City of Newport Beach

3300 Newport Blvd. • Newport Beach, CA 92663

2010 Urban Water Management Plan

May 2011

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Acronyms Used in the Report

20x2020	20% reduction by 2020
Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
Basin	Orange County Groundwater Basin
BDCP	Bay Delta Conservation Plan
BEA	Basin Equity Assessment
BMP	Best Management Practice
BPP	Basin Production Percentage
CDR	Center for Demographic Research
cfs	cubic feet per second
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
City	City of Newport Beach
CRA	Colorado River Aqueduct
CUP	Conjunctive Use Program
CUWCC	California Urban Water Conservation Council
DMM	Demand Management Measure
DWR	Department of Water Resources
EOCF #2	East Orange County Feeder #2
ETo	Evapotranspiration
FY	Fiscal Year
FYE	Fiscal Year Ending
GAP	Green Acres Project
GPCD	gallons per capita per day
gpm	gallons per minute
GWRS	Groundwater Replenishment System
HECW	High Efficiency Clothes Washer
HET	high efficiency toilet
HOA	Homeowners Association
IRP	Integrated Water Resources Plan
IWA	International Water Association
LOI	Letter of Intent
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MF	Microfiltration
MG	million gallons
MGD	million gallons per day
MOU	Memorandum of Understanding
MWDOC	Municipal Water District of Orange County
NBMC	Newport Beach Municipal Code
NDMA	N-nitrosodimethylamine
NOAA	National Oceanic and Atmospheric Administration
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
Poseidon	Poseidon Resources LLC

PPCP	Pharmaceuticals and Personal Care Product
PSA	Public Service Announcements
QSA	Quantification Settlement Agreement
RA	Replenishment Assessment
RHNA	Regional Housing Needs Assessment
RO	Reverse Osmosis
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SDCWA	San Diego County Water Authority
SOI	Sphere of Influence
SWP	State Water Project
TDS	Total Dissolved Solids
ULFT	ultra-low-flush toilet
UWMP	Urban Water Management Plan
WEROC	Water Emergency Response Organization of Orange County
WOCWBF #2	West Orange County Water Board Feeder #2
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	Water Surplus and Drought Management Plan

Executive Summary

This report serves as the 2010 update of the City of Newport Beach's (City) Urban Water Management Plan (UWMP). The UWMP has been prepared consistent with the requirements under Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act), which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. 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, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are due to DWR by August 1, 2011.

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. Water Conservation Act of 2009 or SBx7-7 enacted in 2009 is the water conservation component of the Delta package. It stemmed from the Governor's goal to achieve a 20% statewide reduction in per capita water use by 2020 (20x2020). SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015.

Service Area and Facilities

The City provides water to a population of approximately 67,000 throughout its 35.77 square mile service area. The City receives its water from two main sources, the Lower Santa Ana River Groundwater basin, which is managed by the Orange County Water District (OCWD) and imported water from the Municipal Water District of Orange County (MWDOC). Groundwater is pumped from 4 active wells located throughout the City, and imported water is treated at the Diemer Filtration Plant and is delivered to the City through six imported water connections.

Water Demand

Currently, the total water demand for retail customers served by the City is approximately 16,640 acre-feet annually consisting of 10,052 acre-feet of local groundwater and 432 acre-feet of recycled water. In the last five years, the City's water demand has decreased by about 5 percent while population has increased by 1.5 percent. This illustrates the City's proactive efforts in promoting water use efficiency. With its diligence in the promotion of water conservation as well as financial incentives to customers to retrofit their homes and businesses with water efficient devices and appliances, the City is

projecting a flattening demand trend in the next 25 years despite a projected 11 percent population growth.

With MWDOC's assistance, the City has selected to comply with **Option 1** of the SBx7-7 compliance options. The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. This regional alliance consists of 29 retail agencies in Orange County. Under Compliance Option 1, the City's 2015 interim water use target is 228.1 GPCD and the 2020 final water use target is **202.8 GPCD**.

Water Sources and Supply Reliability

The City's main source of water supply is groundwater from the Lower Santa Ana River Groundwater Basin and imported water from Metropolitan through MWDOC. Recycled water was recently added to the City's water supply portfolio. Today, the City relies on 60% groundwater, 37% imported, and 3% recycled water. It is projected that by 2035, the water supply mix will remain roughly the same. The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035.

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. Metropolitan's 2010 RUWMP finds that Metropolitan is able to meet full service demands of its member agencies with existing supplies from 2015 through 2035 during normal years, single dry year, and multiple dry years. The City is therefore capable of meeting the water demands of its customers in normal, single dry, and multiple dry years between 2015 and 2035, as illustrated in Table 3-12, Table 3-13, and Table 3-14, respectively.

Future Water Supply Projects

Potential recycled water users are locations where recycled water could replace potable water use. These potential users are typically landscape or agricultural irrigation systems, or possibly water users. However, due to the limited access to the project mains and some financial impact on end users, it is not feasible to distribute all of the potential recycled water, and the City does not predict that there will be many other end users in the near future.

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC, including one specifically that may benefit the City. On January 20, 2010, the City signed a non-binding LOI for 7.1 MGD (8,000 AFY) of Huntington Beach Seawater Desalination Project supplies.

1. Introduction

1.1. Urban Water Management Plan Requirements

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (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, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are due to DWR by August 1, 2011.

This UWMP provides DWR with information on the present and future water resources and demands and provide an assessment of the City's water resource needs. Specifically, this document will provide water supply planning for a 25-year planning period in 5-year increments. The plan will identify water supplies for existing and future demands, quantify water demands during normal year, single-dry year, and multiple-dry years, and identify supply reliability under the three hydrologic conditions. The City's 2010 UWMP update revises the 2005 UWMP. This document has been prepared in compliance with the requirements of the Act as amended in 2009, and includes the following analysis:

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

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. Water Conservation Act of 2009 or SBx7-7, enacted in 2009, is the water conservation component of the historic Delta package. It stemmed from the Governor's goal to achieve a 20% statewide reduction in per capita water use by 2020 (20x2020). SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015. Each urban retail water supplier must include in its 2010 UWMPs the following information from its target-setting process:

- Baseline daily per capita water use
- 2020 Urban water use target
- 2015 Interim water use target
- Compliance method being used along with calculation method and support data

Wholesale water suppliers are required to include an assessment of present and proposed future measures, programs, and policies that would help achieve the 20 by 2020 goal.

The other recent amendment made to the UWMP Act to be included in the 2010 UWMP is set forth by SB 1087, Water and Sewer Service Priority for Housing Affordable to Low-Income Households. SB 1087 requires water and sewer providers to grant priority for service allocations to proposed developments that include low income housing. SB 1087 also requires UWMPs to include projected water use for single- and multi-family housing needed for low-income households.

The sections in this Plan correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the City's water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included as Appendix A.

Figure 1-1: Regional Location of Urban Water Supplier

1.2. Agency Overview

The City is located in Orange County, California. It serves a population of approximately 67,000 within a 35.77 square mile through 26,300 service connections. The City supplies groundwater, imported water, and recycled water to its customers. Groundwater is produced from local groundwater wells managed by OCWD and imported water is purchased from MWDOC, the regional wholesale water supplier of Orange County who in turn purchases imported water from northern California and the Colorado River through Metropolitan. The City purchases recycled water from OCWD. Today, the total water demand for the City is approximately 17,000 acre-feet annually consisting of 16,500 acre-feet of potable water and 450 acre-feet of recycled water. Due to its active efforts in promoting water conservation and water use efficiency to residents, the City is projecting a flattening demand trend in the next 25 years despite a projected 11 percent population growth.

The City Council operates under a Council-Manager format of government. Its seven City Council Members are elected by district, but voted on by the population as a whole. The current City Council members are:

- Michael F. Henn, Mayor
- Steven Rosansky
- Rush N. Hill, II
- Leslie Daigle
- Edward D. Selich
- Nancy Gardner, Mayor Pro Tem
- Keith D. Curry

The City receives its water from two main sources, the Lower Santa Ana River Groundwater basin, which is managed by the Orange County Water District (OCWD) and imported water from the Municipal Water District of Orange County (MWDOC). MWDOC is Orange County's wholesale supplier and is a member agency of the Metropolitan Water District of Southern California (Metropolitan).

1.3. Service Area and Facilities

1.3.1. Newport Beach's Service Area

Located along the Orange County coast of Southern California, the City is bounded to the west by the Pacific Ocean. To the north, south, and east, the City is surrounded by the cities of Huntington Beach, Laguna Beach, Irvine and Costa Mesa.

The water service area is entirely within the City's boundaries, and covers approximately 35.77 square miles. A map of the City's service area is shown in Figure 1-2. The City serves a population of approximately 67,000 through 26,300 service connections. The

City supplies groundwater, imported water, and recycled water to its residential and commercial customers. The City does not supply water to any agency customers.

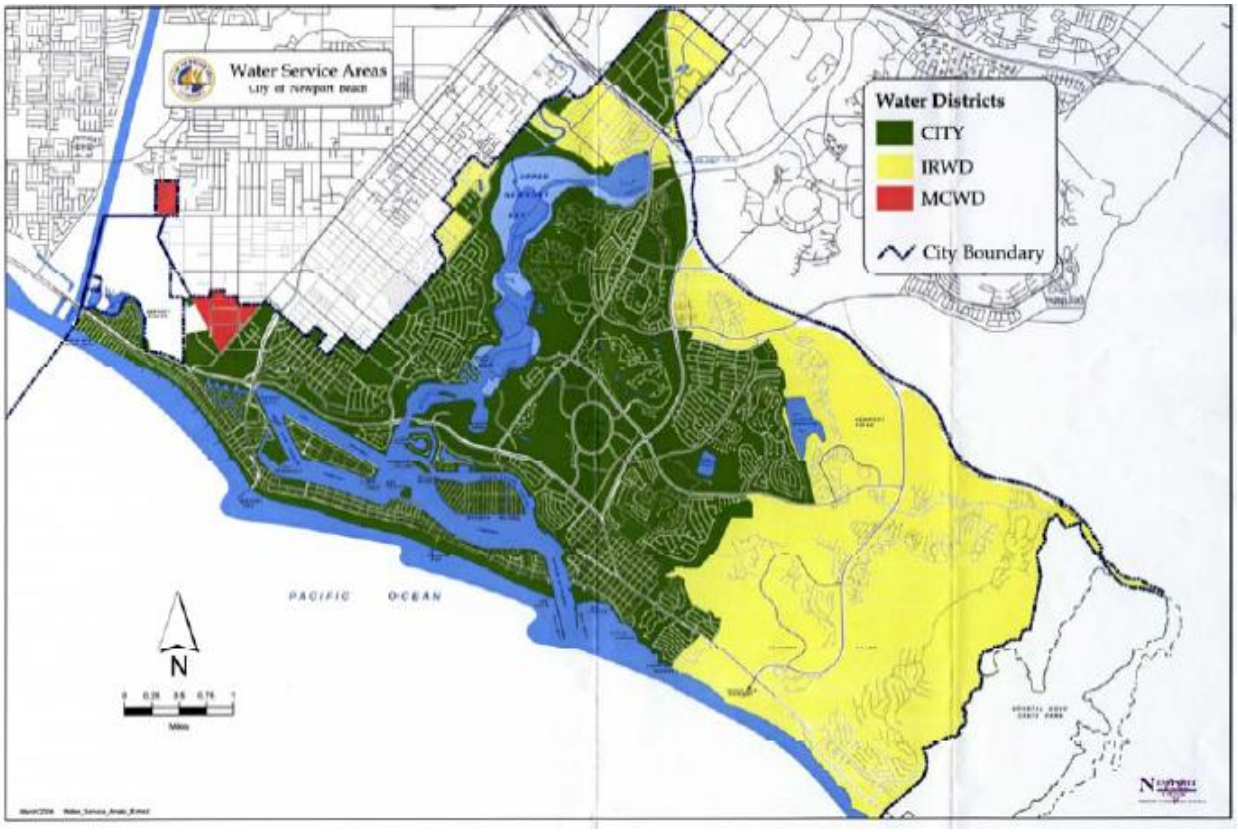

Figure 1-2: City of Newport Beach's Service Area

1.3.2. Newport Beach's Water Facilities

Imported Water Supply Facilities

MWDOC provides imported water to the City. MWDOC receives its water from Metropolitan. Most of Metropolitan's imported water supply is provided through the State Water Project (SWP) and Colorado River Aqueduct (CRA) and is treated at the Diemer and Weymouth plants. A large groundwater supply is also available, as described in Section 3.3. The use of this supply is regulated by the Basin Pumping Percentage (BPP) as set by the Orange County Water District (OCWD).

All of the water supplied by the City is sold to its retail customers (residential and commercial). The City maintains its own retail distribution system. The City delivers potable water through its water system which consists of approximately 284 miles of pipelines ranging in size from 4-inch to 30-inch with various pipe materials. The City has an extensive distribution system, which includes five pressure zones and six connections

along the Orange County Feeder and the East Orange County Feeder No. 2. The total available capacity is 104 cfs. The City has five pump stations which deliver water to the upper zones, and backup generation facilities ensure that the City can still deliver water to all zones during a rolling blackout.

Groundwater Facilities

In addition to surface water, the City receives a large percentage of its supply from groundwater. Groundwater is pumped from four wells within the City of Fountain Valley and travels through over 6 miles of the 30-inch Groundwater Transmission Main in Fountain Valley, Huntington Beach, and Costa Mesa. In addition, a pump station, a treatment facility, and a 3-MG reservoir assist in the transmission and treatment effort. The City meets up to 62 percent of its demand through groundwater, under regulations of OCWD's BPP.

Recycled Water Facilities

Through an agreement with the OCWD, the City purchases between 300 and 800 acre-feet per year (AFY) of recycled water for some large irrigation users. The City has no capability of treating water to produce reclaimed water, but OCWD has an elaborate system. The City began serving recycled water in 1999. OCWD provides water through the Green Acres Project, which has the capability to delivery up to 1,000 AFY. The City has investigated future sites or locations for reclaimed water, but there are limitations to the availability of reclaimed connections. The City is looking into the possibility of inter-district reclaimed water transfers to provide reclaimed water to some associations and recreation facilities.

Water Transmission System

Water is delivered to the City's customers from the Groundwater Transmission Main, and from diversions off of the Orange County Feeder and the East Orange County Feeder No. 2. The transmission system consists of pipelines, booster pump stations, and storage tanks. The current capacity of the City's potable water supply is 104 cfs.

2. Water Demand

2.1. Overview

Currently, the total water demand for retail customers served by the City is approximately 16,640 acre-feet annually consisting of 10,052 acre-feet of local groundwater and 432 acre-feet of recycled water. In the last five years, the City's water demand has decreased by about 5 percent while population has increased by 1.5 percent. This illustrates the City's proactive efforts in promoting water use efficiency. With its diligence in the promotion of water conservation as well as financial incentives to customers to retrofit their homes and businesses with water efficient devices and appliances, the City is projecting a flattening demand trend in the next 25 years despite a projected 11 percent population growth.

The passage of SBx7-7 will increase efforts to reduce the use of potable supplies in the future. This new law requires all of California's retail urban water suppliers serving more than 3,000 AFY or 3,000 service connections to achieve a 20 percent reduction in demands (from a historical baseline) by 2020. Due to great water conservation efforts in the past decade, the City is on its way to meeting this requirement on its own. Moreover, the City has elected to join the Orange County 20x2020 Regional Alliance. The City together with 28 other retail agencies in Orange County are committed to reduce the region's water demand by 2020 through the leadership of MWDOC, the region's wholesale provider.

This section will explore in detail the City's current water demands by customer type and the factors which influence those demands as well as providing a perspective of its expected future water demands for the next 25 years. In addition, to satisfy SBx7-7 requirements, this section will provide details of the City's SBx7-7 compliance method selection, baseline water use calculation, and its 2015 and 2020 water use targets.

2.2. Factors Affecting Demand

Water consumption is influenced by many factors from climate characteristics of that hydrologic region, to demographics, land use characteristics, and economics. The key factors affecting water demand in the City's service area are discussed below.

2.2.1. Climate Characteristics

The City is located in Southern California's coastal plain where the climate is characteristically Mediterranean, with mild year-round temperatures, sunny days, and cool evenings. The average summer and winter temperatures are 75°F and 65°F,

respectively, and the average annual rainfall is just under 12 inches (Table 2-1). The average Evapotranspiration (ETo) is almost 50 inches per year which is four times the annual average rainfall. This translates to a high demand for landscape irrigation for homes, commercial properties, parks, and golf courses. Moreover, a region with low rainfall like Southern California is also more prone to droughts.

Table 2-1: Climate Characteristics

	Standard Monthly Average ETo (inches) [1]	Annual Rainfall (inches) [2]	Average Temperature (˚F) [3]
Jan	2.18	2.60	55.9
Feb	2.49	2.54	56.7
Mar	3.67	2.25	57.4
Apr	4.71	0.70	59.5
May	5.18	0.18	61.7
Jun	5.87	0.08	64.3
Jul	6.29	0.02	67.3
Aug	6.17	0.09	68.7
Sep	4.57	0.30	68.1
Oct	3.66	0.28	65.1
Nov	2.59	1.02	60.0
Dec	2.25	1.59	56.1
Annual	**49.63**	**11.65**	**61.7**

[1] CIMIS Station #75, Irvine, California from October 1987 to Present
[2] NOAA, Newport Beach Harbor, California 1971 to 2000, Mean Precipitation Total
[3] NOAA, Newport Beach Harbor, California 1971 to 2000, Mean Temperature

The source of the City's imported water supplies, the State Water Project and Colorado River Project, is influenced by weather conditions in Northern California and along the Colorado River. Both regions have recently been suffering from multi-year drought conditions and record low rainfalls which directly impact demands and supplies to Southern California.

2.2.2. Demographics

The City serves a population of 67,030. The population within the City's service area is expected to increase by 11 percent in the next 25 years, or 0.44 percent annually. Table 2-2 shows the population projections for the next 25 years based on the California State University at Fullerton, Center for Demographic Research (CDR) projections. Due to proactive water conservation efforts, future water demands are expected to increase at a much lower rate compared to the population growth.

Table 2-2: Population – Current and Projected

	2010	2015	2020	2025	2030	2035
Service Area Population [1]	67,030	68,478	69,926	71,375	72,823	74,271

[1] Center for Demographic Research, California State University, Fullerton 2010

Other demographic factors that also play a role in influencing demands include recreation and tourism which is an important industry in the City. Tourism affects seasonal demands with higher demands in the summer especially at beach facilities as well as hotels and restaurants.

Over 50 percent of the City's residents are employed in professional, managerial, and administrative occupations. The median age of City residents is 40 years, and the median household income is estimated at about $110,500 per year[1]. The average household is 2.8 persons per dwelling unit.

2.2.3. Land Use

Land use within the City's service area is characterized as mostly suburban, and the City is almost built-out.

Most recently, the City approved a 401-acre Newport Banning Ranch development project located within the City's Coastal Zone. The development will comprise of approximately 252 acres of open space and development of up to 1,375 residential dwelling units, 75,000 square feet of commercial area, a 75 room resort inn, and approximately 52 acres of parks. Approximately 40 acres of the project site are located within the City limits and approximately 361 acres are located outside the city limits but within the City's Sphere of Influence (SOI). An annexation and a boundary adjustment will be coordinated through the Local Agency Formation Commission to extend the City limits to include portion of the project site currently within the SOI and to extend the City's water service area to provide water to the entire project site. The estimated total average annual water demand from this development is 613.5 acre-feet[2]. Implementation of this project would be subject to compliance with the water conservation requirements of Newport Beach Municipal Code (NBMC). NBMC requires water efficiency design standards be incorporated into the landscape and irrigation plans as well as other indoor conservation measures including use of low water usage appliances and waterless urinals in public men's restrooms.

[1] 2007 American community Survey
[2] Newport Banning Ranch Water Supply Assessment, City of Newport Beach (October 12, 2010)

2.3. Water Use by Customer Type

The knowledge of an agency's water consumption by type of use or by customer class is key to developing that agency's water use profile which identifies when, where, how, and how much water is used, and by whom within the agency's service area. A comprehensive water use profile is critical to the assessment of impacts of prior conservation efforts as well as to the development of future conservation programs.

This section provides an overview of the City's water consumption by customer type in 2005 and 2010, as well as projections for 2015 to 2035. The customer classes are categorizes as follows: single-family residential, multi-family residential, commercial/industrial/institutional (CII), dedicated landscape, and agriculture. Other water uses including sales to other agencies and non-revenue water are also discussed in this section.

2.3.1. Overview

The City has maintained approximately 26,361 customer connections to its potable water distribution system since 2005. The City is expected to maintain the same numbers of connections through to at least 2015. After that the City is projecting a 5 percent increase by the year 2020 remaining through to 2035. All connections in the City's service area are metered.

Approximately 60 percent of the City's water demand is residential. Commercial/industrial and dedicated landscape sectors each consume approximately 20 percent of the City potable water supply. A small portion of the City's demand is from government/institutional establishments such as municipal buildings and hospitals. The City does not provide any sales to agriculture, nor other agencies, saline water intrusion barriers, groundwater recharge, or conjunctive use. A 4 percent increase in water demand between 2010 and 2035 is anticipated for the City's service area while population is projected to increase by 11 percent over the same period.

Tables 2-3 and 2-4 provide a summary of past, current, and projected water use by customer class and the number of water service customers by sector in five-year increments from 2005 through to 2035.

Table 2-3: Past, Current and Projected Service Accounts by Water Use Sector

Fiscal Year Ending	Number of Accounts by Water Use Sector					
	Single Family	Multi-Family	Commercial /Industrial	Institutional	Landscape	Total Accounts
2005	18,595	4,065	1,273	571	983	**25,487**
2010	19,230	4,198	1,319	596	1,018	**26,361**
2015	19,653	4,292	1,348	609	1,041	**26,943**
2020	20,068	4,382	1,377	622	1,063	**27,512**
2025	20,486	4,473	1,405	635	1,085	**28,084**
2030	20,900	4,564	1,434	648	1,107	**28,653**
2035	21,316	4,655	1,462	661	1,129	**29,223**

Table 2-4: Past, Current and Projected Water Demand by Water Use Sector

Fiscal Year Ending	Water Demand by Water Use Sectors (AFY)					
	Single Family	Multi-Family	Commercial /Industrial	Institutional	Landscape	Total Demand
2005	7,482	2,597	3,300	734	3,719	**17,831**
2010	7,297	2,308	2,960	370	3,710	**16,645**
2015	7,258	2,300	2,947	378	4,140	**17,023**
2020	7,411	2,348	3,009	386	4,268	**17,422**
2025	7,565	2,397	3,072	394	4,346	**17,774**
2030	7,718	2,446	3,134	402	4,424	**18,124**
2035	7,872	2,494	3,196	410	4,502	**18,474**

2.3.2. Residential

Residential water use accounts for the majority of the City's water demands. The single family residential sector accounts for approximately 44 percent and multi-family residential accounts for 14 percent of the total water demand. The remaining demands are for the non-residential sector and system losses. Water consumption by the residential sector is projected to remain at about 58 percent through the 25-year planning horizon.

2.3.3. Non-Residential

The City has a mix of commercial uses (markets, restaurants, etc.), public entities (such as schools, fire stations and government offices), office complexes, light industrial, warehouses and facilities serving the public. In 2010 non-residential demand was approximately 42 percent of the overall demand and is expected to remain so through 2035. Commercial, industrial, and institutional (CII) uses (excluding large landscape) represent a combined 20 percent of the City's total demand. Demands from large

landscapes such as parks and golf courses are expected to remain at around 22 percent of the City's total water demands for the next 25 years.

2.3.4. Other Water Uses

2.3.4.1. Sales to Other Agencies

While the City does sell water outside of its service area, the City does not sell water to other agencies.

2.3.4.2. Non-Revenue Water

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

The City's non-revenue water accounts for about 6 percent of the City's total demand (Table 2-5).

Table 2-5: Additional Water Uses and Losses (AFY)

Water Use	Fiscal Year Ending						
	2005	2010	2015	2020	2025	2030	2035
Saline Barriers							
Groundwater Recharge							
Conjunctive Use							
Raw Water							
Recycled Water							
Unaccounted-for System Losses	925	990	1,078	1,082	1,085	1,099	1,108
Total	**925**	**990**	**1,078**	**1,082**	**1,085**	**1,099**	**1,108**

2.4. SBx7-7 Requirements

2.4.1. Overview

SBx7-7, which became effective on February 3, 2010, is the water conservation component to the Delta legislative package. It seeks to implement Governor Schwarzenegger's 2008 water use reduction goals to achieve a 20% statewide reduction in urban per capita water use by December 31, 2020. As discussed above, the bill requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015. The bill establishes methods for urban retail water suppliers to determine targets to help achieve water reduction targets. The

retail water supplier must select one of the four compliance options. The retail agency may choose to comply to SBx7-7 as an individual or as a region in collaboration with other water suppliers. Under the regional compliance option, the retail water supplier still has to report the water use target for its individual service area. The bill also includes reporting requirements in the 2010, 2015, and 2020 UWMPs. An agency that does not comply with SBx7-7 requirement will not be eligible for a water grant or loan from the state on and after July 16, 2016.

2.4.2. SBx7-7 Compliance Options

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

- *Option 1* requires a simple 20% reduction from the baseline by 2020 and 10 percent by 2015.
- *Option 2* employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics
    - Residential indoor water use of 55 GPCD
    - Landscape water use commiserate with Model Landscape Ordinance
    - 10 percent reduction in baseline CII water use
- *Option 3* is to achieve 95% of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
- *Option 4* requires the subtraction of Total Savings from the Base GPCD:
    - Total Savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

Newport Beach's Compliance Option Selection

With MWDOC's assistance in the calculation of the City's base daily per capita use and water use targets, the City has selected to comply with **Option 1**.

While each retail agency is required to choose a compliance option in 2010, DWR allows for the agency to change its compliance option in 2015. This will allow the City to determine its water use targets for Compliance Option 2 and 4 as it anticipates more data to be available for targets calculation in the future.

2.4.3. Regional Alliance

Retail agencies can choose to meet the SBx7-7 targets on its own or several retail agencies may form a regional alliance and meet the water use targets as a region. The benefit for an agency that joins a regional alliance is that it has multiple means of meeting compliance.

The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. This regional alliance consists of 29 retail agencies in Orange County as described in MWDOC's 2010 RUWMP. The Regional Alliance Weighted 2015 target is 174.1 GPCD and 2020 target is 156.5 GPCD.

2.4.4. Baseline Water Use

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

Recycled water use represents less than 10% of the City's retail delivery in 2008; therefore, a 10-year instead of a 15-year rolling average was calculated. The City's baseline water use is **253.5 GPCD** which was obtained from the 10-year period July 1, 1995 to June 30, 2005.

Tables 2-6 and 2-7 provide the base period ranges used to calculate the baseline water use for the City as well as the service area population and annual water use data which the base daily per capita water use was derived. Data provided in Table 2-6 was used to calculate the continuous 10-year average baseline GPCD. Moreover, regardless of the compliance method adopted by the City, it will need to meet the minimum water use target of 5% reduction from a five-year baseline as calculated in Table 2-7. Because the City is an OCWD agency, the City's gross water use includes deductions for indirect potable recycled water use from the Groundwater Replenishment System (GWRS) and Water Factory 21 managed by OCWD. The calculations for the gross water use are described in MWDOC's 2010 RUWMP.

Table 2-6: Base Daily per Capita Water Use – 10-year range

Highest Available Baseline [1]	Beginning	Ending
10 Year Avg	July 1, 1995	June 30, 2005

Fiscal Year Ending	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
1996	60,709	15,967,145	263
1997	61,277	16,814,358	274
1998	61,896	15,921,266	257
1999	62,514	16,976,611	272
2000	64,923	16,865,461	260
2001	66,033	16,197,012	245
2002	66,495	16,062,298	242
2003	66,734	16,083,658	241
2004	65,500	15,985,387	244
2005	65,993	15,630,375	237
		Base Daily Per Capita Water Use:	253.5

[1] The most recent year in base period must end no earlier than December 31, 2004, and no later than December 31, 2010. The base period cannot exceed 10 years unless at least 10 percent of 2008 retail deliveries were met with recycled water.

Table 2-7: Base Daily per Capita Water Use – 5-year range

Highest Available Baseline [2]	Beginning	Ending
5 Year Avg	July 1, 2003	June 30, 2008

Fiscal Year Ending	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
2004	65,500	15,985,387	244
2005	65,993	15,630,375	237
2006	65,962	15,616,451	237
2007	66,067	16,677,329	252
2008	66,451	16,038,474	241
		Base Daily Per Capita Water Use:	242.3

[2] The base period must end no earlier than December 31, 2007, and no later than December 31, 2010.

2.4.5. SBx7-7 Water Use Targets

Under Compliance Option 1, the simple 20 percent reduction from the baseline, the City's 2015 interim water use target is 228.1 GPCD and the 2020 final water use target is **202.8 GPCD** as summarized in Table 2-8.

Table 2-8: Preferred Compliance Option and Water Use Targets

	Baseline	2015 Target	2020 Target
Option 1 - Simple 20% Reduction	253.5	228.1	202.8

2.5. Demand Projections

2.5.1. 25-Year Projections

One of the main objectives of this UWMP is to provide an insight into the City's future water demand outlook. Currently, the City's total water demand is 16,645 acre-feet comprising of 60% local groundwater, 37% imported water, and 3% recycled water. As illustrated in Table 2-9, the City's water demand is expected to increase by 11% in the next 25 years to 18,474 acre-feet by 2035.

Table 2-9: Current and Projected Water Demands (AFY)

Water Supply Sources	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
MWDOC (Imported Treated Full Service (non-int.))	6,161	6,298	6,430	6,564	6,697	6,830
BPP Groundwater	10,052	10,275	10,492	10,710	10,927	11,144
Recycled Water	432	450	500	500	500	500
Total	**16,645**	**17,023**	**17,422**	**17,774**	**18,124**	**18,474**

The City's 25-year demand projections for imported water shown in Table 2-10 are based on the projections provided by the City to MWDOC. As the regional wholesale supplier of Orange County, MWDOC works in collaboration with each of its member agencies as well as with Metropolitan, its wholesaler, to develop demand projections for imported water.

Table 2-10: Newport Beach's Demand Projections Provided to Wholesale Suppliers (AFY)

Wholesaler	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
MWDOC	6,298	6,430	6,564	6,697	6,830

2.5.2. Low Income Household Projections

One significant change to the UWMP Act since 2005 is the requirement for retail water suppliers to include water use projections for single-family and multifamily residential housing needed for lower income and affordable households. This requirement is to assist the retail suppliers in complying with the requirement under Section 65589.7 of the Government Code that suppliers grant a priority for the provision of service to housing

units affordable to lower income households. A lower income household is defined as a household earning 80% of the County of Orange's median income or less.

In order to identify the planned lower income housing projects within its service area, DWR[3] recommends that retail suppliers may rely on Regional Housing Needs Assessment (RHNA) or Regional Housing Needs Plan information developed by the local council of governments, the California Department of Housing and Community Development.

The RHNA is an assessment process performed periodically as part of Housing Element and General Plan updates at the local level. Regional Council of Governments in California are required by the State Housing Element Law enacted in 1980 to determine the existing and projected regional housing needs for persons at all income levels. The RHNA quantifies the need for housing by income group within each jurisdiction during specific planning periods. The RHNA is used in land use planning, to prioritize local resource allocation and to help decide how to address existing and future housing needs. The RHNA consists of two measurements: 1) existing need for housing, and 2) future need for housing.

The current RHNA planning period is January 1, 2006 to June 30, 2014 completed by the Southern California Association of Governments (SCAG) in 2007. The next RHNA which will cover the planning period of January 1, 2011 to September 30, 2021 is not expected to be completed until fall of 2012; therefore, the 2007 RHNA will be used for the purpose of this 2010 UWMP.

Based on the 2007 Final Regional Housing Need Allocation Plan[4], the projected housing need for low and very low income households (hereafter referred to as low-income) in the City of Newport Beach are 18.0% and 22.0%, respectively or 40.0% combined.

Therefore, from inference, it is estimated that approximately 40.0% of the projected water demands within the City's service area will be for housing needed for low income households. Table 2-11 provides a breakdown of the projected water needs for low income single family and multifamily units. The projected water demands shown here represent 40.0% of the projected water demand by customer type for single-family and multifamily categories provided in Table 2-4 above. For example, the total single family residential demand is projected to be 7,258 AFY in 2015 and 7,872 AFY in 2035. The projected water demands for housing needed for single family low income households are 2,903 and 3,149 AFY for 2015 and 2035, respectively.

[3] California Department of Water Resources, Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP, Final (March 2011)
[4] Southern California Association Governments, Final Regional Housing Need Allocation Plan for Jurisdictions within the Six County SCAG Region (July 2007)

Table 2-11: Projected Water Demands for Housing Needed for Low Income Households (AFY)

Water Use Sector	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
Total Retail Demand	17,023	17,422	17,774	18,124	18,474
Total Residential Demand	9,558	9,759	9,962	10,164	10,366
Total Low Income Households Demand	***3,823***	***3,904***	***3,985***	***4,066***	***4,146***
SF Residential Demand - Total	7,258	7,411	7,565	7,718	7,872
SF Residential Demand - Low Income Households	***2,903***	***2,964***	***3,026***	***3,087***	***3,149***
MF Residential Demand - Total	2,300	2,348	2,397	2,446	2,494
MF Residential Demand - Low Income Households	***920***	***939***	***959***	***978***	***998***

3. Water Sources and Supply Reliability

3.1. Overview

The City's main source of water supply is groundwater from the Lower Santa Ana River Groundwater Basin and imported water from Metropolitan through MWDOC. Recycled water was recently added to the City's water supply portfolio. Today, the City relies on 60% groundwater, 37% imported, and 3% recycled water. It is projected that by 2035, the water supply mix will remain roughly the same.

The City works together with three primary agencies – Metropolitan, MWDOC, and OCWD to insure a safe and high quality water supply, which will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The imported water supply numbers shown here represent only the amount of supplies projected to meet demands and not the full supply capacity.

Local groundwater pumped from the City's wells is managed by OCWD. The Lower Santa Ana River Groundwater Basin is not adjudicated. In any given year, the amount of water which each City is allowed to pump out of the basin is based on the basin production percentage (BPP) established by OCWD. The OCWD sets the percentage of groundwater that an agency can pump based on their total potable water demand. The BPP fluctuates year by year but it is set uniformly for all Producers. Historically, BPP has ranged between approximately 60% to 80% depending on groundwater conditions, availability of recharge water supplies, and basin management objectives. For 2010/11, the BPP was set at 62 percent.[5] As illustrated in Figure 3-1, the BPP is assumed to remain at the conservative 62% level for the next 25 years. The remaining demand is projected to be met through imported water from Metropolitan/MWDOC and through a small portion of recycled water.

[5] The BPP was changed by OCWD in late April 2010 and effective July 2010 to 62 percent.

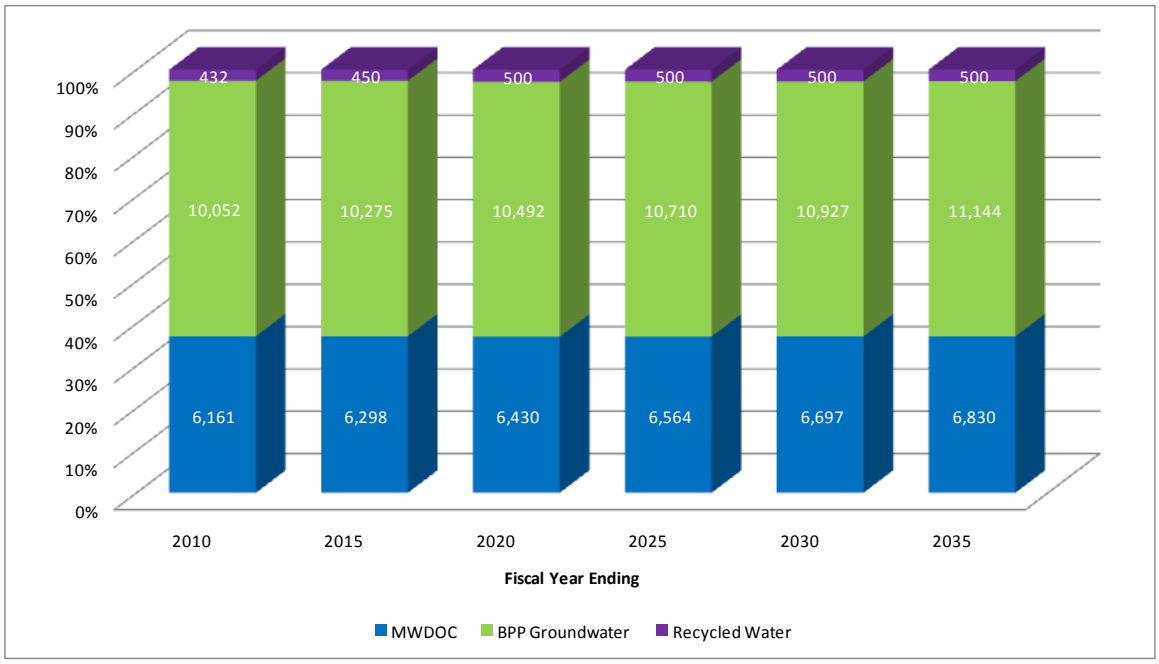

Figure 3-1: Current and Projected Water Supplies (AFY)

The following sections provide a detailed discussion of the City's three main water sources as well as projections to the City's future water supply portfolio for the next 25 years. Moreover, this compares projected supply and demand under various hydrological conditions to determine the City's supply reliability for the 25 year planning horizon. This section satisfies the requirements of § 10631 (b) and (c), and 10635 of the Water Code.

3.2. Imported Water

The City currently relies on 6,161 AFY of imported water wholesaled by Metropolitan through MWDOC to supplement local groundwater. Imported water represents approximately 37% of the City's total water supply. Metropolitan's principal sources of water originate from two sources - the Colorado River via the Colorado Aqueduct and the Lake Oroville watershed in Northern California through the State Water Project (SWP). This water is treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder. The AGENCY currently maintains six connections to the Metropolitan system along the Orange County Feeder and the East Orange County Feeder No. 2. The total available capacity is 104 cfs.

3.2.1. Metropolitan's 2010 Regional Urban Water Management Plan

Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP) reports on its water reliability and identifies projected supplies to meet the long-term demand within its service area. It presents Metropolitan's supply capacities from 2015 through 2035 under the three hydrologic conditions specified in the Act: single dry-year, multiple dry-years, and average year.

Colorado River Supplies

Colorado River Aqueduct supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements to transfer water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis.

State Water Project Supplies

Metropolitan's State Water Project (SWP) supplies have been impacted in recent years by restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008 and June 4, 2009, respectively. In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

State and federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay Delta Conservation Plan (BDCP), which is aimed at addressing the basic elements that include the Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed due to the Biological Opinions.

Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources. In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands.

Supply Reliability

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multi-year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply). For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992. Metropolitan's analyses are illustrated in Tables 3-1, 3-2, and 3-3 which correspond to Metropolitan's 2010 RUWMP's Tables 2-11, 2-9 and 2-10, respectively. These tables show that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry year hydrologies.

Table 3-1: Metropolitan Average Year Projected Supply Capability and Demands for 2015 to 2035

AverageYear
Supply Capability[1] and Projected Demands
Average of 1922-2004 Hydrologies
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,507,000	1,529,000	1,472,000	1,432,000	1,429,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,485,000**	**3,810,000**	**4,089,000**	**3,947,000**	**3,814,000**
Demands					
Firm Demands of Metropolitan	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,006,000**	**1,933,000**	**1,985,000**	**2,049,000**	**2,106,000**
Surplus	**1,479,000**	**1,877,000**	**2,104,000**	**1,898,000**	**1,708,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	382,000	383,000	715,000	715,000	715,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**588,000**	**689,000**	**1,051,000**	**1,051,000**	**1,051,000**
Potential Surplus	**2,067,000**	**2,566,000**	**3,155,000**	**2,949,000**	**2,759,000**

[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 water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers 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 3-2: Metropolitan Single-Dry Year Projected Supply Capability and Demands for 2015 to 2035

Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	522,000	601,000	651,000	609,000	610,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,416,000	1,824,000	1,669,000	1,419,000	1,419,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,457,000**	**2,782,000**	**2,977,000**	**2,823,000**	**2,690,000**
Demands					
Firm Demands of Metropolitan	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,171,000**	**2,162,000**	**2,201,000**	**2,254,000**	**2,319,000**
Surplus	**286,000**	**620,000**	**776,000**	**569,000**	**371,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	556,000	556,000	700,000	700,000	700,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**762,000**	**862,000**	**1,036,000**	**1,036,000**	**1,036,000**
Potential Surplus	**1,048,000**	**1,482,000**	**1,812,000**	**1,605,000**	**1,407,000**

[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 water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers 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 3-3: Metropolitan Multiple-Dry Year Projected Supply Capability and Demands for 2015 to 2035

Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	246,000	373,000	435,000	398,000	353,000
California Aqueduct[2]	752,000	794,000	835,000	811,000	812,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,318,000	1,600,000	1,417,000	1,416,000	1,416,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,248,000**	**2,417,000**	**2,520,000**	**2,459,000**	**2,415,000**
Demands					
Firm Demands of Metropolitan	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
IID-SDCWA Transfers and Canal Linings	180,000	241,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,236,000**	**2,188,000**	**2,283,000**	**2,339,000**	**2,399,000**
Surplus	**12,000**	**229,000**	**237,000**	**120,000**	**16,000**
Programs Under Development					
In-Region Storage and Programs	162,000	280,000	314,000	336,000	336,000
California Aqueduct	242,000	273,000	419,000	419,000	419,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**404,000**	**553,000**	**733,000**	**755,000**	**755,000**
Potential Surplus	**416,000**	**782,000**	**970,000**	**875,000**	**771,000**

[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 water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers 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.

3.2.2. Newport Beach's Imported Water Supply Projections

Based on Metropolitan's supply projections that it will be able to meet full service demands under all three hydrologic scenarios, MWDOC, Orange county's wholesale supplier projects that it would also be able to meet the demands of its retail agencies under these conditions.

California Water Code section 10631 (k) requires the wholesale agency to provide information to the urban retail water supplier for inclusion in its UWMP that identifies and quantifies the existing and planned sources of water available from the wholesale agency. Table 3-4 indicates the wholesaler's water availability projections by source for the next 25 years as provided to the City by MWDOC. The water supply projections shown in Table 3-4 represent the amount of supplies projected to meet demands. They do not represent the full supply capacity.

Table 3-4: Wholesaler Identified & Quantified Existing and Planned Sources of Water (AFY)

Wholesaler Sources	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
MWDOC	6,298	6,430	6,564	6,697	6,830

3.3. Groundwater

Local groundwater has been the cheapest and most reliable source of supply for the City. The City relies on approximately 10,000 acre-feet of groundwater from the Lower Santa Ana River Groundwater Basin (Orange County Basin) each year. This local source of supply meets approximately 60% of the City's total annual demand.

In the effort to maximize local resources, Metropolitan has partnered with OCWD and MWDOC and its member agencies who are groundwater producers in various programs to encourage the development of local resources. Metropolitan's Groundwater Replenishment Program is a program where a groundwater producer may purchase imported water from Metropolitan at a reduced rate when "surplus" water is available in lieu of extracting groundwater. This program indirectly replenishes the basin by avoiding pumping.

This section provides description of the Lower Santa Ana River Groundwater Basin and the management measures taken by OCWD the basin manager to optimize local supply and minimize overdraft. Moreover, this section provides information on historical groundwater production as well as a 25-year projection of the City's groundwater supply.

3.3.1. Lower Santa Ana River Groundwater Basin

The Lower Santa Ana Groundwater Basin, also known as the Orange County Groundwater Basin (Basin) underlies the north half of Orange County beneath broad lowlands. The Basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates at the Orange County line to the northwest, where its aquifer systems continue into the Central Basin of Los Angeles County. The aquifers comprising this Basin extend over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits.

The Orange County Water District (OCWD) was formed in 1933 by a special legislative act of the State of California Legislature to protect and manage the County's vast, natural, underground water supply with the best available technology and to defend its water rights to the Orange County Groundwater Basin. This legislation is found in the State of California Statutes, Water – Uncodified Acts, Act 5683, as amended.[6] The Basin is managed by OCWD under the Act, which functions as a statutorily-imposed physical solution. Section 77 of the Act states that, *'nothing in this act contained shall be so construed as to affect or impair the vested right of any person, association or corporation to the use of water.*[7]

The Basin is managed by OCWD for the benefit of municipal, agricultural and private groundwater producers. The Basin meets approximately 60 to 70 percent of the water supply demand within the boundaries of OCWD. There are 19 major producers including cities, water districts, and private water companies, extracting water from the Basin serving a population of approximately 2.55 million.[8]

Groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the basin and to protect against land subsidence. In 2007, OCWD established a new methodology for calculating accumulated overdraft and establishing new full-basin benchmarks.[9] Based on OCWD's 2009 Groundwater Management Plan, the optimal accumulated overdraft is between 100,000 and 434,000 AF. At the top of the range, OCWD will be able to provide at least three years of drought supply. An accumulated overdraft condition minimizes the localized high groundwater levels and increases ability to recharge storm events from the Santa Ana River. At an accumulated overdraft of 200,000 AF, the Basin is considered 99.7 percent full. OCWD estimates that

[7] Orange County Water District Act, Section 77.
[8] MWDOC and Center for Demographics Research (2008)
[9] The *Report on Evaluation of Orange County Groundwater Basin Storage and Operational Strategy*, published in February 2007,

the Basin can safely be operated on a short-term emergency basis with a maximum accumulated overdraft of approximately 500,000 AF.

In an effort to eliminate long-term overdraft conditions, OCWD developed a comprehensive computer-based groundwater flow model to study and better understand the Basin's reaction to pumping and recharge. OCWD manages the Basin by establishing on an annual basis the appropriate level of groundwater production known as the Basin Production Percentage (BPP) as described below.

3.3.2. Basin Production Percentage

No pumping right exists for the Orange County Basin. Total pumping from the basin is managed through a process that uses financial incentives to encourage groundwater producers to pump an aggregate amount of water that is sustainable without harming the Basin. The framework for the financial incentives is based on establishing the BPP which is the percentage of each Producer's total water supply that comes from groundwater pumped from the basin. Groundwater production at or below the BPP is assessed the Replenishment Assessment (RA). While there is no legal limit as to how much an agency could pump from the Basin, there is a financial disincentive to pumping above the BPP. Pumping above the BPP is also assessed a Basin Equity Assessment (BEA), which is calculated so that the cost of groundwater production is equal to MWDOC's melded rate.

The BPP is set uniformly for all Producers by OCWD on an annual basis. The BPP for the 2008-2009 water year (July 1, 2008 to June 30, 2009) was established at 69.0. The overall BPP achieved within OCWD for non-irrigation use in the 2008-09 water year was equal to 72.5 percent. The BPP has recently been set at 62 percent for the 2010-2011 water year. For the purpose of this UWMP, the BPP is assumed to be 62 percent for the entire 25-year planning horizon (Table 3-5).

Table 3-5: Current Basin Production Percentage

Basin Name	Basin Production Percentage
Orange County Groundwater Basin	62%
Total	**62%**

The BPP is set based on groundwater conditions, availability of imported water supplies, and Basin management objectives. The BPP is also a major factor in determining the cost of groundwater production from the Basin for that year. When Metropolitan has an abundance of water, they may choose to activate their Groundwater Replenishment Program also known as In-Lieu Program, where imported water is purchased in-lieu of pumping groundwater.

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

3.3.3. Recharge Facilities

Recharging water into the basin through natural and artificial means is essential to support pumping from the basin. Active recharge of groundwater began in 1949, in response to increasing drawdown of the basin and consequently the threat of seawater intrusion. In 1949, OCWD began purchasing imported Colorado River water from Metropolitan, which was delivered to Orange County via the Santa Ana River upstream of Prado Dam. The Basin's primary source of recharge is flow from the Santa Ana River. OCWD diverts river flows into recharge basins located in and adjacent to the Santa Ana River and its main Orange County tributary, Santiago Creek. Other sources of recharge water include natural infiltration and recycled water. Today OCWD owns and operates a network of recharge facilities that cover 1,067 acres. The recharge capacity has exceeded 10,000 AFY with the addition of the La Jolla Recharge Basin which came online in 2008. The La Jolla Recharge Basin is a 6-acre recharge basin.

One of OCWD's primary efforts has been the control of seawater intrusion into the Basin, especially via the Talbert and Alamitos seawater intrusion barriers. OCWD began addressing the Alamitos Gap intrusion by entering a partnership in 1965 with the Los Angeles County Flood Control District to operate injection wells in the Alamitos Gap. Operation of the injection wells forms a hydraulic barrier to seawater intrusion. To address seawater intrusion in the Talbert Gap, OCWD constructed Water Factory 21, a plant that treated secondary-treated water from the Orange County Sanitation District (OCSD) to produce purified water for injection. Water Factory 21 operated for approximately 30 years until it was taken off line in 2004. It was replaced by an advanced water treatment system, the Groundwater Replenishment System (GWRS).

The GWRS is a cooperative project between OCWD and OCSD that began operating in 2008. Secondary-treated wastewater from OCSD undergoes treatment consisting of microfiltration, reverse osmosis, and advanced oxidation with ultraviolet light and hydrogen peroxide. It is the largest water purification project of its kind, Phase 1 of the GWRS began operating in 2008 with a capacity of purifying 72,000 AFY of water. The GWRS provides recharge water for the Talbert Injection Barrier as well as to recharge

basins in the City of Anaheim. The Expanded Talbert Injection Barrier included 8 new injection wells which operation began in 2008. The GWRS increased reliable, local water supplies available for barrier injection from 5 MGD to 30 MGD.

3.3.4. Metropolitan Groundwater Replenishment Program

OCWD, MWDOC, and Metropolitan have developed a successful and efficient groundwater replenishment program to increase storage in the Orange County Groundwater Basin. The Groundwater Replenishment Program allows Metropolitan to sell groundwater replenishment water to OCWD and make direct deliveries to agency distribution systems in lieu of producing water from the groundwater basin when surplus water is available. This program indirectly replenishes the basin by avoiding pumping. In the in-lieu program, OCWD requests an agency to halt pumping from specified wells. The agency then takes replacement water through its import connections, which is purchased by OCWD from Metropolitan (through MWDOC). OCWD purchases the water at a reduced rate, and then bills the agency for the amount it would have had to pay for energy and the Replenishment Assessment (RA) if it had produced the water from its wells. The deferred local production results in water being left in local storage for future use. In 2008 and 2009, OCWD did not utilize replenishment water because such water was not available to purchase from Metropolitan.

3.3.5. Metropolitan Conjunctive Use Program

Since 2004, OCWD, MWDOC, and participating producers have participated in Metropolitan's Conjunctive Use Program (known as the Metropolitan Long-Term Groundwater Storage Program). This program allows for the storage of Metropolitan water in the Orange County groundwater basin. The existing Metropolitan storage program provides for Metropolitan to store 66,000 AF of water in the basin in exchange for Metropolitan's contribution to improvements in basin management facilities. These improvements include eight new groundwater production wells, improvements to the seawater intrusion barrier, construction of the Diemer Bypass Pipeline. This water can be withdrawn over a three-year time period. . The preferred means to store water in the Metropolitan storage account has been through the in-lieu deliveries to participating groundwater producers.

3.3.6. Historical Groundwater Production

Since its founding, OCWD has grown in size from 162,676 to 229,000 acres. Groundwater pumping from the basin has grown from approximately 150,000 AFY in the

mid-1950s to over 300,000 AFY. During the water year July 2008 to June 2009, total basin production for all agencies was approximately 324,147 acre-feet (AF).[10]

The City obtains groundwater pumped from four wells owned and operated by the City and managed by OCWD. The City's wells are located in the City of Fountain Valley, approximately five miles north of the City. The only constraints affecting groundwater supply to the City are the pumping capacity of the wells and pumping limitations (BPP) established by OCWD to maintain the groundwater basin.

Table 3-6 shows the City's recent groundwater production from the Basin in the past five years from 2005 to 2009. During certain seasons of 2005, 2006, and 2007, OCWD has operated the In-lieu Program with Metropolitan by purchasing water from Metropolitan to meet demands of member agencies rather than pumping water from the groundwater basin. In 2008 and 2009, OCWD did not utilize in-lieu water because such water was not available to purchase from Metropolitan.[11]

Table 3-6: Amount of Groundwater Pumped in the Past 5 Years (AFY)

Basin Name(s)	Fiscal Year Ending				
	2005	2006	2007	2008	2009
BPP GW	4,984	3,546	3,605	14,338	11,309
Plus In-Lieu taken for OCWD	6,652	7,682	8,553	-	-
Subtotal OCWD Basin GW	11,636	11,228	12,158	14,338	11,309
% of Total Water Supply	**65%**	**63%**	**64%**	**78%**	**65%**

3.3.7. Projections of Groundwater Production

The mission of the OCWD is to provide local water retailers with a reliable, adequate, high quality water supply at the lowest reasonable cost in an environmentally responsible manner. Efforts have been made to develop and secure new supplies. Also in December 2008, OCWD secured the rights to divert and use up to 362,000 AFY of Santa Ana River water through a decision of the State Water Resources Control Board. Description to other recent OCWD projects can be found in OCWD's 2009 GWMP.

Based on the annual MWDOC survey completed by each Producer in the spring of 2008, the estimated demand for groundwater in the OCWD boundary will increase from 519,000 AFY in 2015 to 558,000 AFY in 2035 representing a 7.5 percent increase over a 20 year period. OCWD's estimated total annual groundwater production for the water

[10] *2008-2009 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2010
[11] *2008-2009 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2010

year 2010-2011 is 295,000 AF based on a BPP of 62 percent and includes 22,000 AF of production from water quality improvement projects.

Table 3-7 shows the amount of groundwater projected to be pumped from the Basin in the next 25 years. The BPP is assumed to remain at 62 percent for the entire planning horizon.

Table 3-7: Amount of Groundwater Projected to be Pumped (AFY)

Basin Name(s)	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
BPP GW	10,052	10,275	10,492	10,710	10,927	11,144
% of Total Water Supply	**62%**	**62%**	**62%**	**62%**	**62%**	**62%**

3.4. Recycled Water

The City participates in a reclaimed/recycled water program and uses the water supplies available to water greenbelts, parkways, golf courses, and other landscape areas that may otherwise use valuable potable water for irrigation. This reclaimed/recycled water is wholesaled by OCWD through its Green Acres Project (GAP). In 2009/10, usage of recycled water within the City's Water Utility service area was about 400 acre feet. Recycled water usage meets approximately 3% of the City's water demand. The City's recycled water program is more fully described in Section 6.

3.5. Supply Reliability

3.5.1. Overview

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. The City depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to insure it has adequate supplies. Development of groundwater, recycled water system, and desalination opportunities augments the reliability of the imported water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. The water supplies are projected to meet full-service demands; Metropolitan's 2010 RUWMP finds that Metropolitan is able to meet with existing supplies, full-service demands of its member agencies starting 2015 through 2035 during normal years, single dry year, and multiple dry years.

Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The foundation of

Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements. MWDOC is reliant on Metropolitan for all of its imported water. With the addition of planned supplies under development, Metropolitan's 2010 RUWMP finds that Metropolitan will be able to meet full-service demands from 2015 through 2035, even under a repeat of the worst drought. Table 3-8 shows the reliability of the wholesaler's supply for single dry year and multiple dry year scenarios.

Table 3-8: Wholesaler Supply Reliability - % of Normal AFY

		Multiple Dry Water Years		
Wholesaler Sources	Single Dry	Year 1	Year 2	Year 3
MWDOC	100%	100%	100%	100%

In addition to meeting full-service demands from 2015 through 2035, Metropolitan projects reserve and replenishment supplies to refill system storage. MWDOC's 2010 RUWMP states that it will meet full-service demands to its customers from 2015 through 2035. Table 3-9 shows the basis of water year data used to predict drought supply availability.

Table 3-9: Basis of Water Year Data

Water Year Type	Base Year	Base Year	Base Year
Normal Water Year	Average 1922-2004		
Single-Dry Water Year	1977		
Multiple-Dry Water Years	1990	1991	1992

3.5.2. Factors Impacting Reliability

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

Environment – Endangered species protection needs in the Sacramento-San Joaquin River Delta have resulted in operational constraints to the SWP system. The Bay-Delta's declining ecosystem caused by agricultural runoff, operation of water pumps and other factors has led to historical restrictions in SWP supply deliveries. SWP delivery

restrictions due to the biological opinions resulted in the loss of about one-third of the available SWP supplies in 2008.

Legal – Listings of additional species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations. Additionally, the Quantification Settlement Agreement has been challenged in courts and may have impacts on the Imperial Irrigation District and San Diego County Water Authority transfer. If there are negative impacts, San Diego could become more dependent on the Metropolitan supplies.

Water Quality –Water imported from the Colorado River Aqueduct (CRA) contains high level of salts. The operational constraint is that this water needs to be blended with SWP supplies to meet the target salinity of 500 mg/L of total dissolved solids (TDS). Another water quality concern is related to quagga mussel. Controlling the spread and impacts of quagga mussels within the Colorado River Aqueduct require extensive maintenance and results in reduced operational flexibility.

Climate Change – Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning even more challenging. The areas of concern for California include the reduction in Sierra Nevada snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of levee failure.

Legal, environmental, and water quality issues may have impacts on Metropolitan supplies. It is felt however climatic factors would have more of an impact than the others. Climatic conditions have been projected based on historical patterns; however severe pattern changes may occur in the future. Table 3-10 shows the factors resulting in inconsistency of supply.

Table 3-10: Factors Resulting in Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
State Water Project	X	X		
Colorado River			X	X

These and other factors are addressed in greater detail in Metropolitan's 2010 RUWMP.

3.5.2.1. Water Quality

Imported Water **-** Metropolitan is responsible for providing water of a high quality throughout its service area. The water that Metropolitan delivers is tested both for

currently regulated contaminants and for additional contaminants of concern as over 300,000 water quality tests are conducted each year to regulate the safety of its waters. Metropolitan's supplies originate primarily from the Colorado River Aqueduct (CRA) and from the State Water Project (SWP). A blend of these two sources, proportional to each year's availability of the source, is then delivered throughout Metropolitan's service area.

Metropolitan's primary sources face individual water quality issues of concern. The CRA water source contains a higher level of total dissolved solids (TDS) and a lower level of organic material while the SWP contains a lower TDS level while its level or organic materials is much higher, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic materials, Metropolitan has been blending CRA water with SWP supplies as well as implementing updated treatment processes to decrease the disinfection byproducts. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan has assured its ability to overcome the above mentioned water quality concerns through its protection of source waters, implementation of renovated treatment processes, and blending of its two sources. While unforeseeable water quality issues could alter reliability, Metropolitan's current strategies ensure the deliverability of high quality water.

Groundwater - The Orange County Water District (OCWD) is responsible for managing the Orange County Groundwater Basin. To maintain groundwater quality, OCWD conducts an extensive monitoring program that serves to manage the basin's groundwater production, control groundwater contamination, and comply with all necessary laws and regulations.[12] A network of nearly 700 wells provides OCWD a source for samples, which are tested for a variety of purposes. The District collects 600 to 1,700 samples each month to monitor the quality of the basin's water. These samples are collected and tested according to approved federal and state procedures as well as industry-recognized quality assurance and control protocols.

OCWD recognizes the importance of maintaining the basin's high water quality. OCWD's 2009 Groundwater Management Plan Update includes a section labeled, "Water Quality Management," which discusses the water quality concerns as well as management programs that OCWD is currently involved with.

[12] The information in this section is referenced from the Groundwater Management Plan 2009 Update "Groundwater Monitoring" section (pages 3-1 through 3-20) and "Water Quality Management" section (pages 5-1 through 5-30).

Table 3-11 shows the amount in acre-feet per year that water quality would have on supply.

Table 3-11: Water Quality – Current and Projected Water Supply Impacts (AFY)

Water Source	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
Imported	0	0	0	0	0	0
Local	0	0	0	0	0	0

3.5.3. Normal-Year Reliability Comparison

The City has entitlements and/or written contracts to receive imported water from Metropolitan via the regional distribution system. Although pipeline capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies assumed in this section are available to the City from existing water transmission facilities. Table 3-12 shows supply and demand under normal year conditions. Water supplies are projected to be available from Metropolitan; however, it is not included here since projected supplies meet projected demands.

Table 3-12: Projected Normal Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Total Demand	**17,023**	**17,422**	**17,774**	**18,124**	**18,474**
BPP GW	10,275	10,492	10,710	10,927	11,144
Recycled Water	450	500	500	500	500
Imported	6,298	6,430	6,564	6,697	6,830
Total Supply	17,023	17,422	17,774	18,124	18,474

3.5.4. Single Dry-year Reliability Comparison

The City has documented that it is 100% reliable for single dry year demands from 2015 through 2035 with a demand increase of 4.6% using FY 2006-07 as the single dry year. Table 3-13 compiles supply and demand projections for a single dry water year. The available imported supply is greater than shown; however, it is not included because all demands are met.

Table 3-13: Projected Single-Dry Year Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	**2020**	**2025**	**2030**	**2035**
Total Demand	**17,806**	**18,223**	**18,592**	**18,958**	**19,324**
BPP GW	10,275	10,492	10,710	10,927	11,144
Recycled Water	450	500	500	500	500
Imported	7,081	7,232	7,382	7,531	7,680
Total Supply	17,806	18,223	18,592	18,958	19,324

3.5.5. Multiple Dry-Year Reliability Comparison

The City is capable of providing their customers all their demands with significant reserves in multiple dry years from 2015 through 2035 with a demand increase of 4.6% using FY 2006-07 as the multiple dry years. This is true even if the demand projections were to be increased by a large margin. Table 3-14 shows supply and demand projections under multiple dry year conditions.

Table 3-14: Projected Multiple Dry Year Period Supply and Demand (AFY)

		Fiscal Year Ending				
		2015	**2020**	**2025**	**2030**	**2035**
First Year Supply	**Total Demand**	**17,806**	**18,223**	**18,592**	**18,958**	**19,324**
	BPP GW	10,275	10,492	10,710	10,927	11,144
	Recycled Water	450	500	500	500	500
	Imported	7,081	7,232	7,382	7,531	7,680
	Total Supply	17,806	18,223	18,592	18,958	19,324
Second Year Supply	**Total Demand**	**17,806**	**18,223**	**18,592**	**18,958**	**19,324**
	BPP GW	10,275	10,492	10,710	10,927	11,144
	Recycled Water	450	500	500	500	500
	Imported	7,081	7,232	7,382	7,531	7,680
	Total Supply	17,806	18,223	18,592	18,958	19,324
Third Year Supply	**Total Demand**	**17,806**	**18,223**	**18,592**	**18,958**	**19,324**
	BPP GW	10,275	10,492	10,710	10,927	11,144
	Recycled Water	450	500	500	500	500
	Imported	7,081	7,232	7,382	7,531	7,680
	Total Supply	17,806	18,223	18,592	18,958	19,324

4. Demand Management Measures

4.1. Overview

Water conservation, often called demand-side management, can be defined as practices, techniques, and technologies that improve the efficiency of water use. Such practices are referred to as demand management measures (DMM). Increased efficiency expands the use of the water resource, freeing up water supplies for other uses, such as population growth, new industry, and environmental conservation.

The increasing efforts in water conservation are spurred by a number of factors: growing competition for limited supplies, increasing costs and difficulties in developing new supplies, optimization of existing facilities, delay of capital investments in capacity expansion, and growing public support for the conservation of limited natural resources and adequate water supplies to preserve environmental integrity.

The City recognizes the importance of water conservation and has made water use efficiency an integral part of water use planning. The City has been a signatory to the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs) Memorandum of Understanding (MOU) since August 2005. The City completed and submitted its first BMP Activity Report in fiscal year 2006 showing implementation status of each BMP. This section of the UWMP describes the DMMs currently being implemented or scheduled for implementation by the City to satisfy the requirements of § 10631 (f) & (j).

Demand Management Measures as defined by the Act corresponds to the CUWCC's BMPs. The Act allows the urban water supplier who is signatory to the CUWCC MOU to submit to DWR copies of its annual reports and other relevant documents to assist DWR in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

4.2. Water Use Efficiency Programs

As Signatory to the Urban MOU, the City has committed to use good-faith efforts to implement the 14 cost-effective BMPs. The City has implemented and is actively participating in many water conservation activities. A Water Conservation Ordinance was adopted by the City Council in 2009 in the City's municipal code as Chapter 14.16 Water Conservation and Supply Level Regulations.

Moreover, as a member agency of MWDOC, the City actively participates in various Metropolitan residential and CII rebate programs, as well as school and public education and outreach programs, and other programs administered by MWDOC. MWDOC implements many of the urban water conservation BMPs on behalf of its member agencies. MWDOC's 2010 RUWMP should be referred to for a detailed discussion of each regional BMP program. The City works cooperatively with MWDOC for technical and financial support needed to facilitate meeting the terms of the MOU. MWDOC's current Water Use Efficiency Program, detailed in their 2010 RUWMP, implemented on behalf of its member agencies following three basic focuses:

1. Regional Program Development – MWDOC develops, obtains funding for, and implements regional BMP programs on behalf of all retail water agencies in Orange County.
2. Local Program Assistance - MWDOC assists retail agencies to develop and implement local programs within their individual service areas.
3. Research and Evaluation – MWDOC conducts research programs which allow an agency to measure the water savings benefits of a specific program and then compare those benefits to the costs of implementing the program in order to evaluate the economic feasibility of the program.

Table 4-1 provides an overview of City's DMM program status.

Table 4-1: Urban Supplier's Demand Management Measures Overview

Demand Management Measure (DMM)	DMM Status		
	Past	Current	Future
Residential Water Surveys			
Residential Plumbing Retrofits			
System Water Audits, Leak Detection and Repair			
Metering with Commodity Rates			
Large Landscape Conservation Programs			
High-Efficiency Washing Machine Rebates			
Public Information Programs			
School Education Programs			
Commercial, Industrial and Institutional Programs			
Wholesale Agency Assistance			
Conservation Pricing			
Conservation Coordinator			
Water Waste Prohibition			
Residential ULFT Replacement Programs			

4.2.1. DMM 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

As part of this DMM, an agency targets single- and multi-family homes and sends out a qualified surveyor who checks water using devices within the house and evaluates landscapes and irrigation systems. MWDOC had a formal program that ended in FY 2001/02. Currently, the City has a program to monitor high water users through the billing system. City staff goes out to the high use customer's home to evaluate their indoor use and identify problems and fixes (e.g. leaky toilets). The City also participates in a regional landscape programs through MWDOC as explained below.

In FY 2004/05, the City, along with MWDOC, participated in a regional program called the SmarTimer Rebate Program. Under this program, residential and small commercial properties are eligible for a rebate when they purchase and install a new, state-of-the-art, weather-based irrigation controller which can save 41 gallons per day per residence and can reduce runoff and pollution by 49 percent. The City is eligible to receive 1,192 valves over the life of the program. To date, 278 rebates have been given out to residential customers and 249 rebates to small commercial customers which translate to a water savings of approximately 636 acre-feet. The City will continue to provide on-site meetings, literature and incentives related to this program. As part of the MWDOC Grant for the SmarTimers a site audit and inspection is required and provided by contract through MWDOC.

In FY 2007/08 the City with the assistance of a Cal Fed grant installed 640 weather-based irrigation controllers with pre and post installation inspections. This program found that the first 100 homes retrofit with smart controllers saved 458,000 gallons in the first comparison billing period. One homeowners association (HOA), who first retrofit with smart controllers and them retrofit for irrigation system uniformity, saved 1.3 million gallons in the first comparison billing period.

Moreover, the City is in the process of contracting for a professional/consultant that can assist the City in developing a residential and commercial site auditing program. Presently the City pays a contractor for audits as needed. Once the City has developed a program it is the desire of the City to hire a full or part-time professional staff person to do audits for residential and commercial properties as well as site measurements for public properties.

4.2.2. DMM 2: Residential Plumbing Retrofit

Between 1994 and 2009, the City, in conjunction with MWDOC, distributed a total of 7,219 ultra low flush toilets (ULFT) to single-family and multi-family homes. In addition, through Metropolitan's mass showerhead distribution, the City installed 4,453 low-flow showerheads between 1991 and 1998, and over 75 percent of the City's single- and multi-family homes constructed prior to 1992 are fitted with low-flow showerheads.

MWDOC estimated that today low flow showerhead saturation is at nearly 100% for single-family homes and at 94% for multi-family homes. Both the low-flow shower head program and ULFT rebate program have sunset. The City has met the requirement for this DMM.

4.2.3. DMM 3: System Water Audits, Leak Detection and Repair

The City records daily production and demand data and reads all meters on a bi-monthly basis. All metered sales and other verifiable uses such as backwash, flushwater, and operation and maintenance, are recorded. The unaccounted water loss varies year to year but is approximately five percent of the total water in the system. The City is meeting the requirement for this DMM.

4.2.4. DMM 4: Metering with Commodity Rates

All of the City's water connections are metered and billed based on commodity rates.

4.2.5. DMM 5: Large Landscape Conservation Programs and Incentives

The City supports large landscape conservation through MWDOC's regional programs including the Landscape Performance Certification Program and the Smart Timer Rebate Program. The City encourages commercial properties such as golf courses and HOAs to take advantage of these programs. The City continued participation in MWDOC's landscape rebate programs resulted in the installation of 9,428 sq. ft. of synthetic turf (4.3 acre-feet), 5,520 rotating nozzles (51 acre-feet savings), and 278 smart timers for residential customers and 249 smart timers for commercial customers (636 acre-feet). Details of each landscape program are provided below.

MWDOC Landscape Performance Certification Program

MWDOC has a program titled "Landscape Performance Certification Program", which provides a water-based budget for dedicated meters. This program involves developing water budgets based off of agency-provided consumption data, site-provided area measurement, local weather data, and contact information for the site owner, the responsible landscape company, and a property manager. On a monthly basis, the site's water budget is developed by water meter and provided back to the three involved entities in an e-mail report card format. Also included is a website where all involved can view their site for budget numbers, which illustrate whether a meter is over, under, or exactly at their budget. Included is a calculation based on individual water rates showing dollars lost. This program does not include a formal landscape survey component. Financial incentives are offered to improve landscape water use efficiency, and regional funding is available from Metropolitan.

The City has participated in the Landscape Performance Certification Program since its initiation in FY 2004-05. The number of participated landscape meters has increased

from 32 in FY 2004-05 to 171 in FY 2010-11. Through the SmarTimer Grant the City is requiring all Commercial applicants to participate in this program as a condition of funding by the City.

Smart Timer Rebate Program

As described under DMM 1, the Smart Timer Rebate Program offers residential and small commercial properties a rebate when they purchase and install a new, state-of-the-art, weather-based irrigation controller which can save 41 gallons per day per residence and can reduce runoff and pollution by 49 percent. The City is eligible to receive 1,192 valves over the life of the program. In FY 2004/05, three residential and seventeen small commercial customers participated. As of FY 2010-11 the total program participation has increased to 278 residential and 249 commercial customers.

4.2.6. DMM 6: High-Efficiency Washing Machine Rebate Programs

Orange County residents are eligible to receive an $85 rebate when they purchase of a new High Efficiency Clothes Washer (HECW). This program began in 2001 and is sponsored by MWDOC, Metropolitan, and local retail water agencies. Rebates are available on a first-come, first-served basis, while funds last. Participants must be willing to allow an inspection of the installed machine for verification of program compliance. Machines must have a water factor of 4.0 or less. Depending on use, these machines can save 10,000 gallons of water per year Participants are encouraged to contact their local gas and/or electric utility as additional rebates may be available.

Over the past 9 years, 1,918 residences have installed HECWs through this program representing a water savings of approximately 240 acre-feet. The City continues to provide information to residences about these rebate programs.

4.2.7. DMM 7: Public Information Programs

The City has an active program to promote and educate its customers about water conservation and other water-related topics. The City participates annually in the Children's Water Education Festival sponsored by OCWD, The Disneyland Resort and various cities and agencies throughout Orange County. Moreover, when requested, the Water Conservation Coordinator goes into the classrooms, interest groups, and homeowner associations to discuss various aspects of conservation. The City has also updated its website to include conservation related materials and information.

The City has taken the lead to educating its residents on the importance of using water wisely and caring for their watershed. The City currently provides customers with various tools, programs and incentives that are promoted through outreach marketing campaigns to reach as diverse an audience as possible. The City's Water Conservation Marketing Campaigns comprises of many programs as described below.

July: Smart Irrigation Month – June 2008, City Council adopted a resolution declaring July as "Smart Irrigation Month" to promote a reminder for residents to repair faulty irrigation systems and install ETo controllers using Metropolitan's region-wide TV, radio and print advertising campaign.

WaterSmartNewport.org – This website is the City's water conservation campaign with the goal to create a recognizable brand specific to the City.

Interest Group and Public Events – The City uses public events and relationships with nonprofit groups to promote public awareness. City staff presents at clubs and HOA such Kiwanis and Rotary and participate in environmental related events alongside interest groups and nonprofits.

Media Outreach: Public Service Announcements (PSAs), NBTV and Magazine Print Articles – The City reaches a broad age demographic through TV and magazine articles. In 2010, PSAs are featured on NBTV, City website, cable TV, pre-movie display in all City movie theaters, and through other media outlets.

4.2.8. DMM 8: School Education Programs

Since 1975, MWDOC has offered water education programs to Orange County public and private schools for all grade levels from kindergarten through high school. The City participates in this program, and during FY 2009/10, MWDOC and the City's Water Conservation coordinator made 6 presentations to 1,687 students.

4.2.9. DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts

Save Water, Save a Buck

This program began in 2002 and offers rebates to assist commercial, industrial, and institutional customers in replacing high-flow plumbing fixtures with low-flow fixtures. Facilities where low-flow devices are installed must be located in Orange County.

Rebates are available only on those devices listed in Table 4-2 below and must replace higher water use devices. Installation of devices is the responsibility of each participant. Participants may purchase and install as many of the water saving devices as is applicable to their site.

Table 4-2: Retrofit Devices and Rebate Amounts Available Under Save Water Save a Buck Program

Retrofit Device	Rebate Amount
High Efficiency Toilet	$50
Ultra-Low-Water or Zero Water Urinal	$200
Connectionless Food Steamers	$485 per compartment
Air-Cooled Ice Machines (Tier III)	$300
Cooling Tower Conductivity Controller	$625
pH / Conductivity Controller	$1,750
Dry Vacuum Pumps	$125 per HP
Water Pressurized Broom	$110

As of FY 2010/11 the City's commercial, industrial, and institutional customers have installed a total 1,231 water-saving fixtures since the program inception in FY 2001/02. This represents a water savings of 540 acre-feet. The City will continue to educate this account category to meet the DMM requirements. The City is also working with the Orange County Sanitation District to target CII customers in the City who could benefit from the reduction or recycling are large water using devices that Metropolitan will help fund to upgrade.

Water Smart Hotel Program

In 2008 and 2009, MWDOC received grants from the CA Department of Water Resources and the US Bureau of Reclamation (USBR) to conduct the Water Smart Hotel Program, a program designed to provide Orange County hotels and motels with commercial and landscape water saving surveys, incentives for retrofits and customer follow-up and support. The goal of the program is to implement water use efficiency changes in hotels to achieve an anticipated water savings of 7,078 acre feet over 10 years.

The Program is offered to hotels in MWDOC's service area as identified by retail water agencies. It is anticipated that detailed survey of the indoor and outdoor water using aspects of up to 105 participating hotels will be performed. Participating hotels will receive survey reports that recommend indoor and outdoor retrofits, upgrades, and other changes that should, based on the survey, result in significant water savings. Quantities of each device and associated fixture and installation costs, water savings and payback information (based on rebate amount Incentives offered through the Save Water Save A Buck Rebate Program will be augmented using DWR and USBR Water Use Efficiency

grant funds to bridge the gap between existing incentives and the actual costs of Hotel Water Survey recommendations. To date, over 24 surveys have been performed county-wide, and over 9,500 water-saving devices have been installed through the program. These devices are saving 351 acre feet per year or 3,510 acre feet over the ten year device life

4.2.10. DMM 10: Wholesale Agency Programs

The City is not a wholesale agency, so this DMM does not apply.

4.2.11. DMM 11: Conservation Pricing

The City currently has uniform pricing for all water. The City is currently investigating the various tiered rate pricing schemes so it can report to the Council on the efficiency and staffing requirements to convert the current billing system to one that includes tiered pricing.

4.2.12. DMM 12: Water Conservation Coordinator

The City has a designated water conservation coordinator, Shane Burckle, and thus meets this DMM.

4.2.13. DMM 13: Water Waste Prohibition

Most recently, the City Council has approved NBMC 14.16 Water Conservation and Supply Level Regulations which establishes permanent water conservation requirements intended to alter behavior related to water use efficiency for non-shortage conditions and further establishes four levels of water supply shortage response actions to be implemented during times of declared water shortage. Details of this water ordinance are provided in Section 5 of this UWMP.

4.2.14. DMM 14: Residential Ultra-Low-Flush Toilet Replacement Programs

Over the past 19 years, MWDOC has continuously implemented a regional ULF Toilet Rebate and/or Distribution Program targeting single- and multi-family homes in Orange County. Since the end of distribution program in 2004, MWDOC's program has focused solely on providing rebate incentives for retrofitting non-efficient devices with either ULFTs or High Efficiency Toilets (HETS) – toilets using 1.28 gallons per flush or less. The ULFT portion of this program concluded in June 2009, and over 360,000 ULFTs were replaced in single family and multi-family homes, with an overall program to date savings of approximately 138,457 acre feet of water. The HET rebate program, which concluded in 2010, has incentivized over 26,000 devices, with an overall program to date savings of approximately 3,419.

The City has participated in this program from the beginning. To date 7,219 ULFTs and 254 HETs have been installed representing a combined water savings of 2,719 acre-feet. The City meets the coverage requirements for this DMM.

5. Water Supplies Contingency Plan

Recent water supply challenges throughout the American Southwest and the State of California have resulted in the development of a number of policy actions that water agencies would implement in the event of a water shortage. In southern California, the development of such policies has occurred at both the wholesale and retail level. This section describes how new and existing policies that Metropolitan, MWDOC and the City have in place to respond to water supply shortages, including a catastrophic interruption and up to a 50 percent reduction in water supply.

5.1. Shortage Actions

Metropolitan

As an importer of water from multiple sources, including both the Colorado River and Sierra Nevada, a number of water supply challenges have impacted the reliability of Metropolitan's imported supplies. In response to these challenges, Metropolitan has implemented existing policies as well as developed new ones.

The first action that Metropolitan implements in the event of a water shortage is the suspension and/or reduction of its interruptible supplies, which are supplies sold at a discount in return for the buyers agreeing to be the first to be cutback in the event of a shortage. Metropolitan currently has two interruptible programs for agricultural users and groundwater replenishment, under which supplies were either suspended or reduced in 2007.

In addition, in preparation for the possibility of being unable to the meet "firm demands" (non-interruptible supplies) of its member agencies, in February 2008, the Metropolitan's Board of Directors (Board) adopted the Water Supply Allocation Plan (WSAP), which was subsequently updated in June 2009.

Metropolitan's plan includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2010 RUWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines described in Metropolitan's 1999 Water Surplus and Drought Management Plan (WSDM), with the objective of creating an equitable needs-based allocation. The plan's

formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account: impact on retail customers and the economy; growth and population; changes in supply conditions; investments in local resources; demand hardening aspects of non-potable recycled water use; implementation of conservation savings program; participation in Metropolitan's interruptible programs; and investments in facilities.

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

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

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

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

In order to implement the WSAP, the Metropolitan Board makes a determination on the level of the regional shortage, based on specific criteria, in April each year. If it is determined allocations are necessary, they go into effect in July for that year and remain for a 12-month period, although the schedule is at the discretion of Metropolitan's Board.

Metropolitan's 2010 RUWMP forecasts that Metropolitan will be able to meet projected firm demands throughout the forecast period from 2015 to 2035. However, these projections do not mean that Metropolitan would not implement its WSAP during this period.

MWDOC

To prepare for the potential allocation of imported water supplies from Metropolitan, MWDOC worked collaboratively with its 28 member agencies to develop its own Water

Supply Allocation Plan (MWDOC WSAP), adopted January 2009, to allocate imported water supplies at the retail level. The MWDOC WSAP lays out the essential components of how MWDOC will determine and implement each member agency's allocation during a time of shortage.

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

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

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

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

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

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

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

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

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

City of Newport Beach

In 1992, the City adopted its Water Shortage Contingency Plan (WSCP) in response to California Assembly Bill Number 11. The WSCP is intended to conservatively manage the City's water resources to provide water to its customers on an equitable and business-sound basis, in the event of a curtailment of deliveries of up to 50 percent.

The City adopted Water Conservation and Supply Level Regulations Ordinance No. 2010-16 on September 14, 2010, which establishes a comprehensive staged water conservation program that will encourage reduced water consumption within the City through conservation, enable effective water supply planning, assure reasonable and

beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City. Along with permanent water conservation requirements, the City's Water Conservation and Supply Level Regulations consists of the following four stages found in Table 5-1 to respond to a reduction in potable water available to the City for distribution to its customers with permanent conservation requirements in effect at all times unless a mandatory conservation stage has been implemented by the City.

Table 5-1: Water Supply Shortage Stages and Conditions – Rationing Stages

Stage No.	Water Supply Conditions	% Shortage
Level 1 Mandatory Conservation Requirements	The City Council determines that a water supply shortage or threatened shortage exists, due to drought or other water supply conditions, and it is necessary to impose the mandatory conservation requirements applicable to the particular level of water supply shortage.	To be determined by the City Council.
Level 2 Mandatory Conservation Requirements		
Level 3 Mandatory Conservation Requirements		
Level 4 Mandatory Conservation Requirements		

5.2. Three-Year Minimum Water Supply

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

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

As an alternative to preferential rights, Metropolitan adopted the Water Shortage Allocation Plan (WSAP) in February 2008. Under the WSAP, member agencies are allowed to purchase a specified level of supplies without the imposition of penalty rates. The WSAP uses a combination of estimated total retail demands and historical local supply production within the member agency service area to estimate the firm demands on Metropolitan from each member agency in a given year. Based on a number of

factors, including storage and supply conditions, Metropolitan then determines whether it has the ability to meet these firm demands or will need to allocate its limited supplies among its member agencies. Thus, implicit in Metropolitan's decision not to implement an allocation of its supplies is that at a minimum Metropolitan will be able to meet the firm demands identified for each of the member agencies.

In order to estimate the minimum available supplies from Metropolitan for the period 2011-2013, an analysis was performed to assess the likelihood that Metropolitan would re-implement mandatory water use restrictions in the event of a 1990-92 hydrologic conditions over this period. Specific water management actions during times of water shortage are governed by Metropolitan's Water Shortage and Drought Management Plan (WSDM Plan). Adopted by the Metropolitan Board in 1999, the WSDM Plan provides a general framework for potential storage actions during shortages, but recognizes that storage withdrawals are not isolated actions but part of a set of resource management actions along with water transfers and conservation. As such, there is no specific criterion for which water management actions are to be taken at specific levels of storage. The implementation of mandatory restrictions is solely at the discretion of the Metropolitan Board and there are no set criteria that require the Board to implement restrictions. Given these conditions, the analysis relies upon a review of recent water operations and transactions that Metropolitan has implemented during recent drought.

The first step in the analysis was a review of projected SWP allocations to Metropolitan, based on historical hydrologies. As with the recent drought, potential impacts to SWP supplies from further drought and the recently implemented biological opinions are anticipated to be the biggest challenges facing Metropolitan in the coming three years.

A review of projected SWP allocations from the DWR's State Water Project Delivery Reliability Report 2009 (2009 SWP Reliability Report) was made to estimate a range of conservative supply assumptions regarding the availability of SWP supplies. The 2009 SWP Reliability Report provides estimates of the current (2009) and future (2029) SWP delivery reliability and incorporates regulatory requirements for SWP and CVP operations in accordance with USFWS and NMFS biological opinions. Estimates of future reliability also reflect potential impacts of climate change and sea level rise.

The analysis assumes a maximum SWP allocation available to Metropolitan of 2,011,500 AF and a Metropolitan storage level of 1,700,000 AF at 2010 year-end. The analysis also assumes a stable water supply from the Colorado River in the amount of 1,150,000 AF through 2015. Although the Colorado River watershed has also experienced drought in recent years, Metropolitan has implemented a number of supply programs that should ensure that supplies from this source are relatively steady for the next three years. Based on estimated "firm" demands on Metropolitan of 2.12 MAF, the annual surplus or deficit was calculated for each year of the three-year period.

A review of recent Metropolitan water management actions under shortage conditions was then undertaken to estimate the level of storage withdrawals and water transfers that Metropolitan may exercise under the 1990-92 hydrologic conditions were identified. For this analysis, it was assumed that, if Metropolitan storage levels were greater than 2 MAF at the beginning of any year, Metropolitan would be willing to take up to 600 TAF out of storage in that year. Where Metropolitan storage supplies were between 1.2 MAF and 2 MAF at the beginning of the year, it was assumed that Metropolitan would be willing to take up to 400 TAF in that year. At storage levels below 1.2 MAF, it was assumed that Metropolitan would take up to 200 TAF in a given year.

It was also assumed that Metropolitan would be willing to purchase up to 300 TAF of water transfer in any given year. For years where demands still exceeded supplies after accounting for storage withdrawals, transfer purchases were estimated and compared against the 300 TAF limit.

Table 5-2: Metropolitan Shortage Conditions

Study Year	Actual Year	SWP Allocation (%)	SWP (AF)	CRA (AF)	Total (AF)	Demand (AF)	Surplus/ Shortage (AF)	Storage at YE (AF)	Transfers (AF)
2011	1990	30%	603,450	1,108,000	1,711,450	2,124,000	(400,000)	1,300,000	(12,550)
2012	1991	27%	542,820	1,108,000	1,650,820	2,123,000	(200,000)	1,100,000	(272,180)
2013	1992	26%	522,990	1,108,000	1,630,990	2,123,000	(200,000)	900,000	(292,010)

Based on the analysis above, Metropolitan would be able to meet firm demands under the driest three-year hydrologic scenario using the recent water management actions described above without re-implementing mandatory water use restrictions on its member agencies. Given the assumed absence of mandatory restrictions, the estimated minimum imported water supplies available to MWDOC from Metropolitan is assumed to be equal to Metropolitan's estimate of demand for firm supplies for MWDOC, which Metropolitan uses when considering whether to impose mandatory restrictions. Thus, the estimate of the minimum imported supplies available to MWDOC is 261,577 AF[13].

MWDOC also has also adopted a shortage allocation plan and accompanying allocation model that estimates firm demands on MWDOC. Assuming MWDOC would not be imposing mandatory restrictions if Metropolitan is not, the estimate of firms demands in MWDOC's latest allocation model has been used to estimate the minimum imported supplies available to each of MWDOC's customer agencies for 2011-13. Thus, the estimate of the minimum imported supplies available to the City is 7,891 AF[14].

[13] Metropolitan 2010/11 Water Shortage Allocation Plan model (March 2011)
[14] MWDOC Water Shortage Allocation model (August 2010)

As captured in its 2010 RUWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan and MWDOC will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands through the year 2035. Additionally, through a variety of groundwater reliability programs conducted by OCWD and participated in by the City, local supplies are projected to be maintained at demand levels. Based on the MWDOC Water Supply Allocation Plan, the City is expected to fully meet demands for the next three years assuming Metropolitan and MWDOC are not in shortage, a Basin Production Percentage of 62% for Local Supplies and zero allocations are imposed for Imported Supplies. Normal year supplies are based on the Base Period supply in the MWDOC Water Supply Allocation Plan, which is the average of the last three non-shortage calendar years 2004, 2005, and 2006. The Three Year Estimated Minimum Water Supply is listed in Table 5-3.

Table 5-3: Three-Year Estimated Minimum Water Supply (AFY)

Source	Normal	Year 1	Year 2	Year 3
	Base Year	2010/2011	2011/2012	2012/2013
Local Supplies	4,778	10,267	10,267	10,267
Imported Supply	13,126	7,891	7,891	7,891
Total	*17,904*	*18,158*	*18,158*	*18,158*

5.3. Catastrophic Supply Interruption

Given the great distances that imported supplies travel to reach Orange County, the region is vulnerable to interruptions along hundreds of miles aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, this water is distributed to customers through an intricate network of pipes and water mains that are susceptible to damage from earthquakes and other disasters.

Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM and WSAP Plans. Metropolitan also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the southern California region, including seismic events along the San Andreas Fault. In addition, Metropolitan is working with the State to implement a comprehensive

improvement plan to address catastrophic occurrences that could occur outside of the Southern California region, such as a maximum probable seismic event in the Delta that would cause levee failure and disruption of SWP deliveries. For greater detail on Metropolitan's planned responses to catastrophic interruption, please refer to Metropolitan's RUWMP.

Water Emergency Response Organization of Orange County

In 1983, the Orange County water community identified a need to develop a plan on how agencies would respond effectively to disasters impacting the regional water distribution system. The collective efforts of these agencies resulted in the formation of the Water Emergency Response Organization of Orange County (WEROC) to coordinate emergency response on behalf of all Orange County water and wastewater agencies, develop an emergency plan to respond to disasters, and conduct disaster training exercises for the Orange County water community. WEROC was established with the creation of an indemnification agreement between its member agencies to protect each other against civil liabilities and to facilitate the exchange of resources. WEROC is unique in its ability to provide a single point of contact for representation of all water and wastewater utilities in Orange County during a disaster. This representation is to the county, state, and federal disaster coordination agencies. Within the Orange County Operational Area, WEROC is the recognized contact for emergency response for the water community.

City of Newport Beach

The City developed its Emergency Preparedness Plan in 1998 to meet emergencies within its service area and has updated the plan as necessary. The plan provides information on City operations, assigns responsibilities, and establishes general policies and procedures associated with operations during natural disasters, technological incidents, and nuclear defense emergencies.

Table 5-4 summaries various possible catastrophes and a summary of the actions that would be taken in response.

Table 5-4: Preparation Actions for Catastrophe

Possible Catastrophe	Preparation Actions
Regional Power Outage	Request information from SCE to determine how long outage will be. Pump Stations will automatically utilize back-up power through an auto-transfer switch. Utilize Metropolitan connections and emergency supply in Big Canyon Reservoir. Notify customers, media, state and local authorities if service is disrupted or significant demand management is necessary.
Earthquake	The City would activate its EOC and each Department would activate their respective DOC's. All City departments are assigned specific functions as described in the Functional Responsibility Matrix. Each department will respond to, manage, and request mutual aid resources/personnel to respond to their assigned responsibilities. Issue boil alert of "do not drink" orders as needed.
Diemer Plant Shutdown	Request information from Metropolitan on length of shutdown. If insignificant, utilize emergency water storage or pump groundwater from wells to supply demand for all customers. Also, potentially implement water use prohibitions, depending on length and severity.
Supply Contamination	Notify Newport Beach Police Department and Department of Health Services. Attempt to isolate affected areas, in known, preventing spreading to other areas. Issue a "do not drink" or boil order as necessary. Provide alternate water supply to areas affected. Activation of EOC would depend on severity.
Flooding	Request information from other City departments on the severity and location of the flooding, to determine the potential damage to facilities. Activation of DOC and potentially EOC, based on severity. Utilize portable pumps and generators at locations most affected.
Tsunami	Emergency evacuation. Subsequently, possible activation of DOC and EOC based on severity. Have not fully addressed this event.

5.4. Prohibitions, Penalties and Consumption Reduction Methods

Prohibitions

The Water Conservation and Supply Level Regulations Ordinance No. 2010-16 lists water conservation requirements which shall take effect upon implementation by the City Council. These prohibitions shall promote the efficient use of water, reduce or eliminate water waste, complement the City's Water Quality regulations and urban runoff reduction efforts, and enable implementation of the City's Water Shortage Contingency Measures. Prohibitions include, but are not limited to, restrictions on outdoor watering, washing of vehicles, food preparation establishments, repairing of leaks and other malfunctions, swimming pools, decorative water features, construction activities, and water service provisions which can be found in Table 5-5.

Table 5-5: Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
The use of potable water to irrigate any lawn and/or ornamental landscape area using a landscape irrigation system or watering device that is not continuously attended is prohibited unless such irrigation is limited to no more than fifteen (15) minutes per day per station. Systems that lawfully use recycled water or use very low flow drip type irrigation systems, weather based controllers, or stream rotor sprinklers are exempt.	Year Round
Watering of any vegetated area in a manner that causes excessive water flow or runoff onto an adjoining sidewalk, street, driveway, alley, gutter, or ditch is prohibited.	Year Round
Washing down sidewalks, walkways, drive ways, parking areas, or other paved surfaces is prohibited except as required to alleviate safety or sanitary hazards by use of a handheld container or hose equipped with an automatic shutoff device.	Year Round
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system must be repaired within seven (7) days notice by the City, unless other arrangements have been made with the City.	Year Round
The use of potable water for landscape irrigation during a rainfall event is prohibited.	Year Round
By July 1, 2012, all landscape irrigation systems connected to dedicated landscape meters shall include rain sensors that automatically shut off	Year Round

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
such systems during periods of rain or include evapotranspiration systems that schedule irrigation based on climatic conditions.	
Water fountains and other decorative water features must use a re-circulating water system	Year Round
The use of water to clean a vehicle is prohibited except by use of a handheld container, hose equipped with an automatic shut off device, or at a commercial car washing facility.	Year Round
All new commercial conveyor car wash systems in commercial car washing facilities shall be operational re-circulating water systems.	Year Round
By January 1, 2013, all commercial conveyor car wash systems in commercial car washing facilities shall be operational re-circulating water systems, or the customer must have secured an exemption from this requirement.	Year Round
No public place where food is sold, served, or offered for sale shall serve drinking water to customers unless requested.	Year Round
Commercial lodging establishments must provide customers the option of not having towels and linen laundered daily.	Year Round
No installation of a single pass cooling system.	Year Round
All new washing machines installed in commercial and/or coin-operated laundries shall be ENERGY STAR® and CEE Tier III qualified. By January 1, 2014, all washing machines installed in commercial and/or coin-operated laundries shall be ENERGY STAR® and CEE Tier III qualified.	Year Round
No customer shall use water from any fire hydrant for any purpose other than fire suppression or emergency aid without first: (1) requesting and posting the appropriate fees at the City, and (2) obtaining a hydrant meter to record all water consumption for a specified project.	Year Round
No person shall use potable water for soil compaction or dust control in a construction site where there is an appropriate source of non-potable water approved by the Department of Public Health. No person shall operate a hose within a construction site that is not equipped with an automatic shutoff device, provided such devices are available for the size and type of hose in use.	Year Round

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
New or remodeled commercial kitchens shall be equipped with water conserving kitchen spray valves and best-available water-conserving technology.	Year Round
Defrosting of food with running water is prohibited.	Year Round
Scoop sinks shall be set at minimum water flow at all times and shut off during non-working hours.	Year Round
Hoses used for commercial kitchen areas must be equipped with an automatic shut off device.	Year Round
Watering or irrigation of vegetated areas is limited to four (4) days per week from April – October and two (2) days per week from November – March except by use of a hand held device, hose equipped with an automatic shutoff device, low flow irrigation systems, irrigation of food crops, for the express purpose of adjusting or repairing an irrigation system, or with approved recycled water.	Level 1
No customer shall use more water during any billing period than the percentage of the base amount established in the resolution declaring the Level One water supply shortage, whose percentage shall be in the range from one hundred (100) percent and ninety (90) percent of the base amount.	Level 1
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system must be repaired within three (3) days notice by the City, unless other arrangements have been made with the City.	Level 1
Filling or refilling ornamental lakes and ponds more than once a week is prohibited. Ornamental lakes and ponds that sustain aquatic life of significant value and were actively managed prior to the storage declaration are exempt.	Level 1
The use of potable water to fill or refill by more than one foot a residential swimming pool or outdoor spa more than once a week is prohibited.	Level 1
Watering or irrigation of vegetated areas is limited to the hours between 5 pm and 9:00 am three (3) days per week from April – October and one (1) day per week from November – March except by use of a hand held device, hose equipped with an automatic shutoff device, low flow irrigation systems, irrigation of food crops, for the express	Level 2

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
purpose of adjusting or repairing an irrigation system, or with approved recycled water.	
No customer shall use more water during any billing period than the percentage of the base amount established in the resolution declaring the Level Two water supply shortage, which percentage shall be in the range from ninety (90) percent to seventy-five (75) percent of the base amount.	Level 2
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system must be repaired within two (2) days notice by the City, unless other arrangements have been made with the City.	Level 2
Filling or refilling ornamental lakes and ponds more than once every other week is prohibited. Ornamental lakes and ponds that sustain aquatic life of significant value and were actively managed prior to the storage declaration are exempt.	Level 2
The use of potable water to fill or refill by more than one foot a residential swimming pool or outdoor spa more than once a week is prohibited.	Level 2
Watering or irrigation of vegetated areas is limited to the hours between 5 pm and 9:00 am two (2) days per week from April – October and one (1) day per week from November – March except by use of a hand held device, hose equipped with an automatic shutoff device, low flow irrigation systems, irrigation of food crops, for the express purpose of adjusting or repairing an irrigation system, or with approved recycled water.	Level 3
No customer shall use more water during any billing period than the percentage of the base amount established in the resolution declaring the Level Three water shortage, whose percentage shall be in the range from seventy-five (75) percent and sixty (60) percent of the base amount.	Level 3
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system must be repaired within one (1) day notice by the City, unless other arrangements have been made with the City.	Level 3
Filling or refilling ornamental lakes and ponds is prohibited. Ornamental lakes and ponds that sustain aquatic life of significant value and were actively managed prior to the storage declaration	Level 3

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
are exempt.	
The use of potable water to fill or refill a residential swimming pool or outdoor spa is prohibited.	Level 3
Irrigation of any vegetated area with potable water is prohibited except by use of a hand held container or hose equipped with an automatic shut off device. Maintenance of landscape to the extent necessary for fire and/or erosion protection is exempt. Maintenance of plant materials identified to be rare or essential to the well being of rare animals is exempt. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens is exempt provided that such irrigation does not exceed two times per week. Public work projects and actively irrigated environmental projects are exempt. Food crops, provided that such irrigation does not exceed two times per week, are exempt.	Level 4
No new potable water service, meters, or will-serve letters will be provided except under one or more of the following: a. Projects necessary to protect public health, safety, and/or well being. b. Projects with a valid unexpired building permit. c. Projects with applicants who can provide substantial evidence of an enforceable commitment that water demands will be offset prior to the provision of new water meters to the satisfaction of the City.	Level 4
No customer shall use more water during any billing period than the percentage of the base amount established in the resolution declaring the Level Four water shortage, which percentage shall be less than sixty (60) percent of the base amount.	Level 4

Consumption Reduction Methods

Reductions in water consumption by the City during water shortages will reduce MWDOC's overall demands on Metropolitan. Under the ordinance, the City has the

authority of allocating available supplies as deemed necessary under the water conservation phases. Consumption Reduction Methods are listed in Table 5-6.

Table 5-6: Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Year Round Conservation Measures		To be determined by the City Council.
Level 1 Conservation Measures	1	
Level 2 Conservation Measures	2	
Level 3 Conservation Measures	3	
Level 4 Conservation Measures	4	

Penalties for Excessive Use

Any customer who violates provisions of the Water Conservation and Supply Level Regulations by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by the City and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination which are detailed in Table 5-7.

Table 5-7: Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Written Notice	First Violation
Installation of Water Flow Restrictor	Second and Subsequent Violations
Termination of Service	Willful violations of mandatory restrictions

5.5. Impacts to Revenue

The actions described above to address a range of water shortage conditions have the potential to impact the City's revenues and expenditures. To assess these impacts, the City calculated the revenue impacts resulting from a 10%, 20% and 50% reduction in sales as compared to a base year that was based on an estimate of normal year baseline. Other factors incorporated into the analysis included water losses, pricing structure and avoided costs. The results of this analysis are shown below in Table 5-8.

Table 5-8: Revenue Impacts Analysis

Demand	Baseline	10%	20%	50%
Water Sales (HCF)	6,514,518	5,863,066	5,211,614	3,257,259
Revenue				
Tier 1 Revenue	$16,025,714	$14,423,143	$12,820,571	$11,218,000
Fixed Monthly/Bimonthly Charge Revenue	$4,884,770	$4,884,770	$4,884,770	$4,884,770
Total Rate Revenue	$20,910,484	$19,307,913	$17,705,341	$12,897,627
Revenue Lost		**($1,602,571)**	**($3,205,143)**	**($8,012,857)**
Variable Costs				
Water Produced/Purchased($)	$8,017,810	$7,216,029	$6,414,248	$4,008,905
Avoided Costs		**$801,781**	**$1,603,562**	**$4,008,905**
Net Revenue Change		**($800,790)**	**($1,601,581)**	**($4,003,952)**

Anticipated shortfalls in projected revenue due to water supply shortages would need to be covered through increased water rates and/or an advance from funds set aside by the City. The existing rate structure could be adjusted to recapture a portion of the lost revenue, which would affect all water users within the City's service area. The City has a Water Rate Stabilization Fund to be used in times of drought and emergencies to offset the loss of revenue. The City could also advance funds from its General Fund for the loss of essential revenue.

5.6. Reduction Measuring Mechanism

In order to quantify actual reductions in water use, several measuring mechanisms must be utilized. Water Use Monitoring Mechanisms ranging from water meter auditing, daily production monitoring, distribution records, and monitoring employees are listed in Table 5-9.

Table 5-9: Water Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Type of Data Expected
Water meter auditing	Actual reduction of water used for meters over one-inch
Monitor daily production/distribution records	Daily production and distribution records would be monitored. The data is recorded by zone, which would enable City staff to determine which zone was using more water than expected. Customers would be alerted to actual water use (increase/decrease).
Monitoring Employee	City Code Enforcement Staff employee would monitor all unnecessary domestic irrigation use and serve on the "dawn" patrol to verify that residences and irrigation customers are not over-watering in the early hours of the day.

6. Recycled Water

6.1. Agency Coordination

Recycled water is defined as domestic wastewater purified through primary, secondary and tertiary treatment. Recycled water is acceptable for most non-potable water purposes such as irrigation, commercial, and industrial processes. The City maintains an agreement with OCWD to supply Green Acres Project (GAP) water to customers where available. The addition of this supplemental water will reduce the demand on the City's water supply, thereby providing additional reserves for firefighting capacity, preserving potable water for drinking, and ensuring landscape irrigation during period of drought. Use of recycled water is expected to continue an upward trend in the City; throughout the County of Orange and all throughout the state of California.

The City continues to support regional efforts to increase the use of recycled water. Because the City produces a majority of its water supply from the Basin, the City benefits from the actions of OCWD using recycled water to protect the Basin through seawater intrusion barriers and groundwater recharge basins. The City, therefore, indirectly benefits from this regional use of recycled water.

Table 6-1: Participating Agencies

Participating Agencies	Participated
Water Agencies	Newport Beach
Wastewater Agencies	OCSD
Groundwater Agencies	OCWD
Planning Agencies	

6.2. Wastewater Description and Disposal

Within its service area, the City is responsible for wastewater collection and conveyance to the Orange County Sanitation District (OCSD) sewer treatment plant, located in Huntington Beach. OCSD also treats wastewater from several other municipalities. OCSD discharges treated water into the ocean through a 120-inch diameter ocean outfall pipe that extends five miles offshore to the discharge point. A standby 78-inch diameter outfall pipeline stretches one mile from shore. The treatment levels meet all current State and Federal requirements. OCSD also sends up to 10 mgd of treated wastewater every

day to the Orange County Water District for further processing for landscape irrigation and for injection into the groundwater seawater intrusion barrier.

Within the City's service area, discharge of treated wastewater is regulated by the Regional Water Quality Control Board (RWQCB). In general, the majority of the wastewater generated and treated during the summer months is used for alternative beneficial uses such as wetland habitat and restoration and irrigation for golf courses. The use of the recycled water helps supply part of the water demand during the peak summer months.

Table 6-2 summarizes the past, current, and projected wastewater volumes collected and treated, and the quantity of wastewater treated to recycled water standards for treatment plants within OCSD's service area. Table 6-3 summarizes the disposal method, and treatment level of discharge volumes.

Table 6-2: Wastewater Collection and Treatment (AFY)

Type of Wastewater	Fiscal Year Ending						
	2005	2010	2015	2020	2025	2030	2035-opt
Wastewater Collected & Treated in Service Area	273,017	232,348	302,400	312,704	321,104	329,392	333,536
Volume that Meets Recycled Water Standards	12,156	75,000	105,000	105,000	105,000	105,000	105,000

Table 6-3: Disposal of Wastewater (Non-Recycled) (AFY)

Method of Disposal	Treatment Level	Fiscal Year Ending					
		2010	2015	2020	2025	2030	2035-opt
Ocean Outfall	Secondary	157,348	197,400	207,704	216,104	224,392	228,536

6.3. Current Recycled Water Uses

The City has approximately 10 miles of recycled water distribution pipeline, which currently supplies eight recycled use sites.

Recycled water is supplied to the City from the Orange County Water District (OCWD) from Fountain Valley as part of OCWD's Green Acres Project. OCWD produces approximately 7.5 MGD of tertiary treated, disinfected recycled water. Some of the sites served by recycled water include the Newport Beach County Club, the Big Canyon

Country Club, median strips, and a City owned park. In FY 2009-10, approximately 400 AF of recycled water was used in the City's service area for landscape irrigation, about 3% of the City's annual water demand.

Table 6-4 below illustrates the current uses for recycled water in the City. The usage is limited to landscape irrigation with a tertiary treatment level.

Table 6-4: Current Recycled Water Uses (AFY)

User Type	Treatment Level	Fiscal Year Ending
		2010
Agriculture		
Landscape	Tertiary	432
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Total		**432**

6.4. Potential Recycled Water Uses

Potential recycled water users are locations where recycled water could replace potable water use. These potential users are typically landscape or agricultural irrigation systems, or possibly water users. However, due to the limited access to the project mains and some financial impact on end users, it is not feasible to distribute all of the potential recycled water, and the City does not predict that there will be many other end users in the near future.

Tables 6-5 and 6-6 represent projected recycled water use within the City's service area through 2035. Recycled water use will remain constant through the 25-year period, with landscape irrigation as its sole use.

Table 6-5: Projected Future Use of Recycled Water in Service Area (AFY)

User Type	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
Projected Use of Recycled Water	432	450	500	500	500	500

Table 6-6: Projected Recycled Water Uses (AFY)

User Type	Treatment Level	Fiscal Year Ending				
		2015	2020	2025	2030	2035-opt
Agriculture						
Landscape	Tertiary	450	500	500	500	500
Wildlife Habitat						
Wetlands						
Industrial						
Groundwater Recharge						
Total		**450**	**500**	**500**	**500**	**500**

Table 6-7 compares the recycled water use projections from the City's 2005 UWMP with actual 2010 recycled water use.

Table 6-7: Recycled Water Uses – 2005 Projections compared with 2010 Actual (AFY)

User Type	2005 Projection for 2010	2010 Actual Use
Agriculture		
Landscape	444	432
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Total	**444**	**432**

6.4.1. Direct Non-Potable Reuse

The City currently uses recycled water from OCWD's Green Acres Project for direct non-potable reuse such as landscape irrigation.

6.4.2. Indirect Potable Reuse

The City benefits indirectly from the replenishment of the Orange County groundwater basin using GWRS water that meets state and federal drinking water standards for potable reuse.

6.5. Optimization Plan

To promote the use of recycled water, the City provides financial incentives by offering a 20 percent discount off potable water rates. The current rate for recycled users is $1.66 per unit (one unit equals 748 gallons).

In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, business and communal landscaping. However, future recycled water use can increase by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pumping stations and transmission mains to reach areas far from the treatment plants. Gains in implementing some of these projects have been made throughout the county; however, the additional costs, large energy requirements, and facilities make such projects very expensive to pursue.

The City will conduct future cost/benefit analyses for recycled water projects, and seek creative solutions and a balance to recycled water use, in coordination with MWDOC, OCWD, Metropolitan and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements and public acceptance.

7. Future Water Supply Projects and Programs

7.1. Water Management Tools

Resource optimization such as desalination to minimize the needs for imported water is led by the regional agencies in collaboration with local agencies.

With the eventual replacement of older wells with new more efficient wells, increasing the capacity of existing booster stations, and continued efforts in reducing water waste, the City can meet projected demands with existing facilities and distribution system.

7.2. Transfer or Exchange Opportunities

MWDOC will continue to help its member agencies in developing Transfer or Exchange opportunities and ensuring their success. In fulfilling this role, MWDOC will look to help its member agencies navigate the operational and administrative issues of wheeling water through the Metropolitan water distribution system.

The City relies on the efforts of Metropolitan as well as MWDOC to pursue transfer or exchange opportunities. At this time, the City is not currently involved in any transfer or exchange opportunities.

7.3. Planned Water Supply Projects and Programs

At this time, the City does not have any planned water supply projects or programs.

7.4. Desalination Opportunities

Desalination is viewed as a way to develop a local, reliable source of water that assists agencies reduce their demand on imported water, reduce groundwater overdraft, and in some cases make unusable groundwater available for municipal uses. Currently, there are no identified projects within the City for desalination of seawater or impaired groundwater. However, from a regional perspective, desalination projects within the region indirectly benefit the City.

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC, including one specifically that may benefit the City. These are the Huntington Beach Seawater Desalination Project, the South Orange Coastal Desalination Project, and the Camp Pendleton Seawater Desalination Project.

Table 7-1: Opportunities for Desalinated Water

Sources of Water	Check if Yes
Ocean Water	X
Brackish Ocean Water	X
Brackish Groundwater	

7.4.1. Groundwater

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

7.4.2. Ocean Water

Huntington Beach Seawater Desalination Project – Poseidon Resources LLC (Poseidon), a private company, has proposed development of the Huntington Beach Seawater Desalination Project to be located adjacent to the AES Generation Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water and will distribute water to coastal and south Orange County to provide approximately 8% of Orange County's water supply needs. The project supplies would be distributed to participating agencies through a combination of (1) direct deliveries through facilities including the East Orange County Feeder #2 (EOCF #2), the City of Huntington Beach's distribution system, and the West Orange County Water Board Feeder #2 (WOCWBF #2), and (2) water supply exchanges with agencies with no direct connection to facilities associated with the Project.

Poseidon had received non-binding Letters of Intent (LOI) from the Municipal Water District of Orange County and 17 retail water agencies to purchase a total of approximately 72 MGD (88,000 AFY) of Project supplies. On January 20, 2010, the City signed a non-binding LOI for 7.1 MGD (8,000 AFY) of Project supplies.

The Project has received specific approvals from the Huntington Beach City Council, including the Coastal Development Permit, Tentative Parcel Map, Subsequent Environmental Impact Report and Conditional Use Permit, which collectively provided for the long-term operation of the desalination facility.

In addition to final agreements with the participating agencies, the Project still needs approvals from the State Lands Commission and the California Coastal Commission before Poseidon can commence construction of the desalination facility in Huntington Beach. A public hearing on the Project before the State Lands Commission is expected as early as this October. If project receives all required permits by 2011, it could be producing drinking water for Orange County by as soon as 2013.

South Orange Coastal Desalination Project – MWDOC is proposing a desalination project in joint with Laguna Beach County Water District, Moulton Niguel Water District, City of San Clemente, City of San Juan Capistrano, South Coast Water District, and Metropolitan. The project is to be located adjacent to the San Juan Creek in Dana Point just east of the transition road from PCH to the I-5. The project will provide 15 MGD (16,000 AFY) of drinking water and will provide up to 30% of its potable water supply to the participating agencies.

Phase 1 consists of drilling 4 test borings and installing monitoring wells. Phase 2 consists of drilling, constructing and pumping a test slant well. Phase 3 consists of constructing a Pilot Test Facility to collect and assess water quality. Phases 1 and 2 have been completed and Phase 3 commenced in June 2010 and will last 18 months.

If pumping results are favorable after testing, a full-scale project description and EIR will be developed. If EIR is adopted and necessary permits are approved, project could be operational by 2016.

Camp Pendleton Seawater Desalination Project – San Diego County Water Authority (SDCWA) is proposing a desalination project in joint with Metropolitan to be located at Camp Pendleton Marine Corps Base adjacent to the Santa Margarita River. The initial project would be a 50 or 100 MGD plant with expansions in 50 MGD increments up to a max of 150 MGD making this the largest proposed desalination plant in the US.

The project is currently in the study feasibility stage and is conducting geological surveys to study the effect on ocean life and examining routes to bring desalination to SDCWA's delivery system. MWDOC and south Orange County agencies are maintaining a potential interest in the project, but at this time is only doing some limited fact finding and monitoring of the project.

8. UWMP Adoption Process

8.1. Overview

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

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

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Encouraged public involvement (Public Hearing)	May 28, 2011 & June 4, 2011	Appendix F
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	March 22, 2011	Appendix E
Held public hearing	June 14, 2011	Appendix F
Adopted UWMP		Appendix G
Submitted UWMP to DWR (no later than 30 days after adoption)		
Submitted UWMP to the California State Library and city or county within the supplier's service area (no later than 30 days after adoption)		
Made UWMP available for public review (no later than 30 days after filing with DWR)		

This UWMP was adopted by the City Council on MONTH DAY, YEAR. A copy of the adopted resolution is provided in Appendix G.

A change from the 2004 legislative session to the 2009 legislative session required the City to notify any city or county within its service area at least 60 days prior to the public

hearing. The City sent a Letter of Notification to the County of Orange on March 22, 2011 that it is in the process of preparing an updated UWMP (Appendix E).

8.2. Public Participation

The City encouraged community and public interest involvement in the plan update through public hearings and inspection of the draft document. Public hearing notifications were published in local newspapers. A copy of the published Notice of Public Hearing is included in Appendix E. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the City's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the City Clerk's and Utilities Department offices.

8.3. Agency Coordination

All of the City's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The City is dependent on imported water from Metropolitan through MWDOC, its regional wholesaler. The City is also dependent on groundwater from OCWD, the agency which manages the Santa Ana River Groundwater Basin as well as provides recycled water in partnership with the Orange County Sanitation District (OCSD). As such, the City involved these water providers in the development of its 2010 UWMP at various levels of contribution as summarized in Table 8-2.

Table 8-2: Coordination with Appropriate Agencies

	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Copy of Draft Plan	Sent Notice of Intention to Adopt	Not Involved/No Information
MWDOC	X			X			
Metropolitan	X						
OCWD	X						
County of Orange						X	

As a member agency of MWDOC, MWDOC provided assistance to the City's 2010 UWMP development by providing much of the data and analysis such as, population projections from the California State University at Fullerton, Center of Demographic

Research (CDR) and SBx7-7 modeling. MWDOC provided information that quantifies water availability to meet their projected demands for the next 25 years, in five-year increments. Based on the projections of retail demand and local supplies completed by the City, and the imported supply availability described in Metropolitan's 2010 RUWMP, MWDOC prepared an informational package with data specific to the City, that incorporated additional calculations for the required planning efforts. The City's UWMP was developed in collaboration with MWDOC's 2010 RUWMP to ensure consistency between the two documents as well as Metropolitan's 2010 RUWMP and 2010 Integrated Water Resources Plan.

As a groundwater producer who relies on supplies from the OCWD-managed Orange County Groundwater Basin, the City coordinated the preparation of this 2010 UWMP with OCWD. OCWD provided projections of the amount of groundwater, the City is allowed to extract in the 25-year planning horizon. In addition, information from OCWD's 2009 Groundwater Management Plan and 2008-2009 Engineer's Report were incorporated in this document where relevant.

8.4. UWMP Submittal

8.4.1. Review of Implementation of 2005 UWMP

As required by California Water Code, the City summarizes the implementation of the Water Conservation and Water Recycling Programs to date, and compares the implementation to those as planned in its 2005 UWMP.

Comparison of 2005 Planned Water Conservation Programs with 2010 Actual Programs

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

Comparison of 2005 Projected Recycled Water Use with 2010 Actual Use

Current recycled water projections for the City in 2010 are about 3% less than previously forecasted for 2010 in the 2005 UWMP, as illustrated in Table 6-7.

8.4.2. Filing of 2010 UWMP

The City Council reviewed the Final Draft Plan on DATE. The seven-member City Council approved the 2010 UWMP on DATE. See Appendix G for the resolution approving the Plan.

By August 1, 2011, the City's Adopted 2010 UWMP was filed with DWR, California State Library, County of Orange, and cities within the City's service area.