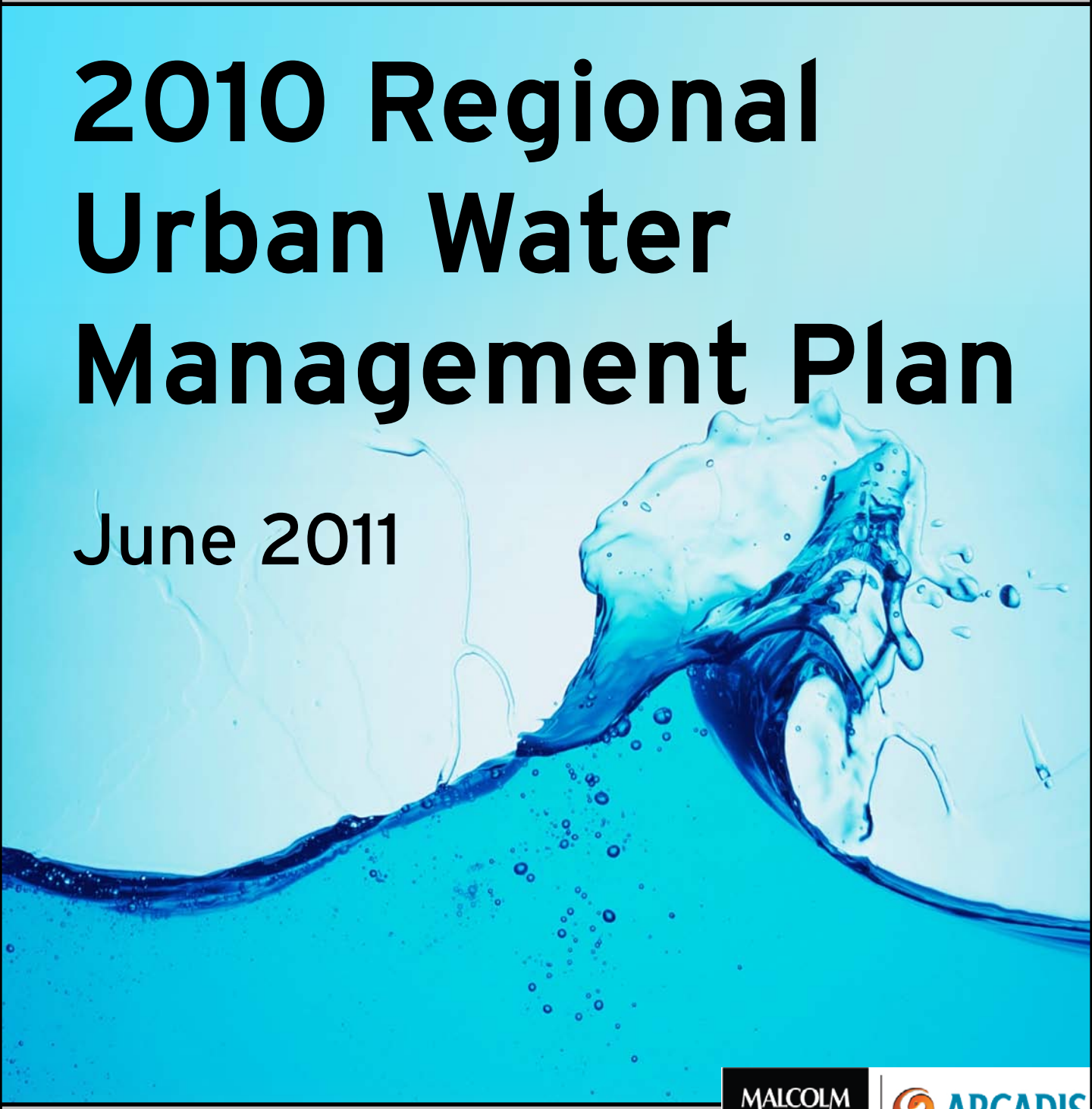
Municipal Water District of Orange County

Final

2010 Regional Urban Water Management Plan

June 2011



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Municipal Water District of Orange County
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2010 Regional Urban Water Management Plan

June 2011

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Acronyms Used in the Report

20x2020	20% water use reduction in GPCD by year 2020
Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
ATM	Aufdenkamp Transmission Main
AWT	Advanced Wastewater Treatment
Basin	Orange County Groundwater Basin
Bay-Delta	San Francisco Bay/Sacramento-San Joaquin River Delta
BDCP	Bay Delta Conservation Plan
BEA	Basin Equity Assessment
BMP	Best Management Practice
Board	Metropolitan's Board of Directors
BPP	Basin Production Percentage
CALFED	CALFED Bay-Delta Program
CDPH	California Department of Public Health
CDR	Center for Demographic Research
CDWC	California Domestic Water Company
cfs	cubic feet per second
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CSUF	California State University Fullerton
CTP	Coastal Treatment Plant
CUP	Conjunctive Use Program
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWD	Coachella Valley Water District
CWRP	Chiquita Water Reclamation Plant
CWTF	Colored Water Treatment Facility
DATS	Deep Aquifer Treatment System
DMM	Demand Management Measure
DWR	Department of Water Resources
EIR	Environmental Impact Report
EOC	Emergency Operations Center
EOCF #2	East Orange County Feeder #2
ESA	Endangered Species Act
ETo	Evapotranspiration
ETWD	El Toro Water District
Festival	Children's Water Education Festival
FY	Fiscal Year
FYE	Fiscal Year Ending

GAC	Granular Activated Carbon
GAP	Green Acres Project
GMFP	Groundwater Management and Facility Plan
GPCD	gallons per capita per day
gpm	gallons per minute
GRF	Groundwater Recovery Facility
GSWC	Golden State Water Company
GWRP	Groundwater Recovery Plant
GWRS	Groundwater Replenishment System
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
HOA	Homeowners Association
IID	Imperial Irrigation District
IPWURP	Industrial Process Water Use Reduction Program
IRP	Integrated Water Resources Plan
IRWD	Irvine Ranch Water District
JRTM	Joint Regional Transmission Main
JRTP	Joint Regional Treatment Plant
LAWRP	Los Alisos Water Reclamation Plant
LOI	Letter of Intent
LRP	Local Resources Program
M&I	Municipal and Industrial
MAF	million acre-feet
MBR	Membrane Biological Reactor
Metropolitan	Metropolitan Water District of Southern California
MF	Microfiltration
MG	million gallons
MGD	million gallons per day
MNWD	Moulton Niguel Water District
MOU	Memorandum of Understanding
MRCD	Mission Resource Conservation District
MTBE	Methyl Tert-Butyl Ether
MWDOC	Municipal Water District of Orange County
MWRP	Michelson Water Reclamation Plant
NDMA	N-nitrosodimethylamine
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
OCWRP	Oso Creek Water Reclamation Plant
Plan	2010 Regional Urban Water Management Plan
Poseidon	Poseidon Resources LLC
PPCP	Pharmaceuticals and Personal Care Product
PPR	Present Perfected Right

QSA	Quantification Settlement Agreement
RA	Replenishment Assessment
RO	Reverse Osmosis
RRWRP	Robinson Ranch Water Reclamation Plant
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SAR	Santa Ana River
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAG	Southern California Association of Governments
SCWD	South Coast Water District
SCWRRS	Southern California Water Reclamation and Reuse Study
SDCWA	San Diego County Water Authority
SDP	Seawater Desalination Program
SEMS	Standardized Emergency Management System
SJBA	San Juan Basin Authority
SLC	State Lands Commission
SMWD	Santa Margarita Water District
SNWA	Southern Nevada Water Authority
SOCIRWMP	South Orange County Integrated Regional Watershed Management Plan
SOCWA	South Orange County Wastewater Authority
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWSD	Semitropic Water Storage District
TAF	thousand acre-feet
TDS	Total Dissolved Solids
ULFT	ultra-low-flush toilet
USBR	United States Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
UWMP	Urban Water Management Plan
WACO	Water Advisory Committee of Orange County
WARN	Water Agencies Response Network
WEROC	Water Emergency Response Organization of Orange County
WOCWBF #2	West Orange County Water Board Feeder #2
WRFPS	Water Recycling Facilities Planning Study
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management Plan
YLWD	Yorba Linda Water District

Message from the Board of Directors

Since the Municipal Water District of Orange County's (MWDOC) formation in 1951, MWDOC has remained steadfast in its commitment to provide a reliable supply of high-quality water for Orange County at a reasonable rate. Through leadership, representation at Metropolitan and collaboration with our member agencies, MWDOC seeks opportunities to improve Orange County's water resources and reliability. By integrating local planning challenges and regional stakeholder partnerships, MWDOC maximizes water system reliability and overall system efficiencies. MWDOC works to expand Orange County's water supply portfolio by providing planning and local resource development in the areas of recycled water, groundwater, ocean water, and water-use efficiency.

DIRECTORS

Division 1 Brett R. Barbre
Brea, Buena Park, La Habra, La Palma, Yorba Linda Water District, and portions of Golden State Water Company

Division 2 Larry D. Dick
Orange, Tustin, East Orange County Water District, portions of Golden State Water Company, Serrano Water District, portions of Garden Grove, and portions of Irvine Ranch Water District

Division 3 Ed Royce, Sr.
Fountain Valley, Westminster, portions of Golden State Water Company, and portions of Garden Grove

Division 4 Joan C. Finnegan
Huntington Beach, Seal Beach, and Mesa Consolidated Water District

Division 5 Wayne A. Clark
Newport Beach and portions of Irvine Ranch Water District and El Toro Water District

Division 6 Jeffery M. Thomas
Santa Margarita Water District, Trabuco Canyon Water District, and portions of Irvine Ranch Water District

Division 7 Susan Hinman
San Clemente, San Juan Capistrano, Moulton Niguel Water District, Laguna Beach County Water District, and South Coast Water District

Mission Statement
"To provide reliable, high-quality supplies from Metropolitan Water District of Southern California and other sources to meet present and future needs, at an equitable and economical cost, and to promote water use efficiency for all of Orange County."

Executive Summary

Background and Purpose

Enacted in 1983, the Urban Water Management Planning Act (Act) requires every urban water supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt an urban water management plan at least once every five years. The Municipal Water District of Orange County (MWDOC), a water wholesaler and regional planning agency, fits the defined criteria and has prepared its 2010 Regional Urban Water Management Plan (Plan) to address all the requirements set forth in the *State of California Water Code* Section 10610 through 10657.

Since its passage, many amendments have been added to the Act. These changes are intended to encourage increased regional planning and the cooperative management of California's most precious commodity – water. As a result, urban water management plans have evolved to become the following:

- Foundational documents and sources of information for Water Supply Assessments (*California Water Code* Section 10613) and Written Verifications of Water Supply (*California Water Code* Section 66473.7);
- Long-range planning documents for water supply;
- Long-range planning documents for water use efficiency;
- Source data for the development of regional water plans;
- Source documents for cities and counties preparing their General Plans;
- Key components of Integrated Regional Water Management Plans; and
- A condition of eligibility for receipt of certain State grant funds.

For MWDOC, the benefits of updating its Plan extend beyond legislative compliance. The regional approach of documenting water-service planning allows MWDOC to do all of the following:

- Evaluate supply-reliability goals for the region and provide a comprehensive assessment of water resource needs in its service area;
- Provide a regional perspective on current and proposed water use efficiency goals and programs, and identify cost-effective measures that can be accomplished;
- Provide assistance to maximize the beneficial use of recycled water and other local resource supplies that reduce the need for imported supplies; and

- Offer opportunities for public participation through publicly-noticed meetings and provide information that will allow the public to gain a better understanding of the region's comprehensive water planning.

The region served by MWDOC is located in Orange County, California and includes 26 cities and water districts, referred to as MWDOC member agencies. Since MWDOC is a wholesaler of imported water for the region, it has taken a regional approach in compiling this Plan for the purpose of providing a comprehensive assessment of the region's water services, sources and supplies. This Plan documents information on all sources of water supplies for the region – imported water, groundwater, surface water, recycled water, and wastewater – as a summary of information for regional planning.

MWDOC is a member agency of the Metropolitan Water District of Southern California. Metropolitan is a consortium of 28 cities and water districts that provides supplemental potable water supplies imported from the Colorado River Aqueduct (CRA) and State Water Project (SWP) to parts of Southern California. MWDOC purchases imported water from these sources from Metropolitan and distributes the water to its member agencies, which provide retail water services to the public. MWDOC currently only supplies imported water from Metropolitan Water District of Southern California (Metropolitan) as a source of water to the region. While MWDOC is not currently responsible for any of the projects or sources other than imported supply discussed in this Plan, it actively supports development of local water supply projects and sources.

Plan Findings

Water Service Reliability

Based on the preliminary information gathered, the Plan concludes that the MWDOC service area will have sufficient existing and planned supplies to meet full service demands under every water-year hydrologic scenario from 2015 through 2035. This does not necessarily mean that moving into water supply allocations to deal with specific water shortage situations will never be necessary. At times, water supply allocations may be necessary to preserve storage to meet demand over prolong periods of drought.

Retail consumptive demand is projected to grow at a slower rate of 0.5% per year compared to historical demand growth of 1.54% per year. Water demand for municipal and industrial use is projected to grow from approximately 485,000 acre-feet per year (AFY) at the present time to nearly 568,000 AFY in 2035.

The Water Conservation Bill of 2009 (SBx7-7), the water conservation component to the Delta legislative package, requires each urban retail water supplier to develop urban water use targets to help meet the goal to reduce the statewide average per capita daily water consumption by 20% by 2020 and the interim reduction goal of 10% by 2015. The

retail agency may choose to comply with SBx7-7 as an individual or as a region in collaboration with other water suppliers. MWDOC and 26 of its member agencies as well as the cities of Anaheim, Fullerton, and Santa Ana have created the Orange County 20x2020 Regional Alliance in an effort to help these agencies meet the water use reduction targets required by SBx7-7. With a regional alliance, the entire region is able to benefit from regional investments such as the Orange County Water District (OCWD) and Orange County Sanitation District's (OCSD) Groundwater Replenishment System (GWRS), recycled water, and water use efficiency. Under this approach, MWDOC estimates the interim regional target for Orange County would be 174.1 gallons per capita per day (GPCD) in 2015 and the final target would be 156.5 GPCD in 2020.

This Plan also evaluates each source of water in the region. The resource mix for meeting total demand includes local groundwater, recycled water, surface water, and imported water from Metropolitan. The Plan documents MWDOC's cooperative efforts with its member agencies in developing local supplies. In fact, the region anticipates that the percentage of its supply from each source will remain approximately the same for the next 25 years, with 45% of its supplies from imported water and 55% of its supplies from local sources in 2035, even with projected growth occurring.

Additionally, the Plan compares the region's supply and demand to determine water service reliability under different climatic conditions – types of water years. The Plan first establishes the hydrologic conditions that define the types of water years in the MWDOC region by considering a combination of the following three variables:

1. Total retail demand of the water year;
2. Local supply condition of the water year; and
3. Imported supply condition of the water year.

Imported-supply demand typically increases during dry years when the weather is hot and there is a decrease in local runoff. Furthermore, in its Regional Urban Water Management Plan (RUWMP), Metropolitan demonstrated it has developed flexible water supplies through transfers and storage programs designed to increase its resources during dry water year conditions. As a result, the water year is defined by the net difference of total retail demand less local supplies. The greater the net difference, the more critical it is for MWDOC to depend on imported supply. Using this approach, types of water years in the region are defined as follows:

- Normal Water Year: average of 83 years, representing the historical hydrology from 1922 to 2004;
- Single Dry Water Year: 1977 hydrology (yields the highest one year demand for imported supply); and
- Multiple Dry Water Years: 1990 to 1992 (a sequence that yields the highest three-year demand for imported supply).

When comparing supply and demand under these defined water years, the region is projected to maintain full service demand under each type of water year. Under single dry water years, retail demand is expected to increase by 6.6%. Local supplies are expected to remain consistent in a single dry year, while imported supply is expected to increase to compensate for the wide gap between retail demand and local supply. When assessing the water supply reliability for the region, MWDOC used an inference approach to conclude that Metropolitan is capable of supplying imported water to meet the full service demand projected by MWDOC under various hydrologic conditions. In its 2010 Regional Urban Water Management Plan (November 2010), Metropolitan was able to demonstrate it can maintain reliability in meeting firm demands under a normal hydrologic year, the single-driest hydrologic year, and a series of multiple dry years from 2015 through 2035. By inference, MWDOC determined the availability of its imported supply should equate to its projected imported demand. Thus, MWDOC concludes Metropolitan will meet imported demand for direct consumption projected by MWDOC under this 2010 Plan.

The Plan also discusses potential sources of water supply that are being investigated by MWDOC and its member agencies to diversify the region's water supply portfolio. Water transfers and exchange and ocean water desalination are two potential sources of supply that are discussed as part of MWDOC's long-term resource evaluation. MWDOC and some of its member agencies are now developing long-term relationships with water suppliers in Northern California. These relationships may lead to mutually beneficial transfer agreements in the near future. The Plan also discusses potential ocean desalination projects in the region: the Huntington Beach Seawater Desalination Project; the South Orange Coastal Ocean Desalination Project; and the Camp Pendleton Seawater Desalination Project.

Impact of Water Quality on Water Service Reliability

Water quality evaluation is based on known contaminants applicable to local and imported supplies by three levels of standards:

- Primary Drinking Water Standards (health)
- Secondary Drinking Water Standards (aesthetics)
- Notification Levels (not yet regulated contaminants)

After evaluating the water quality in the region, the Plan concludes that current management strategies have accounted for all known and foreseeable water quality impacts. The region does not anticipate that any water quality issues would either reduce supply availability or could not be handled through existing management strategies.

Water Conservation Programs (Water Use Efficiency)

As a wholesaler, MWDOC is committed to developing and implementing regional water use efficiency and water conservation programs on behalf of its retail water agencies and their customers. This regional approach enables economies of scale, ensures a consistent message to the public, and assists in the acquisition of grant funding for program implementation.

To facilitate the implementation of Best Management Practices (BMPs) for Water Use Efficiency (WUE) throughout Orange County, MWDOC focuses its effort on the following three areas:

- Regional Program Implementation: MWDOC develops, obtains funding for, and implements regional BMP programs on behalf of all retail water agencies in its service area.
- Local Program Assistance: Upon request, MWDOC assists retail agencies in developing and implementing local programs within their individual service areas. MWDOC provides assistance with a variety of local programs including, but not limited to: Home Water Surveys, Landscape Workshops (residential and commercial), Public Information, School Education, Conservation Pricing, and Water Waste Prohibitions.
- Research and Evaluation: An integral component of any water use efficiency program is the research and evaluation of potential and existing programs. In the past five years, MWDOC has conducted research that allows agencies to measure the water-savings benefits of a specific program and then compare those benefits to the costs of implementing the program. This cost/benefit analysis enables individual agencies to evaluate the economic feasibility of a program prior to its implementation.

Wastewater Management and Water Recycling

Currently, the region collects nearly 313,000 acre-feet of wastewater per year; 35% of that wastewater is used for recycled water supply. The remainder is disposed through ocean outfalls. However, the Plan projects the amount of recycled water supply will increase in the future. The amount of wastewater is expected to grow to approximately 440,000 AFY in 2035, with 37% expected to be treated for recycled use and the rest disposed through ocean outfalls.

Recycled water is a significant, reliable source of supply and its expanded use in the future is examined. The mechanisms encouraging recycled water use include the following:

- Assisting retail agencies to secure funding from local, state, and federal agencies;

- Promoting partnerships to encourage water recycling projects (e.g., the GWRS);
- Encouraging regulatory agencies to streamline permitting requirements;
- Lobbying for state and federal assistance for the construction of brine lines to offset the cost of brine disposal; and
- Supporting research that addresses public concerns on recycled water use, develops new technology for cost reduction, and assesses health effects to protect the public.

Water Shortage Contingency Plan

During water shortages, MWDOC works with its member agencies to manage the water supply in the region to ensure it meets the demands of its member agencies. Water shortages may result from variations in weather, natural disasters, or unanticipated situations (e.g., system failures, acts of terror). During a severe water shortage (Stage 7 supply reduction as defined in Metropolitan's Water Surplus and Drought Management [WSDM] Plan), the MWDOC Board is responsible for allocating imported water from Metropolitan. The Metropolitan Water Shortage Allocation Plan (WSAP) includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation should Metropolitan be unable to meet the "firm demands" (non-interruptible demands) of its member agencies. MWDOC's WSAP uses the same principles as identified in Metropolitan's WSAP for the allocation of imported water to its member (retail) water agencies, subject to any locally developed principles which would be developed in consultation with the retail agencies.

In the early 1980s, three regional water agencies – MWDOC, Coastal Municipal Water District (later merged with MWDOC), and OCWD – jointly formed the Water Emergency Response Organization of Orange County (WEROC) to coordinate emergency response through Orange County water and wastewater agencies. Details of a catastrophic supply interruption plan developed through WEROC are discussed in Section 5.4 of the Plan.

Coordination

It is important to note that Metropolitan and many of MWDOC's retail member agencies are also required to prepare urban water management plans on the same schedule. As a result, MWDOC recognizes that close coordination among its wholesale agency and MWDOC's retail member agencies is a key to the success of its Plan.

The MWDOC Plan is meant to aggregate the planning information in a meaningful way so the public can better understand water resource planning on the regional level. Every effort has been made to coordinate information with local retail agencies' plans to avoid any significant discrepancies in facts, figures, and estimates contained in each local urban water management plan. To that end, much of the information presented the MWDOC

Plan is based on the best available information at the time of drafting. To the extent that any discrepancies exist, the local retail agency urban water management plan governs.

Plan Summary and Adoption

Based on the data compiled in this Plan, water service in the MWDOC region is expected to meet full service demands from 2015 through 2035. The Plan also finds that the region is continuing to improve its water reliability by designing programs to protect and ensure water quality, maximize local supplies, promote conservation, encourage recycled water use, and meet its demands during shortages.

In compliance with *California Water Code* Section 10644(b), MWDOC is required to file this Plan with the Department of Water Resources (DWR) on or before December 31, 2010. However, both retail and wholesale water agencies have been provided an extension to adopt the Plan by July 1, 2011 and submit it to DWR within 30 days of adoption to allow sufficient time to develop water use targets and an interim water use target to increase water use efficiency as required by SBx7-7.

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 urban water management plan (UWMP) with the California Department of Water Resources (DWR) every five years in the years ending in zero and five. A copy of the Act is included in Appendix A. The Water Conservation Bill of 2009 (SBx7-7) provided a 6-month extension for the 2010 UWMPs to allow time for DWR to prepare information related to target methodology for the goal to reduce the statewide average per capita daily water consumption by 20% by 2020 and for retail water agencies to respond to this requirement. Therefore, the 2010 UWMP updates are to be adopted no later than July 1, 2011 and are due to DWR within 30 days of adoption.

This Municipal Water District of Orange County (MWDOC) 2010 Regional Urban Water Management Plan (Plan) provides information on the present and future water resources and demands in MWDOC's service area and provides an assessment of MWDOC's water resource needs. Specifically, this Plan provides water supply planning for a 25-year planning period in 5-year increments. The Plan identifies water supplies for existing and future demands, quantifies water demands during normal year, single-dry year, and multiple-dry years, and identifies supply reliability under the three hydrologic conditions. The MWDOC 2010 Plan update revises the 2005 Plan. This Plan has been prepared in compliance with the requirements of the Act as amended in 2009, and includes the following discussions:

- 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 SBx7-7 as part of the Seventh Extraordinary Session and SB 1087. SBx7-7, enacted in 2009, is part of the Delta package. It stemmed from the Governor's vision to achieve a 20% statewide reduction in urban per capita daily water use by 2020. 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
- An implementation plan to meet the targets

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

In effort to assist retail agencies in Orange County to meet the requirement of SB7x7, the MWDOC 2010 Plan will describe the Orange County Regional Alliance and methodology used to calculate the regional targets for 2015 and 2020.

The other recent amendment made to the Act is set forth in 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.

This 2010 Plan update also incorporates MWDOC's current and planned water use efficiency efforts pursuant to the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU).[1] MWDOC became a signatory and adopted the MOU in 1991.

An UWMP may serve as a foundational document and source of information for a Water Supply Assessment, (Water Code Section 10613), and a Written Verification of Water Supply, (Water Code Section 66473.7). Both statutes require detailed information regarding water supply availability to be provided to city and county decision makers prior to approval of specified large development projects. Additionally, an UWMP also serves as a:

- Long-range planning document for water supply;

[1] The *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) was adopted in September 1991 by a large number of water suppliers, public advocacy organizations and other interested groups. It created the *California Urban Water Conservation Council* and established 16 Best Management Practices (BMPs) for urban water conservation, recently refined to 14 BMPs.

- Long-range planning documents for water use efficiency;
- Source data for development of a regional water plan;
- Source document for cities and counties, as they prepare their General Plans;
- Key component of an Integrated Regional Water Management Plan; and
- Condition to qualify for receipt of certain State grant funds.

For MWDOC, the activities associated with the update of its Plan and the benefits the Plan ultimately affords its local retailers extend far beyond the implied or stated supply-reliability goals. The regional approach allows MWDOC to do the following:

- Provide a comprehensive assessment of water resource needs in its service area;
- Provide guidance to coordinate implementation of water conservation programs in a cost-effective manner;
- Provide assistance to maximize the beneficial use of recycled water and local groundwater supplies, providing the region with new sources of local water to reduce the need for imported supplies from the Metropolitan Water District of Southern California (described in the next section); and
- Offer opportunities for public participation through publicly noticed meetings, and provide information that will allow the public to gain further understanding of the region's comprehensive water planning.

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 MWDOC's water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included as Appendix D.

1.2. Municipal Water District of Orange County

Formation and Purpose

Orange County was settled around areas of surface water. San Juan Creek supplied the mission at San Juan Capistrano. Santa Ana River supplied the early cities of Anaheim and Santa Ana. The Santa Ana River also provided water to a large aquifer underlying the northern half of the county, enabling settlers to move away from the river's edge and still obtain water by drilling wells.

By the early 1900s, Orange County residents understood that their water supply was limited, the rivers and creeks did not flow all year long, and the aquifer would eventually be degraded or even dry up if the water was not replenished on a regular basis.

In 1928, the cities of Anaheim, Santa Ana, and Fullerton joined with 10 other Southern California cities to form the Metropolitan Water District of Southern California (Metropolitan). Their objective was to build an aqueduct to the Colorado River to provide the additional water necessary to sustain the growing Southern California economy and its enviable lifestyle.

The Orange County Water District (OCWD) was formed in 1933 to protect the County's water rights on the Santa Ana River. Later that mission was expanded to manage the underground aquifer, making optimum use of local supplies and augmenting those with imported supplies provided through the Metropolitan member agencies in Orange County.

It was not long before other parts of Orange County also saw the need for supplemental supplies. A severe drought in the late 1940s further emphasized this need for coastal communities from Newport Beach to San Clemente. In 1948, coastal communities from Newport Beach south to the San Diego county line formed the Coastal Municipal Water District as a way to join in the benefits provided by Metropolitan.

MWDOC was formed by Orange County voters in 1951 under the Municipal Water District Act of 1911. Today, MWDOC is Metropolitan's third largest member agency, providing and managing the imported water supplies used within its service area.

The Coastal Municipal Water District became a part of MWDOC in January 2001, a move that streamlined local government and allowed MWDOC to more efficiently provide wholesale water services at a reduced cost for the benefit of residents living throughout the service area.

Relationship to Metropolitan Water District of Southern California

MWDOC became a member agency of Metropolitan in 1951 to bring supplemental imported water supplies to parts of Orange County. Metropolitan is a consortium of 26 cities and water agencies that provides supplemental water supplies to parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura Counties. Metropolitan's two main sources of supply are the Colorado River and Sacramento-San Joaquin Bay-Delta. Supplies from these sources are delivered to Southern California via the Colorado River Aqueduct (CRA) and State Water Project (SWP). MWDOC purchases imported water from these sources from Metropolitan and distributes the water to its member agencies, which provide retail water services to the public.

MWDOC Board of Directors

MWDOC is governed by an elected seven-member Board of Directors, each board member representing a specific area of the County. Each director is elected to a four-year

term by voters who reside within one of the seven divisions within the MWDOC service area.

Each director is a member of at least one of the following three standing committees: Planning and Operations; Administration and Finance; and Public Affairs and Legislation. Each committee meets monthly. The full board convenes for its regular monthly meeting on the third Wednesday of the month, and holds a Board workshop on Metropolitan issues the first Wednesday of the month.

The president of the board, vice president, and immediate past president also comprise the Executive Committee, which meets monthly with the general manager, assistant general manager, and board secretary.

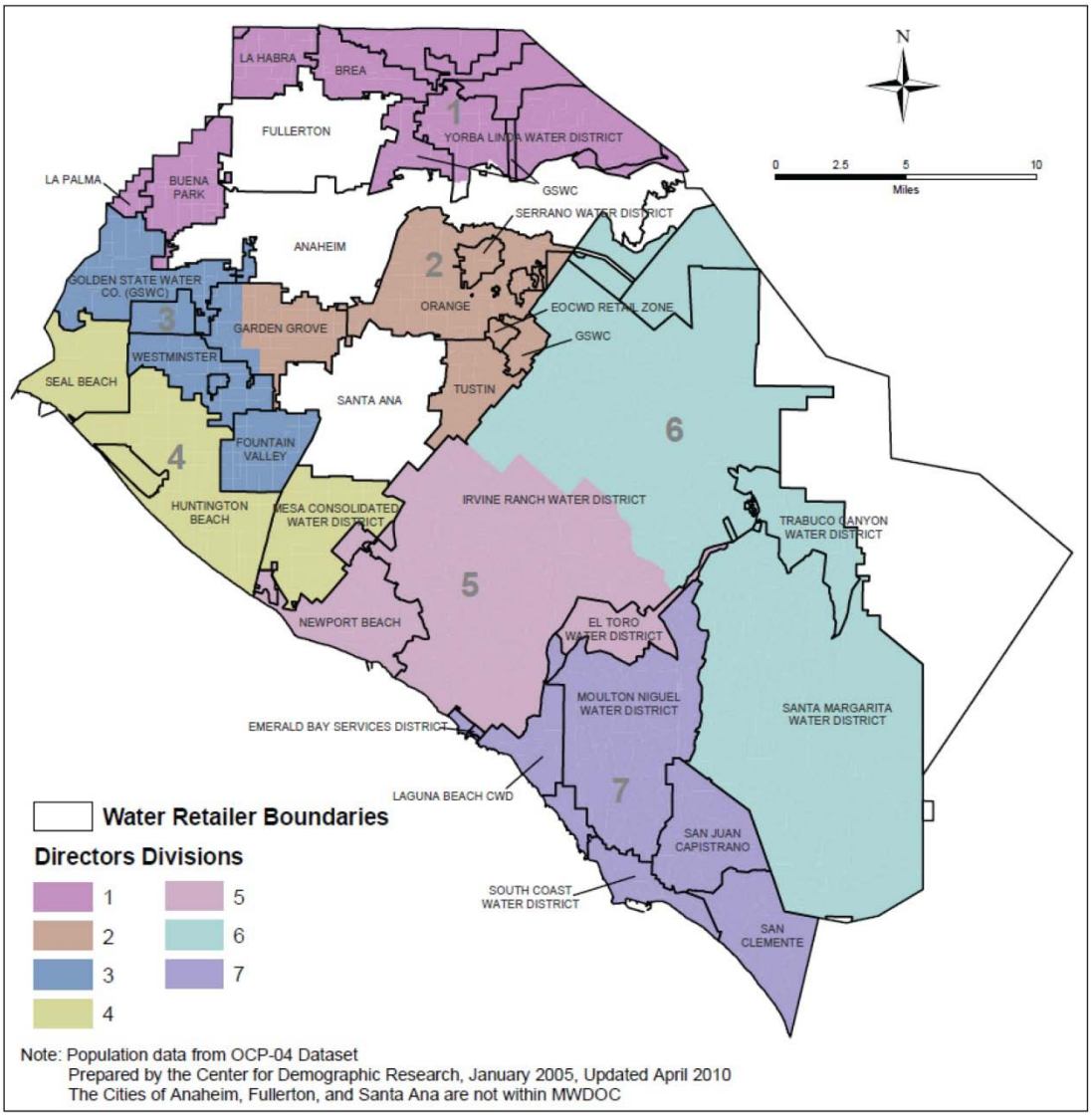

Figure 1-1: MWDOC Board of Directors Map, by Director Division

Goals and Objectives

MWDOC's Mission Statement: *To provide reliable, high-quality supplies from Metropolitan Water District of Southern California and other sources to meet present and future needs, at an equitable and economical cost, and to promote water use efficiency for all of Orange County.*

Related water management goals and objectives include:

- Represent the interests of the public within its jurisdiction;
- Appoint its representative directors to the Board of Metropolitan;
- Inform its directors and its member agencies about Metropolitan issues;
- Guide Metropolitan in its planning efforts and act as a resource of information and advocacy for member agencies;
- Purchase of water from Metropolitan and advocacy representation of the member agencies at Metropolitan;
- Work together with Orange County water agencies and others to focus on solutions and priorities for improving Orange County's future water supply reliability;
- Cooperate with and assist OCWD and other agencies in coordinating the balanced use of the area's imported and native surface and groundwater;
- Plan and manage the allocation of imported water to its member agencies during periods of shortage;
- Coordinate and facilitate the resolution of water issues and development of joint water projects among its member agencies;
- Represent the public and assist its member agencies in dealing with other governmental entities at the local, regional, state, and federal levels on water-related issues; and
- Inform its member agencies and inform and educate the general public on matters affecting present and future water use and supply.

As a regional wholesaler, MWDOC's most significant roles are broadly applicable to all of its member agencies. A key goal of MWDOC is to provide services and programs that are broad-reaching that the retail agencies cannot reasonably provide as single entities.

One major area in which MWDOC works with other agencies to manage Orange County’s water supply is water use efficiency. In terms of water management, MWDOC became a signatory to the Memorandum of Understanding (MOU) in 1991, monitored by the California Urban Water Conservation Council (CUWCC), which outlines 14 Best Management Practices (BMP) for urban water use efficiency. The urban water use efficiency practices are intended to reduce long-term urban demands from what they would have been without implementation of these practices, and are in addition to programs that may be instituted during occasional water supply shortages.

For more than 30 years, MWDOC's Public Information and Water Education programs have reached thousands of consumers and nearly 90,000 Orange County students annually. The programs are performed on behalf of, and in coordination with, MWDOC's member agencies and are designed to facilitate a student's understanding of current water issues, as well as the challenges, opportunities, and costs involved in securing a reliable supply of high quality water.

In 2004, MWDOC formed a partnership with the Discovery Science Center to bring the School Education Program to even more students and provide them with even greater educational experiences in the areas of water and science.

1.3. Service Area

MWDOC is a regional water wholesaler and resource planning agency, managing all of Orange County's imported water supply with the exception of water imported to the cities of Anaheim, Fullerton, and Santa Ana. MWDOC serves more than 2.3 million residents in a 600-square-mile service area (see Figure 1-2 below). Its commitment is to ensure water reliability for the communities it serves. To that end, MWDOC focuses on sound planning and appropriate investments in water supply, regional delivery infrastructure and emergency preparedness.

MWDOC serves imported water in Orange County to 28 retail water agencies. These entities, comprised of cities and water districts, are referred to as MWDOC member agencies and provide water to approximately 2.3 million customers, including:

- City of Brea
- City of Buena Park
- City of Fountain Valley
- City of Garden Grove
- City of Huntington Beach
- City of La Habra
- City of La Palma
- City of Newport Beach
- City of Orange
- City of San Clemente
- City of San Juan Capistrano
- City of Seal Beach
- City of Tustin
- City of Westminster
- East Orange County Water District
- El Toro Water District
- Emerald Bay Services District
- Irvine Ranch Water District
- Laguna Beach County Water District
- Mesa Consolidated Water District
- Moulton Niguel Water District
- Orange County Water District
- Santa Margarita Water District
- Serrano Water District
- South Coast Water District
- Golden State Water Company
- Trabuco Canyon Water District
- Yorba Linda Water District

Figure 1-2: Regional Location of Urban Water Supplier

Orange County relies on numerous sources of water and water purveyors to meet the needs of its growing population, including imported water, groundwater, surface water, and recycled water.

Imported water from Northern California and the Colorado River meet approximately half of the County's water needs. The water is provided by Metropolitan, which serves the needs of six counties – Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego.

South Orange County relies on imported water to meet approximately 95 percent of its water demand. The remaining five percent is provided by surface water, limited groundwater, and water recycling. Figure 1-3 illustrates the water service organization in the MWDOC service area.

OCWD manages the Orange County groundwater basin. The groundwater basin, which underlies north and central Orange County, provides approximately 62 percent of the water needed in that area; imported water meets the balance of the water demand. Groundwater is pumped by producers before being delivered to customers.

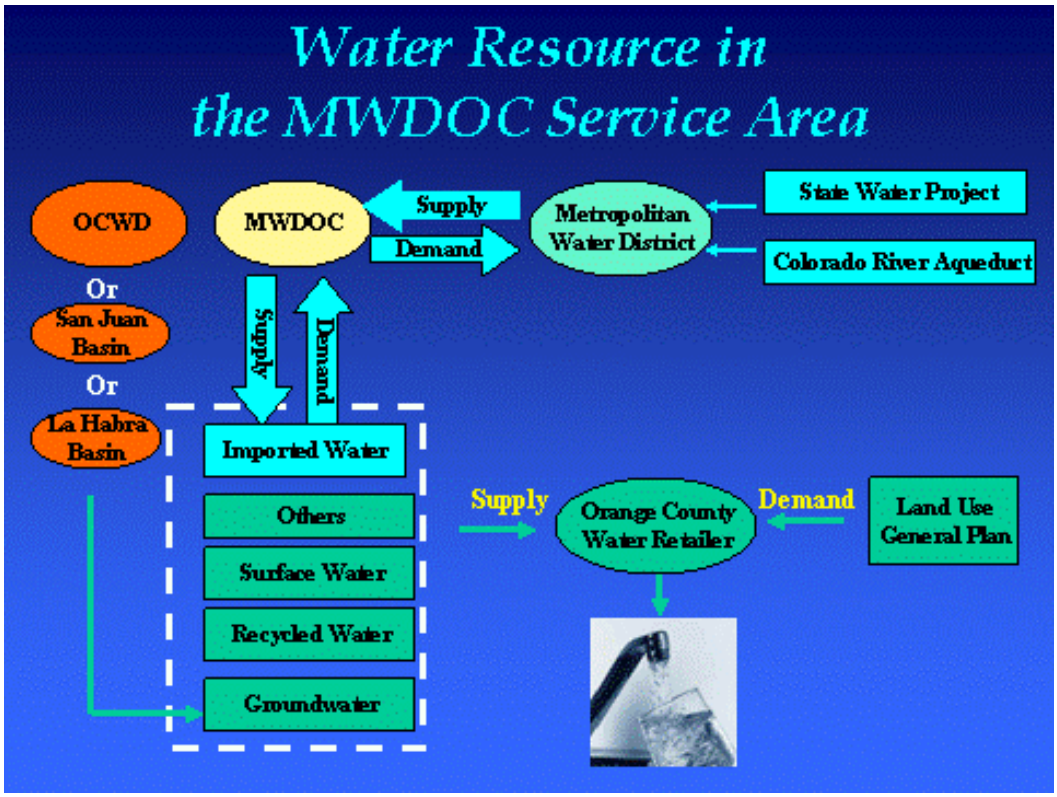

Figure 1-3: Water Service Organization in MWDOC's Service Area

2. Water Demand

2.1. Overview

MWDOC is the wholesale provider of imported water to 28 retail water suppliers in Orange County. Water demand in the MWDOC service area has increased approximately 70 percent since 1970. Water demand increased from 285,200 acre-feet per year (AFY) in 1970 to 467,900 AFY in 1990 due to significant population growth within the service area. Demand began to decline in 1990, and by 1992 demand was 406,500 AFY. From that point on, demand began to increase again. By 2000, demand in the MWDOC service area was 524,000 AFY.

In 2010, the total water demand for MWDOC member agencies is approximately 485,311 AFY consisting of 220,132 acre-feet of imported water (treated and untreated), 220,052 acre-feet of local groundwater, 5,485 acre-feet of local surface water, and 39,642 acre-feet of recycled water. Overall, MWDOC's water demands will continue to increase, although not as rapidly as in the past. Future demand growth will average just under 0.5% per year, as compared to historical demand growth of about 1.54% per year. This is due to more limitations on new land development (e.g. cost, available space and environmental restrictions) and the continued commitment to water use efficiency in the region.

Figure 2-1 shows historical demands with service area population to further illustrate the growth in MWDOC's service area.

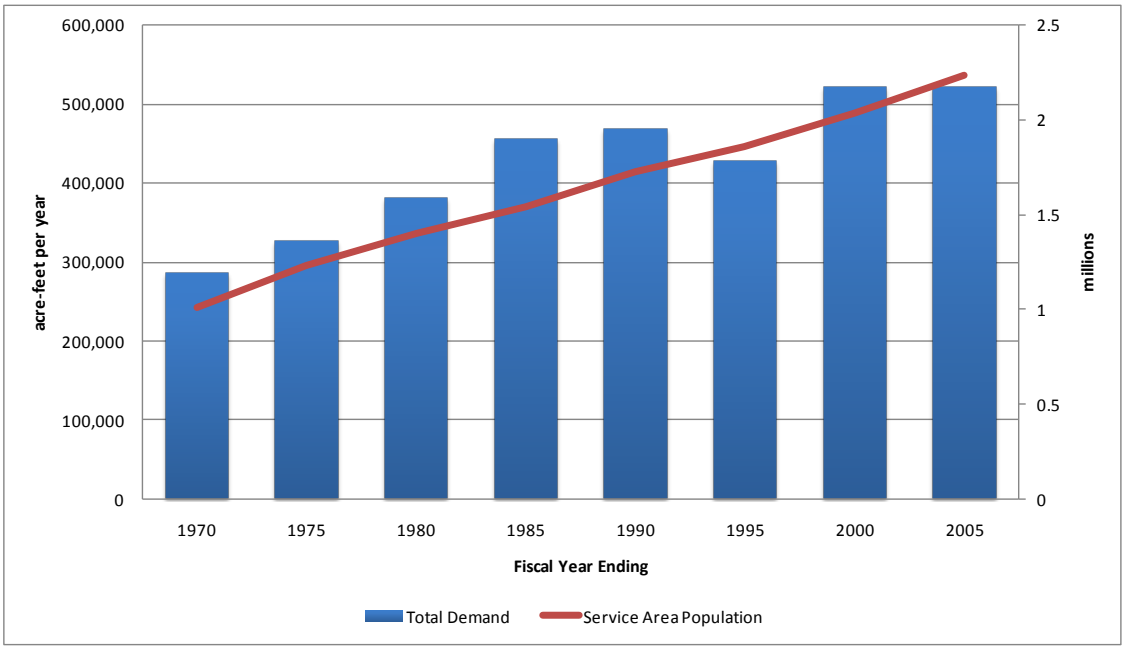

Figure 2-1: Historical Demand and Population in MWDOC's Service Area

Due to MWDOC's active role and leadership in promoting water use efficiency in the region, Orange County is projecting a 17% increase in water demand in the next 25 years accompanying a projected 15% population growth. This projection takes into account economic recovery in the service area that is projected to occur through 2035. This also includes meeting the 20x2020 per capita water use compliance targets for the region. However, it is important to note that the region wide demand projection differs from the 20x2020 compliance target due to how some recycled water supplies are handled in the 20x2020 target calculations, consistent with allowable methodologies. These differences are further discussed in Section 2.5.

The passage of SBx7-7 – the Water Conservation Act of 2009 - will increase efforts in Orange County to reduce the use of potable supplies in the future. This 2009 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% reduction in per capita consumption (from a historical baseline) by 2020. While MWDOC, as a wholesaler, is not directly required to comply with the SBx7-7 water use targets, MWDOC is required to provide an assessment of its present and proposed future measures, programs, and policies to help its retail water users achieve the water use reductions. Due to the region's past and ongoing water use efficiency and recycled water efforts in the past decade, MWDOC member agencies are already on their way to meeting the required 20x2020 reduction.

Moreover, MWDOC, together with its member agencies and the cities of Anaheim, Fullerton, and Santa Ana, has established an Orange County 20x2020 Regional Alliance to assist in reducing the region's water demand and meet the 20% reduction by 2020. Additionally, Metropolitan has established a goal within its 2010 IRP Update of a 20% reduction in demands in its service area by 2020.

This section will identify the key factors affecting water demand, the types of water use within Orange County, and the perspective of expected future water demand for the next 25 years. In addition, this section will describe in detail the formation of the Orange County 20x2020 Regional Alliance, the steps upon how the regional targets for 2015 and 2020 were calculated, and the deduction of recycled water for indirect potable reuse was applied.

2.2. Factors Affecting Demand

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

2.2.1. Climate Characteristics

Orange County has a Mediterranean climate: a semi-arid environment with mild winters, warm summers, and moderate rainfall. The climate is consistent with coastal Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

Orange County's average daily temperatures range from 58 ˚F in December and January to 74 ˚F in August in a typical year. The average annual precipitation is 14 inches, although the region is subject to significant variations in annual precipitation (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. 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	3.18	58.0
Feb	2.49	3.05	59.1
Mar	3.67	2.78	60.2
Apr	4.71	0.67	63.0
May	5.18	0.25	65.7
Jun	5.87	0.11	69.3
Jul	6.29	0.02	72.9
Aug	6.17	0.12	74.3
Sep	4.57	0.34	73.2
Oct	3.66	0.36	68.9
Nov	2.59	1.17	62.4
Dec	2.25	1.79	57.9
Annual	**49.63**	**13.84**	**65.4**

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

The sources of MWDOC's imported water supplies, the State Water Project and Colorado River, are influenced by weather conditions in Northern California and throughout the Colorado River basin. In recent years, both regions suffered from multi-year drought conditions and record low rainfalls which directly impact demands and supplies to Southern California. More recently, the dry weather conditions changed drastically in calendar year 2011 to very wet in California and in the Colorado River basin.

2.2.2. Demographics

Orange County has a population of more than 3 million people living in a 798-square-mile area. Comprised of 34 cities, from Brea in the north to San Clemente in the south, Orange County is recognized worldwide for its beaches, recreational facilities, and enviable quality of life. According to the Southern California Association of Governments (SCAG) Growth Forecast Report, Orange County is projected to grow by more than 500,000 people by 2030, bringing the total population in Orange County to 3.5 million.

Population is a key indicator of regional growth. The population of the MWDOC service area has been calculated by the California State University Fullerton (CSUF) Center for

Demographic Research (CDR) using the California State Department of Finance population data. Based on this information, the MWDOC service area had a population of 1.01 million in 1970, 2.24 million by 2005, and 2.3 million in 2010. This represents an average growth of approximately 2.3% per year. During the 1970s, the population growth averaged 3.3% per year; while during the 1990s growth averaged 1.7% per year. Many older cities, especially those in north and central Orange County, anticipate reaching build-out in the near-term and, therefore, their population growth will remain relatively flat over the next 25 years. This, when combined with a relatively young and growing south Orange County population, will result in nearly 2.65 million living in the MWDOC service area by 2035, representing an average growth of 0.66% annually. This slower rate of growth is attributed to the build-out of the MWDOC service area. Table 2-2 shows the current and projected population for the MWDOC service area.

Table 2-2: Current and Projected MWDOC Service Area Population

	2010	2015	2020	2025	2030	2035
Service Area Population [1]	2,300,021	2,370,931	2,441,838	2,512,752	2,583,659	2,654,569

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

As shown in Table 2-3, the number of households in the MWDOC service area is expected to increase by 9% in the next 25 years from 804,285 in 2010 to 873,605 in 2035. The number of persons per household is also projected to increase from 2.90 in 2010 to 3.03 in 2035. Urban employment in the MWDOC service is expected to rise by 15% in the next 25 years.

Table 2-3: MWDOC Service Area Demographics

Demographics	2010	2015	2020	2025	2030	2035
Occupied Housing Units	804,285	842,174	854,636	864,725	869,961	873,605
Single Family	536,435	560,356	567,525	573,263	575,950	577,546
Multi-Family	267,850	281,818	287,111	291,462	294,011	296,060
Persons Per Household	2.90	2.99	3.01	3.02	3.04	3.03
Urban Employment	1,289,152	1,358,247	1,409,430	1,438,507	1,462,847	1,482,076

Note: Growth projections are based on Southern California Association of Governments (SCAG) 2008 Regional Transportation Plan and San Diego Association of Governments (SANDAG) Series 12 Forecast.

2.3. Direct and Indirect Water Use

There are two types of water use in Orange County. “Direct use” is the consumption of water directly piped from treatment facilities or wells to homes, commercial, institutional, and industrial buildings, landscape, and agriculture. “Indirect use” is the use of water to replenish groundwater basins and to serve as a barrier against seawater intrusion. Water

used to fill the groundwater basins or act as a seawater barrier will eventually become a future source of supply for Orange County residents.

Integrating the two usages of water in the planning process can be confusing and misleading and does not necessarily reflect the actual level of consumptive water demand in the region. In practice, the two types of water usage are often shown separately. The following subsections will discuss these two types of uses separately. However, the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan specifically instructs suppliers to present total water uses by summing both "direct use" and "indirect use." To comply with the requirement, this Plan also provides a table summing direct use and indirect use of water demand. However, a footnote is provided to caution the reader not to view the sum as the total water demand in the region for any given point of time.

2.3.1. Direct Use – Municipal/Industrial and Agricultural Demands

Direct water use in Orange County includes municipal, industrial, and agricultural use. Municipal and Industrial (M&I) demands represent the full spectrum of water use within a region, including residential and commercial, industrial, institutional (CII), as well as un-metered uses (e.g. hydrant flushing, fire-fighting). Demands for direct use are met through imported water, groundwater, local surface water, and recycled water. Direct use represents about 90% of MWDOC's total demands. M&I demands within MWDOC's service area are anticipated to grow, while agricultural demands are projected to decline through 2035. By 2035, agricultural demands are projected to represent less than 1% of the total direct use demand. Table 2-4 shows the amount of historical water used for direct consumption in MWDOC's service area.

Table 2-4: Historical Water Demands for Direct Consumption in MWDOC's Service Area (AFY)

	Fiscal Year Ending			
	1990	1995	2000	2005
Municipal & Industrial	447,100	417,700	500,800	504,997
Agriculture	20,800	10,700	20,600	16,781
Total Demand	**467,900**	**428,400**	**521,400**	**521,778**

2.3.2. Indirect Use – Replenishment and Barrier Demands

Indirect water use in Orange County includes the use of water to replenish groundwater basins and to serve as a barrier against seawater intrusion. The Orange County Water District (OCWD) is the entity responsible for managing and replenishing the Orange County Groundwater Basin. OCWD is a special district created by the state and governed by a ten-member Board of Directors to protect, manage, and replenish the basin

with purchased imported water, storm water, and recycled water. OCWD further protects the groundwater basin from seawater intrusion through the injection of imported and recycled water along the coast, known as the Talbert Injection Barrier.

Since demands for replenishment for groundwater basin storage and seawater barriers are driven by the availability of supply to the groundwater basin in Orange County, the demand forecast for this type of use is based on the projection of the following supplies under normal conditions:

- Santa Ana River Flows;
- Incidental Recharge;
- Replenishment (surplus) supplies from Metropolitan; and
- Recycled Supplies for replenishment use.

Table 2-5 shows the historical amount used for indirect consumption in MWDOC's service area.

Table 2-5: Historical Water Demands for Indirect Water Use in MWDOC's Service Area (AFY)

	Fiscal Year Ending			
	1990	1995	2000	2005
Total Demand	168,000	193,000	228,000	161,000

2.4. SBx7-7 Requirements

2.4.1. Overview

SBx7-7, The Water Conservation Act of 2009, was signed into law on February 3, 2010, as part of a comprehensive water legislation package. As discussed above, the bill sets a goal of achieving a 20% statewide reduction in urban per capita water use, and directs urban retail water suppliers to develop targets to meet a 20% reduction in per capita water use by 2020, and an interim 10% reduction by 2015. Water suppliers receive partial credit for past efforts in conservation and deductions for direct and indirect use of recycled water. As a result not all agencies need to reduce demand by 20% in order to comply with the legislation. A retail agency that does not comply with the requirements of SBx7-7 will not be eligible for water related grants or loans from the state on and after July 16, 2016. However, if an agency is not in compliance documents a plan and obtain funding approval to come into compliance they could become eligible for grants or loans.

As a wholesale water supplier, MWDOC is not required to establish and meet targets on its own. MWDOC's role implementing the legislation is to assist each retail water supplier in Orange County in analyzing the requirements and establishing their baseline and target water use, as guided by DWR under the Methodologies for Calculating

Baseline and Compliance Urban Per Capita Water Use (Technical Methodologies), dated February 2011.

This section includes a description of the efforts by MWDOC to assist retail agencies in complying with the requirements of SBx7-7, including the formation of a Regional Alliance to provide additional flexibility to all water suppliers in Orange County in meeting compliance under the legislation. This section also includes the documentation for calculations that will allow retail water suppliers to use recycled water for groundwater recharge (indirect reuse) to offset a portion of their potable demand when meeting the regional as well as individual water use targets for compliance purposes.

MWDOC is also required to include in its RUWMP a discussion of programs intended to be implemented to support retail agencies in achieving their per capita water reduction goals. This is covered in Section 4 – Demand Management Measures.

2.4.2. Orange County 20x2020 Regional Alliance

MWDOC in collaboration with all of its retail agencies as well as the cities of Anaheim, Fullerton, and Santa Ana, has created the Orange County 20x2020 Regional Alliance in an effort to create flexibility in meeting the per capita water use reduction targets required under SBx7-7. This Regional Alliance will allow all of Orange County to benefit from regional investments such as the GWRS, recycled water, and water use efficiency. The members of the Orange County 20x2020 Regional Alliance are shown below in Table 2-6.

Table 2-6: Members of Orange County 20x2020 Regional Alliance

Orange County 20x2020 Regional Alliance	
Anaheim	Moulton Niguel Water District
Brea	Newport Beach
Buena Park	Orange
East Orange County Water District	San Clemente
El Toro WD	San Juan Capistrano
Fountain Valley	Santa Ana
Fullerton	Santa Margarita Water District
Garden Grove	Seal Beach
Golden State Water Company	Serrano Water District
Huntington Beach	South Coast Water District
Irvine Ranch Water District	Trabuco Canyon Water District
La Habra	Tustin
La Palma	Westminster
Laguna Beach County Water District	Yorba Linda Water District
Mesa Consolidated Water District	

Within a Regional Alliance, each retail water supplier will have an additional opportunity to achieve compliance under both an individual target and a regional water use target.

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

Individual water suppliers in the Orange County 20x2020 Regional Alliance will state their participation in the alliance, and include the regional 2015 and 2020 Urban Water Use Targets in their individual UWMPs.

As the reporting agency for the Orange County 20x2020 Regional Alliance, MWDOC has documented the calculations for the regional urban water use reduction targets. MWDOC will also provide annual monitoring and reporting for the region on progress toward the regional per capita water use reduction targets.

2.4.3. Steps to Calculate Regional Target

Water suppliers in a Regional Alliance are provided three options for calculating their regional targets[2]. To preserve maximum flexibility, the Orange County 20x2020 Regional Alliance has selected the first option. There are two steps under this approach. Under the first step, each water supplier in the Regional Alliance first calculates its individual target in its retail UWMP as if it were complying individually. Under the second step, the individual targets are weighted by each supplier's population and averaged over all members in the alliance to determine the regional water use target.

Step 1 - Retail Agency Compliance Targets

As described above, the first step in calculating a regional water use target is to determine each water supplier's individual target. DWR has established four target options for urban retail water suppliers to choose from in calculating their water use reduction targets under SBx7-7. 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

[2] Steps for calculating a Regional Alliance can be found in Methodology 9 from the Technical Methodologies.

  - 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* uses a target calculator developed by DWR. This option is provisional and will be updated by DWR before 2014.

MWDOC has analyzed each of these options, and has worked with all water suppliers in Orange County to assist them in selecting the most suitable option to document in their UWMPs.

Step 2 - Regional Water Use Reduction Targets Calculation

The regional water use targets for the Orange County 20x2020 Regional Alliance are calculated by weighting the individual water use targets by population and averaging them over all members of the alliance. This calculation is provided below in Table 2-7. Column (1) shows the 2010 population for each individual supplier. The individual targets for each supplier is provided in column (2) for the interim 2015 targets, and column (4) for the final 2020 targets.

To calculate the weighted averages for each retail water supplier, the population is multiplied by the individual targets to get a weighted total for each individual supplier. This is found in column (3) for the interim 2015 targets and in column (5) for the final 2020 targets. The regional targets for the Orange County 20x2020 Regional Alliance are then derived as the sum of the individual weighted averages divided by the total population for a regional alliance.

For example, the 2020 water use target for the city of Brea is 220 gpcd, and the 2010 population is 40,368. By multiplying this 2020 target by the population, the result is a weighted average of 8,864,740. The sum of the weighted averages for all members of the Orange County 20x2020 Regional Alliance is 491,862,589. By dividing this weighted total by the regional population of 3,139,017, the resulting regional 2020 water use target is 157 gpcd.

The source of the information in Table 2-7, including the population figures, is from within the individual UWMPs for each water supplier in the Orange County 20x2020 Regional Alliance.

Table 2-7: Calculation of Regional Urban Water Use Targets for Orange County 20x2020 Regional Alliance

Orange County 20x2020 Regional Alliance	(1) 2010 Population	(2) 2015 Target (GPCD)	(1) x (2) = (3) Weighted Total 2015	(4) 2020 Target (GPCD)	(1)x (4) = (5) Weighted Total 2020
Brea	40,368	247	9,972,833	220	8,864,740
Buena Park	84,141	180	15,145,380	158	13,462,560
East Orange CWD RZ	3,656	296	1,081,493	263	961,327
El Toro WD	52,019	181	9,414,193	161	8,368,172
Fountain Valley	59,227	156	9,216,257	142	8,383,582
Garden Grove	177,020	152	26,903,684	142	25,057,181
Golden State WC	169,944	156	26,521,400	142	24,055,573
Huntington Beach	204,831	148	30,388,941	137	28,136,871
Irvine Ranch WD	337,876	190	64,426,278	170	57,651,782
La Habra	63,118	150	9,495,180	142	8,934,353
La Palma	15,544	146	2,273,660	136	2,111,174
Laguna Beach CWD	21,718	180	3,930,958	160	3,496,598
Mesa Consolidated WD	111,166	161	17,905,542	143	15,916,038
Moulton Niguel WD	172,068	193	33,263,142	172	29,567,237
Newport Beach	67,030	228	15,292,411	203	13,593,254
Orange	141,107	201	28,409,066	179	25,252,503
San Clemente	55,398	167	9,250,401	148	8,222,579
San Juan Capistrano	40,262	199	8,008,531	177	7,118,694
Santa Margarita WD	155,229	189	29,371,222	168	26,107,753
Seal Beach	25,561	146	3,721,700	140	3,565,368
Serrano WD	6,651	421	2,786,769	374	2,480,823
South Coast WD	38,641	168	6,481,118	149	5,760,994
Trabuco Canyon WD	14,907	220	3,284,689	181	2,696,823
Tustin	69,010	171	11,772,844	152	10,464,750
Westminster	95,793	134	12,834,750	126	12,065,039
Yorba Linda WD	77,320	258	19,911,769	229	17,699,351
Anaheim	361,043	181	65,503,883	161	58,225,674
Fullerton	138,600	200	27,704,878	178	24,626,558
Santa Ana	358,136	119	42,457,305	109	39,015,239
Regional Alliance Total	3,139,017	**174**	547,162,676	**157**	491,862,589

Table 2-8 provides the regional urban water use targets for the Orange County 20x2020 Regional Alliance.

Table 2-8: Urban Water Use Targets for Orange County 20x2020 Regional Alliance

	2015 Target	2020 Target
Orange County 20x2020 Regional Alliance	174	157

These targets are subject to revisions, as retail water suppliers have an option to update their target in their 2015 UWMPs. Additionally, the population weightings used to calculate these targets will be revised in 2015 and 2020 based on the most recent compliance-year population data.

Deducting Recycled Water Used for Indirect Potable Reuse

SBx7-7 allows urban retail water suppliers to calculate a deduction for recycled water entering their distribution system indirectly through a groundwater source. Individual water suppliers within the OCWD Groundwater Basin have the option of choosing this deduction to account for the recharge of recycled water into the basin by OCWD historically through Water Factory 21, and more recently by GWRS. These deductions also benefit all members of the Orange County 20x2020 Regional Alliance.

MWDOC has provided the documentation for the calculations of this deduction to assist retail water suppliers if they choose to include recycled water for indirect potable reuse in their individual targets. This calculation is applied as a deduction from the water supplier's calculation of Gross Water Use[3].

Table 2-9 provides the calculation deducting recycled water for indirect potable reuse for OCWD Basin Agencies. Because year-to-year variations can occur in the amount of recycled water applied in a groundwater recharge operations, a previous five year average of recharge is used, as found in column (1). To account for losses during recharge and recovery, a factor of 96.5% was used in column (2)[4]. After accounting for these losses, the estimated volume of recycled water entering the distribution system is calculated in column (3).

In column (4), the annual deduction for recycled water for indirect potable reuse is expressed as a percentage of the total volume of water extracted from the basin in that year. This is the annual percentage of total OCWD basin production that is eligible for a deduction. For individual water suppliers in the OCWD Basin, the annual deduction is calculated as their basin pumping in a given year multiplied by the value in column (5).

For example, if Agency A pumped 10,000 acre-feet of water from the OCWD Basin in Fiscal Year 2004/05, then 1.47% of that total production would be deducted from the agency's calculation of Gross Water Use for that year as found in column (5). This equates to a deduction of 147 acre-feet (AF).

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[3] The calculation is described in Step 8 of Methodology 1 from the Technical Methodologies.
[4] Figure based on in-basin losses to other groundwater basins, which averages 10,000 AF per year or 3.5% of average basin yield. The estimated FY 2090/10 basin losses of 9,315 acre-feet can be found in the *Fiscal Year 2009/10 Conjunctive Use Program (CUP) Account Activity and Losses.* Losses associated with treatment and recharge operations are negligible.

Table 2-9: Calculation of Annual Deductable Volume of Indirect Recycled Water Entering Distribution System

Fiscal Year Ending	(1) 5-Year Average Recharge (Acre-Feet)	(2) Loss Factor for Recharge & Recovery	(1) x (2) = (3) Volume Entering Distribution System (Acre-Feet)	(4) Percent of Total Basin Production
1990	6,498	96.7%	6,284	2.75%
1991	6,498	96.5%	6,271	2.65%
1992	6,566	96.5%	6,336	2.59%
1993	6,658	96.5%	6,425	2.62%
1994	7,034	96.5%	6,788	2.84%
1995	6,636	96.5%	6,403	2.32%
1996	5,884	96.5%	5,678	1.88%
1997	5,413	96.5%	5,224	1.68%
1998	4,922	96.5%	4,750	1.60%
1999	3,789	96.5%	3,657	1.13%
2000	3,479	96.5%	3,357	1.05%
2001	4,086	96.5%	3,943	1.22%
2002	3,643	96.5%	3,515	1.09%
2003	3,594	96.5%	3,468	1.26%
2004	3,868	96.5%	3,733	1.40%
2005	3,527	96.5%	3,404	1.47%
2006	3,203	96.5%	3,091	1.44%
2007	3,607	96.5%	3,481	1.23%
2008	2,822	96.5%	2,723	0.78%
2009	5,607	96.5%	5,411	1.73%
2010	16,103	96.5%	15,539	5.66%

The deductable amount of indirect recycled water is anticipated to increase to approximately 69,000 AF in 2015, after five years of full production from GWRS, which came online in 2008. OCWD has also designed the Phase 2 expansion for GWRS, which will further increase the deductable amount of indirect recycled water to approximately 98,000 AF within the timeframe of the 2020 UWMPs.

2.4.4. Water Use Reduction Plan

MWDOC in collaboration with all of its member agencies as well as the cities of Anaheim, Fullerton, and Santa Ana, has created the Orange County 20x2020 Regional Alliance in an effort to create flexibility in meeting the per capita water use reduction targets required under SBx7-7. The Orange County 20x2020 Regional Alliance will allow local water suppliers to benefit from regional investments such as the GWRS, recycled water, and water use efficiency and to meet their 20% by 2020 reduction targets

under SBx7-7 on a regional basis through the successful implementation of region-wide programs.

The Orange County 20x2020 Regional Alliance will achieve its water use reduction by building on the existing collaboration between Metropolitan, MWDOC and the local agencies in Orange County. MWDOC as a regional wholesale water provider implements many of the urban water conservation Best Management Practices (BMPs) on behalf its member agencies. MWDOC's conservation measures are detailed in MWDOC's RUWMP Section 4, and Metropolitan's conservation measures detailed in Metropolitan's 2010 RUWMP Section 3.4.

Additionally, Metropolitan in collaboration with MWDOC and other Metropolitan member agencies is in the process of developing a Long Term Conservation Plan,[5] which seeks an aggressive water use efficiency target in order to achieve a 20% reduction in per capita water use by 2020 for the entire Metropolitan service area.

Metropolitan Long Term Conservation Plan

Metropolitan's Long Term Conservation Plan will build on Metropolitan's traditional programs of incentives, education and broad outreach while developing a new vision of water use efficiency by altering the public's perspective on water through market transformation. The overreaching goals of the Long Term Conservation Plan are as follows:

- Achieve the 2010 IRP conservation target – The target for new water savings through conservation is a regional per capita use of 159 gallons per day in 2015 and 141 gallons per day in 2020.
- Pursue innovation that will advance water conservation
- Transform the public's value of water within this region – A higher value on water within this region can lead to a conservation ethic that results in permanent change in water use behavior, earlier adoption of new water saving technologies, and transition towards climate-appropriate landscapes.

Achieving these goals requires the use of integrated strategies that leverage the opportunities within this region. It requires regional collaboration and sustained support for a comprehensive, multi-year program. It requires a commitment to pursue behavioral changes and innovation in technologies that evolve the market for water efficient devices and services. It requires strategic, focused implementation approaches that build from broad-based traditional programs. It requires that research be conducted to provide the

[5] Metropolitan Water District of Southern California Long Term Conservation Plan Working Draft Version 6 (November 30, 2010)

basis for decisions. Lastly, it requires the support of local leaders to communicate a new value standard for water within this region. Metropolitan and its member agencies will implement the five strategies through a traditional program, a market acceleration program, and legislation and regulation. The five strategies include:

- **Use catalysts for market transformation.** Metropolitan and member agencies will pursue market transformation to affect the market and consumer choices for water efficient devices and services.
- **Encourage action through outreach and education.** Metropolitan and member agencies will provide outreach, educational workshops, and training classes through a range of media and formats which are essential to changing public perceptions of the value of water.
- **Develop regional technical capability.** Metropolitan and member agencies will conduct research, facilitate information sharing, and/or provide technical assistance to member agencies and retail agencies to develop technical capabilities within the region for water budgeting, advanced metering infrastructure, ordinances, retail rate structures, and other conservation measures.
- **Build strategic alliances.** Metropolitan and member agencies will form strategic alliances with partners to leverage resources, opportunities and existing momentum that support market transformation.
- **Advance water efficiency standards.** Metropolitan and member agencies will work to advance water efficiency codes and standards to increase efficiency and reduce water waste.

Successful market transformation requires the integrated use of all five strategies. It is implemented through three complementary programs: traditional and market acceleration programs, and legislation and regulation. When used together, these approaches can be catalytic and transform markets.

Traditional Program: A traditional program of incentives, outreach, education, and training will be used to provide a foundation of water savings, establish baseline conditions, provide market data, and help determine devices and services that are primed for market acceleration. Implementation may include regional incentive programs, pilot programs, regional outreach, and research for a variety of devices and services.

Market Acceleration Program: A portion of Metropolitan's resources will be used for market acceleration of devices and services that have potential for market change. Metropolitan will use a strategic focus for a specified time period to affect the market for a particular device or service. Tactics may include strategic outreach to manufacturers, retailers, contractors, and consumers; enhanced incentives; and collaboration on implementation.

Legislation and Regulation: Are important tools and often the primary means for ensuring future water savings from devices and services. Regulation, ordinances and codes establish conditions that will ensure a minimum level of water efficiency for a particular device or service in the future. Markets are dynamic, and the influences on manufactures, retailers, and consumers are constantly changing. Progress has been made towards changing consumer preferences; a market share of efficient products is protected through legislation and regulations requiring a minimum efficiency standard. This benefits both water agencies and manufactures who invest in bringing water-efficiency technologies to the market. Legislation and regulation are also effective exit strategies to discontinue traditional incentive programs so that resources can be redirected to new technologies and approaches.

Implementation of the combined programs, Traditional - Market Acceleration – Legislation and Regulation, will be closely coordinated between Metropolitan, member agencies and sub-agencies to maximize synergies. An adaptive management approach will be employed using research, implementation and evaluation to guide decisions on program activities and intensity.

Periodic Review

A periodic review of conservation actions to measure progress towards the water savings goals will be an integral component of the effort. The review will include work that is completed or in progress. It will consider factors that have affected the results as well as the opportunities to improve cost effectiveness and water savings.

2.5. Demand Projections

2.5.1. 25 Year Projections

One of the main objectives of this RUWMP is to provide an insight into the MWDOC service area future water demand outlook. MWDOC's service area total retail water demand in 2010 was 485,311 acre-feet which is met through a combination of 45% groundwater, 45% imported water, 1% surface water and 8% recycled water. The current water demands represent the sum of demands of MWDOC's 28 member agencies in FY 2009-10 as provided to MWDOC by the member agencies.

The most recent survey requested that member agencies provide demand projections for the period 2015- 2035 in five-year increments. Methodologies and assumptions underlying these projections vary from agency to agency, but all projections reflect an in-depth knowledge of the agencies' service areas. In most cases, the projections are closely correlated to the general plans prepared by the County of Orange or cities within MWDOC's service area. Additionally, MWDOC worked with OCWD to determine seawater barrier demands. MWDOC also worked with Metropolitan to obtain projections

on employment and economic growth in the MWDOC service area, and this information was taken into account when developing the demand projections.

Table 2-10 below depicts the current and projected water demands within the MWDOC service area for a 25-year planning period.

Table 2-10: Current and Projected Water Demands in MWDOC Service Area (AFY)

Water Supply Sources	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035
Imported Water	220,132	225,697	234,454	243,853	247,545	250,519
Groundwater	220,052	243,032	246,514	248,933	250,553	251,754
Surface Water	5,485	6,100	6,100	6,100	6,100	6,100
Recycled Water	39,642	51,658	55,699	59,324	59,492	59,597
Total	**485,311**	**526,487**	**542,767**	**558,210**	**563,690**	**567,970**

Table 2-11 shows the projected demands for imported water MWDOC has provided to its member agencies.

Table 2-11: MWDOC's Demand Projections Provided to its Member Agencies (AFY)

	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Member Agencies	225,697	234,454	243,853	247,545	250,519

2.5.2. Low Income Household Projections

The UWMP Act requires 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. Because MWDOC is a wholesale agency, the information on low income household projections can be found in each of the retail water supplier individual UWMPs.

3. Water Sources and Supply Reliability

3.1. Overview

Water supplies in MWDOC's service area come from both local and imported sources. As a member agency of Metropolitan, MWDOC purchases water from Metropolitan to deliver to its member agencies to supplement local supplies. In 2010, MWDOC supplied 220,132 AFY of imported water to its member agencies. Imported water represents approximately 45 percent of the total water supply in the MWDOC service area. Sources of Metropolitan's imported water include the Colorado River Aqueduct (CRA) and the State Water Project (SWP).

Local supplies developed by individual member agencies, primarily groundwater, presently account for about 55 percent of the service area's water supplies. Local supplies include groundwater, recycled wastewater, and surface water. The primary groundwater basin is located in the northern half of MWDOC's service area.

Figure 3-1 depicts Orange County's current water supply sources.

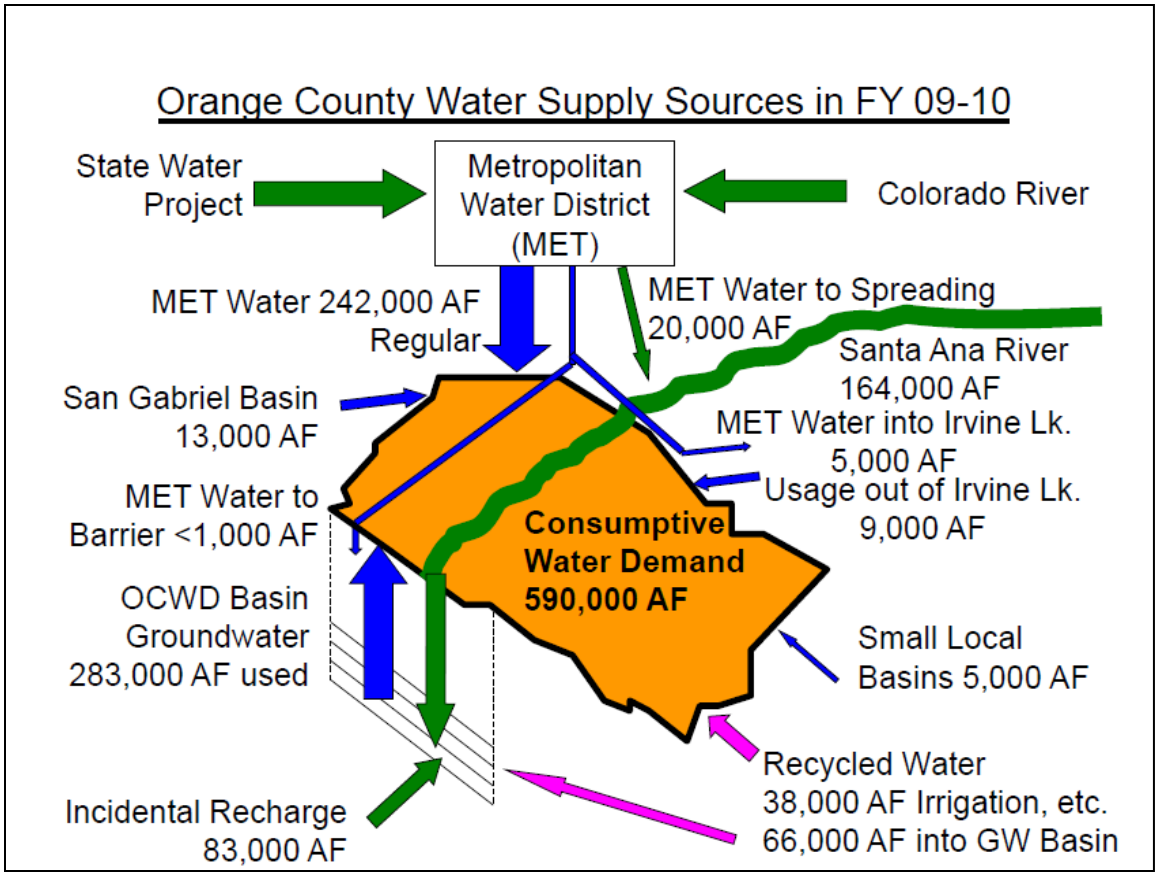

Figure 3-1: Schematic of Water Supply Sources in Orange County6

MWDOC and its member agencies are collectively working to improve the water reliability within the service area by continuously developing local supplies. MWDOC works together with two primary agencies – Metropolitan and OCWD to insure a safe and high quality water supply. 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 water supply mix projected to meet MWDOC's service area demands through 2035 is depicted in Figure 3-2 below. The imported water supply numbers shown here represent only the amount of supplies projected to meet demands and not the full supply capacity, as only the amount of imported water needed to meet demands will be purchased from Metropolitan.

[6] This includes water supply sources for the entire County including the three cities of Anaheim, Fullerton, and Santa Ana

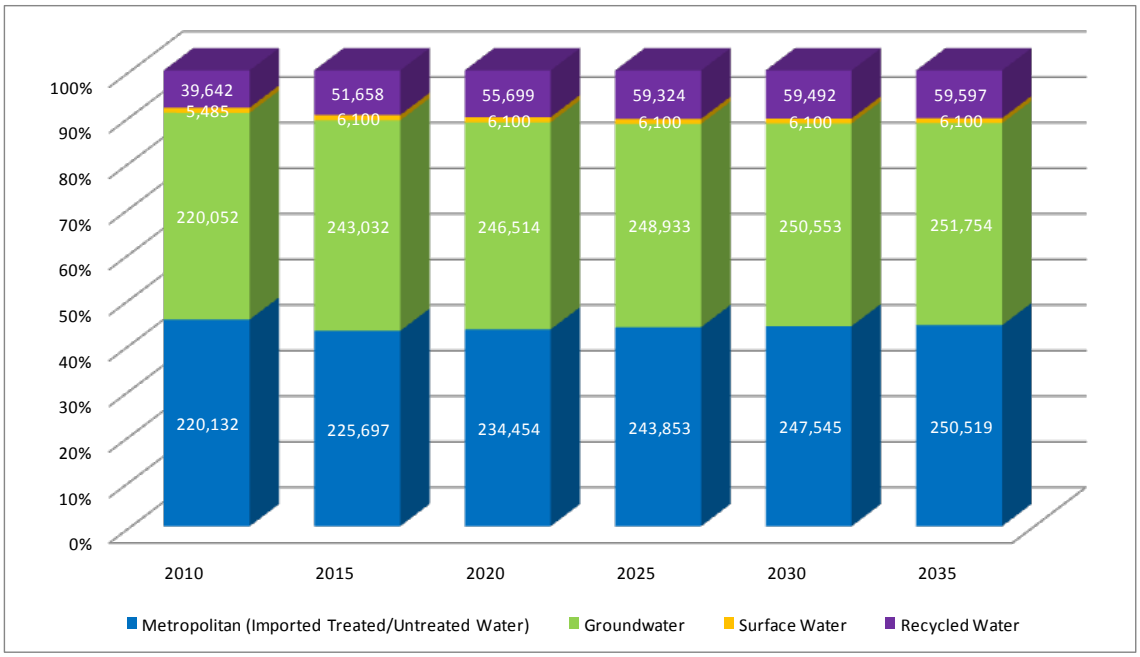

Figure 3-2: Current and Projected Water Supplies for MWDOC Service Area (AFY)

The following section provides a detailed discussion of the main sources of water within MWDOC's service area as well as projections of the region's future water supply portfolio for the next 25 years. This section also compares projected supply and demand under various hydrological conditions to determine MWDOC'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. Metropolitan Water District of Southern California

Metropolitan is the largest water wholesaler for domestic and municipal uses in California. Approximately 19.1 million Southern Californians rely on Metropolitan for imported water. Metropolitan wholesales imported water supplies to 26 member cities and water districts in six Southern California counties. Since 1983, the total regional retail water demands within Metropolitan's service area have increased from about 2.9 million acre-feet to nearly 4.2 million acre-feet in 2007. Metropolitan has provided between 45 and 60 percent of the municipal, industrial, and agricultural water used in its nearly 5,200-squre-mile service area. The remaining supply comes from local wells, local surface water, recycled water supplies, and from the City of Los Angeles's aqueduct in the eastern Sierra Nevada.

Metropolitan is governed by a Board of Directors comprised of 37 appointed individuals with a minimum of one representative from each of Metropolitan's 26 member agencies. The allocation of directors and voting rights are determined by each agency's assessed

valuation. Each member of the Board shall be entitled to cast one vote for each ten million dollars ($10,000,000) of assessed valuation of property taxable for district purposes, in accordance with Section 55 of the Metropolitan Water District Act. As of August 10, 2010, MWDOC has four directors on Metropolitan's Board, which represents 16.94% percent of the vote entitlement.

Metropolitan is responsible for importing water into the region through its operation of the CRA and its contract with the State of California for SWP supplies. Major imported water aqueducts bringing water to Southern California are shown in Figure 3-3. Over the past decade, supplies from the Colorado River have averaged 0.92 million acre-feet. Supplies from the State Water Project over the same period have averaged 1.40 million acre-feet of water. The future reliability of these supplies is increasingly uncertain; however, Metropolitan has increased its ability to supply water, particularly in dry years, through the implementation of storage and transfer programs.

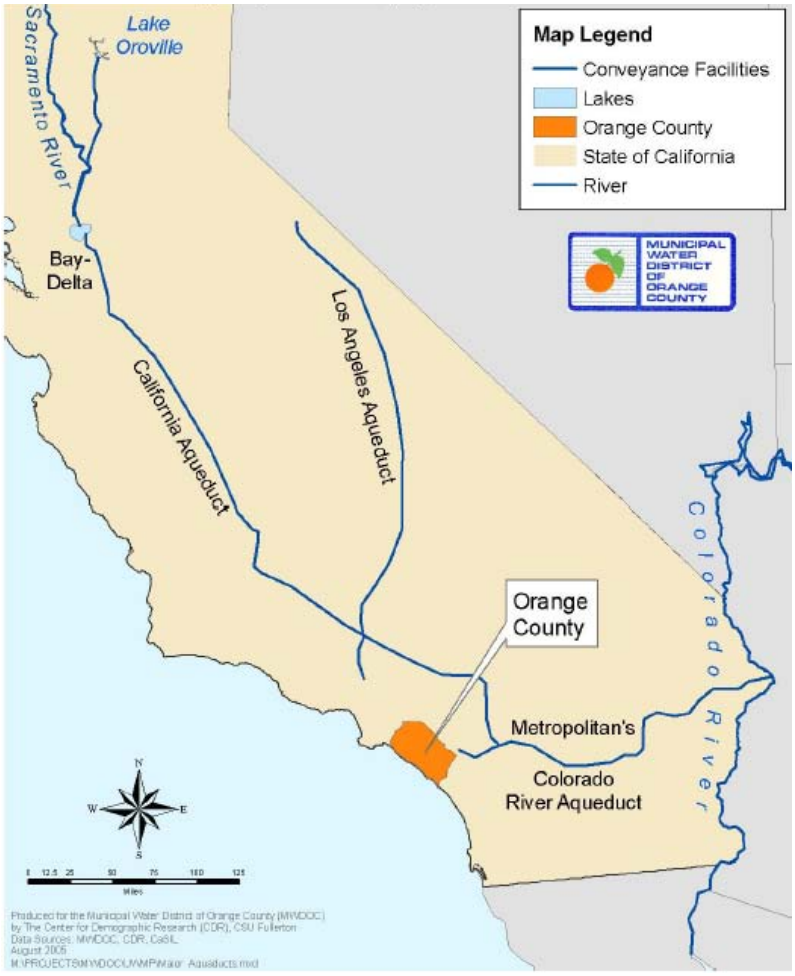

Figure 3-3: Major Aqueducts Bringing Water to Southern California

In Orange County, MWDOC and the cities of Anaheim, Fullerton, and Santa Ana purchase imported water from Metropolitan. MWDOC purchases both treated potable and untreated water from Metropolitan. Figure 3-4 illustrates the Metropolitan feeders and major transmission pipelines that deliver water within the County.

Figure 3-4: Metropolitan Feeders and Transmission Mains Serving Orange County

3.2.1. Metropolitan's 2010 Regional Urban Water Management Plan

Metropolitan's 2010 Regional Urban Water Management Plan (Metropolitan RUWMP) reports on its water reliability and identifies projected supplies to meet the long-term demand within its service area. The Metropolitan RUWMP discusses the current water supply conditions and long-term plans for supply implementation and continued

development of a diversified resource mix. It describes the programs being implemented such as: the CRA, SWP, and Central Valley storage/transfer programs, water use efficiency programs, local resource projects, and in-region storage that will enable the region to meet its water supply needs. The Metropolitan RUWMP also 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.

Information from Metropolitan's RUWMP, including the background, associated challenges, and long-term development programs for each of Metropolitan's supply sources and Metropolitan's supply capacities under various hydrologic conditions have been summarized and included herein. Additional information on Metropolitan can be found in the Metropolitan 2010 RUWMP.

3.2.2. Colorado River Aqueduct (CRA)

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. The CRA, which is owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. After deducting for conveyance losses and considering maintenance requirements, up to 1.25 million acre-feet (MAF) of water per year may be conveyed through the CRA to Metropolitan's member agencies, subject to the availability of Colorado River water for delivery to Metropolitan as described below.

Water from the Colorado River or its tributaries is available to users in California, Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as well as to Mexico. California is apportioned the use of 4.4 MAF of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California, and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to but not used by Arizona or Nevada. Under the 1931 Seven Party Agreement that has formed the basis for the distribution of Colorado River water made available to California, Metropolitan holds the fourth priority right[7] to 550 thousand acre-feet (TAF) per year. Metropolitan also holds a fifth priority for an additional 662 TAF per year that exceeds California's 4.4 MAF per year basic apportionment, and another 180 TAF per year when surplus flows are available. Metropolitan can obtain water under the fifth priority from:

- Water unused by the California holders of priorities 1 through 3
- Water saved by the Palo Verde land management, crop rotation, and water supply program, or

[7] The 1931 Seven Party Agreement provides the basis for the priorities among California's contractors to use of Colorado River water made available to California. The first four priorities total the 4.4 MAF per year available to California.

- When the U.S. Secretary of the Interior makes available either or both:
    - Surplus water, and
    - Water apportioned to, but unused by, Arizona and/or Nevada

Background on CRA Supplies

Historically, Metropolitan's fifth priority rights under the Seven Party Agreement were satisfied with water allocated to Arizona and Nevada that these states did not use. Beginning in 1985, with the commencement of Colorado River water deliveries to the Central Arizona Project, year-to-year availability of Colorado River water to Metropolitan became uncertain. The Secretary of the Interior asserted that California's users of Colorado River water had to limit their use to a total of 4.4 MAF per year, plus any available surplus water. Under the auspices of the State's Colorado River Board, these users developed a draft plan to resolve the problems, which was known as "California's Colorado River Water Use Plan" (California Plan).

The California Plan characterized how California would develop a combination of programs to allow the state to limit its annual use of Colorado River water to 4.4 MAF per year plus any available surplus water. The 2003 Quantification Settlement Agreement (QSA) among Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), and Metropolitan is a critical component of this plan. It established a baseline water use for each of these agencies and facilitates the transfer of water from agricultural agencies to urban uses, and specifies that IID, CVWD, and Metropolitan would forbear use of water to permit the Secretary of the Interior to satisfy the uses of the non-encompassed present perfected rights (PPRs). The PPR holders include certain Indian reservation, federal wildlife refuges, and other users, some but not all of which are encompassed by the Seven Party Agreement.

Current Conditions on CRA

On November 5, 2003, IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that thirteen agreements associated with the IID/San Diego County Water Authority (SDCWA) water transfer and the QSA are valid, legal and binding. Other lawsuits also were filed challenging the execution, approval and subsequent implementation of the QSA on various grounds. One of the key issues was the constitutionality of the QSA Joint Powers Authority Agreement, pursuant to which IID, CVWD, and SDCWA agreed to commit $133 million toward certain mitigation costs associated with implementation of the transfer of 300 TAF of water conserved by IID pursuant to the QSA, and the State agreed to be responsible for any mitigation costs exceeding this amount. A final judgment was issued on February 11, 2010, holding that the State's commitment was unconditional in nature and, as such, violated the State's debt limitation under the California Constitution, and that eleven other agreements, including the QSA, also are invalid because they are inextricably interrelated with the

QSA Joint Powers Authority Agreement and the funding mechanism it established to cover such mitigation costs.

Metropolitan, CVWD and SDCWA have filed appeals of the court's decision, which will stay the ruling pending outcome of the appeal. If the ruling stands, it could delay the implementation of programs authorized under the QSA or result in increased costs or other adverse impacts. The impact, if any, that the ruling might have on Metropolitan's water supplies cannot be adequately determined at this time.

Runoff in the Colorado River Basin above Lake Powell from 2000 through 2007 was the lowest eight-year runoff on record bringing Colorado River system storage down to 50 percent of capacity. Runoff returned to near normal during 2008 through 2010 but the system storage remained just slightly above 50 percent of capacity.

Colorado River Programs and Long-Term Planning

Metropolitan has identified a number of programs that could be used to achieve the regional long-term development targets for the CRA and has entered into or is exploring agreements with a number of agencies as discussed below. These programs are described in greater detail in Metropolitan's 2010 RUWMP.

Existing and proposed Colorado River Water Management Programs include:

- IID / Metropolitan Conservation Program- Under this program, Metropolitan has funded water efficiency improvements within IID's service area in return for the right to divert the water conserved by those investments.
- Palo Verde Land Management, Crop Rotation, and Water Supply Program- Under this program, participating farmers in Palo Verde Irrigation District (PVID) are paid to reduce their water use by not irrigating a portion of their land.
- Southern Nevada Water Authority (SNWA) and Metropolitan Storage and Interstate Release Agreement- Under this agreement, additional Colorado River supplies are made available to Metropolitan when there is space available in the CRA to receive the water. SNWA may call on Metropolitan to reduce is Colorado River water order to return this water no earlier than 2019, unless Metropolitan agrees otherwise.
- Lower Colorado Water Supply Project- Under this contract, Metropolitan receives, on an annual basis, Lower Colorado Water Supply Project water unused by the City of Needles and other entities with no rights or insufficient rights to use of Colorado River water in California.

- Lake Mead Storage Program- This program allows Metropolitan to storage "Intentionally Created Surplus"[8] conserved through extraordinary conservation in Lake Mead.
- Hayfield Groundwater Storage Program- This program will allow CRA water to be stored in the Hayfield Groundwater Basin in east Riverside County for future withdrawal and delivery to the CRA.

Available Supplies on CRA

Metropolitan's current CRA program capabilities under average year, single dry year, and multiple dry year hydrologies are shown below in Table 3-1.

[8] Lake Mead storage program included a provision that water left in Lake Mead must be conserved through extraordinary conservation measures ("Intentionally Created Surplus") and not simply not needed in the year stored.

Table 3-1: Metropolitan Colorado River Aqueduct Program Capabilities

Colorado River Aqueduct
Program Capabilities
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Basic Apportionment – Priority [4]	550,000	550,000	550,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	13,000
PVID Land Management, Crop Rotation, and Water Supply Program	133,000	133,000	133,000
Lower Colorado Water Supply Project	5,000	5,000	5,000
Lake Mead Storage Program	400,000	400,000	400,000
Quechan Settlement Agreement Supply	7,000	7,000	7,000
Forbearance for Present Perfected Rights	(47,000)	(47,000)	(47,000)
CVWD SWP/QSA Transfer Obligation	(35,000)	(35,000)	(35,000)
DWCV SWP Table A Obligation	(77,000)	(60,000)	(155,000)
DWCV SWP Table A Transfer Callback	41,000	32,000	82,000
DWCV Advance Delivery Account	36,000	28,000	73,000
Drop 2 Reservoir Funding	22,000	25,000	25,000
SNWA Agreement	0	0	0
Expand SNWA Agreement	0	0	0
Subtotal of Current Programs	***1,120,000***	***1,123,000***	***1,136,000***
Programs Under Development			
Additional PVID Transfers (Crop Stressing/Fallowing)	62,000	62,000	62,000
Arizona Programs - CAP	50,000	50,000	50,000
California Indians / Other Ag	10,000	10,000	10,000
ICS Exchange	25,000	25,000	25,000
Agreements with CVWD	35,000	35,000	35,000
Hayfield Groundwater Extraction Project	0	0	0
Subtotal of Proposed Programs	***182,000***	***182,000***	***182,000***
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	80,000	80,000	80,000
To San Luis Rey Settlement Parties1	16,000	16,000	16,000
Subtotal of Non-Metropolitan Supplies	***296,000***	***296,000***	***296,000***
Maximum CRA Supply Capability[2]	**1,598,000**	**1,601,000**	**1,614,000**
Less CRA Capacity Constraint (amount above 1.25 MAF)	*(348,000)*	*(351,000)*	*(364,000)*
Maximum Expected CRA Deliveries[3]	**1,250,000**	**1,250,000**	**1,250,000**
Less Non-Metropolitan Supplies[4]	*(296,000)*	*(296,000)*	*(296,000)*
Maximum Metropolitan Supply Capability[5]	**954,000**	**954,000**	**954,000**

[1] Subject to satisfaction of conditions specified in agreement among Metropolitan, the United States, and the San Luis Rey Settlement Parties
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The Colorado River Aqueduct delivery capacity is 1.250 MAF annually.
[4] Exchange obligation for the SDCWA-IID transfer and the Coachella and All American Canal Lining projects.
[5] The amount of CRA water available to Metropolitan after meeting its exchange obligations.

Source: Metropolitan 2010 RUWMP, Table 3-1

3.2.3. State Water Project (SWP)

The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR. This statewide water supply infrastructure provides water to 29 urban and agricultural agencies throughout California. The original State Water Contract called for an ultimate delivery capacity of 4.2 MAF, with Metropolitan holding a contract for 1.911 MAF.

Much of the SWP water supply passes through the San Francisco-San Joaquin Bay-Delta (Bay-Delta). More than two-thirds of California's residents obtain some of their drinking water from the Bay-Delta system. For decades, the Bay-Delta has experienced water quality and supply reliability challenges and conflicts due to variable hydrology and environmental standards that limit pumping operations.

Background on SWP

The listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (respectively, the "Federal ESA" and the "California ESA" and, collectively, the "ESAs") have adversely impacted operations and limited the flexibility of the SWP. An annual environmental water account established under the Bay-Delta Program as a means of meeting environmental flow requirements and export limitations has helped to mitigate these impacts. In 2004 and 2005, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) issued biological opinions and incidental take statements that govern operations of the SWP and the Central Valley Project (CVP) with respect to the Delta smelt, the winter-run and spring-run Chinook salmon, and the Central Valley steelhead.

Litigation filed by several environmental interest groups alleged that the 2004 and 2005 biological opinions and incidental take statements inadequately analyzed impacts on listed species under the Federal ESA. On May 25, 2007, Federal District Judge Wanger issued a decision on summary judgment in NRDC v. Kempthorne, finding the USFWS biological opinion for Delta smelt to be invalid. On December 14, 2007, Judge Wanger issued his Interim Remedial Order requiring that the SWP and CVP operate according to certain specified criteria until a new biological opinion for the Delta smelt is issued. Under the Interim Remedial Order, SWP operations were constrained in the winter and spring of 2007-08 by prevailing conditions and the status of the Delta smelt, reducing SWP deliveries to Metropolitan by approximately 250 TAF, as water that otherwise could have been diverted for delivery through the California Aqueduct, which is owned by DWR and delivers water from the SWP to Metropolitan, bypassed the SWP pumps.

The USFWS released a new biological opinion on the impacts of the SWP and CVP on Delta smelt on December 15, 2008. Metropolitan and others filed lawsuits challenging the biological opinion. On April 16, 2008, the court invalidated the 2004 NMFS's

biological opinion for the salmon and other fish species that spawn in rivers flowing into the Bay-Delta. The NFWS released its new biological opinion for salmonoid species on June 4, 2009. DWR estimated an average 10 percent water loss from the Bay-Delta, expected to begin in 2010, under this biological opinion. The impact on SWP deliveries attributable to the Delta smelt and salmonoid species biological opinions combined is estimated to be 1.0 MAF in an average year, reducing SWP deliveries from approximately 2.3 MAF for the year under average hydrology.

DWR has altered the SWP operations to accommodate species of fish listed under the ESAs, and these changes have adversely impacted SWP deliveries. DWR's Water Allocation Analysis indicated that export restrictions could reduce deliveries to Metropolitan by 150 TAF to 200 TAF for 2010 under median hydrologic conditions.

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

Current Conditions on SWP

The December 2009 draft of DWR's SWP Delivery Reliability Report shows that future SWP deliveries will be impacted by two significant factors: restrictions on SWP and CVP Delta pumping and climate change. The 2009 draft Reliability Report shows greater reductions in water deliveries on average when compared to the 2007 report. Over multiple-year dry periods, average annual "Table A" [9] deliveries vary from 32% to 34% of the maximum "Table A" amount, while average annual deliveries over multiple-year wet periods range from 72 to 94 percent of the maximum Table A amount. Under future conditions, annual SWP Article 21 deliveries average 62 TAF, ranging from 1 TAF to 550 TAF over the 82-year simulation period. The current "Table A" allocation as of April 25, 2011 is 80 percent of the maximum "Table A" allotment.

[9] The term "Table A" refers to Table A in the contract between each of the 29 State Water Contractors and the California Department of Water Resources. Each Contractor's "Table A" amount represents a share of the project (the total amount of Table A for all contractors equals approximately 4.2M acre-feet) which entitles each contractor to a portion of the available water supply for a given year and also obligates each contractor to a share of the operations and debt financial obligations for the State Water Project.

State Water Project Programs and Long-Term Planning

Metropolitan's implementation approach for the SWP depends on full use of the current State Water Contract provisions and successful implementation of a number of agreements, including the Sacramento Valley Water Management (Phase 8 Settlement Agreement and the Bay-Delta Conservation Plan (BDCP). The BDCP is being prepared through a collaboration of state, federal, and local water agencies, state and federal fish agencies, environmental organizations, and other interested parties with the ultimate goal of developing a set of actions that will provide for both species/habitat protection and improved reliability of water supplies. The Phase 8 Settlement Agreement was developed among Bay-Delta watershed users to determine how all Bay-Delta water users would bear some of the responsibility of meeting flow requirements.

Other programs and agreements that Metropolitan has implemented to improve management of SWP supplies include:

- Monterey Amendment – This settlement between SWP contractors and DWR altered the water allocation procedures such that both shortages and surpluses would be shared in the same manner for all contractors, eliminating the prior "agriculture first" shortage provision.
- SWP Terminal Storage – Metropolitan has contractual rights to 65 TAF of flexible storage at Lake Perris and Castaic Lake, which provides Metropolitan with additional options for maximizing yield from the SWP.
- Yuba Dry Year Water Purchase Program – Metropolitan entered into this agreement with DWR in 2007 to provide for Metropolitan's participation in the Yuba Dry Year Water Purchase Program, which provides transfers of water from the Yuba County Water Agency during dry years through 2025.
- Desert Water Agency/CVWD SWP Table A Transfer – Under this agreement, Metropolitan transferred 100 TAF of its SWP Table A contractual amount to Desert Water Agency/CVWD. Metropolitan is able to recall the SWP transfer water in years in which Metropolitan determines it needs the water to meet its water management goals. The main benefit of the agreement is to reduce Metropolitan's SWP fixed costs in wetter years when there are more than sufficient supplies to meet Metropolitan's water management goals, while at the same time preserving its dry-year SWP supply.
- Desert Water Agency/CVWD Advance Delivery Program – Under this program, Metropolitan delivers Colorado River water to the Desert Water Agency and CVWD in advance of the exchange for their SWP Contract Table A allocations. By delivering enough water in advance to cover Metropolitan's exchange obligations, Metropolitan is able to receive Desert Water Agency and CVWD's available SWP supplies in years in which Metropolitan's supplies are insufficient without having to deliver an equivalent amount of Colorado River water.

- Desert Water Agency/CVWD Other SWP Deliveries – Since 2008, Metropolitan has provided Desert Water Agency and CVWD written consent to take delivery from the SWP facilities non-SWP supplies separately acquired by each agency.
- Diamond Valley Lake – The completion and filling of Diamond Valley Lake between 1999 and 2003 marked the most important achievement with respect to protecting Southern California against a SWP system outage. The lake can hold up to 810 TAF that provides Southern California with a six-month emergency water supply as well as carryover and regulatory storage.
- Inland Feeder Project – The Inland Feeder project is a high-capacity water delivery system designed to increase Southern California's water supply reliability. The project will take advantage of large volumes of water when available from northern California, depositing it in surface storage reservoirs, such as Diamond Valley Lake, and local groundwater basins for use during dry periods and emergencies.

In addition to those actions discussed above, Metropolitan adopted a Delta Action Plan in June 2007 which includes a long-term Delta plan. The Delta Action Plan 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 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. Metropolitan also provided input to the Delta Vision Blue-Ribbon Task Force developed as part of the Governor's Delta Vision process. After delivery of the Delta Vision recommendations, a package of bills was signed by the legislature in 2009, including SB 1 x7, which reformed Delta policy and governance.

In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is expected to be operational by 2022 that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed due to the Biological Opinions.

Available Supplies on SWP

Metropolitan's current State Water Project (also known as California Aqueduct) program capabilities under average year, single dry year, and multiple dry year hydrologies are shown below in Table 3-2.

Table 3-2: Metropolitan California Aqueduct Program Capabilities

California Aqueduct Program Capabilities
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
MWD Table A	469,000	107,000	1,026,000
DWCV Table A	77,000	60,000	155,000
San Luis Carryover [1]	69,000	208,000	208,000
Article 21 Supplies	0	0	52,000
Yuba River Accord Purchase	0	0	0
Subtotal of Current Programs	***615,000***	***375,000***	***1,441,000***
Programs Under Development			
Delta Improvements	341,000	628,000	605,000
IRP SWP Target [2]	0	0	0
Subtotal of Proposed Programs	***341,000***	***628,000***	***605,000***
Maximum Supply Capability	**956,000**	**1,003,000**	**2,046,000**

[1] Includes DWCV carryover.
[2] Remaining supply needed to meet IRP target.

Source: Metropolitan 2010 RUWMP, Table 3-2

3.2.4. Central Valley/SWP Storage and Transfer Programs

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. Metropolitan endeavors to increase the reliability of supplies received from the California Aqueduct by developing flexible Central Valley storage and transfer programs. Over the years, Metropolitan has developed numerous voluntary Central Valley storage and transfer programs, aiming to develop additional dry-year water supplies.

Background on SWP Transfers

Metropolitan's storage and transfer programs were established to augment SWP reliability in dry years. Metropolitan's Board determined that the criteria for operating the SWP did not provide sufficient reliability to meet Metropolitan's overall supply reliability objectives. Most recently, DWR's estimates of SWP reliability capability show that SWP reliability under conditions similar to 1977, the driest year on record, could be significantly worse than earlier modeling indicated. Metropolitan estimates that currently in a single dry year similar to 1977, SWP deliveries in its service area would be about 134 TAF rather than the 418 TAF of "Table A" water previously estimated.

Metropolitan estimates that another 280 TAF of carryover storage could be delivered, for a total delivery of 414 TAF.

Metropolitan believes that it now has in place Central Valley/SWP storage and transfer programs capable of reaching its planning target, and it has several other programs under development.

Current Programs and Long-Term Planning on SWP

Metropolitan currently has several Central Valley/SWP storage programs in operation. Metropolitan is also pursuing a new storage program with Mojave Water Agency, and it is currently under development. In addition, Metropolitan pursues Central Valley water transfers on an as needed basis. Existing and planned storage and transfer programs include:

- ***Semitropic Storage Program***- Under this program, Metropolitan can store portions of its SWP entitlement water in excess of the amounds needed to meet its demands. The water is delivered to farmers in the Semitropic Water Storage District (SWSD) who use the water in lieu of pumping groundwater. During dry years, Metropolitan's previously stored water is returned to Metropolitan by direct groundwater pumping by the SWSD and the exchange of SWP entitlement water. The maximum storage capacity of the program is 350 TAF.
- ***Arvin-Edison Storage Program***- This program was amended in 2008 to include the South Canal Improvement Project, which increases reliability and improves the quality of water returned to the California Aqueduct. Metropolitan can use the program to store excess SWP Table A supplies during wet years. The water can either be directly recharged into the groundwater basin or delivered to farmers in the Arvin-Edison Water Storage District who use the water in-lieu of pumping groundwater. During dry years, the water is returned to Metropolitan by direct groundwater pumping or by exchange of surface water supplies. The program storage capacity is 350 TAF.
- ***San Bernardino Valley MWD Storage Program***- This program allows Metropolitan to purchase a portion of San Bernardino Valley Municipal Water District's SWP supply. The program has a minimum purchase provision of 20 TAF and can deliver up to 70 TAF, depending on hydrologic conditions. The agreement also allows Metropolitan to store up to 50 TAF of transfer water for use in dry years.
- ***Kern-Delta Water District Storage Program***- This program, currently under development, will allow Metropolitan to store up to 250 TAF of water and will be capable of providing 50 TAF of dry year supply. The water will be either directly recharged into the groundwater basin or delivered to Kern-Valley Water District farmers who use the water in-lieu of pumping groundwater. During dry years,

MWDOC will return Metropolitan's previously stored water by direct groundwater pump-in return or by exchange of surface water supplies.

- ***Mojave Storage Program***- Currently operated as a demonstration program, the program will store SWP supply delivered in wet years for subsequent withdrawal during dry years. When fully developed, the program is expected to have a dry-year yield of 35 TAF depending on hydrologic conditions.
- ***Central Valley Transfer Programs***- Metropolitan expects to secure Central Valley water transfer supplies via spot markets and option contracts to meet its service area demands when necessary. Metropolitan secured water transfer supplies in 2003, 2005, 2008, and 2009 to fill anticipated supply shortfalls needed to meet service area demands. Metropolitan's recent water transfer activities in have demonstrated Metropolitan's ability to develop and negotiate water transfer agreements either working directly with the agricultural districts who are selling the water or through a statewide Drought Water Bank.

Available Supplies on SWP

Metropolitan's current Central Valley/SWP storage and transfer program supply capabilities under average year, single dry year, and multiple dry year hydrologies are shown below in Table 3-3. In developing the supply capabilities for the Metropolitan 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of the five-year increments based on the balances of supplies and demands.

Table 3-3: Metropolitan Central Valley/State Water Project and Transfer Programs

Central Valley/State Water Project Storage and Transfer Programs
Supply Projection
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
San Bernardino Valley MWD Minimum Purchase	12,000	8,000	20,000
San Bernardino Valley MWD Option Purchase	12,000	11,000	29,000
Central Valley Storage and Transfers			
Semitropic Program	46,000	41,000	69,000
Arvin Edison Program	63,000	75,000	75,000
San Bernardino Valley MWD Program	16,000	49,000	49,000
Kern Delta Program	47,000	50,000	50,000
Subtotal of Current Programs	***196,000***	***234,000***	***292,000***
Programs Under Development			
Mojave Groundwater Storage Program	11,000	5,000	43,000
North of Delta/In-Delta Transfers	33,000	33,000	33,000
SBVMWD Central Feeder	5,000	5,000	5,000
Shasta Return	18,000	18,000	18,000
Semitropic Agricultural Water Reuse Demonstration	11,000	11,000	11,000
Subtotal of Proposed Programs	***78,000***	***72,000***	***110,000***
Maximum Supply Capability	**274,000**	**306,000**	**402,000**

Source: Metropolitan 2010 RUWMP, Table 3-3

3.2.5. Supply Reliability within Metropolitan

In the Metropolitan RUWMP, 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. The analyses also include Colorado River supplies under the same hydrologies. Metropolitan's analyses are illustrated in Tables 3-4, 3-5, and 3-6. 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 3-4: 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.

Source: Metropolitan 2010 RUWMP, Table 2-11

Table 3-5: 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.

Source: Metropolitan 2010 RUWMP, Table 2-19

Table 3-6: 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.

Source: Metropolitan 2010 RUWMP, Table 2-10

3.2.6. MWDOC's Imported Water Supply Projections

California Water Code section 10631 (k) requires Metropolitan to provide information to MWDOC for inclusion in its UWMP that identifies and quantifies the existing and planned sources of water available from the wholesale agency. Table 3-5 indicates Metropolitan's water availability projections by source for the next 25 years as provided to MWDOC. These supply projections include only the supply Metropolitan projects will be needed to serve MWDOC. Metropolitan's projected supplies to serve MWDOC are lower than MWDOC's projected demands on Metropolitan due to Metropolitan's assumption of a 20 percent reduction in demands by 2020.

Based on Metropolitan's supply projections, MWDOC will be able to meet demands under average year, single dry year, and multiple dry year scenarios. The water supply projections shown in Table 3-7 represent the amount of supplies projected to meet MWDOC demands, as MWDOC will only purchase the amount of water needed to meet demands from Metropolitan.

Table 3-7: Wholesaler Identified & Quantified Existing and Planned Sources of Water (AFY)

Wholesaler Sources	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Imported Water from Metropolitan	225,697	234,454	243,853	247,545	250,519

3.3. Groundwater

Among all local supplies available to MWDOC's member agencies, groundwater supplies the most water. The water supply resources in MWDOC's service area are enhanced by the existence of four groundwater basins, which provide a reliable local source and, additionally, are used as reservoirs to store water during wet years and storage to draw on during dry years. This section describes the four groundwater basins utilized by MWDOC's member agencies and provides information on historical groundwater production as well as a 25-year projection of the service area'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. Figure 3-5 depicts the Lower Santa Ana Groundwater Basin.

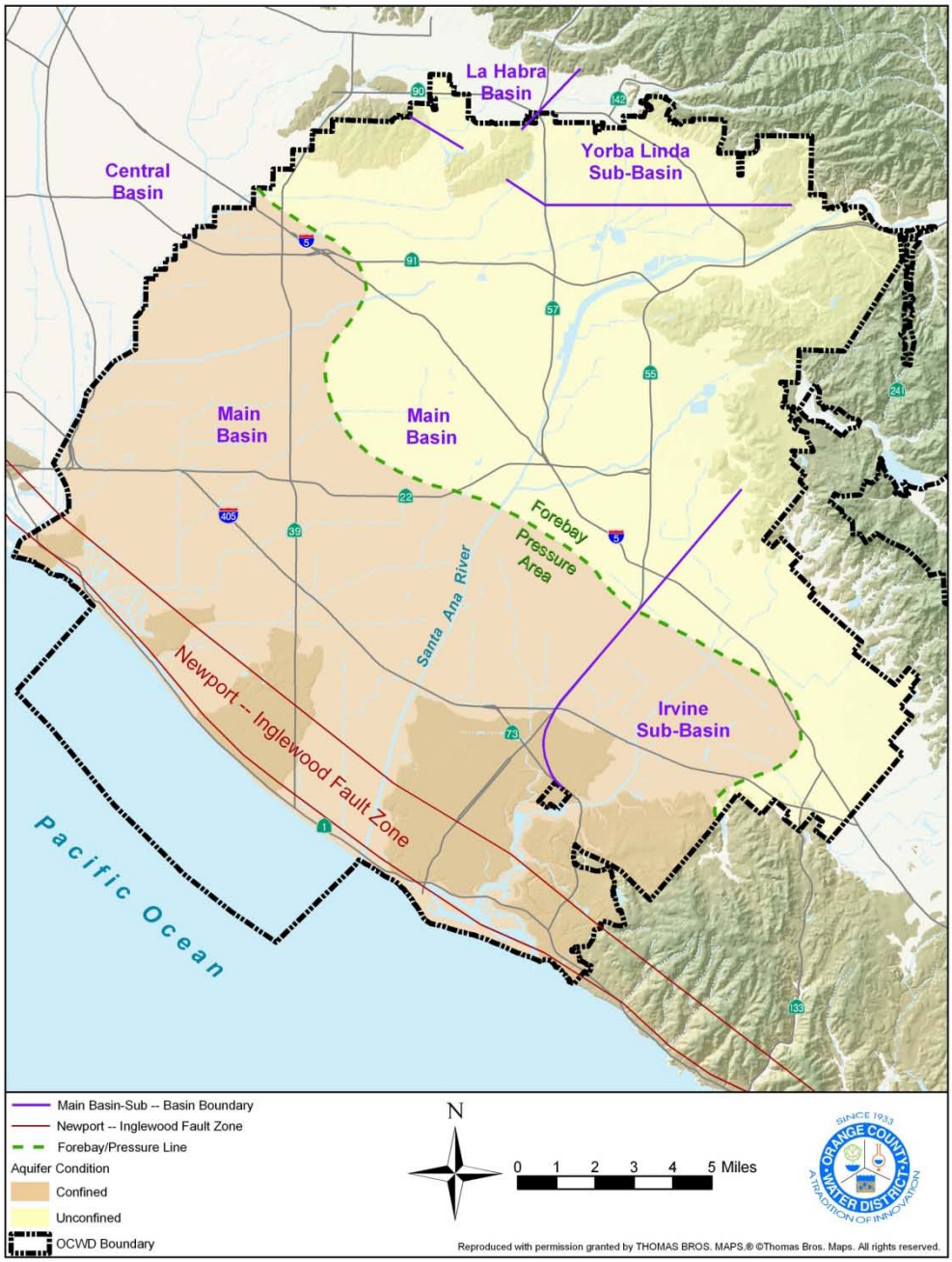

Figure 3-5: Lower Santa Ana Groundwater Basin

The 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. 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.*

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.[10]

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.[11] 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 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.

Basin Production Percentage

Since the Orange County Groundwater Basin is considered a "managed basin", no pumping right exists within the 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.

[10] MWDOC and Center for Demographics Research (2008)
[11] The *Report on Evaluation of Orange County Groundwater Basin Storage and Operational Strategy*, published in February 2007,

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 percent of a producer's total water demand. 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 RUWMP, the BPP is assumed to be 62 percent for the entire 25-year planning horizon (Table 3-8).

Table 3-8: 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, it may choose to activate its Groundwater Replenishment Program or its In-Lieu Program, where imported water is purchased in-lieu of pumping groundwater.

In some cases, OCWD encourages the pumping and treatment of groundwater that does not meet drinking water standards (prior to treatment) 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.

Recharge Management

The Basin is recharged by multiple sources. These include artificial, i.e., man-made systems, and incidental or natural recharge. One of OCWD's core activities is refilling or replenishing the Basin to balance the removal of groundwater by pumping.

OCWD currently owns and operates more than 1,000 acres of recharge facilities in and adjacent to the Santa Ana River and Santiago Creek. Historical groundwater flow was generally toward the ocean in the southwest, but modern pumping has caused groundwater levels to drop below sea level inland of the Newport-Inglewood fault zone. This trough-shaped depression encourages sea water to migrate inland, which if unchecked, could contaminate the groundwater supply. Strategic lines of wells in the Alamitos and Talbert Gaps inject imported and reclaimed water to create a mound of water seaward of the pumping trough to protect the Basin from seawater intrusion. In addition to operating the percolation system, OCWD also operates the Talbert Barrier in Fountain Valley and Huntington Beach, and participates in the financing operation of the Alamitos Barrier in Seal Beach and Long Beach. The barriers help prevent seawater intrusion and also help refill the Basin.

Sources of recharge water include Santa Ana River (SAR) baseflow and storm flow, Santiago Creek Flows, imported supplies purchased from Metropolitan, supplemental supplies from the upper SAR Watershed, and purified water from recycled plants.

Imported Water from Metropolitan via MWDOC is one source of groundwater replenishment. OCWD is able to increase allowable pumping from the Basin, above the natural safe yield, via the purchase of replenishment water. Delivery of replenishment water is interruptible and is not always available. When surplus replenishment water is not available for extended periods, OCWD continues to allow pumping above the Groundwater Basin's natural safe yield. Under this operation, the Orange County Basin draws on stored water to sustain this level of pumping. Depending on the severity of the drought and local supply conditions, this operation can be sustained for two to three years before the Basin reaches significant overdraft (greater than 500,000 acre-feet storage level). OCWD must then cut back pumping until refill of the Basin occurs via heavy rainfall or when the replenishment supply becomes available from Metropolitan. This close coordination of the Basin's operation with the Metropolitan replenishment program benefits the local service area with enhanced pumping levels in most years. Metropolitan also sells treated non-interruptible water to OCWD for injection into the Talbert Seawater Barrier. This water assists in the protection of the Basin from seawater intrusion.

Direct replenishment water is received at OCWD's recharge facilities in the cities of Anaheim and Orange and is physically recharged into the Basin through percolation.

3.3.2. San Juan Basin

The San Juan Basin is located in southern Orange County within the San Juan Creek Watershed and is comprised of four sub-basins: Upper San Juan, Middle San Juan, Lower San Juan and Lower Trabuco. The basin is bounded on the west by the Pacific Ocean and otherwise by tertiary semi-permeable marine deposits. San Juan Creek drains the San Juan Valley, and several other creeks drain valley tributaries to the San Juan.

The primary water-bearing unit within the Basin is Quanternary alluvium - a heterogeneous mixture of sand, silt, and gravel in the eastern portion of the basin to coarse sand near the center to fine-grained lagoonal sediments in the western portion of the basin. Thickness of the alluvium average about 65 feet and may reach more than 125 feet. The total storage capacity has been estimated to be 90,000 AF. Wells typically yield from 450 to 1,000 gallons per minute (gpm).

Recharge of the Basin is from flow in San Juan Creek, Oso Creek, and Arroyo Trabuco and precipitation to the valley floor. Water from springs flows directly from Hot Spring Canyon into San Juan Creek adding to recharge.

Figure 3-6 depicts the San Juan Basin.

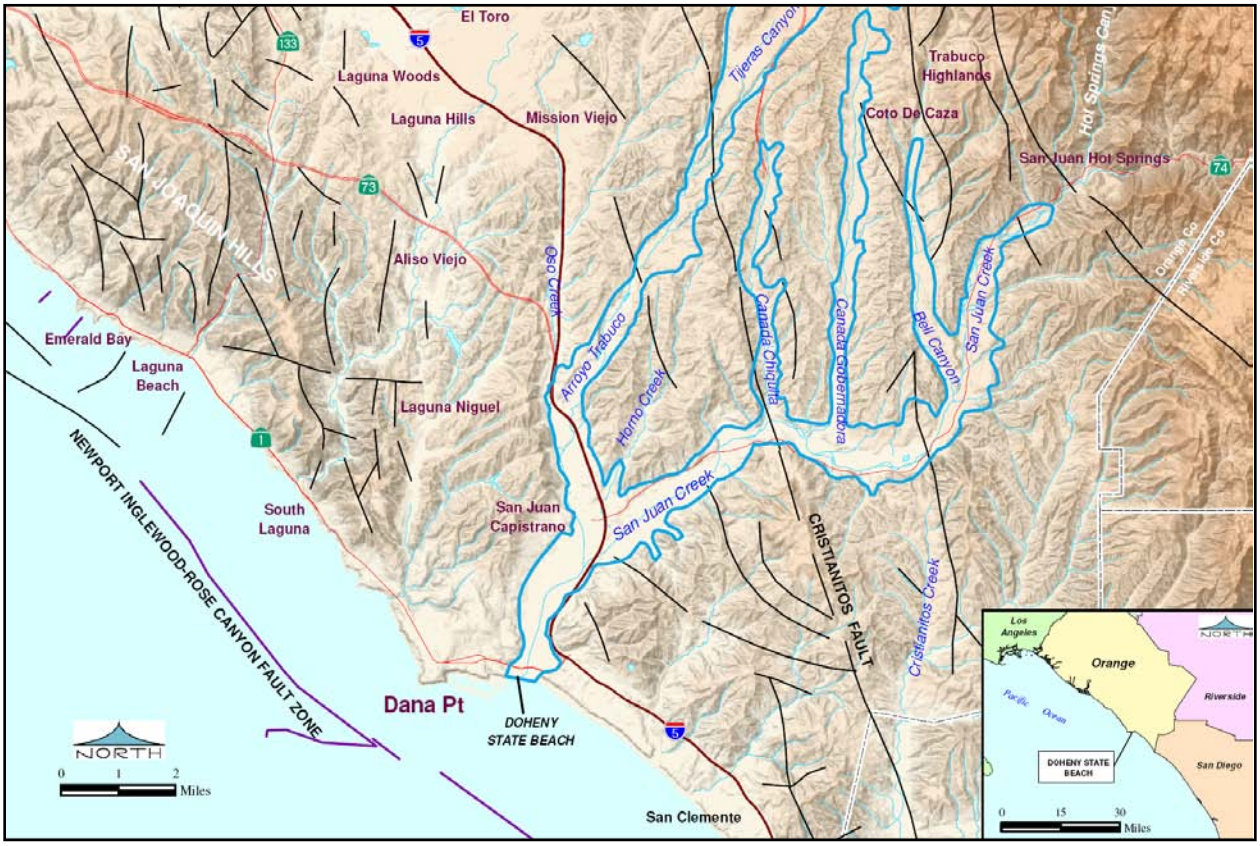

Figure 3-6: San Juan Basin

Basin Management

The State Water Resources Control Board (SWRCB) has determined that the San Juan Creek watershed is not a groundwater basin, but a surface and underground flowing stream and, therefore, it is subject to SWRCB jurisdiction and its processes with respect to the appropriation and use of waters within the watershed. The San Juan Basin Authority (SJBA) is a joint powers agency, formed in 1971 to manage the watershed. Member agencies include the City of San Juan Capistrano, Moulton Niguel Water District (MNWD), Santa Margarita Water District (SMWD), and South Coast Water District (SCWD). SJBA has SWRCB Permit for Diversion and Use of Water Permit No. 21074 for appropriation and diversion of up to 8,026 AFY, with the ability to increase to 10,702 AFY upon demonstration of sufficient availability of unappropriated water.

Groundwater Budget

A study by NBS Lowry (1994) investigated and modeled the Basin for 1979 through 1990. They determined a mean pump extraction capacity of 5,621 AFY and a mean

subsurface inflow of 2,246 AFY. Average subsurface outflow to the ocean is estimated to be about 450 AFY.

SJBA is currently in the process of updating their Groundwater Management Plan. MWDOC is assisting in the effort by providing groundwater modeling of the basin resources, including several groundwater desalters and an ocean water desalination project at the mouth of the basin. Through these current efforts, the Groundwater Management Plan is expected to update the long term sustainable production out of the basin and develop an implementation plan of how to achieve such production and manage the basin through wet and dry cycles. The work is expected to be completed in 2011 with implementation to follow. The overall objectives include developing and maintaining a reliable, good quality and economical local water supply for the residents in the Basin by maximizing use of local ground and surface water from, the San Juan Creek and its tributaries and the local ocean water, with due consideration for the preservation and enhancement of the environment, including, but not limited to, natural resources, fish and wildlife, infrastructure improvements and the cultural heritage of the area.

Groundwater Production

The SJBA completed Phase I of San Juan Basin Desalter Project in December 2004. The original capacity of the plant was projected to reach 4,800 AFY, although numerous problems have occurred, including pollution of City of San Juan Capistrano wells with MTBE. The groundwater desalter plant is currently being expanded to be able to produce about 6,000 to 7,000 AFY and granular activated carbon treatment is being added to remove MTBE. Additionally, SCWD constructed a 1 million gallons per day (MGD) Groundwater Recovery Facility (GRF) that came online in FY 2007-2008. The GRF was built initially for 1,300 AFY but production is currently limited to about 800 AFY by water rights restrictions and the capacity of a single well. The plant extracts and treats brackish groundwater using Reverse Osmosis and iron and manganese removal due to high mineral content. SCWD plans to expand the GRF facilities as well as adding another well or two. When complete, the project is expected to extract up to 2,000 AFY from the basin. Expansion of production requires either agreement with SJBA or confirmation of an additional water right by the State Water Resources Control Board.

3.3.3. La Habra Basin

No groundwater management plan is available for the La Habra Basin. However, the following sections are written, with assistance from the City of La Habra, to describe the basin.

La Habra Groundwater Basin Geology

From a structural geology standpoint, the La Habra Basin area is dominated by the northwest trending La Habra Syncline (a U–shaped down–fold) which is bounded on the north by the Puente Hills and on the south by the Coyote Hills. The fold is a naturally occurring trough, or valley, where significant quantities of groundwater have accumulated over the past 150,000 years. The La Habra Groundwater Basin consists of four major formations, which include bearing zones or aquifer units. These are the Alluvium, the La Habra Formation, the Coyote Hills Formation, and the San Pedro Formation.

Water levels of wells in the La Habra Formation have been measured between 100 and 200 feet below ground surface across the La Habra Basin area. Water levels in wells of the Coyote Hills Formation have been measured at about 120 feet below the ground surface. Pressure levels of confined groundwater in wells of the San Pedro aquifer zone range from about 100 to 200 feet below ground surface.

Currently, this non-adjudicated basin is serving the City of La Habra. The estimated long-term groundwater supplies from the basin have ranged from 3,700 AFY to 4,500 AFY; however, the historical City of La Habra extraction rate is approximately 1,074 AFY (averaged over the past 15 years). The City plans to utilize the additional groundwater supply by increasing the capacity on the existing Idaho Street Well.

Full development of the La Habra Basin could eventually supply up to 40% of the City's current water demands. The City of La Habra currently plans to double production capacity for the Idaho Street Well from 1,200 to 2,400 AFY, which will increase reliance on local sources from 11% to 22% of total demands. Table 2-12 shows projections for water extracted from the La Habra Groundwater Basin.

3.3.4. Main San Gabriel Basin (California Domestic Water Company)

The Main San Gabriel Basin lies in eastern Los Angeles County. The hydrologic basin or watershed coincides with a portion of the upper San Gabriel River watershed, and the aquifer or groundwater basin underlies most of the San Gabriel Valley.

Surface area of the groundwater basin is approximately 167 square miles and has a fresh water storage capacity of the basin is estimated to be about 8.6 million acre-feet.

The physical groundwater basin is divided into two main parts, the Main Basin and the Puente Subbasin. The Puente Subbasin, lying in the southeast portion is hydraulically connected to the Main Basin. However, it is not the legal jurisdiction of the Main San Gabriel Basin Watermaster, and is thus considered a separate entity for management purposes.

The cities of Brea and La Habra obtain imported water from the Main San Gabriel Basin through the California Domestic Water Company (CDWC). The CDWC provides groundwater from the Main San Gabriel Basin to each of its member agencies who own or lease stock in the company. Each CDWC member agency receives a prescribed entitlement to water based upon the number of shares owned and the safe yield of the Main San Gabriel Basin. The member agency entitlement criterion per share varies year by year, based on CDWC's allotted percentage and the Basin Operating Safe Yield of the Main San Gabriel Basin. The Basin Operating Safe Yield is determined annually by the Main San Gabriel Basin Watermaster, the agency which was created by the Main San Gabriel Judgment to manage the Main San Gabriel Basin. Historically, this has been about 1.38 to 1.85 acre–feet per share. The voluntary adjudication of the Main San Gabriel Water Basin provided CDWC 5.60 percent of the basin's safe yield (with purchased water rights totaling 6.11 percent).

Figure 3-7 depicts the Main San Gabriel Basin.

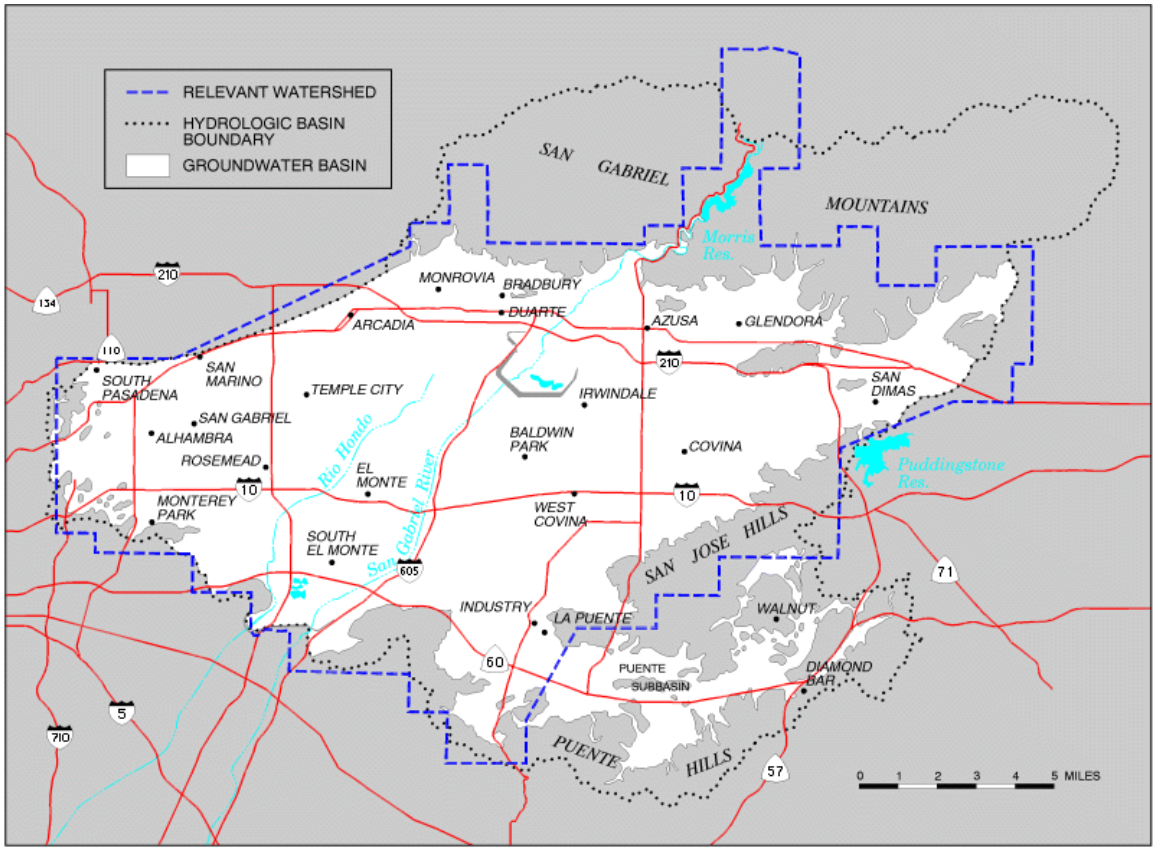

Figure 3-7: Main San Gabriel Basin

3.3.4.1. Main San Gabriel Basin Judgment

Rapid urbanization in the San Gabriel Valley in the 1940s caused an increased demand for groundwater drawn from the Main San Gabriel Basin from the Upper Area users. This resulted in the decrease in available water supply for the Lower Area and downstream users. In 1968, at the request of producers, the Upper San Gabriel Municipal Water District filed a complaint that would adjudicate water rights in the Basin and would bring all Basin producers under control of one governing body. The final result was the entry of the Main San Gabriel Basin Judgment in 1973.

The Judgment defined the water rights of 190 original parties to the legal action. It created a new governing body, the Main San Gabriel Basin Watermaster, and described a program for management of water in the Basin. The Main San Gabriel Basin Watermaster manages and controls the withdrawal and replenishment of water supplies in the Basin. It determines annually the Operating Safe Yield (the amount of groundwater that can safely be extracted) for the succeeding fiscal year, and notifies the pumpers of their shares thereof.[12]

Under the terms of the Main San Gabriel Basin Judgment all rights to the diversion of surface water and production of groundwater within the Main Basin and its Relevant Watershed were adjudicated. The Main Basin Judgment does not restrict the quantity of water which Parties may extract from the Main Basin. Rather, it provides a means for replacing with Supplemental Water all annual extractions in excess of a Party's annual right to extract water. The Main Basin Watermaster annually establishes an Operating Safe Yield for the Main Basin which is then used to allocate to each Party its portion of the Operating Safe Yield which can be produced free of a Replacement Water Assessment. If a producer extracts water in excess of his right under the annual Operating Safe Yield, it must pay an assessment for Replacement Water, which is sufficient to purchase one acre-foot of Supplemental Water to be spread in the basin for each acre-foot of excess production. All water production is metered and is reported quarterly to the Main Basin Watermaster.

In addition to Replacement Water Assessments, the Main Basin Watermaster levies an Administration Assessment to fund the administration of the Main Basin management program under the Main Basin Judgment and a Make-up Obligation Assessment in order to fulfill the requirements for any make-up Obligation under the Long Beach Judgment and to supply fifty percent of the administration costs of the River Watermaster service. The Main Basin Watermaster levies an In-lieu Assessment and may levy special Administration Assessments.

[12] http://www.watermaster.org/projects.html

Water rights under the Main Basin Judgment are transferable by lease or purchase so long as such transfers meet the requirements of the Judgment. There is also provision for Cyclic Storage Agreements by which Parties and non-parties may store imported supplemental water in the Main Basin under such agreements with the Main Basin Watermaster pursuant to uniform rules and conditions and Court approval.

3.3.5. San Mateo Basin

According to information provided by City of San Clemente, MWDOC concludes that no groundwater has been produced or projected to be produced from this basin.

3.3.6. Laguna Canyon Basin

No groundwater management plan is available for the Laguna Canyon Basin. However, the following is written, with assistance from Laguna Beach County Water District, to describe the basin.

The Laguna Creek watershed lies in the San Joaquin Hills of southern Orange County. The drainage area of approximately 5,412 acres includes the Laguna Creek and Niguel Creek basins and is the largest stream basin to drain exclusively from the San Joaquin Hills into the ocean. The drainage basin is roughly 6.5 miles long and averages 1.5 miles wide between its boundaries. The upper or northern half of the basin is relatively wide with low subdued hills, whereas the lower half is narrow, with steep slopes forming Laguna Canyon. Elevations reach 1,000 feet above sea level in parts of the drainage basin.

The average annual rainfall is about 12 inches at Laguna Beach at the mouth of Laguna Creek and, at times, rainfall in the San Joaquin Hills is sufficient to cause sharp, damaging floods along Laguna Creek. In general, however, the drainage basin is dry with only sufficient water discharge to reflect losses from groundwater sources and urban runoff.

Historically, no groundwater has been produced from this basin. However, as augmenting local supply is becoming increasingly critical, Laguna Beach County Water District has proposed a project that will utilize the groundwater from this basin. Table 3-X shows the projected groundwater production from the basin provided by Laguna Beach County Water District.

3.3.7. Impaired Groundwater

The combined yield from the seven projects described below, was 17,864 acre-feet in 2010. This supply is expected to increase to 34,509 acre-feet at ultimate development of these projects. Since these projects are recovering groundwater, a similar amount must either be replenished on an average annual basis to maintain water balance or be salvaged from water that otherwise would flow into the ocean as subsurface outflow. The benefit

of these projects is to provide a firm base supply, restore utilization of groundwater storage impaired by natural causes and/or agricultural drainage, improve conjunctive use storage operations, and provide a drought supply by the additional capacity to tap groundwater in storage.

Tustin Main Street Desalter - The City of Tustin currently operates two Desalter plants. The Main Street Treatment plant began operating in 1989 with a capacity of 2 MGD. The Main Street Desalter reduces nitrate levels from the groundwater produced by Tustin's Main Street wells. The untreated groundwater undergoes either Reverse Osmosis or Ion Exchange treatment.

Tustin 17th Street Desalter - The Tustin 17th Street Desalter began operating in 1996 with a capacity of 3 MGD. The Desalter plant reduces high nitrate and TDS concentrations from the groundwater pumped by Tustin's 17th Street wells. The 17th Street Desalter plant uses two Reverse Osmosis membrane trains to treat the groundwater.

Mesa Colored Water Treatment Facility - Mesa Consolidated Water District currently owns and operates a Colored Water Treatment Facility (CWTF) with a capacity of 5.8 MGD that removes color from the water using ozone treatment and biological filtration.

IRWD Deep Aquifer Treatment System – Irvine Ranch Water District's (IRWD) Deep Aquifer Treatment System (DATS) purifies drinking water from the lower aquifer of the Orange County Groundwater Basin. The water in this aquifer is very high quality, but has a brownish tint imparted from the remains of ancient vegetation. The DATS facility went on-line in 2002 and can treat up to 7.4 MGD from two wells that pump water from 2000 feet below ground level.

IRWD Irvine Desalter Project - The Irvine Desalter Project was completed in 2006 and purifies water found in the Irvine sub-basin of the larger Orange County groundwater basin. It is a two-part endeavor, with recycled water and drinking water components. The Irvine Desalter Potable Treatment Facility uses two reverse osmosis trains to produce 2.7 MGD by removing salts that are caused by natural geology and past agricultural use.

San Juan Basin Desalter - The Groundwater Recovery Plant (GWRP) came on-line in 2004, also known as the San Juan Basin Desalter, is a 5 MGD plant that is owned and operated by the City of San Juan Capistrano. The GWRP takes groundwater high in iron, manganese, and total dissolved solids using reverse osmosis and makes it suitable for potable water uses.

SCWD Capistrano Beach Desalter - SCWD currently owns and operates a 1 MGD GRF that came on-line in 2007, also known as the Capistrano Beach Desalter. The plant extracts brackish groundwater from an aquifer in the San Juan Basin and goes through iron and manganese removal due to high mineral content.

3.3.8. Recharge Facilities for OCWD Basin

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 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 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 40 MGD.

3.3.9. Metropolitan Groundwater Replenishment Program

In an effort to maximize local resources, Metropolitan has partnered with the cities of Anaheim, Fullerton, and Santa Ana, OCWD, and MWDOC and its member agencies who are groundwater producers in various programs to encourage the development of local resources. While MWDOC does not directly produce groundwater, it supports programs that maximize local resources to enhance reliability. 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 a basin by avoiding pumping. Because of the supply impacts from the recent drought conditions and Bay-Delta operational constraints, deliveries under the Replenishment Program were suspended in May 2007. Metropolitan is currently working with its member agencies on potential long-term revisions to the program.

3.3.10. 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 or Metropolitan CUP). This program allows for the storage of Metropolitan water into a Metropolitan storage account within the Orange County groundwater basin. The existing Metropolitan storage program provides for Metropolitan to store up to 66,000 AF of water in the basin in exchange for Metropolitan's contribution to improvements in basin management facilities. These improvements included 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.

3.3.11. Historical Groundwater Production

Table 3-9 shows MWDOC's service area recent groundwater production by the retail groundwater producers from all the Basins within the MWDOC service area 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 replenishment water because such water was not available to purchase from Metropolitan.[13]

Table 3-9: Amount of Groundwater Pumped in the Past 5 Years (AFY)

Basin Name(s)	Fiscal Year Ending				
	2005	2006	2007	2008	2009
Lower Santa Ana Basin	204,215	209,216	227,819	236,706	211,061
San Juan Basin	4,408	6,870	4,450	3,146	4,550
La Habra Basin	1,285	1,241	1,322	1,530	1,657
Main San Gabriel Basin (CDWC)	12,727	12,440	11,504	10,127	9,698
Total Groundwater	222,633	229,767	245,095	251,510	226,967
% of Total Water Supply	**47%**	**47%**	**46%**	**50%**	**47%**

[13] *2008-2009 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2010

3.3.12. Projections of Groundwater Production

Based on the annual MWDOC survey completed by each Producer in the spring of 2010, 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 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 3-10 shows the amount of groundwater projected to be pumped from all the Basins within MWDOC's service area in the next 25 years.

Table 3-10: Amount of Groundwater Projected to be Pumped (AFY)

Basin Name (s)	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035
Lower Santa Ana Basin	201,075	217,168	219,950	222,369	223,989	225,190
San Juan Basin	3,674	8,254	8,954	8,954	8,954	8,954
La Habra Basin	1,688	2,610	2,610	2,610	2,610	2,610
Main San Gabriel Basin (CDWC)	13,615	15,000	15,000	15,000	15,000	15,000
Total	220,052	243,032	246,514	248,933	250,553	251,754
% of Total Water Supply	**45%**	**46%**	**45%**	**45%**	**44%**	**44%**

3.4. Surface Water

MWDOC does not use surface water for its water supply. However, surface water provides an additional local source to some MWDOC member agencies, including IRWD, Serrano Water District, Trabuco Canyon Water District, and the City of Orange. Surface water supplies in Orange County are captured mostly from Santiago Creek into Santiago Reservoir (a.k.a. Irvine Lake) and some reclaimed from local streams and urban runoff in south Orange County (in the Santa Margarita Water District service area).

There are a few other dams located on the smaller streams throughout the County; however, these are generally only for flood control or local agricultural use. Effort has been made in exploring the opportunity for increasing utilization of water in San Juan Basin in south Orange County through the development of desalters and percolation basins.

Table 3-11 shows the projected surface supply in 5-year increments from 2010 to 2035.

Table 3-11: Projected Surface Water Production in MWDOC's Service Area (AFY)

	Fiscal Year Ending					
	2010	**2015**	**2020**	**2025**	**2030**	**2035**
Surface Water	5,485	6,100	6,100	6,100	6,100	6,100
% of Total Water Supply	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**

3.5. Recycled Water

Orange County is the leader in water recycling in the State of California, in both quantity and innovation. Water supply and wastewater treatment agencies in Orange County have received well-deserved recognition in the field of water reclamation and reuse.

Recycled water is widely accepted as a water supply source throughout MWDOC's service area. In the past, recycled water was mainly used for landscape irrigation. IRWD, a MWDOC member agency, is also at the forefront of using recycled water not only for irrigation, but also for other uses such as toilet flushing and commercial needs. Recycled water in MWDOC's service area is treated to various levels dependent upon the ultimate end use and in accordance with Title 22 regulation.

Recycled water is an important source of local water for the region. Current use of recycled water within MWDOC's service area is approximately 40,000 acre-feet per year and is expected to increase to about 60,000 acre-feet per year by 2035, an increase of 50%. Recycled water programs in the region are more fully described in Section 6.

3.6. Transfer and Exchange

A few MWDOC member agencies have expressed interests in pursuing transfers of water from outside of the region. MWDOC will continue to help its member agencies in developing these 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.

Santa Margarita Water District - SMWD has actively pursued additional water supply reliability through water transfers and successfully completed water transfers in the late 1990's through the Metropolitan system. At present the future of such transfers as a reliable and cost-effective means of providing the basic supply are uncertain, however, transfer with specific purposes, such as supplementing dry year supplies can be effective. SMWD will continue to pursue water transfers as an alternative water supply and is currently working with MWDOC and other agencies to investigate possible transfers. The Supplemental Dry Year Agreements are transfer agreements that are triggered under specific conditions when supplies from Metropolitan are limited. Cucamonga County

Water District and Golden State Water Company (GSWC) will utilize groundwater in lieu of taking delivery of imported water from Metropolitan. SMWD has a transfer agreement with Cucamonga County Water District of 4,250 AFY, both short term and long term. SMWD also has a short term transfer agreement with GSWC of 2,000 AFY.

IRWD Strand Ranch Water Banking Program - IRWD has completed negotiations with Metropolitan and MWDOC and prepared an agreement that will accommodate the recharge, storage and recovery of SWP water at the IRWD Strand Ranch Integrated Banking Project and the delivery by exchange of this water to the IRWD service area. IRWD will be securing and placing into storage water in the Strand Ranch project water that will come from multiple sources. The project involves 50,000 AF of storage capacity located in Kern County. Metropolitan's SWP supply contract with DWR prohibits the import of SWP water into Metropolitan's service area without Metropolitan's consent. IRWD, MWDOC and Metropolitan authorized the execution of an Agreement on the negotiated final terms.

3.7. Supply Reliability

3.7.1. Overview

It is required that every water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. MWDOC's service area depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure its member agencies have adequate supplies. Development of groundwater, groundwater recovery, recycled water systems, desalination opportunities, and collection of urban return flows augment the reliability of the imported water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. The water supplies are projected to meet full-service demands; Metropolitan's 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 3-12 shows the reliability of the wholesaler's supply for single dry year and multiple dry year scenarios.

Table 3-12: Wholesaler Supply Reliability in Meeting Full Service Demands- % of Normal AFY

		Multiple Dry Water Years		
Wholesaler Sources	**Single Dry**	**Year 1**	**Year 2**	**Year 3**
Metropolitan	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. Table 3-13 shows the basis of water year data used to predict drought supply availability.

Table 3-13: 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

3.7.2. Factors Contributing to Reliability

The Act requires a description of the reliability of the water supply and vulnerability to seasonal or climatic shortage. MWDOC relies on import supplies provided by Metropolitan. 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 the quagga mussel. Controlling the spread and impacts of quagga mussels within the Colorado River Aqueduct requires 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, that 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 3-14 shows the factors resulting in inconsistency of supply.

Table 3-14: Factors Resulting in Inconsistency of Supply

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

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

3.7.2.1. 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 improved 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.

Table 3-15 shows the amount in acre-feet per year that water quality would have on supply.

Table 3-15: Water Quality – Current and Projected Water Supply Impacts (AFY)

Water Source	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035
Metropolitan	0	0	0	0	0	0

3.7.3. Normal-Year Reliability Comparison

MWDOC's service area receives imported water from Metropolitan via the regional distribution system. Although pipeline capacity does not guarantee the availability of water, it does provide the ability to convey water when it is available to the member agencies. Imported water supplies discussed in this section can be conveyed to MWDOC's service area by existing water transmission facilities. Table 3-16 shows supply and demand under normal year conditions to be fully reliable. Additional water supplies are projected to be available from Metropolitan, if needed.

Table 3-16: Projected Normal Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Total Demand	**526,487**	**542,767**	**558,210**	**563,690**	**567,970**
Groundwater	243,032	246,514	248,933	250,553	251,754
Surface Water	6,100	6,100	6,100	6,100	6,100
Recycled Water	51,658	55,699	59,324	59,492	59,597
Imported	225,697	234,454	243,853	247,545	250,519
Total Supply	526,487	542,767	558,210	563,690	567,970

3.7.4. Single Dry-Year Reliability Comparison

MWDOC's service area is projected to be 100% reliable for single dry year demands from 2015 through 2035 with a demand increase of 6.6% using FY 2001-02 as the single dry year. Table 3-17 compiles supply and demand projections for a single dry water year. Additional water supplies are projected to be available from Metropolitan, if needed.

Table 3-17: Projected Single-Dry Year Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Total Demand	**561,235**	**578,590**	**595,052**	**600,894**	**605,456**
Groundwater	243,032	246,514	248,933	250,553	251,754
Surface Water	6,100	6,100	6,100	6,100	6,100
Recycled Water	51,658	55,699	59,324	59,492	59,597
Imported	260,445	270,277	280,695	284,749	288,005
Total Supply	561,235	578,590	595,052	600,894	605,456

3.7.5. Multiple Dry-Year Reliability Comparison

MWDOC's service area is projected to be 100% reliable in multiple dry years from 2015 through 2035 with a demand increase of 6.6% in each of the three years using FY 2001-02 as the basis of the multiple dry year projections. Table 3-18 shows supply and demand projections under multiple dry year conditions. Additional water supplies are projected to be available from Metropolitan, if needed.

Table 3-18: Projected Multiple Dry Year Period Supply and Demand (AFY)

		Fiscal Year Ending				
		2015	**2020**	**2025**	**2030**	**2035**
First Year Supply	**Total Demand**	**561,235**	**578,590**	**595,052**	**600,894**	**605,456**
	Groundwater	243,032	246,514	248,933	250,553	251,754
	Surface Water	6,100	6,100	6,100	6,100	6,100
	Recycled Water	51,658	55,699	59,324	59,492	59,597
	Imported	260,445	270,277	280,695	284,749	288,005
	Total Supply	561,235	578,590	595,052	600,894	605,456
Second Year Supply	**Total Demand**	**561,235**	**578,590**	**595,052**	**600,894**	**605,456**
	Groundwater	243,032	246,514	248,933	250,553	251,754
	Surface Water	6,100	6,100	6,100	6,100	6,100
	Recycled Water	51,658	55,699	59,324	59,492	59,597
	Imported	260,445	270,277	280,695	284,749	288,005
	Total Supply	561,235	578,590	595,052	600,894	605,456
Third Year Supply	**Total Demand**	**561,235**	**578,590**	**595,052**	**600,894**	**605,456**
	Groundwater	243,032	246,514	248,933	250,553	251,754
	Surface Water	6,100	6,100	6,100	6,100	6,100
	Recycled Water	51,658	55,699	59,324	59,492	59,597
	Imported	260,445	270,277	280,695	284,749	288,005
	Total Supply	561,235	578,590	595,052	600,894	605,456

4. Demand Management Measures

4.1. Overview

California's water is a valuable and limited natural resource. There is a continuing need to conserve and efficiently utilize existing water supplies. Interest in water use efficiency (conservation or demand management measures) has been heightened by the growing need for water throughout California including water for environmental purposes. The growth in water demand will continue due to increases in population, income, and changes in commercial and industrial activity and environmental uses. Water use efficiency will help stretch existing water supplies to meet these growing needs.

MWDOC demonstrated its commitment to water use efficiency in 1991 by voluntarily signing the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California (CUWCC). The California Urban Water Conservation Council was formed through adoption of this MOU and is considered the "keeper" of the Best Management Practices (BMPs), with the authority to add, change, or remove BMPs. The CUWCC also monitors implementation of the MOU. As a signatory to the MOU, MWDOC has committed to a good-faith-effort to implement all cost-effective BMPs.

An ethic of efficient use of water has been developing over the last 19 years of implementing water use efficiency programs. Retail water agencies throughout Orange County also recognize the need to use existing water supplies efficiently – implementation of BMP-based efficiency programs makes good economic sense and reflects responsible stewardship of the region's water resources. All retail water agencies in Orange County are actively implementing BMP-based programs; however, not all retail water agencies are signatory to the MOU.

As a signatory to the CUWCC MOU regarding urban water use efficiency, MWDOC's commitment to implement BMP-based water use efficiency program continues today. To help facilitate implementation of BMPs throughout Orange County, as a wholesaler MWDOC's efforts focus on the following three areas that both comply with and go beyond the basic BMP No. 10 - Wholesaler Assistance requirements.

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

Local Program Assistance - When requested, MWDOC assists retail agencies to develop and implement local programs within their individual service areas. This assistance

includes collaboration with each retail agency to design a program to fit that agency's local needs, which may include providing staffing, targeting customer classes, acquiring grant funding from a variety of sources, and implementing, marketing, reporting, and evaluating the program. MWDOC provides assistance with a variety of local programs including, but not limited to, Home Water Surveys, Large Landscape, Public Information, School Education, Conservation Pricing, and Water Waste Prohibitions. These local programs have also been structured through Integrated Regional Water Management Planning processes in north, central and south Orange County.

Research and Evaluation **-** An integral component of any water use efficiency program is the research and evaluation of potential and existing programs. Research allows an agency to measure the water savings benefits of a specific program and then compare those benefits to the costs of implementing the program in order to evaluate the economic feasibility of the program when compared to other efficiency projects or existing or potential sources of supply.

Table 4-1 summarizes BMP implementation responsibilities of MWDOC as Orange County's wholesale supplier and responsibilities of MWDOC's retail agencies.

Table 4-1: BMP Implementation Responsibility and Regional Programs in Orange County

BMP #	Efficiency Measure	Applies to:		MWDOC Regional Program
		Retailer	MWDOC as a Wholesaler	
1	Home Water Surveys	√		√
2	Residential Plumbing Fixture Retrofits	75% Saturation goal achieved in 2001		
3	System Water Audits, Leak Detection and Repair	√	(1)	√
4	Metering With Commodity Rates	√	(1)	
5	Large Landscape Conservation Programs	√		√
6	High-Efficiency Washing Machine Rebate Programs	√		√
7	Public Information Programs	√	√	√
8	School Education Programs	√	√	√
9	Commercial, Industrial, and Institutional Programs	√		√
10	Wholesale Agency Assistance Programs		√	√
11	Conservation Pricing	√	√	√
12	Conservation Coordinator	√	√	√
13	Water Waste Prohibition	√		√
14	Residential ULFT Replacement Programs	75% Saturation goal achieved in 2009		

(1) MWDOC does not own or operate a distribution system; water wholesaled by MWDOC is delivered through the Metropolitan distribution system and meters.

4.2. BMP Implementation in MWDOC Service Area

This section describes Water Use Efficiency Programs that MWDOC has been implementing in the past five years. Most of these programs are continuing into the future. In addition to the programs discussed in this section, MWDOC has also identified potential programs for future implementation as follows:

- Turf removal
- Swimming pool removal
- Swimming pool covers
- Comprehensive landscape renovation
- Two gallon per minute showerheads
- Composting toilets
- Pressure regulation for irrigation systems
- Return on investment calculator
- Home pressure regulation

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

MWDOC assists its retail water agencies to implement this BMP by making available the following programs aimed at increasing landscape water use efficiency for residential customers.

Smart Timer Rebate Program - In FY 2004/05, MWDOC launched its program aimed at providing a rebate incentive for the purchase and installation of 'weather based irrigation controller' or as MWDOC calls them 'Smart-Timers'. Under this regional program, residential and small commercial properties are eligible for a rebate when they purchase and install a weather-based irrigation controller which has the potential to save 41 gallons per day per residence and can reduce runoff and pollution by 49 percent. While the commercial rebate MWDOC provides has been adjusted over time, the residential rebate has remained steady at $60 per active valve. Commercial rebates evolved from $630 per irrigated acre in the beginning to $25 per station currently. Because it was a new landscape water management device, MWDOC has included a device installation verification step. Mission Resource Conservation District (MRCD) is involved in the program, providing post installation verification and any necessary Smart-Timer scheduling corrections. They also evaluate the site's irrigation system, measure the irrigated area, measure water pressure, place repair flags, and providing important educational advice on efficiency improvements.

Figure 4-1: Smart Irrigation Controller

The rebate program was initially funded by a grant from the State Water Resources Control Board (SWRCB). Since the initial program start, additional funding partners include the Department of Water Resources, the United State Bureau of Reclamation, the Natural Resources Conservation Service, the Metropolitan Water District of Southern California, and the local retail water agencies of Orange County. Because of the funding developed, MWDOC has been able to provide incentives for the installation of just under 2,400 residential smart timers and over 3,400 commercial smart timers. These timer retrofits are savings more than 2,185 AFY.

Rotating Nozzle Rebate Program – This rebate program is offered to both residential and commercial customers. Through this program, site owners will purchase and install rotary nozzles in existing irrigation systems. The rebate issued to participants by a rebate administration contractor, covers up to the cost of the devices and installation. Following the submittal of a rebate application, water bill, and original purchase receipt, MWDOC will direct a third party installation verification contractor to perform installation verifications on up to 100% of the sites that installed devices. Verifications will be across both residential and commercial properties by MRCD. As a final step in the Program, a qualitative and quantitative evaluation will be conducted on those rotary nozzles installed where there is sufficient time to gather consumption data for a 12-month post-installation

period. There have been a total of 146,855 nozzle installed in the MWDOC service area since the program started in 2007. Water savings is more than 2,500 AFY.

Figure 4-2: Rotating Nozzle

South County SmartScape: Landscape Improvement Incentive Program **-** MWDOC has obtained grant funding from the SWRCB to implement this Program. The purpose of the Program is to retrofit existing high water-using landscapes with 'fixes' that will reduce the site's outdoor water consumption in single-family homes and small commercial properties. Each site, within each of the Program's eligible areas, will receive a menu-option of retrofit improvements, labeled as "A," "AB," or "ABC," indicating which specific set of improvements may be implemented.

The three different retrofit improvement designations are summarized in Table 4-2:

Table 4-2: Retrofit Improvement Designations

Retrofit Type	Improvement Description
A	Replacement of an existing conventional "dumb" irrigation timer with a weather-based "smart timer" irrigation controller. REQUIRED STEP (limit of 1 per site)
B	Replacement with a weather-based controller ***and*** implementation of specific irrigation distribution system improvements (may include both front and back yards).
C	Replacement with a weather-based controller, ***and*** implementation of irrigation distribution system improvements, ***and*** replacement of high water using plants, specifically turf grass with a choice of certain water-efficient landscape improvements from a Program Plant List of California Friendly® and native species (plant replacement retrofits in front yards only).

All sites that choose to participate in this Program must receive Retrofit Type A. Depending on the outcome of a pre-installation landscape audit performed by MRCD, sites may become eligible for Retrofit Types A and B, and/or Types A, B, and C. Participating sites may not receive Type B or C without having a smart timer (Type A) installed.

The south Orange County retrofit area is defined as the combined service territories of the following retail water agencies (Agencies) in the South Orange County Integrated Regional Watershed Management Plan (SOCIRWMP) Area:

- El Toro Water District
- Laguna Beach County Water District
- Moulton Niguel Water District
- City of San Clemente
- City of San Juan Capistrano
- Santa Margarita Water District
- South Coast Water District
- Trabuco Canyon Water District

A total of 29 homes have participated in this program with an additional 198 homes planned for participation.

Turf Removal Program – This program is a partnership between MWDOC, Metropolitan, and local retail water agency. Through this program, residential and small commercial customers of participating retail water agencies are eligible to receive $1 per square foot of turf removed for qualifying projects. The goals of this

Turf Removal Program

program are to increase water use efficiency within Orange County, reduce runoff leaving the properties, and evaluate the effectiveness of turf removal as a water-saving practice.

The customer completes the program application and returns it to MWDOC for review and to determine whether the site will be approved or denied. Once the application is approved, the customer will be contacted within two weeks to schedule the mandatory pre-inspection. Once the customer's pre-inspection is complete, the results will be forwarded to the program staff. If the site qualifies, a follow-up letter and authorization to proceed will be mailed/emailed out within a few days. Upon receipt of this authorization to proceed, the customer may begin the turf removal project. The customer will have 60 days to complete the work. Once all work is complete, the customer contacts the Program Administrator to indicate that the work is completed and to schedule the mandatory post-inspection. After the final, mandatory site visit and verification of the amount of turf removed, the rebate check will be issued and mailed. More than 132,000 sq. ft. of turf grass has been removed through this initial effort saving more than 19 AFY.

California Friendly Landscape Training (Residential) **-** The California Friendly Landscape Training provides education to residential homeowners, property managers, and professional landscape contractors on a variety of landscape water efficiency practices they can employ. These classes are hosted by MWDOC and/or the retail agencies to encourage participation across the county. The residential training program consists of either a half-day Mini Class or individual, topic-specific, four-hour classes. The four topics presented include: 1) Basic Landscape Design, 2) California Friendly Plants, 3) Efficiency Irrigation Systems, and 4) Soils, Watering, Fertilizing.

These classes are now available on-line allowing Orange County residents to learn while sitting in the comfort of their own home.

Table 4-3: California Friendly Landscape Training Program Residential Participation Summary

	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	Total
Number of Participants	296	233	207	304	1040

4.2.2. DMM 2: Residential Plumbing Retrofit

Using the 2001 *Orange County Saturation Study* as a benchmark, saturation of low-flow showerheads was measured at 67% and 60% in single- and multi-family housing stock

respectively. Today, low-flow showerhead saturation is estimated to be more than 90% in single- and multi-family homes. As a result, water agencies throughout Orange County have achieved the 75% saturation requirement for this BMP. No further low-flow showerhead distribution or installation activity has occurred.

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

With the sale of the Allen-McColloch Pipeline to Metropolitan in 1995, MWDOC no longer owns or operates a distribution system. Water purchased and sold by MWDOC is distributed through Metropolitan's system to the MWDOC retail agencies. As a result, implementation of BMP No. 3 is not applicable to MWDOC.

However, in an effort to assist its retail agencies, MWDOC publishes annually the *Orange County Water Agencies Water Rates, Water System Operations, and Financial Information* survey. This survey facilitates a pre-screening survey that estimates the volume and percent of unaccounted-for-water for each retail water agency in the county. In 2009, the percent of unaccounted-for-water for retail water agencies ranged from a low of 1.5% to a high of 7.5%, with an average of 3.8%

In addition to the survey, MWDOC was awarded a grant to implement a study titled "Water Loss Management Program Assessment: Potable Water System Audits." This study used the American Water Works Association and International Water Association Water Audit Methodology. The following retail water agencies participated in the study: City of Brea, City of Huntington Beach, Laguna Beach County Water District, Moulton Niguel Water District and City of Tustin.

The purpose of the study was to:

- Educate the agencies on the most current water loss control methods and technologies
- Perform system water audit for each agency to determine current water losses and areas for improvement
- Review each agency's leakage management program and recommend improvements
- Assist the agencies in achieving the California Urban Water Conservation Council Best Management Practice 1.2 compliance

Non-Revenue water ranged from 3 to 10 percent of volume of water supplied, which is very good and will within the range of efficient water utilities concerned about conservation and water loss management practices.

4.2.4. DMM 4: Metering with Commodity Rates

Metering with commodity rates by wholesale and retail agencies has been an industry standard throughout Orange County for many years. All customers are metered and billed based on commodity rates either monthly or bi-monthly.

4.2.5. DMM 5: Large Landscape Conservation Programs and Incentives

MWDOC offers several landscape water use efficiency program aimed at both residential and commercial customers as described under DMM 1. MWDOC also offers programs in Orange County to specifically assist retail agencies and their large landscape customers to use water efficiently as follows:

Water Smart Landscape Program - MWDOC has created a unique and innovative partnership linking landscape water management, green material management, and the non-point source pollution prevention goals of separate agencies into one program -- the Water Smart Landscape Program. This partnership includes MWDOC as lead agency, Metropolitan, Orange County Integrated Waste Management Department, U.S. Bureau of Reclamation, and all retail water agencies in Orange County. The Water Smart Landscape Program is designed to do the following:

- Assist water agencies in meeting the landscape irrigation management requirements of the CUWCC's BMP #5;
- Assist cities and the County in meeting Integrated Waste Management Act goals (AB 979) to reduce the volume of waste and to recycle organic materials for the benefit of the landscape; and
- Assist cities and the County in identifying landscape run-off sites and providing site-by-site remedies.

Homeowner associations (HOAs) managing dedicated landscape irrigation meters are the primary target audience for participation in this program; however, city and school district landscapes also participate. There are more than 17,000 dedicated irrigation meters served by retail water agencies in Orange County, of which nearly 14,000 use potable water, while the remaining 3,000 use reclaimed water to irrigate urban landscapes. Table 4-4 identifies the total number of activated meters and associated AFY water savings in the MWDOC service area. Water savings is based on the results of the "Evaluation of the Landscape Performance Certification Program" which include a 765 gallon per day savings rate per dedicated irrigation meter. Participation in the program has grown from 629 meters in 2001to more than 10,000 meters in 2010. These meters are saving more than 8,700 AFY.

Usually, three different parties are involved in managing landscapes associated with these meters: 1) the property owner (HOA board of directors), 2) the property manager, and 3) the landscape contractor. This program creates a "Loop of Accountability" by providing regular (monthly or bi-monthly) irrigation performance reports to all three parties via the program website, www.waterbudgets.com. Participants are sent an e-mail informing them that their Irrigation Performance Report has been updated and encourages them to log-on to the program website to view their latest reports.

Table 4-4: Landscape Performance Certification Program in MWDOC's Service Area

	Activated Meters	AFY of Water Savings
2001	629	539
2002	900	771
2003	1,489	1,277
2004	1,278	1,095
2005	1,925	1,650
2006	1,785	1,530
2007	1,969	1,687
2008	2,733	2,342
2009	4,395	3,766
2010	10,173	8,717

California Friendly Landscape Training (Professional) **-** The California Friendly Landscape Training provides education to residential homeowners, professional landscape contractors, property managers and HOA Board Members on a variety of landscape water efficiency practices they can employ. These classes are hosted by MWDOC and/or the retail agencies to encourage participation across the county. The Professional Training Program course consists of four consecutive classes in landscape water management, each building upon principles presented in the preceding class. Each participant receives a bound handbook containing educational materials for each class. These classes are offered throughout the year and taught in both English and Spanish languages. The following is a synopsis of each class in the course:

- **Irrigation Principles:** Topics include irrigation system types, sprinkler layouts, sprinkler components, sprinkler selection and spacing, and common sprinkler problems.
- **Irrigation System Troubleshooting:** This session focuses on an analytical approach to solving irrigation system failures. Three potential problem areas are examined: (1) mechanical problems, 2) hydraulic

problems, and 3) electrical problems. Workshop participants receive practical training in the use of electrical troubleshooting equipment.

- **Controller Programming:** A hands-on workshop where participants learn basic controller features by programming sample cases. Participants then move into advanced controller features as they input more complex schedules, taking into consideration temperature/seasonal changes, rain, landscape activities, and demands that limit irrigation times. Irrigation controllers are provided for in-class use.
- **Irrigation Scheduling:** This session focuses on two critical questions: 1) When to irrigate? 2) How much water to apply? A variety of field techniques and methods are presented, along with the technical aspects to be considered when scheduling irrigation run times. Each class participant is furnished with the tools needed to perform an irrigation scheduling assignment.

Upon completion of the course, participants receive a certificate listing all classes completed. Participants are eligible for 21 Continuing Education Units as certified by the Irrigation Association. Table 4-5 summarizes commercial participation in this program.

Table 4-5: California Friendly Landscape Training Program Commercial Participation Summary

	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	Total
Number of English Participants	63	31	53	38	**185**
Number of Spanish Participants	63	49	11	54	**177**

These classes are now available on-line to all residents in Orange County. These classes allow significantly more flexibility on how residents view the classes. Unfortunately, we do not have the ability to track the number of classes taken on-line at this time.

Landscape Ordinance - The Water Conservation in Landscaping Act (Assembly Bill 1881, Laird) was passed in 2006 to increase outdoor water use efficiency. This legislation required cities and counties to adopt a Water Efficient Landscape Ordinance by January 1, 2010. MWDOC worked in partnership with the Orange County Division of the League of Cities, Orange County cities, retail water providers, building industry, landscape architects, and irrigation consultants to develop an Orange County Model Water Efficient Landscape Ordinance specific to the needs of Orange County. The foundation of the Orange County Model Ordinance was based on the State Model Ordinance.

This collaborative, regional approach has ensured that local ordinances are consistent from city to city, and has limited the cost and complexity of implementing the mandate. Based on the Orange County model ordinance, cities and unincorporated areas have adopted local ordinances that set guidelines for designing and approving landscape projects. The new ordinance imposes a lower Maximum Applied Water Allowance (MAWA) that new and rehabilitated landscapes must be designed to meet.

Through this effort, cities throughout Orange County have adopted and are implementing landscape ordinances that are consistent with the requirements of the updated Water Conservation in the Landscape Act.

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

MWDOC participates in the SoCal Water Smart residential rebate program offered by Metropolitan. This program offers financial incentives to single-family and multifamily residential customers through the form of a rebate.

Orange County residents are eligible to receive an $85 rebate when they purchase 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. As of FY 2010-11, more than 68,379 HECWs have been installed in single and multi-family homes through this program. These retrofits are saving 1,900 acre feet of potable water each year. Table 4-6 summarizes the number of high efficiency washers installed in the last five years.

Figure 4-3: High Efficiency Clothes Washer

Table 4-6: High Efficiency Washing Machine Program Summary

Fiscal Year	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10
Washers Replaced	7,632	8,765	9,403	9,474	4,347

4.2.7. DMM 7: Public Information Programs

MWDOC currently offers a wide range of public information programs in Orange County. Each program targets different water customer segments. For example, the O.C. Water Hero Program aims to encourage school children to use water wisely; MWDOC's electronic newsletter "ecurrents" is designed to keep residents and businesses, stakeholder groups, opinion leaders, and others apprised of MWDOC news and programs. MWDOC's current public information programs are described below.

Water Facility Inspection Trip Program **-** The inspection trip program is sponsored by MWDOC and Metropolitan. Each year, Orange County elected officials, residents, business owners, and community leaders are invited to attend educational inspection trips to tour key water facilities throughout the state of California. The goal is to educate members of our community about planning, procurement and management of southern California's water supply and the issues surrounding delivery and management of this vital resource. The inspection trips are specifically designed to address various water issues affecting the state, including water supply, delivery, treatment, sustainability, the environment, and water policy. All trips are hosted by a MWDOC/Metropolitan Director.

Figure 4-4: Diamond Valley Lake, Hemet, California

O.C. Water Hero Program - The O.C. Water Hero Program encourages Orange County's youngest water users to use water wisely and protect our water resources. The goal of this program is to engage children in water use efficiency activities while facilitating discussion with friends and family members about how to save water. Any Orange County child can become a Water Hero by pledging to save 20 gallons of water per day. In exchange for their pledge, they receive a free Water Hero kit, which includes a variety of fun, water-saving items like a 5-minute shower timer and "fix-it" ticket pad for busting water wasters. Water Heroes can then take their water-saving skills to the next level by becoming Water Superheroes. To become a Superhero, a student must get their parents to also pledge to save 20 gallons of water per day. All Superheroes receive a second free kit filled with items like a Superhero t-shirt and keychain. To date, more than 13,000 children in Orange County have become Water Heroes and more than 4,000 have become Superheroes.

Figure 4-5: O.C. Water Hero Program Mascot, Wiley Water Hero

***eCurrents* -** *eCurrents* is the monthly electronic newsletter of the MWDOC. It is designed to keep MWDOC's 28 member agencies, residents and businesses, stakeholder groups, opinion leaders, and others apprised of MWDOC news, programs, events, and activities. The publication also serves to keep readers informed about regional, state, and federal issues affecting water supply, water management, water quality, and water policy and regulation.

Water Advisory Committee of Orange County (WACO) **-** WACO was formed in 1983 to facilitate the introduction, discussion, and debate of current and emerging water issues among Orange County policymakers and water professionals. It has also advocated the Orange County water community's position on issues affecting the provision and management of our water supplies with lawmakers, regulatory agencies, regional and state water organizations, and others.

The committee's membership has evolved during the past quarter century to include elected officials and management staff from Orange County cities and water districts, engineers, attorneys, consultants, and other industry professionals. The meetings are also attended from time-to-time by Orange County residents and community group members who share a common interest in water issues.

Monthly meetings are open to the public and are typically held on the first Friday of each month at 7:30 a.m. The meetings take place at the Fountain Valley headquarters of MWDOC and OCWD. The meetings are designed to provide attendees with an opportunity for professional networking and to receive informative presentations from water industry professionals, academics, economists, engineers, political officials, and industry experts about key water issues affecting Orange County.

4.2.8. DMM 8: School Education Programs

School water education has been part of MWDOC's activities for more than 30 years. It is MWDOC's goal to educate children about local water issues and help them understand the value of water and how they can protect our water resources and the environment. MWDOC's on-going school education programs are described below.

***Water Education School Program* -** One of the most successful and well-recognized water education curriculums in southern California is MWDOC's Water Education School Program. For more than 30 years, School Program mascot "Ricki the Rambunctious Raindrop" has been educating students in grades K-5 about the water

cycle, the importance and value of water, and the personal responsibility we all have as environmental stewards.

Figure 4-6: Water Education School Program Mascot, Ricki the Rambunctious Raindrop

The School Program features assembly-style presentations that are grade-specific and performed on-site at the schools. The program curriculum is aligned with the science content standards established by the State of California. Since its inception in 1973, nearly three million Orange County students have been educated through the School Program.

In 2004, MWDOC formed an exciting partnership with Discovery Science Center that has allowed both organizations to reach more Orange County students each year and provide them with even greater educational experiences in the areas of water and science. Discovery Science Center currently serves as the School Program administrator, handling all of the program marketing, bookings, and program implementation. During the 2010-11 school year, more than 70,000 students will be educated through the program.

Water Education Poster & Slogan Contest - Each year, MWDOC holds a Water Education Poster and Slogan Contest to increase water awareness. To participate, children in grades K-6 develop posters and slogans that reflect a water awareness message. The goal is to get children thinking about how they can use water wisely and to facilitate discussion about water between children and their friend, parents, and teachers. Each year, more than 1,500 poster and slogan entries are received through the contest.

During a special judging event, approximately 16 posters and 10 slogans are selected as the winners. All of our winners – and their parents, teachers, and principals – are invited to attend a special awards ceremony with Ricki the Raindrop at Discovery Science Center. At the awards ceremony, the winners are presented with their framed artwork as well as a custom t-shirt featuring their poster or slogan, a trophy, a certificate, and other fun water-saving prizes.

Children's Water Education Festival - The largest water education festival of its kind is the annual Children's Water Education Festival (Festival). The Festival is presented by OCWD, the National Water Research Institute, Disneyland Resort, and MWDOC. Each year, more than 5,000 students participate in the Festival over the course of this two-day event. The Festival is currently held at the Richard Nixon Library and Birthplace in Yorba Linda, California.

The Festival presents a unique opportunity to educate students in grades four through six about local water issues and help them understand how they can protect our water resources and the environment. Students attend the Festival with their teacher and classmates, visiting a variety of booths focused on different water-related topics throughout the day. Participating organizations (presenters) engage the students through interactive educational presentations that are aligned with the science content standards established by the State of California. Since its inception, more than 80,000 children from schools throughout Orange County have experienced the Festival and all it has to offer.

Figure 4-7: 2010 Water Education Poster & Slogan Contest, Winning Poster

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

MWDOC offers financial incentives under the Save Water Save A Buck Rebate Program which offers rebates for various water efficient devices to Commercial, Industrial and Institutional (CII) customers. MWDOC also administers the Water Smart Hotel Program and Industrial Process Water Use Reduction Program as described below.

Save Water Save a Buck – This program began in 2002 and offers rebates to assist CII 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 4-7 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 4-7: 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, CII customers within MWDOC service area have installed a total of 36,568 water-saving fixtures representing a water savings of more than 1,990 AFY.

Water Smart Hotel Program – In 2008 and 2009, MWDOC received grants from DWR 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 more than 350 AFY.

Water Smart Industrial Program - The IPWURP provides engineering surveys to identify water saving process improvements in the Orange County industrial customer base. Additionally it provides Engineering Assistance and Financial incentives to help implement the recommendations from those surveys. This is done with funding from DWR, USBR, Metropolitan and MWDOC. To date the program has identified a water savings potential of 450 million gallons per year. The program water savings goal is 80 million gallons per year or 245 acre feet per year.

Focused on industrial process water only, the program targets, but is not limited to, the highest water use customers in the following sectors Textile, Metals, Electronics, Laundries, Food Processing, and Pharmaceuticals. The program offers two levels of surveys:

- A preliminary Focused Survey to ascertain the magnitude of water savings possible.
- A Comprehensive Survey which is a more detailed study of the customer's process and includes customized retrofit recommendations, estimated costs, savings in water and sewer discharge, and a simple return on investment.

Incentives are calculated via a "Pay for Performance" model based on water savings (monitored for 1 year). Qualified participants will receive the lesser of:

- $4.37 per 1,000 gallons of water saved, or
- Fifty (50) percent of the total amount of retrofit cost

The incentives are paid in two payments:

- The first payment after verification of equipment installation and startup

- The second payment after a one-year monitoring period to measure water savings

Types of projects have included treating and reusing water in manufacturing process or for cooling towers and new wash equipment with upgraded washers, nozzles and automated control systems. Two industrial customers have implemented water saving recommendations and are saving more than 170 AFY.

4.2.10. DMM 10: Wholesale Agency Programs

MWDOC provides financial incentives, conservation-related technical support, and regional implementation of a variety of BMP-based programs. In addition, MWDOC conducts research projects to evaluate implementation of both existing programs and new pilot programs. On behalf of its member agencies, MWDOC also organizes and provides the following:

- Monthly coordinator meetings
- Marketing materials
- Public speaking
- Community events
- American Water Works Association/International Water Association (AWWA/IWA) Audit Study

4.2.11. DMM 11: Conservation Pricing

MWDOC publishes annually the *Orange County Water Agencies Water Rates, Water System Operations, and Financial Information* survey. This survey documents the rates charged by each retail water agency, as well as the type of rate structure, i.e., a flat rate, inclined block, or seasonal rate structure. Table 4-8 provides a brief summary of the types of rates used by retail water agencies in Orange County and shows a slow progression away from uniform rates.

Table 4-8: Summary of Rate Structure Types Used in Orange County

Types of Rate Structure	Number of Agencies Utilizing Different Rate Structure Types				
	1990	1995	2000	2005	2010
Declining Block	0	**0**	**0**	0	0
Uniform or Flat	22	23	19	16	8
Inclined Block	13	9	10	12	14
Seasonal Inclined Block	1	2	3	3	6
Budget Based Tiered Rate	0	1	1	1	2

MWDOC Budget Based Tiered Rate Study Grant with DWR - The purpose of the study is to concurrently assist 13 retail water agencies in examining the feasibility, approach and implementation of water budget rate structures or various aspects of water budget rate structures. The goal is to help urban communities cope with water shortages and drought conditions while at the same time provide the benefits of *achieving* water savings every year. Equitable allocation of indoor and outdoor water needs by account allows agencies to scientifically determine which accounts are over their allotment. Based on this information, a water agency can focus their resources on saving water from these accounts based on price and/or other complementary device based conservation programs. The flexibility of water budgets in this manner makes them the most equitable mechanism for water conservation.

Water budgets can alleviate the adverse effects of drought conditions with two primary mechanisms. First, it can reduce water *consumption* by sending a price signal specifically to those customers who are the least efficient with their water use. Further, water budgets address equity or fairness, by allocating water based on demographic and geographic factors such as household size, landscaped area, and plant type and weather conditions. Documented water savings on the order of 20% and higher have been achieved via implementation of these types of rate structures.

Some of the challenges agencies face when evaluating and implementing a water budget are determining staff and billing system requirements, designing defensible water budget allocations based on scientific data, gathering public support and setting realistic conservation goals. These challenges are often compounded by lack of technical expertise and policy inexperience. This project proposes to assist the agencies in overcoming these types of obstacles.

Group workshops are held with all participating agencies and then each agency will conduct additional detailed work related to the policy and technical issues associated with water budgets in their service area. As the efforts progress, meetings within each agency are held with the appropriate policy-makers and senior staff to refine the implementation aspects. For some agencies, a billing system compatibility analysis will be conducted to determine if the existing billing system can handle budget based tiered rates and/or if changes or modifications are needed. Lastly, by channeling the energy of 13 neighboring communities to examine water budgets, it creates the political environment required for them to be adopted and increase the likelihood of success.

The Grant Study includes three specific components, although not every agency participates in every component. The components are:

1) Water Rate Development
2) Use of Parcel Data for Water Budget Development
3) Billing and Accounting System Needs (hardware and software)

For the second component, MWDOC utilized the services of Digital Map Products to develop estimates of irrigable area for all parcels within the participating agencies using available infrared imagery from the State and overlaying it on the parcel maps in Orange County. This information is critical to the development of the irrigation water budget portion for each customer and provides the retail agencies with information that is not currently available. This information is then plugged into the modeling software to develop and test options for the rate structure tier width and make up. Even if the irrigation budgets are not incorporated directly into the billing systems, they can be integrated into the billing software to provide a comparison of actual water use compared to budgeted water use. This information is critical to identification of non-efficient water users for implementation of customer interventions.

The Grant Study also outlines the financial and political aspects of water budgets and positions the retail agencies to implement water budgets for equitable allocation of water under a continuing rationing scenario.

It is expected that at least 4 of the retail agencies will move all the way into the implementation phase with the other agencies moving closer to a state of readiness to implement various facets of budget based tiered rates or the ability to monitor and report on the efficiency of water use by existing customers via development of water budgets for their customers.

Other benefits of implementation of budget based tiered rates include:

- Provides a direct feedback mechanism at every billing cycle to measure how residents are doing compared to a scientifically based budget estimate.
- Based on the feedback mechanism, it allows agency customer service representatives to easily target high water users for education and intervention measures.
- Provides equity in that customers are measured against a scientific norm as compared to requests to “cutback, reduce or conserve additional water”. Water conserving customers are rewarded by remaining within the budgets while non-water conscious customers are “penalized” through higher pricing tiers to let them know they are wasting a precious resource.
- Provides a tool and mechanism that can be used to manage water resources both during “drought” situations and on an on-going basis to result in permanent water using changes among the customers of the water agency.
- Provides a mechanism to flag problems with irrigation system or water system components that may need repair or adjustments that might otherwise go unseen.
- Provides environmental benefits by reducing water consumption and irrigation application to an appropriate level thus reducing irrigation water runoff and the transport of sediments and contaminants into waterways, streams and the ocean.

- Certain water budget rate structures are known to improve revenue instability, a financial concern when designing conservation rate structures.
- Produces a reduction in peak demand, which provides financial saving in future capital improvement cost
- Can provide a revenue source to fund implementation of water use efficiency programs.

The participating agencies are listed below in Table 4-9:

Table 4-9: List of Participating Agencies

MWDOC Agencies Participating in Various Phases of Budget Based Tiered Water Rates Grant			
Participant	Phase 1 Rate Structure	Phase 2 Digital Mapping	Phase 3 IT Hardware Software
1. Garden Grove		YES	
2. Buena Park	YES		
3. Yorba Linda WD	YES		YES
4. South Coast WD	YES	YES	
5. El Toro WD	YES	YES	YES
6. Huntington Beach	YES		YES
7. Moulton Niguel	YES	YES	YES
8. SMWD		YES	
9. Newport Beach	YES		YES
10.San Juan Capistrano		YES	
11.East Orange County WD	YES	YES	YES
12.Mesa Consolidated WD		YES	
13.Fountain Valley	YES		
Total participants in each phase	9	8	6

4.2.12. DMM 12: Water Conservation Coordinator

All retail water agencies in Orange County have designated water conservation coordinators, regardless of signatory status to the MOU. MWDOC currently employs a staff of nearly six to develop, implement and evaluate a comprehensive water use efficiency program on behalf of its retail agencies. All retail water agencies in Orange County are actively implementing BMPs in their service areas.

4.2.13. DMM 13: Water Waste Prohibition

Due to our water supply situation, in 2009 Metropolitan and MWDOC partnered to develop a water waste prohibition template for adoption by retail water agencies. MWDOC and Metropolitan worked together to develop a Model Water Conservation Ordinance as a tool to assist local agencies to adopt and enforce local water conservation ordinances in hopes of increasing water use efficiency. The model ordinance form and structure is consistent with many existing water conservation ordinances and contains provisions contained in the CUWCC BMP 13 and DWR's Urban Drought Guidebook. In essence, the Model Ordinance provides a menu of options for agencies to better control local water use and address current water supply conditions within their jurisdictions.

The Model Water Conservation Ordinance includes permanent water-waste prohibitions, existing water restrictions to be implemented over three water-supply shortage conditions, penalties and violations, and other general provisions for consideration. The permanent water-waste restrictions include primarily behavioral measures such as limiting irrigation times, prohibiting the washing of paved surfaces, and controlling excessive runoff.

The Model's escalating water restrictions levels mirror Metropolitan's Water Supply Alert resolution and progress from permanent baseline restrictions to mandatory reductions during a water supply allocation. The Model Ordinance purposely does not contain specific triggers for determining water supply levels, such as a certain percentage of required water reduction or certain amount of reduction in supply. The number of escalating water restrictions levels and the actual triggers for determining particular water supply conditions is left to the discretion of the adopting entity. The Model Ordinance contains penalty provisions that allow for criminal, civil, and administrative enforcement, and include such penalties as monetary fines, water flow-restrictions. The Model Ordinance also contains other provisions for adopting entities' consideration, including requirements to utilize recycled water, development of water conservation plans water-waste hotlines, limit on new building permits, and implementation of water allocations.

Through this effort, the vast majority of MWDOC's retail water agencies used the Model Ordinance to adopt new Water Conservation Ordinances.

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

Over the past 19 years, MWDOC has continuously implemented a regional ULFT 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 26,601 devices, with an overall program to date savings of approximately 3,416. Saturation of ULFTs (and HETs) is currently estimated to be more than 90% in single-family homes and 80% in multi-family homes.

Figure 4-8: Ultra Low Flush Toilet

5. Water Shortage Contingency Plan

5.1. Overview

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 and MWDOC have in place to respond to water supply shortages, including a catastrophic interruption and up to a 50 percent reduction in water supply.

5.2. Shortage Actions

MWDOC is a wholesale water agency, and while it has broad powers to allocate or prohibit uses of water upon the declaration of a Water Shortage Emergency by its Board, MWDOC has not acted to directly mandate how water is used by its member (retail) water agencies in the past. However, MWDOC is responsible for how imported water will be allocated to each member agency, which will then determine specific stages of shortage actions in accordance with local ordinances. Thus, during past shortages, MWDOC has adopted Board Resolutions urging its retail agencies to develop and implement water shortage plans, calling upon each agency to adopt and enforce regulations prohibiting the waste of water, and implementing an allocation plan for available imported water consistent with reductions, incentives, and penalties imposed on MWDOC by Metropolitan.

5.2.1. Metropolitan's Water Supply Allocation Plan

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 can implement the Water Surplus and Drought Management Plan (WSDM) and the Water Supply Allocation Plan (WSAP).

One of the first actions that Metropolitan implements in the event of a water shortage is the suspension and/or reduction of its Replenishment and Interim Agricultural Water Program (IAWP), which are supplies sold at a discount in return for the buyers agreeing to be among the first to be cutback in the event of a shortage. IAWP and Replenishment deliveries were either suspended or reduced in 2007. The IAWP wil be phased out effective January 1, 2013 and the terms and conditions of the Replenishment Program are being reviewed at this time.

In preparation for the possibility of being unable to the meet all demands 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 WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 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 the following: 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 of water supply and delivery data for the different categories of demand and supply 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 imported 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.

5.2.2. MWDOC's Water Supply Allocation Plan

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, to 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 MWDOC member agencies. The MWDOC WSAP model follows five 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 retail agency. After a regional shortage level is established, MWDOC will calculate the initial allocation as a percentage of adjusted Base Period Imported water needs within the model for each 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.

5.3. Three-Year Minimum Water Supply

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

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

As 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 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 hydrology 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 are no specific criteria for which water management actions to take 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 among 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 uses the 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 hydrologies 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 5-1: Metropolitan Three-Year Analysis

Study Year	Actual Year	SWP Allocation (%)	SWP (AF)	CRA (AF)	Total (AF)	Demand (AF)	Surplus/ Shortage (AF)	Storage at Year End (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 the WSAP for its member agencies. Given the assumed absence of an allocation, 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[14].

MWDOC is expected to meet all retail consumption during a three-year dry period of 2011-2013 based on the three driest years on record. Metropolitan is expected to be able to supply all of MWDOC's imported water during the same period. Additionally, through a variety of groundwater reliability programs developed and operated by OCWD, local supplies are projected to be maintained at or above current levels. MWDOC is expected to fully meet retail demands for the next three years assuming Metropolitan is not in a shortage allocation and a BPP of 62% for local supplies for OCWD agencies.

Table 5-2: Three-Year Estimated Minimum Water Supply (AFY)

Source	2010/2011	2011/2012	2012/2013
Local Water	227,487	227,487	227,487
Imported Water	261,577	261,577	261,577
Total	*489,064*	*489,064*	*489,064*

5.4. Catastrophic Supply Interruption

From a regional perspective, Orange County and all of Southern California is heavily dependent upon imported water supplies from Metropolitan. Imported water is conveyed through the SWP and CRA, which travel hundreds of miles to reach urban Southern California, and specifically to Orange County. Additionally, this water is distributed to customers through an intricate network of pipes and water mains that are susceptible to

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

damage from earthquakes and other disasters. Regional storage for Southern California and Orange County is provided by Metropolitan to mitigate an outage of either the SWP or CRA. Diamond Valley Lake, Metropolitan's newest reservoir located in Hemet, Riverside County is an 800,000 acre-foot reservoir, of which about 400,000 acre-feet of water is reserved for catastrophic emergencies. In fact, protection from catastrophic events such as earthquakes was a major reason for the construction of Diamond Valley Lake. Additionally, the Orange County Water purveyors have taken significant efforts to respond to emergencies through the formation of the Water Emergency Response Organization of Orange County (WEROC).

5.4.1. Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSAP and WSDM 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 2010 RUWMP.

5.4.2. Water Emergency Response Organization of Orange County (WEROC)

In 1983, the Orange County water community developed a Water Supply Emergency Preparedness Plan identified a need to develop a plan on how agencies would to 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 with 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 disaster response for the water community.

Each local water and wastewater utility is responsible for developing its own disaster preparedness and response plan to meet emergencies within their service area. WEROC performs coordination of information and mutual-aid requests among water and wastewater agencies, and with Metropolitan. WEROC provides assistance to utilities developing their plans and facilitates working groups when new best practices need to be examined or regulations come into effect. Additionally, WEROC supports the utilities efforts with training, exercise coordination, and representation to other emergency response agencies.

In the event of a major emergency or regional disaster WEROC would perform the following functions:

- Collect damage assessment reports from Orange County water and wastewater utilities;
- Assess the overall condition of the Orange County water supply system; including treatment, storage and distribution; and assess the overall condition of the Orange County wastewater system;
- Identify the information and resource needs of the impacted water and wastewater utilities;
- Quantify available resources, ;
- Determine optimal use of those resources and coordinate the exchange of those resources as mutual aid;
- Determine water supply needs, Establish repair priorities;
- Recommend water emergency allocations and coordinate water distribution as needed;
- Liaison with water utilities, Metropolitan, the Orange and County Operational Area and the California Emergency Management Agency; and
- Document remedial actions taken during the disaster operation and assist impacted agencies with the Federal Public Assistance process.

Two dedicated WEROC Emergency Operations Centers (EOCs) are located within Orange County. Both sites are maintained in a state of readiness in the event that they will be activated following a major emergency disaster. WEROC EOCs are staffed by trained volunteer personnel from the water community. WEROC's Emergency Radio Communication System consists of two mountain-top radio repeaters and several control stations. WEROC is a flexible and dynamic program that continues to make improvements to its emergency preparedness plan, emergency response facilities, and its training program to address new issues as they surface.

During a disaster, WEROC will work cooperatively with Metropolitan through their Member Agency Response System to facilitate the flow of information and requests for

mutual-aid within Metropolitan's 5,100 square mile service area. WEROC also provides updated information to Metropolitan's EOC at Eagle Rock.

Day-to-day management of WEROC is provided by MWDOC. Although MWDOC is a majority contributor to the WEROC budget, the program is also supported by the Orange County Water District, Orange County Sanitation District, South Orange County Wastewater Authority and the three Cities of Anaheim, Fullerton and Santa Ana. Additionally, El Toro Water District and Metropolitan provide facility and maintenance support to the WEROC EOCs on a regular basis. Program oversight is conducted by the WEROC Executive Committee. The Executive Committee includes representatives from MWDOC and OCWD. A WEROC Steering Committee serves as an advisory group providing general guidance to the program, and includes representatives from member agencies, Metropolitan, the California Department of Public Health (CDPH), and the County Operational Area.

Additional emergency services mutual aid plans in the State of California include the Master Mutual Aid Agreement, and the California Water and Wastewater Agencies Agency Response Network (WARN), and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement incorporated the Standardized Emergency Management System (SEMS), and is coordinated out by the California Office of Emergency Services Management Agency. WARN includes all public and private water and wastewater utilities that have signed the WARN agreement, and provides the opportunity for mutual aid assistance. WARN is managed coordinated by a State Steering Committee and can be activated by any signatory to the agreement. . Plan Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists.

Table 5-3 summarizes possible catastrophe scenarios and actions that may be taken in response to a catastrophe. It should be noted that the summary of actions does not include actions that would be standard procedures that would normally occur to any catastrophe event, such as: information gathering and analysis; prioritizing damages and resource needs; coordinating water quality notices and public information; and determining if there is a need to reallocate water supply or to set up Point of Distribution sites for the public to receive drinking water.

Table 5-3: WEROC Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions[1]
Regional Power Outage	Coordinate communication with So. California Edison and Sempra Energy Co. for restoration of services. Provide contacts for vendors of rental generators and initiate mutual assistance between unaffected agencies for emergency backup power. Consult with the impacted utilities and the California Department of Public Health (CDPH) for water quality concerns and public notices.
Earthquake	Coordinate the resources necessary for repair of the Orange County water and wastewater agencies' infrastructure. Facilitate mutual aid from outside agencies through the Orange County Operational Area utilizing the above mentioned mutual aid agreements. Utilize WEROC Mutual Aid Directory and private vendor lists to identify available water haulers, temporary water lines, piping, heavy equipment, etc.
Tsunami	If time allows, notify coastal agencies to take the appropriate actions for life safety; and if there is time protection of infrastructure. Request CDPH support in evaluating water contamination via salt water intrusion and backflow of raw sewer water. Support agency efforts to restore water flow in unique conditions of flooding (safety) and potentially lack of electricity. Continue support similar to an earthquake response.
Malicious Act	Since such an incident typically involves a long-term response with law enforcement. WEROC could support the agency with staff, communications with the County, and resources required for recovery of operational systems. In addition, coordination of WEROC water quality advisors, CDPH, and public information officers will be critical.
Flooding	Coordination with the Orange County Public Works Department for flood control support. Coordination of mutual assistance for repair of infrastructure.
Dam Failure	Identify impacts to water resources and resource management for the county during the current weather season and conditions. Evaluate the need and ability for accelerated reconstruction and/or restoration of services.
SONGS – Nuclear Release	Work with the CDPH and the Orange County retail water agencies that have open water sources to determine impacts to water quality and appropriate protective actions. Work with agencies within the fallout zone to determine current operational capabilities and future use of infrastructure in the affected area.
Wild Land Fire	Coordinate with Fire Unified Command Post to ensure that information and resource needs are being met. Ensure that fire protection is being provided to critical infrastructure and that

Possible Catastrophe	Summary of Actions[1]
	responding agencies understand the impacts of losing infrastructure. Refer to actions in the "Regional Power Outage" for loss of power to pumps due to fire. Coordinate mutual aid as needed.
Water Contamination	Contamination can be from multiple sources: malicious, sewer leak, underground contaminated plume, etc. WEROC would provide information and resource coordination support to the impacted agency if requested. The WEROC Public Information Officer will work with the agency and the media to ensure proper information is provided to the public for their health and safety.
Hazardous Materials Spill/Release	Communicate with impacted agencies to determine the impact to water supply and quality. Provide coordination with responding agencies if necessary. The WEROC Public Information Officer will work with the agency and the media to ensure proper information is provided to the public for their health and safety. Coordinate with Environmental Health Services for cleanup.
Pandemic	Communicate recommended health precautions from the County Public Health Officer. Advocate on behalf of the utilities for any medication that may be made available to first responders only. Assistant agencies in identifying critical functions, mandatory staffing and reduced staffing operations. Coordinate resource allocations if resources become sparse.
Severe Drought	Facilitate a coordinated public information campaign. Coordinate with other government agencies on severe conservation measures and ensure understanding of the impacts.

[1] MWDOC has no facilities of its own.

5.5. Prohibitions, Penalties and Consumption Reduction Methods

Working with its member agencies, MWDOC is able to reduce demands during water shortages. Although MWDOC may actually require more imported water during water shortages to offset losses of local supplies, MWDOC is able to maintain this demand at a lower level than would be possible if water reduction mechanisms were not implemented. A variety of mechanisms, such as mandatory prohibitions, consumption reductions, and penalties and charges has been and can be implemented during water shortages.

5.5.1. Mandatory Water Use Prohibitions

Because MWDOC's does not have power to enforce restriction on the use of water, as a practical matter, mandatory use prohibitions would be difficult for MWDOC to enforce given the different sources of water accessed by end users. The establishment of mandatory prohibitions on water usage during water shortages is therefore not part of MWDOC's Plan under Water Code Section 10620 (c). However, historically MWDOC has focused its activity in developing shortage allocation plans that include water purchase allocations and penalties. MWDOC has also worked with its agencies and others in communicating the conservation need to the general public and in coordinating development of messages and themes. In addition, MWDOC has urged its retail agencies to develop specific shortage management plans to meet targeted reduction in total water demand during a shortage. Retail agencies of MWDOC will address mandatory prohibitions during water shortages in their individual UWMPs.

5.5.2. Consumption Reduction Methods

As mentioned in Section 5.5.1, MWDOC does not have power to enforce restriction on the use of water. Therefore, it is more appropriate for water reduction methods to be applied to the public through the retail agencies. Reductions in water consumption by MWDOC's retail agencies during water shortages will ultimately reduce MWDOC's overall demands on Metropolitan. MWDOC's Board has the authority to provide for a method of allocation for available supplies, as the Board may determine necessary, through adoption of a Water Shortage Management Plan for all classes of service. Each retail agency decides how it will allocate supplies it receives from MWDOC during water shortages. Retail agencies of MWDOC will address water reduction methods during water shortages in their individual UWMPs.

5.6. Impacts to Revenue

During water shortages, MWDOC's revenues can decrease and expenditures can increase as MWDOC purchases more expensive water from Metropolitan to offset reductions in local supplies. There are two potential revenue related issues for which MWDOC must plan: loss of Incremental Rate Revenue due to reduced water sales in a shortage, and increased cost to purchase Tier 2 water during high demand episodes caused by drought conditions.

5.6.1. MWDOC Incremental Water Rate

MWDOC's operating budget is funded from two rate components. One is a fixed annual Retail Meter Charge collected from MWDOC's member agencies for each retail water meter in their service area. This charge provides a stable source of revenue that does not vary with weather or water sales. The other is a commodity Incremental Water Rate (per acre foot of water sold). Revenue from this Incremental Rate increases when water sales rise, and decreases when sales fall. To the extent a water shortage causes water sales to

drop, the shortfall in revenue would be made up from reserves held by MWDOC for this purpose.

5.6.2. Metropolitan Tiered Supply Rate and MWDOC Melded Supply Rate

Metropolitan charges for its full service supply to MWDOC using a Tiered Rate. MWDOC has the ability to purchase up to 228,130 acre-feet at the Tier One supply rate. However, additional water purchased above the pre-determined Tier One demand is at Metropolitan's Tier Two water rate. Tier Two water is sold at a higher price than Tier One water. MWDOC sells water to its retail agencies at a Melded Supply rate. The Melded Supply rate is set each year based on the expected combined cost of Tier One and Tier Two purchases – plus or minus any adjustment to add or decrease from reserves.

In June of 2002, MWDOC adopted a resolution establishing a Tier Two Contingency Fund to offset any Tier Two costs that MWDOC may incur from Metropolitan. The goal of the Tier Two Contingency Fund is to maintain stable water rates regardless of whether variations or other unexpected increases in demand of imported water. The melded water supply rate is higher than Metropolitan's Tier One water supply rate. The revenue difference between MWDOC's Melded Supply rate and Metropolitan's Tier One rate is used to fund Tier Two water purchases or to build up the Tier Two Contingency Fund.

Uses of funds in the Tier Two Contingency Fund are restricted to the following:

- Payment of Tier Two costs if MWDOC's water purchases from Metropolitan exceed the Tier One level;
- Advances to the General Fund to pay charges imposed on MWDOC by Metropolitan, in which the revenues are collected in a period that is different than the payment date. All advances are repaid to the Fund when the charges are collected from the retail agencies; and
- If the funds are not immediately needed for the previous two items, the Board may utilize the funds to offset any increase in water rates or charges imposed by Metropolitan which would require a rate increase by MWDOC.

If the Board determines that any portion of the Tier Two Contingency Fund is no longer needed for the purposes they were designated, then the Board will declare those funds surplus. The Board may either adjust the melded rate to reflect the surplus or distribute the surplus to each retail water agency in proportion to the amount of the melded rate each water agency purchased since the last credit was issued.

5.7. Reduction Measuring Mechanism

The establishment of a method to measure water consumption reductions during water shortages is necessary to determine the effectiveness of water reduction measures. Although MWDOC, as a wholesale supplier, would have difficulty enforcing water

reduction measures upon end users, MWDOC does work closely with its member agencies to develop plans to meet targeted reductions. To monitor the effectiveness, MWDOC generally relies on monthly reading of Metropolitan's meter connections and monthly reports of local water production by the member agencies. Monthly readings allow MWDOC to evaluate the trends of consumption at the retail agency level.

MWDOC's retail agencies will address methods to determine water consumption reductions in their individual UWMPs.

6. Recycled Water

6.1. Agency Coordination

MWDOC does not produce or manage recycled water, but does support, encourage and partner in recycled water efforts in its service area. Recycled water planning within MWDOC's service area requires close coordination with multiple agencies that, in many instances, have overlapping jurisdictional boundaries, leading to institutional hurdles. The Southern California Water Reclamation and Reuse Study (SCWRRS), a six-year study led by the U.S. was completed in 2002 help to identify short- and long-term recycled water implementation plans for areas throughout California, including four sub-regional plans within MWDOC's service area. Following that effort, the local agencies, including OCWD have continued working to identify opportunities for the use of recycled supplies for both irrigation purposes, groundwater recharge and in some non-irrigation applications. MWDOC also facilitated discussions of opportunities in West Orange County, including looking to potential partners in Los Angeles County and in North Orange County in conjunction with the City of La Habra. These options are still potentially available, although the primary obstacle seems to be one of funding of the capital needs for the projects.

6.2. Wastewater Description and Disposal

6.2.1. Overview

Wastewater collection and treatment within MWDOC's service area is managed by multiple agencies ranging from local agencies handling both potable water and wastewater to large regional agencies.

Table 6-1 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 MWDOC's service area. Table 6-2 summarizes the disposal method, and treatment level of discharge volumes.

Table 6-1: Wastewater Collection and Treatment (AFY)

Type of Wastewater	Fiscal Year Ending						
	2005	2010	2015	2020	2025	2030	2035
Wastewater Collected & Treated in Service Area	344,045	313,107	393,351	411,771	424,232	433,426	438,321
Volume that Meets Recycled Water Standards	41,860	111,653 35.7%	149,168	155,431	163,414	163,820	164,071 37.4%

Table 6-2: Disposal of Wastewater (Non-Recycled) (AFY)

Method of Disposal	Treatment Level	Fiscal Year Ending					
		2010	2015	2020	2025	2030	2035
Ocean Outfall	Secondary/Tertiary	201,454	244,183	256,340	260,818	269,606	274,250

6.2.2. Orange County Sanitation District

Orange County Sanitation District (OCSD) collects wastewater from residential, commercial, and industrial customers in 21 cities, three special districts, and portions of unincorporated Orange County, totaling 471 square miles serving approximately 2.4 million residents. Its wastewater system is the third largest west of the Mississippi River. OCSD treats an average daily flow of 264 MGD or approximately 266,472 AFY. These flows include dry weather urban runoff collected from 15 diversion points and discharged into the sewer system for treatment and Santa Ana Regional Interceptor (SARI) flows from the upper Santa Ana watershed. During the dry weather period, May through September, diverted flows range between 0.7 to 2.6 MGD. During wet months, diverted flows range from 0.4 to 1.4 MGD.

OCSD operates and maintains two treatment plants: Reclamation Plant No. 1, located in Fountain Valley with a capacity of 218 MGD, and Treatment Plant No. 2 located in Huntington Beach with a capacity of 168 MGD. OCSD also operates 650 miles of collection system, with pipelines ranging in size from 6 to 96 inches in diameter along with 20 pump stations. The treated wastewater is discharged to the Pacific Ocean via an ocean outfall in strict and consistent compliance with state and federal requirements as set forth in OCSD's National Pollutant Discharge Elimination System permit, while approximately 10 MGD is reclaimed at facilities operated by the OCWD. OCSD’s outfall is 120 inches in diameter and extends four miles into the ocean with an additional one mile long diffuser. Its high tide hydraulic capacity is 480 MGD. A 78-inch-diameter outfall extending one mile offshore is available for emergency situations. Two additional

outfalls are located at the Santa Ana River for use in extreme emergency overflow conditions only.

Biosolids are 100% land applied as an agricultural soil amendment, while grit and screenings are transported under contract for landfill disposal.

OCSD Reclamation Plant No. 1 - Reclamation Plant No. 1 treats raw wastewater conveyed from six major sewer lines. On average the plant treats approximately 120 MGD of wastewater. The maximum treatment capacity is 218 MGD. The plant provides advanced primary and secondary treatment and supplies secondary treated water to OCWD for further treatment to recycled water standards and distribution. This is the only OCSD treatment plant that provides water to OCWD for reclamation. An interplant pipeline allows flows to be conveyed to Treatment Plant No. 2. Management of interplant flows allows for minimum flow requirements for reclamation facilities to be met during off-peak hours.

OCSD Treatment Plant No. 2 - Treatment Plant No. 2 provides a mix of advanced primary and secondary treatment. Influent is received via five major sewers and Reclamation Plant No. 1. The average dry weather treatment flow rate is 144 MGD. The maximum treatment capacity is 168 MGD. All treated wastewater is discharged to the ocean through the ocean outfall.

6.2.3. South Orange County Wastewater Authority

South Orange County Wastewater Authority (SOCWA) is a Joint Powers Authority created on July 1, 2001. It was formed as the legal successor to three agencies: Aliso Water Management Agency, South East Regional Reclamation Authority, and South Orange County Reclamation Authority. SOCWA Member agencies include: City of Laguna Beach, City of San Clemente, City of San Juan Capistrano, El Toro Water District, Emerald Bay Service District, Irvine Ranch Water District, Moulton Niguel Water District, Santa Margarita Water District, South Coast Water District, and Trabuco Canyon Water District. All of these service areas receive wholesale water through MWDOC. The service area encompasses approximately 220 square miles including the Aliso Creek, Laguna Canyon, and San Juan Creek Watersheds.

Within its service area, SOCWA operates four wastewater treatment plants, an additional eight wastewater treatment plants are operated by SOCWA member agencies. Wastewater in the service area is collected at the local and regional level through a series of interceptors that convey influent to the wastewater treatment plants. Treated effluent throughout the service area is conveyed to two gravity flow ocean outfalls, Aliso Creek Outfall and San Juan Creek Outfall, operated by SOCWA. These outfalls have a gravity flow capacity of 50 MGD and 24 MGD (80 MGD pumped), respectively. Aliso Creek outfall extends approximately 7,900 feet offshore near Aliso Creek. San Juan Creek

outfall extends 10,550 feet offshore near Doheny Beach and the mouth of San Juan Creek. Ultimately, the hydraulic capacity of the San Juan Creek Outfall will be expanded to 31.5 MGD. At a minimum, full secondary treatment is provided at wastewater treatment plants within the service area, with most plants exceeding this level of treatment.

SOCWA Coastal Treatment Plant - SOCWA's Coastal Treatment Plant (CTP) located in the City of Laguna Niguel has a maximum influent capacity of 6.7 MGD. Effluent has been treated to secondary or tertiary levels dependent upon disposal or reuse of the wastewater for recycling. Recycled water is treated to applicable Title 22 standards. Treated effluent that is not recycled is disposed through the Aliso Creek Outfall Ocean Outfall. In 2010, 4,400 acre-feet of dry weather flows were collected and treated on average of which 900 acre-feet was used as recycled water.

SOCWA Joint Regional Treatment Plant - The Joint Regional Treatment Plant (JRTP) with a maximum influent capacity of 12 MGD lies within the City of Laguna Niguel and is operated by SOCWA. Effluent has been treated to secondary or tertiary levels dependent upon disposal or reuse of the wastewater for recycling. Recycled water is treated to applicable Title 22 standards. Non-recycled effluent is conveyed to the Aliso Creek Ocean Outfall via the SOCWA Effluent Transmission Main. In 2010, the JRTP received and treated an average dry weather flow of 10,420 acre-feet with 6,721 acre-feet treated to recycled water standards.

SOCWA Plant 3A - Plant 3A is located within the City of Laguna Niguel and is operated by SOCWA. The maximum influent capacity is 6 MGD. Effluent has been treated to secondary or tertiary levels dependent upon disposal or reuse of the wastewater for recycling. Recycled water is treated to applicable Title 22 standards. Unused effluent is conveyed to the San Juan Creek Outfall via the 3A Effluent Transmission Main. On average, in 2010 Plant 3A received and treated 2,352 acre-feet of dry weather flows of which 1,266 acre-feet were treated to recycle water standards.

SOCWA J. B. Latham Treatment Plant - SOCWA's J. B. Latham Treatment Plant is the largest plant in the service area with a design capacity of 13 MGD. This plant is located in the City of Dana Point. Effluent is currently treated to secondary levels. Effluent is conveyed directly to the San Juan Creek Outfall. In 2010, the average dry weather flows collected and treated were 10,977 acre-feet. None of the treated effluent is currently being recycled.

6.3. Current Recycled Water Uses

Recycled water is widely accepted as a source for direct use and indirect use of water supply throughout MWDOC's service area. In the past, recycled water was mainly used for landscape irrigation. Large recycled water projects include: the Green Acres Project,

IRWD's recycled water projects, and the GWRS. GWRS uses include injection for sea water barriers and groundwater recharge. Groundwater recharge will surpass landscape irrigation as the greatest consumer of recycled water in Orange County. IRWD is at the forefront of using recycled water not only for irrigation, but also for other uses such as toilet flushing and commercial uses. Other agencies in south Orange County, such as Moulton Niguel Water District and Santa Margarita Water District use a significant amount of recycled water. Recycled water in Orange County is treated to various levels dependent upon the ultimate end use and in accordance with Title 22 regulations.

OCWD Green Acres Project - The Green Acres Project (GAP) is a water recycling effort that provides recycled water for landscape irrigation at parks, schools and golf courses as well as for industrial uses, such as carpet dyeing.

GAP provides an alternate source of non-potable irrigation water to the cities of Fountain Valley, Huntington Beach, Newport Beach, Santa Ana, and Mesa Consolidated Water District. Current water users include Mile Square Park in Fountain Valley, Costa Mesa Golf Course, Home Ranch bean field and Chroma Systems carpet dyeing. Due to a growing demand for water in Orange County, it is sensible that recycled water be used whenever possible for irrigation and industrial uses to supplement groundwater. The GAP has the capacity to purify 7.5 MGD of reclaimed water from OCSD.

OCWD Groundwater Replenishment System - The GWRS, which has been operational since January 2008, takes treated wastewater from Orange County Sanitation District and purifies it to levels that meet state and federal drinking water standards. It uses a three-step process that includes reverse osmosis, microfiltration and ultraviolet light and hydrogen peroxide advanced oxidation treatment. The treated water is then injected into the seawater barrier to help prevent seawater intrusion into the groundwater basin and is percolated into deep aquifers where it eventually becomes part of Orange County's drinking water supply.

The design and construction of the GWRS was a project jointly-funded by OCWD and OCSD. These two public agencies have worked together for more than 30 years and began the GWRS planning in the mid-1990s. They have led the way in water recycling and providing a locally-controlled, drought-proof and reliable supply of high-quality water in an environmentally sensitive and economical manner.

The GWRS has a current production capacity of 70 MGD (23.5 billion gallons per year). Once the water has been treated with the three-step process at the GWRS, treatment facilities, approximately 35 MGD of GWRS water is pumped into injection wells where it serves as a seawater intrusion barrier. Another 35 MGD is pumped to recharge basins in the City of Anaheim, where GWRS water filters through sand and gravel to replenish the deep aquifers of north and central Orange County's groundwater basin.

ETWD Recycling Plant - El Toro Water District Water Recycling Plant is operated by El Toro Water District and is located in the City of Laguna Wood. The plant has a maximum influent capacity of 6 MGD. Wastewater is treated to a secondary to Title 22 standards depending upon the ultimate use of the effluent. In 2010, 4,220 acre-feet of secondary treated effluent is disposed via the SOCWA Effluent Transmission Main to the Aliso Creek Ocean Outfall and 430 acre-feet of effluent is treated to a tertiary level meeting Title 22 standards and is sent to the recycled water distribution system.

SMWD Chiquita Water Reclamation Plant - Chiquita Water Reclamation Plant (CWRP) is operated by Santa Margarita Water District and is located in Chiquita Canyon. Wastewater is treated to a tertiary level with recycled water treated to Title 22 standards. CWRP has a maximum design capacity of 8 MGD with plans to increase its size to 10 MGD by 2025. In 2010, approximately 2,511 acre-feet was recycled, with the majority of the effluent, 7,569 acre-feet, disposed via the Chiquita Land Outfall with a connection to the San Juan Creek Ocean Outfall.

SMWD Oso Creek Water Reclamation Plant - Oso Creek Water Reclamation Plant (OCWRP) is located along Oso Creek and is operated by Santa Margarita Water District. At this facility, wastewater is treated to a secondary level with recycled water treated to Title 22 standards. A bypass facility allows for excess wastewater to be sent to the previously discussed J.B. Latham Treatment Plant as OCWRP has no outfalls. Without the ability to discharge treated effluent, excess flows beyond recycled water demands are required to be sent to J.B. Latham Treatment Plant. OCWRP has a maximum design capacity of 3 MGD. In 2010, approximately 1,496 acre-feet, is treated and recycled. OCWRP is a clipping plant that removes wastewater from the main sewer trunk line.

SMWD Nichols Institute Water Reclamation Plant - The Nichols Institute Water Reclamation Plant is operated by Santa Margarita Water District and owned by a private company that owns property within SMWD's boundaries. This small facility treats approximately 34 AFY. No outfall is available for this facility. Therefore, all wastewater is treated to Title 22 standards for recycling purposes. Since this facility is remote from the existing water and wastewater facilities, SMWD is not obligated to provide an alternate source of water in the even the Nichols facility becomes inoperable or unusable.

San Clemente Water Reclamation Plant - The City of San Clemente owns and operates the San Clemente Water Reclamation Plant located within the city. The San Clemente Water Reclamation Plant has a design capacity of 7 MGD and treats wastewater to secondary or tertiary levels dependent upon if the water will be recycled or disposed. In 2010, approximately 900 acre-feet were recycled. Any water in excess of the plant's recycling limit is conveyed to the San Juan Creek Ocean Outfall via the San Clemente Land Outfall. Recycling capacity is currently 2.2 MGD with plans to expand to 4.4 MGD.

IRWD Los Alisos Water Reclamation Plant **-** Los Alisos Water Reclamation Plant (LAWRP) is operated by IRWD and is located in the City of Lake Forest. LAWRP has a capacity of 7.5 MGD. Wastewater is treated to a secondary or tertiary level dependent upon the ultimate use of the effluent. In 2010, approximately 1,470 acre-feet were recycled. When excess water beyond its tertiary treatment capacity is received, it is conveyed to the SOCWA Effluent Transmission Main for disposal via the Aliso Creek Ocean Outfall.

IRWD Michelson Water Reclamation Plant **-** Michelson Water Reclamation Plant (MWRP) is located in the city of Irvine and is operated by IRWD. MWRP currently has a maximum influent capacity of 18 MGD with plans to expand to 28 MGD by 2025 to meet non-potable demands. Wastewater is treated to a tertiary level with advanced treatment in the form of nitrification/denitrification. All effluent meets Title 22 standards for unrestricted use, except for potable water consumption. All effluent produced by the plant is conveyed to the recycled water distribution system. In 2010, approximately 20,150 acre-feet were recycled.

TCWD Robinson Ranch Water Reclamation Plant **-** Robinson Ranch Water Reclamation Plant (RRWRP) is operated by Trabuco Canyon Water District and is located in Trabuco Canyon, an unincorporated area of Orange County. RRWRP has a maximum capacity of 0.85 MGD. In 2010, average dry weather flows collected and treated were 809 acre-feet. Wastewater is treated to a secondary level and Title 22 standards. All of the wastewater is recycled as the plant is not permitted to have stream discharges, and it is unfeasible to connect to the existing outfalls in the SOCWA service area.

MNWD JRTP Advanced Wastewater Treatment Plants **–** MNWD's JRTP Advanced Wastewater Treatment (AWT) Plants are operated by SOCWA and are located in the City of Laguna Niguel. AWT No. 1 facility has a capacity of 2.4 MGD, and AWT No. 2 facility has a capacity of 9 MGD. Wastewater is treated to Title 22 standards. In 2010, approximately 6,721 acre-feet were recycled.

MNWD Plant 3A Advanced Wastewater Treatment Plant **-** MNWD's Plant 3A Advanced Wastewater Treatment (AWT) Plant is operated by SOCWA and is located within the City of Laguna Niguel. The Plant 3A AWT was placed on line in 1991 and has a capacity of 2.4 MGD. Wastewater is treated to Title 22 standards. In 2010, approximately 1,266 acre-feet were recycled.

SCWD CTP Advanced Wastewater Treatment Plant **-** SCWD's CTP Advanced Wastewater Treatment (AWT) Plant is operated by SOCWA and is located in the City of Laguna Niguel. The CTP AWT has a capacity of 2.6 MGD. Wastewater is treated to Title 22 standards. In 2010, approximately 900 acre-feet were recycled.

Table 6-3 below illustrates the current uses for recycled water within MWDOC's service area. The usage is limited to landscape irrigation with a secondary and tertiary treatment level.

Table 6-3: Current Recycled Water Uses (AFY)

User Type	Treatment Level	Fiscal Year Ending
		2010
Agriculture		
Landscape	Secondary/Tertiary	39,642
Wildlife Habitat		
Wetlands		
Industrial		
Total		**39,642**

6.4. Potential Recycled Water Uses

Potential recycled water use within MWDOC's service area hinges upon many variables including, but not limited to, economics of treatment and distribution system extension (as well as site retrofits), water quality, public acceptance, infrastructure requirements, and reliability. Recycled water quality, in combination with the tolerance of landscaping to high total dissolved solid levels, plays a large role in whether irrigation with recycled water is feasible. Recycled water that has TDS levels that constantly or occasionally exceed the tolerance level of specific landscape requirements will result in adverse impacts to the landscape. Therefore, some users are not able to utilize recycled water unless TDS levels are held below specific plant-based thresholds.

Even with high identified demands, it is not necessarily economically feasible to provide recycled water to all potential users. Expansion of recycled water systems eventually reaches a point where returns diminish and higher investments for expansion are not cost effective. Water recycling projects involve collecting and treating wastewater to applicable standards dependent upon the ultimate end use, storing recycled water for seasonal use, pipeline construction, pump station installation, and plumbing retrofits for existing end users or dual plumbing systems for new users. Creative solutions to secure funding, overcome regulatory requirements, institutional arrangements, and public acceptance are required to offset existing potable demands with potential recycled water demands.

OCWD Groundwater Replenishment System Expansion - At this time, OCWD has designed and approved proceeding with the Phase 2 expansion of GWRS, which will recycle approximately another 30 MGD of effluent. Investments beyond Phase 2 have not been approved by OCWD and would require further review before proceeding. If the further envisioned phase of the project is approved and developed, it is projected that up to 120 MGD of water will be produced.

IRWD Michelson Water Reclamation Plant Expansion - Michelson Water Reclamation Plant (MWRP) currently has a maximum influent capacity of 18 MGD. To keep up with a growing demand for potable water and a decreasing imported water supply, IRWD will increase the capacity from 18 MGD to 28 MGD by 2025. Design of this project started in September 2006 and was completed in March 2009. Construction began in September 2009 and is anticipated to be completed by July 2012.

San Clemente Water Reclamation Plant Expansion - The San Clemente Water Reclamation Plant located within the City currently has a capacity of 2.2 MGD. The City of San Clemente plans to expand the plant to 4.4 MGD. The expansion will include nearly 9 miles of pipelines, conversion of a domestic water reservoir to recycled water storage, and a pressure reducing station as well as an interconnection with SMWD. Design of this project was completed in spring 2010 and construction is estimated to begin in the fall of 2011 with the first phase of new recycled water customers to come online in 2013.

SMWD Chiquita Water Reclamation Plant Expansion - Chiquita Water Reclamation Plant (CWRP) currently has a capacity of 5 MGD. SMWD plans to expand the plant to 10 MGD by 2015. The expansion will increase total production and reduce dependency on imported water.

SCWD Aliso Creek Water Harvesting Project - SCWD has conducted a preliminary investigation of a project to intercept and treat a portion of the urban runoff in lower Aliso Creek to supplement the recycled water system. This would improve the quality of the recycled water supply to make it more attractive for irrigation users. Treatment would include filtration and reverse osmosis facilities near SOCWA's CTP. The plant would produce up to 0.5 MGD of low TDS water.

Tables 6-4 and 6-5 represent projected recycled water use within MWDOC's service area through 2035. Recycled water use will increase by 50% through the 25-year period, with landscape irrigation as its sole use.

Table 6-4: Projected Future Use of Recycled Water in Service Area (AFY)

User Type	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035
Projected Use of Recycled Water	39,642	51,658	55,699	59,324	59,492	59,597

Table 6-5: Projected Recycled Water Uses (AFY)

User Type	Treatment Level	Fiscal Year Ending				
		2015	2020	2025	2030	2035
Agriculture						
Landscape	Secondary/Tertiary	51,658	55,699	59,324	59,492	59,597
Wildlife Habitat						
Wetlands						
Industrial						
Total		**51,658**	**55,699**	**59,324**	**59,492**	**59,597**

Table 6-6 compares the recycled water use projections from MWDOC's 2005 RUWMP with actual 2010 recycled water use.

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

User Type	2005 Projection for 2010	2010 Actual Use
Agriculture		
Landscape	51,388	39,642
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Total	**51,388**	**39,642**

6.4.1. Direct Non-Potable Reuse

Direct non-potable recycled water reuse totaled 39,642 acre-feet in the MWDOC service area in 2010. In 2035, direct non-potable recycled water usage is projected to reach nearly 59,597 acre-feet, an increase of 50% from 2010.

6.4.2. Indirect Potable Reuse

The indirect potable water reuse via groundwater recharge and for seawater barriers is currently about 67,000 AFY and is expected to reach 102,000 acre-feet by 2015. This water is produced by the GWRS project which will ultimately supply about 132,000 AFY if the further envisioned phase of the project is approved and developed.

6.5. Optimization Plan

Metropolitan and MWDOC supports research efforts to encourage development and use of recycled water. These include conducting studies and research to address public concerns, developing new technologies, and assessing health effects. Addressing public concerns is required to gain the support of stakeholders early in the planning process. Education is required to inform the public of treatment processes. Developing new technologies is a prerequisite to help reduce the cost of producing recycled water. Health effects assessments have a two-fold purpose of alleviating public concerns and ensuring the protection of public health and the environment. Further research supported by Metropolitan and others (such as the National Water Research Institute) will have the benefit of reducing risks for MWDOC's retail agencies.

Recycled water production is projected to increase to 164,071 AFY by 2035 including GWRS production. This means that 37% of the wastewater generated in the MWDOC service area will be recycled and will constitute a significant and valuable resource. To assist in meeting these projections, MWDOC plans to take numerous actions to facilitate the use and production of recycled water within its service area. However, MWDOC is a wholesaler and does not impose development requirements or enact ordinances that mandate the use of recycled water. Most recycled water projects that provide the greatest benefit for the cost have been developed or are planned. In many cases, additional recycled water production and use is economically unfeasible given the current cost of potable water supplies in comparison to recycled water costs. MWDOC has taken the following actions to facilitate further production and use of recycled water:

- Sponsoring member agencies in obtaining Local Resources Program (LRP) incentives from Metropolitan;
- Assisting and supporting member agencies in applications made for bond funds such as Proposition 84;
- Encouraging Metropolitan to participate in studies that will benefit recycled water production;
- Supporting Metropolitan in deriving solutions to regulatory issues;
- Participating in regional plan such as the South Orange County IRWMP;
- Working cooperatively with member agencies, Metropolitan and its member agencies, and other Orange County water and wastewater agencies to encourage

recycled water use and to develop creative solutions to increasing recycled water use.

Dealing with needed additional funding and other implementation barriers for recycled water at the state and regional level would assist in increasing recycled water production within MWDOC's service area. State funding assistance could reduce the overall cost per acre-foot of recycled water so that it is comparable to the cost of potable water would allow the development of more expensive recycled water projects in an earlier timeframe. There are numerous barriers to increasing water recycling that could be addressed at the State level These include establishment of uniform Regional Water Quality Control Board (RWQCB) requirements for recycled water, especially in areas where water and wastewater agency jurisdictions cross RWQCB jurisdictions resulting in varying requirements; partnering in health studies to illustrate the safety of recycled water; increasing public education; and establishing uniform requirements for retrofitting facilities to accept recycled water.

7. Future Water Supply Projects and Programs

7.1. Water Management Tools

MWDOC has worked closely with its member agencies to decrease dependence on imported supplies and increase supply reliability by further developing local supplies. Development of additional local supplies improves both local and regional reliability.

Although MWDOC is not responsible for carrying out specific supply development projects in the region, it follows closely with those currently being developed by its member agencies.

7.2. Transfer or Exchange Opportunities

Metropolitan currently has a tiered unbundled rate structure. Tier 2 of this rate structure increases the cost of supply to a member agency in order to provide a price signal that encourages development of alternative supply sources. One alternative source of supply may be a transfer or exchange of water with a different agency.

The CALFED Bay-Delta Program (CALFED) has helped to develop an effective market for water transactions in the Bay-Delta region. This market is demonstrated by the water purchases made by the Environmental Water Account and Metropolitan in recent years. MWDOC and its member agencies plan to evaluate selected transfer or exchange opportunities in the future. These opportunities can help ensure supply reliability in dry years and avoid the higher Tier 2 cost of supply from Metropolitan. The continued development of a market for water transactions under CALFED will only increase the likelihood of MWDOC's participation in this market when appropriate opportunities arise.

Mesa Consolidated Water District **-** Mesa plans to expand their Colored Water Treatment Facility. With this expansion, Mesa is exploring opportunities that may develop into potential transfer or exchange opportunities. These would include the selling of excess pumped water from the expansion to neighboring entities.

IRWD Strand Ranch Water Banking Program **–** As previously noted, IRWD has completed negotiations with Metropolitan and MWDOC for storage and extraction of water from the Strand Ranch Integrated Banking Project. IRWD is already working on opportunities to expand these types of transactions.

Santa Margarita Water District **–** As previously discussed, SMWD has actively pursued additional water supply reliability through water transfers. They are currently involved in the analysis and evaluation of the Cadiz water storage project.

7.3. Planned Water Supply Projects and Programs

Table 7-1 provides a breakdown of the projects agencies are developing to meet the projected water use for the region (further detail of these projects should be available in the UWMPs developed by each member agency).

Table 7-1: Specific Planned Water Supply Projects and Programs

Project Name	Type of Water	On-line Date	Normal Year Yield AF/yr	Single Dry Year Yield AF/yr	Multiple Dry Year #1 Yield AF/yr	Multiple Dry Year #2 Yield AF/yr	Multiple Dry Year #3 Yield AF/yr
ETWD Recycling Distribution System Expansion Project	Recycled	2015	750	750	750	750	750
IRWD Michelson Reclamation Expansion 18 to 28 mgd & Seasonal Storage	Recycled	2012	10,000	10,000	10,000	10,000	10,000
IRWD Los Alisos Well 2	GW, Potable	2012	435	435	435	435	435
IRWD Los Alisos Wells 3 & 7 Treat to Potable	GW Recovery	2015	400	400	400	400	400
IRWD Wells 21& 22 Treat to Potable	GW Recovery	2012	9,233	9,233	9,233	9,233	9,233
IRWD Well 106 treat to Potable	GW Recovery	2013	1,250	1,250	1,250	1,250	1,250
IRWD Well TL-1A (old #52) treat to Potable	GW Recovery	2015	2,600	2,600	2,600	2,600	2,600
La Habra City wells in the La Habra Basin- Expansion	GW, Potable	2012	1,000	1,000	1,000	1,000	1,000
La Habra North OC Recycled Water	Recycled	unkn.	2,000	2,000	2,000	2,000	2,000
LBCWD Laguna Canyon Recycling Project	Recycled	2013	200	200	200	200	200
LBCWD Well in the OCWD Basin	GW Recovery	2013	2,025	2,025	2,025	2,025	2,025
Mesa Colored Water Treatment Facility Ph 2	GW Recovery	2013	1,418	1,418	1,418	1,418	1,418

Table 7-1: Specific Planned Water Supply Projects and Programs (continued)

Project Name	Type of Water	On-line Date	Normal Year Yield AF/yr	Single Dry Year Yield AF/yr	Multiple Dry Year #1 Yield AF/yr	Multiple Dry Year #2 Yield AF/yr	Multiple Dry Year #3 Yield AF/yr
MNWD por. SJBA Upper Basin wells	GW, Non-potable	2015	900	900	900	900	900
OCWD GWRS Phase II	Recycled for Replen.	2015	30,000	30,000	30,000	30,000	30,000
OCWD GWRS Phase III	Recycled for Replen.	2025	30,000	30,000	30,000	30,000	30,000
OCWD Prado Basin Re-Operation	Surface for Replen.	2015	10,000	10,000	10,000	10,000	10,000
OCWD Burris & Lincoln Basins Re-Configuration	Surface for Replen.	2013	3,150	3,150	3,150	3,150	3,150
OCWD Raymond & Placentia Basins Improvements	Surface for Replen.	2014	2,700	2,700	2,700	2,700	2,700
OCWD Santiago Pits Pump-Out Project	Surface for Replen.	2012	4,500	4,500	4,500	4,500	4,500
OCWD Fletcher Basin Conversion	Surface for Replen.	2012	500	500	500	500	500
OCWD Santiago Pits Intertie	Surface for Replen.	2013	1,000	1,000	1,000	1,000	1,000
OCWD OC Sanit. Distr. Process Water	Recycled	2014	4,500	4,500	4,500	4,500	4,500
San Clemente Water Reclamation Project Expansion	Recycled	2012	900	900	900	900	900
SMWD Chiquita Reclam. Expansion	Recycled	2015	7,564	7,564	7,564	7,564	7,564
SMWD Arroyo Trabuco Sump	Surface Non-potable	2012	270	270	270	270	270
SMWD Canada Gobernadora Surface Water	Surface Non-potable	2015	725	725	725	725	725

Table 7-1: Specific Planned Water Supply Projects and Programs (continued)

Project Name	Type of Water	On-line Date	Normal Year Yield AF/yr	Single Dry Year Yield AF/yr	Multiple Dry Year #1 Yield AF/yr	Multiple Dry Year #2 Yield AF/yr	Multiple Dry Year #3 Yield AF/yr
SMWD por. SJBA Upper Basin wells	GW Non-potable	2015	900	900	900	900	900
So Coast WD S. Laguna Reclamation Expansion	Recycled	2015	400	400	400	400	400
So Coast WD Capistrano Beach Desalter Expansion	GW Recovery	2015	1,200	1,200	1,200	1,200	1,200
YLWD Recycling	Recycled	2014	5,000	5,000	5,000	5,000	5,000

Note: Projects are in various stages of development; some are only conceptual, and some may not get built unless they receive grants and/or rebates.

7.4. Desalination Opportunities

Water treatment technology has continued to advance, and costs have continued to decrease, providing greater opportunities to develop previously unusable surface water, groundwater, wastewater, and ocean water for potable water supply. One of the great success stories in advanced water treatment technology since its invention in the mid-1960s at University of California Los Angeles has been the development and advancement of Reverse Osmosis (RO) membrane systems. Membrane systems have seen increasing application in water supply for removal of salts and other constituents, such as synthetic and natural organic compounds. In addition, many other advanced water treatment technologies, such as advanced oxidation and improved disinfection methods, have been developed and are continuing to be invented and further refined. These unit processes, including membrane systems, can be used in various arrays to meet particular water treatment needs for a given water source.

Today, membrane treatment with RO systems is considered by most practitioners to be the preferred cost-effective technology for desalination and natural organic compound removal (colored groundwater, etc). Most of the earlier ocean desalination projects have been built outside of the United States and were primarily thermal distillation systems. Today, most of the newer plants use RO membrane technology. In addition, a newer membrane technology, Microfiltration (MF), is also seeing increased application in surface water treatment and for pretreatment in ocean water desalination projects using open intakes for feedwater supply and RO for desalination.

To accommodate long-term population and economic growth in Southern California, and to protect against uncertainty and more extreme variability in natural water supply, as well as development and depletion of water resources outside of Southern California, continuing regional and local efforts in water resource management and supply development will be necessary. Application of desalination technology is increasingly being recognized as one important supply component to develop new sustainable water supplies and to bolster water system reliability. Overall supply shortage risks from drought, regulatory constraints on existing supplies and emergency outages can be lessened with a diversified and disaggregated water supply portfolio that incorporates appropriate desalination projects. The different opportunities for desalinated water in MWDOC's service area are shown in Table 7-2.

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC and its member agencies with additional water supply. These are the Huntington Beach Seawater Desalination Project, the South Orange Coastal Ocean Desalination Project, and the Camp Pendleton Seawater Desalination Project.

Table 7-2: Opportunities for Desalinated Water

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

7.4.1. Groundwater Desalination

Metropolitan instituted its Groundwater Recovery Program in 1991 to provide financial incentives (up to $250 per acre-foot) to local agencies to develop brackish groundwater impaired from either natural causes or from agricultural drainage. The purpose of the program was to increase utilization of groundwater storage within the region for firm local production, conjunctive use storage, and drought supply. In MWDOC's service area, five groundwater recovery brackish water projects have contracts with Metropolitan.

Mesa Colored Water Treatment Facility Expansion - The Colored Water Treatment Facility (CWTF) is owned and operated by Mesa Consolidated Water District (Mesa). The CWTF pumps colored water from a deep colored water aquifer and removes the color using ozone treatment and biological filtration. Due to the increase in color and bromide in the source water, Mesa has embarked on a project to replace the ozone and biological filtration treatment with nanofiltration membrane treatment and increase the capacity from 5.8 MGD to 8.6 MGD. Design and construction of the technology

replacement and expansion began September 2009 and is anticipated to be completed April 2012.

SCWD Capistrano Beach Groundwater Recovery Facility Expansion - SCWD constructed a 1 MGD Groundwater Recovery Facility (GRF) that came on-line in FY 07-08 in Capistrano Beach. SCWD plans to expand the GRF with the addition of new wells. The SJBA is performing a study to evaluate the potential new well sites. SCWD will need to construct a second well in order to reach the permitted limit and construction of additional wells will be required to reach the proposed 2,000 AFY goal. Treating in excess of 1,300 AFY will require expansion of the GRF and agreement with San Juan Basin Authority or confirmation of water rights from the State Water Resources Control Board. The expansion is anticipated to begin in 2012 and completed by 2014.

Garden Grove Nitrate Blending Project - The Garden Grove Nitrate Blending Project was active during the years of 1990 to 2005. The project is located at the Lampson Reservoir site, where groundwater pumped from two wells is blended in order to meet the maximum contaminant level for nitrate. The blending project has been shut down since 2005, but the City is currently retrofitting Well 28 with a variable frequency drive and intends to reinstate the blending operation in 2012.

San Juan Desalter Groundwater Recovery Plant Expansion – The GWRP has been impacted by Methyl Tert-Butyl Ether (MTBE), cutting production in half to about 2 MGD or less since the spring of 2008. The installation of a Granular Activated Carbon Filter (GAC) is expected to allow the full 5.1 MGD by winter of 2011 and is expected to increase the treatment capacity expansion to 7 MGD by winter 2011 when the GWRP expansion and GAC systems are complete.

7.4.2. Ocean Water

Desalination of ocean water provides a potentially unlimited supply of water if it can be desalinated and delivered at competitive costs. This section addresses current proposals for developing a desalinated ocean water supply in Orange County.

In 2001, the Metropolitan Water District of Southern California developed a Seawater Desalination Program (SDP) to provide incentives for development of new seawater desalination projects in Metropolitan's service area. Under the SDP, Metropolitan provides incentives up to $250 per acre-foot for locally produced seawater desalination projects that reduce the need for imported supplies. To qualify for the incentive, proposed projects must replace an existing demand or prevent a new demand on Metropolitan's imported water supplies.

To date, there is one project, with a capacity of 56 TAF, within the Metropolitan service area that is currently under construction, which represents 37% of the 150 TAF

desalination goal discussed in Metropolitan's 2004 Integrated Water Resources Plan (IRP) Update.

Given the increasing challenges associated with the delivery of water through San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta), State Water Project (SWP) supplies will remain as supplemental supplies for Southern California. Thus, any new local supply development that reduces the demand for imported supplies will result in a net reduction in SWP supplies or other supplies from Northern California.

The following projects, if developed, could result in a total net reduction in Metropolitan imported water deliveries to the Orange County.

Huntington Beach Seawater Desalination Project – Poseidon Resources (Surfside) LLC (Poseidon), a private company, is developing the Huntington Beach Seawater Desalination Project to be located adjacent to the AES Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water 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 has received non-binding Letters of Intent (LOI) from MWDOC and 17 retail water agencies to purchase a total of approximately 72 MGD (88,000 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 (EIR) and Conditional Use Permit and water delivery pipeline Franchise Agreement, which collectively provided for the construction and long-term operation of the desalination facility. The Project also has an approved National Pollutant Discharge Elimination System Permit (NPDES) issued by the Santa Ana Regional Water Quality Control Board in 2006, an approved lease amendment from the California State Lands Commission (SLC) authorizing Poseidon to use existing offshore seawater intake and discharge facilities utilized by the Huntington Beach Generating Station, and a conditional approval from the Department of Public Health.

Figure 7-1: Dana Point Harbor is located just north of the proposed South Orange Coastal Ocean Desalination Project Site, which is currently under study.

In addition to final water purchase agreements with the participating agencies, the Project still needs approval from the California Coastal Commission before Poseidon can commence construction of the desalination facility in Huntington Beach.

South Orange Coastal Ocean Desalination Project – MWDOC is proposing a desalination project in joint participation with the 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 25% of the potable water supply to the participating agencies.

Phase 1 included drilling 4 test borings and installing monitoring wells. Phase 2 consisted 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 results are favorable after the Phase 3 testing, a full-scale project description and EIR will be developed. If EIR is adopted and necessary permits are approved, the project could be operational by 2017.

Camp Pendleton Seawater Desalination Project– San Diego County Water Authority (SDCWA) is studying a desalination project to be located at the southwest corner of Camp Pendleton Marine Corps Base adjacent to the Santa Margarita River. The initial project would be a 50 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 SDCWA is conducting geological surveys, intake options, and studies of the effect on ocean life and examining routes to bring desalination water to SDCWA's delivery system. MWDOC and south Orange County agencies are maintaining a potential interest in the project, but at this time they are only pursuing 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 Plan, MWDOC also worked closely with many other entities to develop and update this planning document. These agencies include representation from diverse social, cultural, and economic elements of the population within MWDOC's service area to assist in preparation of its plan.

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 MWDOC and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix D.

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Developed Joint Contract for 22 agencies to get their UWMP's completed under a single contract	May 3, 2010	
SBx-7 20x2020 Workshop	November 29, 2010	
Encouraged public involvement (Public Hearing)	May 7, 13, 2011 & May 27, June 3, 2011	Appendix G
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)	February 28, 2011	Appendix F
Held public hearing	May 18, 2011	Appendix G
Adopted UWMP	June 15, 2011	Appendix H
Submitted UWMP to DWR (no later than 30 days after adoption)	July 15, 2011	
Submitted UWMP to the California State Library and cities and county within the supplier's service area (no later than 30 days after adoption)	July 15, 2011	
Made UWMP available for public review (no later than 30 days after filing with DWR)	August 14, 2011	

This RUWMP was adopted by the Board of Directors on June 15, 2011. A copy of the adopted resolution is provided in Appendix H.

8.2. Public Participation

MWDOC encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document. Public hearing notifications were advertised via our normal methods by sending notices to our Member Agencies and other interested parties. Individual letters were also sent to potential stakeholders as to the development of our plan and public review hearing. A copy of the Notice of Public Hearing is included in Appendix G. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply. Copies of the draft plan were made available for public inspection at MWDOC's office.

A Public Hearing for MWDOC's Draft Plan was held May 18, 2011. The hearing was conducted during a regularly scheduled meeting of the MWDOC Board of Directors at MWDOC's offices in Fountain Valley.

A staff report and presentation reviewed the information-gathering process, the data obtained from MWDOC member agencies and other resource planning agencies, and the conclusions that served as the basis of the Draft Plan. The President of the Board of Directors then opened the Public Hearing where all comments were recorded in their entirety.

8.3. Agency Coordination

Recognizing that close coordination among other relevant public agencies is the key to the success of its Plan, MWDOC worked closely with many other entities to develop and update this planning document. MWDOC's coordinated efforts with the relevant agencies are 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 Public Hearing	Not Involved/No Information
MWDOC 28 Member Agencies	√	√	√	√	√	√	√
Cities within MWDOC service area			√		√	√	√
County of Orange			√		√	√	√
Orange County Water District	√			√	√	√	√
San Juan Basin Authority	√			√	√		
Metropolitan Water District of Southern California	√			√	√	√	√
Orange County Sanitation District	√			√	√		
South Orange County Wastewater Authority	√			√	√		
Public Library					√	√	
General Public					√	√	

MWDOC Member Agencies - MWDOC worked cooperatively with its 28 member agencies on descriptions of any planned development of local supplies. Methodologies and assumptions underlying these projections vary from agency to agency, but all projections reflect an in-depth knowledge of the individual agencies' service areas.

Cities and County **-** As described earlier, General Plans are source documents for water suppliers as they assess their own water resource needs. When completed, an UWMP also serves as a source document for cities and counties as they prepare their General Plans. General Plans and UWMPs may be linked, as their accuracy and usefulness are interdependent.

California Water Code Section 10621(b) requires urban water suppliers to notify cities and counties in their service area of the opportunity to submit comments during the UWMP update process. A change from the 2004 legislative session to the 2009 legislative session required MWDOC to notify any city or county within its service area at least 60 days prior to the public hearing. A Letter of Notification was sent to the County of Orange and all cities within the MWDOC service area on February 28, 2011 to inform that MWDOC is in the process of preparing an updated UWMP (Appendix F).

Groundwater Management Agencies **-** MWDOC also worked with the following five agencies to obtain information for the five groundwater basin resources in its service area: OCWD for Lower Santa Ana River Basin, SJBA for San Juan Basin, City of La Habra for La Habra Basin, City of San Clemente for San Mateo Basin, and LBCWD for Laguna Canyon Basin. Details of the basin information are described in Section 2.2.1.

Metropolitan Water District of Southern California **-** As a member agency of Metropolitan, MWDOC participated in workshops hosted by Metropolitan to facilitate the information exchange for the development of this Plan.

MWDOC also worked with Metropolitan staff to develop demand projections using data from SCAG.

Wastewater Management Agencies **-** To meet the requirements of the Act in the preparation of this Plan, MWDOC contacted individual wastewater collection and treatment providers and other water agencies within MWDOC's service area for data on recycled water and associated projects in the region. The information MWDOC obtained was then combined with a review of several completed Orange County studies. MWDOC also reviewed operating information and interviewed staff from individual agencies. The information MWDOC obtained from wastewater collection and treatment providers allows the Plan to describe wastewater disposal methods, treatment levels, discharge volumes, and recycled use in the region.

8.4. UWMP Submittal

8.4.1. Review of Implementation of 2005 UWMP

As required by California Water Code, MWDOC 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 wholesaler, MWDOC did not contain a specific implementation plan its 2005 UWMP. However, as a signatory to the MOU regarding urban water use efficiency, MWDOC's commitment to implement BMP-based water use efficiency program continues today. For MWDOC'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 2010 for MWDOC's service area are about 25% less than previously forecasted for 2010 in the 2005 UWMP, as illustrated in Table 6-6.

8.4.2. Adoption and Filing of 2010 UWMP

Members of the Board of Directors reviewed the Final Draft Plan in June 2011 at the Planning and Operations Committee meeting. The Committee recommended that the Board of Directors approve the 2010 RUWMP at its June 15, 2011 meeting. The seven-member MWDOC Board of Directors approved the 2010 RUWMP at its June 15, 2011 meeting. See Appendix H for the resolution approving the Plan.

By July 15, 2011, the Adopted 2010 MWDOC RUWMP was filed with DWR, California State Library, County of Orange, and cities within MWDOC's service area. MWDOC will make the plan available for public review no later than 30 days after filing with DWR.

Appendices

A. Urban Water Management Planning Act of 1983, as amended
B. Basis of Water Year Data for Single Dry and Multiple Dry Year Hydrologies
C. California Urban Water Conservation Council BMP Implementation Report 2009-10 for MWDOC
D. Urban Water Management Plan Checklist
E. MWDOC Water Shortage Allocation Plan
F. Letters of Notification of Intent to Update UWMP sent to member agencies
G. Notice of Public Hearing
H. Resolution of Adoption of MWDOC 2010 RUWMP
I. Orange County 20x2020 Regional Alliance Letter

Appendix A

Urban Water Management Planning Act of 1983, as amended

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

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

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

WATER CODE
SECTION 10610-10610.4

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10611-10617

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10620-10621

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10630-10634

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

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

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

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

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

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

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

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

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

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

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

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

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

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

(B) Residential plumbing retrofit.

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

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

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) Compliance on an individual basis.

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

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

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

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

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

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

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

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

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

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

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

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

sequence for the agency's water supply.

(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(6) Penalties or charges for excessive use, where applicable.

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's

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

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

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

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

WATER CODE SECTION 10635

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

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

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

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

WATER CODE
SECTION 10640-10645

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10650-10656

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

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

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

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

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

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

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

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

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

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

Appendix B

Basis of Water Year Data for Single Dry and Multiple Dry Year Hydrologies

Demand "Bump" Factors for 2010 UWMP
Description of Methodology

Water agencies must develop estimates of the impacts of single dry years (Single-Dry) and multiple consecutive dry years (Multiple-Dry) on both supplies and demands in future years. In these cases, demands increase somewhat above the normal or average level. The increase can be expressed as a percent "bump" up from the normal level. For example, if dry year demand was 105 percent of normal, this would be a 5% "bump". As the methodology to estimate the Single-Dry and Multiple-Dry "bumps" was developed, several issues needed to be decided, as follows:

1. The methodology used existing data from MWDOC records for each agency, to allow the estimates to reflect the characteristics and differences of demands relative to the makeup of each retail entity. The overall MWDOC estimate was developed from a weighted sum of all of OC's agencies.

2. Total potable demands, including agricultural demands, were used to derive the "bumps" because Orange County agencies have opted to have water that is used for agricultural uses be considered as full service demands. Non-potable demands are included; these demands will be met with non-potable supplies.

3. The methodology focused on per-capita usage (in units of AF/capita) because this removes the influence of growth from the analysis. Overall population growth in Orange County has been about 1% per year over the past two decades, creating about a 20% increase in demand over two decades. Some of the agencies have had even higher growth.

4. The period that was used for the analysis was limited to FY 1992-93 thru FY 2008-09 because fiscal years 1991-92 and 2009-10 were years of extraordinary conservation-- pricing disincentives for using over the allocated amounts were implemented in order to curtail demands-- and so these years were not considered. The Orange County total per-capita water usage in the period FY 1992-93 thru FY 2008-09 is plotted in Figure 1. Per-capita water use in Orange County has been on a decreasing trend in recent years as shown by the trend line in Figure 1. The downward trend is likely due to water use efficiency efforts, principally the plumbing codes since 1992 that have required low-flush toilets in all new construction and prohibited the sale of high-flush toilets for replacement purposes. Because of this drop in per-capita usage over time, the more recent data is a better predictor of future usage than the earlier data. Therefore, we narrowed the focus to the period FY 2001-02 thru FY 2008-09.

5. **Single-Dry "Bump" Methodology:** Per-capita usage for each participant agency from FY 2001-02 thru FY 2008-09 is shown in Table 1. The Single-Dry Bump for each agency was derived using the highest per-capita usage in the period, divided by average per-capita usage for that period. Because of suspect data for Fountain Valley and Santa Ana, the highest year data was eliminated and the second-highest usage in the period was used (when data was suspect, it was also removed from the average for the agency). The resulting Single-Dry "bumps" are shown in Table 2. The OC-average Single-Dry "bump" came to 6.6%

6. **Multiple-Dry "Bump" Methodology:** DWR guidelines recommend that "multiple" years is three years. There are various methods that can be used to derive demand "bumps" for those three years. The same "bump" can be used for all three years, or different "bumps" can be assumed for each of the three years. A pattern can be selected based on historical demand data or on historical water supply data or on another basis. MWDOC selected a Multiple-Dry Bump as the same as the Single-Dry Bump for each agency. This means having three highest-demand years in a row. This is conservative because it would be extremely unlikely for three driest years to occur in a row. However, it should be noted that future demand in any particular year depends on other factors in addition to rainfall, such as the economic situation, and cloudiness, windiness, etc. The OC-average Multiple-Dry "bump" came to 6.6%.

Figure 1
Per-Capita Water Use in Orange County (AF/person)

FY Ending	OC Actual AF/person	Least Sq AF/person	approx high	approx "bump"
1993	0.223327	0.233	0.250	7%
1994	0.223528	0.232		
1995	0.221986	0.230		
1996	0.235919	0.229		
1997	0.244071	0.228		
1998	0.217014	0.226		
1999	0.228797	0.225		
2000	0.242408	0.224		
2001	0.223537	0.222		
2002	0.228534	0.221		
2003	0.214602	0.219		
2004	0.222155	0.218		
2005	0.204941	0.217		
2006	0.207720	0.215		
2007	0.223599	0.214		
2008	0.211873	0.212		
2009	0.202396	0.211	0.225	7%

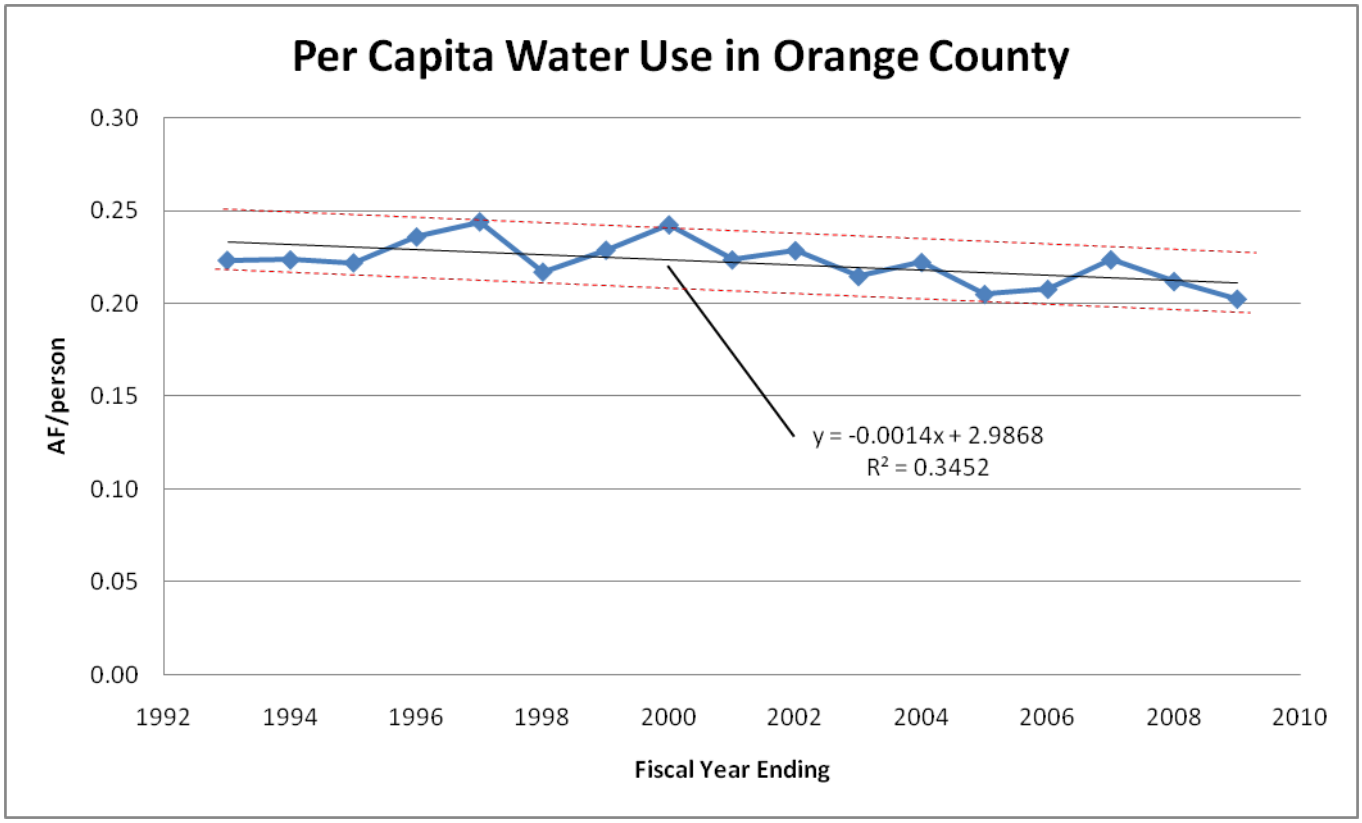

Table 1. Per-Capita Retail Water Usage by Retail Water Agency [1] [2]

Fiscal Year ->	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
				Per Capita Retail Water Usage (AF/person)				
Anaheim	0.23388	0.21670	0.22093	0.20607	0.21017	0.21904	0.20874	0.20535
Brea	0.31745	0.28299	0.31137	0.28272	0.28176	0.31149	0.28878	0.26105
Buena Park								
EOCWD RZ	0.34623	0.32741	0.34728	0.31581	0.31216	0.34414	0.32935	0.31842
El Toro WD	0.23504	0.24329	0.23768	0.21380	0.21395	0.23502	0.22276	0.20742
Fountain Valley	0.19414	0.19499	0.21067	0.20289	0.19759	0.22628	0.21428	0.20206
Fullerton	0.25174	0.23968	0.24862	0.23148	0.23355	0.24431	0.23200	0.22367
Garden Grove	0.17982	0.17299	0.18121	0.17084	0.16817	0.17683	0.16666	0.15584
Golden State WC								
Huntington Beach								
Irvine Ranch WD								
La Habra	0.18352	0.17541	0.17917	0.16891	0.16716	0.17534	0.16598	0.15924
La Palma	0.17332	0.16959	0.17092	0.15831	0.15915	0.16252	0.15741	0.15160
Laguna Beach CWD								
Mesa Consolidated WD	0.20205	0.20005	0.20432	0.19330	0.20014	0.21143	0.19564	0.18117
Moulton Niguel WD	0.26103	0.24574	0.25153	0.22990	0.23678	0.26573	0.25195	0.23988
Newport Beach	0.27970	0.27706	0.28054	0.27020	0.26973	0.28798	0.27601	0.26185
Orange, City of	0.25420	0.24299	0.25335	0.23768	0.23599	0.25638	0.24925	0.23778
San Clemente	0.22226	0.20529	0.20966	0.18725	0.20964	0.22448	0.21330	0.19993
San Juan Capistrano	0.25737	0.24507	0.26582	0.23717	0.22761	0.25485	0.24981	0.24732
Santa Ana	0.14403	0.13553	0.13783	0.12859	0.12696	0.13272	0.12272	0.11599
Santa Margarita WD	0.26168	0.24591	0.26204	0.22419	0.24521	0.27239	0.25213	0.23912
Seal Beach	0.17660	0.17184	0.17613	0.16320	0.16040	0.17078	0.15888	0.15671
Serrano WD								
South Coast WD	0.22187	0.21471	0.22117	0.21229	0.20465	0.22881	0.21979	0.20822
Trabuco Canyon WD								
Tustin	0.21772	0.20203	0.20990	0.19717	0.19694	0.21117	0.19918	0.18841
Westminster								
Yorba Linda WD	0.33796	0.31662	0.33612	0.29541	0.30992	0.34175	0.32562	0.30674
average of OC agencies	0.22853	0.21460	0.22215	0.20494	0.20772	0.22360	0.21187	0.20240

[1] Retail water usage (includes recycled water and Agricultural usage) divided by population.
[2] Population is for Jan. 1 of each fiscal year ending. Source: Center for Demographic Research, CSU Fullerton.

Table 2
Demand Increase "Bump" Factors for Single Dry Years and Multiple Dry Years
for OC Water Agencies participating in MWDOC's 2010 UWMP group effort

	Single	Multiple	
Anaheim	8.7%	8.7%	
Brea	8.6%	8.6%	
Buena Park	6.7%	6.7%	[1]
EOCWD RZ	5.2%	5.2%	
El Toro WD	7.6%	7.6%	
Fountain Valley	5.9%	5.9%	
Fullerton	5.7%	5.7%	
Garden Grove	5.6%	5.6%	
Golden State WC	4.7%	4.7%	[1]
Huntington Beach	8.3%	8.3%	[1]
Irvine Ranch WD	6.7%	6.7%	[1]
La Habra	6.8%	6.8%	
La Palma	6.4%	6.4%	
Laguna Beach CWD	9.1%	9.1%	[1]
Mesa Consolidated WD	6.5%	6.5%	
Moulton Niguel WD	7.2%	7.2%	
Newport Beach	4.6%	4.6%	
Orange, City of	4.2%	4.2%	
San Clemente	7.4%	7.4%	
San Juan Capistrano	7.1%	7.1%	
Santa Ana	7.2%	7.2%	
Santa Margarita WD	8.8%	8.8%	
Seal Beach	5.9%	5.9%	
Serrano WD	6.0%	6.0%	[1]
South Coast WD	5.7%	5.7%	
Trabuco Canyon WD	7.8%	7.8%	[1]
Tustin	7.3%	7.3%	
Westminster	4.6%	4.6%	[1]
Yorba Linda WD	6.4%	6.4%	
OC Average	6.6%	6.6%	weighted average of all OC water agencies

[1] This agency is not participating in MWDOC's 2010 UWMP group effort.

Appendix C

California Urban Water Conservation Council BMP Implementation Report 2009-10 for MWDOC

Enter District ID No.	168

Data File Name	BASE Year	2009WBMP1.1	2010 WBMP1.1	2009 BMP 1.2	2010 BMP 1.2	2009 BMP 1.3	2010 BMP 1.3

CUWCC BMP COVERAGE REPORT FOR WHOLESALE AGENCIES

Foundation Best Management Practices for Urban Water Efficiency

Agency: Municipal Water District of Orange County **District Name:** Municipal Water District of Orange County **CUWCC Unit #:** 168

Primary Contact Joe Berg **Email:** jberg@mwdoc.com

Base Year: Calendar or FiscalYear Reporting Report Date: 27-May-11

Foundational BMPs

BMP 1.1.3 Wholesale Agency Assistance Programs

Date of 2009 Data Download June 7, 2011

Date of 2010 Data Download June 7, 2011

a) Financial investments and building partnerships Value of resources provided to retailers for: **2009**	**2009 Monetary Amount for Financial Incentives**	**2009 Monetary Amount for Equivalent Resources**
Financial Investments and Building Partnr	$ 1,164,921	no data
Technical Support	no data	$ 82,533
Program Management	no data	$ 467,687
Water Shortage Allocation	no data	$ 27,511
Non Signatory Reporting	no data	$ 44,018
Encourage CUWCC Membership	$ 35,052	$ 11,004
Total Value of Resources	$ 1,199,973	$ 632,753
		On Track

"On Track" if Retailer accepted offer and Wholesaler provided resources. "Not on Track" if Retailer accepted offer and Wholesaler did not provde resources.

a) Financial investments and building partnerships Value of resources provided to retailers for: **2010**	**2010 Monetary Amount for Financial Incentives**	**2010 Monetary Amount for Equivalent Resources**
Financial Investments and Building Partnership	$ 2,027,677	no data
Technical Support	no data	$ 97,154
Program Management	no data	$ 355,386
Water Shortage Allocation	no data	$ 25,385
Non-signatory Reporting	no data	$ 40,616
Encourage CUWCC Membership	$ 35,052	$ 10,154
Total Value of Resources	$ 2,062,729	$ 528,695
		On Track

Agency: **Municipal Water District of Orange County** **District Name:** **Municipal Water District of Orange County** **CUWCC Unit #:** **168**

	2009 Technical Support Description	2010 Technical Support Description	
b) Technical Support	As a regional wholesaler of imported water to 28 retail agencies, MWDOC provides technical support in a variety of ways including program evaluation, program development, grant writing, BMP Reporting, Landscape and Water Shortage Contingency Plan models, and staff training. A document providing suplemental information for sections a through f of this form is provided called "BMP1-1Operations Practices-2009-Wholesaler.docx"	As a regional wholesaler of imported water to 28 retail agencies, MWDOC provides technical support in a variety of ways including program evaluation, program development, grant writing, BMP Reporting, Landscape and Water Shortage Contingency Plan models, and staff training. A document providing suplemental information for sections a through f of this form is provided called "BMP1-1Operations Practices-2009-Wholesaler.docx"	" On Track" if Retailer accepted and Wholesaler provided and described Technical Support
	On Track	**On Track**	

2009		2010		
c) Retail Angency	**Programs Managed for Retailers**	**c) Retail Angency**	**Programs Managed for Retailers**	
All MWDOC agencies	Industrial Process Water Use Reduction	All MWDOC agencies	Industrial Process Water Use Reduction	
All MWDOC agencies	Hotel Water Use Reduction Program	All MWDOC agencies	Hotel Water Use Reduction Program	
All MWDOC agencies	Landscape Performance Certification Program	All MWDOC agencies	Landscape Performance Certification Program	" On Track" if Retailer accepted and Wholesaler provided and lists programs managed for retailers
All MWDOC agencies	SmarTimer Rebate Program	All MWDOC agencies	SmarTimer Rebate Program	
All MWDOC agencies	Sprinkler Nozzle Rebate Program	All MWDOC agencies	Sprinkler Nozzle Rebate Program	
All MWDOC agencies	High Efficiency Clotheswasher Rebate Progra	All MWDOC agencies	High Efficiency Clotheswasher Rebate Program	
All MWDOC agenci	School Education Program	All MWDOC agencies	School Education Program	
	On Track		**On Track**	

	2009		2010	
d) Water Shortage Allocation				
Has Water shortage plan or policy been adopted?	May 15, 2009	Adoption Date	May 15, 2009	"OnTrack" if plan /policy adopted and document provided. "Not on Track" if no water shortage plan or policy adopted or document not provided.
	7-1a Board Action -Allocation Implementation (MKB Redline).docx	File Name	7-1a Board Action -Allocation Implementation (MKB Redline).docx	
	On Track		**On Track**	
e) Non signatory Reporting of BMP implementation by non-signatory agencies	P&O Tbls - Katie.xls		P&O Tbls - Katie.xls	Report if possible

f) Encourage CUWCC Membership	List Efforts to recruit retailers		
List Efforts to recruit retailers	2009 CUWCC Dues Sharing.xls	2010 CUWCC Dues Sharing.xls	"On Track" if efforts listed or dues paid.
	On Track	**On Track**	

Agency: Municipal Water District of Orange County **District Name:** Municipal Water District of Orange County **CUWCC Unit #:** 168

BMP 1.2 Water Loss Control

Date of 2009 Data Submittal: May 26, 2011
Date of 2010 Data Submittal: May 26, 2011

	2009	
Complete a prescreening Audit	No	On Track if Yes
Metered Sales AF	N/A	Metered sales to retail agencies
Verifiable Other Uses AF	N/A	
Total Supply AF	N/A	Into wholesale system
(Metered Sales + System uses)/ Total Supply >0.89	N/A	On Track if =>.89, Not on Track if No
If ratio is less than 0.9, complete a full scale Audit in 2009?	N/A	On Track if Yes
Verify Data with Records on File?	N/A	On Track if Yes
Operate a system Leak Detection Program?	N/A	On Track if Yes

See Wholesaler Report On Track

Comments: As a wholesale member agency of the Metropolitan Water District of Southern California, the Municipal Water District of Orange County does not own or operate a distribution system. Water is served directly from Metropolitan's distribution system to the distribution systems of MWDOCs member agencies.

For wholesalers AWWA methodology applies to supplies to wholesalers, sales to retail agencies or sub wholesalers, and pipelines operated by wholesalers. End use retail customers are not considered in this analysis.

	2010	
Compile Standard Water Audit using AWWA Software?	No	On Track if Yes, Not on Track if No
AWWA file provided to CUWCC?	No	On Track if Yes, Not on Track if No
AWWA Water Audit Validity Score?	N/A	Info only until 2012
Completed Training in AWWA Audit Method?	yes	Info only until 2012
Completed Training in Component Analysis Process?	No	Info only until 2012
Complete Component Analysis?	No	Info only until 2012
Repaired all leaks and breaks to the extent cost effective?	Yes	On Track if Yes, Not on Track if No
Locate and repair unreported leaks to the extent cost effective.	Yes	On Track if Yes, Not on Track if No
Maintain a record-keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes	Info only until 2012
Provided 7 types of Water Loss Control Info	N/A	info only until 2012

Leaks Repaire	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Interventions	Water Lost from Leaks AF
no data	$ -	$ -	0	No	$ -	no data

See Wholesaler Report On Track

Comments: As a wholesale member agency of the Metropolitan Water District of Southern California, the Municipal Water District of Orange County does not own or operate a distribution system. Water is served directly from Metropolitan's distribution system to the MWDOC member agnecy distribution systems.

Agency: Municipal Water District of Orange County **District Name:** Municipal Water District of Orange County **CUWCC Unit #:** 168

1.3 METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

Date of 2009 Data Submittal: May 26, 2011
Date of 2010 Data Submittal: May 26, 2011

	2009		2010		
Exemption requested?	No		No		
At least as Effective As Requested?	No		No		
Does Agency have Unmetered Deliveries to Retail Agencies or Other Wholesalers?	No		No		
Metered Accounts billed by volume of use	Yes	On Track	Yes	On Track	Volumetric billing required for all connections on same schedule as metering
Completed a written plan, policy or program to test, repair and replace meters	No	On Track	No	On Track	On Track if Yes, Not on Track if No

Comments: As a wholesale member agency of the Metropolitan Water District of Southern California, the Municipal Water District of Orange County does not own or operate a distribution system including water meters. Water is served directly from Metropolitan's distribution system to the MWDOC member agnecy distribution systems. Metropolitan owns the meters. MWDOC relies on Metropolitan to test, calibrate and repair meters. As a result,

Enter District ID No.	168

Agency Row #	37	34	#N/A	34
Data File Name	2009 BMP2.1	2010 BMP2.1	2009 BMP2.2	2010 BMP2.2

CUWCC BMP COVERAGE REPORT FOR WHOLESALE AGENCIES

Foundation Best Management Practices for Urban Water Efficiency

Agency: **Municipal Water District of Orange County**
WHOLESALE Water Supplier

District Name: **Municipal Water District of Orange County**

CUWCC Unit #: **168**

Coverage Report Date: May 19, 2011

Primary Contact Joseph Berg

Email: jberg@mwdoc.com

BMP 2. EDUCATION PROGRAMS

date 2009 datafile downloaded: May 26, 2011
date 2010 datafile downloaded: May 26, 2011

BMP 2.1 Public Outreach Actions Implemented and Reported to CUWCC

	2009	2010
1) Contacts with the public (minimum = 4 times per year)	91	98
2) Water supplier contacts with media (minimum = 4 times per year, i.e., at least quarterly).	74	93
3) An actively maintained website that is updated regularly (minimum = 4 times per year, i.e., at least quarterly).	Yes	Yes
4) Description of materials used to meet minimum requirement.	Newsletter articles on conservation Website Flyers and/or brochures (total copies), bill stuf General water conservation information Landscape water conservation media campai News releases Newspaper contacts Articles or stories resulting from outreach	Newsletter articles on conservation Flyers and/or brochures (total copies), bill stuff Website General water conservation information Landscape water conservation media campaig News releases Newspaper contacts Articles or stories resulting from outreach
5) Annual budget for public outreach program.	$ 60,000	$ 60,000
6) Description of all other outreach programs	0	0
	On Track for 6 Actions	On Track for 6 Actions

All 6 action types implemented and reported to CUWCC to be 'On Track')

Agency: **Municipal Water District of Orange County**
WHOLESALE Water Supplier

District Name: **Municipal Water District of Orange County**

CUWCC Unit #: **168**

Coverage Report Date: May 19, 2011
date 2009 datafile downloaded: May 26, 2011
date 2010 datafile downloaded: May 26, 2011

2.2 School Education Programs Implemented and Reported to CUWCC

	2009	2010	
Does this wholesale agency implement School Education Programs for Sub Wholesalers or Retail unility's benefit?	Yes	Yes	
Names of Sub Wholesale and Retail Agencies benefiting from Program?	Cities of: Anaheim, Brea, Buena Park, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, La Habra, La Palma, Orange, Newport Beach, San Clemente, San Juan Capistrano, Santa Ana, Seal Beach, Tustin, Westminster. Water District: East Orange County WD,	Cities of: Anaheim, Brea, Buena Park, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, La Habra, La Palma, Orange, Newport Beach, San Clemente, San Juan Capistrano, Santa Ana, Seal Beach, Tustin, Westminster. Water District: East Orange County	
1) Curriculum materials developed and/or provided by wholesale agency	Grade-specific water education assemblies featuring demonstrations, student participation, Q/A, review of learning objectives, lesson summary. Content aligned with State of California science content standards. For students in grades kindergarten-five.	Grade-specific water education assemblies featuring demonstrations, student participation, Q/A, review of learning objectives, lesson summary. Content aligned with State of California science content standards. For students in grades kindergarten-five.	All 5 actions types implemented and reported to CUWCC to be 'On Track'
2) Materials meet state education framework requirements and are grade-level appropriate?	Yes	Yes	
3) Materials Distributed to K-6?	Yes	Yes	
Describe K-6 Materials	Grade-specific water education activity booklets featuring educational lessons and activities. Water conservation giveaway items including stickers and pencils.	Grade-specific water education activity booklets featuring educational lessons and activities. Water conservation giveaway items including stickers and pencils.	Describe materials to meet minimum requirements
Materials distributed to 7-12 students?	No	No	Info Only
4) Annual budget for school education program.	$ 345,527	$ 309,922	
5) Description of all other water supplier education programs	OC Water Hero Program, Annual Poster/Slogan Contest and Awards Ceremony, Water Festival, Community Events, Science Fair Judging, OC Water Camp, Solar Cup Competition.	OC Water Hero Program, Annual Poster/Slogan Contest and Awards Ceremony, Water Festival, Community Events, Science Fair Judging, OC Water Camp, Solar Cup Competition.	
	On Track	**On Track**	

Appendix D

Urban Water Management Plan Checklist

Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 8.3
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Appendix F
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 8.4
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 8.4
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 8.2
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Appendix G
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix I
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 8.4

No.	UWMP requirement a	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 8.4
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 8.4
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 1.3
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2.2.1
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M	Section 2.2.2
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.2.2
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2.2
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 2.4
2	Wholesalers: Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. Retailers: Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Section 2.4.4

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Not applicable
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 2.3
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 2.5
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 2.5.2
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 3.1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 3.3
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Not applicable
16	Describe the groundwater basin.	10631(b)(2)		Section 3.3
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Not applicable

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Not applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Not applicable
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 3.3.11
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 3.3.12
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 3.6 Section 7.2
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 7.3
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 7.4
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 6.1
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 6.2

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 6.2
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 6.3
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 6.4
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 6.4
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 6.5
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 6.5
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 3
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 3.7.1
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 3.7.2
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.2

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.3
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.4
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5.5
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5.5
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.5
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.6
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix E
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.7
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	Four years 2010, 2015, 2020, 2025, and 2030	Section 3.7.2.1

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 3.7.3 Section 3.7.4 Section 3.7.5
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Appendix C Section 4
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Appendix C Section 4
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Appendix C Section 4
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Not applicable
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not applicable

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review

Appendix E

MWDOC Water Shortage Allocation Plan

Municipal Water District of Orange County

Water Supply Allocation Plan

January 2009

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Section 1: Introduction

The Municipal Water District of Orange County (MWDOC) is dedicated to ensuring water reliability for the communities we serve. Hundreds of thousands of Orange County residents have taken advantage of our water conservation rebates to install water saving toilets, clothes washers, and other water saving devices. We continue to partner with our client agencies to develop new local supplies such as recycled water, brackish water desalting, ocean water desalination, and the Groundwater Replenishment System.

However, a combination of water supply challenges have brought about the possibility that MWDOC may not have access to the imported supplies necessary to meet the demands of its client agencies in the coming years. The following factors have dramatically impacted water supply conditions not only in Orange County, but all of Southern California:

- In 2007 many areas of California experienced the driest year on record. California received below average rainfall again in 2008. On June 4, 2008, Governor Schwarzenegger proclaimed a statewide drought.

- The Colorado River experienced the driest 9 years in over a century. Reservoirs along the river are less than half full. Supplies from this source have been reduced since 2003 and will continue to be limited.

- A federal court ruling in late 2007 to protect a threaten fish species, the Delta Smelt, has resulted in the largest court-ordered water transfer restrictions in State history. Pumping from the Sacramento-San Joaquin River Delta (Delta) to the State Water Project has been reduced by up to 30 percent and will remain restricted until permanent solutions can be approved and constructed. Threats to additional Delta species, including Longfin Smelt, could result in further pumping restrictions.

To meet the imported water demands of its member agencies, the Metropolitan Water District of Southern California (MET) is quickly withdrawing supplies from surface and groundwater storage. Over the past two years, MET has drawn down half of its available reserve.

The recent dry conditions and the uncertainty about future supplies from the State Water Project have raised the possibility that MET will not have access to the supplies necessary to meet the imported water demands of its member agencies. As a result, MET has developed a Water Supply Allocation Plan that allocates wholesale imported water supplies among its 26 member agencies throughout Southern California.

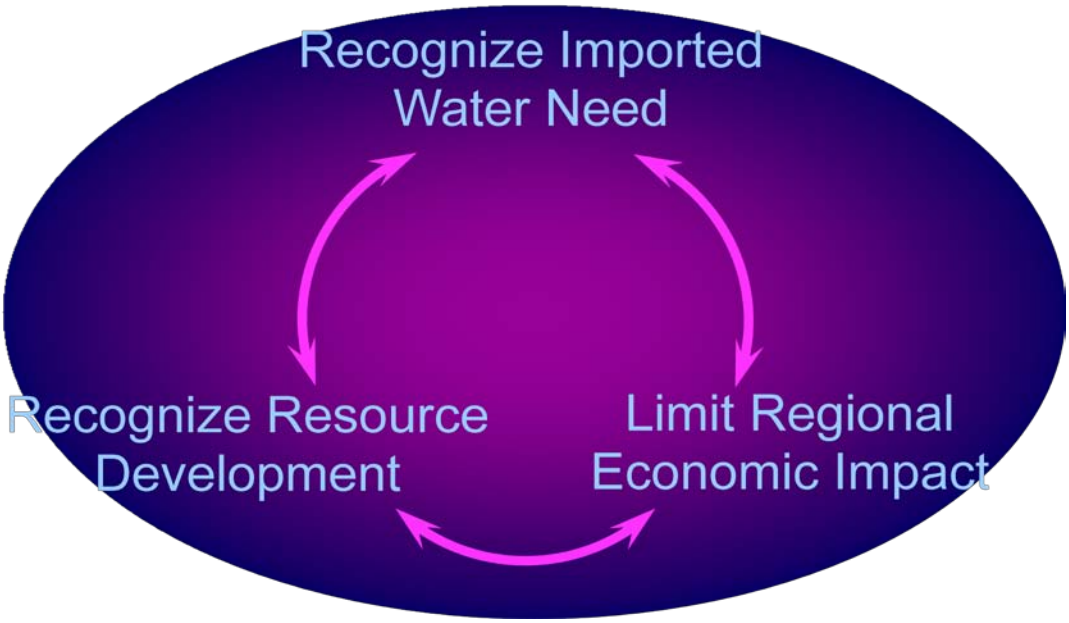
To prepare for the possibility of an allocation of imported water supplies from MET; MWDOC has worked in collaboration with its 28 client agencies to develop this Water Supply Allocation Plan to allocate imported water supplies at the retail level. This document lays out the essential components of how MWDOC plans to determine and implement each agency's allocation during a time of shortage.

Section 2: Metropolitan Water District's Water Supply Allocation Plan

In February 2008, MET approved a Water Supply Allocation Plan (WSAP) designed to distribute imported water to all of its member agencies during a shortage. The WSAP follows the principles and considerations identified in MET's Water Surplus and Drought Management Plan, which calls upon the allocation of water in a fair and equitable manner to all of Metropolitan's member agencies. To the extent possible, this means developing a plan that minimizes regional hardship during times of shortage.

The Metropolitan WSAP seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level. To achieve this, it takes into account:

- The impact on retail customers and the economy
- Allowance for population and growth
- Change and/or loss of local supply
- Reclamation/Recycling
- Conservation
- Investments in local resources
- Participation in MET's interruptible programs
- Investments in MET's facilities



The WSAP states that MET staff will go before the Board with a recommendation in April, from which the Board of Directors will make a determination on the level of the Regional Shortage. If the Board determines allocations are necessary they will go into effect in July and remain for a twelve-month period. *Note: This schedule is at the discretion of the Metropolitan Board, and is subject to change.*

The recommendation to declare a regional shortage will be based upon water supply availability from the State Water Project, the Colorado River Aqueduct, and the amount of surface and groundwater storage remaining in Metropolitan's reserves. It will also take into account the implementation of MET's water management actions i.e. Five Year Water Supply Plan, extraordinary conservation efforts, the acceleration of local resource projects, and the purchases of water transfers.

A full copy of MET's Draft Water Supply Allocation Plan is available in Appendix B.

Section 3: Development Process

In preparation for possible allocation of imported water supplies from MET, MWDOC's Board first adopted the following policy principles to help guide staff and the client agency technical workgroup to develop a plan that is fair and equitable for everyone within its service area:

- **Seek best allocation available from MET**
- **Develop MWDOC Plan in collaboration with client agencies**
- **When reasonable, use similar method/approach as MET**
- **When MET's method would produce significant unintended result, use an alternative approach**
- **Develop accurate data on local supply, conservation, recycling, rate structures, growth and other relevant adjustment factors**
- **Seek opportunities within MWDOC service area to provide mutually beneficial shortage mitigation**

Client Agency Input

Between the months of July and December of 2008, MWDOC staff worked cooperatively with the client agencies through a series of technical workgroups to develop a formula and implementation plan to allocate imported supplies in the event that MET declares a regional shortage. These workgroups provided an arena for in-depth discussion of the objectives, mechanics, and policy aspects of the different parts of the Plan. MWDOC staff also met individually with a number of client agencies for detailed discussions on elements of the Plan. The discussions, suggestions, and comments expressed by the client agencies during this process played a key part in the development of this Plan.

The following MWDOC client agencies participated in the Technical Workgroup:

- **City of Brea**
- **City of Buena Park**
- **City of Fountain Valley**
- **City of Garden Grove**
- **City of Huntington Beach**
- **City of La Habra**
- **City of La Palma**
- **City of Newport Beach**
- **City of Orange**
- **City of San Clemente**
- **City of San Juan Capistrano**
- **City of Seal Beach**
- **City of Tustin**
- **City of Westminster**
- **East Orange County Water District**
- **El Toro Water District**

- **Golden State Water Co.**
- **Irvine Ranch Water District**
- **Laguna Beach County Water District**
- **Mesa Consolidated Water District**
- **Moulton Niguel Water District**
- **Orange County Water District**
- **Santa Margarita Water District**
- **South Coast Water District**
- **Trabuco Canyon Water District**
- **Yorba Linda Water District**

In addition to the workshops, individual meetings were held between MWDOC staff and the following MWDOC client agencies to address more specific and agency-related questions:

Table 3.1: Client Agency Meetings

Agency	Date
East Orange County Water District	8/25/2008
El Toro	9/3/2008
City of Huntington Beach	9/4/2008
East Orange County Water District	9/18/2008
Golden State Water Company	9/25/2008
City of Orange	9/26/2008
Trabuco Canyon Water District	9/30/2008
San Juan Capistrano	10/1/2008
Irvine Ranch Water District	10/6/2008
City of Seal Beach	10/8/2008
City of Tustin	10/15/2008
Yorba Linda Water District	10/16/2008 & 10/22/08
City of Garden Grove	10/20/2008
City of San Juan Capistrano	10/28/2008
East Orange County Water District & City of Tustin	11/25/2008
Santa Margarita Water District	12/11/2008

These individual meetings provided MWDOC staff with a great deal of insight on exactly how a retail agency would implement allocations at the customer level. Such information was extremely valuable in our regional discussion at MET and in the development of this Plan.

Board of Directors Input

Throughout the Plan's development process, the MWDOC Board of Directors was provided with regular progress reports on the status of the Plan and the technical workgroup discussions. During the months the Plan was being developed, the Planning and Operations Committee was kept apprised of key issues regarding MET's and

MWDOC's allocation plan. Moreover, the Committee played an integral part in the development of key implemental issues such as the appeal process and the penalty rate structure.

Section 4: Water Supply Allocation Formula

The MWDOC Water Supply Allocation Model follows five (5) basic steps to determine an agency's imported supply allocation:

- Step 1: Determine Baseline Information
- Step 2: Establish Allocation Year Information
- Step 3: Assess the Shortage Reduction Stage (Based on MET's Declared Shortage Level)
- Step 4: Apply Allocation Adjustments and Credits in the areas of retail impacts, conservation, and the interim agriculture water program
- Step 5: Sum total allocations and determine retail reliability

A description of how the calculation is used in each step is described below:

Step 1 – Determine Baseline Information

In order to determine a client agency's retail demands and imported supply needs in the allocation year, the model needs to establish a historical base period for water supply and delivery data. The base period for each of the different categories of demands and supplies is calculated using data from the last three non-shortage years (calendar years 2004, 2005, and 2006).

The following is a description of the base period calculations:

Base Period Local Supplies: Local supplies for the base period are calculated using a three-year average (from calendar years 2004, 2005, and 2006) of groundwater production, groundwater recovery, surface water production, and other non-imported supplies. *Note: Recycled water production is not included in this calculation to address the impact of demand hardening due to recycled water use.*

Base Period Wholesale ("Imported") Firm Demands: Firm demands on MWDOC for the base period are calculated using a three-year average (from calendar years 2004, 2005, and 2006) of full-service, seawater barrier, seasonal shift, and surface storage operating agreement demands.

Base Period In-lieu Deliveries: Base period in-lieu deliveries to client agencies are calculated using a three year average (from calendar year 2004, 2005, and 2006) of In-lieu deliveries to long-term groundwater replenishment, conjunctive use, cyclic, and supplemental storage programs. In-lieu deliveries are not calculated as imported supplies from MET. They are calculated as local supplies to account for the corresponding reduction in base year local production that was required to take In-lieu deliveries.

Base Period Retail Demands: Total retail municipal and industrial demands for the base period are calculated by adding the Base Period Local Supplies, Base Period Wholesale Imported Firm Demands, and Base Period In-Lieu Deliveries.

Base Period Interim Agricultural Water Program (IAWP) Deliveries: For those agencies that remain in the IAWP, the base period will be Fiscal Year 2003/04 IAWP deliveries. However, for those agencies[1] that opt-out of the program their IAWP baseline would be added to their imported firm demands baseline, after the growth adjustment has been applied.

Base Period Conservation: Conservation savings for the base period are calculated using modeled estimates of the most recent year's savings (in this case calendar year 2006) from active, passive, and avoided system losses. Note that this is different than other Base period calculations, which used three-year averages. This is because, for demand hardening purposes, it is preferable to use the most recent estimate of installed water savings as opposed to a three-year average. Due to the complexity in determining each client agency's conservation savings, MWDOC has determined an alternative approach which is described in Step 4.

Step 2 – Establish Allocation Year Information

In this step, the model adjusts for each member agency's water need in the allocation year. To do so, it adjusts the base period estimates for increased water demand i.e. growth and gains/losses in local supplies.

The following is a description of how the allocation year information is established:

Allocation Year Retail Demands: Total retail M&I demands for the allocation year are calculated by adjusting the Base Period Retail Demands for growth. The method in which MWDOC determines each client agency's growth is through population increases for the calendar years 2006 to 2008[2]. Based on the data received from California State University of Fullerton, Center for Demographic Research, MWDOC prorated each agency's population increase share to MWDOC's growth adjustment received from MET[3], as shown in Appendix C.

Allocation Year Local Supplies: Allocation year local supplies are calculated using the Base Year Local Supplies plus Base Period In-Lieu Deliveries and adjusting for any gains or losses in local supply, including extraordinary increases in local production, which is defined below. In-lieu deliveries are considered as local supplies to account for the corresponding reduction in base year local production that was required to take in-lieu deliveries. Gains/losses and extraordinary increases of local supply are also added to the Base Period local supplies to reflect a more accurate estimate of actual supplies in the allocation year, and in turn more accurately estimates an agency's demand for imported supplies. Below are more detailed descriptions of these categories:

---

[1] As of January 2009, the following MWDOC client agencies opt-out of the IAWP program: City of Brea, Irvine Ranch WD, City of San Juan Capistrano, Trabuco Canyon WD, and Yorba Linda WD.

[2] Although many options were discussed in the technical workgroup sessions, this option was chosen to best reflect the increase in water demand as due to population growth as intended by MWD's allocation formula for each client agency in the MWDOC service area.

[3] MET's growth adjustment is calculated by using the average of the last three year County-wide population growth rates, which include not only MWDOC's service area but also the Cities of Fullerton, Anaheim, and Santa Ana.

- *Gain of Local Supply Adjustment*: This adjustment accounts for planned or scheduled gains in local supply production above the base period, which are not due to extraordinary actions to increase water supply in the allocation year. Gains of local supply include increases in groundwater production that do not result in the mining of a groundwater basin, new brackish water treatment facilities, or increases to surface water supplies due to changes in hydrology. These are considered planned and scheduled increases in local supply production, which are added to the base period local supplies.

- *Loss of Local Supply Adjustment*: This adjustment accounts for losses of local supply production from the base period. Losses of local supply due to hydrology or water quality are subtracted from the Base Period Local Supplies. They cannot be used to cover IAWP shortages.

- *Extraordinary Increased Production Adjustment*: This adjustment accounts for extraordinary increases in local supplies above the base period. Extraordinary increases in production include such efforts as purchasing transfers or mining of groundwater basins. In order not to discourage such extraordinary efforts, only a percentage of the yield from these supplies is added back to Allocation Year Local Supplies in shortage level 3 and beyond as shown below. This has the effect of "setting aside" the majority of the yield for the agency who procured the supply. The percentage of the extraordinary increases in local supply corresponds according to the regional shortage level.

Table 4.1
Extraordinary Increased Production Adjustment

Regional Shortage Level	Regional Shortage Percentage	Extraordinary Increase Percentage
1	5%	0%
2	10%	0%
3	15%	15%
4	20%	20%
5	25%	25%
6	30%	30%
7	35%	35%
8	40%	40%
9	45%	45%
10	50%	50%

Step 3 – Calculate Initial Minimum Allocation Based on Declared Shortage Level

This step sets the initial allocation. After a regional shortage level is established, MWDOC will calculate the initial allocation as a percentage of adjusted Base Period Imported needs within the model for each client agency.

Shortage Levels: The model allocates shortages of supplies over ten levels: from 5 to 50 percent, in 5 percent increments.

Shortage Percentage: The maximum total regional shortage percentage of MWDOC's available supplies when compared to the sum of the demands in the allocation year.

Wholesale ("Imported") Supply Minimum Allocation: The Wholesale Minimum Allocation is established to ensure a minimum level of imported supplies. The Wholesale Minimum Allocation ensures that client agencies will not experience shortages on the wholesale level that are greater than one-and-a-half times the percentage shortage of Metropolitan's regional water supplies. As illustrated below, the Wholesale Minimum Allocation percentage is equal to 100 minus one-and-a-half times the shortage level. The allocation is based on each agency's demand of firm MET water.

Table 4.2
Wholesale ("Imported")
Supply Minimum Allocation

Regional Shortage Level	Regional Shortage Percentage	Wholesale Minimum Allocation
1	5%	92.5%
2	10%	85.0%
3	15%	77.5%
4	20%	70.0%
5	25%	62.5%
6	30%	55.0%
7	35%	47.5%
8	40%	40.0%
9	45%	32.5%
10	50%	25.0%

Step 4 – Assign Allocation Adjustments and Conservation Credit

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.

Retail Impact Adjustment: The Retail Impact Adjustment is the factor used to address major differences in retail level shortages associated with across-the-board cuts. The purpose of this adjustment is to ensure that agencies with a high level of dependence on MET do not experience highly disparate shortages compared to other agencies when faced with a reduction in imported supplies. The Retail Impact Adjustment factor is calculated as the difference between the Regional Shortage Percentage and the Wholesale Imported Minimum Allocation. The amount of the adjustment each client agency receives is prorated on a linear scale, based on its dependence on imported

water at the retail level. The prorated amount of allocation is referred to as the Retail Impact Adjustment Allocation. For agencies that are 100 percent dependent on MWDOC, this method will result in an allocation of MWDOC supplies that, at the retail level, will result in a shortage equal to the Regional Shortage Percentage. This adjustment is only applied when the regional shortage levels are 15 percent (level 3) or greater. Table 4.3 below illustrated the maximum adjustment an agency may receive according to the regional shortage level.

Table 4.3
Retail Impact Adjustment

Regional Shortage Level	Regional Shortage Percentage	Retail Impact Adjustment Maximum
1	5%	0.0%
2	10%	0.0%
3	15%	7.5%
4	20%	10.0%
5	25%	12.5%
6	30%	15.0%
7	35%	17.5%
8	40%	20.0%
9	45%	22.5%
10	50%	25.0%

Unfortunately, the Retail Impact Adjustment MWDOC receives from MET may be less than the total retail impact adjustment for its client agencies. To mitigate this difference, MWDOC decreased each client agency's retail impact adjustment according to their prorated share. However, in doing so the model ensures that no MWDOC client agency falls below the Wholesale Minimum Allocation Percentage Level, as illustrated in Table 4.2.

Conservation Demand Hardening Credit: The Conservation Demand Hardening Credit is used to address the increased difficulty in achieving additional water savings at the retail level due to implementation of conservation. The credit is calculated by multiplying an agency's quantified conservation savings (in acre-feet) by its estimated retail shortage percentage prior to applying the credit. Each agency's quantified conservation savings is calculated from a combination of the following categories:

- *Active Conservation* – The water savings from Water-Use Efficiency devices according to the most recent year data available (year 2006 is currently used within the model). MWDOC's database determines the amount of active conservation each client agency has saved.

- *Passive Conservation* – The water savings from code-based savings in new development and natural replacement of devices. A two-part calculation was used to determine each client agency's passive conservation savings. New development savings were determined by calculating the increase in retail service connections within each client agency's service area for the years 1993

to 2008; in order to incorporate the year that new plumbing codes were established. Natural replacement savings were calculated by prorating each agency's share of existing service connections for the year 1993; prior to new plumbing codes.

- *System Losses* –The water savings from reduced system flows as a result of conservation. This credit is prorated over the savings from the previous two categories.

A detailed description of each client agency's conservation savings and its method of calculation are shown in Appendix D.

Retail Water Rate Conservation: An additional credit will be given to those agencies that have a conservation rate structure. To qualify, a retail agency's rate structure must have at least two tiers of volumetric rates, with a price differential between the bottom and top tiers of at least 10 percent. Retail agencies must submit a report of the percentage of their total service area retail demand that is covered by a qualifying water rate structure to MWDOC prior to allocation implementation. Upon verification of the report by MWDOC and MET, the client agency will be given a credit of 0.5 percent of covered Base Period Retail Demand to be added to the Base Period Conservation estimate listed above.

Step 5 – Sum Total Allocations and Calculate Retail Reliability

This is the final step in calculating an 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.

Total Metropolitan Allocation: The allocation of imported supplies to an agency for its Municipal and Industrial retail demand is the sum of the Wholesale Imported Minimum Allocation, their Retail Adjustment, their Conservation Demand Hardening Credit, and IAWP Allocation (if applicable).

Interim Agricultural Water Program (IAWP) Allocation: In late 2008, the MET Board took action to phase out the IAWP. In doing so, the Board allowed participants in the program the options to either remain in the program until 2012 or opt-out with certain provisions. One such provision, as it relates to the allocation plan, is if an agency opts-out, their IAWP baseline would be added to their imported baseline, after the growth adjustment has been applied.

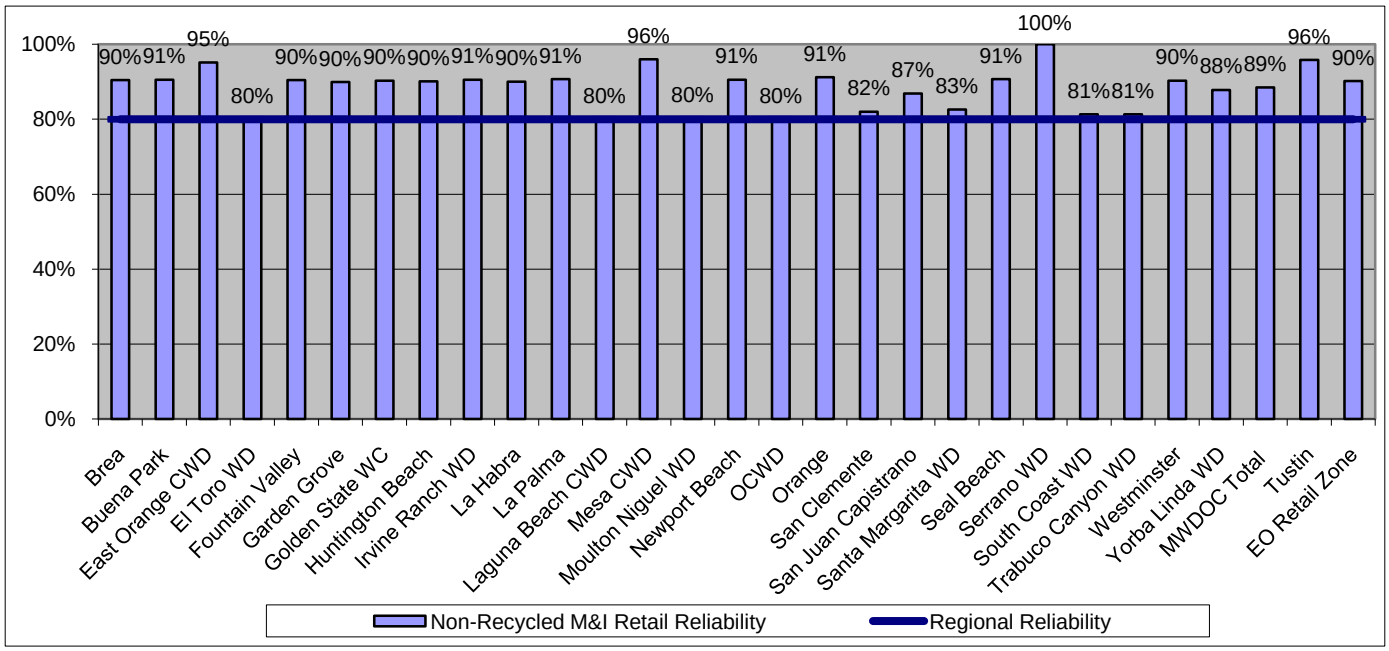
If an agency remains in the IAWP, their IAWP allocation will decrease according to the regional shortage level as illustrated below in Table 4.4

Table 4.4
Interim Agricultural
Water Program Allocation

Regional Shortage Level	Regional Shortage Percentage	IAWP Reduction
1	5%	30.0%
2	10%	30.0%
3	15%	40.0%
4	20%	50.0%
5	25%	75.0%
6	30%	90.0%
7	35%	100.0%
8	40%	100.0%
9	45%	100.0%
10	50%	100.0%

Agency's Retail Reliability: This calculates an agency's total MET allocation versus their allocation year retail demands to determine their overall reliability percentage (supplies as a percentage of retail demand) under a regional shortage level. This percentage excludes recycled water supplies from an agency's total water supply. Figure 4.1 illustrated the MWDOC client agencies' reliability percentages under a stage 4 regional shortage level (20%).

Figure 4.1
MWDOC's Water Supply Allocation Plan
Stage 4 with a Regional Shortage of 20%*



Source: MWDOC Allocation Model Version 1.5 and assumes a BPP of 58%.
[*] These are estimated reliability percentages for MWDOC client agencies under a regional shortage stage 4 (20%) and are subject to change based on local supply data received from the client agencies and OCWD's projected BPP for 2009/10.

Section 5: Plan Implementation

This section covers implementation issues which include: the appeal process, penalties rate structure and billing, tracking and reporting water usage, timeline and option to revisit the plan.

Allocation Appeals Process

The purpose of the appeals process is to provide client agencies the opportunity to request a change to their allocation based on new or corrected information. The grounds for appeal can include but are not limited to:

- Adjusting errors in historical data used in the Base period calculations
- Adjusting for unforeseen losses or gains in local supplies
- Adjusting for extraordinary increases in local supplies
- Adjusting for population growth rates
- Adjusting for credits with the Conservation base data, including Conservation Rate Structure

MWDOC anticipates that under most circumstances, a client agency's appeal will be the basis for an appeal to MET by MWDOC. MWDOC staff will work with client agencies to ensure that such an appeal is a complete and accurate reflection of the client agency's allocation and is properly reviewed by MET. To accomplish this, MWDOC will require the following information from the client agency submitting an appeal:

- Written letter (in the form of a letter or e-mail) from the client agency requesting an appeal
- Brief description of the type of appeal e.g. incorrect base data, loss/gain in local supply, extraordinary increase in local supply, adjustment in agency's conservation base data, or other
- Rationale for the appeal
- Quantity in acre-feet in question
- Verifiable documentation that supports the rationale i.e. billing statements, invoices for conservation device installations, Groundwater reports

To provide clarity of the process and ensure your appeal is properly handled, the following steps will occur:

Step 1 – Submit Appeal – Client agency will submit the necessary information, described above, to MWDOC.

Step 2 – Notification of Response and Appeal Meeting – Once MWDOC staff receives the appeal information, MWDOC will send a response and schedule a meeting with MWDOC staff and the client agency, within two weeks of receiving the information, to discuss the appeal in further detail.

Step 3 – Submittal to MET & MWDOC Board Notification – Using the information received from the client agency, MWDOC will prepare and submit the appeal to MET no later than one month of receiving the information. In addition, MWDOC staff will notify its Board of the submittal to MET.

Step 4 – MET Appeal Process - MWDOC will follow the terms of MET's appeal process, as described in Appendix B. Client agencies will also be invited, as deemed appropriate, by MWDOC to attend any meetings with MET on their appeal.

Step 5 –Client Agency Notification of MET's Decision – Once MET has made a determination of the appeal, MWDOC staff will notify the client agency of the decision and determine if additional actions are needed i.e. Appeal to MET board.

In the event that MET denies the appeal, MWDOC staff will continue to work with the appealing agency to resolve their issue(s). Any action that will result in adjustments to client agency' allocation will be submitted to the Board for review and approval.

Allocation Penalty Rates & Billing

Metropolitan's Penalty Rates

Metropolitan will enforce its allocations through a tiered penalty rate structure. MET will assess penalty rates to a member agency that exceeds its total annual allocation at the end of the twelve-month allocation period, according to the rate structure below:

Table 5.1: Metropolitan Water District Allocation Penalty Rate Structure (FY2009/10 Rates)*

Water Use up to:	(1) Base Rate	(2) Penalty Rate**	(1)+(2) = Total Rate
100% Allocation	Tier 1 ($701/AF)	-	**$701/AF**
100% < = 115%	Tier 1 ($701/AF)	2 x Tier 2*** (1,188/AF)	**1,889/AF**
Use > 115%	Tier 1 ($701/AF)	4 x Tier 2*** (2,376/AF)	**3,077/AF**

[*] These are based on MET's adopted rate and charge increases for FY2009/2010.
[**] If MWDOC exceeds its allocation limit but is within its equivalent preferential right amount, MET will decrease the penalty rate by one level.
[***] The Tier 2 penalty rate excludes the treatment surcharge

These penalty rates will be assessed according to MET water rates in effect at the time of billing. Any penalty funds collected by MET will be invested back to the MET member agency through conservation and local resource development.

MWDOC Penalty Rates

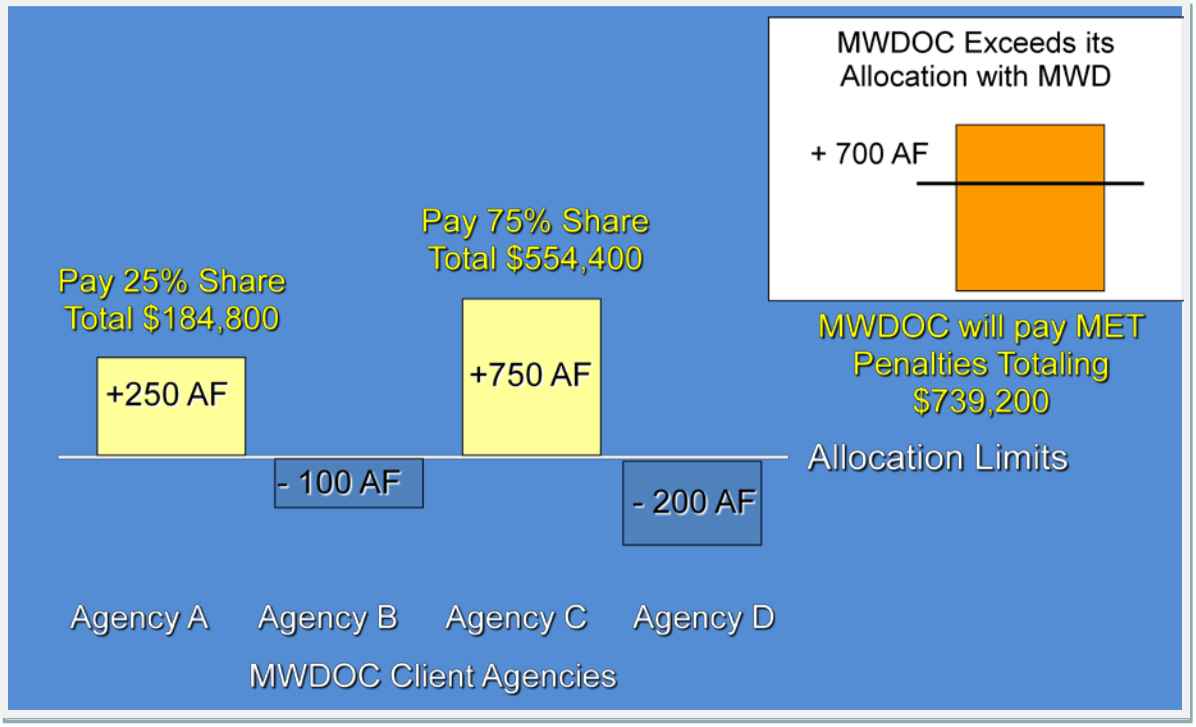
As a water wholesaler, MWDOC has the opportunity to assess penalties in many different ways. A number of options were discussed and analyzed with the client

agencies and Board Committee members. The key components that helped guide development of a penalty structure included:

- A financial incentive to discourage water usage above a client agency's allocation
- A penalty rate structure that is administratively easy to understand and implement
- Penalty rates that are fair and appropriate during a shortage

From these components and input received from both the MWDOC Board and the client agencies, a melded penalty rate structure was recommended. This was mainly due to its "region-wide" style approach and similar structure to other MWDOC rates and charges.

Melded Penalty Rate Structure – At the end of the allocation year, MWDOC would charge a penalty to each client agency that exceeded their allocation. This penalty would be assessed according to the client agency's prorated share (acre-feet over usage) of MWDOC penalty amount with MET. Below is an example of how this penalty rate structure would apply:



Under the melded penalty rate structure, client agencies will only be assessed penalties if MWDOC exceeds its total allocation and is required to pay a penalty to MET.

MWDOC Billing

During the allocation period, MWDOC billing will remain the same. Only at the end of the twelve-month allocation period will MWDOC calculate each member agency's total potable water use based on the local supply certification and MWDOC allocation model and determine which agencies exceeded their annual allocation. From those agencies that exceeded their allocation, MWDOC will assess penalty rates according to the melded penalty rate structure on their next water invoice.

Understanding that the penalties can be significant to a retail agency, MET and MWDOC will allow payment of these penalties to be spread over three monthly billing periods. Therefore, a third of the penalties will be applied each month to the agency's water invoice over a three-month period

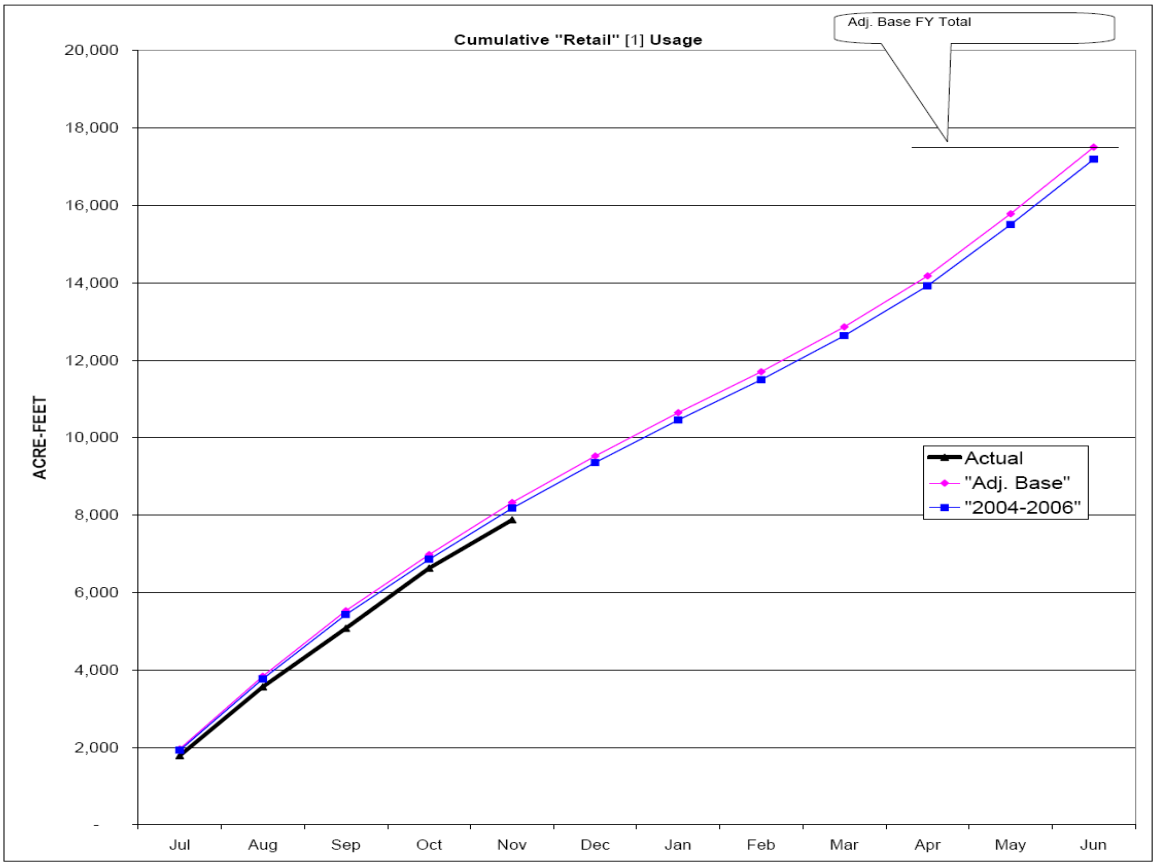
Tracking and Reporting

In preparing for allocation, it is important to track the amount of water the region and each client agency is using monthly. This data is important to help MWDOC and client agencies project their annual usage, evaluate their current demands, and avoid any over usage that will result in allocation penalties. MWDOC will provide water use monthly reports that will compare each client agency's current cumulative retail usage to their allocation baseline (average usage for years 2004 to 2006). In addition, MWDOC will provide quarterly reports on its cumulative retail usage versus its allocation baseline.

To develop these reports, MWDOC will need to work closely with each client agency to get their local supply data on a monthly basis. This data will not only be used by MWDOC to track monthly usage but also by MET to assess MWDOC's total projected water demands.

Below in Figure 5.2 is an example of the type of monthly report MWDOC will provide to each client agency during the allocation period.

Figure 5.2
Example of a Client Agency's Monthly Usage Report



[1] "Retail" usage includes MET water and Local water (except for recycled water)

Key Dates for Implementation

If a regional shortage is declared, the allocation period will cover twelve consecutive months, e.g. July 1st of a given year through June 30. Barring unforeseen large-scale circumstances, the Regional Shortage Level will be set for the entire allocation period, which will provide the client agencies an established water supply shortage allocation amount. Figure 5.3 Illustrates the Metropolitan timeline for allocations during a two year period.

Figure 5.3: Metropolitan Water District
Adopted Allocation Timeline

Year	Month	Year 1 Board Allocation Decision	Year 1 Allocation Year	Year 2 Board Allocation Decision	Year 2 Allocation Year
YEAR 1	January				
	February				
	March				
	April	**Declaration**			
	May				
	June				
	July		**Effective Period** Continuous Tracking Of Member Agency Local Supply and Imported Water Use		
	August				
	September				
	October				
	November				
	December				
YEAR 2	January				
	February				
	March				
	April			**Declaration**	
	May				
	June				
	July				
	August		**Assess Penalties**		
	September				
	October				
	November				
	December				
YEAR 3	January				**Effective Period** Continuous Tracking Of Member Agency Local Supply and Imported Water Use
	February				
	March				
	April				
	May				
	June				

It important to note, MWDOC does not anticipate calling for allocation unless the Metropolitan Board declares a shortage through it WSAP; and no later than 30 days from MET declaration will MWDOC announce allocation to its client agencies.

Revisiting the Plan

Calculating and determine how the amount of imported water each client agency receives during a water shortage is not an easy task. The key objective in developing this allocation plan is to ensure that a proper and fair distribution of water is given to each client agency. However, due to the complexity of this issue and the potential for unforeseen circumstances that may occur during an allocation year, MWDOC offers the opportunity to review and refine components of this plan where deemed necessary.

After one year of implementation, the MWDOC staff and client agencies have the opportunity to revisit the plan and offer any recommendations to the MWDOC Board that will improve the method, calculation, and approach of this plan.

Metropolitan has a similar process which will allow opportunity to review their plan as approved.

Appendix A

List of Acronyms:

AF- Acre-feet
IAWP-Interim Agricultural Water Program
M&I- Municipal and Industrial
MET-Metropolitan Water District of Southern California
WSAP-Water Supply Allocation Plan

Definitions:

Extraordinary Increases in Production: Local water production efforts that increase local supplies, including purchasing water transfers or overproducing groundwater yield.

Groundwater Recovery: The extraction and treatment of groundwater making it usable for a variety of applications by removing high levels of chemicals and/or salts.

In-lieu deliveries: Metropolitan-supplied water bought to replace water that would otherwise be pumped from the groundwater basins.

Overproducing groundwater yield: Withdrawal (removal) of groundwater over a period of time that exceeds the recharge rate of the supply aquifer. Also referred to as overdraft or mining the aquifer.

Seasonal Shift- Water requested in a period of low demand (winter) for use in high demand periods (summer). This water will not be available beyond 2009.

Seawater Barrier: The injection of water by OCWD into wells along the coast to protect the OCWD groundwater basin from seawater intrusion. The injected water acts like a wall, blocking seawater that would otherwise migrate into groundwater basins as a result of pumping inland.

Appendix B

Metropolitan's Draft Water Supply Allocation Plan

Appendix C

MWDOC Growth Adjustment Table per Client Agency

Appendix D

MWDOC Conservation Hardening Credit Table per Client Agency

Appendix F

Letters of Notification of Intent to Update UWMP sent to member agencies

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

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Director

Susan Hinman
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Ed Royce, Sr.
Director

Kevin P. Hunt, P.E.
General Manager

MEMBER AGENCIES

City of Brea
City of Buena Park
East Orange County Water District
El Toro Water District
Emerald Bay Service District
City of Fountain Valley
City of Garden Grove
Golden State Water Co.
City of Huntington Beach
Irvine Ranch Water District
Laguna Beach County Water District
City of La Habra
City of La Palma
Mesa Consolidated Water District
Moulton Niguel Water District
City of Newport Beach
City of Orange
Orange County Water District
City of San Clemente
City of San Juan Capistrano
Santa Margarita Water District
City of Seal Beach
Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Jim Byerrum
President
California Domestic Water Company
P.O. Box 1338
Whittier, CA 90609

Dear Mr. Byerrum:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

Due to the importance of this document, MWDOC is working closely with all of its member agencies and also with Metropolitan Water District of Southern California, Orange County Water District and the Cities of Anaheim, Fullerton and Santa Ana (who are in Orange County, but outside of MWDOC) to reflect a comprehensive regional plan to assist our effort in managing water in Orange County.

A draft of the MWDOC 2010 UWMP will be available for review on our website at www.mwdoc.com by April 18, 2011. Our public hearing is scheduled to be held on May 18, 2011. Please contact Harvey De La Torre, Principal Water Resource Planner, at hdelatorre@mwdoc.com if you have any questions.

Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

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Irvine Ranch Water District
Laguna Beach County Water District
City of La Habra
City of La Palma
Mesa Consolidated Water District
Moulton Niguel Water District
City of Newport Beach
City of Orange
Orange County Water District
City of San Clemente
City of San Juan Capistrano
Santa Margarita Water District
City of Seal Beach
Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Susan Ramos
City Clerk
City of Aliso Viejo
12 Journey, Suite 100
Aliso Viejo, CA 92656-5335

Dear Ms. Ramos:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
President

Jeffery M. Thomas
Vice President

Brett R. Barbre
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Wayne A. Clark
Director

Larry D. Dick
Director

Susan Hinman
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Ed Royce, Sr.
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Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Linda Andal
City Clerk
City of Anaheim
City Hall East, 200 S. Anaheim Blvd.
Anaheim, CA 92805

Dear Ms. Andal:

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February 28, 2011

Ms. Lucinda Williams
City Clerk
City of Brea
1 Civic Center Circle
Brea, CA 92821

Dear Ms. Williams:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Shalice Tilton
City Clerk
City of Buena Park
P.O. Box 5009
Buena Park, CA 90622-5009

Dear Ms. Tilton:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Julie Folcik
City Clerk
City of Costa Mesa
P.O. Box 1200
Costa Mesa, CA 92628-1200

Dear Ms. Folcik:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Denise Basham
City Clerk
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Dear Ms. Basham:

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February 28, 2011

Ms. Katy Ward
City Clerk
City of Dana Point
33282 Golden Lantern St., Ste. 203
Dana Point, CA 92629

Dear Ms. Ward:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Kathy Heard
Deputy City Clerk
City of Fountain Valley
10200 Slater Avenue
Fountain Valley, CA 92708

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Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Kathy Bailor
City Clerk
City of Garden Grove
11222 Acacia Parkway
Garden Grove, CA 92840

Dear Ms. Bailor:

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Sincerely,

Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Joan Flynn
City Clerk
City of Huntington Beach
2000 Main Street
Huntington Beach, CA 92648

Dear Ms. Flynn:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
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February 28, 2011

Ms. Sharie Apodaca
City Clerk
City of Irvine
P.O. Box 19575
Irvine, CA 92623-9575

Dear Ms. Apodaca:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

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Vice President

Brett R. Barbre
Director

Wayne A. Clark
Director

Larry D. Dick
Director

Susan Hinman
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Ed Royce, Sr.
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Kevin P. Hunt, P.E.
General Manager

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Santa Margarita Water District
City of Seal Beach
Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Tamara Mason
City Clerk
City of La Habra
P.O. Box 337
La Habra, CA 90633-0337

Dear Ms. Mason:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Mr. Jeff Moneda
Director of Public Works/City Engineer
City of La Palma
7822 Walker Street
La Palma, CA 90623

Dear Mr. Moneda:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Martha Anderson
City Clerk
City of Laguna Beach
505 Forest Avenue
Laguna Beach, CA 92651

Dear Ms. Anderson:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
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February 28, 2011

Ms. Peggy Johns
City Clerk
City of Laguna Hills
24035 El Toro Rd
Laguna Hills, CA 92653

Dear Ms. Johns:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Pam Lawrence
Deputy City Manager/Acting City Clerk
City of Laguna Niguel
27801 La Paz Road
Laguna Niguel, CA 92677

Dear Ms. Lawrence:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Yolie Trippy
Deputy City Clerk/Public Information Officer
City of Laguna Woods
24262 El Toro Road
Laguna Woods, CA 92637

Dear Ms. Trippy:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Stephanie Smith
City Clerk
City of Lake Forest
25550 Commercentre Dr., Ste. 100
Lake Forest, CA 92630

Dear Ms. Smith:

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Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Jimenez Adria
City Clerk
City of Los Alamitos
3191 Katella Avenue
Los Alamitos, CA 90720-5600

Dear Ms. Adria:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Karen Hamman
City Clerk/Director of Community Relations
City of Mission Viejo
200 Civic Center
Mission Viejo, CA 92691

Dear Ms. Hamman:

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Kevin P. Hunt

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February 28, 2011

Ms. Leilani Brown
City Clerk
City of Newport Beach
P.O. Box 1768
Newport Beach, CA 92658-8915

Dear Ms. Brown:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Mary Murphy
City Clerk
City of Orange
P.O. Box 449
Orange, CA 92866

Dear Ms. Murphy:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
President

Jeffery M. Thomas
Vice President

Brett R. Barbre
Director

Wayne A. Clark
Director

Larry D. Dick
Director

Susan Hinman
Director

Ed Royce, Sr.
Director

Kevin P. Hunt, P.E.
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Yorba Linda Water District

February 28, 2011

Mr. Patrick Melia
City Clerk
City of Placentia
437 Hillcrest Ave.
Placentia, CA 92870

Dear Mr. Melia:

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General Manager

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February 28, 2011

Ms. Molly McLaughlin
City Clerk/Public Informaiton Officer
City of Rancho Santa Margarita
22112 El Paseo
Rancho Santa Margarita, CA 92688

Dear Ms. McLaughlin:

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Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. JoAnne Baade
City Clerk
City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672

Dear Ms. Baade:

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General Manager

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February 28, 2011

Mr. Maria Morris
City Clerk
City of San Juan Capistrano
32400 Paseo Adelanto
San Juan Capistrano, CA 92675

Dear Ms. Morris:

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Sincerely,

Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Patricia Healy
City Clerk
City of Santa Ana
P.O. Box 1988, M-24
Santa Ana, CA 92702

Dear Ms. Healy:

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February 28, 2011

Ms. Linda Devine
City Clerk
City of Seal Beach
211 8th Street
Seal Beach, CA 90740

Dear Ms. Devine:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Brenda Green
City Clerk / Assistant to the City Manager
City of Stanton
7800 Katella Ave.
Stanton, CA 90680

Dear Ms. Green:

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Sincerely,

Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Patty Estrella
City Clerk Services Supervisor
City of Tustin
300 Centennial Way
Tustin, CA 92780

Dear Ms. Estrella:

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Mr. Jarad Hildenbrand
Assistant City Manager / Deputy City Clerk
City of Villa Park
17855 Santiago Blvd.
Villa Park, CA 92861

Dear Mr. Hildenbrand:

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Kevin P. Hunt

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General Manager

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February 28, 2011

Ms. Marian Contreres
City Clerk
City of Westminster
8200 Westminster Blvd.
Westminster, CA 92683

Dear Ms. Contreres:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
President

Jeffery M. Thomas
Vice President

Brett R. Barbre
Director

Wayne A. Clark
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Larry D. Dick
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City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Marcia Brown
City Clerk
City of Yorba Linda
P.O. Box 87014
Yorba Linda, CA 92885

Dear Ms. Brown:

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February 28, 2011

Mr. Tom Daly
Clerk / Recorder
County of Orange
P.O. Box 238
Santa Ana, CA 92701

Dear Mr. Daly:

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February 28, 2011

Ms. Mary Skorpanich
Director, OC Watersheds Program
County of Orange / OC Public Works
P.O. Box 4048
Santa Ana, CA 92703-5000

Dear Ms. Skorpanich:

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February 28, 2011

Mrs. Lisa Ohlund
General Manager
East Orange County Water District
185 N. McPherson Road
Orange, CA 92869-3720

Dear Mrs. Ohlund:

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February 28, 2011

Mr. Robert Hill
General Manager / Assistant Secretary
El Toro Water District
P.O. Box 4000
Laguna Hills, CA 92654

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February 28, 2011

Ms. Lupita Miranda
Executive Assistant
Emerald Bay Service District
600 Emerald Bay
Laguna Beach, CA 92651

Dear Ms. Miranda:

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Kevin P. Hunt

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General Manager

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February 28, 2011

Mr. Robert Hanford
Orange County District Manager
Golden State Water Co. - OC
1920 W. Corporate Way
Anaheim, CA 92801

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February 28, 2011

Mr. Paul Jones
General Manager
Irvine Ranch Water District
P.O. Box 57000
Irvine, CA 92619-7000

Dear Mr. Jones:

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February 28, 2011

Ms. Leslie Bonkowski
District Secretary
Irvine Ranch Water District
P.O. Box 57000
Irvine, CA 92619-7000

Dear Ms. Bonkowski:

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February 28, 2011

Ms. Renae Hinchey
General Manager / Board Secretary
Laguna Beach County Water District
P.O. Box 987
Laguna Beach, CA 92652

Dear Ms. Hinchey:

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Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
President

Jeffery M. Thomas
Vice President

Brett R. Barbre
Director

Wayne A. Clark
Director

Larry D. Dick
Director

Susan Hinman
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Ed Royce, Sr.
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Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Paul Shoenberger
General Manager
Mesa Consolidated Water District
1965 Placentia Avenue
Costa Mesa, CA 92627

Dear Mr. Shoenberger:

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Sincerely,

Kevin P. Hunt

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February 28, 2011

Ms. Brenda Glisson
Administrative Assistant to the General Manager
Metropolitan Water District of Southern CA
P.O. Box 54153, Terminal Annex
Los Angeles, CA 90054-0153

Dear Ms. Glisson:

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February 28, 2011

Ms. Danielle Gerardo
Administrative Assistant/Secretary
Midway City Sanitary District
14451 Cedarwood Avenue
Westminster, CA 92683

Dear Ms. Gerardo:

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February 28, 2011

Mr. Robert Gumerman
General Manager
Moulton Niguel Water District
P.O. Box 30204
Laguna Niguel, CA 92607-0204

Dear Mr. Gumerman:

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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February 28, 2011

Ms. Donna Terrones
Board Clerk
Orange County Sanitation District
14451 Cedarwood Avenue
Westminster, CA 92683

Dear Ms. Terrones:

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Kevin P. Hunt

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February 28, 2011

Mr. Michael Markus
General Manager
Orange County Water District
P.O. Box 8300
Fountain Valley, CA 92728-8300

Dear Mr. Markus:

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Kevin P. Hunt

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February 28, 2011

Mr. West Curry
Co-Administrator
San Juan Basin Authority
27500 La Paz Road
Laguna Niguel, CA 92656

Dear Mr. Curry:

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February 28, 2011

Mr. Dan Ferons
Co-Administrator
San Juan Basin Authority
27500 La Paz Road
Laguna Niguel, CA 92656

Dear Mr. Ferons:

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February 28, 2011

Ms. Patti Bonawitz
Clerk of the Board
Santa Ana Watershed Project Authority
11615 Sterling Ave.
Riverside, CA 92503

Dear Ms. Bonawitz:

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February 28, 2011

Mr. John Schatz
General Manager / General Counsel
Santa Margarita Water District
P.O. Box 7005
Mission Viejo, CA 92690-7005

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Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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Orange County Water District
City of San Clemente
City of San Juan Capistrano
Santa Margarita Water District
City of Seal Beach
Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. David Noyes
General Manager
Serrano Water District
18021 East Lincoln Street
Villa Park, CA 92861

Dear Mr. Noyes:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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A draft of the MWDOC 2010 UWMP will be available for review on our website at www.mwdoc.com by April 18, 2011. Our public hearing is scheduled to be held on May 18, 2011. Please contact Harvey De La Torre, Principal Water Resource Planner, at hdelatorre@mwdoc.com if you have any questions.

Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
President

Jeffery M. Thomas
Vice President

Brett R. Barbre
Director

Wayne A. Clark
Director

Larry D. Dick
Director

Susan Hinman
Director

Ed Royce, Sr.
Director

Kevin P. Hunt, P.E.
General Manager

MEMBER AGENCIES

City of Brea
City of Buena Park
East Orange County Water District
El Toro Water District
Emerald Bay Service District
City of Fountain Valley
City of Garden Grove
Golden State Water Co.
City of Huntington Beach
Irvine Ranch Water District
Laguna Beach County Water District
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Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Mike Wilson
Assistant General Manager
SOCWA- South Orange County Wastewater Authority
34156 Del Obispo
Dana Point, CA 92629

Dear Mr. Wilson:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Michael Dunbar
General Manager
South Coast Water District
P.O. Box 30205
Laguna Beach, CA 92607-0205

Dear Mr. Dunbar:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Ms. Chris Montana
District Clerk
Sunset Beach Sanitary District
P.O. Box 1185
Sunset Beach, CA 90742

Dear Ms. Montana:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

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General Manager

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City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Don Chadd
General Manager / Emergency Response
Trabuco Canyon Water District
32003 Dove Canyon Drive
Trabuco Canyon, CA 92679

Dear Mr. Chadd:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

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City of Tustin
City of Westminster
Yorba Linda Water District

February 28, 2011

Mr. Ken Vecchiarelli
General Manager/Board Secretary
Yorba Linda Water District
P.O. Box 309
Yorba Linda, CA 92886

Dear Mr. Vecchiarelli:

This letter serves as notification that the Municipal Water District of Orange County (MWDOC) is currently preparing a 2010 update of its Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (Act) of the California Water Code. Updates are required every five years. The purpose of the UWMP is to demonstrate to the public how MWDOC plans to meet its service area's current and future water demands with reliable supplies. Since comprehensive water resource planning is extremely critical in California, the Water Code mandates that all urban water purveyors notify the "cities and/or county" in which they serve of this planning effort. To enhance the collaborative planning effort we are also notifying water agencies, groundwater agencies, and other planning agencies.

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Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

Appendix G

Notice of Public Hearing

.AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of 1/18/52, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 7, 13, 2011

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

Executed at Santa Ana, Orange County, California, on

Date: May 13, 2011

Julie Hammell
Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-7000 ext. 2209

PROOF OF PUBLICATION

Proof of Publication of

NOTICE OF PUBLIC HEARING
2010 URBAN WATER MANAGEMENT PLAN

Municipal Water District of Orange County ("MWDOC"), has directed the preparation of a regional 2010 Urban Water Management Plan ("UWMP") for the MWDOC service area pursuant to the Urban Water Management Planning Act ("Act"). Adoption of the 2010 UWMP is required under the Act by July 1, 2011.

The Act requires that an urban water supplier hold a public hearing before adopting a plan. MWDOC's public hearing is scheduled for May 18, 2011 at 8:30 a.m. and will take place at the MWDOC Board Room located in the MWDOC Administration Building at 18700 Ward Street, Fountain Valley CA 92708.

For additional information regarding the public hearing, please contact Maribeth Goldsby, MWDOC Board Secretary, at (714)593-5006.

Publish: Orange County Register
May 7, 13, 2011 R-728 9365961

RECEIVED
JUN 17 2011
MWD OF OC

.AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of 1/18/52, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 27, June 3, 2011

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

Executed at Santa Ana, Orange County, California, on

Date: June 3, 2011

Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-7000 ext. 2209

PROOF OF PUBLICATION

Proof of Publication of

NOTICE OF PUBLIC HEARING
2010 URBAN WATER MANAGEMENT PLAN

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For additional information regarding the public hearing, please contact Maribeth Goldsby, MWDOC Board Secretary, at (714)593-5008.

Publish: Orange County Register
May 27, June 3, 2011 R-889 9372025

Appendix H

Resolution of Adoption of MWDOC 2010 RUWMP

RESOLUTION NO. 1910

**RESOLUTION OF THE BOARD OF DIRECTORS OF
THE MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
ADOPTING THE
2010 REGIONAL URBAN WATER MANAGEMENT PLAN**

WHEREAS, the California Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the California Urban Water Management Planning Act specifics the requirements and procedures for adopting such Urban Water Management Plans; and

WHEREAS, the Board of Directors of the Municipal Water District of Orange County has duly reviewed, discussed, and considered such Urban Water Management Plan and has determined the 2010 Regional Urban Water Management Plan to be consistent with the California Urban Water Management Planning Act and to be an accurate representation of the water resource plan for the Municipal Water District of Orange County.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Municipal Water District of Orange County that, on June 15, 2011 this District hereby adopts this 2010 Regional Urban Water Management Plan for submittal to the state of California.

Said Resolution was adopted, on roll call, by the following vote:

AYES:	Directors Clark, Dick, Finnegan, Hinman & Royce
NOES:	None
ABSENT:	Directors Barbre and Thomas
ABSTAIN:	None

I hereby certify that the foregoing is a true and correct copy of Resolution No. 1910 adopted by the Board of Directors of Municipal Water District of Orange County at its meeting held on June 15, 2011.

ATTEST:

Maribeth Goldsby, Secretary
Municipal Water District of Orange County

Appendix I

Orange County 20x2020 Regional Alliance Letter

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
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Susan Hinman
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Director

Kevin P. Hunt, P.E.
General Manager

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City of Tustin
City of Westminster
Yorba Linda Water District

June 22, 2011

Department of Water Resources
Statewide Integrated Water Management
Water Use Efficiency Branch
P.O. Box 942836
Sacramento, CA 94236-0001

Attention: Coordinator, Urban Water Management Plans

Formation of Orange County 20x2020 Regional Alliance

This letter is to inform you that the Municipal Water District of Orange County (MWDOC), together with its member agencies and the cities of Anaheim, Fullerton, and Santa Ana, has established the Orange County 20x2020 Regional Alliance in order to provide flexibility in meeting the 20% by 2020 requirements under SBx7-7 and the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use.

As the reporting agency for the Orange County 20x2020 Regional Alliance, MWDOC has documented the calculations for the regional urban water use reduction targets in our 2010 Regional Urban Water Management Plan, adopted on June 15, 2011. The individual water suppliers in the alliance have each stated their participation in their individual 2010 Urban Water Management Plans.

The members of the Orange County 20x2020 Regional Alliance are as follows:

- City of Anaheim
- City of Brea
- City of Buena Park
- East Orange County Water District
- El Toro Water District
- City of Fountain Valley
- City of Fullerton
- City of Garden Grove
- Golden State Water Company
- City of Huntington Beach
- Irvine Ranch Water District
- City of La Habra
- City of La Palma
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- Serrano Water District
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- Trabuco Canyon Water District
- City of Tustin
- City of Westminster
- Yorba Linda Water District

Sincerely,

Kevin P. Hunt, P.E.
General Manager
Municipal Water District of Orange County

8001 Irvine Center Drive, Suite 1100
Irvine, CA 92618
949.450.9901 Fax 949.450..9902

MALCOLM PIRNIE | ARCADIS

The Water Division of ARCADIS