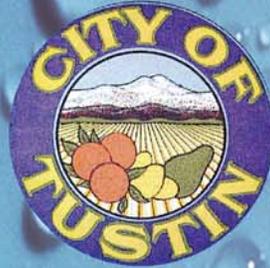


Urban
WATER
Management Plan

April 3, 2006



City of Tustin

2005

PSOMAS

URBAN WATER MANAGEMENT PLAN 2005



City of Tustin

April 3, 2006

PSOMAS

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Acronyms and Abbreviations

AB	Assembly Bill
ACT	Urban Water Management Planning Act of 1983
AF	Acre Feet
AFY	Acre Feet per Year
AWPF	Advanced Water Purification Facilities
BEA	Basin Equity Assessment
BMP	Best Management Practices
BPP	Basin Pumping Percentage
CALSIM	California Water Allocation and Reservoir Operations Model
CCF	Hundred Cubic Feet
CDR	Center for Demographic Research at California State University at Fullerton
CEQA	California Environmental Quality Act
CII	Commercial, Industrial and Institutional
CIP	Capital Improvement Program
CPTP	Coastal Pumping Transfer Program
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DBP	Disinfection Byproducts
DHS	California Department of Health Services
DMM	Demand Management Measure
DRIP	Desalination Research and Innovation Partnership
DWCV	Desert Water Agency/Coachella Water District
DWR	Department of Water Resources
EOC	Emergency Operations Center
EOCWD	East Orange County Water District
EPA	Environmental Protection Agency
ETo	Evapotranspiration
GAP	Green Acres Project
GPCD	Gallons Per Capita Per Day
GPF	Gallons Per Flush
GPM	Gallons Per Minute
GWMP	Groundwater Management Plan
GWRS	Groundwater Replenishment System
HAA	Haloacetic Acids
HECW	High Efficiency Clothes Washer
IAWP	Interim Agricultural Water Program
IID	Imperial Irrigation District
In	Inches
IRP	Integrated Resources Plan
IRWM	Integrated Regional Water Management
LRP	Local Resources Program
LTFP	Long Term Facilities Plan
M&I	Municipal and Industrial
MAF	Million Acre Feet
MCL	Maximum Contaminant Level

MGD	Million Gallons per Day
Mg/L	Milligrams Per Liter
MOU	Memorandum of Understanding
MPR	Master Plan Report
MTBE	Methyl Tertiary Butyl Ether
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
NDMA	N-nitrosodimethylamine
NPDES	National Pollutant Discharge Elimination System
OC	Orange County
OCS	Orange County Sanitation District
OCWA	Orange County Water Association
OCWD	Orange County Water District
PEIR	Program Environmental Impact Report
PVID	Palo Verde Irrigation District
QSA	Quantification Settlement Agreement
RA	Replenishment Assessment
RWQCB	Regional Water Quality Control Board
SAWPA	Santa Ana River Watershed Authority
SB	Senate Bill
SBVMWD	San Bernardino Valley Municipal Water District
SCAB	South Coast Air Basin
SCADA	Supervisory Control Data Acquisition System
SCCWRRS	Southern California Comprehensive Water Reclamation and Reuse Study
SDWA	Safe Drinking Water Act
SOCWRS	South Orange County Water Reliability Study
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	Thousand Acre Feet
TDS	Total Dissolved Solids
THM	Trihalomethanes
TIN	Total Inorganic Nitrogen
TWS	Tustin Water Services
ULFT	Ultra Low Flush Toilet
USBR	U.S. Bureau of Reclamation
UWMP	Urban Water Management Plan
VCP	Vitrified Clay Pipe
VOC	Volatile Organic Compounds
WEROC	Water Emergency Response Organization of Orange County
WMP	Water Master Plan
WOC	Water Operations Center
WSDM	Water Surplus and Drought Management

SECTION 1 INTRODUCTION

1.1 PURPOSE AND UWMP SUMMARY

An Urban Water Management Plan (UWMP) is for the purpose of achieving the conservation and efficient use of water supplies. The California Urban Water Management Planning Act of 1983 (Act), as amended, requires urban water suppliers to develop an UWMP every five years in the years ending in zero and five.

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

The City's 2005 UWMP has been prepared in compliance with the requirements of the Act, as amended (Appendix A)¹, and includes the following:

- Tustin Water Services Area
- Tustin Water Services Division and Facilities
- Water Sources and Supplies
- Water Quality Information
- Water Reliability Planning
- Water Use Provisions
- Water Demand Management Measures
- Water Shortage Contingency Plan
- Water Recycling

1.2 URBAN WATER MANAGEMENT PLAN UPDATE PREPARATION

The City's 2005 UWMP revises the 2000 UWMP prepared by the City of Tustin Water Services (TWS) and incorporates changes enacted by legislation, including Senate Bill (SB) 610 (2001), Assembly Bill (AB) 901 (2001), SB 672 (2001), SB 1348 (2002), SB 1384 (2002), SB 1518 (2002), AB 105 (2004), and SB 318 (2004). TWS has also included requirements of SB 610 (2001) and SB 901 (2001) to integrate the latest urban water management planning directives.

¹California Water Code, Division 6, Part 2.6; §10610, et. seq. Established by Assembly Bill 797 (1983).

The sections in this Plan correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the City's water utility. The Department of Water Resources (DWR) Review for Completeness Form has been completed, which identifies the location of Act requirements in this Plan and is included as Appendix B. Since the City must detail its effort in implementing water conservation demand management measures (DMM), the DWR Review for DMM Completeness Form is also completed and included in Appendix C.

The sections in this UWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used to present the required information, however, differs slightly in order to present the material in a manner reflecting the unique characteristics of TWS.

Plan Adoption

The 2005 UWMP was adopted by resolution of the Tustin City Council on April 3, 2006, following a public hearing. The Plan was submitted to DWR within 30 days of Council approval. Copies of the Notice of Public Hearing and the Resolution of Plan Adoption are included in Appendix D. Copies of the Plan were made available to the public and to the City of Santa Ana, the City of Orange, Irvine Ranch Water District, East Orange County Water District, Orange County Water District, Municipal Water District of Orange County, and Metropolitan Water District of Southern California during the public review period.

The UWMP is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in the water supply trends, conservation and water use efficiency policies for Orange County. This Plan, along with the City's Water Master Plan and other City planning documents, will be used by City staff to guide the City's water use and management efforts through the year 2010, when the UWMP is again required to be updated.

Agency Coordination

Development of this Plan was performed by TWS, in coordination with other departments of the City.

In addition, coordination of information for development of the Plan occurred with the East Orange County Water District (EOCWD), the Municipal Water District of Orange County (MWDOC), and the Metropolitan Water District of Southern California (Metropolitan) for imported water², as well as the Orange County Water District (OCWD), which manages the Orange County Groundwater Basin, and the Orange

² TWS is a contractor of imported water from EOCWD, which subcontracts through MWDOC, which subsequently is a member agency of Metropolitan.

County Sanitation District (OCSD), which manages wastewater. All of the City's water supply planning relates to the policies, rules, and regulations of these agencies. This UWMP details the specifics as they relate to TWS and its service area and will refer to EOCWD, MWDOC, Metropolitan, OCWD and OCSD throughout. Appendix E lists the numerous references used in the development of this Plan.

**Table 1.2-1
Tustin Water Services UWMP Development
Coordination and Public Involvement**

Entities	Coordination and Public Involvement Actions					
	Participated in UWMP Preparation	Contacted for Assistance	Sent/ Available To: Copy of Draft UWMP	Commented on Draft UWMP	Sent Notice of Public Hearing	Attended Public Hearing
TWS	X	X	X	X	X	X
City Planning		X	X	X	X	X
City Clerk		X			X	X
City Attorney			X	X	X	X
EOCWD		X	X	X	X	
MWDOC		X	X	X	X	
Metropolitan		X	X		X	
OCWD		X	X		X	
OCSD		X	X		X	
DWR		X	X	X	X	
General Public			X		X	

1.3 TUSTIN WATER SERVICES AREA

Location

TWS provides potable water service to most of the incorporated area of the City and also to unincorporated county areas north of the City. TWS is located in central east Orange County as shown in Figure 1.1. TWS is bounded by the City of Orange to the north, the City of Santa Ana to the west, the City of Irvine to the south, and unincorporated areas of Orange County to the east. TWS is approximately 35 miles south of Los Angeles and 10 miles inland from the Pacific Ocean. TWS has an area of 8.4 square miles and an elevation of about 50 feet above sea level. The topography of the City combines generally flat areas with gradual rolling hills.

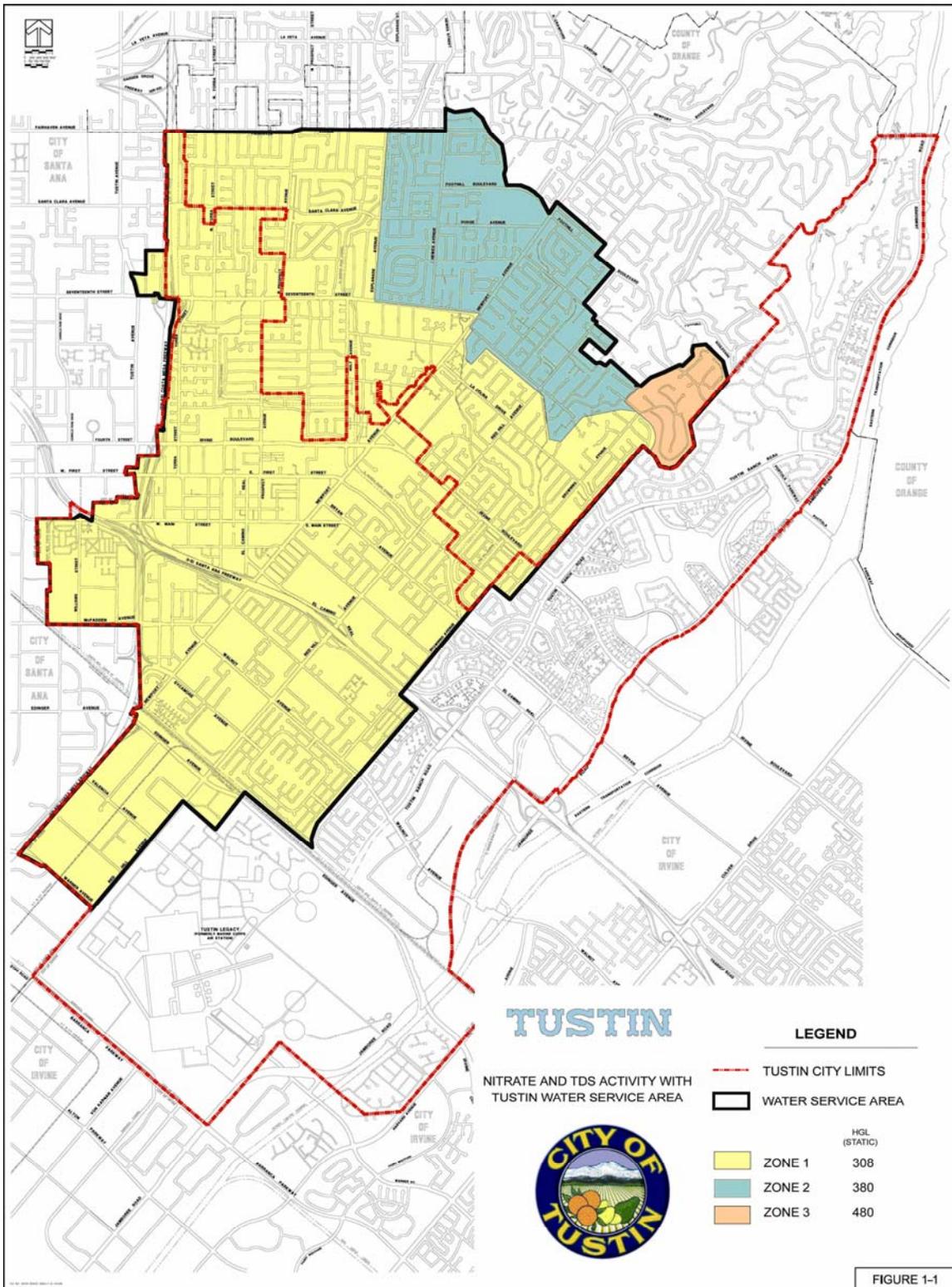


Figure 1.1 Tustin Water Service Area Boundary

Climate Characteristics

TWS is located in an area known as the South Coast Air Basin (SCAB). The SCAB climate is characterized by southern California’s “Mediterranean” climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. 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 climatologically pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The City’s average temperature ranges from 67 degrees Fahrenheit in January to 85 degrees Fahrenheit in August with an average annual temperature of 75 degrees. Annual precipitation is typically approximately 13 inches, occurring mostly between November and April. Evapotranspiration (ETo)³ in the region averages 49.7 inches annually. Specific month-by-month climatologic data and the total or averages are presented in Table 1.3-1.

**Table 1.3-1
City of Tustin Average Temperatures and Rainfall⁴**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total or Avg
Average ETo (inches)		1.86	2.24	3.41	4.80	5.58	6.30	6.51	6.20	4.80	3.72	2.40	1.86	49.7
Temp (°F)	Max	67.0	68.1	69.4	72.9	75.4	79.0	84.0	85.5	84.7	79.7	73.9	68.2	75.6
	Min	40.5	42.4	44.3	47.7	52.2	55.8	59.2	59.5	57.0	51.9	44.4	40.7	49.6
Rainfall (inches)		2.53	2.73	2.21	1.01	0.26	0.07	0.01	0.08	0.27	0.36	1.32	1.99	12.82

Demographics

TWS is predominantly residential with over 90 percent of water service connections serving single-family or multi-family residences. With the exception of commercial development, limited growth potential exists due to minimum availability of open space.

The population of the TWS service area was 62,131 in 2005.⁵ The Center for Demographic Research (CDR) at California State University Fullerton projects minimal

³ Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. ET from a standardized grass species is commonly denoted as ETo.

⁴ [on-line] OC Almanac, <http://www.ocalmanac.com/Weather/we02.htm>, Western Regional Climate Center, Tustin-Irvine (Ranch). Data from 12/1/1927 through 6/30/2003.

⁵ Population extracted from the City of Tustin 2000 UWMP

change in the TWS population percentage and minimal change in land use over the next 20 years. Table 1.3-2 shows the population projections in five-year increments to the year 2030.⁶ The TWS population is projected to remain stable (at approximately 62,100) over this 25-year period.

**Table 1.3-2
Current and Projected Population Projections⁷**

	2000	2005	2010	2015	2020	2025	2030
Service Area Population	62,131	62,100	62,100	62,100	62,100	62,100	62,100

1.4 TUSTIN WATER SERVICES FACILITIES

Tustin Water Services Division

TWS provides domestic and fire protection water service to most of the incorporated area of the City of Tustin and also to unincorporated areas north of the City.

TWS receives approximately 85 percent of its water from underlying groundwater in the Lower Santa Ana Groundwater Basin. The remaining 15 percent is imported water purchased from EOCWD. TWS has seven untreated or “clear” groundwater wells that pump directly into the distribution system and two treatment facilities that treat groundwater from five additional wells.

The groundwater basin is managed by OCWD, who sets the percentage of groundwater that an agency or city can pump based on their total potable water demand. This is referred to as the basin pumping percentage (BPP). For 2005/06, the BPP for TWS is 64 percent.⁸ Production in excess of 64 percent of applicable demands is assessed under the basin equity assessment (BEA) with a production penalty, raising the cost of this supply to exceed imported water rates. However, basin groundwater produced through Tustin’s treatment facilities is exempt from the BEA since the treatment plants remove and use low quality water from the Groundwater Basin, which would otherwise be unusable. This activity, in turn, benefits all OCWD groundwater member agencies.

Imported water is purchased from Metropolitan through MWDOC and EOCWD. Imported potable water delivered to EOCWD comes from the Robert B. Diemer

⁶ The population of the TWS service area (62,100) is not expected to increase over the next 25 years. The CDR projects a total City population of about 74,000 in 2030; however, the additional 11,900 people (in excess of the TWS Service area population) are expected to reside in areas of the City served by the Irvine Ranch Water District.

⁷ Center for Demographic Research, California State University Fullerton, Orange County.

⁸ The BPP was changed by OCWD in late April 2003 and effective July 2003 to 66 percent. However, OCWD again changed the BPP to 64 percent in June 2005. The BPP is projected to increase to 69% for FY 2006/07.

Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and State Water Project (SWP) water through the Yorba Linda Feeder.

Water System Pressure Zones and Facilities

Elevations in the TWS service area range from 60 feet above mean sea level at Warner and Redhill to 435 feet in the Lemon Heights area. The water system is divided into three pressure zones. The average ground elevations for Zones 1, 2, and 3 are 210 feet, 280 feet, and 400 feet above mean sea level, respectively.

TWS delivers water supplies through 170 miles of 1.5-inch to 20-inch water mains and three booster stations. TWS pumps its groundwater from 12 wells, inclusive of five wells that undergo nitrate and total dissolved solids (TDS) removal through the Main Street Plant and the 17th Street Desalter Treatment Plant.⁹ TWS has approximately 11.83 million gallons (MG) of storage capacity in its six existing reservoirs and three booster stations.

⁹ City of Tustin Water Master Plan, p. Executive Summary, 2000

SECTION 2 WATER SOURCES AND SUPPLIES

2.1 WATER SOURCES

TWS works together with three regional water agencies to ensure a safe and high quality water supply, which will continue to serve the community in periods of drought and shortage. The agencies who work collaboratively to provide these services are the EOCWD (the local imported water wholesaler), MWDOC (the Orange County imported water wholesaler), and Metropolitan for imported water; and OCWD for groundwater.

During the 2004/05 Fiscal Year, the City received approximately 48 percent of its water supply from local groundwater, and 52 percent from imported water via Metropolitan. The portion of the City's supply coming from groundwater was less than the 66 percent allowable BPP¹⁰ set by OCWD because of in-lieu purchases made by Tustin. In-lieu water is made available for purchase when Metropolitan has surplus water. When participating in the program, the City purchases the surplus water from Metropolitan through EOCWD and MWDOC "in-lieu" of pumping groundwater, thereby resulting in the pumping of less water than the BPP would otherwise allow.

East Orange County Water District (EOCWD)

In 1961, EOCWD was formed to provide supplemental treated water to the Tustin Waterworks (predecessor water agency of TWS) and other water purveyors operating in the general vicinity of Tustin. Since that time, the City has purchased significant amounts of imported water from EOCWD. However, the magnitude of those purchases is anticipated to decline in future years as the City constructs new wells to serve its constituents.

Municipal Water District of Orange County (MWDOC)

In 1951, MWDOC was formed to provide supplemental water to many purveyors within Orange County who were not Metropolitan member agencies. At the time, the communities surrounding the Lower Santa Ana Groundwater Basin realized that the local underground supply might not be sufficient to meet future demands of the area.

MWDOC was formed for the purpose of contracting with Metropolitan to acquire supplemental imported water supplies from northern California and the Colorado River for use within the Orange County area. MWDOC is Metropolitan's second largest wholesale member agency. MWDOC represents 30 member agencies, including 14 special districts, 14 city water departments, one private water company and one mutual

¹⁰ OCWD sets the BPP annually. For FY 2004/05, it was 66 percent. For the current FY 2005/06, it is set at 64 percent.

water company. MWDOC provides imported water to all of Orange County except for the cities of Anaheim, Fullerton and Santa Ana.¹¹

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan was formed in 1928 by special legislative act. At that time, Orange County was mostly an agriculturally based economy with the cities of Santa Ana, Anaheim, and Fullerton as the primary centers of urban development. Although other cities and residential communities existed at that time, these three cities joined ten others located in southern California, to form Metropolitan. Collectively, these charter members recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of Southern California depended upon the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of southern California and Orange County possible.

Metropolitan acquires water from northern California via the State Water Project and from the Colorado River to supply water to most of southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its member agencies, including MWDOC, which in turn wholesales to EOCWD.

Orange County Water District (OCWD)

In 1933, OCWD was formed by special legislative act 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 Lower Santa Ana Groundwater Basin (Basin). As part of its original formation, OCWD was established by a special act (Act), of the State of California Legislature. This legislation is found in the State of California Statutes, Water – Uncodified Acts, Act 5683, as amended.¹² 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.'*¹³ According to the Act, the TWS has the right to construct and operate groundwater-producing facilities in the Basin. The Act also empowers OCWD to impose replenishment assessments and basin equity assessments on production and to require registration of water-producing facilities and the filing of certain reports; however, OCWD is expressly prohibited from limiting extraction unless a producer agrees.¹⁴

The Basin is managed by OCWD for the benefit of municipal, agricultural and private groundwater producers. OCWD has 23 major producers extracting water from the Basin

¹¹ MWDOC 2005 Regional Urban Water Management Plan, Section 1, Draft.

¹² Orange County Water District Act.

¹³ Orange County Water District Act, Section 77.

¹⁴ Orange County Water District Act, Sections 23 and 31.5.

servicing a population of approximately 2.8 million.¹⁵ Carefully managed by OCWD in collaboration with the other water and wastewater agencies, the growing population can be assured of a secure water supply from the groundwater source. Processes such as groundwater recharge of the Santa Ana River, recycling of wastewater, conservation and water use efficiency, and creative water purchases have aided in replenishing the Groundwater Basin to desired levels to meet required demands. The OCWD is currently pursuing planning and engineering studies as part of its Long Term Facilities Plan aimed at optimizing use of the Basin by all producers.

2.2 WATER SUPPLY

TWS currently has the ability to received 64 percent of its water supply from groundwater wells accessing the Basin and 36 percent from Metropolitan through EOCWD. These percentages are established through OCWD’s allowable BPP. The BPP is typically set by OCWD on an annual basis. However, OCWD does have the option of revising the BPP as needed. The BPP is projected to increase to 69% for FY 2006/07 according to OCWD.

Actual percentages vary somewhat on an annual basis depending on the extent in-lieu delivery programs are implemented. TWS annually participates in the in-lieu program, which allows the City to purchase more imported water. However, TWS is in the process of developing two new wells with plans for two more wells to maximize groundwater production in the next five years.

Current and projected water supplies from imported water and groundwater are shown in Table 2.2-1 and described in subsequent sections.

Table 2.2-1
Tustin Water Services
Current and Planned Water Supplies
(AFY)

Water Supply Sources	2005	2010	2015	2020	2025	2030
EOCWD – Import	6,722	650	630	670	630	590
Treated Groundwater Production	2,330	4,000	4,000	4,000	4,000	4,000
Clear Groundwater Production	2,398	8,220	8,220	8,220	8,220	8,220
Total Water Supply	11,450	12,870	12,850	12,890	12,850	12,810

Source: 2005 data from City records and has been reduced to adjust for brine discharge (303 AF) and unallocated losses (1,459 AF); future projections are from Table 4.2-4 of this UWMP

¹⁵ Orange County Facts and Figures. Center for Demographic Research. Available: <http://www.fullerton.edu/cdr/countyfacts.pdf>. Note: Population served by OCWD is different than MWDOC as it also serves the cities of Santa Ana, Fullerton, and Anaheim. June 2002.

Imported Water

TWS purchases treated imported water from EOCWD, which is a member agency of MWDOC, which in turn is a member agency of Metropolitan. Imported water purchases have decreased significantly in recent years as a result of groundwater system treatment and production improvements. Metropolitan imports raw water from northern California through the State Water Project (SWP) and from the Colorado River through the Colorado River Aqueduct (CRA), then treats the majority of water to potable standards at filtration plants located in southern California.

Imported potable water delivered to EOCWD comes from a single source, the Robert B. Diemer Filtration Plant (Diemer Plant), located north of Yorba Linda. Typically, Diemer Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder. Currently, the blend is approximately a 50/50 split between the two sources.

The TWS maintains three imported water connections to the Metropolitan system. These connections and the pressure zones they serve are shown in Table 2.2-2.

**Table 2.2-2
Imported Water Connections**

Designation	Zone Supply
OC-43	1
OC-48	1 & 2
OC-70	2 & 3

Imported Water is purchased from EOCWD through each of these connections. Water purchased through OC-43 is distributed directly into the TWS system, while water purchased through the other two connections is also distributed to EOCWD's four other retail customers (City of Orange, Golden State Water Company, Orange Park Acres Mutual Water Company and the East Orange County Water District Retail Zone). EOCWD owns a total combined capacity of 25.57 cubic feet per second (cfs) from these three connections. EOCWD's capacity in these three connections is provided on an "as-needed" basis to each of the five retailers, including TWS, with no guaranteed allotment to any agency.

TWS participates, in coordination with EOCWD, MWDOC and the OCWD, in Metropolitan's In-lieu Program. OCWD, MWDOC, and Metropolitan have developed a successful and efficient In-lieu Program to increase storage in the Basin and anticipate working together on future programs. One such future program is the proposed Surplus Water Program.

The Surplus Water Program will allow Metropolitan to make direct deliveries to the TWS distribution system in lieu of producing water from the Basin. This in-lieu program indirectly replenishes the Basin by avoiding pumping. In the in-lieu program, OCWD requests TWS to halt pumping from specified wells. TWS then takes replacement water through its imported water connections, which is purchased by OCWD from Metropolitan (through MWDOC). OCWD purchases the water at a reduced rate, and then bills TWS the amount it would have had to pay for energy and the replenishment assessment (RA) if it had produced the water from its wells. The deferred local production results in water being left in local storage for future use.

Reservoirs

Storage is required to balance variations in demand (operational or regulatory storage), to provide water for fighting fire (fire storage), and to provide water when normal supplies are reduced or unavailable due to unusual circumstances (emergency storage). The existing storage system consists of five reservoirs with a combined storage capacity of approximately 7.83 million gallons (MG) as shown in Table 2.2-3. A sixth reservoir, Rawlings Reservoir, has a capacity of 3.82 MG; however that storage facility was recently taken out of service¹⁶. TWS is currently in the process of designing a replacement to the existing Rawlings Reservoir, which will increase overall capacity to approximately 13.83 MG.

**Table 2.2-3
Tustin Water Services
Existing Reservoir Storage Capacities**

Reservoir	Depth (Ft.)	Capacity (MG)
Main Street	42	2.2
Newport Avenue	19.5	1.15
Foothill	24.0	2.91
Simon Ranch	26.0	1.40
John Lyttle	39.0	0.17
Total	-	7.83

Groundwater Supply

Lower Santa Ana Groundwater Basin

The Lower Santa Ana Groundwater Basin underlies the north half of Orange County beneath broad lowlands. The Basin covers an area of approximately 350 square miles,

¹⁶ Rawlings Reservoir was removed from operation since the 2000 UWMP was completed. It will be replaced by two new 3.0 MG reservoirs projected to be on-line by November 2008.

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. Groundwater supplies currently meet approximately 64 percent of the water supply demand for all of Orange County that overlies the Basin. This amount can be adjusted as needed based on Groundwater Basin hydrologic conditions, but is typically set on an annual basis.

During the water year July 2003 to June 2004, total basin production for all agencies was approximately 284,621 acre-feet (AF).¹⁷ The Groundwater Basin generally operates as a reservoir in which the net amount of water stored is increased in wet years to allow for managed overdrafts in dry years. The Basin is recharged primarily from local rainfall (greater in wet years), base flow from the Santa Ana River (much of which is actually recycled wastewater from treatment plants in Riverside and San Bernardino Counties), imported water percolated into the Basin, and recycled wastewater directly recharged into the Basin. The production capability of the Basin is being increased as a result of a variety of specific management initiatives including increased wastewater reclamation and the blending of lower quality water with potable water for public distribution.

The Basin is not adjudicated and based on DWR's official departmental bulletins, California's Groundwater Bulletin No. 118 Updated 2003 and Bulletin No. 160, The California Water Plan Update 2005, the Basin is not specifically identified as being in an overdraft condition. The California Water Plan Update, however, does state that groundwater overdraft is a challenge for the South Coast Hydrologic Region, which includes the Orange County Groundwater Basin. The Basin is considered in an overdraft condition by OCWD; however, the groundwater levels and amount of overdraft fluctuate over time. OCWD continually monitors groundwater level trends and has collected data since 1962. OCWD's Groundwater Management Plan summarizes the accumulated overdraft and water level elevations within the Basin. OCWD estimates that the accumulated overdraft in June 2004 was approximately 400,000 AF.¹⁸

Based on OCWD's 2004 Groundwater Management Plan, the target accumulated overdraft is 200,000 AF. An accumulated overdraft condition minimizes the localized high groundwater levels and increases ability to recharge storm events from the Santa Ana River. OCWD estimates that the Groundwater Basin can safely be operated on a short-term emergency basis with a maximum accumulated overdraft of approximately 500,000 AF; however, 400,000 AF is preferred. With an accumulated overdraft of 200,000 AF, the Basin is considered 99.5 percent full with 40 million acre feet (MAF) of groundwater in storage.

¹⁷ Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005

¹⁸ Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005

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 has also implemented a monitoring program to track dynamic conditions including groundwater production, storage, elevations, and quality. Components of this monitoring program include the request for the TWS to provide its groundwater production to OCWD on a monthly basis, yearly measurement of groundwater levels, water quality monitoring, and prevention of sea water intrusion. In this regard, TWS is currently working with OCWD to develop several monitoring well sites at two of its abandoned well locations.

Basin Pumping Percentage (BPP)

One of the methods OCWD uses to manage the amount of production from the Basin is the establishment of a BPP. OCWD recommends a BPP each water year which is calculated by dividing a producer's groundwater production by their total water demands. The BPP is 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.

While the BPP has been as high as 75 percent in recent years, the BPP was set at 66 percent for 2004-2005. The BPP has been set at 64 percent for the water year 2005-2006 and is anticipated to increase to 69 percent in FY 2006/2007. Producers may pump above the BPP to 100 percent of their needs by paying the Basin Equity Assessment (BEA). The BEA is the additional fee paid on any water pumped above the BPP, making the cost of that water equal or greater to the cost of imported water. Such flexibility in producing over the BPP guarantees TWS and other water utilities in Orange County the ability to provide water to their customers during periods of varying water availability.

When Metropolitan has an abundance of water, they may choose to activate their In-Lieu Program, where imported water is purchased in-lieu of pumping groundwater. This is a special program supported by OCWD, MWDOC and Metropolitan, which allows some agencies to pump above the BPP without penalty of the BEA.

Recharge Facilities

Another method for controlling overdraft is through recharge management programs. The Basin is recharged by multiple sources including natural and artificial sources. Natural recharge occurs when groundwater producers use surface water in-lieu of groundwater. The reduction in pumping naturally recharges the Basin. Another source of natural recharge is the result of precipitation and OCWD estimates that approximately 60,000 AFY recharged to the Basin.

Artificial recharge occurs through developed percolation ponds (approximately 1,000 acres) and also via injection through the Talbert and Alamitos Barriers. The four groundwater spreading systems throughout OCWD's service area and their respective percolations rates are summarized in Table 2.2-4.

**Table 2.2-4
Orange County Groundwater Basin - Groundwater Spreading Systems**

System	Area (acres)	Storage Capacity (AF)	Percolation Rate (cfs)
Main River System	245	480	87-115
Off-River System	126	394	15-40
Deep Basin System	280	8,484	89-300
Burris Pit/Santiago System	373	17,500	106-210

These percolation systems can recharge Santa Ana River baseflow and storm flows. OCWD estimates that approximately 155,000 AF of baseflow and 60,000 AF of storm flows are recharged each year on average. OCWD also imports between 35,000 and 60,000 AF of replenishment water to be used for recharging the Basin.

OCWD also recharges the Basin by injecting water to prevent seawater intrusion. The seawater intrusion barriers include the Talbert and Alamitos Barriers. The Talbert Barrier has 26 injection wells and injects 12 MGD into the Basin. Over 95 percent of the water injected flows inland and is therefore considered replenishment water. The Alamitos Barrier injects approximately 5,000 AFY of which 50 percent stays within the Basin for replenishment.

The estimated average annual recharge of the Basin based on the information provided above is 328,400 AF to 353,400 AF. The range is due to the amount of imported water purchased from Metropolitan each year. The amount of water available for recharge will vary from year to year.

TWS Wells

Within the TWS service area, groundwater for potable use is produced from 12 operating wells. The TWS categorizes the wells as either clear or treated groundwater. Seven of the wells are categorized as clear groundwater wells even though several wells require blending with either imported water or groundwater from another well to meet the nitrate maximum contaminant level (MCL). Blending is not considered a treatment process by OCWD and blended groundwater is not exempt from the BEA.

TWS also treats groundwater from five wells high in total dissolved solids (TDS) and/or nitrates at the Main Street Plant and 17th Street Desalter Treatment Plant. Groundwater produced through these treatment plants removes TDS and nitrates from the Basin. As such, these wells are exempt from the BEA and are not included in BPP calculations. The specifics for the TWS's wells are shown in Table 2.2-5.

**Table 2.2-5
Tustin Water Service Active and Planned Wells**

Well	Year Drilled
Columbus-Tustin	1985
Beneta	1977
Livingston	NA
Vandenburg	1993
Pasadena Avenue	Future
Tustin Avenue	1952
Yorba Street	NA
Prospect	1955
Pankey	NA
Walnut Avenue	1930
Main St. No. 2	NA
Main St. No. 3	1972
Main St. No. 4	1999
17 th St. No. 1	NA
17 th St. No. 2	1972
17 th St. No. 4	2003
Newport Well No. 3	1926

Table 2.2-6 summarizes the amount of groundwater pumped by the TWS for the last five years.

Table 2.2-6
Amount of Groundwater Pumped
(AF)

Clear Groundwater	2000	2001	2002	2003	2004	2005
Columbus-Tustin	1,656	1,361	1,043	915	693	535
Beneta	737	735	485	240	281	380
Livingston	0	0	0	0	0	0
Vandenburg	2,111	1,937	2,246	1,451	790	752
Tustin Avenue	732	645	358	660	438	304
Yorba Street	653	583	593	12	186	212
Prospect	825	751	881	489	238	331
Pankey	0	0	0	0	0	0
Walnut Avenue	979	993	953	593	283	174
Subtotal	7,693	7,005	6,559	4,360	2,909	2,688
Treated Groundwater	2000	2001	2002	2003	2004	2005
Main St. No. 2	311	0	363	0	0	0
Main St. No. 3	293	558	798	542	621	420
Main St. No. 4	0	518	0	868	1,448	1,079
17 th St. No. 1	826	1,420	1,080	257	0	0
17 th St. No. 2	506	540	304	54	0	0
Newport Well No. 3	1,130	100	648	400	590	1
17 th Street No. 4	0	0	0	1,754	2,503	1,267
Subtotal	3,066	3,136	3,193	3,875	5,162	2,767
Total	10,759	10,141	9,752	8,235	8,071	5,455

Table 2.2-7 presents the total amount of water that is projected to be pumped by TWS in the future.

Table 2.2-7
Amount of Groundwater Projected to be Pumped
(AFY)

Santa Ana Groundwater Basin	2010	2015	2020	2025	2030
Clear Groundwater Production	8,220	8,220	8,220	8,220	8,220
Treated Groundwater Production	4,000	4,000	4,000	4,000	4,000
Percent of Total Supply	95%	95%	95%	95%	95%

SECTION 3 WATER QUALITY

3.1 WATER QUALITY OF EXISTING SOURCES

As required by the Safe Drinking Water Act (reauthorized in 1996), the TWS provides annual water quality reports to its customers, also known as Consumer Confidence Reports. This mandate is governed by the Federal Environmental Protection Agency (EPA) and the California Department of Health Services (DHS) to inform customers about their drinking water quality.

TWS, OCWD, and Metropolitan vigilantly safeguard their water supplies through continuous testing, monitoring, and related processes for water quality. In some cases, TWS, Metropolitan, and OCWD exceed DHS requirements and test for other contaminants that have been known for health risks. In accordance with the Safe Drinking Water Act, the TWS monitors a number of regulated and unregulated compounds in its water supply. The water delivered to the TWS meets the standards required by the state and federal regulatory agencies.¹⁹

IMPORTED WATER

The TWS receives imported water through EOCWD and MWDOC from Metropolitan, which receives raw water from northern California through the SWP and the Colorado River Aqueduct. Metropolitan water is treated in accordance with state and federal potable standards at filtration plants located throughout southern California. The TWS receives its treated imported water from the Robert B. Diemer Filtration Plant located in Yorba Linda, California. Typically, the Diemer Filtration Plant receives a 50/50 blend of SWP and Colorado River water.²⁰

Metropolitan tests and treats its water for microbial, organic, inorganic, and radioactive contaminants as well as pesticides and herbicides. Protection of Metropolitan's water system continues to be a top priority. In coordination with its 26 member public agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Changes have included an increase in the number of water quality tests conducted each year (more than 300,000) as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.²¹ Metropolitan also has one of the most advanced laboratories in the country where water quality staff performs tests, collects data, reviews results, prepares reports, and researches other treatment technologies. Although not required, Metropolitan monitors and samples elements that are not regulated but have captured scientific and/or public interest.

¹⁹ City of Tustin, 2005 Water Quality Report.

²⁰ City of Tustin. Water Master Plan, p. 3-17 through 3-19. 2000.

²¹ Metropolitan's website, www.mwdh2o.com/mwdh2o/pages/yourwater/2005_report/protect_02.html

Metropolitan has tested for chemicals such as perchlorate, methyl tertiary butyl ether (MTBE), and chromium VI among others.

In Metropolitan's Integrated Resources Plan (IRP) Update, water quality was identified as a possible risk to Metropolitan's future water supply reliability. Existing supplies could be threatened in the future because of contamination, more stringent water quality regulations, or the discovery of an unknown contaminant. Water quality of imported water could directly impact the amount of water supplies available to the TWS. Metropolitan's UWMP Update included the following examples:

- If a groundwater basin becomes contaminated and cannot be used, more water will be required from other sources
- Imported water from the Colorado River must be blended (mixed) with lower salinity water from the SWP. Higher salinity levels in the Colorado River would increase the proportion of SWP supplies required.
- High total dissolved solids in water supplies leads to high TDS in wastewater, which increases the cost of recycled water
- If diminished water quality causes a need for membrane treatment, the process typically results in losses of up to 15 percent of the water processed
- Degradation of imported water supply quality could limit the use of local groundwater basins for storage
- Changes in drinking water quality standards such as arsenic, radon, or perchlorate could increase demand on imported water supplies

Because of the concerns identified above, Metropolitan has identified those water quality issues that are of greatest concern and identified necessary water management strategies to minimize the impact on water supplies. Water quality concerns with Metropolitan's water supplies and the approaches taken to ensure acceptable water quality are discussed in the following sections.

Salinity

Water from the Colorado River Aqueduct has the highest level of salinity of all Metropolitan's sources of supply, averaging 650 mg/L during normal water years.²² Several actions have been taken on the state and federal level to control the salinity conditions at the river such as the Colorado River Basin Salinity Control Act in 1974 and formation of the Colorado River Basin Salinity Control Forum. In 1975, water quality standards and a plan for controlling salinity were approved by the Environmental Protection Agency.

In contrast, water from the SWP is significantly lower in total dissolved solids, averaging 250 mg/L. Because of the lower salinity, Metropolitan blends SWP water with Colorado River water to reduce the salinity in the water delivered to its customers. Metropolitan's Board of Directors has adopted a salinity objective of 500 mg/L for blended imported water as defined in Metropolitan's Salinity Management Action Plan. Metropolitan

²² Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

estimates that the objective can be met in seven out of ten years. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies.

In an effort to address concerns over salinity, Metropolitan secured State of California Proposition 13 funding for two water quality programs:

- 1) Water Quality Exchange Partnership – the funding is being used to develop new infrastructure to optimize water management capabilities between the agricultural users of the eastern San Joaquin Valley and urban users of southern California. Installing infrastructure will provide opportunities for Metropolitan to exchange SWP water for higher quality water.
- 2) The Desalination Research and Innovation Partnership (DRIP) – the funding is being used to develop cost-effective advanced water treatment technologies for the desalination of Colorado River water, brackish groundwater, municipal wastewater, and agricultural drainage water.

Perchlorate in Colorado River

Perchlorate is a contaminant of concern to Metropolitan and is known to have adverse effects on the human thyroid. Perchlorate has been detected at low levels in the Colorado River water supply. Perchlorate is difficult to remove from water supplies with conventional water treatment. Successful, but expensive treatment technologies include nanofiltration, reverse osmosis, biological treatment, and fluidized bed bioreactor treatment. Metropolitan continues to monitor perchlorate contamination of the Colorado River as well as research various treatment options. In 2002 Metropolitan adopted a Perchlorate Action Plan which defined the following nine objectives:

- 1) expand monitoring and reporting programs
- 2) assess the impact of perchlorate on local groundwater supplies
- 3) continue tracking health effects studies
- 4) continue tracking remediation efforts in the Las Vegas Wash
- 5) initiate modeling of perchlorate levels in the Colorado River
- 6) investigate the need for additional resource management strategies
- 7) pursue legislative and regulatory options for cleanup activities and regulatory standards
- 8) include information on perchlorate into outreach activities
- 9) provide periodic updates to Metropolitan's board and member agencies

Disinfection by-products formed by disinfectants reacting with bromide and total organic carbon in SWP water

SWP water supplies contain levels of total organic carbon and bromide that are a concern to Metropolitan in maintaining safe drinking water supplies. When water is disinfected at treatment plants certain chemical reactions can occur with these impurities that can form

disinfection byproducts (DBP). DBPs in turn can result in the formation of trihalomethanes (THMs), haloacetic acids (HAAs) and other DBPs. THMs and HAAs have been found to cause cancer in laboratory animals. Inherent in any through-Delta water movement is the high organic and bromide loading imposed on the water from agricultural runoff and salt water intrusion. This poses significant treatment challenges to end users, like Metropolitan. To avoid problems with DBPs and the formation of THMs, it is imperative that the quality of SWP water delivered to Metropolitan be maintained at the highest levels possible.

To control the total organic carbon and bromide concentrations in Metropolitan's water supply, SWP water is blended with Colorado River water. The blending of these two water sources benefits consumers in two ways: reduction in disinfection byproducts and reduction in salinity (as discussed earlier). With recent drought conditions on the Colorado River, water supplies have been reduced which impacts the blending operations at the various filtration plants. As a result, Metropolitan's Board of Directors authorized the use of ozone as the primary disinfectant at all five Metropolitan treatment plants in July 2003 (refer to Figure 3-1 from Metropolitan's 2005 Regional Urban Water Management Plan for a map of MWD's service area and filtration plant sites). Previously, only the Henry J Mills and Jensen Filtration Plants had been approved for this treatment. These two plants were chosen for the use of ozone to meet new disinfection byproducts regulations. Metropolitan's Board of Directors plans to install ozonation at the remaining three plants by 2009, including the Diemer filtration plant.

Methyl Tertiary Butyl Ether (MTBE) in Groundwater and Local Surface Reservoirs

The California Department of Health Services has adopted a primary maximum contaminant level (MCL) of 13 ug/L for MTBE. MTBE is an oxygenate found in gasoline. Metropolitan monitors MTBE levels at Diamond Valley Lake and Lake Skinner. The reservoirs also have boat requirements such as MTBE-free fuel to aid in the protection of imported water supplies. MTBE concentrations have been below the MCL.

Uranium

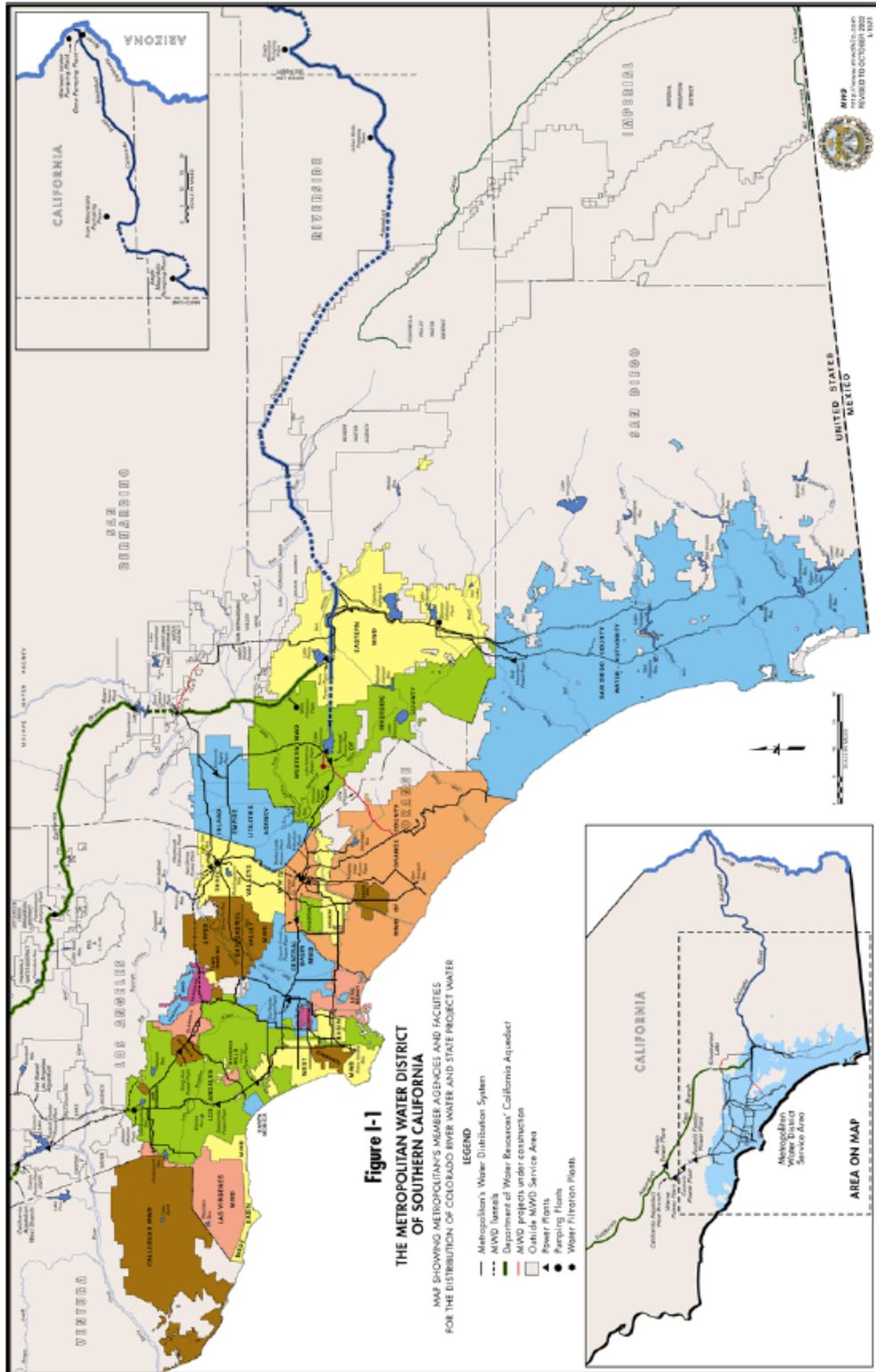
Uranium is a contaminant of concern to Metropolitan in the water from the Colorado River. Significant deposits of uranium mine tailings have been located approximately 600 feet from the river at Moab, Utah. Rainfall seeps through the tailings and contaminates the local groundwater which flows to the river. In 2003, an interim action system was implemented that intercepts some of the contaminated groundwater prior to reaching the river. The U.S. Department of Energy is preparing an Environmental Impact Statement that will evaluate the possibility of moving the pile, capping it in place, and other alternatives. Uranium levels at Metropolitan's intake range from 1 to 5 pCi/L whereas the California drinking water standard is 20 pCi/L.²³

²³ The Metropolitan Water District of Southern California, Regional Urban Water Management Plan, 2005

N-nitrosodimethylamine (NDMA)

NDMA is an emerging contaminant that may have an impact on regional water supplies. Although Metropolitan's water supplies are non-detect for NDMA, there is a concern that chlorine and monochloramine can react with organic nitrogen precursors to form NDMA.

**Figure 3-1
Metropolitan Water District Service Area and Filtration Plant Sites**



Hexavalent Chromium (Chromium VI)

Currently, the MCL for total chromium is 0.05 mg/L, which includes Chromium VI. DHS is to set a MCL for Chromium VI, however, the Office of Health Hazard Assessment must first establish a public health goal. Metropolitan samples for Chromium VI and monitors levels within the Colorado River because of Chromium VI detection in groundwater near the river. The plume of Chromium VI has been detected in recently installed wells that are located less than 60 feet west of the Colorado River near Topock, Arizona. In February 2005, Chromium VI was detected at a concentration of 354 parts per billion (ug/L).²⁴ Metropolitan has been involved in a Technical Work Group promulgated by both the U.S. Environmental Protection Agency and the State Regional Water Quality Control Board that is reviewing monitoring results and remediation plans for groundwater contaminated with hexavalent chromium.

Water Quality Programs

Metropolitan supports and is involved in many programs that address water quality concerns related to both the SWP and Colorado River supplies. Some of the programs and activities include:

- CALFED Program – This program coordinates several SWP water feasibility studies and projects. These include:
 1. A feasibility study on water quality improvement in the California Aqueduct.
 2. The conclusion of feasibility studies and demonstration projects under the Southern California-San Joaquin Regional Water Quality Exchange Project.²⁵ This exchange project was discussed earlier as a mean to convey higher quality water to Metropolitan.
 3. DWR's Municipal Water Quality Investigations Program and the Sacramento River Watershed Program. Both programs address water quality problems in the Bay-Delta and Sacramento River watershed.
- Delta Improvement Package – Metropolitan in conjunction with DWR and US Geologic Survey have completed modeling efforts of the Delta to determine if levee modifications at Franks Tract would reduce ocean salinity concentrations in water exported from the Delta. Currently, tidal flows trap high saline water in the track. By constructing levee breach openings and flow control structures, it is believed saline intrusion can be reduced. This would significantly reduce total dissolved solids and bromide concentrations in water from the Delta.
- Source Water Protection – In 2001, Metropolitan completed a Watershed Sanitary Survey as required by DHS to examine possible sources of drinking water contamination and identify mitigation measures that can be taken to protect the water at the source. DHS requires the survey to be completed every five years. Metropolitan also completed a Source Water Assessment (December 2002) to

²⁴ Arizona Department of Health Services, Topock Groundwater Study Evaluation of Chromium in Groundwater Wells, September 7, 2005.

²⁵ Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

evaluate the vulnerability of water sources to contamination. Water from the Colorado River is considered to be most vulnerable to contamination by recreation, urban/storm water runoff, increasing urbanization in the watershed, wastewater and past industrial practices. Water supplies from SWP are most vulnerable to urban/storm-water runoff, wildlife, agriculture, recreation, and wastewater.²⁶

GROUNDWATER

OCWD manages the Lower Santa Ana River Groundwater Basin (Basin) and conducts a comprehensive water quality monitoring program. OCWD collects over 13,500 groundwater samples each year from over 800 wells. The water quality data collected from these wells is used to assess ambient conditions of the Basin, monitor the effects of extraction, monitor the effectiveness of the seawater intrusion barriers, evaluate impacts from historic and current land use, address poor water quality areas, and also provide early warning of emerging contaminants of concern.²⁷

OCWD's water quality monitoring programs are broadly classified into three categories: (1) regulatory or compliance with permits, environmental and groundwater drinking water regulations, (2) committed OCWD and research projects, and (3) Basin management, i.e., or evaluating and protecting Basin water quality. OCWD is compliant with groundwater drinking water regulations and operates under a Department of Health Services' approved monitoring program that includes monitoring all drinking water wells within the OCWD, including the TWS's wells. Wells are sampled for regulated and unregulated chemicals at a required monitoring frequency.

OCWD operates an extensive groundwater quality management program that allows OCWD to address current issues and develop strategies to anticipate and resolve future issues. OCWD's 2004 Groundwater Management Plan has a section devoted solely to groundwater quality management. The groundwater quality issues facing OCWD and the TWS and the programs implemented to address those issues are summarized in the following sections. As previously discussed, TWS's groundwater meets State potable water quality standards with the exception of nitrate and/or total dissolved solids (TDS) for some of the wells.

Nitrates

The Basin has a number of constituents that are water quality concerns. The early agricultural practices locally contributed to the high concentrations of nitrates in the shallow groundwater. Nitrates are present in groundwater due to contamination by decaying plant or animal material, manure, fertilizers, domestic sewage and/or geological formations containing soluble nitrogen compounds.

²⁶ Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

²⁷ Orange County Water District, *Groundwater Management Plan*, March 2004.

Although nitrates are present throughout the Basin, only a small number of areas exceed the MCL. Groundwater high in nitrate and TDS levels in TWS's service area is shown in Figure 3.2

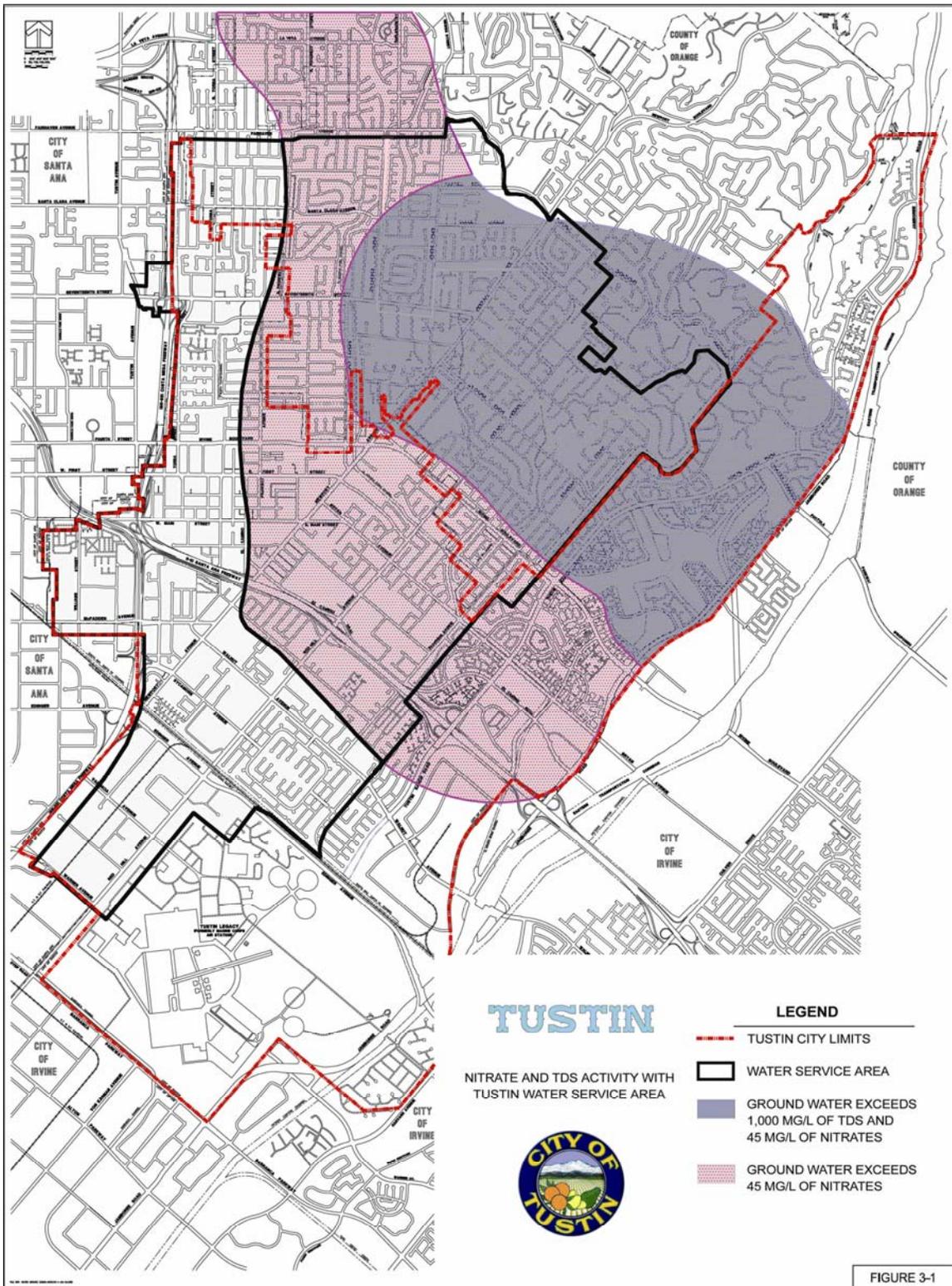


Figure 3.2 Nitrate and TDS Activity in TWS Service Area

Nitrate management goals include remediating groundwater contaminated by nitrate, attaining the Santa Ana Water Quality Control Board's Region 8 (RWQCB) groundwater subbasin nitrate-nitrogen water quality objective of 3 mg/L (the MCL is 10 mg/L), and increasing the frequency of monitoring to quarterly for those wells having concentrations of nitrate above 50 percent of the MCL currently. Currently, the two nitrate removal projects within Orange County include the Garden Grove Nitrate Removal Project and the Tustin Main Street Treatment Plant.

In order to mitigate high nitrate levels, TWS operates two groundwater treatment plants, the Main Street Plant and 17th Street Desalter Treatment Plant. The Main Street Plant uses two separate processes. The plant is capable of treating groundwater to below the nitrate MCL of 45 mg/l through either reverse osmosis (RO) or ion exchange (IX). The product water is blended with lower quality nitrate water from another well and is then pumped into the distribution system, producing approximately 2,000 AFY.²⁸ TWS collects water samples daily to ensure that nitrate levels do not exceed the State MCL of 45 mg/l of nitrate as NO₃.

Total Dissolved Solids (TDS)

Another water quality concern is TDS. OCWD has been proactive in combating the increase in salinity within the Basin; however, many wells within OCWD, exceed the RWQCB's water quality objective of 500 mg/L. The secondary MCL range for TDS is 500 mg/l (recommended), 1,000 mg/l (upper), and 1,500 mg/l (short term).²⁹ TDS concentrations range from 223 to over 600 mg/L and averages 461 mg/L within the Basin.³⁰ The average TDS concentration of untreated groundwater pumped from the TWS is 719 mg/L.

The TDS levels within the recharge waters are higher than the average TDS concentrations within the groundwaters, as a result the TDS concentration within the groundwater continues to rise. In response to the rising TDS concentrations, OCWD has implemented groundwater desalter projects (the Irvine Desalter and the Tustin Seventeenth Street Desalter), has expanded barrier injection facilities, cooperates with upper Santa Ana watershed stakeholders to control TDS at the source, supports Metropolitan's efforts to import high quality water, maintains an aggressive monitoring program, and proposes the Groundwater Replenishment System.³¹

The 17th Street Desalter Treatment Plant utilizes reverse osmosis to treat water with excessive concentrations of nitrates and TDS. This plant receives water from three different wells and treats approximately 3,000 AFY.

²⁸ City of Tustin. Urban Water Management Plan, 2000

²⁹ City of Tustin. Water Master Plan, p. 3-6 through 3-7, 2000

³⁰ Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005.

³¹ Orange County Water District, *Groundwater Management Plan*, March 2004

One of the major challenges for OCWD is the contamination of fresh groundwater by saltwater intrusion and therefore OCWD has implemented two seawater intrusion barriers: the Talbert Barrier and the Alamitos Barrier. The coastal seawater monitoring program focuses on the effectiveness of the barriers and the following parameters are monitored: water level elevations, chloride, TDS, electrical conductivity, and bromide. Each of these parameters aid OCWD in tracking the extent and movement of saline waters throughout the Basin.

Volatile Organic Compounds (VOC)

OCWD has an aggressive VOC monitoring program. Because of the monitoring program, VOC's have been detected in a number of wells within OCWD. Several drinking water wells have been taken out of service, although not within the TWS. OCWD implemented the Irvine Desalter Project to address the VOC's and high TDS concentrations in the Groundwater Basin near Irvine. OCWD is also proposing the Forebay VOC Cleanup project to prevent further spread of groundwater contaminated with VOC's. The other VOC removal project is a well within the City of Santa Ana that treats water for irrigation at the River View Golf Course.

Methyl Tertiary-Butyl Ether (MTBE)

Drinking water wells within OCWD are tested for methyl tertiary-butyl ether, more commonly known as MTBE, at least annually and in some cases quarterly. OCWD aggressively monitors for MTBE to detect a problem before it reaches a drinking water well.³² The health effects of MTBE are uncertain. The EPA currently classifies MTBE as a possible human carcinogen.

Unfortunately there are hundreds of identified sites with leaky underground storage tanks throughout Orange County. The majority of these sites do not have a groundwater cleanup program to remove the MTBE from the shallow groundwater. In response to the MTBE contamination, OCWD filed a lawsuit in 2003 against numerous oil and petroleum-related companies. The suit seeks funding from responsible parties to pay for the investigation, monitoring, and removal of oxygenates from the Basin.³³ Two wells within OCWD, have been taken out of service because of MTBE contamination. Fortunately, a thick underground clay layer helps protect most of the Groundwater Basin from surface contamination of MTBE.

N-nitrosodimethylamine (NDMA)

In the year 2000, OCWD discovered NDMA, a known carcinogen, in the injection water used to prevent seawater intrusion at the Talbert Barrier. OCWD adjusted the operation of Water Factory 21, where recycled water is treated for injection, for NDMA treatment. Ultraviolet light treatment was added to the process to reduce the occurrence of NDMA in injection waters.

³² Orange County Water District, 2001-2002 Annual Report

³³ Orange County Water District, *Groundwater Management Plan*, March 2004

There is currently one NDMA removal project within OCWD. Mesa Consolidated Water District provides wellhead treatment for the removal of NDMA. The treatment process meets the current NDMA Action Level of 10 nanograms per liter and minimizes further down gradient migration of NDMA. The TWS's wells have been tested for NDMA and have not exceeded the action level.

Emerging Contaminants

Pharmaceuticals, personal care products, and endocrine disruptors are considered emerging environmental contaminants. There are water quality concerns associated with these emerging contaminants because of their widespread use among the population and their impact on human health because of exposure to low doses over long periods of time. OCWD is aware of these contaminants and is working with DHS to track and report their concentrations in the groundwater.

Colored Groundwater

Colored groundwater is encountered over a broad region of Orange County and is estimated in excess of one million acre-feet. The area identified as the "colored water" area includes the southern part of the Basin near the coastal area. The colored water is located at depths deeper than the clear zone, and if a deep well can be constructed, a new source of water may be available. The OCWD 2004 Groundwater Management Plan reports nine wells have been drilled in the colored zone. These wells aid in reducing the groundwater level of the colored aquifer and thus minimize the potential for upward vertical migration of colored water into the clear zones.

Water Quality Programs

OCWD supports and is involved in many programs that address water quality concerns in the Basin. Some of the programs and activities include:

- **Source Water Protection** – Similar to Metropolitan, OCWD has completed a drinking water source assessment for the existing drinking supply wells. The source water assessment develops management strategies to prevent or reduce the risks to groundwater from pollution such as:
 - 1) Delineates the time-of-travel aquifer capture zone of the source and identifies land area to be protected
 - 2) Identifies and locates potential sources of contamination to the well
 - 3) Manages land use and planning for future development
 - 4) Requires development to comply with the County's Municipal Stormwater Water Quality Management Plan to protect groundwater replenishment water
- **Surface Water Monitoring** – OCWD also conducts routine monitoring of the Santa Ana River and other surface waterways in the upper watershed. OCWD is conducting the Santa Ana River Water Quality and Health Study to verify the sustainability of continued use of river water for recharge and its impact on groundwater quality.

- Constructed Wetlands – OCWD operates the Prado Basin Wetland in cooperation with the US Army Corps of Engineers and the US Fish and Wildlife Service to reduce the nitrogen concentration of river water. The constructed wetlands comprise of 465 acres.
- Public Outreach – OCWD has implemented a public education outreach program called the Groundwater Guardian Team to inform the public about the benefits of protecting the Groundwater Basin.
- Regulation – In May of 1987, OCWD adopted a Groundwater Quality Protection Policy. The policy established the following objectives:
 - 1) Maintain a suitable groundwater supply for all existing and potential beneficial uses
 - 2) Prevent degradation of the quality of the groundwater supply
 - 3) Assist responsible regulatory agencies in identifying sources of pollution to assure cleanup by the responsible party(s)
 - 4) Maintain or increase the Basin’s usable storage capacity
 - 5) Inform the general public of water quality problems as they are encountered as well as the overall condition of the groundwater supply, through appropriate regulatory agencies and producers

3.2 WATER QUALITY EFFECTS ON WATER MANAGEMENT STRATEGIES AND SUPPLY RELIABILITY

The previous section summarized the general water quality issues of Metropolitan’s imported water and OCWD’s groundwater supplies and the concerns for TWS. Similar to Metropolitan and OCWD, the TWS prepared an assessment of the TWS’s drinking water in December 2002. The groundwater sources were found to be most vulnerable to possible contamination from dry cleaners, electrical/electronic manufacturing, gas stations, known contaminant plumes, metal plating/finishing/fabricating, military installations, and plastics/synthetic producers.³⁴ The TWS continues to monitor its groundwater wells for the first indication of problems as part of its water management strategy.

TWS’s groundwater meets State potable water quality standards with the exception of nitrate and/or TDS for some of the wells. In order to mitigate high nitrate and TDS levels, TWS operates two groundwater treatment plants, the Main Street Plant and 17th Street Desalter Treatment Plant. Both treatment plants have been successful in lowering high nitrate and TDS water to achieve compliance with the nitrate and TDS requirements. In the past approximately eight years there has been a downward trend of nitrate concentrations in TWS wells.³⁵

³⁴ City of Tustin, 2005 Water Quality Report.

³⁵ City of Tustin. Water Master Plan, p. 3-7. 2000

TWS does not anticipate any changes in its available imported water supplies due to water quality issues in part because of the mitigation actions undertaken by Metropolitan as described earlier. In the near future, EPA's Stage 2 Regulation of the Disinfection Byproducts Rule will be in effect. Stage 1 was implemented in 2002 and lowered the total THM maximum annual average concentration level in water supplies; stage 2 will further lower the THM concentration level. TWS's water supplies meet the requirements of Stage 1 and will be required to meet Stage 2 levels when they become finalized.

TWS has taken steps to insure an adequate and reliable water supply for the community. Well and storage studies have been made by independent consulting engineering firms to determine sufficient water supply and stringent water quality standards. Water management strategies and supply reliability are in place to mitigate for population growth and cyclic drought periods. TWS has consistently maintained standards for water quality, thereby enhancing reliability at a local level. TWS will continue to seek alternatives and modifications to improve existing facilities to obtain the highest quality water possible.

SECTION 4 WATER RELIABILITY PLANNING

4.1 RELIABILITY OF WATER SUPPLIES FOR TUSTIN WATER SERVICES

The City of Tustin and all communities and water agencies in Orange County are facing increasing challenges in their role as stewards of water resources in the region. The region faces a growing gap between its water requirements and its firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth in Orange County result in increased water demand within the region, putting an even larger burden on local supplies.

During the 2004/05 Fiscal Year, the City received approximately 48 percent of its water supply from local groundwater, and 52 percent from import water from Metropolitan. The portion of the City's supply from groundwater was less than the 66 percent allowable BPP because of in-lieu purchases made by Tustin. Actual percentages vary somewhat on an annual basis depending on the extent in-lieu delivery programs are implemented.

Both MWDOC and OCWD are implementing water supply alternative strategies for the region aimed at ensuring a reliable future water supply for the Orange County region. Strategies are identified in the MWDOC 2005 Regional UWMP, OCWD's Long Term Facilities Plan (Draft August 2005), OCWD 2020 Master Plan Report, and the OCWD 2004 Groundwater Management Plan. The optimum water supply strategy should attempt to meet the following objectives:

- Ensure that the Groundwater Basin is protected
- Ensure available water for Orange County residents and businesses in the future
- Minimize the consumers water supply cost
- Use a variety of sources
- Reverse the adverse salt balance in the Groundwater Basin
- Provide flexibility to allow both MWDOC and OCWD to quickly take advantage of changing and new markets if and when they develop

The reliability of the City's water supply is currently dependent on the reliability of both imported and groundwater water supplies, which are managed and delivered by Metropolitan and OCWD, respectively. The following sections will discuss these agencies, and others throughout the region, their roles in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the City and the region as a whole.

TWS has developed a water system capital improvement program (CIP) to minimize its dependence on imported water supply and to foster a program to increase the groundwater quality in the aquifer underlying its service area. TWS's goal is to develop local groundwater sources that when combined with treated groundwater supplies will

provide a projected 100 percent of the required supply within the next 20 years. Together with Metropolitan's Local Resource Program (Groundwater Recovery), TWS is implementing a groundwater development program to utilize existing wells and drill additional wells to make use of the local groundwater supply. TWS has seven existing untreated-groundwater wells.

As part of the CIP, the following reservoirs will have major to minor retrofits: (1) the existing Main Street and Rawlings Reservoirs will be replaced at the same sites to increase the system storage capacity; (2) the Foothill and Simon Ranch Reservoirs will have structural rehabilitation, including replacement of the Simon Ranch Booster Pump Station; and (3) the John Lyttle and Newport Avenue Reservoirs will have minor rehabilitation.

The CIP also addresses distribution system improvements, including resizing of the pipeline system to distribute water throughout the system to meet all demand conditions including peak hour demand and maximum day demand plus fire flow.

4.1.1 Regional Agencies and Water Reliability

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. The reliability of Metropolitan's water supply has been threatened as existing imported water supplies from the Colorado River and SWP face increasing challenges. Despite these challenges, Metropolitan continues to develop and encourage projects and programs to ensure reliability now and into the future. One such project is Metropolitan's recently completed Diamond Valley Lake in Hemet, California; an 800,000 AF capacity reservoir for regional seasonal and emergency storage for SWP and Colorado River water. The reservoir began storing water in November 1999 and reached the sustained water level by early 2002.³⁶

Colorado River Aqueduct (CRA)

Pursuant to the 1964 U.S. Supreme Court decree, Metropolitan's dependable supply of Colorado River water was limited to 550,000 acre-feet per year assuming no surplus or unused Arizona and Nevada entitlement was available and California agricultural agencies use all of their contractual entitlement. Historically, Metropolitan has also possessed a priority for an additional 662,000 AFY depending upon availability of surplus water. In addition, Metropolitan maintains agreements for storage, exchanges and transfers within the service area of Imperial Irrigation District that provide water to Metropolitan.³⁷

³⁶ Metropolitan Water District of Southern California, Regional UWMP, 2005

³⁷ Metropolitan Water District of Southern California. Integrated Water Resources Plan. 2003 Update. May 2004.

Water supplies from the Colorado River have been and continue to be a topic of negotiation and intense debate. The 1964 Court Decree required the state of California to limit its annual use to 4.4 million acre-feet (MAF) basic annual apportionment of Colorado River water plus any available surplus. To keep California at 4.4 MAF, Metropolitan reduces its level of diversions in years when no surplus is available.

In 1999, the Colorado River Board developed “California’s Colorado River Water Use Plan,” also known as the “California Plan” and the 4.4 Plan”, which was endorsed by all seven Colorado River Basin states and the U.S. Department of the Interior. This plan developed the framework that specifies how California will transition and live within its basic apportionment of 4.4 MAF of Colorado River water.

The U.S. Bureau of Reclamation implemented Interim Surplus Guidelines to assist California’s transition to the Plan. Seven priorities for use of the waters of the Colorado River within the State of California were established. Metropolitan would only be able to exercise its fourth priority right to 550,000 AF annually, instead of the maximum aqueduct capacity of 1.3 MAF. Priorities 1 through 3 cannot exceed 3.85 MAF annually. Together, Priorities 1 through 4 total California’s 4.4 MAF apportionment.

In October 2003, the Quantification Settlement Agreement (QSA), a critical component of the California’s Colorado River Water Use Plan and for purposes of Section 5(B) of the Interim Surplus Guidelines, was authorized defining Colorado River water deliveries, delivery of Priority 3(a) and 6(a) Colorado River water, and transfer and other water delivery commitments, thus facilitating the transfer of water from agricultural agencies to urban uses. The QSA is a landmark agreement, signed by the four California Colorado River water use agencies and the U.S. Secretary of the Interior, which will guide reasonable and fair use of the Colorado River by California through the year 2037.

Metropolitan’s Integrated Water Resources Plan 2003 Update, recognizes that the QSA supports Metropolitan’s development plans for CRA deliveries, and demonstrates the reliability benefits as a result of the QSA and existing supply enhancement programs.

State Water Project (SWP)

The reliability of the SWP impacts Metropolitan’s member agencies’ ability to plan for future growth and supply. DWR’s Bulletin 132-03, December 2004, provides certain SWP reliability information, and in 2002, the DWR Bay-Delta Office prepared a report specifically addressing the reliability of the SWP.³⁸ This report, *The State Water Project Delivery Reliability Report*, provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns. The following SWP reliability information is included in these reports.

On an annual basis, each of the 29 SWP contractors including Metropolitan request an amount of SWP water based on their anticipated yearly demand. In most cases,

³⁸ Department of Water Resources, State Water Project Delivery Reliability Report. 2002.

Metropolitan's requested supply is equivalent to its full Table A Amount; currently at 1,911,500 AFY. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the SWP annual delivery of water to contractors has ranged from 552,600 AFY in 1991 to 3.5 MAF in 2000. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply.

Typically, around December of each year, DWR provides the contractors with their first estimate of allocation for the following year. For example, on November 23, 2005 DWR announced a 55 percent initial allocation of contractor's Table A Amounts for the year 2006. Due to the variability in water supply for any given year, it is important to understand the reliability of the SWP to supply a specific amount of water each year to the contractors. As hydrologic and water conditions develop throughout the year, DWR revises the allocations.

On January 14, 2005, SWP supplies were projected to meet 60 percent of most SWP contractor's Table A Amounts. This allocation was increased to 70 percent on April 1, 2005 and to 80 percent on April 21, 2005. The final allocation increase occurred on May 27, 2005 and the notice projected SWP would meet 90 percent of most contractor's Table A Amounts.

DWR is preparing an update to the SWP Reliability Report issued in 2003 and expects it to be complete by the end of 2005. On November 18, 2005, DWR released the draft of the 2005 SWP Delivery Reliability Report for public review and comment. The draft Reliability Report updates the reliability report finalized in 2003 with the inclusion of two updated studies. The updated studies, 4 and 5, contain the most current information for assumed demands of SWP contractors. The results of studies 4 and 5 show average deliveries of 69 percent of full Table A under current conditions and 77 percent under future conditions. The more recent studies also show a minimum delivery of 4 and 5 percent, current and future years respectively, compared to 20 percent for the 2003 report. These amounts are shown in Table 4.1.1-1 on the following page compared to the earlier CALSIM modeling as discussed below.

DWR analyzed the SWP's reliability using the California Water Allocation and Reservoir Operations Model (CALSIM II model) in their Reliability Report. The CALSIM II model was developed by DWR and the U.S. Bureau of Reclamation (USBR) to simulate operations of the SWP and the Central Valley Project (CVP). The CALSIM II model is used to estimate water deliveries to both SWP and CVP users under various assumptions such as hydrologic conditions, land use, regulations, and facility configurations. Documentation for CALSIM II, including assumptions, can be found on the DWR Web site at <http://modeling.water.ca.gov>.

One of the key assumptions of the CALSIM II model is that past weather patterns will repeat themselves in the future. The model uses a monthly time step to calculate available water supply based on historical rainfall data from 73 years of records (1922 – 1994). The model scenarios used in the preparation of the Reliability Report also assumed that regulatory requirements and facilities would not change in the future. DWR considered this assumption conservative since additional facilities such as reservoirs may be implemented in the future to specifically increase the SWP’s reliability.

The CALSIM II model was used to complete three benchmark studies dated May 17, 2002 for the Reliability Report. The benchmark studies evaluated the water supply and demand at the 2001 condition and at the 2021 condition. In 2001, SWP water demand was estimated to vary from 3.0 to 4.1 MAF per year depending on the weather conditions (wet or dry years). SWP water demands in 2021 were estimated to range from 3.3 to 4.1 MAF per year. DWR prepared two benchmark studies for the 2021 condition. The first study assumed that SWP water demands would depend on weather conditions, whereas the second study assumed the contractor’s water demand would be their maximum Table A Amount; 4.1 MAF per year regardless of weather. Table 4.1.1-1 shows the results, which demonstrate that SWP deliveries, on average, can meet 75 percent of the maximum Table A Amount.

**Table 4.1.1-1
SWP Table A Deliveries from the Delta
Percent of Total Table A Amount of 4.133 MAF
(MAF)**

Study	Average	Maximum	Minimum
2001 Study	2.962 (72%)	3.845 (93%)	0.804 (19%)
2021 Study A ^[1]	3.083 (75%)	4.133 (100%)	0.830 (20%)
2021 Study B ^[2]	3.130 (76%)	4.133 (100%)	0.830 (20%)
Revised-Demand Today ^[3]	2.818 (69%)	3.848 (94%)	0.159 (4%)
Revised-Demand Future ^[4]	3.178 (77%)	4.133 (100%)	0.187 (5%)

Source: Department of Water Resources, Excerpts from Working Draft of 2005 SWP Delivery Reliability Report – Attachment 1, May 25, 2005

^[1] Assumes demands depend on weather conditions.

^[2] Assumes demands at maximum Table A amount.

^[3] Revises demands to current conditions.

^[4] Revises demands at levels of use projected to occur by 2025.

The Monterey Agreement states that contractors will be allocated part of the total available project supply in proportion to their Table A Amount. The Monterey

Agreement changed SWP water allocation rules by specifying that, during drought years, project supplies be allocated proportionately based on the maximum contractual Table A Amount. Water is allocated to urban and agricultural purposes on a proportional basis, deleting a previous initial supply reduction to agricultural contractors. The agreement further defines and permits permanent sales of SWP Table A Amounts and provides for transfer of up to 130,000 AF of annual Table A Amounts from agricultural use to municipal use. The Agreement also allows SWP contractors to store water in another agency's reservoir or groundwater basin, facilitates the implementation of water transfers and provides a mechanism for using SWP facilities to transport non-project water for SWP water contractors. The Agreement provides greater flexibility for SWP contractors to use their share of storage in SWP reservoirs.

Report on Metropolitan's Water Supplies: Blueprint for Water Reliability

Metropolitan released a *Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability* on March 25, 2003, to provide updated information on Metropolitan's projected supply and demand for incorporation into Water Verification and Water Supply Assessments for compliance with SB 221 and SB 610, respectively. These bills implement requirements to connect land use to a sufficient water supply before a development can be approved. The Metropolitan report addresses water supply reliability issues and states Metropolitan's roles and responsibilities, which include the following: (1) implementing water management programs that support the development of cost-effective local resources; (2) securing additional imported supplies as necessary through programs that increase the availability of water delivered through the Colorado River Aqueduct and the SWP; (3) providing the infrastructure needed to integrate imported and local sources; (4) establishing a comprehensive management plan dealing with periodic surplus and shortage conditions; and (5) developing a rate structure that strengthens Metropolitan's financial capabilities to implement water supply programs and make infrastructure improvements.

The report details that Metropolitan's regional water demand projections are 6 percent to 16 percent *higher*, depending on which 5-year projection period and 11 percent for Year 2025, than the aggregated projections of Metropolitan's member agencies. As stated in the Report, "this difference indicated that Metropolitan supplies would provide a level of 'margin of safety' or flexibility to accommodate delays in local resources development or adjustments in development plans."³⁹ Additionally, the report concludes that "current practices allow Metropolitan to bring water supplies on-line at least ten years in advance of demand with a very high degree of reliability." More particularly, Metropolitan documented sufficient currently available supplies to meet 100 percent of member agencies' supplemental water demands for 20 years under Average and Wet Year conditions, for 15 years under Multiple Dry Year conditions (with 8 to 26 percent reserve capacity), and for 15 years under Single Dry Year conditions (with 8-25 percent reserve capacity). With the addition of supplies under development, Metropolitan will be able to

³⁹ Metropolitan Water District of Southern California. Report on Metropolitan Water Supplies, A Blueprint for Water Reliability, p. 9. March 25, 2003.

meet 100 percent of its agencies' supplemental water needs under all supply and demand conditions through 2030 with 20-25 percent reserve capacity.⁴⁰

The Report also identifies the ways Metropolitan is managing changes in southern California's water supplies, including reduced Colorado River deliveries and water quality constraints. In addition, opportunities for additional supplies are currently being implemented in the following ways:

- 1) Full Diamond Valley Lake: The Lake is now fully operational with an increased conveyance capacity for refill system storage.
- 2) Re-Operation of Storage and Transfer Programs: In 2003, Metropolitan developed additional storage and transfer capabilities and completed filling local resources to achieve full storage accounts in operational reservoirs and banking/transfer programs.
- 3) Enhanced Conservation Programs: A new campaign is designed to encourage more efficient outdoor water use and promote innovative conservation measures.
- 4) Development of Additional Local Resources: There are promising opportunities identified to develop seawater desalination and expand the Local Resources Program.

In addition to the *Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability*, MWD's September 2005 Draft Regional Urban Water Management Plan (RUWMP) demand and supply analysis also projects surpluses (of regional supplies compared with regional demands) ranging from 5 percent to 35 percent in all years and all drought scenarios through 2030.⁴¹

As demand forecasts are refined, supply goals are also refined. Metropolitan has consistently supplied over 50 percent of water supplies to the southern California region. To continue to accomplish this, Metropolitan continues to approve new and innovative projects and programs to ensure reliability. For example, in August 2001, Metropolitan took action to move forward initiatives to bolster future supplies by supporting seawater desalination projects, increased commercial conservation efforts, improve water quality by decreasing salinity in supplies from the State Water Project and the Colorado River, increased underground storage and retrieval facilities, adopted principles for establishing cooperative programs, and endorsed legislation that would further water reliability. Some of these projects are further described in Section 4.4.

Integrated Water Resources Plan (IRP)

To address Metropolitan's reliability challenges, Metropolitan and its member agencies developed an Integrated Water Resources Plan (IRP) in 1996. The overall objective of the

⁴⁰ Metropolitan Water District of Southern California. Report on Metropolitan Water Supplies, A Blueprint for Water Reliability, p. 24-25. March 25, 2003.

⁴¹ Tables II-7, 8 and 9 of Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

IRP process is the selection and implementation of a Preferred Resource Mix (or strategy) consisting of complementary investments in local water resources, imported supplies and demand-side management that meet the region's desired reliability goal in a cost-effective and environmentally sound manner. The 1996 IRP was reviewed as part of Metropolitan's strategic plan and rate refinement to guide the development and implementation of revised Metropolitan water management programs through the year 2005.

The IRP 2003 Update was approved and released July 13, 2004, and includes various projects and programs that contribute to the reliability of Metropolitan's imported water supplies. The IRP Update concluded that the resource targets from the 1996 IRP, factored in with changed conditions, will continue to provide for 100 percent reliability through 2025.

While the IRP 2003 Update includes goals for a variety of resource targets, it identified the most significant programs as conservation and local supply development among the Preferred Resource Mix. The IRP details the Local Resources Program (LRP) and the Seawater Desalination Program as a means to increase reliability of local supplies. Metropolitan initiated the LRP to promote the development of water recycling projects that reduced demand for imported water and improved regional water supply reliability in 1982. In 1991, the Groundwater Recovery Program was implemented to similarly promote the recovery of local degraded groundwater supplies. In 1995, both programs were combined into the LRP. Currently, the LRP, including both recycling and groundwater recovery, has invested over \$121 million and partnered with member agencies on 53 recycled water projects and 22 groundwater recovery projects generating 251,000 acre feet of local supply in 2002.⁴²

The IRP 2003 Update states that Metropolitan's regional production target is 500,000 AF by 2020 for its LRP. Metropolitan's current projection of regional implementation of recycling, groundwater recovery, and seawater desalination resource targets exceeds the 1996 IRP goals. Although in FY 2002, recycling and groundwater recovery programs narrowly missed their target, the region is expected to meet its 2010 and 2020 targets. Meeting the targets will require the region to produce 159,000 AF of additional local project and/or seawater desalination supply by 2010 and 249,000 AF by 2020. Overall, the region has developed about 50 percent of the 1996 IRP local resources target for 2020.

Metropolitan continues to encourage development of local water resource projects through offering financial incentives through the LRP to its member agencies. These anticipated water supply benefits are incorporated into the forecasts of demand on Metropolitan. In addition to the LRP, Metropolitan also provides financial and technical assistance for implementing water conservation Best Management Practices, as well as a significant investment in regional and local water conservation programs. Metropolitan

⁴² Metropolitan Water District of Southern California. Integrated Water Resources Plan, 2003 Update. May 2004.

was also responsible for distributing \$45 million in funds from Proposition 13 funding for development of conjunctive management programs in southern California.

Municipal Water District of Orange County (MWDOC)

In 1951, MWDOC was formed to provide supplemental water to many purveyors within Orange County who were not Metropolitan member agencies. MWDOC was formed for the purpose of contracting with Metropolitan to acquire supplemental import water supplies from northern California and the Colorado River for use within the Orange County area. MWDOC is Metropolitan's second largest wholesale member agency. MWDOC represents 30 member agencies, including 14 special districts, 14 city water departments, one private water company and one mutual water company. The actions of MWDOC have a regional benefit to TWS although the TWS is not a direct member agency.

MWDOC represents its members at a regional, state and federal level, and advocates for the development and protection of imported water supplies and planning along with coordinating the water needs for its service area.⁴³ MWDOC's water management goals and objectives include working together with Orange County water agencies, including the TWS when applicable, to focus on solutions and priorities for improving Orange County's future water supply reliability.

Efforts of MWDOC to maintain a reliable water supply include a commitment to the intensive and cost-effective development of Orange County's water resources. Development of local water supplies will lessen Orange County's dependence on imported water. Therefore, in order to maintain a more reliable water supply, a number of projects including storage, recycling, conjunctive use with groundwater basins, ocean desalination and new groundwater development will contribute to enhanced water reliability.

Programs and projects directly managed by MWDOC include exchanges and transfers, participation with the Best Management Practices (BMPs) as well as extensive conservation and educational programs available to its member agencies. These programs and projects support further water reliability for its member agencies and throughout Orange County.⁴⁴

Integrated Regional Water Management Plan

MWDOC has been working with the County of Orange, as the lead agency, and 24 other cities and special districts to develop and integrate regional strategies for water management within the region. In an effort to manage local and imported water supplies, projects have been identified that protect communities from drought, enhance water supply reliability, ensure continued water security, optimize watershed and coastal resources, improve water quality, and protect habitat. To date, nearly 100 projects have

⁴³ [On-Line]. Municipal Water District of Orange County. Available: <http://www.mwdoc.com>. 2002.

⁴⁴ Municipal Water District of Orange County, Regional UWMP, 2005.

been identified and the responsibility of implementing the projects has been granted to the South Orange County Integrated Regional Water management (IRWM) Group.

South Orange County Water Reliability Study

To ensure continued water reliability for south Orange County, 11 Orange County agencies, Metropolitan, and the USBR joined together to fund the South Orange County Water Reliability Study (SOCWRS). MWDOC served as the lead agency in this effort.

The SOCWRS provides an objective plan that addresses the pressing need to ensure water supply in the event of future water supply outages and/or emergencies. Although the study is focused on south Orange County, implementing measures recommended in the study will provide regional benefits for all of Orange County's water supply, and thus benefit the TWS.

East Orange County Water District (EOCWD)

In 1961, EOCWD was formed to provide supplemental imported water to several water purveyors in the Tustin/Orange area of Orange County. The Tustin Waterworks, which has since been acquired by the City of Tustin, was included among those purveyors and has historically been the largest purchaser of water from EOCWD.

Although EOCWD operates both a wholesale and a retail system (the latter acquired from the County of Orange in 1985), the Tustin Water Services receives water only from the EOCWD wholesale system. EOCWD receives its wholesale supply from three connections to the Metropolitan System including the OC-70 connection to the Allen-McColloch Pipeline and the OC-48 and OC-43 connections to the East Orange County Feeder No. 2. The former two connections deliver water into the EOCWD system, which is subsequently delivered through several metered connections to Tustin Water Services. The OC-43 connection delivers water directly into Tustin Water Services' system.

Orange County Water District (OCWD)

OCWD is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the Basin.⁴⁵ OCWD replenishes and maintains the Basin at safe levels while more than doubling the Basin's annual yield with the best available technology. OCWD primarily recharges the Basin with water from the Santa Ana River and to a lesser extent with imported water purchased from Metropolitan. Other processes such as recycling of wastewater, conservation and water use efficiency programs, and creative water purchases have aided in replenishing the Basin to desired levels to meet required demands.

Furthermore, OCWD has invested in seawater intrusion control (injection barriers), recharge facilities, laboratories, and Basin monitoring to effectively manage the Basin.

⁴⁵ OCWD Groundwater Management Plan, 2004.

Consequently, although the Basin is defined to be in an “overdraft” condition, it is actually managed to allow utilization of up to 500,000 AF of storage capacity of the Basin during dry periods, acting as an underground reservoir and buffer against drought.⁴⁶ OCWD also operates the Basin to keep the target dewatered Basin storage at 200,000 AF as an appropriate accumulated overdraft.⁴⁷ If the Basin is too full, artesian conditions can occur along the coastal area, causing rising water and water logging, an adverse condition.

Since the formation of OCWD in 1933, OCWD has made substantial investments in facilities, Basin management and water rights protection, resulting in the elimination and prevention of adverse long-term “mining” overdraft conditions. OCWD continues to develop new replenishment supplies, recharge capacity and Basin protection measures to meet projected production from the Basin during average/normal rainfall and drought periods.

OCWD Long Term Facilities Plan

OCWD is preparing its Long Term Facilities Plan (LTFP) and will evaluate potential projects that may be implemented over a 20-year planning period. The LTFP’s goal is to enhance Basin management and water quality management activities. The LTFP is proposed to accomplish the following goals:

- Evaluate projects to cost effectively increase the amount of sustainable Basin production and protect water quality;
- Develop an implementation program for the recommended projects;
- Establish the Basin’s future maximum (target) annual production amount and correspondingly how much new recharge capacity would be required; and
- Estimate impacts to potential future Replenishment Assessment and Basin Production Percentage rates.

A program environmental impact report (PEIR), pursuant to the California Environmental Quality Act (CEQA), is being prepared to evaluate environmental impacts of projects in the LTFP and increased levels of Basin production to serve lands currently within OCWD plus proposed annexations of lands by the City of Anaheim and Irvine Ranch Water District. In the PEIR, OCWD’s groundwater model is used to evaluate groundwater conditions, such as groundwater elevations and protection of Basin water supplies from seawater intrusion, for specified amounts of Basin production with and without annexation.

The LTFP utilizes information recently developed in OCWD’s Groundwater Management Plan and Recharge Development Study. The LTFP includes a master list of

⁴⁶ Orange County Water District, *Groundwater Management Plan*, 2004.

⁴⁷ Orange County Water District, *Draft 2003-2004 Engineer’s Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005.

developed and proposed projects. The various projects are grouped into five categories: (1) recharge facilities; (2) water source facilities; (3) Basin management facilities; (4) water quality management facilities; and (5) operational improvements facilities. Each project is evaluated using criteria such as technical feasibility, cost, institutional support, functional feasibility, and environmental compliance. The LTFP develops an implementation plan for the 28 recommended projects over the 20 year planning period.

At the time of this Plan, the LTFP was scheduled to be complete in 2005, and would be updated periodically to reflect changes in pumping and Basin response forecasts to future production increases.

OCWD 2020 Water Master Plan Report (MPR)

OCWD's 2020 Water Master Plan Report (MPR) describes local water supplies and estimates their availability extending to the year 2020. Specifically, OCWD states in their 2020 Water MPR that significant water supply sources will be available in the future for potable, non-potable, and recharge purposes. The 2020 Water MPR discusses source waters such as imported water from Metropolitan, base flows from the Santa Ana River, treated wastewater through the OCWD/OCSD Groundwater Replenishment System (GWRS) program, and possibly desalinated ocean water. The local supplies' availability and projections from the 2020 Water MPR are not being pursued, but instead will be revised and replaced with the LTFP.

Orange County Sanitation District (OCSD)

Wastewater from TWS's service area is collected and treated by OCSD. OCSD manages wastewater collection and treatment for approximately 471 square miles in central and northwest Orange County, which includes 21 cities, 3 special districts, and 2.4 million residents.⁴⁸ OCSD utilizes the following two facilities: Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach to treat a combined daily average of 264 million gallons of wastewater.⁴⁹ Effluent from Reclamation Plant No. 1 is either routed to the ocean disposal system or is sent to the OCWD facility, Green Acres Project, for advanced treatment and recycling. The Green Acres Project supplies recycled water to various municipal users in Orange County and offsets the demand for potable water supplies.

OCWD/OCSD Groundwater Replenishment System (GWRS)

The GWRS is a jointly funded project of OCWD and OCSD. The GWRS is a water supply project designed to ultimately reuse approximately 110,000 AFY of advanced treated wastewater.⁵⁰ The objective of the project is to develop a new source of reliable, high quality, low salinity water that will be used to replenish the Basin and expand the

⁴⁸ Orange County Sanitation District Facts and Key Statistics. www.ocsd.com. January 2005

⁴⁹ MWDOC 2005 Regional Urban Water Management Plan

⁵⁰ Orange County Water District, Draft Long-Term Facilities Plan Review Draft, August 2005.

existing seawater intrusion barrier. Additional information regarding the GWRS is presented in Section 8. The benefits of the proposed GWRS include:

- Supply a significant amount of highly treated recycled water required by OCWD to maintain a higher basin production percentage through and beyond the year 2020.
- Provide a reliable replenishment water supply in times of drought.
- Expand the seawater intrusion barrier to provide additional groundwater production in the coastal zone.

Regional Water Quality Control Board – Santa Ana Region 8

Background

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (Regional Boards) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets statewide policy, and together with Regional Boards, implements state and federal laws and regulations. Each of the nine Regional Boards adopts a Water Quality Control Plan or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's ground and surface waters, and local water quality conditions and problems.⁵¹

In 1975, the Santa Ana Regional Water Quality Control Board (RWQCB) adopted the original Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin. In 1995, the RWQCB updated the Basin Plan to address issues that had evolved over time due to increasing populations and changing water demands in the region. The scope of the document covers the Santa Ana River Basin, which includes the upper and lower Santa Ana River watersheds including northwestern Orange County. In 2002, a triennial review of the Basin Plan was performed. In July 2002, at a public hearing, the RWQCB adopted Resolution No. R8-2002-0070, approving the Triennial Review Priority List and Work Plan.

The Basin Plan is more than just a collection of water quality goals and policies, descriptions of conditions, and discussions of solutions. It is also the basis for the RWQCB's regulatory programs. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The RWQCB also regulates water discharges to minimize and control their effects on the quality of the region's ground and surface water. Permits are issued under a number of programs and authorities.

Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. Legal basis and authority for the RWQCB reflects, incorporates, and

⁵¹ Santa Ana Regional Water Quality Control Board. Region 8 Water Quality Control Plan (Santa Ana River Basin). January 1995.

implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code (Porter-Cologne Water Quality Control Act) and the Clean Water Act.⁵²

Key Regional Issues

Water quality degradation due to high concentrations of nitrogen and TDS is the most significant regional water quality problem in the Santa Ana River Watershed (Watershed). Historically, the Santa Ana River likely flowed during most of the year, recharging deep alluvial groundwater basins in the inland valley and the coastal plain. However, irrigation projects eventually led to the diversion of all surface flow in the river, and the quantity of groundwater recharge diminished greatly. Water quality concerns in the Watershed focus on elevated concentrations of TDS and total inorganic nitrogen (TIN).

A Task Force was formed in 1995 to provide oversight, supervision, and approval of a study to evaluate the impact of TIN and TDS on water resources in the Watershed. The study is coordinated by the Santa Ana Watershed Project Authority (SAWPA), a joint powers agency of which OCWD and OCSD are member agencies, and is investigating questions related to TIN and TDS management in the Watershed, including groundwater subbasin water quality objectives, subbasin boundaries, and regulatory approaches to wastewater reclamation and recharge.⁵³

Water Resources and Water Quality Management

Numerous water resource management studies and projects, focused on water quality and/or water supply, are in progress in the Region under the auspices of a variety of parties. As stated above, the RWQCB has been working with SAWPA concerning water supply and reliability issues. SAWPA has been studying TIN and TDS issues and is a valuable partner in water resource and water quality management. SAWPA, and its member agencies, conduct water related investigations and planning studies, and build physical facilities where needed for water supply, wastewater treatment or water quality remediation. Other studies and projects ongoing and planned that will affect reliability and quality of water supplies to the Region, including areas affecting water supplies in the Orange County Basin, are discussed further in following sections of this Assessment.

Some of these activities bear directly on the implementation of the Basin Plan, while others may lead to future Basin Plan amendments to incorporate appropriate changes, such as revised regulatory strategies for various dischargers. These investigations and the implementation of appropriate physical solutions are an essential and integral part of the effort to restore and maintain water quality in the Region.

⁵² Santa Ana Regional Water Quality Control Board. Region 8 Water Quality Control Plan (Santa Ana River Basin). January 1995.

⁵³ Santa Ana Regional Water Quality Control Board. Watershed Management Initiative. Revised May 2004.

4.2 DEMAND AND SUPPLIES COMPARISON

Metropolitan Water District Supplies and Demands

As previously discussed, the City is a member agency of EOCWD, which is a member agency of MWDOC, which is a member agency of Metropolitan. Therefore, the reliability of Metropolitan's system does impact the City and will be discussed in this Section.

In its September 2005 Draft Regional UWMP, Metropolitan chose the year 1977 as the single driest year since 1922 and the years 1990-1992 as the multiple driest years over that same period. These years have been chosen because they represent the timing of the least amount of available water resources from the SWP, a major source of Metropolitan's supply.

Over the 20 year period beginning in 2010 and ending in 2030, Metropolitan projects a 0.5 percent decrease in available supply during an average year, a 4.5 percent increase during a single dry year, and a 3.8 percent increase during the third year of the multiple dry year period. The increased available supplies during drought year scenarios are primarily due to increased contract allotments of in-basin storage as well as a number of supplies under development.

In its draft report, Metropolitan also projects an increase in member agency demands. Specifically, they project a 10.2 percent increase over the same 20-year period in the average demand, an 8.5 percent increase during the single dry year scenario, and an 8.9 percent increase during the multiple dry year scenario. However, in all cases, the projected regional increase in demands by member agencies are offset by available surpluses in the Metropolitan supply.

Table 4.2-1 summarizes Metropolitan's current imported supply availability projections for average and single dry years over the 20-year period beginning in 2010 and ending in 2030. Based on these projections, Metropolitan will be able to meet all of its projected single dry year service area demands through the year 2030.

**Table 4.2-1
Metropolitan Regional Imported Water Supply Reliability Projections
for Average and Single Dry Years⁵⁴
(AFY)**

Row	Region Wide Projections	2010	2015	2020	2025	2030
Supply Information						
A	Projected Supply During an Average Year ^[1]	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
B	Projected Supply During a Single Dry Year ^[1]	2,842,000	3,033,000	3,002,000	2,970,000	2,970,000
C = B/A	Projected Supply During a Single Dry Year as a % of Average Supply	106.5	116.7	113.1	111.9	111.9
Demand Information						
D	Projected Demand During an Average Year	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
E	Projected Demand During a Single Dry Year	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
F = E/D	Projected Demand During a Single Dry Year as a % of Average Demand	112.4	112.0	112.3	111.7	110.7
Surplus Information						
G = A-D	Projected Surplus During an Average Year	628,000	547,000	665,000	539,000	405,000
H = B-E	Projected Surplus During a Single Dry Year	549,000	732,000	768,000	607,000	481,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	130.8	126.6	133.4	125.5	118.0
J = A/E	Projected Supply During an Average Year as a % of Demand During a Single Dry Year	116.3	113.0	118.8	112.3	106.6
K = B/E	Projected Supply During a Single Dry Year as a % of Single Dry Year Demand (including surplus)	123.9	131.8	134.3	125.6	119.3

^[1] Projected supplies include current supplies and supplies under development, but are limited by MWD's 1.25 MAF allotment to Colorado River Water; data obtained from MWD September 2005 Draft RUWMP supply/demand projections

⁵⁴ Metropolitan Draft Regional UWMP September 2005

Table 4.2-2 summarizes Metropolitan's current imported supply availability projections over the 20-year period beginning in 2010 and ending in 2030 for average and multiple dry year scenarios. When reviewing Table 4.2-2, it is important to note that Metropolitan is projecting a surplus of supply for all multiple dry year scenarios through 2030.

The findings in this plan were derived based upon Metropolitan's September 2005 Draft Regional UWMP. These figures can be interpolated to project Metropolitan's ability to meet a specified demand expressed in terms of a percentage of average demand and supply availability. When viewed on a regional basis, some member agency demands will exceed these averages, while others will fall below the stated averages. However, when viewed from the regional perspective, it is reasonable to assume that these averages will apply to all local water purveyors.

Although a less conservative assumption might suggest surplus water supplies not used by agencies experiencing low or no growth may be freed up for use by those water purveyors experiencing more growth, this is not borne out by the overall Metropolitan supply and demand picture. In fact, Metropolitan is projecting a 19.4 percent increase in total demand (including local supplies) over its entire service area between 2005 and 2030 (4,115,700 AFY to 4,914,000 AFY)⁵⁵ compared with a 20.9 percent increase in population over the same period of (18,233,700 to 22,053,200)⁵⁶. In other words, Metropolitan's projected increase in demand roughly parallels its projected increase in population.

⁵⁵ Table A.1-5 from MWD September 2005 Draft RUWMP

⁵⁶ Table A.1-2 from MWD September 2005 Draft RUWMP

Table 4.2-2
Metropolitan Regional Imported Water Supply Reliability Projections
for Average and Multiple Dry Years⁵⁷
(in AFY)

Row	Region Wide Projections	2010	2015	2020	2025	2030
Supply Information						
A	Projected Supply During an Average Year ^[1]	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
B	Projected Supply During Year 3 of a Multiple Dry Year Period*	2,619,000	2,776,600	2,741,000	2,719,000	2,719,000
C = B/A	Projected Supply During Year 3 of a Multiple Dry Year as a % of Average Supply	98.2	106.8	103.3	102.4	102.4
Demand Information						
D	Projected Demand During an Average Year	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
E	Projected Demand During Year 3 of a Multiple Dry Year Period ^[2]	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
F = E/D	Projected Demand During Year 3 of a Multiple Dry Year Period as a % of Average Demand	116.5	116.4	116.5	116.0	115.0
Surplus Information						
G = A-D	Projected Surplus During an Average Year	549,000	732,000	768,000	607,000	481,000
H = B-E	Projected Surplus During Year 3 of a Multiple Dry Year Period	243,000	377,000	424,000	265,000	132,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	130.8	126.6	133.4	125.5	118.0
J = A/E	Projected Supply During an Average Year as a % of Demand During Year 3 of a Multiple Dry Year	112.3	108.8	114.5	108.1	102.6
K = B/E	Projected Supply During a Multiple Dry Year as a % of Multiple Dry Year Demand (including surplus)	110.2	116.2	118.3	110.7	105.1

^[1] Projected supplies include current supplies and supplies under development, but are limited by MWD's 1.25 MAF allotment to Colorado River Water; data obtained from MWD September 2005 final draft RUWMP.

^[2] MWD only projects demands for year 3 of a multiple dry year period

⁵⁷ Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft.

In addition to Metropolitan's Regional UWMP, MWDOC has also prepared a draft 2005 UWMP for the Orange County region and has also held a series of workshops for its member agencies including direct Metropolitan member agencies in Orange County. MWDOC is also looking at the 1922 through 2004 period and has adopted the same average year scenario as Metropolitan; however, they differ in the selection of a single dry year and the multiple dry year scenario. MWDOC has chosen to determine these years based on hydrologic records for Orange County rather than on the State Water Project availability. That methodology has resulted in the selection of 1961 as the single driest year on record and the years 1959 through 1961 as the multiple dry years.

In viewing its entire service area, MWDOC projects single dry year demands that are 105.5 percent of normal and three multiple dry years demands that are 106.7, 103.7 and 105.5 percent of normal. These same factors are representative of all of Orange County and will be applied to project the City's demands in single and multiple dry years.

Prior to proceeding with future water supply and demand projections, it is first necessary to establish a base water year from which to estimate demands over the next 25 years. Actual demand during 2005 was 11,449 AF. Additional data provided by the City suggests the number of water service connections will increase from 13,945 in 2005 to 14,294 in 2010 (a 2.5 percent increase) and then stabilize at that number for the following 20 year period (through 2030). Water demand will therefore be assumed to increase in a parallel track with the number of water connections. This estimated increase in water demand is compared with Metropolitan's estimated increase in supply over the same period in Table 4.2-3. The major point reflected in Table 4.2-3 is that Metropolitan's (and therefore MWDOC's and EOCWD's) will greatly exceed Tustin's demands over the next 25 years.

**Table 4.2-3
Comparison Between MWD Supply Availability and
Tustin Water Services Demand During an Average Year**

Row	Projection	2010	2015	2020	2025	2030
A	Tustin Projected Increase in Demand During an Average Year as a % of 2005 Average Demand ^[1]	102.5	102.5	102.5	102.5	102.5
B	MWD Projected Increase in Regional Supply Availability During an Average Year as a % of 2005 Average Year ^[2]	104.9	102.2	104.4	104.4	104.4
C (from Row I, Table 4.2-1)	MWD Projected Regional Supply During an Average Year as a % of Demand During an Average Year ^[3]	130.8	126.6	133.4	125.5	118.0
D = (C-A)	Percentage Difference Between Growth in MWD Supply Availability (including surplus supply) During an Average Year Compared with Growth in Tustin Demand During an Average Year	28.3	24.1	30.9	23.0	15.5

[1] Increase in demand based on City's projected increase in future water service connections.

[2] MWD did not include any supply projections for 2005 in its final draft RUWMP supply/demand tables released in September 2005. The 2005 supply projection released in May 2005 (2,542,800 AFY) is therefore used as a base year for calculating the increase in supply availability in future years as compared with 2005 average year supply.

[3] Values extracted from Table 4.2-1.

Tables 4.2-4 through 4.2-10 compare current and projected water supplies and demands in normal, single dry year and multiple dry year scenarios. The results displayed in these tables indicate that the City's will have no problems meeting its demands in average, single dry, and multiple dry years through 2030.

The source of the data in Tables 4.2-4 through 4.2-10 is footnoted in each table. Single and Multiple dry year supplies and demands are based largely on the data extracted from the normal year table (4.2-4).

Table 4.2-4
Tustin Water Services
Projected Water Supply and Demand
Normal Water Year
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2010	2015	2020	2025	2030
Supply	Normal Water Years				
Projected Supply During an Average Year as a % of Demand During an Average Year ^[1]	130.8	126.6	133.4	125.5	118.0
Imported ^[2]	650	630	670	630	590
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[4]	8,220	8,220	8,220	8,220	8,220
Total Supply	12,870	12,850	12,890	12,850	12,810
% of Normal Year	100.0	100.0	100.0	100.0	100.0
Demand					
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[4]	7,240	7,240	7,240	7,240	7,240
Total Demand^[5]	11,740	11,740	11,740	11,740	11,740
% of Year 2005 Demand (11,450 AF)	102.5	102.5	102.5	102.5	102.5
Supply/ Demand Difference	1,130	1,110	1,150	1,110	1,070
Difference as % of Supply	8.8	8.6	8.9	8.6	8.4
Difference as % of Demand	9.6	9.5	9.8	9.5	9.1

[1] From Table 4.2-1, Row I.

[2] Imported water supply = (imported water demand) x (MWD Projected Supply Available During an Average Year as a % of Demand During an Average Year (from Table 4.2-1, Row I); Imported demand = 500 AF based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[5] Total Demand = 2005 (11,450 AF) escalated at 0.5% per year growth in demand factor for five years (to 2010) based on projected growth estimate provided by City. No growth in demand is anticipated after 2010 as City approached full build-out.

Table 4.2-5
Tustin Water Services
Projected Water Supply and Demand
Single Dry Water Year
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2010	2015	2020	2025	2030
Supply	Single Dry Years				
MWD Projected Supply Available During an Average Year as a % of Demand During a Single Dry Year ^[1]	116.3	113	118.8	112.3	106.6
MWD Projected Supply Available During a Single Dry Year as a % of Single Dry Year Demand (including surplus) ^[2]	123.9	131.8	134.3	125.6	119.3
Imported ^[3]	810	830	900	790	700
Local (Treated Groundwater) ^[4]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[5]	8,670	8,670	8,670	8,670	8,670
Total Supply	13,480	13,500	13,570	13,460	13,370
Normal Year Supply ^[6]	12,870	12,850	12,890	12,850	12,810
% of Normal Year	104.7	105.1	105.3	104.7	104.4
Demand					
Imported ^[3]	500	500	500	500	500
Local (Treated Groundwater) ^[4]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[5]	7,890	7,890	7,890	7,890	7,890
Total Demand^[7]	12,390	12,390	12,390	12,390	12,390
Normal Year Demand ^[5]	11,740	11,740	11,740	11,740	11,740
% of Normal Year Demand	105.5	105.5	105.5	105.5	105.5
% of Year 2005 Demand (11,450 AF)	108.2	108.2	108.2	108.2	108.2
Supply/ Demand Difference	1,090	1,110	1,180	1,070	980
Difference as % of Supply	8.1	8.2	8.7	7.9	7.3
Difference as % of Demand	8.8	9.0	9.5	8.6	7.9

[1] From Table 4.2-1, Row J

[2] From Table 4.2-1, Row K (includes MWD surplus supplies)

[3] Available Imported supply is estimated to equal MWD's September 2005 Draft RUWMP projected available supplies including surplus supplies = (normal year import supply) x (MWD projected supply as a % of the single dry year demand); Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD

[4] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[5] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[6] Normal year supplies and demands and taken from Table 4.2-4

[7] Total Demand = (normal year demand) x (105.5% single dry year demand developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region)

**Table 4.2-6
Tustin Water Services
Projected Water Supply and Demand
Multiple Dry Water Years 2006-2010**
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2006	2007	2008	2009	2010
Supply	Normal Years		Dry Years		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply ^[1]			98.2	98.2	98.2
Imported ^[2]	1,520	1,480	650	640	640
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	7,370	7,400	8,680	8,480	8,670
Total Supply	12,890	12,880	13,330	13,120	13,310
Normal Year Supply ^[4]	12,890	12,880	12,880	12,870	12,870
% of Normal Year	100.0	100.0	103.5	101.9	103.4
Demand					
MWD Projected Multiple Dry Year Demand as % of Normal Year ^[5]			116.5	116.5	116.5
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	7,010	7,070	7,900	7,610	7,890
Total Demand	11,510	11,570	12,400	12,110	12,390
Normal Year Demand ^[6]	11,510	11,570	11,620	11,680	11,740
% of Normal Year	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (11,450 AF)	100.5	101.1	108.3	105.8	108.2
Supply/ Demand Difference	1,380	1,310	930	1,010	920
Difference as % of Supply	10.7	10.2	7.0	7.7	6.9
Difference as % of Demand	12.0	11.3	7.5	8.3	7.4

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from 2005 demand data and Table 4.2-4 data) x (escalation factor from Table 4.2-2, Row C. Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 64% for 2006 and 2007 and 70% for 2008-2010). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 64% or 70% of the Total Demand for previously referenced years.

[5] Normal Year Supply interpolated from 2005 demand data and from Table 4.2-4 projected data.

[6] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%

[7] Total Demand estimated base on 0.5%/year growth factor beginning in 2005 for all normal years; total demand for multiple dry years = (Interpolated Normal Year Demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region.

[8] Normal Year Demand interpolated from 2005 demand and Table 4.2-4 projected demands

Table 4.2-7
Tustin Water Services
Projected Water Supply and Demand
Multiple Dry Water Years 2011-2015
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2011	2012	2013	2014	2015
Supply	Normal Years		Dry Years		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply ^[1]			106.8	106.8	106.8
Imported ^[2]	650	640	680	680	670
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[4]	8,220	8,220	8,770	8,520	8,670
Total Supply	12,870	12,860	13,450	13,200	13,340
Normal Year Supply ^[5]	12,870	12,860	12,860	12,850	12,850
% of Normal Year	100.0	100.0	104.6	102.7	103.8
Demand					
MWD Projected Multiple Dry Year Demand as % of Normal Year ^[6]			116.4	116.4	116.4
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[4]	7,240	7,240	8,030	7,670	7,890
Total Demand^[7]	11,740	11,740	12,530	12,170	12,390
Normal Year Demand ^[8]	11,740	11,740	11,740	11,740	11,740
% of Normal Year	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (11,450 AF)	102.5	102.5	109.4	106.3	108.2
Supply/ Demand Difference	1,130	1,120	920	1,030	950
Difference as % of Supply	8.8	8.7	6.8	7.8	7.1
Difference as % of Demand	9.6	9.5	7.3	8.5	7.7

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-4) x (escalation factor from Table 4.2-2, Row C). Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD.

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[5] Normal Year Supply interpolated from Table 4.2-4

[6] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.4%

[7] Total Demand of 11,740 AFY extracted from Table 4.2-4 for all normal years; total demand for multiple dry years = (Normal Year Demand of 11,740 AFY) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region.

[8] Normal Year Demand for all years after 2010 = 11,740 AFY

**Table 4.2-8
Tustin Water Services
Projected Water Supply and Demand
Multiple Dry Water Years 2016-2020**
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2016	2017	2018	2019	2020
Supply	Normal Years		Dry Years		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply ^[1]			103.3	103.3	103.3
Imported ^[2]	640	650	680	680	690
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	8,220	8,220	8,770	8,520	8,670
Total Supply	12,860	12,870	13,450	13,200	13,360
Normal Year Supply ^[4]	12,860	12,870	12,870	12,880	12,890
% of Normal Year	100.0	100.0	104.5	102.5	103.6
Demand					
MWD Projected Multiple Dry Year Demand as % of Normal Year ^[5]			116.5	116.5	116.5
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	7,240	7,240	8,030	7,670	7,890
Total Demand	11,740	11,740	12,530	12,170	12,390
Normal Year Demand ^[6]	11,740	11,740	11,740	11,740	11,740
% of Normal Year	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (11,450 AF)	102.5	102.5	109.4	106.3	108.2
Supply/ Demand Difference	1,120	1,130	920	1,030	970
Difference as % of Supply	8.7	8.8	6.8	7.8	7.3
Difference as % of Demand	9.5	9.6	7.3	8.5	7.8

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-4) x (escalation factor from Table 4.2-2, Row C). Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[5] Normal Year Supply interpolated from Table 4.2-4

[6] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%

[7] Total Demand of 11,740 AFY extracted from Table 4.2-4 for all normal years; total demand for multiple dry years = (Normal Year Demand of 11,740 AFY) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region.

[8] Normal Year Demand for all years after 2010 = 11,740 AFY

Table 4.2-9
Tustin Water Services
Projected Water Supply and Demand
Multiple Dry Water Years 2021-2025
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2021	2022	2023	2024	2025
Supply	Normal Years		Dry Years		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply ^[1]			102.4	102.4	102.4
Imported ^[2]	660	650	660	650	650
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	8,220	8,220	8,770	8,520	8,670
Total Supply	12,880	12,870	13,430	13,170	13,320
Normal Year Supply ^[4]	12,880	12,870	12,870	12,860	12,850
% of Normal Year	100.0	100.0	104.4	102.4	103.7
Demand					
MWD Projected Multiple Dry Year Demand as % of Normal Year ^[5]			116.0	116.0	116.0
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	7,240	7,240	8,030	7,670	7,890
Total Demand	11,740	11,740	12,530	12,170	12,390
Normal Year Demand ^[6]	11,740	11,740	11,740	11,740	11,740
% of Normal Year	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (11,450 AF)	102.5	102.5	109.4	106.3	108.2
Supply/ Demand Difference	1,140	1,130	900	1,000	930
Difference as % of Supply	8.9	8.8	6.7	7.6	7.0
Difference as % of Demand	9.7	9.6	7.2	8.2	7.5

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-4) x (escalation factor from Table 4.2-2, Row C. Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[5] Normal Year Supply interpolated from Table 4.2-4

[6] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.0%

[7] Total Demand of 11,740 AFY extracted from Table 4.2-4 for all normal years; total demand for multiple dry years = (Normal Year Demand of 11,740 AFY) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region.

[8] Normal Year Demand for all years after 2010 = 11,740 AFY

Table 4.2-10
Tustin Water Services
Projected Water Supply and Demand
Multiple Dry Water Years 2026-2030
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2026	2027	2028	2029	2030
Supply	Normal Years		Dry Years		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply ^[1]			102.4	102.4	102.4
Imported ^[2]	620	610	620	610	600
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	8,220	8,220	8,770	8,520	8,670
Total Supply	12,840	12,830	13,390	13,130	13,270
Normal Year Supply ^[4]	12,840	12,830	12,830	12,820	12,810
% of Normal Year	100.0	100.0	104.4	102.4	103.6
Demand					
MWD Projected Multiple Dry Year Demand as % of Normal Year ^[5]			115.0	115.0	115.0
Imported ^[2]	500	500	500	500	500
Local (Treated Groundwater) ^[3]	4,000	4,000	4,000	4,000	4,000
Local (Clear Groundwater) ^[3]	7,240	7,240	8,030	7,670	7,890
Total Demand	11,740	11,740	12,530	12,170	12,390
Normal Year Demand ^[6]	11,740	11,740	11,740	11,740	11,740
% of Normal Year	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (11,450 AF)	102.5	102.5	109.4	106.3	108.2
Supply/ Demand Difference	1,100	1,090	860	960	880
Difference as % of Supply	8.6	8.5	6.4	7.3	6.6
Difference as % of Demand	9.4	9.3	6.9	7.9	7.1

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-4) x (escalation factor from Table 4.2-2, Row C. Imported demand is estimated to remain constant at 500 AFY based on City provided estimate; however, it should be noted that significant additional imported supplies may also be available from EOCWD.

[3] Local Treated Groundwater supply is limited by treated well capacity of 4,000 AFY. Local treated Groundwater demand is estimated to equal maximum treatment capacity of 4,000 AFY.

[4] Local Clear Groundwater supply is estimated = 70% of Total Demand (based on BPP of 70%). Clear groundwater well demand = Total Demand - Imported Demand - treated groundwater well demand, not to exceed 70% of the Total Demand.

[5] Normal Year Supply interpolated from Table 4.2-4

[6] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 115.0%

[7] Total Demand of 11,740 AFY extracted from Table 4.2-4 for all normal years; total demand for multiple dry years = (Normal Year Demand of 11,740 AFY) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors developed by MWDOC based on hydrologic analysis of 1922-2004 period and applicable to entire Orange County region.

[8] Normal Year Demand for all years after 2010 = 11,740 AFY

4.3 VULNERABILITY OF SUPPLY TO SEASONAL OR CLIMATIC SHORTAGE

TWS's climate is a semi-arid environment with mild winters, warm summers and moderate rainfall, 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. The average annual temperature is 68 degrees Fahrenheit in January to 84 degrees Fahrenheit in July. Precipitation is typically 13 inches, occurring mostly between November and April.

Climatological data in California has been recorded since the year 1858. During the twentieth century, California has experienced three periods of severe drought: 1928-34, 1976-77 and 1987-91. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the San Francisco Bay Delta and are the source of water for the SWP.

Southern California and, in particular, Orange County sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water and groundwater stored in the Lower Santa Ana Groundwater Basin. But the 1987-91 drought created considerably more concern for southern California and Orange County.

As a result, TWS is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. While the data shown in Tables 4.2-4 through 4.2-10 identify water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of Metropolitan's Water Surplus and Drought Management (WSDM) Plan, along with implementation of the appropriate stage of the TWS's Water Conservation Program. These programs are more specifically discussed in Section 7.

4.4 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS TO MEET PROJECTED WATER USE

4.4.1 Tustin Water Services Projects

TWS projects that water demand will not increase 2010 to 2030 due to full build out of the service area combined with continued water conservation. Potentially, TWS could purchase all the water it needs to serve its customers from Metropolitan through MWDOC and EOCWD. However, TWS has planned water infrastructure improvements to maximize groundwater production in the future. New water supply sources will be developed primarily to better manage the Lower Santa Ana Groundwater Basin resource and to replace or upgrade inefficient wells, rather than to support population growth and new development.

TWS has developed a water system capital improvement program (CIP) to minimize the dependence on imported water supply and to foster a program to increase the groundwater quality in the aquifer underlying the service area. TWS's goal is to develop local groundwater sources that when combined with treated groundwater supplies will provide 100 percent of the required supply within the next 25 years. Together with Metropolitan's Local Resource Program (Groundwater Recovery), TWS is implementing a groundwater development program to utilize existing wells and drill additional wells to make use of the local groundwater supply. TWS has seven existing untreated-groundwater wells.

As part of the CIP, the following reservoirs will have major to minor retrofits: (1) the existing Rawlings Reservoir will be replaced at the same sites to increase the total service area system storage capacity; (2) the Foothill and Simon Ranch Reservoirs will have structural rehabilitation, including replacement of the Simon Ranch Booster Pump Station; and (3) the John Lyttle and Newport Avenue Reservoirs will have minor rehabilitation.

The CIP also addresses distribution system enhancements by resizing of the pipeline system to distribute water throughout the system to meet all demand conditions including peak hour demand and maximum day demand plus fire flow.

4.4.2 Regional Agency Projects

Since the City's imported water comes from the SWP and the Colorado River through EOCWD, the projects implemented by Metropolitan, MWDOD, and EOCWD to secure their water supplies have a direct effect on the TWS water supply. In addition, OCWD's planned projects and programs for groundwater and recycled water will also impact TWS.

Metropolitan Water District of Southern California

Metropolitan is implementing water supply alternative strategies for the region and on behalf of their member agencies to insure available water in the future. Some of the strategies identified in Metropolitan's 2005 UWMP include:

- Conservation
- Water recycling and groundwater recovery
- Storage and groundwater management programs within the Southern California region
- Storage programs related to the State Water Project and the Colorado River
- Other water supply management programs outside of the region

Metropolitan has made investments in conservation, water recycling, storage, and supply that are all part of Metropolitan's long-term water management strategy. Metropolitan's approach to a long-term water management strategy was to develop an Integrated Resource Plan that depended on many sources of supply. Metropolitan's implementation

approach for achieving the goals of the Integrated Resource Plan Update is summarized in Table 4.4.2-1. A comprehensive description of Metropolitan's implementation approach is contained in their 2003 report on Metropolitan water supplies "A Blueprint for Water Reliability" as well as their 2005 Regional Urban Water Management Plan. A brief description of the various programs implemented by Metropolitan is also included following Table 4.4.2-1.

**Table 4.4.2-1
Metropolitan Integrated Resource Plan Update Resources Status**

Target	Programs and Status
<ul style="list-style-type: none"> • Conservation 	<p>Current</p> <ul style="list-style-type: none"> - Conservation Credits Program - Residential; Non-residential Landscape Water Use Efficiency; Commercial, Industrial, and Institutional Programs - Grant Programs <p>In Development or Identified</p> <ul style="list-style-type: none"> - Innovative Conservation Program
<ul style="list-style-type: none"> • Recycling • GW Recovery • Desalination 	<p>Current</p> <ul style="list-style-type: none"> - LRP Program <p>In Development or Identified</p> <ul style="list-style-type: none"> - Additional LRP Requests for Proposals - Seawater Desalination Program - Innovative Supply Program
<ul style="list-style-type: none"> • In Region Dry-Year Surface Water Storage 	<p>Current</p> <ul style="list-style-type: none"> - Diamond Valley Reservoir, Lake Mathews, Lake Skinner - SWP Terminal Reservoirs (Monterey Agreement)
<ul style="list-style-type: none"> • In Region Groundwater Conjunctive Use 	<p>Current</p> <ul style="list-style-type: none"> - North Las Posas (Eastern Ventura County) - Cyclic Storage - Replenishment Deliveries - Proposition 13 Programs (short listed) <p>In Development or Identified</p> <ul style="list-style-type: none"> - Raymond Basin GSP - Proposition 13 Programs (wait listed) - Expanding existing programs - New groundwater storage programs
<ul style="list-style-type: none"> • SWP 	<p>Current</p> <ul style="list-style-type: none"> - SWP Deliveries - San Luis Carryover Storage (Monterey Agreement) - SWP Call Back with DWCV Table A transfer <p>In Development or Identified</p> <ul style="list-style-type: none"> - Sacramento Valley Water Management Agreement - CALFED Delta Improvement Program (Phase 8 Agreement)
<ul style="list-style-type: none"> • Colorado River 	<p>Current</p> <ul style="list-style-type: none"> - Base Apportionment

Target	Programs and Status
<p>Aqueduct</p>	<ul style="list-style-type: none"> - IID/Metropolitan Conservation Program - Coachella and All American Canal Lining Programs - PVID Land Management Program <p>In Development or Identified</p> <ul style="list-style-type: none"> - Lower Coachella Storage Program - Hayfield Storage Program - Chuckwalla Storage Program - Storage in Lake Mead
<ul style="list-style-type: none"> • CVP/SWP Storage and Transfers • Spot Transfers and Options 	<p>Current</p> <ul style="list-style-type: none"> - Arvin Edison Program - Semitropic Program - San Bernardino Valley MWD Program - Kern Delta Program <p>In Development or Identified</p> <ul style="list-style-type: none"> - Mojave Storage Program - Other Central Valley Transfer Programs

Conservation Target

Metropolitan’s conservation policies and practices are shaped by Metropolitan’s Integrated Resource Plan and the California Urban Water Conservation Council *Memorandum of Understanding Regarding Water Conservation in California*.

Recycled Water, Groundwater Recovery, and Desalination Target

Metropolitan supports the use of alternative water supplies such as recycled water and degraded groundwater when there is a regional benefit to offset imported water supplies. Currently, 355 thousand acre-feet (TAF) of recycled water is permitted for use within Metropolitan service area.⁵⁸ Metropolitan estimates that an additional 480 TAF per year of new recycled water could be developed and used by 2025 with an additional 130 TAF per year by 2050. Approximately 30 percent of the recycled water use within Metropolitan’s service area is for groundwater replenishment and seawater barriers. In the future it is anticipated that up to 90 percent of all water used for seawater barriers will be recycled water.

Metropolitan recognizes the importance of member agencies developing local supplies and has implemented several programs to provide financial assistance. Metropolitan’s incentive programs include:

- **Competitive Local Resources Program**: Supports the development of cost-effective water recycling and groundwater recovery projects that reduce demands for imported supplies

⁵⁸ Metropolitan Water District of Southern California, Regional UWMP, Draft September 2005

- Seawater Desalination Program: Supports the development of seawater desalination within Metropolitan's service area
- Innovative Supply Program: Encourages investigations into alternative approaches to increasing the region's water supply.

According to Metropolitan's 2005 UWMP, 13 projects were selected in 2004 for implementation under the Competitive Local Resources Program. None of the projects are within the TWS's service area, however two projects are proposed under MWDOC, the wholesaler to EOCWD. The projects include the Groundwater Replenishment System and a recycled water upgrade within Irvine Ranch Water District's service area. The Groundwater Replenishment System is discussed as a planned project under OCWD. Under the Innovative Supply Program, Metropolitan selected 10 projects for grant funding. Proposals included harvesting storm runoff, onsite recycling, and desalination. The project findings will be presented to member agencies in 2006.

Regional Groundwater Conjunctive Use Target

Other programs within Metropolitan to maximize water supplies include storage and groundwater management programs. The IRP Update identified the need for dry-year storage within surface water reservoirs and the need for groundwater storage. In 2002, Diamond Valley Lake reached its full storage capacity of 800,000 AF. Approximately 400,000 AF are dedicated for dry-year storage. Metropolitan has developed a number of local programs to increase storage in the groundwater basins. The programs include:

- North Las Posas Basin – In 1995, Metropolitan and Calleguas Municipal Water District developed facilities for groundwater storage and extraction from the North Las Posas Basin. Metropolitan has the right to store up to 210,000 AF of water. The well fields are expected to be fully operational in 2007 with Phases I and II already complete. It is expected the North Las Posas program will yield 47,000 AF of groundwater from the Basin each year.
- Proposition 13 Projects – In 2000, DWR selected Metropolitan to receive financial funding to help fund the southern California Water Supply Reliability Projects Program. The program coordinates eight conjunctive use projects with a total storage capacity of 195 TAF and a dry-year yield of 65 TAF per year. One of the projects selected through the request for proposals for Proposition 13 funding includes the Orange County Groundwater Conjunctive Use Program. This program was submitted by OCWD and MWDOC.
- Raymond Basin – In January 2000, Metropolitan entered into agreements with the City of Pasadena and Foothill Municipal Water District to implement a groundwater storage program that is anticipated to yield 22 TAF per year by 2010.
- Other Programs – Metropolitan intends to expand the conjunctive use programs to add another 80 TAF to groundwater storage. Other basins in the area are being evaluated for possible conjunctive use projects.

State Water Project Target

The major actions Metropolitan is completing to improve SWP reliability include the following:

- Delta Improvements Package – The actions outlined in this package are related to water project operations in the Delta. The actions are designed to allow the SWP to operate the Banks Pumping Plant in the Delta at 8,500 CFS. Currently Banks Pumping Plant operates at 6,680 CFS. Metropolitan anticipates that increase diversion from the Delta will result in an increase of 130 TAF per year will be available for groundwater and surface water storage.
- Phase 8 Settlement – This agreement includes various recommended water supply projects that meet demand and water quality objectives within the Sacramento Valley. The various conjunctive use projects will yield approximately 185 TAF per year in the Sacramento Valley of which approximately 55 TAF would be available to Metropolitan through its SWP allocation.
- Monterey Amendment – The Monterey Amendment enables Metropolitan to use a portion of the San Luis Reservoir’s capacity for carryover storage. This will increase SWP delivery to Metropolitan by 93 to 285 TAF depending on supply conditions.
- SWP Terminal Storage – Metropolitan has water rights for storage at Lake Perris and Castaic Lake. The storage provides Metropolitan with options for managing SWP deliveries and store up to 73 to 219 TAF of carryover water.
- Desert Water Agency/Coachella Valley Water District (DWCV) SWP Table A Transfer – This transfer to DWCV includes 100 TAF of Metropolitan SWP Table A amount in exchange for other rights such as its full carryover amounts in San Luis and full use of flexible storage in Castaic and Perris Reservoirs. It is anticipated that the call-back provision of the entitlement transfer can provide between 5 and 26 TAF of water depending on the water year.
- Desert Water Agency/Coachella Valley Water District (DWCV) Advance Delivery Program – Under this program Metropolitan delivers Colorado River water to the DWCV in exchange for their SWP Contract Table A allocations. Metropolitan can expect increases in SWP Table A deliveries of 6 to 18 TAF depending on the water year.

Colorado River Aqueduct Target

Metropolitan also receives imported water from the Colorado River Aqueduct. Metropolitan, Imperial Irrigation District (IID) and Coachella Valley Water District executed the Quantification Settlement Agreement (QSA) in October 2003. The QSA established the baseline water use for each agency and facilitated the transfer agricultural water to urban uses. A number of programs have been identified to assist Metropolitan meet their target goal of 1.2 MAF per year from the Colorado River Aqueduct. These programs include the following:

- Coachella and All-American Canal Lining Project – The Coachella Canal Lining Project is scheduled to be completed in January 2007 and is expected to conserve 26,000 AFY. The All-American Canal Lining Project is scheduled to be completed in 2008 and is expected to conserve 67,700 AFY. The conserved water will be made available in Lake Havasu for diversion from Metropolitan. In exchange, Metropolitan will supply a like amount to the San Luis Rey Settlement Parties and San Diego County Water Authority.
- IID/San Diego County Water Authority Transfer – IID has agreed to implement a conservation program and transfer water to San Diego County Water Authority. The transfer began in 2003 with 10 TAF and will increase yearly until 2023 where the transfer will be 200 TAF annually. Water will be conserved through land fallowing and irrigation efficiency measures. Metropolitan will supply the water conserved to San Diego County Water Authority in exchange for a like amount out of Lake Havasu.
- Imperial Irrigation District/Metropolitan Conservation Program – The program originally provided funding from Metropolitan to implement water efficiency improvements within IID. Metropolitan in turn would reserve the right to divert the water conserved by those investments. Execution of the QSA extended the term of the program to 2078 and guaranteed Metropolitan at least 80 TAF per year.
- Palo Verde Land Management and Crop Rotation Program – This program offers financial incentives to farmers with Palo Verde Irrigation District to not irrigate a portion of their land. A maximum of 29 percent of lands within Palo Verde Irrigation District can be fallowed in any year. The water conserved will be available to Metropolitan with a maximum of 111 TAF per year expected.
- Hayfield Groundwater Storage Program – Metropolitan will divert Colorado River water and store it in the Hayfield Groundwater Basin in east Riverside County. Currently there is 73 TAF of water in storage. Metropolitan expects the program to eventually develop a storage capacity of approximately 500 TAF.
- Chuckwalla Groundwater Storage Program – Metropolitan proposes to store water when available in the Upper Chuckwalla Groundwater Basin for future delivery to Metropolitan.
- Lower Coachella Valley Groundwater Storage Program – Metropolitan, Coachella Valley Water District, and the Desert Water Agency are investigating the feasibility of a conjunctive use program in the Lower Coachella Groundwater Basin. The Basin has the potential to store 500 TAF of groundwater for Metropolitan.
- Salton Sea Restoration Transfer – A transfer of up to 1.6 MAF would be conserved by IID and made available to Metropolitan. The proceeds from the DWR transfer would be placed in the Salton Sea Restoration Fund.

- Lake Mead Storage – Metropolitan is exploring options for storing water in Lake Mead.

CVP/SWP Storage and Transfers Target

Metropolitan has focused on voluntary short and long-term transfer and storage programs with Central Valley Project and other SWP contractors. Currently, Metropolitan has enough transfer and storage programs to meet their 2010 target goal of 300 TAF. Metropolitan has four CVP/SWP transfer and storage programs in place for a total of 317,000 acre-feet of dry-year supply. Metropolitan is also pursuing a new storage program with Mojave Water Agency and continues to pursue Central Valley water transfers on an as needed basis. The operational programs include:

- Semitropic – 107,000 AF dry-year supply
- Arvin-Edison – 90,000 AF dry-year supply
- San Bernardino Valley Municipal Water District – 70,000 AF dry-year supply
- Kern Delta Water District – 50,000 AF dry-year supply
- Mojave Storage Program – 35,000 AF dry-year supply
- Central Valley Transfer Program – 160,000 AF dry-year supply

Municipal Water District of Orange County (MWDOC) Projects

Sufficient water storage programs will help to ensure adequate water supplies in the future and in time of drought. The need for local storage intensifies with southern California's and the Orange County region's dependence on imported water to serve water demands. One of the most effective forms of storage in a highly dry and arid climate is conjunctive use wherein water is stored under ground during wet periods and pumped out during dry or drought periods.

The MWDOC 2005 Regional Urban Water Management Plan discusses a number of water supply opportunities in Orange County, including the Groundwater Replenishment System, to protect and maximize the yield of the Basin.

Orange County Groundwater Conjunctive Use Program

As discussed above, the Orange County Groundwater Conjunctive Use Program was selected by Metropolitan in June 2003, funded by Proposition 13, to construct groundwater conjunctive use projects that would store imported water in wet years for use in dry years. This is a 25-year project between MWDOC, OCWD, and Metropolitan to store up to 60,000 AF of imported water in the Basin for this purpose, extracting up to 20,000 AF of water during dry periods from 7-10 strategically sited wells. Although the TWS was not selected to participate in this program, the additional wells would reduce the region's dependence on imported water during dry periods and would provide greater reliability.

Orange County Water District (OCWD) Projects

OCWD is dedicated to maintaining a reliable supply of water for its groundwater users. OCWD has identified reliability measures to help mitigate emergency water shortages or increase water supply, including the following:

- OCWD has an agreement with San Bernardino Valley Municipal Water District (SBVMWD) to purchase groundwater supplies. SBVMWD's groundwater table is very high, making excess supply available for pumping to the Santa Ana River for OCWD's use.
- OCWD continues to discuss the purchase of non-SWP water supplies via SBVMWD's capacity in the SWP system.
- OCWD previously entered into a one-year contract with Western Water Company to purchase water from Northern California and plans to continue with similar contracts in the future.
- Wheeled water supplies are available for purchase through Metropolitan.
- Facilities to capture greater amounts of Santa Ana River Storm flows are being proposed and constructed such as recharge basins.
- OCWD continues to work with the Army Corps of Engineers to allow an increase in the water conservation pool level behind Prado Dam. An increase in the conservation pool level allows more storage of storm flows for later use as recharge water.

Orange County Sanitation Districts (OCS D)

As mentioned earlier, OCS D supplies treated wastewater to OCWD for further treatment. OCWD relies on recycled water from OCS D's treatment facilities to protect the Basin through seawater intrusion barriers and landscape irrigation. OCS D in conjunction with OCWD have implemented the GWRS, beginning in October 2002 with OCWD and OCS D signing a Joint Exercise of Powers Agreement for the GWRS. The first phase is currently underway, which will treat wastewater to drinking water standards for direct injection into the existing seawater intrusion barrier and percolation through recharge basins in Anaheim, California.⁵⁹ The project is scheduled to go online in 2007 and will maintain and improve the reliability of the region's water supply. Further discussion on water recycling is included in Section 8 of this Plan.

4.5 TRANSFER AND EXCHANGE OPPORTUNITIES

TWS maintains three connections to the Metropolitan system and four emergency inter-connections with neighboring public water systems to ensure a backup supply in the event of a short-term emergency situations. The Metropolitan connections are typically

⁵⁹ Orange County Water District, *Draft 2002-2003 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2004

operated as constant flow sources, but they function as emergency standby sources when pressures drop significantly. The other interconnections are normally closed, but the valves can be opened in emergency situations.

In addition to emergency connections, water exchange or transfer opportunities outside of MWDOC, EOCWD, and OCWD are obtainable if needed. However, based on the current availability of groundwater and imported water, along with the opportunity for recycled water to TWS, no water exchanges or transfers are being considered at this time.

The TWS has not entered into any agreements for transfer or exchange of water. However, Metropolitan, MWDOC, and OCWD are exploring options that would benefit the entire Orange County region. These exchanges were discussed earlier under proposed projects.

4.6 DESALINATED WATER OPPORTUNITIES

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

Department of Water Resources Desalination Task Force

Assembly Bill 2717 called for DWR to establish a Desalination Task Force to evaluate the following: (1) Potential opportunities for desalination of seawater and brackish water in California; (2) Impediments to using desalination technology; and (3) the role of the State in furthering the use of desalination.⁶⁰ The task force was comprised of 27 organizations, and in October 2003 provided a list of recommendations related to the following issues: general, energy, environment, planning, and permitting.

Metropolitan's Seawater Desalination Program

In August 2001, Metropolitan launched its Seawater Desalination Program. The program objectives were to provide financial and technical support for the development of cost-effective seawater desalination projects that will contribute to greater water supply reliability. In 2004, Metropolitan adopted an IRP Update that includes a target of 150,000 AFY for seawater desalination projects to meet future demands. A call for proposals, under the Seawater Desalination Program, produced five projects by member agencies including the Los Angeles Department of Water and Power, Long Beach Water Department, MWDOC, San Diego County Water Authority, and West Basin Municipal Water District. Collectively, the projects could produce approximately 126,000 AFY.

⁶⁰ DWR, California Water Plan Update 2005, Volume 2 – Resource Management Strategies

This additional source of water supply would provide greater water reliability for southern California residents.

Metropolitan has also provided funding to five member agencies to research specific aspects of seawater desalination. The agencies are reviewing and assessing treatment technologies, pretreatment alternatives, and brine disposal, permitting, and regulatory approvals associated with delivery of desalinated seawater to the local distribution system.⁶¹ Metropolitan continues to work with its member agencies to develop local projects, inform decision makers about the role of desalinated sea water on future supplies, and secure funding from various state and federal programs.

Department of Water Resources Proposition 50 Funding

In January 2005, DWR received 42 eligible applications requesting \$71.3 million from funds available through Proposition 50. Proposition 50, the Water Quality, Supply and Safe Drinking Water Projects, Coastal Wetlands Purchase and Protection Act was passed by voters in 2002. Projects eligible for the program include construction projects, research and development, feasibility studies, pilot projects, and demonstration programs. Local agencies, water districts, academic and research institutions will be able to use the funds in the development of new water supplies through brackish water and seawater desalination.

DWR is recommending funding for 25 of the 43 projects with the available \$25 million under the current desalination grant cycle. With this funding recommendation, 54 percent of the fund will support brackish water desalination related projects and 46 percent will support ocean desalination related projects. The projects recommended for funding include facilities in Marin, Alameda and San Bernardino counties. Pilot projects in Long Beach, Santa Cruz, San Diego and Los Angeles are among those that will receive grants under the proposed funding plan. Research and development activities at the Lawrence Livermore National Laboratory and the University of California, Los Angeles are included in the recommendations, as are feasibility studies by agencies in the Bay Area, Monterey, and Riverside County.

The Draft 2006 Water Desalination Proposal Solicitation Package (PSP) was released on October 13, 2005. A final PSP is anticipated to be released November 25, 2005, with proposals due to DWR by January 31, 2006. The 2006 funding cycle, the second and last cycle of this funding program, includes \$21.5 million for eligible projects similar to those in the first funding cycle: brackish water and seawater desalination construction projects; research and development; feasibility studies; and pilot and demonstration projects for the development of local potable water supplies.

MWDOC and OCWD's Seawater Desalination Concept Analysis

MWDOC and OCWD conducted a study, *Seawater Desalination Concept Analysis*, in March 1999, to determine the relative cost-effectiveness of ocean desalting compared to

⁶¹ Metropolitan Water District of Southern California, 2005 Regional Urban Water Management Plan

other potential supplies. They continued to develop a program concept and in 2003 published their draft *Ocean Water Desalination Program Concept Development Paper* (Concept Paper). The Concept Paper was prepared to provide the OCWD and MWDOC with additional information on potentially developing an ocean water desalter at the AES Huntington Beach Generating Station site, owned by AES Corporation.

The purpose was to outline the AES site opportunities and identify the key issues to be resolved before moving forward with planning and implementation efforts. The project continues to be conceptual in nature; however, the concept paper investigates the opportunities surrounding the planning and feasibility of ocean desalination in Orange County using a specified site with existing infrastructure. The project concept is the development of a 50 MGD ocean water desalination plant to provide base water supply for the OCWD service area. A 50 MGD plant could be expected to produce 50,000 AFY.

The implementation of an ocean water desalination plant can reduce groundwater pumping levels in coastal OCWD and assist in refilling the groundwater basin. It could serve as an emergency backup supply for South Orange County as well as reduce the amount of water required for seawater barrier injection. Implementation of the ocean water desalination plant would require regulatory compliance, environmental stewardship stakeholder interface, and a lengthy completion schedule.

Proposed Projects for Desalination

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC. The proposed projects are discussed in MWDOC's 2005 Regional UWMP and summarized below.

Poseidon Resources Corporation Proposed Project – Poseidon Resources Corporation, a private company, is proposing a seawater desalination project to be located adjacent to the AES Generation Power Plant in Huntington Beach. The proposed project would provide 50 MGD of water supply to coastal and south Orange County. In 2003, the City of Huntington Beach determined the project would cause unacceptable environmental impacts as proposed. Poseidon Resources Corporation therefore submitted a revised draft Environmental Impact Report. The project is currently in the environmental review and permitting phase and there are no contractual agreements in place for the purchase of water.

Joint San Diego/Orange County Proposed Regional San Onofre Project – This joint project is currently being investigated to determine project feasibility. The project size is anticipated to range from 50 – 150 MGD and utilize the decommissioned Unit 1 San Onofre Nuclear Generation Station cooling water inlet and outlet conduits for feedwater and brine disposal. The project may be implemented in 2020.

MWDOC Proposed Dana Point Ocean Desalination Project – MWDOC is currently investigating the feasibility of a desalination project in Dana Point adjacent to San Juan Creek. The feasibility study will evaluate feedwater supply, concentrated RO reject

disposal, and energy. The recommended capacity is 25 mgd. MWDOC received DWR Proposition 50 funding in the amount of \$1,000,000 to investigate horizontal directional drilling with water well technology for use in constructing feedwater supply wells in the marine alluvial channel system.⁶²

⁶² Municipal Water District of Orange County, Draft 2005 Regional UWMP.

**SECTION 5
WATER USE PROVISIONS**

5.1 PAST, CURRENT AND PROJECTED WATER USE BY SECTOR

Water use for the City includes services both inside and outside the City boundaries. Table 5.1-1 shows past, current and projected water use per sector between 2000 and 2030. The total water use per sector has decreased by 5 percent from 2000 to current 2005 use. This may be attributed to an increase in water conservation and the wet weather in 2004, which contributed to high precipitation throughout southern California. Thus, the decrease in water demand is consistent with other agency data throughout the region.

The projected water use by sector reflects the water demand projections shown in Table 4.2-4 in Section 4.2.

**Table 5.1-1
Historic and Projected Water Use by Sector**
(Acre-feet – All Future Projections Rounded to the Nearest 10 AF)

Water Use Sectors	2000	2005	2010	2015	2020	2025	2030
Single Family Residential	7,186	6,413	6,580	6,580	6,580	6,580	6,580
Multi Family Residential	2,836	2,784	2,850	2,850	2,850	2,850	2,850
Commercial	956	1,120	1,160	1,160	1,160	1,160	1,160
Industrial	337	150	160	160	160	160	160
Institutional	490	631	630	630	630	630	630
Dedicated Irrigation Meter	309	339	340	340	340	340	340
Fire	35	3	10	10	10	10	10
Agricultural	17	9	10	10	10	10	10
Subtotal For Sectors	12,166	11,449	11,740	11,740	11,740	11,740	11,740
Unaccounted-for-System Losses (%) ^[1]	1,630	1,293	1,330	1,330	1,330	1,330	1,330
Brine Discharge ^[2]	380	303	300	300	300	300	300
Total Water Use	12,166	11,449	13,370	13,370	13,370	13,370	13,370

^[1] Unaccounted-for-losses in 2000 and 2005 are based on actual records; future years unaccounted-for losses are estimated to be 11.3% as experienced in 2005

^[2] Brine discharge of 380 AF/Y in 2000 and 302.7 AF/Y in 2005 is not accounted for in Total Water Use since it is discharged directly into the sewer system and not delivered to customers.

Unaccounted-for-water is the difference between water production and water consumption and represents “lost” water. Unaccounted-for-water occurs for a number of reasons:

- » Water lost from system leakage, i.e. from pipes, valves, pumps, and other water system appurtenances.
- » Water used by the Fire Department to fight fires. This water is not metered.
- » Customer meter inaccuracies. Meters have an inherent accuracy for a specified flow range. However, flow above or below this range is usually registered at a lower rate. Meters become less accurate with time due to wear.
- » Water theft by unauthorized users. This water is also not metered.

5.2 WATER SERVICE CONNECTIONS BY SECTOR

Table 5.1-2 shows the number of water service customers by sector between 2000 and 2005, and projections of customers through 2030. The number of service connections is anticipated to increase very slightly through 2030, consistent with the projected small increase in population and general built-out status of lands within the TWS service area.

**Table 5.1-2
Number of Water Service Connections by Sector**

Water Use Sectors	2000	2005	2010	2015	2020	2025	2030
Single Family Residential	11,676	11,686	11,978	11,978	11,978	11,978	11,978
Multi Family Residential	864	858	879	879	879	879	879
Commercial	754	795	821	821	821	821	821
Industrial	50	51	52	52	52	52	52
Institutional	159	177	177	177	177	177	177
Dedicated Irrigation Meters	192	195	200	200	200	200	200
Fire	156	177	181	181	181	181	181
Agriculture	8	6	6	6	6	6	6
Total Connections	13,859	13,954	14,294	14,294	14,294	14,294	14,294

Source: 2000 and 2005 data is based on actual data; all future projections are estimates based on 2.5% projected growth over the next five years, which then stabilizes in 2010.

SECTION 6 WATER DEMAND MANAGEMENT MEASURES

6.1 INTRODUCTION

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

Water conservation is often equated with temporary restrictions on customer water use. Although water restrictions can be a useful emergency tool for drought management or service disruptions, as discussed in Section 7, water conservation programs emphasize lasting day-to-day improvements in water use efficiency.

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

TWS recognizes water use efficiency as an integral component of current and future water strategy for the City. The DMMs outlined in the Water Code section 10631(f) are consistent with the 14 Best Management Practices (BMP) established through the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). These BMPs refer to policies, programs, rules, regulations and ordinances, and the use of devices, equipment and facilities that, over the long term, have been generally justified and accepted by the industry as providing a "reliable" reduction in water demand. The BMPs (or DMMs) are technically and economically reasonable and not environmentally or socially unacceptable, and are not otherwise unreasonable for most water suppliers to carry out.

TWS implements numerous programs related to the 14 DMMs as discussed in Section 6.3 below. While TWS is not a signatory to the MOU, MWDOC is a signatory and provides the following services on behalf of its member agencies, from which TWS benefits through EOCWD:

1. An on-going water use efficiency program support for member agencies and their subagencies.
2. Lead agency implementing water use efficiency programs that are more cost-effectively implemented on a regional basis rather than a local basis.

3. Secures outside funding for water use efficiency projects and programs from Metropolitan's Conservation Credits Program, United States Bureau of Reclamation, State Water Resources Control Board, and other state and federal sources.

6.2 DETERMINATION OF DMM IMPLEMENTATION

TWS has continued to work cooperatively with EOCWD, MWDOC, and Metropolitan toward implementing the 14 cost-effective DMMs. Most of the cost of implementing these programs is incorporated in the regional water agencies rate surcharges.

These 14 DMMs include technologies and methodologies that have been sufficiently documented in multiple demonstration projects that result in more efficient water use and conservation. TWS' 2000 UWMP indicated activities currently underway to implement the DMMs. Section 6.3 provides an updated review of the TWS' efforts accomplished since 2000 to successfully implement the DMMs, as well as projections of conservation program efforts through 2010.

6.3 DEMAND MANAGEMENT MEASURES

TWS is committed to conservation as a means to provide a sustainable source of water supply to its service area, and plans to continue implementation of its conservation programs in conjunction with MWDOC during the next five years. As a sub-agency of EOCWD and MWDOC, the City benefits from various regional programs performed by MWDOC on behalf of its sub-agencies.

As a signatory to the MOU, MWDOC has made the State-mandated DMMs for water conservation the cornerstone of its conservation programs for its member agencies. MWDOC's regional water use efficiency DMM programs, as well as TWS DMM activities are presented below.

DMM 1 – Residential Water Surveys for Single and Multi-Family Residential Customers

Residential surveys by TWS have been done on an informal basis via customer requests responding to high water bill complaints or meter readings that indicated higher than normal usage. In 1997, MWDOC began accessing Metropolitan funding assistance for residential surveys, which included retrofitting high water-using devices with low flow devices. MWDOC ceased its program in FY 01/02 and does not plan to offer the program in the future. However, TWS plans to continue its program contingent upon customer requests. Table 6.3-1 shows the projected number of surveys to be conducted in the service area.

**Table 6.3-1
DMM 1 – Single Family and Multi-Family Surveys**

Year	2006-2010
# of surveys (1)	200
Total Expenditures (\$) (2)	\$40,000
Water Savings (AFY) (3)	4.7

Note: The quantities above were derived based on the following assumptions:

1. Estimated that 40 surveys will be conducted per year.
2. Estimated that \$100/hour for 2 man hours per survey equals \$200/survey X 200 surveys.
3. Estimated at 200 total surveys x 365 days/year x 21 gpd / 325,900 gallons/AF.

Based on the California Urban Water Conservation Council’s savings rates, set forth in the BMP Costs and Savings Study (December 2003), savings from untargeted intensive home surveys results in an average of 21gpd per household (both single family and multi-family) total savings for future projections.

TWS will measure the effectiveness of water survey programs through analyzing the number of surveys distributed and the difference in water consumption for the families after the surveys are conducted. The program will continue on an ongoing basis through 2010, at which time a decision will be made whether to continue the surveys.

DMM 2 – Residential Plumbing Retrofits

Since 1991, TWS has participated in the residential plumbing program offered by MWDOC since 1991. From 1991 to date, 5,473 ULFTs have been retrofitted in single family homes throughout MWDOC’s service area, 3,978 in multi-family homes, and 8,059 low-flow showerheads have been installed. MWDOC has tracked replacement of 5,811 toilets with ULFTs on behalf of TWS from FY 00/01 and FY 05/06 through the ULFT rebate program.⁶³ Of this total amount, 3,176 ULFTs were installed in single family homes, and 2,635 ULFTs were installed in multi-family homes. The ULFT program is discussed in more detail under DMM 14. Approximately 21.2-27.2 gallons of water per day are saved with the installation of the ULFTs for single family and 36.7-63.7 gallons per day per device for multi-family. Table 6.3-2 shows the number of ULFT residential retrofits in TWS’ service area and the total estimated water savings.

⁶³ Municipal Water District of Orange County, City of Tustin Water Conservation Achievement, In-house document.

**Table 6.3-2
DMM 2 – TWS Residential Plumbing Retrofit Devices**

Fiscal Year	ULFT Single Family	ULFT Multi- Family
2001	502	1,006
2002	363	843
2003	688	408
2004	555	272
2005	55	14
2006	6	1
2007	25	75
2008	25	75
2009	25	75
2010	25	75
Total Retrofits	2,269	2,844
Total Water Savings	61	159

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 at nearly 100% and 94% saturation in single- and multi-family homes. As a result, water agencies throughout Orange County have achieved the 75% saturation requirement for this BMP.

The method to evaluate effectiveness will consist of calculating estimated water savings for each BMP and comparing historic water demand with the current water demand and determining the quantity of water savings. EOCWD will continue to offer the program to its service area through MWDOC through 2010.

DMM 3 – Distribution System Water Audits, Leaks Detection and Repair

The TWS Water Master Plan evaluates the water distribution system to meet all demand conditions, including peak hour demand and maximum day demand plus fire flow.⁶⁴ In addition, the distribution system will be sized to allow an even distribution of flow to reservoirs during low demand periods. As part of the TWS water system CIP, a program has been developed and scheduling is in place to retrofit old distribution pipelines on an annual basis.

TWS maintains an emergency response program that aggressively repairs main breaks, hydrant leaks or breaks, and meter leaks. A team of TWS staff are available to permanently repair main or hydrant breaks, and promptly restore water service. Both proactive and “inform and response” approaches are utilized for addressing water meter

⁶⁴City of Tustin. Water Master Plan. 2000.

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

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 Orange County. In 2004, the percent of unaccounted-for-water for retail water agencies ranged from a low of 1.2% to a high of 10.7%, with an average of 5.1%.⁶⁵

TWS' unaccounted-for-water percentage is monitored on a monthly basis⁶⁶. As shown in Table 5.1, unaccounted-for-water loss for 2000 was 13.4% and 11.3% in 2005. The level of unaccounted water will continue to be regularly monitored. If water losses were to rise appreciably, by the City, a system wide survey of distribution facilities would be implemented. The City's distribution system improvements program is expected to help reduce unaccounted-for-water loss by at least 1-3% through 2010.

To evaluate the effectiveness of these conservation measures, staff will continue to monitor the data records to confirm that the unaccounted-for-water losses remain low and consistent throughout the City's water system.

The City is presently working with the Municipal Water District of Orange County on a Water Audit Demonstration Project with funding assistance from the U.S. Bureau of Reclamation. The project will be piloting a new Distribution System Audit methodology developed by the American Water Works Association Research Foundation (AWWARF) and International Water Association (IWA). The project includes two parts: (1) a survey of all MWDOC retail agencies to assess the context for existing water loss among the agencies; and (2) the selection of one retail agency to conduct a detailed water audit consistent with methods developed by the AWWARF and IWA. The new methodology includes several features that have been lacking in traditional auditing practices. The basic concept is that all water can and should be "accounted-for" as either a consumptive use or a loss.

Non-revenue water is the new term to be analyzed by the study, with all non-revenue water falling into the categories of either unbilled authorized consumption, or apparent losses, or real losses. Apparent losses include unauthorized consumption, metering errors and data errors resulting in lost revenue to the water utility. Real losses include leakage from mains, storage and service connections. Such losses represent a waste of water causing unnecessary infrastructure capacity, inflated production and energy costs and undue stress on available water resources – solely to meet the non-beneficial demand of

⁶⁵ MWDOC Draft Urban Water Management Plan. October 5, 2005.

⁶⁶ Unaccounted-for water is the difference between water production and water consumption and represents "lost" water. Unaccounted-for water may occur from: (1) water lost from system leaking, i.e. from pipes, valves, pumps, and other water system appurtenances; (2) water used by the Fire Department to fight fires, which is not metered; and (3) occasional customer meter inaccuracies.

mostly system leakage. The results of the MWDOC Water Audit Demonstration Project are expected to be used as the basis for a possible grant application from the USBR for future targeted distribution system improvements within Tustin's service area.

DMM 4 – Metering with Commodity Rates

TWS requires meters for all new water connections and bills by volume of use. All water service connections, with the exception of dedicated fire services, are metered. TWS has retrofitted all existing unmetered connections to be metered.

Metering allows the City to conserve a total of 20-30 percent of the water demand overall, and up to 40 percent savings during peak demand periods, as estimated by the CUWCC's BMP Costs and Savings Study (December 2003). Table 5.1-2 in Section 5 shows the number of water service customers by sector between 2000 and 2005, and projections of customers through 2030. All service connections are metered. The measure of effectiveness for this DMM will include a comparison of water use before and after meter calibration. The City will continue to require metering for all connections.

DMM 5 – Large Landscape Conservation Programs

TWS participates in MWDOC's regional irrigation efficiency programs. MWDOC and Metropolitan provide sponsorship and performance-based funding for these programs to offset the cost to the customer. These programs include the Landscape Contractor Certification Program and the Protector Del Agua Irrigation Management Training.⁶⁷ Following is a brief description of these programs:

Landscape Contractor Certification Program: This program is designed to develop landscape irrigation budgets for dedicated landscape meters in cooperation with landscape contractors, property management companies, cities, school districts, and county facilities. Financial incentives are offered to improve landscape water use efficiency through regional funding provided by Metropolitan.

Protector del Agua Irrigation Training Program. This program is free to TWS participants and offers information for the landscape professional on water management, enhanced landscape practices, and practical ideas to improve their bottom line. The Program allows landscape contractors to stay abreast of the policy and activities of the water agencies, and proper cultural practices within their industry. As part of the program, landscape certification training is offered.

These programs directly benefit TWS through its landscape contractor activities. Such activities include landscape irrigation budgets, green material management, computer controlled irrigation systems, and bilingual irrigation management training, including

⁶⁷ Municipal Water District of Orange County, Regional Urban Water Management Plan, December 2000.

advanced irrigation schedule programming and plant identification to promote use of arid climate plantings.

On a smaller scale, TWS residents are also eligible to participate in MWDOC's Smart Timer Landscape Irrigation Controller Program (Rebate Program). The SmartTimer Rebate Program began in September 2004 and offers an incentive to retrofit the existing irrigation controller with a weather based irrigation controller. Both single family residential and commercial customers who have an existing clock are eligible to participate. SmartTimers sense weather conditions and apply the right amount of water for plants to prevent over watering and urban run-off. In collaboration with Metropolitan and the State Water Boards, MWDOC offers rebates of \$20 per set up and operating valve for residential use. Single family residential homes must have a minimum of 1,200 square feet of irrigated landscape. Rebates for commercial customers are \$12 per attached and operating valve and an additional \$500 per acre under the control of the installed technology. TWS will continue to offer this program to residents within its service area, and plans to budget \$2,000 per year for this program beginning in FY 2006-2007. This program also allows MWDOC member agency residents to accomplish the following:

1. Save money by reducing outdoor water use by up to 25%
2. Advance the health and appearance of landscape; and
3. Protect the environment by reducing runoff.

Large landscape devices may provide 19-35 percent savings in water consumption, based on CUWCC approximations. Residents of TWS' service area have installed a total of two SmartTimers and the number of participants is anticipated to grow. The measure of effectiveness for the City in implementing this BMP will consist of the amount of increase in customer participation and demand for scheduled presentations.

In Section 5, Table 5.2 shows the number of landscape accounts by sector between 2000 and 2005, and projections of customers through 2030. The number of irrigation accounts is projected to remain fairly consistent from 2005-2030.

DMM 6 – High-Efficiency Washing Machine Rebate Programs

Through MWDOC, a current high efficiency clothes washer (HECW) rebate of \$100 is provided to member agencies for the purchase of a HEWC machine installed in Orange County. As of July 1, 2005, machines must have a water factor of 6.0 or less to qualify for the rebate program, as determined by MWDOC. Such machines typically use 15 to 25 gallons less water per load, with a potential water savings of up to 7,000 gallons per year. These washing machines are offered for single family residential homes. Since FY 2001/02, a total of 407 HECWs have been installed in the TWS service area in single family residential homes

Southern California Edison (SCE) initiated a HECW Rebate Program in 1999. The HECW Program consists of two different tiers of rebates (\$50 and \$100) based on the level of energy savings by specified HECWs. Metropolitan participated in the program,

which includes the Orange County region, and has contributed \$35 for each HECW. The method to measure effectiveness of this DMM will include quantifying the number of HECW's distributed and the total potential water savings, and then analyzing the water demand after one year of implementation to observe how the water demand has changed.

The water savings can be estimated at an average of 85 to 109 gallons per week per machine, with 14.4 to 28.7 gpd/machine for single family residences, based on CUWCC estimates. The mean savings of 5,085.6 gallons per year may be applied to each HECW. Table 6.3-3 below shows estimated water savings based on this rate of savings.

Table 6.3-3
DMM 6 – High-Efficiency Washing Machine Rebates

TWS	Historical (2001/02- 2004/05)	Current and Projected (2005/06-2009/10)
\$ per rebate	\$100	\$100
# of HECW rebates	407	125 ¹
Water Savings (AFY) ²	1.03	0.32

Notes:

1. Estimated at 25 rebates per year over the 5 year period.
2. Estimated at 11.5 gpd water savings per machine.

DMM 7 – Public Information Programs

TWS and MWDOC partner together on public information education and outreach programs that provide information regarding present and future water supplies, the demand for a reliable supply of high quality water, and the importance of implementing water efficient techniques and behaviors. TWS informs its water customers of upcoming public information events and encourages participation in water conservation efforts and programs sponsored by EOCWD, MWDOC, and Metropolitan.

MWDOC provides a comprehensive public information program built around communication, coordination and partnerships. TWS participates in the monthly Public Affairs Workgroup meetings conducted by MWDOC with its member agencies. The meetings are held to coordinate public outreach efforts, as well as share information and ideas on a countywide basis.

MWDOC has assisted TWS in promoting water conservation awareness in the annual statewide Water Awareness Month held in May. In addition, TWS has participated in the National Drinking Water Week, which includes a Children Drinking Water Festival geared to promote water education, a poster and slogan contest, and distribution of water education kits to classrooms. TWS invested \$16,200 in the Children Drinking Water Festival for FY 2003-2005. To continue this program, TWS anticipates spending \$27,000 during FY 2006-2010. TWS regularly distributes a variety of information materials to the public, including newsletters, fact sheets, brochures, issue bulletins, manager's reports, annual reports, briefing books, and press kits.

The method to measure effectiveness of implementing this DMM for the City will include quantifying the number of participants in the public programs, as well the number of public announcements/brochures distributed throughout the service area. An increase in the participation and distribution of materials will indicate heightened public water conservation awareness to work towards decreases in water use. TWS will continue to work with MWDOC to offer public information programs through 2010.

DMM 8 – School Education Programs

Through MWDOC, water education programs are available to the TWS’s public and private schools. Specific programs with State-approved curriculum are offered for students from kindergarten through high school. Programs include classroom presentations by MWDOC staff teachers, audio-visual programs, hands-on activities, take-home materials for students, and workbooks and supplies for teachers.

During the 1999/00 school year, nearly 120,000 students were educated in Orange County through MWDOC's program and over 500,000 students since 1995.⁶⁸ The number of students educated annually has doubled since 1979/80. The number of students reached in the City of Tustin through MWDOC’s Water Education Program is shown in Table 6.3-4. More than 7,500 students have participated in TWS’ water education program since 2000. TWS is dedicated to continue providing water education and encourages participation in its program.

**Table 6.3-4
DMM 8 –MWDOC Water Education Program
Number of Students Reached in Tustin**

	2000/01	2001/02	2002/03	2003/04	2004/05	2006-2010
TWS	2,628	1,888	208	2,177	605	6,000

Source: MWDOC – 2005 Regional Urban Water Management Plan

The City will measure the effectiveness of this DMM by analyzing the total number of students and schools participating in the presentations and assess whether the program calls for expansion.

DMM 9 – Commercial, Industrial and Institutional Programs

In FY 1995/96, MWDOC designed and implemented a commercial, industrial and institutional (CII) Water Use Survey Program on behalf of its member agencies with funding from Metropolitan and the U.S. Bureau of Reclamation (USBR). Through FY 1995/96 to 1999/00, five CII sites were surveyed for TWS through MWDOC’s program. A trained auditor visited each location to survey all water using devices at each site.

⁶⁸ Municipal Water District of Orange County, Regional Urban Water Management Plant, December 2000.

Participants received a report detailing potential water saving areas, both through behavioral modifications and the retrofitting of specific low-flow devices.

During fiscal years 1997/98 and 1998/99, MWDOC developed an in-house CII rebate program utilizing funding provided by Metropolitan and OCSD. MWDOC's CII rebate program signified the first time MWDOC was able to acquire funds from OCSD to assist in the installation of retrofit devices aimed at reductions in waste water flows. Participants from the CII Program were solicited to participate with rebate funds targeting specific devices identified through the survey process. TWS was successful in securing two service area participants in the rebate program.

During fiscal year 1999/00, MWDOC phased out its own rebate program and began arrangements to participate in Metropolitan's regional rebate program. MWDOC will work with its member agencies, including Tustin, to target smaller commercial and institutional sites to retrofit high water using devices. In order to provide the highest possible funding incentive, MWDOC is looking to OCSD, OCWD, and highly motivated member agencies to augment the funding provided by Metropolitan.

MWDOC's Save Water - Save a Buck! Program began in 2002 and offers rebates to assist commercial, industrial, and institutional customers in replacing high-flow plumbing fixtures with low-flow fixtures. Facilities where low-flow devices are installed must be located in Orange County. Rebates are available only on those devices listed in Table 6.3-5 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 6.3-5
DMM 9 – MWDOC “Save Water – Save a Buck!” Program

Retrofit Device	Rebate Amount
Ultra-Low-Flush Toilet	\$60 to \$120
Ultra-Low-Flush Urinal or Waterless Urinal	\$60
Flush Valve Retrofit Kit	\$15
Coin/Card-Operated High Efficiency Commercial Clothes Washer	\$250
Cooling Tower Conductivity Controller	\$500
Hospital X-ray Film Processor	\$2,000
Water Pressurized Broom	\$100

Source: Municipal Water District of Orange County 2005 Urban Water Management Plan

More than 5,800 water wasting plumbing fixtures have been replaced with low flow fixtures through this program. These retrofits are saving more than 560 acre-feet of potable water per year.

Through MWDOC's CII Retrofit Program, TWS has actively provided rebates throughout its service area. Approximately 24.5 gallons of water per day are saved with

the installation of commercial ULFTs, based on CUWCC data. Table 6.3-6 shows the past and projected number of rebates distributed through the CII Rebate Program within the TWS' service area:

**Table 6.3-6
DMM 9 –TWS CII Retrofit Program**

TWS	2001/02	2002/03	2003/04	2004/05	2006 - 2010
# of Rebates	9	64	16	34	120
Water Savings (GPD)	221	1,568	392	833	3,000

Additionally, since 1999, TWS has been participating in OCWD's Hotel and Motel Water Conservation Program. This program offers free laminated hangers to promote the reuse of towels and bed linens for multiple day usage. This program allows the guests and the hotel or motel to be environmentally aware while reducing water use, lowering costs, savings energy, and reducing pollution. In addition, hotels and motels that sign up for the program also receive a bilingual instructional video for use in training their housekeeping staff.

Through OCWD, TWS promotes a Restaurant Water Conservation Program that offers free laminated tent cards for restaurants to place on their tables. The cards explain to guests the restaurants' interest in helping conserve water for Orange County and that the restaurant will be serving water only upon request.

TWS will continue to promote and support the regional CII Program through ongoing program endorsement and distribution of informational brochures. MWDOC will provide program effectiveness and conservation savings information, and will fund the program through their budget. The CII Rebate Program provides a total of 17.8-20.3 percent median and 17.9-29.2 percent mean in savings on an annual basis.

The number of commercial and industrial accounts is shown in Table 5.1-2 of Section 5. To measure the effectiveness of this DMM, the City will perform a water savings analysis by calculating the total number of rebates distributed and the estimated water savings for each. The total of this calculation will show the amount of water saved and should be reflected in the overall water use before and after implementation of the DMM.

DMM 10 – Wholesale Agency Assistance Programs

TWS receives assistance to implement water use efficiency programs from MWDOC. MWDOC has consistently provided the following assistance: (1) implementation of regional programs on behalf of Tustin and all Orange County water agencies; (2) acquisition of annual grant funding from a variety of sources; and (3) technical assistance regarding local program design and implementation, benefit/cost analysis, conservation based rate structures, and program marketing.

TWS will continue to work cooperatively with MWDOC to participate in regional DMM programs, informational groups and projects, determination of the most cost-effective DMMs, and tailoring programs specific to TWS on an ongoing basis.

DMM 11 – Conservation Pricing

The first goal of any rate structure is to generate sufficient revenues to maintain efficient and reliable utility operations. The second target is fairness in the allocation of utility service costs. Generally, it is possible to satisfy both of these goals in a rate structure that encourages water conservation or penalizes excessive water use. Designing water rates must include the following: (1) determination of the water utility's total annual revenue requirements for the period for the period for which the rates are to be in effect; (2) determination of service costs by allocation of the total revenue requirements to the basic water system cost components and distribution of these costs to the various customer classes in accordance with service requirements; and (3) design water rates to recover the cost of service from each class of customer.

The City's current water rates clearly meet the definition of "conservation pricing" as defined by the CUWCC, which states that conservation pricing includes, "rates designed to recover the cost of providing service." TWS' rates are designed in this manner. Customers are billed bimonthly on the basis of a commodity charge, and a fixed service charge.⁶⁹ The service charge is based on meter size; a standard residential meter is currently \$16.00 per the bimonthly billing period.

The commodity component of the monthly water service charge is structured to recover the actual cost of water, including the groundwater replenishment assessment (RA), imported water charges, and energy and maintenance costs for TWS's water production facilities. The fixed portion of the monthly charge is designed to cover the cost of water distribution, meter reading and maintenance of the water distribution system, as well as a portion of the capital improvement program. Distribution and production are distinct programs in the annual Water Division budget. Applicable portions of administration, engineering and water quality costs were assigned to each rate program. TWS' water rates will be re-evaluated for FY 2006-07.

Conservation-oriented water rate structures by themselves do not constitute an effective water conservation program. Rate structures work best as a conservation tool when coupled with a sustained customer education program. Customer education is important to establish and maintain the link between customer behavior and their water bill. Utility customers require practical information about water-conserving practices and technologies. Participation in other water conservation programs, such as plumbing fixture retrofit and replacement programs, can also be enhanced by rate incentives and

⁶⁹ MWDOC, Orange County Water Agencies: Water Rates, Water Systems Operations and Financial Information, 2001.

customer education. Finally, public acceptance of a rate structure is often enhanced if customers understand the need for and benefits of water conservation.

DMM 12 – Conservation Coordinator

TWS assigns staff to implement conservation programs as defined within each of the DMMs. TWS staff works closely with the Water Use Efficiency staff of MWDOC to provide successful execution of regional programs, and those conducted on behalf of TWS. TWS may either directly participate in or be represented by MWDOC in regional workgroups including the Water Use Efficiency Workgroup, Public Affairs Workgroup, County of Orange Supervisor’s Water Task Force, and the Orange County Water Use Efficiency Steering Committee.

DMM 13 – Water Waste Prohibition

The City Council passed Ordinance No. 1063 (April 1991) which allows passage of a resolution from time to time to impose charges, surcharges, and penalties as deemed necessary to accommodate water allocations, charges and penalties imposed by Metropolitan, and other factors affecting the supply and cost of water to the City. Ordinance No. 1063 is located within Appendix F. This Ordinance includes provisions stating that at no time shall water be wasted or used unreasonably. The ordinance is phased into four water conservation stages from voluntary compliance to mandatory compliance. The ordinance prohibits “gutter flooding,” where water is wasted from inefficient irrigation practices or any other water usage onto any public street or alley.

Ordinance No. 1063 is also incorporated into the City’s Water Shortage Contingency Plan to comply with Section 10631(e)(6) of the Act “*Penalties or charges for excessive use.*” Resolution 92-49 amends Ordinance No. 1063 by rescinding all additional charges and penalties for excessive water use based on Metropolitan’s adjustment in voluntary water use reduction. Metropolitan had imposed severe financial penalties on the City if it had not achieved a 30 percent reduction in imported water purchases during the last drought of 1988-1992; however, in 1992, Metropolitan modified its requirements in 1992 to request a voluntary 10 percent reduction in water use and rescinded its penalties for excessive use.

DMM 14 – Residential Ultra-Low-Flush Toilet (ULFT) Program

The ULFT Program is sponsored by the Water Use Efficiency Steering Committee, which includes OCWD, MWDOC, OCSD and cities and water districts in Orange County. The Steering Committee participates in underwriting the no-cost, ULFT program that encourages county residents to replace inefficient toilets. The program has targeted to replace 900,000 residential toilets in Orange County, creating an annual savings of approximately 25,000 AF of water per year.

TWS customers have participated in various regional programs that are jointly funded from the foregoing entities through ULFT give-aways and ULFT rebate programs. Since the inception of the ULFT program in 1995-96, TWS has successfully installed 9,451 ULFT's, with a total of 4,713 ULFTs installed between 2000/01 to present, as shown in Table 6.3-7 below. Approximately 21.2-27.2 gallons of water per day are saved with the installation of the ULFTs for single family and 36.7-63.7 gallons per day per device for multi-family.

Table 6.3-7
DMM 14 – TWS Residential ULFT Replacements

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07- 2009/10
# of ULFTs	1,508	1,206	1,096	827	69	7	400
Water Savings (AFY)	40	33	30	22	2	.2	2.35

Source: MWDOC, Draft 2005 Regional Urban Water Management Plan

The method to measure effectiveness will include a calculation of the total number of ULFT's and rebates distributed throughout the service area, the resulting water savings, and the changes in water demand following implementation of the ULFT's.

ADDITIONAL WATER CONSERVATION PROGRAMS

TWS has implemented additional water conservation related activities. TWS is continuing to work toward the development and implementation of customer outreach programs designed to identify high water consumption. TWS is dedicated to being responsive to broken sprinklers and water misuse when notified by its customers. Upon identification of high water consumption or misuse, TWS will efficiently investigate the report and inform the customer of any problems found, as well as possible water conservation measures.

For Orange County, a MWDOC Industrial Process Water Use Reduction Program was approved for full funding under the DWR Water Use Efficiency Grant Program at \$404,801. It is anticipated that the project, once implemented, will result in a total water savings of 689 AFY, meeting CALFED Benefits. The program will result in both local and state benefits. The programs' main purpose is to promote water conservation, such as reducing wastewater flows to treatment plants and decreasing pollution along coastal waters.

At the regional level, Metropolitan proposed five water conservation programs for funding under the DWR Water Use Efficiency Grant Program. These programs will benefit member agencies, including MWDOC and its member agencies. Therefore, TWS will benefit from the implementation of the programs. The programs include the following:

- Residential High Efficiency Clothes Washer Rebate Program - The Residential High Efficiency Clothes Washer Rebate Program offers rebates toward the purchase of water- and energy-saving clothes washing machines, which will reduce the demand on water imported from the Bay Delta by 12,275 AFY. This 2-year program was funded at \$1.66 million.
- California Friendly Communities - The program will result in CALFED Benefits, which include avoiding Bay Delta diversions. California Friendly Communities is a grant program in which cities receive funding to transform their landscape to increase water conservation. A maintenance plan, enhanced irrigation and controllers, and landscaping techniques are exercised through this program. This program received \$424,150 in funding for 1,650 valves for multi-family residences.
- High-Efficiency Toilet Rebate Program – A rebate is given to customers who purchase a new High Efficiency Toilet. The toilet uses a minimum of 20% less water than standard toilets and will supply 41 AFY of water savings. This program was funded at \$1.0 million for a total of 10,000 ULFTs.
- Online/Web-Based Irrigation Efficiency Training – This program will provide two class courses for residential and professional participants, as well as educate individuals about water use, efficiency training, and educational programs. DWR funded one residential series class and two classes from the professional course for a total of \$77,500.

6.4 WATER USE EFFICIENCY EFFECTIVENESS

The Orange County Water Plan, *Focus on Orange County's Water Future*, as discussed in MWDOC's 2005 Regional UWMP, adapts and applies the Metropolitan-Main Model. The Model forecasts water demands on both a regional basis and at the retail level to produce an estimate of future water demand, the identification of potential benefits, and costs associated with implementation of the DMMs. The conservation potential by individual retail water agencies will be used to develop DMM implementation plans using a "least cost approach" to develop a "most cost effective" package of DMM programs customized for each retail agency. A Conservation Savings Model estimates the potential water conservation from implementation of the DMMs. Once the potential water savings are quantified, programs can be developed to target potential savings.

Quantifiable DMM programs include ULF toilet and low-flow showerhead retrofits, water audits and conservation pricing. Programs and activities that are not quantifiable, but known to save water, include public information, school education, conservation coordinator, water waste prohibitions, and metering with commodity rates.

Water use efficiency is an integral part of water supply planning and operations. TWS works to improve the understanding of costs and benefits of conservation so that investment decisions are efficient and effective at meeting program goals. As a cooperative member of California's conservation community, TWS supports MWDOC's significant contributions to the development and coordination of water use efficiency activities for its member agencies and throughout Orange County.

Many of the DMMs have been implemented based upon the MOU schedule, others are being implemented, and all DMMs will continue on an ongoing basis. TWS will continue to work cooperatively with MWDOC to implement cost-effective DMMs.

SECTION 7 WATER SHORTAGE CONTINGENCY PLAN

7.1 INTRODUCTION

One dry year does not constitute a drought in California, but does serve as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure, its reservoirs, groundwater basins, and inter-regional conveyance facilities, mitigates the effects of most short-term dry periods. Defining when a drought begins is a function of drought impacts to water users. Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Droughts occur slowly, over a multiyear period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

In order to meet short-term water demand deficiencies, and short- or long-term drought requirements, TWS has implemented its own water shortage policy, *Water Shortage Contingency Plan*, through adoption of Resolution No. 92-15, January 1992. The Plan is in accordance with MWDOC and OCWD water shortage/drought activities. TWS will respond to MWDOC's water shortage and drought management policy, which is based on Metropolitan's adopted Water Surplus and Drought Management Plan (WSDM Plan). The WSDM Plan guides the management of regional water supplies to achieve the reliability goals of Southern California's Integrated Water Resource Plan. Details of the WSDM Plan can be reviewed in the Metropolitan 2005 Regional Urban Water Management Plan.

7.2 STAGES OF ACTION

In order to meet short-term water demand deficiencies, and short- or long-term drought requirements, TWS will implement its own Water Shortage Contingency Plan, as adopted on February 3, 1992 through City Resolution No. 92-15. A copy of the Water Shortage Contingency Plan is included in Appendix F. In a water shortage emergency, TWS would request the City Council to invoke the City's Water Management Program, Ordinance No. 1060, adopted by the City Council of the City of Tustin on March 18, 1991, and is also included in Appendix F. Depending on seasonal demand considerations, one of four stages of the Ordinance would be implemented. Ordinance No. 1060 delineates the stages of action that will be taken if up to a 50 percent reduction in water supply occurs. Ordinance No. 1063, which established a Mandatory Water Conservation and Rationing Program to reduce consumption by 15 percent, was adopted by the City Council on April 1, 1991.

Rationing Stages and Reduction Goals

The City's Ordinance No. 1060 identifies four stages of action that may be implemented in the event of a declared water shortage, based on the severity of the shortage. The City prohibits the waste of water throughout the TWS service area. In addition, the following stages shall be enforced, as appropriate, based on the extent of the water shortage:

Stage 1 – Voluntary Compliance – Water Watch. Applies during the possibility that the City will not be able to meet the demand of its customers. Stage 2 elements apply on a voluntary basis.

Stage 2 – Mandatory Compliance – Water Alert. Applies during periods when the probability exists that the City will not be able to meet all of the water demands of its customers or when statewide shortages cause a need for local conservation measures to be implemented. The following water conservation measures shall apply except when reclaimed or recycled water is used:

1. Lawn watering and landscape irrigation is limited to 10am to 6pm and hand-held hoses, buckets, and drip irrigation must be used. Watering is on an as-needed basis.
2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
3. Washing of specific mobile equipment shall be done with hand-held bucket or hose equipped with a shut-off nozzle. Commercial car washes are permitted to wash at any time. Washing is exempted from these regulation where health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.
4. Watering parks, school grounds, public facilities, and recreation fields is not permitted between the hours of 10 am and 4pm.
5. Restaurants shall not serve water to their customers except when specifically requested.
6. The operation of any ornamental fountain or similar structure is prohibited unless reclaimed water is used.
7. Agriculture users and commercial nurseries are exempt from Stage 2 irrigation restrictions, but will be required to curtail all non-essential water use.

Stage 3 – Mandatory Compliance – Water Warning. Applies during periods when the City will not be able to meet all the water demands of its customers. The following will apply:

1. Lawn watering and landscape irrigation is limited to 6pm to 6am and hand-held hoses, buckets, and drip irrigation must be used. Watering is on an as-needed basis. A designated irrigation day is determined by the last digit in the street address.
2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
3. Washing of specific mobile equipment shall be done with hand-held bucket or hose equipped with a shut-off nozzle. Commercial car washes are permitted to wash at any time. Washing is exempted from these regulation where health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.
4. Watering parks, school grounds, public facilities, and recreation fields is not permitted between the hours of 6 pm and 6 am.
5. The use of water from fire hydrants shall be limited to fire fighting and related activities, or other activities necessary to maintain the health, safety and welfare of the public.
6. Agricultural users and commercial nurseries shall use water only between the hours of 6 pm and 6 am.
7. Restaurants shall not serve water to their customers except when specifically requested.
8. The operation of any ornamental fountain or similar structure is prohibited unless reclaimed water is used.
9. All water leaks shall be repaired immediately.
10. Construction water shall not be used for earthwork or road construction purposes unless authorized as a mitigation or erosion control, compaction or backfilling earthwork or as required by the Air Quality Management Plan (AQMP) Control Measure F-4.
11. Exceptions: The prohibited uses of water are not applicable to that use of water necessary for public health and safety or for essential governmental services such as police, fire and other similar emergency services.

Stage 4 – Mandatory Compliance – Water Emergency. Applies when a major failure of any supply or distribution facility, whether temporary or permanent, occurs in the water distribution system of the State Water Project, Metropolitan, MWDOC, EOCWD or City facilities. During Stage 4, the following water conservation measures shall apply except when reclaimed or recycled water is used:

1. All outdoor irrigation of vegetation is prohibited.
2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
3. Washing of specific mobile equipment shall be done with hand-held bucket or hose equipped with a shut-off nozzle. Commercial car washes are permitted to wash at any time. The use of water by all types of commercial car washes shall be reduced in volume by 50%. Washing is exempted from these regulation where health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.
4. Filling, refilling or adding of water to swimming pools, spas, ponds, and artificial lakes is prohibited.
5. Watering parks, school grounds, public facilities, and recreation fields is prohibited with the exception of plant materials classified to be rare, exceptionally valuable or essential to the well being of rare animals.
6. The use of water from fire hydrants shall be limited to fire fighting and related activities, or other activities necessary to maintain the health, safety and welfare of the public.
7. Use of water for agricultural users and commercial, except for livestock watering, is prohibited.
8. Restaurants shall not serve water to their customers except when specifically requested.
9. The operation of any ornamental fountain or similar structure is prohibited unless reclaimed water is used.
10. New construction meters or permits for unmetered service will not be issued. Construction water shall not be used for earth work or road construction purposes.
11. The use of water for commercial, manufacturing or processing purposes shall be reduced in volume by 50%.
12. No water shall be used for air conditioning purposes.
13. All water leaks shall be repaired immediately.
14. Exceptions: The prohibited uses of water are not applicable to that use of water necessary for public health and safety or for essential governmental services such as police, fire and other similar emergency services.

TWS's Water Shortage Contingency Plan will be implemented in coordination with the policy of MWDOC, which is anticipated to be based on Metropolitan's WSDM Plan. The WSDM Plan defines the expected sequence of resource management actions Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. The MWDOC 2005 Regional UWMP details each of the surplus and shortage stages, actions by stage and allocation of supply for M&I demand. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

Metropolitan WSDM Plan

In 1999, Metropolitan in conjunction with its member agencies developed the WSDM Plan. This plan addresses both surplus and shortage contingencies on a regional basis.

The WSDM Plan will guide management of regional water supplies to achieve the reliability goals of Southern California's IRP. The IRP sought to meet long-term supply and reliability goals for future water supply planning. The WSDM Plan guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. From this guiding principle come the following supporting principles:

- Encourage efficient water use and economical local resource programs.
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years.
- Pursue innovative transfers and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

The WSDM Plan guides the operations of water resources (local resources, Colorado River, State Water Project, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

The WSDM Plan distinguishes between *Surpluses*, *Shortages*, *Severe Shortages*, and *Extreme Shortages*. Within the WSDM Plan, these terms have specific meaning relating to Metropolitan's capability to deliver water to the City, and are defined as follows:

Surplus: Metropolitan can meet full-service and interruptible program demands, and it can deliver water to local and regional storage.

Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation. In a Severe Shortage, Metropolitan may have to curtail Interim Agricultural Water Program (IAWP) deliveries in accordance with IAWP.

Extreme Shortage: Metropolitan must allocate available supply to full-service customers.

The WSDM Plan also defines five surplus management stages and seven shortage management stages to guide resource management activities. Each year, Metropolitan will consider the level of supplies available and the existing levels of water in storage to determine the appropriate management stage for that year. Each stage is associated with specific resource management actions designed to: (1) avoid an Extreme Shortage to the maximum extent possible; and (2) minimize adverse impacts to retail customers should an “Extreme Shortage” occur. The current sequencing outline in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan’s existing and expected resource mix. This sequencing may change as the resource mix evolves.

WSDM Plan Shortage Actions by Shortage Stage

When Metropolitan must make net withdrawals from storage, it is considered to be in a shortage condition. However, under most of these stages, it is still able to meet all end-use demands for water. The following summaries describe water management actions to be taken under each of the seven shortage stages:

Shortage Stage 1. Metropolitan may make withdrawals from Diamond Valley Lake.

Shortage Stage 2. Metropolitan will continue Shortage Stage 1 actions and may draw from out-of-region groundwater storage.

Shortage Stage 3. Metropolitan will continue Shortage Stage 2 actions and may curtail or temporarily suspend deliveries to Long Term Seasonal and Replenishment Programs in accordance with their discounted rates.

Shortage Stage 4. Metropolitan will continue Shortage Stage 3 actions and may draw from conjunctive use groundwater storage (such as the North Las Posas program) and the SWP terminal reservoirs.

Shortage Stage 5. Metropolitan will continue Shortage Stage 4 actions. Metropolitan’s Board of Directors may call for extraordinary conservation through a coordinated outreach effort and may curtail Interim Agricultural Water Program deliveries in accordance with their discounted rates. In the event of a call for extraordinary conservation, Metropolitan’s Drought Program Officer will coordinate public information activities with member agencies and monitor the effectiveness of ongoing conservation programs. The Drought Program Officer will implement

monthly reporting on conservation program activities and progress and will provide quarterly estimates of conservation water savings.

Shortage Stage 6. Metropolitan will continue Shortage Stage 5 actions and may exercise any and all water supply option contracts and/or buy water on the open market either for consumptive use or for delivery to regional storage facilities for use during the shortage.

Shortage Stage 7. Metropolitan will discontinue deliveries to regional storage facilities, except on a regulatory or seasonal basis, continue extraordinary conservation efforts, and develop a plan to allocate available supply fairly and efficiently to full-service customers. The allocation plan will be based on the Board-adopted principles for allocation listed previously. Metropolitan intends to enforce these allocations using rate surcharges. Under the current WSDM Plan, the surcharges will be set at a minimum of \$175 per AF for any deliveries exceeding a member agency's allotment. *Any deliveries exceeding 102% of the allotment will be assessed a surcharge equal to three times Metropolitan's full-service rate.*

The overriding goal of the WSDM Plan is to never reach Shortage Stage 7, an Extreme Shortage. Given present resources, Metropolitan fully expects to achieve this goal over the next ten years.

Reliability Modeling of the WSDM Plan

Using a technique known as “sequentially indexed Monte Carlo simulation,” Metropolitan undertook an extensive analysis of its regional water system including reservoirs, forecasted demands, and probable hydrologic conditions to estimate the likelihood of reaching each Shortage Stage through 2010. The results of this analysis demonstrated the benefits of coordinated management of regional supply and storage resources. Expected occurrence of a Severe Shortage is four percent or less in most years and never exceeds six percent; equating to an expected shortage occurring once every 17 to 25 years. An Extreme Shortage was avoided in every simulation run.

Metropolitan also tested the WSDM Plan by analyzing its ability to meet forecasted demands given a repeat of the two most severe California droughts in recent history. Hydrologic conditions for the years 1923–34 and 1980–91 were used in combination with demographic projections to generate two hypothetical supply and demand forecasts for the period 1999–2010. Metropolitan then simulated operation to determine the extent of regional shortage, if any. The results again indicate 100 percent reliability for full-service demands through the forecast period.

Allocation of Supply for M&I Demands

The equitable allocation of supplies is addressed by the Implementation Goals for the WSDM Plan, with the first goal being to “avoid mandatory import water allocations to the extent practicable.” The reliability modeling for the WSDM Plan discussed above

results in 100 percent reliability for full-service demands through the year 2010. However, the second fundamental goal of the WSDM Plan is to “equitably allocate imported water on the basis of agencies’ needs.” Factors for consideration in establishing the equitable allocation include retail and economic impacts, recycled water production, conservation levels, growth, local supply production, and participation and investment in Metropolitan’s system and programs. In the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

In an effort to avoid allocation, imported water reliability is planned through the Southern California IRP and the WSDM Plan. The IRP presents a comprehensive water resource strategy to provide the region with a reliable and affordable water supply for the next 25 years. The WSDM Plan will guide management of regional water supplies to achieve the reliability goals of the IRP.

Under a drought scenario, OCWD may have Metropolitan replenishment water temporarily unavailable to them for replenishment of the Groundwater Basin. OCWD would first attempt to purchase other water supplies at a similar cost to replace the Metropolitan source. If no alternative water supply sources are economically available, OCWD may temporarily mine the Basin by increasing the BPP to meet local demand and refill it in the future. OCWD used this strategy during the later years of the 1986-92 drought period. If this option is not available, then OCWD may lower the current BPP to match the Basin’s Dependable Yield. Under this last scenario, the TWS may request increased imported water along with conservation and water use efficiency measures by customers to meet demand. The OCWD Master Plan Report, Chapter 14 – Basin Management Issues, further describes OCWD activities that may affect the City during a declared drought.

Health and Safety Requirements

The primary goal of the TWS’s water system is to preserve the health and safety of its customers and personnel. Meeting this goal is a continuous function of the system – before, during and after a disaster or water shortage. Fire suppression capabilities will continue to be maintained during any water shortage contingency stage. Some water needs are more immediate than others. The following list of public health needs and the allowable time without potable water is a guideline and will depend on the magnitude of a given water shortage event:

- Hospitals – continuous need
- Emergency shelters – immediate need
- Kidney dialysis – 24 hours
- Drinking water – 72 hours
- Personal hygiene, waste disposal – 72 hours

Based on commonly accepted estimates of interior residential water use in the United States, Table 7.2-1 indicates per capita health and safety water requirements. During the

initial stage of a shortage, customers may adjust either interior and/or outdoor water use in order to meet the voluntary water reduction goal.

**Table 7.2-1
Per Capita Health and Safety Water Quantity Calculations**

	Non-Conserving Fixtures		Habit Changes ^[1]		Conserving Fixtures ^[2]	
Toilet	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min. x 4.0 gpm	20.0	4 min. x 3.0 gpm	12.0	4 min. x 2.5 gpm	10.0
Washer	12.5 gpcd	12.5	11.5 gpcd	11.5	11.5 gpcd	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total		68.0		48.0		37.5
CCF per capita per year		33.0		23.0		18.0

Source: 2000 MWDOC RUWMP

gpcd = gallons per capita per day
gpf = gallons per flush

gpm = gallons per minute
ccf = hundred cubic feet

^[1] Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.

^[2] Fixtures include ULF 1.6 gpf toilets, 2.5 gpm showerheads, and efficient clothes washers.

Priority by Use

Conditions prevailing in the TWS area require that the water resources available be put to maximum beneficial use to the extent to which they are capable. The waste or unreasonable use, or unreasonable method of use, of water should be prevented and that water conservation and water use efficiency is encouraged with a view to the maximum reasonable and beneficial use thereof in the interests of the people of the TWS and for the public welfare. Preservation of health and safety will be a top priority for the TWS.

7.3 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS

According to MWDOC, Metropolitan projects 100 percent reliability for full-service demands through the year 2030.⁷⁰ Additionally, through a variety of groundwater reliability programs conducted by OCWD and participated in by the City, local supplies are projected to be maintained at demand levels. TWS anticipates the ability to meet water demand through the next three years based on the driest historic three-years as shown in Table 7.3-1.

⁷⁰ Metropolitan Water District of Southern California, 2005 UWMP.

Table 7.3-1
Total Estimated Minimum Water Supply Based on Driest 3-Year History
(AF)

Source	2006 Base Year	2007 Base Year	2008 Base Year	2006 Dry Year	2007 Dry Year	2008 Dry Year
Imported	1,520	1,480	1,440	1,490	1,450	1,410
Treated Groundwater	4,000	4,000	4,000	4,000	4,000	4,000
Clear Groundwater	7,370	7,400	7,430	9,760	9,690	9,620
Total	12,890	12,880	12,870	15,250	15,140	15,030

Data extracted from Table 4.2-6; MWD supply of imported water assumed to equal only 98.2% of average supply as is the case in 2008-2010; BPP assumed to be 64% in all years; total minimum supply of clear groundwater assumed to equal 64% of total estimated water supply

7.4 CATASTROPHIC SUPPLY INTERRUPTION PLAN

The Tustin City Council adopted the Water Shortage Contingency Plan on February 3, 1992, by Resolution No. 92-15, which are both shown in Appendix F. This four-stage program, known as the Water Management Program, establishes water conservation measures ranging from a voluntary 10 percent reduction at Stage 1, through a mandatory 50 percent reduction at Stage 4. Resolution No. 92-15 provides TWS the ability to obtain a higher level of water efficiency and allows the City Manager, through Council ratification, the flexibility to adjust to any rapidly varying water supply situation.

7.5 PROHIBITIONS, CONSUMPTION REDUCTION METHODS AND PENALTIES

Any violation of the TWS's Water Management Program, including waste of water and excessive use, is a misdemeanor. In addition to any other remedies that TWS may have for enforcement, service of water would be discontinued or appropriately limited to any customer who willfully uses water in violation of any provision of the ordinance.

The City prohibits the waste of water throughout the TWS service area and enforces four stages of water conservation, as established through Ordinance No. 1060. The stages and prohibitions are summarized in Section 7.2. Stage 4 of the water conservation stages implements mandatory compliance measures where prohibitions are strongly enforced and the City may, by resolution, enforce measures to implement a 50% consumption reduction in water use.

The City shall monitor the projected supply and demand for water by its customers on a daily basis. The City Manager shall determine the extent of the conservation required through the implementation and/or termination of particular conservation stages in order for the City to prudently plan for and supply water to its customers. Thereafter, the City

Manager may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provision of the Ordinance. The declaration of any stage beyond Stage 1 shall be made by public announcement and notice shall be published a minimum of three (3) consecutive times in a newspaper of general circulation. The stage designation shall become effective immediately upon announcement. The declaration of any stage beyond State 1 shall be reported to the City Council at its next regular meeting. The City Council shall thereupon ratify the declaration, rescind the declaration, or direct the declaration of a different stage.

Failure to comply will result in the following actions, as established in Ordinance No. 1060:

- a) Stage 1 Violation – Written notice from City to violator.
- b) Stage 2 Violation – Citations will be issued to violators. The first violation by any violator shall subject the violator to a fine of \$25. A second violation will result in a fine of \$35. A third violation will result in a fine of \$45. A fourth violation will result in a fine of \$55.
- c) The fifth violation allows the City to install a flow restricting device in the customer's water service line for a period not less than 48 hours and until the customer satisfies the City that the failure to comply will not continue. The charge for installing and removing the flow restricting device shall be \$65 and shall be paid by the customer prior to removal.
- d) For the sixth and each subsequent violation, the City may discontinue water service for a period of not less than 24 hours and until the customer satisfies the City that the failure to comply will not continue. The customer shall pay \$70 for restoration of water service.

In addition to Ordinance No. 1060, the City passed Ordinance No. 1063 on April 1, 1991 that established a Mandatory Water Conservation and Rationing Program to further implement water conservation measures. In an extreme shortage, Ordinance No. 1060 will be superseded with the water conservation and penalties established in Ordinance No 1063.

The Program establishes water usage limits for each customer and additional charges to be imposed if a violation of the usage occurs. For every billing unit over and above the allowable water usage, a charge of ninety cents shall be imposed. If two consecutive billing periods show water usage exceeding the Allowable Water Usage, an additional surcharge of twentyfive percent of the total amount of the bill (including the additional ninety cents per Billing Unit) will be imposed. After the third consecutive billing period where water usage exceeds the Allowable Water Usage a surcharge of fifty percent of the total bill (including the additional ninety cents per Billing Unit) will be imposed.

For consecutive billing periods, four or more of which exceed the Allowable Water Usage, the City may install a flow restricting device to reduce the amount of water supplied to the customer and a surcharge of seventy-five percent of the total charge shall

be imposed will be added to the total bill for all periods exceeding the allowable usage. The device shall not be removed until such time as the customer has provided proof satisfactory to the City that the customer will not exceed the allowable usage charge. A fee of fifty dollars shall be charged for installing the flow restricting device. Penalties shall appear on the first billing statement for that account immediately after the Billing Period in which the excess water usage occurred. The penalty shall be paid at the same time as the payment for normal water service. Failure to pay the entire amount due shall incur the same penalties as those imposed for failure to pay for normal water service.

Any excess revenues received by the City from the additional charges and penalties imposed due to Ordinance No. 1063 that are greater than the additional charges and penalties paid by the City to the MWD, shall be used by the City solely for capital improvement costs of water facilities. The City may revised the allowable water usage and the charges, surcharges, and penalties as deemed necessary to accommodate water allocations, charges, and penalties imposed by Metropolitan and other factors. Such resolutions shall become effective within ten days of their adoption, be published in a newspaper of general circulation, printed, published, and circulated throughout the City of Tustin.

TWS will also follow the allocation plan guidelines of MWDOC as adopted by Metropolitan once an extreme shortage is declared. This allocation plan will be enforced by Metropolitan using rate surcharges. MWDOC will follow the guidelines of the allocation plan and impose the surcharge that Metropolitan applies to its member agencies that exceed their water allocation.

7.6 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES

TWS receives water revenue from a commodity charge and a fixed service charge. The rates have been designed to recover the full cost of water service in the commodity and service charges. Therefore, the total cost of purchasing water and producing groundwater would decrease as the usage or sale of water decreases. Should an extreme shortage be declared and a large reduction in water sales occur for an extended period of time, TWS would monitor projected revenues and expenditures, and then reexamine its water rate structure.

7.7 WATER SHORTAGE CONTINGENCY ORDINANCE

Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used to measure the effectiveness of any water shortage contingency stage that may be implemented.

TWS will implement its Water Shortage Contingency Plan, as adopted by the City Council on February 3, 1992 through Resolution No. 92-15. Ordinances No. 1060 and

No. 1063 of the Water Shortage Contingency Plan impose prohibitions, regulations of water use, and penalties for violations of water use during times of sever water shortages.

As stages of water shortage are declared by MWDOC, TWS will follow implementation of those stages and continue to monitor water demand levels. It is not until Shortage Stage 5 that Metropolitan may call for extraordinary conservation. During this stage, Metropolitan's Drought Program Officer will coordinate public information activities with MWDOC and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided.

TWS will participate in monthly member agency manager meetings with both MWDOC and OCWD to monitor and discuss monthly water allocation charts. This will enable TWS to be aware of imported and groundwater use on a timely basis as a result of specific actions taken responding to the Water Shortage Contingency Plan.

7.8 MECHANISMS TO DETERMINE ACTUAL REDUCTIONS IN WATER USE

Water Shortage Emergency Response

A water shortage emergency could be catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions. TWS maintains and exercises a comprehensive Emergency Management Program for such emergencies including Water Shortage Emergency Response.

The Water Shortage Emergency Response Plan includes the organizational and operational policies and procedures required to meet the needs of sufficient water for firefighting operations and safe drinking water, and provides a system for organizing and prioritizing water repairs. It also cites authorities and specifies the public and private organizations responsible for providing water service.

TWS will operate under normal operating procedures until a situation is beyond its control. This includes implementation of any allocation plan passed through by MWDOC for Metropolitan and water shortage contingency plans of OCWD.

If the situation is beyond TWS's control, the City's Emergency Operations Center (EOC) may be activated to better manage the situation. If the situation warrants, the EOC may be activated at which time a water representative will be sent to the EOC to coordinate water emergency response.

In the event the EOC is activated, the City Management Policy Group will set priorities. When the EOC is activated, the TWS will take its direction from the EOC. An EOC Action Plan will be developed in the EOC that will carry out the policies dictated by the

Policy Group. The TWS will use the EOC Action Plan in determining its course of action.

If the situation is beyond TWS and the City's control, additional assistance will be sought through coordination with the Water Emergency Response Organization of Orange County (WEROC) and the County Operational Area.

Water Emergency Response Organization of Orange County (WEROC)

In 1983, the Orange County water community developed a *Water Supply Emergency Preparedness Plan* to respond effectively to disasters impacting the regional water distribution system. This plan was jointly funded by three regional water agencies: Coastal Municipal Water District, MWDOC, and OCWD, with the support and guidance from the Orange County Water Association (OCWA). The collective efforts of these agencies resulted in the formation of the countywide Volunteer Emergency Preparedness Organization. This entity was later replaced in the mid 1990s by the Water Emergency Response Organization of Orange County. WEROC is unique in its ability to provide a single point of contact for water representation in Orange County during a disaster. WEROC facilitates coordination of information and mutual-aid requests among Orange County water agencies, and conducts disaster training exercises for the Orange County water community and with Metropolitan. The MWDOC 2000 Regional Urban Water Management Plan, Section 7, presents the details of WEROC.

TWS actively participates in the WEROC training exercises and provides WEROC with listing of equipment, vehicles, and materials that can be made available to other agencies during an emergency.

Additional emergency services available to TWS through the State of California include the Master Mutual Aid Agreement, WARN and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned through the California Office of Emergency Services. The California Water Agencies Response Network (WARN) includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. WARN is managed by a State Steering Committee. 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.

SECTION 8 WATER RECYCLING

8.1 RECYCLED WATER IN SOUTHERN CALIFORNIA

The southern California region, from Ventura to San Diego is estimated to discharge over 1 billion gallons (1.1 million AFY) of treated wastewater to the ocean each day. This is considered a reliable and drought-proof water source and could greatly reduce the areas' and the TWS's reliance on imported water. As technological improvements continue to reduce treatment costs, and as public perception and acceptance continue to improve, numerous reuse opportunities should develop. Recycled water is a critical part of the California water resource management picture because of the strong drought potential and as technology continues to improve, demand continues to increase for its use.

8.2 COORDINATION OF RECYCLED WATER IN SERVICE AREA

Currently, the TWS does not utilize or serve directly applied recycled water to any of its customers or for municipal purposes. However, the TWS produces a majority of its water supply from the Basin. OCWD utilizes recycled water generated from Orange County Sanitation District's (OCSD) treatment facilities to protect the Basin through seawater intrusion barriers and groundwater recharge basins. The TWS, therefore, indirectly benefits from this regional use of recycled water. The regional projects are discussed later in this section.

8.3 WASTEWATER COLLECTION AND TREATMENT IN THE CITY SERVICE AREA

Wastewater from the TWS's water service area is collected and treated by OCSD. OCSD operates and maintains the localized sewer branches that feed into OCSD's trunk system from the TWS area. The Tustin sewer system includes approximately 51.5 miles of mostly 8-inch vitrified clay pipe (VCP) sewer lines and 1,033 manholes. Sewer infrastructure in the TWS is currently owned and operated by OCSD, as well as by Irvine Ranch Water District in the newer sections of the TWS, including Peters Canyon.

OCSD operates the third largest wastewater system on the West Coast, consisting of nearly 600 miles of trunk sewers and 200 miles of subtrunk sewers, two regional treatment plants, and an ocean disposal system. The OCSD sewerage system collects wastewater through an extensive system of gravity flow sewers, pump stations, and pressurized sewers (force mains). The sewer system consists of 12 trunk sewer systems ranging in size from 12 to 96 inches in diameter and collectively over 500 miles long. Additionally, there are 39 sewer interconnections and 87 diversions to maximize conveyance of flows through the system. Twenty pump stations are used to pump sewage from lower lying areas to the treatment plants.

Orange County Sanitation Districts (OCSD) Treatment Plants

OCSD's Reclamation Plant No. 1 is located in the City of Fountain Valley about 4 miles northeast of the ocean and adjacent to the Santa Ana River. The plant provides advanced primary and secondary treatment and supplies secondary treatment water to OCWD which further treats and distributes the water for various uses, including irrigation, groundwater recharge, and operation of coastal seawater barrier system.

The treatment process at Reclamation Plant No. 1 includes secondary treatment through an activated sludge system. This plant receives raw wastewater from six major sewer pipes, often called "interceptors" or "trunk lines." The secondary effluent is either blended with the advanced primary effluent and routed to the ocean disposal system, or is sent to the OCWD facilities for advanced treatment and recycling. The solid materials removed in the treatment systems are processed in large tanks to facilitate natural decomposition. Half of the material is converted to methane, which is burned as fuel in the energy recovery system, and the remaining solids are used as a soil amendment or fertilizer in Kern, Kings, Riverside, and San Diego Counties.

OCWD's Treatment Plant No. 2 is located in the City of Huntington Beach adjacent to the Santa Ana River and about 1,500 feet from the ocean. This plant provides a mix of advanced primary and secondary treatment. The plant receives raw wastewater through five major sewers. The treatment process is similar to Plant No. 1. Approximately 33 percent of the influent receives secondary treatment through an activated sludge system, and all of the effluent is discharged to the ocean disposal system.

OCSD's treated wastewater is discharged through a 120-inch outfall at a depth of approximately 200 feet below sea level and nearly five miles offshore from the mouth of the Santa Ana River. Its high tide hydraulic capacity is 480 mgd. A 78-inch standby outfall stretches approximately one mile from shore that is used for emergency purposes. Table 8.3-1 projects the treated wastewater discharged to the ocean from Treatment Plant No. 1 and 2.

Table 8.3-1
Wastewater Discharged to the Ocean
(AFY)

Year	Wastewater Discharged to the Ocean
2005	249,678
2010	197,055
2015	217,209
2020	200,414
2025	200,414
2030	200,414

Source: MWDOC 2005 Regional UWMP

Current capacity for Reclamation Plant No. 1 is 218 million gallons per day (mgd) of wastewater, with an average day flow of 120 mgd. Current capacity for Plant No. 2 is 168 mgd of wastewater, with an average flow of 144 mgd.⁷¹

The TWS directs its wastewater flow to OCSD's Reclamation Plant No. 1. If needed, TWS could direct its wastewater flows to OCSD's Treatment Plant No. 2. Although TWS does not utilize recycled water at this time, it is assumed most of the wastewater generated within TWS is treated to recycled water standards after being treated at Plant No. 1. The quantities of wastewater generated are generally proportional to the population and the water use in the service area. Estimates of the wastewater flows in the TWS are included in Table 8.3-2. The wastewater flows were calculated using the population projections included in Section 1.

Table 8.3-2
Wastewater Generated Within the City of Tustin
(MGD / AFY)

Year	Unit Flow Coefficient (gpcd) ¹	Wastewater Generated by the City (MGD / AFY)
2000	104	6.46 / 7,233
2005	106	6.58 / 7,372
2010	109	6.77 / 7,581
2015	112	6.96 / 7,790
2020	115	7.14 / 7,998
2025	115	7.14 / 7,998
2030	115	7.14 / 7,998

¹ The OCSD Interim Strategic Plan Update, September 2002. Years 2025 and 2030 were assumed to be the same as 2020.

8.4 REGIONAL RECYCLED WATER

Since the TWS currently has available groundwater for at least 64 percent of its total water supply, the TWS supports the efforts of the regional water management agencies to utilize recycled water in Orange County. Recycled water is used to protect the Basin through recharge and prevention of saltwater intrusion. Recycled water in Orange County is also used to irrigate crops, golf courses, parks, schools, business landscapes, residential lawns, and some industrial uses thus offsetting potable water demands. In 2003/2004, over 10,000 AF of recycled water was applied by water retailers in the County.⁷² The regional projects planned or currently used to provide recycled water are discussed in the following sections.

⁷¹ MWDOC 2005 Regional Urban Water Management Plan.

⁷² OCWD, 2003-2004 Engineer's Report, February 2005.

Green Acres Project (GAP)

OCSD produces recycled water year round for OCWD's Green Acres Project (GAP), providing recycled water for industrial customers and landscape irrigation in the cities of Santa Ana, Fountain Valley, Costa Mesa, and Newport Beach. The GAP has the capacity to treat up to 7.5 mgd of recycled water.

Water Factory 21

Although currently offline due to the construction of the GWRS, Water Factory 21 had been used by OCWD since 1976 to produce recycled water for injection into the Basin to protect against seawater intrusion. Water Factory 21 purified approximately 4 mgd of recycled water and deep well water. This blended water supplied a hydraulic barrier system that consisted of a series of injection wells, located approximately four miles inland, to produce a fresh water mound within the groundwater aquifer to block further passage of seawater. The GWRS will replace Water Factory 21 and continue to provide recycled water for injection into the Basin.

Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS)

In 1993, the DWR, in cooperation with the U.S. Bureau of Reclamation (USBR) and seven southern California water agencies, including Metropolitan, undertook a study to evaluate the feasibility of a regional water reclamation plan. The Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS) is a six-year effort to identify regional reclamation systems, and promote efficient use of total water resources by increasing the use of recycled water and identifying opportunities for and constraints to maximizing water reuse in southern California.

Based upon draft findings of the SCCWRRS, a regional water recycling system that spans the entire study area is not practical or feasible; however, subregional systems warrant further evaluation. Orange County and the Lower Santa Ana River Watershed has been identified as one of the four geographical regions, and is being examined for a regional water recycling system for short-term (2010) and long-term (2040) applications.

OCWD/OCSD Groundwater Replenishment System (GWRS)

The most immediate potential use for recycled water in Orange County is for Basin recharge. To supplement regional water recycling projects such as the Green Acres Project, the GWRS (a groundwater recharge project) jointly sponsored by OCWD and OCSD is being implemented.

The GWRS is a water supply project designed to ultimately reuse approximately 110,000 AFY of advanced treated wastewater. The first phase is currently underway and is scheduled to go online in 2007. The first phase anticipates treating 61,000 AFY in

2007/08, 68,000 AFY in 2008/09, and eventually 72,000 AFY.⁷³ Timing of future phases will be determined by projected flow requirements for anticipated water demands.

The objective of the project is to develop a new source of reliable, high quality, low salinity water that will be used to replenish the Basin and expand the existing seawater intrusion barrier. The GWRS supplements existing water supplies, and provides a new, cost-effective and reliable source of water to recharge the Basin, protect the Basin from further degradation due to seawater intrusion, and augment the supply of recycled water for irrigation and industrial use. Thus, the GWRS is comprised of three major components: (1) Advanced Water Purification Facilities (AWPF) and pumping stations; (2) a major pipeline connecting the treatment facilities to existing recharge basins; and (3) expansion of an existing seawater intrusion barrier.

The GWRS takes secondary, treated municipal wastewater from the OCSD Treatment Plant No. 1 in Fountain Valley and further cleans this water to levels that exceed current drinking water standards. A portion of the treated product water would be pumped upstream via a major conveyance pipeline generally paralleling the Santa Ana River to the OCWD spreading basins where it would be allowed to percolate into the Basin. The treated water will also be injected into the ground to create an expanded seawater intrusion barrier.

A small portion of the treated water will be made available to supplement the irrigation demands of OCWD's existing GAP. Some of the treated water may also be made available for use as industrial process water, irrigation water or for other approved uses in industrial areas, business parks, golf courses, and parks located near the Santa Ana River pipeline alignment.

8.5 Potential Uses of Recycled Water

While the TWS recognizes the potential uses of recycled water in its community, such as landscape irrigation, parks, industrial and other uses, the OCWD does not have the recycled water infrastructure to support the use of recycled water. The cost-effectiveness analyses that have been conducted throughout the years regarding recycled water infrastructure have not shown to be beneficial at this time. Therefore, the TWS supports, encourages and contributes to the continued development of recycled water and potential uses throughout the region through the GWRS.

8.6 2000 Projected and Potential Uses of Recycled Water

In 2000, the TWS did not project any recycled water use by the year 2005, or any year thereafter. The TWS currently does not utilize or serve directly applied recycled water to any of its customers or for municipal uses.

⁷³ Orange County Water District, Long Term Facilities Plan, Draft October 2005.

8.7 Encouraging Recycled Water Use

Studies of water recycling opportunities within southern California provide a context for promoting the development of water recycling plans. It is recognized that broad public acceptance of recycled water requires continued education and public involvement. However, planning for most of the recycled water available is being directed toward replenishment of the Basin and improvements in groundwater quality. As a user of groundwater, the TWS supports the efforts of OCWD and OCSD to utilize recycled water as a primary resource for groundwater recharge in Orange County.

Public Education

The TWS participates in the MWDOC public education and school education programs, which include extensive sections on water recycling. MWDOC's water use efficiency public information programs are a partnership with agencies throughout the county.

Through a variety of public information programs, MWDOC reaches the public, including those in the TWS, with accurate information regarding present and future water supplies, the demands for a suitable quantity and quality of water, including recycled water, and the importance of implementing water efficient techniques and behaviors. Through MWDOC, water education programs have reached thousands of students with grade-specific programs that include information on recycled water. Between September 2004 and June 2005, school education presentations were made in seven TWS schools reaching over 2,800 students. Two schools are expected to participate between September 2005 and June 2006 with over 1,300 students in attendance.

Financial Incentives

The implementation of recycled water projects involves a substantial upfront capital investment for planning studies, environmental impact reports, engineering design and construction before there is any recycled water to market. For some water agencies, these capital costs exceed the short-term expense of purchasing additional imported water supplies from Metropolitan.

The establishment of new supplemental funding sources through federal, state and regional programs now provide significant financial incentives for local agencies to develop and make use of recycled water. Potential sources of funding include federal, state and local funding opportunities. These funding sources include the USBR, California Proposition 13 Water Bond, and Metropolitan's Local Resources Program. These funding opportunities may be sought by the TWS or possibly more appropriately by regional agencies. The TWS will continue to support seeking funding for regional water recycling projects and programs.

8.8 Optimizing Recycled Water Use

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

To optimize the use of recycled water, cost/benefit analyses must be conducted for each potential project. Once again, this brings about the discussion on technical and economic feasibility of a recycled water project requiring a relative comparison to alternative water supply options. For the TWS, analysis has shown capital costs exceed the short-term expense of purchasing additional imported water supplies from Metropolitan through EOCWD and MWDOC.

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

APPENDIX A

CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT OF 1983 AS AMENDED TO 2005

Established: AB 797, Klehs, 1983

Amended: AB 2661, Klehs, 1990

AB 11X, Filante, 1991

AB 1869, Speier, 1991

AB 892, Frazee, 1993

SB 1017, McCorquodale, 1994

AB 2853, Cortese, 1994

AB 1845, Cortese, 1995

SB 1011, Polanco, 1995

AB 2552, Bates, 2000

SB 553, Kelley, 2000

SB 610, Costa, 2001

AB 901, Daucher, 2001

SB 672, Machado, 2001

SB 1348, Brulte, 2002

SB 1384, Costa, 2002

SB 1518, Torlakson, 2002

AB 105, Wiggins, 2004

SB 318, Alpert, 2004

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

CHAPTER 1. GENERAL DECLARATION AND POLICY

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.

CHAPTER 2. DEFINITIONS

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.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

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 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).

Article 2. Contents of Plans

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 and 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) 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:

- (1) An average water year.
- (2) A single dry water year.
- (3) Multiple dry water years.

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) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(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), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. 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.

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

- (a) 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 which are applicable to each stage.
- (b) 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.
- (c) 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.
- (d) 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.
- (e) 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.
- (f) Penalties or charges for excessive use, where applicable.
- (g) 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.
- (h) A draft water shortage contingency resolution or ordinance.
- (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

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, 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.

Article 2.5 Water Service Reliability

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.

Article 3. Adoption and Implementation of Plans

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 file with the department 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 filed with the department 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 outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with 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.

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.

CHAPTER 4. MISCELLANEOUS PROVISIONS

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.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

APPENDIX B

2005 URBAN WATER MANAGEMENT PLAN “REVIEW FOR COMPLETENESS” FORM

2005 Urban Water Management Plan "Review for Completeness" Form
For DWR Review Staff Use

Coordination with Appropriate Agencies (Water Code § 10620 (d)(1)(2))

- Yes
 Participated in area, regional, watershed or basin wide plan
 Name of plan 2005 UWMP Lead Agency City of Tustin Sec 1, p.1-2 Reference & Page Number
 Describe the coordination of the plan preparation and anticipated benefits. Sec 1, p.1-2 Reference & Page Number

Table 1 Coordination with Appropriate Agencies							
Check at least one box on each row	Participated in developing the plan	Commented on the draft	Sent/Available To: Copy of Draft UWMP	Commented on Draft UWMP	Sent Notice of Public Hearing	Attended Public Hearing	Not Involved / No Information
Tustin Water Service	X	X	X	X	X	X	
City Planning		X	X	X	X	X	
City Clerk		X			X	X	
City Attorney			X	X	X	X	
East Orange County Water District		X	X	X	X		
MWDOC		X	X	X	X		
Metropolitan		X	X		X		
Orange County Water District		X	X		X		
Orange County Sanitation District		X	X		X		
DWR		X	X	X	X		
General Public			X		X		

Describe resource maximization / import minimization plan (Water Code §10620 (f))

- Describe how water management tools / options maximize resources & minimize need to import water Sec 2. p. 2-4 Reference & Page Number

Plan Updated in Years Ending in Five and Zero (Water Code § 10621(a))

- Date updated and adopted plan received XX/XX/06 (enter date) Sec 1, p.1-2 Reference & Page Number

City and County Notification and Participation

(Water Code § 10621(b))

- Notify any city or county within service area of UWMP of plan review & revision Sec 1, p.1-2 Reference & Page Number
- Consult and obtain comments from cities and counties within service area Sec 1, p.1-2 Reference & Page Number

Service Area Information

Water Code § 10631 (a)

- Include current and projected population Sec 1, p.1-6 Reference & Page Number
- Population projections were based on data from state, regional or local agency Sec 1, p.1-6 Reference & Page Number

Table 2 Population - Current and Projected						
	2000	2005	2010	2015	2020	2025
Service Area Population	62,131	62,100	62,100	62,100	62,100	62,100

- Describe climate characteristics that affect water management Sec 1, p.1-5 Reference & Page Number
- Describe other demographic factors affecting water management Sec 1, p.1-5 Reference & Page Number

Table 3 Climate						
	January	February	March	April	May	June
Standard Average ETo	1.86	2.24	3.41	4.80	5.58	6.30
Average Rainfall	2.53	2.73	2.21	1.01	0.26	0.07
Average Temperature	67	68.1	69.4	72.9	75.4	79.0

Table 3 (continued) Climate							
	July	August	September	October	November	December	Annual
Average ETo	6.51	6.20	4.80	3.72	2.40	1.86	49.68
Average Rainfall	0.01	0.08	0.27	0.36	1.32	1.99	12.84
Average Temperature	84.0	85.5	84.7	79.7	73.9	68.2	75.65

Water Sources

(Water Code § 10631 (b))

- Identify existing and planned water supply sour Sec 2, p.2-1 Reference & Page Number
- Provide current water supply quantities Sec 2, p.2-3 Reference & Page Number
- Provide planned water supply quantities Sec 2, p.2-3 Reference & Page Number

Table 4 Current and Planned Water Supplies - AFY						
Water Supply Sources	2005	2010	2015	2020	2025	2030
Water purchased from:						
EOCWD - Import	6,722	650	630	670	630	590
Treated Groundwater Production	2,330	4,000	4,000	4,000	4,000	4,000
Clear Groundwater Production	2,398	8,220	8,220	8,220	8,220	8,220
Total	11,450	12,870	12,850	12,890	12,850	12,810

If Groundwater identified as existing or planned source

(Water Code §10631 (b)(1-4))

<input type="checkbox"/>	Has management plan	_____	Reference & Page Number
<input type="checkbox"/>	Attached management plan (b)(1)	_____	Reference & Page Number
<input checked="" type="checkbox"/>	Description of basin(s) (b)(2)	<u>Sec 2, p. 2-5</u>	Reference & Page Number
<input type="checkbox"/>	Basin is adjudicated	_____	Reference & Page Number
<input type="checkbox"/>	If adjudicated, attached order or decree (b)(2)	_____	Reference & Page Number
<input type="checkbox"/>	Quantified amount of legal pumping right (b)(2)	_____	Reference & Page Number

Table 5 Groundwater Pumping Rights - AF Year	
Basin Name	Pumping Right - AFY
Orange County Groundwater Basin	
Total	0

<input checked="" type="checkbox"/>	DWR identified, or projected to be, in overdraft (b)(2)	<u>Sec 2, p. 2-6</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Plan to eliminate overdraft (b)(2)	<u>Sec 2, p. 2-6</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Analysis of location, amount & sufficiency, last five years (b)(3)	<u>Sec 2, p.2-10</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Analysis of location & amount projected, 20 years (b)(4)	<u>Sec 2, p.2-10</u>	Reference & Page Number

Table 6						
Amount of Groundwater pumped - AFY						
Clear Groundwater	2000	2001	2002	2003	2004	2005
Columbus-Tustin	1,656	1,361	1,043	915	693	535
Beneta	737	735	485	240	281	380
Livingston	0	0	0	0	0	0
Vandenburg	2,111	1,937	2,246	1,451	790	752
Tustin Avenue	732	645	358	660	438	304
Yorba Street	653	583	593	12	186	212
Prospect	825	751	881	489	238	331
Pankey	0	0	0	0	0	0
Walnut Avenue	979	993	953	593	283	174
Subtotal	7,693	7,005	6,559	4,360	2,909	2,688
Treated Groundwater	2000	2001	2002	2003	2004	2005
Main St. No. 2	311	0	363	0	0	0
Main St. No. 3	293	558	798	542	621	420
Main St. No. 4	0	518	0	868	1,448	1,079
17th St. No. 1	826	1,420	1,080	257	0	0
17th St. No. 2	506	540	304	54	0	0
Newport Well No. 3	1,130	100	648	400	590	1
17th St. No. 4	0	0	0	1,754	2,503	1,267
Subtotal	3,066	3,136	3,193	3,875	5,162	2,767
Total	10,759	10,141	9,752	8,235	8,071	5,455

Table 7					
Amount of Groundwater projected to be pumped - AFY					
Basin Name(s)	2010	2015	2020	2025	2030 - opt
Clear Groundwater Production	8,220	8,220	8,220	8,220	8,220
Treated Groundwater Production	4,000	4,000	4,000	4,000	4,000
% of Total Water Supply	95%	95%	95%	95%	95%

TABLE12 (continued) - Past, Current and Projected Water Deliveries								
	2015		2020		2025		2030 - opt	
	metered		metered		metered		metered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries A
Single family	11,978	6,580	11,978	6,580	11,978	6,580	11,978	6,58
Multi-family	879	2,850	879	2,850	879	2,850	879	2,85
Commercial	821	1,160	821	1,160	821	1,160	821	1,16
Institutional	52	160	52	160	52	160	52	16
Industrial	177	630	177	630	177	630	177	63
Dedicated Irrigation Meter	200	340	200	340	200	340	200	34
Fire	181	10	181	10	181	10	181	1
Agriculture	6	10	6	10	6	10	6	1
Total	14,294	11,740	14,294	11,740	14,294	11,740	14,294	11,74

- Identify and quantify sales to other agencies
 No sales to other agencies

Reference & Page Number
Sec 5, p.5-1 Reference & Page Number

Table 13 Sales to Other Agencies - AF Year							
Water Distributed	2000	2005	2010	2015	2020	2025	2030 - op
name of agency	0	0	0	0	0	0	
name of agency							
name of agency							
Total	0	0	0	0	0	0	

- Identify and quantify additional water uses

Sec 5, p.5-1 Reference & Page Number

Table 14 Additional Water Uses and Losses - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - op
Brine Discharge	380	303	300	300	300	300	300
Total	380	303	300	300	300	300	30

Any recycled water was included in table 12 should not be included in table 14.

Table 15 Total Water Use - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - op
Total of Tables 12, 13, 14	12,166	11,449	13,370	13,370	13,370	13,370	13,370

2005 Urban Water Management Plan "Review of DMMs for Completeness" Form

(Water Code §10631 (f))

(Water Code §10631 (f) & (g), the 2005 Urban Water Management Plan "Review of DMMs for Completeness" Form is found on Sheet 2

Planned Water Supply Projects and Programs, including non-implemented DMMs

(Water Code §10631 (g))

- No non-implemented / not scheduled DMMs Sec 6, p.6-1 Reference & Page Number
- Cost-Benefit includes economic and non-economic factors (environmental, social, health, customer impact, and technological factors) Reference & Page Number
- Cost-Benefit analysis includes total benefits and total costs Reference & Page Number
- Identifies funding available for Projects with higher per-unit-cost than DMMs Reference & Page Number
- Identifies Suppliers' legal authority to implement DMMs, efforts to implement the measures and efforts to identify cost share partners Sec 6, p.6-1 Reference & Page Number

Table 16 Evaluation of unit cost of water resulting from non-implemented / non-scheduled DMMs and planned water supply project and programs	
Non-implemented & Not Scheduled DMM / Planned Water Supply Projects (Name)	Per-AF Cost (\$)

Planned Water Supply Projects and Programs

(Water Code §10631 (h))

- No future water supply projects or programs
- Detailed description of expected future supply projects & programs Sec 4, p.4-28 Reference & Page Number
- Timeline for each proposed project Sec 4, p.4-28+ Reference & Page Number
- Quantification of each projects normal yield (AFY) Sec 4, p.4-28+ Reference & Page Number
- Quantification of each projects single dry-year yield (AFY) Sec 4, p.4-28+ Reference & Page Number
- Quantification of each projects multiple dry-year yield (AFY) Reference & Page Number

Table 17 Future Water Supply Projects							
Project Name	Projected Start Date	Projected Completion Date	Normal-year AF to agency	Single-dry year yield AF	Multiple-Dry-Year 1 AF	Multiple-Dry-Year 2 AF	Multiple-Dry-Year 3 AF

Opportunities for development of desalinated water (Water Code §10631 (i))

- Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply Sec 4, p.4-37 Reference & Page Number
- No opportunities for development of desalinated water Reference & Page Number

Table 18 Opportunities for desalinated water	
Sources of Water	Check if yes
Ocean Water (by Metropolitan)	X
Brackish ocean water	
Brackish groundwater	

District is a CUWCC signatory (Water Code § 10631 (j))

Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g). The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.

- Agency is a CUWCC member Sec 6, p.6-1 Reference & Page Number
- 2003-04 annual updates are attached to plan Reference & Page Number
- Both annual updates are considered completed by CUWCC website Reference & Page Number

If Supplier receives or projects receiving water from a wholesale supplier

(Water Code §10631 (k))

Yes

- Agency receives, or projects receiving, wholesale water
- Agency provided written demand projections to wholesaler, 20 years

Sec 4, p.4-21 Reference & Page Number

Sec 4, p.4-21 Reference & Page Number

Table 19 Agency demand projections provided to wholesale suppliers - AFY					
Wholesaler	2010	2015	2020	2025	2030 - opt
Municipal Water District of Orange County	500	500	500	500	500

- Wholesaler provided written water availability projections, by source, to agency, 20 years Sec 4, p. 4- 21 Reference & Page Number
(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 20 Wholesaler identified & quantified the existing and planned sources of water- AFY					
Wholesaler sources	2010	2015	2020	2025	2030 - opt
Municipal Water District of Orange County	650	630	670	630	590
(source 2)					
(source 3)					

- Reliability of wholesale supply provided in writing by wholesale agency Sec 4, p. 4-16 Reference & Page Number
(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 21 Wholesale Supply Reliability - % of normal AFY					
Wholesaler sources	Multiple Dry Water Years				
	Single Dry	Year 1	Year 2	Year 3	Year 4

Table 22 Factors resulting in inconsistency of wholesaler's supply				
Name of supply	Legal	Environment	Water Quality	Climatic

Water Shortage Contingency Plan Section

(Water Code § 10632)

Stages of Action

(Water Code § 10632 (a))

- Provide stages of action Sec 7, p. 7-1 Reference & Page Number
- Provide the water supply conditions for each stage Sec 7, p. 7-6 Reference & Page Number
- Includes plan for 50 percent supply shortage Sec 7, p. 7-2 Reference & Page Number

Table 23 Water Supply Shortage Stages and Conditions RATIONING STAGES		
Stage No. (MWD WSDM)	Water Supply Conditions	% Shortage
Shortage Stage 1	Withdrawals from Diamond Valley Lake	
Shortage Stage 2	Continue with Stage 1 & out of region groundwater storage	
Shortage Stage 3	Continue with Stage 2, Long Term Seasonal & Replenishment Programs	
Shortage Stage 4	Continue with Stage 3, gwtr. Storage, SWP terminal reservoirs	
Shortage Stage 5	Continue with Stage 4, monthly reports on conservation program	
Shortage Stage 6	Continue with Stage 5, water supply option contracts	
Shortage Stage 7	Metropolitan discontinues deliveries to regional storage facilities.	
Stage 1	Voluntary Compliance - Water Watch	
Stage 2	Mandatory Compliance - Water Alert	
Stage 3	Mandatory Compliance - Water Warning	
Stage 4	Mandatory Compliance - Water Emergency	

Three-Year Minimum Water Supply

(Water Code §10632 (b))

- Identifies driest 3-year period Sec 4, p. 4-17 Reference & Page Number
- Minimum water supply available by source for the next three years Sec 7, p.7-10 Reference & Page Number

Table 24 Three-Year Estimated Minimum Water Supply - AF Year						
source**	2006 Base Year	2007 Base Year	2008 Base Year	2006 Dry Year	2007 Dry Year	2008 Dry Year
Imported	1,520	1,480	1,440	1,490	1,450	1,410
Treated Groundwater	4,000	4,000	4,000	4,000	4,000	4,000
Clear Groundwater	7,370	7,400	7,430	9,760	9,690	9,620
Total	12,890	12,880	12,870	15,250	15,140	15,030

Preparation for catastrophic water supply interruption

(Water Code §10632 (c))

- Provided catastrophic supply interruption plan Sec 7, p.7-10 Reference & Page Number

Table 25 Preparation Actions for a Catastrophe	
Possible Catastrophe	Check if Discussed
Regional power outage	X
Earthquake	X

Prohibitions

(Water Code § 10632 (d))

List the mandatory prohibitions against specific water use practices during water shortages

Sec 7, p.7-2 Reference & Page Number

Table 26 Mandatory Prohibitions	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Lawn watering & landscape irrigation limited during specific times	I, II
Hosing or washing sidewalks, driveways, or other paved surfaces	I, II, III
Washing of mobile equipment shall be done with hand-held bucket or shut-off nozzle hose	I, II, III
Watering parks, school grounds, public facilities, & recreation fields is not permitted during specific times	I, II, III
Serving drinking water to customer without consent	I, II, III
Operation of ornamental fountain or similar structure is prohibited unless using reclaimed water	I, II, III
Use of water from fire hydrants shall be limited	II, III
Agricultural users and commercial nurseries shall use water only during specific times	I, II, III
All water leaks shall be repaired immediately	II, III
Construction water cannot be used for earthwork or road construction purposes	II, III
All outdoor irrigation of vegetation is prohibited	III
Use of water for commercial, manufacturing or processing purposes shall be reduced in volume by 50%	III
No water shall be used for air conditioning purposes	III

Consumption Reduction Methods**(Water Code § 10632 (e))**List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction. Sec 7, p.7-11 Reference & Page Number

Table 27 Consumption Reduction Methods		
Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Voluntary Compliance - Water Watch	Stage 1	
Mandatory Compliance - Water Alert	Stage 2	
Mandatory Compliance - Water Warning	Stage 3	
Mandatory Compliance - Water Emergency	Stage 4	50%

Penalties**(Water Code § 10632 (f))**

List excessive use penalties or charges for excessive use

Sec 7, 7-11 Reference & Page Number

Table 28 Penalties and Charges	
Penalties or Charges	Stage When Penalty Takes Effect
Written notice from City to violator	Stage 1 Violation
Citations will be issued to violators	Stage 2 Violation
First violation by any violator will be fined \$25	Stage 2, 1st Violation
Second violation by any violator will be \$35	Stage 2, 2nd Violation
Third violation by any violator will be \$45	Stage 2, 3rd Violation
Fouth violation by any violator will be \$55	Stage 2, 4th Violation
City must install flow restricting device in customer's water service line and charge of \$65	Stage 2, 5th Violation
City may discontinue water service for period of not less than 24 hours, \$70 for restoration of water services	Stage 2, 6th Violation

Revenue and Expenditure Impacts**(Water Code § 10632 (g))**

Describe how actions and conditions impact revenues

Sec 7, p. 7-12 Reference & Page Number

Describe how actions and conditions impact expenditures

Sec 7, p. 7-12 Reference & Page Number

Describe measures to overcome the revenue and expenditure impacts

Sec 7, p. 7-12 Reference & Page Number

Table 29 Proposed measures to overcome revenue impacts	
Names of measures	Check if Discussed
Rate adjustment	X
Development of reserves	

Table 30 Proposed measures to overcome expenditure impacts	
Names of measures	Check if Discussed
name of measure	

Water Shortage Contingency Ordinance/Resolution

(Water Code § 10632 (h))

Attach a copy of the draft water shortage contingency resolution or ordinance.

Sec 7, p. 7-12 Reference & Page Number

Reduction Measuring Mechanism

(Water Code § 10632 (i))

Provided mechanisms for determining actual reductions

Sec 7, p. 7-13 Reference & Page Number

Table 31 Water Use Monitoring Mechanisms	
Mechanisms for determining actual reductions	Type data expected (pop-up?)
Daily/Weekly/Monthly Reports	Estimated water savings
Drought Program Officer activities	Monitored effectiveness
Member agency meetings with OCWD	Groundwater conditions

Recycling Plan Agency Coordination

Water Code § 10633

Describe the coordination of the recycling plan preparation information to the extent available

Sec 8, p.8-1 Reference & Page Number

Table 32 Participating agencies	
	participated
Water agencies	OCWD
Wastewater agencies	OCSD
Groundwater agencies	
Planning Agencies	

Wastewater System Description

(Water Code § 10633 (a))

Describe the wastewater collection and treatment systems in the supplier's service area

Sec 8, p.8-3 Reference & Page Number

Quantify the volume of wastewater collected and treated

 Reference & Page Number

Table 33 Wastewater Collection and Treatment - AF Year							
Type of Wastewater	2000	2005	2010	2015	2020	2025	2030 - op
Wastewater collected & treated in service area	7,233	7,372	7,581	7,790	7,998	7,998	7,99

Wastewater Disposal and Recycled Water Uses

(Water Code § 10633 (a - d))

Describes methods of wastewater disposal

Sec 8, p. 8-2 Reference & Page Number

Describe the current type, place and use of recycled water

 Reference & Page Number

None

 Reference & Page Number

Describe and quantify potential uses of recycled water

 Reference & Page Number

Table 34 Disposal of wastewater (non-recycled) AF Year							
Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030 - op
Discharged to Ocean	Advance Primary and Secondary	249,678	197,055	217,209	200,414	200,414	200,41
Total		249,678	197,055	217,209	200,414	200,414	200,41

Table 35 Recycled Water Uses - Actual and Potential (AFY)							
User type	Treatment Level	2005	2010	2015	2020	2025	2030 - op
Agriculture							
Landscape							
Wildlife Habitat							
Wetlands							
Industrial							
Groundwater Recharge							
Other (user type)							
Other (user type)							
Total		0	0	0	0	0	

Determination of technical and economic feasibility of serving the potential uses

Sec 8, p.8-5 Reference & Page Number

Projected Uses of Recycled Water

(Water Code § 10633 (e))

Projected use of recycled water, 20 years

Sec 8, p.8-5 Reference & Page Number

Table 36 Projected Future Use of Recycled Water in Service Area - AF Year					
	2010	2015	2020	2025	2030 - opt
Projected use of Recycled Water					

Compare UWMP 2000 projections with UWMP 2005 actual (§ 10633 (e))
 None

Sec 8, p.8-5 Reference & Page Number
 Reference & Page Number

Table 37 Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY		
User type	2000 Projection for 2005	2005 actual use
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (user type)		
Other (user type)		
Total	0	0

Plan to Optimize Use of Recycled Water

(Water Code § 10633 (f))

Describe actions that might be taken to encourage recycled water uses
 Describe projected results of these actions in terms of acre-feet of recycled water used per year

Sec 8, p.8-6 Reference & Page Number
 Reference & Page Number

Table 38 Methods to Encourage Recycled Water Use					
Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030 - opt
Financial incentives					
Public Education					
Total	0	0	0	0	0

Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses)

Sec 8, p.8-7 Reference & Page Number

Water quality impacts on availability of supply

(Water Code §10634)

Discusses water quality impacts (by source) upon water management strategies and supply reliability

Sec 3, p. 3-11 Reference & Page Number

No water quality impacts projected

Table 39 Current & projected water supply changes due to water quality - percentage						
water source	2005	2010	2015	2020	2025	2030 - opt

Supply and Demand Comparison to 20 Years

(Water Code § 10635 (a))

Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.

Sec 4, p. 4-21 Reference & Page Number

Table 40 Projected Normal Water Supply - AF Year					
(from table 4)	2010	2015	2020	2025	2030 - opt
Supply	12,870	12,850	12,890	12,850	12,810
% of year 2005	100%	100%	100%	100%	100%

Table 41 Projected Normal Water Demand - AF Year					
(from table 15)	2010	2015	2020	2025	2030 - opt
Demand	11,740	11,740	11,740	11,740	11,740
% of year 2005	102.5%	102.5%	102.5%	102.5%	102.5%

Table 42 Projected Supply and Demand Comparison - AF Year					
	2010	2015	2020	2025	2030 - opt
Supply totals	12,870	12,850	12,890	12,850	12,810
Demand totals	11,740	11,740	11,740	11,740	11,740
Difference	1,130	1,110	1,150	1,110	1,070
Difference as % of Supply	9%	9%	9%	9%	8%
Difference as % of Demand	10%	9%	10%	9%	9%

Supply and Demand Comparison: Single-dry Year Scenario

(Water Code § 10635 (a))

Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.

Sec 4, p. 4-22 Reference & Page Number

Table 43 Projected single dry year Water Supply - AF Year					
	2010	2015	2020	2025	2030 - opt
Supply	13,480	13,500	13,570	13,460	13,370
% of projected normal	104.7%	105.1%	105.3%	104.7%	104.4%

Table 44 Projected single dry year Water Demand - AF Year					
	2010	2015	2020	2025	2030 - opt
Demand	12,390	12,390	12,390	12,390	12,390
% of projected normal	105.5%	105.5%	105.5%	105.5%	105.5%

Table 45 Projected single dry year Supply and Demand Comparison - AF Year					
	2010	2015	2020	2025	2030 - opt
Supply totals	13,480	13,500	13,570	13,460	13,370
Demand totals	12,390	12,390	12,390	12,390	12,390
Difference	1,090	1,110	1,180	1,070	980
Difference as % of Supply	8.1%	8.2%	8.7%	7.9%	7.3%
Difference as % of Demand	8.8%	9.0%	9.5%	8.6%	7.9%

Supply and Demand Comparison: Multiple-dry Year Scenario

(Water Code § 10635 (a))

- Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and Sec 4, p. 4-23 Reference & Page Number compare projected supply and demand during those years

Table 46					
Projected supply during multiple dry year period ending in 2010 - AF Year					
	2006	2007	2008	2009	2010
Supply	12,890	12,880	13,330	13,120	13,310
% of projected normal	100.0%	100.0%	103.5%	101.9%	103.4%

Table 47					
Projected demand multiple dry year period ending in 2010 - AFY					
	2006	2007	2008	2009	2010
Demand	11,510	11,570	12,400	12,110	12,390
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

Table 48					
Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year					
	2006	2007	2008	2009	2010
Supply totals	12,890	12,880	13,330	13,120	13,310
Demand totals	11,510	11,570	12,400	12,110	12,390
Difference	1,380	1,310	930	1,010	920
Difference as % of Supply	10.7%	10.2%	7.0%	7.7%	6.9%
Difference as % of Demand	12.0%	11.3%	7.5%	8.3%	7.4%

- Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 and Sec 4, p. 4-24 Reference & Page Number compare projected supply and demand during those years

Table 49					
Projected supply during multiple dry year period ending in 2015 - AF Year					
	2011	2012	2013	2014	2015
Supply	12,870	12,860	13,450	13,200	13,340
% of projected normal	100.0%	100.0%	104.6%	102.7%	103.8%

Table 50					
Projected demand multiple dry year period ending in 2015 - AFY					
	2011	2012	2013	2014	2015
Demand	11,740	11,740	12,530	12,170	12,390
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

Table 51					
Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year					
	2011	2012	2013	2014	2015
Supply totals	12,870	12,860	13,450	13,200	13,340
Demand totals	11,740	11,740	12,530	12,170	12,390
Difference	1,130	1,120	920	1,030	950
Difference as % of Supply	8.8%	8.7%	6.8%	7.8%	7.1%
Difference as % of Demand	9.6%	9.5%	7.3%	8.5%	7.7%

- Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 and Sec 4, p.4-25 Reference & Page Number compare projected supply and demand during those years

Table 52					
Projected supply during multiple dry year period ending in 2020 - AF Year					
	2016	2017	2018	2019	2020
Supply	12,860	12,870	13,450	13,200	13,360
% of projected normal	100.0%	100.0%	104.5%	102.5%	103.6%

Table 53					
Projected demand multiple dry year period ending in 2020 - AFY					
	2016	2017	2018	2019	2020
Demand	11,740	11,740	12,530	12,170	12,390
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

Table 54					
Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year					
	2016	2017	2018	2019	2020
Supply totals	12,860	12,870	13,450	13,200	13,360
Demand totals	11,740	11,740	12,530	12,170	12,390
Difference	1,120	1,130	920	1,030	970
Difference as % of Supply	8.7%	8.8%	6.8%	7.8%	7.3%
Difference as % of Demand	9.5%	9.6%	7.3%	8.5%	7.8%

Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and Sec 4, p.4-26 Reference & Page Number compare projected supply and demand during those years

Table 55					
Projected supply during multiple dry year period ending in 2025 - AF Year					
	2021	2022	2023	2024	2025
Supply	12,880	12,870	13,430	13,170	13,320
% of projected normal	100.0%	100.0%	104.4%	102.4%	103.7%

Table 56					
Projected demand multiple dry year period ending in 2025 - AFY					
	2021	2022	2023	2024	2025
Demand	11,740	11,740	12,530	12,170	12,390
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

Table 57					
Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year					
	2021	2022	2023	2024	2025
Supply totals	12,880	12,870	13,430	13,170	13,320
Demand totals	11,740	11,740	12,530	12,170	12,390
Difference	1,140	1,130	900	1,000	930
Difference as % of Supply	8.9%	8.8%	6.7%	7.6%	7.0%
Difference as % of Demand	9.7%	9.6%	7.2%	8.2%	7.5%

Provision of Water Service Reliability section to cities/counties within service area		(Water Code § 10635(b))	
<input checked="" type="checkbox"/>	Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR	<u>Sec 1, p.1-2</u>	Reference & Page Number

Does the Plan Include Public Participation and Plan Adoption		(Water Code § 10642)	
<input checked="" type="checkbox"/>	Attach a copy of adoption resolution	<u>Sec 1, p.1-2</u>	<u>Appendix D</u> Reference & Page Number
<input checked="" type="checkbox"/>	Encourage involvement of social, cultural & economic community groups		<u>Sec 1, p.1-2</u> Reference & Page Number
<input checked="" type="checkbox"/>	Plan available for public inspection	<u>Sec 1, p.1-2</u>	<u>Appendix D</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide proof of public hearing		<u>Sec 1, p.1-2</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provided meeting notice to local governments		Reference & Page Number

Review of implementation of 2000 UWMP		(Water Code § 10643)	
<input checked="" type="checkbox"/>	Reviewed implementation plan and schedule of 2000 UWMP	<u>Sec 4, 6, 7,8</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Implemented in accordance with the schedule set forth in plan	<u>Sec 4, 6, 7,8</u>	Reference & Page Number
<input type="checkbox"/>	2000 UWMP not required		Reference & Page Number

Provision of 2005 UWMP to local governments		(Water Code § 10644 (a))	
<input checked="" type="checkbox"/>	Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	<u>Sec 1, p.1-2</u>	Reference & Page Number

Does the plan or correspondence accompanying it show where it is available for public review		(Water Code § 10645)	
<input checked="" type="checkbox"/>	Does UWMP or correspondence accompanying it show where it is available for public review	<u>Back Cover</u>	Reference & Page Number

APPENDIX C

2005 URBAN WATER MANAGEMENT PLAN “REVIEW FOR DMM COMPLETENESS” FORM

2005 Urban Water Management Plan "Review of DMMs for Completeness" Form
For DWR Review Staff Use

Water Survey Programs for Single-Family and Multi-Family Residential Customers (10631 f(1)(a))

Implementation

(Section 10631 (f))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-2 Reference & Page Number
 Year program started _____ or Year program scheduled to start _____
- Describes steps necessary to implement measure Sec 6, p. 6-2 Reference & Page Number

Table A1					
Actual	2001	2002	2003	2004	2005
# of single family surveys					
total expenditures - \$					
actual water savings - AFY					

Table A2					
Planned	2006	2007	2008	2009	2010
# of single family surveys	200	200	200	200	200
total expenditures - \$	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
projected water savings - AFY	4.7	4.7	4.7	4.7	4.7

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-3 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p. 6-3 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table A3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water (\$ per AF)	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

Residential Plumbing Retrofit (10631 (f)(1)(b))

Implementation

(Section 10631 (f) & (h))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-3 Reference & Page Number

Year program started 1991 or Year program scheduled to start _____

- Describes steps necessary to implement measure Sec 6, p. 6-3 Reference & Page Number

of pre-1992 SF accounts _____ # of pre-1992 MF accounts _____

Table B1					
Actual	2001	2002	2003	2004	2005
# of single family devices	502	363	688	555	55
# of multi-family devices	1006	843	408	272	14
actual expenditures - \$					
actual water savings - AFY					

Table B2							
Planned	2006	2007	2008	2009	2010	Total Retrofits	Total Water Savings
# of single family devices	6	25	25	25	25	2,269	61
# of multi-family devices	1	75	75	75	75	2,844	159
projected expenditures - \$							
projected water savings - AFY							

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-4 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p. 6-4 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table B3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

System Water Audits, Leak Detection and Repair (10631 (f)(1)(c))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-4 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure

Sec 6, p. 6-4 Reference & Page Number

Year of last complete audit _____

Year of next complete audit _____

Table C1					
Actual	2001	2002	2003	2004	2005
% of unaccounted water	11.3%	11.3%	11.3%	11.3%	< than 9%
expenditures for line repair	\$2 million/yr	\$2 million/yr	\$2 million/yr	\$2 million/yr	\$1 million/yr
actual water savings - AFY					

Table C2					
Planned	2006	2007	2008	2009	2010
% of unaccounted water	< than 9%				
expenditures for line repair	\$1 million/yr				
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3))

Sec 6, p.6-5 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4))

Sec 6, p.6-5 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table C3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name

Metering with Commodity Rates (10631 (f)(1)(d))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-5 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p.6-5 Reference & Page Number

Total number of accounts _____ # of accounts w/o commodity rates _____

Table D1					
Actual	2001	2002	2003	2004	2005
# of unmetered accounts					
# of retrofit meters installed					
# of accounts w/o commodity rates					
actual expenditures - \$					
actual water savings - AFY					

Table D2					
Planned	2006	2007	2008	2009	2010
# of unmetered accounts					
# of retrofit meters installed					
# of accounts w/o commodity rates					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-5 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-5 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table D3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name

Large Landscape Conservation Programs and Incentives (10631 (f)(1)(e))

Implementation

(Section 10631 (f) & (h))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-6 Reference & Page Number
 Year program started _____ or Year program scheduled to start _____

- Describes steps necessary to implement measure Sec 6, p. 6-6 Reference & Page Number

# of landscape accounts _____	# of landscape accounts with budgets _____
# of CII accounts _____	# of CII accounts w/ landscape surveys _____ (CII mixed use meters)

Table E1					
Actual	2001	2002	2003	2004	2005
# of budgets developed					
# of surveys completed					
# of follow-up visits					
actual expenditures - \$					
actual water savings - AFY					

Table E2					
Planned	2006	2007	2008	2009	2010
# of budgets developed					
# of surveys completed					
# of follow-up visits					
projected expenditures - \$					
projected water savings - AFY					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-6 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) _____ Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table E3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

High-Efficiency Washing Machine Rebate Programs (10631 (f)(1)(f))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-7 Reference & Page Number

Year program started 2001/2002 or Year program scheduled to start _____

Other agencies offer rebates _____ Cost-effectiveness calcs attached _____

Describes steps necessary to implement measure Sec 6, p. 6-7 Reference & Page Number

Table F1					
Actual	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
\$ per rebate	\$100	\$100	\$100	\$100	\$100
# of HECW rebates	407	407	407	407	125
actual water savings - AFY	1.03	1.03	1.03	1.03	0.32

Table F2					
Planned	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
\$ per rebate	\$100	\$100	\$100	\$100	
# of rebates paid	125	125	125	125	
actual water savings - AFY	0.32	0.32	0.32	0.32	

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-7 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-7 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table F3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

Public Information Programs (10631 (f)(1)(g))

Implementation

(Section 10631 (f))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-8 Reference & Page Number
 Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p.6-8 Reference & Page Number

Table G1					
Actual	2001	2002	2003	2004	2005
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau					
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
actual expenditures - \$					

Table G2					
Planned	2006	2007	2008	2009	2010
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau					
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
Projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-8 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table G3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

School Education Programs (10631 (f)(1)(h))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-9 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p. 6-9 Reference & Page Number

Table H1		No. of class presentations				
Actual	# of classes	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
TWS		2,628	1,888	208	2,177	605

Table H2		No. of class presentations				
Actual	# of classes	2006	2007	2008	2009	2010
TWS		6,000	6,000	6,000	6,000	6,000

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-9 Reference & Page Number

Did your agency's material meet state education framework requirements? _____ Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table H3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

Conservation Programs for Commercial, Industrial and Institutional (10631 (f)(1)(i))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-9 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p. 6-9 Reference & Page Number
 # of Commercial accounts _____ # of Industrial accounts _____ # of Institutional accounts _____

Table I1					
Actual	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
# of Rebates	9	64	16	34	120
Water Savings (GPD)	221	1,568	392	833	3,000

Table I2				
Planned	2006/2007	2007/2008	2008/2009	2010/2011
# of Rebates	120	120	120	120
Water Savings (GPD)	3,000	3,000	3,000	3,000

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-11 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-11 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table I3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County, Orange County Water District

Conservation Programs for Commercial, Industrial & Institutional - Toilet Replacement (10631 (f)(1)(i))

(this data is part of the Council Annual Report but is not specifically requested in the UWMP Act)

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-11 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p. 6-11 Reference & Page Number

Actual	2001	2002	2003	2004	2005
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
actual expenditures - \$					
actual water savings - AFY					

Planned	2006	2007	2008	2009	2010
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-11 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) _____ Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table I6 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County, Orange County Water District

Wholesale Agency Programs (10631 (f)(1)(j))

- Not a wholesale agency

Implementation

(Section 10631 (f) & (h))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-11 Reference & Page Number
 Year program started _____ or Year program scheduled to start _____
 # of suppliers you serve _____

- Describes steps necessary to implement measure Sec 6, p. 6-11 Reference & Page Number

Table J1	Number of agencies assisted				
program activities	2001	2002	2003	2004	2005
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
actual expenditures - \$					

Table J2	Number of agencies to be assisted				
program activities	2006	2007	2008	2009	2010
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
projected expenditures - \$					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-11 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) _____ Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table J3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

Conservation Pricing (10631 (f)(1)(k))

Implementation

(Section 10631 (f) & (h))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-12 Reference & Page Number
- Year program started _____ or Year program scheduled to start _____
- Agency provides sewer service
- Describes steps necessary to implement measure Sec 6, p. 6-12 Reference & Page Number

Table K1			
RETAILERS			
Residential			
Water Rate Structure	pop-up list	Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Commercial			
Water Rate Structure	pop-up list	Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Industrial			
Water Rate Structure	pop-up list	Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Institutional/Government			
Water Rate Structure	pop-up list	Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Irrigation			
Water Rate Structure	pop-up list		
Year rate effective			
Other			
Water Rate Structure	pop-up list	Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Table K2			
WHOLESALEERS			
Water Rate Structure	pop-up list		
Year rate effective			

Provided an evaluation for this DMM if it is not implemented

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

(Section 10631 (g))

Table K3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name

Water Conservation Coordinator (10631 (f)(1)(I))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-13 Reference & Page Number

Year program started _____ or Year program scheduled to start _____

Describes steps necessary to implement measure Sec 6, p. 6-13 Reference & Page Number

Table L1					
Actual	2001	2002	2003	2004	2005
# of full-time positions	1	1	1	1	1
# of full/part-time staff					
actual expenditures - \$					

Table L2					
Planned	2006	2007	2008	2009	2010
# of full-time positions	1	1	1	1	1
# of full/part-time staff					
projected expenditures - \$					

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table L3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

Waste Water Prohibition (10631 (f)(1)(m))

Implementation

(Section 10631 (f) & (h))

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-13 Reference & Page Number
 Year program started April 1999 or Year program scheduled to start _____
- Describes steps necessary to implement measure Sec 6, p. 6-13 Reference & Page Number

Table M1					
Actual	2001	2002	2003	2004	2005
waste ordinance in effect	Yes	Yes	Yes	Yes	Yes
# of on-site visits					
water softener ordinance					
actual expenditures - \$					

Table M2					
Planned	2006	2007	2008	2009	2010
waste ordinance in effect	Yes	Yes	Yes	Yes	Yes
# of on-site visits					
water softener ordinance					
projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f) (3)) Sec 6, p. 6-13 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table M3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name

Residential Ultra-Low-Flush Toilet Replacement Programs (10631 (f)(1)(n))

Implementation

(Section 10631 (f) & (h))

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-13 Reference & Page Number

Year program started 1995 or Year program scheduled to start _____
 # of SF pre-1992 accounts _____

X

Describes steps necessary to implement measure

Sec 6, p. 6-13 Reference & Page Number

Table N1	Single-Family				
Actual	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
# of ULFT's	1,508	1,206	1,096	827	69
water savings (AFY)	40	33	30	22	2

Table N2	Single-Family				
Planned	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
# of ULFT's	7	400	400	400	400
water savings (AFY)	0.2	2.35	2.35	2.35	2.35

of MF pre-1992 units _____

Table N3	Multi-Family				
Actual	2001	2002	2003	2004	2005
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - \$					
actual water savings - AFY					

Table N4	Multi-Family				
Planned	2006	2007	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - \$					
projected water savings - AFY					

Is a toilet retrofit on resale ordinance in effect for your service area?

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4))

Sec 6, p. 6-13 Reference & Page Number

Provided an evaluation for this DMM if it is not implemented

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

(Section 10631 (g))

Table N5 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

If Another Agency Implementing

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County, Orange County Water District, Orange County Sanitation District

2005 Urban Water Management Plan Review for Completeness Form

(Water Code §10620 (d)(1)(2) - 10645

(Water Code §10620 (d)(1)(2) - 10645, the 2005 Urban Water Management Plan Review for Completeness Form is found on Sheet 1

APPENDIX D

NOTICE OF PUBLIC HEARING AND RESOLUTION FOR PLAN ADOPTION



RESOLUTION NO. 06-32

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
TUSTIN ADOPTING THE CITY OF TUSTIN URBAN
WATER MANAGEMENT PLAN PURSUANT TO
CALIFORNIA WATER CODE 10610 TO 10657

WHEREAS, the waters of the State of California are a limited yet renewable resource subject to ever-increasing demands statewide; and

WHEREAS, 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; and

WHEREAS, a long-term, reliable supply of water is essential and urban water management plans are required to effectuate the efficient use of available supplies; and

WHEREAS, the City of Tustin has completed a 2005 update to its 2000 Urban Water Management Plan pursuant to the requirements of the Urban Water Management Planning Act of 1983 as prescribed by AB-797; and

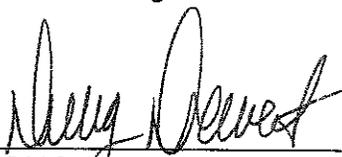
WHEREAS, the 2005 Plan is a local resource information document and complements other regional water planning documents, including the Municipal Water District of Orange County and the East Orange County Water District 2005 Urban Water Management Plans; and

WHEREAS, the purpose of the City's 2005 Plan is to provide an analysis of the current and alternative water demands, supplies, conservation activities and water shortage contingency planning for the City; and

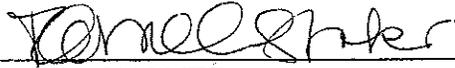
WHEREAS, the 2005 Plan will be updated no less than every five years to reflect changes in local water supply trends, resource management reliability planning and conservation policies within the boundaries of the City.

NOW, THEREFORE, BE IT HEREBY RESOLVED that the City Council of the City of Tustin adopts the 2005 Urban Water Management Plan and orders the Plan to be filed with the State of California Department of Water Resources.

PASSED AND ADOPTED at a regular meeting of the Tustin City Council held on the 3rd day of April, 2006.



DOUG DAVERT,
Mayor



PAMELA STOKER,
City Clerk

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

I, Pamela Stoker, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, do hereby certify that the whole number of the members of the City Council of the City of Tustin is five; that the above and foregoing Resolution No. 06-32 was duly passed and adopted at a regular meeting of the Tustin City Council, held on the 3rd day of April, 2006 by the following vote:

COUNCILMEMBER AYES:	<u>DAVERT, HAGEN, AMANTE, BONE, KAWASHIMA</u>	(5)
COUNCILMEMBER NOES:	<u>NONE</u>	(0)
COUNCILMEMBER ABSTAINED:	<u>NONE</u>	(0)
COUNCILMEMBER ABSENT:	<u>NONE</u>	(0)



PAMELA STOKER,
City Clerk

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

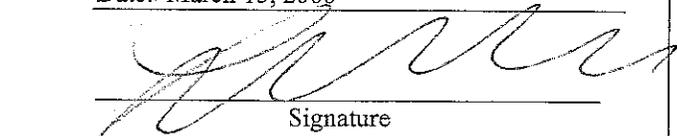
I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa 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:

March 15, 2006

"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: March 15, 2006


Signature

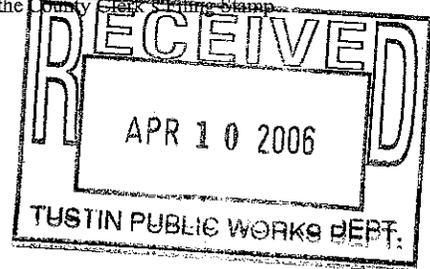
The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-7000 ext. 2209

RECEIVED
MAR 20 2006

OFFICE-TUSTIN CITY CLERK

PROOF OF PUBLICATION

This space is for the County Clerk's Filing Stamp



Proof of Publication of

<p>PUBLIC NOTICE NOTICE OF PUBLIC HEARING BEFORE THE CITY COUNCIL OF THE CITY OF TUSTIN</p> <p>NOTICE IS HEREBY GIVEN that on Monday, April 3, 2006 at 7:00 p.m. in the City Council Chambers, 300 Centennial Way, Tustin, California 92780, the City Council will hold a public hearing on the following:</p> <p>PUBLIC HEARING REGARDING A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TUSTIN ADOPTING THE 2005 URBAN WATER MANAGEMENT PLAN PURSUANT TO CALIFORNIA WATER CODE 10610 TO 10657.</p> <p>THOSE DESIRING to testify in favor of or in opposition to the plan will be given an opportunity to do so at the public hearing. If further information is desired you may contact the City Clerk's office at 714-573-3000. A copy of said report is on file in the office of the City Clerk, and is available for public inspection during regular business hours.</p> <p>Maria Huizar Chief Deputy City Clerk</p> <p>Pub: Orange County Register March 15, 2006 R534/7001973</p>	<p>A P 3 tr fr au th br A of C tr Ve er re w or w th ic d re</p>
--	--

APPENDIX E

REFERENCES



City of Tustin

2005 Urban Water Management Plan

REFERENCES

- Assembly Bill 797, *California Water Code Division 6 Part 2.6 Urban Water Management Planning*, 1983, as amended to 2005
- California Urban Water Conservation Council, *Memorandum of Understanding Regarding Urban Water Conservation in California (MOU)*, September 1991
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Orange County Water District, *Groundwater Management Plan*, March 2004

Santa Ana Regional Water Quality Control Board, *Region 8 Water Quality Control Plan (Santa Ana River Basin)*, January 1995

Santa Ana Regional Water Quality Control Board, *Watershed Management Initiative*, Revised May 2004

APPENDIX F

RESOLUTION NO. 92-15 TUSTIN WATER SHORTAGE CONTINGENCY PLAN ADOPTION AND WATER SHORTAGE CONTINGENCY PLAN



RESOLUTION NO. 92-15

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
TUSTIN, CALIFORNIA, ADOPTING THE TUSTIN WATER
SHORTAGE CONTINGENCY PLAN

The City Council of the City of Tustin does hereby resolve as follows:

WHEREAS, the CITY COUNCIL of the CITY OF TUSTIN, CALIFORNIA ("City"), has heretofore undertaken proceedings to review the Tustin Water Shortage Contingency Plan ("Plan") pursuant to Assembly Bill No. 11 ("AB-11") of the State of California approved by the Governor on October 13, 1991; and,

WHEREAS, said Plan is an amendment to the Urban Water Management Plan (AB-797), adopted by City Council on March 4, 1991 by Resolution No. 91-27; and,

WHEREAS, said Plan was prepared in accordance with AB-11; and,

WHEREAS, said proceedings provide for the adoption of the said Plan consisting of water shortage/conservation elements; and,

WHEREAS, a public hearing was duly called, noticed and held on said Plan on February 3, 1992 pursuant to AB-11.

NOW, THEREFORE, it is hereby resolved as follows:

Section 1. That the above recitals are all true and correct.

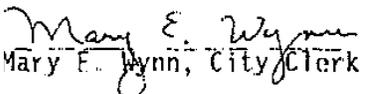
Section 2. That it is hereby ordered that said Plan be filed with the State of California Department of Water Resources.

Section 3. The City Manager is hereby authorized to declare a Water Shortage Emergency, should such an emergency exist, and implement this Plan.

Section 4. The City Manager shall make recommendations to the City Council regarding additional procedures, rules, and regulations to carry out effective and equitable allocation of water resources during a water shortage.

PASSED AND ADOPTED by the City Council of the City of Tustin at a regular meeting held on the 3rd day of February, 1992.


Charles E. Puckett, Mayor


Mary E. Wynn, City Clerk

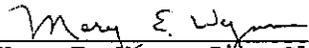
City of Tustin
RESOLUTION CERTIFICATION

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss
CITY OF TUSTIN)

RESOLUTION NO. 92-15

Mary E. Wynn, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, does hereby certify that the whole number of the members of the City Council is five; that the above and foregoing resolution was passed and adopted at a regular meeting of the City Council held on the 3rd day of February, 1992, by the following vote:

COUNCILMEMBER AYES:	Puckett, Pontious, Edgar, Potts, Prescott
COUNCILMEMBER NOES:	None
COUNCILMEMBER ABSTAINED:	None
COUNCILMEMBER ABSENT:	None



Mary E. Wynn, City Clerk

WATER SHORTAGE CONTINGENCY PLAN
(AN AMENDMENT TO THE URBAN WATER MANAGEMENT PLAN)



TUSTIN WATER SERVICE
TUSTIN, CALIFORNIA

JANUARY 1992

THE WATER SHORTAGE CONTINGENCY PLAN

FOR

THE CITY OF TUSTIN

JANUARY 1992

CHARLES E. PUCKETT - MAYOR

LESLIE ANNE PONTIOUS - MAYOR PRO TEM

RICHARD B. EDGAR - COUNCILMEMBER

JIM POTTS - COUNCILMEMEBER

EARL J. PRESCOTT - COUNCILMEMBER

**PREPARED FOR
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**CITY OF TUSTIN
WATER SHORTAGE CONTINGENCY PLAN**

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CITY OF TUSTIN

WATER SHORTAGE CONTINGENCY PLAN

INTRODUCTION

This report is a required amendment to the Urban Water Management Plan (UWMP) which was prepared by the City of Tustin Water Service (TWS), and was adopted by the City Council of the City of Tustin on March 4, 1991 by Resolution No. 91-27 (a copy is included in the Appendix). It was submitted to the State of California Department of Water Resources (DWR) on March 6, 1991 in response to AB-797.

This document has been prepared in accordance with California State Legislature Assembly Bill 11 (AB-11) which amends Sections 10620, 10621, 10631, and 10652 of the Water Code, and adds Section 10656 (a copy of AB-11 is included in the Appendix). California Water Code Sections 10610 through 10656, known as the Urban Water Management Planning Act (Act), became effective on January 1, 1984. The Act (known as AB-797) requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more that 3,000 acre-feet of water annually to prepare and adopt an UWMP in accordance with prescribed requirements.

AB-11 amends AB-797 (or UWMP) to require every urban water supplier, whether serving water directly or indirectly to customers, to prepare, adopt, and

submit to DWR a Water Shortage Contingency Plan (Plan). The nine specific elements required by AB-11 are:

1. Past, current, and projected water use, and to the extent possible, a breakdown of water use (residential, commercial, single-family, etc.)
2. An estimate of minimum supplies available at the end of 12, 24, and 36 months; assuming a worst case scenario (assume the years 1992, 1993, and 1994)
3. Stages of action that a supplier would undertake to deal with up to a 50 percent shortage
4. Mandatory provisions to reduce water use
5. Consumption limits in the most restrictive stages
6. Penalties for excessive use
7. An analysis of the effects that these measures would have on revenues and the measures that an agency would take to overcome revenue shortages
8. A draft ordinance or resolution to carry out the drought plan
9. A mechanism for determining actual reductions in water use

This Plan will cover only those items required in AB-11 and will not review in depth any information which can be found in the City's UWMP. Reference is also made to urban water shortage contingency plans prepared by the Municipal Water District of Orange County (MWDOC) and the Metropolitan Water District of Southern California (MWD). Copies of all City ordinances referred to herein can be found in the Appendix.

THE PLAN

This document begins with Section 10620(d)(2) and then follows with Section 10621(e), which essentially is the Plan.

Sections 10631(a-d) of the Act were addressed in the City's UWMP and therefore been omitted from this Plan.

Section 10620(d)(2) of the Act requires: "Each urban water supplier shall coordinate the preparation of its urban water shortage contingency plan with other urban water suppliers and public agencies in the area, to the extent practicable."

TWS has coordinated its Plan through information obtained from both the MWD and the MWDOC Water Shortage Contingency Plans, and from information contained in the Orange County Water District (OCWD) Groundwater Management Plan.

Section 10631(e) of the Water Code is amended to read:

- (e) Provide an urban water shortage contingency plan which includes all of the following elements which are within the authority of the urban water supplier:
 - (1) Past, current, and projected water use and, to the extent records are available, a breakdown of those uses on the basis of residential single family, residential multifamily, industrial, commercial, governmental, and agricultural use.

This section has been covered in Chapter 2 of the City's UWMP and in Chapter II of the MWD and in the MWDOC plans.

Section 10631(e)(2) of the Act requires: "An estimate of the minimum water supply available at the end of 12, 24, and 36 months, assuming the worst case water supply shortages."

TWS receives approximately 30 percent of its water supply from MWD through East Orange County Water District (EOCWD) import connections. Assuming a worst case supply shortage scenario, this amount of water would not be available.

TWS has interconnections with other local water agencies (see Chapter 7 of the UWMP). These interconnections are intended for use in short-term local emergencies, such as pipeline breaks or well failures. It is not likely that a significant amount of water could be obtained from them in times of severe drought.

In order to maintain an adequate water supply for the health and welfare of its customers, TWS would request the City Council to invoke the City's Water Management Program, Ordinance No. 1060, adopted by the City Council of the City of Tustin on March 18, 1991. Depending on seasonal demand considerations, one of the four stages of the ordinance would be implemented. It has been estimated that Stages 1 through 4 could reduce the TWS water demand between 10 and 50 percent.

TWS is currently working towards independence from import water. With the addition of a proposed groundwater desalter which will recover the supply from 3 inactive wells, and two proposed new wells, TWS will be able to supply nearly

100% of its demands from the local groundwater supply. This approach is supported by the OCWD, which manages the local groundwater basin. The following charts illustrate current and future TWS water production along with average and maximum day water demand projections.

CURRENT PRODUCTION	
DAILY PRODUCTION	FACILITY DESCRIPTION
7.7 MG	Existing Wells
2.3 MG	Main St. Plant
10.0 MG	TOTAL

FUTURE ADDITIONAL PRODUCTION	
DAILY PRODUCTION	FACILITY DESCRIPTION
2.7 MG	17th Street Plant
5.0 MG	2 High Production Wells
7.7 MG	TOTAL

MG = million gallons

The following average day demand projections were obtained from the Water System Storage Evaluation Study prepared for TWS by Daniel Boyle Engineering, Inc. on October 19, 1990. The maximum day demand projections were derived using duty factors obtained from the Tustin Water Service Management Program - Phase II, prepared for TWS by Boyle Engineering Corporation in March, 1984. There has not been significant growth in the service area since preparation of the program, and the values are considered accurate.

AVERAGE DAY DEMAND	
YEAR	DEMAND
1990	12.7 MGD
2000	13.3 MGD
2010	14.0 MGD

MAXIMUM DAY DEMAND	
YEAR	DEMAND
1990	21.6 MGD
2000	22.6 MGD
2010	23.8 MGD

MGD = million gallons per day

Total future groundwater production will reach approximately 17.7 MGD within 2 to 3 years. Although it appears that current and future maximum day demands will not be supplied, reservoir storage facilities are planned which will provide the necessary additional supply in times of peak demand.

TWS will not place any new facilities into service within 12 months (by January, 1993), therefore Ordinance No. 1060 would be invoked in times of extreme shortage.

Within 24 months (January, 1994) it is anticipated that supply from at least 1 new well will be available, and Ordinance No. 1063, or the less restrictive stages of Ordinance No. 1060 will result in adequate reductions in use.

It is anticipated that within 36 months (January, 1995), with planned improvements in place, it is unlikely that shortages will exist within the TWS system.

Section 10631(e)(3) of the Act requires: "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 which are applicable to each stage."

The City's Ordinance No. 1060 delineates the stages of action that will be taken if up to a 50 percent reduction in water supply occurs. Ordinance No. 1063, which established a Mandatory Water Conservation and Rationing Program to reduce consumption by 15 percent, was adopted by City Council on April 1, 1991 and remains in effect.

The MWD Plan in Chapter IV, and MWDOC, have also outlined stages of action in their water shortage contingency plans.

Section 10631(e)(4) of the Act requires: "Mandatory provisions to reduce water use which include prohibitions against specific wasteful practices, such as gutter flooding."

Mandatory provisions to reduce water use have been outlined in detail in the City's Ordinance No. 1060, and in the MWD and the MWDOC Water Shortage Contingency Plans.

Section 10631(e)(5) of the Act requires: "Consumption limits in the most restrictive stages. Each urban water supplier may use any type of consumption limit in its water shortage contingency plan that would reduce water use and is appropriate for its area. Examples of consumption limits that may be used include, but are not limited to, percentage reductions in water allotments, per capita allocations, an increasing block rate schedule for high usage of water with incentives for conservation, or restrictions on specific uses."

Stage VI of the MWDOC Incremental Interruption and Conservation Plan (IICP) requires a 50 percent reduction in imported water usage by TWS.

TWS projects that even with the loss of half of its import supply, it can meet the demands of its customers provided Ordinances Nos. 1060 and 1063 remain in place. Ordinance No. 1063 calls for a mandatory 15 percent reduction of water supplied to its customers. A chart noting consumption limits is also included. Should additional reduction in the water supply become necessary, the

TWS would request that the City Council invoke the most appropriate stage of Ordinance No. 1060.

Section 10631(e)(6) of the Act requires: "Penalties or charges for excessive use."

Additional charges and penalties are outlined in the City's Ordinance Nos. 1060 and 1063, and in the MWD and the MWDOC Water Shortage Contingency Plans.

Section 10631(e)(7) of the Act requires: "An analysis of the impacts of the plan 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."

The water rate is a combination of fixed rates and water usage charge. The fixed portion of the rate, which is comprised of customer service, meter demand, debt service, and multiple dwelling unit charges, is designed to recover fixed operating costs and 75% of funding for the Capital Improvement Program. The water usage charge is designed to recover the costs of purchasing/producing water and 25% of funding for the Capital Improvement Program. The probable response to a 50% water shortage would be to reduce or defer capital spending.

Section 10631(e)(8) of the Act requires: "A draft water shortage contingency resolution or ordinance to carry out the urban water shortage contingency plan."

A draft water shortage contingency plan Resolution No. 92-15 and Certification for said resolution is included in the Appendix of this Plan.

Section 10631(e)(9) of the Act requires: "A mechanism for determining actual reduction in water use pursuant to the urban water shortage contingency plan."

TWS maintains monthly water production statistics by source. It utilizes this information to monitor its water conservation program. Samples of reports have been included in the Appendix for your reference.

Section 10631(f) of the Act requires: "To the extent feasible, describe the method which will be used to evaluate the effectiveness of each conservation measure implemented under the plan."

The TWS will use the data as specified in Section 10631(e)(9) to evaluate the effectiveness of each element of its water conservation plan.

Section 10631(g) of the Act requires: "Describe the steps which would be necessary to implement any proposed actions in the plan."

The steps necessary are outlined in Ordinance Nos. 1060 and 1063, and in Resolution No. 92-15.

APPENDIX

CITY OF TUSTIN WATER SHORTAGE CONTINGENCY PLAN

GENERAL INFORMATION

This plan was prepared by:

City of Tustin Water Service
15222 Del Amo
Tustin, California 92680
(714) 573-3375
Fax (714) 838-0039

For information concerning this plan contact:

City of Tustin Water Service
Gary Veeh, Water Service Manager, (714) 573-3381
Michael Martin, Water Services Engineer, (714) 573-3380

For water conservation information contact:

City of Tustin Finance Department, Water Billing
Irma Hernandez, Administrative Assistant, (714) 544-8890, Ext. 262



OFFICIAL NOTICE
OF
PUBLIC HEARING
TUSTIN CITY COUNCIL

OFFICIAL NOTICE OF PUBLIC HEARING
CITY OF TUSTIN

Notice is hereby given that the City Council of the City of Tustin, California, will conduct a public hearing on February 3, 1992 at 7:00 p.m. in the Council Chambers, 300 Centennial Way, Tustin, California to consider the following:

Tustin Water Shortage Contingency Plan

A plan required by Assembly Bill No. 11 ("AB-11") approved by the Governor on October 13, 1991. AB-11 amends certain sections of the Urban Water Management Plan (AB-797), which the City Council adopted on March 4, 1991.

AB-11 requires that every urban water supplier providing municipal water directly or indirectly 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, a Water Shortage Contingency Plan containing prescribed elements, and requires the plan be filed with the California Department of Water Resources.

Information relative to this item is on file in the Public Works Department and is available for public inspection at City Hall. Anyone interested in the information above may call the Public Works Department at (714) 544-8890, ext 280.

Mary E. Wynn
City Clerk

Publish: January 23, 1992 &
January 30, 1992

DRAFT

RESOLUTION NO. 92-15

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TUSTIN, CALIFORNIA, ADOPTING THE TUSTIN WATER SHORTAGE CONTINGENCY PLAN

The City Council of the City of Tustin does hereby resolve as follows:

WHEREAS, the CITY COUNCIL of the CITY OF TUSTIN, CALIFORNIA ("City"), has heretofore undertaken proceedings to review the Tustin Water Shortage Contingency Plan ("Plan") pursuant to Assembly Bill No. 11 ("AB-11") of the State of California approved by the Governor October 13, 1991; and,

WHEREAS, said Plan is an amendment to the Urban Water Management Plan (AB-797), adopted by City Council on March 4, 1991 by Resolution No. 91-27; and,

WHEREAS, said Plan was prepared in accordance with AB-11; and,

WHEREAS, said proceedings provide for the adoption of the said Plan consisting of water shortage/conservation elements; and,

WHEREAS, a public hearing was duly called, noticed and held on said Plan on February 3, 1992 pursuant to AB-11.

NOW, THEREFORE, it is hereby resolved as follows:

Section 1. That the above recitals are all true and correct.

Section 2. That it is hereby ordered that said Plan be filed with the State of California Department of Water Resources.

Section 3. The City Manager is hereby authorized to declare a Water Shortage Emergency, should such an emergency exist, and implement this Plan.

Section 4. The City Manager shall make recommendations to the City Council regarding additional procedures, rules, and regulations to carry out effective and equitable allocation of water resources during a water shortage.

PASSED AND ADOPTED by the City Council of the City of Tustin at a regular meeting held on the 3rd day of February, 1992.

Charles E. Puckett, Mayor

Mary E. Wynn, City Clerk

DRAFT

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

CERTIFICATION FOR RESOLUTION NO. 92-15

Mary E. Wynn, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, does hereby certify that the whole number of the members of the City council is five; that the above and foregoing Resolution was duly and regularly passed and adopted at a regular meeting of the City Council held on the 3rd day of February, 1992 by the following vote:

COUNCILMEMBER AYES:
COUNCILMEMBER NOES:
COUNCILMEMBER ABSTAINED:
COUNCILMEMBER ABSENT:

Mary E. Wynn, City Clerk

ORDINANCES/RESOLUTIONS

ORDINANCE NO. 1060

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF TUSTIN,
CALIFORNIA, FINDING AND DETERMINING THE NECESSITY FOR AND
ADOPTING A WATER MANAGEMENT PROGRAM

The City Council of the City of Tustin does hereby ordain as follows:

SECTION 1. Declaration of Policy. California Water Code Sections 375 et seq. permit public entities which supply water at retail to adopt and enforce a water conservation program to reduce the quantity of water used by the people therein for the purpose of conserving the water supplies of such public entity. The City Council of the City of Tustin hereby establishes a comprehensive water conservation program pursuant to California Water Code Sections 375 et seq., based upon the need to conserve water supplies and to avoid or minimize the effects of any future shortage.

SECTION 2. Findings. The City Council of the City of Tustin finds and determines that a water shortage will exist upon the occurrence of one or more of the following:

- (A) A general water supply shortage due to limited supplies.
- (B) Distribution or storage facilities of the Metropolitan Water District of Southern California, the Municipal Water District of Orange County, the East Orange County Water District, or the City of Tustin become inadequate.
- (C) A major failure of the supply, storage and distribution facilities of the Metropolitan Water District of Southern California, the Municipal Water District of Orange County, the East Orange County Water District, or of the City of Tustin occurs.

The City Council of the City of Tustin also finds and determines that the conditions prevailing in State and in the Orange County area require that the water resources available be put to maximum beneficial use to the extent to which they are capable, and that the waste or unreasonable use, or unreasonable method of use, of water be prevented and that the conservation of such water encouraged with a view to the maximum reasonable and beneficial use thereof in the interests of the people of the City of Tustin and for the public welfare.

SECTION 3. CEQA Exemption. The City Council of the City of Tustin finds that this Ordinance and actions taken hereafter pursuant to this Ordinance are exempt from the California Environmental Quality Act as specific actions necessary to prevent or mitigate an emergency pursuant to Public Resources Code Section 21080(b) (4) and the California Environmental Quality Act Guidelines Section 15269(c).

/

The City Manager of the City of Tustin is hereby authorized and directed to file a Notice of Exemption as soon as possible following adoption of this Ordinance.

SECTION 4. Application. The provisions of this Ordinance shall apply to all persons, customers, and property served by the City of Tustin water service.

SECTION 5. Authorization. The City Manager or a designated representative is hereby authorized and directed to implement the provisions of this Ordinance.

SECTION 6. Water Conservation Stages. No customer of the City shall knowingly make, cause, use, or permit the use of water supplied by the City for residential, commercial, industrial, agricultural, governmental or any other purpose in a manner in excess of the amounts authorized by this Ordinance, or during any period of time other than the periods of time specified in this Ordinance. AT NO TIME SHALL WATER BE WASTED OR USED UNREASONABLY. The following stages shall take effect upon declaration as herein provided.

- (A) STAGE 1 - VOLUNTARY COMPLIANCE - WATER WATCH. STAGE 1 applies during periods when the possibility exists that the City will not be able to meet all of the demands of its customers. During STAGE 1, all elements of STAGE 2 shall apply on a voluntary basis only.
- (B) STAGE 2 - MANDATORY COMPLIANCE - WATER ALERT. STAGE 2 applies during periods when the probability exists that the City will not be able to meet all of the water demands of its customers or when statewide shortages cause a need for local conservation measures to be implemented. During STAGE 2, the following water conservation measures shall apply except when reclaimed or recycled water is used.
 - 1. Lawn watering and landscape irrigation, including construction meter irrigation, is not permitted between the hours of 10:00 a.m. and 6:00 p.m. any day. Watering is permitted at any time if a hand-held hose equipped with a positive shut-off nozzle is used, a hand-held faucet-filled bucket of five (5) gallons or less is used, or a drip irrigation system is used. Watering shall be done as needed only.
 - 2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
 - 3. Washing of autos, trucks, mobile homes, buses, trailers, boats, airplanes and other types of mobile equipment shall be done with a hand-held bucket or a hand-held hose equipped with a positive shut-off nozzle

for quick rinses. Washing is permitted at any time on the immediate premises of a commercial car wash. Further, such washing is exempted from these regulations where health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

4. Watering parks, school grounds, public facilities, and recreational fields is not permitted between the hours of 10:00 a.m. and 4:00 p.m.
5. Restaurants shall not serve water to their customers except when specifically requested.
6. The operation of any ornamental fountain or similar structure is prohibited unless reclaimed water is used.
7. Agriculture users and commercial nurseries as defined in the Metropolitan Water District Code are exempt from STAGE 2 irrigation restrictions, but will be required to curtail all non-essential water use.

(C) STAGE 3 - MANDATORY COMPLIANCE - WATER WARNING. STAGE 3 applies during periods when the City will not be able to meet all the water demands of its customers. During STAGE 3, the following water conservation measures shall apply except when reclaimed or recycled water is used.

1. Lawn watering and landscape irrigation, including construction meter irrigation, is permitted only on designated irrigation days and only between the hours of 6:00 p.m. and 6:00 a.m. A "designated irrigation day" is determined by the last digit in the street address. Properties with addresses ending in an even number may use water on even numbered days and addresses ending with an odd number may use water on odd numbered days.
2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
3. Washing of autos, trucks, mobile homes, buses, trailers, boats, airplanes and other types of mobile equipment is prohibited. Washing is permitted at any time on the immediate premises of a commercial car wash. The use of water by all types of commercial car washes not using partially reclaimed or recycled water shall be reduced in volume by 20%. Further, such washings are exempted from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

4. Watering parks, school grounds, public facilities, and recreational fields is permitted only after 6:00 p.m. and before 6:00 a.m.
5. The use of water from fire hydrants shall be limited to fire fighting and related activities, or other activities necessary to maintain the health, safety and welfare of the public.
6. Agricultural users and commercial nurseries shall use water only between the hours of 6:00 p.m. and 6:00 a.m.
7. Restaurants shall not serve water to their customers except when specifically requested.
8. The operation of any ornamental fountain or similar structure is prohibited.
9. All water leaks shall be repaired immediately.
10. Construction water shall not be used for earthwork or road construction purposes unless authorized as a mitigation or erosion control, compaction or backfilling earthwork or as required by the Air Quality Management Plan (AQMP) Control Measure F-4.
11. Exceptions: The prohibited uses of water are not applicable to that use of water necessary for public health and safety or for essential governmental services such as police, fire and other similar emergency services.

(D) STAGE 4 - MANDATORY COMPLIANCE - WATER EMERGENCY. STAGE 4 applies when a major failure of any supply or distribution facility, whether temporary or permanent, occurs in the water distribution system of the State Water Project, Metropolitan Water District of Southern California, Municipal Water District of Orange County, East Orange County Water District or City facilities. During STAGE 4, the following water conservation measures shall apply except when reclaimed or recycled water is used:

1. All outdoor irrigation of vegetation is prohibited.
2. Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
3. Washing of autos, trucks, mobile homes, buses, trailers, boats, airplanes and other types of mobile equipment is prohibited. Washing is permitted at any time upon the immediate premises of a commercial car wash. The use of water by all types of commercial car washes shall be reduced in volume by 50%. Further, such washings are

exempted from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

4. Filling, refilling or adding of water to swimming pools, spas, ponds and artificial lakes is prohibited.
5. Watering of parks, school grounds, public facilities and recreation fields is prohibited with the exception of plant materials classified to be rare, exceptionally valuable, or essential to the well being of rare animals.
6. The use of water from fire hydrants shall be limited to fire fighting or related activities necessary to maintain the health, safety and welfare of the public.
7. Use of water for agricultural or commercial nursery purposes, except for livestock watering, is prohibited.
8. Restaurants shall not serve water to their customers except when specifically requested.
9. The operation of any ornamental fountain or similar structure is prohibited.
10. New construction meters or permits for unmetered service will not be issued. Construction water shall not be used for earth work or road construction purposes.
11. The use of water for commercial, manufacturing or processing purposes shall be reduced in volume by 50%.
12. No water shall be used for air conditioning purposes.
13. All water leaks shall be repaired immediately.
14. Exceptions: The prohibited uses of water are not applicable to that use of water necessary for public health and safety or for essential governmental services such as police, fire and other similar emergency services.

SECTION 7. Mandatory Conservation Phase Implementation. The City shall monitor the projected supply and demand for water by its customers on a daily basis. The City Manager shall determine the extent of the conservation required through the implementation and/or termination of particular conservation stages in order for the City to prudently plan for and supply water to its customers. Thereafter, the City Manager may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provision of this Ordinance. The declaration of any stage beyond STAGE 1 shall be made by public announcement and notice shall be published a minimum of three (3) consecutive times in a newspaper of general circulation. The stage

designated shall become effective immediately upon announcement. The declaration of any stage beyond STAGE 1 shall be reported to the City Council at its next regular meeting. The City Council shall thereupon ratify the declaration, rescind the declaration, or direct the declaration of a different stage.

SECTION 8. FAILURE TO COMPLY.

- (A) Following a declaration of a Stage 1 condition as provided herein, upon the occurrence of violations of any of the provisions of this ordinance, City shall cause written notice to be given to each violator.
- (B) Following a declaration of a Stage 2 condition as provided herein, citations shall be issued to violators. The first violation by any violator shall subject the violator to a fine of Twenty-Five dollars (\$25.00). Upon a second violation, the violator shall be subject to a fine of Thirty-Five dollars (\$35.00). Upon a third violation, the violator shall be subject to a fine of Forty-Five dollars (\$45.00). Upon a fourth violation, the violator shall be subject to a fine of Fifty-Five dollars (\$55.00).
- (C) For the fifth violation, the City may install a flow restricting device in the customer's water service line for a period not less than 48 hours and until the customer satisfies the City that the failure to comply will not continue. The charge for installing and removing the flow restricting device shall be \$65.00 and shall be paid by the customer prior to removal.
- (D) For the sixth and each subsequent violation, the City may discontinue water service for a period of not less than 24 hours and until the customer satisfies the City that the failure to comply will not continue. The customer shall pay \$70.00 for restoration of water service.

SECTION 9. Appeal Procedure. A customer shall have the right to appeal by filing a written request for appeal within five days with the City Manager or his designee. Within ten days after receipt of such a request, a written decision shall be issued. The City Council or their designee shall be the final appeal body on all decisions.

SECTION 10. Severability. If any section, sub-section, clause or phrase in this Water Conservation Ordinance or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of the Conservation Ordinance or the application of such provisions to other persons or circumstances shall not be affected.

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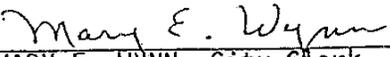
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PASSED AND ADOPTED by the City Council of the City of Tustin at a regular meeting held on the 18th day of March, 1991.


RICHARD B. EDGAR, Mayor

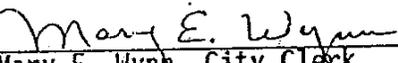

MARY E. WYNN, City Clerk

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

CERTIFICATION FOR ORDINANCE NO. 1060

MARY E WYNN, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, does hereby certify that the whole number of the members of the City Council is five; that the above and foregoing Ordinance was duly and regularly read and introduced at a meeting of the City Council held on the 4th day of March, 1991, and was given its second reading and duly passed and adopted at a meeting of the City Council held on the 18th day of March, 1991, by the following roll call vote:

COUNCILMEMBER AYES: Edgar, Puckett, Pontious, Potts, Prescott
COUNCILMEMBER NOES: None
COUNCILMEMBER ABSTAINED: None
COUNCILMEMBER ABSENT: None


Mary E. Wynn, City Clerk

ORDINANCE NO. 1063

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF TUSTIN,
CALIFORNIA, ESTABLISHING A MANDATORY WATER CONSERVATION
AND RATIONING PROGRAM

The City Council of the City of Tustin does hereby ordain as follows:

SECTION 1. Water Consumption Reduction.

A. Findings. The City Council hereby finds and determines as follows: the State of California is entering the fifth year of an unprecedented drought; water levels at many reservoirs are at an all time low; deliveries of water to the Southern California region from the State Water Project, Colorado River, Owens Valley and Mono County have declined due to the lack of rainfall and litigation regarding entitlement; the Metropolitan Water District of Southern California (MWD) is the supplier of thirty percent (30%) of the water supplied to the Tustin Water Service and MWD has reduced the City's allocation of water by thirty percent (30%) as of March 1, 1991 and advised that it will charge the City a premium of at least Three Hundred Ninety-Four Dollars (\$394) per acre foot for delivery of water in excess of new allocation levels; the Mandatory Conservation Rate on the effective date of this ordinance is a collective fifteen percent (15%); this Conservation Rate corresponds with the recent decision of MWD to allocate only seventy percent (70%) of the water used by the City during comparable periods in the past; the failure of Tustin Water Service consumers to collectively reduce water consumption may lead to even more drastic cutbacks in allocations, deliveries, and costs; the failure to reduce water consumption and a continuation of the drought may, in the long term, result in the inability of the City to supply water at or above minimum levels required for health and sanitation; this ordinance will promote reductions in water consumption and permit recovery of additional costs incurred with the purchase of water and the administration of water conservation measures.

B. Definitions.

1. "Billing Period" means the time interval between two consecutive water meter readings taken for billing purposes and will average sixty (60) days.

2. "Billing Unit" means one hundred (100) cubic feet of water (748 gallons).

3. "MWD" shall mean The Metropolitan Water District of Southern California.

4. "Allowable Water Usage" means the amount of water delivered to a customer's premises which does not exceed the maximum amount established pursuant to this ordinance and by resolutions of the City Council made from time to time pursuant to the provisions of this ordinance.

5. "Customer" means each person or entity who has contracted for water service from the City of Tustin.

6. "Penalty Amount" shall mean the additional charge, expressed in terms of cost per Billing Unit, imposed on water consumption in excess of the Allowable Water Usage.

7. "Water" means potable water and does not include reclaimed water.

C. Customer Responsibility. Each customer of the Tustin Water Service shall be responsible for the use and misuse of all water pipes and facilities connected to the meter or meters which measure the amount of water for which the customer is obligated to pay the City of Tustin.

D. Water Usage Limitation. All customers shall make all reasonable efforts to not receive, use, consume or permit to be delivered to the premises for which the customer contracted with the City for service, water in an amount in excess of the Allowable Water Usage. The Allowable Water Usage shall be as set forth below, effective at 12:01 a.m. on April 22, 1991:

<u>Water User</u>	<u>Summer Allotment May - Oct.</u>	<u>Gallons Per Day</u>	<u>Winter Allotment Nov. - April</u>	<u>Gallons Per Day</u>
Single Family Residential Dwelling	48 units *	598	30 units	374
Multi-Family unit (including condominium unit)	18 units	224	16 units	200
Commercial business	138 units	1720	105 units	1309
Industrial business	278 units	3466	138 units	1720
Non-Profit establishment (including church, boys and girls club, etc.)	186 units	2319	109 units	1359
Government unit (including school districts, City, State)	675 units	8415	235 units	2930
Landscape (multi-family developments (including condominiums) served by Green Meter)	161 units	2007	98 units	1221

* 1 unit equal 100 cubic feet and equals 748 gallons

For purposes of this subsection, measurements of water consumption falling between full Billing Units shall be rounded up to the next full Billing Unit.

E. Additional Charges and Penalties. In the event a customer fails to comply with prescribed water usage limitations, an additional charge of ninety cents (\$0.90) shall be imposed on each Billing Unit received over and above the Allowable Water Usage. If two consecutive billing periods show water usage exceeding the Allowable Water Usage, an additional surcharge of twenty-five percent (25%) of the total amount of the bill (including the additional ninety cents (\$0.90) per Billing Unit prescribed above) will be imposed. After the third consecutive billing period where water usage exceeds the Allowable Water Usage a surcharge of fifty percent (50%) of the total bill (including the additional ninety cents (\$0.90) per Billing Unit prescribed above) will be imposed. For consecutive billing periods, four or more of which exceed the Allowable Water Usage, the City may install a flow restricting device to reduce the amount of water supplied to the customer and a surcharge of seventy-five percent (75%) of the total charge shall be imposed will be added to the total bill (including the additional ninety cents (\$0.90) per Billing Unit prescribed above) for all periods exceeding the allowable usage. The device shall not be removed until such time as the customer has provided proof satisfactory to the City that the customer will not exceed the Allowable Water Usage. A fee of Fifty Dollars (\$50) shall be charged for installing the flow restricting device. Penalties shall appear on the first billing statement for that account immediately after the Billing Period in which the excess water usage occurred. The penalty shall be paid at the same time as the payment for normal water service. Failure to pay the entire amount due shall incur the same penalties as those imposed for failure to pay for normal water service.

Any excess revenues received by the City from the additional charges and penalties prescribed in this ordinance greater than the additional charges and penalties paid by the City to the MWD, shall be used by the City solely for capital improvement costs of water facilities.

F. Changes in Allowable Water Usage, Charges, Penalties, etc. The City Council may by resolution adopted from time to time set, revise, increase or decrease the Allowable Water Usage and the charges, surcharges and penalties as deemed necessary to accommodate water allocations, charges and penalties imposed by MWD and other factors affecting the supply and cost of water to the City of Tustin. Such resolutions shall become effective as specified in such resolutions and shall within ten (10) days of their adoption be published in a newspaper of general circulation, printed, published and circulated in the City of Tustin.

G. New Customers. The water billing section shall notify new customers of their Allowable Water Usage rate, charges,

penalties, etc., at the time application is made for new water service.

H. Adjustments. The City Manager or designee upon application by a customer for relief, shall have the authority to modify the billing to a customer if the City Manager or designee determines that strict application of the provisions of this ordinance would create undue hardship to, or result in inequitable treatment of, the customer.

I. Relief from Compliance.

1. A customer may file an application for relief from the water usage reduction requirements of this ordinance. The application shall be on a form provided by the City and shall specify the basis for the request for relief. The application shall be filed with the City Manager or designee. An application seeking relief relative to a previously billed amount shall be filed within fifteen (15) days after the date on which the water bill was mailed to the customer. In determining whether to grant relief and the nature of any relief, the City Manager or designee may consider the following:

(a) Whether mandated reduction in water usage will result in unemployment;

(b) Whether a larger number of persons than average reside or are employed on the premises;

(c) Whether a commercial or industrial user has previously undertaken extensive water conservation activities and an additional reduction in allowable water usage would be a hardship;

(d) Whether specific health or safety considerations are present that require the use of water in excess of the Allowable Water Usage.

2. No relief shall be granted to any customer in the absence of a showing that the customer has achieved the maximum practical reduction in water consumption aside from those factors which would otherwise warrant an adjustment. No relief shall be granted to any customer who fails to provide the City Manager or designee with requested information relevant to a determination of the adequacy of the grounds of relief or a finding that maximum practical reduction and consumption has been achieved.

3. The decision of the City Manager or designee shall be made after all material has been reviewed.

4. The City Manager or designee will make a determination no later than fourteen (14) days after the appeal is received. If an appeal is decided in full or partial favor of the customer, an immediate adjustment will be made to the customer's

account. If the appeal is rejected, customer must pay the bill in full within five (5) business days to avoid service interruption. Provided, however, if the customer files an appeal with the Water Appeals Board, to be appointed by the City Council, payment need not be made until five (5) business days following decision of the Board. Appeals of decisions of the Water Appeals Board may be made to the City Council, provided, however, the customer must first make a deposit with the City of seventy-five percent (75%) of the disputed bill to avoid service interruption.

J. Confirmation. A customer shall have the right to request confirmation of the amount of water used during a Billing Period for which the customer has been billed.

K. Irrigation. Where an improperly maintained irrigation system results in a waste of water, e.g., causes excessive runoff, the City Manager or designee shall have the authority to discontinue water service. Notice of the termination of service shall be given by posting notice of the decision on the meter which measures water flowing through the system and by mailing written notice of the decision to the customer within twenty-four (24) hours after service was terminated. The customer shall have the right to appeal the decision to terminate service by filing a written request for hearing with the City Manager or designee within fifteen (15) days after the date on which notice was mailed. Appeals of the decision of the City Manager or designee may be made to the Water Appeals Board and thereafter to the City Council.

SECTION 2. The City Council finds and declares that adoption of this ordinance as an emergency measure is necessary to preserve the public peace, health, and safety in that:

A. California is currently experiencing a drought of unprecedented magnitude with current water reserves throughout the State far below normal.

B. The City has initiated a voluntary water conservation program, but the program has not achieved the desired results.

C. Metropolitan Water District, the supplier of imported water to the City of Tustin, has announced its intention to reduce the amount of water delivered to the City and to impose a surcharge on all water sold to the City in excess of new allocation levels. The surcharge and reduced allocation levels were effective on February 1, 1991 and compliance with MWD directives cannot be achieved other than through the adoption of an emergency ordinance.

D. The imposition of penalties on excess consumption of water will reduce water usage and allow the City to recover the additional costs it incurs relative to the purchase of water from MWD.

E. Failure to achieve a fifteen percent (15%) reduction in water consumption will reduce available water supplies, lead to further MWD mandated reductions, and require imposition of more stringent restrictions on water use in the future. In the long term, the failure to conserve water combined with continued drought could lead to the inability of the City to provide water in amounts necessary for health and sanitation.

SECTION 3. Effective Date and Publication. This ordinance shall be effective immediately upon its adoption by a majority of the members of the City Council pursuant to Water Code Section 375. The City Clerk is hereby directed to cause this ordinance to be published pursuant to Government Code Section 6061 within ten (10) days of its adoption in a newspaper of general circulation, printed, published and circulated in the City of Tustin.

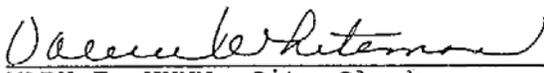
SECTION 4. Severability. The City Council of the City of Tustin hereby declares that should any section, paragraph, sentence or word of this ordinance be declared, for any reason, to be invalid, it is the intent of the Council that it would have passed all other portions of this ordinance independent of the portion declared invalid.

SECTION 5. Savings Clause. Neither the adoption of this ordinance nor the repeal of any other ordinance of the City shall, in any manner, affect the prosecution for violations of ordinances committed prior to the effective date of the adoption or repeal, nor be construed as a waiver of any of the penalty or penal provisions applicable to such violation. The provisions of this ordinance, to the extent they are substantially the same as ordinances previously adopted by the City and relating to the same subject matter, shall be construed as restatements and continuations, and not as new enactments.

PASSED AND APPROVED by the City Council of the City of Tustin at a regular meeting held on the 1st day of April, 1991.



RICHARD B. EDGAR, Mayor



MARY E. WYNN, City Clerk

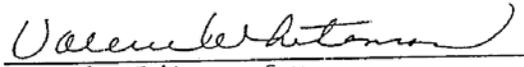
City of Tustin
ORDINANCE CERTIFICATION

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

ORDINANCE NO. 1063

Mary E. Wynn, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, does hereby certify that the whole number of the members of the City Council of the City of Tustin is five; that the above and foregoing Ordinance No. 1063 was duly and regularly introduced, read, passed and adopted as an urgency ordinance at a regular meeting held on the 1st day of April, 1991, by the following vote:

COUNCILMEMBER AYES: Edgar, Puckett, Pontious, Potts
COUNCILMEMBER NOES: None
COUNCILMEMBER ABSTAINED: None
COUNCILMEMBER ABSENT: Prescott



Valerie Whiteman for
Mary Wynn, City Clerk

RESOLUTION NO. 91-27

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
TUSTIN, CALIFORNIA, ADOPTING THE TUSTIN URBAN WATER
MANAGEMENT PLAN

The City Council of the City of Tustin does hereby resolve as follows:

WHEREAS, the CITY COUNCIL of the CITY OF TUSTIN, CALIFORNIA ("City"), has heretofore undertaken proceedings to review the Tustin Urban Water Management Plan ("Plan") pursuant to Assembly Bill No. 797 ("AB-797") of the State of California approved by the Governor September 21, 1983; and,

WHEREAS, said Plan was prepared in accordance with AB-797; and,

WHEREAS, said proceedings provide for the adoption of the said Plan consisting of water conservation elements; and,

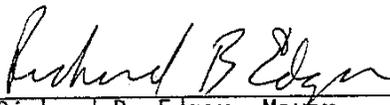
WHEREAS, a public hearing was duly called, noticed and held on said Plan on March 4, 1991 pursuant to AB-797.

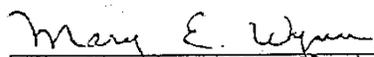
NOW, THEREFORE, it is hereby resolved as follows:

Section 1. That the above recitals are all true and correct.

Section 2. That it is hereby ordered that said Plan be filed with the State of California Department of Water Resources.

PASSED AND ADOPTED by the City Council of the City of Tustin at a regular meeting held on the 4th day of March, 1991.


Richard B. Edgar, Mayor


Mary E. Wynn, City Clerk

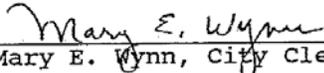
City of Tustin
RESOLUTION CERTIFICATION

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

RESOLUTION NO. 91-27

MARY E. WYNN, City Clerk and ex-officio Clerk of the City Council of the City of Tustin, California, does hereby certify that the whole number of the members of the City Council of the City of Tustin is five; that the above and foregoing Resolution No. 91-27 was duly and regularly introduced, passed and adopted at a regular meeting of the City Council held on the 4th day of March, 1991 by the following vote:

COUNCILMEMBER AYES: Edgar, Puckett, Pontious, Potts, Prescott
COUNCILMEMBER NOES: None
COUNCILMEMBER ABSTAINED: None
COUNCILMEMBER ABSENT: None



Mary E. Wynn, City Clerk

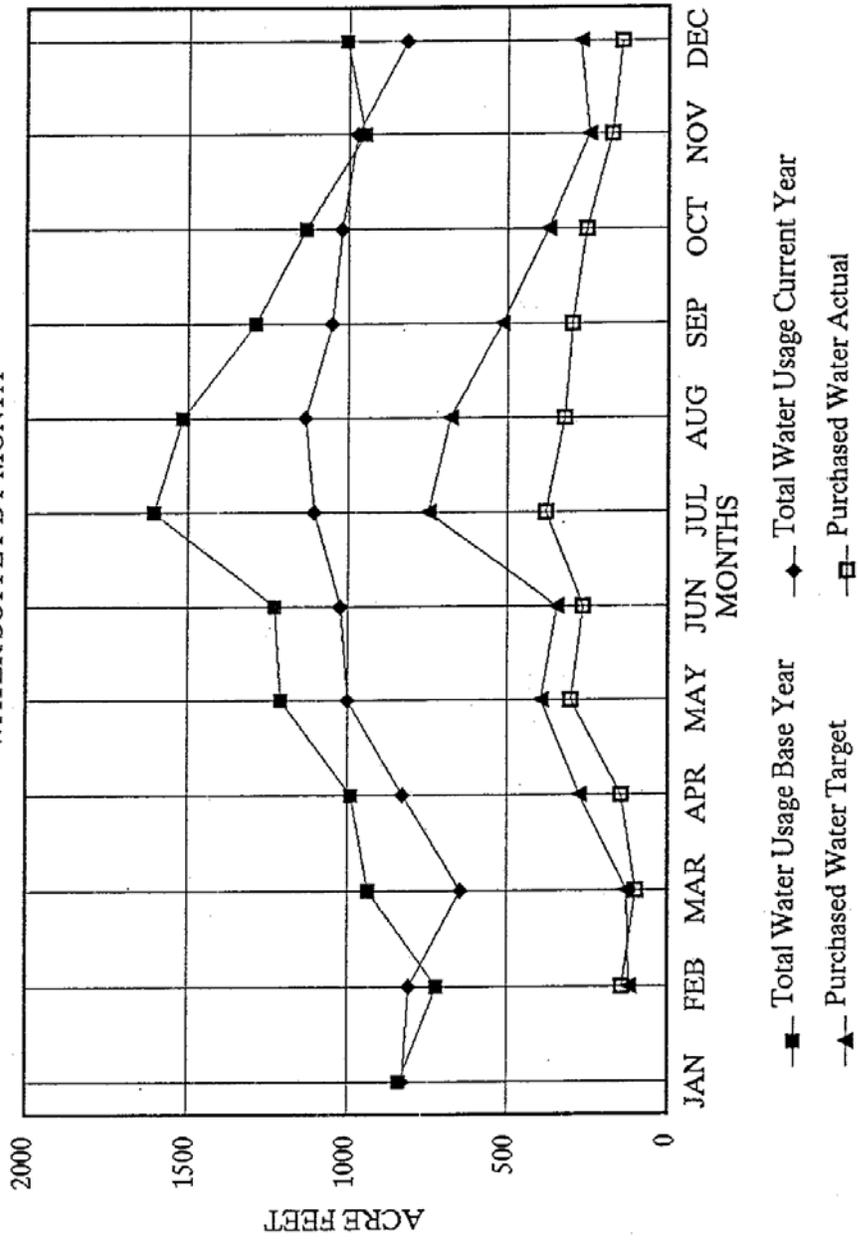
**SAMPLE
TWS WATER PRODUCTION
REPORTS/STATISTICS**

CITY OF TUSTIN
WATER SUPPLY BY MONTH (ACRE FEET)

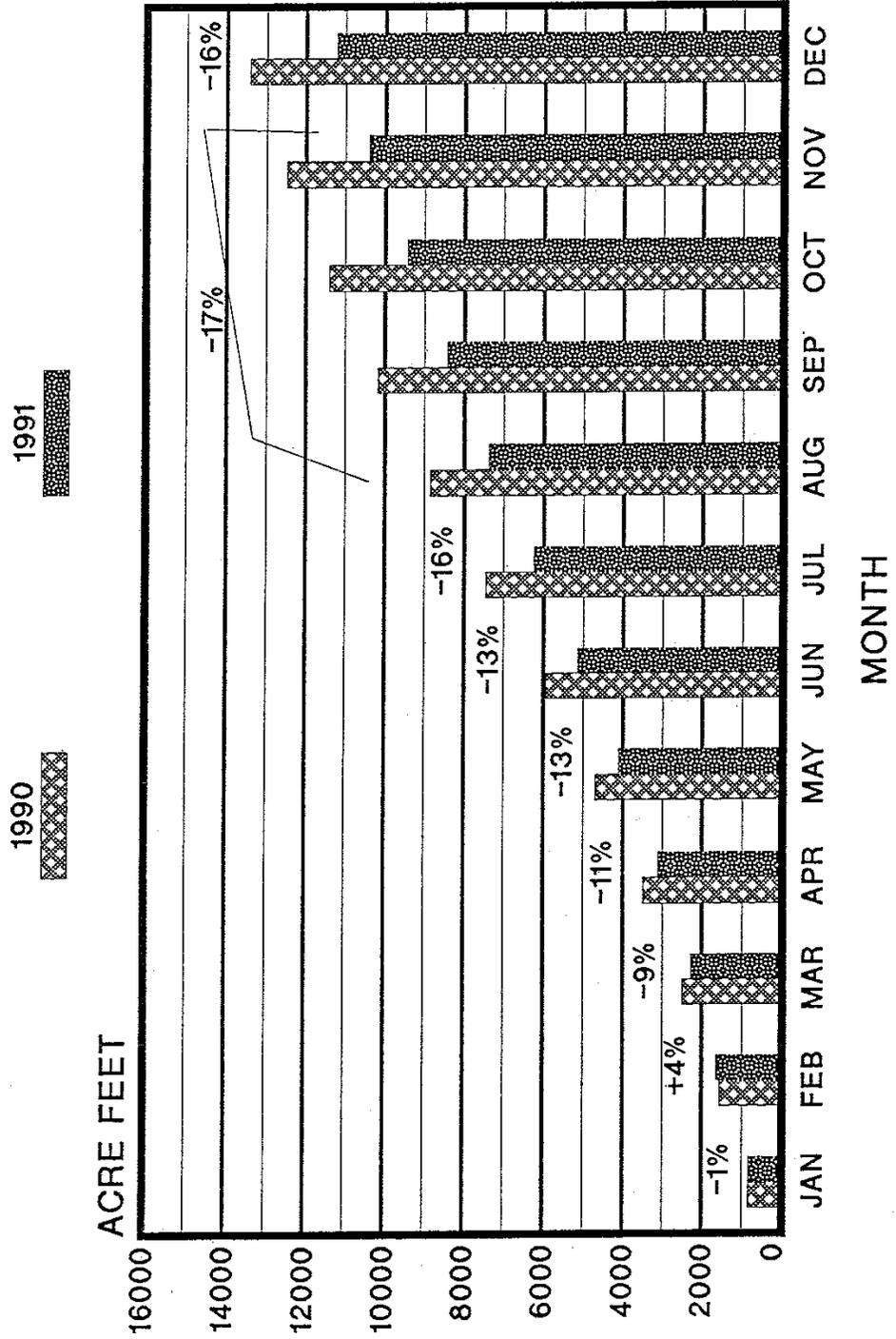
MONTH	1986 1987	1987 1988	1988 1989	1989 1990	1990 1991	1991 1992	MONTHLY AVERAGE
JULY	1,506.2	1,379.3	1,433.0	1,606.8	1,524.0	1,104.9	1,425.7
AUGUST	1,504.9	1,440.4	1,460.5	1,516.1	1,405.3	1,132.5	1,410.0
SEPTEMBER	1,263.5	1,273.2	1,256.7	1,291.3	1,329.8	1,051.0	1,244.3
OCTOBER	1,058.4	1,065.6	1,174.4	1,132.8	1,226.7	1,021.4	1,113.2
NOVEMBER	1,018.7	842.6	882.6	948.9	1,064.3	972.3	954.9
DECEMBER	841.3	788.7	836.3	1,006.8	956.6	817.9	874.6
6 MONTH TOTAL	7,193.0	6,789.8	7,043.5	7,502.7	7,506.7	6,100.0	7,022.6
JANUARY	819.7	822.8	832.3	839.0	826.8		828.1
FEBRUARY	770.8	861.1	711.7	721.2	806.3		774.2
MARCH	848.0	1,067.5	898.5	934.8	644.4		878.6
APRIL	1,153.4	957.9	1,176.1	989.9	828.8		1,021.2
MAY	1,303.7	1,429.5	1,310.7	1,209.0	997.7		1,250.1
JUNE	1,362.7	1,373.5	1,278.2	1,230.4	1,023.6		1,253.7
6 MONTH TOTAL	6,258.3	6,512.3	6,207.5	5,924.3	5,127.6	0.0	6,006.0
TOTAL FOR YEAR	13,451.3	13,302.1	13,251.0	13,427.0	12,634.3	6,100.0	13,213.1

CITY OF TUSTIN

WATER SUPPLY BY MONTH



CITY OF TUSTIN WATER SERVICE CUMULATIVE WATER PRODUCTION



MONTH
AUG, SEP, OCT. & NOV. ARE ALL -17%

CITY OF TUSTIN WATER SERVICE

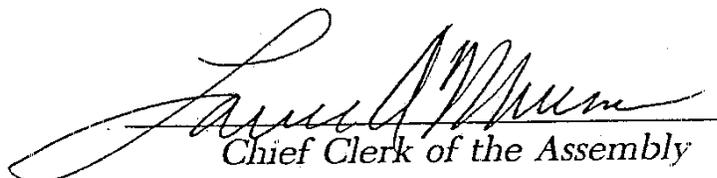
Selected Water Production Statistics
Comparison of Conservation Program Base Year to Current Year

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCTOBER	NOV.	DEC.
TOTAL WATER USAGE (Acre Feet)												
BASE YEAR	839	721	934	990	1209	1230	1607	1516	1291	1133	948	1007
CURRENT YEAR	826	806	644	829	998	1023	1105	1133	1051	1021	972	818
PERCENT REDUCTION		- 12%	31%	16%	17%	17%	31%	25%	19%	10%	- 3%	19%
IMPORTED WATER												
ASSIGNED TARGET (MWD)		122	129	277	397	347	750	679	519	376	249	274
ACTUAL PURCHASES		142	101	146	304	266	380	322	298	254	177	146

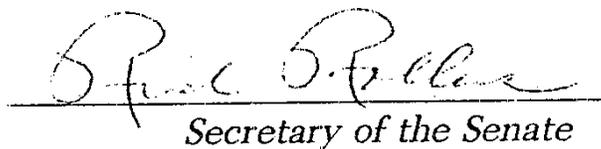
ASSEMBLY BILL NO. 11

Assembly Bill No. 11

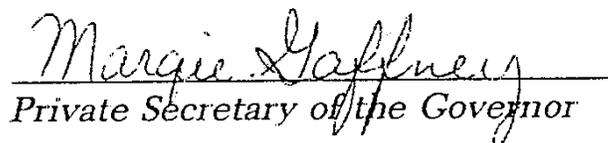
Passed the Assembly September 13, 1991


Chief Clerk of the Assembly

Passed the Senate September 11, 1991


Secretary of the Senate

This bill was received by the Governor this 27th
day of September, 1991, at 1:40 o'clock P.M.


Private Secretary of the Governor

CHAPTER _____

An act to amend Sections 10620, 10621, 10631, and 10652 of, and to add Section 10656 to, the Water Code, relating to water.

LEGISLATIVE COUNSEL'S DIGEST

AB 11, Filante. Urban water management plans.

(1) Existing law requires every urban water supplier serving water directly to customers to, not later than December 31, 1985, prepare and adopt an urban water management plan. Existing law authorizes an urban water supplier indirectly providing water to customers to adopt an urban water management plan or to participate in urban water management planning.

This bill would, instead, require every urban water supplier, whether serving water directly or indirectly to customers, to prepare and adopt an urban water management plan, as prescribed.

(2) Existing law requires the urban water management plan to include a prescribed description of water supply deficiencies.

This bill would delete that provision and would require the urban water management plan to include an urban water shortage contingency plan, as specified. The bill would require each urban water supplier to coordinate the preparation of its urban water shortage contingency plan with other urban water suppliers and public agencies in the area to the extent practicable. The bill would require each urban water supplier, not later than January 31, 1992, to prepare, adopt, and submit to the Department of Water Resources an amendment to its urban water management plan which meets the requirements relating to the preparation of the urban water shortage contingency plan. The bill would make an urban water supplier that does not submit the amendment by that date ineligible to receive drought assistance from the state until the urban water management plan is submitted, as prescribed.

(3) Existing law exempts the preparation and

adoption of urban water management plans from the California Environmental Quality Act.

This bill would exempt the implementation of urban water shortage contingency plans from that act. The bill would provide that the exemption provisions do not exempt specified projects from the requirements of that act.

The people of the State of California do enact as follows:

SECTION 1. Section 10620 of the Water Code is amended to read:

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 after December 31, 1984, 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 urban water shortage contingency plan with other urban water suppliers and public agencies in the area, 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.

SEC. 2. Section 10621 of the Water Code is amended

to read:

10621. (a) Each urban water supplier shall, not later than January 31, 1992, prepare, adopt, and submit to the department an amendment to its urban water management plan which meets the requirements of subdivision (e) of Section 10631.

(b) Each urban water supplier shall periodically review its plan at least once every five years. After the review, it shall make any amendments or changes to its plan which are indicated by the review. Amendments or changes in its plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

SEC. 3. Section 10631 of the Water Code is amended to read:

10631. A plan shall do all of the following:

(a) Include an estimate of past, current, and projected water use and, to the extent records are available, segregate those uses between residential, industrial, commercial, and governmental uses.

(b) Identify conservation measures currently adopted and being practiced.

(c) Describe alternative conservation measures, including, but not limited to, consumer education, metering, water saving fixtures and appliances, lawn and garden irrigation techniques, and low water use landscaping, which would improve the efficiency of water use with an evaluation of their costs and their environmental and other significant impacts.

(d) Provide a schedule of implementation for proposed actions as indicated by the plan.

(e) Provide an urban water shortage contingency plan which includes all of the following elements which are within the authority of the urban water supplier:

(1) Past, current, and projected water use and, to the extent records are available, a breakdown of those uses on the basis of residential single family, residential multifamily, industrial, commercial, governmental, and agricultural use.

(2) An estimate of the minimum water supply available at the end of 12, 24, and 36 months, assuming the

worst case water supply shortages.

(3) 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 which are applicable to each stage.

(4) Mandatory provisions to reduce water use which include prohibitions against specific wasteful practices, such as gutter flooding.

(5) Consumption limits in the most restrictive stages. Each urban water supplier may use any type of consumption limit in its water shortage contingency plan that would reduce water use and is appropriate for its area. Examples of consumption limits that may be used include, but are not limited to, percentage reductions in water allotments, per capita allocations, an increasing block rate schedule for high usage of water with incentives for conservation, or restrictions on specific uses.

(6) Penalties or charges for excessive use.

(7) An analysis of the impacts of the plan 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 to carry out the urban water shortage contingency plan.

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

(f) To the extent feasible, describe the method which will be used to evaluate the effectiveness of each conservation measure implemented under the plan.

(g) Describe the steps which would be necessary to implement any proposed actions in the plan.

SEC. 4. Section 10652 of the Water Code is amended to read:

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 subdivision (e) of Section 10631. 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 subdivision (e) of Section 10631, or any project for expanded or additional water supplies.

SEC. 5. Section 10656 is added to the Water Code, to read:

10656. An urban water supplier that does not submit an amendment to its urban water management plan pursuant to subdivision (a) of Section 10621 to the department by January 31, 1992, is ineligible to receive drought assistance from the state until the urban water management plan is submitted pursuant to Article 3 (commencing with Section 10640) of Chapter 3.

Approved October 13, 1991

Pat Herson

Governor

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APPENDIX G

DRAFT WATER SHORTAGE STAGE RESOLUTION



DRAFT

Resolution No. _____

**A RESOLUTION OF THE CITY COUNCIL OF
THE CITY OF TUSTIN FINDING THE
EXISTENCE OF A WATER SHORTAGE,
ORDERING THE IMPLEMENTATION OF STAGE __ OF
ORDINANCE NO. 1060 AND
ADOPTING A SCHEDULE OF PENALTIES.**

WHEREAS, the Municipal Water District of Orange County and/or Orange County Water District has implemented a mandatory reduction program for its member agencies, including the City of Tustin; and

WHEREAS, the City Council has Ordinance No.1060 to regulate water use and implement water conservation, which provides that the City Council may, upon finding that a water shortage exists, order implementation of a plan which it deems appropriate to address such a water shortage and shall establish a schedule of penalties to be assessed for violation of that plan.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUSTIN AS FOLLOWS:

1. That, for the reasons hereinabove set forth, the City Council hereby finds and determines that a Water Shortage exists in the City of Tustin service area.
2. That the City Council hereby orders implementation of the Water Shortage Contingency Plan, Stage ____, as set forth in Ordinance No. 1060.
3. That the following penalties shall be assessed for violation of the Water Shortage Contingency Plan, including waste of water and excessive use, as follows:
 - 1) Stage 1 Violation – Written notice from City to violator.
 - 2) Stage 2 Violation – Citations will be issued to violators. The first violation by any violator shall subject the violator to a fine of \$25. A second violation will result in a fine of \$35. A third violation will result in a fine of \$45. A fourth violation will result in a fine of \$55.
 - 3) The fifth violation allows the City to install a flow restricting device in the customer’s water service line for a period not less than 48 hours and until the customer satisfies the City that the failure to comply will not continue. The charge for installing and removing the flow restricting device shall be \$65 and shall be paid by the customer prior to removal.
 - 4) For the sixth and each subsequent violation, the City may discontinue water service for a period of not less than 24 hours and until the customer satisfies the City that the failure to comply will not continue. The customer shall pay \$70 for restoration of water service.

PASSED AND ADOPTED by the City Council of the City of Tustin this __ day of _____, 20__

MAYOR OF THE CITY OF TUSTIN

ATTEST:

CITY CLERK

APPENDIX H

INDIVIDUALS AND ORGANIZATIONS CONSULTED



City of Tustin Water Services

- Art Valenzuela, Treatment Superintendent
- Brian McNamara, Distribution Superintendent
- Victor Sagredo, P.E., Associate Engineer
- Fred Adjarian, Water Services Manager
- Tim Serlet, P.E., Director Public Works/City Engineer

Municipal Water District of Orange County

- Karl Seckel, P.E., Assistant General Manager
- Joe Berg, Conservation Coordinator

Orange County Water District

- Roy Herndon, Hydrologist
- John Kennedy, Assistant General Manager
- Bill Everest, Project Manager

East Orange County Water District

- Bill Redcay, General Manager
- Harvey Gobas, District Engineer
- Denise Dobson, Administrative Assistant

Metropolitan Water District of Southern California

- Brandon Goshi, Manager, Resource Analysis Unit, Water Resource Management Group
- Gary Tikian, Resource Analysis Unit, Water Resource Management Group
- Michael Hurley, Water Resource Management Group

California Department of Water Resources

- David Todd, Land and Water Use Program Manager, Office of Waste Use Efficiency and Transfer

Orange County Sanitation District

- Nick Arhontes, Manager, Collection Facilities Operation and Maintenance and Facilities Services

City of Tustin

300 Centennial Way, Tustin, CA 92780
(714) 573-3000

