore in excess of 65 years old; 4% of the system is approximately 100 years old. With a

planning-level useful life of 80 to 100 years, the City should plan for the repair/replacement of many of the pipelines in the next 10 to 20 years.

It should be noted that the City has developed an asset management system of its underground water pipelines and has budgeted for the methodical replacement of underground infrastructure for many years. The infrastructure replacement line item has historically been underfunded, increasing the risk of water main breaks and system losses similar to the ones experienced by other cities in the area. A projection of the projected capital investment required over the next 30 years for the City's underground water pipeline network was established in the 2010 Asset Management Plan (GHD). The findings of this assessment are shown on Figure 7-2.

Figure 7-2 Water System 30-year Future Investment Projection



Source: Asset Management Implementation Program, December 2010, GHD

As demonstrated in the 2010 Asset Management Plan, the City is projected to need to invest approximately $13 Million per year in the water system pipeline network. The current level of annual funding for this line item is approximately $2 Million in the FY 14-15 budget, down from the originally proposed annual budget level of $3.8 Million to minimize the impacts on water rates at this time.

7.4 Capacity Improvement Program

As previously discussed, a number of capacity related improvements have been identified for the City. These improvements are located throughout the City's service area and consist of

pumping improvements, and increases in pipeline capacity. The costs and prioritization of these improvements are provided herein.

7.4.1 Capacity Related Prioritization Criteria

Similar to the pipeline replacement program, some general criteria are required to prioritize the identified improvements to promote an efficient capital improvement implementation plan. For The criteria for the three primary asset categories (tanks, pumps, and pipes) are as follows:

Storage Tank Capacity Improvements - Storage deficiencies under current conditions are greater priority than future storage deficits. Current storage deficits are prioritized by the severity of the deficiency by pressure zone.

Pumping Capacity Improvements - Pumping deficiencies under current conditions are greater priority than future pumping deficits. Current pumping deficits are prioritized by the severity of the deficiency by pressure zone. Pumping capacity deficits for zones with no alternate supply are greater priority than those for zones with an alternate supply.

Pipeline Capacity Improvements - Similar to the storage and pumping prioritization, pipelines that were identified to have capacity deficiencies under current conditions have a higher priority than those pipelines that exhibited a capacity deficit only under future demand conditions. Additionally, fire flow-related capacity deficiencies have a higher priority than peak hour pressure-related capacity deficiencies, which have a higher priority than deficiencies related to excessive velocity or head loss. The degree of deficiency also provides a tertiary criterion for phasing improvements among both fire flow and capacity improvements.

7.4.2 Capacity Improvement Program Summary

A capacity-based improvement program is derived by applying the unit costs and prioritization criteria to the system hydraulic improvements identified in Section 6. The results are summarized by facility type in Table 7-2.

Table 7-2 Summary of Capacity-Based Capital Improvements

CIP Description	Existing Cost	Future Cost
Pipe CIP	$3,137,000	$0
Storage CIP	$0	$0
Pumping CIP	$2,154,000	$1,677,000
Total CIP	**$5,291,000**	**$1,677,000**

Note that the pumping capacity improvement projects are all for the 350 zone. As noted previously, the 350 zone has an alternate supply from the 500 zone. This fact can be considered when prioritizing CIP projects.

All of the pipeline projects that were identified are recommended to address fire flow-related deficiencies. Because all of these projects were derived based on the same fire-flow related design criteria, there is no effective method of prioritizing these projects based on their capacity

deficiency. However, given that there is already an effort within the City to replace pipes that have reached their useful life, the material of the pipes identified for capacity-based improvements were further examined. From this review, it was determined that the pipes recommended for replacement by CIP projects 1, 2, 6, 7, 8 and 9 were either all or mostly cast iron. Project 10 was a mixture of asbestos cement and cast iron. Projects 4 and 5 were asbestos cement, and project 3 was ductile iron.

To prioritize these capacity-based pipeline improvement projects using material as an indication of age, it is recommended that cast iron pipes be the highest priority, asbestos cement be the second priority and ductile iron be the third priority. Since these particular improvements are primarily facilities scheduled for replacement anyway, the annual capital replacement fund would be an appropriate funding mechanism, suggesting no additional capacity-based CIP line item is required in the City's future budget. Pipeline capacity projects are recommended to be of a higher priority than the pumping capacity deficiency identified for the 350 zone.

7.5 Capital Improvement Program Summary

The City's capital improvement program is formed by merging the capacity, operational, and reliability-related improvements derived herein with other asset management and infrastructure identified by staff in its five year CIP. These programs and projects are developed to address the full range of capacity, reliability, sustainability, and self-sufficiency improvements, and generally phased to incorporate the new facilities associated with the Olympic Sub-basin settlement funds and support the methodical implementation of the SWMP while minimizing the financial impacts on its water system customers. This plan is intended to be a living document and will evolve over time to adapt to new conditions, regulations, operational efficiencies, and local policies.

In addition to the findings of the system hydraulic analysis provided herein, there has been substantial discussion and analysis related to staging and operational requirements of the future water supply portfolio. In particular, there is the need to formalize a water supply plan that aligns with the City's proactive development of the Olympic Well Field Management Plan, the phasing of self-sufficiency improvements and demand management programs, the operational strategies to meet seasonal demands, and the adoption and implementation of appropriate water system funding.

As an implementation element of the SWMP, it is recommended the City consider the development of several additional programs that will support the success of the SWMP. These include:

- Prepare an operational plan that integrates the timing of various supply programs and facilities, documents the sequential priority of each new source of supply, establishes the baseline/peak relationship of the two water treatment plants, and evaluates the seasonal operational plan for each water treatment plant to meet average day, minimum day, and maximum day demands under various hydrologic conditions.

- Develop a Groundwater Management/Sustainability Roadmap to position the City to be the leader of the Santa Monica Groundwater Basin, enhancing its ability to control this local water resource.

- Prepare a Grant Funding Program Plan so that the use of grant funds can be utilized to lessen the impact of these program/facility costs on the City's water customers over the next 10 years.

- Develop an Olympic Water Treatment Plant (OWTP) Technical Oversight Team that will review and evaluate key technical information associated with the new OWTP. This panel of experts will support the City's development of this project and will convene periodically to facilitate the efficient integration of this facility into the City's water self-sufficiency program.

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Appendix C: Sustainable Groundwater Management Act of 2014 Support Material

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SUSTAINABLE GROUNDWATER MANAGEMENT ACT OF 2014

Summary

AB 1739 (Dickinson), SB 1168 (Pavley) and SB 1319 (Pavley)

The Sustainable Groundwater Management Act empowers local agencies to manage groundwater basins in a sustainable manner over a long-term horizon. The Act provides five to seven years for locals to form a Groundwater Sustainability Agency (GSA) and to create a Groundwater Sustainability Plan (GSP). The plan would have a 20-year implementation horizon with the opportunity for two five-year extensions, if the agency is making progress towards sustainability.

(All references to code sections are to the Water Code, unless otherwise noted.)

State Policy and Local Government Coordination

- Establishes that it is the policy of the state that groundwater resources be managed sustainably for long-term water supply reliability and multiple economic, social, or environmental benefits for current and future beneficial uses. Section 1. (a) of SB 1168
- Requires a city or county planning agency, before adopting or substantially amending a general plan, to review and consider groundwater sustainability plans. Government Code Section 65352.5

I. Core Provisions

Groundwater Sustainability Agency Formation

- Local Agencies have until June 30, 2017, to form a GSA. Section 10735.2 (1)
- Any local agency or combination of local agencies overlying a groundwater basin may elect to be a Groundwater Sustainability Agency. Section 10723
- Agencies that have been created by statute to manage groundwater are deemed the exclusive agencies to comply with the Act within their boundaries, unless the agency elects to opt out. Section 10723 (c)(1) and (c)(2)
- A GSA may adopt rules, regulations, ordinances, and resolutions for the purposes of the Act.

Tools for GSAs

- The Act gives local agencies new tools to manage groundwater sustainably.
- A GSA may conduct investigations to carry out the requirements of the Act. Section 10725.4
- A GSA may require the registration of wells. Section 10725.6

- A GSA may require the installation of water-measuring devices on all groundwater wells within the basin boundaries at the expense of the operator or owner. Section 10725.8
- A GSA may require annual extraction statements or other reasonable method to determine groundwater extractions. Section 10725.8 (c) and (d)
- A GSA may impose well spacing requirements and control extractions by regulating, limiting or suspending extractions from individual groundwater wells. Section 10726.4 (a)(1) and (2)
- A GSA may assess fees to establish and implement local groundwater management plans. Section 10725.4 (a)(3)
- Local agencies may request that the Department of Water Resources (DWR) revise the boundaries of a basin, including establishing new subbasins. The request shall include information, to be specified by DWR in regulations by January 1, 2016, to support the request. Section 10722.2 (a)

Creation of Groundwater Sustainability Plans

- GSAs much create and implement a GSP in each high- and medium-priority basin to meet the sustainability goal of the Act. Section 10727 (a) [See the attached map indicating the location high- and medium-priority basins as currently identified.]
- GSAs in basins that are in "critical conditions of overdraft" must adopt a compliant plan by January 31, 2020. Section 10720.7 (a)(1)
- GSAs in all other high- and medium-priority basins must adopt a compliant plan by January 31, 2022. Section 10720.7 (a)(2)
- A plan may be a single plan covering the entire basin, a single plan covering the entire basin created by multiple agencies, or multiple plans created by multiple agencies. Section 10727 (b)(1), (2), and (3)
- A GSP must include:
    - A description of the physical setting and characteristics of the aquifer system. Section 10727.2 (a)
    - Historical date, groundwater levels, ground water quality, subsidence, groundwater-surface water interaction, a discussion of historical and projected water demands and supplies. Section 10727.2 (1), (2) and (3)
    - A map that details the area of the basin and boundaries. Section 10727.2 (4)
    - A map identifying existing and potential recharge areas that substantially contribute to the recharge of the basin. Section 10727.2 (5)
    - Measurable objectives, as well as interim milestones in increments of five years, to achieve the sustainability goal in the basin within 20 years. Section 10727.2 (b) (1)
    - A planning and implementing horizon. Section 10727.2 (c)
    - The monitoring and management of groundwater levels, water quality, groundwater quality degradation, and inelastic land surface subsidence. Section 10727.2 (d)(1), (2), (3), (4), and (5)
    - A summary of the type of monitoring. Section 10727.2 (e)
    - The monitoring protocols. Section 10727.2 (f)

  - A description of the consideration of other applicable local government plans and how the GSP may affect those plans. Section 10727.2 (g)
- DWR may grant two five-year extensions upon a showing of good cause beyond the 20-year sustainability timeframe. Section 10727.2 (3) (A)
- DWR may grant an extension beyond the two five-year extensions, if the local agency demonstrates a need for an extension, has made progress toward meeting its sustainability goal and adopts a feasibility work plan for meeting the sustainability goal during the extension period. Section 10727.2 (3) (B) (i), (ii) and (iii)

DWR Evaluation and Assessment

- DWR shall periodically review GSPs to evaluate whether they conform with the Act and are likely to achieve the sustainability goal. Section 10733 (a)
- If multiple plans are created for a basin, DWR shall evaluate whether the plans conform with the Act and together are likely to achieve the sustainability goal. Section 10733 (b)
- DWR shall evaluate whether a GSP adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of the sustainability goals in an adjacent basin. Section 10733 (c)

Probationary Status

In general, the State Water Resources Control Board (State Board) may designate a basin as "probationary" if, after consulting with DWR, it is found that a GSA has not been formed, a GSP has not been created, the GSP is inadequate or the GSP is not being implemented in a way that will lead to sustainability. "Sustainable groundwater management" means the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." "Undesirable results" are defined as follows, based on a "significant and unreasonable" standard:

- Chronic lowering groundwater level
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses

Probationary status requires a GSA to respond to the State Board and describe how it intends to rectify these shortcomings.

Specifically, the State Board may designate a basin as a probationary, if:

  - After June 30, 2017, the State Board finds that there is no local agency or a collection of agencies that has elected to become the GSA or an agency has not provided an alternative plan. Section 10735.2 (1)

  - After January 31, 2020, a GSA in any high- or medium-priority basin in critical condition of overdraft has not adopted a GSP for the entire basin. Section 10735.2 (2)
  - After, January 31, 2020, DWR in consultation with the State Board determines that the GSP is inadequate or the GSP is not being implemented in a manner that will likely achieve the sustainability goal. Section 10735.2 (3)
  - After January 31, 2022, a GSA in any high- or medium-priority basin that is not subject to the critical conditions of overdraft has not adopted a plan for the entire basin. Section 10735.2 (4)
  - After January 31, 2022, DWR in consultation with the State Board determines that the GSP is inadequate or that the GSP is not being implemented in a manner that will achieve the sustainability goal and the State Board determines that the basin is in a condition of long-term overdraft. Section 10735.2 (5)(A)
  - After January 31, 2025, DWR in consultation with the State Board determines that the GSP is inadequate or that the GSP is not being implemented in a manner that will achieve the sustainability goal and the State Board determines that the basin is in a condition where groundwater extractions result in significant depletions of interconnected surface waters. Section 10735.2 (5)(B)

- A GSA has 180 days to remedy any deficiency with additional time provided if the agency is making substantial progress toward remedying the problem. Section 10735.4 (a) and (b)

State Board Intervention/Interim Plans

A GSA has 180 days to respond appropriately to the designation of “probationary status” before the State Board can move forward with the next step. Failure to respond to the deficiencies in the GSP could lead to limited state intervention and the development of a State Board- created interim plan.

- The State Board may develop an “interim plan” for a probationary basin if at the end of the time provided for rectifying the deficiency the State Board, in consultation with DWR, determines that the local agency has not remedied the deficiency. Section 10735.4 (c)
- The State Board must exclude from probationary status any portion of a basin for which a GSA demonstrates compliance with the sustainability goal. Section 10735.2 (e)
- Before January 1, 2025, the State Board is prohibited from establishing an interim plan to remedy a condition where the groundwater extractions result in significant depletions of interconnected surface waters. Section 10735.8 (h)
- The State Board may adopt regulations to establish the allocation, administration or collection of fees in carrying out its duties. Section 10736 (d)(3)

Protections for Areas under Sustainable Management

- The State Board must exclude from probationary status any portion of a basin for which a GSA demonstrates compliance with the sustainability goal. Section 10735.2 (e)

- State fees may be assessed by the State Board to carry out its duties only in areas not in compliance with the Act after 2017, or 2020, or later, as described in the requirements for "probationary status" designation.

II. Other Important Provisions

California Environmental Quality Act (CEQA)

- The formation of a GSA is not expressly exempt from CEQA. Any deadlines missed due to litigation challenging the formation of the agency would be extended until the litigation is resolved. Section 10735.2 (d)
- The preparation of a GSP is exempt from CEQA. Section 10728.6
- The Act does not exempt the implementation of projects under a GSP from CEQA. Section 10728.6

Water Rights

- The Act states that the intent of the Legislature is to "respect overlying and other proprietary rights to groundwater, consistent with section 1200 of the Water Code." Section 1(b)(4) of AB 1739
- The Act further states that it is in the intent of the Legislature to "preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater." Section 10720.1(b)
- Additionally, the Act states that "nothing in this part or in any groundwater management plan adopted pursuant to this part, determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights." Section 10720.5(b). Similar language is at Section 10726.8(b)

Application to Adjudicated Basins

- The Act does not contain any provisions affecting the adjudicatory process.
- Adjudicated basins are required to submit to DWR a copy of a governing final judgment, or other judicial order or decree and any amendments entered before April 1, 2016. Section 10720.8 (f)(1) [See the attached map indicating the location of adjudicated basins.]
- After April 1, 2016, adjudicated basins are required to submit:
    - Any amendment made to the decree or final judgment.
    - Groundwater elevation data unless submitted under Section 10932.
    - Annual aggregate data identifying extraction for the preceding year.
    - Surface water supply used for or available for groundwater recharge or in-lieu use.
    - Total water use.
    - Change in groundwater storage.
    - The annual report submitted to the court.

Tribal Lands

- The Act applies to tribes to the extent authorized under federal law. Section 10720.3(b)
- The Act provides that tribes may voluntarily agree to participate in a GSA and GSP. Section 10720.3(c)
- The Act provides that federally reserved rights to groundwater shall be respected in full. Section 10720.3(d)

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
1	3-4.02	SALINAS VALLEY	EAST SIDE AQUIFER	Central Coast	SCRO	**27.0**	High
2	4-4.02	SANTA CLARA RIVER VALLEY	OXNARD	South Coast	SRO	**26.8**	High
3	5-22.11	SAN JOAQUIN VALLEY	KAWEAH	Tulare Lake	SCRO	**26.5**	High
4	3-3.01	GILROY-HOLLISTER VALLEY	LLAGAS AREA	Central Coast	SCRO	**25.8**	High
5	5-22.01	SAN JOAQUIN VALLEY	EASTERN SAN JOAQUIN	San Joaquin River	NCRO	**25.5**	High
6	5-22.06	SAN JOAQUIN VALLEY	MADERA	San Joaquin River	SCRO	**25.0**	High
7	4-11.04	COASTAL PLAIN OF LOS ANGELES	CENTRAL	South Coast	SRO	**24.8**	High
8	3-2	PAJARO VALLEY		Central Coast	SCRO	**24.8**	High
9	8-2.03	UPPER SANTA ANA VALLEY	RIVERSIDE-ARLINGTON	South Coast	SRO	**24.5**	High
10	8-5	SAN JACINTO		South Coast	SRO	**24.3**	High
11	3-12	SANTA MARIA		Central Coast	SRO	**24.0**	High
12	3-4.01	SALINAS VALLEY	180/400 FOOT AQUIFER	Central Coast	SCRO	**24.0**	High
13	5-22.02	SAN JOAQUIN VALLEY	MODESTO	San Joaquin River	SCRO	**23.5**	High
14	3-4.06	SALINAS VALLEY	PASO ROBLES AREA	Central Coast	SCRO	**23.3**	High
15	8-2.01	UPPER SANTA ANA VALLEY	CHINO	South Coast	SRO	**23.3**	High
16	9-5	TEMECULA VALLEY		South Coast	SRO	**23.0**	High
17	5-22.08	SAN JOAQUIN VALLEY	KINGS	Tulare Lake	SCRO	**22.8**	High
18	5-21.57	SACRAMENTO VALLEY	VINA	Sacramento River	NRO	**22.8**	High
19	4-4.07	SANTA CLARA RIVER VALLEY	SANTA CLARA RIVER VALLEY EAST	South Coast	SRO	**22.8**	High
20	3-7	CARMEL VALLEY		Central Coast	SCRO	**22.8**	High
21	5-22.14	SAN JOAQUIN VALLEY	KERN COUNTY	Tulare Lake	SCRO	**22.5**	High
22	5-22.09	SAN JOAQUIN VALLEY	WESTSIDE	Tulare Lake	SCRO	**22.5**	High
23	5-22.04	SAN JOAQUIN VALLEY	MERCED	San Joaquin River	SCRO	**22.5**	High
24	5-21.64	SACRAMENTO VALLEY	NORTH AMERICAN	Sacramento River	NCRO	**22.5**	High
25	4-6	PLEASANT VALLEY		South Coast	SRO	**22.5**	High
26	5-22.07	SAN JOAQUIN VALLEY	DELTA-MENDOTA	San Joaquin River	SCRO	**22.3**	High
27	5-22.12	SAN JOAQUIN VALLEY	TULARE LAKE	Tulare Lake	SCRO	**22.3**	High
28	5-22.13	SAN JOAQUIN VALLEY	TULE	Tulare Lake	SCRO	**22.3**	High
29	5-21.65	SACRAMENTO VALLEY	SOUTH AMERICAN	Sacramento River	NCRO	**22.3**	High
30	5-21.67	SACRAMENTO VALLEY	YOLO	Sacramento River	NCRO	**22.3**	High
31	4-8	LAS POSAS VALLEY		South Coast	SRO	**22.3**	High
32	3-1	SOQUEL VALLEY		Central Coast	SCRO	**22.3**	High
33	5-27	CUMMINGS VALLEY		Tulare Lake	SCRO	**22.0**	High
34	3-8	LOS OSOS VALLEY		Central Coast	SCRO	**22.0**	High
35	6-42	UPPER MOJAVE RIVER VALLEY		South Lahontan	SRO	**21.8**	High
36	4-4.06	SANTA CLARA RIVER VALLEY	PIRU	South Coast	SRO	**21.8**	High

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
37	6-44	ANTELOPE VALLEY		South Lahontan	SRO	**21.5**	High
38	5-22.03	SAN JOAQUIN VALLEY	TURLOCK	San Joaquin River	SCRO	**21.5**	High
39	5-21.58	SACRAMENTO VALLEY	WEST BUTTE	Sacramento River	NRO	**21.5**	High
40	5-22.05	SAN JOAQUIN VALLEY	CHOWCHILLA	San Joaquin River	SCRO	**21.3**	High
41	4-13	SAN GABRIEL VALLEY		South Coast	SRO	**21.3**	High
42	8-2.06	UPPER SANTA ANA VALLEY	BUNKER HILL	South Coast	SRO	**21.3**	High
43	8-4	ELSINORE		South Coast	SRO	**21.3**	High
44	8-1	COASTAL PLAIN OF ORANGE COUNTY		South Coast	SRO	**20.8**	Medium
45	4-11.03	COASTAL PLAIN OF LOS ANGELES	WEST COAST	South Coast	SRO	**20.8**	Medium
46	2-2.01	NAPA-SONOMA VALLEY	NAPA VALLEY	San Francisco Bay	NCRO	**20.8**	Medium
47	4-23	RAYMOND		South Coast	SRO	**20.8**	Medium
48	3-4.08	SALINAS VALLEY	SEASIDE AREA	Central Coast	SCRO	**20.8**	Medium
49	8-2.07	UPPER SANTA ANA VALLEY	YUCAIPA	South Coast	SRO	**20.8**	Medium
50	4-4.05	SANTA CLARA RIVER VALLEY	FILLMORE	South Coast	SRO	**20.8**	Medium
51	3-26	WEST SANTA CRUZ TERRACE		Central Coast	SCRO	**20.8**	Medium
52	4-4.04	SANTA CLARA RIVER VALLEY	SANTA PAULA	South Coast	SRO	**20.5**	Medium
53	2-9.02	SANTA CLARA VALLEY	SANTA CLARA	San Francisco Bay	NCRO	**20.3**	Medium
54	1-4	SHASTA VALLEY	SHASTA VALLEY	North Coast	NRO	**20.3**	Medium
55	5-21.54	SACRAMENTO VALLEY	ANTELOPE	Sacramento River	NRO	**20.3**	Medium
56	5-28	TEHACHAPI VALLEY WEST		Tulare Lake	SCRO	**20.3**	Medium
57	5-21.52	SACRAMENTO VALLEY	COLUSA	Sacramento River	NRO	**19.8**	Medium
58	4-12	SAN FERNANDO VALLEY		South Coast	SRO	**19.8**	Medium
59	2-9.01	SANTA CLARA VALLEY	NILES CONE	San Francisco Bay	NCRO	**19.8**	Medium
60	4-7	ARROYO SANTA ROSA VALLEY		South Coast	SRO	**19.8**	Medium
61	5-21.51	SACRAMENTO VALLEY	CORNING	Sacramento River	NRO	**19.5**	Medium
62	5-12.01	SIERRA VALLEY	SIERRA VALLEY	Sacramento River	NRO	**19.5**	Medium
63	8-2.09	UPPER SANTA ANA VALLEY	TEMESCAL	South Coast	SRO	**19.5**	Medium
64	3-9	SAN LUIS OBISPO VALLEY		Central Coast	SCRO	**19.5**	Medium
65	7-21.01	COACHELLA VALLEY	INDIO	Colorado River	SRO	**19.3**	Medium
66	4-11.01	COASTAL PLAIN OF LOS ANGELES	SANTA MONICA	South Coast	SRO	**19.3**	Medium
67	5-22.15	SAN JOAQUIN VALLEY	TRACY	San Joaquin River	NCRO	**19.0**	Medium
68	8-2.08	UPPER SANTA ANA VALLEY	SAN TIMOTEO	South Coast	SRO	**19.0**	Medium
69	9-7	SAN LUIS REY VALLEY		South Coast	SRO	**19.0**	Medium
70	9-10	SAN PASQUAL VALLEY		South Coast	SRO	**19.0**	Medium

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
71	1-55.01	SANTA ROSA VALLEY	SANTA ROSA PLAIN	North Coast	NCRO	**18.8**	Medium
72	7-21.04	COACHELLA VALLEY	SAN GORGONIO PASS	Colorado River	SRO	**18.8**	Medium
73	3-4.09	SALINAS VALLEY	LANGLEY AREA	Central Coast	SCRO	**18.8**	Medium
74	3-16	GOLETA		Central Coast	SRO	**18.8**	Medium
75	4-2	OJAI VALLEY		South Coast	SRO	**18.5**	Medium
76	2-1	PETALUMA VALLEY		San Francisco Bay	NCRO	**18.3**	Medium
77	1-1	SMITH RIVER PLAIN		North Coast	NRO	**18.3**	Medium
78	8-2.04	UPPER SANTA ANA VALLEY	RIALTO-COLTON	South Coast	SRO	**18.3**	Medium
79	6-5.01	TAHOE VALLEY	TAHOE SOUTH	North Lahontan	NCRO	**18.3**	Medium
80	8-2.02	UPPER SANTA ANA VALLEY	CUCAMONGA	South Coast	SRO	**18.3**	Medium
81	4-3.01	VENTURA RIVER VALLEY	UPPER VENTURA RIVER	South Coast	SRO	**18.3**	Medium
82	9-4	SANTA MARGARITA VALLEY		South Coast	SRO	**17.8**	Medium
83	5-14	SCOTTS VALLEY		Sacramento River	NRO	**17.8**	Medium
84	5-21.59	SACRAMENTO VALLEY	EAST BUTTE	Sacramento River	NRO	**17.5**	Medium
85	5-21.62	SACRAMENTO VALLEY	SUTTER	Sacramento River	NCRO	**17.5**	Medium
86	3-3.03	GILROY-HOLLISTER VALLEY	HOLLISTER AREA	Central Coast	SCRO	**17.5**	Medium
87	9-6	CAHUILLA VALLEY		South Coast	SRO	**17.5**	Medium
88	3-15	SANTA YNEZ RIVER VALLEY		Central Coast	SRO	**17.3**	Medium
89	5-6.03	REDDING AREA	ANDERSON	Sacramento River	NRO	**17.3**	Medium
90	3-4.04	SALINAS VALLEY	FOREBAY AQUIFER	Central Coast	SCRO	**17.3**	Medium
91	1-2.01	KLAMATH RIVER VALLEY	TULELAKE	North Coast	NRO	**17.3**	Medium
92	2-10	LIVERMORE VALLEY		San Francisco Bay	NCRO	**17.3**	Medium
93	5-6.04	REDDING AREA	ENTERPRISE	Sacramento River	NRO	**17.3**	Medium
94	4-4.03	SANTA CLARA RIVER VALLEY	MOUND	South Coast	SRO	**17.3**	Medium
95	6-67	MARTIS VALLEY		North Lahontan	NCRO	**17.0**	Medium
96	3-3.04	GILROY-HOLLISTER VALLEY	SAN JUAN BAUTISTA AREA	Central Coast	SCRO	**16.8**	Medium
97	1-10	EEL RIVER VALLEY		North Coast	NRO	**16.3**	Medium
98	2-2.02	NAPA-SONOMA VALLEY	SONOMA VALLEY	San Francisco Bay	NCRO	**16.3**	Medium
99	3-3.02	GILROY-HOLLISTER VALLEY	BOLSA AREA	Central Coast	SCRO	**16.3**	Medium
100	5-21.50	SACRAMENTO VALLEY	RED BLUFF	Sacramento River	NRO	**16.0**	Medium
101	5-6.01	REDDING AREA	BOWMAN	Sacramento River	NRO	**16.0**	Medium
102	6-43	EL MIRAGE VALLEY		South Lahontan	SRO	**15.8**	Medium
103	7-21.02	COACHELLA VALLEY	MISSION CREEK	Colorado River	SRO	**15.8**	Medium

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
104	1-52	UKIAH VALLEY		North Coast	NCRO	**15.8**	Medium
105	5-15	BIG VALLEY		Sacramento River	NRO	**15.8**	Medium
106	9-15	SAN DIEGO RIVER VALLEY		South Coast	SRO	**15.8**	Medium
107	5-21.66	SACRAMENTO VALLEY	SOLANO	Sacramento River	NCRO	**15.5**	Medium
108	3-4.05	SALINAS VALLEY	UPPER VALLEY AQUIFER	Central Coast	SCRO	**15.5**	Medium
109	1-3	BUTTE VALLEY		North Coast	NRO	**15.5**	Medium
110	6-40	LOWER MOJAVE RIVER VALLEY		South Lahontan	SRO	**15.3**	Medium
111	7-24	BORREGO VALLEY		Colorado River	SRO	**15.3**	Medium
112	1-5	SCOTT RIVER VALLEY		North Coast	NRO	**15.3**	Medium
113	7-12	WARREN VALLEY		Colorado River	SRO	**15.3**	Medium
114	5-22.16	SAN JOAQUIN VALLEY	COSUMNES	San Joaquin River	NCRO	**15.0**	Medium
115	3-14	SAN ANTONIO CREEK VALLEY		Central Coast	SRO	**15.0**	Medium
116	3-4.10	SALINAS VALLEY	CORRAL DE TIERRA AREA	Central Coast	SCRO	**15.0**	Medium
117	6-54	INDIAN WELLS VALLEY		South Lahontan	SRO	**14.8**	Medium
118	2-9.04	SANTA CLARA VALLEY	EAST BAY PLAIN	San Francisco Bay	NCRO	**14.8**	Medium
119	5-21.61	SACRAMENTO VALLEY	SOUTH YUBA	Sacramento River	NCRO	**14.5**	Medium
120	8-9	BEAR VALLEY		South Coast	SRO	**14.5**	Medium
121	5-21.60	SACRAMENTO VALLEY	NORTH YUBA	Sacramento River	NCRO	**14.3**	Medium
122	3-21	SANTA CRUZ PURISIMA FORMATION		Central Coast	SCRO	**14.3**	Medium
123	5-21.56	SACRAMENTO VALLEY	LOS MOLINOS	Sacramento River	NRO	**14.3**	Medium
124	6-12	OWENS VALLEY		South Lahontan	SRO	**13.8**	Medium
125	3-13	CUYAMA VALLEY		Central Coast	SRO	**13.8**	Medium
126	5-21.55	SACRAMENTO VALLEY	DYE CREEK	Sacramento River	NRO	**13.8**	Medium
127	5-4	BIG VALLEY		Sacramento River	NRO	**13.5**	Medium
128	9-1	SAN JUAN VALLEY		South Coast	SRO	**13.3**	Low
129	4-9	SIMI VALLEY		South Coast	SRO	**13.3**	Low
130	4-10	CONEJO		South Coast	SRO	**13.0**	Low
131	7-38	PALO VERDE VALLEY		Colorado River	SRO	**12.8**	Low
132	5-5	FALL RIVER VALLEY		Sacramento River	NRO	**12.8**	Low
133	6-4	HONEY LAKE VALLEY		North Lahontan	NRO	**12.3**	Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
134	7-21.03	COACHELLA VALLEY	DESERT HOT SPRINGS	Colorado River	SRO	**12.3**	Low
135	5-22.10	SAN JOAQUIN VALLEY	PLEASANT VALLEY	Tulare Lake	SCRO	**11.8**	Low
136	5-21.68	SACRAMENTO VALLEY	CAPAY VALLEY	Sacramento River	NCRO	**11.5**	Low
137	1-18	RED ROCK VALLEY		North Coast	NRO	**11.5**	Low
138	6-41	MIDDLE MOJAVE RIVER VALLEY		South Lahontan	SRO	**11.3**	Low
139	4-17	LOCKWOOD VALLEY		South Coast	SRO	**11.3**	Low
140	7-5	CHUCKWALLA VALLEY		Colorado River	SRO	**10.8**	Low
141	6-46	FREMONT VALLEY		South Lahontan	SRO	**10.8**	Low
142	5-2.01	ALTURAS AREA	SOUTH FORK PITT RIVER	Sacramento River	NRO	**10.5**	Low
143	6-47	HARPER VALLEY		South Lahontan	SRO	**9.8**	Low
144	7-19	LUCERNE VALLEY		Colorado River	SRO	**9.8**	Low
145	5-2.02	ALTURAS AREA	WARM SPRINGS VALLEY	Sacramento River	NRO	**9.5**	Low
146	7-39	PALO VERDE MESA		Colorado River	SRO	**9.3**	Low
147	6-1	SURPRISE VALLEY		North Lahontan	NRO	**8.8**	Low
148	7-10	TWENTYNINE PALMS VALLEY		Colorado River	SRO	**8.8**	Low
149	7-8	BRISTOL VALLEY		Colorado River	SRO	**8.3**	Low
150	7-44	NEEDLES VALLEY		Colorado River	SRO	**8.3**	Low
151	6-2	MADELINE PLAINS		North Lahontan	NRO	**7.8**	Low
152	1-2.02	KLAMATH RIVER VALLEY	LOWER KLAMATH	North Coast	NRO	**7.8**	Low
153	7-25	OCOTILLO-CLARK VALLEY		Colorado River	SRO	**7.3**	Low
154	6-14	FISH LAKE VALLEY		South Lahontan	SRO	**6.8**	Low
155	7-30	IMPERIAL VALLEY		Colorado River	SRO	**0.0**	Very Low
156	6-18	DEATH VALLEY		South Lahontan	SRO	**0.0**	Very Low
157	7-3	WARD VALLEY		Colorado River	SRO	**0.0**	Very Low
158	7-2	FENNER VALLEY		Colorado River	SRO	**0.0**	Very Low
159	6-20	MIDDLE AMARGOSA VALLEY		South Lahontan	SRO	**0.0**	Very Low
160	6-33	SODA LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low

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161	7-43	CHEMEHUEVI VALLEY		Colorado River	SRO	**0.0**	Very Low
162	7-7	CADIZ VALLEY		Colorado River	SRO	**0.0**	Very Low
163	6-58	PANAMINT VALLEY		South Lahontan	SRO	**0.0**	Very Low
164	7-37	ARROYO SECO VALLEY		Colorado River	SRO	**0.0**	Very Low
165	6-31	KELSO VALLEY		South Lahontan	SRO	**0.0**	Very Low
166	6-21	LOWER KINGSTON VALLEY		South Lahontan	SRO	**0.0**	Very Low
167	7-9	DALE VALLEY		Colorado River	SRO	**0.0**	Very Low
168	3-19	CARRIZO PLAIN		Central Coast	SRO	**0.0**	Very Low
169	6-30	IVANPAH VALLEY		South Lahontan	SRO	**0.0**	Very Low
170	6-52	SEARLES VALLEY		South Lahontan	SRO	**0.0**	Very Low
171	7-33	EAST SALTON SEA		Colorado River	SRO	**0.0**	Very Low
172	7-4	RICE VALLEY		Colorado River	SRO	**0.0**	Very Low
173	7-6	PINTO VALLEY		Colorado River	SRO	**0.0**	Very Low
174	6-22	UPPER KINGSTON VALLEY		South Lahontan	SRO	**0.0**	Very Low
175	7-45	PIUTE VALLEY		Colorado River	SRO	**0.0**	Very Low
176	6-9	MONO VALLEY		South Lahontan	SRO	**0.0**	Very Low
177	7-1	LANFAIR VALLEY		Colorado River	SRO	**0.0**	Very Low
178	7-29	COYOTE WELLS VALLEY		Colorado River	SRO	**0.0**	Very Low
179	6-17	SALINE VALLEY		South Lahontan	SRO	**0.0**	Very Low
180	7-42	VIDAL VALLEY		Colorado River	SRO	**0.0**	Very Low
181	6-51	PILOT KNOB VALLEY		South Lahontan	SRO	**0.0**	Very Low
182	7-35	OGILBY VALLEY		Colorado River	SRO	**0.0**	Very Low
183	2-3	SUISUN-FAIRFIELD VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
184	7-34	AMOS VALLEY		Colorado River	SRO	**0.0**	Very Low
185	7-32	CHOCOLATE VALLEY		Colorado River	SRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
186	6-16	EUREKA VALLEY		South Lahontan	SRO	**0.0**	Very Low
187	6-35	CRONISE VALLEY		South Lahontan	SRO	**0.0**	Very Low
188	7-36	YUMA VALLEY		Colorado River	SRO	**0.0**	Very Low
189	7-28	VALLECITO-CARRIZO VALLEY		Colorado River	SRO	**0.0**	Very Low
190	6-49	SUPERIOR VALLEY		South Lahontan	SRO	**0.0**	Very Low
191	7-16	AMES VALLEY		Colorado River	SRO	**0.0**	Very Low
192	7-22	WEST SALTON SEA		Colorado River	SRO	**0.0**	Very Low
193	7-14	LAVIC VALLEY		Colorado River	SRO	**0.0**	Very Low
194	7-31	OROCOPIA VALLEY		Colorado River	SRO	**0.0**	Very Low
195	6-24	RED PASS VALLEY		South Lahontan	SRO	**0.0**	Very Low
196	6-50	CUDDEBACK VALLEY		South Lahontan	SRO	**0.0**	Very Low
197	6-28	PAHRUMP VALLEY		South Lahontan	SRO	**0.0**	Very Low
198	6-32	BROADWELL VALLEY		South Lahontan	SRO	**0.0**	Very Low
199	6-25	BICYCLE VALLEY		South Lahontan	SRO	**0.0**	Very Low
200	7-13.01	DEADMAN VALLEY	DEADMAN LAKE	Colorado River	SRO	**0.0**	Very Low
201	6-29	MESQUITE VALLEY		South Lahontan	SRO	**0.0**	Very Low
202	6-37	COYOTE LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low
203	6-23	RIGGS VALLEY		South Lahontan	SRO	**0.0**	Very Low
204	1-59	WILSON GROVE FORMATION HIGHLANDS		North Coast	NCRO	**0.0**	Very Low
205	7-41	CALZONA VALLEY		Colorado River	SRO	**0.0**	Very Low
206	5-25	KERN RIVER VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
207	7-18.01	JOHNSON VALLEY	SOGGY LAKE	Colorado River	SRO	**0.0**	Very Low
208	6-38	CAVES CANYON VALLEY		South Lahontan	SRO	**0.0**	Very Low
209	6-11	LONG VALLEY		South Lahontan	SRO	**0.0**	Very Low
210	6-19	WINGATE VALLEY		South Lahontan	SRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
211	5-6.05	REDDING AREA	MILLVILLE	Sacramento River	NRO	**0.0**	Very Low
212	6-27	LEACH VALLEY		South Lahontan	SRO	**0.0**	Very Low
213	6-84	GREENWATER VALLEY		South Lahontan	SRO	**0.0**	Very Low
214	3-6	LOCKWOOD VALLEY		Central Coast	SCRO	**0.0**	Very Low
215	6-79	CALIFORNIA VALLEY		South Lahontan	SRO	**0.0**	Very Low
216	6-104	LONG VALLEY		North Lahontan	NRO	**0.0**	Very Low
217	5-6.02	REDDING AREA	ROSEWOOD	Sacramento River	NRO	**0.0**	Very Low
218	6-57	DARWIN VALLEY		South Lahontan	SRO	**0.0**	Very Low
219	6-56	ROSE VALLEY		South Lahontan	SRO	**0.0**	Very Low
220	2-2.03	NAPA-SONOMA VALLEY	NAPA-SONOMA LOWLANDS	San Francisco Bay	NCRO	**0.0**	Very Low
221	6-10	ADOBE LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low
222	3-5	CHOLAME VALLEY		Central Coast	SCRO	**0.0**	Very Low
223	7-15	BESSEMER VALLEY		Colorado River	SRO	**0.0**	Very Low
224	2-9.03	SANTA CLARA VALLEY	SAN MATEO PLAIN	San Francisco Bay	NCRO	**0.0**	Very Low
225	1-9	EUREKA PLAIN		North Coast	NRO	**0.0**	Very Low
226	5-1.01	GOOSE LAKE	GOOSE VALLEY	Sacramento River	NRO	**0.0**	Very Low
227	6-34	SILVER LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low
228	7-18.02	JOHNSON VALLEY	UPPER JOHNSON VALLEY	Colorado River	SRO	**0.0**	Very Low
229	5-6.06	REDDING AREA	SOUTH BATTLE CREEK	Sacramento River	NRO	**0.0**	Very Low
230	6-100	SECRET VALLEY		North Lahontan	NRO	**0.0**	Very Low
231	5-23	PANOCHE VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
232	6-8	BRIDGEPORT VALLEY		North Lahontan	NCRO	**0.0**	Very Low
233	3-30	BITTER WATER VALLEY		Central Coast	SCRO	**0.0**	Very Low
234	6-13	BLACK SPRINGS VALLEY		South Lahontan	SRO	**0.0**	Very Low
235	7-11	COPPER MOUNTAIN VALLEY		Colorado River	SRO	**0.0**	Very Low
236	6-15	DEEP SPRINGS VALLEY		South Lahontan	SRO	**0.0**	Very Low
237	5-66	CLEAR LAKE CACHE FORMATION		Sacramento River	NRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
238	6-53	SALT WELLS VALLEY		South Lahontan	SRO	**0.0**	Very Low
239	7-13.02	DEADMAN VALLEY	SURPRISE SPRING	Colorado River	SRO	**0.0**	Very Low
240	5-9	INDIAN VALLEY		Sacramento River	NRO	**0.0**	Very Low
241	6-48	GOLDSTONE VALLEY		South Lahontan	SRO	**0.0**	Very Low
242	6-26	AVAWATZ VALLEY		South Lahontan	SRO	**0.0**	Very Low
243	7-62	JOSHUA TREE		Colorado River	SRO	**0.0**	Very Low
244	6-55	COSO VALLEY		South Lahontan	SRO	**0.0**	Very Low
245	1-8.02	MAD RIVER VALLEY	DOWS PRAIRIE SCHOOL AREA	North Coast	NRO	**0.0**	Very Low
246	7-40	QUIEN SABE POINT VALLEY		Colorado River	SRO	**0.0**	Very Low
247	2-35	WESTSIDE		San Francisco Bay	NCRO	**0.0**	Very Low
248	6-74	HARRISBURG FLATS		South Lahontan	SRO	**0.0**	Very Low
249	1-54.01	ALEXANDER VALLEY	ALEXANDER AREA	North Coast	NCRO	**0.0**	Very Low
250	3-28	SAN BENITO RIVER VALLEY		Central Coast	SCRO	**0.0**	Very Low
251	9-8	WARNER VALLEY		South Coast	SRO	**0.0**	Very Low
252	1-21	FORT BRAGG TERRACE AREA		North Coast	NCRO	**0.0**	Very Low
253	6-45	TEHACHAPI VALLEY EAST		South Lahontan	SRO	**0.0**	Very Low
254	7-27	SAN FELIPE VALLEY		Colorado River	SRO	**0.0**	Very Low
255	6-71	LOST LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low
256	8-2.05	UPPER SANTA ANA VALLEY	CAJON	South Coast	SRO	**0.0**	Very Low
257	6-88	OWL LAKE VALLEY		South Lahontan	SRO	**0.0**	Very Low
258	6-76	BROWN MOUNTAIN VALLEY		South Lahontan	SRO	**0.0**	Very Low
259	5-21.53	SACRAMENTO VALLEY	BEND	Sacramento River	NRO	**0.0**	Very Low
260	5-35	MCCLOUD AREA		Sacramento River	NRO	**0.0**	Very Low
261	2-30	NOVATO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
262	6-66	LEE FLAT		South Lahontan	SRO	**0.0**	Very Low
263	6-7	ANTELOPE VALLEY		North Lahontan	NCRO	**0.0**	Very Low
264	1-25	PRAIRIE CREEK AREA		North Coast	NRO	**0.0**	Very Low
265	6-36.01	LANGFORD VALLEY	LANGFORD WELL LAKE	South Lahontan	SRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
266	5-11	MOHAWK VALLEY		Sacramento River	NRO	**0.0**	Very Low
267	5-1.02	GOOSE LAKE	FANDANGO VALLEY	Sacramento River	NRO	**0.0**	Very Low
268	6-101	BULL FLAT		North Lahontan	NRO	**0.0**	Very Low
269	6-63	HIDDEN VALLEY		South Lahontan	SRO	**0.0**	Very Low
270	2-5	CLAYTON VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
271	6-94	GRASSHOPPER VALLEY		North Lahontan	NRO	**0.0**	Very Low
272	7-51	LOST HORSE VALLEY		Colorado River	SRO	**0.0**	Very Low
273	6-68	SANTA ROSA FLAT		South Lahontan	SRO	**0.0**	Very Low
274	8-6	HEMET LAKE VALLEY		South Coast	SRO	**0.0**	Very Low
275	5-58	CLOVER VALLEY		Sacramento River	NRO	**0.0**	Very Low
276	2-11	SUNOL VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
277	1-11	COVELO ROUND VALLEY		North Coast	NRO	**0.0**	Very Low
278	6-86	RHODES HILL AREA		South Lahontan	SRO	**0.0**	Very Low
279	2-6	YGNACIO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
280	1-55.02	SANTA ROSA VALLEY	HEALDSBURG AREA	North Coast	NCRO	**0.0**	Very Low
281	5-71	VALLECITOS CREEK VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
282	7-56	YAQUI WELL AREA		Colorado River	SRO	**0.0**	Very Low
283	7-17	MEANS VALLEY		Colorado River	SRO	**0.0**	Very Low
284	8-7	BIG MEADOWS VALLEY		South Coast	SRO	**0.0**	Very Low
285	6-62	RACE TRACK VALLEY		South Lahontan	SRO	**0.0**	Very Low
286	5-46	LAKE BRITTON AREA		Sacramento River	NRO	**0.0**	Very Low
287	1-8.01	MAD RIVER VALLEY	MAD RIVER LOWLAND	North Coast	NRO	**0.0**	Very Low
288	5-59	GRIZZLY VALLEY		Sacramento River	NRO	**0.0**	Very Low
289	1-27	BIG LAGOON AREA		North Coast	NRO	**0.0**	Very Low
290	5-50	NORTH FORK BATTLE CREEK		Sacramento River	NRO	**0.0**	Very Low
291	6-96	EAGLE LAKE AREA		North Lahontan	NRO	**0.0**	Very Low
292	9-11	SANTA MARIA VALLEY		South Coast	SRO	**0.0**	Very Low
293	6-3	WILLOW CREEK VALLEY		North Lahontan	NRO	**0.0**	Very Low

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Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
294	2-4	PITTSBURG PLAIN		San Francisco Bay	NCRO	**0.0**	Very Low
295	7-53	HEXIE MOUNTAIN AREA		Colorado River	SRO	**0.0**	Very Low
296	6-69	KELSO LANDER VALLEY		South Lahontan	SRO	**0.0**	Very Low
297	6-6	CARSON VALLEY		North Lahontan	NCRO	**0.0**	Very Low
298	6-36.02	LANGFORD VALLEY	IRWIN	South Lahontan	SRO	**0.0**	Very Low
299	6-64	MARBLE CANYON AREA		South Lahontan	SRO	**0.0**	Very Low
300	4-11.02	COASTAL PLAIN OF LOS ANGELES	HOLLYWOOD	South Coast	SRO	**0.0**	Very Low
301	6-77	GRASS VALLEY		South Lahontan	SRO	**0.0**	Very Low
302	1-13	LITTLE LAKE VALLEY		North Coast	NRO	**0.0**	Very Low
303	5-60	HUMBUG VALLEY		Sacramento River	NRO	**0.0**	Very Low
304	3-32	PEACH TREE VALLEY		Central Coast	SCRO	**0.0**	Very Low
305	7-52	PLEASANT VALLEY		Colorado River	SRO	**0.0**	Very Low
306	6-92	PINE CREEK VALLEY		North Lahontan	NRO	**0.0**	Very Low
307	6-61	CAMEO AREA		South Lahontan	SRO	**0.0**	Very Low
308	2-22	HALF MOON BAY TERRACE		San Francisco Bay	NCRO	**0.0**	Very Low
309	5-64	BEAR VALLEY		Sacramento River	NRO	**0.0**	Very Low
310	6-81	BUTTE VALLEY		South Lahontan	SRO	**0.0**	Very Low
311	1-49	ANNAPOLIS OHLSON RANCH FM HIGHLANDS		North Coast	NCRO	**0.0**	Very Low
312	1-61	FORT ROSS TERRACE DEPOSITS		North Coast	NCRO	**0.0**	Very Low
313	4-5	ACTON VALLEY		South Coast	SRO	**0.0**	Very Low
314	1-51	POTTER VALLEY		North Coast	NCRO	**0.0**	Very Low
315	5-8	MOUNTAIN MEADOWS VALLEY		Sacramento River	NRO	**0.0**	Very Low
316	3-18	CARPINTERIA		Central Coast	SRO	**0.0**	Very Low
317	7-26	TERWILLIGER VALLEY		Colorado River	SRO	**0.0**	Very Low
318	1-17	BRAY TOWN AREA		North Coast	NRO	**0.0**	Very Low
319	6-90	CADY FAULT AREA		South Lahontan	SRO	**0.0**	Very Low
320	5-26	WALKER BASIN CREEK VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
321	2-40	DOWNTOWN		San Francisco Bay	NCRO	**0.0**	Very Low

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Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
322	5-12.02	SIERRA VALLEY	CHILCOOT	Sacramento River	NRO	**0.0**	Very Low
323	5-69	YOSEMITE VALLEY		San Joaquin River	SCRO	**0.0**	Very Low
324	9-19	TIA JUANA		South Coast	SRO	**0.0**	Very Low
325	9-14	MISSION VALLEY		South Coast	SRO	**0.0**	Very Low
326	3-47	BIG SPRING AREA		Central Coast	SRO	**0.0**	Very Low
327	6-78	DENNING SPRING VALLEY		South Lahontan	SRO	**0.0**	Very Low
328	7-20	MORONGO VALLEY		Colorado River	SRO	**0.0**	Very Low
329	5-36	ROUND VALLEY		Sacramento River	NRO	**0.0**	Very Low
330	5-13	UPPER LAKE VALLEY		Sacramento River	NRO	**0.0**	Very Low
331	9-16	EL CAJON VALLEY		South Coast	SRO	**0.0**	Very Low
332	5-68	POPE VALLEY		Sacramento River	NCRO	**0.0**	Very Low
333	5-7	LAKE ALMANOR VALLEY		Sacramento River	NRO	**0.0**	Very Low
334	7-55	COLLINS VALLEY		Colorado River	SRO	**0.0**	Very Low
335	6-70	CACTUS FLAT		South Lahontan	SRO	**0.0**	Very Low
336	2-7	SAN RAMON VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
337	1-14	LOWER KLAMATH RIVER VALLEY		North Coast	NRO	**0.0**	Very Low
338	7-54	BUCK RIDGE FAULT VALLEY		Colorado River	SRO	**0.0**	Very Low
339	9-18	OTAY VALLEY		South Coast	SRO	**0.0**	Very Low
340	3-44	POZO VALLEY		Central Coast	SRO	**0.0**	Very Low
341	5-10	AMERICAN VALLEY		Sacramento River	NRO	**0.0**	Very Low
342	7-63	VANDEVENTER FLAT		Colorado River	SRO	**0.0**	Very Low
343	5-3	JESS VALLEY		Sacramento River	NRO	**0.0**	Very Low
344	1-60	LOWER RUSSIAN RIVER VALLEY		North Coast	NCRO	**0.0**	Very Low
345	5-18	COYOTE VALLEY		Sacramento River	NRO	**0.0**	Very Low
346	1-54.02	ALEXANDER VALLEY	CLOVERDALE AREA	North Coast	NCRO	**0.0**	Very Low
347	6-95	DRY VALLEY		North Lahontan	NRO	**0.0**	Very Low
348	5-19	COLLAYOMI VALLEY		Sacramento River	NRO	**0.0**	Very Low
349	5-63	STONYFORD TOWN AREA		Sacramento River	NRO	**0.0**	Very Low

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Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
350	6-99	PAINTERS FLAT		North Lahontan	NRO	**0.0**	Very Low
351	1-30	PEPPERWOOD TOWN AREA		North Coast	NRO	**0.0**	Very Low
352	3-49	MONTECITO		Central Coast	SRO	**0.0**	Very Low
353	3-17	SANTA BARBARA		Central Coast	SRO	**0.0**	Very Low
354	6-5.02	TAHOE VALLEY	TAHOE WEST	North Lahontan	NCRO	**0.0**	Very Low
355	5-54	ASH VALLEY		Sacramento River	NRO	**0.0**	Very Low
356	6-89	KANE WASH AREA		South Lahontan	SRO	**0.0**	Very Low
357	9-17	SWEETWATER VALLEY		South Coast	SRO	**0.0**	Very Low
358	2-33	ISLAIS VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
359	2-32	VISITACION VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
360	5-43	ROCK PRAIRIE VALLEY		Sacramento River	NRO	**0.0**	Very Low
361	5-95	MEADOW VALLEY		Sacramento River	NRO	**0.0**	Very Low
362	6-91	COW HEAD LAKE VALLEY		North Lahontan	NRO	**0.0**	Very Low
363	1-53	SANEL VALLEY		North Coast	NCRO	**0.0**	Very Low
364	7-59	MASON VALLEY		Colorado River	SRO	**0.0**	Very Low
365	1-55.03	SANTA ROSA VALLEY	RINCON VALLEY	North Coast	NCRO	**0.0**	Very Low
366	7-46	CANEBRAKE VALLEY		Colorado River	SRO	**0.0**	Very Low
367	5-52	GRAYS VALLEY		Sacramento River	NRO	**0.0**	Very Low
368	4-18	HUNGRY VALLEY		South Coast	SRO	**0.0**	Very Low
369	4-3.02	VENTURA RIVER VALLEY	LOWER VENTURA RIVER	South Coast	SRO	**0.0**	Very Low
370	7-50	IRON RIDGE AREA		Colorado River	SRO	**0.0**	Very Low
371	6-75	WILDROSE CANYON		South Lahontan	SRO	**0.0**	Very Low
372	6-98	TULEDAD CANYON VALLEY		North Lahontan	NRO	**0.0**	Very Low
373	2-19	KENWOOD VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
374	1-12	LAYTONVILLE VALLEY		North Coast	NRO	**0.0**	Very Low
375	1-19	ANDERSON VALLEY		North Coast	NCRO	**0.0**	Very Low
376	5-53	DIXIE VALLEY		Sacramento River	NRO	**0.0**	Very Low
377	5-70	LOS BANOS CREEK VALLEY		San Joaquin River	SCRO	**0.0**	Very Low
378	6-82	SPRING CANYON VALLEY		South Lahontan	SRO	**0.0**	Very Low

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Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
379	6-107	SWEETWATER FLAT		North Lahontan	NCRO	**0.0**	Very Low
380	3-24	QUIEN SABE VALLEY		Central Coast	SCRO	**0.0**	Very Low
381	3-45	HUASNA VALLEY		Central Coast	SRO	**0.0**	Very Low
382	5-57	LAST CHANCE CREEK VALLEY		Sacramento River	NRO	**0.0**	Very Low
383	4-15	TIERRA REJADA		South Coast	SRO	**0.0**	Very Low
384	6-105	SLINKARD VALLEY		North Lahontan	NCRO	**0.0**	Very Low
385	6-93	HARVEY VALLEY		North Lahontan	NRO	**0.0**	Very Low
386	5-86	JOSEPH CREEK		Sacramento River	NRO	**0.0**	Very Low
387	5-87	MIDDLE FORK FEATHER RIVER		Sacramento River	NRO	**0.0**	Very Low
388	5-83	CUDDY RANCH AREA		Tulare Lake	SCRO	**0.0**	Very Low
389	5-47	GOOSE VALLEY		Sacramento River	NRO	**0.0**	Very Low
390	8-8	SEVEN OAKS VALLEY		South Coast	SRO	**0.0**	Very Low
391	5-41	EGG LAKE VALLEY		Sacramento River	NRO	**0.0**	Very Low
392	1-50	KNIGHTS VALLEY		North Coast	NCRO	**0.0**	Very Low
393	6-65	COTTONWOOD SPRING AREA		South Lahontan	SRO	**0.0**	Very Low
394	1-7	HOOPA VALLEY		North Coast	NRO	**0.0**	Very Low
395	9-27	COTTONWOOD VALLEY		South Coast	SRO	**0.0**	Very Low
396	6-97	HORSE LAKE VALLEY		North Lahontan	NRO	**0.0**	Very Low
397	4-1	UPPER OJAI VALLEY		South Coast	SRO	**0.0**	Very Low
398	1-31	WEOTT TOWN AREA		North Coast	NRO	**0.0**	Very Low
399	7-61	DAVIES VALLEY		Colorado River	SRO	**0.0**	Very Low
400	9-12	SAN DIEGUITO CREEK		South Coast	SRO	**0.0**	Very Low
401	5-29	CASTAC LAKE VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
402	9-28	CAMPO VALLEY		South Coast	SRO	**0.0**	Very Low
403	3-36	SANTA ROSA VALLEY		Central Coast	SRO	**0.0**	Very Low
404	5-93	NORTH FORK CACHE CREEK		Sacramento River	NRO	**0.0**	Very Low
405	5-84	CUDDY VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
406	7-49	PIPES CANYON FAULT VALLEY		Colorado River	SRO	**0.0**	Very Low
407	3-25	TRES PINOS VALLEY		Central Coast	SCRO	**0.0**	Very Low
408	5-37	TOAD WELL AREA		Sacramento River	NRO	**0.0**	Very Low
409	6-73	WILD HORSE MESA AREA		South Lahontan	SRO	**0.0**	Very Low
410	5-82	CUDDY CANYON VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
411	1-6	HAYFORK VALLEY		North Coast	NRO	**0.0**	Very Low
412	1-22	FAIRCHILD SWAMP VALLEY		North Coast	NRO	**0.0**	Very Low

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Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
413	6-85	GOLD VALLEY		South Lahontan	SRO	**0.0**	Very Low
414	5-51	BUTTE CREEK VALLEY		Sacramento River	NRO	**0.0**	Very Low
415	5-80	BRITE VALLEY		Tulare Lake	SCRO	**0.0**	Very Low
416	1-28	MATTOLE RIVER VALLEY		North Coast	NRO	**0.0**	Very Low
417	9-25	RANCHITA TOWN AREA		South Coast	SRO	**0.0**	Very Low
418	3-53	FOOTHILL		Central Coast	SRO	**0.0**	Very Low
419	4-19	THOUSAND OAKS AREA		South Coast	SRO	**0.0**	Very Low
420	4-20	RUSSELL VALLEY		South Coast	SRO	**0.0**	Very Low
421	5-49	DRY BURNEY CREEK VALLEY		Sacramento River	NRO	**0.0**	Very Low
422	5-90	FUNKS CREEK		Sacramento River	NRO	**0.0**	Very Low
423	9-2	SAN MATEO VALLEY		South Coast	SRO	**0.0**	Very Low
424	3-46	RAFAEL VALLEY		Central Coast	SRO	**0.0**	Very Low
425	1-48	GRAVELLY VALLEY		North Coast	NRO	**0.0**	Very Low
426	6-72	COLES FLAT		South Lahontan	SRO	**0.0**	Very Low
427	9-9	ESCONDIDO VALLEY		South Coast	SRO	**0.0**	Very Low
428	2-26	PESCADERO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
429	5-17	BURNS VALLEY		Sacramento River	NRO	**0.0**	Very Low
430	3-31	HERNANDEZ VALLEY		Central Coast	SCRO	**0.0**	Very Low
431	5-31	LONG VALLEY		Sacramento River	NRO	**0.0**	Very Low
432	1-15	HAPPY CAMP TOWN AREA		North Coast	NRO	**0.0**	Very Low
433	3-22	SANTA ANA VALLEY		Central Coast	SCRO	**0.0**	Very Low
434	1-57	BODEGA BAY AREA		North Coast	NCRO	**0.0**	Very Low
435	7-48	HELENDALE FAULT VALLEY		Colorado River	SRO	**0.0**	Very Low
436	3-43	RINCONADA VALLEY		Central Coast	SRO	**0.0**	Very Low
437	6-106	LITTLE ANTELOPE VALLEY		North Lahontan	NCRO	**0.0**	Very Low
438	9-13	POWAY VALLEY		South Coast	SRO	**0.0**	Very Low
439	7-47	JACUMBA VALLEY		Colorado River	SRO	**0.0**	Very Low
440	5-40	HOT SPRINGS VALLEY		Sacramento River	NRO	**0.0**	Very Low
441	5-30	LOWER LAKE VALLEY		Sacramento River	NRO	**0.0**	Very Low
442	1-29	HONEYDEW TOWN AREA		North Coast	NRO	**0.0**	Very Low
443	2-38	LOBOS		San Francisco Bay	NCRO	**0.0**	Very Low
444	5-16	HIGH VALLEY		Sacramento River	NRO	**0.0**	Very Low
445	5-48	BURNEY CREEK VALLEY		Sacramento River	NRO	**0.0**	Very Low
446	5-85	MIL POTRERO AREA		Tulare Lake	SCRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
447	5-56	YELLOW CREEK VALLEY		Sacramento River	NRO	**0.0**	Very Low
448	1-34	DINSMORES TOWN AREA		North Coast	NRO	**0.0**	Very Low
449	1-16	SEIAD VALLEY		North Coast	NRO	**0.0**	Very Low
450	1-20	GARCIA RIVER VALLEY		North Coast	NCRO	**0.0**	Very Low
451	5-92	BLANCHARD VALLEY		Sacramento River	NRO	**0.0**	Very Low
452	4-16	HIDDEN VALLEY		South Coast	SRO	**0.0**	Very Low
453	2-39	MARINA		San Francisco Bay	NCRO	**0.0**	Very Low
454	2-37	SOUTH SAN FRANCISCO		San Francisco Bay	NCRO	**0.0**	Very Low
455	1-38	LOWER LAYTONVILLE VALLEY		North Coast	NCRO	**0.0**	Very Low
456	9-32	SAN MARCOS AREA		South Coast	SRO	**0.0**	Very Low
457	1-32	GARBERVILLE TOWN AREA		North Coast	NRO	**0.0**	Very Low
458	5-38	PONDOSA TOWN AREA		Sacramento River	NRO	**0.0**	Very Low
459	5-91	ANTELOPE CREEK		Sacramento River	NRO	**0.0**	Very Low
460	9-29	POTRERO VALLEY		South Coast	SRO	**0.0**	Very Low
461	3-20	ANO NUEVO AREA		Central Coast	SCRO	**0.0**	Very Low
462	1-26	REDWOOD CREEK AREA		North Coast	NRO	**0.0**	Very Low
463	6-5.03	TAHOE VALLEY	TAHOE NORTH	North Lahontan	NCRO	**0.0**	Very Low
464	2-8	CASTRO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
465	2-28	ROSS VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
466	6-80	MIDDLE PARK CANYON		South Lahontan	SRO	**0.0**	Very Low
467	1-45	BIG RIVER VALLEY		North Coast	NCRO	**0.0**	Very Low
468	1-43	WILLIAMS VALLEY		North Coast	NCRO	**0.0**	Very Low
469	3-42	CHORRO VALLEY		Central Coast	SRO	**0.0**	Very Low
470	9-24	PAMO VALLEY		South Coast	SRO	**0.0**	Very Low
471	1-40	TEN MILE RIVER VALLEY		North Coast	NCRO	**0.0**	Very Low
472	1-56	McDOWELL VALLEY		North Coast	NCRO	**0.0**	Very Low
473	5-62	ELK CREEK AREA		Sacramento River	NRO	**0.0**	Very Low
474	3-23	UPPER SANTA ANA VALLEY		Central Coast	SCRO	**0.0**	Very Low
475	3-29	DRY LAKE VALLEY		Central Coast	SCRO	**0.0**	Very Low
476	5-61	CHROME TOWN AREA		Sacramento River	NRO	**0.0**	Very Low
477	2-27	SAND POINT AREA		San Francisco Bay	NCRO	**0.0**	Very Low
478	1-39	BRANSCOMB TOWN AREA		North Coast	NCRO	**0.0**	Very Low
479	1-44	EDEN VALLEY		North Coast	NCRO	**0.0**	Very Low
480	5-20	BERRYESSA VALLEY		Sacramento River	NCRO	**0.0**	Very Low
481	3-37	VILLA VALLEY		Central Coast	SRO	**0.0**	Very Low
482	1-35	HYAMPOM VALLEY		North Coast	NRO	**0.0**	Very Low

CASGEM Groundwater Basin Prioritization Results - Abridged Sorted by Overall Basin Score						Overall Ranking	
Basin count	Basin Number	Basin Name	Sub-Basin Name	Hydrologic Region	DWR Region Office	Overall Basin Ranking Score ***	Overall Basin Priority
483	5-45	CAYTON VALLEY		Sacramento River	NRO	**0.0**	Very Low
484	5-89	SQUAW FLAT		Sacramento River	NRO	**0.0**	Very Low
485	5-65	LITTLE INDIAN VALLEY		Sacramento River	NRO	**0.0**	Very Low
486	9-3	SAN ONOFRE VALLEY		South Coast	SRO	**0.0**	Very Low
487	3-39	OLD VALLEY		Central Coast	SRO	**0.0**	Very Low
488	3-50	FELTON AREA		Central Coast	SCRO	**0.0**	Very Low
489	1-42	SHERWOOD VALLEY		North Coast	NCRO	**0.0**	Very Low
490	5-44	LONG VALLEY		Sacramento River	NRO	**0.0**	Very Low
491	2-24	SAN GREGORIO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
492	5-88	STONY GORGE RESERVOIR		Sacramento River	NRO	**0.0**	Very Low
493	3-33	SAN CARPOFORO VALLEY		Central Coast	SRO	**0.0**	Very Low
494	3-34	ARROYO DE LA CRUZ VALLEY		Central Coast	SRO	**0.0**	Very Low
495	1-33	LARABEE VALLEY		North Coast	NRO	**0.0**	Very Low
496	9-23	SAN ELIJO VALLEY		South Coast	SRO	**0.0**	Very Low
497	2-29	SAN RAFAEL VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
498	1-36	HETTENSHAW VALLEY		North Coast	NRO	**0.0**	Very Low
499	1-41	LITTLE VALLEY		North Coast	NCRO	**0.0**	Very Low
500	2-31	ARROYO DEL HAMBRE VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
501	3-27	SCOTTS VALLEY		Central Coast	SCRO	**0.0**	Very Low
502	1-46	NAVARRO RIVER VALLEY		North Coast	NCRO	**0.0**	Very Low
503	1-37	COTTONEVA CREEK VALLEY		North Coast	NCRO	**0.0**	Very Low
504	9-22	BATIQUITOS LAGOON VALLEY		South Coast	SRO	**0.0**	Very Low
505	3-40	TORO VALLEY		Central Coast	SRO	**0.0**	Very Low
506	1-62	WILSON POINT AREA		North Coast	NRO	**0.0**	Very Low
507	5-94	MIDDLE CREEK		Sacramento River	NRO	**0.0**	Very Low
508	6-108	OLYMPIC VALLEY		North Lahontan	NCRO	**0.0**	Very Low
509	2-36	SAN PEDRO VALLEY		San Francisco Bay	NCRO	**0.0**	Very Low
510	3-41	MORRO VALLEY		Central Coast	SRO	**0.0**	Very Low
511	4-22	MALIBU VALLEY		South Coast	SRO	**0.0**	Very Low
512	3-35	SAN SIMEON VALLEY		Central Coast	SRO	**0.0**	Very Low
513	3-52	NEEDLE ROCK POINT		Central Coast	SCRO	**0.0**	Very Low
514	3-51	MAJORS CREEK		Central Coast	SCRO	**0.0**	Very Low
515	3-38	CAYUCOS VALLEY		Central Coast	SRO	**0.0**	Very Low

* Overall Basin Ranking Score = Population + Population Growth + PSW + (Total Wells x .75) + Irr Acreage + (GW Use + GW %)/2 + Impacts + Other

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Groundwater Legislation Timeline

Jan 1, 2015
Local Agencies may no longer adopt or update GMPs for high and medium priority basins.

Jan 31, 2015 *
DWR updates basin prioritization. **

2015 - 2016 *
DWR identifies basins subject to critical conditions of overdraft.

Jan 1, 2016
DWR adopts regulations to revise basin boundaries.

Apr 1, 2016
Adjudicated basins submit final judgment to DWR and begin submitting annual reports to DWR.

Jun 1, 2016
DWR adopts regulations for evaluating and implementing GSPs and coordination agreements and DWR adopts regulations for evaluating alternatives to GSPs.

Dec 31, 2016 *
DWR publishes report on water available for groundwater replenishment.

2017
DWR publishes Bulletin 118- Interim Update with updated Basin Boundaries, updated Basin Prioritization, and reissues (as needed) basins subject to critical conditions of overdraft.

Jan 1, 2017 *
DWR publishes BMPs for sustainable management of groundwater.

Jan 1, 2017
Alternative to a GSP due to DWR.

Jun 30, 2017
Establish GSAs (or equivalent) for all high and medium priority basins.

Jul 1, 2017
County must affirm or disaffirm responsibility as GSA if no GSA has been established.

2020
DWR publishes Bulletin 118- Comprehensive Update.

Jan 31, 2020
High and medium priority basins identified subject to critical conditions of overdraft must be managed under a GSP.

On April 1 following GSP adoption and annually thereafter, GSAs provide report on progress towards sustainability to DWR.

Jan 31, 2022
All other high and medium priority basins must be managed under a GSP.

On April 1 following GSP adoption and annually thereafter, GSAs provide report on progress towards sustainability to DWR.

2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2025

Jun 30, 2017
Board may hold a hearing to designate a basin as "probationary" if a GSA or approved alternative is not established.

Jul 1, 2017
Board adopts a fee schedule for "state back-stop" related costs.

Dec 15, 2017
Board begins collection of annual reports from persons extracting more than two acre feet per year from areas not managed by a GSA.

Jan 1, 2018
Board may begin to develop interim plans if a local agency has not remedied the deficiency that resulted in the "probationary basin" status. The Board consults with DWR.

Probationary basins may petition for un-designation. The Board consults with DWR to determine if the petition is complete. The Board acts on the petition within 90 days of submittal.

Jan 31, 2020
Board may hold a hearing to designate a critically-overdrafted basin as "probationary" if DWR, in consultation with the Board, determines that the GSP is inadequate or will not achieve sustainability.

Jan 2021
Board may begin developing interim plans for critically overdrafted "probationary basins" one year after the probationary designation, if the Board, in consultation with the DWR, determines that a local agency has not remedied the deficiency that resulted in the probationary status.

Jan 31, 2022
Board may hold a hearing to designate a high and medium priority basin as "probationary" if DWR, in consultation with the Board, determines that the GSP is inadequate or will not achieve sustainability.

Jan 1, 2025
Board may designate a basin as "probationary" if DWR, in consultation with the Board, determines that the GSP is inadequate or not being implemented correctly, and the Board determines that the basin is in a condition where groundwater extractions result in significant depletion of interconnected surface waters.

- Water Board Action
- DWR Action
- Joint Water Board and DWR Action
- Local Action

GMP Groundwater Management Plan
GSA Groundwater Sustainability Agency
GSP Groundwater Sustainability Plan
BMPs Best Management Practices
* Elements to be documented in Bulletin 118 Updates
** Basin prioritization will be updated prior to each Bulletin 118 Update (estimated to be every 5 years)

October 2014

Appendix K: Minutes of the April 18 2016 Task Force on the Environment

City of Santa Monica 2015 Urban Water Management Plan

City of Santa Monica
Task Force on the Environment
Regular Meeting
Monday, April 18, 2016 - 7:00 p.m.

Task Force members in attendance: Mark Gold, Bill Selby, David Pettit, Rob Lempert, and Erik Neandross

Task Force members absent: Susan Mearns and David Hertz

City Staff in attendance: Suja Lowenthal, Getty Modica, Ed King, Gil Borboa, Rick Valte, Garrett Wong, Kim O'Cain and Shannon Parry

Community Members in attendance: Harvey Eder and Sharin Stinson-Ure

I. Call to Order & Roll Call

A regular meeting of the Task Force on the Environment was called to order by Task Force Chair Mark Gold at 7:07 pm, on Monday, April 18, 2016 at Virginia Avenue Park. Public input was permitted only on items listed on the Agenda.

II. Public Input on Agenda Items

No public input was provided.

III. Approval of Minutes from the February 22, 2016 Special Meeting Minutes

The Task Force unanimously approved the February 22, 2016 Special Meeting Minutes.

IV. Discussion and Recommendations Regarding Measure V

Rick Valte provided a summary of the past, current and future projects funded in part by Measure V, the storm water parcel tax, to improve the water quality of the Santa Monica Bay through innovative and collaborative best management practices. Current projects include the Marine Debris TMDL

Project, Los Amigos Park Retrofit, Marine Park Retrofit, Clean Beaches Project, and the Pier and Pico Kenter Improvement Project. Future projects include the Sustainable Water Infrastructure Project that is estimated to produce 1.5 million gallons of treated alternate water supplies to offset potable water supplies. After discussion, the Task Force requested a future presentation on the proposed Sustainable Water Infrastructure Project.

V. Discussion and Recommendations Regarding Big Blue Bus Alternative Fuel Fleet

Ed King, Director of Transit Services, introduced the item and Getty Modica, Transit Maintenance Officer, provided a summary of the Big Blue Bus's (BBB) roadmap to achieve zero emissions by 2040 through a combination of using renewable natural gas, retrofitting existing coaches using off the shelf-technology, and purchasing new coaches that will emit little to no emissions, such as electric buses.They reported that this three-prong plan will minimize costs while maximizing emission reductions and does not require large infrastructure projects with specialized training and equipment for motor coach maintenance and repairs. By 2019, the Big Blue Bus estimates reductions in NOx emissions by 90.2% (approximately 300,000 pounds per year). By comparison, one retrofitted coach, running a full schedule for one year, will emit the same amount of NOx that one passenger car will emit going 10,000 miles in one year.

VI. Discussion and Recommendations Regarding Urban Water Management Plan

Gil Borboa provided a summary of the draft 2015 Urban Water Management Plan (UWMP). The UWMP is a 20-year water supply planning document required by the California Department of Water Resources every five years. This year's plan includes a new section on managing water supplies in response to climate change. The draft UWMP also includes an update on the City's compliance with the State's Water Conservation Act (SBx7-7), which

requires urban water retailers to reduce water use twenty percent by 2020. The City is currently achieving, and has gone beyond, its water reduction target of 123 gallons per capita per day (gpcd) and is at 113 gpcd.

Staff noted that the next public meeting will be held on May 4, 2016 at 6:00 pm at the Ken Edwards Center, and the public hearing will be held at the City Council meeting on May 24, 2016.

VII. Discussion and Recommendations Regarding Water Smart Pilot Projects

Kim O'Cain provided an update on the City's response to the drought, compliance with the State regulations to reduce use 20%, and reviewed the programs to support the community. As of March 2016, the City's cumulative water reduction is 20.6%. In addition, the City reached water self- sufficiency 59 out of 121 days by not importing any water. The City is currently providing 87% of its water from local groundwater supplies. The City is achieving its goals through a combination of policies, ordinances, enforcement, programs and incentives. In April 2016 the City will launch the MyWaterReport pilot project (also known as WaterSmart) which is a water customer engagement program that will provide 6,000 single-family water customers with water reports that compare their use to their neighbors and their water use allowance, as well as, provide specific recommendations for additional savings. Two hundred water customers will be included in a smart meter program that provides hour-by-hour water usage data and leak alerts.

VIII. Discussion and Recommendations Regarding Single-Use Carryout Bag Ban

No report was provided**.**

IX. Discussion and Recommendations Regarding Update on Climate Action and Adaptation

No discussions and recommendations were provided.

X. Discussion and Recommendations Regarding the Santa Monica Airport

No discussions and recommendations were provided.

XI. Discussion and Recommendations Regarding Metropolitan Water District and Local Water Self Reliance

No discussions and recommendations were provided

XII. Setting of Agenda for May 16, 2016 Regular Meeting

- Discussion and Recommendations Regarding the Urban Runoff Ordinance Update
- Discussion and Recommendations Regarding the Sustainable Water Infrastructure Plan
- Discussion and Recommendations Regarding the Sustainable City Plan Indicators and Targets
- Discussion and Recommendations Regarding Measure V
- Discussion and Recommendations Regarding Update on Climate Action and Adaptation
- Discussion and Recommendations Regarding the Fleet Management Division's Emissions Reduction Plan

XIII. Comments and Announcements

No comments and announcements were provided.

XIV. Adjourn

The meeting was adjourned at 9:08 pm.

Appendix L: Comments from the May 24 2016 Public Hearing on the 2015 UWMP

City of Santa Monica 2015 Urban Water Management Plan

Note: During the May 24th Public Hearing on the 2015 UWMP, there were no comments on the UWMP. Council adopted the UWMP by resolution, which is provided in Appendix A.

Appendix M: Written & Phoned Comments on the 2015 UWMP

City of Santa Monica 2015 Urban Water Management Plan

Add to 9A

RECEIVED
OFFICE OF THE
CITY CLERK

2016 MAY 24 AM 11:50

SANTA MONICA, CALIF.

MAY 24 2016

1462 Franklin St.

Santa Monica, CA

90404.

May 24, 2016

To Honourable Santa Monica City Council Members

Re Meeting 5/24/2016, Item 9A, City"s 2015 Urban Water Management Plan (UWMP)

I have read the plan and did some comparisons with the plan from 2010.

I found several items which I feel the plan omitted or under reported.

Currently the city has a goal of being more transparent and the points I make below could help to do that.

1. The 2010 UWMP stated population of the city was 91,000.

The 2010 UWMP estimated that the poulation in 2015 would be 91243, a gain of 243 people in 5 years or 49 people per year.

The 2015 UWMP states the population of the city is 93,283. Gain of 2,283 people or 457 people per year or TEN times the forcast.

The 2015 UWMP estimates the poulation of the city in 2020 will be 93,868 or a gain of 585 people or 117 per year.

In the 2015 UWMP section 1.4 notes updates from the 2010 UWMP. However nowhere in the update is the population growth noted or corrected.

The 2010 UWMP notes the estimated poulation in 2035 would be about 92,124. So as you see we have already surpassed the estimates 20 years early by 1000 people.

Thus I feel the 2015 report needs to correct the 2010 report's population numbers.

2. In the 2010 UWMP in section 1.7 Population it is noted that "since Santa Monica is a major commercial center the day time population is up to 200,000."

In the 2015 UWMP in section 1.8 Population it is noted that the exact same sentence notes " the daytime population of up tp 200,000."

In Santa Monica at a Glance FY 2011-13 Adopted Biennial Budget page 9 it states "Tourists, shoppers, and employees significantly boost the daytime poulation to an estimated 250,000 people.

In Santa Monica at a Glance FY 2013-15 Proposed Biennial Budget on page 13 the exact same statement is made about "Tourists, shoppers, and employees significantly boost the daytime population to an estimated 250,000 people.

This is 50,000 more people per day or a 25% increase of the city's daytime population and significantly increases water use.

Thus the correct population numbers need to be reported in the current UWMP.

3.In the 2015 UWMP in section 3.2.1 Imported Water it is stated "The city receives imported water from MWD in order to supplement its groundwater supplies and for blending needs to meet Federal and California Department of Health Standards."

Santa Monica is using blended water with our groundwater to meet government standards. The groundwater in section 3.2.2 is noted to have total disolved solids exceeding the secondary maximum contaminint level.

Thus how can Santa Monica's water be safe without blending water from MWD? If we obtain all our water from the groundwater by 2020 to meet the goal of being sustainable then the water must meet all government standards and the report does not state how this is to occur.

I am not able to attend tonight's meeting and hope this helps to make the report more accurate.

You will find the references made on the following pages.

Yours Sincerely

Linda Lancaster

LINDA LANCASTER

1.7 POPULATION

According to the most recent census figures, the current 2010 resident population of the City is approximately 91,000 persons. Since the City serves only 25 customers in the City of Los Angeles, the total service area population essentially equals that of the City. Thus, the total current resident population served by the City's water system is approximately 91,000 persons. Population is expected to expand very modestly with an annual growth rate of less than 1.0% annually over the next 25 years as shown in **Table 1.3** below.

Table 1.3
Population Projections
(MWD 2010 IRP Update)

Year	Estimated Population
2015	91,243
2020	91,487
2025	91,716
2030	91,928
2035	92,124

Since Santa Monica is a major commercial center for the region, the City has estimated daytime populations of up to 200,000 due in large part to the number of businesses and attractions located in the City.

1.8 WATER SYSTEM

Imported Water

The City's imported water supply is delivered through two 24-inch connections to MWD. MWD provides the City and the region with imported water via its Santa Monica, Sepulveda, and Culver City Feeder Systems. The City's connections with MWD are designated as SM-1 and SM-2. SM-1 is located at the Arcadia Water Treatment Facility and SM-2 is located at the Charnock Well Field; both in West Los Angeles. **Table 1.4** lists the capacities of the City's imported connections:

Table 1.4
Imported Connections with MWD

Description	Capacity (cfs)
SM-1	30
SM-2	25

Groundwater

The City receives groundwater from ten groundwater wells that pump water from the Santa Monica Basin. The City's wells are located in the Charnock, Arcadia, and Olympic Subbasins. The City's wells range in capacity from 1,100 gpm to 3,500 gpm as listed in **Section 2** (see **Table 2.3**).

Recycled Dry Weather Urban Runoff

The City receives dry weather urban runoff from its Pico-Kenter and Pier storm drains and treats it at its Santa Monica Urban Runoff Recycling Facility (SMURRF). The SMURRF has a capacity of 0.75 MGD and provides water treated at Title 22 levels to various commercial and landscape customers in the City.

Distribution System

The City distributes its water to its 17,000 service customers through a 250 mile network of distribution mains with pipelines sizes ranging from 6 to 36 inches. The water system consists of three pressure zones that provide sufficient water pressure to customers. The water service area and districting map are shown in **Figures 1.3** and **1.4** on the following pages.

the State of California and the LA region has undergone a several-year drought, rainfall has been much lower in the City. This is reflected in Table 1.3 below:

Table 1.3
Recent Climate Characteristics

Month	Rainfall (in)	ETo (in)
Feb '15	0.6	2.9
Mar '15	1.5	4.6
Apr '15	0.3	5.5
May '15	0.5	4.9
Jun '15	0.1	5.2
Jul '15	0.3	5.6
Aug '15	0.0	5.9
Sep '15	2.0	5.0
Oct '15	0.2	4.1
Nov '15	0.1	3.2
Dec '15	0.9	2.6
Jan '16	2.7	2.0
Totals:	8.9	51.3

As noted in the table, rainfall totals for January 2016 are back up to normal levels (2.7 inches). The City is expected to be in an El Nino year for 2016.

1.8 POPULATION

According to the most recent California Depth of Finance (CA DOF) figures, the current 2015 resident population of the City is approximately 93,283 persons. Since the City serves only 25 customers in the City of Los Angeles, the total service area population essentially equals that of the City. Thus, the total current resident population served by the City's water system is approximately 93,308 persons. Population is expected to expand very

modestly with an annual growth rate of less than 1.0% annually over the next 25 years as shown in Table 1.3 below.

Table 1.3
Population Projections
(Based on 0.12% Growth Rate* since 1990)

Year	Estimated Population
2020	93,868
2025	94,431
2030	94,998
2035	95,568
2040	96,141

*Per CA DOF Data

Despite the slow population growth rate, since Santa Monica is a major commercial and cultural center for the region, the City has estimated daytime populations of up to 200,000 due in large part to the number of businesses & attractions located in the City.

Figure 1.3: Daytime Visitors to Santa Monica

The large daytime populations places pressure on the City to supply adequate water to meet peeks in water demands.

1.9 WATER SYSTEM

The City distributes its water to its 17,000 service customers through a 250-mile network of distribution mains ranging in size from 6 to 36 inches. The water system consists of three pressure zones that provide

Santa Monica at a Glance

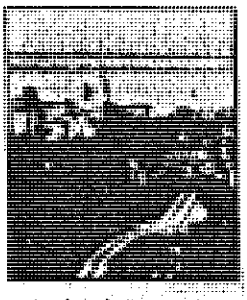
FY 2011-13 Adopted Biennial Budget

Santa Monica at a Glance

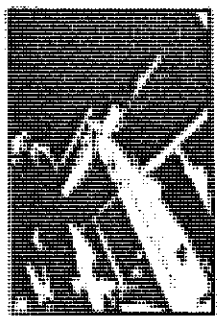
The Local Economy

Santa Monica has a strong, diverse economy. Local businesses are at the leading edge of the nation's creative economy and the center of sustainable innovation. Santa Monica offers Class A office space to global financial, marketing, entertainment, internet, and software development companies. Principal local employers are in the fields of education, municipal government, health care, policy and research (see http://santa-monica.webdev/finance/financial_operations/cafr/2009-10/0910_CAFR_-_final_for_web.pdf). Employers and employees are drawn to the area's cultural, artistic, and recreational amenities.

Tourism is a key piece of the local economy. Santa Monica attracts visitors from around the world as well as millions of day-trippers. Over 6 million people visit the City each year from outside Los Angeles County for pleasure, vacation, or business. These visitors spend over $1 billion annually generating retail sales and transient occupancy taxes for the City.



Nearly 12,000 jobs within the City are supported by the tourist industry. The City's 36 hotels, with more than 3,500 rooms, typically operate with occupancy rates in the high 70% range on an annual basis. Room rates are among some of the highest in Los Angeles County.



Retail plays a major role in Santa Monica's economy. Santa Monica is home to a number of distinctive shopping districts. In the heart of Downtown, the open-air Third Street Promenade and Santa Monica Place, a newly remodeled adjacent shopping mall, draw locals and visitors. South of the Civic Center are the Main Street and Pica Boulevard districts, with eclectic shops, art, antiques, exotic cuisines, performance venues, and fine dining. On the north end of town, numerous boutiques and trendy restaurants line Montana Avenue.

Tourists, shoppers, and employees significantly boost the daytime population to an estimated 250,000 people.

Schools and Health Care

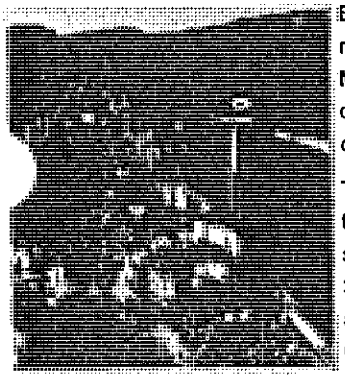
The highly-rated Santa Monica-Malibu Unified School District serves both Santa Monica and Malibu residents. The district's 2010 Growth Academic Performance Index (API) score was 844, well above the state target. There are ten elementary schools, two middle schools, three high schools and an alternative K-8 school in the district.

Santa Monica College (SMC), a two-year community college, serves 30,000 full-time and part-time students

Santa Monica at a Glance

FY 2013-15 Proposed Biennial Budget

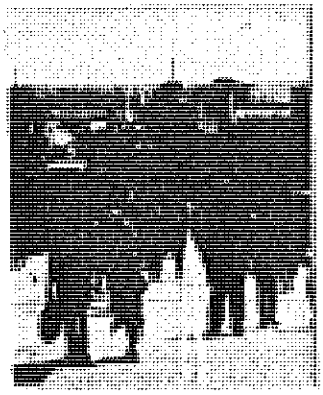
Santa Monica at a Glance



Employers and employees are drawn to the area's cultural, artistic, and recreational amenities. Tourism is a key piece of the local economy. Santa Monica attracts visitors from around the world as well as millions of day-trippers. Over six and a half million people visit the City each year from outside Los Angeles County for pleasure, vacation, or business.

These visitors spend over $1.3 billion annually, generating retail sales and transient occupancy taxes for the City. Nearly 12,000 jobs within the City are supported by the tourist industry. The City's 36 hotels, with more than 3,800 rooms, typically operate with occupancy rates above the 80% range on an annual basis. Room rates are among some of the highest in Los Angeles County.

Retail plays a major role in Santa Monica's economy. Santa Monica is home to a number of distinctive shopping districts. In the heart of Downtown, the open-air Third Street Promenade and Santa Monica Place draw locals and visitors. South of the Civic Center are the Main Street and Pico Boulevard districts, with eclectic shops, art, antiques, exotic cuisines, performance venues, and fine dining. On the north end of town, numerous boutiques and trendy restaurants line Montana Avenue.



Tourists, shoppers, and employees significantly boost the daytime population to an estimated 250,000 people.

Schools and Health Care

The highly-rated Santa Monica-Malibu Unified School District serves both Santa Monica and Malibu residents. The district's 2012 Growth Academic Performance Index (API) score was 859, well above the state target. There are ten elementary schools, two middle schools, three high schools and an alternative K-8 school in the district.

Santa Monica College (SMC), a two-year community college, serves 34,000 full-time and part-time students on several campuses and offers more than 90 fields of study. The college is the leader among the state's 112 community colleges in transferring students to the University of California, University of Southern California, and other four-year campuses.

Sana Monica is also home to two renowned and respected health facilities, Saint John's Health Center and

SECTION 3: WATER QUALITY

3.1 WATER QUALITY SUMMARY

In 1974, Congress passed the Safe Drinking Water Act in order to protect public health by regulating the nation's drinking water supply. As required by the Safe Drinking Water Act, the City provides annual Water Quality Reports to its customers. Currently, all of the water that the City distributes to its customers meet federal EPA standards and California Department of Health Services (CDHS) Standards.

The quality of water distributed to the City's water system is directly related to the quality of the supply sources from which the City obtains its water. This section explores the quality of the City's supply sources and examines important water contaminants that the City actively monitors as part of its efforts to supply safe drinking water to its customers

3.2 QUALITY OF SOURCES

3.2.1 Imported Water

The City receives imported water from MWD in order to supplement its groundwater supplies and for blending needs to meet Federal and CDHS standards. Imported water obtained from the SWP and the CRA contain specific contaminants which are characteristic of the Bay Delta and the Colorado River regions. Some of the contaminants of concern include: salinity, biological loads, disinfection by-products, percholorate, uranium, and arsenic. MWD's 2010 RUWMP discusses the water quality concerns of its supplies.

To provide safe drinking water to its customers, MWD treats its water supply at five (5) separate treatment plants, three of which blend a mixture of SWP and CRA water. Of the five plants that serve Southern California, the City has access to treated effluent from the Weymoth Treatment Plant via MWD's Middle Feeder pipeline.

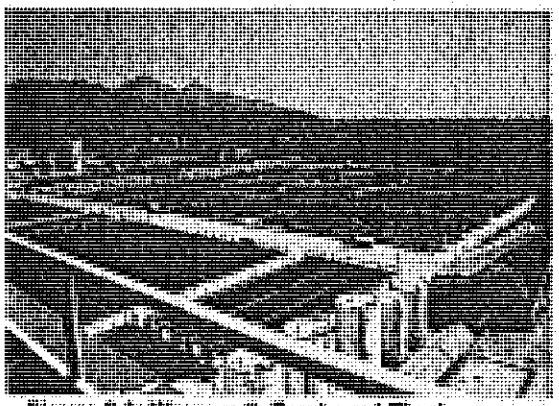


Figure 3.1: Weymouth Treatment Plant

Although MWD water meets all regulatory requirements, MWD understands the need for strong testing and quality assurance for its customers. Water is analyzed and tested at one central, state-of-the-art treatment facility in addition to five satellite laboratories at each treatment facility to ensure the quality and safety of its water.

3.2.2 Groundwater

Groundwater extracted from the Santa Monica Basin and its sub basins contains various levels of contaminants specific to the Basin which include, Total Dissolved Solids (TDS), Nitrate, Volatile Organic Compounds (VOCs), and methyl tertiary butyl ether (MTBE). Overall TDS concentrations in the Santa Monica Basin are typically high and exceed the secondary maximum contaminant level (MCL) of 500 mg/l in all three of the subbasins